

COTTONWOOD CREEK WATERSHED ASSESSMENT



CH2MHILL

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1. INTRODUCTION



Introduction

General Description

The Cottonwood Creek drainage area lies within Shasta and Tehama counties on the north-west side of northern California's Central Valley. The lower two-thirds of the drainage area lie in Central Valley uplands, and the upstream portion includes the east slope of the North Coast Mountain Range and Klamath Mountains and the southern slopes of the Trinity Mountains. The creek flows eastward through the valley to the Sacramento River, the confluence lying approximately 16 miles north of Red Bluff and about 150 miles northwest of Sacramento. The pear-shaped watershed has three main tributaries: North Fork, Middle Fork (flowing along the Shasta-Tehama County line), and South Fork. The watershed drains approximately 938 square miles. With an annual runoff of 586,000 acre-feet (ac-ft), Cottonwood Creek is the third largest watershed tributary west of the Sacramento River and the largest undammed watershed in the northern Central Valley. The community of Cottonwood, at the lower end of the watershed, is the most developed area of the watershed, although there are also notable communities in other regions of the watershed, including Platina and Igo/Ono.

In many ways, Cottonwood Creek is typical of watersheds along the west side of the Sacramento Valley. Relatively low elevations limit the amount of snowpack that can accumulate in any given year, which reduces seasonal storage and produces a hydrology with abrupt swings closely correlated to storm events. The watershed has a large amount of open space and provides habitats for a wide array of species, including some notable threatened and endangered species such as the northern spotted owl and the spring-run chinook salmon (*Oncorhynchus tshawytscha*).

Several important features distinguish the Cottonwood Creek watershed from others in the valley. Watershed runoff is flashy: high in the rainy seasons and low in the dry seasons. This pattern is particularly pronounced in Cottonwood Creek because there is very little recharge to aquifers in the upper watershed, which reduces the potential for intra-annual storage. The most heavily populated portion of the drainage is the region surrounding the community of Cottonwood, population 2,960. The remainder of the watershed is rural, which has helped the watershed avoid impacts typically associated with development. There are no large water development projects, nor any comprehensive flood control efforts or other attributes of urbanized watersheds. Cottonwood Creek watershed is a working watershed with large tracts of harvestable timber in the upper reaches, grazing land in the middle reaches, and gravel mining operations in the lower reaches of the creek. This combination of factors creates a number of challenges and opportunities for future management of the watershed.

Hydrology

The hydrology of Cottonwood Creek is typical of watersheds found along the west side of the Sacramento Valley. The lack of elevation along the upper rim of the watershed limits the

amount of snowpack that can accumulate in any given year, thus there is less time between precipitation events and subsequent runoff than there might be in watersheds with greater intra-annual storage capacity. The overall lack of storage in the watershed results in runoff with pronounced seasonal characteristics. The baseflow component of runoff is generally small, with the majority of flows directly attributable to storm events. Groundwater development is largely limited to the alluvial area near the confluence with the Sacramento River. Although there is a fair amount of hydrologic data available on watershed factors, it has not generally been collected on a watershed scale. Thus, additional data may need to be collected prior to undertaking project-level planning efforts or comprehensive watershed-level plans.

There are a number of summary reports and substantial raw data available on various hydrologic topics in the watershed. The hydrology of Cottonwood Creek demonstrates extreme seasonal variability typical of westside tributaries to the Sacramento River and is a source of flood flow in the Sacramento River between Shasta Dam and Ord Ferry. The watershed has been the subject of several water supply studies and may potentially be the subject of additional studies in the future, but is not currently considered a likely location for foreseeable surface-water projects.

There are a number of watershed-based projects that may be considered in the future that attempt to improve management of watershed resources. Issues that may be addressed in the future include flood control, fishery resources, erosion, riparian habitat, groundwater, and land use. In some cases, there may be sufficient hydrologic data to allow site-specific projects to proceed. However, in many cases it is likely that additional site-specific data may be needed.

Sediment and Fluvial Geomorphology

Cottonwood Creek is the largest undammed tributary in the upper Sacramento River with natural hydrologic and sediment characteristics. After Cache Creek, Cottonwood Creek provides the largest sediment input to Sacramento River (CALFED, 1997). The high natural sediment and gravel yield is a result of recent tectonic uplift combined with erodible geologic formations. Human activity has exacerbated erosion rates (California Department of Water Resources [DWR], 1992; 1994). The increased sediment loads from Cottonwood Creek may adversely affect water quality, freshwater fishery, and navigation as far away as the Sacramento-San Joaquin Delta. Gravel mining significantly reduces the gravel supply to the Sacramento River (DWR, 1992).

The sediment and gravel resources of Cottonwood Creek provide benefits ranging from economic to environmental. The current use of the land and sediment resources of Cottonwood Creek are not mutually beneficial and should be reviewed and optimized. For instance, improved land use practices could reduce suspended sediment levels in the creek, which would increase fish spawning habitat and decrease the amount of unwanted fine material in gravel extraction, and better protect lands from undesirable erosion.

Soil Resources

The soil associations portrayed in the State Soil Geographic Soil Types (STATSGO) database describe a highly diverse assemblage of soil resources throughout the Cottonwood Creek

watershed (U.S. Department of Agriculture, 1994.). Other than site-specific studies related to the proposed reservoirs, and selected management activities in the watershed, there is little information on the relationship of the soil resources to site productivity and/or erosion issues.

Water Quality

Surface-water and groundwater monitoring has been ongoing in Cottonwood Creek since the early 1950s. The majority of the monitoring stations have been maintained by both DWR and U.S. Geological Survey (USGS), and are generally located in the mid-eastern section of the watershed.

The water quality of Cottonwood Creek is generally considered good from a drinking water standard perspective. There is some concern regarding the South Fork's regular contributions of suspended sediments and turbidity to the mainstem. It is likely that the source of elevated water-quality measurements in the mainstem were caused by the water flows from the South Fork.

An additional study of the specific water-quality characteristics of the South Fork may be needed to develop more detailed information regarding the source or sources of turbidity in the South Fork. Identifying the causes may lead to development of solutions to the elevated turbidity in the South Fork and help determine whether there are other constituents of concern that should be considered.

Vegetative Cover

Over 40 percent of the watershed is classified as Blue Oak/Gray Pine. Other major vegetative classifications include Chaparral (16 percent), Annual Grassland (13 percent), Douglas Fir/True Fir (15 percent), and Mixed Conifer (10 percent). These percentages are reflective of the geography of the watershed—relatively steep ridges with a broad, flat center, as well as a basically undeveloped open space. It is difficult to ascertain whether land use has affected the relative abundance of major vegetative covers in the watershed; however, it is likely that oak woodland has decreased in recent time.

Although, there is adequate information available on the current types of vegetation, the information necessary to characterize historical vegetation within the watershed is limited. Additional studies into the historical changes that have occurred to vegetation would assist current land management decisions.

Fishery Resources

The Cottonwood Creek watershed currently remains relatively undeveloped and continues to provide suitable habitat for anadromous and resident fish. Environmental factors including hydrology, stream temperature, channel morphology, gravel recruitment, and access allow Cottonwood Creek to support significant fish populations on a seasonal and year-round basis (Resource Management International, Inc. [RMI], 1987). Beegum Creek, tributary to the Middle Fork, has recently received attention as an important habitat for spring-run chinook salmon.

Currently, CCWG has submitted a grant application to CALFED requesting funding for the establishment of a fish monitoring program. The fish monitoring program would monitor

populations and correlate fish presence with flow and water temperature parameters. Funding of the fish monitoring project would establish a baseline of information against which future projects could be evaluated.

Additionally, the actions recommended in the AFRP Final Restoration Plan should be reviewed from a landowner and stakeholder perspective. AFRP actions were established to meet population goals, and initiation of the actions may preclude future regulatory efforts in the basin regarding fisheries.

Wildlife Resources and Habitat Types

The Cottonwood Creek watershed provides an array of wildlife resources and habitat types that reflect the diversity of landscapes and disturbance mechanisms. A combination of climate, slope, aspect, and soil characteristics has resulted in a variety of habitats situated within the diverse geographic setting.

The information available for wildlife resources and their habitat elements is general in nature for large components of the watershed. Where actions have been proposed, or activities conducted, specific studies have been conducted to address the needs of these projects. Likewise, future projects will likely require individual studies of local wildlife characteristics.

Special-status Species

Several species of note are afforded special status in the Cottonwood Creek watershed. These include the spring-run chinook salmon, northern spotted owl, and California red-legged frog. It is possible that these species may require additional management actions in the foreseeable future. In order to better understand the importance of the watershed to the long-term survival of these species, it is likely that more detailed studies will be necessary.

Special-status species in the Cottonwood Creek watershed have likely declined in numbers since settlement of the area by people of European descent. It is probable that these local declines are proportional to the regional declines in these populations; there is no available information to suggest that declines of any special-status wildlife or plant species are particularly pronounced in the Cottonwood Creek watershed.

Riparian Communities

A number of distinct riparian communities can be found throughout the Cottonwood Creek watershed. These communities represent particularly dynamic portions of the landscape, and are shaped by disturbance characteristics of the ecosystems surrounding them, such as fire and wind. Riparian communities are also susceptible to disturbance processes unique to stream systems, including channel erosion, peak flows, and deposition resulting from floods and mass wasting events. The dynamic equilibrium that defines a riparian community can be observed in a number of locations within the watershed.

Generally, it can be concluded that a number of factors have contributed to change in riparian communities throughout the watershed. As described in earlier sections, these changes can be attributed to dynamic response to ecological elements including fires, floods, and droughts. There is minimal documentation available to quantify the changes in the riparian areas from 1800 to 1975. Observations of riparian ecosystems in other westside streams sug-

gest that the pattern of settlement and resource utilization in the watershed has affected these communities in some respects (DWR, 1992).

Land Use

In general, agriculture, timber, and federal lands cover the largest percentage of the land area within the watershed; and these three categories also make up the primary economic land use classifications within the watershed. For example, each county is a significant contributor to the agricultural industry that thrives in the valley, and the agriculture industry provides a large percentage of the respective county's economic base. The timber industry is also a major contributor to the economic growth of the counties. In addition, large portions of land within each county are federally owned and are used for a variety of economic, environmental, and recreational purposes.

Digitizing and standardizing land use information would greatly enhance the ability to make informed land use decisions in the watershed.

Objective

The purpose of the Cottonwood Creek Watershed Assessment is to gather and integrate existing information on the present and historical environmental and land use conditions within the Cottonwood Creek watershed. This represents the first comprehensive effort to document the state of information available in the entire watershed. In many cases the scale of the watershed proved problematic. Information gathered for past studies was often intended to address relatively narrow areas of interest. Where possible, these smaller pieces of information have been assembled together to present a mosaic of the watershed, which lacks a uniform degree of detail. General pictures of the watershed are presented for a number of resource areas and, where possible, in the context of trends. In many cases, supplemental studies are needed as there is insufficient information available to adequately characterize the watershed. This report does not present management recommendations for the Cottonwood Creek watershed; rather, it focuses on prior studies and suggests avenues for further study that may be useful to watershed managers and stakeholders.

The specific objectives of this project are:

- Compile, assemble, and integrate data into a format compatible for use in Geographic Information Systems (GIS), electronic databases, and appropriate watershed modeling software.
- Assemble a library of hard-copy reports and studies to complement and support the electronic database.
- Conduct a thorough review of the available hard-copy and electronic information and generate a report with maps (as appropriate) that describes and illustrates the current and historical conditions (for each of the focus items) in the watershed. Identify gaps in the current database.
- Provide recommendations on how to obtain and integrate the additional data needed to characterize the watershed and for subsequent phases of the watershed assessment.

Scope

Information collected from previous studies has been organized according to a five-step process, consistent with the goal of the CALFED Watershed Program, to promote collaboration and integration among community-based watershed efforts. Further, this Watershed Assessment is intended to assist the efforts of the Cottonwood Creek Watershed Group (CCWG) in maintaining a viable stakeholder-driven instrument for accessing and implementing watershed-based projects and management. The basic approach to data collection and organization follows:

- Step 1 - Characterization of the Watershed
- Step 2 - Description of Current Conditions
- Step 3 - Description of Reference (historical) Conditions
- Step 4 - Synthesis of Information
- Step 5 - Conclusions and Recommendations

Information collected and organized in this report has been developed in collaboration with the CCWG Board of Directors and the Technical Advisory Committee.

Background

CALFED, in its Ecosystem Restoration Program Plan (CALFED, 1997), has established a vision for the upper and lower Cottonwood Creek ecological units. Specifically, the ERPP notes the desirability of “restoring gravel recruitment, cleansing and transport” in the upper reaches of the watershed while seeking to “restore, reactivate and maintain natural sediment supply, gravel recruitment and stream meander” in the lower watershed. The ERPP notes that these desired conditions can best be implemented by developing and implementing a local watershed management plan. CCWG has undertaken the primary responsibility for developing and implementing this watershed plan. This Watershed Assessment represents an early step toward achieving that goal.

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2. HYDROLOGY



SECTION 2

Hydrology

The hydrology of Cottonwood Creek is typical of watersheds found along the west side of the Sacramento Valley. The lack of elevation along the upper rim of the watershed limits the amount of snowpack that can accumulate in any given year, thus there is less time between precipitation events and subsequent runoff than there might be in watersheds with greater intra-annual storage capacity. The overall lack of storage in the watershed results in runoff with pronounced seasonal characteristics. The baseflow component of runoff is generally small, with the majority of flows directly attributable to storm events. Groundwater development is largely limited to the alluvial area near the confluence with the Sacramento River. Although there is a fair amount of hydrologic data available on watershed factors, it has not generally been collected on a watershed scale. Thus, additional data may need to be collected prior to undertaking project-level planning efforts or comprehensive watershed level plans.

Setting

The Cottonwood Creek drainage area lies within Shasta and Tehama counties on the north-west side of Northern California's Central Valley. The lower two-thirds of the drainage area lies in Central Valley uplands, and the upstream portion includes the east slope of the North Coast Mountain Range and Klamath Mountains and the southern slopes of the Trinity Mountains. The creek flows eastward through the valley to its confluence with the Sacramento River, occurring approximately 16 miles north of Red Bluff and about 150 miles northwest of Sacramento. The pear-shaped watershed has three main tributaries: North Fork, Middle Fork (flowing along the Shasta-Tehama County line), and South Fork. The stream geometry map shows the main tributaries of Cottonwood Creek within the watershed (see Figure 2-1). The South Fork and its tributary Cold Fork are the main drainage ways for the southern half of the watershed; and the Middle Fork, and its tributary Beegum Creek, and North Fork are the main drainage ways for the northern half. The watershed area consists of approximately 938 square miles (DWR, 1992) and is the third largest watershed tributary west of the Sacramento River. Table 2-1 provides a simple hydrologic overview of Cottonwood Creek.

Current Hydrologic Regime

The following provides a brief overview of the overall hydrology of Shasta and Tehama counties. General climate information is recorded on a county-by-county basis rather than on a watershed basis. County information is provided to establish the range of climatic characteristics that may be found in the watershed.

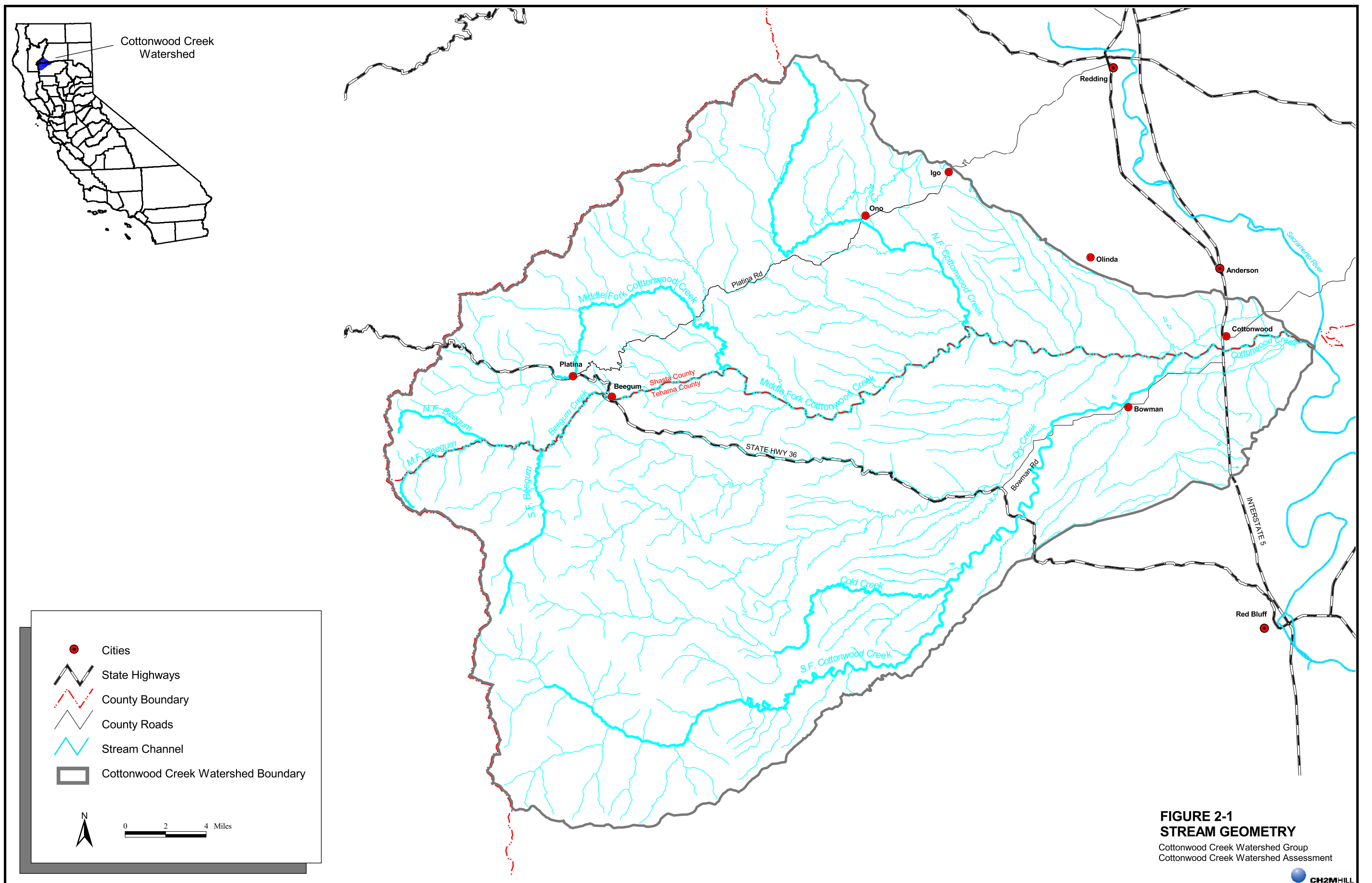


TABLE 2-1
 Hydrologic Overview of Cottonwood Creek
Cottonwood Creek Watershed Assessment

Description	Unit
Area	938 square miles
Gage Area	927 square miles
Headwater Elevation	7,860 feet
Mean Rainfall	36 inches
Mean Discharge	860 cfs
Stream Length	68 miles
10-year Flood	50,000 cfs
100-year Flood	93,000 cfs

Source: DWR. 1992.
 cfs = cubic feet per second.

Shasta County

The climate varies across the county. The Sacramento Valley and the foothill area have a Mediterranean climate with hot, dry summers and moist, cool winters. The mountainous portion is generally cooler than the valley floor.

The average annual temperature is 62 degrees Fahrenheit (°F) in Redding and 50° to 60°F in the mountains. The average high temperature in July is 98°F, and the average low is 65°F. The average high temperature in December is 53°F, and the average low is 35°F.

Precipitation ranges from 39 inches annually in the valley to less than 20 inches in portions of the northeast, and averages 80 inches in the northwest. Moderate to heavy snowfall can be found at 3,500 feet. Fog is a common winter element below 1,000 feet. Relative humidity in the summer is less than 30 percent during the day and rises to about 50 percent at night. Winter humidity usually exceeds 50 percent.

Tehama County

The average annual temperature in Red Bluff is 63°F. Summer temperatures in the valley portions of Tehama County are typically high, with July temperatures in Red Bluff averaging 98°F. Winter low temperatures vary from 17°F in the valley to -10°F in mountainous areas. The average high temperature in December is 53°F, and the average winter low is 38°F. Frost-free days range from slightly over 250 in the region just west of Red Bluff to 75 days in the eastern part of the county.

Annual precipitation varies from less than 20 inches near Red Bluff to more than 70 inches in the surrounding mountains. Most of the precipitation occurs between November and April. Major winter storms often result in intense precipitation over a short duration. The pattern is one of large cyclic storms in the winter and infrequent thunderstorms in the summer. On the valley floor, average annual snowfall is 1 to 3 inches. The upper western portion of Cottonwood Creek receives some snow in the winter, approximately 50 to

70 inches (Clements, 1985). The lower edge of the normal semi-permanent snow pack is at Elevation 5000 feet.

Description of the Cottonwood Creek Watershed Area

Cottonwood Creek is a perennial stream that drains the northeastern slopes of the Coast Range and the southeastern slopes of the Trinity Mountains. The drainage area is 45 miles long and 40 miles wide, and encompasses approximately 938 square miles. Average annual precipitation in the watershed is approximately 36 inches (DWR, 1992). The mainstem Cottonwood Creek is about 20 miles long. Cottonwood Creek, and its three main forks are more than 100 miles long. See Table 2-2 for the average annual flow of the main tributaries.

North Fork

North Fork Cottonwood Creek begins in southwestern Shasta County, 10 to 20 miles west of Anderson, California. It drains the northern portion of the watershed and joins the mainstem Cottonwood Creek approximately 28 miles from its confluence with the mainstem. It has a maximum elevation of approximately 5,720 feet. The USGS streamflow gaging station on this fork is No. 11375700 and is located near Igo. The average annual flow in the North Fork is 165 cfs. Rainbow Lake, a manmade surface impoundment, is located approximately 5 miles northwest of the Town of Ono. The reservoir was formed in 1920 with the construction of a 96-foot-high dam called Misselbeck Dam. For a more complete discussion of the dam see the Surface-water Development section of this document.

Middle Fork

The Middle Fork originates on the east slope of the Coast Range at an altitude of about 7,860 feet, approximately 4 miles west of Platina. It runs eastward for about 30 miles from the lowermost portion of the Klamath Mountains to the junction where it joins the North Fork. The USGS sampling station on Middle Fork is No. 11374400 and is located about 0.5 mile upstream from the Middle Fork Cottonwood Creek/Cottonwood Creek confluence at Elevation 550 feet. The average annual flow in the Middle Fork is 266 cfs. Studies of streamflow data indicate that the primary source of flow gains of Cottonwood Creek downstream from the mouth of South Fork is from tributary inflow and irrigation-return flow (Blodgett et al., 1992).

Beegum Creek is a major tributary to the Middle Fork Creek. The North, Middle, and South forks of Beegum Creek originate in the easternmost portion of the Trinity National Forest and converge to form the mainstem of Beegum Creek before entering a remote, steep-sided canyon known as Beegum Gorge. The gorge is about 7.5 miles long and terminates at the Highway 36 bridge. Beegum Creek flows about 10 more miles downstream from the gorge before entering Middle Fork.

South Fork

The South Fork Cottonwood Creek originates in the crest of the Yolla Bolly Mountain Range and reaches an elevation of approximately 7,900 feet in the wilderness. The South Fork is approximately 56 miles long and joins the mainstem Cottonwood Creek approximately 9 miles upstream from the confluence with the Sacramento River and about 10 miles

downstream from the confluence of the Middle and North forks. South Fork drains 397 square miles and comprises approximately half of the acreage in the entire watershed. The South Fork sampling station is No. 11375820, and is located about 10 miles upstream from its junction with the mainstem Cottonwood Creek at Elevation 525 feet. Another station, 11375870-South Fork Cottonwood Creek near Olinda, is also used as a streamflow gaging station. The average annual flow measured at each station in the South Fork is 213 to 322 cfs, respectively.

In 1959, McCartney Dam was removed from South Fork Cottonwood Creek (California Department of Fish and Game [CDFG], 1961). The dam was located 1 mile west of Oxbow Bridge below Maple Gulch. South Fork has a tributary known as Slides Creek, which flows through a huge landslide in the Yolla Bolly Middle-Eel Wilderness. Another tributary to South Fork is Cold Fork, which also originates above the Yolla Bolly-Middle Eel Wilderness, flows through the lower part of the watershed, and meets South Fork approximately 12 miles from the South Fork/Middle Fork confluence.

Cottonwood Creek

The main basin sampling Station No. 11376000–Cottonwood Creek near Cottonwood—is located approximately 2 miles upstream from the mouth of the Sacramento River. The gage station is at Elevation 364 feet with a drainage area of approximately 927 square miles. Table 2-2 shows the average annual flow of the USGS gaging stations, and their locations, on all of the main tributaries.

TABLE 2-2
Summary of Gaging Data^a
Cottonwood Creek Watershed Assessment

USGS Gaging Station No.	Location	Average Annual Flow (cfs)	Period of Record (years)	Gage Area (mi ²) ^b
11375700	North Fork near Igo	165	1957-1980	89
11374400	Middle Fork, 0.4 miles upstream of Middle Fork Cottonwood Creek/Cottonwood Creek confluence	272	1957-1975	244
11375800	South Fork, 10 miles upstream of South Fork Cottonwood Creek/Cottonwood Creek confluence	221	1963-1978	217
11375870	South Fork near Olinda	326	1976-present	371
11376000	Cottonwood Creek near Cottonwood	860	1941-present	927

^aDWR, 1992.

^bmi² = square miles

Topography

The Cottonwood Creek watershed area ranges between an elevation of 150 feet at the confluence of the mainstem and the Sacramento River, to a peak elevation of approximately 8,000 feet in the Shasta-Trinity National Forest. Long, steep ridges extend along the southwest, west, and northwest of the watershed. The valley has some rolling hills and foothills near the South Fork and mainstem near the mouth of Cottonwood Creek. Figure 2-2 shows the contours throughout the majority of the watershed.

Water Development

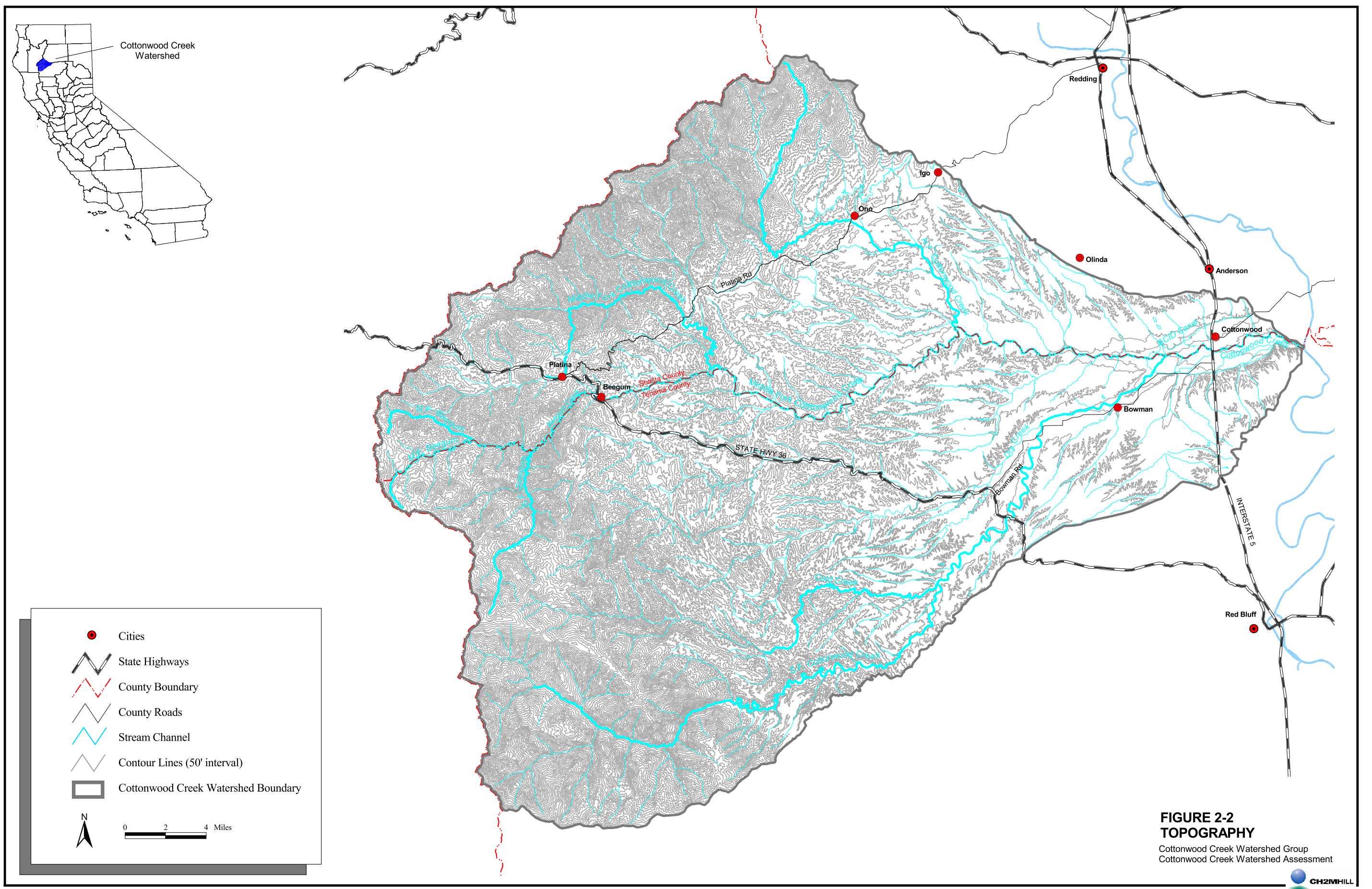
Surface-water Development

Rainbow Lake is the only major reservoir in the Cottonwood Creek drainage area. The lake was formed when the Misselbeck Dam was built on North Fork in 1920. The capacity of the lake is 4,800 ac-ft. It is used for flood control, and provides municipal and agricultural supplies for Igo-Ono communities and the surrounding area. The dam is owned and operated by the Igo-Ono Community Services District. The Igo-Ono Community Services District encompasses about 8,500 acres (DWR, 1989). An annual average of 550 ac-ft of water was delivered to customers of the water company in the district between the years 1982 and 1987. The maximum delivery was 600 ac-ft in 1984, with a minimum of 500 ac-ft in 1983 (DWR, 1989).

Structurally, the dam is a hydraulic fill, with a length of about 1,110 feet and a width that varies from 20 feet at the crest to approximately 600 feet at the toe. The discharge capacity of the spillway of the dam is about 16,000 cfs (Vleck et al., 1989). During the 1990 geotechnical investigation and stability evaluation of the dam by the Division of Safety of Dams (DSOD), two problems were mentioned regarding the continued operation of the dam: siltation at the dam outlet and erosion at the spillway. It was noted that these two problems would have to be corrected prior to DSOD allowing unrestricted operation of the dam. Both problems have since been corrected (DWR, 1990).

The Anderson-Cottonwood Irrigation District's (ACID) canal diverts irrigation water from the Sacramento River in Redding. The gravity-fed diversion is developed from a seasonal dam that is placed across the river just upstream of the Market Street Bridge in the city of Redding. Average daily ACID irrigation demand is approximately 300 cfs during the period from April through October. As shown in Figure 2-2, the canal flows in a southern direction and enters the watershed just north of the Town of Cottonwood. The canal enters into a siphon on the north bank of Middle Fork, and crosses underneath the creek approximately 1 mile upstream of the Middle Fork/South Fork confluence. The canal then continues southeast, and crosses the South Fork approximately 1 mile upstream of the Middle Fork/South Fork confluence. It has been speculated that irrigation return flow, and leakage from the canal contributes to both groundwater and surface flow in Cottonwood Creek and its tributaries. This seepage may also influence water temperatures in this reach of the creek (Swearingen, 2001, pers. comm.).

Phase I (planning and feasibility study) of a major water project, the Cottonwood Project, had been carried out by the United States Army Corps of Engineers (USACE) under the federal Flood Control Act of 1970. In the early 1970s, the USACE produced a draft general design memorandum for the construction of two dams and reservoirs on the mainstem



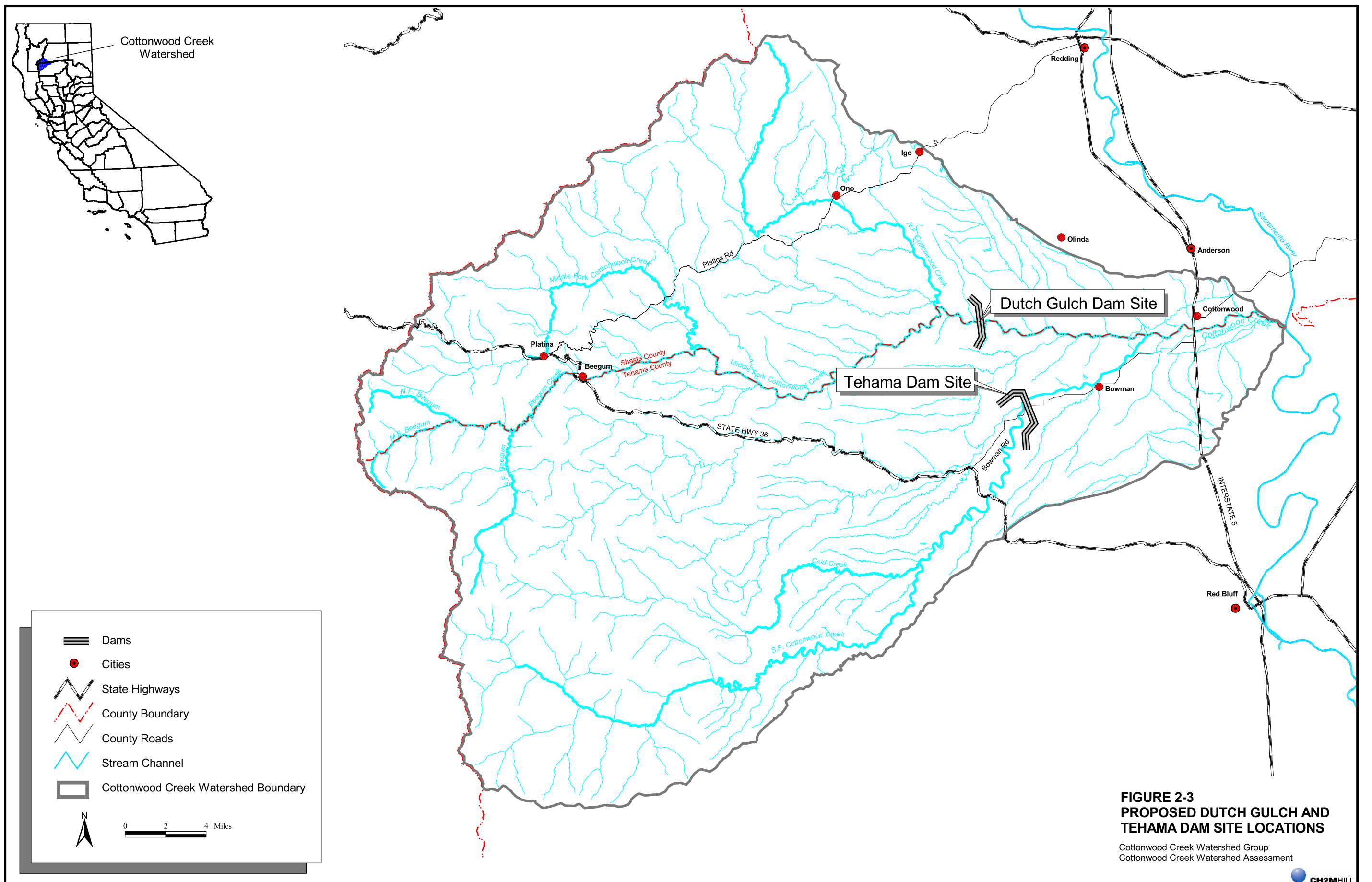
Cottonwood Creek and South Fork. The project objective was to assist flood control, supply 180,000 to 205,000 ac-ft of water to the State Water Project (SWP) annually, enhance in-stream fishery use, and provide potential hydropower generation. The project mainly focused on two potential reservoir sites: Dutch Gulch and Tehama reservoirs (See Figure 2-3 for the proposed dam locations). Dutch Gulch Reservoir was proposed for the mainstem Cottonwood Creek and would receive runoff from North Fork and Middle Fork, and Tehama Reservoir was proposed for the South Fork and would receive runoff from South Fork Cottonwood Creek and its tributary Cold Fork. Dutch Gulch would provide 1,100,000 ac-ft of storage and would have a surface area of 12,700 acres, with a maximum dam height of 268 feet above the streambed. Tehama Reservoir would provide 900,000 ac-ft of storage and would have a surface area of 12,200 acres with a maximum dam height of 238 feet above the streambed.

By the time USACE completed the Phase I plan of the reservoir development in 1981, because of inflation and increasing interest rates, the project cost had increased over four times the original estimated amount. The USACE General Design Memorandum in May 1983 showed an additional increase in cost, which pushed the cost of water in the reservoirs to near \$400 per ac-ft. The SWP contractors announced that they could not afford the water supply at that price, and USACE was asked to reanalyze the project. In May 1985, DWR announced the withdrawal of SWP participation in the authorized USACE project and expressed the intent to continue evaluation of other projects such as Hulen, Fiddlers, and Dippingvat (DWR, 1987).

While USACE was reanalyzing their previous study for the proposed Dutch Gulch and Tehama reservoirs, DWR was conducting an analysis using the same design and economic criteria. The results of the DWR study showed that a combination of three tributary reservoirs, Hulen, Fiddlers, and Dippingvat could be built for approximately half the cost of the Dutch Gulch and Tehama reservoirs. The Dippingvat Dam and Reservoir would have been located on the South Fork about 20 miles west of Red Bluff, just inside of the southern watershed boundary. The proposed dam was to be a 256-foot-high roller-compacted concrete structure with a crest at Elevation 1226 feet and a length of 1,000 feet. The gross capacity of the reservoir would have been 104,000 ac-ft, with a water-surface area of 1,260 acres and a drainage area of 132 square miles. After the Dippingvat Feasibility Study was approved, DWR decided not to publish additional information regarding the study, and the project was never carried out to completion (DWR, 1987). These reservoir projects were recently reviewed as part of the CALFED Storage and Conveyance Component Inventories but were not recommended for further consideration in the CALFED Record of Decision (CALFED, 1997; 2001).

Groundwater Development

Most of the recorded historical groundwater development in the watershed was initiated during the planning phase of the proposed construction of the Dutch Gulch and Tehama reservoirs. Currently, the majority of the groundwater development in the watershed is for domestic and agricultural purposes.



Information regarding groundwater, its source, storage, quality, and susceptibility within the watershed was used as a component of the reservoir planning study. Groundwater investigations were conducted by USGS and was based on data collected by several agencies including DWR, U.S. Bureau of Reclamation (USBR), and previous USGS studies.

The reservoir studies developed a comprehensive network of observation wells in the watershed, although there is not a current effort to corroborate information collected from the wells. Two hundred wells were inventoried for groundwater sampling; 100 of those wells were selected for groundwater-level monitoring, and 50 were selected for water-quality monitoring during autumn 1982 (Evenson and Kinsey, 1985; Fogelman and Evenson, 1985). Most of the monitoring wells are domestic wells with 100- to 200-foot-deep penetrating layers of gravel and clay. The shallowest and deepest wells are the ones located along the borders of the monitoring area.

Of the 100 wells that were selected for monitoring, 97 are currently being used, 94 measure monthly and 3 measure continuous records. The results of the monitoring showed that the water level responds quickly to precipitation in the basin—low in September through November, high in December through March, and decreases in April through July.

Precipitation and Runoff

Climatic conditions in the Cottonwood Creek watershed are determined by the Pacific Coast air pressure areas and the topography of local mountains and valleys. Winter storms originating off the Coast move inland, dropping their precipitation as they encounter the higher mountain masses and lower valley depressions (Uniconsult, Inc., 1963). The precipitation varies considerably with altitude (i.e., increases with elevation), particularly in the western and northern part of the Sacramento Valley. Annual precipitation ranges from 25 inches at lower elevations (near the Town of Cottonwood) to 65 inches at higher elevations (near the Bully Choop Mountain) near the northwest edge of the watershed. Average annual precipitation for the entire basin is 37 inches (CDFG, 1978) and generally occurs from November to April. The portion of the western Sacramento Valley where Cottonwood Creek lies receives approximately 31 to 42 inches of rainfall annually, which occurs mostly as low-intensity winter and/or spring rain or snow.

Streamflow is very responsive to precipitation, and the runoff pattern follows the seasonal distribution. Snow is common in the small uppermost portion of mountains in the watershed area (where elevation exceeds 5,000 feet) but melts by early spring. Extremely cold storms can bring the snow level to lower elevations in the watershed, but these are rare events (DWR, 1992). Table 2-3 gives a list of existing DWR precipitation stations located within the watershed. Precipitation data for those individual stations can be extracted from the DWR web site (<http://cdec.water.ca.gov>).

Streamflow Gaging Stations and Records

Cottonwood Creek has a natural flow pattern of high flows in the winter and low flows in the summer and fall. This is typical of many Sacramento Valley streams that originate in the foothills rather than at higher elevations in the Cascade or Sierra Nevada ranges. In low-rainfall years, flows average 40 to 80 cfs in the summer and fall, and 400 to 800 cfs in the winter. Average winter monthly flows in the driest years reach 50 to 150 cfs, and in the wettest years, flows in winter average 5,000 to 11,000 cfs.

TABLE 2-3

California Department of Water Resources Precipitation Monitoring Stations
Cottonwood Creek Watershed Assessment

Station ID	Latitude	Longitude	Nearest City	Operator	Elevation	Period of Record
BKR	40.2830°N	122.3730°W	Cottonwood	CDF	700 ft	January, 1984 to present
COT	40.3870°N	122.2390°W	Cottonwood	DWR	364 ft	February, 1995 to present
CTN	40.3170°N	122.8810°W	Beegum	USBR	3400 ft	January, 1989 to present
DVR	40.3500°N	122.4500°W	Cottonwood	USBR	550 ft	December, 1994 to present
HRR	40.3670°N	122.9670°W	--	USFS	2750 ft	October, 1941 to present
OGO	40.423°N	122.7370°W	Redding	DWR	1300 ft	January, 1987 to present
SAD	40.1670°N	122.8000°W	Red Bluff	DWR	3850 ft	January, 1987 to present

^a<http://cdec.water.ca.gov/staInfo.html>

USFS = U.S. Forest Service

Table 2-4 lists all the stations located within the watershed and their corresponding period of record. Most of the streamflow records listed in the table are of relatively short duration. These records represent both USGS stations (measuring streamflow) and DWR stations (measuring precipitation) for the entire creek. Figure 2-4 shows the location of USGS and DWR sampling stations in the watershed.

TABLE 2-4

Streamflow Stations and Record
Cottonwood Creek Watershed Assessment

Station ID	Station Name	Latitude	Longitude	Hydrologic Unit	Administrative Agency	County	Basin Name	Period of Record
11374300	Arbuckle Mtn Pp Nr Platina CA	40°24'35"	122°52'52"	18020113	USGS	Shasta	Cottonwood Headwaters	Nov 97 - Jun 99
11374305	MF Cottonwood C below Div to Arbuckle Mtn Pp CA	40°24'39"	122°52'28"	18020113	USGS	Shasta	Cottonwood Headwaters	Nov 97 - Jun 99
CTN	Cottonwood C (USBR)	40°19'1.2"	122°52'52"	0	USBR	Tehama	Cottonwood Creek	n/a
11375500	NF Cottonwood at Ono CA	40°28'20"	122°37'20"	18020113	USGS	Shasta	Cottonwood Headwaters	Oct 07 - Sept 13
11375700	NF Cottonwood C Nr Igo CA	40°26'32"	122°32'57"	18020102	USGS	Shasta	Lower Cottonwood	Oct 56 - Sept 80
11374400	MF Cottonwood C Nr Ono CA	40°22'03"	122°34'19"	18020102	USGS	Shasta	Lower Cottonwood	Oct 56 - Sept 75
11375810	Cottonwood C Nr Olinda CA	40°23'06"	122°28'31"	18020102	USGS	Shasta	Lower Cottonwood	Aug 71 - Sept 86
DVR	Davis Ranch	40°21'00"	122°27'00"	0	USBR	Tehama	Cottonwood Creek	n/a
11375870	SF Cottonwood C Nr Olinda CA	40°19'34"	122°26'40"	18020102	USGS	Shasta	Lower Cottonwood	Nov 76 - Sept 86
11375820	SF Cottonwood C Nr Cottonwood CA	40°18'59"	122°26'52"	18020102	USGS	Tehama	Lower Cottonwood	Oct 62 - Sept 78

TABLE 2-4
Streamflow Stations and Record
Cottonwood Creek Watershed Assessment

Station ID	Station Name	Latitude	Longitude	Hydrologic Unit	Administrative Agency	County	Basin Name	Period of Record
BKR	Baker	40°16'59"	122°22'23"	0	CA Dept of Forestry	Tehama	Cottonwood Creek	n/a
11375900	SF Cottonwood C A Evergreen Rd Nr Cottonwood CA	40°21'45"	122°20'18"	18020102	USGS	Tehama	Lower Cottonwood	Oct 81 - Sept 85
11375815	Cottonwood C Ab SF Nr Cottonwood CA	40°22'19"	122°20'17"	18020102	USGS	Tehama	Lower Cottonwood	Oct 81 - Sept 85
CWA	Cottonwood Creek Auxiliary Gage	40°23'06"	122°14'20"	0	USGS	Tehama	Cottonwood Creek	n/a
COT	Cottonwood Creek (DWR)	40°23'13"	122°14'20"	0	CA DWR	Tehama	Cottonwood Creek	
11376000	Cottonwood C Nr Cottonwood CA	40°23'14"	122°14'15"	18020102	USGS	Tehama	Lower Cottonwood	Oct 40 – current
11375871	Results of Combining 11375810 and 11375870 CA	40°23'14"	122°14'15"	18020102	USGS	Tehama	Lower Cottonwood	

NF = North Fork
MF = Middle Fork
SF = South Fork
Pp = Powerplant

C = Creek
Cyn = Canyon
CA = California
Nr = near

Table 2-5 presents the six stations that are the focus of this document. These six stations have more comprehensive data than any other existing stations.

TABLE 2-5
Six Primary Stations
Cottonwood Creek Watershed Assessment

USGS Sta. No.	DWR Ref. No.	Station Name	Latitude	Longitude	Drainage Area (mi ²)	Period of Record
11376000	A03520	Cottonwood C Nr Cottonwood	40°23'14"	122°14'15"	945	10/40 to present
11375810		Cottonwood C Nr Olinda	40°23'06"	122°28'31"	395	08/71 to present
11374400	A03580	MF Cottonwood C Nr Ono	40°22'03"	122°34'19"	249 ^a	10/56 to present
11375820	A03595	SF Cottonwood C Nr Cottonwood	40°18'59"	122°26'52"	218	10/62 to 09/78
11375870		SF Cottonwood C Nr Olinda	40°19'34"	122°26'40"	371	11/76 to 09/86

^aPrior to Nov 1, 1969, gage located at site 4.2 miles downstream.

Flow records for No. 11376000 have been maintained by USGS since 1940. The gaging station is located 2.2 miles east of the Town of Cottonwood and 2.5 miles upstream from the Cottonwood Creek/Sacramento River confluence (Latitude 40°23'14", longitude 122°14'15", In NE ¼ NE ¼ S7, T .29N, R.3W [MDB&M], Shasta County, Hydrology Unit 18020102). The

average annual runoff for the 50-year period from 1941 to 1999 is about 867cfs with a maximum annual runoff of 3,052 cfs in 1983 and a minimum annual runoff of 187 cfs in 1976. A maximum instantaneous discharge of 70,000 cfs was recorded from Cottonwood Creek during the January 1974 flood (USACE, 1978). Minimum flow measuring as low as 15 cfs occurred for several days during August and early September in 1945 (USGS, 1999). According to average monthly water flow records, 71percent of the runoff occurs from December through March and 4 percent from July through October (CDFG, 1978). Floods exceeding the 15,000-cfs channel capacity have occurred on an average of once every 1.6 years since 1941. On January 1, 1997, the daily mean streamflow was 32,300 cfs.

Fifteen-minute-interval instantaneous flow and river stage data (real time data) for the station can be obtained from the USGS web site (<http://water.usgs.gov/nwis/sw>).

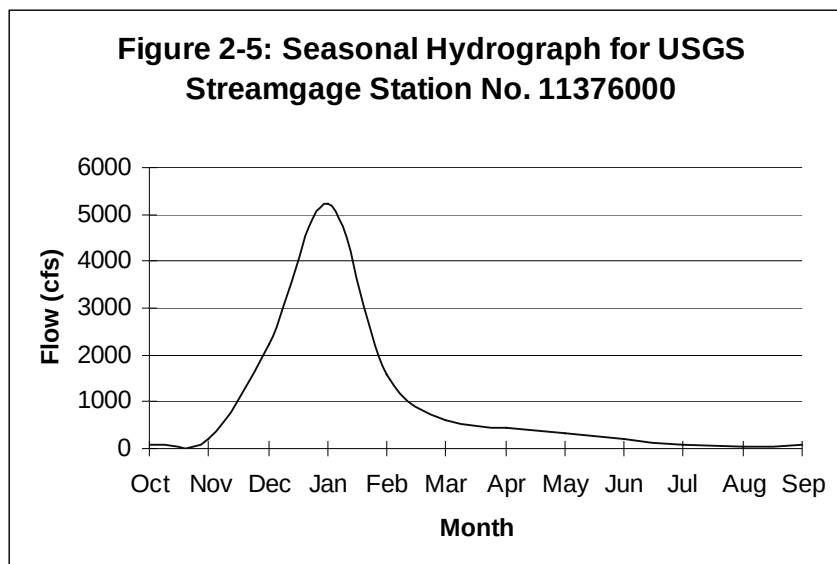
The following presents the properties of gage Station No. 11376000 in Tehama County:

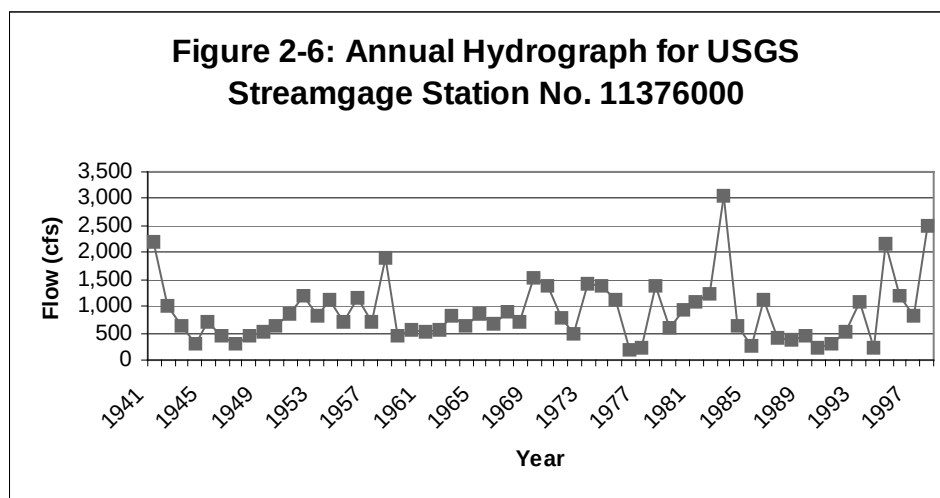
- Hydrologic Unit Code = 18020102
- Latitude = 40°23'14"
- Longitude = 122°14'15" NAD27
- Drainage area = 927 square miles
- Gage datum = 364 feet above sea level NGVD29

Basic information regarding the flood-flow volume on Cottonwood Creek includes:

- USGS gaging station: 11376000
- River mile of confluence (mi²): 273.5
- Mean annual runoff (cfs): 847
- Average annual precipitation (estimated): 30.3 inches
- Flow exceeded 50 percent of the time (cfs): 258
- Flow exceeded 1 percent of the time (cfs): 8,942

Figure 2-5 shows a graphical representation of the mean annual streamflow hydrograph for Station No. 11376000 from 1941 through 1998. Figure 2-6 represents the seasonal hydrograph of the same station for 1997.





A comparison of mean annual runoff between North Fork, Middle Fork, South Fork, and Cottonwood Creek near the Town of Cottonwood is shown in Table 2-6.

TABLE 2-6

Mean Seasonal Unimpaired Flows (for Gaging Stations and Intermediate Areas)
Cottonwood Creek Watershed Assessment

Gaging Station	Drainage Area (mi ²)	Mean Precipitation	Mean ^a Unimpaired Runoff	
			(acre-ft)	(inches)
MF Cottonwood C Nr Ono ^b	249	40	150,240	11.3
NF Cottonwood C at Ono ^c	52	55	75,900	27.4
Ungaged area of NF below Ono	85	32	73,440	16.2
NF Cottonwood Creek	137	42	149,340	20.5
SF Cottonwood Creek	198	44	135,010	12.8
Cottonwood C near Cottonwood	229.3	26.5	70,400	5.8

Source: DWR. 1968.

^aFor the 50-year period from 1910 to 1911 through 1959 to 1960.

^bStation for which unimpaired flows are tabulated. "Unimpaired Runoff" or "Full Natural Flow" represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds. Gaged flows at the given measurement points are increased or decreased to account for these upstream operations (DWR).

^cThis station has period of records 10/07 to 9/13 (USGS-11375500 and DWR-A35150).

Streamflow gains and losses were studied between 1982-85, by USGS for selected reaches of Cottonwood Creek to examine characteristics of flow for irrigation supply, effect of groundwater contribution, and possible flood control. A gaining reach is defined as one in which the flow increases in a downstream direction as a result of in-channel flow, tributary inflow, groundwater inflow, or precipitation. A losing reach, defined as one in which the flow decreases in a downstream direction, occurs when a stream is subject to high rates of evapotranspiration or is contributing to groundwater. As such, flow gains and losses in a reach represent the net effect of all hydrologic factors affecting flow.

Five continuous record gaging stations were selected for the study of the lower reach of Cottonwood Creek downstream of the mouth of South Fork. Regression equations were developed using streamflow data and gaging Stations No. 11375810, No. 11375870, and No. 11376000 which had the most complete records. See Figure 2-4 for gage locations. The regression calculations were performed for annual, summer, and winter seasons for three reaches of Cottonwood Creek and South Fork. These equations indicate that varying rates of flow gains and losses depend on the season and the magnitude of streamflow. The analyses of low-flow frequency relations also indicate that flows in South Fork do not gain as much flow from groundwater compared to other reaches in the watershed. During summer, the mainstem reach downstream of South Fork gains more flow than during the winter (Blodgett, 1992).

The largest floods during the period of record (1941 to 2000) occurred in January 1974 and between February and March 1983. The January 1974 flood had the largest 1-day flow volume on record, and the February to March 1983 flood recorded the largest 3- and 8-day volumes ever. Table 2-7 shows the peak flows of historical floods near Station No. 11376000.

Groundwater

The productive groundwater region consists of unconsolidated continental sediment of Tehama and Red Bluff formation. The ACID canal is the only inter-basin source of surface water to the watershed. The canal conveys approximately 18,000 ac-ft per month to the basin during irrigation season, a portion of which percolates to groundwater.

The general trend of groundwater slope is eastward with a mound near the Town of Cottonwood at the ACID canal. Generally, the mound does not fluctuate; and has roughly the same size and shape of water level throughout the year when compared to other parts of the creek. The cause of the mound may be leakage from the ACID canal since the canal is unlined, but this has not yet been confirmed (Fogelman and Evenson, 1985).

As previously noted, a network of groundwater monitoring wells was developed and analyzed as part of the reservoir development studies. The well network was located downstream of the proposed dam sites and upstream of the Sacramento River. Monthly groundwater records were analyzed for 1 year from September 1982 to October 1983. The groundwater study showed that the groundwater level reaches its maximum in the spring and its lowest in the fall, and groundwater quality did not show any significant chemical variation between sampling during the period of highest water levels to lowest (Fogelman and Evenson, 1982).

TABLE 2-7

Peak Annual Flows of Historical Floods (greater than 10,000cfs) for Cottonwood Creek near Cottonwood (Station No. 11376000)^a

Cottonwood Creek Watershed Assessment

Date	Peak Flow (cfs)
March 1941	52,300
February 1942	42,600
December 1951	32,600
December 1955	49,000
February 1958	48,600
December 1964	60,000
January 1969	23,500
January 1970	58,500
January 1974	70,000
March 1975	30,600
January 1978	39,100
March 1979	13,200
February 1980	36,300
December 1981 ^b	64,400
March 1983	86,000
February 1986	52,400
January 1988	10,500
March 1991	13,000
February 1992	18,000
January 1993	42,200
January 1995	48,600
February 1996	14,400
January 1997	40,600
February 1998	46,500
March 1999	12,900
February 2000	16,700

^aUSGS, 2001.

^bBase discharge changed during this year.

Historical Hydrologic Conditions

1800 to 1850

No information for this time period was available.

1850 to 1900

The State of California recognized the need for flood control as early as the winter of 1849 to 1850. However, it was not until 1878 that actions were implemented in an engineered flood control plan for the Sacramento River. Cottonwood Creek has historically contributed the majority of peak flood flow in the Sacramento River between Shasta Dam and Ord Ferry (DWR, 1969). During the winter of 1880 to 1881 a series of storms “rendered streams dangerous, roads bottomless, buildings flooded” (Smith, 1994).

1900 to 1950

Misselbeck Dam was established in 1920. It is located on the upper reach of North Fork Cottonwood Creek and provides municipal and agricultural supplies for Igo-Ono communities and the surrounding area. It also supports wildlife habitat within the reservoir and surrounding areas.

Initial water development planning studies in the Cottonwood Creek basin were conducted by USBR in the mid-1940s. USBR mapped and core-drilled the Hulen and Fiddlers sites, then apparently deferred further action on the projects because of the State of California's initiation of a comprehensive study to develop *The California Water Plan*. That study culminated, after 10 years of intensive effort, in a master plan to guide and coordinate the development of the state water resources (Bulletin 3, *The California Water Plan*, May 1957).

Bulletin 3 investigations of the Redding Stream Group and the Westside Stream Group concluded that the tributary reservoirs – Hulen, Fiddlers, Rosewood, Dippingvat, and Shoenfield – should be developed primarily for local water supply, recreation, flood control, and streamflow enhancement to improve the anadromous fishery (DWR, 1987).

1950 to 1975

One of the largest floods of the period of record occurred in January of 1974. This flood had the largest one-day flood in the period of record: 70,000 cfs.

As previously mentioned, the Flood Control Act of 1970 authorized a planning and feasibility study for two multi-purpose storage reservoirs in the Cottonwood Creek basin and the Dutch-Gulch and Tehama dams. The construction of these reservoirs was abandoned, and Cottonwood Creek remains the largest uncontrolled perennial stream northwest of Sacramento Valley.

Additionally, in the late 1960s, DWR initiated a study that focused on the economic development of water resources in the Upper Sacramento River Basin Investigation (Basin Investigation). The Basin Investigation focused on a number of tributaries north of the City of Sacramento, with Cottonwood Creek listed as a principal tributary between Shasta Dam and the Feather River. No known projects have been initiated on Cottonwood Creek as a result of the Basin Investigation.

1975 to Current

The majority of the hydrological studies that were initiated in the watershed occurred between the late 1960s to the mid-1980s. These studies primarily focused on flood control, water supply, fish and wildlife resource management, hydropower supply, and recreation in the Cottonwood Creek watershed.

The Cottonwood Creek Project involved the most comprehensive study of water resources in the Cottonwood Creek watershed. A large amount of the water resources data was supplied from monitoring efforts performed by USGS in the early 1980s. The Cottonwood Creek Project was abandoned in the mid-1980s.

In 1982, a detailed watershed study was performed by DWR in Thomes Creek. Included in the report were studies of Cottonwood Creek, Reeds Creek, and Red Bank Creek. A follow-up study occurred in 1992, when DWR published a report titled *Sacramento Valley Westside*

Tributary Watersheds Erosion Study, Executive Summary. The report was prepared to document watershed conditions and determine recent changes in the westside tributary watersheds, including Cottonwood Creek. The information contained in these reports helped to give the existing conditions description for the Cottonwood Creek watershed.

Monitoring efforts are continuous in the watershed by both USGS and DWR. Because the conditions in the watershed have remained relatively static in the past quarter-century, information gathered from the Cottonwood Creek Project and *Westside Tributary Watersheds Erosion Study* is used to report the current hydrologic conditions of the watershed. Up-to-date surface flow, precipitation, and temperature information was obtained from monitoring data from existing USGS and DWR stations.

Hydrology Conclusions and Recommendations

There are a number of summary reports and substantial raw data available on various hydrologic topics in the watershed. The hydrology of Cottonwood Creek demonstrates extreme seasonal variability typical of westside tributaries to the Sacramento River and is a source of flood flow in the Sacramento River between Shasta Dam and Ord Ferry. The watershed has been the subject of several water supply studies and may potentially be the subject of additional studies in the future, but is not currently considered a likely location for foreseeable surface-water projects.

There are a number of watershed-based projects that may be considered in the future that attempt to improve management of watershed resources. Issues that may be addressed in the future include flood control, fishery resources, erosion, riparian habitat, groundwater, and land use. In some cases, there may be sufficient hydrologic data to allow site-specific projects to proceed. However, in many cases it is likely that additional site-specific data may be needed.

Recommendations

The following recommendations are examples of the type of hydrologic data collection that may be valuable for different types of potential projects in the watershed. Ideally, a network of stream gages, water-quality sampling points, and monitoring wells could be established throughout the watershed. Unfortunately, without specific project objectives, it is unlikely that such a comprehensive network of data collecting points would be established.

1. **Flood Control:** Projects seeking to reduce flooding in portions of the watershed or in the Sacramento River may need to develop additional flow information, particularly real-time flow information to correlate storm events to flooding.
2. **Water Quality/Total Maximum Daily Load (TMDL):** To date there has not been a review of historical water-quality data to analyze potential trends. Existing and ongoing monitoring efforts could be re-assessed in the context of change over time to develop conclusions regarding the effect of land use on water quality in the watershed. This information may be valuable as new water-quality standards for TMDLs are developed for the watershed. Hydrologic monitoring would be an important aspect of such an investigation.

3. ACID Canal: As noted in the Surface-water Development section, the ACID canal is thought to have both quantity and quality effects on mainstem Cottonwood Creek. However, this relationship is unsubstantiated. Additional study is necessary to better understand the linkage between these two water sources.
4. Fisheries: Flow-temperature relationships are poorly understood in the watershed. The interactions between flows and temperatures throughout the year may have important implications for fishery management opportunities in the watershed. A network of data recorders could be used to monitor flows and temperature in the watershed.
5. Geomorphic Studies: Control of erosion and loss of usable land in the lower watershed have been identified as concerns. However, the role that hydrology plays in causing excessive erosion is poorly understood. Future geomorphic or erosion control studies may require additional hydrologic studies that better define the relationship between flow and erosion, especially in the alluvial reaches of the watershed.

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3. SEDIMENT AND FLUVIAL GEOMORPHOLOGY



Sediment and Fluvial Geomorphology

Setting

Cottonwood Creek is the largest undammed tributary in the upper Sacramento River with natural hydrologic and sediment characteristics. After Cache Creek, Cottonwood Creek provides the largest sediment input to Sacramento River (CALFED, 1997). The high natural sediment and gravel yield is a result of recent tectonic uplift combined with erodible geologic formations. Human activity has exacerbated erosion rates (DWR, 1992; 1994). The increased sediment loads from Cottonwood Creek may adversely affect water quality, freshwater fishery, and navigation as far away as the Sacramento-San Joaquin Delta. Gravel mining significantly reduces the gravel supply to the Sacramento River (DWR, 1992).

Geology

The three principal geologic provinces in the watershed are the Great Valley Province, the Coast Range Province, and the Klamath Mountain Province. The distribution of provinces is shown in Table 3-1. The Great Valley Province is a 400-mile-long by 60-mile-wide sedimentary basin that comprises the majority of the watershed.

TABLE 3-1
Cottonwood Creek Geologic Provinces
Cottonwood Creek Watershed Assessment

Province	Entire Watershed (percent)	South Fork (percent)	Middle Fork (percent)	North Fork (percent)
Great Valley	61.1	66	21	47.5
Coast Range	12.7	28.7	2.6	0
Klamath Mountains	21.1	5.3	76.4	18.8
Plutonic Rocks	5.1	0	0	33.7

Source: DWR, 1992.

The Coast Range Province and the Klamath Mountains Province consist of various highly erosive formations including South Fork Mountain Schist, Rattlesnake Creek terrain, North Fork terrain, and the decomposed granitic soils of the Shasta Bally Batholith. The principal geologic units of the Great Valley Province are the Great Valley sequence, the Tehama formation, and the Red Bluff formation. These formations are predominately alluvium that eroded from the eastern Klamath Mountains. The Great Valley sequence forms long, linear ridges and valleys that are typically underlain by sandstone, conglomerates, and mudstone. The Tehama formation consists mostly of moderately consolidated clay with silt and minor sand and gravel lenses, and is relatively resistant to erosion. The Tehama formation underlies much of the lower portions of Cottonwood Creek. The Red Bluff formation is a coarse gravel deposit with a dark red clay matrix. The Red Bluff formation is found primarily in

the higher elevation north of Cottonwood Creek away from the stream banks and floodplain and is easily eroded.

The Coast Range fault, Stoney Creek fault, Cold Fork fault, Sulfur Spring fault, Oak Flat fault, Battle Creek fault, and numerous cross faults and thrust faults occur in the watershed. The reader is referred to DWR (1992) for a map of the major faults occurring in the watershed. The vertical displacement of the Battle Creek fault is about 150 feet and is located immediately east of the Sacramento River. Fault traces located east of South Fork are likely obscured by stream activity and agricultural practices (USGS, 1988; Water Engineering and Technology, Inc. [WET], 1991; Dupras, 1997). The most recent fault movement is believed to have occurred more than 125,000 years ago (DWR, 1993).

Large, active landslides that contribute to the sediment discharge are abundant in the South Fork Mountain Schist of the South Fork of Cottonwood Creek (DWR, 1992) and the Rattlesnake Creek terrain of Beegum Creek (USFS, 1997). A notable slide is located on Slide Creek, tributary to the South Fork. However, most landslides in the Cottonwood Creek watershed occur mid-slope and often do not reach the base. Such mid-slope landslides typically do not contribute significant amounts of sediment to the streams (DWR, 1992).

DWR (1992) developed an instability and erosion hazard map for the Cottonwood Creek watershed. The evaluation of relative geologic instability and soil erosion hazard was based on geologic, soil, conversion, and vegetation maps; aerial photos; and ground observations. Results of the DWR instability and erosion hazard mapping are tabulated in Table 3-2. The erosion hazard tends to be highest in the western uplands and generally decreases downstream with the mainstem having the lowest hazard.

TABLE 3-2
Cottonwood Creek Watershed Instability and Erosion Hazard Rating
Cottonwood Creek Watershed Assessment

Instability Rating	Erosion Hazard Rating	Area (square miles)	Area (percent of total)
Very High	Very high	204.6	22
High	High	65	7
Moderately High	Very high	45.5	5
Moderate	High	73.3	8
Moderate	Moderately High	371	39
Moderate	Moderate	73	8
Low	Low	105.6	11
Total		938	100

Source: DWR, 1992.

Current Sediment and Fluvial Geomorphology Characteristics

Sediment discharge is the total amount of sediment transported by the stream. Fluvial geomorphology is the study of the physical form of the river channel and floodplain. Sediment provides material that is shaped by geomorphic processes, which define the physical character of water courses. Fluvial geomorphology can be used to characterize the stream and

identify potential problem areas for resources ranging from water quality to wildlife habitat to land use. The sediment discharge and fluvial geomorphology is affected by a host of factors including geology, climate, streamflow, channel slope, sediment size, land use, gravel extraction, riparian vegetation, bank protection, dams, and roads.

The three main sediment sources are sheet and rill erosion of the land surface, headcutting (particularly in gullies located in the upper watershed), and erosion of the stream channel bed and banks. Sheet and rill erosion is often the result of grazing, which causes soil compaction, vegetation removal, and increased storm peak discharges (DWR, 1992). Timber harvesting, as has occurred on moderately steep slopes in the upper watershed, may lead to increased sheet and rill erosion and landslides. However, it is often difficult to conclude that any one action results in erosion because many factors, including natural events, can contribute to sheet and rill erosion. Other factors contributing increased land surface erosion include cultivation, wildfires, off-road vehicular use, urbanization, and roads (DWR, 1992). For instance, the sediment load of South Fork was significantly elevated for several years following the 1976 Skinner Mills fire. Much of the sediment released by the fire has been deposited in the stream channel and has not yet reached the mouth (DWR, 1997). In addition, failure of unvegetated banks in the summer occurs because dry raveling creates piles of sediment that get washed out during the first big storm of the year (DWR, 1992).

Bank erosion along lower Cottonwood Creek and the Sacramento River causes loss of agricultural lands, riparian vegetation, roads, bridges, levees, and residences. Few bank protection structures have been constructed along Cottonwood Creek to protect against bank erosion (USACE, 1982).

Previous Studies

Fluvial geomorphology, sediment deposits, and sediment discharge of Cottonwood Creek have been examined in several previous studies including the following: Dupras (1997), CH2M HILL (1995), USFS (1997), Diaz Associates (1995), DWR (1994), DWR (1992), WET (1991), USGS (1988), RMI (1987), USACE (1982), USGS (1972), and others. A variety of analyses were used in these reports including sediment sampling, sediment equations, aerial photo interpretation, channel profile and cross-section surveys, gage analysis, and computer modeling. Additional raw data is available from annual spawning gravel monitoring program survey reports conducted by Buell & Associates for Cottonwood Creek Sand and Gravel. The surveys cover the mainstem Cottonwood Creek from North Fork to Interstate 5 (I-5).

Sediment Discharge

Sediment discharge, or total load, includes both suspended load and bedload. Suspended load is the clay, silt, and sand carried in the water column. The volume of suspended sediment is largely dependent on the erosion pattern of the upland areas. Bedload is the sand, pebbles, cobbles, and boulders transported along the streambed. Bedload is a function of the sediment available from the streambed and banks, stream gradient, and capacity of high-flow events to transport material. Sediment discharge can be highly variable.

Sediment discharge data, suspended sediment, and bedload size distribution data has been collected periodically by USGS. Table 3-3 lists the USGS sediment gage locations in Cotton-

wood Creek. The data is summarized in Table 3-4. The full data set for these gages are included in Appendix H, and are available to download for free from the Internet at <http://webserver.cr.usgs.gov/sediment/>.

TABLE 3-3
USGS Sediment Gage Locations in Cottonwood Creek
Cottonwood Creek Watershed Assessment

USGS Gage Number	Gage Name	Contributing Area (square miles)	Latitude	Longitude
11375810	Cottonwood Creek near Olinda	395	402306	1222831
11375870	South Fork of Cottonwood Creek near Olinda	371	401934	1222640
11374400	Middle Fork of Cottonwood Creek near Ono	244	402203	1223419
11375871	Results from Combining USGS Gages No. 11-3758.1 and 11-3758.7	Not applicable	Not applicable	Not applicable
11376000	Cottonwood Creek near Cottonwood	927	402314	1221415

TABLE 3-4
Sediment Discharge for Cottonwood Creek and Tributaries
Cottonwood Creek Watershed Assessment

Gage	Area Upstream of Gage (square miles)	Mean Annual Suspended Sediment Transported (tons/year)	Mean Annual Suspended Sediment Yield (tons/square mile)	Average Annual Bedload Transported (tons/year)	Average Annual Bedload Yield (tons/square mile)
North Fork	456 ^a	320,000 ^a	702	No data	No data
Middle Fork	249	260,000	1,040	25,000	100
South Fork	217	230,000	1,060	3,300	15
Cottonwood Creek	922	810,000	880	65,000 ^b	70

Source: Crippen et al, 1972.

^aValue for "intervening area" between the Cottonwood Creek Gage and the South Fork and Middle Fork gages.

^bUSGS as cited by DWR (1994). Estimate does not include effects of gravel mining.

Discrepancies are found among the various reports as to the amount of suspended sediment and bedload that reach the Sacramento River. Ignoring the effects of gravel mining, the average annual bedload transported by Cottonwood Creek is 65,000 tons per year (DWR, 1994) or 33 percent of all gravel that enters the Sacramento River (DWR as cited by McKevitt, 1984). An additional report by CALFED states that Cottonwood Creek supplies almost 85 percent of the gravel introduced into the Sacramento River between Redding and

Red Bluff (CALFED, 1998). USACE (1982) estimates that 6,800 tons of the bedload currently reaching the Sacramento River is of spawning gravel size. Spawning gravel is bedload in the size range that is suitable for fish spawning. The published size range for spawning gravel varies among the reports reviewed. The typical size range is 0.5 inch to 5 inches and comprises about 45 percent of the total bedload in Cottonwood Creek (RMI, 1987). Despite the conflicting accounts, Cottonwood Creek is an important source of gravel for the Sacramento River.

According to RMI (1987), sediments in the size range of 0.5 inch to 3 inches are not being mobilized in the Sacramento River. Consequently, a large delta has formed at the mouth of Cottonwood Creek, and the sediment composition of the Sacramento River is dominated by sediment load from Cottonwood Creek for 10 miles downstream of the confluence. This is corroborated by USACE (as cited by State Water Resources Control Board [SWRCB], 1982), which believes no more than 1,700 tons per year of spawning gravel from Cottonwood Creek can be made available for fish spawning in the Sacramento River because of transport capacity restraints. However, according to a DWR study (as cited by SWRCB, 1982), the Sacramento River erodes and transports approximately 6,800 tons of gravel per year from the Cottonwood Creek delta to downstream spawning areas.

Gravel Extraction

Two major gravel mines operate in the Shasta County portion of the watershed, on or near Cottonwood Creek. The Anderson-Cottonwood Concrete Mine is located in Section 11, Township 29N, Range 4W (S 11, T 29N, R 4W), and the Moore Pit (Cottonwood Creek) is located in S 11 and 12, T 29N, R 4W. Tehama County has four mines, one of which is located in Cottonwood Creek: Cottonwood Creek Sand and Gravel is located in S 9 and 10, T 29N, R 4W. The other three mining operations in the county include those located on Hooker Creek: County of Tehama located in S 33, T 29N, R 4W, Westside Aggregate located in S 28 and 33, T 29N R 4W, and Chuck Wolf Sand and Gravel located in S 5, T 28N, R 4W. The other three mining operations in the county include those located on Hooker Creek: County of Tehama located in S 33, T 29N, R 4W; Westside Aggregate located in S 28 and 33, T 29N, R 4W; and Chuck Wolf Sand and Gravel located in S 5, T 28N, R 4W. The effects of gravel extraction from mining operations are discussed below. Hooker Creek is generally located just southwest of the Town of Cottonwood, and runs northward, along Hooker Creek Road.

The total combined permitted extraction of sand as gravel from Cottonwood Creek is 590,000 tons per year (DWR, 1994). Over the 30-year life of the mining contract, the combined operations will remove approximately 4,800,000 cubic yards, or 11 percent of the total material stored in the stream channel and banks. Of the 4,800,000 cubic yards, 2,040,000 will be mined from the floodplain, and the remainder will be captured during downstream movement of sand and gravel (RMI, 1987). Assuming the unit weight of extracted material is 165 pounds per cubic foot, this translates into an average annual extraction of 205,000 tons from the river channel. RMI (1987) estimates that it will take approximately 160 years for Cottonwood Creek to recover to pre-gravel mining conditions after the currently permitted mining operations end.

The Anderson-Cottonwood Concrete Products pit traps most of the bedload larger than 0.5 inch (RMI, 1987). Sediment modeling conducted by USACE indicated that the effects of gravel mining on bedload transport have not yet reached the Sacramento River. Most of the

bedload currently reaching the Sacramento River originates from the section of channel between the gravel mines and the mouth of Cottonwood Creek. As the effects of gravel mining reach the Sacramento River, the total bedload delivery to the Sacramento River will be reduced to 20,000 tons per year (DWR, 1994), and spawning gravel transport rates will be reduced to 1,700 tons per year (USACE as cited by SWRCB, 1982). To mitigate for the gravel extraction, mine operators are required to place 570 cubic yards (approximately 1,300 tons) of 1-inch and larger gravel in the Sacramento River annually (RMI, 1987).

Within the past 10 years, Anderson-Cottonwood Concrete (ACC) has ceased all in-stream operations. In the mid-1990s, prior to continued operation in the creek, ACC was required to establish a reclamation plan under the Surface Mining and Reclamation Act of 1975 (SMARA). As part of this process, ACC would have had to obtain a permit under Section 404 of the Clean Water Act from USACE. As part of the permit, a major hydraulic study would have been performed to determine if the channel was aggrading from mining activities. Because of the high cost of the hydraulic study and the uncertainty of the issuance of the 404 Permit, ACC decided to cease all in-channel operations (Walker, 2002, pers. comm.). ACC is currently still in operation and is exclusively a sand and gravel mining operation. They are located just south of the bank of Cottonwood Creek, near the Town of Cottonwood.

SMARA of 1975 states that the extraction of minerals is essential to the continued economic well being of the state and to the needs of society. It also requires that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety (Public Resources Code, Division 2, Chapter 9, Section 2710 et seq.) Under this act, California has established a state policy for the reclamation of mined lands and the conduct of surface mining operations, and sets minimum acceptable practices surface mining operations are required to follow.

Under the Office of Mine Reclamation, a dataset has been established called the Principal Areas of Mine Pollution. This dataset is a compilation of 2,422 mining operations in California and their potential water-quality problems. This information was originally compiled in 1972 by the Division of Mines and Geology for SWRCB. It was published in a series of volumes of tabular data. The dataset includes operations where production exceeded \$100,000 or where other factors indicated a high potential for pollution (<http://www.consrv.ca.gov>).

The former Midas Mining Company, located in the Harrison Gulch area (S 10, T 29N, R 10W) has been listed under the Principal Areas of Mine Pollution designation. This mine is no longer in operation; however, it is listed as a potential pollutant to Middle Fork Cottonwood Creek.

Sediment Size Distribution

The sand and gravel bed of the mainstem Cottonwood Creek ranges from 0 to 20 feet thick. A hardpan layer resistant to erosion is located beneath the gravel bed. USGS (1988) found the sediment size distribution of stream channel, banks, and floodplain to be very coarse and poorly sorted (i.e., predominately gravel, narrow overall size range). The mean grain size ranged from 39.6 millimeters (mm) to 82.3mm using the pebble count method of sampling. Sieve analysis indicated a mean grain size of 3.0 mm to 24.3 mm. All samples

contained less than 3 percent silt and clay by weight. Terrace deposits contain up to 15 percent silt and clay (RMI, 1987) and tend to be less coarse than channel deposits.

Gravel extraction increases the stream gradient, thereby increasing velocity and mobilization of the bed, elevating bedload transport rates, especially in the smaller size range (e.g., fines). The result is an overall lowering of the stream channel and a coarsening of the bed material (RMI, 1987). Pebble counts on the mainstem show a slight coarsening trend of the bed material in the downstream direction (WET, 1991). The local area bridges may also contribute to the downstream coarsening trend of the channel bed.

Streambed armoring occurs when most of the fine material is scoured out of the bed and only the larger material remains. Fish cannot spawn when the streambed is armored, or if silt and sand cover spawning gravel. Thus, healthy streams typically establish an equilibrium state between eroding and aggrading processes that allow for a high level of ecologic production. Armoring of the streambed is not a concern in the watershed because Cottonwood Creek lacks bed material large enough to withstand mobilization at high flows. (WET, 1991; RMI, 1987). Sorting data for active riffles and bars indicate paved conditions form during recessional flows (WET, 1991).

Channel Form

Aerial photography can be used to describe the general pattern the river makes and identify characteristics that are collectively known as “channel form.” These characteristics include meander, number and shape of stream channels, and floodplain definition.

The three forks of Cottonwood Creek follow steep, narrow canyons from the headwaters until they reach the valley. The lower reaches of Cottonwood Creek and its tributaries are characterized as braided alluvial streams with coarse-grained, non-cohesive gravel bed and banks. Stream braiding into multiple channels occurs when the sediment load is greater than the stream’s capacity to transport the sediment. The sediment deposits in the stream channel, creating bars that redirect the streamflow, thereby forming multiple channels. Large, rapid channel shifts occur at high flow.

Sinuosity is a measure of the extent that a river meanders as it flows through the landscape. Table 3-5 describes the meander pattern associated with various values of sinuosity. The extent of meandering is determined by water velocity (a function of the volume of water and slope of the stream) and erodability of the stream bed and banks. As the water flows through the meander bend, energy is transferred from the stream to the banks, thereby causing erosion. The amount of streambank erosion increases until the erosive potential of the water and the streambank’s susceptibility to erosion are balanced. Meander bends in the mainstem migrate down the river at a rate of 50 to 70 feet per year (RMI, 1987).

TABLE 3-5
Description of Sinuosity
Cottonwood Creek Watershed Assessment

Sinuosity Score	Meander Pattern
0 to 3	Channel is essentially straight; waterway has been channelized for a long distance.
4 to 7	The bends in the stream increase the stream length 1 to 2 times longer than if it were in a straight line.
8 to 11	The bends in the stream increase the stream length 2 to 3 times longer than if it were in a straight line.
12 to 15	The bends in the stream increase the stream length 3 to 4 times longer than if it were a straight line.

The sinuosity of Cottonwood Creek is low, ranging from 1.04 to 1.47 (DWR, 1994). Low sinuosity is expected for braided channels with coarse, non-cohesive stream bed and banks (e.g., high gravel and low silt content). The sinuosity of South Fork is slightly lower than average. The reduced sinuosity of South Fork is attributed to a lower silt and clay content in the stream bed and banks. The Battle Creek fault may control the drainage pattern and channel location of mainstem Cottonwood Creek and South Fork (USGS, 1988).

The relatively straight, braided channel in the lower mainstem is confined within a sinuous high-flow channel that is surrounded by numerous terraces (i.e., abandoned floodplains). The floodplain has a variable width that generally broadens downstream to form a wide, poorly defined floodplain along the mainstem (DWR, 1994). Local outcrops of the Tehama formation and bridges create contractions in the floodplain (WET, 1991). The terraces consist of unconsolidated alluvial sediments seldom exceeding a thickness greater than the scour depth (USGS, 1988).

Channel Width

Cottonwood Creek has a high width-to-depth ratio. The channel width at low flow ranges from 50 to 150 feet, but ranges over 1,500 feet at the bankfull discharges in the lower reaches (DWR, 1994). The channel width of South Fork is relatively constant. Lateral stream migration of the mainstem tends toward the right bank and increases in magnitude downstream (USGS, 1988). Significant bank sloughing occurs in several locations (USACE, 1982).

The meanders stay within an area that roughly corresponds to the 100-year floodplain (RMI, 1987). A large meander bend formed upstream of the Southern Pacific Railroad bridge in 1952. The bridge prevented the downstream migration of the meander, causing increased lateral erosion. The meander was cut off (e.g., bypassed) in 1983 after improvements increased the conveyance capacity of the Southern Pacific Railroad bridge (WET, 1991).

Channel Slope and Elevation

Channel slope is affected by several factors, including geology and the amount and size of bedload material. As mentioned above, slope is one of the main factors controlling the energy of the water (i.e., stream power). The mean slope along the mainstem is 0.0017foot/foot. Channel profiles for Cottonwood Creek and the major tributaries are shown in the *Sacramento Valley Westside Tributary Watersheds Erosion Study* (DWR, 1992).

Some creek reaches are aggrading, and others are degrading. USGS analyzed 42 years of cross-section data from USGS Gage No. 11376000, located near the Town of Cottonwood,

and concluded that the variations in streambed indicated bedforms were moving past the gage and that no net aggradation or degradation was evident (USGS, 1988). DWR (1994) believes that gage is not a reliable indicator of degradation/aggradation trends because it is located in a narrow section of the creek with bedrock visible in the channel during some years. Consequently, DWR asserts that no conclusions can be drawn from the cross-section data. California Department of Transportation (Caltrans; as cited by CH2MHILL, 1995) found the historical degradation near I-5 has averaged 0.2 foot per year.

Headcuts are sudden drops in the stream profile that cause increased erosion. As the toe of the headcut is eroded, the headcut moves upstream, thereby lowering the overall stream elevation. Periods of headcutting are often followed by a widening of the stream channel. Headcuts can be started in a variety of ways including changes in slope because of gravel extraction and road construction. RMI (1987) estimates headcuts from gravel mining will erode 68,000 cubic yards per year. After 30 years of gravel mining, the mainstem Cottonwood Creek will drop in elevation by 1.4 feet, and floodplain elevations may lose up to 6 feet. (RMI, 1987).

Bankfull Discharge

Bankfull discharge is the amount of flow the stream channel can convey right before it spills onto the floodplain. The bankfull discharge for Cottonwood Creek is 20,000 cfs +/- 2,000cfs. Flows of this magnitude occur approximately every 1.8 years (USGS, 1988). Caltrans (as cited by CH2M HILL, 1995) estimated a peak-flow event to have a 20-foot-deep flow with a 12-feet-per-second velocity.

Upstream of the bridge crossings near I-5, the Tehama formation bluffs create a natural constriction of the channel and cause the floodwater to back up (i.e., backwater). The backwater is exacerbated by the reduced conveyance through the bridge crossings. The average annual bridge scour depth potential ranges from approximately 8 to 11 feet. Maximum bridge scour depths of up to 30 feet are expected for a 100-year flood (WET, 1991).

Historical Sediment and Fluvial Geomorphologic Conditions

1800 to 1850

The first Europeans to enter the area in 1828 were trappers. Pierson B. Reading obtained the first land grant for nearly 27,000 acres in 1844 and began ranching operations. He discovered placer gold on Clear Creek, just north of Cottonwood Creek, in 1848. The first road was established in 1849 and followed Dry Creek from Cottonwood to Shasta, a newly established gold rush settlement (Smith, 1994). No information is available on how the Native Americans who lived in the area affected Cottonwood Creek.

1850 to 1900

Mining operations during this period directly affected the sediment and fluvial geomorphology. According to Dupras (1997), hydraulic placer mining began in 1855 and lasted until 1884 when the Sawyer Decision halted hydraulic mining in California. Hydraulic placer mining in the Cottonwood Creek watershed occurred primarily on Antelope Creek,

Dry Creek, Roaring River, Crow Creek, and Squaw Creek. Platina and Beegum creeks were mechanically mined for placer gold in the 1890s and early 1900s.

1900 to 1950

Mining operations during this period directly affected the sediment and fluvial geomorphology. Dupras (1997) reports that 13 mechanical placer mines were operated between 1890 and 1942 and processed 390,500 cubic yards of material. Placer mining was particularly pervasive during the 1930s and 1940s. Mechanical mining operations occurred at depths of up to 25 feet. Remnants of the mine tailings are probably still stored in the channel. Several large deposits of tailings from mechanical and dredge placer mining are still found along North Fork and Middle Fork, Roaring River, Crow Creek, and Dry Creek. The tailing piles appear as long, parallel, steep ridges of cobble and gravel that are 6 to 25 feet tall and generally barren of vegetation. The tailings can provide high-quality construction aggregate but have not yet been mined for gravel. Gravel mining on Cottonwood Creek for construction aggregate began in 1901.

CH2M HILL (1995) cites the 1930 *Main Street Bridge Final Construction Report* to note that “excavated material consisted almost entirely of gravel, intermixed with small quantities of red clay. Gold dredgers have operated on the upper reaches of Cottonwood Creek and the stream has carried down large quantities of tailings, which have spread out over a considerable area at the site of the bridge.”

1950 to 1975

Mining operations during this period directly affected the sediment and fluvial geomorphology. Large-scale gravel mining on Cottonwood Creek began in 1960 when Caltrans excavated several hundred thousand cubic yards of gravel for the construction of I-5 (RMI, 1997). According to DWR (1994), the mean sinuosity has gradually increased from 1.19 in 1940 to 1.26 in 1972, and has remained relatively constant since then.

1975 to Current

As previously mentioned, three active mines are in the watershed, all of which are sand and gravel operations. There is speculation that introduction of SMARA was a factor in reduced mining operations in the area.

Recently, Cottonwood Creek has been a focus area for several erosion and sediment studies. High sediment yields in tributaries of the Sacramento River adversely affect water quality, freshwater fishery, and navigation as far away as the Sacramento-San Joaquin Delta. South Fork Cottonwood Creek and Cottonwood Creek are said to be the second and third most turbid streams, respectively, of 11 westside tributaries north of Thomas Creek (DWR, 1992). The increased erosion is speculated to be caused by specific land use practices, as well as natural occurrences such as wildfires and landslides. Additionally, a CALFED study titled *Geomorphic Change and Analysis* is being performed by Graham Mathews & Association on the geomorphic changes occurring in Cottonwood Creek. The report was not available at the printing of this document.

Sediment and Fluvial Geomorphology Conclusions and Recommendations

The sediment and gravel resources of Cottonwood Creek provide benefits ranging from economic to environmental. The current use of the land and sediment resources of Cottonwood Creek are not mutually beneficial and should be reviewed and optimized. For instance, linkages between land use practices and erosion should be reviewed in the context of water quality and biological resources.

Optimization of resources is dependent upon the development of a set of goals and objectives for the watershed, which would include a vision of the watershed. Once such a vision is established, a comprehensive set of studies could be developed to fill in information gaps and develop best management practices (BMP) to achieve the stated goals. One such study would be to rectify the discrepancies and contradictions among the published reports on the existing sediment transport rates in Cottonwood Creek. The development of BMPs would build on the recommendations already suggested in DWR (1994), DWR (1992), USFS (1997), SWRCB (1982), and others. Pilot projects could then be conducted to determine the effectiveness of approved BMPs. Alternatively, pilot projects such as the one currently proposed in a CALFED grant could be used to demonstrate the utility of various proposed BMPs.

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4. SOIL RESOURCES



Soil Resources

Setting

The soil associations portrayed in the State Soil Geographic Soil Types (STATSGO) database describe a highly diverse assemblage of soil resources throughout the Cottonwood Creek watershed (U.S. Department of Agriculture, 1994.). The development of soils is based on several important elements, including the underlying geology, slope gradient and position, aspect, and climate. While these elements are integrated within a landscape, the soil profile often is controlled by one or two of these factors. Eighteen unique soil complexes are shown on Figure 4-1. Using the information derived from the aerial extent, the following section provides a brief description of the major soil units identified. Additional information on the soil associations is provided in Appendix F.

These soil descriptions do not address the erosional processes in this section. A limited discussion of erosion and mass wasting is provided in the Fluvial Geomorphology and Sediment section of this assessment.

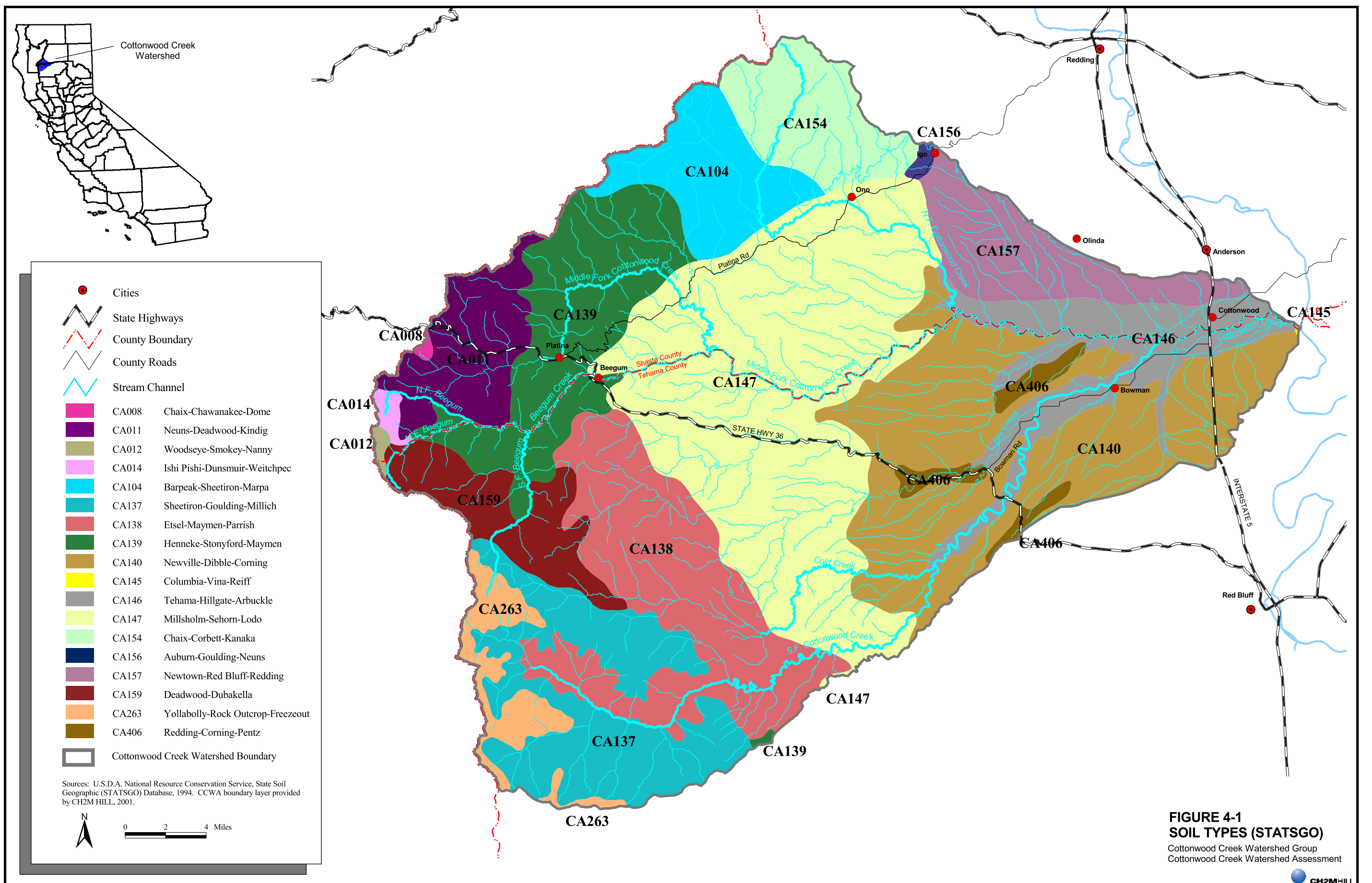
Current Soil Characteristics

Millsholm-Sehorn-Lodo (CA147)

This soil association occupies 24 percent of the assessment area, primarily in the central region of the watershed. Consisting of well-drained to somewhat excessively drained gravelly loams, silty clays, and clay loams, these soils can be found on slopes ranging from 3 to 75 percent and are underlain by sedimentary and metamorphic rocks. Elevation ranges from 600 to 1,800 feet with an annual precipitation of 25 to 40 inches. Millsholm soils comprise approximately 38 percent of the association, Sehorn soils approximately 21 percent, and Lodo soils approximately 16 percent, with other various minor components comprising the remaining amount. Millsholm soils typically are gravelly loams formed from sandstone and conglomerate. The surface layer in some areas may be very rocky. Sehorn soils have a surface layer of silty clay underlain by silty clay loam and can be quite stony in some areas. Lodo soils are clay loams typically located on mountainous uplands. Vegetation consists of grasses, forbs, oaks, and gray pine; except for Sehorn soils where the vegetative cover is predominantly grassland.

Newville-Dibble-Corning (CA140)

This soil association occupies 15 percent of the assessment area and is predominantly south of Cottonwood Creek. It is found in the foothills west of the Sacramento River on high terraces or terrace remnants with slopes ranging from 0 to 50 percent, and formed from alluvium and loosely consolidated stratified sedimentary rock, especially sandstone and shale. Elevation ranges from 500 to 2,000 feet with an annual precipitation of 19 to 30 inches. Newville and Dibble soils are typically fine to medium texture, and in some areas may be



high in lime or calcium carbonate. Newville soils comprise approximately 72 percent of the association and have a surface layer of gravelly loam and a subsoil of gravelly clay. Dibble soils make up approximately 7 percent and consist of layers of silty loam or silty clay loam. Corning soils comprise approximately 7 percent and are found at the lower elevations of this association. Located on slopes ranging from 0 to 30 percent, Corning soils are deep and well drained, and commonly exhibit hogwallow microrelief. Vegetation consists of grasses and forbs, blue oak, manzanita, buckbrush, interior live oak, and gray pine.

Etsel-Maymen-Parrish (CA138)

This soil association occupies 11 percent of the area and is located along the eastern edge of the Coast Range in the southern section of the watershed. The topography consists of a series of narrow ridges and deep canyons. Soils are shallow or moderately deep; slopes are steep to very steep and rocky and are underlain by sedimentary and metamorphic rock. Elevation ranges between 1,000 and 4,000 feet with an annual precipitation of 25 to 45 inches. Etsel soils comprise approximately 34 percent of the association and are very shallow, to shallow, somewhat excessively drained loamy soils that formed from sedimentary rock. Slopes range from 10 to 65 percent, with rock outcrops comprising up to 25 percent of the area. Maymen soils are shallow gravelly loams that are derived from sedimentary rock. Parrish soils are moderately deep with a clay subsoil. Vegetation consists of a dense cover of shrubs such as chamise and manzanita, with oaks and gray pine.

Heneke-Stonyford-Maymen (CA139)

This soil association occupies 9 percent of the watershed and is confined to the northwestern and western regions of the watershed. It consists of shallow to moderately shallow, rocky soils on steep to very steep slopes of 10 to 75 percent. All of this association is on the eastern edge of the Coast Range mountains and are underlain by sedimentary, metamorphic, and metavolcanic rock such as serpentine and greenstone. Elevation ranges from 1,000 to 4,500 feet with an annual precipitation of 20 to 45 inches. All soils are gravelly to gravelly clay loams and are well drained to excessively drained. The surface layer may be quite stony. Vegetation cover consists primarily of shrubs such as chamise, buckbrush, ceanothus, and manzanita, as well as gray pine.

Sheetiron-Goulding-Millich (CA137)

This soil association occupies 8 percent of the watershed and is only found in the extreme southwestern area of the watershed. Elevation ranges between 1,500 and 6,500 feet, with Millich soils occurring at the higher elevations on foothill and mountain ridge tops and Goulding soils at the lower elevations. Annual precipitation ranges from 25 to 70 inches, with Millich soils found in the drier regions of the area. Sheetiron soils comprise approximately 25 percent of the association, Goulding approximately 22 percent, and Millich soils approximately 20 percent, with other minor components making up the remaining amount. Sheetiron soils consist of well-drained, moderately deep, gravelly loams on slopes ranging from 10 to 90 percent. Goulding soils are stony to gravelly loams that are shallow and somewhat excessively drained. Both Sheetiron and Goulding soils are derived from metamorphic rock material, with Goulding soils formed predominantly from greenstone. Millich soils are sandy loams that contain clayey, montmorillonitic components and were formed from volcanic materials of andesitic rock, tuff, and breccia. Vegetation cover consists

primarily of chaparral and oak woodlands at the lower elevations, with mixed conifer on the higher slopes.

Tehama-Hillgate-Arbuckle (CA146)

These soils occupy 7 percent of the watershed and are very similar to one another. They are found on older alluvium deposits on floodplains and low-lying terraces along Cottonwood Creek and its low-elevation tributaries. They are all deep and well drained with a medium-textured surface layer and a finer-textured subsoil layer. Elevation ranges from 50 to 1,400 feet with an annual precipitation of 12 to 35 inches. Tehama soils are located on fans and terraces with slopes ranging from 0 to 15 percent. Slopes where Hillgate and Arbuckle soils are found range from 0 to 50 percent, with Arbuckle soils occurring at the higher elevations. Hillgate soils contain a hardpan layer, and Arbuckle soils are gravelly throughout. Vegetation consists of shrubs, grasses and forbs, and oaks.

Newtown-Red Bluff-Redding (CA157)

Soils of this association are found on the sides and tops of broad terraces, with slopes ranging from 0 to 50 percent. These soils consist of well-drained and moderately well drained clays and clay loams formed in old gravelly alluvium from mixed sources on high terraces. Newtown soils comprise approximately 47 percent of this association, Red Bluff soils approximately 33 percent, and Redding soils approximately 9 percent, with various minor components comprising the remaining amount. Red Bluff soils are located on the nearly level to gently sloping terrace tops, with Newtown soils on the steeper side slopes. Both soils have a surface layer ranging from stony loam to very gravelly clay loam and brown clay subsoil. Redding soils are well drained and contain a hardpan layer. Found on nearly level to gently undulating terrace tops, the landscape takes on a hummocky appearance known as hogwallow microrelief. Elevation for these soils range from 500 to 1,000 feet with an annual precipitation of 25 to 40 inches. Typical vegetation consists of grasses, oaks, shrubs, and gray pine.

Barpeak-Sheetiron-Marpa (CA104)

These are soils of rugged topography and strongly sloping to very steep, well-drained, and somewhat excessively drained gravelly and very gravelly loams and clay loams. Slopes range from 50 to 90 percent, with slopes more than 50 percent in about 2/3 of the total area. These soils were formed from the underlying sedimentary and metamorphic rocks, such as sandstone, shale, and slate. Elevation ranges from 800 to 5,000 feet with an annual precipitation of 30 to 60 inches. Natural vegetation typically consists of hardwood or conifer woodland. Barpeak soils comprise approximately 27 percent of the association, Sheetiron soils approximately 25 percent, and Marpa soils approximately 12 percent, with other minor components making up the remaining amount. Barpeak soils are very deep and well-drained gravelly loams and were formed in weathered metamorphic rock material. Sheetiron soils are on the upper side slopes and ridge tops at the highest elevations and are derived from metamorphic rock. They are well drained to somewhat excessively drained and have a surface layer of very stony loam to very gravelly loam. Marpa soils are on slopes at lower elevations than Barpeak or Sheetiron and are well drained with a surface layer of gravelly loam and a subsoil layer of gravelly loam and clay loam.

Chaix-Corbett-Kanaka (CA154)

This soil association is located in the northern area of the watershed and consists of well-drained to excessively drained, medium to coarse sandy loams that were derived from granite and metavolcanic rock. Slopes range from 3 to 75 percent, but are mostly more than 30 percent because of the rugged topography of the area. Elevation ranges from 1,000 to 6,500 feet with an annual precipitation of 30 to 60 inches. Natural vegetative cover is predominantly ponderosa pine, Douglas fir, white fir, and oak woodland with a shrubby understory. Chaix soils comprise approximately 49 percent of the association, Corbett soils approximately 28 percent, and Kanaka soils approximately 10 percent, with other minor components providing the remaining amount. Chaix soils are in warmer areas than Corbett soils and consist of sandy loams and coarse sandy loams. Corbett soils are found at higher elevations on steeper slopes and may be very rocky in areas. Kanaka soils are coarse-textured, sandy loams that may be quite rocky in some areas at higher elevations.

Neuns-Deadwood-Kindig (CA011)

Soils of this association were formed from metamorphic rock and are characterized by gently sloping to very steep rugged terrain with slopes ranging from 9 to 80 percent. Elevation ranges from 2,000 to 6,000 feet with an annual precipitation of 30 to 60 inches. Neuns soils total approximately 25 percent of this association, Deadwood soils approximately 25 percent, and Kindig soils approximately 20 percent, with various other minor components making up the remaining amount. Neuns soils are well-drained, gravelly sandy loams that are moderately deep in some areas and were derived from metamorphosed volcanic rock material. Deadwood soils are shallow loams, somewhat excessively drained, which formed from metamorphosed sedimentary rocks on mountainous uplands. Kindig soils are deep and well drained. Vegetation on this association consists predominantly of coniferous forest.

Historical Characteristics

1800 to 1850

The History of Cottonwood: Now and Then contains a discussion of Major Reading's effort to cultivate his ranch in 1846, indicating the productivity of the soils in the vicinity of the community of Cottonwood Creek (Smith, 1994).

1850 to 1900

In 1852, the three major human practices in the Cottonwood area included gold mining, lumbering, and farming (Smith, 1994). From 1885 to 1900 the economic benefits of mining prevailed in the watershed. As a result, the soil-vegetation-wildlife balance of the watershed became vulnerable to soil erosion, sedimentation of stream channels, and impaired vegetative cover (Uniconsult, Inc., 1963).

1900 to 1950

The devastating effects of dredge mining destroyed vegetation and riparian habitat in the Dry Creek area between the years 1910 and 1920 and again in the 1930s (Smith, 1994). This likely resulted in the erosion and loss of native soils.

1950 to 1975

Possibilities for future development in the Cottonwood Creek watershed were being discussed in the early 1960s. The Cottonwood Soil Conservation District began investigations for future water development plans alongside the initial development of short- and long-range watershed programs (Uniconsult, Inc. 1963).

Historical photographs of Cottonwood Creek in 1962 depict densely vegetated banks alongside clear gravel channels. Vegetated banks act to reduce erosion while providing significant aquatic habitat (Uniconsult, Inc., 1963).

1975 to Current

This period of road building, timber harvest activities, and large fires like the Skinner Mill fire in 1976 had effects on the sediment yield, thereby affecting soil productivity at some level (DWR, 1992). The majority of recent studies however, have had a larger focus on sedimentation and fluvial geomorphology than on soil resources. Therefore, the most comprehensive study of the soil resources in the watershed are available from the STATSGO database, which is used for the basis of the existing soil resources in this document.

Soil Resources Conclusions and Recommendations

Other than site-specific studies related to the proposed reservoirs, and selected management activities in the watershed, there is little information on the relationship of the soil resources to site productivity and/or erosion issues. A comprehensive mapping effort is being conducted for USFS lands that will provide additional information on soil and geomorphic relationships in the future. The existing Natural Resource Conservation Service soils surveys for Shasta and Tehama counties are other sources of information that can be utilized, although the formats may not be directly compatible.

Recommendations

1. While it is understood that there is a strong relationship between fire, vegetation, soils, slopes, and erosion, additional information is necessary to assess these relationships in the watershed. Existing GIS layers may provide information necessary to evaluate these relationships at multiple scales dependent on the interest and values identified. An approach that stratifies the watershed using selected variables combined with limited field investigation could be used to identify erodable soil resources that are vulnerable to disturbance.
2. The effects of roads on soil resources have been documented in a large body of literature over the past 30 years. While the road network within the watershed is well documented and characterized from a transportation perspective, there is little information available on the effects of these specific roads on soil and other resources. Studies investigating

the effects of roads on soil resources would increase understanding of the impact of roads on erosion in the basin.

3. A process needs to be established that identifies and prioritizes erosion and other areas of concern within the watershed.
4. Empirical soil erosion studies to better customize universal soil erosion equations and models to the unique conditions in the Cottonwood Creek Watershed.

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5. WATER QUALITY



Water Quality

Setting

Surface-water and groundwater monitoring has been ongoing in Cottonwood Creek since the early 1950s. The majority of the monitoring stations have been maintained by both DWR and USGS, and are generally located in the mid-eastern section of the watershed. Most of the historical USGS water-quality monitoring data included information pertinent to the proposed Dutch Gulch and Tehama Dam sites (see Figure 2-3 in the Hydrology section). Additionally, the majority of the existing groundwater and surface-water analysis was performed for the proposed dams and is in the form of reports published by USACE.

Water-quality Monitoring

Surface-water-quality Monitoring—USACE

During the study for the proposed Dutch Gulch and Tehama Dam sites, a stream monitoring program was conducted for selected parameters. Monthly water-quality samples were collected from 1976 to 1979. During flood events, or high-flow conditions, samples occurred more frequently. The parameters sampled were divided into three main groups: water-quality base parameters, heavy metals, and pesticides. Under contract with USACE, USGS also monitored streamflow, water temperature, total sediment load, and turbidity at particular sites.

Data from the study showed that the maximum water temperatures attained were 86° to 95°F with diurnal fluctuations of 11° to 14°F at the Dutch Gulch site. The Tehama Dam site had a higher maximum temperature of 2° to 3°F more than Dutch Gulch, with a diurnal fluctuation of 16° to 22°F (see Figure 2-3 in the Hydrology section for dam site locations). Data from the two dam sites study indicated that South Fork probably reaches higher temperatures with more diurnal variation than Middle Fork because of its shallower depth.

In a follow-up study, dated 1982 to 1983, 25 surface-water sites were selected for water-quality monitoring, and samples were collected semiannually to determine water quality of Cottonwood Creek and South Fork Cottonwood Creek. A comparison of the spring and autumn analyses showed that there was generally an increase in concentrations of major ions during the low-flow periods. Dissolved-solids concentrations ranged from 48 to 163 milligrams per liter (mg/L) and from 43 to 248 mg/L and had mean concentrations of 121 and 102 mg/L in the spring analyses of 1982 and 1983, respectively. Dissolved-solids concentrations ranged from 63 to 214 mg/L and had a mean concentration of 139 mg/L in autumn (USGS, 1982-83).

Surface-water samples from Cottonwood Creek and South Fork Cottonwood Creek have water quality that is chemically similar to groundwater from south of Cottonwood Creek (USGS, 1982-83).

Surface-water-quality Monitoring, DWR

Data collected from DWR contains water-quality information from 16 stations in the watershed. These stations are located throughout the watershed on the North Fork, South Fork, Middle Fork, and mainstem Cottonwood Creek. Figure 5-1 shows the location of all DWR surface-water and groundwater monitoring stations.

The most extensive sampling data occurs at the following four stations:

- Station No. A0352050 (COTTONWOOD C A COTTONWOOD)—located 1/8-mile downstream of the Highway 99 bridge, S11, T29N, 4W
- Station No. A0358100 (COTTONWOOD C MF NR GAS PT)—located 1 mile upstream from the confluence with the North Fork, S 12, T 29N, 6W,
- Station No. A0359500 (COTTONWOOD C SF NR COTTONWOOD)—located at Bowman Road, S5, T28N, R5W,

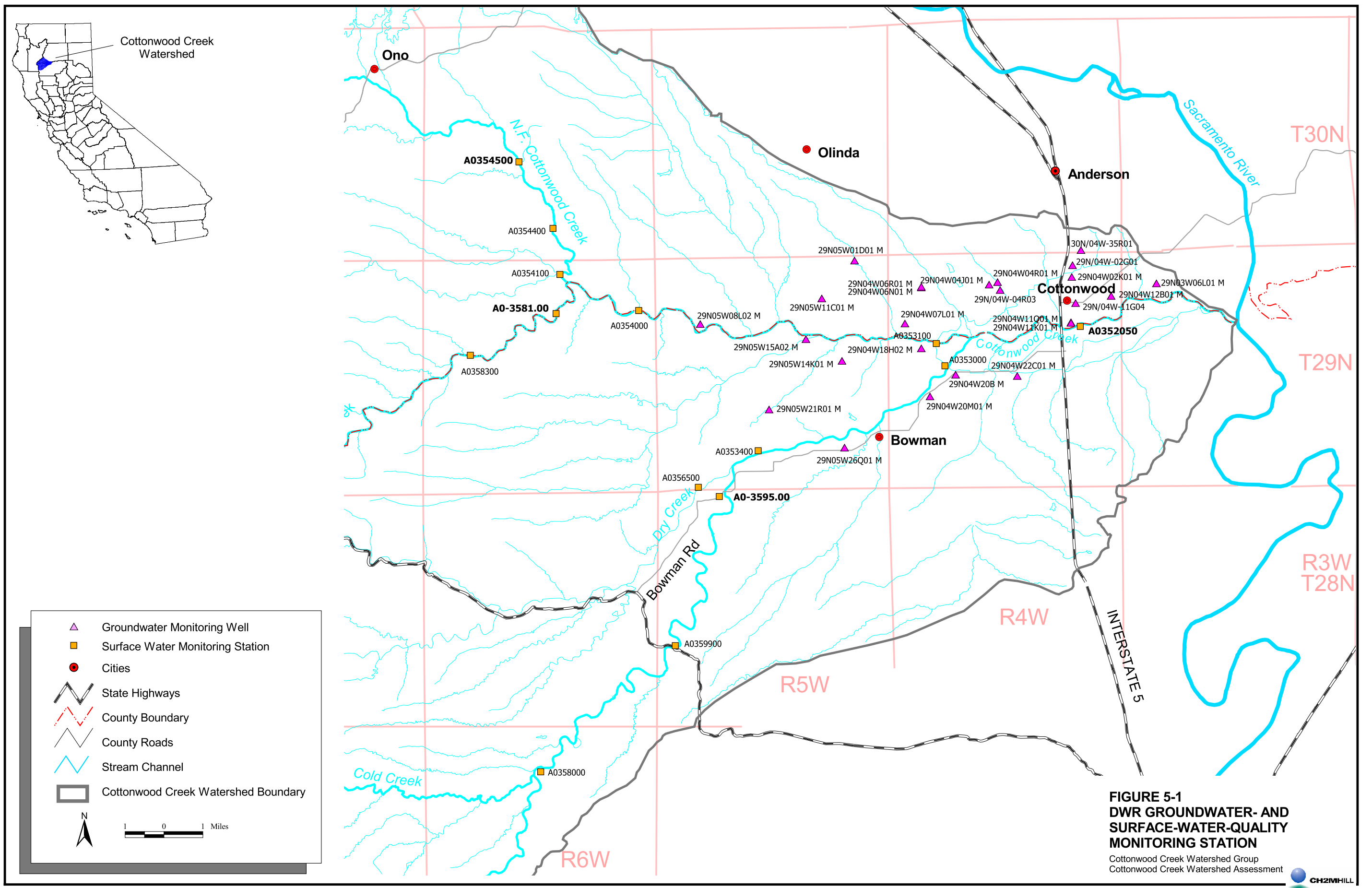
Station No. A0354500 (COTTONWOOD C NF NR IGO)—located at Gas Point Road, S21, T30N, Range 6W,

These four stations are important because of their location. These sampling stations summarize the overall water quality of each of the main tributaries to Cottonwood Creek. This type of information can be analyzed to determine the condition of each tributary and its effect on Cottonwood Creek and ultimately the Sacramento River. It can also help isolate areas in the watershed that are prone to high levels of nutrients, turbidity, or other constituents.

Comparison of Measured Parameters to Respective State/Federal Criteria

Concentrations of measured constituents at the four sample locations in Cottonwood Creek were compared to several state and federal criteria for initial screening. U.S. Environmental Protection Agency (USEPA) National Ambient Water Quality Criteria (NAWQC) and California Toxics Rule (CTR) criteria were used as benchmark toxicity values to screen for potential toxicity to aquatic life. Federal and state Maximum Contaminant Levels (MCLs) were used as benchmark toxicity values for protecting groundwater, a common source of drinking water. Lowest Observed Effects Levels (LOELs) were used if they were the only available criteria. For most comparisons, the measured concentrations of constituents in Cottonwood Creek were below the listed criteria used to protect aquatic life and drinking water supplies.

Direct comparisons of the measured concentrations were made to these criteria. However, many values for individual measurements were reported as “0,” without any explanation of the detection limit, reporting limit, or lack of data collected. Therefore, all values reported as “0” were dropped from the analyses and not included in the mean estimations. For several metals, this reduced the sample size to 1, and in some cases these individual values were higher than promulgated criteria. It should be noted that there is a high degree of uncertainty associated with a point estimate (i.e., a sample size of 1), particularly for field-collected samples from a fairly dynamic system such as Cottonwood Creek. Increasing the number of viable samples will help to reduce the uncertainty associated with point estimates and help determine, with greater precision, whether the criteria are exceeded on a more regular basis (i.e., compare maxima to criteria versus compare means to criteria).



Tables 5-1 through 5-4 present data summaries for Station Nos. A0354500, A0358100, A0359500, A0352050, respectively. Table 5-4 summarizes data collected at the Cottonwood Creek at Cottonwood station. Exceedances in this table are more likely to represent actual conditions because the sample size for each metal that exceeds a criterion value is greater than one. For example, the mean dissolved aluminum concentration for 15 samples is 0.08 mg/L, and the maximum concentration is 0.32 mg/L. These values are greater than NAWQC chronic criteria. For some comparisons, the maximum measured aluminum concentration exceeds one criterion, whereas the mean measured aluminum concentration does not exceed the same criterion. These conditions may be further assessed to determine potential risk to aquatic life.

A brief summary of the data, including apparent trends in water quality, follows.

Cottonwood Creek North Fork near Igo – Station No. A0354500. Several constituent concentrations measured at this station are similar to those measured at Station No. A0352050, Station No. A0359500, and Station No. A0358100. However, either the patterns are not as distinct or the range of values is not as large as seen at other stations. For example, hardness, alkalinity, and specific conductance and their associated ion concentrations are lower at Station No. A0354500. Additionally, the multiyear pattern in chloride concentration observed at the other three stations does not seem to be present in the data measured at Station No. A0354500. Additionally, the multiyear pattern observed in the turbidity data is not as distinct at Station No. A0354500 as the pattern observed in the data from the other two stations. This could mean that Station No. A0354500 is more removed from the source of the patterns observed in the data from the other stations, or some structure (i.e., a lake) could mute the chemical patterns observed at the other two locations. Overall, the data from this station may indicate that this area of Cottonwood Creek is less dynamic, or it may have fewer external stimuli than other sampled areas of the creek.

Cottonwood Creek Middle Fork near Gas Point – Station No. A0358100. As noted for Station No. A0352050, chloride concentrations peaked in the mid-1970s and then again in the mid-to late-1980s. Sodium concentrations appeared to follow this pattern as well. However, alkalinity, hardness, specific conductance, and their associated ions (calcium and magnesium) did not follow the same pattern as measured at Station No. A0352050. The concentrations of these parameters were apparently less variable, as noted by the smaller range of values. Measured pH values were less variable at Station No. A0358100 than at Station No. A0352050. However, there appears to be a 3-year repeating pattern of elevated turbidity at the middle fork of Cottonwood Creek, but it is not as clearly defined as the pattern observed in the data from Station No. A0352050. The sodium, chloride, and turbidity data suggest that some process or combination of processes has been affecting this creek on a multiyear cycle.

Cottonwood Creek South Fork near Cottonwood – Station No. A0359500. Boron, calcium, magnesium, chloride, sodium, pH, and turbidity measured at Station No. A0359500 are very similar to the patterns seen in these constituents measured at Stations No. A0358100 and A0352050. Multiyear patterns are present in the sodium, chloride, specific conductance, and turbidity data and may reflect influences and conditions similar to those that may cause these patterns at Station Nos. A0358100 and A0352050. The magnitude of the values and their associated ranges are similar, as well.

TABLE 5-1
Metals, Nutrients, and Water-quality Parameters Measured in Cottonwood Creek North Fork near Igo (Station No. A0354500)^b
Cottonwood Creek Watershed Assessment

Type	Constituent/Analyte	Measurement	N	Means	Maximum	NAWCQ			CTR			Federal MCL		California MCL		USEPA LOEL
						Acute	Chronic	Instant	Acute	Chronic	Instant	Primary	Secondary	Primary	Secondary	
Metal	As	Dissolved	1			0.34	0.15		0.34	0.15						
	As	Total	1	0.060	0.060							0.05		0.05		0.85
	B	Dissolved	6	0.100	0.100											
	Ca	Dissolved	27	14.207	26.000											
	Cd ^c	Total	1	0.009	0.009	0.0043	0.0022		0.0043	0.0022		0.005		0.005		
	Cl ^d	Dissolved	46	7.833	31.000	860	230									
	Cr	Total	1									0.1		0.05		
	Cu	Dissolved	1			0.013	0.009		0.013	0.009						
	Cu	Total	1	0.040	0.040							1.3		1.3		
	F	Dissolved	1	0.100	0.100											
	Fe	Dissolved	1	0.020	0.020											
	Fe	Total	1	38.000	38.000			1					0.3		0.3	
	K	Dissolved	15	1.353	2.000											
	Mg	Dissolved	27	5.356	10.000											
	Mn	Dissolved	1													
	Mn	Total	1	0.370	0.370								0.05		0.05	
	Na	Dissolved	46	8.498	18.000											
	Pb	Dissolved	1			0.065	0.0025		0.065	0.0025						
	Pb	Total	1	0.010	0.010								0.015		0.015	
	Si	Dissolved	1	16.000	16.000											
	Zn	Dissolved	1			0.12	0.12		0.12	0.12						
	Zn	Total	1	0.160	0.160								5		5	
Nutrient	Ammonia & Organic N	Total	4	0.408	0.610											
	Ammonia as N ^e	Total	2	0.015	0.020	1.77 - 2.65	0.646									
	Nitrite as N	Dissolved	4	0.690	0.970							1		1		
	Nitrate (NO ₃)	Dissolved	10	0.560	1.700							10		45		
	Organic Nitrogen as N	Total	2	0.450	0.600											
	Orthophosphate as P	Dissolved	2	0.025	0.050											
	Phosphorous as P	Total	4	0.215	0.410											
	Total Phosphorous	Dissolved	2	0.025	0.030											
	Hardness (CaCO ₃)	Dissolved	44	60.000	126.000											
	Lab pH		42	7.893	8.600								6.5-8.5			
Water Quality	Mineral Turbidity (HACH) ^f		74	7.311	180.000											
	Mineral Turbidity (Hellige) ^f		2	205.000	250.000											
	Solids mg/L (at 180°C) ^g	Dissolved	4	109.250	168.000								500		500	
	Specific Conductance (25°C)		49	159.673	343.000											
	SO ₄	Dissolved	5	8.420	16.000								250		250	
	Suspended Solids (at 105°C)		1	110.000	110.000											
	Total Alkalinity ^h	Dissolved	45	58.311	120.000		>20									
	Volatile Suspended Solids		1	27.000	27.000											

NOTES:
Means and Maximum are BOLD when their values are greater than any criterion.
^aUnits are mg/L, where applicable.
^bEmpty cells contain values equal to zero.
^cCadmium concentrations in creek water converted to dissolved concentrations at hardness=100 to compare to criteria. Used the CMC (acute) conversion equation.
^dFor chloride associated with sodium.
^eTotal Ammonia as N is dependent upon pH, temperature, fish life stage, and fish species present. Values in this table reflect a pH = 8.6; temp = 20C; early life stage present; and salmonids present and absent (range for acute value).
^fAt no time to exceed 5 Nephelometric Turbidity Units (NTU); 1.0/0.5/0.3 criterion levels are dependent upon filtration systems and populations size.
^gC= degrees Celcius.
^hCriterion for total alkalinity represents a minimum value, whereas other criteria in this table represent maximum values.

TABLE 5-2
Metals, Nutrients, and Water-quality Parameters Measured in Cottonwood Creek Middle Fork near Gas Point (Station No. A0358100)^a
Cottonwood Creek Watershed Assessment

Type	Constituent/Analyte	Measurement	N	Means	Maximum	NAWCQ			CTR			Federal MCL		California MCL		USEPA LOEL
						Acute	Chronic	Instant	Acute	Chronic	Instant	Primary	Secondary	Primary	Secondary	
Metal	B	Dissolved	9	0.1000	0.1000											
	Ca	Dissolved	23	25.9130	35.0000											
	Cl ^c	Dissolved	40	12.6450	40.0000	860	230									
	K	Dissolved	13	0.9308	1.2000											
	Mg	Dissolved	23	17.0870	29.0000											
	Na	Dissolved	40	10.2100	21.0000											
Nutrient	NO ₃	Dissolved	10	0.6200	1.5000							10		45		
Water Quality	Hardness CaCO ₃	Dissolved	36	139.7500	198.0000											
	LAB pH		36	8.1500	8.6000								6.5-8.5			
	Mineral Turbidity (HACH) ^d		68	13.3088	200.0000											
	SO ₄	Dissolved	3	11.7333	14.0000											
	Solids (180°C)	Dissolved	3	163.3333	210.0000								500		500	
	Specific Conductance (25°C)		41	309.4390	468.0000											
	Total Alkalinity ^e	Dissolved	40	129.2500	173.0000		>20									

NOTES:
Means and Maximum are BOLD when their values are greater than any criterion.
^aUnits are mg/L, where applicable.
^bEmpty cells contain values equal to zero.
^cFor chloride associated with sodium.
^dAt no time to exceed 5 NTU; 1.0/0.5/0.3 criterion levels are dependent upon filtration systems and populations size.
^eCriterion for total alkalinity represents a minimum value, whereas other criteria in this table represent maximum values.

TABLE 5-3
Metals, Nutrients, and Water-quality Parameters Measured in Cottonwood Creek South Fork near Cottonwood (Station No. A0359500)^b
Cottonwood Creek Watershed Assessment

Type	Constituent/Analyte	Measurement	N	Means	Maximum	NAWCQ		CTR			Federal MCL		California MCL		USEPA LOEL	
						Acute	Chronic	Instant	Acute	Chronic	Instant	Primary	Secondary	Primary		Secondary
Metal	Al ^c	Dissolved	3	0.027	0.040	0.75	0.087						0.05 - 0.2	1	0.2	
	As	Dissolved	1													
	Ba	Dissolved	1	0.200	0.200							2		1		
	Ba	Dissolved	79	0.126	0.300							2		1		
	Ca	Dissolved	63	31.302	52.000											
	Cd	Dissolved	1													
	Cl ^d	Dissolved	151	18.861	81.000	860	230									
	Cr	Dissolved	1													
	Cr	Total	1													
	Cu	Dissolved	1	0.010	0.010	0.013	0.009		0.013	0.009						
	F	Dissolved	13	0.146	0.200											
	Fe ^c	Dissolved	5	0.018	0.030		1					0.3			0.3	
	Hg	Total	1													
	K	Dissolved	48	1.058	2.500											
	Mg	Dissolved	63	9.516	16.000											
	Mn	Dissolved	1													
	Na	Dissolved	151	13.331	33.000											
	Pb	Dissolved	1													
	Se	Dissolved	1													
	Si	Dissolved	24	14.375	22.000											
	Zn	Dissolved	1													
Nutrient	Ammonia & Organic N	Total	8	1.616	4.500											
	Ammonia as N	Total	1	0.030	0.030											
	Ammonia as N ^e	Dissolved	1	0.010	0.010	1.77 - 2.65	0.646									
	Nitrate (NO ₃)	Dissolved	42	0.383	3.900						10			45		
	Nitrate as N	Dissolved	5	0.790	1.600											
	Nitrite and Nitrate	Dissolved	3	0.110	0.170											
	Organic Nitrogen as N	Total	3	1.533	3.200											
	Orthophosphate as P	Dissolved	17	0.013	0.050											
	Phosphorous as P	Total	8	0.904	1.900											
	Total Phosphorous	Dissolved	1	0.030	0.030											
Water Quality	Hardness CaCO ₃	Dissolved	148	122.520	207.000											
	Lab pH		145	8.128	8.600								6.5 - 8.5			
	Methylene Blue active substance		1	0.100	0.100											
	Mineral Turbidity (HACH)		86	69.919	1044.000											

TABLE 5-3
Metals, Nutrients, and Water-quality Parameters Measured in Cottonwood Creek South Fork near Cottonwood (Station No. A0359500)^b
Cottonwood Creek Watershed Assessment

Type	Constituent/Analyte	Measurement	N	Means	Maximum	NAWCQ			CTR			Federal MCL		California MCL		USEPA LOEL
						Acute	Chronic	Instant	Acute	Chronic	Instant	Primary	Secondary	Primary	Secondary	
	Mineral Turbidity (HELLIGE)		101	105.129	7000.000											
	Nutrient Turbidity (HACH) ^f		1	1044.000	1044.000							1.0/0.5/0.3		5 NTU		
	SO ₄	Dissolved	35	15.646	32.000							250		250		
	Solids (180°C)	Dissolved	10	163.400	255.000							500		500		
	Specific Conductance (25°C)		153	297.248	563.000											
	Total Alkalinity ^g	Dissolved	151	106.331	157.000	>20										

NOTES:
Means and Maximum are BOLD when their values are greater than any criterion.
^aUnits are mg/L, where applicable.
^bEmpty cells contain values equal to zero.
^cIron and Aluminum criteria calculated as total recoverable.
^dFor chloride associated with sodium.
^eTotal Ammonia as N is dependent upon pH, temperature, fish life stage, and fish species present. Values in this table reflect a pH = 8.6; temp = 20 C; early life stage present; and salmonids present and absent (range for acute value).
^fAt no time to exceed 5 NTU; 1.0/0.5/0.3 criterion levels are dependent upon filtration systems and populations size.
^gCriterion for total alkalinity represents a minimum value, whereas other criteria in this table represent maximum values.

TABLE 5-4
Metals, Nutrients, and Water-quality Parameters Measured in Cottonwood Creek at Cottonwood (Station No. A0352050)^{a,b}
Cottonwood Creek Watershed Assessment

Type	Constituent/Analyte	Measurement	N	Means	Maximum	NAWCQ			CTR			Federal MCL		California MCL		LOEL
						Acute	Chronic	Instant	Acute	Chronic	Instant	Primary	Secondary	Primary	Secondary	
Metal	Al ^c	Dissolved	15	0.0800	0.320	0.75	0.087						0.05 - 0.2	1	0.2	
	Al ^c	Total	1	0.1050	0.105	0.75	0.087						0.05 - 0.2	1	0.2	
	As	Dissolved	1	0.0200	0.020						0.05			0.05		0.85
	B	Dissolved	106	0.0935	1.100											
	Ba	Dissolved	1	0.1000	0.100						2			1		
	Ca	Dissolved	127	20.7252	40.000											
	Cd	Dissolved	1			0.004	0.0022		0.0043	0.0022		0.005		0.005		
	Cd	Total	1													
	Cl ^d	Dissolved	304	7.7066	50.000	860	230									
	Cr	Total	1	0.0050	0.005						0.1			0.05		
	Cr ^(VI)	Dissolved	1													
	Cu	Dissolved	10	0.0190	0.060	0.013	0.009		0.013	0.009						
	Cu	Total	2	0.0190	0.028											
	F	Dissolved	19	0.1263	0.300											
	Fe ^c	Dissolved	15	0.0780	0.700											
	Fe ^c	Total	7	0.9157	3.000			1					0.3		0.3	
	K	Dissolved	105	1.3600	6.800											
	Mg	Dissolved	126	9.7690	18.000											
	Mn	Total	6	0.0283	0.060								0.05		0.05	
	Mn	Dissolved	1	0.0900	0.090											
	Na	Dissolved	291	8.7378	21.000											
	Ni ^e	Total	2	0.0060	0.0060	0.47	0.052		0.47	0.052				0.1		
	Pb	Dissolved	1										0.015		0.015	
	Pb ^e	Total	1	0.006	0.006	0.065	0.0025		0.065	0.0025						
	Se	Dissolved	1						0.02	0.005		0.05		0.05		
	Si	Dissolved	35	22.0286	31.000											
	Zn	Total	5	0.0158	0.032								5		5	
	Zn	Dissolved	5	0.0220	0.060	0.12	0.12		0.12	0.12						
Nutrient	Ammonia as N	Dissolved	1	0.0300	0.030											
	Nitrite and Nitrate	Dissolved	3	0.0333	0.060											
	Nitrate as N	Dissolved	8	0.0750	0.290											
	Nitrate (NO ₃)	Dissolved	51	1.0000	6.000						10		45			
	Orthophosphate as P	Dissolved	22	0.0300	0.210											
	Ammonia & Organic N	Total	8	0.3150	0.600				1.77 - 2.65	0.646						
	Ammonia as N ^f	Total	1	0.0200	0.020											
	Organic Nitrogen as N	Total	1	0.3000	0.300											
	Phosphorous as P	Total	9	0.0600	0.170											
Water Quality	BOD 5-DAY		4	1.0250	2.200											
	Hardness CaCO ₃	Dissolved	301	95.8140	174.000											
	Solids (180°C)	Dissolved	24	127.2500	156.000								500		500	
	SO ₄	Dissolved	52	9.5385	27.000								250		250	
	Total Alkalinity ^g	Dissolved	301	92.1429	18.000				>20							
	LAB pH		289	7.9121	9.000								6.5 - 8.5			
	Methylene Blue active substance		1													

TABLE 5-4
Metals, Nutrients, and Water-quality Parameters Measured in Cottonwood Creek at Cottonwood (Station No. A0352050)^b
Cottonwood Creek Watershed Assessment

Type	Constituent/Analyte	Measurement	N	Means	Maximum	NAWCQ			CTR			Federal MCL		California MCL		LOEL
						Acute	Chronic	Instant	Acute	Chronic	Instant	Primary	Secondary	Primary	Secondary	
	Mineral Turbidity (HACH)		212	28.7123	858.000											
	Mineral Turbidity (HELLIGE)		233	31.0300	1535.000											
	Nutrient Turbidity (HACH) ^h		6	8.8333	25.000							1.0/0.5/0.3			5 NTU	
	Nutrient Turbidity (not C,A,E,B)		18	11.5556	75.000											
	Specific Conductance (25°C)		303	221.5149	389.000											

NOTES:
Means and Maxima are BOLD when their values are greater than any criterion.
^aUnits are mg/L, where applicable.
^bEmpty cells contain values equal to zero.
^cIron and Aluminum criteria calculated as total recoverable.
^dFor chloride associated with sodium.
^eLead and nickel means and maximum were adjusted from total measurable to dissolve concentrations to be compared to their respective criteria.
^fTotal Ammonia as N is dependent upon pH, temperature, fish life stage, and fish species present. Values in this table reflect a pH = 8.6; temp = 20°C; early life stage present; and salmonids present and absent (range for acute value).
^gCriterion for total alkalinity represents a minimum value, whereas other criteria in this table represent maximum values. Value listed in the "Maximum" column is actually the minimum.
^hAt no time to exceed 5 NTU; 1.0/0.5/0.3 criterion levels are dependent upon filtration systems and populations size.

Cottonwood Creek at Cottonwood – Station No. A0352050. The concentrations of 10 constituents—boron, calcium, chloride, hardness, magnesium, sodium, alkalinity, pH, mineral turbidity, and specific conductance—were analyzed to determine whether seasonal or other temporal water-quality conditions within the watershed are apparent. For example, boron concentrations between 1951 and 1996 did not fluctuate much. Only one high value (1.1 mg/L) was recorded in this 45-year period, on February 21, 1979. However, other measured parameters such as hardness, alkalinity, and specific conductance appear to fluctuate more. These values and their constituent ions (calcium, magnesium, sodium, etc.) were at their lowest levels near February 1979, February 1981, and February 1983. This suggests that weather patterns or other processes external to the creek may have been influencing water chemistry at or near Station No. A0352050. Chloride concentrations peaked from April 1974 to April 1978, and then again from April 1984 to April 1988. Additionally, measured mineral turbidity is repeated highest in January, every 3 years, starting in 1974. These three lines of evidence suggest that there is a repeating pattern of influence on a multiyear cycle in this portion of the watershed. Interestingly, pH measured between 1974 and 1988 was fairly stable, with the exception of a low of almost 6.5 and a high of almost 9.0.

Groundwater Quality

Cottonwood Creek falls within Redding Groundwater basin. The Redding Groundwater basin is 120 square miles and is drained by the Sacramento River. Water-bearing minerals include younger and older alluvium with an average well yield of 640 gallons per minute. The basin is moderate for domestic, irrigation, municipal, stock, and industrial use (<http://www.dpl.water.ca.gov/nd/index.html>).

Aquifers are classified as unconfined and confined according to their occurrence and field situation. An unconfined aquifer is one in which a free water surface (i.e., water table) exists. A confined aquifer is one that is confined between two impermeable layers. The basin is considered to be unconfined to confined in the watershed area. The various lithological changes in the sediments at depths cause varying degrees of confinement. Perched groundwater bodies held at shallow depths by underlying tight materials may occur locally. The regional groundwater movement of the creek is easterly toward the Sacramento River. Generally, groundwater quality is considered good for irrigation and domestic uses.

Groundwater Monitoring, DWR

The groundwater chemistry in the Cottonwood Creek watershed, based on temporal and spatial groundwater-quality data from 24 wells, shows little variability. Groundwater samples were collected sporadically in the study area from 1957 to 1997. Table 5-5 summarizes the analytical results obtained from these groundwater sampling events, presenting minimum, maximum, and average values for each constituent. Only trace amounts of boron, fluoride, manganese, lead, selenium, barium, iron, and zinc are detected in the groundwater; thus, these constituents are not included in Table 5-5. Sodium levels have the widest concentration range with a minimum value of 10 mg/L and a maximum value of 51 mg/L sodium. Observed nitrate values are well below the federal drinking water standard (44 mg/L NO₃⁻ or 10 mg/L N) and are fairly consistent both spatially and temporally across the study area. The total dissolved solids, electrical conductivity (EC), and pH values average 153 mg/L, 242 microsiemens per centimeter (µS/cm), and 7.2, respectively.

TABLE 5-5
Groundwater-quality Data, Multiple Locations^a
Cottonwood Creek Watershed Assessment

Constituent ^b	Number of Samples	Minimum	Maximum	Average
Potassium	32	0.5	5	1.0
Nitrate	31	0.2	13	2.8
Calcium	37	5.2	23	14
Chloride	37	<1.0	8	3.6
Magnesium	37	2.3	18	10
Sodium	37	10	51	16
Silica	20	26	66	50
Sulfate	32	0.5	9	4
Dissolved solids	27	120	240	158
Hardness ^c	37	30	130	76
Alkalinity ^c	37	25	140	96
EC ^d	35	151	328	204
PH	22	6.7	8.1	7
Total coliform ^e	6	0	94	19
Turbidity ^f	Text 8	0.1	1.5	0.5

^aSource: DWR, 2002.

^bMost constituents measures in mg/L, unless otherwise noted.

^cHardness and alkalinity are in mg/L CaCO₃.

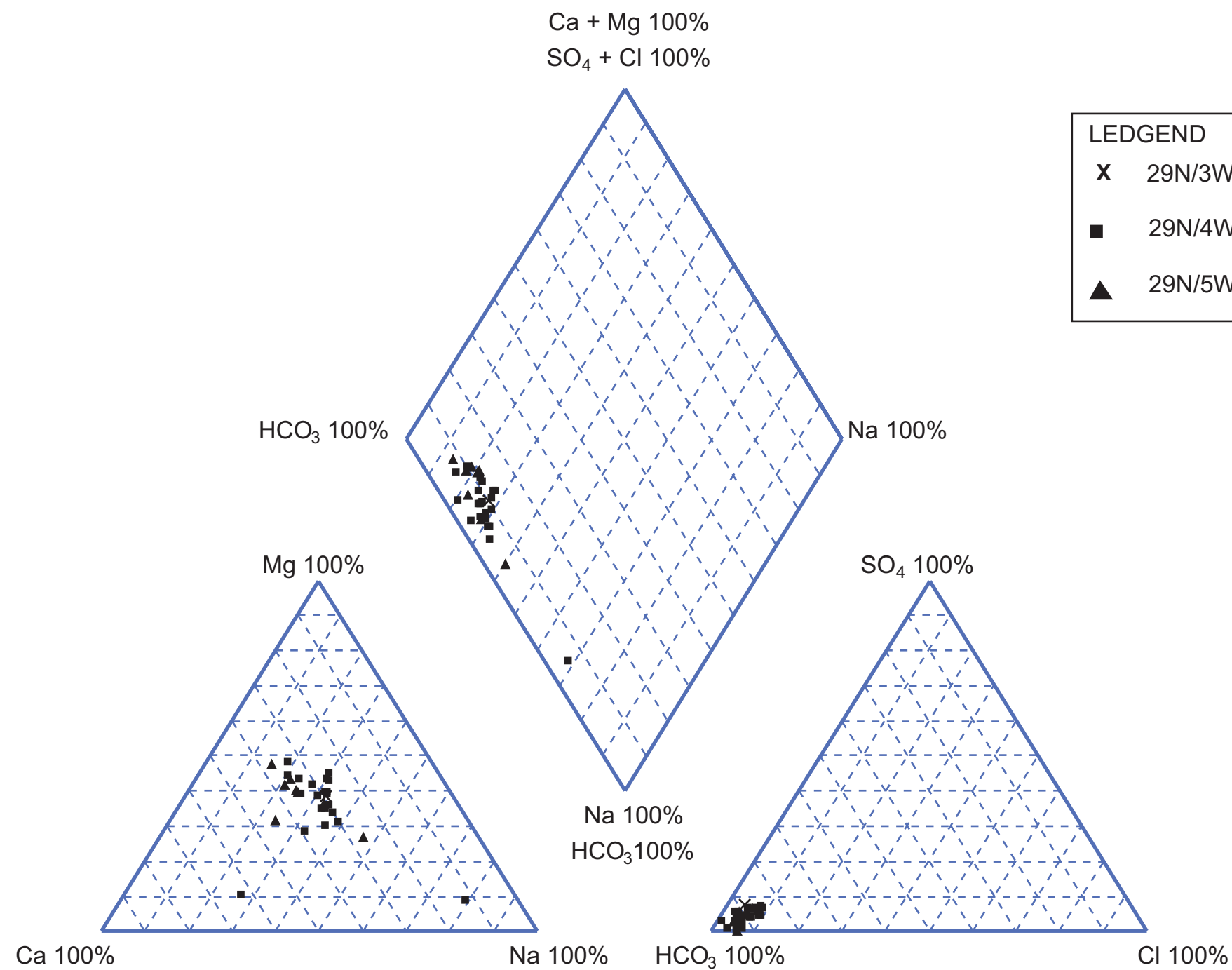
^dEC is in μ S/cm at 25°C.

^eTotal coliform is in colonies/100 milliliters.

^fTurbidity is in NTUs.

Five wells have temporal groundwater-quality data. Three wells were sampled four times between 1984 and 1997 (29N/04W-04R03, 29N/04W-11G04, 30N/04W-35R01); one well was sampled four times between 1970 and 1985 (29N/04W-02F01); and one well was sampled three times between 1957 and 1959 (29N/04W-06N01). In all cases, the wells showed very little variation in groundwater quality over time. Nitrate values only varied by a maximum of 1.8 mg/L and a minimum of 0.1 mg/L at the five locations over their respective sampling periods.

The predominant water type throughout the study area, based on the Piper diagram shown on Figure 5-2, is magnesium calcium bicarbonate (40 percent of the sample set). Magnesium sodium bicarbonate types were only slightly less prevalent at 34 percent. The remaining 26 percent of these samples are classified as follows: 13 percent sodium calcium bicarbonate, 7 percent calcium sodium bicarbonate, 3 percent sodium magnesium bicarbonate, and



LEDGEND

X 29N/3W WELLS (1 SAMPLE FROM 1 WELL)

■ 29N/4W WELLS (22 SAMPLES FROM 14 WELLS)

▲ 29N/5W WELLS (7 SAMPLES FROM 7 WELLS)

FIGURE 5-2
GROUNDWATER CHEMISTRY
 COTTONWOOD CREEK WATERSHED GROUP
 COTTONWOOD CREEK WATERSHED ASSESSMENT
CH2MHILL

3 percent calcium magnesium bicarbonate. No clear trends are observed in the dataset either temporally or spatially.

In summary, the groundwater in the Cottonwood Creek watershed is composed of magnesium as the dominant cation in 75 percent of samples, and sodium or calcium in the remaining 25 percent. In all samples analyzed, bicarbonate is the dominant anion. No temporal or spatial trends in the water quality are apparent from the dataset, indicating that no degradation in water quality has been observed over time in the basin. Table 5-5 shows the minimum, maximum, and mean concentrations measured.

Groundwater Monitoring, USGS

During June and July of 1982, USGS inventoried 200 wells, 100 of which were selected for groundwater-level monitoring, and 50 for water-quality monitoring.

At the time of the study, most of the inventoried wells were used for domestic purposes, with 100- to 200-foot-deep penetrating layers of gravel and clay with varying water depths. Most of the wells were located in the area downstream from the proposed dam sites and generally near Middle Fork and South Fork. The shallowest and deepest wells are those located in the hills bordering the monitoring area. The information supplied from the study included data from 97 groundwater-level monitoring wells; 94 were measured monthly, and three were continuous recorders (USGS, 1982-83).

Records showed highest groundwater levels in spring and lowest in autumn. Groundwater sloped eastward, and a mound was detected near the Town of Cottonwood at ACID canal. It was suspected that the mound was created by leakage from ACID canal. The mound did not fluctuate, having roughly the same size and shape of water level throughout the year when compared to other parts of the creek (USGS, 1982-83).

Groundwater quality throughout the studied area showed little chemical variation. With respect to recommended drinking water standards, the groundwater was good to excellent. The study also reported that few wells had exceeded USEPA primary drinking water limit for nitrate, arsenic, and manganese. High nitrate concentrations in domestic wells in many cases is caused by inadequate sealing of supplying aquifers from surface contamination. The study reported that it was only a local point-source problem and was not indicative of nitrate concentrations in the groundwater of the area (USGS, 1982-83). From an agricultural point of view, higher nitrate concentrations in irrigation water is beneficial to crop output because of the higher nutrient value; therefore, no limits have been established for nitrate-nitrogen in irrigation water.

Mostly, monitoring samples showed concentrations of calcium, magnesium, sulfate, manganese, cadmium, molybdenum, strontium, and vanadium decrease with increasing depth; and dissolved solids, sodium alkalinity, chloride, arsenic, boron, lead, lithium, and zinc concentrations increase with increasing depth.

Generally, groundwater north of Cottonwood is sodium-magnesium or magnesium-sodium bicarbonate, and south of Cottonwood is predominant in calcium-magnesium or magnesium-calcium bicarbonate. Table A-4 in Appendix A shows the groundwater-quality data from the 1982 study.

Current Water Quality

Surface-water Quality

Streamflow

For a complete discussion of streamflow, refer to the Hydrology section of this document.

Turbidity

Turbidity is a measure of water clarity. It indicates the degree to which light entering a column of water is scattered by suspended solids and colloidal matter. Turbidity can be an indication of the relative severity of erosion, poor land use practices, or both. High measurements can be used to locate problem areas in a watershed. The general causes of turbidity include silt, clay, finely divided organic matter, and algae. Stream turbidities are typically elevated during winter storm flows. Measurements are typically reported in NTU. Turbidity in the Sacramento River is normally below 100 NTUs with a low of less than 10 NTUs for upper reaches below Keswick (USACE, 1982). Turbidity in Cottonwood Creek fluctuates greatly depending on antecedent flow and rainfall intensity, and can reach several thousand to less than 100 NTUs within a few days.

Between 1986 and 1990, turbidities were sampled in 11 westside streams. The 11 streams included: Cottonwood, South Fork Cottonwood, Blue Tent, Dibble, Reeds, Red Bank, Coyote, Oat, Elder McClure, and Thomes Creek. A total of 22 sampling runs were made. The results of these samples showed that, of all westside tributaries, South Fork Cottonwood Creek and Cottonwood Creek are the second and third most turbid streams respectively, with Thomes Creek being the most turbid (DWR, 1992).

Suspended Solids

Suspended solids are defined as small pieces of organic or inorganic material floating in a column of water. Annual suspended sediment load transported from the basin is 810,000 tons (Crippen et al., 1972). Average annual yield from South Fork, Dry Creek (paralleling Highway 36), and Middle Fork areas is 750 to 1,200 tons per square mile. The North Fork ranges from 200 to 750 tons per square mile (USACE, 1982).

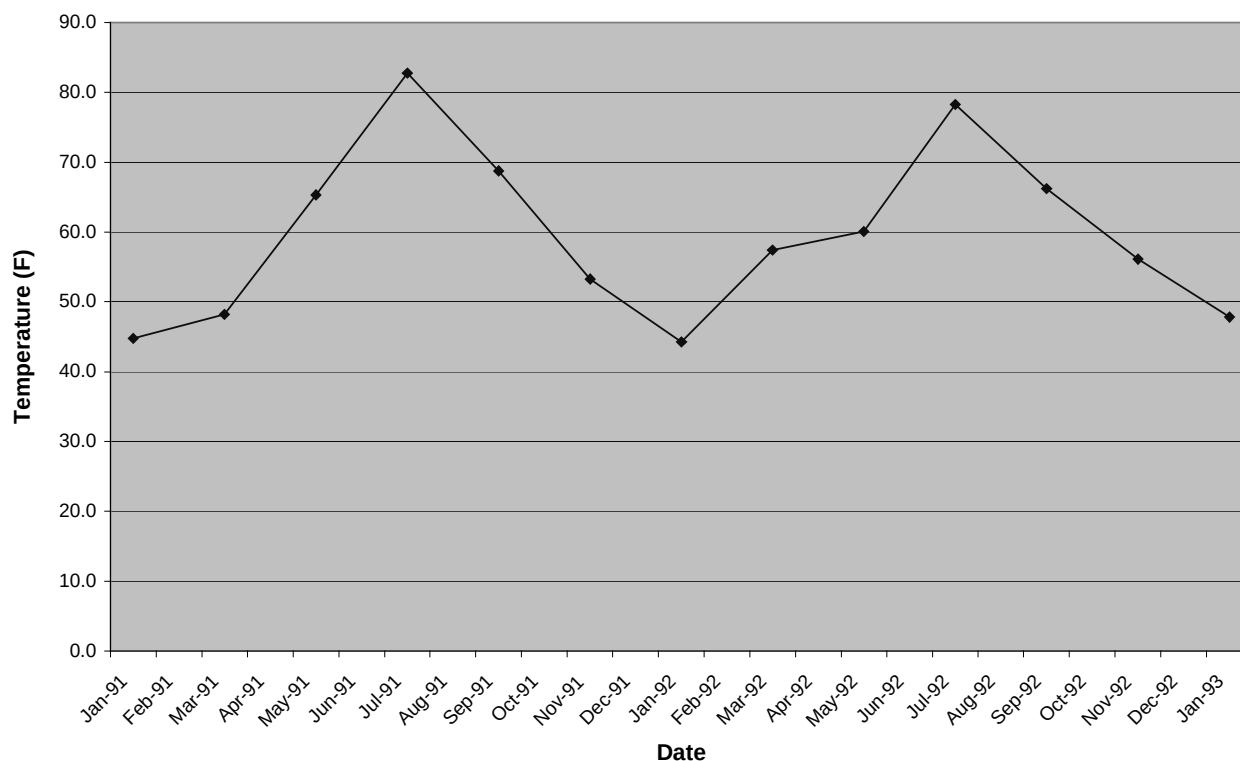
Temperature

Changes in water temperatures should not exceed natural seasonal fluctuations. High fluctuations in water temperatures can disrupt aquatic ecosystems, can reduce available oxygen in the water, and can be physically detrimental to fish populations. As Cottonwood Creek flows from the foothills to the valley floor, water and flows are subjected to warming by meteorological conditions and by the lack of riparian vegetation along the banks of the creek. Cottonwood Creek water temperature reaches its maximum near the Town of Cottonwood during early August (USACE, 1982).

August stream temperatures reach a maximum of about 82° to 86°F, with diurnal fluctuations of 11° to 16°F at lower reaches, near the Town of Cottonwood. (USACE, 1982). Irrigation runoff and groundwater inflows also affect stream temperatures, and occur mostly in the lower 6 to 7 miles of the creek. Normally, South Fork, because of its shallower depth, reaches higher temperatures with more diurnal variation as compared to Middle Fork

(USACE, 1982). Figure 5-3 shows the annual water temperature of Cottonwood Creek at Cottonwood (DWR Station No. A0352050) from January 1991 to January 1993.

Figure 5-3: Temperature-Cottonwood Creek at Cottonwood



Other Water-quality Parameters

At the time of the USACE study, it was determined that the water quality in Cottonwood Creek was generally good. Nutrients and organic loads were within a reasonable range, and the water had a low salt concentration. Occasionally, the heavy metals copper and zinc exceeded fish criteria, and pesticides exceeded municipal and industrial use criteria (USACE, 1982). Chemical data showed moderate concentrations of calcium bicarbonate, which makes water relatively hard. At the time of the 1982 USACE General Design Memorandum, the Shasta County Department of Health had classified the lower reaches of Cottonwood Creek as a serious health hazard during the low-flow period in summer and fall because of effluent from septic tanks. Such effluent raised the coliform levels above that recommended for a raw source of municipal and domestic water supply, or for contact recreation (USACE, 1982).

Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basin

The California Water Code (Section 13240) requires that a water-quality control plan be prepared and water-quality standards be adopted that “consist of the designated uses of the navigable waters involved and the water-quality criteria for such waters based upon such uses.” Basin Plans consist of a designation or establishment for the waters within a specified

area of beneficial uses to be protected, water-quality objectives to protect those uses, and a program of implementation for achieving the objectives (California Regional Water Quality Control Board [CRWQCB], 1998).

The Sacramento River basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. Cottonwood Creek is listed as a principal stream or tributary to the Sacramento River basin (CRWQCB, 1998).

Beneficial uses are critical to water-quality management in California. State law defines beneficial uses of California's waters that may be protected against quality degradation to include (and not be limited to) "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(f)). Protection and enhancement of existing and potential beneficial uses are primary goals of water-quality planning. Beneficial uses of Cottonwood Creek are shown in Table 5-6.

TABLE 5-6
Beneficial Uses of Cottonwood Creek
Cottonwood Creek Watershed Assessment

Beneficial Uses		Existing Beneficial Use	Potential Beneficial Uses	Existing Limited Beneficial Uses	No Beneficial Uses
MUN – Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.	Municipal and Domestic Supply	X			
AGR – Uses of water for farming, horticulture, or ranching including but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.	Irrigation	X			
	Stock Watering	X			
Proc – Uses of water for industrial activities that depend primarily on water quality.	Process		X		
IND – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.	Service Supply		X		
POW – Uses of water for hydropower generation.	Power		X		
REC 1 – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white-water activities, fishing, or use of natural hot springs	Contact	X			
	Canoeing and Rafting	X			

TABLE 5-6
Beneficial Uses of Cottonwood Creek^a
Cottonwood Creek Watershed Assessment

Beneficial Uses		Existing Beneficial Use	Potential Beneficial Uses	Existing Limited Beneficial Uses	No Beneficial Uses
REC 2 – Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine-life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.	Other Noncontact	X			
WARM – Uses of water that support warmwater ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife including invertebrates.	Warm	X			
COLD – Uses of water that support coldwater ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.	Cold	X			
MIGR – Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.	Warm				X
	Cold	X			
SPWN – Uses of water that support high-quality aquatic habitats suitable for reproduction and early development of fish.	Warm	X			
	Cold	X			
WILD – Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.	Wildlife Habitat	X			
NAV – Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.					X

^aData supplied by the CRWQCB, 1998.

The Basin Plan also establishes water-quality objectives as required by the Porter-Cologne Water Quality Control Act. Under this act, water-quality objectives are defined as “...the limits or levels of water-quality constituents or characteristics which are established for the

reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" (Water Code Section 13050(h) as cited by CRWQCB, 1998). Water-quality objectives are set for particular bodies of water, and include maximum and/or minimum allowable levels of several constituents. Water-quality objectives are not established for Cottonwood Creek; however, certain constituents apply to the upper Sacramento River in the vicinity of Cottonwood Creek. These constituents, with their maximum and minimum allowable levels, relative time period, and applicable body of water, are shown in Table 5-7.

TABLE 5-7

Water-quality Objectives for the Sacramento River near Cottonwood Creek
Cottonwood Creek Watershed Assessment

Constituent	Maximum Concentration/Level	Minimum Concentration/Level	Time Period	Applicable Water Body
Arsenic	0.01 (mg/L)			Sacramento River from Keswick Dam to I Street Bridge at City of Sacramento.
Barium	0.1 (mg/L)			As noted for Arsenic.
Cadmium	0.00022 (mg/L)			Sacramento River and its tributaries above State Highway 32 Bridge at Hamilton City.
Cyanide	0.01 (mg/L)			As noted for Arsenic.
Iron	0.3 (mg/L)			As noted for Arsenic.
Manganese	0.05 (mg/L)			As noted for Arsenic.
Silver	0.01 (mg/L)			As noted for Arsenic.
Dissolved Oxygen		9.0 mg/L	June 1 to August 31	Sacramento River from Keswick Dam to Hamilton City.
pH	8.5	6.5		All.
Electrical Conductivity (at 25°C)	230 micromhos/centimeter (µmhos/cm)			Sacramento River.
Temperature	56°F		Periods that may be detrimental to the fishery	Sacramento River from Shasta Dam to I Street Bridge.

^aSee the Water Quality Control Plan for the Sacramento River and San Joaquin River Basin for a complete listing of all constituents, applicable water bodies, and minimum and maximum levels.

Water-quality data from DWR sampling stations located on Cottonwood Creek contain measurements of several of these constituents. Table 5-8 shows the maximum and minimum concentrations of Basin Plan constituents measured in Cottonwood Creek.

TABLE 5-8
Maximum/Minimum Constituents Measured in Cottonwood Creek
Cottonwood Creek Watershed Assessment

Constituent	Maximum Recorded Concentration/Level	Minimum Recorded Concentration/Level	Date
Arsenic	<0.005 mg/L		09/29/94
Cadmium	<0.005 mg/L		09/22/93
Iron	4.5 mg/L		1/29/96
Manganese	0.110 mg/L		1/29/96
Dissolved Oxygen		4.6 parts per million	3/21/89
pH (field)	8.5		7/17/95
		7.0	9/13/88
pH (lab)	9		5/12/88
		6.5	1/19/83
Electrical Conductivity	370 µmhos/cm		3/17/77
Temperature (F)	87°		8/14/89

^aAll measurements from DWR Station No. A0352050, Cottonwood Creek at Cottonwood.

Historical Water Quality

1800 to 1850

Historical water-quality information for this time period is limited. However, many land use practices may have had an adverse effect on water quality in Cottonwood Creek. Beaver trapping records for the Pacific Northwest date as far back as the 1820s. It is unknown what percentage of beaver trapping occurred in the watershed; however, trappers were known to exist in the Cottonwood area as far back as 1828 (Smith, 1994). There is speculation that the settlement of trappers in the northern areas may have had an indirect affect on water quality resulting from the depletion of the beaver. Beaver activity changes the ecology of rivers in ways that enhance salmon habitat. Beaver dams create pools that store sediments, organic material, and nutrients, releasing them slowly to the stream (Lichatowich, 1999). The destruction of salmon habitat in the rivers of the Pacific Northwest started with the near annihilation of the beaver in the last half of the nineteenth century (as cited in Lichatowich, 1999, National Research Council, 1996).

Additionally, the first known cattle drive in the Cottonwood area occurred in 1837. Ewing Young led the first cattle drive (800 head of wild Spanish cattle) with Philip Edwards through what is today Shasta County (Cottonwood included) into Oregon (Smith, 1994).

1850 to 1900

Although specific water-quality data do not exist for this period, it is likely that human impacts, such as gold mining, had a direct impact on the water quality of Cottonwood Creek. In the 1850s, gold mining in placer deposits on Cottonwood Creek commonly used dredge, hydraulic, and ground sluicing techniques. These placer mining activities undoubtedly resulted in the discharge of sediment to the stream. During this time, using mercury was a common practice, creating additional water-quality issues related to mercury discharge.

1900 to 1950

Adequate water-quality data on Cottonwood Creek had not been gathered prior to 1950. No information was available for this period. There is speculation, however, that logging (flume construction) and stream-debris clearing that occurred in this era may have had an effect on the water quality of Cottonwood Creek.

1950 to 1975

Most of the water-quality research started with the initiation of the proposed plans of two dams/reservoirs (Dutch Gulch and Tehama) in the early 1970s. The primary study efforts for the project focused on temperature and turbidity because of their importance to anadromous fishery. DWR studied the geohydrologic sector of the creek during 1955 and 1956, and their data were reported in the preliminary edition of the *Upper Sacramento River Basin Investigation Bulletin No. 150, 1965*. USBR also reported a reconnaissance-level study on the groundwater geology in May 1968. Additionally, DWR installed surface-water and groundwater monitoring stations in the watershed. As noted above, these monitoring stations contain data dated as far back as 1951.

Historical water-quality information on Cottonwood Creek was not adequately available until Congress authorized an investigation of a potential multi-purpose reservoir project in 1970. USACE proposed two reservoirs: Dutch Gulch and Tehama on Cottonwood Creek and South Fork Cottonwood Creek, respectively. With the view to construct these dams/reservoirs, pre-construction planning studies were done related to surface water and groundwater of Cottonwood Creek, of which water quality was a major factor. The water-quality-based research mainly addressed issues such as the existing stream water quality, the prediction of water-quality conditions in the project reservoirs, and possible changes downstream of the Cottonwood Creek. The purpose of the water-quality study was to ensure the continuation of beneficial uses of water under project conditions. Beneficial uses included municipal and domestic water supply, industrial water supply, irrigation, recreation, wildlife habitat, and fish restoration. The project was never built because of a lack of funding and related environmental impacts; however, the initiation of it produced various multi-disciplinary reports, memoranda, and documents that contain valuable information pertinent to Cottonwood Creek.

1975 to Current

The water quality of Cottonwood Creek has remained relatively unchanged for this time period. A number of studies regarding the water quality of Cottonwood Creek and its main tributaries were initiated in the late 1960s and continued through the 1980s. Monitoring data

as current as 2001 are available from both USGS and DWR for various locations throughout the watershed. The water-quality studies performed between the 1960s and 1980s showed similar data to what was evaluated using more current monitoring data for this document. A summary of recent water-quality data is supplied above in the Current Water Quality section.

During the past few decades, regulatory agencies such as CRWQCB have implemented water-quality standards and minimum and maximum concentration and measurement levels for particular water-quality constituents. Current monitoring efforts help to establish whether or not Cottonwood Creek or any of its tributaries are above or below the established levels.

Land use practices in the past 25 years have remained relatively unchanged throughout the watershed. However, increases in land use practices may have adverse effects on the overall water quality, particularly suspended solids and turbidity. With an increased awareness of the importance of water quality to anadromous fishery, several studies have been performed regarding the erosion rates of Cottonwood Creek. High sediment yields in tributaries of the Sacramento River adversely affect water quality, freshwater fishery, and navigation as far away as the Sacramento-San Joaquin Delta. South Fork Cottonwood Creek and Cottonwood Creek are said to be the second and third most turbid streams, respectively, of 11 westside tributaries north of Thomas Creek (DWR, 1992). The increased erosion is speculated to be caused by specific land use practices, as well as natural occurrences such as wildfires and landslides.

Water-quality Conclusions and Recommendations

The water quality of Cottonwood Creek is generally considered good from a drinking water standard perspective. There is some concern regarding the South Fork's regular contributions of suspended sediments and turbidity to the mainstem. It is likely that the source of elevated water-quality measurements in the mainstem were caused by the water flows from the South Fork. There are several potential causes for elevated measurements in the South Fork. These potential sources include:

- The landslide at Slides Creek, or other unique geography or soils in the South Fork drainage
- Major fires that may have occurred in the South Fork drainage
- Land use in the South Fork watershed that affects water quality to a different degree than the North or Middle forks
- Construction and decommissioning of structures on the South Fork.

An additional study of the specific water-quality characteristics of the South Fork may be needed to develop more detailed information regarding the source or sources of turbidity in the South Fork. Identifying the causes may lead to development of solutions to the elevated turbidity in the South Fork and help determine whether there are other constituents of concern that should be considered.

At a few local point sources, evidence of nitrate problems exists, which may be a result of surface contamination, but it is not indicative of the general quality of the groundwater. The groundwater slope is eastward toward the Sacramento River. The monitoring wells in this area showed little fluctuations in water levels throughout the year. The suppressed water-level fluctuations may be the result of seepage from ACID canal, which runs through this area. Additional development of groundwater resources in this area would require a better understanding of the potential water-quality implications of such development.

The water levels in many wells in the bordering areas varied compared to others in the area, indicating that local conditions, such as local confinement or perched water, may exist (USGS, 1982-83).

Recommendations

1. An additional study of the specific water-quality characteristics of the South Fork may be needed to develop more detailed information regarding the source or sources of turbidity in the South Fork. Identifying the causes may lead to development of solutions to the elevated turbidity in the South Fork and may help determine whether there are other constituents of concern that should be considered.
2. Determine which monitoring wells are currently active and continue monitoring groundwater levels and water quality. Install additional monitoring wells as needed to increase quality and quantity of groundwater data.
3. Continue surface-water monitoring. Analyze existing water-quality data to determine trends in water quality and impacts of significant historical events to surface-water quality (i.e., geological events, fires, landslides, timber harvesting, and mined lands).
4. Locate abandoned and inactive wells; determine if wells will be used in future. Determine if abandoned and unused wells contribute to contamination of groundwater from surface runoff or land use activities.
5. Locate active wells that are situated near land use activities that potentially contaminate groundwater. Establish groundwater-monitoring wells near these areas to monitor the potential effects of land use activities to groundwater quality.
6. Initiate water-quality monitoring to better define temperature conditions seasonally and spatially throughout the watershed (particularly in areas where fish are present). Better define temperature/flow relationships and evaluate implications of stream temperature for anadromous fish use and enhancement.
7. Initiate a watershed-scale monitoring program that will better establish existing, base-line conditions and will provide a means to track water-quality/watershed conditions over time. This will provide a mechanism to evaluate cumulative benefits of watershed improvement projects in the future.

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6. VEGETATIVE COVER



Vegetative Cover

Setting

Over 40 percent of the watershed is classified as Blue Oak/Gray Pine. Other major vegetative classifications include Chaparral (16 percent), Annual Grassland (13 percent), Douglas Fir/True Fir (15 percent), and Mixed Conifer (10 percent). These percentages are reflective of the geography of the watershed—relatively steep ridges with a broad, flat center, as well as a basically undeveloped open space. It is difficult to ascertain whether land use has affected the relative abundance of major vegetative covers in the watershed; however, it is likely that oak woodland has decreased in recent time.

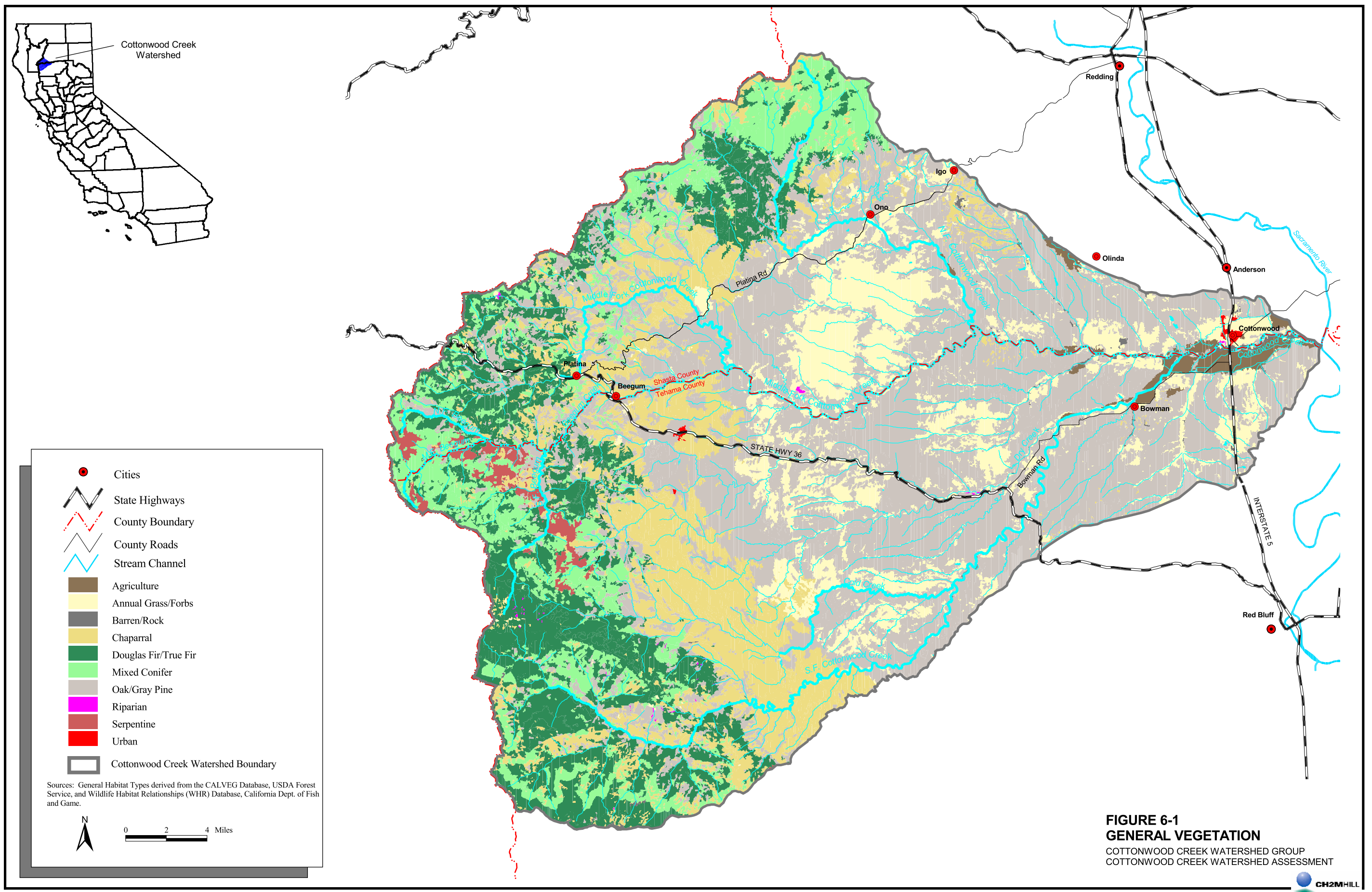
Landscape patterns of vegetation, land use, and natural disturbances provide an important starting point for understanding the relationships of vegetative elements and associated wildlife habitat. This section addresses the overall patterns of vegetation in the Cottonwood Creek watershed. Vegetation in the Cottonwood Creek watershed is shown on Figures 6-1 and 6-2. These vegetation patterns were identified based on the relationship to wildlife and botanical elements with an emphasis on species with special status.

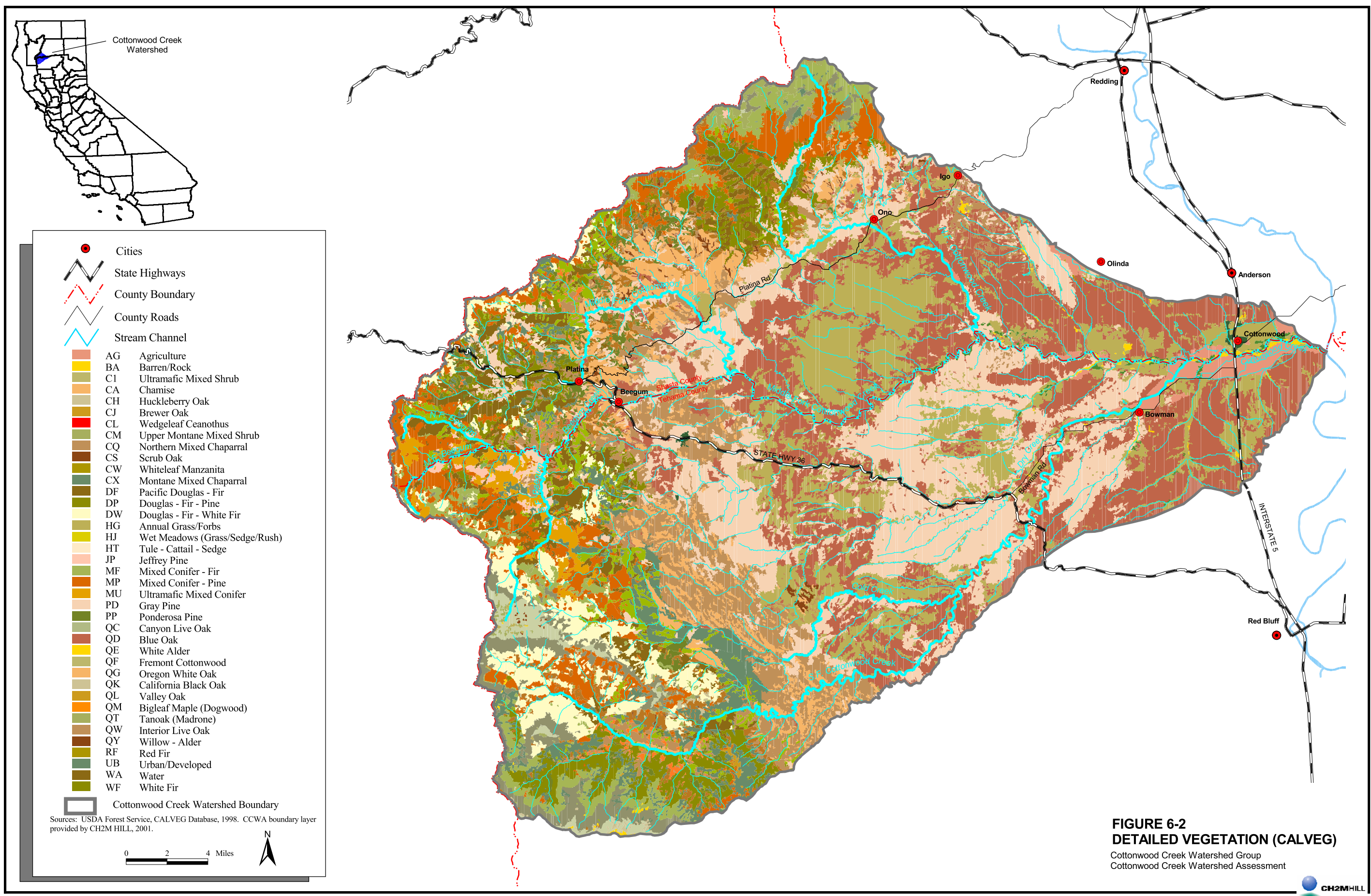
Current Vegetation

Review of Available Technical Data

The primary resource available for characterizing vegetation at the watershed scale is the CALVEG system. This data set relies on interpretation of satellite imagery with extensive verification of the images in a field setting by an ecologist and vegetation specialist. The CALVEG database was updated in 1998 to include the project area with a much higher level of mapping and field verification than earlier efforts. The minimum mapping unit for this coverage is 2.5 acres. This system classifies the existing plant communities in California. The plant communities are based on one or several dominant plant species or the dominant vegetation form (i.e., meadows or grasslands). This simplified, broad classification describes the diverse array of plant communities that occurs within the Cottonwood Creek watershed. The vegetation structure that underlies the foundation for CALVEG includes the size, density, and arrangement of trees, snags, logs, shrubs, or understory plants. CALVEG's principle value lies in its ability to characterize forests and woodland features. Little information is available about the structure of vegetation dominated by shrublands or herbaceous plants.

A comprehensive search was made for available published and unpublished information on the vegetation resources in the Cottonwood Creek watershed. The literature reviewed for information on the vegetation resources of the watershed included *Beegum Watershed Analysis*, USACE files pertaining to the water resources projects proposed in the Cottonwood Creek watershed, and information on the Farmland Mapping and





Monitoring Program available from the California Office of Land Conservation. A complete list of references is identified in the References section. As appropriate, information from these references has been incorporated into this section.

Research on the sensitive plant communities and plant species of the Cottonwood Creek watershed included the review of two current electronic databases/inventories. The California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants and the CDFG Natural Diversity Database (CNDDB) were searched for the USGS 7.5-minute quadrangles that occur within the boundaries of the watershed. This search identified several locations of sensitive habitats, including great valley oak riparian forest, great valley willow scrub, and great valley mixed riparian forest.

Vegetative Cover

The compilation of the vegetative information available for the project area resulted in the identification of 39 distinct CALVEG alliances. These alliances were summarized into more general groups, or habitat types, more appropriate to the scale of the watershed. Figure 6-1 summarizes habitat types used to describe the watershed and provides an overview of the vegetative diversity in the watershed. A full description of these units is described in Appendix G.

TABLE 6-1
General Habitat Units
Cottonwood Creek Watershed Assessment

CALVEG Vegetation General Habitat Types	CALVEG Grouping	Approximate Percentage of Watershed
Agriculture	Agriculture	1%
Barren	Barren	less than 1%
Urban	Urban	less than 1%
Serpentine	Ultramafic Mixed Shrub, Ultramafic Mixed Conifer	1%
Chaparral	Chamise, Huckleberry Oak, Brewer Oak, Wedgeleaf Ceanothus, Upper Montane Mixed Shrub, Northern Mixed Chaparral, Scrub Oak, Whiteleaf Manzanita, Montane Mixed Chaparral	16%
Annual Grassland	Annual Grassland	13%
Riparian	Wet Meadow, Tule – Cattail – Sedge, White Alder, Fremont Cottonwood, Willow - Alder, Bigleaf Maple (Dogwood)	less than 1%
Douglas Fir/True Fir	Pacific Douglas Fir, Douglas Fir – Pine, Douglas Fir - White Fir, Red Fir, White Fir	15%
Mixed Conifer	Jeffrey Pine, Mixed Conifer-Pine, Mixed Conifer-Fir, Ponderosa Pine	10%
Blue Oak/Gray Pine	Gray Pine, Canyon Live Oak, Blue Oak, Oregon White Oak, California Black Oak, Valley Oak, Tanoak (Madrone), Interior Live Oak	40%
Water	Water	less than 1%

The following discussion provides an overview of the general habitat types identified on Figure 6-1. These descriptions were developed to provide a perspective on vegetation patterns in the watershed.

Agriculture

Approximately 1 percent of the Cottonwood Creek watershed consists of agricultural land. Vegetation classified as “Agriculture” in the CALVEG system is found in the eastern region of the Cottonwood Creek watershed, specifically along Cottonwood Creek, the North Fork of Cottonwood Creek, and in the Happy Valley area. Agricultural land uses include forest landscapes such as orchards, as well as non-forested land uses such as vineyards and field crops. Land used exclusively for livestock pasture may, however, be mapped as Annual Grassland in those cases where land uses are not recognizable.

The lower portion of the Cottonwood Creek drainage, on the west side of the Sacramento Valley, contains agricultural lands that are predominantly orchards, irrigated pasture, and upland range. Common orchard crops include English walnut (*Juglans regia*), and peach, almond, and plum (*Prunus* spp.). The irrigated pastures of the Sacramento Valley are dominated by seeded or naturally occurring grasses and forbs such as perennial ryegrass (*Lolium perenne*), crop barley (*Hordeum vulgare*), alfalfa (*Medicago sativa*), rose clover (*Trifolium hirtum*), and white clover (*Trifolium repens*).

Barren

Less than 1 percent of the Cottonwood Creek watershed is barren or identified as rock outcrops. Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography are labeled as “Barren.” This category includes areas where surface lithology dominates the map unit, such as exposed bedrock, cliffs, and other open landscapes. While identified as barren at the landscape scale, these areas often provide microhabitat for a variety of vegetation types when evaluated in field surveys.

Areas mapped as Barren are located on South Yolla Bolly Mountain, south of Dry Creek in the northeast portion of the Cottonwood Creek watershed, and include dredge tailings found along Dry Creek, Antelope Creek, Cottonwood Creek, and the South Fork of Cottonwood Creek in the northeastern and eastern portion of Cottonwood Creek watershed. It does not include areas considered to be modified or developed, as in urban areas.

Urban

A very small fraction of the Cottonwood Creek watershed is developed to the point it meets the “Urban” definition of CALVEG. These areas include lands near Wild Horse Mesa, the Foss Ranch, and the Town of Cottonwood. This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, cemeteries, and the like. In those cases where the managed landscapes may have a considerable vegetation component, other land use categories may be more appropriate.

Serpentine

Within the “Serpentine” habitat type, two distinct vegetation alliances are found in the Cottonwood Creek watershed. Although only 1 percent of the watershed is made up of serpentine habitat, the unique nature of the soils in conjunction with their isolated occurrences provide habitat for a diverse range of species.

Serpentine habitat is associated with discrete geologic units in the lower elevations of the western Klamath Mountains and Northern California Coast ranges. Serpentine habitat is generally located on the western side of the watershed, in higher elevations, near Round Mountain, Little Red Mountain, and Tedoc Mountain. These rock units often produce soils low in essential minerals such as calcium and magnesium or have excessive accumulations of heavy metals such as nickel and chromium. These sites vary widely in the degree of serpentization and effects on their overlying plant communities. Some common trees associated with serpentine habitat include Douglas fir (*Pseudotsuga menziesii*), sugar pine (*Pinus lambertiana*), and incense cedar (*Calocedrus decurrens*). Hardwoods are often sparse, but Pacific madrone (*Arbutus menziesii*) and California bay (*Umbellularia californica*) may also occupy these sites. Shrubs such as pinemat and whiteleaf manzanita (*Arctostaphylos* spp.) and huckleberry and Brewer oaks (*Quercus* spp.) are likely to occur; however, not in the densities found on more productive soils.

Chaparral

An estimated 16 percent of the Cottonwood Creek watershed comprises “Chaparral” habitat. The chaparral communities are generally distributed on harsh sites with rocky substrates in the foothills and montane portions of the watershed, and consist of short-statured shrubs and trees (less than 15 feet tall). It is generally located on the western side of the watershed, just east of the higher mountainous elevations of the Shasta-Trinity National Forest. Chaparral communities are fire-adapted and have reproductive methods that are dependent on periodic and/or recurring fires. Plants associated with chaparral areas are adapted to harsh exposures where few other plants can survive.

Nine specific chaparral alliances are identified in the Cottonwood Creek watershed, and although there are distinct similarities in habitat requirements such as elevation, topography, soils, and moisture regimes, there is a high level of vegetative diversity in this unit. An alliance identified as noteworthy in the analysis area is the “Chamise” habitat. Although it comprises only 4 percent of the entire area, it is the northernmost extension of pure chamise (*Adenostoma fasciculatum*) population in California.

Annual Grassland

Approximately 13 percent of the Cottonwood Creek watershed is mapped as “Annual Grassland” in the CALVEG database. This vegetation component occurs at lower elevations in the Sacramento Valley and extends into openings within blue oak – gray pine woodland in the foothill zone of the Cascade Range. Annual grassland supports a variety of annual grasses and associated forbs, the majority of which are non-native species. Dominant species include wild oats (*Avena fatua*), soft chess (*Bromus mollis*), ryegrass (*Lolium* sp.), and ripgut brome (*Bromus diandrus*). Annual and perennial forbs are common associates and include filaree (*Erodium* sp.), California poppy (*Eschscholzia californica*), bluedicks (*Dichelostemma capitatum*), and elegant brodiaea and common

brodiaea (*Brodiaea* spp.). Scattered valley oaks (*Quercus lobata*) and interior live oaks (*Quercus wislizenii*) are also found in this community. Portions of the annual grassland have been invaded by invasive exotic plant species such as yellow star thistle (*Centaurea solstitialis*), medusa-head (*Taeniatherum asperum*), and bull thistle (*Cirsium vulgare*).

Small areas of dry grasslands are found scattered at moderately low elevations in the western Klamath Mountains and Northern California Interior Coast Ranges. These areas become more extensive on private lands scattered throughout the area and intermix with agriculturally managed sites. Blue oak (*Quercus douglasii*) stands are often found adjacent to upland annual grasslands. In the watershed, annual grasslands are found near the confluence of the Middle and North forks, and mainstem Cottonwood Creek. Additionally, annual grasslands are scattered throughout the lower elevations of the watershed.

Riparian

CALVEG data identified about 0.5 percent of the watershed as “Riparian” habitat (wet meadow, montane, and valley foothill riparian). This mapping unit may not identify the riparian features that actually occur in the watershed because of the limitation of the mappable unit. A riparian feature that is not included in the CALVEG layer is the vernal pool. While its importance is recognized in terms of wetland value, the nature of its origin does not provide a strong basis for delineation with remote imagery. Elements of this general habitat type include wet meadow, tule, white alder, Fremont cottonwood, bigleaf-maple and willow-alder alliances.

The willow-alder alliance is the predominant habitat identified in the riparian element. It constitutes almost 50 percent of the riparian features mapped using CALVEG. This type includes willows (*Salix* spp.) combined with white, red, or mountain alders (*Alnus* spp.) occurring together in stream or seepage areas where neither is clearly dominant in the riparian mixture. It usually occurs in low-elevation riparian areas scattered throughout the Cottonwood Creek watershed. Common associates include species of gooseberry and currant (*Ribes* spp.), edible berries including blackberry (*Rubus ursinus*), wild rose (*Rosa* spp.), and poison oak (*Toxicodendron diversilobum*).

A significant component of the lower reaches of Cottonwood Creek and its tributaries are stands of Fremont cottonwood (*Populus fremontii*). Willows, valley oak, Oregon ash (*Fraxinus latifolia*), and California black walnut (*Juglans californica*) may be important species in conjunction with cottonwoods. These stands occur in and adjacent to floodplains and occasionally islands, and generally require some flow throughout the year.

A limited number of perennially or seasonally wet meadows and grasslands occur on level or gently sloping areas adjacent to perennial streams, seeps, springs, and near lakes. While these features may be limited in size and number, the value to ecosystems may be substantial. They have been identified in isolated locations throughout the watershed, often in association with water resource improvements such as stock ponds and irrigation projects. These usually small sites are occupied by obligate hydrophytes such as sedges, rushes, and bulrushes, as well as perennial grasses. These moist sites encourage the development of a rich herbaceous layer that includes such species as lily

(*Chalochortus* sp.), false hellebore (*Veratrum californicum*), shooting star (*Dodecatheon jeffreyi*), and lousewort (*Pedicularis* sp.). Meadow edges often abruptly terminate in upper montane coniferous forest species.

Douglas Fir/True Fir

An estimated 15 percent of the watershed is made up of “Douglas Fir” and “True Fir” habitat. Douglas fir forest is primarily distributed in upland areas on the western side of the watershed, and typically grows on moist sites having north-facing or east-facing slopes. Some areas have rocky substrates. Douglas fir is the dominant species in the tree overstory. Incense cedar, white fir (*Abies concolor*), sugar pine, and black oak (*Quercus kelloggii*) are frequently found as subdominant species. On drier, rocky sites, ponderosa pine and canyon live oak occur, whereas in wetter areas, tree species may include Pacific yew (*Taxus brevifolia*) and mountain dogwood (*Cornus nuttallii*). At higher elevations, red fir (*Abies magnifica*) becomes an associate species.

Red fir forest soils tend to be coarse and well drained, but moist. The forest has a dense canopy with overlapping tree crowns that cast a deep shade. The dominant species in these areas is red fir, which may form pure stands or may include white fir and sugar pine, as the red fir forest grades into other forest types. Cool temperatures rather than droughty conditions limit forest growth. White fir forest may integrate with red fir forest. In some areas, white fir forest occurs on cool, moist sites with moderately deep or deep soils. White fir dominates the tree overstory.

In these forests, the understory density is variable depending on the substrate and available moisture and density of canopy. In some areas, the understory is sparsely distributed because of an accumulation of needle and twig litter. An important component of this habitat type is large organic debris on the forest floor. Accumulations of large wood provide benefits to the soil resources as well as serve as microhabitat for a suite of organisms.

Mixed Conifer

Approximately 10 percent of the Cottonwood Creek watershed consists of “Mixed Conifer” habitats. The CALVEG data indicates the majority of this vegetation type is associated with mid-elevation landscapes in the South Fork and Middle Fork watersheds. No single conifer species dominates the overstory of this extensively occurring habitat type. It occurs on non-serpentinized or slightly serpentinized soils at elevations between about 2,000 – 6,000 ft (1,220 to 1,830 meters) in the North Coast and Montane Ecological Province. Geologic characteristics and aspect play a significant role in the location of these units, with a strong northeastern trend. Ponderosa pine and sugar pine are the predominant pine species in this assemblage. Douglas fir often occurs and may be an important component of the mixture in some areas of the watershed. Incense cedar is a common associate, and white fir occurs less commonly. California black oak and greenleaf manzanita (*Arctostaphylos patula*) may be found on better sites, and Oregon white oak (*Quercus garryana*), canyon live oak, and whiteleaf manzanita (*Arctostaphylos viscida*) often occur on harsher sites. Other shrubs include poison oak, western redbud (*Cercis occidentalis*), mountain whitethorn (*Ceanothus cordulatus*), and California honeysuckle (*Lonicera hispidula*).

Blue Oak/Gray Pine

The “Blue Oak/Gray Pine” habitat type is the largest vegetation complex identified in the Cottonwood Creek watershed. Over 40 percent of the area is mapped as oak and gray pine vegetation. As described earlier, these general characterizations encompass a diverse assemblage of habitat alliances. Within this unit, seven distinct units were identified with CALVEG data. Blue oak and gray pine (formerly known as digger pine; *Pinus sabiniana*) occur together over most of the blue oak woodland of California, usually with blue oak predominating. These climax cover types encompass 89 percent of the entire oak-pine habitat within the watershed. Because of the diversity in terrain, soils, and moisture regimes, there is a highly variable range of stand densities and species composition throughout this ecotype.

Often several other tree species co-occur, and stands have a shrub or grass understory. Associated tree species may include interior live oak, canyon live oak, California scrub oak (*Quercus dumosa*), and California buckeye (*Aeschulus californica*). Characteristic shrub species include poison oak, California coffeeberry (*Rhamnus californica*), and several species of ceanothus and manzanita.

In some areas, interior live oak becomes dominant, and stands may resemble chaparral, especially on rocky sites and on north slopes just below the montane forest. Soil depth, aspect, elevation, and fire frequency determine the distribution of this vegetation type. Terrain is hilly and generally dry; soils are rocky; and soil-water is very low for much of the year. At lower elevations, the blue oak-gray pine type intergrades with more open woodlands where blue oak may be the sole tree species. Stands there tend to be open with an understory of annual plants. Valley oak may also be part of the lower elevation sites, particularly in low-lying floodplains. At higher elevations, the blue oak type intergrades with dense chaparral shrub cover, the California black oak type, or the Pacific ponderosa pine type.

In addition to the dominant blue oak units, localized occurrences of other hardwoods provide diversity in the watershed. Characteristic hardwoods in the watershed include canyon live oak, California black oak, and, to a lesser extent, Oregon white oak, tanoak (*Lithocarpus densiflorus*), and Pacific madrone. Many of these areas occur on moderately productive forest soils, typically in association with pine species. These hardwood forest types usually have a pronounced hardwood tree layer and diverse shrub and herbaceous layers. Depending on the successional phase, brush species, including poison oak, may play an important role in defining this unit. Where canopies are more open, grasses often dominate the understory.

Blue oak woodlands occupy nearly a continuous band in the Cottonwood Creek watershed. This community occurs on dry foothill slopes and valley borders at low to moderate elevations. This woodland type is distributed in a nearly continuous belt between valley/foothill grassland and mixed conifer forest or mixed chaparral. The substrates are typically well drained and rocky, or are exposed with shallow soils. Blue oaks tend to have a high tolerance for extended periods of drought, and frequent fires favor the establishment of blue oak, a stump-sprouter, over gray pine.

Water

Water bodies mapped as “Water” are scattered throughout the Cottonwood Creek drainage, but are generally located in the central and eastern areas of the watershed. They comprise approximately 502.51 acres or approximately 0.08 percent of the total area.

Water is labeled in CALVEG mapping in those cases where permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams, and impoundments of various sizes. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows and Tule-Cattail freshwater marshes. In some cases, Vernal Pools may be identified as a water body in the CALVEG layer; however, there is no description within the CALVEG legend for these features.

Historical Vegetative Cover Conditions

1800 to 1850

John Fremont named Cottonwood Creek in 1846 on the basis of “the creek where cottonwoods grow.” During this time frame, several large Spanish land grants were established, including Rancho Buena Ventura encompassing over 24,000 acres in the vicinity of the lower Cottonwood Creek and the Sacramento River (Smith, 1994).

Vegetation patterns were consistent with those found elsewhere in the Northern Sacramento Valley and Klamath Mountains. The primary disturbance processes that affected vegetation development were related to severe weather events such as fires and floods.

1850 to 1900

In 1852, the three major human practices in the Cottonwood area included gold mining, lumbering, and farming (Smith, 1994). As early as 1855, agriculture was a principal activity in the lower parts of the watershed. Major Reading had more than 6000 acres under cultivation with a diverse assemblage of crops. During this period, large livestock operations were established throughout the watershed. The active management of vegetation for livestock production is indicated by this excerpt from an 1874 article: “Cottonwood valley and surrounding hills are described as a land of grain, sheep, cattle and hogs.”

From 1885 to 1900, the economic benefits of mining prevailed in the watershed. As a result, the soil-vegetation-wildlife balance of the watershed became vulnerable to soil erosion, sedimentation of stream channels, and impaired vegetative cover (Uniconsult, Inc., 1963).

A general practice incorporating fire in managing and controlling vegetation was observed throughout the north state by Native Americans as well as European settlers after their arrival.

1900 to 1950

The devastating effects of dredge mining destroyed vegetation and riparian habitat in the Dry Creek area between the years 1910 and 1920 and again in the 1930s (Smith, 1994).

With the advent of the railroad, fuel wood was a marketable commodity (Smith 1994). It is unknown what type of wood was removed, but it is possible that there were changes in vegetation from this activity.

After World War II, the westside watersheds, including, Cottonwood Creek, Reeds Creek, and Redbank Creek were subject to a conversion of blue oak woodlands to grasslands, urban use, and dryland agriculture (DWR, 1992). In a number of instances, this conversion was made directly through the County Agriculture Soil Conservation and Stabilization Committee from about 1940 through the late 1960s.

1950 to 1975

The role of fire suppression within the watershed during this period resulted in a change in successional characteristics in a number of vegetative communities (U.S. Forest Service [USFS], 1997). Although these changes may be pronounced in the coniferous vegetation types, it has been identified throughout the watershed. In addition, USFS land was being converted from brush to rangeland during this time period (Tricia Bratcher, 2001, pers. comm.).

Beginning about 1970, increased interest in utilizing the oak woodlands as a commodity resulted in the removal of oak trees to support the fuel wood market. Although no quantifiable information is available for the Cottonwood basin, an analysis of the Reeds Creek basin, an adjacent watershed, suggests that conversion of oak woodland habitat for range enhancement purposes resulted in a 25-percent reduction in this habitat between 1958 and 1979 (DWR, 1992).

Possibilities for future development in the Cottonwood Creek watershed were being discussed in the early 1960s. The Cottonwood Soil Conservation District began investigations for future water development plans alongside the initial development of short- and long-range watershed programs (Uniconsult, Inc., 1963).

Historical photographs of Cottonwood Creek in 1962 depict densely vegetated banks alongside clear gravel channels. Vegetated banks act to reduce erosion while providing significant aquatic habitat (Uniconsult, Inc., 1963).

1975 to Current

The past 25 years have resulted in a higher level of urbanization in the central part of the watershed. Land use practices such as livestock grazing, road building, agriculture, and wildfires have had an affect on the vegetative resources in the watershed. The reliance on wood heating has dramatically increased the harvesting and clearing of oak woodlands (approximately 60 percent of the oak woodland in the watershed has been converted to other uses; DWR, 1992).

Detailed vegetative cover studies throughout the watershed are limited. Studies relating to other projects have been performed, and usually included some limited vegetative information, in various resource areas (i.e., *Beegum Watershed Analysis*). As previously mentioned, the most current information available regarding the characterization of vegetation at the watershed scale is the CALVEG system. Because the database contains a wide range of information watershed-wide, it is the main resource used for the basis of this document.

Vegetative Cover Conclusions and Recommendations

The information available at the landscape level is limited for Cottonwood Creek. There are some general conclusions that can be developed pertaining to the change in vegetative patterns and conditions over time, largely based on general conclusions reached in other watersheds with similar characteristics.

Although, there is adequate information available on the current types of vegetation, the information necessary to characterize historical vegetation within the watershed is limited. Additional studies into the historical changes that have occurred to vegetation would assist current land management decisions.

The hardwood-rangelands within the basin may be subject to the concerns regarding regeneration identified in other westside watersheds (Pavlik, 1991). Additional information at the stand level would provide information useful in evaluating this topic at the appropriate scale.

The relationship between vegetation and exotic, invasive, and noxious plants is acknowledged; however, this issue was not developed in the context of vegetation resources. Additional studies on this topic may be warranted.

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7. FISHERY RESOURCES



Fishery Resources

Setting

The Cottonwood Creek watershed currently remains relatively undeveloped and continues to provide suitable habitat for anadromous and resident fish. Environmental factors including hydrology, stream temperature, channel morphology, gravel recruitment, and access allow Cottonwood Creek to support significant fish populations on a seasonal and year-round basis (RMI, 1987). Beegum Creek, tributary to the Middle Fork, has recently received attention as an important habitat for spring-run chinook salmon.

As indicated in the Hydrology section, large stream flows in Cottonwood Creek during the winter are contrasted by low flows in the summer. For a complete hydrological description of the watershed, see the Hydrology section of this document. Average monthly flow records for the USGS gaging station at Cottonwood Creek near Cottonwood indicate 70 percent of the annual runoff occurs from December through March, and 4 percent occurs July through October (U.S. Fish and Wildlife Service [USFWS], 1980). This hydrology results in a wide range of environmental conditions. The temporal presence of anadromous species, such as fall-run chinook salmon (*Oncorhynchus tshawytscha*), in Cottonwood Creek is affected by the onset and magnitude of the rainy season. During years with late-occurring rainfall, access and migration of adult salmon into Cottonwood Creek can be delayed; whereas, years of earlier or large rainfall volumes allow adult salmon and steelhead to enter the creek. Additionally, subsequent low winter and spring flows often impede production and successful recruitment of young salmonids. In certain higher-elevation stream reaches that support spring-run chinook (*Oncorhynchus tshawytscha*), exceptionally low flows in the early summer create increased stream temperatures and limit access of adults into high-gradient reaches.

The water quality of Cottonwood Creek is considered good. Specific parameters and variations are discussed in the Water Quality section.

Cottonwood Creek is the second greatest contributor of gravel in the upper Sacramento River (CALFED Bay-Delta Program, 1997). The DWR gravel source studies conclude that Cottonwood Creek contributes 33 percent of gravel bedload movement to the Sacramento River, and increased gravel mining in past years has reduced potential gravel contributions by 60 percent (McKevitt, 1984). A report by CAFED indicated that Cottonwood Creek supplies almost 85 percent of the gravel introduced into the Sacramento River between Redding and Red Bluff (CALFED, 1998). DWR (1980) estimated an annual bedload in Cottonwood Creek of approximately 20,000 tons a year, of which approximately 3,000 tons (15 percent) is greater than one-half inch in diameter. DWR (1980) stated that the existing gravel permits require that spawning-size gravels extracted from Cottonwood Creek be provided to the CDFG for spawning gravel rehabilitation (e.g., Sacramento River). DWR (1980) concluded that the impact of gravel mining on spawning areas in Cottonwood Creek would be less if this gravel were placed into the Cottonwood Creek channel.

Current Fishery Resources

Habitat Conditions

In the 1970s, fishery resources and habitat conditions were extensively studied under the assumption a water development plan for Cottonwood Creek would eventually be implemented. Much of the following discussion is a result of these investigations.

Record high-water temperatures in Cottonwood Creek occurred during the spring of 1977 and 1978, following the 1976 to 1977 drought (CDFG, 1978b). Water temperatures greater than 60°F are not favorable for rearing juvenile salmon (Jensen, 1977 as cited in CDFG, 1978b).

RMI (1987) defined suitable spawning gravel as gravel with a diameter greater than 0.5 inch up to 3 inches. Adult steelhead have been reported to spawn in substrates from 0.2 to 4.0 inches (Reiser and Bjornn, 1979). Buer (1994) states that chinook salmon prefer well-graded gravel ranging from 0.5 inch to 6.0 inches. Estimated bedload deposit substrate particle size in Cottonwood Creek from the mouth to its confluence with South Fork are shown in Table 7-1 (RMI, 1987). RMI (1987) estimated approximately 45 percent of the total substrate bedload particles were of suitable sizes (0.5 to 3.0 inches) for salmonid spawning.

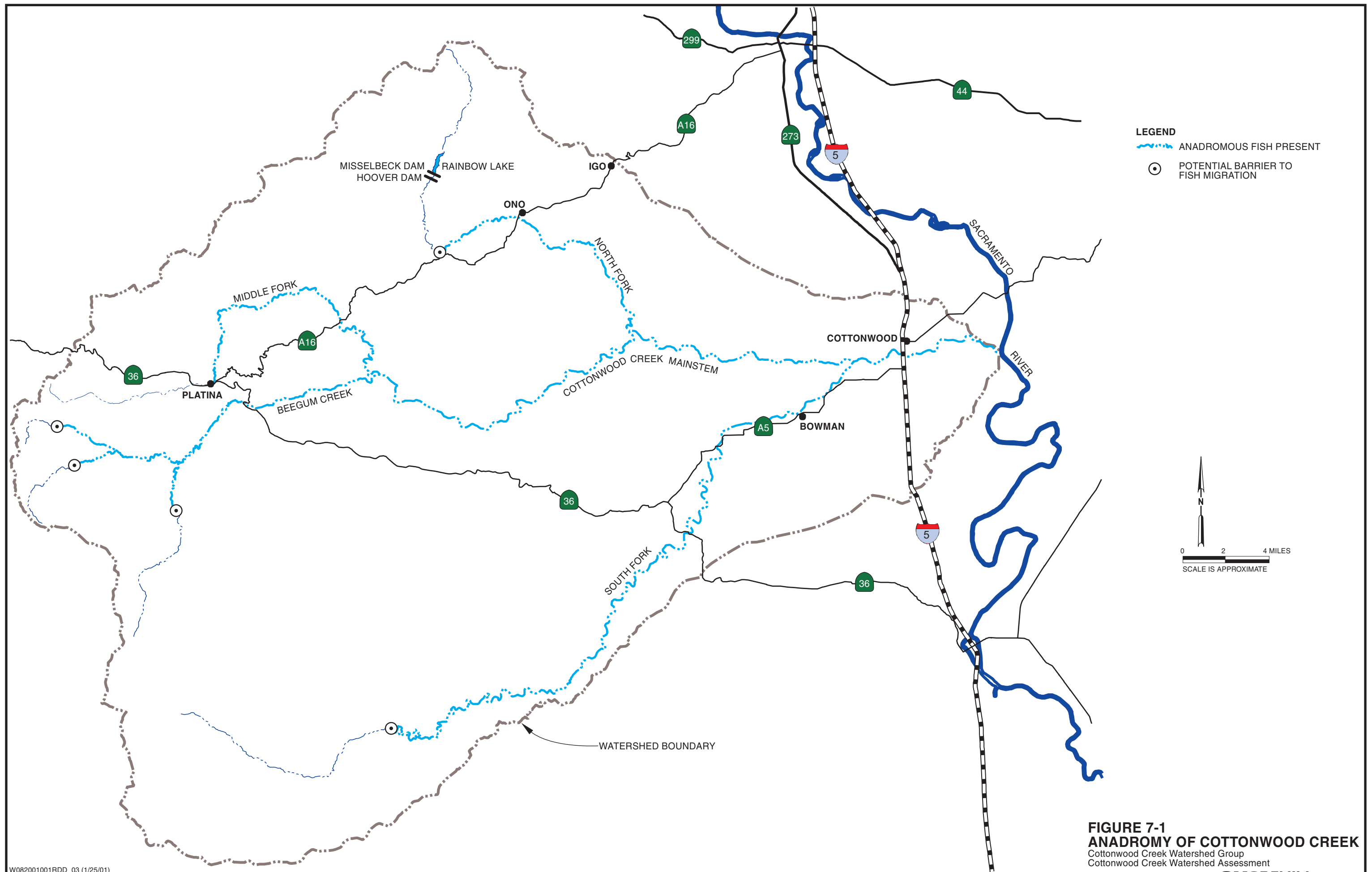
TABLE 7-1
Summary of Substrate Characteristics
Cottonwood Creek Watershed Assessment

Substrate Particle Size (inches)	Percent Composition
0.15	32
0.15 to 0.3	14
0.3 to 0.5	9
0.5 to 1.0	16
1.0 to 3.0	29
3.0	1

Source: RMI, 1987. Information developed by DWR, USACE, and USGS.

The mainstem Cottonwood Creek is fed by three major branches: the North, Middle, and South forks. Each fork of Cottonwood Creek is used by both anadromous and resident coldwater and warmwater species. Figure 7-1 depicts the known potential extent of anadromy within Cottonwood Creek, the location of known permanent fish barriers, and summer holding reaches for spring-run chinook. Approximately 42 percent (390,000 square feet) of the drainage basin was determined to contain suitable spawning areas (CDFG, 1978b). However, low stream flows during the fall can leave up to 75 percent of this habitat inaccessible at any one time (USFWS, 1980).

Low flows and warm temperatures restrict juvenile fall-run and both adult and juvenile spring-run chinook salmon from utilizing this stretch of the stream during the late-spring and summer period. However, several resident native and non-native fish species inhabit the deep pools and riffles of the mainstem during the warm summer months.



The North Fork originates in southwestern Shasta County and flows southeasterly to the confluence with the mainstem Cottonwood Creek (Table 7-2). The maximum elevation of the North Fork is 5,720 feet. A natural waterfall on the North Fork forms an anadromous fish barrier approximately 5 miles upstream from the Ono Bridge at T 30N, R 7W (Figure 7-1). About 12 miles upstream from this waterfall, Misselbeck Dam creates a small impoundment called Rainbow Lake. Because the dam had been previously declared structurally unsafe, the reservoir is currently maintained at minimum levels and acts to prevent siltation in the North Fork, mainstem Cottonwood Creek, and the Sacramento River. Two low-head diversion dams are located downstream of the waterfall on the North Fork but do not block anadromous fish migration. One is located in the rugged canyon 2 miles above Ono, diverting less than 1 cfs; and a smaller dam, 2 or 3 feet high, is located about 1 mile above Gas Point Road. Species that have been confirmed to use the North Fork include various resident species in addition to fall-run, late-fall-run, and spring-run chinook salmon (Table 7-3).

TABLE 7-2
Characteristics of Cottonwood Creek Watershed
Cottonwood Creek Watershed Assessment

Creek	Total Length (miles)	Total Length of Anadromy (miles)	Maximum Elevation (feet)	Total Suitable Spawning Habitat (square feet)
Mainstem	20.57	20.57	350	152,400
North Fork	28.0	20.24	5,720	37,400
Middle Fork	30.5	Unknown	7,860	36,600
South Fork	56.78	43.91	7,900	165,900
Beegum Creek	33.49	18.0	Unknown	Unknown
Totals for Cottonwood and Beegum Creeks	169.31	~130^a	7,900	392,000

Note: The amount of suitable spawning habitat varies each year depending upon flow and runoff conditions of the previous year. This data is based on a stream survey performed by CDFG (1978b).

^aCDFG, 1979b.

TABLE 7-3
Recorded Presence of Anadromous Fish in the Cottonwood Creek Watershed (CDFG Region 1 files)
Cottonwood Creek Watershed Assessment

Anadromous Species	Mainstem	North Fork	Middle Fork	South Fork	Beegum Creek
Fall-run Chinook	X	X	X	X	
Late-fall-run Chinook	X	X	X	X	
Spring-run Chinook	X	X	X	X	X
Steelhead Trout	X		X	X	X

The Middle Fork flows easterly from the lowermost portion of the Klamath Mountains to the confluence with the North Fork (30.5 miles) (see Table 7-2). The maximum elevation of the Middle Fork is about 7,860 feet above mean sea level. Beegum Creek, a principal

tributary to the Middle Fork, is the primary documented spring-run chinook salmon spawning and holding area in the Cottonwood Creek watershed. Because of seasonal variation of streamflow, partial natural barriers can block anadromous fish migration into portions of Beegum Creek. Past surveys on Beegum Creek have characterized habitat quality for anadromous species as fair to good (USFS, 1997). Over the past 25 years, small runs of steelhead have been observed in the mainstem and lower sections of the South, North, and Middle forks of Beegum Creek (Table 7-3) (USFS, 1997).

The South Fork reaches an altitude of approximately 7,900 feet and flows northeasterly a distance of 45 miles before connecting with the mainstem Cottonwood Creek (Table 7-2). McCartney Dam, previously a barrier to anadromous fish migration, was removed in 1959. After the dam was removed, spring-run chinook salmon were observed 7 to 8 miles upstream of the dam site (CDFG, 1961). A human-made barrier to fish migration upstream of the McCartney Dam site exists approximately 3.5 miles upstream of Maple Creek, which is a tributary to the South Fork. Slides Creek, another tributary to the South Fork, flows through a major landslide on the South Fork, and could be a potential source of heavy sedimentation in the tributary, which could negatively affect aquatic habitat in the sub basin. Also, in 1976, the Skinner Mill Fire caused extensive erosion and streambed siltation in the South Fork, resulting in severe impacts to habitat quality. The indirect impacts of this fire and subsequent siltation resulted in a fish kill in the South Fork and the mainstem Cottonwood Creek all the way to the Sacramento River. Recent records indicate that the South Fork maintains populations of steelhead trout and fall- and spring-run chinook salmon (Table 7-3).

Fish Populations

Anadromous Species

Approximately 130 miles of Cottonwood Creek and its tributaries are accessible to anadromous fish (USFWS, 1980). Populations of fall-run, late-fall-run, and spring-run chinook salmon, and steelhead use various reaches depending on life history needs. Appendix B contains historical to present-day population records and estimates for chinook salmon and steelhead in Cottonwood and Beegum creeks. Winter-run chinook salmon, a federally listed species, are known to exist in Sacramento River, but neither their historical nor present range includes Cottonwood Creek (Myers et al., 1998). Non-natal rearing of chinook salmon has not been investigated in Cottonwood Creek (Maslin et al., 1998).

Adult fall-run chinook salmon ascend Cottonwood Creek and spawn in late October through November (Table 7-4). Juvenile salmon begin migrating following emergence as early as December, and smolts continue to leave the stream through May (CDFG, 1978b). Although adult fall-run chinook have been observed spawning in the Middle Fork up to 2 miles downstream of the Beegum Creek confluence, most fall-run chinook salmon spawning and rearing occurs in the mainstem and the valley reaches of the North, Middle, and South forks. Fall-run chinook use the North Fork regularly and have been observed spawning as far upstream as the old highway bridge near Ono (CDFG, 1979a). Fall-run chinook salmon have also been observed in the South Fork, but the upper limit of spawning has not been determined. The approximate spawning distribution for fall-run chinook salmon in the mainstem Cottonwood Creek is presented in Table 7-5. CDFG (1993) estimated that, on average, approximately 1,000 to 1,500 (range of a few hundred to over

8,000) adult fall-run chinook salmon return to spawn in Cottonwood Creek each year (see Appendix B).

TABLE 7-4

Life History Timing for Anadromous Salmonids Found in Cottonwood Creek Watershed
Cottonwood Creek Watershed Assessment

Name	Adult Immigration	Spawning	Incubation	Rearing	Juvenile Emigration
Fall-run Chinook	October to December	November to December	October to March	December to June	December to May
Late-fall-run Chinook	January to March	January to April	January to June	April to November	April to June
Spring-run Chinook	April to June	August to October	August to December	October to April	October to May
Steelhead	November to December	December to April	December to June	Year-round (1 to 2 years)	January to October

TABLE 7-5

Spawning Distribution of Fall-run Chinook in the Mainstem Cottonwood Creek
Cottonwood Creek Watershed Assessment

Location on the Mainstem	Percentage of Total Run
Confluence with the Sacramento River to I-5 bridge	53
I-5 bridge to confluence with the South Fork	23
Confluence with the South Fork to confluence with the North and Middle forks	24

Source: CDFG, 1978b.

Adult late-fall-run chinook salmon migrate up the mainstem Cottonwood Creek and typically spawn from January through April. Juvenile late-fall-run chinook salmon migrate downstream as late as May or June (Table 7-4). Adult late-fall-run chinook salmon have been observed in the lower reaches of the South, Middle, and North forks, but the extent of their spawning distribution is unknown. Because they are present in Cottonwood Creek during high flows and turbidities, direct observations of late-fall-run chinook are limited. No recent estimates of late-fall-run chinook salmon have been made, but CDFG believes fewer than 500 adults return to spawn in Cottonwood Creek each year (CDFG, 1993).

Spring-run chinook salmon are listed as both State of California Threatened (February 5, 1999) and federal Threatened (November 15, 1999). Cottonwood Creek supports a small, but very important, population of spring-run chinook salmon (see Table 7-2 and Appendix B). Central Valley spring-run chinook salmon are known to exist in only a few remaining locations throughout the Sacramento River watershed. Adult spring-run chinook salmon migrate into the headwaters of the South and Middle forks during April, May, and June (Table 7-4). They spend the summer months in deep pools that provide cool temperatures and protective cover. The two known summer holding locations are Beegum Creek and in the South Fork above the confluence with Maple Gulch (CDFG, 1978b). Spring-run chinook salmon spawn in the early fall, and juvenile migration begins the following spring. CDFG

(1993) believes that fewer than 500 spring-run chinook salmon historically returned to annually spawn in the Cottonwood Creek watershed, and no current estimate of populations is available.

Steelhead were listed as a threatened species under the federal Endangered Species Act (ESA) May 18, 1998. Critical habitat was designated February 16, 2000. Adult steelhead enter Cottonwood Creek during November and December and spawn during the winter and early spring months (Table 7-4). Fry and juvenile steelhead rear in freshwater for 1 to 3 years before migrating to the ocean in late winter and early spring. Cottonwood Creek is one of the major tributaries to the Sacramento River system that supports steelhead spawning (CDFG, 1979). Because they migrate during high flows, and it is difficult to distinguish juvenile steelhead from resident rainbow trout, few steelhead population estimates have been recorded in Cottonwood Creek. USFS and CDFG biologists observed populations of juvenile steelhead in the upper South Fork Cottonwood Creek Yolla Bolly Wilderness Area in the summer of 1976; however, no population estimates of either juvenile or adult steelhead spawners are available.

Other Species

Numerous resident salmonids and warmwater species have been observed in Cottonwood Creek and its tributaries. Species recorded for Cottonwood Creek are listed in Table 7-6. Puckett (1979) conducted an extensive stream survey in anticipation of a future water development plan. This stream survey included:

- Mapping of riffles, pools, and other stream habitat types
- Locating passage barriers
- Determining distribution of fish species

Moyle (1976), as cited by CDFG (1979a), described that the three main zones of fish habitat in Cottonwood Creek watershed are the following:

- The rainbow trout zone
- The California roach zone
- The pikeminnow-sucker-hardhead zone, formerly known as squawfish-sucker-hardhead zone

The rainbow trout zone is found in clear, cold, swift, high-gradient headwater streams with a predominance of riffles. The bottom substrates are usually cobble, boulders, and bedrock; and the banks are generally well shaded and often undercut. Trout, riffle sculpin, dace, and sometimes suckers and roach inhabit this zone. The California roach zone is warm tributary streams flowing through open foothill woodlands of oaks and gray pines. During summers, flows diminish and often become intermittent. In winter, stream flows are swift and subject to flooding. The California roach and introduced species such as sunfish are predominate. During winter and spring months, these streams provide spawning habitats for anadromous species such as steelhead and resident species such as suckers, pikeminnows, and other native minnow species. The pikeminnow-sucker-hardhead zone is characterized by warm, permanently flowing streams with deep pools and wide, shallow riffles. Species found in this zone include native minnow and sucker species as well as other introduced species and the seasonally occurring anadromous species of salmon and steelhead.

TABLE 7-6
Fish Species in Cottonwood Creek
Cottonwood Creek Watershed Assessment

Common Name	Scientific Name	Native(N)/Introduced(I)
Black bullhead	<i>Ictalurus melas</i>	I
Bluegill	<i>Lepomis macrochirus</i>	I
Brown bullhead	<i>Ictalurus nedulosus</i>	I
Brown trout	<i>Salmo trutta</i>	I
California roach	<i>Hesperoleucus symmetricus</i>	N
Carp	<i>Cyprinus carpio</i>	I
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	N
Golden shiner	<i>Notemigonus crysoleucas</i>	I
Green sunfish	<i>Lepomis cyanellus</i>	I
Hardhead	<i>Mylopharodon conocephalus</i>	N
Hitch	<i>Lavinia exilicauda</i>	N
Largemouth bass	<i>Micropterus salmoides</i>	I
Mosquito fish	<i>Gambusia affinis</i>	I
Pacific lamprey	<i>Entosphenus tridentatus</i>	N
Prickly sculpin	<i>Cottus asper</i>	N
Rainbow trout	<i>Oncorhynchus mykiss</i>	N
Riffle sculpin	<i>Cottus gulosus</i>	N
Sacramento pikeminnow	<i>Ptychoeilus grandis</i>	N
Sacramento sucker	<i>Catoostomus occidentalis</i>	N
Smallmouth bass	<i>Micropterus dolomieu</i>	I
Speckled dace	<i>Rhinichthys osculus</i>	N
Steelhead	<i>Oncorhynchus mykissirideus</i>	
Threespine stickleback	<i>Gasterosteus aculeatus</i>	N
Tule perch	<i>Hysterocarpus traski</i>	N
White catfish	<i>Ictalurus catus</i>	I

Source: CDFG, 1979b.

The rainbow trout zone comprises the upper sections of the Cottonwood Creek watershed where water temperatures remain cool during the summer months. The California roach zone is located at elevations below the rainbow trout zone and is characterized by low to intermittent streamflows and summer water temperatures that exceed 86°F. The squawfish-sucker-hardhead zone occurs in elevations below the California roach zone and extends to Cottonwoods Creek's confluence with the Sacramento River. The creek in this zone is characteristically wide, with deep pools and shallow riffles. Summer water temperatures of the pikeminnow-sucker-hardhead zone exceed 68°F. Fish predominantly found in deep pools are mosquito fish, green sunfish, hardhead, squawfish, sucker, smallmouth bass, and

carp. Fish species predominantly found in the riffles are juvenile bass, prickly sculpin, mosquito fish, Sacramento sucker, roach, and speckled dace (CDFG, 1979b).

Sport fishing on Cottonwood Creek occurs on the mainstem Cottonwood Creek and the upper tributaries. Fishing in the lower reaches is primarily for warmwater species such as smallmouth bass. Fishing in the upper reaches is primarily for rainbow and brown trout; however, not many brown trout are known to exist in the watershed (Bratcher, 2001, pers. comm.). Cottonwood Creek is not extensively fished because of limited access (CDFG, 1978a).

Population estimates for resident species are generally unknown. No extensive stream surveys have been performed since the suspension of plans for water development in the Cottonwood Creek watershed. Other species observed in Cottonwood Creek have been briefly studied in the past. Table 7-7 describes specific life history patterns of resident fish in Cottonwood Creek.

Resident rainbow and brown trout are found in the South Fork above Maple Gulch, in Beegum Creek from the Highway 36 bridge upstream, in the Middle Fork from Platina upstream, and the Rainbow Lake vicinity of the North Fork (CDFG, 1978b). These upstream reaches provide cooler water temperatures during summer months. CDFG stocking records indicate rainbow trout were stocked in the North, Middle, South, and Cold Fork, and brown trout in the Middle Fork (Appendix B).

Smallmouth bass have been observed in Cottonwood Creek from the confluence with the Sacramento to 3 miles above Maple Gulch on the South Fork, through Beegum Gorge on Beegum Creek to Platina on the Middle Fork, and to Rainbow Lake on the North Fork. Smallmouth bass generally spawn on the sand when water temperatures reach 60°F during the months of April, May, and June (CDFG, 1979b).

Historical Fishery Resources Conditions

1800 to 1850

Historically, the Wintu Indian tribe resided in the Cottonwood Creek basin. These tribal people depended on the seasonal availability of various food supplies, with salmon being one of the most important resources (<http://nepa.eh.doe.gov/eis/eis-0232/0232TOC.HTM>). Steelhead, sucker, eel, trout, and freshwater shellfish were also a predominate component of the Wintu diet (USFS, 1980). The Nor-El-Muk tribe was the principal Native American Indian tribe to subside in the Beegum watershed. These people were proficient anglers and depended on the seasonal availability of salmon in the watershed (Jensen, 1979, as cited by USFS, 1980). Early European settlers also likely encountered the watershed during this time, although there are no specific accounts of how these settlers may have physically affected the watershed.

TABLE 7-7

Habitat Requirements for Common Native Resident Fish in Cottonwood Creek Watershed
Cottonwood Creek Watershed Assessment

Common Name	Scientific Name	Temperature Requirements	Preferred Spawning Habitat; Substrate	Adult Food Preference	Preferred Habitat Types	Notes or Comments
Brown trout	<i>Salmo trutta</i>	Most favorable conditions between 44.6° and 66.2°F	Streams with gravel ripples when temperatures reach 42.8° to 50°F	Dependent upon size: drift organisms, aquatic invertebrates, other fish (piscivores)	Medium to large sized, slightly alkaline, clear streams with both swift riffles and large, deep pools	Plentiful in the upper reaches of the North Fork, South Fork, and Middle Fork
Rainbow trout	<i>Oncorhynchus mykiss</i>	Temperatures from 32° to 82.4°F	Gravel riffle (typically spawn once a year)	Drift organisms and bottom-dwelling invertebrates	Cool, clear, fast-flowing permanent streams and rivers	Plentiful in the upper reaches of the North Fork, South Fork, and Middle Fork
Smallmouth bass	<i>Micropterus dolomieu</i>	Cool summer temperatures (68° to 80.6°F)	Typically spawn on the sand when temperatures reach 60°F	Frequently cannibalistic (piscivores), crayfish, amphibians, and insects	Clear streams and rivers with many large pools, abundant cover, and cool summer temperatures	Found in the lower reach of Cottonwood Creek's three Forks and the mainstem
Hardhead	<i>Mylopharodon conocephalus</i>	Warmwater conditions typical of low- to mid-elevation streams	Low-velocity riffles with gravel, (thought to be mass spawners)	Filamentous algae, small invertebrates, aquatic plants	Clear, warm streams with large, deep, rock and sandy bottom pools	Found in undisturbed sections of larger streams; move into smaller tributaries to spawn
Sacramento pikeminnow	<i>Ptychocheilus grandis</i>	Do not flourish in waters less than 59°F; spawn above 57°F	Gravel riffles, congregate to spawn over rocky-gravelly areas	Highly predatory on fish and crayfish	Clear, well-shaded sand-rock bottomed pools with rocks/logs	Sedentary habits, often remaining in one pool for long intervals; also known to migrate up- and downstream to spawn and forage
Sacramento sucker	<i>Catostomus occidentalis</i>	Wide temperature range, most abundant in cool streams, pools	Congregate over clean gravel	Filamentous algae, detritus, invertebrates associated with the bottom	Feed in small groups at head of pools or edge beds of aquatic vegetation; deep pools	Typically migrate up Cottonwood Creek in early fall and spring and then spawn in gravel riffles between late February and early June

Source: Moyle, 1976.

1850 to 1900

The Shasta County gold rush began in 1848 with the discovery of gold on Clear Creek. By February 1850, Cottonwood Creek and its tributaries were prospected by miners. The first mining site on Cottonwood Creek was known as Arbuckle District. Following the success of mining at the Arbuckle District, the creek became extensively and successfully mined (Smith, 1994).

By the 1860s, miners had adopted mining techniques such as ground sluicing, dredging, and hydraulic mining. This type of mining marked the beginning of significant fish habitat degradation on Cottonwood Creek. Dredges upturned the streambed leaving behind large rock piles. Both hydraulic and dredge mining directly impacted fish spawning grounds by causing heavy sedimentation. Less direct impacts of mining include an increase of human settlement that led to disturbances such as agricultural activity and logging.

1900 to 1950

Prior to the early 1900s, it was recognized that the Cottonwood watershed supported a considerable fall and spring chinook salmon run (Clark, 1929). However, by 1928, the runs of chinook salmon in Cottonwood Creek had diminished to a few fall-run fish (Clark, 1929). While there are no documented references to causes for these declines, it is probable that habitat modification and loss, overfishing, and water diversions within both the Cottonwood and the Sacramento River watersheds were responsible for these population declines.

Descriptions of Cottonwood Creek in 1909 indicate substantial populations of fall-run chinook salmon. An “old-timer” noted that “...you couldn’t step without stepping on them...the salmon would just run right over your feet and almost trip you...you had to be very careful walking across!” (Smith, 1994). Additional observations in 1909 describe children using big sticks to push salmon out of way so they could safely walk across the creek (Smith, 1994). The following year (1910) an account from the *Cottonwood Enterprise* issue of November 26 states “Salmon fish are very plentiful in Cottonwood Creek now. One with a spear or gun can easily get them” (Smith, 1994).

Spawner estimates for chinook salmon using carcass surveys began in the late 1940s. These estimates accounted for factors affecting the fish observed, such as turbidity and high streamflow (CDFG, 1979b). However, spawner estimates from surveys conducted prior to 1964 are fragmented and may be inaccurate.

1950 to 1975

In 1959, the McCartney Dam, previously an impediment to fish migration of spring-run chinook salmon, was removed from South Fork Cottonwood Creek. In the summer of 1960, spring-run chinook were caught and observed by an angler/rancher above the stream reach previously blocked by the McCartney Dam (CDFG, 1961).

Prior to the early 1960s, gravel extraction records were not maintained, although it is thought that Cottonwood Creek has supplied the region with gravel over the past 80 years. Construction of the I-5 bridge over Cottonwood Creek in 1962 indicates the earliest substantial occurrence of gravel extraction (RMI, 1987). Gravel mining causes damage to fish by

degrading suitable habitat and creating undesirable changes in stream morphology (Buer, 1994). Gravel mining also causes stranding problems as well as increased siltation in the creeks and streams, which disturbs and can possibly destroy spawning habitat (Bratcher, 2001, pers. comm.).

A 1963 report on flood control projects assessed the spawning potential of Cottonwood Creek and estimated 542,000 square feet of spawning area in some 19 to 20 miles of gravel (Uniconsult, Inc., 1963).

As mentioned in the Hydrology section, two reservoirs (Dutch Gulch and Tehama Project) were proposed in the early 1970s to reduce flood damages in the Cottonwood Creek watershed area. These projects were not carried out to completion partly because of lack of funding as well as significant evidence that a water development plan on Cottonwood Creek was proven harmful to fish populations of Cottonwood Creek and the Sacramento River system (CDFG, 1979b). Dam construction and operation can block all anadromous fish migration while limiting access to valuable habitat in upper stream reaches. Rainbow Lake, located on the North Fork, remains the only reservoir on Cottonwood Creek. Rainbow Lake has provided water to the Igo-Ono and Happy Valley services area since the completion of the Misselbeck Dam in 1920. It is unknown how much potential spawning area the Misselbeck Dam blocks, although a natural barrier occurs 12 miles downstream at a waterfall.

Population estimates for fall-run chinook salmon (the most documented species) indicate a maximum estimate of 8,540 existing in 1969 (Menchen, 1969). Records for spring-run chinook salmon and late-fall-run chinook salmon on Cottonwood Creek are less complete with minimal observations, summarized in Tables 1 and 2 of Appendix B. CDFG stream surveys for spring-run chinook salmon on Beegum Creek have, so far, indicated small populations of spring-run chinook (see Table 3 in Appendix B).

1975 to Current

In the 1970s, fishery resources and habitat conditions were extensively studied under the assumption that a water development plan for Cottonwood Creek would eventually be implemented. The habitat conditions discussion in the Current Fishery Resources section gives a complete discussion of these investigations.

Recent legislation, including the Central Valley Project Improvement Act (CVPIA) was signed into law in 1992. The purpose of that legislation is to implement major changes in the operation of the Central Valley Project (CVP) water delivery system. One of the main goals of the CVPIA is to restore the Central Valley's anadromous fish populations by implementing provisions dedicating water to in-stream use for fish and wildlife. As part of the implementation of the CVPIA, actions planned to double the populations of anadromous fisheries in the Central Valley have identified Cottonwood Creek as an important watershed. Cottonwood Creek is one of the few tributary streams draining into the Sacramento River from the west side of the Central Valley. Because of its unique watershed size and characteristics, it has the potential for significant opportunities to restore anadromous fisheries and habitats within the Sacramento Valley. The Cottonwood Creek watershed has an important role in meeting the CVPIA doubling goals.

Federal and state listings: spring-run chinook salmon are listed as both State of California Threatened (February 5, 1999) and federal Threatened (November 15, 1999). Central Valley steelhead were listed as a threatened species under the ESA May 18, 1998. Critical habitat was designated February 16, 2000, within the Cottonwood Creek remnant, but significantly important populations of spring-run chinook salmon continue to inhabit the upper reaches of the watershed (i.e., Beegum Creek). Currently, efforts to monitor and plan for the recovery of this species are being undertaken by CDFG and federal resource agencies. Recovery of this and other anadromous species are dependent on the continued protection, enhancement, and restoration of key habitats throughout the Central Valley including Cottonwood Creek.

Fishery Resources Conclusions and Recommendations

Relative to other, more developed, watersheds in the Central Valley, Cottonwood Creek continues to provide important habitat for anadromous fish. However, resource agencies have indicated a desire to increase the amount of usable habitat. Specifically, this is stated in the *Final Restoration Plan for the Anadromous Fish Restoration Program* as finalized in 2001. That report established a population target of 5,900 chinook salmon and included recommended actions that would assist in meeting that target. Anadromous Fish Restoration Program (AFRP)-recommended actions for Cottonwood Creek are listed in Table 7-8, along with the potential parties that would be involved in the proposed actions.

TABLE 7-8

Anadromous Fishery Restoration Program-recommended Actions for Cottonwood Creek
Cottonwood Creek Watershed Assessment

Action	Involved Parties	Priority
1. Establish limits on in-stream gravel mining operations by working with state and local agencies to protect spawning gravel and enhance recruitment of spawning gravel to the Sacramento River in the valley sections of Cottonwood Creek.	USACE, Shasta and Tehama counties, California Division of Mines, CDFG, USFWS, USBR	High
2. Restore the stream channel to prevent ACID siphon from becoming a barrier to migration of spring- and fall-run chinook salmon and steelhead.	ACID, gravel miners, USFWS, USBR	Medium
3. Eliminate adult fall-run chinook stranding by stopping attraction flows in Crowley Gulch or by constructing a barrier at the mouth of Crowley Gulch.	ACID, CDFG, USFWS, USBR	Medium
4. Facilitate watershed protection and restoration to reduce water temperatures and siltation to improve holding, spawning, and rearing habitats for salmonids.	Landowners, CDFG, USFWS, USBR	High
5. Establish, restore, and maintain riparian habitat on Cottonwood Creek.	ACID, gravel miners, landowners, USFWS, USBR	High

Source: USFWS and USBR, 2001.

Cottonwood Creek is an important source of spawning gravel for the upper Sacramento River, contributing 33 percent of gravel bedload movement into the Sacramento River. The contribution of gravel to the Sacramento River is currently affected by gravel mining, which

reduces the amount of gravel contributed to that system. The geometry of the lower reach may also be affected by gravel mining, resulting in potential impacts to fish habitat. However, additional study is needed before a causative relationship is defined.

Recommendations

As with other resource areas, there is a fair amount of information available on fishery resources in the basin, but the majority of it has not been compiled at the watershed scale. Also, as with other resource areas, specific fisheries projects may require additional data collection. Currently, CCWG has submitted a grant application to CALFED requesting funding for the establishment of a fish monitoring program. The fish monitoring program would monitor populations and correlate fish presence with flow and water temperature parameters. Funding of the fish monitoring project would establish a baseline of information against which future projects could be evaluated.

Additionally, the actions recommended in the AFRP Final Restoration Plan should be reviewed from a landowner and stakeholder perspective. AFRP actions were established to meet population goals, and initiation of the actions may preclude future regulatory efforts in the basin regarding fisheries.

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8. WILDLIFE RESOURCES AND HABITAT TYPES



Wildlife Resources and Habitat Types

Setting

The Cottonwood Creek watershed provides an array of wildlife resources and habitat types that reflect the diversity of landscapes and disturbance mechanisms. A systematic review identified at least 10 specific habitat types throughout the watershed. The Hydrology section of this document describes the watershed's climate as Mediterranean in nature. A combination of climate, slope, aspect, and soil characteristics has resulted in a variety of habitats situated within the diverse geographic setting.

The areas identified as agriculture, annual grasslands, and to some extent blue oak woodlands are predominantly found on the gentle to moderate slopes in the lower elevations of the watershed. A number of game species rely on these habitats on a seasonal basis, and a management plan for the Yolla Bolly deer herd has been in place since 1982 (USFS, 1997). Additionally, the Cottonwood Bridge had one of the largest pallid bat (*Antrozous pallidus*) populations known in the state (Bratcher, 2001, pers. comm.).

The mountainous terrain within the upper watershed is sparsely populated and has remained relatively undeveloped. Although timber management activities and large fires have occurred within the watershed (USFS, 1997), mixed conifer and true fir habitat types are still predominant in the headwaters of the watershed.

Riparian habitats are recognized as vital to a diverse assemblage of wildlife species, over a wide array of geographic settings. Cottonwood Creek supports a significant riparian corridor. Although riparian habitat acreage constitutes a relatively small component of a very large watershed, the distribution of riparian habitat is important in a variety of ways. In addition to providing primary residential and breeding habitat for a number of species, riparian corridors serve as transition habitat or migratory corridors and provide for population dispersal over time.

The focus of this section is to characterize the wildlife resources and habitat types that occur in the Cottonwood Creek watershed. The primary resource available to accomplish this task is the California Wildlife Habitat Relationships (WHR) model. The WHR classification system emphasizes the importance of tree size and canopy closure for wildlife species (Mayer and Laudenslayer, 1988). Shrub and herbaceous layers may be important wildlife habitat attributes; however, they are not emphasized in the WHR forest classification system. The early forest successional stages and the more open-canopied forests frequently include a shrub and herbaceous vegetation layer. The denser classes also often contain shrub and herbaceous components, but in more variable amounts. In the non-forested settings that were modeled, WHR's emphasis on tree size and canopy closure is not predominant.

WHR is a predictive model that can generate a list of species potentially occurring within a specified area under certain user-defined habitat, seasonality, status, and special habitat element criteria. Because the models are intended for use at relatively large scales and the underlying habitat classification system is relatively coarse, accuracy of the WHR system generally decreases with the decreasing size of an assessment area. For this assessment, the WHR query is intended to provide a sense of the species' diversity in the watershed and provide the reader with a broad overview of the wildlife community.

At least 10 distinct habitat types were identified within the assessment area using WHR. Figure 8-1 displays the distribution of habitat types throughout the watershed. The model identified almost 150 species of wildlife that may exist within the watershed. Appendix C provides a list of general wildlife species, their habitat associations, and WHR identifiers. The information presented in Appendix C includes the outputs of the WHR database. The results of that query have not been edited, but were thereafter subject to interpretation by the biologists who prepared this section of the document. Where appropriate, WHR predictions that are incongruent with known distributions of wildlife species in the watershed and in the region are excluded from further discussion in this document. Similarly, erroneous legal-status descriptions in the WHR output are not carried forward in the main body of this document.

Current Wildlife and Habitat Conditions

Methods

Sources Consulted

California Natural Diversity Database (CDFG, 2001) records for all USGS 7.5-minute quadrangles in the Cottonwood Creek watershed were reviewed in their current form. Twenty-seven USGS quadrangles were evaluated to provide information on known and potential wildlife species in the region. The USFWS provided additional species' information in relation to their Sensitive and Listed Species Database. These informational documents are provided as attachments in hardcopy format.

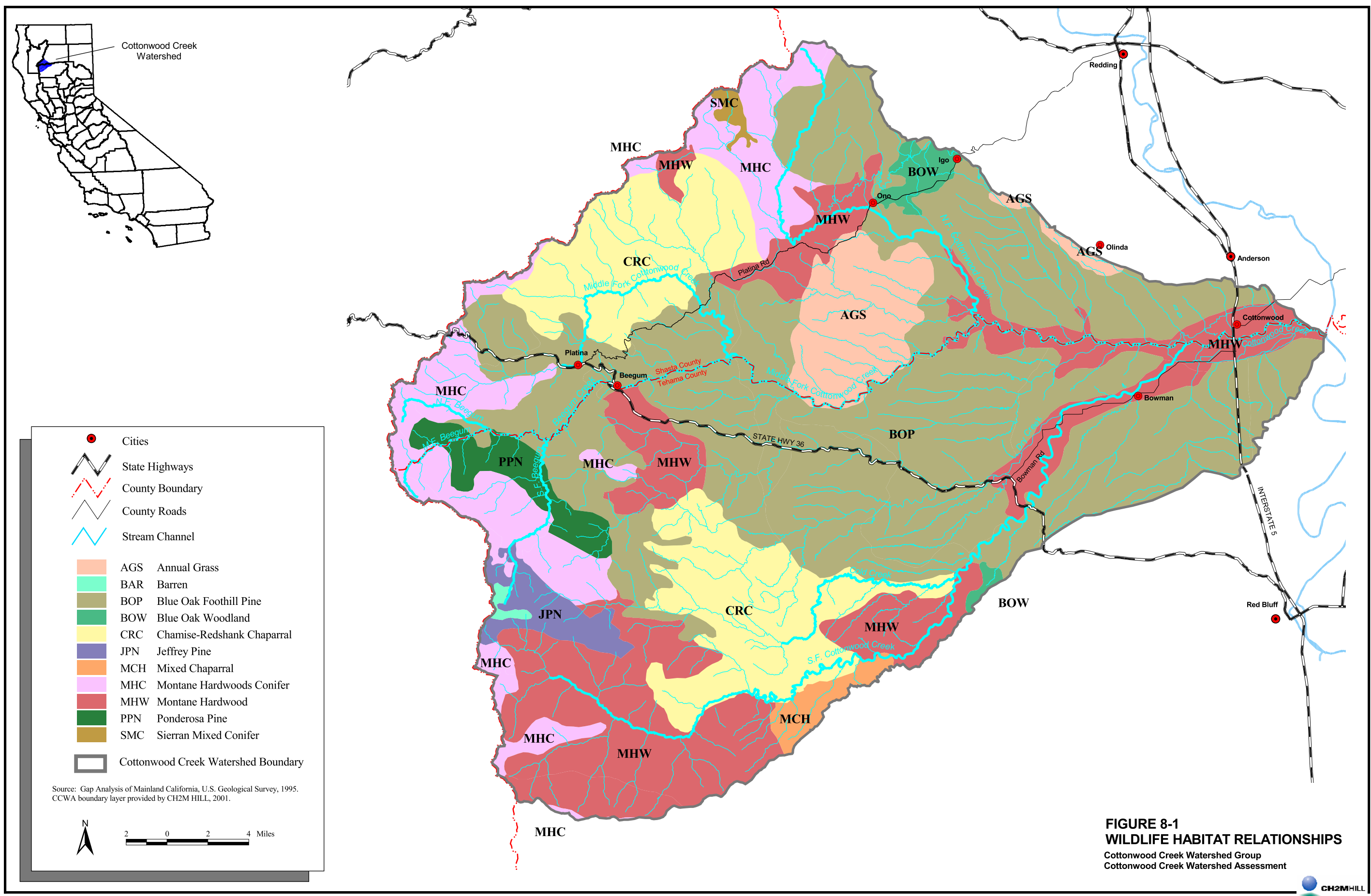
The information gathered during literature review and consultations with members of the technical advisory committee was used to expand the available information base employed to describe the existing conditions of wildlife habitat in the Cottonwood Creek watershed. Other consulting and agency biologists and ecologists with local expertise contributed to this effort.

Information regarding species with state or federal status is provided in the Special-status Species section.

Habitat Types

Agriculture

This habitat type is not reflected as a specific map unit because of the diversity of uses and locations in the watershed. The following discussion provides a general overview of the types of habitats that may be associated with agricultural lands.



Grasslands, such as pastures, can be productive habitats for small mammals, providing abundant food and cover. Many species of birds and reptiles are also able to use this type of habitat. Over 100 species may be found in Cottonwood Creek's agricultural areas, including numerous special-status species.

The value of orchards for wildlife varies and is highly dependent on the management practice and the type of orchard tree. These orchards are found as very isolated elements in the lower elevations of the watershed. Management practices that result in a lack of understory canopy, use of pesticides, and tilling of the soil reduce the overall wildlife value of orchards. However, many wildlife species currently depend on the fruits, nuts, and foliage provided by orchards. Seasonal irrigation and plantings of understory cover crops can provide beneficial value to wildlife. Irrigation ditches and water diversion channels (not to be confused with natural slough channels or water diversion channels with adjacent riparian corridors) provide drinking water for medium- and large-sized mammals.

The wildlife value of cropland varies with management practices and the type of crop plant. Grain crops may provide ample food for rodent populations that in turn become a food base for predatory birds. The level of this assessment precluded identifying specific areas under production; however, it is generally recognized that grain-eating birds also benefit from crops. The value of croplands to wildlife is reflective of specific management practices (e.g., tilling dates and pesticide use). Croplands can be of significant value for ground-nesting bird species depending on tilling date; however, in some instances, the use of a monoculture can reduce diversity.

Species typically found in agricultural landscapes include, black-tailed jackrabbit (*Lepus californicus*), California vole (*Microtus californicus*), coyote (*Canis latrans*), Cooper's hawk (*Accipiter cooperii*), gopher snake (*Pituophis melanoleucus*), and ring-necked pheasant (*Phasianus colchicus*). Some specific species identified within the watershed included American crow (*Corvus brachyrhynchos*), raccoon (*Procyon lotor*), mourning dove (*Zenaida macroura*), and California quail (*Callipepla californica*). Agricultural lands also support a wide variety of special-status species including northwestern pond turtle (*Clemmys marmorata marmorata*) and western burrowing owl (*Athene cunicularia hypugea*).

Barren

This WHR type is mapped as **BAR** and is similar in nature to the map unit derived from CALVEG. These are generally rock outcrops, cliffs, and soils that do not support vegetation; barren habitat provides excellent habitat for some species. Approximately 30 species may utilize Cottonwood Creek's barren areas. Ledges and crevices in rock cliffs are of great value as nesting and foraging perches for the following species: peregrine falcon (*Falco peregrinus*), golden eagle (*Aquila chrysaetos*), bank swallow (*Riparia riparia*), and many bat species. Ringtail (*Bassariscus astutus*) and many of the birds listed in association with barren areas and outcrops are listed as state or federal Species of Special Concern (see the Special-status Species section).

Urban

Although the map legend displays this unit as **URB**, it is recognized that there are no real urban landscapes within the watershed. The semirural community of Cottonwood and the residential areas in the lower elevations stand out in the WHR database and are mapped in

this manner. Approximately 70 different species, including some special-status species, can be found in urban habitat types. Commonly found species include black-tailed jackrabbit, California vole, coyote, gopher snake (*Pituophis melanoleucus*), mourning dove, raccoon, Virginia opossum (*Didelphis virginiana*), and American crow.

Serpentine

WHR does not have a specific identifier for this habitat; however, as described in the Vegetative Cover section, its occurrence in association with a number of diverse habitats merits some discussion. Serpentine habitats are associated with soils low in minerals such as calcium and magnesium or soils high in heavy metals, and thus support a plant community tolerant of poor soil conditions. Plant species found in serpentine habitats, such as Douglas fir and sugar pine, support a variety of generalist wildlife species. Approximately 80 species including western scrub jay (*Aphelocoma californica*), California kangaroo rat (*Dipodomys californicus*), mule deer (*Odocoileus hemionus*), coyote, quail species, gopher snake, and several bat species inhabit serpentine habitat types.

Chaparral and Montane Hardwoods

There is a strong relationship between chaparral and montane hardwood habitats with respect to wildlife resources. In this section, the wildlife resources described are identified for four distinct WHR units. Discussion of chaparral and montane hardwoods includes the following: chamise-redshank chaparral (**CRC**); mixed chaparral (**MCH**); montane hardwoods conifer (**MHC**) and montane hardwood (**MHW**). There is also a significant intermix of chaparral and valley hardwood in the valley areas.

Wildlife species' abundance and diversity in chaparral and hardwood habitats is dependent on the plant community structure of the habitat type, as well as the availability of water. Habitat preferences of wildlife are described in relation to plant community successional stage, percent of plant cover, proximity to openings, and the amount of habitat edge. These characteristics are primarily a function of habitat disturbances, with fire being the most important in chaparral. Disturbed and more open stands of chaparral are frequented by those species that require open areas for foraging adjacent to dense cover.

A wide variety of reptiles make use of this habitat. Prey populations of rodents and invertebrates provide foraging resources, while rock outcrops and the abundance of low-growing shrubs offer excellent cover, sunning, and display sites. Typical species include striped racer (*Masticophis lateralis*) and ringneck snake (*Diadophis punctatus*).

Numerous mammal species also use chaparral and montane habitats. Deer depend on whitethorn and deerbrush ceanothus as a food source, especially during the winter. Deer also use these habitats for escape cover and fawning. Rabbits and hares forage and take cover in these plant communities.

Shrub habitat, especially at the edges of the grasslands, provides important structural cover for many species including bobcat (*Lynx rufus*), wild pig (*Sus scrofa*), raccoon, striped skunk (*Mephitis mephitis*), mountain lion (*Puma concolor*), coyote, California quail, and garter snakes. The habitat provides abundant food for many rodents and birds in the form of seeds, fruit, and insects. Manzanita berries provide a source of fluid for many species associated with this otherwise arid habitat. Coyote and black bear (*Ursus americanus*) may

forage heavily on manzanita berries; bobcats and hawks will hunt for rodents and reptiles; and skunks will forage on insects, rodents, and bird eggs.

Many species of birds use this shrub habitat. The dense vegetation offers excellent cover for secretive birds and those requiring dense cover adjacent to open foraging sites. Representative birds of this habitat include wild turkey (*Meleagris gallopavo*), band-tailed pigeon (*Columba fasciata*), California thrasher (*Toxostoma redivivum*), California towhee (*Pipilo crissalis*), and California quail.

Because of the high quality of these chaparral habitats and hardwood habitats, many special-status species use them. Special-status birds include sharp-shinned hawk (*Accipiter striatus*) and prairie falcon (*Falco mexicanus*). Reptiles include rubber boa (*Charina bottae*) and ringneck snake. Mammals include bobcat, long-tailed weasel (*Mustela frenata*), and fisher (*Martes pennanti*).

Annual Grassland

The unit identified as Annual Grassland (**AGS**) in the Cottonwood Creek watershed is found in several locations throughout the watershed, predominantly at middle and lower elevations. A somewhat atypical occurrence of grassland habitat is located in an area known as the “Bald Hills.” This area is underlain by a sequence of sedimentary rocks with very shallow soils. The designation of this area as grassland habitat may not adequately describe its distinctive characteristics.

In general, the wildlife values of grasslands are highest when interspersed with trees or shrubs and when adjacent to other habitats, creating a diversified habitat that supports wildlife that use both the grasslands for feeding, and the trees and shrubs for cover and nest sites. The mosaic of open grassy areas surrounded by forest increases the wildlife species’ richness of grasslands, especially near the edges where shrubs predominate and provide valuable cover from predators.

Grasslands provide an important foraging resource for about 100 wildlife species. The grasses and forbs produce an abundance of seeds and attract numerous insects, providing food for granivorous and insectivorous wildlife (such as small birds, rabbits, and rodents). Consequently, grasslands are valuable foraging sites for raptors (e.g., hawks and owls) and other predators (e.g., coyote, fox, skunk, and snakes).

Riparian

The identification of riparian habitat with WHR data is limited by the resolution of the data. The size and location of these habitats are typically inclusions in much larger map units and are not well represented in the watershed. Two distinct map units are identified in the WHR data. These valley riparian (**VRI**) and montane riparian (**MRI**) habitats are primarily associated with stream environments. Valley riparian habitat is located at lower elevations in the watershed (i.e., on the mainstem Cottonwood Creek). Valley riparian corridors are typically wider, caused by the availability of riparian groundwater and alluvial soils. Montane riparian habitats typically line narrow streams in the upper watershed, and are often no more than stringers of trees and shrubs immediately adjacent to the stream channel.

Wet meadows are typically associated with grassland habitats, but are included in this section owing to their water-dependent nature, often provided by stream overflow, shallow groundwater associated with streams or rivers, or flood irrigation. The wet meadow areas include meadow grasses that are of medium height, native grass and forb species, and grasses with a bunched quality, which provide cover for small rodents. Amphibians such as the California newt (*Taricha torosa*), bullfrog (*Rana catesbeiana*), and foothill yellow-legged frog (*Rana boylei*) use wet meadow and riparian areas for breeding habitat (where ponding occurs); and deer use these areas for foraging and resting.

The insect life linked with the meadow habitats and creeks (e.g., crickets, dragonflies, damselflies, and mosquitoes) provide ample food for a diverse assemblage of avian species, including dark-eyed junco (*Junco hyemalis*), great blue heron (*Ardea herodias*), and waterfowl such as Canada goose (*Branta canadensis*) and mallard (*Anas platyrhynchos*).

Riparian forests support some of the highest levels of wildlife species' diversity and abundance in the state. Factors contributing to the high wildlife value include the presence of surface water, the variety of niches provided by the high structural complexity of the habitat, the condition of the associated upland habitat, and the abundance of plant growth. Riparian forest habitat is used by wildlife for food, water, escape cover, nesting, migration and dispersal corridors, and thermal cover. Types of species found in this habitat type include various waterfowl species; raptors; small mammals such as rodents, skunks, and opossums; several frog and toad species; and various reptiles including several garter snake species.

Mixed Conifer Forest and Douglas Fir/True Fir

The value of the mixed conifer forest to wildlife varies with the degree of canopy cover and density and the diversity of understory plant species present. In this section, several WHR elements are aggregated for discussion purposes. Jeffery pine (JPN), ponderosa pine (PPN), Klamath mixed conifer (KMC), and montane hardwood conifer (MHC) are included in this element. Wildlife species' diversity and abundance are highest where vegetation is highly stratified, offering a greater variety of niches for wildlife species. Areas where the mixed conifer forest integrates with shrub communities create a mosaic that is also highly stratified and is of high value to wildlife.

Some important food plants for wildlife that occur in mixed conifer forest include California hazelnut, ceanothus, tanoak, gooseberry/currant, black oak, manzanita, Pacific madrone, coffeeberry, Himalayan and California blackberry, and poison oak. These plants and their products, including cones, berries, and seeds, provide seasonal wildlife forage material that is used by a variety of bird and mammal species.

Mature and fire-damaged forests typically contain snags (standing dead trees). Snags are valuable resources for mammals and bird species such as woodpeckers that prefer dead trees and limbs for excavation of roost and nest sites. Snags receive high levels of use by secondary cavity-nesting birds. Snags also support wood-boring insects that provide food for bark-gleaning insectivorous birds.

Bird species' richness and abundance is high in the mixed conifer forest where the understory is stratified and dense. White fir stands provide foraging habitat for a number of insect-gleaning birds. Martens and fishers have been known to utilize white fir habitat,

although little information is available for the Cottonwood Creek watershed. Surveys were performed by CDFG between 1994 and 1995. Fishers were present at very low elevations, below 2,000 feet (Bratcher, 2001, pers. comm.).

Great horned owls and western screech owls nest in mixed conifer forest and prey on rodents that are active at night. The northern spotted owl (*Strix occidentalis caurina*), a federal-listed species, has been identified in a number of locations, primarily at the upper elevations of the watershed. In addition, five diurnal raptors (all of which are state Species of Special Concern) are known to utilize this mixed conifer habitat for nesting and foraging purposes; these are goshawks (*Accipiter gentilis*), golden eagles, osprey (*Pandion haliaetus*), Cooper's hawks, and sharp-shinned hawks. These raptors feed primarily on small mammals or other birds, but golden eagles do occasionally take larger prey.

An important feature of the mixed conifer forest is the abundance of fallen woody debris (e.g., limbs and logs). Woody debris adds structural complexity to the forest habitat and is important as cover, nesting, roosting, and foraging substrate for wildlife. Woody debris provides habitat for a prey base (e.g., rodents). Downed wood also helps moderate arid conditions, creating microclimates suitable for amphibians and reptiles. Downed woody debris also provides suitable breeding and cover sites for several species including arboreal salamander. Aquatic breeding species including some newt species may spend their terrestrial existence in rodent burrows in grasslands but utilize woody debris in adjacent forests for refugia.

The mixed conifer forest supports a high diversity of reptiles because of the abundant prey and cover provided. Representative species (e.g., common kingsnake, garter snakes, and ringneck snake) prefer the moist, wooded drainage bottoms.

Non-mixed stands of red fir have relatively low species diversity. However, these stands are significant to many species of special concern, such as the northern spotted owl and goshawk.

Blue Oak/Gray Pine

Oak woodlands are considered critical habitats for the conservation of many bird and mammal species. Important habitat features of oak woodlands include acorn production and the presence of cavity-bearing trees (usually mature trees). As seasonal food, acorns are important for the survival of many species of wildlife in the fall and winter. Animals that are dependent on acorns as a seasonal food source include deer, western gray squirrel (*Sciurus griseus*), northern flicker (*Colaptes auratus*), woodpecker, scrub jay, band-tailed pigeons, California quail, wild turkeys, black bears, and feral pigs.

Cavity-nesting birds and small- to medium-sized mammals depend on the natural cavities associated with mature oak trees. Mature oak trees often have broken limbs that contain some degree of decay and are then excavated by birds and mammals for nest and roosting sites. These cavities receive a high level of use by secondary cavity-nesting birds (e.g., acorn woodpecker [*Melanerpes formicivorus*], owls, tree swallow, violet-green swallow [*Tachycineta thalassina*], and purple martin [*Progne subis*]).

The insects associated with oaks are prey for several birds (e.g., bushtit, kinglets, and warblers). California towhee, rufous-crowned, and savannah sparrows will forage for insects on the ground beneath the oaks.

Water

Amphibian and reptile species that use aquatic habitats have been addressed in the Riparian Communities section.

Previous Studies

Cottonwood Creek Project, A Detailed Evaluation of Fish and Wildlife Resources (USFWS, 1983). In 1983, the USFWS study performed an assessment of the wildlife habitats and resources associated with the Cottonwood Creek project. The report gives a brief discussion of the wildlife habitats and species located within the vicinity of the proposed Dutch Gulch and Tehama Dam locations (see Figure 2-3 in the Hydrology section). The report identified eight habitat types that occur on or near the project area: woodland-grass, woodland-chaparral, improved rangeland (cleared woodland-grass), grassland, rock willow (stream wash), dredger tailings, riparian, and irrigated pasture. Table 8-1 gives the acreages of the various vegetative types found within the gross reservoir pool areas.

TABLE 8-1

Habitat Acreages, Cottonwood Creek Project Reservoir Sites, Gross Pools^a
Cottonwood Creek Watershed Assessment

Type	Tehama Reservoir		Dutch Gulch Reservoir	
	Acres	Percent ^b	Acres	Percent
Woodland-Grass	4,782	47	6,730	60
Woodland-Chaparral	2,611	25	1,176	11
Improved Rangeland	1,333	13	927	8
Riparian				
Riparian Forest	312	3	298	3
Rock/Willow (Stream Wash)	489	5	498	4
Grassland	723	7	649	6
Dredger Tailings	0	0	676	6
Irrigated Pasture	0	0	246	2
Total	10,250	100	11,200	100

^aSource: CDFG, 1979 as cited in USFWS, 1983.

^bRounded to the nearest percent.

The study also reported the presence and potential presence of several different species in the project area. The identified species included: deer (no specific species identified), turkeys, and California quail. Additionally, federal-listed bald eagles were sighted on 45 occasions during the 1-year study period. The species that were identified as potentially existing in the project area include the peregrine falcon and yellow-billed cuckoo.

Draft Environmental Impact Report on the Revocation of the Certificate of Approval for Misselbeck Dam and Reservoir (DWR, 1989). DWR produced a Draft Environmental Impact Report that addressed the safety of Misselbeck Dam. The Misselbeck Dam is located on North Fork Cottonwood Creek, northwest of the Town of Ono. The report included a full

environmental impact analysis for the revocation of the Certificate of Approval for the dam. The impacts analysis for wildlife concluded that the loss of fish and wildlife caused by the prohibition of water storage in the reservoir would probably not be significant. What was determined as significant however, was reduced irrigated pasture from a diminished water supply. This would cause the loss of seasonally important wildlife forage habitat, and would ultimately affect game species such as black-tailed deer, feral pigs, turkeys, and black bears that are known to exist in the area.

Numerous game species were identified in the reservoir area and included black-tailed deer, black bear, western gray squirrel, black-tailed jackrabbit, California quail, mountain quail, mourning dove, band-tailed pigeon, and wild turkey. During the time of the study, no endangered, threatened, or rare species were known to occur within the reservoir area.

Beegum Watershed Analysis (USFS, 1997). The Beegum watershed is located entirely within the Cottonwood Creek watershed, on the westernmost boundary, southwest of the Town of Beegum. The watershed analysis identified three management objects that focused on seven core topics. The management objectives included timber production, wildlife (deer habitat) management, and fuels management. The first step of the watershed analysis was to characterize the watershed. The following is a summary of the species and habitats characterization of the watershed.

The Beegum watershed is used as both a summer and winter range for the Columbian black-tailed deer. The report stated that, based on 1981 data, the herd is estimated at 4,600 to 5,000 animals. It also stated that habitat conditions in the watershed have decreased in quality because of the lack of early seral vegetation and minor competition for forage by cattle, the most critical of these being the lack of early seral vegetation (USFS, 1997).

Yolla Bolly Deer Herd Management Plan, Tehama and Shasta Counties, California (CDFG, U.S. Bureau of Land Management [BLM], and USFS, 1983 and amended 2001) The Yolla Bolly Deer Herd Management Plan was established in 1983 as a result of the March 1976 decision by CDFG to develop “A Plan for California Deer.” At the time of the report, the Yolla Bolly deer herd was said to occupy the western half of Tehama County and had historically produced about 30 percent of the overall county total. The plan stated that the herd contained resident and migratory Columbian black-tailed deer (*Odocoileus hemionus columbianus*) and inhabited Tehama County west of I-5. Additionally, because of common summer ranges, the portion of southwestern Shasta County is included as part of that herd.

The Deer Herd Management Units that are located in the vicinity of Cottonwood Creek include the Beegum Subunit, and the Tomhead Subunit. The Beegum Subunit covers about 630 square miles of northwestern Tehama and southwestern Shasta County. The summer range for this area consists of public lands administered by the Shasta-Trinity National Forest and private timber company lands. A common winter range of BLM and private lands is located in the area around Beegum and Platina. Deer migrate to these winter ranges from summer areas in the Yolla Bolly Wilderness and Bully Choop Mountain (at the north end of the plan area). The Tomhead Subunit covers about 300 square miles with a summer range mainly on public land within the Yolla Bolly Wilderness. The winter range of this subunit is BLM or privately owned chaparral- and oak-covered foothills bordering lower Cottonwood Creek, which was mainly burned over by the 76,000-acre Skinner Mill Fire of 1976 (CDFG, 1983).

The report summarized three vegetative communities associated with this deer range. Those communities include: woodland-annual grass, chaparral (chamise and other brush species), and pine-Douglas fir-true fir (mixed conifer).

Composition data is available for the herd from 1960 to 2001. Composition surveys typically take place in April and December annually. December counts provide buck and fawn ratios per 100 does. Fawns per 100 does are determined in the spring. Data have been primarily gathered from the Lake Hollow and Platina areas. Table 8-2 gives a summary of the Yolla Bolly deer herd composition data.

TABLE 8-2

Yolla Bolly Deer Herd Composition Data (1960 to 2001)^a
Cottonwood Creek Watershed Assessment

Year	Fall			Spring	
	Bucks per 100 Does	Fawns per 100 Does	Sample	Fawns per 100 Does	Sample
1960 to 1961	36	51	1,006	37	1,239
1961 to 1962	33	37	1,214	31	598
1962 to 1963	33	38	887	40	873
1963 to 1964	21	55	899	52	676
1964 to 1965	23	43	806	29	667
1965 to 1966	25	42	851	21	679
1966 to 1967	20	37	754	23	792
1967 to 1968	25	50	522	36	769
1968 to 1969	17	48	917	30	1,087
1969 to 1970	17	47	820	36	419
1970 to 1971	16	38	751	25	996
1971 to 1972	20	34	949	25	885
1972 to 1973	13	33	1,084	--	--
1973 to 1974	11	46	534	32	339
1974 to 1975	20	49	639	38	494
1975 to 1976	34	60	620	44	459
1976 to 1977	25	52	707	39	363
1977 to 1978	35	50	982	45	523
1978 to 1979	31	33	787	22	443
1979 to 1980	28	32	747	26	681
1980 to 1981	22	46	428	30	514
1981 to 1982	20	36	560	30	501
1982 to 1983	21	40	251	33	457
1983 to 1984	23	45	326	39	389
1984 to 1985	18	42	267	34	Unknown
1985 to 1986	11	39	345	26	258
1986 to 1987	25	30	98	24	239
1987 to 1988	26	52	286	33	274
1988 to 1989	34	37	170	31	419
1989 to 1990	23	52	415	40	355
1990 to 1991	23	48	502	29	408
1991 to 1992	23	51	432	45	594
1992 to 1993	17	43	556	18	576
1993 to 1994	30	35	132	23	474
1994 to 1995	17	45	362	No Data ^b	
1995 to 1996	*	*	*	*	29

TABLE 8-2Yolla Bolly Deer Herd Composition Data (1960 to 2001)^a*Cottonwood Creek Watershed Assessment*

Year	Fall			Spring	
	Bucks per 100 Does	Fawns per 100 Does	Sample	Fawns per 100 Does	Sample
1996 to 1997	*	*	*		43
1997 to 1998	24	48	93		160
1998 to 1999	26	41	73		162
1999 to 2000	36	62	117		170
2000 to 2001	36	48	95		

^aCDFG, 1983 and 2001.^bIn 1995, the landowner no longer allowed CDFG access to historical count areas. In 1997, a new program of triplicate samples was developed using public roads. Spring fawn counts were no longer conducted because questionable assumptions had to be used in analyzing the data.

*No comparable data because of lack of access to previously sampled areas on private land.

Table 8-3 contains daily spring deer counts in Cottonwood Creek watershed. In 1998, two routes were added, William's Ranch and Ditch grade. In 2001, the spring counts were discontinued.

During the years of the study, the routes were replicated 3 days consecutively, and 3-day means were used as a relative indicator of abundance. Since that time, CDFG's statisticians have indicated that there are no significant differences between days over groups of years, so the 3-day approach was discontinued, and surveys are only conducted 1 day each year per route (Smith, 2002, pers. comm.).

TABLE 8-3

March Deer Counts, Cottonwood Creek Area (1996 to 2000)

Cottonwood Creek Watershed Assessment

Year	Zone	Transect	Day 1	Day 2	Day 3	Mean
1996	B5	Hammer Loop	4	1	4	3.0
1996	B5	Paskenta	10	3	7	6.7
1997	B5	Hammer Loop	7	2	5	4.7
1997	B5	Paskenta	10	7	12	9.7
1998	B5	Ditch Grade	27	17	19	21.0
1998	B5	Hammer Loop	13	20	22	18.3
1998	B5	Paskenta	28	42	35	35.0
1998	B5	Williams Ranch	48	41	63	50.7
		Total	116	123	139	125.0
1999	B5	Ditch Grade	22	44	44	36.7
1999	B5	Hammer	20	21	19	20.0
1999	B5	Paskenta	38	28	36	34.0
1999	B5	Williams Ranch	25	70	31	87.3
		Total	105	163	130	132.7
2000	B5	Ditch Grade	7	27	33	25.7
2000	B5	Hammer Loop	37	16	24	25.7
2000	B5	Paskenta	39	40	14	31.0
2000	B5	Williams Ranch	27	34	30	30.3
		Total	110	127	101	112.7

Historical Occurrence of Wildlife and Habitat

Some historical information on wildlife in the Cottonwood Creek watershed is available from published sources; however, these historical accounts of wildlife occurrences are general in nature.

1800 to 1850

Historically, the Wintu Indian tribe resided in the Cottonwood Creek basin. Wildlife resources were an important element in their society and were utilized in a variety of ways (Smith, 1994). Species such as deer and elk were far roaming and utilized a variety of habitat elements (USFS, 1997). These big game species provided a seasonal contribution to the native population.

Trappers were also known to exist in the early 1800s in the watershed area. The existence of trappers indicates the probable presence of beavers in and around Cottonwood Creek.

1850 to 1900

Wildlife habitat was subjected to a number of changes in association with the Shasta County gold rush that began in 1848. Mining activities were commonplace throughout the Cottonwood drainage, beginning with exploratory placer operations, and continuing through the era of hydraulic and dredging operations (Smith, 1994). The settlement pattern that developed provided the opportunity for a variety of agriculture efforts. By 1855, Major Reading had over 6000 acres under cultivation in the vicinity of the current Town of Cottonwood, and by 1870, there were a number of established livestock operations in place (Smith, 1994).

The focused efforts of mining activities resulted in the transformation of riparian vegetation into acres of dredge tailings (USGS, 1988).

1900 to 1950

Several observations are available pertaining to the wildlife resources of this period. A 1904 excerpt of the State Fish and Game Open Season Laws identify established seasons for game species, including: deer, doves, ducks, and quail. It also states that populations of rabbits, geese, and wild pigeons were unprotected (Smith, 1994).

A 1907 reference states that wild pigeons were becoming plentiful and hunters were very successful along Cottonwood Creek (Smith, 1994). An additional reference dated 1911 suggests that the sky was dark with pigeons, and hunters collected them by the gunnysack.

In 1938, 425 wild hogs were removed from the Bald Hills in 2 months in an effort to reduce the impacts to valuable grazing lands (Smith, 1994).

The development of the Anderson-Cottonwood Irrigation District resulted in changes in agricultural practices and the development of wetland habitat in upland landscapes (Smith, 1994).

After World War II, the westside watersheds, including Cottonwood Creek, Reeds Creek, and Redbank Creek were subject to a conversion of blue oak woodlands to grasslands,

urban use, and dryland agriculture (DWR, 1992). In a number of instances, this conversion was directly through the County Agriculture Soil Conservation and Stabilization Committee from about 1940 through the late 1960s.

1950 to 1975

In response to the USACE Cottonwood Project, a number of localized wildlife studies were conducted in and adjacent to the proposed projects. These studies were conducted under the direction of USFWS and CDFG (USFWS, 1983). Although they represent a small percentage of the watershed, they provide an indication of the diversity of habitats and species that occupy the areas originally proposed for inundation by the reservoirs and the downstream reaches.

Some information is available on the quality of shrub and oak woodland communities during this period. 1944 and 1955 air photo analysis indicates some change in the density and dispersion of these habitats (USFS, 1997).

1975 to Current

In response to the USACE's Cottonwood Creek Project, a number of localized wildlife studies were conducted in and adjacent to the proposed projects. These studies were conducted under the direction of USFWS and CDFG (USFWS, 1983). Although they represent a small percentage of the watershed, they provide an indication of the diversity of habitats and species that occupy the areas originally proposed for inundation by the reservoirs and the downstream reaches. A summary of each report is located above under Current Conditions.

Additionally, CDFG maintains current surveys of the Yolla Bolly deer herd, as part of the Yolla Bolly Deer Herd Management Plan. The watershed is currently used as both summer and winter range for the herd.

Detailed wildlife resources studies throughout the watershed are limited. Studies relating to other projects have been performed, and usually included some limited wildlife or wildlife habitat information, in various resource areas (i.e., Beegum watershed). As previously mentioned, the most current information available regarding the characterization of wildlife resources at the watershed scale is the California WHR model. Because the database contains a wide range of information watershed-wide, it is the main resource used for the basis of this document.

Wildlife Resources and Habitat Types Conclusions and Recommendations

In general, wildlife species found in the watershed were more abundant prior to settlement in the 1850s. Wildlife species that required large home ranges and/or special habitats may have been present in greater numbers because of large expanses of habitat that were unencumbered by the land use practices associated with European settlement (USFS, 1997).

Between 1850 and 1900, a number of land use changes occurred within the Cottonwood Creek watershed. Factors that influenced these changes included the gold discovery,

development of agriculture, and changes in settlement patterns. Wildlife populations that required special habitats were subject to influences brought by homesteading, livestock grazing, and timber harvesting (USFS, 1997).

The continued settlement of the Cottonwood Creek watershed in the first half of the twentieth century occurred in conjunction with the development of the transportation network throughout the basin.

The information available for wildlife resources and their habitat elements is general in nature for large components of the watershed. Where actions have been proposed, or activities conducted, specific studies have been conducted to address the needs of these projects. Likewise, future projects will likely require individual studies of local wildlife characteristics.

Recommendations

1. Initiate a study of historical and ongoing wildlife habitat trends in the watershed. Because of the paucity of historical information in the Cottonwood Creek watershed, additional investigation of historical trends may require comparative studies and inferences from other watersheds in the region. Develop a historical GIS for the watershed in conjunction with this effort.
2. Promote restoration projects on public and private lands focused on improving the understanding of wildlife-habitat relationships in the watershed.
3. Assess status and trends of native oak woodlands, particularly blue oak woodlands, in the middle and lower watershed.
4. With assistance of U.C. Davis Cooperative Extension Rangeland Monitoring Program, evaluate the effects of various grazing strategies on propagation of native vegetation.
5. Continue to evaluate and monitor the effects of fire and fire management in the watershed.

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9. SPECIAL-STATUS SPECIES



Special-status Species

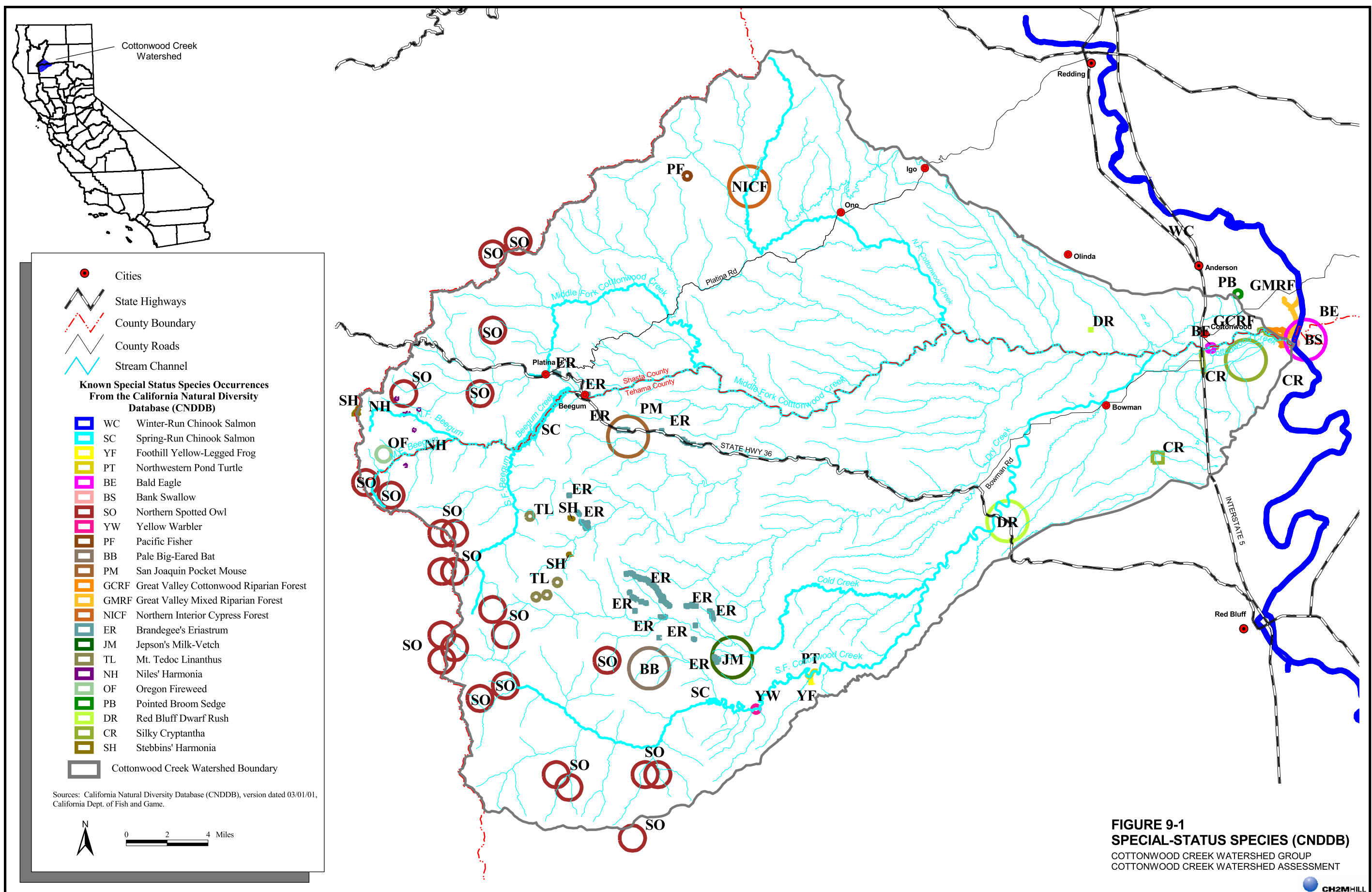
Setting

Several species of note are afforded special status in the Cottonwood Creek watershed. These include the spring-run chinook salmon, northern spotted owl, and California red-legged frog. It is possible that these species may require additional management actions in the foreseeable future. In order to better understand the importance of the watershed to the long-term survival of these species, it is likely that more detailed studies will be necessary.

Special-status species generally are taxa afforded some degree of legal protection or special consideration by lead agencies, responsible agencies, and resource/land management agencies. Information in the following section was developed using a variety of resources including the following: CNDDDB (CDFG, 2001), CNPS, consultation with USFWS, and the Shasta-Trinity National Forest. An example of the spatial distribution of species identified through CNDDDB is displayed on Figure 9-1.

CNDDDB is a continually refined and updated, computerized inventory of location (includes repeated sightings) information on the more rare animals, plants, and natural communities in California. These taxa generally fall into one or more of the following categories:

- Officially listed or proposed for listing under the California Endangered Species Act (CESA) and/or Federal Endangered Species Act (ESA)
- State or federal candidate for possible listing
- Taxa that meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act Guidelines
- Taxa considered by CDFG to be Species of Special Concern
- Taxa that are biologically rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring
- Populations in California that may be on the periphery of a taxon's range, but are threatened with extirpation in California
- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, and vernal pools)
- Taxa designated as a special-status, sensitive, or declining species by other state or federal agencies, or non-governmental organization



Additional database searches were conducted using the CNPS Electronic Inventory (Electronic Inventory). The Electronic Inventory allows users to query the Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik, 1994) using a set of search criteria. The result of the search is a list of special-status plants selected by the particular search criteria.

Tables 9-1 through 9-4 describe species relative to the status information available. These tables are designed to briefly describe the species, their respective status, general habitat features, and the WHR habitats they may occupy. A large number of acronyms are used in describing the special-status species. These acronyms are defined in Appendix D, Special-status Species Legend. This information is routinely updated by CDFG and should be considered subject to revision. These tables include species that were identified in the USFWS database as potentially occurring within the general watershed assessment area. It should be noted that the information presented within these tables reflect the database retrievals. It is recognized that the status of these species may not be consistent with information provided by the databases. For a discussion of special-status fish species, please see the Fisheries Resources section.

Potential Presence of Special-status Species

State- and Federal-listed Threatened and Endangered Species

TABLE 9-1

Threatened and Endangered Wildlife Species Potentially Occurring in the Project Area
Cottonwood Creek Watershed Assessment

Information Gathered from CNDDB and USFWS			
Species	Fed/State BLM/USFS	General Habitat ^a	WHR Occurrences in Cottonwood Creek
Birds			
Bald Eagle <i>Haliaeetus leucocephalus</i>	FT (FPD)/SE None/None	Ocean shorelines, lake margins, and other river courses for both nesting and wintering. Most nests within 1 mile of water. Nests in large old growth or dominant live tree with open branches, especially Ponderosa pine. Roosts communally in winter.	BAR, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, DFT, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Bank Swallow <i>Riparia riparia</i>	-/ST None/None	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, and the ocean to dig nesting hole.	AGR, BAR, URB, WTM, AGS, MCH, MRI, VRI
Northern Spotted Owl <i>Strix occidentalis caurina</i>	FT/- Sens/Sens	There is federally designated Critical Habitat within the upper Cottonwood Creek watershed. Old-growth forests or mixed stands of old growth and mature trees. Occasionally in younger forests with patches of big trees. High multi-story canopy dominated by big trees, many trees with cavities or broken tops, woody debris and space under canopy.	JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP
Reptiles (none)			

TABLE 9-1

Threatened and Endangered Wildlife Species Potentially Occurring in the Project Area
Cottonwood Creek Watershed Assessment

Information Gathered from CNDDB and USFWS			
Species	Fed/State BLM/USFS	General Habitat ^a	WHR Occurrences in Cottonwood Creek
Amphibians			
California Red-legged Frog <i>Rana aurora draytonii</i>	FT/SOC None/None	There is federally designated Critical Habitat within the headwaters of the Cottonwood Creek watershed. This is specific to the Tehama County portion of the basin. Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Maximum elevation range is approximately 4,000 feet. Requires 11 to 20 weeks of permanent water for larval development. Must have access to aestivation habitat.	WTM, AGS, MCH, MRI, DFR, MHC, MHW, PPN, VRI, BOP, BOW
Invertebrates			
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorohus</i>	FT/- None/None	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Will lay eggs in elderberry stems 1-inch diameter and greater, and shows some preference for "stressed" elderberries.	VRI
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i>	FT/- None/None	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains in static rain-filled pools. Inhabit small, clean-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	VRI
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i>	FE/- None/None	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	VRI

^aFrom CNDDB, unless otherwise noted.

TABLE 9-2

Threatened and Endangered Plant Species Potentially Occurring in the Project Area
Cottonwood Creek Watershed Assessment

Common/Scientific Name	Status FED/ST CNPS, R-E-D	General Habitat	Blooming Season
Boggs Lake Hedge-Hyssop <i>Gratiola heterosepala</i>	-/CE 1B, 1-2-2	Marshes, swamps (lake margins). Vernal pools/clay substrate.	April-August
Palmate-Bracted Bird's-Beak <i>Cordylanthus palmatus</i>	FE/SE 1B, 3-3-3	Chenopod scrub, valley and foothill grasslands, (alkaline).	May-October
Slender Orcutt Grass <i>Orcuttia tenuis</i>	FT/CE 1B, 2-3-3	Vernal pools.	May-October

Other Special-status Species

TABLE 9-3

Other Special-status Wildlife Species Potentially Occurring in the Project Area

Cottonwood Creek Watershed Assessment

Information Gathered from CNDDB and USFWS			
Species	Fed/State BLM/USFS	General Habitat ^a	WHR Occurrences in Cottonwood Creek
Birds			
Aleutian Canada Goose <i>Branta canadensis leucopareia</i>	D/- None/None	Forages on natural pasture or that cultivated to grain; loaf on lakes, reservoirs, ponds. Primarily in fly-over situations	AGR, URB, WTM, AGS
American Peregrine Falcon <i>Falco peregrinus anatum</i>	D/FP None/None	Requires cliff and or steep inaccessible habitat for nesting and roosting purposes. Proximity to wetlands, lakes, rivers is also necessary for nesting and foraging. Primarily in winter/fall periods.	AGR, BAR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, SMC, MHC, MHW, PPN, VRI, BOP, BOW
Prairie Falcon <i>Falco mexicanus</i>	-/SOC None/None	Year-round resident in upper watershed; winter resident lower. Usually nests on a scrape or sheltered ledge of a cliff overlooking large, open areas. Uses open terrain for foraging.	AGR, BAR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, SMC, MHC, MHW, PPN, VRI, BOP, BOW
Osprey <i>Pandion haliaetus</i>	-/SOC None/None	Ocean shores, bays, freshwater lakes, and larger streams. Large nests built in treetops within 15 miles of good fish-producing body of water.	AGR, BAR, WTM, AGS, MCP, MCH, JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Ferruginous Hawk <i>Buteo regalis</i>	SC/SOC Sens/None	In arid grasslands hunts small mammals from a perch or by kiting; it often perches on poles or the ground. Fall/winter use in watershed.	AGR, BAR, WTM, AGS, CRC, VRI, BOP, BOW
Little Willow Flycatcher <i>Empidonax trailii brewsteri</i>	SC/- None/None	Inhabit extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters; 2000- to 8000-foot elevation. Requires dense willow thickets for nesting/roosting. Low, exposed branches are used for singing posts/hunting perches.	WTM, VRI, MRI
Cooper's Hawk <i>Accipiter cooperi</i>	-/SOC None/None	Year-round resident. Nests in riparian deciduous trees and second-growth conifers, usually near water. Often uses patchy woodlands and edges for perching and hunting.	AGR, URB, AGS, MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Northern Goshawk <i>Accipiter gentilis</i>	SC/SOC None/Sens	In summer, within and in vicinity of coniferous forests, uses old nests, and maintains alternate sites. Usually nests on north slopes, near water; red fir, lodgepole pine, jeffrey pine, and aspens	MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW

TABLE 9-3

Other Special-status Wildlife Species Potentially Occurring in the Project Area
Cottonwood Creek Watershed Assessment

Information Gathered from CNDDB and USFWS			
Species	Fed/State BLM/USFS	General Habitat ^a	WHR Occurrences in Cottonwood Creek
Sharp-shinned Hawk <i>Accipiter striatus</i>	-/SOC None/None	are typical nesting trees. Year-round resident. Summer resident of conifer forests; winter resident of entire watershed. Nests in dense, shady, cool stands of conifers, usually near water.	AGR, BAR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Golden Eagle <i>Aquila chrysaetos</i>	-/SOC Sens/None	Year-round resident in upper watershed, winters throughout watershed. Nests on cliffs and in large trees in open areas. Alternative nest sites are maintained. Forages in any habitat with available prey (rodents & lagomorphs) in relatively open terrain.	AGR, BAR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Western Burrowing Owl <i>Athene cunicularia hypugea</i>	SC/SOC Sens/None	Grassland habitat and open woodlands. Most frequently found where ground squirrel burrows are abundant.	AGR, BAR, URB, WTM, AGS, MCP, MCH, CRC, PPN, VRI, BOP, BOW
White-faced Ibis <i>Plegadis chihi</i>	SC/SOC None/None	Fall/winter use of grasslands and marshes.	AGR, BAR, URB, WTM, AGS, MCP, MCH, CRC, PPN, VRI, BOP, BOW
Yellow Warbler <i>Dendroica petechia brewsteri</i>	-/SOC None/None	Riparian plant associations; prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging. Also nests in montane shrubbery in open conifer forests.	AGR, URB, MCP, MCH, CRC, JPN, RFR, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Reptiles			
Northwestern Pond Turtle <i>Clemmys marmorata marmorata</i>	SC/SOC Sens/Sens	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nest sites may be found up to 0.5 kilometer from water.	AGR, URB, WTM, AGS, MCP, CRC, MCH, MRI, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Amphibians			
Foothill Yellow-legged Frog <i>Rana boylei</i>	SC/SOC Sens/Sens	Partly shaded, shallow streams and riffles with rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg laying. Need at least 15 weeks to attain metamorphosis.	WTM, AGS, MCP, MCH, CRC, MRI, DFR, WFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Tailed Frog <i>Ascaphus truei</i>	SC/SOC None/None	Occurs in montane hardwood-conifer, redwood, Douglas fir, and ponderosa pine habitats. Restricted to perennial montane streams. Tadpoles require water below 15 degrees Celsius.	JPN, RFR, MRI, DFR, WFR, MHC, PPN

TABLE 9-3

Other Special-status Wildlife Species Potentially Occurring in the Project Area
Cottonwood Creek Watershed Assessment

Information Gathered from CNDDB and USFWS			
Species	Fed/State BLM/USFS	General Habitat ^a	WHR Occurrences in Cottonwood Creek
Western Spadefoot Toad <i>Scaphiopus hammondi</i>	SC/SOC Sens/None	Vernal pools, grasslands, and seasonal marshes.	AGR, AGS, MCH, CRC, BOP, BOW, VRI
Mammals			
Pacific Fisher <i>Martes pennanti pacifica</i>	SC/SOC Sens/Sens	Intermediate to large-tree stages of coniferous forests and deciduous- riparian areas with high percent canopy closure. Uses cavities, snags, logs, and rocky areas for cover and denning. Need large areas of mature, dense forest.	JPN, RFR, MRI, DFR, WFR, KMC, MHC, PPN
Townsend's Big-eared Bat <i>Corynorhinus townsendii</i>	SC/SOC None/None	Lives in a wide variety of habitats but most common in mesic sites. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance. Seeks cover in caves, under bridges, and bark and occasionally in buildings	AGR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, WFR, DFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Pallid Bat <i>Antrozous pallidus</i>	-/SOC None/None	Lives in a wide variety of habitats but most common in mesic sites. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance. Seeks cover in caves, buildings, crevices, and occasionally under bridges and bark.	AGR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, WFR, DFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Small-footed Myotis Bat <i>Myotis ciliolabrum</i>	SC/- Sens/None	Lives in a wide variety of habitats but most common in mesic sites. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance. Seeks cover in caves, buildings, crevices, and occasionally under bridges and bark.	AGR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, WFR, DFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Yuma Myotis Bat <i>Myotis yumanensis</i>	SC/- Sens/None	Lives in a wide variety of habitats but most common in mesic sites. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance. Seeks cover in caves, buildings, crevices, and occasionally under bridges and bark	AGR, URB, WTM, AGS, MCP, MCH, CRC, JPN, RFR, MRI, WFR, DFR, KMC, MHC, MHW, PPN, VRI, BOP, BOW
Invertebrates			
Leech's Chaetarthrian Water Scavenger Beetle <i>Chaetarthria leechi</i>	SC/- None/None	Known only from Hayfork Creek, Trinity County.	VRI

^aFrom CNDDB, unless otherwise noted.

TABLE 9-4

Other Special-status Plant Species Potentially Occurring in the Project Area
 Cottonwood Creek Watershed Assessment

Common/Scientific Name	Status FED/ST CNPS, R-E-D	General Habitat	Blooming Season
Adobe-Lily <i>Fritillaria pluriflora</i>	SOC/- 1B, 3-2-3	Chaparral, cismontane, woodland, foothill grassland. Usually found on clay soils. Sometimes serpentine.	February-April
Ahart's Paronychia <i>Paronychia ahartii</i>	SOC/- 1B, 3-2-3	Cismontane woodland, valley and foothill grassland, vernal pools.	March-June
Anthony Peak Lupine <i>Lupinus antoninus</i>	SOC/- 1B, 3-1-3	Lower montane coniferous forests, upper montane coniferous forests.	May-July
Big-Scale Balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	-/ 1B, 2-2-3	Chaparral, cismontane woodland, valley and foothill Grassland. Usually found on clay soils. Sometimes serpentine.	March-June
Boggs Lake Hedge-Hyssop <i>Gratiola heterosepala</i>	-/CE 1B, 1-2-2	Marshes, swamps (lake margins). Vernal pools/clay substrate.	April-August
Brandegee's Eriastrum <i>Eriastrum brandegeae</i>	SOC/- 1B, 2-2-3	Chaparral, cismontain woodland. On barren volcanic soils; often in open areas.	April-August
Brittlescale <i>Atriplex depressa</i>	-/ 1B, 2-2-3	Chenopod scrub, meadows, playas, valley and foothill grasslands, vernal pools. Found in alkaline soils and clay.	May-October
Colusa Layia <i>Layia septentrionalis</i>	-/ 1B, 2-2-3	Chaparral, cismontane woodland, valley and foothill grassland. Usually found in sand and serpentinite soils.	April-May
Dissected-leaved Toothwort <i>Cardamine pachystigma</i> var. <i>dissectifolia</i>	-/ 3, ?-?-3	Perennial rhizomatous herb found in chaparral, lower montane coniferous forests. Usually in serpentinite soils.	February-May
Dubious Pea <i>Lathyrus sulphureus</i> var. <i>argillaceus</i>	-/ 3, 3-?-3	Perennial herb found in cismontane woodlands, lower montane coniferous forests, and upper montane coniferous forests.	April
Ferris's Milk-vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	SOC/- 1B, 3-3-3	Meadows (vernally mesic), valley and foothill grasslands (subalkaline flats).	April-May
Fox Sedge <i>Carex vulpinoidea</i>	-/ 2, 2-2-1	Freshwater marshes and swamps, riparian woodlands.	May-June
Henderson's Bent Grass <i>Agrostis hendersonii</i>	SOC/- 3, 3-2-2	Valley and foothill grasslands (mesic), vernal pools.	April-May
Jepson's Milk-vetch <i>Astragalus Rattanii</i> var. <i>jepsonianus</i>	-/ 1B, 2-2-3	Chaparral, cismontane woodlands, valley and foothill grasslands. Often found in serpentinite areas.	April-June
Leafy-stemmed Mitrewort <i>Mitella caulescens</i>	-/ 2, 2-1-1	Broadleaved upland forests, lower montane coniferous forests, meadows, coast coniferous forests. Often mesic.	May-July
Legenere <i>Legenere limosa</i>	SOC/- 2-3-3	Vernal pools.	April-June
Mt. Tedoc Linanthus <i>Linthanthus nuttallii</i> ssp. <i>Howellii</i>	SOC/- 1B, 3-1-3	Lower montane coniferous forests (serpentinite).	May-August
Nile's Harmonia	-/	Chaparral, cismontane woodlands, lower	May-July

TABLE 9-4

Other Special-status Plant Species Potentially Occurring in the Project Area
 Cottonwood Creek Watershed Assessment

Common/Scientific Name	Status FED/ST	General Habitat	Blooming Season
	CNPS, R-E-D		
<i>Harmonia doris-nilesiae</i>	1B, 3-3-3	montane coniferous forests. Usually in serpentinite soils in openings and rocky areas.	
Oregon Fireweed <i>Epilobium oreganum</i>	SOC/- 1B, 2-2-2	Bogs and fens, lower montane coniferous forests, upper montane coniferous forests. (mesic).	June-September
Oval-leaved Viburnum <i>Viburnum ellipticum</i>	-/- 2, 2-1-1	Chaparral, cismontane woodlands, lower montane coniferous forests.	May-June
Pointed Broom Sedge <i>Carex scoparia</i>	-/- 2, 3-2-1	Perennial herb found in mesic great basin scrub.	May
Red Bluff Dwarf Rush <i>Juncus leiospermus</i> var. <i>leiospermus</i>	-/- 1B, 2-3-3	Chaparral, cismontane woodlands, meadows, valley and foothill grasslands, vernal pools/vernally mesic.	March-May
Round-leaved Filaree <i>Erodium macrophyllum</i>	-/- 2, 2-3-1	Cismontane woodland, valley and foothill grasslands. Clay soils.	March-May
Scabrid Alpine Tarplant <i>Anisocarpus scabridus</i>	-/- 1B, 2-1-3	Upper montane coniferous forests, (metamorphic, rocky areas).	July-August
Silky Cryptanthia <i>Cryptanthia crinita</i>	SOC/- 1B, 3-2-3	Cismontane woodlands, lower montane coniferous forests, riparian forests, riparian woodlands, valley and foothill grasslands. Mostly found in gravelly streambeds.	April-May
Stebbin's Harmonia <i>Harmonia stebbinsii</i>	-/- 1B, 3-2-3	Chaparral, lower montane coniferous forests, (serpentinite).	May-June
Stebbin's Lewisia <i>Lewisia stebbinsii</i>	SOC/- 1B, 3-2-3	Perennial herb found in lower montane coniferous forests, upper montane coniferous forests. Found in gravelly and sometimes serpentinite soils.	May-July
Stony Creek Spurge <i>Chamaesyce ocellata</i> ssp. <i>Rattanii</i>	-/- 1B, 2-2-3	Chaparral, valley and foothill grasslands. Mostly in sandy or rocky soils.	May-October
Tracy's Eriastrum <i>Eriastrum tracyi</i>	-/CR 1B, 3-2-3	Chaparral, cismontane woodlands.	June-July
Umpqua Green-gentian <i>Swertia umpquaensis</i>	-/- 2, 3-2-1	Chaparral, lower montane coniferous forests, meadows, north coast coniferous forests.	June-July
White Beaked-rush <i>Rhynchospora alba</i>	-/- 2, 2-2-1	Bogs and fens, meadows, marshes and swamps, (freshwater).	July-August
Wright's Trichocoronis <i>Trichocoronis wrightii</i> var. <i>Wrightii</i>	-/- 2, 3-3-1	Meadows, marshes and swamps, riparian forests, vernal pools. Found in alkaline soils.	May-September

Note: Appendix D (North State Resources Special-status Species Legend) describes the legend for Column 2 "Status" in tables above.

Previous Studies

Biological Data Report on Threatened and Endangered Species Relating to the Cottonwood Creek Project (USACE, 1980). The Biological Data Report was prepared for USACE and involved a 6-week assessment of threatened and endangered species potentially occurring in the Cottonwood Creek Project area. The report focused on the presence of the bald eagle and slender orcutt grass. The project areas delineated for this report included the proposed Dutch Gulch Lake location and the Tehama Lake location (See Figure 2-3 in the Hydrology section of this document). The study areas included both proposed lakes, spillways, quarry sites, tentative haul roads, and adjacent lands identified for recreation purposes for the project.

The report concluded that known populations of slender orcutt grass in the vicinity of Redding and Red Bluff were found only east of the Sacramento River. Except for the proposed Dutch Gulch site, no similar vernal pool habitat areas were located in the project area. The report also recommended two studies be performed to ensure that the presence of the species does not exist. These recommended studies included low-level flight during the late spring to observe for vernal pools, and color and infrared photography as well as ground surveys in areas that may have been identified as possible habitat. The remainder of the report was unavailable.

In a recent discussion with CDFG, it was concluded that nesting of bald eagles in the Cottonwood Creek watershed area has not been confirmed. There have been rumors of sightings; however, because of the lack of bird counts and surveys in the area, there are no documented sightings of bald eagles (Duell, 2002, pers. comm.).

Beegum Watershed Analysis (USFS, 1997). The Beegum watershed is located entirely within the Cottonwood Creek watershed, on the westernmost boundary, southwest of the Town of Beegum. The watershed analysis identified three management objects that focused on seven core topics. The management objectives included timber production, wildlife (deer habitat) management, and fuels management. The first step of the watershed analysis was to characterize the watershed. The following is a summary of the known or potential special-status species characterization of the watershed.

The report stated the known presence of one American peregrine falcon (endangered) on the east side of the watershed, but outside of the Shasta-Trinity National Forest, and one known northern goshawk nest site in Beegum. The falcons forage within the watershed in the general area of Beegum Gorge and toward Walker Point, as well as to the south and east outside of the watershed boundary (USFS, 1997). It also stated that five northern spotted owl (endangered) activity centers lie within the watershed. Four additional owl activity centers lie outside the watershed but within 1.3 miles of the boundary, suggesting that these owls may be using habitat within the watershed. Surveys were being conducted during the time of the report to verify the status of the owl activity centers. The Beegum watershed is bordered by Critical Habitat Unit (CHU) CA-36 on the northwest corner of the watershed, and is within 2 miles of CHU RC-331 and RC-330, respectively (USFS, 1997).

At the time of the *Beegum Watershed Analysis*, there were no records of the California red-legged frog (threatened) occurring in the watershed, although the species historically occurred in Shasta County. Because of the presence of riparian habitat in the watershed, it was assumed that they historically occurred in the Beegum watershed (USFS, 1997).

Five other sensitive species were reported to either have been sighted or have suitable habitat, and were suspected to occur in the watershed. These species included: Pacific fisher, American marten, willow flycatcher, California red-legged frog, and northwestern pond turtle. While suitable habitat exists for seven species of bats, there were no confirmed sightings in the watershed at the time of the report (USFS, 1997).

Historical Occurrence of Special-status Species

Prior to the establishment of environmental legislation including ESA of 1973 and subsequent federal and state statutes, the biological resources associated with the Cottonwood Creek watershed were not identified as special-status species. The limited information available on the wildlife resources prior to this time has been discussed in the Wildlife Resources and Habitat Types section.

1975 to Current

The majority of special-status species in the watershed are documented in the various studies that are included in this document. Because such a large portion of the watershed contains land that is privately owned, detailed surveys of special-status surveys are limited. However, it is known that with increased urbanization, habitat generally decreases. Cottonwood Creek has had a significant increase in urbanization in recent years, which ultimately has led to the destruction of wildlife habitat. A reduction in habitat resources directly affects the presence of all species.

Special-status Species Conclusions and Recommendations

Special-status species in the Cottonwood Creek watershed have likely declined in numbers since settlement of the area by people of European descent. It is probable that these local declines are proportional to the regional declines in these populations; there is no available information to suggest that declines of any special-status wildlife or plant species are particularly pronounced in the Cottonwood Creek watershed.

Recommendations

There are numerous opportunities to explore the relationships of special-status species, their habitat requirements, and response to disturbance factors in the Cottonwood Creek watershed, including the following:

1. Develop mapping of critical habitat in the watershed and educate landowners of its significance.
2. Establish standardized BMPs and educate landowners of standard land uses practices that promote co-habitation with special-status species.

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10. RIPARIAN COMMUNITIES



Riparian Communities

Setting

A number of distinct riparian communities can be found throughout the Cottonwood Creek watershed. These communities represent particularly dynamic portions of the landscape, and are shaped by disturbance characteristics of the ecosystems surrounding them, such as fire and flood. Riparian communities are also susceptible to disturbance processes unique to stream systems, including channel erosion, peak flows, and deposition resulting from floods and mass wasting events. The dynamic equilibrium that defines a riparian community can be observed in a number of locations within the watershed.

The diverse assemblages of riparian communities that exist in the watershed provide a disproportionate amount of habitat for a large number species. Approximately 75 percent of the potential species identified in Appendix C rely on riparian habitat for some component of their life stage. The CALVEG and WHR data provide a perspective of the riparian habitat in terms of mappable units. The resolution of these data sets does not provide an accurate representation of the riparian habitat that is present. Topographic data available identifies approximately 1,266 miles of stream in the watershed (refer to Figure 2-1 in the Hydrology section). This number is based on those streams identified in the digital elevation coverage shown on Figure 11-2 in the Land Use section.

As part of the CNDDDB program, CDFG maintains occurrence information on natural plant communities that are designated as being “sensitive” based on their lack of abundance, unique characteristics, and being essential habitat for special-status plant and wildlife species. Examples of sensitive communities include great valley oak riparian forest, great valley willow scrub, and great valley mixed riparian forest. The CNDDDB assessment identified these units in several of the quadrangles within the project area.

Current Riparian Communities

Three identifiable riparian communities provide the largest elements of riparian habitat in the Cottonwood Creek watershed: riverine, lacustrine, and vernal pools. The predominant habitat in terms of percentage is the riverine component associated with intermittent or perennial streams. A much smaller component are features that develop in association with lacustrine habitats such as lakes, ponds, and impoundments. Vernal pools may also be found throughout the lower elevations of the watershed dependent on soil and climatic conditions.

Water supplied by irrigation canals in the watershed have resulted in the development of riparian vegetation within upland habitat units (DWR, 1989). The Happy Valley Canal is an example where substantial riparian growth has developed adjacent to the canal, typically in the form of willow riparian scrub.

The riverine riparian community within the watershed can be described in terms of stream order, whereby the lower-order streams exist in the headwaters, and the higher-order streams occur in the lower reaches of the basin. USFS conducted riparian surveys of eight tributary headwater streams in the upper reaches of the watershed beginning about 1975. A summary of this information is provided as Appendix E. This information is useful in providing an overview of riparian conditions and describes the type of habitat elements that occur. These surveys typically describe steep-gradient streams with large wood and rock being the primary structural elements controlling the channel morphology. Riparian vegetation was primarily a function of aspect, elevation, and upland soils, except where localized alluvial features were present. In most cases, the vegetation described in the preceding sections encompasses the types of habitats encountered. Little information is available to characterize the riparian resources in large portions of the watershed.

The lower-order streams in the watershed are predominantly alluvial in nature, and Cottonwood Creek exhibits a number of features of an alluvial system. A predominant component of these stream types are the well-developed floodplains and alluvial deposits within and adjacent to the channel. These deposits are important elements in the recruitment and establishment of a vegetation succession that may result in a climax overstory of Fremont cottonwood (*Populus fremontii*). An established cottonwood stand in Dry Gulch was identified as a source for recruitment during the investigation for a large borrow site (USFWS, 1983).

Historical Occurrence of Riparian Communities

1800 to 1850

There is little historical information available on riparian communities prior to the settlement patterns of the 1800s. Anecdotal descriptions of mining in Cottonwood Creek and a number of its tributaries suggest that intensive mining was initiated as early as 1849 (Smith, 1994).

1850 to 1900

The attraction of a stable water supply and high-quality soils resulted in the development of agricultural activities such as orchards and row crops along the lower reaches of Cottonwood Creek as early as 1850 (Smith, 1994). A description of placer mining activities suggests that significant placer gold-mining operations occurred between 1890 and 1942 (Blodgett et al., 1988). The early mining used hydraulic mining techniques, and later activities incorporated large dredges in and adjacent to the streams.

1900 to 1950

Gravel and aggregate extraction occurred on Cottonwood Creek and several of its tributaries since the turn of the twentieth century. This activity has principally been located within the active floodplain of Cottonwood Creek in the lower reaches. Little information is available on the extent of this activity relative to riparian resources. However, it was noted that the devastating effects of dredge mining destroyed vegetation and riparian habitat in the Dry Creek area between the years 1910 and 1920 and again in the 1930s (Smith, 1994).

1950 to 1975

Aggregate mining in and adjacent to the floodplain continued during this period, with several operations expanding their excavations in the vicinity of the community of Cottonwood. Two specific areas of aggregate resources are identified within the watershed: Cottonwood Creek and Dry Creek (California Department of Mines and Geology, 1997). The areas have been utilized to some extent through the current period.

1975 to Current

Although a large majority of mining operations have ceased, mining still exists on the banks of the mainstem Cottonwood Creek and on Hooker Creek. As previously mentioned, USFS conducted riparian surveys of eight tributary headwater streams in the upper reaches of the watershed beginning about 1975. A summary of this information is provided as Appendix E.

Because direct studies on riparian communities are limited, the Current Riparian Communities section of this document is reflective of this time period.

Riparian Communities Conclusions and Recommendations

Generally, it can be concluded that a number of factors have contributed to change in riparian communities throughout the watershed. As described in earlier sections, these changes can be attributed to dynamic response to ecological elements including fires, floods, and droughts. There is minimal documentation available to quantify the changes in the riparian areas from 1800 to 1975. Observations of riparian ecosystems in other westside streams suggest that the pattern of settlement and resource utilization in the watershed has affected these communities in some respects (DWR, 1992).

Recommendations

1. Initiate a study of historical and ongoing riparian habitat trends in the watershed. Because of the paucity of historical information in the Cottonwood Creek watershed, additional investigation of historical trends may require comparative studies and inferences from other watersheds in the region. Develop GIS mapping for the watershed in conjunction with this effort.
2. Promote restoration projects on public and private lands focused on improving the understanding of the relationship between ecological health of riparian areas and land management practices.
3. Analyze historical aerial photographs from California Department of Forestry, Natural Resources Conservation Service and other sources to determine the change in riparian resources over time.

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11. LAND USE



SECTION 11

Land Use

Setting

The Cottonwood Creek watershed is located in the southwest section of Shasta County and the northwest section of Tehama County. Shasta County is the northernmost county in the Sacramento Valley, and Tehama County is located directly south of Shasta County. Shasta County comprises 238,179 acres of the watershed, and Tehama County comprises the remaining 365,258 acres. The total acreage located within Shasta and Tehama counties in relationship to the Cottonwood Creek watershed is shown in Table 11-1.

TABLE 11-1

Total Acreage within Shasta County, Tehama County, and Cottonwood Creek Watershed
Cottonwood Creek Watershed Assessment

Land Type	Shasta County (acres)	Tehama County (acres)	Cottonwood Creek Watershed (acres)	Shasta County Watershed Area (acres)	Tehama County Watershed Area (acres)
Total Acreage	2,460,670 ^a	1,894,413 ^a	603,427	238,179	365,258
Other Public ^b	252,644	102,915			
Total Public	993,080	491,135	166,040	49,697	116,343
Private Lands	1,466,260	1,402,078			
Timber Preserve	604,347 ^c		27,360	10,778	16,582
Total Acreage in Williamson Act ^d	163,352 ^d	801,671 ^d	197,080	48,022	149,058
Agriculture (Public and Private)	316,743 ^e	885,426 ^e			

^a<http://phobos.lab.csuchico.edu/hosted/sustainable/index.html>

^bOther public lands are administered by BLM; the Bureau of Indian Affairs; miscellaneous federal agencies; lands owned by states, counties, and local public agencies; and lands leased by governmental units for more than 50 years.

^cShasta County, 1998.

^dDepartment of Conservation, 1998. (<http://www.consrv.ca.gov/dlrp/LCA/index.htm>)

^e<http://www.nass.usda.gov/census/census97/>

The Shasta and Tehama County sections of the watershed are separated by the Cottonwood Creek mainstem. Topographically, however, the watershed is similar in both counties with the low-lying Central Valley running through the center of each county, and the valley floor of the watershed gradually converging with the Klamath and Coast Range mountains located along the north, northwest, and western boundaries of the watershed.

Current Land Use

This section categorizes current land use in the Cottonwood Creek watershed under the following major land use classifications:

- Agriculture
- Timber
- Public Lands
- Habitat Resource/Open Space/Recreation
- Residential
- Mining

The land use classifications listed above occur in varying degrees within each county's designated section of the watershed. However, these particular classifications have been selected for discussion because of their relative importance in the watershed. Figure 11-1 shows the land use distribution in the watershed.

In general, agriculture, timber, and federal lands cover the largest percentage of the land area within the watershed; and these three categories also make up the primary economic land use classifications within the watershed. For example, each county is a significant contributor to the agricultural industry that thrives in the valley, and the agriculture industry provides a large percentage of the respective county's economic base. The timber industry is also a major contributor to the economic growth of the counties. In addition, large portions of land within each county are federally owned and are used for a variety of economic, environmental, and recreational purposes. Specific details describing each of the respective land use categories are provided below.

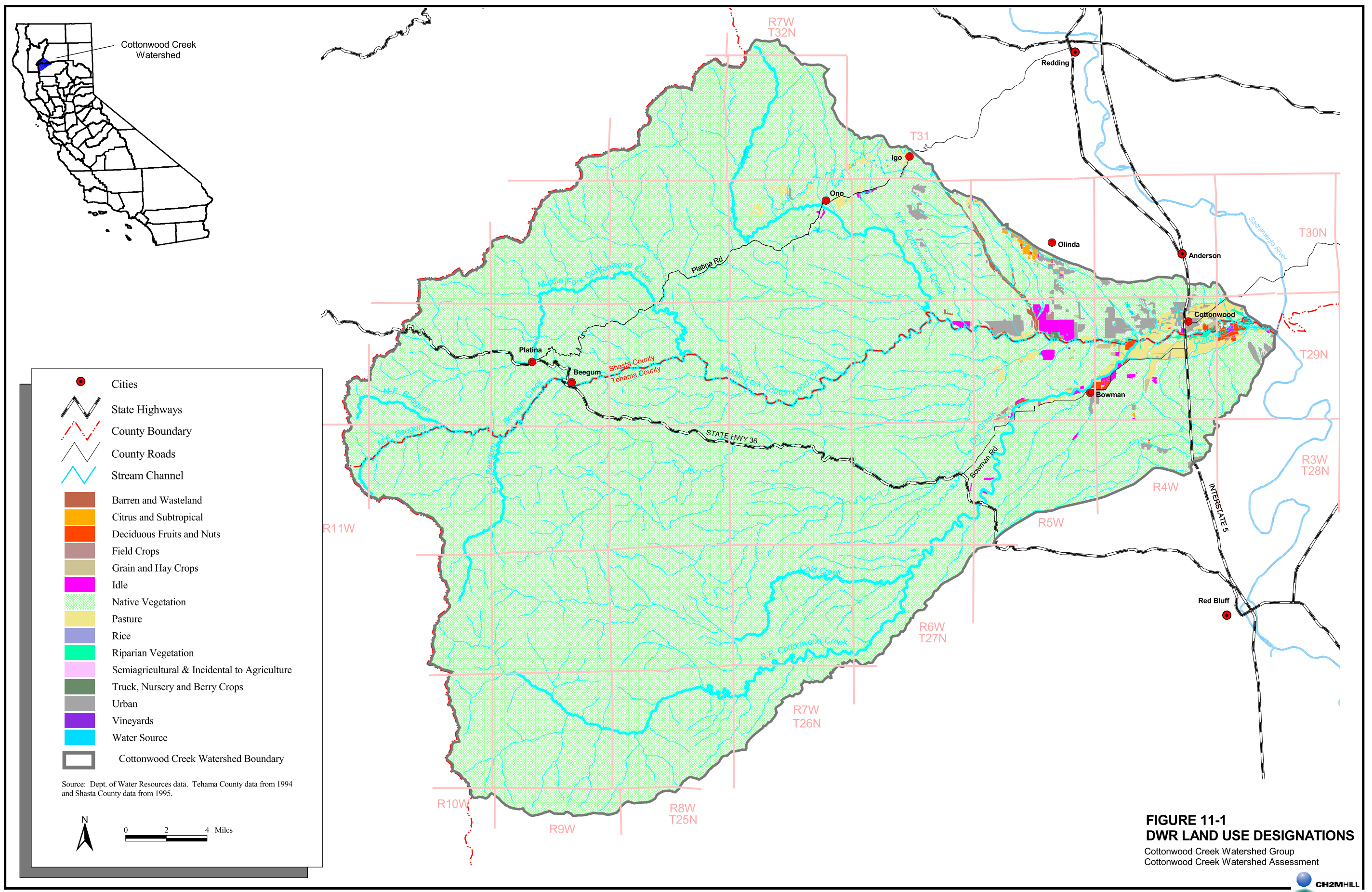
Agriculture

Land Conservation Act of 1965

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open-space use. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open-space uses rather than full market value. Local governments receive annual funding of forgone property tax revenues from the state via the Open Space Subvention Act of 1971. In the 1998 tax year, Shasta County enrolled a total of 163,352 acres and Tehama County enrolled a total of 801,671 acres in the Williamson Act Contract (U.S. Department of Conservation, 2001).

Shasta County

The majority of agricultural lands in Shasta County are located in the northeast and south of the City of Redding along the Sacramento River. In 1997, land in Shasta County dedicated to agriculture totaled approximately 316,743 acres. Nurseries and greenhouse crops; cattle and calves; and hay, silage, field seeds, and grass seeds were Shasta County's top three commodities in 1997, in terms of value of sales. Agriculture in the county is currently on a decreasing trend. While the number of farms increased from 1992 to 1997, the total amount of land occupied by farms in Shasta County has had an 18-percent decrease. The market



value of agricultural products sold has also decreased over the past 5 years. However, at approximately \$31 million in market value of products sold in 1997, agriculture still remains a large portion of the county's economic base (U.S. Department of Agriculture, 1997).

A large portion of Shasta County's agricultural land is found in the watershed. The lands within the watershed dedicated to agriculture comprise small-scale cropland and livestock grazing. The majority of the grazing lands in this area are subject to the Land Conservation Act of 1965 (a contract). Approximately 30 percent of the total agricultural land area (48,022 acres) within the county that has entered into contract is located in the watershed (Shasta County, 1998).

Tehama County

Tehama County is characterized as an agricultural county. In 1997, approximately 885,426 acres of land (almost 50 percent of total county land) were used for agricultural purposes. Fruits, nuts, and berries; cattle and calves; and dairy products were Tehama County's top three commodities in 1997, in terms of value of sales. While farmland in Tehama County has decreased approximately 3 percent from 1992 to 1997, the market value of agriculture products sold has increased 13 percent to well over \$100 million (U.S. Department of Agriculture, 1997).

Within the watershed, the majority of the agricultural land in Tehama County is found in the north-central area. The dominant use of these lands is for livestock grazing. Lands contracted under the Land Conservation Act within the watershed are found along Cottonwood Creek and the Sacramento River; however, the majority of lands in Tehama County (approximately 81 percent) under this contract are located outside of the watershed.

Timber

Forest Taxation Reform Act of 1976 (Timber Production Zoning)

The Forest Taxation Reform Act of 1976 was designed to "promote prudent and responsible forest resource management calculated to serve the public's need for Watershed protection, fisheries and wildlife, and recreational opportunities" (Chapter 176, Statutes of 1976, Section 1). This act developed what is known as Timber Production Zoning (TPZ). Land use under a TPZ is restricted to growing and harvesting timber and to compatible uses approved by the county. TPZ allows a property owner the opportunity to place their lands into an ad valorem property tax system (or tax system that remains fixed in proportion to the value of the property) with a yield tax in harvested timber and an established statewide system of preferential assessment for timberlands. TPZ protects the integrity of timber resources and prevents the occurrence of adverse impacts from timber harvesting operations on non-timber land uses.

Shasta County

Timber harvest is one of Shasta County's most valuable resources. Countywide, approximately 1,231,000 acres (slightly over 50 percent of the total land area) are dedicated to commercial forest use. For the 1999 tax year, Shasta County ranked fifth in overall value and volume percentages for California (California State Board of Equalization, 1999). The forest industry and miscellaneous private corporations control over 50 percent of the total

commercial timberland in the county. Approximately 49 percent of the timberland countywide is designated in TPZ pursuant to California's Forest Taxation Reform Act of 1976 (Shasta County, 1998).

Only a small portion of the overall timber preserve lands in Shasta County are located in the watershed. Timber preserve lands account for approximately 10,778 acres (less than 2 percent) in the Shasta County portion of the watershed. The majority of these lands are located in the northwest (Shasta-Trinity National Forest land) where elevations reach well over 5,000 feet.

Tehama County

Timber resources contribute to almost 25 percent of the total land area in the eastern and western planning areas of Tehama County. For the 1999 tax year, Tehama County ranked seventh in overall value and volume percentages for the State of California (California State Board of Equalization, 1999). The primary timberland owner in the county is the federal government. The majority of these lands are located in the Lassen, Mendocino, and Shasta-Trinity national forests. Virtually all of the county's timber resources are protected from conversion to other uses and from adjacent potential land use conflicts under the TPZ provisions (Tehama County, 1983).

Similar to Shasta County, the majority of timber resources are located outside of the watershed. Approximately 16,582 acres in the watershed are dedicated timber preserve lands. The lands designated "timber" can be found on the higher elevations of the northwestern side of the watershed.

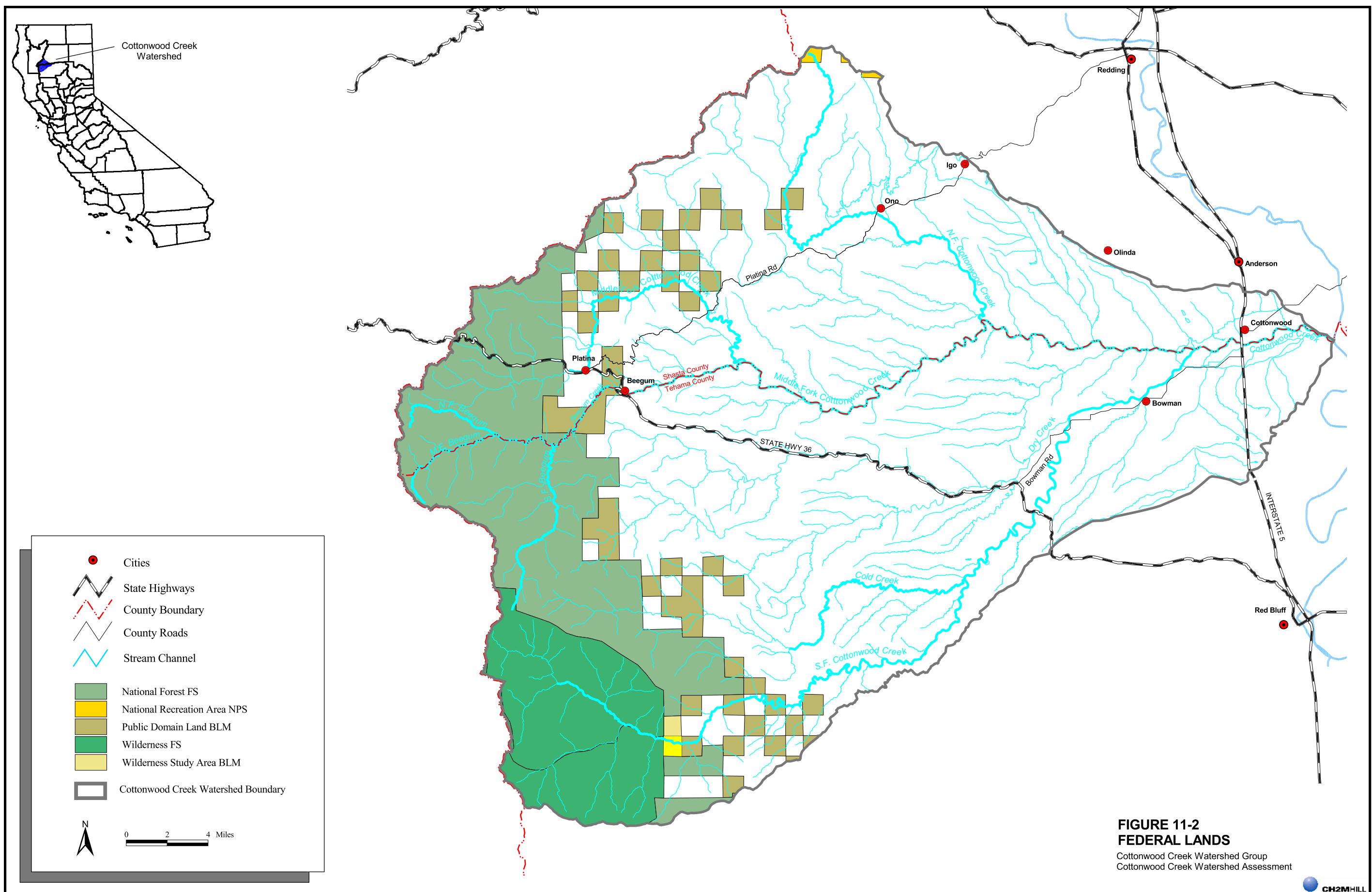
Public Lands

Shasta County

The federal government, particularly the U.S. Department of the Interior BLM and USFS, is a major landowner within Shasta and Tehama counties. Public land in Shasta County totals approximately 993,080 acres, about 40 percent of the total land area within the county. USFS owns 740,436 acres within Shasta County, including 495,639 acres in the Shasta-Trinity National Forest and 244,797 acres in the Lassen National Forest. Other public lands within the county total approximately 252,644 acres (California State University, 1997). Other public lands are administered by BLM; Bureau of Indian Affairs; miscellaneous federal agencies; lands owned by states, counties, and local public agencies; and lands leased by governmental units for more than 50 years. See Figure 11-2 for federal land ownership in Shasta County.

Tehama County

Public lands in Tehama County total approximately 491,135 acres, about 26 percent of the total land area within the county. USFS owns approximately 388,220 acres within Tehama County. Of this amount, 123,975 acres lie within the Mendocino National Forest, 188,420 acres lie within the Lassen National Forest, and 75,825 acres lie within the Shasta-Trinity National Forest. Other public lands within the county total approximately 102,915 acres (California State University, 1997).



Within the watershed, 49,697 acres (approximately 21 percent) of public-owned lands exist in Shasta County, and 116,343 acres (approximately 32 percent) exist in Tehama County. As a whole, approximately 27 percent of the watershed comprises publicly owned property. The majority of public lands within the watershed lie in the Shasta-Trinity National Forest, which is owned by USFS. BLM is also a major landowner within the watershed in both the Shasta and Tehama County areas. See Figure 11-2 for federal land ownership in Tehama County.

Habitat Resource/Open Space/Recreation

The purpose of this designation is to protect lands having significant wildlife habitat values. Natural habitat areas are needed to sufficiently maintain species diversity and to allow necessary corridors for seasonal species migration. The wildlife species diversity for Shasta and Tehama counties would not be possible without a diversity of natural habitats to support them. Both counties have significant ecological and environmental quality benefits from habitat conservation efforts as set forth in their respective general plans.

The open-space element of a general plan attempts to preserve lands that have ecological, economical, and recreational benefit for current and future populations. Large portions of publicly owned land are maintained under the open-space designation. Land that is not publicly owned is given a specific general plan designation that limits the amount of development on the land, so as to preserve natural resources.

Recreational resources in Shasta and Tehama counties are numerous. Recreational resources in the two counties are primarily found in open space or undeveloped lands. Many hiking trails, camping facilities, sport hunting, and fishing areas are available in each county. In addition, the many national parks, national recreation areas, wilderness areas, and state parks attract large numbers of tourists, which helps to boost the economy of the counties. The open-space and natural resource designations help to protect these recreational resources so the county can benefit economically, ecologically, and recreationally.

Within the watershed, Shasta County has non-public-owned land dedicated to open-space or habitat conservation. These lands are found on the western side of the watershed, north and south of Platina Road, west of the Town of Ono, and east of the Town of Platina. A large portion of these lands that are privately owned have recently been re-zoned to Agricultural Preserve and are being held in the Williamson Act Contract.

Residential

In the year 2000, Shasta County's population was 163,256, and Tehama County's population was 56,039 (U.S. Department of Finance, 2001). The majority of the population in both Shasta and Tehama counties is located outside of the Cottonwood Creek watershed in urban centers such as the cities of Redding, Anderson, and Shasta Lake in Shasta County, and the City of Red Bluff in Tehama County.

I-5 is a principal arterial for the western United States that extends north to south from Canada to the Mexican border and cuts through the easternmost portion of the watershed. High population densities for each county are located near the corridor of I-5. The reasoning attributed to this is threefold:

1. The I-5 corridor provides access to regional markets
2. Housing and labor resources must be located near sources of employment and major transportation linkages
3. The I-5 corridor growth pattern is necessary to use existing and potential unused capacity of community water supply and wastewater treatment systems

Cottonwood is the only town in the watershed that is situated on the I-5 corridor. The estimated population of Cottonwood is approximately 2,500 and is considered an unincorporated (not a self-governing city) part of Shasta County. Cottonwood, however, is considered a “Town Center,” and is served by most urban services.

Unincorporated areas account for approximately 41 percent of the population in Shasta County, and almost 65 percent of the population in Tehama County. The majority of the watershed comprises a town center, small rural community centers, unincorporated communities, and individuals. The unincorporated rural community centers located within the watershed include towns such as Igo, Ono, and Platina in Shasta County, and Bowman and Beegum in Tehama County. While these communities represent a very small percentage of the total population in both Shasta and Tehama counties (actual population counts are unavailable for these communities), they are the most developed and densely populated areas within the watershed.

Most general plan designations allow for at least one dwelling unit per parcel. Within the watershed, the average parcel size is over 5 acres. The minimum parcel requirement in the majority of the residential general plan designations in the watershed range from 2 to 5 acres depending on topography. In the Tehama County portion of the watershed, the minimum parcel requirement ranges from 2 to 10 acres depending on topography.

Mining

Although mining activities played a major role in the historical economy and land use development of the Cottonwood Creek watershed, actual mining activities have been significantly reduced in recent years. Past major mining land use activities, such as placer and hard rock precious metal (primarily gold) mining, have for the most part transitioned into a recreational land use. However, mining for industrial purposes (i.e., aggregate mining) continues and constitutes a major land use that provides economic value to the watershed.

Table 11-2 lists all of the mining operations that have existed or currently exist in Shasta County, their location, and the minerals extracted.

Land Use Plans

Redding Resource Management Plan and Record of Decision, U.S. Department of the Interior Bureau of Land Management

The Resource Management Plan is a 15-year strategy regarding the administration of public lands under the jurisdiction of BLM within the Redding Resources Area (RRA). The planning area for the Resource Management Plan includes all or portions of the counties of

Butte, Shasta, Siskiyou, Tehama, and Trinity. RRA encompasses approximately 247,500 acres of public land and 142,400 acres of federal mineral estate within the counties (BLM, 1993). To adequately address issues within this large area, RRA was broken down using geographic and political divisions into seven smaller areas called “management areas.” The Cottonwood Creek watershed area lies primarily within the Yolla Bolly Management Area, with a small portion of the northern end of the watershed lying in the Shasta Management Area.

TABLE 11-2
Mining Activity in Cottonwood Creek Watershed
Cottonwood Creek Watershed Assessment

Name of Claim, Mine, or Group	Location	Mineral Resource	In Operation
Shasta County			
Green ^a	S 7, T 30N, R 7W	Gold, Lode	No
Midas (Gold Hill, Harrison Gulch, Victor and Twinvict) ^a	S 3,4,10, T 29N, R 10W	Gold, Lode	No
Big Windy Placer Mine ^b	S 8, 16, 17, T 29N, R 6W	Gold, Placer	No
Shasta County			
Alta California Exploration ^b	S 9, 17, T 29N, R 6W	Platinum, Placer, Gold, Placer and Silver, Placer	No
Anderson-Cottonwood Concrete ^a	S 11, T 29N, R 4W	Sand and Gravel	Yes
Black Lane Pit (Cottonwood Creek Pit, Westside Aggregate, formerly Northstate Asphalt) ^b	S 7, T 29N, R 3W	Sand and Gravel	No
Clear Creek Dredging Co. ^a	S 2, T 29N, R 6W & S 28, T 31N, R 5W	Gold, Placer	No
Crow Creek Dredging Co. ^a	S 33, T 30N, R 6W	Gold, Placer	No
Emperor Mine ^b	S 27, 34, T 30N, R 6W	Gold and Silver, Placer	No
Hardscrabble (Piety Hill) ^a	S 37, 34, 35, 36, T 31N, RW	Gold, Placer	No
Ludwig Creek Pit ^b	S 8, T 29N, R 4W	Gravel Base and Sub-base	No
Midas	S 10, T 29N, R 10W	Gold	No
Moore Pit (Cottonwood Creek) ^b	S 11, 12, T 29N, R 4W	Sand and Gravel	Yes
Negro Hill ^a	S 14, T 30N, R 8W	Manganese	No
North Fork Cottonwood Creek Pit (Shoup) ^b	S 18, T 30N, R 6W	Gravel	No
Round Bottom ^a	S 5, T 28N, R 10W	Chrome	No
Russell (Blue Bird, Igo Mining Corporation, Igo Placer Mining Company, Lost Channel, Western Contracting Company) ^a	S 34, T 31N, R 6W	Gold, Placer	No
Tehama County^c			
Chuck Wolf Sand and Gravel	S 5, T 28N, R 4W	Sand and Gravel	Yes
Cottonwood Creek Sand and Gravel	S 9, 10, T 29N, R 4W	Sand and Gravel	Yes
County of Tehama	S 33, T 29N, R 4W	Sand and Gravel	Yes
Westside Aggregate	S 28, 33, T 29N, R 4W & S 4, T 28N, R 4W	Sand and Gravel	Yes

^aCalifornia Division of Mines and Geology, 1974.

^bShasta County, 2001.

^cStoufer, 2002, pers. comm.

Each land use decision description within the management areas consists of three individual planning elements: resource condition objectives, land use allocations, and management actions. Resource condition objectives are the goals established for each decision area. They condition allocations, actions, and unforeseen future proposals to conform with these goals. Land use allocations prescribe general management categories, specific limitations to full resource use, or formal designations that are needed to meet the resource condition objectives and/or comply with federal law. Management actions are implementation measures that ensure that the resource condition objectives are met and alert the public and BLM to specific follow-up actions that are anticipated to implement the land use management alternatives.

Two resource condition objectives that are stated in both management areas include: (1) enhance the ability to acquire high-value resource lands within RRA by disposal of BLM-administered (public land) interests within the management areas and (2) enhance resource management efficiency and the public service mission of local, state, and federal agencies via transfer of jurisdiction of specific public lands from BLM (BLM, 1993).

Within the Shasta Management Area, one of the management actions includes a recommendation for the development of reports addressing the suitability of the North Fork Cottonwood Creek for inclusion in the National Wild and Scenic Rivers system. The Yolla Bolly Management area includes a recommendation for the development of reports addressing the suitability of the Middle Fork and South Fork Cottonwood Creek for the inclusion in the National Wild and Scenic Rivers system (BLM, 1993).

Land and Resource Management Plan, Shasta-Trinity National Forest, U.S. Forest Service

The National Forest Land and Resource Management Plan was prepared to guide the management of the Shasta-Trinity National Forest. The primary goals of the Land and Resource Management Plan are to integrate a mix of management activities that allow use and protection of forest resources; meet the needs of guiding legislation; and address local, regional, and national issues (USFS, 1995). Shasta-Trinity National Forest is divided into 22 management areas with separate, distinct management direction in response to localized issues and resource opportunities. These management areas are divided according to definite topographical lines, where possible. Management area direction applies only to national forest land, not private land. The westernmost portion of the Cottonwood Creek watershed lies within the Beegum Management Area.

The information contained within the Beegum Management Area includes the area's description, management prescriptions, desired future conditions, and supplemental management direction. Over one-third of this management area is managed to maintain and enhance late-successional and "old-growth" forests and aquatic ecosystems within the late-successional and riparian reserve systems. This management area contains a high degree of ecological diversity as a result of land capability and management activities (USFS, 1995).

General Plan

The Shasta County General Plan and Tehama County General Plan are documents that have been adopted to set forth long-range, general policies and guidelines for their communities.

These plans are not detailed, parcel-specific policy statements, but rather generalized policies that protect the interests of both current residents and future generations. The General Plan attempts to show land use over a relatively long time, while keeping scheduled review periods to allow it to be adjusted in response to changing conditions and shifts in community values.

California planning law states that:

“decisions involving the future growth of the State, most of which are made and will continue to be made at the local level, should be guided by an effective planning process, including the local General Plan, and should proceed within the framework of officially approved statewide goals and policies directed to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water quality, and other related physical, social and economic development factors” (Government Code Section 65030.1).

Shasta County General Plan

Applicable Shasta County General Plan designations within Cottonwood Creek watershed include the following:

Residential	Agriculture
RA – Rural Residential “A”	A-G – Grazing
RB – Rural Residential “B”	A-cg – Small-scale Cropland/Grazing
Resource Management	Other
T – Timberland	PF – Public Facility
NO – Open space	
NH 40/NH 80 – Habitat Resource (40- and 80-acre minimum parcel size)	

Tehama County General Plan

Applicable Tehama County General Plan designations within Cottonwood Creek watershed include the following:

Residential	Commercial
RS – Rural Small Lot	GC – General Commercial
RL – Rural Large Lot	
Industrial	Other
IG – General Industrial	Public Land
	P – Public Facility
Resource Management	
T – Timber	
C – Cropland	
G – Grazing	

Zoning Plan

Shasta County and Tehama County zoning plans apply throughout the unincorporated portions of each county. These provisions also apply to lands owned, leased, or otherwise

controlled by the state or a local government. The provisions of the zoning plan establishes various zoning districts by ordinance of each county's board of supervisors. Zoning districts are typically accompanied by maps, which usually maintain consistency with the General Plan designation for the area. Zoning maps are used to show districts or areas in more detail than the General Plan maps, as well as some parcel-specific designations where applicable.

Shasta County Zoning Plan

Applicable Shasta County Zoning Plan designations within Cottonwood Creek watershed include the following:

Residential	Commercial
RL – Limited Residential	CM – Commercial—Light Industrial
RR – Rural Residential	CR – Commercial Recreational
IR – Interim Rural Residential	ML – Light Industrial
	M – General Industrial
Resource Management	Other
AP – Agricultural Preserve	U – Unclassified
TL – Timberland	F1 – Designated Floodway
MR – Mineral Resources	F2 – Restrictive Flood
HP – Habitat Protection	MU – Mixed Use
	PF – Public Facility
	PD – Planned Development
Agriculture	
A1 – Limited Agriculture	

Tehama County Zoning Plan

Applicable Tehama County Zoning Plan designations within Cottonwood Creek watershed include the following:

Residential	Industrial
RE – Residential Estates	M1 – Light Industrial
R1 – One-family Residential	
Agriculture	Others
UA – Upland Agricultural	PD – Planned Development
EA – Exclusive Agricultural	PF – Primary Floodplain
	NR – Natural Resource Lands and Recreation
	PA – Public Agency
	TPZ – Timber Preserve
Commercial	
C1 – Neighborhood Commercial	
C2 – Community Commercial	

Department of Water Resources Land Use Surveys

The land use program for DWR provides information of the nature, location, and rate of change in water use for all hydrologic regions in the State of California. Urban and agricultural land use and water use data have been collected and digitized on maps and provide information on current and projected water uses throughout California's 58 counties. The goal of this program is to monitor land use more frequently and efficiently.

Land use information is used by DWR and others for many programs and investigations, including the following:

- Developing both baseline irrigated agricultural acreage and forecast acreage for Bulletin 160, the California Water Plan Update
- Developing annual irrigated agricultural acreage statistics
- Monitoring urban land use and encroachment on agricultural land to help determine future encroachment and changes in land use as indicated by population projections
- Use as input for various surface-water and groundwater models by DWR and other agencies
- Use by other state, federal, and local agencies in their planning efforts

The data contained on these maps generally include acreage for land use designations including both agricultural and non-agricultural uses, crop types, irrigation, and water supply information. See Figure 11-1 for DWR land use designations.

Applicable DWR land use designations within Cottonwood Creek watershed include the following:

G	=	Grain and Hay Crops
F	=	Field Crops
P	=	Pasture
T	=	Truck and Berry Crops
D	=	Deciduous Fruits and Nuts
I	=	Idle
U	=	Urban
UR	=	Residential
NV	=	Native Vegetation
NR	=	Riparian Vegetation
NW	=	Water Surface

Land Use Maps

Several maps that document county-approved land uses are available.

Shasta County

- General Plan Maps:
 - Western Upland
 - South Central Region
 - French Gulch
- Zoning Maps:
 - See Table 11-3

TABLE 11-3
Shasta County Zoning Maps^a
Cottonwood Creek Watershed Assessment

Township	Range	Map
29N	3W	A
29N	4W	A, B, C
29N	5W	A, B, C
29N	6W	A, B, C, D
29N	7W	A through F, H
29N	8W	A through F
29N	9W	A through F, G
29N	10W	A through I
29N	11W	I
30N	3W	G
30N	4W	G, H, I
30N	5W	A, D, E, G, H, I
30N	6W	A through I
30N	7W	A through I
30N	8W	A through I
30N	9W	B through I
30N	10W	H, I
31N	7W	A through I
32N	7w	G, H

^aSome maps are not currently in print.

- Assessor's Parcel Maps:
 - Book Numbers 11, 42, 43, 44, 45, 87, 205, 206, 207
- Historical land use maps from the mid-1900s

Tehama County

- General Plan Maps:
 - North I-5 Planning Area
 - Western Planning Area
- Zoning Maps:
 - See Table 11-4

TABLE 11-4
Tehama County Zoning Maps
Cottonwood Creek Watershed Assessment

Township	Range	Map	Section Map ^a
25N	9W	64	
26N	7W	59	
26N	8W	60	
26N	9W	61	
26N	10W	62	
27N	6W	38	
27N	7W	37	
27N	8W	36	
27N	9W	35	
27N	10W	34	
28N	4W	27	1 through 6
28N	5W	28	1, 2, 5, 6
28N	6W	29	
28N	7W	30	
28N	8W	31	
28N	9W	32	
28N	10W and 11W	33	
29N	3W	11	5, 4, 9
29N	4W	10	4 through 9
29N	5W	9	5 through 9
29N	6W	8	
29N	7W	7	
29N	8W	6	
29N	9W	5	

^aSection map refers to maps applicable to individual sections within townships and ranges.

- Assessor's Parcel Maps:
 - Book Numbers 1, 3, 4, 6, 7, 19, 21, 57
- Historical maps from 1888 depicting people and places either once located or currently existing on land within project areas, from Tehama County Library

California Department of Water Resources

- Land use surveys for Tehama and Shasta counties
 - Quad Numbers: 1214, 1215, 1216, 1217, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1412, 1413, 1415, 1416, 1417, 1418, 1419, 1513, 1514, 1515, 1516, 1517, 1518, 1613, 1614, 1615, 1616

Available Software

Software that is available to understand land use within the counties follows:

- Parcel Quest-Assessor Direct Data and Maps
- Locate properties, ownership, acreage, and parcel maps via:
 - Parcel number (book and/or page numbers)
 - Owner name
 - Land use category
 - Address
 - Sale date
 - Sale amount
 - Assessed value of land

The cost of the above-listed software totals \$199.00 plus tax per county. A 20-percent discount applies to a software order for more than one county.

Historical Land Use

Historical land use information for both Shasta and Tehama counties is limited. Prior to 1815, the land was inhabited primarily by Native Americans, and historical records of activities before this date are scarce. However, historical land uses are similar to those that currently exist. Since the settlers of the early 1800s, historical land uses in each county have primarily focused around activities such as mining, agriculture, and timber harvesting.

1800 to 1850

By 1815, trappers and explorers began traveling through the area, and by the mid- to late-1820s, they had become a permanent fixture in the north state. During this time in what is now Shasta County, land had been sectioned off into territories the Native Americans had established. In the mid-1840s, a portion of the watershed existed in the Wintu territory and was occupied mainly by the Wintu tribe. This territory included the headwaters and the South Fork of the Trinity River, lower portions of the Sacramento and McCloud rivers, and the Squaw and Cottonwood creeks within Shasta, Trinity, and Tehama counties. The Nomlaki tribe was mainly found in southern areas of Cottonwood Creek. The Native Americans who lived within this area were hunter-gatherers and lived along the valley floor during autumn, winter, and spring, and journeyed into the foothills of the mountains during the summer months in search of food.

The landscape in the watershed consisted mainly of pristine oak woodlands in the lowlands, and fir and pine forests at higher elevations. Once Spanish and English settlement began, these forests began to be eliminated and cultivated for agricultural uses.

Historical records indicate that all land associated with Mexican jurisdiction was located outside of the watershed. However, in 1844, William Bennitz and Pierson B. Reading obtained Mexican land grants in the southern portion of Shasta County. This land acquisition promoted additional settling, which ultimately affected the watershed.

1850 to 1900

During the period from 1850 to 1900, mining was the predominant land use that had the greatest impact on the area's economy and population growth. Upon the discovery of gold in 1848, mining became a lucrative industry in the north state, contributing roughly \$23 million dollars to Shasta County's economy alone during this period (Department of Conservation, 1974). As a result, the population of the area began to grow, and communities such as Harrison Gulch, Knob Gulch, Janesville, and Tüttletown were formed. The majority of the area's early inhabitants established settlements near the mining operations. In 1852, the Town of Cottonwood was formed when Marcus Clanton received federal approval to establish the Cottonwood post office (Smith, 1994).

The majority of the early mining operations were located in what is now western Shasta and eastern Trinity counties. The primary materials mined in the first few decades were gold and quartz, but copper increased in significance toward the latter part of the century when copper mining operations at the Iron Mountain Mine commenced in 1896. Mining's greatest impact on the Cottonwood Creek watershed during this period occurred as a result of the associated population growth. This growth and the construction of the California and Oregon railroad helped to establish and accelerate growth in the area's agricultural and forest products industries.

Settlers who followed the mining activity brought agriculture to the north state. In Shasta and Tehama counties, agriculture started out mainly with small cattle ranches and farms that primarily raised wheat and barley. By the late 1800s, livestock ranching had increased significantly, and cattle and sheep became the main livestock industry in both Shasta and Tehama counties (with alfalfa, wheat, and barley remaining the primary crops).

In the late 1800s, mining activities associated with hydraulic and gold dredger mining began interfering with the agriculture industry when dredger tails and discharge associated with hydraulic mine runoff resulted in a significant increase in water-quality problems. This was the case in areas discharging to Cottonwood Creek and in Cottonwood Creek discharge to the Sacramento River. Eventually, water-quality issues caused the demise of hydraulic mining in the watershed and northern California as a whole, and hydraulic mining activities saw a significant drop-off by the turn of the century. However, dredge operations continued in the watershed with some mining continuing into the late 1950s. The development of the lumber industry in the area was also a direct result of the mining industry. While lumbering dates back as far as 1844, permanent lumbering was not established until after the gold rush. The majority of the lumbering that occurred during this era was centered in the Shingletown area of Shasta County.

1900 to 1950

In the early 1900s, mining was mainly concentrated on copper. Gold had become more costly to mine than it proved to be worth, so the concentration of mining turned to other

metals and ores. During this time, Shasta County became the most important copper-producing area in California. Coal was also mined in Shasta County until 1929; however, when natural gas resources were developed, coal mining virtually ceased.

In the very early 1900s, the number of farms in Shasta County increased 22 percent.. With the construction of the Anderson-Cottonwood Irrigation District canal in 1914, agriculture in Shasta County turned toward irrigated crops such as alfalfa and landino clover. By the 1930s, alfalfa had replaced fruit crops such as prunes and peaches; and by 1940, nearly 72 percent of Shasta County was under irrigation. The dairy industry also used up much of the prime fruit cropland in Shasta County.

In the early 1900s, most of Shasta County's lumber industry was owned by Red River Lumber Company. Transportation through mountainous areas was limited, thus lumbering came almost to a stand-still. After World War II and when transportation was more accessible, the lumber industry began to flourish and became the dominant industry in Shasta County.

1950 to 1975

Between World War II and 1962, Iron Mountain Mine was in full operation. However, because of high operating costs, the mine was forced to close down in 1962. Aggregate for roads and buildings has become the dominant mining industry in Shasta County. Sand and gravel, crushed stone, and volcanic cinders were the predominant minerals that were being produced after the closure of the Iron Mountain Mine. Abandoned mines and dredge tailings are leftover signs of previous mining eras.

Historical land use maps from Shasta County indicate a concentration of agriculture and conservation dating as far back as 1954.

1975 to Current

County, state, and federal agencies began taking a stronger look at land use during this time period. Various local, state, and federal agencies have written land use management plans, and the corresponding agency has adhered to its goals and policies. With an increasing populace, land use practices have been scrutinized at a more detailed level to help guide future development. These plans are summarized under the Current Land Use section above.

Agriculture still plays a key role in the economic base of the watershed. Over the past 25 years however, farm land in both Shasta and Tehama counties has been declining in numbers. Unfortunately, a study that focuses on the agricultural aspect of the watershed has not yet been performed, so it is unclear what the overall agricultural trend in the watershed is. One can only speculate that the general agricultural trend in the watershed is similar to that of the two counties in which it is located.

Timber harvest plans dating as far back as 1990 are available from the California Department of Forestry (see Appendix I). The plan records that were collected for this document show the amount of acreage, location, and type of harvesting that has been performed in various locations in the watershed. Some private timber harvests are not documented; therefore, actual impacts of all timber harvesting are unknown. DWR has

stated that the reliance of wood heating has increased with an increasing population and has thus caused a dramatic increase in harvesting and clearing of oak woodlands, possibly as much as 60 percent in Cottonwood Creek (DWR, 1992).

Mining operations have slowed in the watershed and surrounding areas during this time period. It is unclear why mining operations have been reduced. It is probable that one reason for the reduction can be attributed to the regulatory aspects of operating a mine. Nonetheless, six mining operations are known to exist in the watershed, and the principle material that is currently being mined is sand and gravel. A summary of these operations is located in the Mining section above.

Land Use Conclusions and Recommendations

Although the population within the watershed has increased significantly over the past 200 years, land use has generally remained the same. Agriculture has been, and still is, a large part of the area's economy in and around the watershed. It is, however, unclear to what degree of Shasta and Tehama counties' agricultural industry the watershed comprises.

Mining played a large role in the land use changes that occurred throughout recorded history in Cottonwood Creek and around the watershed area. Upon the discovery of gold in the mid-1800s, there was a significant increase in European settlement. Ultimately, agriculture, grazing, and timber harvest can be attributed to the increase in population.

Within the last 50 years, mining activity has significantly decreased in the watershed, with fewer mining sites, as well as fewer materials being mined. Part of this decrease may be attributed to SMARA of 1977. SMARA was implemented by the California Department of Conservation to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of current mining operations to public health, property, and the environment. Currently, mining operations focus on sand and gravel removal.

Ownership information is easily obtained through county assessor's records. Because the watershed area is so expansive, it is time-consuming to determine private ownership within the entire watershed. Urbanization and more densely populated areas are centered around the creek and major roads. This leads to smaller parcel sizes and an increased number of landowners. In the more rural areas of the watershed, parcel sizes tend to be larger in size (typically 40+ acres per parcel) and have fewer owners.

Recommendations

1. Digitize county land use maps, ownership maps, and open rangeland maps. Update ownership information according to county assessor's data for federal lands. Synchronize land use data between Shasta and Tehama counties to create uniformity. In addition, perform land use surveys to determine consistency with county general plan areas and DWR land use designations.
2. Conduct livestock surveys within the watershed boundaries. Determine livestock type, quantities, and location and intensity of grazing. Survey agriculture lands and leases to determine location, crop type, and irrigation system used. Associate livestock and

cropping data with county- and state-designated land use type and location in the watershed.

3. Integrate data from timber harvest plans (presented in Appendix I) into ongoing watershed management efforts.

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12. SUMMARY CONCLUSIONS AND RECOMMENDATIONS



Cottonwood Creek Watershed Assessment

Summary Conclusions and Recommendations

The Cottonwood Creek Watershed Assessment forms the basis for future projects that may be undertaken in the basin. In some cases there is adequate information to accommodate specific projects. In some cases there is not. Following is a summary of the conclusions and recommendations outlined in the Watershed Assessment. Taken as a whole, the conclusions and recommendations establish a set of preliminary policy determinations of CCWG, although the group has not outlined a specific policy statement regarding the overall conclusions and recommendations of the Watershed Assessment. These recommendations will direct future efforts in the watershed and will shape the topics on which data are collected. Such data will further characterize the watershed and form the rationale for future projects. Clearly, these recommendations will influence the future of the watershed.

Phased Approach to Watershed Management

The following represents a draft representation of the CCWG's phased approach to watershed management. In some cases, watershed issues may be straightforward and uncontroversial. In such cases, there may be opportunities for early implementation of specific watershed actions. Other, more complicated issues may require a more measured deliberate approach. This Watershed Assessment represents work conducted under Phase 2.

Phase 1 Establish CCWG

Build Base

- Mailing lists of stakeholders
- Relationships with agencies
- Collect existing data

Phase 2 Develop CCWG

Understand and educate

- Organize existing data
- Summarize data
 - Establish what is known and what is not known*
- Recommend additional study where necessary or desirable
- Share with stakeholders and agencies

Phase 3 Establish Desired Condition of Watershed

- Develop organizational team and responsibilities**
- Develop guidelines for establishment of desired conditions**
- Develop detailed goals and objectives of watershed efforts**
- Liaison between stakeholders and agencies**
- Studies of physical processes**
- Pilot projects**

Phase 4 Affect Change in Watershed

- Recommend policy and land use**
- Implement watershed-scale projects**

Overall Conclusions and Recommendations

Data collection efforts undertaken as part of the Watershed Assessment encountered challenges relating to the scale of the watershed. With an area greater than 900 square miles, the Cottonwood Creek watershed is relatively large. A large number of studies have been undertaken within the watershed, but few address a large enough area to be representative of the diversity of the watershed. Examples of these data sources include the environmental impact statement for the XTRA Power Gravel Extraction Project (RMI, 1987) and the Preliminary Report for the I-5 Bridge (CH2M HILL, 1995). Information contained in these reports, though informative, does not lend itself to a watershed-scale report.

There are also several examples of information sources that covered areas much larger than the watershed. Often, these sources did not encompass the entire watershed, either leaving large tracts of the watershed uncharacterized, or providing a characterization that was not representative of the watershed itself. Examples of these data sources include the County Plans for Shasta and Tehama counties and the investigation of upper Sacramento River basins (DWR, 1969). In these cases, the scale of the source data was greater than the scale of the watershed.

Despite these challenges, this Watershed Assessment provides a valuable characterization of the watershed and serves as a guidebook for the watershed and information sources that may be available for more detailed projects in the watershed. As noted under several of the topic areas below, there are opportunities to implement projects within the watershed based on the existing state of information. However, the majority of topic areas have a need for additional study that would either form the basis for future projects or determine whether additional projects are necessary or desirable.

Further definition of these future projects will be necessary in order to secure funding, landowner cooperation, and agency support. Identifying and advocating particular projects will require CCWG to develop more specific goals and objectives for the watershed. It is possible that some future projects, including projects with the sole purpose of improving the understanding of physical features in the watershed, may be controversial.

CCWG recently submitted three applications for grant funding under CALFED.

Educational outreach: Project would establish educational outreach programs for a number of kindergarten through eighth-grade schools that do not currently have watershed stewardship curricula. Implementation of this project is anticipated to receive widespread support from the greater community.

Fish-monitoring program: Project would establish a fish-monitoring program in the watershed with the intent of improving the understanding of fish populations in the watershed and the influence of water quality on the existence of fish in the watershed. Implementation of this project may encounter resistance from local landowners with concerns regarding potential future regulatory implications of documenting the presence of anadromous fish in the watershed, particularly in the case of endangered or threatened species.

Demonstration projects: Project would comprise two demonstration projects in the watershed with the intent of showcasing the ability of stream restoration techniques to stabilize eroding property while improving in-stream habitat. This project may also encounter opposition if the project establishes a link between erosion and a particular land use in the watershed such as logging, grazing, or mining.

Establishing clear goals and objectives for future actions in the watershed would better facilitate implementation of such projects and is outlined as a specific effort under the phased approach outlined above.

Hydrology Conclusions and Recommendations

A number of summary reports and substantial raw data is available on various hydrologic topics in the watershed. The hydrology of Cottonwood Creek demonstrates extreme seasonal variability, typical of westside tributaries to the Sacramento River. The watershed has been the subject of several water supply studies and may potentially be the subject of additional studies in the future, but the watershed is not currently considered a likely location for foreseeable surface-water projects.

A number of watershed-based projects that may be considered in the future attempt to improve management of watershed resources. Issues that may be addressed in the future include flood control, fishery resources, erosion, riparian habitat, groundwater, and land use. In some cases, there may be sufficient hydrologic data to allow site-specific projects to proceed. However, in many cases, it is likely that additional site-specific data may be needed.

Recommendations

The following recommendations are examples of the type of hydrologic data collection that may be valuable for different types of potential projects in the watershed. Ideally, a network of stream gages, water-quality sampling points, and monitoring wells could be established throughout the watershed. Unfortunately, without specific project objectives, it is unlikely that such a comprehensive network of data collecting points would be established.

1. **Flood Control:** Projects seeking to reduce flooding in portions of the watershed may need to develop additional flow information, particularly real-time flow information to correlate storm events to flooding.
2. **Water Quality/Total Maximum Daily Load:** To date there has not been a review of historical water-quality data to analyze potential trends. Existing and ongoing monitoring efforts could be re-assessed in the context of change over time to develop conclusions regarding the effect of land use on water quality in the watershed. This information may be valuable as new water-quality standards for TMDLs are developed for the watershed. Hydrologic monitoring would be an important aspect of such an investigation.
3. **ACID Canal:** As noted in the Surface-water Development section, the ACID canal is thought to have both quantity and quality effects on mainstem Cottonwood Creek. However, this relationship is unsubstantiated. Additional study is necessary to better understand the linkage between these two water sources.
4. **Fisheries:** Flow-temperature relationships are poorly understood in the watershed. The interactions between flows and temperatures throughout the year may have important implications for fishery management opportunities in the watershed. A network of data recorders could be used to monitor flows and temperature in the watershed.
5. **Geomorphic Studies:** Control of erosion and loss of usable land in the lower watershed have been identified as concerns. However, the role that hydrology plays in causing excessive erosion is poorly understood. Future geomorphic or erosion control studies may require additional hydrologic studies that better define the relationship between flow and erosion, especially in the alluvial reaches of the watershed.

Sediment and Fluvial Geomorphology Conclusions and Recommendations

The sediment and gravel resources of Cottonwood Creek provide benefits ranging from economic to environmental. The current use of the land and sediment resources of Cottonwood Creek are not mutually beneficial and should be reviewed and optimized. For instance, linkages between land use practices and erosion should be reviewed in the context of water quality and biological resources.

Optimization of resources is dependent upon the development of a set of goals and objectives for the watershed, which would include a vision of how the watershed should be. Once such a vision is established, a comprehensive set of studies could be developed to fill in information gaps and develop BMPs to achieve the stated goals. One such study would be to rectify the discrepancies and contradictions among the published reports on the existing sediment transport rates in Cottonwood Creek. The development of BMPs would build on the recommendations already suggested in DWR (1994), DWR (1992), USFS (1997), SWRCB (1982), and others. Pilot projects could then be conducted to determine the effectiveness of approved BMPs.

- Construction and decommissioning of structures on the South Fork.

An additional study of the specific water-quality characteristics of the South Fork may be needed to develop more detailed information regarding the source or sources of turbidity in the South Fork. Identifying the causes may lead to development of solutions to the elevated turbidity in the South Fork and may help determine whether there are other constituents of concern that should be considered.

At a few local point-sources, evidence of nitrate problems exists, which may be a result of surface contamination, but it is not indicative of the general quality of the groundwater. The groundwater slope is eastward toward the Sacramento River with a mound located between the confluence of the South Fork of Cottonwood Creek and the Town of Cottonwood. This mound has had practically no change in its shape and size. The monitoring wells in this area also showed little fluctuation in water levels throughout the year. The mound and the suppressed water-level fluctuations may be the result of seepage from ACID canal, which runs through this area. Additional development of groundwater resources in this area would require a better understanding of the potential water-quality implications of such development.

The water levels in many wells in the bordering areas varied compared to others in the area, indicating that local conditions, such as local confinement or perched water, may exist (USGS, 1982-83).

Recommendations

1. An additional study of the specific water-quality characteristics of the South Fork may be needed to develop more detailed information regarding the source or sources of turbidity in the South Fork. Identifying the causes may lead to development of solutions to the elevated turbidity in the South Fork and may help determine whether there are other constituents of concern that should be considered.
2. Determine which monitoring wells are currently active and continue monitoring groundwater levels and water quality. Install additional monitoring wells as needed to increase quality and quantity of groundwater data.
3. Continue surface-water monitoring. Analyze existing water-quality data to determine trends in water quality and impacts of significant historical events to surface-water quality (i.e., geological events, fires, landslides, timber harvesting, and mined lands).
4. Locate abandoned and inactive wells; determine if wells will be used in future. Determine if abandoned and unused wells contribute to contamination of groundwater from surface runoff or land use activities.
5. Locate active wells that are situated near land use activities that potentially contaminate groundwater. Establish groundwater-monitoring wells near these areas to monitor the potential effects of land use activities to groundwater quality.
6. Initiate water-quality monitoring to better define temperature conditions seasonally and spatially throughout the watershed (particularly in areas where fish are present). Better define temperature/flow relationships and evaluate implications of stream temperature for anadromous fish use and enhancement.

7. Initiate a watershed-scale monitoring program that will better establish existing, baseline conditions and will provide a means to track water-quality/watershed conditions over time. This will provide a mechanism to evaluate cumulative benefits of watershed improvement projects in the future.

Vegetative Cover Conclusions and Recommendations

The information available at the landscape level is limited for Cottonwood Creek. Some general conclusions can be developed pertaining to the change in vegetative patterns and conditions over time, largely based on general conclusions reached in other watersheds with similar characteristics.

Although, there is adequate information available on the current types of vegetation, the information necessary to characterize historical vegetation within the watershed is limited.

The hardwood-rangelands within the basin may be subject to the concerns regarding regeneration identified in other westside watersheds (Pavlik, 1991). Additional information at the stand level would provide information useful in evaluating this topic at the appropriate scale.

The relationship between vegetation and exotic, invasive, and noxious plants is acknowledged; however, this issue was not developed in the context of vegetation resources. Additional studies on this topic may be warranted.

Fishery Resources Conclusions and Recommendations

Relative to other, more developed watersheds in the Central Valley, Cottonwood Creek continues to provide important habitat for anadromous fish. However, resource agencies have indicated a desire to increase the amount of usable habitat. Specifically, this is stated in the 2001 Final Restoration Plan for AFRP. That report established a population target of 5,900 chinook salmon and included recommended actions that would assist in meeting that target. AFRP-recommended actions for Cottonwood Creek are listed in Table 12-1, along with the potential parties that would be involved in the proposed actions.

Cottonwood Creek is an important source of spawning gravel for the upper Sacramento River, contributing 33 percent of gravel bedload movement into the Sacramento River. The contribution of gravel to the Sacramento River is currently affected by gravel mining, which reduces the amount of gravel contributed to the Sacramento River.

Recommendations

As with other resource areas, there is a fair amount of information available on fishery resources in the basin, but the majority of it has not been compiled at the watershed scale. Also, as with other resource areas, specific fisheries projects may require additional data collection. Recently, CCWG submitted a grant application to CALFED requesting funding to establish a fish monitoring program. The fish monitoring program would monitor populations and correlate fish presence with flow and water-temperature parameters. Funding of the fish monitoring project would establish a baseline of information against which future projects could be evaluated.

Soil Resources Conclusions and Recommendations

Other than site-specific studies related to the proposed reservoirs, and selected management activities in the watershed, there is little information on the relationship of the soil resources to site productivity and/or erosion issues. A comprehensive mapping effort is being conducted for USFS lands that will provide additional information on soil and geomorphic relationships in the future. The existing Natural Resource Conservation Service soils surveys for Shasta and Tehama counties are other sources of information that can be utilized, although the formats may not be directly compatible.

Recommendations

1. While it is understood that there is a strong relationship between fire, vegetation, soils, slopes, and erosion, additional information is necessary to assess these relationships in the watershed. Existing GIS layers may provide information necessary to evaluate these relationships at multiple scales dependent on the interest and values identified. An approach that stratifies the watershed using selected variables combined with limited field investigation could be used to identify erodible soil resources that are vulnerable to disturbance.
2. The effects of roads on soil resources have been documented in a large body of literature over the past 30 years. While the road network within the watershed is well documented and characterized from a transportation perspective, there is little information available on the effects of these specific roads on soil and other resources. Studies investigating the effects of roads on soil resources would increase understanding of the impact of roads on erosion in the basin.
3. A process needs to be established that identifies and prioritizes erosion and other areas of concern within the watershed.
4. Empirical soil erosion studies to better customize universal soil erosion equations and models to the unique conditions in the Cottonwood Creek Watershed.

Water-quality Conclusions and Recommendations

The water quality of Cottonwood Creek is generally considered good from a drinking water standard perspective. There is some concern about the South Fork's regular contributions of suspended sediments and turbidity to the mainstem. It is likely that the source of elevated water-quality measurements in the mainstem were caused by the water flows from the South Fork. There are several potential causes for elevated measurements in the South Fork. These potential sources include:

- The landslide at Slides Creek, or other unique geography or soils in the South Fork drainage
- Major fires that may have occurred in the South Fork drainage
- Land use in the South Fork watershed that affects water quality to a different degree than the North or Middle forks

TABLE 12-1

Anadromous Fishery Restoration Program-recommended Actions for Cottonwood Creek
Cottonwood Creek Watershed Assessment

Action	Involved Parties	Priority
1. Establish limits on in-stream gravel mining operations by working with state and local agencies to protect spawning gravel and enhance recruitment of spawning gravel to the Sacramento River in the valley sections of Cottonwood Creek.	USACE, Shasta and Tehama counties, California Division of Mines, CDFG, USFWS, USBR	High
2. Restore the stream channel to prevent ACID siphon from becoming a barrier to migration of spring- and fall-run chinook salmon and steelhead.	ACID, gravel miners, USFWS, USBR	Medium
3. Eliminate adult fall-run chinook stranding by stopping attraction flows in Crowley Gulch or by constructing a barrier at the mouth of Crowley Gulch.	ACID, CDFG, USFWS, USBR	Medium
4. Facilitate watershed protection and restoration to reduce water temperatures and siltation to improve holding, spawning, and rearing habitats for salmonids.	Landowners, CDFG, USFWS, USBR	High
5. Establish, restore, and maintain riparian habitat on Cottonwood Creek.	ACID, gravel miners, landowners, USFWS, USBR	High

Source: USFWS and USBR, 2001.

Additionally, the actions recommended in the AFRP Final Restoration Plan should be reviewed from a landowner and stakeholder perspective. The AFRP actions were established to meet population goals and initiation of the actions may preclude future regulatory efforts in the basin regarding fisheries.

Wildlife Resources and Habitat Types Conclusions and Recommendations

In general, wildlife species found in the watershed were more abundant prior to settlement in the 1850s. Wildlife species that required large home ranges and/or special habitats may have been present in greater numbers because of large expanses of habitat that were unencumbered by the land use practices associated with European settlement (USFS, 1997).

Between 1850 and 1900, a number of land use changes occurred within the Cottonwood Creek watershed. Factors that influenced these changes included gold discovery, development of agriculture, and changes in settlement patterns. Wildlife populations that required special habitats were subject to influences brought by homesteading, livestock grazing, and timber harvesting (USFS, 1997).

The continued settlement of the Cottonwood Creek watershed in the first half of the twentieth century occurred in conjunction with the development of the transportation network throughout the basin.

The information available for wildlife resources and their habitat elements is general in nature for large components of the watershed. Where actions have been proposed, or

activities conducted, specific studies have been conducted to address the needs of these projects.

Recommendations

1. Initiate a study of historical and ongoing wildlife habitat trends in the watershed. Because of the paucity of historical information in the Cottonwood Creek watershed, additional investigation of historical trends may require comparative studies and inferences from other watersheds in the region. Develop a historical GIS for the watershed in conjunction with this effort.
2. Promote restoration projects on public and private lands focused on improving the understanding of wildlife-habitat relationships in the watershed.
3. Assess status and trends of native oak woodlands, particularly blue oak woodlands, in the middle and lower watershed.
4. With assistance of U.C. Davis Cooperative Extension Rangeland Monitoring Program, evaluate the effects of various grazing strategies on propagation of native vegetation.
5. Continue to evaluate and monitor the effects of fire and fire management in the watershed.

Special-status Species Conclusions and Recommendations

Special-status species in the Cottonwood Creek watershed have likely declined in numbers since settlement of the area by people of European descent. These local declines are likely proportional to the regional declines in these populations; there is no available information to suggest that declines of any special-status wildlife or plant species are particularly pronounced in the Cottonwood Creek watershed.

Recommendations

There are numerous opportunities to explore the relationships of special-status species, their habitat requirements, and response to disturbance factors in the Cottonwood Creek watershed, including the following:

1. Develop mapping of critical habitat in the watershed for spotted owl, red-legged frog, and vernal pools.
2. Work to establish standardized BMPs that facilitate standard land uses in the watershed in a way that promotes the co-habitation and enhancement of special-status species and existing landowners.

Riparian Communities Conclusions and Recommendations

A general conclusion related to riparian communities is that a number of factors have contributed to change throughout the watershed. As described in earlier sections, these changes can be attributed to dynamic response to ecological elements including fires, floods, and droughts. There is minimal documentation available to quantify the changes in the

riparian areas from period of 1800 to 1975. Observations of riparian ecosystems in other westside streams suggest that the pattern of settlement and resource utilization in the watershed has affected these communities in some respects (DWR, 1992).

Recommendations

1. Initiate a study of historical and ongoing riparian habitat trends in the watershed. Because of the paucity of historical information in the Cottonwood Creek watershed, additional investigation of historical trends may require comparative studies and inferences from other watersheds in the region. Develop GIS mapping for the watershed in conjunction with this effort.
2. Promote restoration projects on public and private lands focused on improving the understanding of the relationship between ecological health of riparian areas and land management practices.
3. Analyze historical aerial photographs from California Department of Forestry, Natural Resources Conservation Service and other sources to determine the change in riparian resources over time.

Land Use Conclusions and Recommendations

Although the population within the watershed has increased significantly over the past 200 years, land use has generally remained the same. Agriculture has been, and still is, a large part of the area's economy in and around the watershed. It is, however, unclear to what degree of Shasta and Tehama counties' agricultural industry the watershed comprises.

Mining played a large role in the land use changes that occurred throughout recorded history in Cottonwood Creek and around the watershed area. Upon the discovery of gold in the mid-1800s, there was a significant increase in European settlement. Ultimately, agriculture, grazing, and timber harvest can be attributed to the increase in population.

Within the last 50 years, mining activity has significantly decreased in the watershed, with fewer mining sites, as well as fewer materials being mined. Part of this decrease may be attributed to SMARA of 1977. SMARA was implemented by the California Department of Conservation to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of current mining operations to public health, property, and the environment.

Ownership information is easily obtained through county assessor's records. Because the watershed area is so expansive, it is time-consuming to determine private ownership watershed wide. Urbanization and more densely populated areas are centered near the creek and major roads. This leads to smaller parcel sizes and an increased number of landowners. In the more rural areas of the watershed, parcel sizes tend to be larger in size (typically 40+ acres per parcel) and have fewer owners.

Recommendations

1. Digitize county land use maps, ownership maps, and open rangeland maps. Update ownership information according to county assessor's data for federal lands.

Synchronize land use data between Shasta and Tehama counties to create uniformity. In addition, perform land use surveys to determine consistency with county general plan areas and DWR land use designations.

2. Conduct livestock surveys within the watershed boundaries. Determine livestock type, quantities, and location and intensity of grazing. Survey agriculture lands and leases to determine location, crop type, and irrigation system used. Associate livestock and cropping data with county- and state-designated land use type and location in the watershed.
3. Integrate data from timber harvest plans (presented in Appendix I) into ongoing watershed management efforts.

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APPENDICES



APPENDIX A

WATER DATA

Water Quality Data

Approach

The water quality studies done so far have been divided mainly into a literature search to collect and compile applicable available historical data and to search for monitoring result as an outcome of a monitoring program, which was started by the U.S. Army Corps of Engineers to get information on various water quality parameters.

- a. **Literature Search:** This involved gathering all known historical water quality and related data on Cottonwood Creek. Information could be found mainly from California Department of Water Resources (DWR), U.S. Geological Survey (USGS) Water Supply, U. S. Bureau of Reclamation (USBR) reports, and other sources. Water quality constituents such as temperatures, streamflow (stage and volume), minerals, nutrients, turbidity and heavy metals were the prime candidates in Cottonwood Creek for this report.
- b. **Stream Monitoring Program:** The Literature search resulted in inadequate specific field data to adequately define certain water quality parameters of the Cottonwood Creek. To obtain the necessary data for accurate quantitative presentation of water quality, a comprehensive stream monitoring program for selected parameters was formulated in late 1976 by the Sacramento District of the U.S. Army Corps of Engineers. The following is a description of the program:
 - i. **Corps of Engineers –** The Corps was responsible for collecting monthly water quality samples at seven sites in the Cottonwood Creek Basin. During flood or high-flow condition, sample collection frequency was higher. The program was initiated in November 1976 and consisted of both field and laboratory analyses. The program has been divided into three main groups: water quality base parameters, heavy metals, and pesticides. Water quality base parameters were analyzed from all seven sites, heavy metals from three and general pesticide and polychlorinated biphenols (PCB) survey was conducted in one site. The specific items measured for each group include the following:

Water Quality Base Parameter Group

- Chemical oxygen demand
- Ammonia – nitrogen
- Nitrate – nitrogen
- Organic nitrogen
- Orthophosphate – phosphorus
- Total phosphorus
- Total Suspended solids
- Volatile suspended solids
- Arsenic

- Onsite field measurements of pH
- Water temperature
- Air temperature
- Flow rate estimation
- Algal growth or decay observations

Heavy Metals Group

- Copper
- Cadmium
- Chromium
- Lead
- Mercury
- Zinc

Pesticides and PCBs Group

- Chlorinated hydrocarbon biocides
- Organophosphate biocides
- Non-chlorinated hydrocarbon herbicides
- Polychlorinated biphenols (PCBs)

Table A-1 represents water quality groups measured at each station:

TABLE A-1
Water Quality Groups Measured at each Station

Monitoring Site	Station ID	Water Quality Base Parameters	Heavy Metals	Pesticides
M.F. Cottonwood Creek near Ono	11374400	X		
N.F. Cottonwood Creek near Igo	11375700	X		
Cottonwood Creek near Olinda	11375810	X	X	
S.F. Cottonwood Creek near Cottonwood	11375820	X		
S.F. Cottonwood Creek near Olinda	11375870	X	X	
Dry Creek near Cottonwood		X		
Cottonwood Creek near Cottonwood	11376000	X	X	X

ii. U.S. Geological Survey (USGS)

As shown in Table A-2 the USGS has been monitoring four parameters: 1) streamflow, 2) water temperature, 3) total sediment load and 4) turbidity. This monitoring program was started in December 1976. Data was being collected at the same sites as in the Corps collection program.

TABLE A-2
USGS Monitoring Program

Monitoring Site	Streamflow	Total Sediment Load	Turbidity	Temperature
M.F. Cottonwood Creek near Ono				X
N.F. Cottonwood Creek near Igo				X
Cottonwood Creek near Olinda	X	X	X	X
S.F. Cottonwood Creek near Cottonwood				X
S.F. Cottonwood Creek near Olinda	X	X	X	X
Dry Creek near Cottonwood				
Cottonwood Creek near Cottonwood	X	X	X	X

DWR data were available from three Forks of Cottonwood Creek where damsites were proposed though much of these data were collected only intermittently and some collection sites were located a great distance from the project site. As mentioned before, the Corps of Engineers collected water quality data from 1976-1979 at seven sites in the vicinity of two dam sites. Both DWR and Corps of Engineers showed similar general water quality characteristics for streams in the Cottonwood drainage. Water quality was generally good and was of a moderately hard bicarbonate type. The Corps also showed Cu and Zn occasionally exceed the criteria for protection of fish at the mouth of Cottonwood Creek.

Currently, web sites of DWR and USGS provides more current information on water quality for Cottonwood Creek and its tributaries in a user-friendly manner. Table A-3 contains a summary of information that can be gathered online about the creek.

TABLE A-3
Web Sites of DWR and USGS On Cottonwood Creek

Station Name	Station ID Number	Source	Period of Records	Type of Data
M.F. Cottonwood Creek near Ono	11374400	DWR	Jul'68-Oct'79	Daily Max + Min Temp
		USGS	Oct'62-Aug'70	Temp, Discharge, Sediment, Water quality base parameters
N.F. Cottonwood Creek near Igo	11375700	DWR	Jan'77-Oct'79	Daily Max + Min Temp
		USGS	Jan'79-Jun'79	Temp, Discharge, Sediment, Water quality base parameters
Cottonwood Creek near Olinda	11375810	DWR	Feb'73-Sept'80	Daily Max + Min Temp
		USGS	Nov'70-Oct'84	Temp, Discharge, Sediment, Water quality base parameters
S.F. Cottonwood Creek near Cottonwood	11375820	DWR	Jan'77-Aug'79	Daily Max + Min Temp

TABLE A-3
Web Sites of DWR and USGS On Cottonwood Creek

Station Name	Station ID Number	Source	Period of Records	Type of Data
		USGS	Oct'60-Apr'70	Temp, Discharge, Sediment, Water quality base parameters
S.F. Cottonwood Creek near Olinda	11375870	DWR	Nov'76-Sept'80	Daily Max + Min Temp
		USGS	Jan'77-Oct'84	Temp, Discharge, Sediment, Water quality base parameters
Cottonwood Creek near Cottonwood	11376000	DWR	Jun'65-Sept'85	Daily Max + Min Temp
		USGS	Apr'51-Jul'98	Temp, Discharge, Sediment, Water quality base parameters

Table A-4 shows Cottonwood Creek groundwater quality data.

TABLE A-4
Summary of Groundwater Quality Data

Properties and constituents	October 1982	May 1983	October 1983
Specific Conductance:			
Min-Max	75-424	58-412	64-516
Mean	243	248	240
Median	234	226	226
pH			
Min-Max	6.4-8.1	6.5-8	6.4-8.2
Mean	7.4	7.2	7.3
Median	7.3	7.1	7.3
Temperature:			
Min-Max	11-20	15.5-22.5	14-21.5
Mean	17.2	19	18
Median	17.5	18.5	18
Hardness as CaCO ₃ :			
Min-Max	18-189	16-180	16-200
Mean	97	99	97
Median	92	90	92.5
Hardness, noncarbonate:			
Min-Max	0-67	0-50	0-69
Mean	3	4	3.5
Median	0	0	0
Calcium (Ca):			
Min-Max	3.3-42	3.1-39	3.2-38
Mean	19	19	19
Median	17	18	17
Magnesium (Mg):			
Min-Max	2.3-27	2-25	1.9-28
Mean	12	13	12

TABLE A-4
Summary of Groundwater Quality Data

Properties and constituents	October 1982	May 1983	October 1983
Median	12	11	10
Sodium (Na):			
Min-Max	6.3-25	6.4-20	6.5-40
Mean	14	13	14
Median	13	13	13
Potassium (K):			
Min-Max	0.3-3	0.3-3	0.3-3
Mean	0.8	0.8	0.87
Median	0.7	0.7	0.7
Alkalinity, total as CaCO ₃ :			
Min-Max	28-185	25-170	25-180
Mean	109	108	107
Median	113	110	110
Sulphate (SO ₄):			
Min-Max	<5-24	0.2-20	0.5-26
Mean	--	6.1	6.6
Median	--	5	4.8
Chloride (Cl):			
Min-Max	1.7-23	1.3-20	1.6-45
Mean	6.2	6.7	7.8
Median	3.7	3.9	4
Fluoride (F):			
Min-Max	0.1-0.2	<0.1-0.2	<0.1-0.2
Mean	--	--	--
Median	--	--	--
Silica (SiO ₂):			
Min-Max	17-74	20-74	9.5-70
Mean	42	43	41.4
Median	43	42	42
Dissolved solids, residue at 180°C:			
Min-Max	76-304	70-277	71-306
Mean	166	162	164.2
Median	156	155	151.5
Nitrogen, NO ₂ + NO ₃ :			
Min-Max	0.1-12	0.2-9.2	0.17-14
Mean	1.5	1.8	1.5
Median	0.9	0.9	0.9
Phosphorus, ortho as P:			
Min-Max	<0.01-0.22	<0.01-0.02	--
Mean	--	--	--
Median	--	--	--
Aluminum (Al):			
Min-Max	<0.01-0.02	<0.01-0.02	--
Mean	--	--	--
Median	--	--	--
Arsenic (As):			
Min-Max	<0.001-<0.003	<0.001-<0.003	--
Mean	--	--	--

TABLE A-4
Summary of Groundwater Quality Data

Properties and constituents	October 1982	May 1983	October 1983
Median	--	--	--
Boron (B):			
Min-Max	<0.01-0.05	--	<0.01-0.09
Mean	--	--	--
Median	--	--	--
Iron (Fe):			
Min-Max	<0.003-0.17	<0.003-0.05	<0.003-0.26
Mean	--	--	--
Median	--	--	--
Manganese (Mn):			
Min-Max	<0.001-0.066	<0.001-0.02	<0.001-0.093
Mean	--	--	--
Median	--	--	--

Notes: Specific conductance is in microsiemens per centimeter at 25°C. pH is in units. Temperature is in °C. All other values are in mg/l. All constituents are dissolved unless otherwise specified. <, actual value is less than value shown. --, no data available

Water Quality Data Results

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Below are the water quality for station A0353100, COTTONWOOD C AB SF COTTONWOOD C.

Date	Sample Number	Constituent/Analyte	Result*
06/25/1957	3006	DISSOLVED BORON	0.03
06/25/1957	3006	DISSOLVED CHLORIDE	4
06/25/1957	3006	DISSOLVED FLUORIDE	0
06/25/1957	3006	DISSOLVED POTASSIUM	1.2
06/25/1957	3006	LAB pH	7.9
06/25/1957	3006	DISSOLVED SODIUM	5.7
06/25/1957	3006	DISSOLVED NITRATE NO3 mg/L	0.2
06/25/1957	3006	DISSOLVED SULFATE SO4 mg/L	7.2
06/25/1957	3006	DISSOLVED CALCIUM	23
06/25/1957	3006	DISSOLVED HARDNESS CaCO3 mg/L	103
06/25/1957	3006	DISSOLVED TOTAL ALKALINITY	103
06/25/1957	3006	SPECIFIC CONDUCTANCE 25C	218
06/25/1957	3006	DISSOLVED MAGNESIUM	11
06/25/1957	3006	DISSOLVED SILICA	23
07/23/1957	23049	DISSOLVED ORTHOPHOSPHATE as P	0
07/23/1957	23049	DISSOLVED BORON	0
07/23/1957	23049	DISSOLVED CHLORIDE	7.8
07/23/1957	23049	DISSOLVED FLUORIDE	0.2
07/23/1957	23049	DISSOLVED POTASSIUM	1.8
07/23/1957	23049	LAB pH	7.9
07/23/1957	23049	DISSOLVED SODIUM	8.6
07/23/1957	23049	DISSOLVED NITRATE NO3 mg/L	0
07/23/1957	23049	DISSOLVED CALCIUM	28
07/23/1957	23049	DISSOLVED HARDNESS CaCO3 mg/L	118
07/23/1957	23049	DISSOLVED TOTAL ALKALINITY	115
07/23/1957	23049	SPECIFIC CONDUCTANCE 25C	242
07/23/1957	23049	DISSOLVED MAGNESIUM	12
07/23/1957	23049	DISSOLVED SILICA	19
07/23/1957	23049	DISSOLVED SULFATE SO4 mg/L	11
07/23/1957	23049	Al mg/L D	0
07/23/1957	23049	As mg/L D	0
07/23/1957	23049	CHROMIUM (+6) Dissolved	0
07/23/1957	23049	Cu mg/L D	0.01
07/23/1957	23049	Fe mg/L D	0
07/23/1957	23049	Mn mg/L D	0
07/23/1957	23049	Pb mg/L D	0
07/23/1957	23049	Zn mg/L D	0
08/26/1957	23398	DISSOLVED BORON	0.03
08/26/1957	23398	DISSOLVED FLUORIDE	0.1
08/26/1957	23398	DISSOLVED POTASSIUM	1.6
08/26/1957	23398	LAB pH	8.2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

A0353100, COTTONWOOD C AB SF COTTONWOOD C.

08/26/1957	23398	DISSOLVED SODIUM	8.8
08/26/1957	23398	DISSOLVED NITRATE NO3 mg/L	0.3
08/26/1957	23398	DISSOLVED SULFATE SO4 mg/L	5.4
08/26/1957	23398	DISSOLVED CALCIUM	24
08/26/1957	23398	DISSOLVED CHLORIDE	11
08/26/1957	23398	DISSOLVED HARDNESS CaCO3 mg/L	116
08/26/1957	23398	DISSOLVED TOTAL ALKALINITY	118
08/26/1957	23398	SPECIFIC CONDUCTANCE 25C	261
08/26/1957	23398	DISSOLVED MAGNESIUM	14
08/26/1957	23398	DISSOLVED SILICA	23
08/26/1957	23398	MINERAL TURBIDITY HELLIGE	0
09/30/1957	23977	DISSOLVED ORTHOPHOSPHATE as P	0.07
09/30/1957	23977	DISSOLVED BORON	0
09/30/1957	23977	DISSOLVED FLUORIDE	0.1
09/30/1957	23977	DISSOLVED POTASSIUM	1.5
09/30/1957	23977	LAB pH	7.2
09/30/1957	23977	DISSOLVED MAGNESIUM	7.7
09/30/1957	23977	DISSOLVED SODIUM	8.1
09/30/1957	23977	DISSOLVED NITRATE NO3 mg/L	0.5
09/30/1957	23977	DISSOLVED SULFATE SO4 mg/L	6.7
09/30/1957	23977	DISSOLVED CALCIUM	18
09/30/1957	23977	DISSOLVED CHLORIDE	12
09/30/1957	23977	DISSOLVED HARDNESS CaCO3 mg/L	76
09/30/1957	23977	DISSOLVED TOTAL ALKALINITY	70
09/30/1957	23977	SPECIFIC CONDUCTANCE 25C	187
09/30/1957	23977	DISSOLVED SILICA	26
09/30/1957	23977	Al mg/L D	0.01
09/30/1957	23977	As mg/L D	0
09/30/1957	23977	CHROMIUM (+6) Dissolved	0
09/30/1957	23977	Cu mg/L D	0.01
09/30/1957	23977	Fe mg/L D	0
09/30/1957	23977	Mn mg/L D	0
09/30/1957	23977	Pb mg/L D	0
09/30/1957	23977	Zn mg/L D	0.01
10/24/1957	24277	DISSOLVED ORTHOPHOSPHATE as P	0.05
10/24/1957	24277	DISSOLVED BORON	0
10/24/1957	24277	DISSOLVED CHLORIDE	7
10/24/1957	24277	DISSOLVED FLUORIDE	0
10/24/1957	24277	DISSOLVED POTASSIUM	1.6
10/24/1957	24277	LAB pH	7.3
10/24/1957	24277	DISSOLVED SODIUM	7.9
10/24/1957	24277	DISSOLVED NITRATE NO3 mg/L	0.4
10/24/1957	24277	DISSOLVED CALCIUM	16
10/24/1957	24277	DISSOLVED HARDNESS CaCO3 mg/L	81
10/24/1957	24277	DISSOLVED TOTAL ALKALINITY	75
10/24/1957	24277	SPECIFIC CONDUCTANCE 25C	185
10/24/1957	24277	DISSOLVED MAGNESIUM	10
10/24/1957	24277	DISSOLVED SILICA	20
10/24/1957	24277	DISSOLVED SULFATE SO4 mg/L	14
10/24/1957	24277	MINERAL TURBIDITY HELLIGE	4
10/24/1957	24277	Al mg/L D	0.23
10/24/1957	24277	As mg/L D	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

10/24/1957	24277	CHROMIUM (+6) Dissolved	0
10/24/1957	24277	Cu mg/L D	0.07
10/24/1957	24277	Fe mg/L D	0.01
10/24/1957	24277	Mn mg/L D	0
10/24/1957	24277	Pb mg/L D	0
10/24/1957	24277	Zn mg/L D	0

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Water Quality Data Results

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Below are the water quality for station A0354000, COTTONWOOD C BL NF COTTONWOOD C.

Date	Sample Number	Constituent/Analyte	Result*
10/02/1958	28067	DISSOLVED BORON	0.1
10/02/1958	28067	DISSOLVED FLUORIDE	0
10/02/1958	28067	DISSOLVED POTASSIUM	1.1
10/02/1958	28067	LAB pH	8.2
10/02/1958	28067	DISSOLVED SODIUM	9.1
10/02/1958	28067	DISSOLVED NITRATE NO3 mg/L	0.4
10/02/1958	28067	DISSOLVED CALCIUM	26
10/02/1958	28067	DISSOLVED CHLORIDE	13
10/02/1958	28067	DISSOLVED HARDNESS CaCO3 mg/L	116
10/02/1958	28067	DISSOLVED TOTAL ALKALINITY	100
10/02/1958	28067	SPECIFIC CONDUCTANCE 25C	269
10/02/1958	28067	DISSOLVED MAGNESIUM	12
10/02/1958	28067	DISSOLVED SILICA	20
10/02/1958	28067	DISSOLVED SULFATE SO4 mg/L	13
11/11/1958	28281	DISSOLVED BORON	0
11/11/1958	28281	DISSOLVED FLUORIDE	0
11/11/1958	28281	DISSOLVED POTASSIUM	1.1
11/11/1958	28281	LAB pH	8
11/11/1958	28281	DISSOLVED SODIUM	9
11/11/1958	28281	DISSOLVED NITRATE NO3 mg/L	0
11/11/1958	28281	DISSOLVED SULFATE SO4 mg/L	9.6
11/11/1958	28281	DISSOLVED CALCIUM	23
11/11/1958	28281	DISSOLVED CHLORIDE	14
11/11/1958	28281	DISSOLVED HARDNESS CaCO3 mg/L	110
11/11/1958	28281	DISSOLVED TOTAL ALKALINITY	106
11/11/1958	28281	SPECIFIC CONDUCTANCE 25C	252
11/11/1958	28281	DISSOLVED MAGNESIUM	13
11/11/1958	28281	DISSOLVED SILICA	19
12/04/1958	28485	DISSOLVED BORON	0.1
12/04/1958	28485	DISSOLVED FLUORIDE	0
12/04/1958	28485	DISSOLVED POTASSIUM	0.7
12/04/1958	28485	LAB pH	7.8
12/04/1958	28485	DISSOLVED SODIUM	8.6
12/04/1958	28485	DISSOLVED NITRATE NO3 mg/L	0
12/04/1958	28485	DISSOLVED SULFATE SO4 mg/L	9.6
12/04/1958	28485	DISSOLVED CALCIUM	22
12/04/1958	28485	DISSOLVED CHLORIDE	10
12/04/1958	28485	DISSOLVED HARDNESS CaCO3 mg/L	113
12/04/1958	28485	DISSOLVED TOTAL ALKALINITY	110
12/04/1958	28485	SPECIFIC CONDUCTANCE 25C	251

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

12/04/1958	28485	DISSOLVED MAGNESIUM	14
12/04/1958	28485	DISSOLVED SILICA	20
01/05/1959	28758	DISSOLVED BORON	0.1
01/05/1959	28758	DISSOLVED FLUORIDE	0.1
01/05/1959	28758	DISSOLVED POTASSIUM	1.9
01/05/1959	28758	LAB pH	6.7
01/05/1959	28758	DISSOLVED MAGNESIUM	3.9
01/05/1959	28758	DISSOLVED NITRATE NO3 mg/L	3.5
01/05/1959	28758	DISSOLVED CALCIUM	16
01/05/1959	28758	DISSOLVED CHLORIDE	16
01/05/1959	28758	DISSOLVED HARDNESS CaCO3 mg/L	56
01/05/1959	28758	DISSOLVED TOTAL ALKALINITY	27
01/05/1959	28758	SPECIFIC CONDUCTANCE 25C	168
01/05/1959	28758	DISSOLVED SODIUM	11
01/05/1959	28758	DISSOLVED SILICA	11
01/05/1959	28758	DISSOLVED SULFATE SO4 mg/L	27
02/03/1959	29033	DISSOLVED BORON	0
02/03/1959	29033	DISSOLVED CHLORIDE	5.5
02/03/1959	29033	DISSOLVED FLUORIDE	0.1
02/03/1959	29033	DISSOLVED POTASSIUM	1.1
02/03/1959	29033	LAB pH	7.2
02/03/1959	29033	DISSOLVED MAGNESIUM	5.5
02/03/1959	29033	DISSOLVED SODIUM	5.3
02/03/1959	29033	DISSOLVED NITRATE NO3 mg/L	0.5
02/03/1959	29033	DISSOLVED SULFATE SO4 mg/L	5.8
02/03/1959	29033	DISSOLVED CALCIUM	11
02/03/1959	29033	DISSOLVED HARDNESS CaCO3 mg/L	50
02/03/1959	29033	DISSOLVED TOTAL ALKALINITY	48
02/03/1959	29033	SPECIFIC CONDUCTANCE 25C	121
02/03/1959	29033	DISSOLVED SILICA	23
03/13/1959	29492	DISSOLVED BORON	0
03/13/1959	29492	DISSOLVED CHLORIDE	5.4
03/13/1959	29492	DISSOLVED FLUORIDE	0
03/13/1959	29492	DISSOLVED POTASSIUM	0.4
03/13/1959	29492	LAB pH	8.1
03/13/1959	29492	DISSOLVED MAGNESIUM	9.1
03/13/1959	29492	DISSOLVED SODIUM	4.1
03/13/1959	29492	DISSOLVED NITRATE NO3 mg/L	0.2
03/13/1959	29492	DISSOLVED SULFATE SO4 mg/L	4.8
03/13/1959	29492	DISSOLVED CALCIUM	17
03/13/1959	29492	DISSOLVED HARDNESS CaCO3 mg/L	80
03/13/1959	29492	DISSOLVED TOTAL ALKALINITY	77
03/13/1959	29492	SPECIFIC CONDUCTANCE 25C	167
03/13/1959	29492	DISSOLVED SILICA	22
04/13/1959	29743	DISSOLVED BORON	0
04/13/1959	29743	DISSOLVED CHLORIDE	4
04/13/1959	29743	DISSOLVED FLUORIDE	0.1
04/13/1959	29743	DISSOLVED POTASSIUM	1.3
04/13/1959	29743	LAB pH	8.2
04/13/1959	29743	DISSOLVED SODIUM	4.7
04/13/1959	29743	DISSOLVED NITRATE NO3 mg/L	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

04/13/1959	29743	DISSOLVED SULFATE SO4 mg/L	8.6
04/13/1959	29743	DISSOLVED CALCIUM	20
04/13/1959	29743	DISSOLVED HARDNESS CaCO3 mg/L	94
04/13/1959	29743	DISSOLVED TOTAL ALKALINITY	90
04/13/1959	29743	SPECIFIC CONDUCTANCE 25C	195
04/13/1959	29743	DISSOLVED MAGNESIUM	11
04/13/1959	29743	DISSOLVED SILICA	21
05/04/1959	29967	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/04/1959	29967	DISSOLVED BORON	0.1
05/04/1959	29967	DISSOLVED CHLORIDE	4.7
05/04/1959	29967	DISSOLVED FLUORIDE	0
05/04/1959	29967	DISSOLVED POTASSIUM	0.5
05/04/1959	29967	LAB pH	8.1
05/04/1959	29967	DISSOLVED MAGNESIUM	7.7
05/04/1959	29967	DISSOLVED SODIUM	4.8
05/04/1959	29967	DISSOLVED NITRATE NO3 mg/L	0.1
05/04/1959	29967	DISSOLVED SULFATE SO4 mg/L	8.6
05/04/1959	29967	DISSOLVED CALCIUM	21
05/04/1959	29967	DISSOLVED HARDNESS CaCO3 mg/L	84
05/04/1959	29967	DISSOLVED TOTAL ALKALINITY	84
05/04/1959	29967	SPECIFIC CONDUCTANCE 25C	184
05/04/1959	29967	DISSOLVED SILICA	20
05/04/1959	29967	Al mg/L D	0.04
05/04/1959	29967	As mg/L D	0
05/04/1959	29967	Cr mg/L D	0
05/04/1959	29967	Cu mg/L D	0
05/04/1959	29967	Fe mg/L D	0.01
05/04/1959	29967	Mn mg/L D	0
05/04/1959	29967	Pb mg/L D	0
05/04/1959	29967	Zn mg/L D	0
06/02/1959	30299	DISSOLVED BORON	0
06/02/1959	30299	DISSOLVED CHLORIDE	5
06/02/1959	30299	DISSOLVED FLUORIDE	0
06/02/1959	30299	DISSOLVED POTASSIUM	1.5
06/02/1959	30299	LAB pH	7.9
06/02/1959	30299	DISSOLVED MAGNESIUM	3.6
06/02/1959	30299	DISSOLVED SODIUM	5.2
06/02/1959	30299	DISSOLVED NITRATE NO3 mg/L	0.6
06/02/1959	30299	DISSOLVED SULFATE SO4 mg/L	5.8
06/02/1959	30299	DISSOLVED CALCIUM	14
06/02/1959	30299	DISSOLVED HARDNESS CaCO3 mg/L	50
06/02/1959	30299	DISSOLVED TOTAL ALKALINITY	49
06/02/1959	30299	SPECIFIC CONDUCTANCE 25C	116
06/02/1959	30299	DISSOLVED SILICA	14
07/14/1959	30547	DISSOLVED BORON	0
07/14/1959	30547	DISSOLVED POTASSIUM	1.7
07/14/1959	30547	LAB pH	8.4
07/14/1959	30547	DISSOLVED SODIUM	8.7
07/14/1959	30547	DISSOLVED NITRATE NO3 mg/L	1.2
07/14/1959	30547	DISSOLVED SULFATE SO4 mg/L	8
07/14/1959	30547	DISSOLVED CALCIUM	30

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

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07/14/1959	30547	DISSOLVED CHLORIDE	10
07/14/1959	30547	DISSOLVED HARDNESS CaCO3 mg/L	129
07/14/1959	30547	DISSOLVED TOTAL ALKALINITY	126
07/14/1959	30547	SPECIFIC CONDUCTANCE 25C	275
07/14/1959	30547	DISSOLVED MAGNESIUM	13
07/14/1959	30547	DISSOLVED SILICA	22
08/11/1959	30935	DISSOLVED BORON	0
08/11/1959	30935	DISSOLVED FLUORIDE	0.1
08/11/1959	30935	DISSOLVED POTASSIUM	2.6
08/11/1959	30935	LAB pH	8.1
08/11/1959	30935	DISSOLVED NITRATE NO3 mg/L	0
08/11/1959	30935	DISSOLVED SULFATE SO4 mg/L	7
08/11/1959	30935	DISSOLVED CALCIUM	30
08/11/1959	30935	DISSOLVED CHLORIDE	15
08/11/1959	30935	DISSOLVED HARDNESS CaCO3 mg/L	135
08/11/1959	30935	DISSOLVED TOTAL ALKALINITY	132
08/11/1959	30935	SPECIFIC CONDUCTANCE 25C	299
08/11/1959	30935	DISSOLVED MAGNESIUM	15
08/11/1959	30935	DISSOLVED SODIUM	10
08/11/1959	30935	DISSOLVED SILICA	24
09/02/1959	31221	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/02/1959	31221	NUTRIENT TURBIDITY NOT C,A,E,B	1
09/02/1959	31221	DISSOLVED BORON	0
09/02/1959	31221	DISSOLVED FLUORIDE	0
09/02/1959	31221	DISSOLVED POTASSIUM	1.8
09/02/1959	31221	LAB pH	8
09/02/1959	31221	DISSOLVED NITRATE NO3 mg/L	0
09/02/1959	31221	DISSOLVED SULFATE SO4 mg/L	7.2
09/02/1959	31221	DISSOLVED CALCIUM	30
09/02/1959	31221	DISSOLVED CHLORIDE	17
09/02/1959	31221	DISSOLVED HARDNESS CaCO3 mg/L	132
09/02/1959	31221	DISSOLVED TOTAL ALKALINITY	127
09/02/1959	31221	SPECIFIC CONDUCTANCE 25C	296
09/02/1959	31221	DISSOLVED MAGNESIUM	14
09/02/1959	31221	DISSOLVED SODIUM	11
09/02/1959	31221	DISSOLVED SILICA	21
09/02/1959	31221	MINERAL TURBIDITY HELLIGE	1
09/02/1959	31221	Al mg/L D	0.02
09/02/1959	31221	As mg/L D	0
09/02/1959	31221	Cr mg/L D	0
09/02/1959	31221	Cu mg/L D	0.01
09/02/1959	31221	Fe mg/L D	0
09/02/1959	31221	Mn mg/L D	0
09/02/1959	31221	Pb mg/L D	0
09/02/1959	31221	Zn mg/L D	0
10/13/1959	31633	DISSOLVED BORON	0
10/13/1959	31633	DISSOLVED FLUORIDE	0.2
10/13/1959	31633	DISSOLVED POTASSIUM	1.1
10/13/1959	31633	LAB pH	8
10/13/1959	31633	DISSOLVED NITRATE NO3 mg/L	0
10/13/1959	31633	DISSOLVED SULFATE SO4 mg/L	7

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10/13/1959	31633	DISSOLVED CALCIUM	26
10/13/1959	31633	DISSOLVED CHLORIDE	18
10/13/1959	31633	DISSOLVED HARDNESS CaCO3 mg/L	114
10/13/1959	31633	DISSOLVED TOTAL ALKALINITY	106
10/13/1959	31633	SPECIFIC CONDUCTANCE 25C	256
10/13/1959	31633	DISSOLVED MAGNESIUM	12
10/13/1959	31633	DISSOLVED SODIUM	10
10/13/1959	31633	DISSOLVED SILICA	20
11/03/1959	32014	DISSOLVED BORON	0
11/03/1959	32014	LAB pH	7.9
11/03/1959	32014	DISSOLVED CHLORIDE	15
11/03/1959	32014	DISSOLVED HARDNESS CaCO3 mg/L	72
11/03/1959	32014	DISSOLVED TOTAL ALKALINITY	71
11/03/1959	32014	SPECIFIC CONDUCTANCE 25C	194
11/03/1959	32014	DISSOLVED SODIUM	14
11/03/1959	32014	MINERAL TURBIDITY HELLIGE	2
12/02/1959	32307	DISSOLVED BORON	0
12/02/1959	32307	DISSOLVED FLUORIDE	0.1
12/02/1959	32307	DISSOLVED POTASSIUM	1.6
12/02/1959	32307	LAB pH	7.8
12/02/1959	32307	DISSOLVED NITRATE NO3 mg/L	0
12/02/1959	32307	DISSOLVED SULFATE SO4 mg/L	5
12/02/1959	32307	DISSOLVED CALCIUM	28
12/02/1959	32307	DISSOLVED CHLORIDE	21
12/02/1959	32307	DISSOLVED HARDNESS CaCO3 mg/L	124
12/02/1959	32307	DISSOLVED TOTAL ALKALINITY	118
12/02/1959	32307	SPECIFIC CONDUCTANCE 25C	287
12/02/1959	32307	DISSOLVED MAGNESIUM	13
12/02/1959	32307	DISSOLVED SODIUM	12
12/02/1959	32307	DISSOLVED SILICA	19
01/12/1960	32665	DISSOLVED BORON	0
01/12/1960	32665	LAB pH	7.8
01/12/1960	32665	DISSOLVED CHLORIDE	20
01/12/1960	32665	DISSOLVED HARDNESS CaCO3 mg/L	113
01/12/1960	32665	DISSOLVED TOTAL ALKALINITY	98
01/12/1960	32665	SPECIFIC CONDUCTANCE 25C	271
01/12/1960	32665	DISSOLVED SODIUM	13
01/12/1960	32665	MINERAL TURBIDITY HELLIGE	6
02/02/1960	32840	DISSOLVED BORON	0
02/02/1960	32840	DISSOLVED CHLORIDE	9
02/02/1960	32840	LAB pH	7.2
02/02/1960	32840	DISSOLVED SODIUM	6.6
02/02/1960	32840	DISSOLVED HARDNESS CaCO3 mg/L	64
02/02/1960	32840	DISSOLVED TOTAL ALKALINITY	44
02/02/1960	32840	SPECIFIC CONDUCTANCE 25C	154
02/02/1960	32840	MINERAL TURBIDITY HELLIGE	170
03/08/1960	33133	DISSOLVED BORON	0
03/08/1960	33133	DISSOLVED CHLORIDE	3.5
03/08/1960	33133	LAB pH	7.4
03/08/1960	33133	DISSOLVED SODIUM	4.5
03/08/1960	33133	DISSOLVED HARDNESS CaCO3 mg/L	46

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03/08/1960	33133	DISSOLVED TOTAL ALKALINITY	39
03/08/1960	33133	SPECIFIC CONDUCTANCE 25C	105
03/08/1960	33133	MINERAL TURBIDITY HELLIGE	450
04/12/1960	33388	DISSOLVED BORON	0
04/12/1960	33388	DISSOLVED CHLORIDE	4
04/12/1960	33388	LAB pH	7.6
04/12/1960	33388	DISSOLVED SODIUM	3.9
04/12/1960	33388	DISSOLVED HARDNESS CaCO3 mg/L	48
04/12/1960	33388	DISSOLVED TOTAL ALKALINITY	46
04/12/1960	33388	SPECIFIC CONDUCTANCE 25C	110
04/12/1960	33388	MINERAL TURBIDITY HELLIGE	15
05/05/1960	33591	DISSOLVED ORTHOPHOSPHATE as P	0.03
05/05/1960	33591	NUTRIENT TURBIDITY NOT C,A,E,B	1
05/05/1960	33591	DISSOLVED BORON	0
05/05/1960	33591	DISSOLVED CHLORIDE	4.5
05/05/1960	33591	DISSOLVED FLUORIDE	0
05/05/1960	33591	DISSOLVED POTASSIUM	1.2
05/05/1960	33591	LAB pH	7.8
05/05/1960	33591	DISSOLVED SODIUM	6.8
05/05/1960	33591	DISSOLVED NITRATE NO3 mg/L	0
05/05/1960	33591	DISSOLVED CALCIUM	21
05/05/1960	33591	DISSOLVED HARDNESS CaCO3 mg/L	98
05/05/1960	33591	DISSOLVED TOTAL ALKALINITY	95
05/05/1960	33591	SPECIFIC CONDUCTANCE 25C	211
05/05/1960	33591	DISSOLVED MAGNESIUM	11
05/05/1960	33591	DISSOLVED SILICA	19
05/05/1960	33591	DISSOLVED SULFATE SO4 mg/L	11
05/05/1960	33591	MINERAL TURBIDITY HELLIGE	1
05/05/1960	33591	Al mg/L D	0.04
05/05/1960	33591	As mg/L D	0
05/05/1960	33591	Cr mg/L D	0
05/05/1960	33591	Cu mg/L D	0
05/05/1960	33591	Fe mg/L D	0.05
05/05/1960	33591	Mn mg/L D	0
05/05/1960	33591	Pb mg/L D	0.01
05/05/1960	33591	Zn mg/L D	0
06/14/1960	34091	DISSOLVED BORON	0
06/14/1960	34091	DISSOLVED CHLORIDE	6
06/14/1960	34091	LAB pH	7.9
06/14/1960	34091	DISSOLVED SODIUM	4.9
06/14/1960	34091	DISSOLVED HARDNESS CaCO3 mg/L	98
06/14/1960	34091	DISSOLVED TOTAL ALKALINITY	101
06/14/1960	34091	SPECIFIC CONDUCTANCE 25C	207
06/14/1960	34091	MINERAL TURBIDITY HELLIGE	1
07/04/1960	34243	DISSOLVED BORON	0
07/04/1960	34243	DISSOLVED CHLORIDE	7
07/04/1960	34243	LAB pH	8.2
07/04/1960	34243	DISSOLVED SODIUM	6
07/04/1960	34243	DISSOLVED HARDNESS CaCO3 mg/L	106
07/04/1960	34243	DISSOLVED TOTAL ALKALINITY	103
07/04/1960	34243	SPECIFIC CONDUCTANCE 25C	212

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07/04/1960	34243	MINERAL TURBIDITY HELLIGE	4
08/08/1960	34460	DISSOLVED BORON	0
08/08/1960	34460	LAB pH	8.4
08/08/1960	34460	DISSOLVED SODIUM	9.1
08/08/1960	34460	DISSOLVED CHLORIDE	10
08/08/1960	34460	DISSOLVED HARDNESS CaCO3 mg/L	106
08/08/1960	34460	DISSOLVED TOTAL ALKALINITY	104
08/08/1960	34460	SPECIFIC CONDUCTANCE 25C	244
08/08/1960	34460	MINERAL TURBIDITY HELLIGE	1
09/05/1960	34690	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/05/1960	34690	NUTRIENT TURBIDITY NOT C,A,E,B	6
09/05/1960	34690	DISSOLVED BORON	0.1
09/05/1960	34690	DISSOLVED FLUORIDE	0
09/05/1960	34690	DISSOLVED POTASSIUM	1.1
09/05/1960	34690	LAB pH	8.4
09/05/1960	34690	DISSOLVED NITRATE NO3 mg/L	0
09/05/1960	34690	DISSOLVED SULFATE SO4 mg/L	9
09/05/1960	34690	DISSOLVED CALCIUM	27
09/05/1960	34690	DISSOLVED CHLORIDE	16
09/05/1960	34690	DISSOLVED HARDNESS CaCO3 mg/L	125
09/05/1960	34690	DISSOLVED TOTAL ALKALINITY	123
09/05/1960	34690	SPECIFIC CONDUCTANCE 25C	281
09/05/1960	34690	DISSOLVED MAGNESIUM	14
09/05/1960	34690	DISSOLVED SODIUM	12
09/05/1960	34690	DISSOLVED SILICA	18
09/05/1960	34690	MINERAL TURBIDITY HELLIGE	6
09/05/1960	34690	Al mg/L D	0.16
09/05/1960	34690	As mg/L D	0
09/05/1960	34690	Cr mg/L D	0
09/05/1960	34690	Cu mg/L D	0
09/05/1960	34690	Fe mg/L D	0
09/05/1960	34690	Mn mg/L D	0
09/05/1960	34690	Pb mg/L D	0
09/05/1960	34690	Zn mg/L D	0
10/10/1960	34931	DISSOLVED BORON	0
10/10/1960	34931	LAB pH	8.2
10/10/1960	34931	DISSOLVED CALCIUM	26
10/10/1960	34931	DISSOLVED CHLORIDE	20
10/10/1960	34931	DISSOLVED HARDNESS CaCO3 mg/L	124
10/10/1960	34931	DISSOLVED TOTAL ALKALINITY	118
10/10/1960	34931	SPECIFIC CONDUCTANCE 25C	296
10/10/1960	34931	DISSOLVED MAGNESIUM	14
10/10/1960	34931	DISSOLVED SODIUM	12
10/10/1960	34931	MINERAL TURBIDITY HELLIGE	1
11/07/1960	35202	DISSOLVED BORON	0
11/07/1960	35202	LAB pH	8.3
11/07/1960	35202	DISSOLVED CHLORIDE	24
11/07/1960	35202	DISSOLVED HARDNESS CaCO3 mg/L	152
11/07/1960	35202	DISSOLVED TOTAL ALKALINITY	140
11/07/1960	35202	SPECIFIC CONDUCTANCE 25C	347
11/07/1960	35202	DISSOLVED SODIUM	13

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11/07/1960	35202	MINERAL TURBIDITY HELLIGE	1
12/12/1960	35524	DISSOLVED BORON	0.1
12/12/1960	35524	LAB pH	8
12/12/1960	35524	DISSOLVED SODIUM	9
12/12/1960	35524	DISSOLVED CHLORIDE	12
12/12/1960	35524	DISSOLVED HARDNESS CaCO3 mg/L	106
12/12/1960	35524	DISSOLVED TOTAL ALKALINITY	102
12/12/1960	35524	SPECIFIC CONDUCTANCE 25C	239
12/12/1960	35524	MINERAL TURBIDITY HELLIGE	3
01/10/1961	35757	DISSOLVED BORON	0
01/10/1961	35757	DISSOLVED CHLORIDE	8.5
01/10/1961	35757	LAB pH	7.6
01/10/1961	35757	DISSOLVED SODIUM	8.1
01/10/1961	35757	DISSOLVED HARDNESS CaCO3 mg/L	88
01/10/1961	35757	DISSOLVED TOTAL ALKALINITY	89
01/10/1961	35757	SPECIFIC CONDUCTANCE 25C	179
01/10/1961	35757	MINERAL TURBIDITY HELLIGE	2
02/13/1961	36018	DISSOLVED BORON	0
02/13/1961	36018	DISSOLVED CHLORIDE	2.2
02/13/1961	36018	LAB pH	8.1
02/13/1961	36018	DISSOLVED SODIUM	5.6
02/13/1961	36018	DISSOLVED HARDNESS CaCO3 mg/L	62
02/13/1961	36018	DISSOLVED TOTAL ALKALINITY	48
02/13/1961	36018	SPECIFIC CONDUCTANCE 25C	147
02/13/1961	36018	MINERAL TURBIDITY HELLIGE	40
03/06/1961	36230	DISSOLVED BORON	0
03/06/1961	36230	DISSOLVED CHLORIDE	4.2
03/06/1961	36230	LAB pH	8.1
03/06/1961	36230	DISSOLVED SODIUM	7.2
03/06/1961	36230	DISSOLVED HARDNESS CaCO3 mg/L	92
03/06/1961	36230	DISSOLVED TOTAL ALKALINITY	85
03/06/1961	36230	SPECIFIC CONDUCTANCE 25C	210
03/06/1961	36230	MINERAL TURBIDITY HELLIGE	15
04/10/1961	36557	DISSOLVED BORON	0
04/10/1961	36557	DISSOLVED CHLORIDE	3.5
04/10/1961	36557	LAB pH	8.3
04/10/1961	36557	DISSOLVED SODIUM	6.1
04/10/1961	36557	DISSOLVED HARDNESS CaCO3 mg/L	107
04/10/1961	36557	DISSOLVED TOTAL ALKALINITY	98
04/10/1961	36557	SPECIFIC CONDUCTANCE 25C	217
04/10/1961	36557	MINERAL TURBIDITY HELLIGE	4
05/08/1961	36874	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/08/1961	36874	NUTRIENT TURBIDITY NOT C,A,E,B	5
05/08/1961	36874	DISSOLVED BORON	0
05/08/1961	36874	DISSOLVED CHLORIDE	4.2
05/08/1961	36874	DISSOLVED FLUORIDE	0.1
05/08/1961	36874	DISSOLVED POTASSIUM	0.8
05/08/1961	36874	LAB pH	8
05/08/1961	36874	DISSOLVED MAGNESIUM	9.5
05/08/1961	36874	DISSOLVED SODIUM	6.3
05/08/1961	36874	DISSOLVED NITRATE NO3 mg/L	0.1

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05/08/1961	36874	DISSOLVED SULFATE SO4 mg/L	8
05/08/1961	36874	DISSOLVED CALCIUM	20
05/08/1961	36874	DISSOLVED HARDNESS CaCO3 mg/L	89
05/08/1961	36874	DISSOLVED TOTAL ALKALINITY	89
05/08/1961	36874	SPECIFIC CONDUCTANCE 25C	182
05/08/1961	36874	DISSOLVED SILICA	19
05/08/1961	36874	MINERAL TURBIDITY HELLIGE	5
05/08/1961	36874	Al mg/L D	0.06
05/08/1961	36874	As mg/L D	0
05/08/1961	36874	Cr mg/L D	0
05/08/1961	36874	Cu mg/L D	0.01
05/08/1961	36874	Fe mg/L D	0
05/08/1961	36874	Mn mg/L D	0
05/08/1961	36874	Pb mg/L D	0
05/08/1961	36874	Zn mg/L D	0
05/08/1961	36874	METHYLENE BLUE ACTIVE SUBSTANC	0
06/12/1961	37128	DISSOLVED BORON	0
06/12/1961	37128	DISSOLVED CHLORIDE	7.6
06/12/1961	37128	LAB pH	7.9
06/12/1961	37128	DISSOLVED SODIUM	8.6
06/12/1961	37128	DISSOLVED HARDNESS CaCO3 mg/L	84
06/12/1961	37128	DISSOLVED TOTAL ALKALINITY	81
06/12/1961	37128	SPECIFIC CONDUCTANCE 25C	199
06/12/1961	37128	MINERAL TURBIDITY HELLIGE	6
07/10/1961	37285	DISSOLVED BORON	0
07/10/1961	37285	DISSOLVED CHLORIDE	8.2
07/10/1961	37285	LAB pH	8.3
07/10/1961	37285	DISSOLVED SODIUM	8.7
07/10/1961	37285	DISSOLVED HARDNESS CaCO3 mg/L	119
07/10/1961	37285	DISSOLVED TOTAL ALKALINITY	121
07/10/1961	37285	SPECIFIC CONDUCTANCE 25C	268
07/10/1961	37285	MINERAL TURBIDITY HELLIGE	6
08/07/1961	37556	DISSOLVED BORON	0
08/07/1961	37556	LAB pH	8.4
08/07/1961	37556	DISSOLVED CHLORIDE	12
08/07/1961	37556	DISSOLVED HARDNESS CaCO3 mg/L	128
08/07/1961	37556	DISSOLVED TOTAL ALKALINITY	126
08/07/1961	37556	SPECIFIC CONDUCTANCE 25C	279
08/07/1961	37556	DISSOLVED SODIUM	10
08/07/1961	37556	MINERAL TURBIDITY HELLIGE	2
09/07/1961	37802	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/07/1961	37802	NUTRIENT TURBIDITY NOT C,A,E,B	3
09/07/1961	37802	DISSOLVED BORON	0
09/07/1961	37802	DISSOLVED FLUORIDE	0.1
09/07/1961	37802	DISSOLVED POTASSIUM	1.4
09/07/1961	37802	LAB pH	8.4
09/07/1961	37802	DISSOLVED NITRATE NO3 mg/L	0.2
09/07/1961	37802	DISSOLVED SULFATE SO4 mg/L	7
09/07/1961	37802	DISSOLVED CALCIUM	29
09/07/1961	37802	DISSOLVED CHLORIDE	15
09/07/1961	37802	DISSOLVED HARDNESS CaCO3 mg/L	126

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/07/1961	37802	DISSOLVED TOTAL ALKALINITY	123
09/07/1961	37802	SPECIFIC CONDUCTANCE 25C	283
09/07/1961	37802	DISSOLVED MAGNESIUM	13
09/07/1961	37802	DISSOLVED SODIUM	11
09/07/1961	37802	DISSOLVED SILICA	22
09/07/1961	37802	MINERAL TURBIDITY HELLIGE	3
09/07/1961	37802	Al mg/L D	0
09/07/1961	37802	As mg/L D	0
09/07/1961	37802	Cu mg/L D	0.01
09/07/1961	37802	Fe mg/L T	0.05
09/07/1961	37802	Mn mg/L D	0
09/07/1961	37802	Pb mg/L D	0
09/07/1961	37802	Zn mg/L D	0
09/07/1961	37802	METHYLENE BLUE ACTIVE SUBSTANC	0
10/05/1961	38007	DISSOLVED BORON	0.1
10/05/1961	38007	LAB pH	8.2
10/05/1961	38007	DISSOLVED CHLORIDE	14
10/05/1961	38007	DISSOLVED HARDNESS CaCO3 mg/L	121
10/05/1961	38007	DISSOLVED TOTAL ALKALINITY	115
10/05/1961	38007	SPECIFIC CONDUCTANCE 25C	274
10/05/1961	38007	DISSOLVED SODIUM	12
10/05/1961	38007	MINERAL TURBIDITY HELLIGE	3
11/09/1961	38412	DISSOLVED BORON	0
11/09/1961	38412	LAB pH	8.3
11/09/1961	38412	DISSOLVED CHLORIDE	19
11/09/1961	38412	DISSOLVED HARDNESS CaCO3 mg/L	137
11/09/1961	38412	DISSOLVED TOTAL ALKALINITY	129
11/09/1961	38412	SPECIFIC CONDUCTANCE 25C	315
11/09/1961	38412	DISSOLVED SODIUM	12
11/09/1961	38412	MINERAL TURBIDITY HELLIGE	2
12/07/1961	38622	DISSOLVED BORON	0
12/07/1961	38622	LAB pH	7.8
12/07/1961	38622	DISSOLVED SODIUM	4.9
12/07/1961	38622	DISSOLVED CHLORIDE	10
12/07/1961	38622	DISSOLVED HARDNESS CaCO3 mg/L	80
12/07/1961	38622	DISSOLVED TOTAL ALKALINITY	69
12/07/1961	38622	SPECIFIC CONDUCTANCE 25C	190
12/07/1961	38622	MINERAL TURBIDITY HELLIGE	8
01/11/1962	38973	DISSOLVED BORON	0
01/11/1962	38973	LAB pH	8.1
01/11/1962	38973	DISSOLVED CHLORIDE	12
01/11/1962	38973	DISSOLVED HARDNESS CaCO3 mg/L	108
01/11/1962	38973	DISSOLVED TOTAL ALKALINITY	98
01/11/1962	38973	SPECIFIC CONDUCTANCE 25C	247
01/11/1962	38973	DISSOLVED SODIUM	10
01/11/1962	38973	MINERAL TURBIDITY HELLIGE	2
02/09/1962	39201	DISSOLVED BORON	0
02/09/1962	39201	DISSOLVED CHLORIDE	3.3
02/09/1962	39201	LAB pH	7.5
02/09/1962	39201	DISSOLVED SODIUM	7.9
02/09/1962	39201	DISSOLVED HARDNESS CaCO3 mg/L	78

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/09/1962	39201	DISSOLVED TOTAL ALKALINITY	66
02/09/1962	39201	SPECIFIC CONDUCTANCE 25C	183
02/09/1962	39201	MINERAL TURBIDITY HELLIGE	250
03/14/1962	39530	DISSOLVED BORON	0
03/14/1962	39530	DISSOLVED CHLORIDE	3.8
03/14/1962	39530	LAB pH	7.9
03/14/1962	39530	DISSOLVED SODIUM	6.4
03/14/1962	39530	DISSOLVED HARDNESS CaCO3 mg/L	92
03/14/1962	39530	DISSOLVED TOTAL ALKALINITY	87
03/14/1962	39530	SPECIFIC CONDUCTANCE 25C	203
03/14/1962	39530	MINERAL TURBIDITY HELLIGE	15
04/11/1962	39808	DISSOLVED BORON	0
04/11/1962	39808	DISSOLVED CHLORIDE	1.4
04/11/1962	39808	LAB pH	8.2
04/11/1962	39808	DISSOLVED SODIUM	4.7
04/11/1962	39808	DISSOLVED HARDNESS CaCO3 mg/L	77
04/11/1962	39808	DISSOLVED TOTAL ALKALINITY	75
04/11/1962	39808	SPECIFIC CONDUCTANCE 25C	165
04/11/1962	39808	MINERAL TURBIDITY HELLIGE	20
05/03/1962	39914	DISSOLVED ORTHOPHOSPHATE as P	0
05/03/1962	39914	NUTRIENT TURBIDITY NOT C,A,E,B	1
05/03/1962	39914	DISSOLVED BORON	0
05/03/1962	39914	DISSOLVED CHLORIDE	6.6
05/03/1962	39914	DISSOLVED FLUORIDE	0.1
05/03/1962	39914	DISSOLVED POTASSIUM	1
05/03/1962	39914	LAB pH	8.2
05/03/1962	39914	DISSOLVED SODIUM	5.7
05/03/1962	39914	DISSOLVED NITRATE NO3 mg/L	0
05/03/1962	39914	DISSOLVED SULFATE SO4 mg/L	8
05/03/1962	39914	DISSOLVED CALCIUM	21
05/03/1962	39914	DISSOLVED HARDNESS CaCO3 mg/L	96
05/03/1962	39914	DISSOLVED TOTAL ALKALINITY	93
05/03/1962	39914	SPECIFIC CONDUCTANCE 25C	201
05/03/1962	39914	DISSOLVED MAGNESIUM	11
05/03/1962	39914	DISSOLVED SILICA	19
05/03/1962	39914	MINERAL TURBIDITY HELLIGE	1
06/08/1962	40468	DISSOLVED BORON	0
06/08/1962	40468	DISSOLVED CHLORIDE	5.5
06/08/1962	40468	LAB pH	8.2
06/08/1962	40468	DISSOLVED SODIUM	6.7
06/08/1962	40468	DISSOLVED HARDNESS CaCO3 mg/L	103
06/08/1962	40468	DISSOLVED TOTAL ALKALINITY	105
06/08/1962	40468	SPECIFIC CONDUCTANCE 25C	222
06/08/1962	40468	MINERAL TURBIDITY HELLIGE	2
07/03/1962	40723	DISSOLVED BORON	0
07/03/1962	40723	DISSOLVED CHLORIDE	8.5
07/03/1962	40723	LAB pH	8.2
07/03/1962	40723	DISSOLVED SODIUM	8.1
07/03/1962	40723	DISSOLVED HARDNESS CaCO3 mg/L	103
07/03/1962	40723	DISSOLVED TOTAL ALKALINITY	104
07/03/1962	40723	SPECIFIC CONDUCTANCE 25C	231

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

07/03/1962	40723	MINERAL TURBIDITY HELLIGE	1
08/03/1962	40950	DISSOLVED BORON	0
08/03/1962	40950	LAB pH	8.1
08/03/1962	40950	DISSOLVED CHLORIDE	10
08/03/1962	40950	DISSOLVED HARDNESS CaCO3 mg/L	116
08/03/1962	40950	DISSOLVED TOTAL ALKALINITY	120
08/03/1962	40950	SPECIFIC CONDUCTANCE 25C	262
08/03/1962	40950	DISSOLVED SODIUM	10
08/03/1962	40950	MINERAL TURBIDITY HELLIGE	2
09/14/1962	41191	DISSOLVED ORTHOPHOSPHATE as P	0
09/14/1962	41191	NUTRIENT TURBIDITY NOT C,A,E,B	5
09/14/1962	41191	DISSOLVED BORON	0
09/14/1962	41191	DISSOLVED FLUORIDE	0
09/14/1962	41191	DISSOLVED POTASSIUM	1.1
09/14/1962	41191	LAB pH	8.2
09/14/1962	41191	DISSOLVED NITRATE NO3 mg/L	0.2
09/14/1962	41191	DISSOLVED SULFATE SO4 mg/L	7
09/14/1962	41191	DISSOLVED CALCIUM	28
09/14/1962	41191	DISSOLVED CHLORIDE	16
09/14/1962	41191	DISSOLVED HARDNESS CaCO3 mg/L	122
09/14/1962	41191	DISSOLVED TOTAL ALKALINITY	122
09/14/1962	41191	SPECIFIC CONDUCTANCE 25C	279
09/14/1962	41191	DISSOLVED MAGNESIUM	13
09/14/1962	41191	DISSOLVED SODIUM	11
09/14/1962	41191	DISSOLVED SILICA	21
09/14/1962	41191	DISSOLVED SOLIDS mg/L at 180C	169
09/14/1962	41191	MINERAL TURBIDITY HELLIGE	5
10/02/1962	41398	DISSOLVED BORON	0
10/02/1962	41398	LAB pH	8
10/02/1962	41398	DISSOLVED CHLORIDE	20
10/02/1962	41398	DISSOLVED HARDNESS CaCO3 mg/L	111
10/02/1962	41398	DISSOLVED TOTAL ALKALINITY	108
10/02/1962	41398	SPECIFIC CONDUCTANCE 25C	266
10/02/1962	41398	DISSOLVED SODIUM	14
10/02/1962	41398	MINERAL TURBIDITY HELLIGE	1
11/02/1962	41701	DISSOLVED BORON	0.2
11/02/1962	41701	DISSOLVED CHLORIDE	9.5
11/02/1962	41701	LAB pH	8.1
11/02/1962	41701	DISSOLVED SODIUM	9.2
11/02/1962	41701	DISSOLVED HARDNESS CaCO3 mg/L	117
11/02/1962	41701	DISSOLVED TOTAL ALKALINITY	116
11/02/1962	41701	SPECIFIC CONDUCTANCE 25C	260
11/02/1962	41701	MINERAL TURBIDITY HELLIGE	1
12/07/1962	42041	DISSOLVED BORON	0
12/07/1962	42041	DISSOLVED CHLORIDE	7.1
12/07/1962	42041	LAB pH	8.3
12/07/1962	42041	DISSOLVED SODIUM	8
12/07/1962	42041	DISSOLVED HARDNESS CaCO3 mg/L	117
12/07/1962	42041	DISSOLVED TOTAL ALKALINITY	115
12/07/1962	42041	SPECIFIC CONDUCTANCE 25C	249
12/07/1962	42041	MINERAL TURBIDITY HELLIGE	5

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01/04/1963	42281	DISSOLVED BORON	0
01/04/1963	42281	DISSOLVED CHLORIDE	8.2
01/04/1963	42281	LAB pH	8.3
01/04/1963	42281	DISSOLVED SODIUM	7.9
01/04/1963	42281	DISSOLVED HARDNESS CaCO3 mg/L	115
01/04/1963	42281	DISSOLVED TOTAL ALKALINITY	109
01/04/1963	42281	SPECIFIC CONDUCTANCE 25C	250
01/04/1963	42281	MINERAL TURBIDITY HELLIGE	1
02/11/1963	42513	DISSOLVED BORON	0
02/11/1963	42513	DISSOLVED CHLORIDE	2
02/11/1963	42513	LAB pH	7.9
02/11/1963	42513	DISSOLVED SODIUM	7.8
02/11/1963	42513	DISSOLVED HARDNESS CaCO3 mg/L	83
02/11/1963	42513	DISSOLVED TOTAL ALKALINITY	82
02/11/1963	42513	SPECIFIC CONDUCTANCE 25C	179
02/11/1963	42513	MINERAL TURBIDITY HELLIGE	200
03/04/1963	42845	DISSOLVED BORON	0
03/04/1963	42845	DISSOLVED CHLORIDE	5.8
03/04/1963	42845	LAB pH	8.4
03/04/1963	42845	DISSOLVED SODIUM	5.5
03/04/1963	42845	DISSOLVED HARDNESS CaCO3 mg/L	105
03/04/1963	42845	DISSOLVED TOTAL ALKALINITY	105
03/04/1963	42845	SPECIFIC CONDUCTANCE 25C	222
03/04/1963	42845	MINERAL TURBIDITY HELLIGE	9
04/04/1963	43092	DISSOLVED BORON	0
04/04/1963	43092	DISSOLVED CHLORIDE	3.1
04/04/1963	43092	LAB pH	8.1
04/04/1963	43092	DISSOLVED SODIUM	5.7
04/04/1963	43092	DISSOLVED HARDNESS CaCO3 mg/L	93
04/04/1963	43092	DISSOLVED TOTAL ALKALINITY	93
04/04/1963	43092	SPECIFIC CONDUCTANCE 25C	201
04/04/1963	43092	MINERAL TURBIDITY HELLIGE	25
05/03/1963	43355	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/03/1963	43355	NUTRIENT TURBIDITY NOT C,A,E,B	15
05/03/1963	43355	DISSOLVED BORON	0
05/03/1963	43355	DISSOLVED CHLORIDE	2.2
05/03/1963	43355	DISSOLVED FLUORIDE	0.1
05/03/1963	43355	DISSOLVED POTASSIUM	0.8
05/03/1963	43355	LAB pH	8.3
05/03/1963	43355	DISSOLVED SODIUM	5.4
05/03/1963	43355	DISSOLVED NITRATE NO3 mg/L	1.1
05/03/1963	43355	DISSOLVED SULFATE SO4 mg/L	9
05/03/1963	43355	DISSOLVED CALCIUM	20
05/03/1963	43355	DISSOLVED HARDNESS CaCO3 mg/L	92
05/03/1963	43355	DISSOLVED TOTAL ALKALINITY	94
05/03/1963	43355	SPECIFIC CONDUCTANCE 25C	196
05/03/1963	43355	DISSOLVED MAGNESIUM	10
05/03/1963	43355	DISSOLVED SILICA	20
05/03/1963	43355	DISSOLVED SOLIDS mg/L at 180C	130
05/03/1963	43355	MINERAL TURBIDITY HELLIGE	15
06/05/1963	43424	DISSOLVED BORON	0

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06/05/1963	43424	DISSOLVED CHLORIDE	4.8
06/05/1963	43424	LAB pH	8.5
06/05/1963	43424	DISSOLVED SODIUM	5.7
06/05/1963	43424	DISSOLVED HARDNESS CaCO3 mg/L	94
06/05/1963	43424	DISSOLVED TOTAL ALKALINITY	94
06/05/1963	43424	SPECIFIC CONDUCTANCE 25C	194
06/05/1963	43424	MINERAL TURBIDITY HELLIGE	2
07/12/1963	43807	DISSOLVED BORON	0
07/12/1963	43807	DISSOLVED CHLORIDE	6.6
07/12/1963	43807	LAB pH	8.4
07/12/1963	43807	DISSOLVED SODIUM	7
07/12/1963	43807	DISSOLVED HARDNESS CaCO3 mg/L	122
07/12/1963	43807	DISSOLVED TOTAL ALKALINITY	117
07/12/1963	43807	SPECIFIC CONDUCTANCE 25C	241
07/12/1963	43807	MINERAL TURBIDITY HELLIGE	5
08/02/1963	44197	DISSOLVED BORON	0.1
08/02/1963	44197	DISSOLVED CHLORIDE	6.8
08/02/1963	44197	LAB pH	8.4
08/02/1963	44197	DISSOLVED SODIUM	7.6
08/02/1963	44197	DISSOLVED HARDNESS CaCO3 mg/L	102
08/02/1963	44197	DISSOLVED TOTAL ALKALINITY	108
08/02/1963	44197	SPECIFIC CONDUCTANCE 25C	227
08/02/1963	44197	MINERAL TURBIDITY HELLIGE	4
09/12/1963	44450	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/12/1963	44450	NUTRIENT TURBIDITY NOT C,A,E,B	3
09/12/1963	44450	DISSOLVED BORON	0
09/12/1963	44450	DISSOLVED FLUORIDE	0.2
09/12/1963	44450	DISSOLVED POTASSIUM	1.4
09/12/1963	44450	LAB pH	8
09/12/1963	44450	DISSOLVED SODIUM	7.9
09/12/1963	44450	DISSOLVED NITRATE NO3 mg/L	0.4
09/12/1963	44450	DISSOLVED SULFATE SO4 mg/L	5
09/12/1963	44450	DISSOLVED CALCIUM	23
09/12/1963	44450	DISSOLVED CHLORIDE	12
09/12/1963	44450	DISSOLVED HARDNESS CaCO3 mg/L	108
09/12/1963	44450	DISSOLVED TOTAL ALKALINITY	108
09/12/1963	44450	SPECIFIC CONDUCTANCE 25C	237
09/12/1963	44450	DISSOLVED MAGNESIUM	12
09/12/1963	44450	DISSOLVED SILICA	20
09/12/1963	44450	DISSOLVED SOLIDS mg/L at 180C	140
09/12/1963	44450	MINERAL TURBIDITY HELLIGE	3
09/12/1963	44450	As mg/L D	0
09/12/1963	44450	METHYLENE BLUE ACTIVE SUBSTANC	0
10/10/1963	44631	DISSOLVED BORON	0
10/10/1963	44631	LAB pH	8.2
10/10/1963	44631	DISSOLVED SODIUM	9.5
10/10/1963	44631	DISSOLVED CHLORIDE	16
10/10/1963	44631	DISSOLVED HARDNESS CaCO3 mg/L	108
10/10/1963	44631	DISSOLVED TOTAL ALKALINITY	103
10/10/1963	44631	SPECIFIC CONDUCTANCE 25C	250
10/10/1963	44631	MINERAL TURBIDITY HELLIGE	1

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11/04/1963	44928	DISSOLVED BORON	0
11/04/1963	44928	LAB pH	8
11/04/1963	44928	DISSOLVED SODIUM	8
11/04/1963	44928	DISSOLVED CHLORIDE	12
11/04/1963	44928	DISSOLVED HARDNESS CaCO3 mg/L	90
11/04/1963	44928	DISSOLVED TOTAL ALKALINITY	83
11/04/1963	44928	SPECIFIC CONDUCTANCE 25C	214
11/04/1963	44928	MINERAL TURBIDITY HELLIGE	40
12/02/1963	45093	DISSOLVED BORON	0
12/02/1963	45093	DISSOLVED CHLORIDE	7.2
12/02/1963	45093	LAB pH	8.1
12/02/1963	45093	DISSOLVED SODIUM	6.6
12/02/1963	45093	DISSOLVED HARDNESS CaCO3 mg/L	100
12/02/1963	45093	DISSOLVED TOTAL ALKALINITY	98
12/02/1963	45093	SPECIFIC CONDUCTANCE 25C	219
12/02/1963	45093	MINERAL TURBIDITY HELLIGE	2
01/03/1964	45474	DISSOLVED BORON	0
01/03/1964	45474	DISSOLVED CHLORIDE	9.1
01/03/1964	45474	LAB pH	8.4
01/03/1964	45474	DISSOLVED SODIUM	8
01/03/1964	45474	DISSOLVED HARDNESS CaCO3 mg/L	109
01/03/1964	45474	DISSOLVED TOTAL ALKALINITY	103
01/03/1964	45474	SPECIFIC CONDUCTANCE 25C	233
01/03/1964	45474	MINERAL TURBIDITY HELLIGE	2
02/06/1964	45701	DISSOLVED BORON	0
02/06/1964	45701	DISSOLVED CHLORIDE	3
02/06/1964	45701	LAB pH	8.5
02/06/1964	45701	DISSOLVED SODIUM	6.4
02/06/1964	45701	DISSOLVED HARDNESS CaCO3 mg/L	108
02/06/1964	45701	DISSOLVED TOTAL ALKALINITY	103
02/06/1964	45701	SPECIFIC CONDUCTANCE 25C	230
02/06/1964	45701	MINERAL TURBIDITY HELLIGE	3
03/12/1964	45943	DISSOLVED BORON	0
03/12/1964	45943	LAB pH	8.2
03/12/1964	45943	DISSOLVED SODIUM	9.2
03/12/1964	45943	DISSOLVED CHLORIDE	10
03/12/1964	45943	DISSOLVED HARDNESS CaCO3 mg/L	113
03/12/1964	45943	DISSOLVED TOTAL ALKALINITY	103
03/12/1964	45943	SPECIFIC CONDUCTANCE 25C	257
03/12/1964	45943	MINERAL TURBIDITY HELLIGE	15
04/09/1964	46257	DISSOLVED BORON	0
04/09/1964	46257	DISSOLVED CHLORIDE	9.8
04/09/1964	46257	LAB pH	8.5
04/09/1964	46257	DISSOLVED SODIUM	7.5
04/09/1964	46257	DISSOLVED HARDNESS CaCO3 mg/L	122
04/09/1964	46257	DISSOLVED TOTAL ALKALINITY	117
04/09/1964	46257	SPECIFIC CONDUCTANCE 25C	253
04/09/1964	46257	MINERAL TURBIDITY HELLIGE	1
05/07/1964	46510	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/07/1964	46510	DISSOLVED BORON	0
05/07/1964	46510	DISSOLVED FLUORIDE	0.1

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05/07/1964	46510	DISSOLVED POTASSIUM	0.6
05/07/1964	46510	LAB pH	8.2
05/07/1964	46510	DISSOLVED SODIUM	7.1
05/07/1964	46510	DISSOLVED NITRATE NO3 mg/L	0.6
05/07/1964	46510	DISSOLVED SULFATE SO4 mg/L	9
05/07/1964	46510	DISSOLVED CALCIUM	24
05/07/1964	46510	DISSOLVED CHLORIDE	10
05/07/1964	46510	DISSOLVED HARDNESS CaCO3 mg/L	111
05/07/1964	46510	DISSOLVED TOTAL ALKALINITY	107
05/07/1964	46510	SPECIFIC CONDUCTANCE 25C	239
05/07/1964	46510	DISSOLVED MAGNESIUM	12
05/07/1964	46510	DISSOLVED SILICA	19
05/07/1964	46510	DISSOLVED SOLIDS, invalid temp	140
05/07/1964	46510	MINERAL TURBIDITY HELLIGE	40
05/07/1964	46510	As mg/L D	0
05/07/1964	46510	METHYLENE BLUE ACTIVE SUBSTANC	0
06/08/1964	46730	DISSOLVED BORON	0
06/08/1964	46730	DISSOLVED CHLORIDE	9
06/08/1964	46730	LAB pH	8.5
06/08/1964	46730	DISSOLVED SODIUM	8.5
06/08/1964	46730	DISSOLVED HARDNESS CaCO3 mg/L	117
06/08/1964	46730	DISSOLVED TOTAL ALKALINITY	112
06/08/1964	46730	SPECIFIC CONDUCTANCE 25C	249
06/08/1964	46730	MINERAL TURBIDITY HELLIGE	1
07/09/1964	46862	DISSOLVED BORON	0
07/09/1964	46862	LAB pH	8.4
07/09/1964	46862	DISSOLVED SODIUM	9.7
07/09/1964	46862	DISSOLVED CHLORIDE	13
07/09/1964	46862	DISSOLVED HARDNESS CaCO3 mg/L	142
07/09/1964	46862	DISSOLVED TOTAL ALKALINITY	135
07/09/1964	46862	SPECIFIC CONDUCTANCE 25C	302
07/09/1964	46862	MINERAL TURBIDITY HELLIGE	1
08/03/1964	47224	DISSOLVED BORON	0
08/03/1964	47224	DISSOLVED CHLORIDE	9
08/03/1964	47224	LAB pH	8.4
08/03/1964	47224	DISSOLVED HARDNESS CaCO3 mg/L	144
08/03/1964	47224	DISSOLVED TOTAL ALKALINITY	136
08/03/1964	47224	SPECIFIC CONDUCTANCE 25C	317
08/03/1964	47224	DISSOLVED SODIUM	10
08/03/1964	47224	MINERAL TURBIDITY HELLIGE	4
09/04/1964	47510	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/04/1964	47510	NUTRIENT TURBIDITY NOT C,A,E,B	1
09/04/1964	47510	DISSOLVED BORON	0
09/04/1964	47510	DISSOLVED POTASSIUM	1.3
09/04/1964	47510	LAB pH	8.2
09/04/1964	47510	DISSOLVED NITRATE NO3 mg/L	0.8
09/04/1964	47510	DISSOLVED SULFATE SO4 mg/L	8
09/04/1964	47510	DISSOLVED CALCIUM	31
09/04/1964	47510	DISSOLVED CHLORIDE	23
09/04/1964	47510	DISSOLVED HARDNESS CaCO3 mg/L	142
09/04/1964	47510	DISSOLVED TOTAL ALKALINITY	129

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/04/1964	47510	SPECIFIC CONDUCTANCE 25C	326
09/04/1964	47510	DISSOLVED MAGNESIUM	16
09/04/1964	47510	DISSOLVED SODIUM	12
09/04/1964	47510	DISSOLVED SILICA	20
09/04/1964	47510	DISSOLVED SOLIDS mg/L at 180C	181
09/04/1964	47510	MINERAL TURBIDITY HELLIGE	1
09/04/1964	47510	As mg/L D	0
09/04/1964	47510	METHYLENE BLUE ACTIVE SUBSTANC	0
10/08/1964	47638	DISSOLVED BORON	0.1
10/08/1964	47638	LAB pH	8.3
10/08/1964	47638	DISSOLVED CHLORIDE	24
10/08/1964	47638	DISSOLVED HARDNESS CaCO3 mg/L	143
10/08/1964	47638	DISSOLVED TOTAL ALKALINITY	130
10/08/1964	47638	SPECIFIC CONDUCTANCE 25C	328
10/08/1964	47638	DISSOLVED SODIUM	12
10/08/1964	47638	MINERAL TURBIDITY HELLIGE	1
11/13/1964	47827	DISSOLVED BORON	0
11/13/1964	47827	LAB pH	8.3
11/13/1964	47827	DISSOLVED CHLORIDE	12
11/13/1964	47827	DISSOLVED HARDNESS CaCO3 mg/L	113
11/13/1964	47827	DISSOLVED TOTAL ALKALINITY	96
11/13/1964	47827	SPECIFIC CONDUCTANCE 25C	273
11/13/1964	47827	DISSOLVED SODIUM	11
11/13/1964	47827	MINERAL TURBIDITY HELLIGE	20
12/10/1964	48043	DISSOLVED BORON	0.1
12/10/1964	48043	DISSOLVED CHLORIDE	8.3
12/10/1964	48043	LAB pH	8.2
12/10/1964	48043	DISSOLVED SODIUM	9.8
12/10/1964	48043	DISSOLVED HARDNESS CaCO3 mg/L	112
12/10/1964	48043	DISSOLVED TOTAL ALKALINITY	103
12/10/1964	48043	SPECIFIC CONDUCTANCE 25C	258
12/10/1964	48043	MINERAL TURBIDITY HELLIGE	3
01/15/1965	48307	DISSOLVED BORON	0
01/15/1965	48307	DISSOLVED CHLORIDE	1.9
01/15/1965	48307	LAB pH	8.3
01/15/1965	48307	DISSOLVED SODIUM	5.6
01/15/1965	48307	DISSOLVED HARDNESS CaCO3 mg/L	95
01/15/1965	48307	DISSOLVED TOTAL ALKALINITY	93
01/15/1965	48307	SPECIFIC CONDUCTANCE 25C	203
01/15/1965	48307	MINERAL TURBIDITY HELLIGE	40
02/05/1965	48634	DISSOLVED BORON	0
02/05/1965	48634	DISSOLVED CHLORIDE	3.4
02/05/1965	48634	LAB pH	8.1
02/05/1965	48634	DISSOLVED SODIUM	6.4
02/05/1965	48634	DISSOLVED HARDNESS CaCO3 mg/L	101
02/05/1965	48634	DISSOLVED TOTAL ALKALINITY	96
02/05/1965	48634	SPECIFIC CONDUCTANCE 25C	223
02/05/1965	48634	MINERAL TURBIDITY HELLIGE	35
03/01/1965	48912	DISSOLVED BORON	0
03/01/1965	48912	DISSOLVED CHLORIDE	3.1
03/01/1965	48912	LAB pH	8.2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/01/1965	48912	DISSOLVED SODIUM	6.1
03/01/1965	48912	DISSOLVED HARDNESS CaCO3 mg/L	112
03/01/1965	48912	DISSOLVED TOTAL ALKALINITY	103
03/01/1965	48912	SPECIFIC CONDUCTANCE 25C	236
03/01/1965	48912	MINERAL TURBIDITY HELLIGE	8
04/09/1965	49163	DISSOLVED BORON	0.1
04/09/1965	49163	DISSOLVED CHLORIDE	2.7
04/09/1965	49163	LAB pH	7.9
04/09/1965	49163	DISSOLVED SODIUM	8.1
04/09/1965	49163	DISSOLVED HARDNESS CaCO3 mg/L	80
04/09/1965	49163	DISSOLVED TOTAL ALKALINITY	72
04/09/1965	49163	SPECIFIC CONDUCTANCE 25C	188
04/09/1965	49163	MINERAL TURBIDITY HELLIGE	70
05/06/1965	49238	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/06/1965	49238	NUTRIENT TURBIDITY NOT C,A,E,B	15
05/06/1965	49238	DISSOLVED BORON	0
05/06/1965	49238	DISSOLVED CHLORIDE	2.8
05/06/1965	49238	DISSOLVED POTASSIUM	0.7
05/06/1965	49238	LAB pH	8.3
05/06/1965	49238	DISSOLVED MAGNESIUM	9.4
05/06/1965	49238	DISSOLVED SODIUM	6.5
05/06/1965	49238	DISSOLVED NITRATE NO3 mg/L	1
05/06/1965	49238	DISSOLVED CALCIUM	27
05/06/1965	49238	DISSOLVED HARDNESS CaCO3 mg/L	106
05/06/1965	49238	DISSOLVED TOTAL ALKALINITY	102
05/06/1965	49238	SPECIFIC CONDUCTANCE 25C	225
05/06/1965	49238	DISSOLVED SILICA	22
05/06/1965	49238	DISSOLVED SULFATE SO4 mg/L	14
05/06/1965	49238	DISSOLVED SOLIDS mg/L at 180C	140
05/06/1965	49238	MINERAL TURBIDITY HELLIGE	15
05/06/1965	49238	As mg/L D	0
05/06/1965	49238	METHYLENE BLUE ACTIVE SUBSTANC	0
06/11/1965	49725	DISSOLVED BORON	0
06/11/1965	49725	DISSOLVED CHLORIDE	4.4
06/11/1965	49725	LAB pH	8.5
06/11/1965	49725	DISSOLVED SODIUM	6.5
06/11/1965	49725	DISSOLVED HARDNESS CaCO3 mg/L	111
06/11/1965	49725	DISSOLVED TOTAL ALKALINITY	110
06/11/1965	49725	SPECIFIC CONDUCTANCE 25C	235
06/11/1965	49725	DISSOLVED SOLIDS mg/L at 180C	0
06/11/1965	49725	MINERAL TURBIDITY HELLIGE	2
07/12/1965	49826	DISSOLVED BORON	0
07/12/1965	49826	DISSOLVED CHLORIDE	7.1
07/12/1965	49826	LAB pH	8.5
07/12/1965	49826	DISSOLVED SODIUM	7.7
07/12/1965	49826	DISSOLVED HARDNESS CaCO3 mg/L	117
07/12/1965	49826	DISSOLVED TOTAL ALKALINITY	115
07/12/1965	49826	SPECIFIC CONDUCTANCE 25C	254
07/12/1965	49826	DISSOLVED SOLIDS mg/L at 180C	0
07/12/1965	49826	MINERAL TURBIDITY HELLIGE	1
08/09/1965	50143	DISSOLVED BORON	0.1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

08/09/1965	50143	DISSOLVED CHLORIDE	10
08/09/1965	50143	LAB pH	8.4
08/09/1965	50143	DISSOLVED SODIUM	9.4
08/09/1965	50143	DISSOLVED HARDNESS CaCO3 mg/L	129
08/09/1965	50143	DISSOLVED TOTAL ALKALINITY	129
08/09/1965	50143	SPECIFIC CONDUCTANCE 25C	280
08/09/1965	50143	DISSOLVED SOLIDS mg/L at 180C	0
08/09/1965	50143	MINERAL TURBIDITY HELLIGE	1
09/13/1965	50487	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/13/1965	50487	DISSOLVED BORON	0
09/13/1965	50487	DISSOLVED CALCIUM	29
09/13/1965	50487	DISSOLVED CHLORIDE	12
09/13/1965	50487	DISSOLVED POTASSIUM	1.5
09/13/1965	50487	LAB pH	8.2
09/13/1965	50487	DISSOLVED MAGNESIUM	15
09/13/1965	50487	DISSOLVED SODIUM	10
09/13/1965	50487	DISSOLVED NITRATE NO3 mg/L	3.7
09/13/1965	50487	DISSOLVED SILICA	20
09/13/1965	50487	DISSOLVED SULFATE SO4 mg/L	6
09/13/1965	50487	DISSOLVED HARDNESS CaCO3 mg/L	136
09/13/1965	50487	DISSOLVED TOTAL ALKALINITY	132
09/13/1965	50487	SPECIFIC CONDUCTANCE 25C	297
09/13/1965	50487	DISSOLVED SOLIDS mg/L at 180C	166
09/13/1965	50487	MINERAL TURBIDITY HELLIGE	1
09/13/1965	50487	As mg/L D	0
09/13/1965	50487	METHYLENE BLUE ACTIVE SUBSTANC	0
10/07/1965	50655	DISSOLVED BORON	0
10/07/1965	50655	DISSOLVED CHLORIDE	16
10/07/1965	50655	LAB pH	8.6
10/07/1965	50655	DISSOLVED SODIUM	11
10/07/1965	50655	DISSOLVED HARDNESS CaCO3 mg/L	148
10/07/1965	50655	DISSOLVED TOTAL ALKALINITY	143
10/07/1965	50655	SPECIFIC CONDUCTANCE 25C	322
10/07/1965	50655	DISSOLVED SOLIDS mg/L at 180C	0
10/07/1965	50655	MINERAL TURBIDITY HELLIGE	1
11/04/1965	50885	DISSOLVED BORON	0
11/04/1965	50885	DISSOLVED CHLORIDE	16
11/04/1965	50885	LAB pH	8.5
11/04/1965	50885	DISSOLVED SODIUM	11
11/04/1965	50885	DISSOLVED HARDNESS CaCO3 mg/L	133
11/04/1965	50885	DISSOLVED TOTAL ALKALINITY	127
11/04/1965	50885	SPECIFIC CONDUCTANCE 25C	299
11/04/1965	50885	DISSOLVED SOLIDS mg/L at 180C	0
11/04/1965	50885	MINERAL TURBIDITY HELLIGE	0
12/13/1965	51365	DISSOLVED BORON	0
12/13/1965	51365	DISSOLVED CHLORIDE	6.5
12/13/1965	51365	LAB pH	8.3
12/13/1965	51365	DISSOLVED SODIUM	7.6
12/13/1965	51365	DISSOLVED HARDNESS CaCO3 mg/L	95
12/13/1965	51365	DISSOLVED TOTAL ALKALINITY	89
12/13/1965	51365	SPECIFIC CONDUCTANCE 25C	216

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12/13/1965	51365	DISSOLVED SOLIDS mg/L at 180C	0
12/13/1965	51365	MINERAL TURBIDITY HELLIGE	5
01/05/1966	51482	DISSOLVED BORON	0
01/05/1966	51482	DISSOLVED CHLORIDE	2.2
01/05/1966	51482	LAB pH	8
01/05/1966	51482	DISSOLVED SODIUM	5.6
01/05/1966	51482	DISSOLVED HARDNESS CaCO3 mg/L	66
01/05/1966	51482	DISSOLVED TOTAL ALKALINITY	59
01/05/1966	51482	SPECIFIC CONDUCTANCE 25C	158
01/05/1966	51482	DISSOLVED SOLIDS mg/L at 180C	0
01/05/1966	51482	MINERAL TURBIDITY HELLIGE	180
02/04/1966	52051	DISSOLVED BORON	0
02/04/1966	52051	DISSOLVED CHLORIDE	2.2
02/04/1966	52051	LAB pH	8
02/04/1966	52051	DISSOLVED SODIUM	6.2
02/04/1966	52051	DISSOLVED HARDNESS CaCO3 mg/L	67
02/04/1966	52051	DISSOLVED TOTAL ALKALINITY	62
02/04/1966	52051	SPECIFIC CONDUCTANCE 25C	161
02/04/1966	52051	DISSOLVED SOLIDS mg/L at 180C	0
02/04/1966	52051	MINERAL TURBIDITY HELLIGE	105
03/02/1966	52134	DISSOLVED BORON	0
03/02/1966	52134	DISSOLVED CHLORIDE	2.2
03/02/1966	52134	LAB pH	8.3
03/02/1966	52134	DISSOLVED SODIUM	7.5
03/02/1966	52134	DISSOLVED HARDNESS CaCO3 mg/L	105
03/02/1966	52134	DISSOLVED TOTAL ALKALINITY	98
03/02/1966	52134	SPECIFIC CONDUCTANCE 25C	227
03/02/1966	52134	DISSOLVED SOLIDS mg/L at 180C	0
03/02/1966	52134	MINERAL TURBIDITY HELLIGE	10
04/13/1966	52554	DISSOLVED BORON	0
04/13/1966	52554	DISSOLVED CHLORIDE	1.2
04/13/1966	52554	LAB pH	8.4
04/13/1966	52554	DISSOLVED SODIUM	4.7
04/13/1966	52554	DISSOLVED HARDNESS CaCO3 mg/L	79
04/13/1966	52554	DISSOLVED TOTAL ALKALINITY	76
04/13/1966	52554	SPECIFIC CONDUCTANCE 25C	169
04/13/1966	52554	DISSOLVED SOLIDS mg/L at 180C	0
04/13/1966	52554	MINERAL TURBIDITY HELLIGE	5
05/03/1966	52921	DISSOLVED ORTHOPHOSPHATE as P	0.01
05/03/1966	52921	As mg/L D	0
05/03/1966	52921	METHYLENE BLUE ACTIVE SUBSTANC	0
05/03/1966	52921	DISSOLVED BORON	0
05/03/1966	52921	DISSOLVED CALCIUM	22
05/03/1966	52921	DISSOLVED CHLORIDE	3.6
05/03/1966	52921	DISSOLVED POTASSIUM	0.8
05/03/1966	52921	LAB pH	8.2
05/03/1966	52921	DISSOLVED MAGNESIUM	11
05/03/1966	52921	DISSOLVED SODIUM	5.6
05/03/1966	52921	DISSOLVED NITRATE NO3 mg/L	0.9
05/03/1966	52921	DISSOLVED SILICA	18
05/03/1966	52921	DISSOLVED SULFATE SO4 mg/L	10

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05/03/1966	52921	DISSOLVED HARDNESS CaCO3 mg/L	100
05/03/1966	52921	DISSOLVED TOTAL ALKALINITY	92
05/03/1966	52921	SPECIFIC CONDUCTANCE 25C	209
05/03/1966	52921	DISSOLVED SOLIDS mg/L at 180C	128
05/03/1966	52921	MINERAL TURBIDITY HELLIGE	1
06/03/1966	53268	DISSOLVED BORON	0
06/03/1966	53268	DISSOLVED CHLORIDE	4.4
06/03/1966	53268	LAB pH	8.2
06/03/1966	53268	DISSOLVED SODIUM	6.1
06/03/1966	53268	DISSOLVED HARDNESS CaCO3 mg/L	97
06/03/1966	53268	DISSOLVED TOTAL ALKALINITY	95
06/03/1966	53268	SPECIFIC CONDUCTANCE 25C	223
06/03/1966	53268	DISSOLVED SOLIDS mg/L at 180C	0
06/03/1966	53268	MINERAL TURBIDITY HELLIGE	1
07/07/1966	53448	DISSOLVED BORON	0
07/07/1966	53448	DISSOLVED CHLORIDE	8.8
07/07/1966	53448	LAB pH	8.6
07/07/1966	53448	DISSOLVED SODIUM	8.9
07/07/1966	53448	DISSOLVED HARDNESS CaCO3 mg/L	132
07/07/1966	53448	DISSOLVED TOTAL ALKALINITY	131
07/07/1966	53448	SPECIFIC CONDUCTANCE 25C	278
07/07/1966	53448	DISSOLVED SOLIDS mg/L at 180C	0
07/07/1966	53448	MINERAL TURBIDITY HELLIGE	1
09/02/1966	54020	DISSOLVED ORTHOPHOSPHATE as P	0.01
09/02/1966	54020	As mg/L D	0
09/02/1966	54020	METHYLENE BLUE ACTIVE SUBSTANC	0
09/02/1966	54020	DISSOLVED BORON	0
09/02/1966	54020	DISSOLVED CALCIUM	29
09/02/1966	54020	DISSOLVED CHLORIDE	15
09/02/1966	54020	DISSOLVED POTASSIUM	1.3
09/02/1966	54020	LAB pH	8.2
09/02/1966	54020	DISSOLVED MAGNESIUM	17
09/02/1966	54020	DISSOLVED SODIUM	11
09/02/1966	54020	DISSOLVED NITRATE NO3 mg/L	0.6
09/02/1966	54020	DISSOLVED SILICA	20
09/02/1966	54020	DISSOLVED SULFATE SO4 mg/L	9
09/02/1966	54020	DISSOLVED HARDNESS CaCO3 mg/L	142
09/02/1966	54020	DISSOLVED TOTAL ALKALINITY	138
09/02/1966	54020	SPECIFIC CONDUCTANCE 25C	312
09/02/1966	54020	DISSOLVED SOLIDS mg/L at 180C	189
09/02/1966	54020	MINERAL TURBIDITY HELLIGE	1
11/02/1966	54371	DISSOLVED BORON	0
11/02/1966	54371	DISSOLVED CALCIUM	31
11/02/1966	54371	DISSOLVED CHLORIDE	22
11/02/1966	54371	DISSOLVED POTASSIUM	1.3
11/02/1966	54371	LAB pH	8.5
11/02/1966	54371	DISSOLVED MAGNESIUM	20
11/02/1966	54371	DISSOLVED SODIUM	13
11/02/1966	54371	DISSOLVED HARDNESS CaCO3 mg/L	160
11/02/1966	54371	DISSOLVED TOTAL ALKALINITY	146
11/02/1966	54371	SPECIFIC CONDUCTANCE 25C	363

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

11/02/1966	54371	DISSOLVED SOLIDS mg/L at 180C	0
11/02/1966	54371	MINERAL TURBIDITY HELLIGE	2
01/03/1967	54732	DISSOLVED BORON	0
01/03/1967	54732	DISSOLVED CALCIUM	20
01/03/1967	54732	DISSOLVED CHLORIDE	5.3
01/03/1967	54732	DISSOLVED POTASSIUM	0.8
01/03/1967	54732	LAB pH	8.4
01/03/1967	54732	DISSOLVED MAGNESIUM	12
01/03/1967	54732	DISSOLVED SODIUM	6.5
01/03/1967	54732	DISSOLVED HARDNESS CaCO3 mg/L	100
01/03/1967	54732	DISSOLVED TOTAL ALKALINITY	95
01/03/1967	54732	SPECIFIC CONDUCTANCE 25C	217
01/03/1967	54732	DISSOLVED SOLIDS mg/L at 180C	0
01/03/1967	54732	MINERAL TURBIDITY HELLIGE	4
03/06/1967	55192	DISSOLVED BORON	0
03/06/1967	55192	DISSOLVED CALCIUM	21
03/06/1967	55192	DISSOLVED CHLORIDE	3.1
03/06/1967	55192	DISSOLVED POTASSIUM	0.8
03/06/1967	55192	LAB pH	8.4
03/06/1967	55192	DISSOLVED MAGNESIUM	12
03/06/1967	55192	DISSOLVED SODIUM	5.8
03/06/1967	55192	DISSOLVED HARDNESS CaCO3 mg/L	102
03/06/1967	55192	DISSOLVED TOTAL ALKALINITY	97
03/06/1967	55192	SPECIFIC CONDUCTANCE 25C	212
03/06/1967	55192	DISSOLVED SOLIDS mg/L at 180C	0
03/06/1967	55192	MINERAL TURBIDITY HELLIGE	4
05/04/1967	55510	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/04/1967	55510	As mg/L D	0
05/04/1967	55510	METHYLENE BLUE ACTIVE SUBSTANC	0
05/04/1967	55510	DISSOLVED SOLIDS mg/L at 180C	134
05/04/1967	55510	MINERAL TURBIDITY HELLIGE	10
05/04/1967	55510	DISSOLVED BORON	0
05/04/1967	55510	DISSOLVED CALCIUM	22
05/04/1967	55510	DISSOLVED CHLORIDE	1.5
05/04/1967	55510	DISSOLVED POTASSIUM	0.8
05/04/1967	55510	LAB pH	8.2
05/04/1967	55510	DISSOLVED MAGNESIUM	11
05/04/1967	55510	DISSOLVED SODIUM	5.8
05/04/1967	55510	DISSOLVED NITRATE NO3 mg/L	0.9
05/04/1967	55510	DISSOLVED SILICA	18
05/04/1967	55510	DISSOLVED SULFATE SO4 mg/L	11
05/04/1967	55510	DISSOLVED HARDNESS CaCO3 mg/L	100
05/04/1967	55510	DISSOLVED TOTAL ALKALINITY	98
05/04/1967	55510	SPECIFIC CONDUCTANCE 25C	211
07/05/1967	48160	DISSOLVED BORON	0
07/05/1967	48160	DISSOLVED CHLORIDE	4.1
07/05/1967	48160	LAB pH	8.4
07/05/1967	48160	DISSOLVED SODIUM	5.9
07/05/1967	48160	DISSOLVED HARDNESS CaCO3 mg/L	102
07/05/1967	48160	DISSOLVED TOTAL ALKALINITY	97
07/05/1967	48160	SPECIFIC CONDUCTANCE 25C	213

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

07/05/1967	48160	DISSOLVED SOLIDS mg/L at 180C	0
07/05/1967	48160	MINERAL TURBIDITY HELLIGE	2
09/06/1967		DISSOLVED BORON	0.1
09/06/1967		DISSOLVED CALCIUM	27
09/06/1967		DISSOLVED CHLORIDE	12
09/06/1967		DISSOLVED POTASSIUM	1.4
09/06/1967		LAB pH	8.1
09/06/1967		DISSOLVED MAGNESIUM	16
09/06/1967		DISSOLVED SODIUM	9.8
09/06/1967		DISSOLVED NITRATE NO3 mg/L	0.5
09/06/1967		DISSOLVED SULFATE SO4 mg/L	9.5
09/06/1967		DISSOLVED HARDNESS CaCO3 mg/L	134
09/06/1967		DISSOLVED TOTAL ALKALINITY	128
09/06/1967		SPECIFIC CONDUCTANCE 25C	296
09/06/1967		DISSOLVED SOLIDS mg/L at 180C	160
11/02/1967	50958	DISSOLVED BORON	0
11/02/1967	50958	LAB pH	8.2
11/02/1967	50958	DISSOLVED CHLORIDE	13
11/02/1967	50958	DISSOLVED HARDNESS CaCO3 mg/L	126
11/02/1967	50958	DISSOLVED TOTAL ALKALINITY	118
11/02/1967	50958	SPECIFIC CONDUCTANCE 25C	282
11/02/1967	50958	DISSOLVED SODIUM	10
11/02/1967	50958	DISSOLVED SOLIDS mg/L at 180C	0
11/02/1967	50958	MINERAL TURBIDITY HELLIGE	2
01/17/1968	51363	DISSOLVED BORON	0
01/17/1968	51363	DISSOLVED CHLORIDE	2.9
01/17/1968	51363	LAB pH	8
01/17/1968	51363	DISSOLVED SODIUM	6
01/17/1968	51363	DISSOLVED HARDNESS CaCO3 mg/L	101
01/17/1968	51363	DISSOLVED TOTAL ALKALINITY	89
01/17/1968	51363	SPECIFIC CONDUCTANCE 25C	219
01/17/1968	51363	DISSOLVED SOLIDS mg/L at 180C	0
01/17/1968	51363	MINERAL TURBIDITY HELLIGE	80
03/06/1968	51922	DISSOLVED BORON	0
03/06/1968	51922	DISSOLVED CHLORIDE	3.2
03/06/1968	51922	LAB pH	8.3
03/06/1968	51922	DISSOLVED SODIUM	5.5
03/06/1968	51922	DISSOLVED HARDNESS CaCO3 mg/L	107
03/06/1968	51922	DISSOLVED TOTAL ALKALINITY	99
03/06/1968	51922	SPECIFIC CONDUCTANCE 25C	233
03/06/1968	51922	DISSOLVED SOLIDS mg/L at 180C	0
03/06/1968	51922	MINERAL TURBIDITY HELLIGE	20
05/01/1968	52714	DISSOLVED BORON	0
05/01/1968	52714	DISSOLVED CHLORIDE	5
05/01/1968	52714	DISSOLVED POTASSIUM	0.4
05/01/1968	52714	LAB pH	8.4
05/01/1968	52714	DISSOLVED SODIUM	7.3
05/01/1968	52714	DISSOLVED NITRATE NO3 mg/L	0.8
05/01/1968	52714	DISSOLVED SULFATE SO4 mg/L	8.6
05/01/1968	52714	DISSOLVED CALCIUM	22
05/01/1968	52714	DISSOLVED HARDNESS CaCO3 mg/L	114

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/01/1968	52714	DISSOLVED TOTAL ALKALINITY	109
05/01/1968	52714	SPECIFIC CONDUCTANCE 25C	246
05/01/1968	52714	DISSOLVED MAGNESIUM	14
05/01/1968	52714	DISSOLVED SOLIDS mg/L at 180C	135
05/01/1968	52714	MINERAL TURBIDITY HELLIGE	1
07/05/1968	54182	DISSOLVED BORON	0
07/05/1968	54182	LAB pH	8.7
07/05/1968	54182	DISSOLVED SODIUM	9.2
07/05/1968	54182	DISSOLVED CHLORIDE	11
07/05/1968	54182	DISSOLVED HARDNESS CaCO3 mg/L	148
07/05/1968	54182	DISSOLVED TOTAL ALKALINITY	130
07/05/1968	54182	SPECIFIC CONDUCTANCE 25C	318
07/05/1968	54182	DISSOLVED SOLIDS mg/L at 180C	0
07/05/1968	54182	MINERAL TURBIDITY HELLIGE	3
09/06/1968	55321	DISSOLVED BORON	0
09/06/1968	55321	DISSOLVED POTASSIUM	1.6
09/06/1968	55321	LAB pH	8.1
09/06/1968	55321	DISSOLVED NITRATE NO3 mg/L	0.1
09/06/1968	55321	DISSOLVED CALCIUM	32
09/06/1968	55321	DISSOLVED CHLORIDE	19
09/06/1968	55321	DISSOLVED HARDNESS CaCO3 mg/L	161
09/06/1968	55321	DISSOLVED TOTAL ALKALINITY	151
09/06/1968	55321	SPECIFIC CONDUCTANCE 25C	384
09/06/1968	55321	DISSOLVED MAGNESIUM	20
09/06/1968	55321	DISSOLVED SODIUM	12
09/06/1968	55321	DISSOLVED SULFATE SO4 mg/L	13
09/06/1968	55321	DISSOLVED SOLIDS mg/L at 180C	205
09/06/1968	55321	MINERAL TURBIDITY HELLIGE	2
11/06/1968	56970	DISSOLVED BORON	0
11/06/1968	56970	LAB pH	8.4
11/06/1968	56970	DISSOLVED CHLORIDE	20
11/06/1968	56970	DISSOLVED HARDNESS CaCO3 mg/L	142
11/06/1968	56970	DISSOLVED TOTAL ALKALINITY	117
11/06/1968	56970	SPECIFIC CONDUCTANCE 25C	313
11/06/1968	56970	DISSOLVED SODIUM	14
11/06/1968	56970	DISSOLVED SOLIDS mg/L at 180C	0
11/06/1968	56970	MINERAL TURBIDITY HELLIGE	7
01/06/1969	57544	DISSOLVED BORON	0
01/06/1969	57544	DISSOLVED CHLORIDE	3
01/06/1969	57544	LAB pH	8.2
01/06/1969	57544	DISSOLVED SODIUM	7.6
01/06/1969	57544	DISSOLVED HARDNESS CaCO3 mg/L	101
01/06/1969	57544	DISSOLVED TOTAL ALKALINITY	86
01/06/1969	57544	SPECIFIC CONDUCTANCE 25C	209
01/06/1969	57544	DISSOLVED SOLIDS mg/L at 180C	0
01/06/1969	57544	MINERAL TURBIDITY HELLIGE	180
03/04/1969	58168	DISSOLVED BORON	0
03/04/1969	58168	DISSOLVED CHLORIDE	2.3
03/04/1969	58168	LAB pH	8.3
03/04/1969	58168	DISSOLVED SODIUM	6.8
03/04/1969	58168	DISSOLVED HARDNESS CaCO3 mg/L	109

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/04/1969	58168	DISSOLVED TOTAL ALKALINITY	96
03/04/1969	58168	SPECIFIC CONDUCTANCE 25C	230
03/04/1969	58168	DISSOLVED SOLIDS mg/L at 180C	0
03/04/1969	58168	MINERAL TURBIDITY HELLIGE	45
05/02/1969	58779	DISSOLVED BORON	0
05/02/1969	58779	DISSOLVED CHLORIDE	2
05/02/1969	58779	DISSOLVED POTASSIUM	0.5
05/02/1969	58779	LAB pH	7.9
05/02/1969	58779	DISSOLVED SODIUM	3.2
05/02/1969	58779	DISSOLVED NITRATE NO3 mg/L	0.1
05/02/1969	58779	DISSOLVED SULFATE SO4 mg/L	4.9
05/02/1969	58779	DISSOLVED CALCIUM	12
05/02/1969	58779	DISSOLVED HARDNESS CaCO3 mg/L	73
05/02/1969	58779	DISSOLVED TOTAL ALKALINITY	71
05/02/1969	58779	SPECIFIC CONDUCTANCE 25C	156
05/02/1969	58779	DISSOLVED MAGNESIUM	10
05/02/1969	58779	DISSOLVED SOLIDS mg/L at 180C	94
05/02/1969	58779	MINERAL TURBIDITY HELLIGE	6
07/02/1969	59648	DISSOLVED BORON	0
07/02/1969	59648	DISSOLVED CHLORIDE	4.8
07/02/1969	59648	LAB pH	8.3
07/02/1969	59648	DISSOLVED SODIUM	6.2
07/02/1969	59648	DISSOLVED HARDNESS CaCO3 mg/L	114
07/02/1969	59648	DISSOLVED TOTAL ALKALINITY	111
07/02/1969	59648	SPECIFIC CONDUCTANCE 25C	233
07/02/1969	59648	DISSOLVED SOLIDS mg/L at 180C	0
07/02/1969	59648	MINERAL TURBIDITY HELLIGE	6
09/03/1969	60724	DISSOLVED BORON	0
09/03/1969	60724	DISSOLVED POTASSIUM	0.5
09/03/1969	60724	LAB pH	8
09/03/1969	60724	DISSOLVED SODIUM	8.6
09/03/1969	60724	DISSOLVED NITRATE NO3 mg/L	0.1
09/03/1969	60724	DISSOLVED SULFATE SO4 mg/L	6.6
09/03/1969	60724	DISSOLVED CALCIUM	27
09/03/1969	60724	DISSOLVED CHLORIDE	11
09/03/1969	60724	DISSOLVED HARDNESS CaCO3 mg/L	135
09/03/1969	60724	DISSOLVED TOTAL ALKALINITY	128
09/03/1969	60724	SPECIFIC CONDUCTANCE 25C	283
09/03/1969	60724	DISSOLVED MAGNESIUM	16
09/03/1969	60724	DISSOLVED SOLIDS mg/L at 180C	158
09/03/1969	60724	MINERAL TURBIDITY HELLIGE	4
11/13/1969	62111	DISSOLVED BORON	0.1
11/13/1969	62111	LAB pH	7.7
11/13/1969	62111	DISSOLVED CHLORIDE	16
11/13/1969	62111	DISSOLVED HARDNESS CaCO3 mg/L	141
11/13/1969	62111	DISSOLVED TOTAL ALKALINITY	130
11/13/1969	62111	SPECIFIC CONDUCTANCE 25C	314
11/13/1969	62111	DISSOLVED SODIUM	10
11/13/1969	62111	DISSOLVED SOLIDS mg/L at 180C	0
11/13/1969	62111	MINERAL TURBIDITY HELLIGE	2
01/07/1970	62885	DISSOLVED BORON	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/07/1970	62885	DISSOLVED CHLORIDE	7.1
01/07/1970	62885	LAB pH	7.8
01/07/1970	62885	DISSOLVED SODIUM	7.1
01/07/1970	62885	DISSOLVED HARDNESS CaCO3 mg/L	109
01/07/1970	62885	DISSOLVED TOTAL ALKALINITY	99
01/07/1970	62885	SPECIFIC CONDUCTANCE 25C	239
01/07/1970	62885	DISSOLVED SOLIDS mg/L at 180C	0
01/07/1970	62885	MINERAL TURBIDITY HELLIGE	4
03/05/1970	63538	DISSOLVED BORON	0.1
03/05/1970	63538	DISSOLVED CHLORIDE	2.8
03/05/1970	63538	LAB pH	7.8
03/05/1970	63538	DISSOLVED SODIUM	7.8
03/05/1970	63538	DISSOLVED HARDNESS CaCO3 mg/L	91
03/05/1970	63538	DISSOLVED TOTAL ALKALINITY	85
03/05/1970	63538	SPECIFIC CONDUCTANCE 25C	207
03/05/1970	63538	DISSOLVED SOLIDS mg/L at 180C	0
03/05/1970	63538	MINERAL TURBIDITY HELLIGE	90
05/07/1970	64356	DISSOLVED BORON	0
05/07/1970	64356	DISSOLVED CHLORIDE	3.4
05/07/1970	64356	DISSOLVED POTASSIUM	0.9
05/07/1970	64356	LAB pH	8.1
05/07/1970	64356	DISSOLVED SODIUM	7.6
05/07/1970	64356	DISSOLVED NITRATE NO3 mg/L	0
05/07/1970	64356	DISSOLVED CALCIUM	24
05/07/1970	64356	DISSOLVED HARDNESS CaCO3 mg/L	111
05/07/1970	64356	DISSOLVED TOTAL ALKALINITY	109
05/07/1970	64356	SPECIFIC CONDUCTANCE 25C	240
05/07/1970	64356	DISSOLVED MAGNESIUM	12
05/07/1970	64356	DISSOLVED SULFATE SO4 mg/L	13
05/07/1970	64356	DISSOLVED SOLIDS mg/L at 180C	130
05/07/1970	64356	MINERAL TURBIDITY HELLIGE	1
07/03/1970	65350	DISSOLVED BORON	0
07/03/1970	65350	DISSOLVED CHLORIDE	7
07/03/1970	65350	LAB pH	8.2
07/03/1970	65350	DISSOLVED SODIUM	8.7
07/03/1970	65350	DISSOLVED HARDNESS CaCO3 mg/L	123
07/03/1970	65350	DISSOLVED TOTAL ALKALINITY	121
07/03/1970	65350	SPECIFIC CONDUCTANCE 25C	272
07/03/1970	65350	DISSOLVED SOLIDS mg/L at 180C	0
07/03/1970	65350	MINERAL TURBIDITY HELLIGE	1
09/03/1970	66215	DISSOLVED BORON	0.1
09/03/1970	66215	LAB pH	8.3
09/03/1970	66215	DISSOLVED CHLORIDE	15
09/03/1970	66215	DISSOLVED HARDNESS CaCO3 mg/L	165
09/03/1970	66215	DISSOLVED TOTAL ALKALINITY	154
09/03/1970	66215	SPECIFIC CONDUCTANCE 25C	345
09/03/1970	66215	DISSOLVED SODIUM	10
09/03/1970	66215	DISSOLVED SOLIDS mg/L at 180C	0
09/03/1970	66215	MINERAL TURBIDITY HELLIGE	2
11/12/1970	67393	DISSOLVED BORON	0
11/12/1970	67393	DISSOLVED POTASSIUM	1.6

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11/12/1970	67393	LAB pH	8.3
11/12/1970	67393	DISSOLVED NITRATE NO3 mg/L	3
11/12/1970	67393	DISSOLVED CALCIUM	26
11/12/1970	67393	DISSOLVED CHLORIDE	12
11/12/1970	67393	DISSOLVED HARDNESS CaCO3 mg/L	128
11/12/1970	67393	DISSOLVED TOTAL ALKALINITY	101
11/12/1970	67393	SPECIFIC CONDUCTANCE 25C	289
11/12/1970	67393	DISSOLVED MAGNESIUM	15
11/12/1970	67393	DISSOLVED SODIUM	11
11/12/1970	67393	DISSOLVED SULFATE SO4 mg/L	26
11/12/1970	67393	DISSOLVED SOLIDS, invalid temp	162
11/12/1970	67393	MINERAL TURBIDITY HELLIGE	70
01/18/1971	68111	DISSOLVED BORON	0.1
01/18/1971	68111	DISSOLVED CHLORIDE	1.5
01/18/1971	68111	LAB pH	8
01/18/1971	68111	DISSOLVED SODIUM	3
01/18/1971	68111	DISSOLVED HARDNESS CaCO3 mg/L	72
01/18/1971	68111	DISSOLVED TOTAL ALKALINITY	68
01/18/1971	68111	SPECIFIC CONDUCTANCE 25C	153
01/18/1971	68111	MINERAL TURBIDITY HELLIGE	380
03/09/1971	68848	DISSOLVED BORON	0.1
03/09/1971	68848	DISSOLVED CHLORIDE	5.1
03/09/1971	68848	LAB pH	8.1
03/09/1971	68848	DISSOLVED SODIUM	6
03/09/1971	68848	DISSOLVED HARDNESS CaCO3 mg/L	97
03/09/1971	68848	DISSOLVED TOTAL ALKALINITY	92
03/09/1971	68848	SPECIFIC CONDUCTANCE 25C	213
03/09/1971	68848	MINERAL TURBIDITY HELLIGE	4
05/24/1971	70121	DISSOLVED BORON	0
05/24/1971	70121	DISSOLVED CHLORIDE	3.4
05/24/1971	70121	DISSOLVED POTASSIUM	0.9
05/24/1971	70121	LAB pH	8.2
05/24/1971	70121	DISSOLVED SODIUM	5.3
05/24/1971	70121	DISSOLVED NITRATE NO3 mg/L	0
05/24/1971	70121	DISSOLVED SULFATE SO4 mg/L	9.6
05/24/1971	70121	DISSOLVED CALCIUM	20
05/24/1971	70121	DISSOLVED HARDNESS CaCO3 mg/L	100
05/24/1971	70121	DISSOLVED TOTAL ALKALINITY	94
05/24/1971	70121	SPECIFIC CONDUCTANCE 25C	213
05/24/1971	70121	DISSOLVED MAGNESIUM	12
05/24/1971	70121	DISSOLVED SOLIDS, invalid temp	108
05/24/1971	70121	MINERAL TURBIDITY HELLIGE	1
07/14/1971	70812	DISSOLVED BORON	0
07/14/1971	70812	DISSOLVED CHLORIDE	7.3
07/14/1971	70812	LAB pH	7.7
07/14/1971	70812	DISSOLVED SODIUM	7.2
07/14/1971	70812	DISSOLVED HARDNESS CaCO3 mg/L	130
07/14/1971	70812	DISSOLVED TOTAL ALKALINITY	119
07/14/1971	70812	SPECIFIC CONDUCTANCE 25C	263
07/14/1971	70812	MINERAL TURBIDITY HELLIGE	1
09/27/1971	71885	DISSOLVED BORON	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/27/1971	71885	LAB pH	7.6
09/27/1971	71885	DISSOLVED CHLORIDE	15
09/27/1971	71885	DISSOLVED HARDNESS CaCO3 mg/L	157
09/27/1971	71885	DISSOLVED TOTAL ALKALINITY	139
09/27/1971	71885	SPECIFIC CONDUCTANCE 25C	322
09/27/1971	71885	DISSOLVED SODIUM	10
09/27/1971	71885	MINERAL TURBIDITY HELLIGE	2
11/22/1971	72741	DISSOLVED BORON	0
11/22/1971	72741	DISSOLVED POTASSIUM	2.1
11/22/1971	72741	LAB pH	7.9
11/22/1971	72741	DISSOLVED SODIUM	9.7
11/22/1971	72741	DISSOLVED NITRATE NO3 mg/L	0
11/22/1971	72741	DISSOLVED SULFATE SO4 mg/L	7.9
11/22/1971	72741	DISSOLVED CALCIUM	24
11/22/1971	72741	DISSOLVED CHLORIDE	11
11/22/1971	72741	DISSOLVED HARDNESS CaCO3 mg/L	111
11/22/1971	72741	DISSOLVED TOTAL ALKALINITY	106
11/22/1971	72741	SPECIFIC CONDUCTANCE 25C	259
11/22/1971	72741	DISSOLVED MAGNESIUM	12
11/22/1971	72741	DISSOLVED SOLIDS, invalid temp	152
01/06/1972	73104	DISSOLVED BORON	0
01/06/1972	73104	LAB pH	7.9
01/06/1972	73104	DISSOLVED CHLORIDE	10
01/06/1972	73104	DISSOLVED HARDNESS CaCO3 mg/L	125
01/06/1972	73104	DISSOLVED TOTAL ALKALINITY	107
01/06/1972	73104	SPECIFIC CONDUCTANCE 25C	282
01/06/1972	73104	DISSOLVED SODIUM	11
01/06/1972	73104	MINERAL TURBIDITY HELLIGE	2
03/02/1972	128F	MINERAL TURBIDITY HACH	80
05/08/1972	129F	MINERAL TURBIDITY HACH	0
07/21/1972	130F	MINERAL TURBIDITY HACH	11
09/22/1972	131F	MINERAL TURBIDITY HACH	1
11/24/1972	922B	MINERAL TURBIDITY HACH	7
01/05/1973	923B	MINERAL TURBIDITY HACH	2
03/23/1973	924B	MINERAL TURBIDITY HACH	21
05/18/1973	925B	DISSOLVED BORON	0
05/18/1973	925B	DISSOLVED CHLORIDE	2.4
05/18/1973	925B	LAB pH	7.5
05/18/1973	925B	DISSOLVED SODIUM	4.2
05/18/1973	925B	DISSOLVED HARDNESS CaCO3 mg/L	78
05/18/1973	925B	DISSOLVED TOTAL ALKALINITY	80
05/18/1973	925B	SPECIFIC CONDUCTANCE 25C	171
05/18/1973	925B	MINERAL TURBIDITY HACH	1
07/17/1973	926B	MINERAL TURBIDITY HACH	1
09/20/1973	927B	MINERAL TURBIDITY HACH	1
11/12/1973	233B	DISSOLVED BORON	0
11/12/1973	233B	DISSOLVED CHLORIDE	2.8
11/12/1973	233B	DISSOLVED POTASSIUM	1
11/12/1973	233B	LAB pH	8
11/12/1973	233B	DISSOLVED MAGNESIUM	8
11/12/1973	233B	DISSOLVED SODIUM	3.4

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11/12/1973	233B	DISSOLVED NITRATE NO3 mg/L	2.2
11/12/1973	233B	DISSOLVED CALCIUM	16
11/12/1973	233B	DISSOLVED HARDNESS CaCO3 mg/L	73
11/12/1973	233B	DISSOLVED TOTAL ALKALINITY	65
11/12/1973	233B	SPECIFIC CONDUCTANCE 25C	163
11/12/1973	233B	DISSOLVED SULFATE SO4 mg/L	10
11/12/1973	233B	DISSOLVED SOLIDS mg/L at 180C	106
11/12/1973	233B	MINERAL TURBIDITY HACH	130

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

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Water Quality Data Results

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Below are the water quality for station A0356500, COTTONWOOD C DF OF SF NR CTNWOOD.

Date	Sample Number	Constituent/Analyte	Result*
01/21/1964	45698	DISSOLVED BORON	0.3
01/21/1964	45698	LAB pH	8.2
01/21/1964	45698	DISSOLVED CHLORIDE	16
01/21/1964	45698	DISSOLVED HARDNESS CaCO3 mg/L	107
01/21/1964	45698	DISSOLVED TOTAL ALKALINITY	98
01/21/1964	45698	SPECIFIC CONDUCTANCE 25C	280
01/21/1964	45698	DISSOLVED SODIUM	15
01/21/1964	45698	MINERAL TURBIDITY HELLIGE	290
12/23/1964	48572	DISSOLVED TOTAL PHOSPHORUS	0.03
12/23/1964	48572	DISSOLVED BORON	0.1
12/23/1964	48572	DISSOLVED CHLORIDE	2.3
12/23/1964	48572	DISSOLVED FLUORIDE	0.1
12/23/1964	48572	DISSOLVED POTASSIUM	1.8
12/23/1964	48572	LAB pH	7.8
12/23/1964	48572	DISSOLVED MAGNESIUM	6.7
12/23/1964	48572	DISSOLVED SODIUM	5.7
12/23/1964	48572	DISSOLVED NITRATE NO3 mg/L	2.4
12/23/1964	48572	DISSOLVED CALCIUM	21
12/23/1964	48572	DISSOLVED HARDNESS CaCO3 mg/L	80
12/23/1964	48572	DISSOLVED TOTAL ALKALINITY	78
12/23/1964	48572	SPECIFIC CONDUCTANCE 25C	182
12/23/1964	48572	DISSOLVED SILICA	17
12/23/1964	48572	DISSOLVED SULFATE SO4 mg/L	11
12/23/1964	48572	DISSOLVED SOLIDS, invalid temp	115
12/23/1964	48572	MINERAL TURBIDITY HELLIGE	1600
01/03/1977	BP57	MINERAL TURBIDITY HACH	219
01/10/1978	BP58	MINERAL TURBIDITY HACH	270
01/14/1980	NS0037	DISSOLVED AMMONIA as N	0.01
01/14/1980	NS0037	DISSOLVED ORTHOPHOSPHATE as P	0.03
01/14/1980	NS0037	DISSOLVED NITRATE AND NITRITE	0.24
01/14/1980	NS0037	TOTAL PHOSPHORUS as P	0.49
01/14/1980	NS0037	TOTAL AMMONIA & ORGANIC NITROG	0.8
01/14/1980	NS0037	DISSOLVED BORON	0
01/14/1980	NS0037	DISSOLVED POTASSIUM	1
01/14/1980	NS0037	LAB pH	8.1
01/14/1980	NS0037	DISSOLVED CALCIUM	20
01/14/1980	NS0037	DISSOLVED CHLORIDE	4
01/14/1980	NS0037	DISSOLVED HARDNESS CaCO3 mg/L	95
01/14/1980	NS0037	DISSOLVED TOTAL ALKALINITY	91
01/14/1980	NS0037	SPECIFIC CONDUCTANCE 25C	234

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

A0356500, COTTONWOOD C DF OF SF NR CTNWOOD

01/14/1980	NS0037	DISSOLVED MAGNESIUM	11
01/14/1980	NS0037	DISSOLVED SODIUM	10
01/14/1980	NS0037	MINERAL TURBIDITY HACH	320
02/22/1980	NS0134	DISSOLVED ORTHOPHOSPHATE as P	0.02
02/22/1980	NS0134	DISSOLVED NITRATE AND NITRITE	0.32
02/22/1980	NS0134	TOTAL PHOSPHORUS as P	0.22
02/22/1980	NS0134	TOTAL AMMONIA & ORGANIC NITROG	0.9
02/22/1980	NS0134	DISSOLVED BORON	0.1
02/22/1980	NS0134	DISSOLVED POTASSIUM	1.2
02/22/1980	NS0134	LAB pH	8.3
02/22/1980	NS0134	DISSOLVED CALCIUM	32
02/22/1980	NS0134	DISSOLVED CHLORIDE	5
02/22/1980	NS0134	DISSOLVED HARDNESS CaCO3 mg/L	146
02/22/1980	NS0134	DISSOLVED TOTAL ALKALINITY	135
02/22/1980	NS0134	SPECIFIC CONDUCTANCE 25C	344
02/22/1980	NS0134	DISSOLVED MAGNESIUM	16
02/22/1980	NS0134	DISSOLVED SODIUM	15
02/22/1980	NS0134	MINERAL TURBIDITY HACH	140
01/27/1981	N00611	DISSOLVED ORTHOPHOSPHATE as P	0.07
01/27/1981	N00611	DISSOLVED NITRATE AND NITRITE	0.2
01/27/1981	N00611	TOTAL AMMONIA & ORGANIC NITROG	1.3
01/27/1981	N00611	DISSOLVED BORON	0.1
01/27/1981	N00611	DISSOLVED POTASSIUM	1.1
01/27/1981	N00611	LAB pH	7.7
01/27/1981	N00611	DISSOLVED CALCIUM	12
01/27/1981	N00611	DISSOLVED CHLORIDE	5
01/27/1981	N00611	DISSOLVED HARDNESS CaCO3 mg/L	54
01/27/1981	N00611	DISSOLVED TOTAL ALKALINITY	49
01/27/1981	N00611	SPECIFIC CONDUCTANCE 25C	146
01/27/1981	N00611	DISSOLVED MAGNESIUM	6
01/27/1981	N00611	DISSOLVED SODIUM	7
01/27/1981	N00611	MINERAL TURBIDITY HACH	600
12/22/1982	FEN11	MINERAL TURBIDITY HACH	281
03/03/1983	N02705	DISSOLVED ORTHOPHOSPHATE as P	0.01
03/03/1983	N02705	DISSOLVED NITRATE AND NITRITE	0.18
03/03/1983	N02705	TOTAL AMMONIA & ORGANIC NITROG	3.8
03/03/1983	N02705	TOTAL PHOSPHORUS as P	1.4
03/03/1983	N02705	NUTRIENT TURBIDITY HACH	3163
03/03/1983	N02705	DISSOLVED BORON	0.1
03/03/1983	N02705	DISSOLVED POTASSIUM	1.4
03/03/1983	N02705	LAB pH	7.8
03/03/1983	N02705	DISSOLVED CALCIUM	22
03/03/1983	N02705	DISSOLVED CHLORIDE	2
03/03/1983	N02705	DISSOLVED HARDNESS CaCO3 mg/L	92
03/03/1983	N02705	DISSOLVED TOTAL ALKALINITY	83
03/03/1983	N02705	SPECIFIC CONDUCTANCE 25C	213
03/03/1983	N02705	DISSOLVED MAGNESIUM	9
03/03/1983	N02705	DISSOLVED SODIUM	9
03/03/1983	N02705	MINERAL TURBIDITY HACH	3163
02/14/1986	L246	MINERAL TURBIDITY HACH	720

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Water Quality Data Results

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Below are the water quality for station A0358100, COTTONWOOD C MF NR GAS PT.

Date	Sample Number	Constituent/Analyte	Result*
05/21/1974	234B	DISSOLVED BORON	0.1
05/21/1974	234B	DISSOLVED CALCIUM	27
05/21/1974	234B	DISSOLVED CHLORIDE	4.2
05/21/1974	234B	DISSOLVED HARDNESS CaCO3 mg/L	130
05/21/1974	234B	DISSOLVED MAGNESIUM	15
05/21/1974	234B	DISSOLVED NITRATE NO3 mg/L	0
05/21/1974	234B	DISSOLVED POTASSIUM	1
05/21/1974	234B	DISSOLVED SODIUM	6.3
05/21/1974	234B	DISSOLVED SOLIDS mg/L at 180C	142
05/21/1974	234B	DISSOLVED SULFATE SO4 mg/L	12
05/21/1974	234B	DISSOLVED TOTAL ALKALINITY	125
05/21/1974	234B	LAB pH	8.3
05/21/1974	234B	MINERAL TURBIDITY HACH	0
05/21/1974	234B	SPECIFIC CONDUCTANCE 25C	264
07/16/1974	235B	DISSOLVED BORON	0
07/16/1974	235B	DISSOLVED CHLORIDE	6.9
07/16/1974	235B	DISSOLVED HARDNESS CaCO3 mg/L	138
07/16/1974	235B	DISSOLVED SODIUM	6.9
07/16/1974	235B	DISSOLVED TOTAL ALKALINITY	130
07/16/1974	235B	LAB pH	8.3
07/16/1974	235B	MINERAL TURBIDITY HACH	0
07/16/1974	235B	SPECIFIC CONDUCTANCE 25C	278
09/23/1974	236B	DISSOLVED BORON	0
09/23/1974	236B	DISSOLVED CHLORIDE	17
09/23/1974	236B	DISSOLVED HARDNESS CaCO3 mg/L	156
09/23/1974	236B	DISSOLVED SODIUM	13
09/23/1974	236B	DISSOLVED TOTAL ALKALINITY	144
09/23/1974	236B	LAB pH	8.3
09/23/1974	236B	MINERAL TURBIDITY HACH	0
09/23/1974	236B	SPECIFIC CONDUCTANCE 25C	353
11/14/1974	88249	DISSOLVED BORON	0
11/14/1974	88249	DISSOLVED CHLORIDE	16
11/14/1974	88249	DISSOLVED HARDNESS CaCO3 mg/L	165
11/14/1974	88249	DISSOLVED SODIUM	13
11/14/1974	88249	DISSOLVED TOTAL ALKALINITY	151
11/14/1974	88249	LAB pH	8.3
11/14/1974	88249	MINERAL TURBIDITY HACH	0
11/14/1974	88249	SPECIFIC CONDUCTANCE 25C	372
01/15/1975	89090	DISSOLVED BORON	0.1
01/15/1975	89090	DISSOLVED CHLORIDE	8
01/15/1975	89090	DISSOLVED HARDNESS CaCO3 mg/L	143

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/15/1975	89090	DISSOLVED SODIUM	9.2
01/15/1975	89090	DISSOLVED TOTAL ALKALINITY	130
01/15/1975	89090	LAB pH	8.3
01/15/1975	89090	MINERAL TURBIDITY HACH	0
01/15/1975	89090	SPECIFIC CONDUCTANCE 25C	298
03/05/1975	89611	DISSOLVED BORON	0
03/05/1975	89611	DISSOLVED CHLORIDE	2.8
03/05/1975	89611	DISSOLVED HARDNESS CaCO3 mg/L	110
03/05/1975	89611	DISSOLVED SODIUM	4.8
03/05/1975	89611	DISSOLVED TOTAL ALKALINITY	104
03/05/1975	89611	LAB pH	7.9
03/05/1975	89611	MINERAL TURBIDITY HACH	15
03/05/1975	89611	SPECIFIC CONDUCTANCE 25C	216
05/19/1975	90651	DISSOLVED BORON	0
05/19/1975	90651	DISSOLVED CHLORIDE	1.5
05/19/1975	90651	DISSOLVED HARDNESS CaCO3 mg/L	88
05/19/1975	90651	DISSOLVED SODIUM	3.6
05/19/1975	90651	DISSOLVED TOTAL ALKALINITY	87
05/19/1975	90651	LAB pH	8.3
05/19/1975	90651	MINERAL TURBIDITY HACH	1
05/19/1975	90651	SPECIFIC CONDUCTANCE 25C	184
07/22/1975	176L	MINERAL TURBIDITY HACH	1
09/11/1975	93484	DISSOLVED BORON	0
09/11/1975	93484	DISSOLVED CHLORIDE	14
09/11/1975	93484	DISSOLVED HARDNESS CaCO3 mg/L	150
09/11/1975	93484	DISSOLVED SODIUM	12
09/11/1975	93484	DISSOLVED TOTAL ALKALINITY	142
09/11/1975	93484	LAB pH	8.4
09/11/1975	93484	MINERAL TURBIDITY HACH	0
09/11/1975	93484	SPECIFIC CONDUCTANCE 25C	318
11/17/1975	94162	DISSOLVED BORON	0
11/17/1975	94162	DISSOLVED CHLORIDE	8.4
11/17/1975	94162	DISSOLVED HARDNESS CaCO3 mg/L	125
11/17/1975	94162	DISSOLVED SODIUM	9
11/17/1975	94162	DISSOLVED TOTAL ALKALINITY	117
11/17/1975	94162	LAB pH	8.1
11/17/1975	94162	MINERAL TURBIDITY HACH	0
11/17/1975	94162	SPECIFIC CONDUCTANCE 25C	273
01/14/1976	83G	MINERAL TURBIDITY HACH	1
03/11/1976	95646	DISSOLVED BORON	0
03/11/1976	95646	DISSOLVED CHLORIDE	5.9
03/11/1976	95646	DISSOLVED HARDNESS CaCO3 mg/L	142
03/11/1976	95646	DISSOLVED SODIUM	7.6
03/11/1976	95646	DISSOLVED TOTAL ALKALINITY	139
03/11/1976	95646	LAB pH	8
03/11/1976	95646	MINERAL TURBIDITY HACH	0
03/11/1976	95646	SPECIFIC CONDUCTANCE 25C	289
05/20/1976	158S	MINERAL TURBIDITY HACH	1
07/23/1976	98036	DISSOLVED BORON	0
07/23/1976	98036	DISSOLVED CHLORIDE	17
07/23/1976	98036	DISSOLVED HARDNESS CaCO3 mg/L	163
07/23/1976	98036	DISSOLVED SODIUM	12

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

07/23/1976	98036	DISSOLVED TOTAL ALKALINITY	153
07/23/1976	98036	LAB pH	8.1
07/23/1976	98036	MINERAL TURBIDITY HACH	0
07/23/1976	98036	SPECIFIC CONDUCTANCE 25C	350
09/07/1976	159S	MINERAL TURBIDITY HACH	1
11/12/1976	100580	DISSOLVED BORON	0.1
11/12/1976	100580	DISSOLVED CHLORIDE	27
11/12/1976	100580	DISSOLVED HARDNESS CaCO3 mg/L	182
11/12/1976	100580	DISSOLVED SODIUM	15
11/12/1976	100580	DISSOLVED TOTAL ALKALINITY	166
11/12/1976	100580	LAB pH	8.5
11/12/1976	100580	MINERAL TURBIDITY HACH	1
11/12/1976	100580	SPECIFIC CONDUCTANCE 25C	402
01/17/1977	100813	DISSOLVED BORON	0
01/17/1977	100813	DISSOLVED CHLORIDE	28
01/17/1977	100813	DISSOLVED HARDNESS CaCO3 mg/L	179
01/17/1977	100813	DISSOLVED SODIUM	16
01/17/1977	100813	DISSOLVED TOTAL ALKALINITY	152
01/17/1977	100813	LAB pH	8.6
01/17/1977	100813	MINERAL TURBIDITY HACH	0
01/17/1977	100813	SPECIFIC CONDUCTANCE 25C	408
03/17/1977	102310	DISSOLVED BORON	0.1
03/17/1977	102310	DISSOLVED CHLORIDE	12
03/17/1977	102310	DISSOLVED HARDNESS CaCO3 mg/L	122
03/17/1977	102310	DISSOLVED SODIUM	13
03/17/1977	102310	DISSOLVED TOTAL ALKALINITY	97
03/17/1977	102310	LAB pH	7.9
03/17/1977	102310	MINERAL TURBIDITY HACH	130
03/17/1977	102310	SPECIFIC CONDUCTANCE 25C	282
05/17/1977	103764	DISSOLVED BORON	0.1
05/17/1977	103764	DISSOLVED CHLORIDE	13
05/17/1977	103764	DISSOLVED HARDNESS CaCO3 mg/L	159
05/17/1977	103764	DISSOLVED SODIUM	12
05/17/1977	103764	DISSOLVED TOTAL ALKALINITY	151
05/17/1977	103764	LAB pH	8.1
05/17/1977	103764	MINERAL TURBIDITY HACH	1
05/17/1977	103764	SPECIFIC CONDUCTANCE 25C	345
07/19/1977	104957	DISSOLVED BORON	0
07/19/1977	104957	DISSOLVED CALCIUM	30
07/19/1977	104957	DISSOLVED CHLORIDE	21
07/19/1977	104957	DISSOLVED HARDNESS CaCO3 mg/L	159
07/19/1977	104957	DISSOLVED MAGNESIUM	20
07/19/1977	104957	DISSOLVED NITRATE NO3 mg/L	0
07/19/1977	104957	DISSOLVED POTASSIUM	1
07/19/1977	104957	DISSOLVED SODIUM	14
07/19/1977	104957	DISSOLVED SOLIDS mg/L at 180C	210
07/19/1977	104957	DISSOLVED SULFATE SO4 mg/L	9.2
07/19/1977	104957	DISSOLVED TOTAL ALKALINITY	148
07/19/1977	104957	LAB pH	7.9
07/19/1977	104957	MINERAL TURBIDITY HACH	0
07/19/1977	104957	SPECIFIC CONDUCTANCE 25C	366
09/19/1977	108286	DISSOLVED BORON	0.1

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09/19/1977	108286	DISSOLVED CHLORIDE	40
09/19/1977	108286	DISSOLVED HARDNESS CaCO3 mg/L	198
09/19/1977	108286	DISSOLVED SODIUM	21
09/19/1977	108286	DISSOLVED TOTAL ALKALINITY	161
09/19/1977	108286	LAB pH	8.2
09/19/1977	108286	MINERAL TURBIDITY HACH	1
09/19/1977	108286	SPECIFIC CONDUCTANCE 25C	468
11/09/1977	109059	DISSOLVED BORON	0
11/09/1977	109059	DISSOLVED CHLORIDE	34
11/09/1977	109059	DISSOLVED HARDNESS CaCO3 mg/L	185
11/09/1977	109059	DISSOLVED SODIUM	19
11/09/1977	109059	DISSOLVED TOTAL ALKALINITY	162
11/09/1977	109059	LAB pH	8.4
11/09/1977	109059	MINERAL TURBIDITY HACH	0
11/09/1977	109059	SPECIFIC CONDUCTANCE 25C	451
01/11/1978	110287	DISSOLVED BORON	0
01/11/1978	110287	DISSOLVED CALCIUM	22
01/11/1978	110287	DISSOLVED CHLORIDE	3.1
01/11/1978	110287	DISSOLVED HARDNESS CaCO3 mg/L	106
01/11/1978	110287	DISSOLVED MAGNESIUM	13
01/11/1978	110287	DISSOLVED NITRATE NO3 mg/L	1
01/11/1978	110287	DISSOLVED POTASSIUM	0.9
01/11/1978	110287	DISSOLVED SODIUM	6
01/11/1978	110287	DISSOLVED SOLIDS mg/L at 180C	138
01/11/1978	110287	DISSOLVED SULFATE SO4 mg/L	14
01/11/1978	110287	DISSOLVED TOTAL ALKALINITY	100
01/11/1978	110287	LAB pH	7.8
01/11/1978	110287	MINERAL TURBIDITY HACH	100
01/11/1978	110287	SPECIFIC CONDUCTANCE 25C	234
03/13/1978	550A	MINERAL TURBIDITY HACH	14
05/16/1978	38F	MINERAL TURBIDITY HACH	1
07/18/1978	32C	MINERAL TURBIDITY HACH	1
09/20/1978	5F	MINERAL TURBIDITY HACH	1
11/17/1978	35E	MINERAL TURBIDITY HACH	0
01/19/1979	117604	DISSOLVED BORON	0
01/19/1979	117604	DISSOLVED CHLORIDE	13
01/19/1979	117604	DISSOLVED HARDNESS CaCO3 mg/L	161
01/19/1979	117604	DISSOLVED SODIUM	14
01/19/1979	117604	DISSOLVED TOTAL ALKALINITY	136
01/19/1979	117604	LAB pH	7.9
01/19/1979	117604	MINERAL TURBIDITY HACH	0
01/19/1979	117604	SPECIFIC CONDUCTANCE 25C	353
03/20/1979	33	MINERAL TURBIDITY HACH	3
05/21/1979	X111	MINERAL TURBIDITY HACH	1
07/24/1979	DF44	MINERAL TURBIDITY HACH	1
09/24/1979	121778	DISSOLVED BORON	0
09/24/1979	121778	DISSOLVED CALCIUM	31
09/24/1979	121778	DISSOLVED CHLORIDE	22
09/24/1979	121778	DISSOLVED HARDNESS CaCO3 mg/L	185
09/24/1979	121778	DISSOLVED MAGNESIUM	26
09/24/1979	121778	DISSOLVED POTASSIUM	1.2
09/24/1979	121778	DISSOLVED SODIUM	14

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/24/1979	121778	DISSOLVED TOTAL ALKALINITY	173
09/24/1979	121778	LAB pH	8.4
09/24/1979	121778	MINERAL TURBIDITY HACH	2
09/24/1979	121778	SPECIFIC CONDUCTANCE 25C	402
11/20/1979	X21	MINERAL TURBIDITY HACH	4
01/23/1980	F8	MINERAL TURBIDITY HACH	3
03/25/1980	F55	MINERAL TURBIDITY HACH	0
05/23/1980	FD13	MINERAL TURBIDITY HACH	1
07/24/1980	N00040	DISSOLVED BORON	0.1
07/24/1980	N00040	DISSOLVED CALCIUM	27
07/24/1980	N00040	DISSOLVED CHLORIDE	11
07/24/1980	N00040	DISSOLVED HARDNESS CaCO3 mg/L	146
07/24/1980	N00040	DISSOLVED MAGNESIUM	19
07/24/1980	N00040	DISSOLVED POTASSIUM	1
07/24/1980	N00040	DISSOLVED SODIUM	9
07/24/1980	N00040	DISSOLVED TOTAL ALKALINITY	144
07/24/1980	N00040	LAB pH	8.1
07/24/1980	N00040	MINERAL TURBIDITY HACH	1
07/24/1980	N00040	SPECIFIC CONDUCTANCE 25C	323
09/30/1980	F45	MINERAL TURBIDITY HACH	1
11/12/1980	OK44	MINERAL TURBIDITY HACH	1
01/29/1981	N00623	DISSOLVED BORON	0.1
01/29/1981	N00623	DISSOLVED CALCIUM	21
01/29/1981	N00623	DISSOLVED CHLORIDE	3
01/29/1981	N00623	DISSOLVED HARDNESS CaCO3 mg/L	94
01/29/1981	N00623	DISSOLVED MAGNESIUM	10
01/29/1981	N00623	DISSOLVED POTASSIUM	0.9
01/29/1981	N00623	DISSOLVED SODIUM	6
01/29/1981	N00623	DISSOLVED TOTAL ALKALINITY	89
01/29/1981	N00623	LAB pH	8
01/29/1981	N00623	MINERAL TURBIDITY HACH	120
01/29/1981	N00623	SPECIFIC CONDUCTANCE 25C	211
03/11/1981	F1	MINERAL TURBIDITY HACH	1
03/16/1981	N02731	DISSOLVED BORON	0
03/16/1981	N02731	DISSOLVED CALCIUM	22
03/16/1981	N02731	DISSOLVED CHLORIDE	1
03/16/1981	N02731	DISSOLVED HARDNESS CaCO3 mg/L	100
03/16/1981	N02731	DISSOLVED MAGNESIUM	11
03/16/1981	N02731	DISSOLVED POTASSIUM	0.7
03/16/1981	N02731	DISSOLVED SODIUM	6
03/16/1981	N02731	DISSOLVED TOTAL ALKALINITY	98
03/16/1981	N02731	LAB pH	8.2
03/16/1981	N02731	MINERAL TURBIDITY HACH	88
03/16/1981	N02731	SPECIFIC CONDUCTANCE 25C	211
05/27/1981	C38	MINERAL TURBIDITY HACH	2
07/28/1981	F32	MINERAL TURBIDITY HACH	1
09/22/1981	FD21	MINERAL TURBIDITY HACH	1
11/25/1981	N01632	DISSOLVED BORON	0
11/25/1981	N01632	DISSOLVED CALCIUM	21
11/25/1981	N01632	DISSOLVED CHLORIDE	4
11/25/1981	N01632	DISSOLVED HARDNESS CaCO3 mg/L	114
11/25/1981	N01632	DISSOLVED MAGNESIUM	15

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11/25/1981	N01632	DISSOLVED POTASSIUM	0.6
11/25/1981	N01632	DISSOLVED SODIUM	6
11/25/1981	N01632	DISSOLVED TOTAL ALKALINITY	108
11/25/1981	N01632	LAB pH	7.9
11/25/1981	N01632	MINERAL TURBIDITY HACH	9
11/25/1981	N01632	SPECIFIC CONDUCTANCE 25C	243
01/12/1982	NFL03	MINERAL TURBIDITY HACH	2
05/24/1982	N02089	DISSOLVED BORON	0
05/24/1982	N02089	DISSOLVED CALCIUM	24
05/24/1982	N02089	DISSOLVED CHLORIDE	3
05/24/1982	N02089	DISSOLVED HARDNESS CaCO3 mg/L	118
05/24/1982	N02089	DISSOLVED MAGNESIUM	14
05/24/1982	N02089	DISSOLVED POTASSIUM	0.7
05/24/1982	N02089	DISSOLVED SODIUM	5
05/24/1982	N02089	DISSOLVED TOTAL ALKALINITY	115
05/24/1982	N02089	LAB pH	7.8
05/24/1982	N02089	MINERAL TURBIDITY HACH	1
05/24/1982	N02089	SPECIFIC CONDUCTANCE 25C	257
07/21/1982	CS3	MINERAL TURBIDITY HACH	2
09/10/1982	L924	MINERAL TURBIDITY HACH	1
11/16/1982	VDB13	MINERAL TURBIDITY HACH	2
11/16/1982	VDB13	SPECIFIC CONDUCTANCE 25C	369
01/19/1983	ACH09	MINERAL TURBIDITY HACH	35
05/11/1983	A52513	MINERAL TURBIDITY HACH	5
07/06/1983	N03071	DISSOLVED BORON	0.1
07/06/1983	N03071	DISSOLVED CALCIUM	24
07/06/1983	N03071	DISSOLVED CHLORIDE	4
07/06/1983	N03071	DISSOLVED HARDNESS CaCO3 mg/L	114
07/06/1983	N03071	DISSOLVED MAGNESIUM	13
07/06/1983	N03071	DISSOLVED POTASSIUM	0.8
07/06/1983	N03071	DISSOLVED SODIUM	6
07/06/1983	N03071	DISSOLVED TOTAL ALKALINITY	112
07/06/1983	N03071	LAB pH	8.3
07/06/1983	N03071	MINERAL TURBIDITY HACH	1
07/06/1983	N03071	SPECIFIC CONDUCTANCE 25C	238
09/26/1983	A032	MINERAL TURBIDITY HACH	2
11/15/1983	P213	MINERAL TURBIDITY HACH	4
03/26/1984	N03732	DISSOLVED BORON	0
03/26/1984	N03732	DISSOLVED CALCIUM	24
03/26/1984	N03732	DISSOLVED CHLORIDE	4
03/26/1984	N03732	DISSOLVED HARDNESS CaCO3 mg/L	122
03/26/1984	N03732	DISSOLVED MAGNESIUM	15
03/26/1984	N03732	DISSOLVED SODIUM	7
03/26/1984	N03732	DISSOLVED TOTAL ALKALINITY	119
03/26/1984	N03732	LAB pH	7.8
03/26/1984	N03732	MINERAL TURBIDITY HACH	4
03/26/1984	N03732	SPECIFIC CONDUCTANCE 25C	269
05/25/1984	P52913	MINERAL TURBIDITY HACH	0
07/20/1984	P72334	MINERAL TURBIDITY HACH	13
09/11/1984	P91439	MINERAL TURBIDITY HACH	1
11/21/1984	P13113	MINERAL TURBIDITY HACH	3
03/12/1985	L113	MINERAL TURBIDITY HACH	1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/23/1985	N04546	DISSOLVED BORON	0
05/23/1985	N04546	DISSOLVED CALCIUM	27
05/23/1985	N04546	DISSOLVED CHLORIDE	10
05/23/1985	N04546	DISSOLVED HARDNESS CaCO3 mg/L	105
05/23/1985	N04546	DISSOLVED MAGNESIUM	9
05/23/1985	N04546	DISSOLVED SODIUM	11
05/23/1985	N04546	DISSOLVED TOTAL ALKALINITY	104
05/23/1985	N04546	LAB pH	8
05/23/1985	N04546	MINERAL TURBIDITY HACH	1
05/23/1985	N04546	SPECIFIC CONDUCTANCE 25C	262
07/25/1985	P7262	MINERAL TURBIDITY HACH	1
09/24/1985	P9253	MINERAL TURBIDITY HACH	1
11/20/1985	A1120	MINERAL TURBIDITY HACH	2
01/09/1986	P0193	MINERAL TURBIDITY HACH	4
03/24/1986	N05286	DISSOLVED BORON	0
03/24/1986	N05286	DISSOLVED CALCIUM	22
03/24/1986	N05286	DISSOLVED CHLORIDE	3
03/24/1986	N05286	DISSOLVED HARDNESS CaCO3 mg/L	92
03/24/1986	N05286	DISSOLVED MAGNESIUM	9
03/24/1986	N05286	DISSOLVED POTASSIUM	1.1
03/24/1986	N05286	DISSOLVED SODIUM	8
03/24/1986	N05286	DISSOLVED TOTAL ALKALINITY	89
03/24/1986	N05286	LAB pH	7.9
03/24/1986	N05286	MINERAL TURBIDITY HACH	19
03/24/1986	N05286	SPECIFIC CONDUCTANCE 25C	210
05/08/1986	P593	MINERAL TURBIDITY HACH	25
07/15/1986	N05608	DISSOLVED CALCIUM	27
07/15/1986	N05608	DISSOLVED CHLORIDE	13
07/15/1986	N05608	DISSOLVED HARDNESS CaCO3 mg/L	150
07/15/1986	N05608	DISSOLVED MAGNESIUM	20
07/15/1986	N05608	DISSOLVED SODIUM	10
07/15/1986	N05608	DISSOLVED TOTAL ALKALINITY	145
07/15/1986	N05608	LAB pH	8.5
07/15/1986	N05608	MINERAL TURBIDITY HACH	1
07/15/1986	N05608	SPECIFIC CONDUCTANCE 25C	326
11/18/1986	P11113	MINERAL TURBIDITY HACH	1
01/13/1987	P1141	MINERAL TURBIDITY HACH	1
03/16/1987	N06140	DISSOLVED CALCIUM	22
03/16/1987	N06140	DISSOLVED CHLORIDE	6
03/16/1987	N06140	DISSOLVED MAGNESIUM	14
03/16/1987	N06140	DISSOLVED NITRATE NO3 mg/L	0.7
03/16/1987	N06140	DISSOLVED SODIUM	6
03/16/1987	N06140	DISSOLVED TOTAL ALKALINITY	110
03/16/1987	N06140	LAB pH	8.2
03/16/1987	N06140	MINERAL TURBIDITY HACH	11
03/16/1987	N06140	SPECIFIC CONDUCTANCE 25C	225
05/21/1987	A41	MINERAL TURBIDITY HACH	1
07/15/1987	N06445	DISSOLVED CALCIUM	32
07/15/1987	N06445	DISSOLVED CALCIUM	32
07/15/1987	N06445	DISSOLVED CHLORIDE	17
07/15/1987	N06445	DISSOLVED CHLORIDE	17
07/15/1987	N06445	DISSOLVED HARDNESS CaCO3 mg/L	179

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07/15/1987	N06445	DISSOLVED MAGNESIUM	24
07/15/1987	N06445	DISSOLVED MAGNESIUM	24
07/15/1987	N06445	DISSOLVED NITRATE NO3 mg/L	1.5
07/15/1987	N06445	DISSOLVED NITRATE NO3 mg/L	1.5
07/15/1987	N06445	DISSOLVED POTASSIUM	1.1
07/15/1987	N06445	DISSOLVED POTASSIUM	1.1
07/15/1987	N06445	DISSOLVED SODIUM	12
07/15/1987	N06445	DISSOLVED SODIUM	12
07/15/1987	N06445	DISSOLVED TOTAL ALKALINITY	151
07/15/1987	N06445	DISSOLVED TOTAL ALKALINITY	151
07/15/1987	N06445	LAB pH	8
07/15/1987	N06445	LAB pH	8
07/15/1987	N06445	MINERAL TURBIDITY HACH	1
07/15/1987	N06445	MINERAL TURBIDITY HACH	1
07/15/1987	N06445	SPECIFIC CONDUCTANCE 25C	352
07/15/1987	N06445	SPECIFIC CONDUCTANCE 25C	352
11/19/1987	N06684	DISSOLVED CALCIUM	32
11/19/1987	N06684	DISSOLVED CHLORIDE	36
11/19/1987	N06684	DISSOLVED MAGNESIUM	29
11/19/1987	N06684	DISSOLVED SODIUM	17
11/19/1987	N06684	DISSOLVED TOTAL ALKALINITY	155
11/19/1987	N06684	LAB pH	8.5
11/19/1987	N06684	SPECIFIC CONDUCTANCE 25C	436
01/13/1988	P11112	MINERAL TURBIDITY HACH	11
03/24/1988	N06890	DISSOLVED CALCIUM	27
03/24/1988	N06890	DISSOLVED CHLORIDE	6
03/24/1988	N06890	DISSOLVED MAGNESIUM	21
03/24/1988	N06890	DISSOLVED NITRATE NO3 mg/L	0.5
03/24/1988	N06890	DISSOLVED SODIUM	7
03/24/1988	N06890	DISSOLVED TOTAL ALKALINITY	142
03/24/1988	N06890	LAB pH	8.2
03/24/1988	N06890	MINERAL TURBIDITY HACH	1
03/24/1988	N06890	SPECIFIC CONDUCTANCE 25C	298
11/22/1988	N07396	DISSOLVED CALCIUM	35
11/22/1988	N07396	DISSOLVED CHLORIDE	39
11/22/1988	N07396	DISSOLVED HARDNESS CaCO3 mg/L	186
11/22/1988	N07396	DISSOLVED MAGNESIUM	24
11/22/1988	N07396	DISSOLVED SODIUM	20
11/22/1988	N07396	DISSOLVED TOTAL ALKALINITY	137
11/22/1988	N07396	MINERAL TURBIDITY HACH	16
11/22/1988	N07396	SPECIFIC CONDUCTANCE 25C	447
01/23/1989	N07492	DISSOLVED CALCIUM	23
01/23/1989	N07492	DISSOLVED CHLORIDE	4
01/23/1989	N07492	DISSOLVED HARDNESS CaCO3 mg/L	128
01/23/1989	N07492	DISSOLVED MAGNESIUM	17
01/23/1989	N07492	DISSOLVED NITRATE NO3 mg/L	0.1
01/23/1989	N07492	DISSOLVED SODIUM	6
01/23/1989	N07492	DISSOLVED TOTAL ALKALINITY	117
01/23/1989	N07492	MINERAL TURBIDITY HACH	6
01/23/1989	N07492	SPECIFIC CONDUCTANCE 25C	259
03/09/1989	N07585	DISSOLVED CALCIUM	15
03/09/1989	N07585	DISSOLVED CHLORIDE	1

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03/09/1989	N07585	DISSOLVED HARDNESS CaCO3 mg/L	78
03/09/1989	N07585	DISSOLVED MAGNESIUM	10
03/09/1989	N07585	DISSOLVED NITRATE NO3 mg/L	0.7
03/09/1989	N07585	DISSOLVED SODIUM	4
03/09/1989	N07585	DISSOLVED TOTAL ALKALINITY	77
03/09/1989	N07585	MINERAL TURBIDITY HACH	200
03/09/1989	N07585	SPECIFIC CONDUCTANCE 25C	166
01/23/1990	N08187	DISSOLVED CALCIUM	29
01/23/1990	N08187	DISSOLVED CHLORIDE	9
01/23/1990	N08187	DISSOLVED HARDNESS CaCO3 mg/L	159
01/23/1990	N08187	DISSOLVED MAGNESIUM	21
01/23/1990	N08187	DISSOLVED NITRATE NO3 mg/L	0.2
01/23/1990	N08187	DISSOLVED SODIUM	9
01/23/1990	N08187	DISSOLVED TOTAL ALKALINITY	139
01/23/1990	N08187	SPECIFIC CONDUCTANCE 25C	327
03/16/1990	P32115	MINERAL TURBIDITY HACH	1
03/14/1991	P3143	MINERAL TURBIDITY HACH	13

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Water Quality Data Results

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Below are the water quality for station A0358000, COTTONWOOD C MF NR ONO.

Date	Sample Number	Constituent/Analyte	Result*
07/07/1977	RM130	LAB pH	8
07/07/1977	RM130	DISSOLVED TOTAL ALKALINITY	140
07/07/1977	RM130	SPECIFIC CONDUCTANCE 25C	350
07/07/1977	RM130	MINERAL TURBIDITY HACH	1
07/07/1977	RM131	LAB pH	8.2
07/07/1977	RM131	DISSOLVED TOTAL ALKALINITY	138
07/07/1977	RM131	SPECIFIC CONDUCTANCE 25C	349
07/07/1977	RM131	MINERAL TURBIDITY HACH	1
07/07/1977	RM132	LAB pH	7.9
07/07/1977	RM132	DISSOLVED TOTAL ALKALINITY	137
07/07/1977	RM132	SPECIFIC CONDUCTANCE 25C	348
07/07/1977	RM132	MINERAL TURBIDITY HACH	7
07/07/1977	RM133	LAB pH	8
07/07/1977	RM133	DISSOLVED TOTAL ALKALINITY	116
07/07/1977	RM133	SPECIFIC CONDUCTANCE 25C	342
07/07/1977	RM133	MINERAL TURBIDITY HACH	15
07/07/1977	RM134	LAB pH	8.4
07/07/1977	RM134	DISSOLVED TOTAL ALKALINITY	131
07/07/1977	RM134	SPECIFIC CONDUCTANCE 25C	320
07/07/1977	RM134	MINERAL TURBIDITY HACH	3
07/08/1977	RM135	LAB pH	8.2
07/08/1977	RM135	DISSOLVED TOTAL ALKALINITY	133
07/08/1977	RM135	SPECIFIC CONDUCTANCE 25C	335
07/08/1977	RM135	MINERAL TURBIDITY HACH	1
07/08/1977	104929	DISSOLVED ORTHOPHOSPHATE as P	0.01
07/08/1977	104929	DISSOLVED NITRATE as N	0.03
07/08/1977	104929	TOTAL AMMONIA as N	0
07/08/1977	RM136	LAB pH	8.1
07/08/1977	RM136	DISSOLVED TOTAL ALKALINITY	141
07/08/1977	RM136	SPECIFIC CONDUCTANCE 25C	347
07/08/1977	RM136	MINERAL TURBIDITY HACH	3
07/08/1977	RM137	LAB pH	8.1
07/08/1977	RM137	DISSOLVED TOTAL ALKALINITY	139
07/08/1977	RM137	SPECIFIC CONDUCTANCE 25C	351
07/08/1977	RM137	MINERAL TURBIDITY HACH	1
08/11/1977	105843	DISSOLVED NITRATE as N	0.01
08/11/1977	105843	TOTAL PHOSPHORUS as P	0.06
08/11/1977	105843	TOTAL AMMONIA & ORGANIC NITROG	0
08/11/1977	105843	Cd mg/L T	0
08/11/1977	105843	Cu mg/L T	0
08/11/1977	105843	Fe mg/L T	0.06

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08/11/1977	105843	Mn mg/L T	0.01
08/11/1977	105843	Pb mg/L T	0
08/11/1977	105843	Zn mg/L T	0.01
11/09/1977	RM138	MINERAL TURBIDITY HACH	0
11/23/1977	112782	TOTAL PHOSPHORUS as P	0.23
11/23/1977	112782	TOTAL AMMONIA & ORGANIC NITROG	0.6
11/23/1977	112782	DISSOLVED NITRATE as N	1.2
11/23/1977	112782	LAB pH	7.9
11/23/1977	112782	DISSOLVED CHLORIDE	15
11/23/1977	112782	DISSOLVED HARDNESS CaCO3 mg/L	102
11/23/1977	112782	DISSOLVED TOTAL ALKALINITY	74
11/23/1977	112782	SPECIFIC CONDUCTANCE 25C	256
11/23/1977	112782	DISSOLVED SODIUM	12
11/23/1977	112782	MINERAL TURBIDITY HACH	170
12/12/1977	112772	DISSOLVED NITRATE as N	0.22
12/12/1977	112772	TOTAL PHOSPHORUS as P	0.06
12/12/1977	112772	TOTAL AMMONIA & ORGANIC NITROG	0.2
12/12/1977	112772	LAB pH	8.2
12/12/1977	112772	DISSOLVED CHLORIDE	18
12/12/1977	112772	DISSOLVED HARDNESS CaCO3 mg/L	140
12/12/1977	112772	DISSOLVED TOTAL ALKALINITY	114
12/12/1977	112772	SPECIFIC CONDUCTANCE 25C	340
12/12/1977	112772	DISSOLVED SODIUM	16
12/12/1977	112772	MINERAL TURBIDITY HACH	41
12/15/1977	RM141	MINERAL TURBIDITY HACH	31
01/10/1978	112787	DISSOLVED NITRATE as N	0.3
01/10/1978	112787	TOTAL PHOSPHORUS as P	0.42
01/10/1978	112787	TOTAL AMMONIA & ORGANIC NITROG	0.5
01/10/1978	112787	DISSOLVED CHLORIDE	0.5
01/10/1978	112787	LAB pH	8.6
01/10/1978	112787	DISSOLVED SODIUM	4.8
01/10/1978	112787	DISSOLVED HARDNESS CaCO3 mg/L	97
01/10/1978	112787	DISSOLVED TOTAL ALKALINITY	90
01/10/1978	112787	SPECIFIC CONDUCTANCE 25C	202
01/10/1978	112787	MINERAL TURBIDITY HACH	180
03/15/1978	RM143	MINERAL TURBIDITY HACH	16
04/11/1978	112768	DISSOLVED NITRATE as N	0.01
04/11/1978	112768	TOTAL PHOSPHORUS as P	0.02
04/11/1978	112768	TOTAL AMMONIA & ORGANIC NITROG	0
04/11/1978	112768	DISSOLVED CHLORIDE	2.1
04/11/1978	112768	LAB pH	8.2
04/11/1978	112768	DISSOLVED SODIUM	6.1
04/11/1978	112768	DISSOLVED HARDNESS CaCO3 mg/L	107
04/11/1978	112768	DISSOLVED TOTAL ALKALINITY	101
04/11/1978	112768	SPECIFIC CONDUCTANCE 25C	226
04/11/1978	112768	MINERAL TURBIDITY HACH	5
05/11/1978	RM145	MINERAL TURBIDITY HACH	1
06/20/1978	RM146	MINERAL TURBIDITY HACH	1
06/20/1978	RM147	MINERAL TURBIDITY HACH	1
06/20/1978	RM148	MINERAL TURBIDITY HACH	1
06/20/1978	RM149	MINERAL TURBIDITY HACH	7
06/21/1978	RM150	MINERAL TURBIDITY HACH	1

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06/21/1978	RM151	MINERAL TURBIDITY HACH	1
06/21/1978	RM109	MINERAL TURBIDITY HACH	1
06/21/1978	RM110	MINERAL TURBIDITY HACH	1
08/15/1978	RM111	MINERAL TURBIDITY HACH	1
08/15/1978	RM112	MINERAL TURBIDITY HACH	1
08/15/1978	RM113	MINERAL TURBIDITY HACH	1
08/15/1978	RM114	MINERAL TURBIDITY HACH	1
08/16/1978	RM115	MINERAL TURBIDITY HACH	1
08/16/1978	RM116	MINERAL TURBIDITY HACH	1
08/16/1978	RM117	MINERAL TURBIDITY HACH	1
08/16/1978	118527	DISSOLVED NITRATE AND NITRITE	0
08/16/1978	118527	TOTAL PHOSPHORUS as P	0.02
08/16/1978	118527	TOTAL AMMONIA & ORGANIC NITROG	0.2
08/16/1978	RM118	MINERAL TURBIDITY HACH	1
01/08/1979	118532	DISSOLVED NITRATE AND NITRITE	0
01/08/1979	118532	TOTAL PHOSPHORUS as P	0.01
01/08/1979	118532	TOTAL AMMONIA & ORGANIC NITROG	0.1
01/08/1979	118532	LAB pH	8.2
01/08/1979	118532	DISSOLVED CALCIUM	29
01/08/1979	118532	DISSOLVED CHLORIDE	15
01/08/1979	118532	DISSOLVED HARDNESS CaCO3 mg/L	151
01/08/1979	118532	DISSOLVED TOTAL ALKALINITY	135
01/08/1979	118532	SPECIFIC CONDUCTANCE 25C	335
01/08/1979	118532	DISSOLVED MAGNESIUM	19
01/08/1979	118532	DISSOLVED SODIUM	12
01/08/1979	118532	MINERAL TURBIDITY HACH	1
01/12/1979	RM120	MINERAL TURBIDITY HACH	20
02/26/1979	RM121	MINERAL TURBIDITY HACH	5
03/01/1979	RM122	MINERAL TURBIDITY HACH	11
04/11/1979	RM123	LAB pH	8.3
04/11/1979	RM123	MINERAL TURBIDITY HACH	1
04/11/1979	RM124	LAB pH	8.3
04/11/1979	RM124	MINERAL TURBIDITY HACH	2
04/12/1979	RM125	LAB pH	8.2
04/12/1979	RM125	MINERAL TURBIDITY HACH	1
04/12/1979	RM126	LAB pH	8.1
04/12/1979	RM126	MINERAL TURBIDITY HACH	2
04/12/1979	RM127	LAB pH	8.3
04/12/1979	RM127	MINERAL TURBIDITY HACH	1
04/12/1979	RM128	LAB pH	8.4
04/12/1979	RM128	MINERAL TURBIDITY HACH	2
02/22/1980	NS0135	DISSOLVED ORTHOPHOSPHATE as P	0
02/22/1980	NS0135	DISSOLVED NITRATE AND NITRITE	0.11
02/22/1980	NS0135	TOTAL PHOSPHORUS as P	0.16
02/22/1980	NS0135	TOTAL AMMONIA & ORGANIC NITROG	0.6
02/22/1980	NS0135	DISSOLVED BORON	0.1
02/22/1980	NS0135	DISSOLVED POTASSIUM	1
02/22/1980	NS0135	LAB pH	8.2
02/22/1980	NS0135	DISSOLVED CALCIUM	22
02/22/1980	NS0135	DISSOLVED CHLORIDE	2
02/22/1980	NS0135	DISSOLVED HARDNESS CaCO3 mg/L	96
02/22/1980	NS0135	DISSOLVED TOTAL ALKALINITY	92

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02/22/1980	NS0135	SPECIFIC CONDUCTANCE 25C	210
02/22/1980	NS0135	DISSOLVED MAGNESIUM	10
02/22/1980	NS0135	DISSOLVED SODIUM	6
02/22/1980	NS0135	MINERAL TURBIDITY HACH	120

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Water Quality Data Results

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Below are the water quality for station A0358300, COTTONWOOD C MF NR ONO.

Date	Sample Number	Constituent/Analyte	Result*
05/20/1959	8006	DISSOLVED BORON	0.22
05/20/1959	8006	DISSOLVED CHLORIDE	5.4
05/20/1959	8006	DISSOLVED FLUORIDE	0.2
05/20/1959	8006	DISSOLVED POTASSIUM	0.6
05/20/1959	8006	LAB pH	8
05/20/1959	8006	DISSOLVED SODIUM	5.8
05/20/1959	8006	DISSOLVED NITRATE NO3 mg/L	0.2
05/20/1959	8006	DISSOLVED SULFATE SO4 mg/L	8.7
05/20/1959	8006	DISSOLVED CALCIUM	29
05/20/1959	8006	DISSOLVED HARDNESS CaCO3 mg/L	127
05/20/1959	8006	DISSOLVED TOTAL ALKALINITY	125
05/20/1959	8006	SPECIFIC CONDUCTANCE 25C	271
05/20/1959	8006	DISSOLVED MAGNESIUM	13
05/20/1959	8006	DISSOLVED SILICA	14
09/03/1959	9862	DISSOLVED BORON	0.06
09/03/1959	9862	DISSOLVED FLUORIDE	0.2
09/03/1959	9862	DISSOLVED POTASSIUM	1.2
09/03/1959	9862	LAB pH	7.9
09/03/1959	9862	DISSOLVED NITRATE NO3 mg/L	0.4
09/03/1959	9862	DISSOLVED SULFATE SO4 mg/L	7.7
09/03/1959	9862	DISSOLVED CALCIUM	34
09/03/1959	9862	DISSOLVED CHLORIDE	20
09/03/1959	9862	DISSOLVED HARDNESS CaCO3 mg/L	176
09/03/1959	9862	DISSOLVED TOTAL ALKALINITY	165
09/03/1959	9862	SPECIFIC CONDUCTANCE 25C	384
09/03/1959	9862	DISSOLVED MAGNESIUM	22
09/03/1959	9862	DISSOLVED SODIUM	12
09/03/1959	9862	DISSOLVED SILICA	21
11/10/1970	68047	DISSOLVED NITRATE as N	0.8
11/10/1970	68047	TOTAL AMMONIA as N	0
11/10/1970	68047	TOTAL PHOSPHORUS as P	0.03
11/10/1970	68047	TOTAL AMMONIA & ORGANIC NITROG	0.2
11/10/1970	68047	TOTAL ORGANIC NITROGEN as N	0.2
11/28/1970	68046	TOTAL AMMONIA as N	0
11/28/1970	68046	TOTAL PHOSPHORUS as P	0.31
11/28/1970	68046	TOTAL AMMONIA & ORGANIC NITROG	0.5
11/28/1970	68046	DISSOLVED NITRATE as N	1.6
11/28/1970	68046	TOTAL ORGANIC NITROGEN as N	0.5
11/28/1970	68046	As mg/L D	0
11/28/1970	68046	Cr mg/L T	0
11/28/1970	68046	Cu mg/L D	0

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11/28/1970	68046	Fe mg/L D	0.01
11/28/1970	68046	Mn mg/L D	0
11/28/1970	68046	Pb mg/L D	0
11/28/1970	68046	Zn mg/L D	0
11/28/1970	68046	SPECIFIC CONDUCTANCE 25C	205
12/04/1970	68048	DISSOLVED NITRATE as N	0.96
12/04/1970	68048	TOTAL AMMONIA as N	0
12/04/1970	68048	TOTAL PHOSPHORUS as P	0.31
12/04/1970	68048	TOTAL AMMONIA & ORGANIC NITROG	0.4
12/04/1970	68048	TOTAL ORGANIC NITROGEN as N	0.4
12/27/1971	72932	DISSOLVED ORTHOPHOSPHATE as P	0
12/27/1971	72932	TOTAL PHOSPHORUS as P	0.02
12/27/1971	72932	TOTAL AMMONIA & ORGANIC NITROG	0.3
12/27/1971	72932	DISSOLVED NITRATE as N	1
01/21/1972	73234	DISSOLVED ORTHOPHOSPHATE as P	0
01/21/1972	73234	DISSOLVED NITRATE as N	0
01/21/1972	73234	TOTAL PHOSPHORUS as P	0.04
01/21/1972	73234	TOTAL AMMONIA & ORGANIC NITROG	0.2
01/21/1972	73234	As mg/L T	0.06
01/21/1972	73234	Cd mg/L T	0.01
01/21/1972	73234	Cu mg/L T	0
01/21/1972	73234	Mn mg/L T	0.04
01/21/1972	73234	Pb mg/L T	0
01/21/1972	73234	Zn mg/L T	0.08
01/21/1972	73234	Fe mg/L T	3.4
01/21/1972	73234	SUSPENDED SOLIDS AT 105C	46
01/21/1972	73234	VOLATILE SUSPENDED SOLIDS	10

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Water Quality Data Results

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Below are the water quality for station A0354400, COTTONWOOD C NF A GAS PT RD.

Date	Sample Number	Constituent/Analyte	Result*
03/02/1952	3892	DISSOLVED BORON	0.03
03/02/1952	3892	DISSOLVED CALCIUM	12
03/02/1952	3892	DISSOLVED CHLORIDE	3
03/02/1952	3892	DISSOLVED FLUORIDE	0
03/02/1952	3892	DISSOLVED HARDNESS CaCO3 mg/L	53
03/02/1952	3892	DISSOLVED MAGNESIUM	5.5
03/02/1952	3892	DISSOLVED NITRATE NO3 mg/L	0
03/02/1952	3892	DISSOLVED POTASSIUM	2.1
03/02/1952	3892	DISSOLVED SILICA	23
03/02/1952	3892	DISSOLVED SODIUM	5.6
03/02/1952	3892	DISSOLVED SULFATE SO4 mg/L	11
03/02/1952	3892	DISSOLVED TOTAL ALKALINITY	52
03/02/1952	3892	LAB pH	8
03/02/1952	3892	SPECIFIC CONDUCTANCE 25C	129
10/31/1952	5919	DISSOLVED BORON	0.08
10/31/1952	5919	DISSOLVED CALCIUM	15
10/31/1952	5919	DISSOLVED CHLORIDE	8.5
10/31/1952	5919	DISSOLVED FLUORIDE	0
10/31/1952	5919	DISSOLVED HARDNESS CaCO3 mg/L	61
10/31/1952	5919	DISSOLVED MAGNESIUM	5.6
10/31/1952	5919	DISSOLVED NITRATE NO3 mg/L	0.4
10/31/1952	5919	DISSOLVED POTASSIUM	1.5
10/31/1952	5919	DISSOLVED SILICA	24
10/31/1952	5919	DISSOLVED SODIUM	9.6
10/31/1952	5919	DISSOLVED SULFATE SO4 mg/L	6.1
10/31/1952	5919	DISSOLVED TOTAL ALKALINITY	65
10/31/1952	5919	LAB pH	7.5
10/31/1952	5919	SPECIFIC CONDUCTANCE 25C	161
09/19/1958	6375	DISSOLVED BORON	0.11
09/19/1958	6375	DISSOLVED CALCIUM	16
09/19/1958	6375	DISSOLVED CHLORIDE	11
09/19/1958	6375	DISSOLVED FLUORIDE	0.2
09/19/1958	6375	DISSOLVED HARDNESS CaCO3 mg/L	63
09/19/1958	6375	DISSOLVED MAGNESIUM	5.6
09/19/1958	6375	DISSOLVED NITRATE NO3 mg/L	0.7
09/19/1958	6375	DISSOLVED POTASSIUM	1.6
09/19/1958	6375	DISSOLVED SILICA	22
09/19/1958	6375	DISSOLVED SODIUM	10
09/19/1958	6375	DISSOLVED SULFATE SO4 mg/L	1.6
09/19/1958	6375	DISSOLVED TOTAL ALKALINITY	67

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/19/1958	6375	LAB pH	7.7
09/19/1958	6375	SPECIFIC CONDUCTANCE 25C	178
05/20/1959	8005	DISSOLVED BORON	0.23
05/20/1959	8005	DISSOLVED CALCIUM	14
05/20/1959	8005	DISSOLVED CHLORIDE	4.2
05/20/1959	8005	DISSOLVED FLUORIDE	0
05/20/1959	8005	DISSOLVED HARDNESS CaCO3 mg/L	46
05/20/1959	8005	DISSOLVED MAGNESIUM	2.7
05/20/1959	8005	DISSOLVED NITRATE NO3 mg/L	0.3
05/20/1959	8005	DISSOLVED POTASSIUM	1.1
05/20/1959	8005	DISSOLVED SILICA	22
05/20/1959	8005	DISSOLVED SODIUM	5.2
05/20/1959	8005	DISSOLVED SULFATE SO4 mg/L	1.8
05/20/1959	8005	DISSOLVED TOTAL ALKALINITY	49
05/20/1959	8005	LAB pH	7.4
05/20/1959	8005	SPECIFIC CONDUCTANCE 25C	129
05/05/1960	12234	DISSOLVED BORON	0.02
05/05/1960	12234	DISSOLVED CALCIUM	14
05/05/1960	12234	DISSOLVED CHLORIDE	2.7
05/05/1960	12234	DISSOLVED FLUORIDE	0.1
05/05/1960	12234	DISSOLVED HARDNESS CaCO3 mg/L	51
05/05/1960	12234	DISSOLVED MAGNESIUM	3.9
05/05/1960	12234	DISSOLVED NITRATE NO3 mg/L	0
05/05/1960	12234	DISSOLVED POTASSIUM	0.9
05/05/1960	12234	DISSOLVED SILICA	22
05/05/1960	12234	DISSOLVED SODIUM	4.1
05/05/1960	12234	DISSOLVED SULFATE SO4 mg/L	4.9
05/05/1960	12234	DISSOLVED TOTAL ALKALINITY	51
05/05/1960	12234	LAB pH	7.6
05/05/1960	12234	SPECIFIC CONDUCTANCE 25C	129
10/06/1977	108677	DISSOLVED NITRATE as N	0.01
10/06/1977	108677	DISSOLVED ORTHOPHOSPHATE as P	0.01
10/06/1977	108677	TOTAL AMMONIA & ORGANIC NITROG	0.2
10/06/1977	108677	TOTAL AMMONIA as N	0
10/06/1977	108677	TOTAL ORGANIC NITROGEN as N	0.2
10/06/1977	108677	TOTAL PHOSPHORUS as P	0.01

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*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

Water Quality Data Results

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Below are the water quality for station A0354100, COTTONWOOD C NF AB COTTONWOOD C.

Date	Sample Number	Constituent/Analyte	Result*
09/09/1958	6376	DISSOLVED BORON	0.1
09/09/1958	6376	DISSOLVED FLUORIDE	0.2
09/09/1958	6376	DISSOLVED POTASSIUM	1.1
09/09/1958	6376	LAB pH	8.1
09/09/1958	6376	DISSOLVED NITRATE NO3 mg/L	0.7
09/09/1958	6376	DISSOLVED SULFATE SO4 mg/L	7.9
09/09/1958	6376	DISSOLVED CALCIUM	32
09/09/1958	6376	DISSOLVED CHLORIDE	12
09/09/1958	6376	DISSOLVED HARDNESS CaCO3 mg/L	168
09/09/1958	6376	DISSOLVED TOTAL ALKALINITY	162
09/09/1958	6376	SPECIFIC CONDUCTANCE 25C	357
09/09/1958	6376	DISSOLVED MAGNESIUM	21
09/09/1958	6376	DISSOLVED SODIUM	10
09/09/1958	6376	DISSOLVED SILICA	18
05/05/1960	12233	DISSOLVED BORON	0.05
05/05/1960	12233	DISSOLVED CHLORIDE	4.6
05/05/1960	12233	DISSOLVED FLUORIDE	0.1
05/05/1960	12233	DISSOLVED POTASSIUM	0.5
05/05/1960	12233	LAB pH	8
05/05/1960	12233	DISSOLVED SODIUM	4.8
05/05/1960	12233	DISSOLVED NITRATE NO3 mg/L	0.1
05/05/1960	12233	DISSOLVED CALCIUM	26
05/05/1960	12233	DISSOLVED HARDNESS CaCO3 mg/L	131
05/05/1960	12233	DISSOLVED TOTAL ALKALINITY	128
05/05/1960	12233	SPECIFIC CONDUCTANCE 25C	275
05/05/1960	12233	DISSOLVED MAGNESIUM	16
05/05/1960	12233	DISSOLVED SILICA	16
05/05/1960	12233	DISSOLVED SULFATE SO4 mg/L	10
11/29/1973	RM179	MINERAL TURBIDITY HACH	5
01/17/1974	RM180	MINERAL TURBIDITY HACH	230
01/03/1977	RM181	MINERAL TURBIDITY HACH	25
07/07/1977	RM182	SPECIFIC CONDUCTANCE 25C	286
07/07/1977	RM182	MINERAL TURBIDITY HACH	1
07/07/1977	RM183	SPECIFIC CONDUCTANCE 25C	271
07/07/1977	RM183	MINERAL TURBIDITY HACH	1
07/07/1977	RM184	SPECIFIC CONDUCTANCE 25C	276
07/07/1977	RM184	MINERAL TURBIDITY HACH	1
07/07/1977	RM185	SPECIFIC CONDUCTANCE 25C	261
07/07/1977	RM185	MINERAL TURBIDITY HACH	1
07/07/1977	RM186	SPECIFIC CONDUCTANCE 25C	272

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

07/07/1977	RM186	MINERAL TURBIDITY HACH	1
07/08/1977	RM187	SPECIFIC CONDUCTANCE 25C	290
07/08/1977	RM187	MINERAL TURBIDITY HACH	1
07/08/1977	104928	DISSOLVED ORTHOPHOSPHATE as P	0
07/08/1977	104928	DISSOLVED NITRATE as N	0.02
07/08/1977	104928	TOTAL AMMONIA as N	0
07/08/1977	RM188	SPECIFIC CONDUCTANCE 25C	285
07/08/1977	RM188	MINERAL TURBIDITY HACH	1
07/08/1977	RM189	SPECIFIC CONDUCTANCE 25C	274
07/08/1977	RM189	MINERAL TURBIDITY HACH	1
07/08/1977	RM190	SPECIFIC CONDUCTANCE 25C	273
07/08/1977	RM190	MINERAL TURBIDITY HACH	1
07/08/1977	RM191	SPECIFIC CONDUCTANCE 25C	264
07/08/1977	RM191	MINERAL TURBIDITY HACH	1
07/08/1977	RM192	SPECIFIC CONDUCTANCE 25C	281
07/08/1977	RM192	MINERAL TURBIDITY HACH	2
07/09/1977	RM193	SPECIFIC CONDUCTANCE 25C	280
07/09/1977	RM193	MINERAL TURBIDITY HACH	1
08/11/1977	105844	TOTAL AMMONIA & ORGANIC NITROG	0.1
08/11/1977	105844	DISSOLVED NITRATE as N	0.01
08/11/1977	105844	Cd mg/L T	0
08/11/1977	105844	Cu mg/L T	0
08/11/1977	105844	Fe mg/L T	0.04
08/11/1977	105844	Mn mg/L T	0.03
08/11/1977	105844	Pb mg/L T	0.01
08/11/1977	105844	Zn mg/L T	0.01
11/09/1977	RM194	MINERAL TURBIDITY HACH	0
11/23/1977	112781	DISSOLVED NITRATE as N	0.38
11/23/1977	112781	TOTAL PHOSPHORUS as P	0.08
11/23/1977	112781	TOTAL AMMONIA & ORGANIC NITROG	0.3
11/23/1977	112781	LAB pH	7.8
11/23/1977	112781	DISSOLVED CHLORIDE	18
11/23/1977	112781	DISSOLVED HARDNESS CaCO3 mg/L	85
11/23/1977	112781	DISSOLVED TOTAL ALKALINITY	50
11/23/1977	112781	SPECIFIC CONDUCTANCE 25C	239
11/23/1977	112781	DISSOLVED SODIUM	13
11/23/1977	112781	MINERAL TURBIDITY HACH	42
12/12/1977	112771	DISSOLVED NITRATE as N	0.04
12/12/1977	112771	TOTAL PHOSPHORUS as P	0.02
12/12/1977	112771	TOTAL AMMONIA & ORGANIC NITROG	0.3
12/12/1977	112771	LAB pH	7.6
12/12/1977	112771	DISSOLVED CHLORIDE	14
12/12/1977	112771	DISSOLVED HARDNESS CaCO3 mg/L	76
12/12/1977	112771	DISSOLVED TOTAL ALKALINITY	58
12/12/1977	112771	SPECIFIC CONDUCTANCE 25C	218
12/12/1977	112771	DISSOLVED SODIUM	12
12/12/1977	112771	MINERAL TURBIDITY HACH	13
12/15/1977	112805	DISSOLVED NITRATE as N	0.36
12/15/1977	112805	TOTAL PHOSPHORUS as P	0.59
12/15/1977	112805	TOTAL AMMONIA & ORGANIC NITROG	1.3
12/15/1977	112805	DISSOLVED CHLORIDE	7.3

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

12/15/1977	112805	LAB pH	7.7
12/15/1977	112805	DISSOLVED SODIUM	8.1
12/15/1977	112805	DISSOLVED HARDNESS CaCO3 mg/L	74
12/15/1977	112805	DISSOLVED TOTAL ALKALINITY	52
12/15/1977	112805	SPECIFIC CONDUCTANCE 25C	189
12/15/1977	112805	MINERAL TURBIDITY HACH	225
01/10/1978	112786	DISSOLVED NITRATE as N	0.14
01/10/1978	112786	TOTAL PHOSPHORUS as P	0.18
01/10/1978	112786	TOTAL AMMONIA & ORGANIC NITROG	0.4
01/10/1978	112786	DISSOLVED CHLORIDE	2
01/10/1978	112786	LAB pH	8
01/10/1978	112786	DISSOLVED SODIUM	4.4
01/10/1978	112786	DISSOLVED HARDNESS CaCO3 mg/L	49
01/10/1978	112786	DISSOLVED TOTAL ALKALINITY	39
01/10/1978	112786	SPECIFIC CONDUCTANCE 25C	117
01/10/1978	112786	MINERAL TURBIDITY HACH	77
03/15/1978	RM199	MINERAL TURBIDITY HACH	8
04/11/1978	RM200	MINERAL TURBIDITY HACH	5
05/11/1978	RM201	MINERAL TURBIDITY HACH	2
06/20/1978	RM202	MINERAL TURBIDITY HACH	1
06/20/1978	RM155	MINERAL TURBIDITY HACH	1
06/20/1978	RM156	MINERAL TURBIDITY HACH	1
06/20/1978	RM157	MINERAL TURBIDITY HACH	1
06/21/1978	RM158	MINERAL TURBIDITY HACH	1
06/21/1978	RM159	MINERAL TURBIDITY HACH	1
06/21/1978	RM160	MINERAL TURBIDITY HACH	1
06/21/1978	RM161	MINERAL TURBIDITY HACH	1
08/15/1978	RM162	MINERAL TURBIDITY HACH	1
08/15/1978	RM163	MINERAL TURBIDITY HACH	1
08/15/1978	RM164	MINERAL TURBIDITY HACH	1
08/15/1978	RM165	MINERAL TURBIDITY HACH	1
08/16/1978	RM166	MINERAL TURBIDITY HACH	1
08/16/1978	RM167	MINERAL TURBIDITY HACH	1
08/16/1978	RM168	MINERAL TURBIDITY HACH	1
08/16/1978	118526	DISSOLVED NITRATE AND NITRITE	0
08/16/1978	118526	TOTAL PHOSPHORUS as P	0.02
08/16/1978	118526	TOTAL AMMONIA & ORGANIC NITROG	0.2
08/16/1978	RM169	MINERAL TURBIDITY HACH	1
01/08/1979	118531	DISSOLVED NITRATE AND NITRITE	0
01/08/1979	118531	TOTAL PHOSPHORUS as P	0.02
01/08/1979	118531	TOTAL AMMONIA & ORGANIC NITROG	0.2
01/08/1979	118531	LAB pH	7.9
01/08/1979	118531	DISSOLVED CALCIUM	15
01/08/1979	118531	DISSOLVED CHLORIDE	12
01/08/1979	118531	DISSOLVED HARDNESS CaCO3 mg/L	58
01/08/1979	118531	DISSOLVED TOTAL ALKALINITY	55
01/08/1979	118531	SPECIFIC CONDUCTANCE 25C	170
01/08/1979	118531	DISSOLVED MAGNESIUM	5
01/08/1979	118531	DISSOLVED SODIUM	10
01/08/1979	118531	MINERAL TURBIDITY HACH	3
01/12/1979	RM171	MINERAL TURBIDITY HACH	16

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/26/1979	RM172	MINERAL TURBIDITY HACH	14
03/01/1979	RM173	MINERAL TURBIDITY HACH	10
04/11/1979	RM174	LAB pH	7.7
04/11/1979	RM174	MINERAL TURBIDITY HACH	2
04/11/1979	RM175	LAB pH	7.8
04/11/1979	RM175	MINERAL TURBIDITY HACH	2
04/11/1979	RM176	LAB pH	7.7
04/11/1979	RM176	MINERAL TURBIDITY HACH	2
04/12/1979	RM177	LAB pH	7.8
04/12/1979	RM177	MINERAL TURBIDITY HACH	2
04/12/1979	RM178	LAB pH	7.6
04/12/1979	RM178	MINERAL TURBIDITY HACH	2
04/12/1979	RM152	LAB pH	7.8
04/12/1979	RM152	MINERAL TURBIDITY HACH	2
04/12/1979	RM153	LAB pH	7.9
04/12/1979	RM153	MINERAL TURBIDITY HACH	2
02/22/1980	NS0136	DISSOLVED ORTHOPHOSPHATE as P	0.01
02/22/1980	NS0136	DISSOLVED NITRATE AND NITRITE	0.04
02/22/1980	NS0136	TOTAL PHOSPHORUS as P	0.11
02/22/1980	NS0136	TOTAL AMMONIA & ORGANIC NITROG	0.3
02/22/1980	NS0136	DISSOLVED BORON	0
02/22/1980	NS0136	DISSOLVED POTASSIUM	1.1
02/22/1980	NS0136	LAB pH	7.9
02/22/1980	NS0136	DISSOLVED CALCIUM	10
02/22/1980	NS0136	DISSOLVED CHLORIDE	0
02/22/1980	NS0136	DISSOLVED HARDNESS CaCO3 mg/L	42
02/22/1980	NS0136	DISSOLVED TOTAL ALKALINITY	39
02/22/1980	NS0136	SPECIFIC CONDUCTANCE 25C	104
02/22/1980	NS0136	DISSOLVED MAGNESIUM	4
02/22/1980	NS0136	DISSOLVED SODIUM	4
02/22/1980	NS0136	MINERAL TURBIDITY HACH	70

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Water Quality Data Results

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Below are the water quality for station A0354500, COTTONWOOD C NF NR IGO.

Date	Sample Number	Constituent/Analyte	Result*
11/28/1970	68044	As mg/L D	0
01/21/1972	73235	As mg/L T	0.06
01/21/1972	73235	Cd mg/L T	0.01
11/28/1970	68044	Cr mg/L T	0
11/28/1970	68044	Cu mg/L D	0
01/21/1972	73235	Cu mg/L T	0.04
12/23/1964	48573	DISSOLVED BORON	0.1
05/21/1974	YUK020	DISSOLVED BORON	0
07/16/1974	YUK021	DISSOLVED BORON	0
09/23/1974	YUK022	DISSOLVED BORON	0
11/14/1974	C88248	DISSOLVED BORON	0
01/15/1975	89091	DISSOLVED BORON	0.1
03/05/1975	89603	DISSOLVED BORON	0
05/19/1975	90650	DISSOLVED BORON	0
07/22/1975	91695	DISSOLVED BORON	0
09/11/1975	93483	DISSOLVED BORON	0
01/14/1976	94735	DISSOLVED BORON	0
03/11/1976	95645	DISSOLVED BORON	0
05/20/1976	96461	DISSOLVED BORON	0
07/23/1976	98035	DISSOLVED BORON	0
09/07/1976	99601	DISSOLVED BORON	0.1
11/12/1976	100579	DISSOLVED BORON	0.1
01/17/1977	100817	DISSOLVED BORON	0
03/17/1977	102291	DISSOLVED BORON	0
05/17/1977	103772	DISSOLVED BORON	0
07/19/1977	104968	DISSOLVED BORON	0
11/09/1977	109057	DISSOLVED BORON	0
01/11/1978	110286	DISSOLVED BORON	0
03/13/1978	110900	DISSOLVED BORON	0
09/20/1978	115754	DISSOLVED BORON	0
07/24/1980	N00039	DISSOLVED BORON	0.1
11/12/1980	N00453	DISSOLVED BORON	0
01/29/1981	N00622	DISSOLVED BORON	0.1
03/11/1981	N00754	DISSOLVED BORON	0
07/28/1981	N01228	DISSOLVED BORON	0
11/25/1981	N01631	DISSOLVED BORON	0
05/24/1982	N02088	DISSOLVED BORON	0
03/16/1983	N02730	DISSOLVED BORON	0
07/06/1983	N03070	DISSOLVED BORON	0
03/26/1984	N03731	DISSOLVED BORON	0
05/23/1985	N04545	DISSOLVED BORON	0

03/24/1986	N05285	DISSOLVED BORON	0
12/23/1964	48573	DISSOLVED CALCIUM	9.6
05/21/1974	YUK020	DISSOLVED CALCIUM	10
07/23/1976	98035	DISSOLVED CALCIUM	26
01/11/1978	110286	DISSOLVED CALCIUM	12
09/20/1978	115754	DISSOLVED CALCIUM	15
07/24/1980	N00039	DISSOLVED CALCIUM	16
11/12/1980	N00453	DISSOLVED CALCIUM	21
01/29/1981	N00622	DISSOLVED CALCIUM	11
03/11/1981	N00754	DISSOLVED CALCIUM	12
07/28/1981	N01228	DISSOLVED CALCIUM	18
11/25/1981	N01631	DISSOLVED CALCIUM	11
05/24/1982	N02088	DISSOLVED CALCIUM	12
03/16/1983	N02730	DISSOLVED CALCIUM	9
07/06/1983	N03070	DISSOLVED CALCIUM	11
03/26/1984	N03731	DISSOLVED CALCIUM	12
05/23/1985	N04545	DISSOLVED CALCIUM	21
03/24/1986	N05285	DISSOLVED CALCIUM	10
07/15/1986	N05607	DISSOLVED CALCIUM	16
03/16/1987	N06141	DISSOLVED CALCIUM	12
07/15/1987	N06444	DISSOLVED CALCIUM	20
01/13/1988	N06779	DISSOLVED CALCIUM	19
05/11/1988	N06988	DISSOLVED CALCIUM	10
11/22/1988	N07397	DISSOLVED CALCIUM	12
01/23/1989	N07491	DISSOLVED CALCIUM	16
03/09/1989	N07586	DISSOLVED CALCIUM	11
11/16/1989	N08134	DISSOLVED CALCIUM	15
01/23/1990	N08188	DISSOLVED CALCIUM	16
12/23/1964	48573	DISSOLVED CHLORIDE	0.9
12/23/1964	48578	DISSOLVED CHLORIDE	0.8
05/21/1974	YUK020	DISSOLVED CHLORIDE	1.9
07/16/1974	YUK021	DISSOLVED CHLORIDE	4.6
09/23/1974	YUK022	DISSOLVED CHLORIDE	14
11/14/1974	C88248	DISSOLVED CHLORIDE	8.9
01/15/1975	89091	DISSOLVED CHLORIDE	4.6
03/05/1975	89603	DISSOLVED CHLORIDE	2.8
05/19/1975	90650	DISSOLVED CHLORIDE	0.8
07/22/1975	91695	DISSOLVED CHLORIDE	7.5
09/11/1975	93483	DISSOLVED CHLORIDE	20
01/14/1976	94735	DISSOLVED CHLORIDE	7.9
03/11/1976	95645	DISSOLVED CHLORIDE	4.4
05/20/1976	96461	DISSOLVED CHLORIDE	6.4
07/23/1976	98035	DISSOLVED CHLORIDE	20
09/07/1976	99601	DISSOLVED CHLORIDE	26
11/12/1976	100579	DISSOLVED CHLORIDE	16
01/17/1977	100817	DISSOLVED CHLORIDE	13
03/17/1977	102291	DISSOLVED CHLORIDE	16
05/17/1977	103772	DISSOLVED CHLORIDE	8
07/19/1977	104968	DISSOLVED CHLORIDE	31
11/09/1977	109057	DISSOLVED CHLORIDE	15
01/11/1978	110286	DISSOLVED CHLORIDE	1.8
03/13/1978	110900	DISSOLVED CHLORIDE	0

09/20/1978	115754	DISSOLVED CHLORIDE	8
07/24/1980	N00039	DISSOLVED CHLORIDE	7
11/12/1980	N00453	DISSOLVED CHLORIDE	21
01/29/1981	N00622	DISSOLVED CHLORIDE	2
03/11/1981	N00754	DISSOLVED CHLORIDE	2
07/28/1981	N01228	DISSOLVED CHLORIDE	18
11/25/1981	N01631	DISSOLVED CHLORIDE	3
05/24/1982	N02088	DISSOLVED CHLORIDE	4
03/16/1983	N02730	DISSOLVED CHLORIDE	1
07/06/1983	N03070	DISSOLVED CHLORIDE	3
03/26/1984	N03731	DISSOLVED CHLORIDE	2
05/23/1985	N04545	DISSOLVED CHLORIDE	11
03/24/1986	N05285	DISSOLVED CHLORIDE	2
07/15/1986	N05607	DISSOLVED CHLORIDE	10
03/16/1987	N06141	DISSOLVED CHLORIDE	2
01/13/1988	N06779	DISSOLVED CHLORIDE	3
05/11/1988	N06988	DISSOLVED CHLORIDE	1
11/22/1988	N07397	DISSOLVED CHLORIDE	6
01/23/1989	N07491	DISSOLVED CHLORIDE	5
03/09/1989	N07586	DISSOLVED CHLORIDE	1
11/16/1989	N08134	DISSOLVED CHLORIDE	10
01/23/1990	N08188	DISSOLVED CHLORIDE	6
12/23/1964	48573	DISSOLVED FLUORIDE	0.1
12/23/1964	48573	DISSOLVED HARDNESS CaCO3 mg/L	35
12/23/1964	48578	DISSOLVED HARDNESS CaCO3 mg/L	34
05/21/1974	YUK020	DISSOLVED HARDNESS CaCO3 mg/L	43
07/16/1974	YUK021	DISSOLVED HARDNESS CaCO3 mg/L	48
09/23/1974	YUK022	DISSOLVED HARDNESS CaCO3 mg/L	70
11/14/1974	C88248	DISSOLVED HARDNESS CaCO3 mg/L	63
01/15/1975	89091	DISSOLVED HARDNESS CaCO3 mg/L	55
03/05/1975	89603	DISSOLVED HARDNESS CaCO3 mg/L	41
05/19/1975	90650	DISSOLVED HARDNESS CaCO3 mg/L	39
07/22/1975	91695	DISSOLVED HARDNESS CaCO3 mg/L	54
09/11/1975	93483	DISSOLVED HARDNESS CaCO3 mg/L	78
01/14/1976	94735	DISSOLVED HARDNESS CaCO3 mg/L	58
03/11/1976	95645	DISSOLVED HARDNESS CaCO3 mg/L	64
05/20/1976	96461	DISSOLVED HARDNESS CaCO3 mg/L	56
07/23/1976	98035	DISSOLVED HARDNESS CaCO3 mg/L	102
09/07/1976	99601	DISSOLVED HARDNESS CaCO3 mg/L	115
11/12/1976	100579	DISSOLVED HARDNESS CaCO3 mg/L	70
01/17/1977	100817	DISSOLVED HARDNESS CaCO3 mg/L	72
03/17/1977	102291	DISSOLVED HARDNESS CaCO3 mg/L	89
05/17/1977	103772	DISSOLVED HARDNESS CaCO3 mg/L	70
07/19/1977	104968	DISSOLVED HARDNESS CaCO3 mg/L	126
11/09/1977	109057	DISSOLVED HARDNESS CaCO3 mg/L	68
01/11/1978	110286	DISSOLVED HARDNESS CaCO3 mg/L	48
03/13/1978	110900	DISSOLVED HARDNESS CaCO3 mg/L	36
09/20/1978	115754	DISSOLVED HARDNESS CaCO3 mg/L	62
07/24/1980	N00039	DISSOLVED HARDNESS CaCO3 mg/L	60
11/12/1980	N00453	DISSOLVED HARDNESS CaCO3 mg/L	82
01/29/1981	N00622	DISSOLVED HARDNESS CaCO3 mg/L	44
03/11/1981	N00754	DISSOLVED HARDNESS CaCO3 mg/L	46

07/28/1981	N01228	DISSOLVED HARDNESS CaCO3 mg/L	70
11/25/1981	N01631	DISSOLVED HARDNESS CaCO3 mg/L	44
05/24/1982	N02088	DISSOLVED HARDNESS CaCO3 mg/L	46
03/16/1983	N02730	DISSOLVED HARDNESS CaCO3 mg/L	35
07/06/1983	N03070	DISSOLVED HARDNESS CaCO3 mg/L	44
03/26/1984	N03731	DISSOLVED HARDNESS CaCO3 mg/L	46
05/23/1985	N04545	DISSOLVED HARDNESS CaCO3 mg/L	82
03/24/1986	N05285	DISSOLVED HARDNESS CaCO3 mg/L	42
07/15/1986	N05607	DISSOLVED HARDNESS CaCO3 mg/L	64
05/11/1988	N06988	DISSOLVED HARDNESS CaCO3 mg/L	42
11/22/1988	N07397	DISSOLVED HARDNESS CaCO3 mg/L	50
01/23/1989	N07491	DISSOLVED HARDNESS CaCO3 mg/L	69
03/09/1989	N07586	DISSOLVED HARDNESS CaCO3 mg/L	52
11/16/1989	N08134	DISSOLVED HARDNESS CaCO3 mg/L	62
01/23/1990	N08188	DISSOLVED HARDNESS CaCO3 mg/L	64
12/23/1964	48573	DISSOLVED MAGNESIUM	2.7
05/21/1974	YUK020	DISSOLVED MAGNESIUM	4.4
07/23/1976	98035	DISSOLVED MAGNESIUM	9
01/11/1978	110286	DISSOLVED MAGNESIUM	4.5
09/20/1978	115754	DISSOLVED MAGNESIUM	6
07/24/1980	N00039	DISSOLVED MAGNESIUM	5
11/12/1980	N00453	DISSOLVED MAGNESIUM	7
01/29/1981	N00622	DISSOLVED MAGNESIUM	4
03/11/1981	N00754	DISSOLVED MAGNESIUM	4
07/28/1981	N01228	DISSOLVED MAGNESIUM	6
11/25/1981	N01631	DISSOLVED MAGNESIUM	4
05/24/1982	N02088	DISSOLVED MAGNESIUM	4
03/16/1983	N02730	DISSOLVED MAGNESIUM	3
07/06/1983	N03070	DISSOLVED MAGNESIUM	4
03/26/1984	N03731	DISSOLVED MAGNESIUM	4
05/23/1985	N04545	DISSOLVED MAGNESIUM	7
03/24/1986	N05285	DISSOLVED MAGNESIUM	4
07/15/1986	N05607	DISSOLVED MAGNESIUM	6
03/16/1987	N06141	DISSOLVED MAGNESIUM	5
07/15/1987	N06444	DISSOLVED MAGNESIUM	7
01/13/1988	N06779	DISSOLVED MAGNESIUM	10
05/11/1988	N06988	DISSOLVED MAGNESIUM	4
11/22/1988	N07397	DISSOLVED MAGNESIUM	5
01/23/1989	N07491	DISSOLVED MAGNESIUM	7
03/09/1989	N07586	DISSOLVED MAGNESIUM	6
11/16/1989	N08134	DISSOLVED MAGNESIUM	6
01/23/1990	N08188	DISSOLVED MAGNESIUM	6
11/28/1970	68044	DISSOLVED NITRATE as N	0.97
12/04/1970	68045	DISSOLVED NITRATE as N	0.67
12/27/1971	72931	DISSOLVED NITRATE as N	0.69
01/21/1972	73235	DISSOLVED NITRATE as N	0.43
12/23/1964	48573	DISSOLVED NITRATE NO3 mg/L	1.7
05/21/1974	YUK020	DISSOLVED NITRATE NO3 mg/L	0
07/23/1976	98035	DISSOLVED NITRATE NO3 mg/L	0.4
01/11/1978	110286	DISSOLVED NITRATE NO3 mg/L	0.3
09/20/1978	115754	DISSOLVED NITRATE NO3 mg/L	0.3
03/16/1987	N06141	DISSOLVED NITRATE NO3 mg/L	0.8

01/13/1988	N06779	DISSOLVED NITRATE NO3 mg/L	0.9
01/23/1989	N07491	DISSOLVED NITRATE NO3 mg/L	0.2
03/09/1989	N07586	DISSOLVED NITRATE NO3 mg/L	0.6
11/16/1989	N08134	DISSOLVED NITRATE NO3 mg/L	0.4
12/27/1971	72931	DISSOLVED ORTHOPHOSPHATE as P	0
01/21/1972	73235	DISSOLVED ORTHOPHOSPHATE as P	0.05
12/23/1964	48573	DISSOLVED POTASSIUM	1.8
05/21/1974	YUK020	DISSOLVED POTASSIUM	1.5
07/23/1976	98035	DISSOLVED POTASSIUM	2
01/11/1978	110286	DISSOLVED POTASSIUM	1.1
09/20/1978	115754	DISSOLVED POTASSIUM	1.1
07/24/1980	N00039	DISSOLVED POTASSIUM	1.4
11/12/1980	N00453	DISSOLVED POTASSIUM	1.6
01/29/1981	N00622	DISSOLVED POTASSIUM	1.1
03/11/1981	N00754	DISSOLVED POTASSIUM	1.1
07/28/1981	N01228	DISSOLVED POTASSIUM	1.9
11/25/1981	N01631	DISSOLVED POTASSIUM	1.1
05/24/1982	N02088	DISSOLVED POTASSIUM	1.4
03/16/1983	N02730	DISSOLVED POTASSIUM	1
07/06/1983	N03070	DISSOLVED POTASSIUM	1.2
05/11/1988	N06988	DISSOLVED POTASSIUM	1
12/23/1964	48573	DISSOLVED SILICA	16
12/23/1964	48573	DISSOLVED SODIUM	3.8
05/21/1974	YUK020	DISSOLVED SODIUM	4.6
07/16/1974	YUK021	DISSOLVED SODIUM	5.4
09/23/1974	YUK022	DISSOLVED SODIUM	12
11/14/1974	C88248	DISSOLVED SODIUM	9.8
01/15/1975	89091	DISSOLVED SODIUM	7.1
03/05/1975	89603	DISSOLVED SODIUM	4.4
05/19/1975	90650	DISSOLVED SODIUM	3.6
07/22/1975	91695	DISSOLVED SODIUM	6.4
09/11/1975	93483	DISSOLVED SODIUM	16
01/14/1976	94735	DISSOLVED SODIUM	7.6
03/11/1976	95645	DISSOLVED SODIUM	7.4
05/20/1976	96461	DISSOLVED SODIUM	6.8
07/23/1976	98035	DISSOLVED SODIUM	16
09/07/1976	99601	DISSOLVED SODIUM	18
11/12/1976	100579	DISSOLVED SODIUM	12
01/17/1977	100817	DISSOLVED SODIUM	10
03/17/1977	102291	DISSOLVED SODIUM	12
05/17/1977	103772	DISSOLVED SODIUM	8.6
07/19/1977	104968	DISSOLVED SODIUM	18
11/09/1977	109057	DISSOLVED SODIUM	13
01/11/1978	110286	DISSOLVED SODIUM	5.1
03/13/1978	110900	DISSOLVED SODIUM	3.6
09/20/1978	115754	DISSOLVED SODIUM	8.7
07/24/1980	N00039	DISSOLVED SODIUM	8
11/12/1980	N00453	DISSOLVED SODIUM	15
01/29/1981	N00622	DISSOLVED SODIUM	5
03/11/1981	N00754	DISSOLVED SODIUM	5
07/28/1981	N01228	DISSOLVED SODIUM	13
11/25/1981	N01631	DISSOLVED SODIUM	6

05/24/1982	N02088	DISSOLVED SODIUM	6
03/16/1983	N02730	DISSOLVED SODIUM	4
07/06/1983	N03070	DISSOLVED SODIUM	5
03/26/1984	N03731	DISSOLVED SODIUM	6
05/23/1985	N04545	DISSOLVED SODIUM	11
03/24/1986	N05285	DISSOLVED SODIUM	6
07/15/1986	N05607	DISSOLVED SODIUM	10
03/16/1987	N06141	DISSOLVED SODIUM	5
07/15/1987	N06444	DISSOLVED SODIUM	16
01/13/1988	N06779	DISSOLVED SODIUM	8
05/11/1988	N06988	DISSOLVED SODIUM	4
11/22/1988	N07397	DISSOLVED SODIUM	7
01/23/1989	N07491	DISSOLVED SODIUM	8
03/09/1989	N07586	DISSOLVED SODIUM	5
11/16/1989	N08134	DISSOLVED SODIUM	10
01/23/1990	N08188	DISSOLVED SODIUM	8
05/21/1974	YUK020	DISSOLVED SOLIDS mg/L at 180C	72
07/23/1976	98035	DISSOLVED SOLIDS mg/L at 180C	168
01/11/1978	110286	DISSOLVED SOLIDS mg/L at 180C	89
09/20/1978	115754	DISSOLVED SOLIDS mg/L at 180C	108
12/23/1964	48573	DISSOLVED SOLIDS, invalid temp	69
12/23/1964	48573	DISSOLVED SULFATE SO4 mg/L	9
05/21/1974	YUK020	DISSOLVED SULFATE SO4 mg/L	5.9
07/23/1976	98035	DISSOLVED SULFATE SO4 mg/L	6.4
01/11/1978	110286	DISSOLVED SULFATE SO4 mg/L	16
09/20/1978	115754	DISSOLVED SULFATE SO4 mg/L	4.8
12/23/1964	48573	DISSOLVED TOTAL ALKALINITY	30
05/21/1974	YUK020	DISSOLVED TOTAL ALKALINITY	46
07/16/1974	YUK021	DISSOLVED TOTAL ALKALINITY	52
09/23/1974	YUK022	DISSOLVED TOTAL ALKALINITY	70
11/14/1974	C88248	DISSOLVED TOTAL ALKALINITY	71
01/15/1975	89091	DISSOLVED TOTAL ALKALINITY	51
03/05/1975	89603	DISSOLVED TOTAL ALKALINITY	40
05/19/1975	90650	DISSOLVED TOTAL ALKALINITY	42
07/22/1975	91695	DISSOLVED TOTAL ALKALINITY	57
09/11/1975	93483	DISSOLVED TOTAL ALKALINITY	75
01/14/1976	94735	DISSOLVED TOTAL ALKALINITY	59
03/11/1976	95645	DISSOLVED TOTAL ALKALINITY	57
05/20/1976	96461	DISSOLVED TOTAL ALKALINITY	55
07/23/1976	98035	DISSOLVED TOTAL ALKALINITY	99
09/07/1976	99601	DISSOLVED TOTAL ALKALINITY	106
11/12/1976	100579	DISSOLVED TOTAL ALKALINITY	67
01/17/1977	100817	DISSOLVED TOTAL ALKALINITY	63
03/17/1977	102291	DISSOLVED TOTAL ALKALINITY	69
05/17/1977	103772	DISSOLVED TOTAL ALKALINITY	66
07/19/1977	104968	DISSOLVED TOTAL ALKALINITY	120
11/09/1977	109057	DISSOLVED TOTAL ALKALINITY	67
01/11/1978	110286	DISSOLVED TOTAL ALKALINITY	41
03/13/1978	110900	DISSOLVED TOTAL ALKALINITY	37
09/20/1978	115754	DISSOLVED TOTAL ALKALINITY	60
07/24/1980	N00039	DISSOLVED TOTAL ALKALINITY	63
11/12/1980	N00453	DISSOLVED TOTAL ALKALINITY	78

01/29/1981	N00622	DISSOLVED TOTAL ALKALINITY	40
03/11/1981	N00754	DISSOLVED TOTAL ALKALINITY	44
07/28/1981	N01228	DISSOLVED TOTAL ALKALINITY	67
11/25/1981	N01631	DISSOLVED TOTAL ALKALINITY	42
05/24/1982	N02088	DISSOLVED TOTAL ALKALINITY	44
03/16/1983	N02730	DISSOLVED TOTAL ALKALINITY	35
07/06/1983	N03070	DISSOLVED TOTAL ALKALINITY	48
03/26/1984	N03731	DISSOLVED TOTAL ALKALINITY	47
05/23/1985	N04545	DISSOLVED TOTAL ALKALINITY	77
03/24/1986	N05285	DISSOLVED TOTAL ALKALINITY	48
07/15/1986	N05607	DISSOLVED TOTAL ALKALINITY	70
03/16/1987	N06141	DISSOLVED TOTAL ALKALINITY	48
01/13/1988	N06779	DISSOLVED TOTAL ALKALINITY	72
05/11/1988	N06988	DISSOLVED TOTAL ALKALINITY	40
11/22/1988	N07397	DISSOLVED TOTAL ALKALINITY	36
01/23/1989	N07491	DISSOLVED TOTAL ALKALINITY	59
03/09/1989	N07586	DISSOLVED TOTAL ALKALINITY	45
11/16/1989	N08134	DISSOLVED TOTAL ALKALINITY	64
01/23/1990	N08188	DISSOLVED TOTAL ALKALINITY	57
12/23/1964	78578	DISSOLVED TOTAL PHOSPHORUS	0.03
12/23/1964	48578	DISSOLVED TOTAL PHOSPHORUS	0.02
11/28/1970	68044	Fe mg/L D	0.02
01/21/1972	73235	Fe mg/L T	38
12/23/1964	48573	LAB pH	7.4
05/21/1974	YUK020	LAB pH	7.3
07/16/1974	YUK021	LAB pH	8.1
09/23/1974	YUK022	LAB pH	7.9
11/14/1974	C88248	LAB pH	8.1
01/15/1975	89091	LAB pH	7.9
03/05/1975	89603	LAB pH	7.7
05/19/1975	90650	LAB pH	8
07/22/1975	91695	LAB pH	7.9
09/11/1975	93483	LAB pH	8
01/14/1976	94735	LAB pH	8.1
03/11/1976	95645	LAB pH	7.8
05/20/1976	96461	LAB pH	7.8
07/23/1976	98035	LAB pH	8.4
09/07/1976	99601	LAB pH	8.2
11/12/1976	100579	LAB pH	8.2
01/17/1977	100817	LAB pH	8.1
03/17/1977	102291	LAB pH	7.3
05/17/1977	103772	LAB pH	7.7
07/19/1977	104968	LAB pH	8
11/09/1977	109057	LAB pH	7.8
01/11/1978	110286	LAB pH	7.4
03/13/1978	110900	LAB pH	7.4
09/20/1978	115754	LAB pH	8
07/24/1980	N00039	LAB pH	7.9
11/12/1980	N00453	LAB pH	8.1
01/29/1981	N00622	LAB pH	7.7
03/11/1981	N00754	LAB pH	7.6
07/28/1981	N01228	LAB pH	7.8

11/25/1981	N01631	LAB pH	7.6
05/24/1982	N02088	LAB pH	7.4
03/16/1983	N02730	LAB pH	7.8
07/06/1983	N03070	LAB pH	8.2
03/26/1984	N03731	LAB pH	7.4
05/23/1985	N04545	LAB pH	8
03/24/1986	N05285	LAB pH	8
07/15/1986	N05607	LAB pH	8.4
03/16/1987	N06141	LAB pH	8.2
07/15/1987	N06444	LAB pH	7.9
01/13/1988	N06779	LAB pH	8.2
05/11/1988	N06988	LAB pH	8.6
01/23/1989	N07491	LAB pH	8.2
05/21/1974	YUK020	MINERAL TURBIDITY HACH	5
07/16/1974	YUK021	MINERAL TURBIDITY HACH	0
09/23/1974	YUK022	MINERAL TURBIDITY HACH	0
11/14/1974	C88248	MINERAL TURBIDITY HACH	0
01/15/1975	89091	MINERAL TURBIDITY HACH	0
03/05/1975	89603	MINERAL TURBIDITY HACH	5
05/19/1975	90650	MINERAL TURBIDITY HACH	1
07/22/1975	91695	MINERAL TURBIDITY HACH	0
09/11/1975	93483	MINERAL TURBIDITY HACH	0
11/17/1975	82G	MINERAL TURBIDITY HACH	1
01/14/1976	94735	MINERAL TURBIDITY HACH	0
03/11/1976	95645	MINERAL TURBIDITY HACH	1
05/20/1976	96461	MINERAL TURBIDITY HACH	0
09/07/1976	99601	MINERAL TURBIDITY HACH	1
11/12/1976	100579	MINERAL TURBIDITY HACH	1
01/17/1977	100817	MINERAL TURBIDITY HACH	0
03/17/1977	102291	MINERAL TURBIDITY HACH	1
05/17/1977	103772	MINERAL TURBIDITY HACH	1
07/19/1977	104968	MINERAL TURBIDITY HACH	0
09/19/1977	44B	MINERAL TURBIDITY HACH	1
11/09/1977	109057	MINERAL TURBIDITY HACH	1
01/11/1978	110286	MINERAL TURBIDITY HACH	26
03/13/1978	110900	MINERAL TURBIDITY HACH	6
05/16/1978	35F	MINERAL TURBIDITY HACH	2
07/18/1978	31C	MINERAL TURBIDITY HACH	1
09/20/1978	115754	MINERAL TURBIDITY HACH	0
11/17/1978	34E	MINERAL TURBIDITY HACH	1
01/19/1979	3X36	MINERAL TURBIDITY HACH	7
03/20/1979	34	MINERAL TURBIDITY HACH	4
05/21/1979	XV	MINERAL TURBIDITY HACH	1
07/24/1979	DF43	MINERAL TURBIDITY HACH	1
09/24/1979	9F	MINERAL TURBIDITY HACH	1
11/20/1979	X20	MINERAL TURBIDITY HACH	3
01/23/1980	F4	MINERAL TURBIDITY HACH	2
03/25/1980	F54	MINERAL TURBIDITY HACH	2
05/23/1980	FD12	MINERAL TURBIDITY HACH	1
07/24/1980	N00039	MINERAL TURBIDITY HACH	1
09/30/1980	F44	MINERAL TURBIDITY HACH	1
11/12/1980	N00453	MINERAL TURBIDITY HACH	0

01/29/1981	N00622	MINERAL TURBIDITY HACH	34
03/11/1981	N00754	MINERAL TURBIDITY HACH	3
05/27/1981	C37	MINERAL TURBIDITY HACH	2
07/28/1981	N01228	MINERAL TURBIDITY HACH	1
09/22/1981	FD20	MINERAL TURBIDITY HACH	1
11/25/1981	N01631	MINERAL TURBIDITY HACH	5
01/12/1982	NFL02	MINERAL TURBIDITY HACH	2
05/24/1982	N02088	MINERAL TURBIDITY HACH	1
07/21/1982	CS2	MINERAL TURBIDITY HACH	2
09/10/1982	L925	MINERAL TURBIDITY HACH	2
11/16/1982	VDB12	MINERAL TURBIDITY HACH	1
01/19/1983	ACH08	MINERAL TURBIDITY HACH	15
03/16/1983	N02730	MINERAL TURBIDITY HACH	35
05/11/1983	A52510	MINERAL TURBIDITY HACH	3
07/06/1983	N03070	MINERAL TURBIDITY HACH	1
09/26/1983	A031	MINERAL TURBIDITY HACH	12
11/15/1983	P214	MINERAL TURBIDITY HACH	4
01/23/1984	A14	MINERAL TURBIDITY HACH	3
03/26/1984	N03731	MINERAL TURBIDITY HACH	2
05/25/1984	P52914	MINERAL TURBIDITY HACH	1
07/20/1984	P72333	MINERAL TURBIDITY HACH	14
09/11/1984	P91438	MINERAL TURBIDITY HACH	1
11/21/1984	L1263	MINERAL TURBIDITY HACH	4
01/16/1985	P3273	MINERAL TURBIDITY HACH	1
03/12/1985	L114	MINERAL TURBIDITY HACH	1
05/23/1985	N04545	MINERAL TURBIDITY HACH	1
07/25/1985	P7263	MINERAL TURBIDITY HACH	2
09/24/1985	P9254	MINERAL TURBIDITY HACH	1
11/20/1985	A1121	MINERAL TURBIDITY HACH	2
01/09/1986	P0194	MINERAL TURBIDITY HACH	3
03/24/1986	N05285	MINERAL TURBIDITY HACH	5
05/08/1986	P594	MINERAL TURBIDITY HACH	13
07/15/1986	N05607	MINERAL TURBIDITY HACH	2
09/04/1986	P951	MINERAL TURBIDITY HACH	1
11/18/1986	P11114	MINERAL TURBIDITY HACH	1
01/13/1987	P1142	MINERAL TURBIDITY HACH	1
03/16/1987	N06141	MINERAL TURBIDITY HACH	5
05/21/1987	A42	MINERAL TURBIDITY HACH	1
07/15/1987	N06444	MINERAL TURBIDITY HACH	1
05/11/1988	N06988	MINERAL TURBIDITY HACH	13
11/22/1988	N07397	MINERAL TURBIDITY HACH	180
01/23/1989	N07491	MINERAL TURBIDITY HACH	5
03/09/1989	N07586	MINERAL TURBIDITY HACH	65
05/11/1989	P5123	MINERAL TURBIDITY HACH	1
01/23/1990	N08188	MINERAL TURBIDITY HACH	1
03/16/1990	P32116	MINERAL TURBIDITY HACH	2
03/14/1991	P3144	MINERAL TURBIDITY HACH	5
12/23/1964	48573	MINERAL TURBIDITY HELLIGE	250
12/23/1964	48578	MINERAL TURBIDITY HELLIGE	160
11/28/1970	68044	Mn mg/L D	0
01/21/1972	73235	Mn mg/L T	0.37
11/28/1970	68044	Pb mg/L D	0

01/21/1972	73235	Pb mg/L T	0.01
12/23/1964	48573	SPECIFIC CONDUCTANCE 25C	89
12/23/1964	48578	SPECIFIC CONDUCTANCE 25C	85
11/28/1970	68044	SPECIFIC CONDUCTANCE 25C	109
05/21/1974	YUK020	SPECIFIC CONDUCTANCE 25C	107
07/16/1974	YUK021	SPECIFIC CONDUCTANCE 25C	123
09/23/1974	YUK022	SPECIFIC CONDUCTANCE 25C	194
11/14/1974	C88248	SPECIFIC CONDUCTANCE 25C	164
01/15/1975	89091	SPECIFIC CONDUCTANCE 25C	142
03/05/1975	89603	SPECIFIC CONDUCTANCE 25C	101
05/19/1975	90650	SPECIFIC CONDUCTANCE 25C	97
07/22/1975	91695	SPECIFIC CONDUCTANCE 25C	140
09/11/1975	93483	SPECIFIC CONDUCTANCE 25C	226
01/14/1976	94735	SPECIFIC CONDUCTANCE 25C	154
03/11/1976	95645	SPECIFIC CONDUCTANCE 25C	158
05/20/1976	96461	SPECIFIC CONDUCTANCE 25C	142
07/23/1976	98035	SPECIFIC CONDUCTANCE 25C	281
09/07/1976	99601	SPECIFIC CONDUCTANCE 25C	305
11/12/1976	100579	SPECIFIC CONDUCTANCE 25C	195
01/17/1977	100817	SPECIFIC CONDUCTANCE 25C	184
03/17/1977	102291	SPECIFIC CONDUCTANCE 25C	239
05/17/1977	103772	SPECIFIC CONDUCTANCE 25C	183
07/19/1977	104968	SPECIFIC CONDUCTANCE 25C	343
11/09/1977	109057	SPECIFIC CONDUCTANCE 25C	206
01/11/1978	110286	SPECIFIC CONDUCTANCE 25C	128
03/13/1978	110900	SPECIFIC CONDUCTANCE 25C	94
09/20/1978	115754	SPECIFIC CONDUCTANCE 25C	160
07/24/1980	N00039	SPECIFIC CONDUCTANCE 25C	162
11/12/1980	N00453	SPECIFIC CONDUCTANCE 25C	240
01/29/1981	N00622	SPECIFIC CONDUCTANCE 25C	113
03/11/1981	N00754	SPECIFIC CONDUCTANCE 25C	121
07/28/1981	N01228	SPECIFIC CONDUCTANCE 25C	207
11/25/1981	N01631	SPECIFIC CONDUCTANCE 25C	121
05/24/1982	N02088	SPECIFIC CONDUCTANCE 25C	123
11/16/1982	VDB12	SPECIFIC CONDUCTANCE 25C	141
03/16/1983	N02730	SPECIFIC CONDUCTANCE 25C	90
07/06/1983	N03070	SPECIFIC CONDUCTANCE 25C	110
03/26/1984	N03731	SPECIFIC CONDUCTANCE 25C	124
05/23/1985	N04545	SPECIFIC CONDUCTANCE 25C	222
03/24/1986	N05285	SPECIFIC CONDUCTANCE 25C	105
07/15/1986	N05607	SPECIFIC CONDUCTANCE 25C	176
03/16/1987	N06141	SPECIFIC CONDUCTANCE 25C	112
07/15/1987	N06444	SPECIFIC CONDUCTANCE 25C	229
01/13/1988	N06779	SPECIFIC CONDUCTANCE 25C	199
05/11/1988	N06988	SPECIFIC CONDUCTANCE 25C	98
11/22/1988	N07397	SPECIFIC CONDUCTANCE 25C	145
01/23/1989	N07491	SPECIFIC CONDUCTANCE 25C	174
03/09/1989	N07586	SPECIFIC CONDUCTANCE 25C	123
11/16/1989	N08134	SPECIFIC CONDUCTANCE 25C	174
01/23/1990	N08188	SPECIFIC CONDUCTANCE 25C	166
01/21/1972	73235	SUSPENDED SOLIDS AT 105C	110
11/28/1970	68044	TOTAL AMMONIA & ORGANIC NITROG	0.61

12/04/1970	68045	TOTAL AMMONIA & ORGANIC NITROG	0.32
12/27/1971	72931	TOTAL AMMONIA & ORGANIC NITROG	0.2
01/21/1972	73235	TOTAL AMMONIA & ORGANIC NITROG	0.5
11/28/1970	68044	TOTAL AMMONIA as N	0.01
12/04/1970	68045	TOTAL AMMONIA as N	0.02
11/28/1970	68044	TOTAL ORGANIC NITROGEN as N	0.6
12/04/1970	68045	TOTAL ORGANIC NITROGEN as N	0.3
11/28/1970	68044	TOTAL PHOSPHORUS as P	0.41
12/04/1970	68045	TOTAL PHOSPHORUS as P	0.19
12/27/1971	72931	TOTAL PHOSPHORUS as P	0.01
01/21/1972	73235	TOTAL PHOSPHORUS as P	0.25
01/21/1972	73235	VOLATILE SUSPENDED SOLIDS	27
11/28/1970	68044	Zn mg/L D	0
01/21/1972	73235	Zn mg/L T	0.16

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

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Water Quality Data Results

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Below are the water quality for station A0352000, COTTONWOOD C NR COTTONWOOD.

Date	Sample Number	Constituent/Analyte	Result*
06/25/1957	3004	DISSOLVED BORON	0.08
06/25/1957	3004	DISSOLVED CHLORIDE	5.2
06/25/1957	3004	DISSOLVED FLUORIDE	0.1
06/25/1957	3004	DISSOLVED POTASSIUM	1.9
06/25/1957	3004	LAB pH	7.9
06/25/1957	3004	DISSOLVED MAGNESIUM	9.8
06/25/1957	3004	DISSOLVED SODIUM	8.1
06/25/1957	3004	DISSOLVED NITRATE NO3 mg/L	0.2
06/25/1957	3004	DISSOLVED SULFATE SO4 mg/L	8.2
06/25/1957	3004	DISSOLVED CALCIUM	21
06/25/1957	3004	DISSOLVED HARDNESS CaCO3 mg/L	93
06/25/1957	3004	DISSOLVED TOTAL ALKALINITY	94
06/25/1957	3004	SPECIFIC CONDUCTANCE 25C	211
06/25/1957	3004	DISSOLVED SILICA	26
07/23/1957	23048	DISSOLVED ORTHOPHOSPHATE as P	0.02
07/23/1957	23048	As mg/L D	0
07/23/1957	23048	CHROMIUM (+6) Dissolved	0
07/23/1957	23048	Cu mg/L D	0.01
07/23/1957	23048	Fe mg/L D	0
07/23/1957	23048	Mn mg/L D	0
07/23/1957	23048	Pb mg/L D	0
07/23/1957	23048	Zn mg/L D	0
07/23/1957	23048	DISSOLVED BORON	0
07/23/1957	23048	DISSOLVED CHLORIDE	5.7
07/23/1957	23048	DISSOLVED FLUORIDE	0.2
07/23/1957	23048	DISSOLVED POTASSIUM	1.8
07/23/1957	23048	LAB pH	8
07/23/1957	23048	DISSOLVED SODIUM	9
07/23/1957	23048	DISSOLVED NITRATE NO3 mg/L	0
07/23/1957	23048	DISSOLVED SULFATE SO4 mg/L	4.8
07/23/1957	23048	DISSOLVED CALCIUM	16
07/23/1957	23048	DISSOLVED HARDNESS CaCO3 mg/L	88
07/23/1957	23048	DISSOLVED TOTAL ALKALINITY	95
07/23/1957	23048	SPECIFIC CONDUCTANCE 25C	203
07/23/1957	23048	DISSOLVED MAGNESIUM	12
07/23/1957	23048	DISSOLVED SILICA	24
07/23/1957	23048	Al mg/L D	0
08/26/1957	23400	DISSOLVED BORON	0.06
08/26/1957	23400	DISSOLVED CHLORIDE	5
08/26/1957	23400	DISSOLVED FLUORIDE	0.1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

08/26/1957	23400	DISSOLVED POTASSIUM	1.6
08/26/1957	23400	LAB pH	8.2
08/26/1957	23400	DISSOLVED MAGNESIUM	9.1
08/26/1957	23400	DISSOLVED SODIUM	9.3
08/26/1957	23400	DISSOLVED NITRATE NO3 mg/L	0.3
08/26/1957	23400	DISSOLVED SULFATE SO4 mg/L	4.8
08/26/1957	23400	DISSOLVED CALCIUM	17
08/26/1957	23400	DISSOLVED HARDNESS CaCO3 mg/L	80
08/26/1957	23400	DISSOLVED TOTAL ALKALINITY	89
08/26/1957	23400	SPECIFIC CONDUCTANCE 25C	189
08/26/1957	23400	DISSOLVED SILICA	31
08/26/1957	23400	MINERAL TURBIDITY HELLIGE	1
09/30/1957	23979	DISSOLVED ORTHOPHOSPHATE as P	0.07
09/30/1957	23979	As mg/L D	0
09/30/1957	23979	CHROMIUM (+6) Dissolved	0
09/30/1957	23979	Cu mg/L D	0.01
09/30/1957	23979	Fe mg/L D	0.04
09/30/1957	23979	Mn mg/L D	0
09/30/1957	23979	Pb mg/L D	0
09/30/1957	23979	Zn mg/L D	0
09/30/1957	23979	DISSOLVED BORON	0
09/30/1957	23979	DISSOLVED FLUORIDE	0.1
09/30/1957	23979	DISSOLVED POTASSIUM	1.6
09/30/1957	23979	LAB pH	7.5
09/30/1957	23979	DISSOLVED MAGNESIUM	9.4
09/30/1957	23979	DISSOLVED SODIUM	8.7
09/30/1957	23979	DISSOLVED NITRATE NO3 mg/L	0.7
09/30/1957	23979	DISSOLVED CALCIUM	19
09/30/1957	23979	DISSOLVED CHLORIDE	12
09/30/1957	23979	DISSOLVED HARDNESS CaCO3 mg/L	86
09/30/1957	23979	DISSOLVED TOTAL ALKALINITY	76
09/30/1957	23979	SPECIFIC CONDUCTANCE 25C	206
09/30/1957	23979	DISSOLVED SILICA	27
09/30/1957	23979	DISSOLVED SULFATE SO4 mg/L	12
09/30/1957	23979	Al mg/L D	0.12

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Water Quality Data Results

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Below are the water quality for station A0353400, COTTONWOOD C SF A FARQUHAR RD.

Date	Sample Number	Constituent/Analyte	Result*
07/07/1977	RM63	DISSOLVED TOTAL ALKALINITY	125
07/07/1977	RM64	DISSOLVED TOTAL ALKALINITY	119
07/07/1977	RM65	DISSOLVED TOTAL ALKALINITY	114
07/07/1977	RM66	DISSOLVED TOTAL ALKALINITY	110
07/07/1977	RM67	DISSOLVED TOTAL ALKALINITY	117
07/07/1977	RM63	LAB pH	8
07/07/1977	RM64	LAB pH	8
07/07/1977	RM65	LAB pH	8
07/07/1977	RM66	LAB pH	7.9
07/07/1977	RM67	LAB pH	7.9
07/07/1977	RM63	MINERAL TURBIDITY HACH	1
07/07/1977	RM64	MINERAL TURBIDITY HACH	1
07/07/1977	RM65	MINERAL TURBIDITY HACH	2
07/07/1977	RM66	MINERAL TURBIDITY HACH	78
07/07/1977	RM67	MINERAL TURBIDITY HACH	17
07/07/1977	RM63	SPECIFIC CONDUCTANCE 25C	438
07/07/1977	RM64	SPECIFIC CONDUCTANCE 25C	427
07/07/1977	RM65	SPECIFIC CONDUCTANCE 25C	423
07/07/1977	RM66	SPECIFIC CONDUCTANCE 25C	423
07/07/1977	RM67	SPECIFIC CONDUCTANCE 25C	420
07/08/1977	104927	DISSOLVED NITRATE as N	0.09
07/08/1977	104927	DISSOLVED ORTHOPHOSPHATE as P	0
07/08/1977	RM68	DISSOLVED TOTAL ALKALINITY	127
07/08/1977	RM69	DISSOLVED TOTAL ALKALINITY	132
07/08/1977	RM70	DISSOLVED TOTAL ALKALINITY	119
07/08/1977	RM71	DISSOLVED TOTAL ALKALINITY	141
07/08/1977	RM72	DISSOLVED TOTAL ALKALINITY	144
07/08/1977	RM73	DISSOLVED TOTAL ALKALINITY	118
07/08/1977	RM68	LAB pH	7.9
07/08/1977	RM69	LAB pH	7.5
07/08/1977	RM70	LAB pH	8
07/08/1977	RM71	LAB pH	7.9
07/08/1977	RM72	LAB pH	7.8
07/08/1977	RM73	LAB pH	7.9
07/08/1977	RM68	MINERAL TURBIDITY HACH	1
07/08/1977	RM69	MINERAL TURBIDITY HACH	38
07/08/1977	RM70	MINERAL TURBIDITY HACH	2
07/08/1977	RM71	MINERAL TURBIDITY HACH	2
07/08/1977	RM72	MINERAL TURBIDITY HACH	2
07/08/1977	RM73	MINERAL TURBIDITY HACH	2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

07/08/1977	RM68	SPECIFIC CONDUCTANCE 25C	441
07/08/1977	RM69	SPECIFIC CONDUCTANCE 25C	445
07/08/1977	RM70	SPECIFIC CONDUCTANCE 25C	431
07/08/1977	RM71	SPECIFIC CONDUCTANCE 25C	464
07/08/1977	RM72	SPECIFIC CONDUCTANCE 25C	466
07/08/1977	RM73	SPECIFIC CONDUCTANCE 25C	433
07/08/1977	104927	TOTAL AMMONIA as N	0.01
07/09/1977	RM74	DISSOLVED TOTAL ALKALINITY	125
07/09/1977	RM74	LAB pH	8
07/09/1977	RM74	MINERAL TURBIDITY HACH	2
07/09/1977	RM74	SPECIFIC CONDUCTANCE 25C	443
11/23/1977	112780	DISSOLVED CHLORIDE	30
11/23/1977	112780	DISSOLVED HARDNESS CaCO3 mg/L	106
11/23/1977	112780	DISSOLVED NITRATE as N	1.6
11/23/1977	112780	DISSOLVED SODIUM	20
11/23/1977	112780	DISSOLVED TOTAL ALKALINITY	66
11/23/1977	112780	LAB pH	7.6
11/23/1977	112780	MINERAL TURBIDITY HACH	740
11/23/1977	112780	SPECIFIC CONDUCTANCE 25C	307
11/23/1977	112780	TOTAL AMMONIA & ORGANIC NITROG	10
11/23/1977	112780	TOTAL PHOSPHORUS as P	2.9
12/12/1977	112770	DISSOLVED CHLORIDE	82
12/12/1977	112770	DISSOLVED HARDNESS CaCO3 mg/L	185
12/12/1977	112770	DISSOLVED NITRATE as N	0.21
12/12/1977	112770	DISSOLVED SODIUM	37
12/12/1977	112770	DISSOLVED TOTAL ALKALINITY	106
12/12/1977	112770	LAB pH	8
12/12/1977	112770	MINERAL TURBIDITY HACH	79
12/12/1977	112770	SPECIFIC CONDUCTANCE 25C	562
12/12/1977	112770	TOTAL AMMONIA & ORGANIC NITROG	0.6
12/12/1977	112770	TOTAL PHOSPHORUS as P	0.27
12/15/1977	112804	DISSOLVED CHLORIDE	7.2
12/15/1977	112804	DISSOLVED HARDNESS CaCO3 mg/L	81
12/15/1977	112804	DISSOLVED NITRATE as N	1
12/15/1977	112804	DISSOLVED SODIUM	7.2
12/15/1977	112804	DISSOLVED TOTAL ALKALINITY	65
12/15/1977	112804	LAB pH	7.9
12/15/1977	112804	MINERAL TURBIDITY HACH	900
12/15/1977	112804	SPECIFIC CONDUCTANCE 25C	195
12/15/1977	112804	TOTAL AMMONIA & ORGANIC NITROG	5.4
12/15/1977	112804	TOTAL PHOSPHORUS as P	3.2
01/10/1978	RM78	MINERAL TURBIDITY HACH	190
03/15/1978	RM79	MINERAL TURBIDITY HACH	27
04/11/1978	112767	DISSOLVED CHLORIDE	9.7
04/11/1978	112767	DISSOLVED HARDNESS CaCO3 mg/L	111
04/11/1978	112767	DISSOLVED NITRATE as N	0.04
04/11/1978	112767	DISSOLVED SODIUM	10
04/11/1978	112767	DISSOLVED TOTAL ALKALINITY	99
04/11/1978	112767	LAB pH	8.1
04/11/1978	112767	MINERAL TURBIDITY HACH	12
04/11/1978	112767	SPECIFIC CONDUCTANCE 25C	263

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

04/11/1978	112767	TOTAL AMMONIA & ORGANIC NITROG	0.1
04/11/1978	112767	TOTAL PHOSPHORUS as P	0.04
05/11/1978	RM81	MINERAL TURBIDITY HACH	6
06/20/1978	RM82	MINERAL TURBIDITY HACH	6
06/20/1978	RM83	MINERAL TURBIDITY HACH	5
06/20/1978	RM84	MINERAL TURBIDITY HACH	5
06/20/1978	RM85	MINERAL TURBIDITY HACH	6
06/21/1978	RM86	MINERAL TURBIDITY HACH	6
06/21/1978	RM87	MINERAL TURBIDITY HACH	5
06/21/1978	RM88	MINERAL TURBIDITY HACH	5
06/21/1978	RM89	MINERAL TURBIDITY HACH	5
08/15/1978	RM90	MINERAL TURBIDITY HACH	1
08/15/1978	RM91	MINERAL TURBIDITY HACH	1
08/15/1978	RM92	MINERAL TURBIDITY HACH	1
08/15/1978	RM93	MINERAL TURBIDITY HACH	1
08/15/1978	RM94	MINERAL TURBIDITY HACH	1
08/16/1978	118505	DISSOLVED NITRATE AND NITRITE	0.02
08/16/1978	RM95	MINERAL TURBIDITY HACH	1
08/16/1978	RM96	MINERAL TURBIDITY HACH	1
08/16/1978	RM97	MINERAL TURBIDITY HACH	1
08/16/1978	118505	TOTAL AMMONIA & ORGANIC NITROG	0.2
08/16/1978	118505	TOTAL PHOSPHORUS as P	0.02
01/08/1979	118530	DISSOLVED CALCIUM	43
01/08/1979	118530	DISSOLVED CHLORIDE	50
01/08/1979	118530	DISSOLVED HARDNESS CaCO3 mg/L	173
01/08/1979	118530	DISSOLVED MAGNESIUM	16
01/08/1979	118530	DISSOLVED NITRATE AND NITRITE	0.02
01/08/1979	118530	DISSOLVED SODIUM	25
01/08/1979	118530	DISSOLVED TOTAL ALKALINITY	126
01/08/1979	118530	LAB pH	8.1
01/08/1979	118530	MINERAL TURBIDITY HACH	10
01/08/1979	118530	SPECIFIC CONDUCTANCE 25C	461
01/08/1979	118530	TOTAL AMMONIA & ORGANIC NITROG	0.3
01/08/1979	118530	TOTAL PHOSPHORUS as P	0.03
01/12/1979	118550	DISSOLVED CALCIUM	26
01/12/1979	118550	DISSOLVED CHLORIDE	19
01/12/1979	118550	DISSOLVED HARDNESS CaCO3 mg/L	98
01/12/1979	118550	DISSOLVED MAGNESIUM	8
01/12/1979	118550	DISSOLVED NITRATE AND NITRITE	0.38
01/12/1979	118550	DISSOLVED SODIUM	13
01/12/1979	118550	DISSOLVED TOTAL ALKALINITY	73
01/12/1979	118550	LAB pH	7.7
01/12/1979	118550	MINERAL TURBIDITY HACH	125
01/12/1979	118550	SPECIFIC CONDUCTANCE 25C	260
01/12/1979	118550	TOTAL AMMONIA & ORGANIC NITROG	0.7
01/12/1979	118550	TOTAL PHOSPHORUS as P	0.23
02/26/1979	RM100	MINERAL TURBIDITY HACH	4
03/01/1979	RM101	MINERAL TURBIDITY HACH	37
04/11/1979	RM102	LAB pH	8.1
04/11/1979	RM103	LAB pH	8.2
04/11/1979	RM104	LAB pH	8.2

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04/11/1979	RM102	MINERAL TURBIDITY HACH	2
04/11/1979	RM103	MINERAL TURBIDITY HACH	2
04/11/1979	RM104	MINERAL TURBIDITY HACH	2
04/12/1979	RM105	LAB pH	8.2
04/12/1979	RM106	LAB pH	8.1
04/12/1979	RM107	LAB pH	8.2
04/12/1979	RM108	LAB pH	8.4
04/12/1979	RM105	MINERAL TURBIDITY HACH	2
04/12/1979	RM106	MINERAL TURBIDITY HACH	2
04/12/1979	RM107	MINERAL TURBIDITY HACH	2
04/12/1979	RM108	MINERAL TURBIDITY HACH	2
12/22/1982	N02567	DISSOLVED BORON	0
12/22/1982	N02567	DISSOLVED CALCIUM	18
12/22/1982	N02567	DISSOLVED CHLORIDE	3
12/22/1982	N02567	DISSOLVED HARDNESS CaCO3 mg/L	70
12/22/1982	N02567	DISSOLVED MAGNESIUM	6
12/22/1982	N02567	DISSOLVED POTASSIUM	0.9
12/22/1982	N02567	DISSOLVED SODIUM	6
12/22/1982	N02567	DISSOLVED TOTAL ALKALINITY	63
12/22/1982	N02567	LAB pH	7.8
12/22/1982	N02567	MINERAL TURBIDITY HACH	230
12/22/1982	N02567	SPECIFIC CONDUCTANCE 25C	163

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Water Quality Data Results

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Below are the water quality for station A0359900, COTTONWOOD C SF A HWY 36 BR.

Date	Sample Number	Constituent/Analyte	Result*
04/23/1956	8424	DISSOLVED BORON	0.01
04/23/1956	8424	DISSOLVED CHLORIDE	3.2
04/23/1956	8424	DISSOLVED POTASSIUM	0.9
04/23/1956	8424	LAB pH	6.9
04/23/1956	8424	DISSOLVED MAGNESIUM	5.4
04/23/1956	8424	DISSOLVED SODIUM	4.8
04/23/1956	8424	DISSOLVED NITRATE NO3 mg/L	0.2
04/23/1956	8424	DISSOLVED CALCIUM	20
04/23/1956	8424	DISSOLVED HARDNESS CaCO3 mg/L	71
04/23/1956	8424	DISSOLVED TOTAL ALKALINITY	66
04/23/1956	8424	DISSOLVED FLUORIDE	0
04/23/1956	8424	SPECIFIC CONDUCTANCE 25C	161
04/23/1956	8424	DISSOLVED SILICA	13
04/23/1956	8424	DISSOLVED SULFATE SO4 mg/L	10
04/23/1956	8424	Fe mg/L T	5

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*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

Water Quality Data Results

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Below are the water quality for station A3580000, COTTONWOOD C SF AB COLD FORK.

Date	Sample Number	Constituent/Analyte	Result*
05/20/1959	8008	DISSOLVED BORON	0.25
05/20/1959	8008	DISSOLVED CHLORIDE	9.8
05/20/1959	8008	DISSOLVED FLUORIDE	0
05/20/1959	8008	DISSOLVED POTASSIUM	0.8
05/20/1959	8008	LAB pH	7.9
05/20/1959	8008	DISSOLVED MAGNESIUM	2.8
05/20/1959	8008	DISSOLVED SODIUM	9.3
05/20/1959	8008	DISSOLVED NITRATE NO3 mg/L	0.2
05/20/1959	8008	DISSOLVED SILICA	9.9
05/20/1959	8008	DISSOLVED SULFATE SO4 mg/L	7.1
05/20/1959	8008	DISSOLVED CALCIUM	27
05/20/1959	8008	DISSOLVED HARDNESS CaCO3 mg/L	79
05/20/1959	8008	DISSOLVED TOTAL ALKALINITY	76
05/20/1959	8008	SPECIFIC CONDUCTANCE 25C	204
10/06/1977	108676	DISSOLVED ORTHOPHOSPHATE as P	0
10/06/1977	108676	TOTAL AMMONIA & ORGANIC NITROG	0.33
10/06/1977	108676	DISSOLVED NITRATE as N	0.05
10/06/1977	108676	TOTAL AMMONIA as N	0.03
10/06/1977	108676	TOTAL PHOSPHORUS as P	0.01
10/06/1977	108676	TOTAL ORGANIC NITROGEN as N	0.3

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Water Quality Data Results

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Below are the water quality for station A0359500, COTTONWOOD C SF NR COTTONWOOD.

Date	Sample Number	Constituent/Analyte	Result*
05/04/1959	29968	Al mg/L D	0.01
09/02/1959	31222	Al mg/L D	0
05/05/1960	33592	Al mg/L D	0.04
05/02/1961	36755	Al mg/L D	0.03
05/04/1959	29968	As mg/L D	0
09/02/1959	31222	As mg/L D	0
05/05/1960	33592	As mg/L D	0
05/02/1961	36755	As mg/L D	0
05/07/1964	46511	As mg/L D	0
05/06/1965	49239	As mg/L D	0
09/13/1965	50488	As mg/L D	0
05/03/1966	52922	As mg/L D	0
05/04/1967	55511	As mg/L D	0
11/28/1970	68049	As mg/L D	0
05/24/1971	70118	As mg/L D	0
05/24/1971	70118	Ba mg/L D	0.2
05/24/1971	70118	Cd mg/L D	0
05/04/1959	29968	Cr mg/L D	0
09/02/1959	31222	Cr mg/L D	0
05/05/1960	33592	Cr mg/L D	0
05/02/1961	36755	Cr mg/L D	0
11/28/1970	68049	Cr mg/L T	0
05/04/1959	29968	Cu mg/L D	0
09/02/1959	31222	Cu mg/L D	0.01
05/05/1960	33592	Cu mg/L D	0
05/02/1961	36755	Cu mg/L D	0
11/28/1970	68049	Cu mg/L D	0
01/14/1980	NS0036	DISSOLVED AMMONIA as N	0.01
09/19/1958	6374	DISSOLVED BORON	0.16
11/11/1958	28282	DISSOLVED BORON	0
12/04/1958	28486	DISSOLVED BORON	0.1
01/05/1959	28754	DISSOLVED BORON	0.2
02/02/1959	29023	DISSOLVED BORON	0
03/13/1959	29494	DISSOLVED BORON	0
04/13/1959	29744	DISSOLVED BORON	0.1
05/04/1959	29968	DISSOLVED BORON	0
05/20/1959	8007	DISSOLVED BORON	0.28
06/02/1959	30309	DISSOLVED BORON	0.1
07/14/1959	30548	DISSOLVED BORON	0
08/11/1959	30936	DISSOLVED BORON	0
09/02/1959	31222	DISSOLVED BORON	0.1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

10/13/1959	31634	DISSOLVED BORON	0
11/03/1959	32015	DISSOLVED BORON	0
01/12/1960	32666	DISSOLVED BORON	0.2
02/02/1960	32841	DISSOLVED BORON	0
03/08/1960	33134	DISSOLVED BORON	0
04/12/1960	33389	DISSOLVED BORON	0
05/05/1960	33592	DISSOLVED BORON	0.1
06/14/1960	34092	DISSOLVED BORON	0.1
07/04/1960	34244	DISSOLVED BORON	0
08/08/1960	34461	DISSOLVED BORON	0.1
10/10/1960	34932	DISSOLVED BORON	0
12/12/1960	35525	DISSOLVED BORON	0.1
01/03/1961	35758	DISSOLVED BORON	0.1
02/15/1961	36019	DISSOLVED BORON	0
03/14/1961	36323	DISSOLVED BORON	0.2
04/11/1961	36558	DISSOLVED BORON	0.1
05/02/1961	36755	DISSOLVED BORON	0.1
06/06/1961	37020	DISSOLVED BORON	0.2
07/07/1961	37286	DISSOLVED BORON	0
08/07/1961	37557	DISSOLVED BORON	0.2
12/07/1961	38623	DISSOLVED BORON	0
01/11/1962	38974	DISSOLVED BORON	0
02/09/1962	39202	DISSOLVED BORON	0
03/14/1962	39531	DISSOLVED BORON	0
04/11/1962	39809	DISSOLVED BORON	0
05/03/1962	39915	DISSOLVED BORON	0
06/08/1962	40469	DISSOLVED BORON	0
07/03/1962	40724	DISSOLVED BORON	0.1
08/03/1962	40951	DISSOLVED BORON	0
11/01/1962	41702	DISSOLVED BORON	0.3
12/07/1962	42042	DISSOLVED BORON	0.1
01/04/1963	42282	DISSOLVED BORON	0
02/11/1963	42514	DISSOLVED BORON	0
03/01/1963	42846	DISSOLVED BORON	0
04/05/1963	43093	DISSOLVED BORON	0
05/03/1963	43356	DISSOLVED BORON	0
06/05/1963	43425	DISSOLVED BORON	0
07/08/1963	43808	DISSOLVED BORON	0
08/02/1963	44198	DISSOLVED BORON	0.1
11/07/1963	44929	DISSOLVED BORON	0.2
12/05/1963	45094	DISSOLVED BORON	0.1
01/03/1964	45475	DISSOLVED BORON	0.1
01/21/1964	45699	DISSOLVED BORON	0
02/06/1964	45700	DISSOLVED BORON	0
03/12/1964	45944	DISSOLVED BORON	0.1
04/09/1964	46258	DISSOLVED BORON	0.1
05/07/1964	46511	DISSOLVED BORON	0.1
06/11/1964	46731	DISSOLVED BORON	0.1
07/09/1964	46863	DISSOLVED BORON	0.1
11/13/1964	47828	DISSOLVED BORON	0.2
12/10/1964	48044	DISSOLVED BORON	0.1
12/23/1964	48574	DISSOLVED BORON	0.1

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01/14/1965	48308	DISSOLVED BORON	0.1
02/05/1965	48635	DISSOLVED BORON	0
03/01/1965	48913	DISSOLVED BORON	0
04/05/1965	49164	DISSOLVED BORON	0
05/06/1965	49239	DISSOLVED BORON	0.1
06/11/1965	49724	DISSOLVED BORON	0
07/12/1965	49827	DISSOLVED BORON	0.1
08/09/1965	50144	DISSOLVED BORON	0.1
09/13/1965	50488	DISSOLVED BORON	0.1
10/07/1965	50656	DISSOLVED BORON	0.1
11/04/1965	50886	DISSOLVED BORON	0.1
12/13/1965	51366	DISSOLVED BORON	0
01/17/1966	51782	DISSOLVED BORON	0
02/10/1966	52052	DISSOLVED BORON	0.1
03/02/1966	52135	DISSOLVED BORON	0
04/13/1966	52555	DISSOLVED BORON	0
05/03/1966	52922	DISSOLVED BORON	0
06/02/1966	53269	DISSOLVED BORON	0
07/06/1966	53449	DISSOLVED BORON	0
11/22/1966	54559	DISSOLVED BORON	0
01/03/1967	54733	DISSOLVED BORON	0.2
03/06/1967	55193	DISSOLVED BORON	0
05/04/1967	55511	DISSOLVED BORON	0.1
07/05/1967	48163	DISSOLVED BORON	0.1
09/06/1967		DISSOLVED BORON	0.2
11/02/1967	50952	DISSOLVED BORON	0.1
01/16/1968	51359	DISSOLVED BORON	0
03/07/1968	51921	DISSOLVED BORON	0
05/01/1968	52711	DISSOLVED BORON	0.1
07/02/1968	54178	DISSOLVED BORON	0.1
09/06/1968	55323	DISSOLVED BORON	0
11/06/1968	56972	DISSOLVED BORON	0.1
01/06/1969	57542	DISSOLVED BORON	0
03/04/1969	58166	DISSOLVED BORON	0
05/02/1969	58778	DISSOLVED BORON	0
07/02/1969	59647	DISSOLVED BORON	0
09/03/1969	60721	DISSOLVED BORON	0.1
11/13/1969	62112	DISSOLVED BORON	0.2
01/07/1970	62882	DISSOLVED BORON	0
03/05/1970	63540	DISSOLVED BORON	0.1
05/07/1970	64353	DISSOLVED BORON	0
07/03/1970	65351	DISSOLVED BORON	0.1
11/12/1970	67392	DISSOLVED BORON	0.1
01/13/1971	68110	DISSOLVED BORON	0.1
03/09/1971	68850	DISSOLVED BORON	0.1
05/24/1971	70118	DISSOLVED BORON	0
07/14/1971	70810	DISSOLVED BORON	0.1
01/06/1972	73105	DISSOLVED BORON	0.1
03/02/1972	73507	DISSOLVED BORON	0
11/24/1972	827B	DISSOLVED BORON	0.1
05/18/1973	80125	DISSOLVED BORON	0
11/12/1973	YUK014	DISSOLVED BORON	0

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03/05/1975	89612	DISSOLVED BORON	0.1
05/19/1975	90652	DISSOLVED BORON	0.1
01/14/1976	94736	DISSOLVED BORON	0.1
11/12/1976	100581	DISSOLVED BORON	0.2
01/17/1977	100816	DISSOLVED BORON	0.2
03/17/1977	102287	DISSOLVED BORON	0.2
05/17/1977	103765	DISSOLVED BORON	0.2
01/11/1978	110282	DISSOLVED BORON	0
09/20/1978	115753	DISSOLVED BORON	0.2
01/19/1979	117563	DISSOLVED BORON	0.1
11/20/1979	122841	DISSOLVED BORON	0.1
01/14/1980	NS0036	DISSOLVED BORON	0.1
02/22/1980	NS0133	DISSOLVED BORON	0.1
07/24/1980	N00043	DISSOLVED BORON	0.2
03/11/1981	N00753	DISSOLVED BORON	0.1
07/28/1981	N01227	DISSOLVED BORON	0.1
11/25/1981	N01630	DISSOLVED BORON	0.1
05/24/1982	N02087	DISSOLVED BORON	0.1
03/03/1983	N02704	DISSOLVED BORON	0.1
03/16/1983	N02729	DISSOLVED BORON	0.1
07/06/1983	N03069	DISSOLVED BORON	0.1
03/26/1984	N03730	DISSOLVED BORON	0
05/23/1985	N04544	DISSOLVED BORON	0
03/24/1986	N05284	DISSOLVED BORON	0
09/19/1958	6374	DISSOLVED CALCIUM	33
11/11/1958	28282	DISSOLVED CALCIUM	36
12/04/1958	28486	DISSOLVED CALCIUM	43
01/05/1959	28754	DISSOLVED CALCIUM	31
02/02/1959	29023	DISSOLVED CALCIUM	31
03/13/1959	29494	DISSOLVED CALCIUM	29
04/13/1959	29744	DISSOLVED CALCIUM	27
05/04/1959	29968	DISSOLVED CALCIUM	23
05/20/1959	8007	DISSOLVED CALCIUM	28
06/02/1959	30309	DISSOLVED CALCIUM	29
07/14/1959	30548	DISSOLVED CALCIUM	33
08/11/1959	30936	DISSOLVED CALCIUM	34
09/02/1959	31222	DISSOLVED CALCIUM	34
10/13/1959	31634	DISSOLVED CALCIUM	36
05/05/1960	33592	DISSOLVED CALCIUM	32
10/10/1960	34932	DISSOLVED CALCIUM	33
05/02/1961	36755	DISSOLVED CALCIUM	28
05/03/1962	39915	DISSOLVED CALCIUM	27
05/03/1963	43356	DISSOLVED CALCIUM	29
05/07/1964	46511	DISSOLVED CALCIUM	32
12/23/1964	48574	DISSOLVED CALCIUM	19
05/06/1965	49239	DISSOLVED CALCIUM	42
09/13/1965	50488	DISSOLVED CALCIUM	40
05/03/1966	52922	DISSOLVED CALCIUM	28
11/22/1966	54559	DISSOLVED CALCIUM	32
01/03/1967	54733	DISSOLVED CALCIUM	37
03/06/1967	55193	DISSOLVED CALCIUM	39
05/04/1967	55511	DISSOLVED CALCIUM	37

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09/06/1967		DISSOLVED CALCIUM	32
05/01/1968	52711	DISSOLVED CALCIUM	28
09/06/1968	55323	DISSOLVED CALCIUM	33
05/02/1969	58778	DISSOLVED CALCIUM	13
09/03/1969	60721	DISSOLVED CALCIUM	36
05/07/1970	64353	DISSOLVED CALCIUM	37
11/12/1970	67392	DISSOLVED CALCIUM	35
03/09/1971	68850	DISSOLVED CALCIUM	34
03/02/1972	73507	DISSOLVED CALCIUM	20
11/12/1973	YUK014	DISSOLVED CALCIUM	18
09/20/1978	115753	DISSOLVED CALCIUM	42
11/20/1979	122841	DISSOLVED CALCIUM	30
01/14/1980	NS0036	DISSOLVED CALCIUM	16
02/22/1980	NS0133	DISSOLVED CALCIUM	26
07/24/1980	N00043	DISSOLVED CALCIUM	33
03/11/1981	N00753	DISSOLVED CALCIUM	37
07/28/1981	N01227	DISSOLVED CALCIUM	35
11/25/1981	N01630	DISSOLVED CALCIUM	20
05/24/1982	N02087	DISSOLVED CALCIUM	26
03/03/1983	N02704	DISSOLVED CALCIUM	23
03/16/1983	N02729	DISSOLVED CALCIUM	30
07/06/1983	N03069	DISSOLVED CALCIUM	26
03/26/1984	N03730	DISSOLVED CALCIUM	28
05/23/1985	N04544	DISSOLVED CALCIUM	29
03/16/1986	N06139	DISSOLVED CALCIUM	22
03/24/1986	N05284	DISSOLVED CALCIUM	32
11/18/1986	N05940	DISSOLVED CALCIUM	44
11/19/1987	N06682	DISSOLVED CALCIUM	52
03/24/1988	N06889	DISSOLVED CALCIUM	32
11/22/1988	N07395	DISSOLVED CALCIUM	50
01/23/1989	N07490	DISSOLVED CALCIUM	24
03/09/1989	N07584	DISSOLVED CALCIUM	16
05/11/1989	N07696	DISSOLVED CALCIUM	27
11/16/1989	N08133	DISSOLVED CALCIUM	48
01/23/1990	N08186	DISSOLVED CALCIUM	36
09/19/1958	6374	DISSOLVED CHLORIDE	26
11/11/1958	28282	DISSOLVED CHLORIDE	36
12/04/1958	28486	DISSOLVED CHLORIDE	49
01/05/1959	28754	DISSOLVED CHLORIDE	34
02/02/1959	29023	DISSOLVED CHLORIDE	17
03/13/1959	29494	DISSOLVED CHLORIDE	10
04/13/1959	29744	DISSOLVED CHLORIDE	9
05/04/1959	29968	DISSOLVED CHLORIDE	10
05/20/1959	8007	DISSOLVED CHLORIDE	10
06/02/1959	30309	DISSOLVED CHLORIDE	14
07/14/1959	30548	DISSOLVED CHLORIDE	13
08/11/1959	30936	DISSOLVED CHLORIDE	14
09/02/1959	31222	DISSOLVED CHLORIDE	14
10/13/1959	31634	DISSOLVED CHLORIDE	14
11/03/1959	32015	DISSOLVED CHLORIDE	8.9
01/12/1960	32666	DISSOLVED CHLORIDE	81
02/02/1960	32841	DISSOLVED CHLORIDE	19

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/08/1960	33134	DISSOLVED CHLORIDE	6.2
04/12/1960	33389	DISSOLVED CHLORIDE	12
05/05/1960	33592	DISSOLVED CHLORIDE	13
06/14/1960	34092	DISSOLVED CHLORIDE	12
07/04/1960	34244	DISSOLVED CHLORIDE	16
08/08/1960	34461	DISSOLVED CHLORIDE	16
10/10/1960	34932	DISSOLVED CHLORIDE	12
12/12/1960	35525	DISSOLVED CHLORIDE	47
01/03/1961	35758	DISSOLVED CHLORIDE	33
02/15/1961	36019	DISSOLVED CHLORIDE	8.2
03/14/1961	36323	DISSOLVED CHLORIDE	17
04/11/1961	36558	DISSOLVED CHLORIDE	10
05/02/1961	36755	DISSOLVED CHLORIDE	9.8
06/06/1961	37020	DISSOLVED CHLORIDE	9.5
07/07/1961	37286	DISSOLVED CHLORIDE	13
08/07/1961	37557	DISSOLVED CHLORIDE	14
12/07/1961	38623	DISSOLVED CHLORIDE	56
01/11/1962	38974	DISSOLVED CHLORIDE	46
02/09/1962	39202	DISSOLVED CHLORIDE	7.6
03/14/1962	39531	DISSOLVED CHLORIDE	18
04/11/1962	39809	DISSOLVED CHLORIDE	7.8
05/03/1962	39915	DISSOLVED CHLORIDE	10
06/08/1962	40469	DISSOLVED CHLORIDE	9.5
07/03/1962	40724	DISSOLVED CHLORIDE	14
08/03/1962	40951	DISSOLVED CHLORIDE	14
11/01/1962	41702	DISSOLVED CHLORIDE	28
12/07/1962	42042	DISSOLVED CHLORIDE	16
01/04/1963	42282	DISSOLVED CHLORIDE	23
02/11/1963	42514	DISSOLVED CHLORIDE	5
03/01/1963	42846	DISSOLVED CHLORIDE	14
04/05/1963	43093	DISSOLVED CHLORIDE	8.8
05/03/1963	43356	DISSOLVED CHLORIDE	5.8
06/05/1963	43425	DISSOLVED CHLORIDE	9
07/08/1963	43808	DISSOLVED CHLORIDE	16
08/02/1963	44198	DISSOLVED CHLORIDE	15
11/07/1963	44929	DISSOLVED CHLORIDE	48
12/05/1963	45094	DISSOLVED CHLORIDE	26
01/03/1964	45475	DISSOLVED CHLORIDE	32
01/21/1964	45699	DISSOLVED CHLORIDE	5
02/06/1964	45700	DISSOLVED CHLORIDE	13
03/12/1964	45944	DISSOLVED CHLORIDE	24
04/09/1964	46258	DISSOLVED CHLORIDE	21
05/07/1964	46511	DISSOLVED CHLORIDE	19
06/11/1964	46731	DISSOLVED CHLORIDE	20
07/09/1964	46863	DISSOLVED CHLORIDE	21
11/13/1964	47828	DISSOLVED CHLORIDE	45
12/10/1964	48044	DISSOLVED CHLORIDE	31
12/23/1964	48574	DISSOLVED CHLORIDE	0.6
01/14/1965	48308	DISSOLVED CHLORIDE	6.2
02/05/1965	48635	DISSOLVED CHLORIDE	6.6
03/01/1965	48913	DISSOLVED CHLORIDE	7.2
04/05/1965	49164	DISSOLVED CHLORIDE	14

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05/06/1965	49239	DISSOLVED CHLORIDE	7.4
06/11/1965	49724	DISSOLVED CHLORIDE	10
07/12/1965	49827	DISSOLVED CHLORIDE	16
08/09/1965	50144	DISSOLVED CHLORIDE	18
09/13/1965	50488	DISSOLVED CHLORIDE	22
10/07/1965	50656	DISSOLVED CHLORIDE	22
11/04/1965	50886	DISSOLVED CHLORIDE	32
12/13/1965	51366	DISSOLVED CHLORIDE	28
01/17/1966	51782	DISSOLVED CHLORIDE	12
02/10/1966	52052	DISSOLVED CHLORIDE	14
03/02/1966	52135	DISSOLVED CHLORIDE	12
04/13/1966	52555	DISSOLVED CHLORIDE	5.1
05/03/1966	52922	DISSOLVED CHLORIDE	8.3
06/02/1966	53269	DISSOLVED CHLORIDE	8.5
07/06/1966	53449	DISSOLVED CHLORIDE	16
11/22/1966	54559	DISSOLVED CHLORIDE	36
01/03/1967	54733	DISSOLVED CHLORIDE	22
03/06/1967	55193	DISSOLVED CHLORIDE	14
05/04/1967	55511	DISSOLVED CHLORIDE	6.4
07/05/1967	48163	DISSOLVED CHLORIDE	9.4
09/06/1967		DISSOLVED CHLORIDE	21
11/02/1967	50952	DISSOLVED CHLORIDE	42
01/16/1968	51359	DISSOLVED CHLORIDE	3.6
03/07/1968	51921	DISSOLVED CHLORIDE	5.9
05/01/1968	52711	DISSOLVED CHLORIDE	10
07/02/1968	54178	DISSOLVED CHLORIDE	18
09/06/1968	55323	DISSOLVED CHLORIDE	38
11/06/1968	56972	DISSOLVED CHLORIDE	64
01/06/1969	57542	DISSOLVED CHLORIDE	7.2
03/04/1969	58166	DISSOLVED CHLORIDE	6.8
05/02/1969	58778	DISSOLVED CHLORIDE	4.3
07/02/1969	59647	DISSOLVED CHLORIDE	10
09/03/1969	60721	DISSOLVED CHLORIDE	22
11/13/1969	62112	DISSOLVED CHLORIDE	48
01/07/1970	62882	DISSOLVED CHLORIDE	16
03/05/1970	63540	DISSOLVED CHLORIDE	7.6
05/07/1970	64353	DISSOLVED CHLORIDE	12
07/03/1970	65351	DISSOLVED CHLORIDE	18
11/12/1970	67392	DISSOLVED CHLORIDE	30
01/13/1971	68110	DISSOLVED CHLORIDE	9.2
03/09/1971	68850	DISSOLVED CHLORIDE	11
05/24/1971	70118	DISSOLVED CHLORIDE	7
07/14/1971	70810	DISSOLVED CHLORIDE	14
01/06/1972	73105	DISSOLVED CHLORIDE	28
03/02/1972	73507	DISSOLVED CHLORIDE	4.3
11/24/1972	827B	DISSOLVED CHLORIDE	28
05/18/1973	80125	DISSOLVED CHLORIDE	4
11/12/1973	YUK014	DISSOLVED CHLORIDE	4.7
03/05/1975	89612	DISSOLVED CHLORIDE	6.6
05/19/1975	90652	DISSOLVED CHLORIDE	2.8
01/14/1976	94736	DISSOLVED CHLORIDE	29
11/12/1976	100581	DISSOLVED CHLORIDE	58

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/17/1977	100816	DISSOLVED CHLORIDE	76
03/17/1977	102287	DISSOLVED CHLORIDE	32
05/17/1977	103765	DISSOLVED CHLORIDE	34
01/11/1978	110282	DISSOLVED CHLORIDE	7.2
09/20/1978	115753	DISSOLVED CHLORIDE	36
01/19/1979	117563	DISSOLVED CHLORIDE	31
11/20/1979	122841	DISSOLVED CHLORIDE	18
01/14/1980	NS0036	DISSOLVED CHLORIDE	0
02/22/1980	NS0133	DISSOLVED CHLORIDE	3
07/24/1980	N00043	DISSOLVED CHLORIDE	18
03/11/1981	N00753	DISSOLVED CHLORIDE	12
07/28/1981	N01227	DISSOLVED CHLORIDE	23
11/25/1981	N01630	DISSOLVED CHLORIDE	10
05/24/1982	N02087	DISSOLVED CHLORIDE	6
03/03/1983	N02704	DISSOLVED CHLORIDE	2
03/16/1983	N02729	DISSOLVED CHLORIDE	3
07/06/1983	N03069	DISSOLVED CHLORIDE	9
03/26/1984	N03730	DISSOLVED CHLORIDE	7
05/23/1985	N04544	DISSOLVED CHLORIDE	12
03/16/1986	N06139	DISSOLVED CHLORIDE	6
03/24/1986	N05284	DISSOLVED CHLORIDE	5
11/18/1986	N05940	DISSOLVED CHLORIDE	51
11/19/1987	N06682	DISSOLVED CHLORIDE	72
03/24/1988	N06889	DISSOLVED CHLORIDE	15
11/22/1988	N07395	DISSOLVED CHLORIDE	70
01/23/1989	N07490	DISSOLVED CHLORIDE	11
03/09/1989	N07584	DISSOLVED CHLORIDE	3
05/11/1989	N07696	DISSOLVED CHLORIDE	10
11/16/1989	N08133	DISSOLVED CHLORIDE	45
01/23/1990	N08186	DISSOLVED CHLORIDE	20
09/19/1958	6374	DISSOLVED FLUORIDE	0.2
11/11/1958	28282	DISSOLVED FLUORIDE	0
12/04/1958	28486	DISSOLVED FLUORIDE	0
01/05/1959	28754	DISSOLVED FLUORIDE	0.1
02/02/1959	29023	DISSOLVED FLUORIDE	0.1
03/13/1959	29494	DISSOLVED FLUORIDE	0
04/13/1959	29744	DISSOLVED FLUORIDE	0
05/04/1959	29968	DISSOLVED FLUORIDE	0.2
05/20/1959	8007	DISSOLVED FLUORIDE	0.2
06/02/1959	30309	DISSOLVED FLUORIDE	0.1
07/14/1959	30548	DISSOLVED FLUORIDE	0
08/11/1959	30936	DISSOLVED FLUORIDE	0.1
09/02/1959	31222	DISSOLVED FLUORIDE	0
10/13/1959	31634	DISSOLVED FLUORIDE	0.1
05/05/1960	33592	DISSOLVED FLUORIDE	0
05/02/1961	36755	DISSOLVED FLUORIDE	0.1
05/03/1962	39915	DISSOLVED FLUORIDE	0.1
05/03/1963	43356	DISSOLVED FLUORIDE	0.2
05/07/1964	46511	DISSOLVED FLUORIDE	0.2
12/23/1964	48574	DISSOLVED FLUORIDE	0.2
09/19/1958	6374	DISSOLVED HARDNESS CaCO3 mg/L	126
11/11/1958	28282	DISSOLVED HARDNESS CaCO3 mg/L	138

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

12/04/1958	28486	DISSOLVED HARDNESS CaCO3 mg/L	168
01/05/1959	28754	DISSOLVED HARDNESS CaCO3 mg/L	122
02/02/1959	29023	DISSOLVED HARDNESS CaCO3 mg/L	120
03/13/1959	29494	DISSOLVED HARDNESS CaCO3 mg/L	113
04/13/1959	29744	DISSOLVED HARDNESS CaCO3 mg/L	99
05/04/1959	29968	DISSOLVED HARDNESS CaCO3 mg/L	97
05/20/1959	8007	DISSOLVED HARDNESS CaCO3 mg/L	89
06/02/1959	30309	DISSOLVED HARDNESS CaCO3 mg/L	104
07/14/1959	30548	DISSOLVED HARDNESS CaCO3 mg/L	121
08/11/1959	30936	DISSOLVED HARDNESS CaCO3 mg/L	128
09/02/1959	31222	DISSOLVED HARDNESS CaCO3 mg/L	132
10/13/1959	31634	DISSOLVED HARDNESS CaCO3 mg/L	137
11/03/1959	32015	DISSOLVED HARDNESS CaCO3 mg/L	128
01/12/1960	32666	DISSOLVED HARDNESS CaCO3 mg/L	204
02/02/1960	32841	DISSOLVED HARDNESS CaCO3 mg/L	92
03/08/1960	33134	DISSOLVED HARDNESS CaCO3 mg/L	72
04/12/1960	33389	DISSOLVED HARDNESS CaCO3 mg/L	100
05/05/1960	33592	DISSOLVED HARDNESS CaCO3 mg/L	127
06/14/1960	34092	DISSOLVED HARDNESS CaCO3 mg/L	94
07/04/1960	34244	DISSOLVED HARDNESS CaCO3 mg/L	110
08/08/1960	34461	DISSOLVED HARDNESS CaCO3 mg/L	128
10/10/1960	34932	DISSOLVED HARDNESS CaCO3 mg/L	131
12/12/1960	35525	DISSOLVED HARDNESS CaCO3 mg/L	186
01/03/1961	35758	DISSOLVED HARDNESS CaCO3 mg/L	165
02/15/1961	36019	DISSOLVED HARDNESS CaCO3 mg/L	106
03/14/1961	36323	DISSOLVED HARDNESS CaCO3 mg/L	129
04/11/1961	36558	DISSOLVED HARDNESS CaCO3 mg/L	108
05/02/1961	36755	DISSOLVED HARDNESS CaCO3 mg/L	105
06/06/1961	37020	DISSOLVED HARDNESS CaCO3 mg/L	84
07/07/1961	37286	DISSOLVED HARDNESS CaCO3 mg/L	102
08/07/1961	37557	DISSOLVED HARDNESS CaCO3 mg/L	115
12/07/1961	38623	DISSOLVED HARDNESS CaCO3 mg/L	173
01/11/1962	38974	DISSOLVED HARDNESS CaCO3 mg/L	161
02/09/1962	39202	DISSOLVED HARDNESS CaCO3 mg/L	68
03/14/1962	39531	DISSOLVED HARDNESS CaCO3 mg/L	168
04/11/1962	39809	DISSOLVED HARDNESS CaCO3 mg/L	82
05/03/1962	39915	DISSOLVED HARDNESS CaCO3 mg/L	94
06/08/1962	40469	DISSOLVED HARDNESS CaCO3 mg/L	89
07/03/1962	40724	DISSOLVED HARDNESS CaCO3 mg/L	93
08/03/1962	40951	DISSOLVED HARDNESS CaCO3 mg/L	120
11/01/1962	41702	DISSOLVED HARDNESS CaCO3 mg/L	127
12/07/1962	42042	DISSOLVED HARDNESS CaCO3 mg/L	100
01/04/1963	42282	DISSOLVED HARDNESS CaCO3 mg/L	134
02/11/1963	42514	DISSOLVED HARDNESS CaCO3 mg/L	88
03/01/1963	42846	DISSOLVED HARDNESS CaCO3 mg/L	150
04/05/1963	43093	DISSOLVED HARDNESS CaCO3 mg/L	126
05/03/1963	43356	DISSOLVED HARDNESS CaCO3 mg/L	114
06/05/1963	43425	DISSOLVED HARDNESS CaCO3 mg/L	113
07/08/1963	43808	DISSOLVED HARDNESS CaCO3 mg/L	126
08/02/1963	44198	DISSOLVED HARDNESS CaCO3 mg/L	123
11/07/1963	44929	DISSOLVED HARDNESS CaCO3 mg/L	152
12/05/1963	45094	DISSOLVED HARDNESS CaCO3 mg/L	138

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01/03/1964	45475	DISSOLVED HARDNESS CaCO3 mg/L	152
01/21/1964	45699	DISSOLVED HARDNESS CaCO3 mg/L	75
02/06/1964	45700	DISSOLVED HARDNESS CaCO3 mg/L	116
03/12/1964	45944	DISSOLVED HARDNESS CaCO3 mg/L	138
04/09/1964	46258	DISSOLVED HARDNESS CaCO3 mg/L	124
05/07/1964	46511	DISSOLVED HARDNESS CaCO3 mg/L	114
06/11/1964	46731	DISSOLVED HARDNESS CaCO3 mg/L	111
07/09/1964	46863	DISSOLVED HARDNESS CaCO3 mg/L	134
11/13/1964	47828	DISSOLVED HARDNESS CaCO3 mg/L	152
12/10/1964	48044	DISSOLVED HARDNESS CaCO3 mg/L	146
12/23/1964	48574	DISSOLVED HARDNESS CaCO3 mg/L	66
01/14/1965	48308	DISSOLVED HARDNESS CaCO3 mg/L	132
02/05/1965	48635	DISSOLVED HARDNESS CaCO3 mg/L	122
03/01/1965	48913	DISSOLVED HARDNESS CaCO3 mg/L	120
04/05/1965	49164	DISSOLVED HARDNESS CaCO3 mg/L	141
05/06/1965	49239	DISSOLVED HARDNESS CaCO3 mg/L	141
06/11/1965	49724	DISSOLVED HARDNESS CaCO3 mg/L	125
07/12/1965	49827	DISSOLVED HARDNESS CaCO3 mg/L	135
08/09/1965	50144	DISSOLVED HARDNESS CaCO3 mg/L	146
09/13/1965	50488	DISSOLVED HARDNESS CaCO3 mg/L	155
10/07/1965	50656	DISSOLVED HARDNESS CaCO3 mg/L	157
11/04/1965	50886	DISSOLVED HARDNESS CaCO3 mg/L	154
12/13/1965	51366	DISSOLVED HARDNESS CaCO3 mg/L	160
01/17/1966	51782	DISSOLVED HARDNESS CaCO3 mg/L	136
02/10/1966	52052	DISSOLVED HARDNESS CaCO3 mg/L	171
03/02/1966	52135	DISSOLVED HARDNESS CaCO3 mg/L	168
04/13/1966	52555	DISSOLVED HARDNESS CaCO3 mg/L	90
05/03/1966	52922	DISSOLVED HARDNESS CaCO3 mg/L	99
06/02/1966	53269	DISSOLVED HARDNESS CaCO3 mg/L	98
07/06/1966	53449	DISSOLVED HARDNESS CaCO3 mg/L	120
11/22/1966	54559	DISSOLVED HARDNESS CaCO3 mg/L	125
01/03/1967	54733	DISSOLVED HARDNESS CaCO3 mg/L	142
03/06/1967	55193	DISSOLVED HARDNESS CaCO3 mg/L	155
05/04/1967	55511	DISSOLVED HARDNESS CaCO3 mg/L	150
07/05/1967	48163	DISSOLVED HARDNESS CaCO3 mg/L	108
09/06/1967		DISSOLVED HARDNESS CaCO3 mg/L	114
11/02/1967	50952	DISSOLVED HARDNESS CaCO3 mg/L	145
01/16/1968	51359	DISSOLVED HARDNESS CaCO3 mg/L	69
03/07/1968	51921	DISSOLVED HARDNESS CaCO3 mg/L	119
05/01/1968	52711	DISSOLVED HARDNESS CaCO3 mg/L	113
07/02/1968	54178	DISSOLVED HARDNESS CaCO3 mg/L	114
09/06/1968	55323	DISSOLVED HARDNESS CaCO3 mg/L	122
11/06/1968	56972	DISSOLVED HARDNESS CaCO3 mg/L	178
01/06/1969	57542	DISSOLVED HARDNESS CaCO3 mg/L	104
03/04/1969	58166	DISSOLVED HARDNESS CaCO3 mg/L	185
05/02/1969	58778	DISSOLVED HARDNESS CaCO3 mg/L	77
07/02/1969	59647	DISSOLVED HARDNESS CaCO3 mg/L	114
09/03/1969	60721	DISSOLVED HARDNESS CaCO3 mg/L	108
11/13/1969	62112	DISSOLVED HARDNESS CaCO3 mg/L	157
01/07/1970	62882	DISSOLVED HARDNESS CaCO3 mg/L	116
03/05/1970	63540	DISSOLVED HARDNESS CaCO3 mg/L	129
05/07/1970	64353	DISSOLVED HARDNESS CaCO3 mg/L	135

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07/03/1970	65351	DISSOLVED HARDNESS CaCO3 mg/L	129
11/12/1970	67392	DISSOLVED HARDNESS CaCO3 mg/L	122
01/13/1971	68110	DISSOLVED HARDNESS CaCO3 mg/L	107
03/09/1971	68850	DISSOLVED HARDNESS CaCO3 mg/L	135
05/24/1971	70118	DISSOLVED HARDNESS CaCO3 mg/L	89
07/14/1971	70810	DISSOLVED HARDNESS CaCO3 mg/L	121
01/06/1972	73105	DISSOLVED HARDNESS CaCO3 mg/L	144
03/02/1972	73507	DISSOLVED HARDNESS CaCO3 mg/L	65
11/24/1972	827B	DISSOLVED HARDNESS CaCO3 mg/L	161
05/18/1973	80125	DISSOLVED HARDNESS CaCO3 mg/L	68
11/12/1973	YUK014	DISSOLVED HARDNESS CaCO3 mg/L	60
03/05/1975	89612	DISSOLVED HARDNESS CaCO3 mg/L	86
05/19/1975	90652	DISSOLVED HARDNESS CaCO3 mg/L	62
01/14/1976	94736	DISSOLVED HARDNESS CaCO3 mg/L	135
11/12/1976	100581	DISSOLVED HARDNESS CaCO3 mg/L	168
01/17/1977	100816	DISSOLVED HARDNESS CaCO3 mg/L	207
03/17/1977	102287	DISSOLVED HARDNESS CaCO3 mg/L	144
05/17/1977	103765	DISSOLVED HARDNESS CaCO3 mg/L	154
01/11/1978	110282	DISSOLVED HARDNESS CaCO3 mg/L	96
09/20/1978	115753	DISSOLVED HARDNESS CaCO3 mg/L	161
01/19/1979	117563	DISSOLVED HARDNESS CaCO3 mg/L	164
11/20/1979	122841	DISSOLVED HARDNESS CaCO3 mg/L	108
01/14/1980	NS0036	DISSOLVED HARDNESS CaCO3 mg/L	56
02/22/1980	NS0133	DISSOLVED HARDNESS CaCO3 mg/L	102
07/24/1980	N00043	DISSOLVED HARDNESS CaCO3 mg/L	120
03/11/1981	N00753	DISSOLVED HARDNESS CaCO3 mg/L	138
07/28/1981	N01227	DISSOLVED HARDNESS CaCO3 mg/L	133
11/25/1981	N01630	DISSOLVED HARDNESS CaCO3 mg/L	70
05/24/1982	N02087	DISSOLVED HARDNESS CaCO3 mg/L	94
03/03/1983	N02704	DISSOLVED HARDNESS CaCO3 mg/L	94
03/16/1983	N02729	DISSOLVED HARDNESS CaCO3 mg/L	116
07/06/1983	N03069	DISSOLVED HARDNESS CaCO3 mg/L	94
03/26/1984	N03730	DISSOLVED HARDNESS CaCO3 mg/L	103
05/23/1985	N04544	DISSOLVED HARDNESS CaCO3 mg/L	106
03/24/1986	N05284	DISSOLVED HARDNESS CaCO3 mg/L	125
11/18/1986	N05940	DISSOLVED HARDNESS CaCO3 mg/L	172
11/22/1988	N07395	DISSOLVED HARDNESS CaCO3 mg/L	187
01/23/1989	N07490	DISSOLVED HARDNESS CaCO3 mg/L	84
03/09/1989	N07584	DISSOLVED HARDNESS CaCO3 mg/L	60
05/11/1989	N07696	DISSOLVED HARDNESS CaCO3 mg/L	96
11/16/1989	N08133	DISSOLVED HARDNESS CaCO3 mg/L	174
01/23/1990	N08186	DISSOLVED HARDNESS CaCO3 mg/L	127
09/19/1958	6374	DISSOLVED MAGNESIUM	10
11/11/1958	28282	DISSOLVED MAGNESIUM	12
12/04/1958	28486	DISSOLVED MAGNESIUM	15
01/05/1959	28754	DISSOLVED MAGNESIUM	11
02/02/1959	29023	DISSOLVED MAGNESIUM	10
03/13/1959	29494	DISSOLVED MAGNESIUM	10
04/13/1959	29744	DISSOLVED MAGNESIUM	7.7
05/04/1959	29968	DISSOLVED MAGNESIUM	9.6
05/20/1959	8007	DISSOLVED MAGNESIUM	4.6
06/02/1959	30309	DISSOLVED MAGNESIUM	7.7

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07/14/1959	30548	DISSOLVED MAGNESIUM	9.4
08/11/1959	30936	DISSOLVED MAGNESIUM	10
09/02/1959	31222	DISSOLVED MAGNESIUM	11
10/13/1959	31634	DISSOLVED MAGNESIUM	11
05/05/1960	33592	DISSOLVED MAGNESIUM	12
10/10/1960	34932	DISSOLVED MAGNESIUM	12
05/02/1961	36755	DISSOLVED MAGNESIUM	8.6
05/03/1962	39915	DISSOLVED MAGNESIUM	6.4
05/03/1963	43356	DISSOLVED MAGNESIUM	10
05/07/1964	46511	DISSOLVED MAGNESIUM	8.3
12/23/1964	48574	DISSOLVED MAGNESIUM	4.5
05/06/1965	49239	DISSOLVED MAGNESIUM	8.8
09/13/1965	50488	DISSOLVED MAGNESIUM	13
05/03/1966	52922	DISSOLVED MAGNESIUM	7.1
11/22/1966	54559	DISSOLVED MAGNESIUM	11
01/03/1967	54733	DISSOLVED MAGNESIUM	12
03/06/1967	55193	DISSOLVED MAGNESIUM	14
05/04/1967	55511	DISSOLVED MAGNESIUM	14
09/06/1967		DISSOLVED MAGNESIUM	8.3
05/01/1968	52711	DISSOLVED MAGNESIUM	10
09/06/1968	55323	DISSOLVED MAGNESIUM	9.6
05/02/1969	58778	DISSOLVED MAGNESIUM	11
09/03/1969	60721	DISSOLVED MAGNESIUM	8
05/07/1970	64353	DISSOLVED MAGNESIUM	10
11/12/1970	67392	DISSOLVED MAGNESIUM	8.4
03/09/1971	68850	DISSOLVED MAGNESIUM	12
03/02/1972	73507	DISSOLVED MAGNESIUM	3.9
11/12/1973	YUK014	DISSOLVED MAGNESIUM	3.6
09/20/1978	115753	DISSOLVED MAGNESIUM	14
11/20/1979	122841	DISSOLVED MAGNESIUM	8
01/14/1980	NS0036	DISSOLVED MAGNESIUM	4
02/22/1980	NS0133	DISSOLVED MAGNESIUM	9
07/24/1980	N00043	DISSOLVED MAGNESIUM	9
03/11/1981	N00753	DISSOLVED MAGNESIUM	11
07/28/1981	N01227	DISSOLVED MAGNESIUM	11
11/25/1981	N01630	DISSOLVED MAGNESIUM	5
05/24/1982	N02087	DISSOLVED MAGNESIUM	7
03/03/1983	N02704	DISSOLVED MAGNESIUM	9
03/16/1983	N02729	DISSOLVED MAGNESIUM	10
07/06/1983	N03069	DISSOLVED MAGNESIUM	7
03/26/1984	N03730	DISSOLVED MAGNESIUM	8
05/23/1985	N04544	DISSOLVED MAGNESIUM	8
03/16/1986	N06139	DISSOLVED MAGNESIUM	7
03/24/1986	N05284	DISSOLVED MAGNESIUM	11
11/18/1986	N05940	DISSOLVED MAGNESIUM	15
11/19/1987	N06682	DISSOLVED MAGNESIUM	16
03/24/1988	N06889	DISSOLVED MAGNESIUM	10
11/22/1988	N07395	DISSOLVED MAGNESIUM	15
01/23/1989	N07490	DISSOLVED MAGNESIUM	6
03/09/1989	N07584	DISSOLVED MAGNESIUM	5
05/11/1989	N07696	DISSOLVED MAGNESIUM	7
11/16/1989	N08133	DISSOLVED MAGNESIUM	13

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01/23/1990	N08186	DISSOLVED MAGNESIUM	9
01/14/1980	NS0036	DISSOLVED NITRATE AND NITRITE	0.07
02/22/1980	NS0133	DISSOLVED NITRATE AND NITRITE	0.17
03/03/1983	N02704	DISSOLVED NITRATE AND NITRITE	0.09
11/28/1970	68049	DISSOLVED NITRATE as N	0.96
12/04/1970	68050	DISSOLVED NITRATE as N	0.68
01/16/1971	68678	DISSOLVED NITRATE as N	0.49
12/27/1971	72933	DISSOLVED NITRATE as N	0.22
03/17/1977	102287	DISSOLVED NITRATE as N	1.6
09/19/1958	6374	DISSOLVED NITRATE NO3 mg/L	0.5
11/11/1958	28282	DISSOLVED NITRATE NO3 mg/L	0
12/04/1958	28486	DISSOLVED NITRATE NO3 mg/L	0
01/05/1959	28754	DISSOLVED NITRATE NO3 mg/L	0
02/02/1959	29023	DISSOLVED NITRATE NO3 mg/L	0.5
03/13/1959	29494	DISSOLVED NITRATE NO3 mg/L	0
04/13/1959	29744	DISSOLVED NITRATE NO3 mg/L	0
05/04/1959	29968	DISSOLVED NITRATE NO3 mg/L	0.5
05/20/1959	8007	DISSOLVED NITRATE NO3 mg/L	0.1
06/02/1959	30309	DISSOLVED NITRATE NO3 mg/L	0
07/14/1959	30548	DISSOLVED NITRATE NO3 mg/L	0.1
08/11/1959	30936	DISSOLVED NITRATE NO3 mg/L	0
09/02/1959	31222	DISSOLVED NITRATE NO3 mg/L	0.4
10/13/1959	31634	DISSOLVED NITRATE NO3 mg/L	0
05/05/1960	33592	DISSOLVED NITRATE NO3 mg/L	0
05/02/1961	36755	DISSOLVED NITRATE NO3 mg/L	0
05/03/1962	39915	DISSOLVED NITRATE NO3 mg/L	0.1
05/03/1963	43356	DISSOLVED NITRATE NO3 mg/L	1.4
05/07/1964	46511	DISSOLVED NITRATE NO3 mg/L	0.4
12/23/1964	48574	DISSOLVED NITRATE NO3 mg/L	1.5
05/06/1965	49239	DISSOLVED NITRATE NO3 mg/L	0.7
09/13/1965	50488	DISSOLVED NITRATE NO3 mg/L	3.9
05/03/1966	52922	DISSOLVED NITRATE NO3 mg/L	0.5
05/04/1967	55511	DISSOLVED NITRATE NO3 mg/L	0.8
09/06/1967		DISSOLVED NITRATE NO3 mg/L	0.4
05/01/1968	52711	DISSOLVED NITRATE NO3 mg/L	0
09/06/1968	55323	DISSOLVED NITRATE NO3 mg/L	0
05/02/1969	58778	DISSOLVED NITRATE NO3 mg/L	0.1
09/03/1969	60721	DISSOLVED NITRATE NO3 mg/L	0.1
05/07/1970	64353	DISSOLVED NITRATE NO3 mg/L	0
11/12/1970	67392	DISSOLVED NITRATE NO3 mg/L	0
03/09/1971	68850	DISSOLVED NITRATE NO3 mg/L	0
03/02/1972	73507	DISSOLVED NITRATE NO3 mg/L	0.1
11/12/1973	YUK014	DISSOLVED NITRATE NO3 mg/L	0.9
09/20/1978	115753	DISSOLVED NITRATE NO3 mg/L	0.4
03/16/1986	N06139	DISSOLVED NITRATE NO3 mg/L	0.9
11/18/1986	N05940	DISSOLVED NITRATE NO3 mg/L	0.1
03/24/1988	N06889	DISSOLVED NITRATE NO3 mg/L	0.3
01/23/1989	N07490	DISSOLVED NITRATE NO3 mg/L	0.1
03/09/1989	N07584	DISSOLVED NITRATE NO3 mg/L	0.3
05/11/1989	N07696	DISSOLVED NITRATE NO3 mg/L	0.6
11/16/1989	N08133	DISSOLVED NITRATE NO3 mg/L	0.4
05/04/1959	29968	DISSOLVED ORTHOPHOSPHATE as P	0.02

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09/02/1959	31222	DISSOLVED ORTHOPHOSPHATE as P	0
05/05/1960	33592	DISSOLVED ORTHOPHOSPHATE as P	0
05/02/1961	36755	DISSOLVED ORTHOPHOSPHATE as P	0
05/03/1962	39915	DISSOLVED ORTHOPHOSPHATE as P	0
05/03/1963	43356	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/07/1964	46511	DISSOLVED ORTHOPHOSPHATE as P	0
05/06/1965	49239	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/13/1965	50488	DISSOLVED ORTHOPHOSPHATE as P	0
05/03/1966	52922	DISSOLVED ORTHOPHOSPHATE as P	0
05/04/1967	55511	DISSOLVED ORTHOPHOSPHATE as P	0.02
01/16/1971	68678	DISSOLVED ORTHOPHOSPHATE as P	0.05
12/27/1971	72933	DISSOLVED ORTHOPHOSPHATE as P	0
03/17/1977	102287	DISSOLVED ORTHOPHOSPHATE as P	0.05
01/14/1980	NS0036	DISSOLVED ORTHOPHOSPHATE as P	0.02
02/22/1980	NS0133	DISSOLVED ORTHOPHOSPHATE as P	0.02
03/03/1983	N02704	DISSOLVED ORTHOPHOSPHATE as P	0
09/19/1958	6374	DISSOLVED POTASSIUM	1.3
11/11/1958	28282	DISSOLVED POTASSIUM	0.9
12/04/1958	28486	DISSOLVED POTASSIUM	0.7
01/05/1959	28754	DISSOLVED POTASSIUM	0.8
02/02/1959	29023	DISSOLVED POTASSIUM	0.6
03/13/1959	29494	DISSOLVED POTASSIUM	0.5
04/13/1959	29744	DISSOLVED POTASSIUM	1.2
05/04/1959	29968	DISSOLVED POTASSIUM	1.3
05/20/1959	8007	DISSOLVED POTASSIUM	0.7
06/02/1959	30309	DISSOLVED POTASSIUM	1.5
07/14/1959	30548	DISSOLVED POTASSIUM	1.8
08/11/1959	30936	DISSOLVED POTASSIUM	2
09/02/1959	31222	DISSOLVED POTASSIUM	1.4
10/13/1959	31634	DISSOLVED POTASSIUM	1.1
05/05/1960	33592	DISSOLVED POTASSIUM	1.4
05/02/1961	36755	DISSOLVED POTASSIUM	0.8
05/03/1962	39915	DISSOLVED POTASSIUM	1
05/03/1963	43356	DISSOLVED POTASSIUM	0.8
05/07/1964	46511	DISSOLVED POTASSIUM	0.8
12/23/1964	48574	DISSOLVED POTASSIUM	2.5
05/06/1965	49239	DISSOLVED POTASSIUM	0.7
09/13/1965	50488	DISSOLVED POTASSIUM	1.5
05/03/1966	52922	DISSOLVED POTASSIUM	0.8
11/22/1966	54559	DISSOLVED POTASSIUM	0.9
01/03/1967	54733	DISSOLVED POTASSIUM	0.8
03/06/1967	55193	DISSOLVED POTASSIUM	0.8
05/04/1967	55511	DISSOLVED POTASSIUM	0.8
09/06/1967		DISSOLVED POTASSIUM	1.4
05/01/1968	52711	DISSOLVED POTASSIUM	0.5
09/06/1968	55323	DISSOLVED POTASSIUM	1.4
05/02/1969	58778	DISSOLVED POTASSIUM	0.5
09/03/1969	60721	DISSOLVED POTASSIUM	0.5
05/07/1970	64353	DISSOLVED POTASSIUM	1
11/12/1970	67392	DISSOLVED POTASSIUM	1.1
03/09/1971	68850	DISSOLVED POTASSIUM	0.8
03/02/1972	73507	DISSOLVED POTASSIUM	0.5

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11/12/1973	YUK014	DISSOLVED POTASSIUM	1.2
09/20/1978	115753	DISSOLVED POTASSIUM	1.4
01/14/1980	NS0036	DISSOLVED POTASSIUM	0.9
02/22/1980	NS0133	DISSOLVED POTASSIUM	1
07/24/1980	N00043	DISSOLVED POTASSIUM	1.4
03/11/1981	N00753	DISSOLVED POTASSIUM	1.1
07/28/1981	N01227	DISSOLVED POTASSIUM	1.6
11/25/1981	N01630	DISSOLVED POTASSIUM	1.3
05/24/1982	N02087	DISSOLVED POTASSIUM	0.9
03/03/1983	N02704	DISSOLVED POTASSIUM	1.1
03/16/1983	N02729	DISSOLVED POTASSIUM	0.9
07/06/1983	N03069	DISSOLVED POTASSIUM	0.9
09/19/1958	6374	DISSOLVED SILICA	15
11/11/1958	28282	DISSOLVED SILICA	12
12/04/1958	28486	DISSOLVED SILICA	17
01/05/1959	28754	DISSOLVED SILICA	10
02/02/1959	29023	DISSOLVED SILICA	13
03/13/1959	29494	DISSOLVED SILICA	13
04/13/1959	29744	DISSOLVED SILICA	15
05/04/1959	29968	DISSOLVED SILICA	13
05/20/1959	8007	DISSOLVED SILICA	10
06/02/1959	30309	DISSOLVED SILICA	18
07/14/1959	30548	DISSOLVED SILICA	17
08/11/1959	30936	DISSOLVED SILICA	21
09/02/1959	31222	DISSOLVED SILICA	20
10/13/1959	31634	DISSOLVED SILICA	22
05/05/1960	33592	DISSOLVED SILICA	12
05/02/1961	36755	DISSOLVED SILICA	10
05/03/1962	39915	DISSOLVED SILICA	14
05/03/1963	43356	DISSOLVED SILICA	13
05/07/1964	46511	DISSOLVED SILICA	12
12/23/1964	48574	DISSOLVED SILICA	13
05/06/1965	49239	DISSOLVED SILICA	14
09/13/1965	50488	DISSOLVED SILICA	16
05/03/1966	52922	DISSOLVED SILICA	12
05/04/1967	55511	DISSOLVED SILICA	13
09/19/1958	6374	DISSOLVED SODIUM	14
11/11/1958	28282	DISSOLVED SODIUM	12
12/04/1958	28486	DISSOLVED SODIUM	17
01/05/1959	28754	DISSOLVED SODIUM	14
02/02/1959	29023	DISSOLVED SODIUM	12
03/13/1959	29494	DISSOLVED SODIUM	9.6
04/13/1959	29744	DISSOLVED SODIUM	8.4
05/04/1959	29968	DISSOLVED SODIUM	9
05/20/1959	8007	DISSOLVED SODIUM	9.6
06/02/1959	30309	DISSOLVED SODIUM	11
07/14/1959	30548	DISSOLVED SODIUM	11
08/11/1959	30936	DISSOLVED SODIUM	13
09/02/1959	31222	DISSOLVED SODIUM	12
10/13/1959	31634	DISSOLVED SODIUM	12
11/03/1959	32015	DISSOLVED SODIUM	12
01/12/1960	32666	DISSOLVED SODIUM	28

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/02/1960	32841	DISSOLVED SODIUM	10
03/08/1960	33134	DISSOLVED SODIUM	6
04/12/1960	33389	DISSOLVED SODIUM	9.4
05/05/1960	33592	DISSOLVED SODIUM	14
06/14/1960	34092	DISSOLVED SODIUM	9.8
07/04/1960	34244	DISSOLVED SODIUM	11
08/08/1960	34461	DISSOLVED SODIUM	14
10/10/1960	34932	DISSOLVED SODIUM	12
12/12/1960	35525	DISSOLVED SODIUM	20
01/03/1961	35758	DISSOLVED SODIUM	18
02/15/1961	36019	DISSOLVED SODIUM	10
03/14/1961	36323	DISSOLVED SODIUM	15
04/11/1961	36558	DISSOLVED SODIUM	11
05/02/1961	36755	DISSOLVED SODIUM	11
06/06/1961	37020	DISSOLVED SODIUM	9.2
07/07/1961	37286	DISSOLVED SODIUM	12
08/07/1961	37557	DISSOLVED SODIUM	14
12/07/1961	38623	DISSOLVED SODIUM	26
01/11/1962	38974	DISSOLVED SODIUM	22
02/09/1962	39202	DISSOLVED SODIUM	8.7
03/14/1962	39531	DISSOLVED SODIUM	19
04/11/1962	39809	DISSOLVED SODIUM	8.3
05/03/1962	39915	DISSOLVED SODIUM	9.7
06/08/1962	40469	DISSOLVED SODIUM	10
07/03/1962	40724	DISSOLVED SODIUM	11
08/03/1962	40951	DISSOLVED SODIUM	13
11/01/1962	41702	DISSOLVED SODIUM	17
12/07/1962	42042	DISSOLVED SODIUM	12
01/04/1963	42282	DISSOLVED SODIUM	15
02/11/1963	42514	DISSOLVED SODIUM	10
03/01/1963	42846	DISSOLVED SODIUM	14
04/05/1963	43093	DISSOLVED SODIUM	12
05/03/1963	43356	DISSOLVED SODIUM	9.3
06/05/1963	43425	DISSOLVED SODIUM	9.6
07/08/1963	43808	DISSOLVED SODIUM	13
08/02/1963	44198	DISSOLVED SODIUM	13
11/07/1963	44929	DISSOLVED SODIUM	23
12/05/1963	45094	DISSOLVED SODIUM	17
01/03/1964	45475	DISSOLVED SODIUM	19
01/21/1964	45699	DISSOLVED SODIUM	7.8
02/06/1964	45700	DISSOLVED SODIUM	12
03/12/1964	45944	DISSOLVED SODIUM	17
04/09/1964	46258	DISSOLVED SODIUM	15
05/07/1964	46511	DISSOLVED SODIUM	13
06/11/1964	46731	DISSOLVED SODIUM	13
07/09/1964	46863	DISSOLVED SODIUM	15
11/13/1964	47828	DISSOLVED SODIUM	26
12/10/1964	48044	DISSOLVED SODIUM	21
12/23/1964	48574	DISSOLVED SODIUM	3.8
01/14/1965	48308	DISSOLVED SODIUM	11
02/05/1965	48635	DISSOLVED SODIUM	9.3
03/01/1965	48913	DISSOLVED SODIUM	9.9

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04/05/1965	49164	DISSOLVED SODIUM	14
05/06/1965	49239	DISSOLVED SODIUM	11
06/11/1965	49724	DISSOLVED SODIUM	11
07/12/1965	49827	DISSOLVED SODIUM	13
08/09/1965	50144	DISSOLVED SODIUM	15
09/13/1965	50488	DISSOLVED SODIUM	15
10/07/1965	50656	DISSOLVED SODIUM	15
11/04/1965	50886	DISSOLVED SODIUM	15
12/13/1965	51366	DISSOLVED SODIUM	19
01/17/1966	51782	DISSOLVED SODIUM	12
02/10/1966	52052	DISSOLVED SODIUM	18
03/02/1966	52135	DISSOLVED SODIUM	19
04/13/1966	52555	DISSOLVED SODIUM	8.1
05/03/1966	52922	DISSOLVED SODIUM	8.8
06/02/1966	53269	DISSOLVED SODIUM	9.5
07/06/1966	53449	DISSOLVED SODIUM	13
11/22/1966	54559	DISSOLVED SODIUM	21
01/03/1967	54733	DISSOLVED SODIUM	16
03/06/1967	55193	DISSOLVED SODIUM	15
05/04/1967	55511	DISSOLVED SODIUM	13
07/05/1967	48163	DISSOLVED SODIUM	9.7
09/06/1967		DISSOLVED SODIUM	14
11/02/1967	50952	DISSOLVED SODIUM	17
01/16/1968	51359	DISSOLVED SODIUM	4.8
03/07/1968	51921	DISSOLVED SODIUM	8.4
05/01/1968	52711	DISSOLVED SODIUM	12
07/02/1968	54178	DISSOLVED SODIUM	13
09/06/1968	55323	DISSOLVED SODIUM	18
11/06/1968	56972	DISSOLVED SODIUM	23
01/06/1969	57542	DISSOLVED SODIUM	9.6
03/04/1969	58166	DISSOLVED SODIUM	12
05/02/1969	58778	DISSOLVED SODIUM	5.1
07/02/1969	59647	DISSOLVED SODIUM	9.9
09/03/1969	60721	DISSOLVED SODIUM	12
11/13/1969	62112	DISSOLVED SODIUM	20
01/07/1970	62882	DISSOLVED SODIUM	13
03/05/1970	63540	DISSOLVED SODIUM	11
05/07/1970	64353	DISSOLVED SODIUM	14
07/03/1970	65351	DISSOLVED SODIUM	14
11/12/1970	67392	DISSOLVED SODIUM	18
01/13/1971	68110	DISSOLVED SODIUM	8.2
03/09/1971	68850	DISSOLVED SODIUM	11
05/24/1971	70118	DISSOLVED SODIUM	7.5
07/14/1971	70810	DISSOLVED SODIUM	10
01/06/1972	73105	DISSOLVED SODIUM	21
03/02/1972	73507	DISSOLVED SODIUM	6.4
11/24/1972	827B	DISSOLVED SODIUM	20
05/18/1973	80125	DISSOLVED SODIUM	5.2
11/12/1973	YUK014	DISSOLVED SODIUM	4.6
03/05/1975	89612	DISSOLVED SODIUM	7.2
05/19/1975	90652	DISSOLVED SODIUM	4.6
01/14/1976	94736	DISSOLVED SODIUM	16

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11/12/1976	100581	DISSOLVED SODIUM	21
01/17/1977	100816	DISSOLVED SODIUM	33
03/17/1977	102287	DISSOLVED SODIUM	23
05/17/1977	103765	DISSOLVED SODIUM	22
01/11/1978	110282	DISSOLVED SODIUM	10
09/20/1978	115753	DISSOLVED SODIUM	20
01/19/1979	117563	DISSOLVED SODIUM	22
11/20/1979	122841	DISSOLVED SODIUM	13
01/14/1980	NS0036	DISSOLVED SODIUM	4
02/22/1980	NS0133	DISSOLVED SODIUM	8
07/24/1980	N00043	DISSOLVED SODIUM	14
03/11/1981	N00753	DISSOLVED SODIUM	15
07/28/1981	N01227	DISSOLVED SODIUM	18
11/25/1981	N01630	DISSOLVED SODIUM	10
05/24/1982	N02087	DISSOLVED SODIUM	8
03/03/1983	N02704	DISSOLVED SODIUM	7
03/16/1983	N02729	DISSOLVED SODIUM	8
07/06/1983	N03069	DISSOLVED SODIUM	10
03/26/1984	N03730	DISSOLVED SODIUM	10
05/23/1985	N04544	DISSOLVED SODIUM	12
03/16/1986	N06139	DISSOLVED SODIUM	8
03/24/1986	N05284	DISSOLVED SODIUM	10
11/18/1986	N05940	DISSOLVED SODIUM	22
11/19/1987	N06682	DISSOLVED SODIUM	20
03/24/1988	N06889	DISSOLVED SODIUM	15
11/22/1988	N07395	DISSOLVED SODIUM	27
01/23/1989	N07490	DISSOLVED SODIUM	10
03/09/1989	N07584	DISSOLVED SODIUM	5
05/11/1989	N07696	DISSOLVED SODIUM	11
11/16/1989	N08133	DISSOLVED SODIUM	23
01/23/1990	N08186	DISSOLVED SODIUM	16
06/11/1965	49724	DISSOLVED SOLIDS mg/L at 180C	0
07/12/1965	49827	DISSOLVED SOLIDS mg/L at 180C	0
08/09/1965	50144	DISSOLVED SOLIDS mg/L at 180C	0
09/13/1965	50488	DISSOLVED SOLIDS mg/L at 180C	211
10/07/1965	50656	DISSOLVED SOLIDS mg/L at 180C	0
11/04/1965	50886	DISSOLVED SOLIDS mg/L at 180C	0
12/13/1965	51366	DISSOLVED SOLIDS mg/L at 180C	0
01/17/1966	51782	DISSOLVED SOLIDS mg/L at 180C	0
02/10/1966	52052	DISSOLVED SOLIDS mg/L at 180C	0
03/02/1966	52135	DISSOLVED SOLIDS mg/L at 180C	0
04/13/1966	52555	DISSOLVED SOLIDS mg/L at 180C	0
05/03/1966	52922	DISSOLVED SOLIDS mg/L at 180C	138
06/02/1966	53269	DISSOLVED SOLIDS mg/L at 180C	0
07/06/1966	53449	DISSOLVED SOLIDS mg/L at 180C	0
11/22/1966	54559	DISSOLVED SOLIDS mg/L at 180C	0
01/03/1967	54733	DISSOLVED SOLIDS mg/L at 180C	0
03/06/1967	55193	DISSOLVED SOLIDS mg/L at 180C	0
05/04/1967	55511	DISSOLVED SOLIDS mg/L at 180C	199
07/05/1967	48163	DISSOLVED SOLIDS mg/L at 180C	0
09/06/1967		DISSOLVED SOLIDS mg/L at 180C	156
11/02/1967	50952	DISSOLVED SOLIDS mg/L at 180C	0

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01/16/1968	51359	DISSOLVED SOLIDS mg/L at 180C	0
03/07/1968	51921	DISSOLVED SOLIDS mg/L at 180C	0
05/01/1968	52711	DISSOLVED SOLIDS mg/L at 180C	144
07/02/1968	54178	DISSOLVED SOLIDS mg/L at 180C	0
09/06/1968	55323	DISSOLVED SOLIDS mg/L at 180C	191
11/06/1968	56972	DISSOLVED SOLIDS mg/L at 180C	0
01/06/1969	57542	DISSOLVED SOLIDS mg/L at 180C	0
03/04/1969	58166	DISSOLVED SOLIDS mg/L at 180C	0
05/02/1969	58778	DISSOLVED SOLIDS mg/L at 180C	94
07/02/1969	59647	DISSOLVED SOLIDS mg/L at 180C	0
09/03/1969	60721	DISSOLVED SOLIDS mg/L at 180C	154
11/13/1969	62112	DISSOLVED SOLIDS mg/L at 180C	0
01/07/1970	62882	DISSOLVED SOLIDS mg/L at 180C	0
03/05/1970	63540	DISSOLVED SOLIDS mg/L at 180C	0
07/03/1970	65351	DISSOLVED SOLIDS mg/L at 180C	0
11/12/1973	YUK014	DISSOLVED SOLIDS mg/L at 180C	92
09/20/1978	115753	DISSOLVED SOLIDS mg/L at 180C	255
05/03/1963	43356	DISSOLVED SOLIDS, invalid temp	161
05/07/1964	46511	DISSOLVED SOLIDS, invalid temp	157
12/23/1964	48574	DISSOLVED SOLIDS, invalid temp	100
05/06/1965	49239	DISSOLVED SOLIDS, invalid temp	193
05/07/1970	64353	DISSOLVED SOLIDS, invalid temp	161
11/12/1970	67392	DISSOLVED SOLIDS, invalid temp	184
03/09/1971	68850	DISSOLVED SOLIDS, invalid temp	154
03/02/1972	73507	DISSOLVED SOLIDS, invalid temp	78
09/19/1958	6374	DISSOLVED SULFATE SO4 mg/L	16
11/11/1958	28282	DISSOLVED SULFATE SO4 mg/L	19
12/04/1958	28486	DISSOLVED SULFATE SO4 mg/L	23
01/05/1959	28754	DISSOLVED SULFATE SO4 mg/L	18
02/02/1959	29023	DISSOLVED SULFATE SO4 mg/L	14
03/13/1959	29494	DISSOLVED SULFATE SO4 mg/L	15
04/13/1959	29744	DISSOLVED SULFATE SO4 mg/L	7.9
05/04/1959	29968	DISSOLVED SULFATE SO4 mg/L	12
05/20/1959	8007	DISSOLVED SULFATE SO4 mg/L	7.2
06/02/1959	30309	DISSOLVED SULFATE SO4 mg/L	12
07/14/1959	30548	DISSOLVED SULFATE SO4 mg/L	12
08/11/1959	30936	DISSOLVED SULFATE SO4 mg/L	11
09/02/1959	31222	DISSOLVED SULFATE SO4 mg/L	9.4
10/13/1959	31634	DISSOLVED SULFATE SO4 mg/L	10
05/05/1960	33592	DISSOLVED SULFATE SO4 mg/L	32
05/02/1961	36755	DISSOLVED SULFATE SO4 mg/L	13
05/03/1962	39915	DISSOLVED SULFATE SO4 mg/L	12
05/03/1963	43356	DISSOLVED SULFATE SO4 mg/L	17
05/07/1964	46511	DISSOLVED SULFATE SO4 mg/L	13
12/23/1964	48574	DISSOLVED SULFATE SO4 mg/L	13
05/06/1965	49239	DISSOLVED SULFATE SO4 mg/L	28
09/13/1965	50488	DISSOLVED SULFATE SO4 mg/L	20
05/03/1966	52922	DISSOLVED SULFATE SO4 mg/L	14
05/04/1967	55511	DISSOLVED SULFATE SO4 mg/L	27
09/06/1967		DISSOLVED SULFATE SO4 mg/L	18
05/01/1968	52711	DISSOLVED SULFATE SO4 mg/L	15
09/06/1968	55323	DISSOLVED SULFATE SO4 mg/L	15

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05/02/1969	58778	DISSOLVED SULFATE SO4 mg/L	9.4
09/03/1969	60721	DISSOLVED SULFATE SO4 mg/L	14
05/07/1970	64353	DISSOLVED SULFATE SO4 mg/L	25
11/12/1970	67392	DISSOLVED SULFATE SO4 mg/L	20
03/09/1971	68850	DISSOLVED SULFATE SO4 mg/L	21
03/02/1972	73507	DISSOLVED SULFATE SO4 mg/L	6.6
11/12/1973	YUK014	DISSOLVED SULFATE SO4 mg/L	7.1
09/20/1978	115753	DISSOLVED SULFATE SO4 mg/L	21
09/19/1958	6374	DISSOLVED TOTAL ALKALINITY	100
11/11/1958	28282	DISSOLVED TOTAL ALKALINITY	100
12/04/1958	28486	DISSOLVED TOTAL ALKALINITY	115
01/05/1959	28754	DISSOLVED TOTAL ALKALINITY	89
02/02/1959	29023	DISSOLVED TOTAL ALKALINITY	107
03/13/1959	29494	DISSOLVED TOTAL ALKALINITY	104
04/13/1959	29744	DISSOLVED TOTAL ALKALINITY	98
05/04/1959	29968	DISSOLVED TOTAL ALKALINITY	95
05/20/1959	8007	DISSOLVED TOTAL ALKALINITY	89
06/02/1959	30309	DISSOLVED TOTAL ALKALINITY	100
07/14/1959	30548	DISSOLVED TOTAL ALKALINITY	116
08/11/1959	30936	DISSOLVED TOTAL ALKALINITY	123
09/02/1959	31222	DISSOLVED TOTAL ALKALINITY	129
10/13/1959	31634	DISSOLVED TOTAL ALKALINITY	131
11/03/1959	32015	DISSOLVED TOTAL ALKALINITY	134
01/12/1960	32666	DISSOLVED TOTAL ALKALINITY	114
02/02/1960	32841	DISSOLVED TOTAL ALKALINITY	69
03/08/1960	33134	DISSOLVED TOTAL ALKALINITY	66
04/12/1960	33389	DISSOLVED TOTAL ALKALINITY	95
05/05/1960	33592	DISSOLVED TOTAL ALKALINITY	115
06/14/1960	34092	DISSOLVED TOTAL ALKALINITY	93
07/04/1960	34244	DISSOLVED TOTAL ALKALINITY	105
08/08/1960	34461	DISSOLVED TOTAL ALKALINITY	130
10/10/1960	34932	DISSOLVED TOTAL ALKALINITY	132
12/12/1960	35525	DISSOLVED TOTAL ALKALINITY	157
01/03/1961	35758	DISSOLVED TOTAL ALKALINITY	143
02/15/1961	36019	DISSOLVED TOTAL ALKALINITY	96
03/14/1961	36323	DISSOLVED TOTAL ALKALINITY	119
04/11/1961	36558	DISSOLVED TOTAL ALKALINITY	103
05/02/1961	36755	DISSOLVED TOTAL ALKALINITY	100
06/06/1961	37020	DISSOLVED TOTAL ALKALINITY	82
07/07/1961	37286	DISSOLVED TOTAL ALKALINITY	103
08/07/1961	37557	DISSOLVED TOTAL ALKALINITY	113
12/07/1961	38623	DISSOLVED TOTAL ALKALINITY	112
01/11/1962	38974	DISSOLVED TOTAL ALKALINITY	112
02/09/1962	39202	DISSOLVED TOTAL ALKALINITY	58
03/14/1962	39531	DISSOLVED TOTAL ALKALINITY	145
04/11/1962	39809	DISSOLVED TOTAL ALKALINITY	78
05/03/1962	39915	DISSOLVED TOTAL ALKALINITY	90
06/08/1962	40469	DISSOLVED TOTAL ALKALINITY	89
07/03/1962	40724	DISSOLVED TOTAL ALKALINITY	90
08/03/1962	40951	DISSOLVED TOTAL ALKALINITY	121
11/01/1962	41702	DISSOLVED TOTAL ALKALINITY	112
12/07/1962	42042	DISSOLVED TOTAL ALKALINITY	98

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01/04/1963	42282	DISSOLVED TOTAL ALKALINITY	116
02/11/1963	42514	DISSOLVED TOTAL ALKALINITY	90
03/01/1963	42846	DISSOLVED TOTAL ALKALINITY	141
04/05/1963	43093	DISSOLVED TOTAL ALKALINITY	124
05/03/1963	43356	DISSOLVED TOTAL ALKALINITY	113
06/05/1963	43425	DISSOLVED TOTAL ALKALINITY	112
07/08/1963	43808	DISSOLVED TOTAL ALKALINITY	121
08/02/1963	44198	DISSOLVED TOTAL ALKALINITY	121
11/07/1963	44929	DISSOLVED TOTAL ALKALINITY	116
12/05/1963	45094	DISSOLVED TOTAL ALKALINITY	119
01/03/1964	45475	DISSOLVED TOTAL ALKALINITY	126
01/21/1964	45699	DISSOLVED TOTAL ALKALINITY	70
02/06/1964	45700	DISSOLVED TOTAL ALKALINITY	110
03/12/1964	45944	DISSOLVED TOTAL ALKALINITY	124
04/09/1964	46258	DISSOLVED TOTAL ALKALINITY	117
05/07/1964	46511	DISSOLVED TOTAL ALKALINITY	106
06/11/1964	46731	DISSOLVED TOTAL ALKALINITY	102
07/09/1964	46863	DISSOLVED TOTAL ALKALINITY	118
11/13/1964	47828	DISSOLVED TOTAL ALKALINITY	107
12/10/1964	48044	DISSOLVED TOTAL ALKALINITY	118
12/23/1964	48574	DISSOLVED TOTAL ALKALINITY	59
01/14/1965	48308	DISSOLVED TOTAL ALKALINITY	122
02/05/1965	48635	DISSOLVED TOTAL ALKALINITY	112
03/01/1965	48913	DISSOLVED TOTAL ALKALINITY	110
04/05/1965	49164	DISSOLVED TOTAL ALKALINITY	126
05/06/1965	49239	DISSOLVED TOTAL ALKALINITY	130
06/11/1965	49724	DISSOLVED TOTAL ALKALINITY	117
07/12/1965	49827	DISSOLVED TOTAL ALKALINITY	125
08/09/1965	50144	DISSOLVED TOTAL ALKALINITY	135
09/13/1965	50488	DISSOLVED TOTAL ALKALINITY	138
10/07/1965	50656	DISSOLVED TOTAL ALKALINITY	140
11/04/1965	50886	DISSOLVED TOTAL ALKALINITY	122
12/13/1965	51366	DISSOLVED TOTAL ALKALINITY	126
01/17/1966	51782	DISSOLVED TOTAL ALKALINITY	120
02/10/1966	52052	DISSOLVED TOTAL ALKALINITY	151
03/02/1966	52135	DISSOLVED TOTAL ALKALINITY	144
04/13/1966	52555	DISSOLVED TOTAL ALKALINITY	85
05/03/1966	52922	DISSOLVED TOTAL ALKALINITY	90
06/02/1966	53269	DISSOLVED TOTAL ALKALINITY	94
07/06/1966	53449	DISSOLVED TOTAL ALKALINITY	112
11/22/1966	54559	DISSOLVED TOTAL ALKALINITY	94
01/03/1967	54733	DISSOLVED TOTAL ALKALINITY	123
03/06/1967	55193	DISSOLVED TOTAL ALKALINITY	138
05/04/1967	55511	DISSOLVED TOTAL ALKALINITY	143
07/05/1967	48163	DISSOLVED TOTAL ALKALINITY	98
09/06/1967		DISSOLVED TOTAL ALKALINITY	95
11/02/1967	50952	DISSOLVED TOTAL ALKALINITY	100
01/16/1968	51359	DISSOLVED TOTAL ALKALINITY	62
03/07/1968	51921	DISSOLVED TOTAL ALKALINITY	99
05/01/1968	52711	DISSOLVED TOTAL ALKALINITY	105
07/02/1968	54178	DISSOLVED TOTAL ALKALINITY	101
09/06/1968	55323	DISSOLVED TOTAL ALKALINITY	87

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11/06/1968	56972	DISSOLVED TOTAL ALKALINITY	108
01/06/1969	57542	DISSOLVED TOTAL ALKALINITY	91
03/04/1969	58166	DISSOLVED TOTAL ALKALINITY	157
05/02/1969	58778	DISSOLVED TOTAL ALKALINITY	71
07/02/1969	59647	DISSOLVED TOTAL ALKALINITY	102
09/03/1969	60721	DISSOLVED TOTAL ALKALINITY	90
11/13/1969	62112	DISSOLVED TOTAL ALKALINITY	116
01/07/1970	62882	DISSOLVED TOTAL ALKALINITY	101
03/05/1970	63540	DISSOLVED TOTAL ALKALINITY	107
05/07/1970	64353	DISSOLVED TOTAL ALKALINITY	125
07/03/1970	65351	DISSOLVED TOTAL ALKALINITY	116
11/12/1970	67392	DISSOLVED TOTAL ALKALINITY	98
01/13/1971	68110	DISSOLVED TOTAL ALKALINITY	92
03/09/1971	68850	DISSOLVED TOTAL ALKALINITY	85
05/24/1971	70118	DISSOLVED TOTAL ALKALINITY	83
07/14/1971	70810	DISSOLVED TOTAL ALKALINITY	105
01/06/1972	73105	DISSOLVED TOTAL ALKALINITY	112
03/02/1972	73507	DISSOLVED TOTAL ALKALINITY	62
11/24/1972	827B	DISSOLVED TOTAL ALKALINITY	126
05/18/1973	80125	DISSOLVED TOTAL ALKALINITY	65
11/12/1973	YUK014	DISSOLVED TOTAL ALKALINITY	53
03/05/1975	89612	DISSOLVED TOTAL ALKALINITY	79
05/19/1975	90652	DISSOLVED TOTAL ALKALINITY	61
01/14/1976	94736	DISSOLVED TOTAL ALKALINITY	121
11/12/1976	100581	DISSOLVED TOTAL ALKALINITY	122
01/17/1977	100816	DISSOLVED TOTAL ALKALINITY	149
03/17/1977	102287	DISSOLVED TOTAL ALKALINITY	94
05/17/1977	103765	DISSOLVED TOTAL ALKALINITY	137
01/11/1978	110282	DISSOLVED TOTAL ALKALINITY	85
09/20/1978	115753	DISSOLVED TOTAL ALKALINITY	125
01/19/1979	117563	DISSOLVED TOTAL ALKALINITY	126
11/20/1979	122841	DISSOLVED TOTAL ALKALINITY	94
01/14/1980	NS0036	DISSOLVED TOTAL ALKALINITY	52
02/22/1980	NS0133	DISSOLVED TOTAL ALKALINITY	92
07/24/1980	N00043	DISSOLVED TOTAL ALKALINITY	108
03/11/1981	N00753	DISSOLVED TOTAL ALKALINITY	121
07/28/1981	N01227	DISSOLVED TOTAL ALKALINITY	123
11/25/1981	N01630	DISSOLVED TOTAL ALKALINITY	64
05/24/1982	N02087	DISSOLVED TOTAL ALKALINITY	87
03/03/1983	N02704	DISSOLVED TOTAL ALKALINITY	86
03/16/1983	N02729	DISSOLVED TOTAL ALKALINITY	105
07/06/1983	N03069	DISSOLVED TOTAL ALKALINITY	89
03/26/1984	N03730	DISSOLVED TOTAL ALKALINITY	97
05/23/1985	N04544	DISSOLVED TOTAL ALKALINITY	99
03/16/1986	N06139	DISSOLVED TOTAL ALKALINITY	81
03/24/1986	N05284	DISSOLVED TOTAL ALKALINITY	115
11/18/1986	N05940	DISSOLVED TOTAL ALKALINITY	126
11/19/1987	N06682	DISSOLVED TOTAL ALKALINITY	122
03/24/1988	N06889	DISSOLVED TOTAL ALKALINITY	109
11/22/1988	N07395	DISSOLVED TOTAL ALKALINITY	118
01/23/1989	N07490	DISSOLVED TOTAL ALKALINITY	81
03/09/1989	N07584	DISSOLVED TOTAL ALKALINITY	57

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/11/1989	N07696	DISSOLVED TOTAL ALKALINITY	89
11/16/1989	N08133	DISSOLVED TOTAL ALKALINITY	132
01/23/1990	N08186	DISSOLVED TOTAL ALKALINITY	101
12/23/1964	48574	DISSOLVED TOTAL PHOSPHORUS	0.03
05/04/1959	29968	Fe mg/L D	0.02
09/02/1959	31222	Fe mg/L D	0
05/05/1960	33592	Fe mg/L D	0.03
05/02/1961	36755	Fe mg/L D	0.02
11/28/1970	68049	Fe mg/L D	0.02
05/24/1971	70118	Hg mg/L T	0
09/19/1958	6374	LAB pH	7.9
11/11/1958	28282	LAB pH	8
12/04/1958	28486	LAB pH	7.9
01/05/1959	28754	LAB pH	7.5
02/02/1959	29023	LAB pH	8
03/13/1959	29494	LAB pH	8.3
04/13/1959	29744	LAB pH	8.3
05/04/1959	29968	LAB pH	8
05/20/1959	8007	LAB pH	7.8
06/02/1959	30309	LAB pH	8.2
07/14/1959	30548	LAB pH	8.1
08/11/1959	30936	LAB pH	7.8
09/02/1959	31222	LAB pH	7.7
10/13/1959	31634	LAB pH	8
11/03/1959	32015	LAB pH	7.9
01/12/1960	32666	LAB pH	7.9
02/02/1960	32841	LAB pH	7.5
03/08/1960	33134	LAB pH	7.3
04/12/1960	33389	LAB pH	8
05/05/1960	33592	LAB pH	7.9
06/14/1960	34092	LAB pH	8
07/04/1960	34244	LAB pH	8.1
08/08/1960	34461	LAB pH	8
10/10/1960	34932	LAB pH	7.8
12/12/1960	35525	LAB pH	8.2
01/03/1961	35758	LAB pH	8.1
02/15/1961	36019	LAB pH	8.2
03/14/1961	36323	LAB pH	8.3
04/11/1961	36558	LAB pH	8.4
05/02/1961	36755	LAB pH	8.1
06/06/1961	37020	LAB pH	8.2
07/07/1961	37286	LAB pH	8.4
08/07/1961	37557	LAB pH	8.2
12/07/1961	38623	LAB pH	8.1
01/11/1962	38974	LAB pH	8.1
02/09/1962	39202	LAB pH	7.5
03/14/1962	39531	LAB pH	8.1
04/11/1962	39809	LAB pH	8.2
05/03/1962	39915	LAB pH	8.3
06/08/1962	40469	LAB pH	8.4
07/03/1962	40724	LAB pH	8.4
08/03/1962	40951	LAB pH	7.9

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11/01/1962	41702	LAB pH	8
12/07/1962	42042	LAB pH	8.3
01/04/1963	42282	LAB pH	8.4
02/11/1963	42514	LAB pH	8
03/01/1963	42846	LAB pH	8.3
04/05/1963	43093	LAB pH	8.3
05/03/1963	43356	LAB pH	8.4
06/05/1963	43425	LAB pH	8.4
07/08/1963	43808	LAB pH	8.2
08/02/1963	44198	LAB pH	8.5
11/07/1963	44929	LAB pH	8.3
12/05/1963	45094	LAB pH	8.3
01/03/1964	45475	LAB pH	8.4
01/21/1964	45699	LAB pH	7.9
02/06/1964	45700	LAB pH	8.4
03/12/1964	45944	LAB pH	8.4
04/09/1964	46258	LAB pH	8.6
05/07/1964	46511	LAB pH	8.3
06/11/1964	46731	LAB pH	8.5
07/09/1964	46863	LAB pH	8.5
11/13/1964	47828	LAB pH	8.2
12/10/1964	48044	LAB pH	8.2
12/23/1964	48574	LAB pH	7.7
01/14/1965	48308	LAB pH	8.3
02/05/1965	48635	LAB pH	8.4
03/01/1965	48913	LAB pH	8.4
04/05/1965	49164	LAB pH	8.2
05/06/1965	49239	LAB pH	8.4
06/11/1965	49724	LAB pH	8.6
07/12/1965	49827	LAB pH	8.3
08/09/1965	50144	LAB pH	8.6
09/13/1965	50488	LAB pH	7.7
10/07/1965	50656	LAB pH	8.5
11/04/1965	50886	LAB pH	8.5
12/13/1965	51366	LAB pH	8.4
01/17/1966	51782	LAB pH	8.2
02/10/1966	52052	LAB pH	8.4
03/02/1966	52135	LAB pH	8.5
04/13/1966	52555	LAB pH	8.4
05/03/1966	52922	LAB pH	8.2
06/02/1966	53269	LAB pH	8
07/06/1966	53449	LAB pH	8.4
11/22/1966	54559	LAB pH	8.4
01/03/1967	54733	LAB pH	8.5
03/06/1967	55193	LAB pH	8.4
05/04/1967	55511	LAB pH	8.3
07/05/1967	48163	LAB pH	8.3
09/06/1967		LAB pH	8
11/02/1967	50952	LAB pH	8.2
01/16/1968	51359	LAB pH	8.1
03/07/1968	51921	LAB pH	8.2
05/01/1968	52711	LAB pH	8.3

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07/02/1968	54178	LAB pH	8.6
09/06/1968	55323	LAB pH	8.1
11/06/1968	56972	LAB pH	8.4
01/06/1969	57542	LAB pH	8.2
03/04/1969	58166	LAB pH	8.3
05/02/1969	58778	LAB pH	7.9
07/02/1969	59647	LAB pH	8.3
09/03/1969	60721	LAB pH	8
11/13/1969	62112	LAB pH	8
01/07/1970	62882	LAB pH	7.8
03/05/1970	63540	LAB pH	7.9
05/07/1970	64353	LAB pH	8.3
07/03/1970	65351	LAB pH	8.2
11/12/1970	67392	LAB pH	8.3
01/13/1971	68110	LAB pH	8.1
03/09/1971	68850	LAB pH	8.6
05/24/1971	70118	LAB pH	8.1
07/14/1971	70810	LAB pH	8
01/06/1972	73105	LAB pH	7.9
03/02/1972	73507	LAB pH	7.9
11/24/1972	827B	LAB pH	7.9
05/18/1973	80125	LAB pH	7.4
11/12/1973	YUK014	LAB pH	7.6
03/05/1975	89612	LAB pH	7.8
05/19/1975	90652	LAB pH	8
01/14/1976	94736	LAB pH	8.3
11/12/1976	100581	LAB pH	8.4
01/17/1977	100816	LAB pH	8.4
03/17/1977	102287	LAB pH	7.5
05/17/1977	103765	LAB pH	7.9
01/11/1978	110282	LAB pH	8.3
09/20/1978	115753	LAB pH	8
01/19/1979	117563	LAB pH	7.9
11/20/1979	122841	LAB pH	8
01/14/1980	NS0036	LAB pH	7.8
02/22/1980	NS0133	LAB pH	8.1
07/24/1980	N00043	LAB pH	7.9
03/11/1981	N00753	LAB pH	7.9
07/28/1981	N01227	LAB pH	8
11/25/1981	N01630	LAB pH	7.7
05/24/1982	N02087	LAB pH	7.5
03/03/1983	N02704	LAB pH	7.8
03/16/1983	N02729	LAB pH	7.9
07/06/1983	N03069	LAB pH	8.1
03/26/1984	N03730	LAB pH	7.8
05/23/1985	N04544	LAB pH	7.9
03/16/1986	N06139	LAB pH	8.2
03/24/1986	N05284	LAB pH	8.2
11/18/1986	N05940	LAB pH	8.4
11/19/1987	N06682	LAB pH	8.2
03/24/1988	N06889	LAB pH	8.2
05/02/1961	36755	METHYLENE BLUE ACTIVE SUBSTANC	0

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05/07/1964	46511	METHYLENE BLUE ACTIVE SUBSTANC	0
05/06/1965	49239	METHYLENE BLUE ACTIVE SUBSTANC	0.1
09/13/1965	50488	METHYLENE BLUE ACTIVE SUBSTANC	0
05/03/1966	52922	METHYLENE BLUE ACTIVE SUBSTANC	0
05/04/1967	55511	METHYLENE BLUE ACTIVE SUBSTANC	0
03/02/1972	73507	MINERAL TURBIDITY HACH	65
05/08/1972	133F	MINERAL TURBIDITY HACH	0
11/24/1972	827B	MINERAL TURBIDITY HACH	0
01/05/1973	828B	MINERAL TURBIDITY HACH	3
03/23/1973	829B	MINERAL TURBIDITY HACH	15
05/18/1973	80125	MINERAL TURBIDITY HACH	17
07/17/1973	830B	MINERAL TURBIDITY HACH	1
11/12/1973	YUK014	MINERAL TURBIDITY HACH	700
01/04/1974	YUK015	MINERAL TURBIDITY HACH	19
03/18/1974	YUK016	MINERAL TURBIDITY HACH	80
05/21/1974	YUK017	MINERAL TURBIDITY HACH	6
07/16/1974	YUK018	MINERAL TURBIDITY HACH	1
09/23/1974	YUK019	MINERAL TURBIDITY HACH	1
11/14/1974	172L	MINERAL TURBIDITY HACH	1
01/15/1975	173L	MINERAL TURBIDITY HACH	3
03/05/1975	89612	MINERAL TURBIDITY HACH	50
05/19/1975	90652	MINERAL TURBIDITY HACH	32
07/22/1975	174L	MINERAL TURBIDITY HACH	1
09/11/1975	175L	MINERAL TURBIDITY HACH	1
11/17/1975	80G	MINERAL TURBIDITY HACH	9
01/14/1976	94736	MINERAL TURBIDITY HACH	0
03/11/1976	81G	MINERAL TURBIDITY HACH	1
05/20/1976	156S	MINERAL TURBIDITY HACH	1
07/23/1976	157S	MINERAL TURBIDITY HACH	0
11/12/1976	100581	MINERAL TURBIDITY HACH	1
01/03/1977	BP53	MINERAL TURBIDITY HACH	177
01/17/1977	100816	MINERAL TURBIDITY HACH	2
03/17/1977	102287	MINERAL TURBIDITY HACH	720
05/17/1977	103765	MINERAL TURBIDITY HACH	48
01/10/1978	950	MINERAL TURBIDITY HACH	220
01/11/1978	110282	MINERAL TURBIDITY HACH	310
03/13/1978	549A	MINERAL TURBIDITY HACH	19
05/16/1978	44F	MINERAL TURBIDITY HACH	7
07/18/1978	30C	MINERAL TURBIDITY HACH	1
09/20/1978	115753	MINERAL TURBIDITY HACH	0
11/17/1978	33E	MINERAL TURBIDITY HACH	1
01/19/1979	117563	MINERAL TURBIDITY HACH	2
03/20/1979	30	MINERAL TURBIDITY HACH	7
05/21/1979	XV11	MINERAL TURBIDITY HACH	3
07/24/1979	DF42	MINERAL TURBIDITY HACH	1
11/20/1979	122841	MINERAL TURBIDITY HACH	5
01/14/1980	NS0036	MINERAL TURBIDITY HACH	900
01/23/1980	F7	MINERAL TURBIDITY HACH	25
02/22/1980	NS0133	MINERAL TURBIDITY HACH	180
03/25/1980	F53	MINERAL TURBIDITY HACH	3
05/23/1980	FD11	MINERAL TURBIDITY HACH	2
07/24/1980	N00043	MINERAL TURBIDITY HACH	1

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09/30/1980	F43	MINERAL TURBIDITY HACH	1
11/12/1980	OK43	MINERAL TURBIDITY HACH	1
01/27/1981	R15	MINERAL TURBIDITY HACH	180
01/27/1981	BP1190	MINERAL TURBIDITY HACH	168
03/11/1981	N00753	MINERAL TURBIDITY HACH	1
05/27/1981	C36	MINERAL TURBIDITY HACH	2
07/28/1981	N01227	MINERAL TURBIDITY HACH	0
11/25/1981	N01630	MINERAL TURBIDITY HACH	150
01/12/1982	NFL01	MINERAL TURBIDITY HACH	17
05/24/1982	N02087	MINERAL TURBIDITY HACH	6
07/21/1982	CS1	MINERAL TURBIDITY HACH	2
09/10/1982	L923	MINERAL TURBIDITY HACH	1
11/16/1982	VDB11	MINERAL TURBIDITY HACH	1
01/19/1983	ACH07	MINERAL TURBIDITY HACH	92
03/03/1983	N02704	MINERAL TURBIDITY HACH	1044
03/16/1983	N02729	MINERAL TURBIDITY HACH	168
05/11/1983	A5259	MINERAL TURBIDITY HACH	17
07/06/1983	N03069	MINERAL TURBIDITY HACH	2
09/26/1983	A030	MINERAL TURBIDITY HACH	2
11/15/1983	P212	MINERAL TURBIDITY HACH	17
03/26/1984	N03730	MINERAL TURBIDITY HACH	1
05/25/1984	P52912	MINERAL TURBIDITY HACH	1
07/20/1984	P72332	MINERAL TURBIDITY HACH	12
11/21/1984	L1262	MINERAL TURBIDITY HACH	7
01/16/1985	P3272	MINERAL TURBIDITY HACH	1
03/12/1985	L112	MINERAL TURBIDITY HACH	1
05/23/1985	N04544	MINERAL TURBIDITY HACH	2
09/24/1985	P9252	MINERAL TURBIDITY HACH	2
11/20/1985	A1119	MINERAL TURBIDITY HACH	2
01/09/1986	P0192	MINERAL TURBIDITY HACH	2
03/16/1986	N06139	MINERAL TURBIDITY HACH	32
03/24/1986	N05284	MINERAL TURBIDITY HACH	34
05/08/1986	P592	MINERAL TURBIDITY HACH	18
07/15/1986	P7162	MINERAL TURBIDITY HACH	1
11/18/1986	N05940	MINERAL TURBIDITY HACH	1
01/13/1987	P1140	MINERAL TURBIDITY HACH	1
05/21/1987	A40	MINERAL TURBIDITY HACH	1
01/13/1988	P11111	MINERAL TURBIDITY HACH	13
03/24/1988	N06889	MINERAL TURBIDITY HACH	1
05/11/1988	P5191	MINERAL TURBIDITY HACH	1
01/23/1989	N07490	MINERAL TURBIDITY HACH	24
03/09/1989	N07584	MINERAL TURBIDITY HACH	330
05/11/1989	N07696	MINERAL TURBIDITY HACH	7
01/16/1991	P19111	MINERAL TURBIDITY HACH	1
03/14/1991	P3142	MINERAL TURBIDITY HACH	3
05/04/1959	29968	MINERAL TURBIDITY HELLIGE	1
09/02/1959	31222	MINERAL TURBIDITY HELLIGE	2
11/03/1959	32015	MINERAL TURBIDITY HELLIGE	4
01/12/1960	32666	MINERAL TURBIDITY HELLIGE	1
02/02/1960	32841	MINERAL TURBIDITY HELLIGE	170
03/08/1960	33134	MINERAL TURBIDITY HELLIGE	700
04/12/1960	33389	MINERAL TURBIDITY HELLIGE	10

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/05/1960	33592	MINERAL TURBIDITY HELLIGE	1
06/14/1960	34092	MINERAL TURBIDITY HELLIGE	1
07/04/1960	34244	MINERAL TURBIDITY HELLIGE	12
08/08/1960	34461	MINERAL TURBIDITY HELLIGE	1
10/10/1960	34932	MINERAL TURBIDITY HELLIGE	2
12/12/1960	35525	MINERAL TURBIDITY HELLIGE	2
01/03/1961	35758	MINERAL TURBIDITY HELLIGE	1
02/15/1961	36019	MINERAL TURBIDITY HELLIGE	30
03/14/1961	36323	MINERAL TURBIDITY HELLIGE	8
04/11/1961	36558	MINERAL TURBIDITY HELLIGE	4
05/02/1961	36755	MINERAL TURBIDITY HELLIGE	2
06/06/1961	37020	MINERAL TURBIDITY HELLIGE	5
07/07/1961	37286	MINERAL TURBIDITY HELLIGE	4
08/07/1961	37557	MINERAL TURBIDITY HELLIGE	2
12/07/1961	38623	MINERAL TURBIDITY HELLIGE	6
01/11/1962	38974	MINERAL TURBIDITY HELLIGE	1
02/09/1962	39202	MINERAL TURBIDITY HELLIGE	350
03/14/1962	39531	MINERAL TURBIDITY HELLIGE	6
04/11/1962	39809	MINERAL TURBIDITY HELLIGE	35
05/03/1962	39915	MINERAL TURBIDITY HELLIGE	1
06/08/1962	40469	MINERAL TURBIDITY HELLIGE	2
07/03/1962	40724	MINERAL TURBIDITY HELLIGE	1
08/03/1962	40951	MINERAL TURBIDITY HELLIGE	2
11/01/1962	41702	MINERAL TURBIDITY HELLIGE	2
12/07/1962	42042	MINERAL TURBIDITY HELLIGE	7
01/04/1963	42282	MINERAL TURBIDITY HELLIGE	1
02/11/1963	42514	MINERAL TURBIDITY HELLIGE	200
03/01/1963	42846	MINERAL TURBIDITY HELLIGE	5
04/05/1963	43093	MINERAL TURBIDITY HELLIGE	15
05/03/1963	43356	MINERAL TURBIDITY HELLIGE	8
06/05/1963	43425	MINERAL TURBIDITY HELLIGE	1
07/08/1963	43808	MINERAL TURBIDITY HELLIGE	1
08/02/1963	44198	MINERAL TURBIDITY HELLIGE	3
11/07/1963	44929	MINERAL TURBIDITY HELLIGE	6
12/05/1963	45094	MINERAL TURBIDITY HELLIGE	1
01/03/1964	45475	MINERAL TURBIDITY HELLIGE	2
01/21/1964	45699	MINERAL TURBIDITY HELLIGE	160
02/06/1964	45700	MINERAL TURBIDITY HELLIGE	3
03/12/1964	45944	MINERAL TURBIDITY HELLIGE	2
04/09/1964	46258	MINERAL TURBIDITY HELLIGE	2
05/07/1964	46511	MINERAL TURBIDITY HELLIGE	1
06/11/1964	46731	MINERAL TURBIDITY HELLIGE	1
07/09/1964	46863	MINERAL TURBIDITY HELLIGE	1
11/13/1964	47828	MINERAL TURBIDITY HELLIGE	20
12/10/1964	48044	MINERAL TURBIDITY HELLIGE	2
12/23/1964	48574	MINERAL TURBIDITY HELLIGE	7000
01/14/1965	48308	MINERAL TURBIDITY HELLIGE	80
02/05/1965	48635	MINERAL TURBIDITY HELLIGE	300
03/01/1965	48913	MINERAL TURBIDITY HELLIGE	40
04/05/1965	49164	MINERAL TURBIDITY HELLIGE	10
05/06/1965	49239	MINERAL TURBIDITY HELLIGE	40
06/11/1965	49724	MINERAL TURBIDITY HELLIGE	2

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07/12/1965	49827	MINERAL TURBIDITY HELLIGE	1
08/09/1965	50144	MINERAL TURBIDITY HELLIGE	2
09/13/1965	50488	MINERAL TURBIDITY HELLIGE	1
10/07/1965	50656	MINERAL TURBIDITY HELLIGE	1
11/04/1965	50886	MINERAL TURBIDITY HELLIGE	1
12/13/1965	51366	MINERAL TURBIDITY HELLIGE	1
01/17/1966	51782	MINERAL TURBIDITY HELLIGE	25
02/10/1966	52052	MINERAL TURBIDITY HELLIGE	4
03/02/1966	52135	MINERAL TURBIDITY HELLIGE	2
04/13/1966	52555	MINERAL TURBIDITY HELLIGE	40
05/03/1966	52922	MINERAL TURBIDITY HELLIGE	1
06/02/1966	53269	MINERAL TURBIDITY HELLIGE	1
07/06/1966	53449	MINERAL TURBIDITY HELLIGE	1
11/22/1966	54559	MINERAL TURBIDITY HELLIGE	15
01/03/1967	54733	MINERAL TURBIDITY HELLIGE	1
03/06/1967	55193	MINERAL TURBIDITY HELLIGE	1
05/04/1967	55511	MINERAL TURBIDITY HELLIGE	10
07/05/1967	48163	MINERAL TURBIDITY HELLIGE	2
11/02/1967	50952	MINERAL TURBIDITY HELLIGE	1
01/16/1968	51359	MINERAL TURBIDITY HELLIGE	640
03/07/1968	51921	MINERAL TURBIDITY HELLIGE	30
05/01/1968	52711	MINERAL TURBIDITY HELLIGE	1
07/02/1968	54178	MINERAL TURBIDITY HELLIGE	2
09/06/1968	55323	MINERAL TURBIDITY HELLIGE	1
11/06/1968	56972	MINERAL TURBIDITY HELLIGE	2
01/06/1969	57542	MINERAL TURBIDITY HELLIGE	280
03/04/1969	58166	MINERAL TURBIDITY HELLIGE	50
05/02/1969	58778	MINERAL TURBIDITY HELLIGE	25
07/02/1969	59647	MINERAL TURBIDITY HELLIGE	5
09/03/1969	60721	MINERAL TURBIDITY HELLIGE	3
11/13/1969	62112	MINERAL TURBIDITY HELLIGE	2
01/07/1970	62882	MINERAL TURBIDITY HELLIGE	5
03/05/1970	63540	MINERAL TURBIDITY HELLIGE	105
05/07/1970	64353	MINERAL TURBIDITY HELLIGE	1
07/03/1970	65351	MINERAL TURBIDITY HELLIGE	1
11/12/1970	67392	MINERAL TURBIDITY HELLIGE	25
01/13/1971	68110	MINERAL TURBIDITY HELLIGE	35
03/09/1971	68850	MINERAL TURBIDITY HELLIGE	4
05/24/1971	70118	MINERAL TURBIDITY HELLIGE	2
07/14/1971	70810	MINERAL TURBIDITY HELLIGE	2
11/22/1971	132F	MINERAL TURBIDITY HELLIGE	1
01/06/1972	73105	MINERAL TURBIDITY HELLIGE	2
05/04/1959	29968	Mn mg/L D	0
09/02/1959	31222	Mn mg/L D	0
05/05/1960	33592	Mn mg/L D	0
05/02/1961	36755	Mn mg/L D	0
11/28/1970	68049	Mn mg/L D	0
03/03/1983	N02704	NUTRIENT TURBIDITY HACH	1044
05/04/1959	29968	Pb mg/L D	0
09/02/1959	31222	Pb mg/L D	0
05/05/1960	33592	Pb mg/L D	0
05/02/1961	36755	Pb mg/L D	0

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11/28/1970	68049	Pb mg/L D	0
05/24/1971	70118	Pb mg/L D	0
05/24/1971	70118	Se mg/L D	0
09/19/1958	6374	SPECIFIC CONDUCTANCE 25C	320
11/11/1958	28282	SPECIFIC CONDUCTANCE 25C	336
12/04/1958	28486	SPECIFIC CONDUCTANCE 25C	408
01/05/1959	28754	SPECIFIC CONDUCTANCE 25C	308
02/02/1959	29023	SPECIFIC CONDUCTANCE 25C	288
03/13/1959	29494	SPECIFIC CONDUCTANCE 25C	253
04/13/1959	29744	SPECIFIC CONDUCTANCE 25C	225
05/04/1959	29968	SPECIFIC CONDUCTANCE 25C	233
05/20/1959	8007	SPECIFIC CONDUCTANCE 25C	224
06/02/1959	30309	SPECIFIC CONDUCTANCE 25C	245
07/14/1959	30548	SPECIFIC CONDUCTANCE 25C	278
08/11/1959	30936	SPECIFIC CONDUCTANCE 25C	294
09/02/1959	31222	SPECIFIC CONDUCTANCE 25C	301
10/13/1959	31634	SPECIFIC CONDUCTANCE 25C	299
11/03/1959	32015	SPECIFIC CONDUCTANCE 25C	293
01/12/1960	32666	SPECIFIC CONDUCTANCE 25C	520
02/02/1960	32841	SPECIFIC CONDUCTANCE 25C	218
03/08/1960	33134	SPECIFIC CONDUCTANCE 25C	164
04/12/1960	33389	SPECIFIC CONDUCTANCE 25C	241
05/05/1960	33592	SPECIFIC CONDUCTANCE 25C	310
06/14/1960	34092	SPECIFIC CONDUCTANCE 25C	225
07/04/1960	34244	SPECIFIC CONDUCTANCE 25C	261
08/08/1960	34461	SPECIFIC CONDUCTANCE 25C	311
10/10/1960	34932	SPECIFIC CONDUCTANCE 25C	311
12/12/1960	35525	SPECIFIC CONDUCTANCE 25C	421
01/03/1961	35758	SPECIFIC CONDUCTANCE 25C	370
02/15/1961	36019	SPECIFIC CONDUCTANCE 25C	252
03/14/1961	36323	SPECIFIC CONDUCTANCE 25C	319
04/11/1961	36558	SPECIFIC CONDUCTANCE 25C	251
05/02/1961	36755	SPECIFIC CONDUCTANCE 25C	248
06/06/1961	37020	SPECIFIC CONDUCTANCE 25C	202
07/07/1961	37286	SPECIFIC CONDUCTANCE 25C	255
08/07/1961	37557	SPECIFIC CONDUCTANCE 25C	280
12/07/1961	38623	SPECIFIC CONDUCTANCE 25C	460
01/11/1962	38974	SPECIFIC CONDUCTANCE 25C	423
02/09/1962	39202	SPECIFIC CONDUCTANCE 25C	166
03/14/1962	39531	SPECIFIC CONDUCTANCE 25C	387
04/11/1962	39809	SPECIFIC CONDUCTANCE 25C	192
05/03/1962	39915	SPECIFIC CONDUCTANCE 25C	223
06/08/1962	40469	SPECIFIC CONDUCTANCE 25C	216
07/03/1962	40724	SPECIFIC CONDUCTANCE 25C	231
08/03/1962	40951	SPECIFIC CONDUCTANCE 25C	289
11/01/1962	41702	SPECIFIC CONDUCTANCE 25C	327
12/07/1962	42042	SPECIFIC CONDUCTANCE 25C	248
01/04/1963	42282	SPECIFIC CONDUCTANCE 25C	329
02/11/1963	42514	SPECIFIC CONDUCTANCE 25C	202
03/01/1963	42846	SPECIFIC CONDUCTANCE 25C	342
04/05/1963	43093	SPECIFIC CONDUCTANCE 25C	291
05/03/1963	43356	SPECIFIC CONDUCTANCE 25C	251

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

06/05/1963	43425	SPECIFIC CONDUCTANCE 25C	254
07/08/1963	43808	SPECIFIC CONDUCTANCE 25C	296
08/02/1963	44198	SPECIFIC CONDUCTANCE 25C	299
11/07/1963	44929	SPECIFIC CONDUCTANCE 25C	411
12/05/1963	45094	SPECIFIC CONDUCTANCE 25C	337
01/03/1964	45475	SPECIFIC CONDUCTANCE 25C	373
01/21/1964	45699	SPECIFIC CONDUCTANCE 25C	182
02/06/1964	45700	SPECIFIC CONDUCTANCE 25C	278
03/12/1964	45944	SPECIFIC CONDUCTANCE 25C	339
04/09/1964	46258	SPECIFIC CONDUCTANCE 25C	306
05/07/1964	46511	SPECIFIC CONDUCTANCE 25C	280
06/11/1964	46731	SPECIFIC CONDUCTANCE 25C	274
07/09/1964	46863	SPECIFIC CONDUCTANCE 25C	317
11/13/1964	47828	SPECIFIC CONDUCTANCE 25C	427
12/10/1964	48044	SPECIFIC CONDUCTANCE 25C	394
12/23/1964	48574	SPECIFIC CONDUCTANCE 25C	146
01/14/1965	48308	SPECIFIC CONDUCTANCE 25C	297
02/05/1965	48635	SPECIFIC CONDUCTANCE 25C	275
03/01/1965	48913	SPECIFIC CONDUCTANCE 25C	271
04/05/1965	49164	SPECIFIC CONDUCTANCE 25C	326
05/06/1965	49239	SPECIFIC CONDUCTANCE 25C	318
06/11/1965	49724	SPECIFIC CONDUCTANCE 25C	285
07/12/1965	49827	SPECIFIC CONDUCTANCE 25C	323
08/09/1965	50144	SPECIFIC CONDUCTANCE 25C	342
09/13/1965	50488	SPECIFIC CONDUCTANCE 25C	366
10/07/1965	50656	SPECIFIC CONDUCTANCE 25C	366
11/04/1965	50886	SPECIFIC CONDUCTANCE 25C	368
12/13/1965	51366	SPECIFIC CONDUCTANCE 25C	391
01/17/1966	51782	SPECIFIC CONDUCTANCE 25C	279
02/10/1966	52052	SPECIFIC CONDUCTANCE 25C	400
03/02/1966	52135	SPECIFIC CONDUCTANCE 25C	390
04/13/1966	52555	SPECIFIC CONDUCTANCE 25C	205
05/03/1966	52922	SPECIFIC CONDUCTANCE 25C	226
06/02/1966	53269	SPECIFIC CONDUCTANCE 25C	231
07/06/1966	53449	SPECIFIC CONDUCTANCE 25C	285
11/22/1966	54559	SPECIFIC CONDUCTANCE 25C	361
01/03/1967	54733	SPECIFIC CONDUCTANCE 25C	349
03/06/1967	55193	SPECIFIC CONDUCTANCE 25C	362
05/04/1967	55511	SPECIFIC CONDUCTANCE 25C	332
07/05/1967	48163	SPECIFIC CONDUCTANCE 25C	245
09/06/1967		SPECIFIC CONDUCTANCE 25C	289
11/02/1967	50952	SPECIFIC CONDUCTANCE 25C	394
01/16/1968	51359	SPECIFIC CONDUCTANCE 25C	158
03/07/1968	51921	SPECIFIC CONDUCTANCE 25C	260
05/01/1968	52711	SPECIFIC CONDUCTANCE 25C	267
07/02/1968	54178	SPECIFIC CONDUCTANCE 25C	292
09/06/1968	55323	SPECIFIC CONDUCTANCE 25C	339
11/06/1968	56972	SPECIFIC CONDUCTANCE 25C	459
01/06/1969	57542	SPECIFIC CONDUCTANCE 25C	237
03/04/1969	58166	SPECIFIC CONDUCTANCE 25C	407
05/02/1969	58778	SPECIFIC CONDUCTANCE 25C	172
07/02/1969	59647	SPECIFIC CONDUCTANCE 25C	247

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/03/1969	60721	SPECIFIC CONDUCTANCE 25C	278
11/13/1969	62112	SPECIFIC CONDUCTANCE 25C	406
01/07/1970	62882	SPECIFIC CONDUCTANCE 25C	275
03/05/1970	63540	SPECIFIC CONDUCTANCE 25C	296
05/07/1970	64353	SPECIFIC CONDUCTANCE 25C	313
07/03/1970	65351	SPECIFIC CONDUCTANCE 25C	316
11/12/1970	67392	SPECIFIC CONDUCTANCE 25C	333
11/28/1970	68049	SPECIFIC CONDUCTANCE 25C	181
01/13/1971	68110	SPECIFIC CONDUCTANCE 25C	242
03/09/1971	68850	SPECIFIC CONDUCTANCE 25C	298
05/24/1971	70118	SPECIFIC CONDUCTANCE 25C	204
07/14/1971	70810	SPECIFIC CONDUCTANCE 25C	277
01/06/1972	73105	SPECIFIC CONDUCTANCE 25C	358
03/02/1972	73507	SPECIFIC CONDUCTANCE 25C	155
11/24/1972	827B	SPECIFIC CONDUCTANCE 25C	406
05/18/1973	80125	SPECIFIC CONDUCTANCE 25C	157
11/12/1973	YUK014	SPECIFIC CONDUCTANCE 25C	139
03/05/1975	89612	SPECIFIC CONDUCTANCE 25C	193
05/19/1975	90652	SPECIFIC CONDUCTANCE 25C	146
01/14/1976	94736	SPECIFIC CONDUCTANCE 25C	350
11/12/1976	100581	SPECIFIC CONDUCTANCE 25C	443
01/17/1977	100816	SPECIFIC CONDUCTANCE 25C	563
03/17/1977	102287	SPECIFIC CONDUCTANCE 25C	393
05/17/1977	103765	SPECIFIC CONDUCTANCE 25C	408
01/11/1978	110282	SPECIFIC CONDUCTANCE 25C	230
09/20/1978	115753	SPECIFIC CONDUCTANCE 25C	402
01/19/1979	117563	SPECIFIC CONDUCTANCE 25C	416
11/20/1979	122841	SPECIFIC CONDUCTANCE 25C	279
01/14/1980	NS0036	SPECIFIC CONDUCTANCE 25C	130
02/22/1980	NS0133	SPECIFIC CONDUCTANCE 25C	236
07/24/1980	N00043	SPECIFIC CONDUCTANCE 25C	306
03/11/1981	N00753	SPECIFIC CONDUCTANCE 25C	337
07/28/1981	N01227	SPECIFIC CONDUCTANCE 25C	348
11/25/1981	N01630	SPECIFIC CONDUCTANCE 25C	185
05/24/1982	N02087	SPECIFIC CONDUCTANCE 25C	225
11/16/1982	VDB11	SPECIFIC CONDUCTANCE 25C	420
03/03/1983	N02704	SPECIFIC CONDUCTANCE 25C	211
03/16/1983	N02729	SPECIFIC CONDUCTANCE 25C	256
07/06/1983	N03069	SPECIFIC CONDUCTANCE 25C	223
03/26/1984	N03730	SPECIFIC CONDUCTANCE 25C	244
05/23/1985	N04544	SPECIFIC CONDUCTANCE 25C	260
03/16/1986	N06139	SPECIFIC CONDUCTANCE 25C	192
03/24/1986	N05284	SPECIFIC CONDUCTANCE 25C	284
11/18/1986	N05940	SPECIFIC CONDUCTANCE 25C	441
11/19/1987	N06682	SPECIFIC CONDUCTANCE 25C	521
03/24/1988	N06889	SPECIFIC CONDUCTANCE 25C	287
11/22/1988	N07395	SPECIFIC CONDUCTANCE 25C	501
01/23/1989	N07490	SPECIFIC CONDUCTANCE 25C	219
03/09/1989	N07584	SPECIFIC CONDUCTANCE 25C	141
05/11/1989	N07696	SPECIFIC CONDUCTANCE 25C	229
11/16/1989	N08133	SPECIFIC CONDUCTANCE 25C	443
01/23/1990	N08186	SPECIFIC CONDUCTANCE 25C	315

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11/28/1970	68049	TOTAL AMMONIA & ORGANIC NITROG	0.6
12/04/1970	68050	TOTAL AMMONIA & ORGANIC NITROG	0.8
01/16/1971	68678	TOTAL AMMONIA & ORGANIC NITROG	3.23
12/27/1971	72933	TOTAL AMMONIA & ORGANIC NITROG	0.1
03/17/1977	102287	TOTAL AMMONIA & ORGANIC NITROG	1.8
01/14/1980	NS0036	TOTAL AMMONIA & ORGANIC NITROG	1.3
02/22/1980	NS0133	TOTAL AMMONIA & ORGANIC NITROG	0.6
03/03/1983	N02704	TOTAL AMMONIA & ORGANIC NITROG	4.5
11/28/1970	68049	TOTAL AMMONIA as N	0
12/04/1970	68050	TOTAL AMMONIA as N	0
01/16/1971	68678	TOTAL AMMONIA as N	0.03
11/28/1970	68049	TOTAL ORGANIC NITROGEN as N	0.6
12/04/1970	68050	TOTAL ORGANIC NITROGEN as N	0.8
01/16/1971	68678	TOTAL ORGANIC NITROGEN as N	3.2
11/28/1970	68049	TOTAL PHOSPHORUS as P	0.21
12/04/1970	68050	TOTAL PHOSPHORUS as P	1.1
01/16/1971	68678	TOTAL PHOSPHORUS as P	1.4
12/27/1971	72933	TOTAL PHOSPHORUS as P	0.01
03/17/1977	102287	TOTAL PHOSPHORUS as P	1
01/14/1980	NS0036	TOTAL PHOSPHORUS as P	1.2
02/22/1980	NS0133	TOTAL PHOSPHORUS as P	0.41
03/03/1983	N02704	TOTAL PHOSPHORUS as P	1.9
05/04/1959	29968	Zn mg/L D	0
09/02/1959	31222	Zn mg/L D	0
05/05/1960	33592	Zn mg/L D	0
05/02/1961	36755	Zn mg/L D	0
11/28/1970	68049	Zn mg/L D	0

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Water Quality Data Results

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Below are the water quality for station A0353000, COTTONWOOD C SF NR MO.

Date	Sample Number	Constituent/Analyte	Result*
06/25/1957	3005	DISSOLVED BORON	0.08
06/25/1957	3005	DISSOLVED FLUORIDE	0.2
06/25/1957	3005	DISSOLVED POTASSIUM	1.4
06/25/1957	3005	LAB pH	7.9
06/25/1957	3005	DISSOLVED MAGNESIUM	9.1
06/25/1957	3005	DISSOLVED NITRATE NO3 mg/L	0.1
06/25/1957	3005	DISSOLVED CALCIUM	31
06/25/1957	3005	DISSOLVED CHLORIDE	12
06/25/1957	3005	DISSOLVED HARDNESS CaCO3 mg/L	115
06/25/1957	3005	DISSOLVED TOTAL ALKALINITY	107
06/25/1957	3005	SPECIFIC CONDUCTANCE 25C	272
06/25/1957	3005	DISSOLVED SODIUM	12
06/25/1957	3005	DISSOLVED SILICA	19
06/25/1957	3005	DISSOLVED SULFATE SO4 mg/L	13
07/23/1957	23047	DISSOLVED ORTHOPHOSPHATE as P	0.02
07/23/1957	23047	DISSOLVED BORON	0.02
07/23/1957	23047	DISSOLVED FLUORIDE	0.3
07/23/1957	23047	DISSOLVED POTASSIUM	1.5
07/23/1957	23047	LAB pH	8.2
07/23/1957	23047	DISSOLVED MAGNESIUM	9.5
07/23/1957	23047	DISSOLVED NITRATE NO3 mg/L	0
07/23/1957	23047	DISSOLVED SULFATE SO4 mg/L	4.8
07/23/1957	23047	DISSOLVED CALCIUM	24
07/23/1957	23047	DISSOLVED CHLORIDE	19
07/23/1957	23047	DISSOLVED HARDNESS CaCO3 mg/L	99
07/23/1957	23047	DISSOLVED TOTAL ALKALINITY	93
07/23/1957	23047	SPECIFIC CONDUCTANCE 25C	244
07/23/1957	23047	DISSOLVED SODIUM	13
07/23/1957	23047	DISSOLVED SILICA	14
07/23/1957	23047	Al mg/L D	0.04
07/23/1957	23047	As mg/L D	0
07/23/1957	23047	CHROMIUM (+6) Dissolved	0
07/23/1957	23047	Cu mg/L D	0
07/23/1957	23047	Fe mg/L D	0
07/23/1957	23047	Mn mg/L D	0
07/23/1957	23047	Pb mg/L D	0
07/23/1957	23047	Zn mg/L D	0
08/26/1957	23399	DISSOLVED BORON	0.06
08/26/1957	23399	DISSOLVED FLUORIDE	0.1
08/26/1957	23399	DISSOLVED POTASSIUM	1.6

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08/26/1957	23399	LAB pH	8.4
08/26/1957	23399	DISSOLVED NITRATE NO3 mg/L	0.6
08/26/1957	23399	DISSOLVED CALCIUM	35
08/26/1957	23399	DISSOLVED CHLORIDE	18
08/26/1957	23399	DISSOLVED HARDNESS CaCO3 mg/L	134
08/26/1957	23399	DISSOLVED TOTAL ALKALINITY	129
08/26/1957	23399	SPECIFIC CONDUCTANCE 25C	320
08/26/1957	23399	DISSOLVED MAGNESIUM	11
08/26/1957	23399	DISSOLVED SODIUM	15
08/26/1957	23399	DISSOLVED SILICA	22
08/26/1957	23399	DISSOLVED SULFATE SO4 mg/L	14
08/26/1957	23399	MINERAL TURBIDITY HELLIGE	1
09/30/1957	23978	DISSOLVED ORTHOPHOSPHATE as P	0.03
09/30/1957	23978	DISSOLVED BORON	0.12
09/30/1957	23978	DISSOLVED FLUORIDE	0.1
09/30/1957	23978	DISSOLVED POTASSIUM	1.8
09/30/1957	23978	LAB pH	7.7
09/30/1957	23978	DISSOLVED NITRATE NO3 mg/L	2.7
09/30/1957	23978	DISSOLVED CALCIUM	40
09/30/1957	23978	DISSOLVED CHLORIDE	44
09/30/1957	23978	DISSOLVED HARDNESS CaCO3 mg/L	154
09/30/1957	23978	DISSOLVED TOTAL ALKALINITY	112
09/30/1957	23978	SPECIFIC CONDUCTANCE 25C	398
09/30/1957	23978	DISSOLVED MAGNESIUM	13
09/30/1957	23978	DISSOLVED SODIUM	19
09/30/1957	23978	DISSOLVED SILICA	20
09/30/1957	23978	DISSOLVED SULFATE SO4 mg/L	21
09/30/1957	23978	Al mg/L D	0.02
09/30/1957	23978	As mg/L D	0
09/30/1957	23978	CHROMIUM (+6) Dissolved	0
09/30/1957	23978	Cu mg/L D	0
09/30/1957	23978	Fe mg/L D	0
09/30/1957	23978	Mn mg/L D	0
09/30/1957	23978	Pb mg/L D	0
09/30/1957	23978	Zn mg/L D	0
10/24/1957	24276	DISSOLVED ORTHOPHOSPHATE as P	0.02
10/24/1957	24276	DISSOLVED BORON	0.11
10/24/1957	24276	DISSOLVED FLUORIDE	0
10/24/1957	24276	DISSOLVED POTASSIUM	1.4
10/24/1957	24276	LAB pH	7.2
10/24/1957	24276	DISSOLVED NITRATE NO3 mg/L	0.4
10/24/1957	24276	DISSOLVED CALCIUM	35
10/24/1957	24276	DISSOLVED CHLORIDE	24
10/24/1957	24276	DISSOLVED HARDNESS CaCO3 mg/L	134
10/24/1957	24276	DISSOLVED TOTAL ALKALINITY	112
10/24/1957	24276	SPECIFIC CONDUCTANCE 25C	332
10/24/1957	24276	DISSOLVED MAGNESIUM	11
10/24/1957	24276	DISSOLVED SODIUM	16
10/24/1957	24276	DISSOLVED SILICA	13
10/24/1957	24276	DISSOLVED SULFATE SO4 mg/L	18
10/24/1957	24276	MINERAL TURBIDITY HELLIGE	3

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

10/24/1957	24276	Al mg/L D	0.16
10/24/1957	24276	As mg/L D	0
10/24/1957	24276	CHROMIUM (+6) Dissolved	0
10/24/1957	24276	Cu mg/L D	0.05
10/24/1957	24276	Fe mg/L D	0.08
10/24/1957	24276	Mn mg/L D	0
10/24/1957	24276	Pb mg/L D	0
10/24/1957	24276	Zn mg/L D	0.1
09/03/1959	9863	DISSOLVED BORON	0.1
09/03/1959	9863	DISSOLVED FLUORIDE	0.1
09/03/1959	9863	DISSOLVED POTASSIUM	1
09/03/1959	9863	LAB pH	7.3
09/03/1959	9863	DISSOLVED NITRATE NO3 mg/L	0.2
09/03/1959	9863	DISSOLVED CALCIUM	34
09/03/1959	9863	DISSOLVED CHLORIDE	14
09/03/1959	9863	DISSOLVED HARDNESS CaCO3 mg/L	132
09/03/1959	9863	DISSOLVED TOTAL ALKALINITY	126
09/03/1959	9863	SPECIFIC CONDUCTANCE 25C	312
09/03/1959	9863	DISSOLVED MAGNESIUM	11
09/03/1959	9863	DISSOLVED SODIUM	12
09/03/1959	9863	DISSOLVED SILICA	10
09/03/1959	9863	DISSOLVED SULFATE SO4 mg/L	12
11/29/1973	BP47	MINERAL TURBIDITY HACH	4
11/30/1973	BP48	MINERAL TURBIDITY HACH	250
01/17/1974	BP49	MINERAL TURBIDITY HACH	970
01/03/1977	BP50	MINERAL TURBIDITY HACH	450
01/10/1978	951	MINERAL TURBIDITY HACH	200
01/14/1980	BP52	MINERAL TURBIDITY HACH	200
01/27/1981	N00610	DISSOLVED ORTHOPHOSPHATE as P	0.05
01/27/1981	N00610	DISSOLVED NITRATE AND NITRITE	0.19
01/27/1981	N00610	TOTAL AMMONIA & ORGANIC NITROG	1.4
01/27/1981	N00610	DISSOLVED BORON	0.1
01/27/1981	N00610	DISSOLVED POTASSIUM	1.1
01/27/1981	N00610	LAB pH	7.8
01/27/1981	N00610	DISSOLVED CALCIUM	15
01/27/1981	N00610	DISSOLVED CHLORIDE	5
01/27/1981	N00610	DISSOLVED HARDNESS CaCO3 mg/L	62
01/27/1981	N00610	DISSOLVED TOTAL ALKALINITY	55
01/27/1981	N00610	SPECIFIC CONDUCTANCE 25C	164
01/27/1981	N00610	DISSOLVED MAGNESIUM	6
01/27/1981	N00610	DISSOLVED SODIUM	8
01/27/1981	N00610	MINERAL TURBIDITY HACH	340
03/03/1983	N02703	DISSOLVED ORTHOPHOSPHATE as P	0.01
03/03/1983	N02703	DISSOLVED NITRATE AND NITRITE	0.11
03/03/1983	N02703	TOTAL AMMONIA & ORGANIC NITROG	5.2
03/03/1983	N02703	TOTAL PHOSPHORUS as P	2.1
03/03/1983	N02703	NUTRIENT TURBIDITY HACH	2397
03/03/1983	N02703	DISSOLVED BORON	0
03/03/1983	N02703	DISSOLVED POTASSIUM	1.2
03/03/1983	N02703	LAB pH	7.7
03/03/1983	N02703	DISSOLVED CALCIUM	23

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/03/1983	N02703	DISSOLVED CHLORIDE	2
03/03/1983	N02703	DISSOLVED HARDNESS CaCO ₃ mg/L	94
03/03/1983	N02703	DISSOLVED TOTAL ALKALINITY	88
03/03/1983	N02703	SPECIFIC CONDUCTANCE 25C	216
03/03/1983	N02703	DISSOLVED MAGNESIUM	9
03/03/1983	N02703	DISSOLVED SODIUM	8
03/03/1983	N02703	MINERAL TURBIDITY HACH	2397

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Groundwater-quality Data

Station 29N04W06N01 M

Date	Sample Number	Constituent/Analyte	Result*
09/24/1957	PA80	DISSOLVED BORON	0.03
09/24/1957	PA80	DISSOLVED CHLORIDE	3.4
09/24/1957	PA80	DISSOLVED FLUORIDE	0.3
09/24/1957	PA80	DISSOLVED POTASSIUM	1.3
09/24/1957	PA80	LAB pH	7.1
09/24/1957	PA80	DISSOLVED MAGNESIUM	6
09/24/1957	PA80	DISSOLVED NITRATE NO3 mg/L	0
09/24/1957	PA80	DISSOLVED SULFATE SO4 mg/L	0.5
09/24/1957	PA80	DISSOLVED CALCIUM	11
09/24/1957	PA80	DISSOLVED HARDNESS CaCO3 mg/L	52
09/24/1957	PA80	DISSOLVED TOTAL ALKALINITY	78
09/24/1957	PA80	SPECIFIC CONDUCTANCE 25C	160
09/24/1957	PA80	DISSOLVED SODIUM	13
09/24/1957	PA80	DISSOLVED SILICA	44
09/24/1957	PA80	DISSOLVED SOLIDS, invalid temp	127
10/12/1958	PA81	DISSOLVED BORON	0.05
10/12/1958	PA81	DISSOLVED CHLORIDE	2
10/12/1958	PA81	DISSOLVED FLUORIDE	0.2
10/12/1958	PA81	DISSOLVED POTASSIUM	0.7
10/12/1958	PA81	LAB pH	7.9
10/12/1958	PA81	DISSOLVED MAGNESIUM	5.7
10/12/1958	PA81	DISSOLVED NITRATE NO3 mg/L	1.3
10/12/1958	PA81	DISSOLVED SULFATE SO4 mg/L	2
10/12/1958	PA81	DISSOLVED CALCIUM	13
10/12/1958	PA81	DISSOLVED HARDNESS CaCO3 mg/L	56
10/12/1958	PA81	DISSOLVED TOTAL ALKALINITY	76
10/12/1958	PA81	SPECIFIC CONDUCTANCE 25C	164
10/12/1958	PA81	DISSOLVED SODIUM	12
10/12/1958	PA81	DISSOLVED SILICA	62
10/12/1958	PA81	DISSOLVED SOLIDS, invalid temp	145
07/14/1959	PA82	DISSOLVED BORON	0.03
07/14/1959	PA82	DISSOLVED CHLORIDE	3.8
07/14/1959	PA82	DISSOLVED FLUORIDE	0.2
07/14/1959	PA82	DISSOLVED POTASSIUM	1.4
07/14/1959	PA82	LAB pH	7.8
07/14/1959	PA82	DISSOLVED MAGNESIUM	7.4
07/14/1959	PA82	DISSOLVED NITRATE NO3 mg/L	1.2
07/14/1959	PA82	DISSOLVED SULFATE SO4 mg/L	2.5
07/14/1959	PA82	DISSOLVED CALCIUM	11
07/14/1959	PA82	DISSOLVED HARDNESS CaCO3 mg/L	58
07/14/1959	PA82	DISSOLVED TOTAL ALKALINITY	76
07/14/1959	PA82	SPECIFIC CONDUCTANCE 25C	169
07/14/1959	PA82	DISSOLVED SODIUM	13
07/14/1959	PA82	DISSOLVED SILICA	56
07/14/1959	PA82	DISSOLVED SOLIDS, invalid temp	142

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Station 29N04W04R01 M

Date	Sample Number	Constituent/Analyte	Result*
12/01/1955	L8192	DISSOLVED BORON	0.04
12/01/1955	L8192	DISSOLVED CHLORIDE	3.1
12/01/1955	L8192	DISSOLVED FLUORIDE	0.1
12/01/1955	L8192	DISSOLVED POTASSIUM	0.7
12/01/1955	L8192	LAB pH	8
12/01/1955	L8192	DISSOLVED MAGNESIUM	7.4
12/01/1955	L8192	DISSOLVED NITRATE NO3 mg/L	2.3
12/01/1955	L8192	DISSOLVED SULFATE SO4 mg/L	1.4
12/01/1955	L8192	DISSOLVED CALCIUM	11
12/01/1955	L8192	DISSOLVED HARDNESS CaCO3 mg/L	58
12/01/1955	L8192	DISSOLVED TOTAL ALKALINITY	74
12/01/1955	L8192	SPECIFIC CONDUCTANCE 25C	159
12/01/1955	L8192	DISSOLVED SODIUM	12
12/01/1955	L8192	DISSOLVED SILICA	53

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Station 29N04W04J01 M

01 M.

Date	Sample Number	Constituent/Analyte	Result*
10/10/1979	RD9	DISSOLVED BORON	0
10/10/1979	RD9	DISSOLVED FLUORIDE	0.1
10/10/1979	RD9	DISSOLVED POTASSIUM	0.9
10/10/1979	RD9	DISSOLVED NITRATE NO3 mg/L	0.7
10/10/1979	RD9	DISSOLVED CALCIUM	11
10/10/1979	RD9	DISSOLVED CHLORIDE	3
10/10/1979	RD9	DISSOLVED HARDNESS CaCO3 mg/L	60
10/10/1979	RD9	DISSOLVED TOTAL ALKALINITY	84
10/10/1979	RD9	SPECIFIC CONDUCTANCE 25C	175
10/10/1979	RD9	DISSOLVED MAGNESIUM	8
10/10/1979	RD9	DISSOLVED SODIUM	14
10/10/1979	RD9	DISSOLVED SILICA	66
10/10/1979	RD9	DISSOLVED SULFATE SO4 mg/L	2
10/10/1979	RD9	DISSOLVED SOLIDS mg/L at 180C	156

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Station 29N04W02K01 M

01 M.

Date	Sample Number	Constituent/Analyte	Result*
10/10/1979	RD8	DISSOLVED BORON	0.3
10/10/1979	RD8	DISSOLVED FLUORIDE	0
10/10/1979	RD8	DISSOLVED POTASSIUM	2.4
10/10/1979	RD8	DISSOLVED NITRATE NO3 mg/L	0.2
10/10/1979	RD8	DISSOLVED CALCIUM	7
10/10/1979	RD8	DISSOLVED CHLORIDE	5
10/10/1979	RD8	DISSOLVED HARDNESS CaCO3 mg/L	30
10/10/1979	RD8	DISSOLVED TOTAL ALKALINITY	140
10/10/1979	RD8	SPECIFIC CONDUCTANCE 25C	160
10/10/1979	RD8	DISSOLVED MAGNESIUM	3
10/10/1979	RD8	DISSOLVED SODIUM	51
10/10/1979	RD8	DISSOLVED SILICA	26
10/10/1979	RD8	DISSOLVED SULFATE SO4 mg/L	1
10/10/1979	RD8	DISSOLVED SOLIDS mg/L at 180C	176

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Station 29N04W02F01 M

Date	Sample Number	Constituent/Analyte	Result*
02/06/1970	L3562	DISSOLVED FLUORIDE	0.2
02/06/1970	L3562	DISSOLVED POTASSIUM	1
02/06/1970	L3562	LAB pH	7.7
02/06/1970	L3562	DISSOLVED MAGNESIUM	8.2
02/06/1970	L3562	DISSOLVED NITRATE NO3 mg/L	3.3
02/06/1970	L3562	DISSOLVED CALCIUM	12
02/06/1970	L3562	DISSOLVED CHLORIDE	3
02/06/1970	L3562	DISSOLVED HARDNESS CaCO3 mg/L	65
02/06/1970	L3562	DISSOLVED TOTAL ALKALINITY	91
02/06/1970	L3562	DISSOLVED SODIUM	16
02/06/1970	L3562	DISSOLVED SULFATE SO4 mg/L	2
02/06/1970	L3562	DISSOLVED SOLIDS mg/L at 180C	168
02/06/1970	L2414	Fe mg/L T	0.01
02/06/1970	L2414	Mn mg/L T	0
06/01/1978	L3563	DISSOLVED CALCIUM	5.2
06/01/1978	L3563	DISSOLVED FLUORIDE	0.1
06/01/1978	L3563	LAB pH	8.1
06/01/1978	L3563	DISSOLVED MAGNESIUM	7.6
06/01/1978	L3563	DISSOLVED NITRATE NO3 mg/L	5.8
06/01/1978	L3563	DISSOLVED CHLORIDE	4
06/01/1978	L3563	DISSOLVED HARDNESS CaCO3 mg/L	44
06/01/1978	L3563	DISSOLVED TOTAL ALKALINITY	79
06/01/1978	L3563	SPECIFIC CONDUCTANCE 25C	181
06/01/1978	L3563	DISSOLVED SODIUM	25
06/01/1978	L3563	DISSOLVED SULFATE SO4 mg/L	9
06/01/1978	L3563	DISSOLVED SOLIDS mg/L at 105C	169
08/07/1981	L3564	DISSOLVED FLUORIDE	0.2
08/07/1981	L3564	LAB pH	7.9
08/07/1981	L3564	DISSOLVED MAGNESIUM	9
08/07/1981	L3564	DISSOLVED NITRATE NO3 mg/L	3.3
08/07/1981	L3564	DISSOLVED CALCIUM	11
08/07/1981	L3564	DISSOLVED CHLORIDE	2
08/07/1981	L3564	DISSOLVED HARDNESS CaCO3 mg/L	65
08/07/1981	L3564	DISSOLVED TOTAL ALKALINITY	93
08/07/1981	L3564	SPECIFIC CONDUCTANCE 25C	169
08/07/1981	L3564	DISSOLVED SODIUM	15
08/07/1981	L3564	DISSOLVED SULFATE SO4 mg/L	1
08/07/1981	L3564	DISSOLVED SOLIDS mg/L at 105C	138
07/01/1985	L3565	DISSOLVED FLUORIDE	0.1
07/01/1985	L3565	LAB pH	7.8
07/01/1985	L3565	DISSOLVED MAGNESIUM	6.2
07/01/1985	L3565	DISSOLVED NITRATE NO3 mg/L	3
07/01/1985	L3565	DISSOLVED CALCIUM	11
07/01/1985	L3565	DISSOLVED CHLORIDE	4
07/01/1985	L3565	DISSOLVED HARDNESS CaCO3 mg/L	52
07/01/1985	L3565	DISSOLVED TOTAL ALKALINITY	89
07/01/1985	L3565	SPECIFIC CONDUCTANCE 25C	183
07/01/1985	L3565	DISSOLVED SODIUM	15
07/01/1985	L3565	DISSOLVED SULFATE SO4 mg/L	2
07/01/1985	L3565	DISSOLVED SOLIDS mg/L at 105C	139

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Station 29N03W22L01 M

01 M.

Date	Sample Number	Constituent/Analyte	Result*
07/07/1981	L3558	DISSOLVED FLUORIDE	0.2
07/07/1981	L3558	LAB pH	8.3
07/07/1981	L3558	DISSOLVED MAGNESIUM	7.3
07/07/1981	L3558	DISSOLVED NITRATE NO3 mg/L	1.2
07/07/1981	L3558	DISSOLVED CALCIUM	17
07/07/1981	L3558	DISSOLVED CHLORIDE	4
07/07/1981	L3558	DISSOLVED HARDNESS CaCO3 mg/L	73
07/07/1981	L3558	DISSOLVED TOTAL ALKALINITY	101
07/07/1981	L3558	SPECIFIC CONDUCTANCE 25C	183
07/07/1981	L3558	DISSOLVED SODIUM	17
07/07/1981	L3558	DISSOLVED SULFATE SO4 mg/L	4
07/07/1981	L3558	DISSOLVED SOLIDS mg/L at 105C	157
08/20/1982	L3559	DISSOLVED FLUORIDE	0.1
08/20/1982	L3559	LAB pH	8.1
08/20/1982	L3559	DISSOLVED MAGNESIUM	6.6
08/20/1982	L3559	DISSOLVED NITRATE NO3 mg/L	0.2
08/20/1982	L3559	DISSOLVED CALCIUM	12
08/20/1982	L3559	DISSOLVED CHLORIDE	5
08/20/1982	L3559	DISSOLVED HARDNESS CaCO3 mg/L	56
08/20/1982	L3559	DISSOLVED TOTAL ALKALINITY	88
08/20/1982	L3559	SPECIFIC CONDUCTANCE 25C	189
08/20/1982	L3559	DISSOLVED SODIUM	20
08/20/1982	L3559	DISSOLVED SULFATE SO4 mg/L	4
08/20/1982	L3559	DISSOLVED SOLIDS mg/L at 105C	156
08/17/1983	L3560	DISSOLVED POTASSIUM	3.6
08/17/1983	L3560	DISSOLVED MAGNESIUM	7
08/17/1983	L3560	DISSOLVED NITRATE NO3 mg/L	2.5
08/17/1983	L3560	DISSOLVED CALCIUM	11
08/17/1983	L3560	DISSOLVED CHLORIDE	5
08/17/1983	L3560	DISSOLVED HARDNESS CaCO3 mg/L	57
08/17/1983	L3560	DISSOLVED TOTAL ALKALINITY	109
08/17/1983	L3560	SPECIFIC CONDUCTANCE 25C	203
08/17/1983	L3560	DISSOLVED SODIUM	19
08/17/1983	L3560	DISSOLVED SULFATE SO4 mg/L	4
02/09/1984	L3561	DISSOLVED FLUORIDE	0.1
02/09/1984	L3561	LAB pH	8
02/09/1984	L3561	DISSOLVED MAGNESIUM	9.8
02/09/1984	L3561	DISSOLVED NITRATE NO3 mg/L	3.7
02/09/1984	L3561	DISSOLVED CALCIUM	17
02/09/1984	L3561	DISSOLVED CHLORIDE	6
02/09/1984	L3561	DISSOLVED HARDNESS CaCO3 mg/L	83
02/09/1984	L3561	DISSOLVED TOTAL ALKALINITY	109
02/09/1984	L3561	SPECIFIC CONDUCTANCE 25C	244
02/09/1984	L3561	DISSOLVED SODIUM	26
02/09/1984	L3561	DISSOLVED SULFATE SO4 mg/L	1
02/09/1984	L3561	DISSOLVED SOLIDS mg/L at 105C	144

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

29N03W06L01 M

01 M.

Date	Sample Number	Constituent/Analyte	Result*
10/17/1979	RD7	DISSOLVED BORON	0
10/17/1979	RD7	DISSOLVED FLUORIDE	0.1
10/17/1979	RD7	DISSOLVED POTASSIUM	0.9
10/17/1979	RD7	DISSOLVED NITRATE NO3 mg/L	0.6
10/17/1979	RD7	DISSOLVED CALCIUM	10
10/17/1979	RD7	DISSOLVED CHLORIDE	2
10/17/1979	RD7	DISSOLVED HARDNESS CaCO3 mg/L	58
10/17/1979	RD7	DISSOLVED TOTAL ALKALINITY	74
10/17/1979	RD7	SPECIFIC CONDUCTANCE 25C	151
10/17/1979	RD7	DISSOLVED MAGNESIUM	8
10/17/1979	RD7	DISSOLVED SODIUM	12
10/17/1979	RD7	DISSOLVED SILICA	44
10/17/1979	RD7	DISSOLVED SULFATE SO4 mg/L	5
10/17/1979	RD7	DISSOLVED SOLIDS mg/L at 180C	136
10/17/1979	RD7	Hg mg/L D	0
10/17/1979	RD7	Ag mg/L D	0
10/17/1979	RD7	As mg/L D	0.002
10/17/1979	RD7	Cu mg/L D	0
10/17/1979	RD7	Mn mg/L D	0.002
10/17/1979	RD7	Pb mg/L D	0
10/17/1979	RD7	Se mg/L D	0
10/17/1979	RD7	Ba mg/L D	0.02
10/17/1979	RD7	Cd mg/L D	0
10/17/1979	RD7	Cr mg/L D	0
10/17/1979	RD7	Zn mg/L D	0.13
10/17/1979	RD7	Fe mg/L D	0

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Station 29N03W04H01 M

Date	Sample Number	Constituent/Analyte	Result*
10/17/1979	RD6	DISSOLVED BORON	0
10/17/1979	RD6	DISSOLVED FLUORIDE	0.1
10/17/1979	RD6	DISSOLVED POTASSIUM	2
10/17/1979	RD6	DISSOLVED NITRATE NO3 mg/L	1.2
10/17/1979	RD6	DISSOLVED CALCIUM	9
10/17/1979	RD6	DISSOLVED CHLORIDE	2
10/17/1979	RD6	DISSOLVED HARDNESS CaCO3 mg/L	47
10/17/1979	RD6	DISSOLVED TOTAL ALKALINITY	64
10/17/1979	RD6	SPECIFIC CONDUCTANCE 25C	138
10/17/1979	RD6	DISSOLVED MAGNESIUM	6
10/17/1979	RD6	DISSOLVED SODIUM	12
10/17/1979	RD6	DISSOLVED SILICA	64
10/17/1979	RD6	DISSOLVED SULFATE SO4 mg/L	4
10/17/1979	RD6	DISSOLVED SOLIDS mg/L at 180C	157

*Most results are reported in units of mg/L, with the exception of temperature, pH, EC, turbidity, etc.

Minerals

Minerals

Areal	Well Number	Meridian	Date	Time	Temp	Temp.	pH	field EC	lab EC	Total Coliform	Turbidity	Dissolved K	Dissolved Na	Dissolved Ca	Dissolved Mg	Alkalinity (Lab)	Dissolved SO4	Dissolved Cl	Dissolved NO3	Total Diss. Solids	Diss. Hardness	Dissolved B	Dissolved F
Designation		M/H		(PST)	C	F	(field)	(micromhos)	(micromhos)	(Colonies/100 mL)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L as CaCO3)	(mg/L)	(mg/L)	(mg/L)	(at 180 degree F)	(mg/L as CaCO3)	(mg/L)	(mg/L)
A17.A0	29N/03W-05G02	M	07/01/85	0815	20	68	6.8	210	209					15	12			3			87		
A17.A0	29N/03W-05G02	M	07/23/90	0800			7.1	218	211			2.7	10	15	12	95	6	3	4.7	172	87	<0.1	
A17.B0	29N/03W-05G02	M	05/22/91	0800			7.0	223															
A17.B0	29N/03W-05G02	M	06/16/93	0930			7.1	193	220			3.0	11	16	12	93	4	3	4.9	180	89	<0.05	
A17.B0	29N/04W-02G01	M	10/13/92				6.9	170					13	10	8	75	0	3	4.3	120	55		0.15
A17.B0	29N/04W-04R03	M	08/29/88	0805			6.7	308	306			0.5	23	19	18	121		8			122	<0.1	
A17.B0	29N/04W-04R03	M	07/23/90	0900			6.4	326															
A17.B0	29N/04W-04R03	M	05/22/91	0745			6.6	332															
A17.B0	29N/04W-04R03	M	06/16/93	0800			6.8	271	300			1.0	23	18	15	120	5	7	13	240	107	<0.05	
A17.B0	29N/04W-04R03	M	07/08/98	1030			7.0	314	310	0	0.2	0.6	24	19	16	126	8	7			114	<0.1	
A17B0	29N/04W-04R03	M	01/04/2001	1520			6.8	328	330	0	0.5	0.6	27	21	18	134	8	8	12	233	127	<0.1	
A17.B0	29N/04W-11G04	M	06/19/86	0800	18	65	7.2	190	195			0.8	12	12	10	88	3	4	4.0	141	71	0.0	
A17.B0	29N/04W-11G04	M	07/23/90	0750			7.3	195															
A17.B0	29N/04W-11G04	M	05/22/91	0750			7.5	194															
A17.B0	29N/04W-11G04	M	10/15/98	1345			7.1	176	181	0	0.1	0.9	13	12	9	80	3	3			67	<0.1	
A17B0	29N/04W-11G04	M	01/05/2001	1000			7	175	178	0	0.5	0.9	14	12	8	79	2	3	4.1	153	63	<0.1	
A17.A0	30N/03W-04M01	M	08/30/88	1045	20	68	7.0	190	188			1.8	8	13	13	89	5	2	3.7	173	86	<0.1	
A17.A0	30N/03W-04M01	M	07/24/90	0835			7.0	199															
A17.A0	30N/03W-04M01	M	05/22/91	0950			6.9	202															
A17.A0	30N/03W-04M01	M	07/23/98	1400			7.0	202	209	0	84	2.0	9	14	12	84	4	3			84	<0.1	
A17A0	30N/03W-04M01	M	01/04/2001	1110			6.8	284	285	27	0.5	2.3	14	20	16	114	5	9	7.3	229	116	<0.1	
A17.A0	30N/03W-18F02	M	07/01/85	0740	23	73	7.1	203	201				8	15	13	93		2	4.9		91		
A17.A0	30N/03W-18F02	M	07/24/90	0815			6.2	199	191			0.3	7	13	12	81	6	3	6.2	141	82	<0.1	
A17.A0	30N/03W-18F02	M	05/22/91	0940			6.3	199															
A17.A0	30N/03W-18F02	M	06/17/93	0830			6.3	197	210			<1	9	15	14	91	4	5	9.3	180	95	<0.05	
A17.A0	30N/03W-18F02	M	07/23/98	1130			6.7	320	320	0	104	0.7	11	22	20	104	14	7			137	<0.1	
A17A0	30N/03W-18F02	M	01/04/2001	1130	17.1	63	6.5	228	230	0	0.2	<0.5	12	17	15	95	7	3	8	171	104	<0.1	
A17.A0	30N/03W-34D01	M	05/17/89	0755			6.5	337	338			1.1	14	26	22	119	32	6	16	238	156	<0.1	
A17.A0	30N/03W-34D01	M	07/23/90	0845			6.4	337															
A17.A0	30N/03W-34D01	M	05/22/91	0810			6.4	298															
A17.A0	30N/03W-34D01	M	07/08/98	1120	16	60	6.8	391	394	0	0.2	1.2	17	29	23	129	37	4			167	<0.1	
A17A0	30N/03W-34D01	M	01/05/2001	0930	17.1	63	6.6	394		0	0.6	1.2	18	28	22	138	30	6	24.3	270	161	<0.1	
A17.A0	30N/04W-01E01	M	05/17/89	1105			7.1	102	105			0.7	8	5	5	27	1	3	22	109	33	<0.1	
A17.A0	30N/04W-01E01	M	07/24/90	0915			7.3	107															
A17.A0	30N/04W-01E01	M	05/22/91	1010			7.1	115															
A17.A0	30N/04W-01E01	M	10/15/98	1300			7.3	182	186	2	0.4	0.6	11	11	10	65	5	6			68	<0.1	
A17.A0	30N/04W-08R01	M	05/17/89	0925			6.9	128	132			0.8	9	8	7	56	13	3		98	49	<0.1	
A17.A0	30N/04W-08R01	M	07/23/90	1020			7.1	138															
A17.A0	30N/04W-08R01	M	05/22/91	0905			7.0	143															
A17.A0	30N/04W-08R01	M	10/15/98	1415			6.9	128	132	0	0.9	0.8	9	8	6	51	5	3			44	<0.1	
A17A0	30N/04W-08R01	M	01/04/2001	1200			7	129	128	0	0.9	0.8	10	8	6	51	4	3	4.8	103	45	<0.1	
A17.A0	30N/04W-15M03	M	05/17/89	0910			6.8	294	295			1.5	13	21	21	132		6			139	<0.1	
A17.A0	30N/04W-15M03	M	07/23/90	1010			7.0	316															
A17.A0	30N/04W-15M03	M	05/22/91	0855	20	68	7.3	312															
A17.A0	30N/04W-15M03	M	06/16/93	1130	19	65	7.1	261	280			2.0	14	20	19	130	9	6	6.6	230	128	<0.05	
A17.A0	30N/04W-15M03	M	07/23/98	1300	19	67	7.1	295	291	0	122	1.8	13	20	18	122	10	5			124	<0.1	
A17.B0	30N/04W-35R01	M	05/17/89	0840			7.2	186	190			0.9	14	11	12	90		2			77	<0.1	
A17.B0	30N/04W-35R01	M	07/23/90	0840			7.1	200															
A17.B0	30N/04W-35R01	M	05/22/91	0825			7.1	201															
A17.B0	30N/04W-35R01	M	06/16/93	0830			7.1	171	190			1.0	13	10	10	83	2	<1	3.6	170	66	<0.05	
A17.B0	30N/04W-35R01	M	07/31/98	1330			7.2	200	202	94	1.5	1.2	14	11	11	86	4	2			73	<0.1	
A17B0	30N/04W-35R01	M	01/04/2001	1400			7.2	204	206	18	0.3	0.98	16	12	13	90	4	2	5.8	169	84	<0.1	
A17.A0	30N/04W-36D01	M	06/19/86	1045	19	66	7.0	225	220			1.2	14	13	14	110		2	3.0		90	0.0	
A17.A0	30N/04W-36D01	M	07/23/90	0930			7.1	239															
A17.A0	30N/04W-36D01	M	05/22/91	0835			7.0	242															
A17.A0	30N/04W-36D01	M	06/16/93	1030			7.1	197	220			2.0	15	13	13	110	<2	2	0.4	190	86	<0.05	
A17.A0	30N/04W-36D01	M	07/23/98	1030	20	67	7.1	221	221	2	96	1.2	14	13	13	96	2	2			86	<0.1	
A17A0	30N/04W-36D01	M	01/04/2001	1430			7.1	229	229	0	0.2	1.2	15	13	14	115	2	2	3.2	188	90	<0.1	

Organics

Basin	Areal Designation	Well Number	Date ____	Time PST	Chloroform ug/L	Ethylene Dibromide ug/L	DBCP ug/L	2,4-D ug/L	Bentazon ug/L	Dacthal ug/L	Dalapon	DCPA	Dibromochloropropane	Dichloromethane	1,2-Dichloropropane ug/L	Dichlorprop ug/L	1, 2-Dichloroethane (EDC) ug/L	Dithiocarbamates	Endothall ug/L	Paraquat	Simazine ug/L	Alachlor	Lindane	Heptachlor	Aldrin	Heptachlor Epoxide
5-6.00	A17.B0	29N-03W-05G2	06/16/93	930					<0.1											<0.2						
5-6.00	A17.B0	29N-04W-04R3	06/16/93	800					<0.1											<0.2						
5-6.00	A17.A0	30N-03W-18F2	06/17/93	830					<0.1											<0.2						
5-6.00	A17.A0	30N-04W-15M3	06/16/93	1130					<0.1											<0.2						
5-6.00	A17.B0	30N-04W-35R1	06/16/93	830					<0.1											<0.2						
5-6.00	A17.A0	30N-04W-36D1	06/16/93	1030					<0.1											<0.2						

Organics

Dieldrin Endrin Methoxychlor Chlordane Toxaphene PCB 1016 PCB 1221 PCB 1232 PCB 1242 PCB 1248 PCB 1254 PCB 1260 Altrazine Simazine Hexachlorobenzene Hexachlorocyclopentadiene beta-BHC Molinate Altrazine Diazinon Prometryn Bromacil Thiobencarb Dinoseb 2,4,5-TP Pentachlorophenol Picloram

Minor Elements

Basin	Areal Designation	Well Number	Meridian M/H	Date	Time (PST)	Form	Al (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Ni (mg/L)	Selenium (mg/L)	Zinc (mg/L)	Ag (mg/L)
5-6.00	A17.B0	29N/03W-05G02	M	06/16/93	0930	Total		0.0006	0.02	<0.001	<0.005	0.005	<0.01	<0.002	<0.005	<0.0002		<0.0005	0.04	
5-6.00	A17.B0	29N/04W-02G01	M	10/13/92		Total	<0.10	<0.001	<0.1	<0.001	<0.010	<0.05	0.23	0.007	<0.03	<0.001		<0.005	<0.05	<0.01
5-6.00	A17.B0	29N/04W-04R03	M	06/16/93	0800	Total		<0.0005	0.05	<0.001	<0.005	0.17	0.01	<0.002	<0.005	<0.0002		<0.0005	0.02	
5-6.00	A17.A0	29N/04W-04R03	M	07/08/98	1030	Total	<0.010	<0.001	0.058	<0.001	<0.005	0.034	0.011	<0.001	<0.005		0.001	<0.001	<0.005	
5-6.00	A17B0	29N/04W-04R03	M	01/04/01	1530	Total	<0.01	<0.001		<0.001	<0.005	0.07	0.011	<0.001	<0.005	<0.0002	0.001	<0.001	0.006	<0.001
5-6.00	A17.A0	29N/04W-11G04	M	10/15/98	1345	Total	<0.010	<0.001	<0.050	<0.001	<0.005	0.007	<0.005	<0.001	<0.005	<0.0002	<0.001	<0.001	<0.005	
5-6.00	A17B0	29N/04W-11G04	M	01/05/01	1000	Total	<0.01	<0.001		<0.001	<0.005	0.001	<0.005	<0.001	<0.005	<0.0002	<0.001	<0.001	<0.005	<0.001
5-6.00	A17.A0	30N/03W-04M01	M	07/23/98	1230	Total	<0.010	<0.001	<0.050	<0.001	0.006	0.001	<0.005	<0.001	<0.005		<0.001	<0.001	<0.005	
5-6.00	A17A0	30N/03W-04M01	M	01/04/01	1110	Total	<0.01	<0.001		<0.001	0.005	0.002	0.035	<0.001	<0.005	<0.0002	<0.001	<0.001	0.019	<0.001
5-6.00	A17.A0	30N/03W-18F02	M	06/17/93	0830	Total		<0.0005	0.01	<0.001	<0.005	0.053	<0.01	<0.002	<0.005	<0.0002		<0.0005	0.03	
5-6.00	A17.A0	30N/03W-18F02	M	07/23/98	1130	Total	<0.010	<0.001	<0.050	<0.001	<0.005	0.008	<0.005	<0.001	<0.005		0.001	<0.001	<0.005	
5-6.00	A17A0	30N/03W-18F02	M	01/04/01	1130	Total	<0.01	<0.001		<0.001	<0.005	0.021	0.005	<0.001	<0.005	<0.0002	0.001	<0.001	<0.005	<0.001
5-6.00	A17.A0	30N/03W-34D01	M	07/08/98	1120	Total	<0.010	<0.001	<0.050	<0.001	<0.005	0.003	0.016	0.001	<0.005		0.001	<0.001	0.021	
5-6.00	A17A0	30N/03W-34D01	M	01/05/01	0930	Total	<0.01	<0.001		<0.001	<0.005	0.004	<0.005	<0.001	<0.005	<0.0002	0.001	<0.001	<0.005	<0.001
5-6.00	A17.A0	30N/04W-01E01	M	10/15/98	1300	Total	<0.010	<0.001	<0.050	<0.001	<0.005	<0.001	<0.005	<0.001	<0.005	<0.0002	<0.001	<0.001	<0.005	
5-6.00	A17.A0	30N/04W-08R01	M	10/15/98	1430	Total	0.029	<0.001	<0.050	<0.001	<0.005	0.002	0.062	<0.001	<0.005	<0.0002	<0.001	<0.001	0.033	
5-6.00	A17A0	30N/04W-08R01	M	01/04/01	1200	Total	0.023	<0.001		<0.001	<0.005	0.017	0.087	0.001	0.007	<0.0002	<0.001	<0.001	0.046	<0.001
5-6.00	A17.A0	30N/04W-15M03	M	06/16/93	1130	Total		<0.0005	0.04	<0.001	<0.005	<0.005	<0.01	<0.002	<0.005	<0.0002		<0.0005	<0.01	
5-6.00	A17.A0	30N/04W-15M03	M	07/23/98	1300	Total	<0.010	<0.001	<0.050	<0.001	<0.005	0.013	<0.005	0.009	<0.005		<0.001	<0.001	0.013	
5-6.00	A17.B0	30N/04W-35R01	M	06/16/93	0830	Total		0.0006	0.02	<0.001	<0.005	<0.005	<0.01	<0.002	<0.005	<0.0002		<0.0005	0.02	
5-6.00	A17.A0	30N/04W-35R01	M	07/31/98	1330	Total	<0.010	<0.001	<0.050	<0.001	<0.005	0.001	0.009	<0.001	<0.005	<0.0002	<0.001	<0.001	0.012	
5-6.00	A17B0	30N/04W-35R01	M	01/04/01	1400	Total	<0.01	<0.001		<0.001	<0.005	0.001	<0.005	<0.001	<0.005	<0.0002	<0.001	<0.001	0.016	<0.001
5-6.00	A17.A0	30N/04W-36D01	M	06/16/93	1030	Total		0.0006	0.04	<0.001	<0.005	<0.005	<0.01	<0.002	<0.005	<0.0002		<0.0005	0.10	
5-6.00	A17.A0	30N/04W-36D01	M	07/23/98	1030	Total	<0.010	<0.001	<0.050	<0.001	<0.005	0.004	<0.005	0.001	<0.005		<0.001	<0.001	0.138	
5-6.00	A17A0	30N/04W-36D01	M	01/04/01	1430	Total	<0.01	<0.001		<0.001	<0.005	0.002	<0.005	<0.001	<0.005	<0.0002	<0.001	<0.001	0.159	<0.001

Nutrients

Basin	Areal	Well Number	Meridian	Date	Time	Diss. NO2+NO3	Diss. NO3	Diss. NH3	Diss. Ortho-P04	Total P	Diss. Organic N
-	Designation		M/H		(PST)	(mg/L)	as N (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
5-6.00	A17.B0	29N/03W-05G02	M	06/16/93	0930		1.1	<0.05	0.08	0.14	0.1
5-6.00	A17.B0	29N/04W-04R03	M	06/16/93	0800		3.0	<0.05	0.19	0.20	0.1
5-6.00	A17.A0	29N/04W-04R03	M	07/08/98	1030	3.0		<0.01	0.17	0.22	
5-6.00	A17B0	29N/04W-04R03	M	01/04/01	1530	3		<0.01	0.18	0.2	
5-6.00	A17.A0	29N/04W-11G04	M	10/15/98	1345	1.0		<0.01	0.14	0.16	
5-6.00	A17B0	29N/04W-11G04	M	01/05/01	1000	0.97		0.02	0.16	0.16	
5-6.00	A17.A0	30N/03W-04M01	M	07/23/98	1230	1.3		<0.01	0.04	0.09	
5-6.00	A17A0	30N/03W-04M01	M	01/04/01	1110	1.7		<0.01	0.06	0.08	
5-6.00	A17.A0	30N/03W-18F02	M	06/17/93	0830		2.1	<0.05	0.03	0.04	0.3
5-6.00	A17.A0	30N/03W-18F02	M	07/23/98	1130	6.1		<0.01	0.01	0.04	
5-6.00	A17A0	30N/03W-18F02	M	01/04/01	1130	1.8		<0.01	0.04	0.02	
5-6.00	A17.A0	30N/03W-34D01	M	07/08/98	1120	5.4		<0.01	0.02	0.06	
5-6.00	A17A0	30N/03W-34D01	M	01/05/01	0930	5.3		<0.01	0.05	0.07	
5-6.00	A17.A0	30N/04W-01E01	M	10/15/98	1300	2.2		<0.01	0.06	0.07	
5-6.00	A17.A0	30N/04W-08R01	M	10/15/98	1430	1.3		<0.01	0.07	0.08	
5-6.00	A17A0	30N/04W-08R01	M	01/04/01	1200	1.2		0.01	0.08	0.09	
5-6.00	A17.A0	30N/04W-15M03	M	06/16/93	1130		1.5	<0.05	0.11	0.12	0.1
5-6.00	A17.A0	30N/04W-15M03	M	07/23/98	1300	1.5		<0.01	0.06	0.12	
5-6.00	A17.B0	30N/04W-35R01	M	06/16/93	0830		0.82	<0.05	0.16	0.18	<0.1
5-6.00	A17.A0	30N/04W-35R01	M	07/31/98	1330	2.7		<0.01	0.14	0.17	
5-6.00	A17B0	30N/04W-35R01	M	01/04/01	1400	1.4		<0.01	0.16	0.14	
5-6.00	A17.A0	30N/04W-36D01	M	06/16/93	1030		0.74	<0.05	0.14	0.17	0.1
5-6.00	A17.A0	30N/04W-36D01	M	07/23/98	1030	0.73		<0.01	0.13	0.14	
5-6.00	A17A0	30N/04W-36D01	M	01/04/01	1430	0.77		<0.01	0.14	0.16	

Surface-water-quality Data

Water Quality Data Results

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Below are the water quality for station A0352050, COTTONWOOD C A COTTONWOOD.

Date	Sample Number	Constituent/Analyte	Result*
04/12/1951	1163	DISSOLVED CHLORIDE	7.5
04/12/1951	1163	DISSOLVED HARDNESS CaCO3 mg/L	112
04/12/1951	1163	DISSOLVED SODIUM	8.6
04/12/1951	1163	DISSOLVED TOTAL ALKALINITY	109
04/12/1951	1163	LAB pH	7.8
04/12/1951	1163	MINERAL TURBIDITY HELLIGE	5
04/12/1951	1163	SPECIFIC CONDUCTANCE 25C	248
05/09/1951	1381	DISSOLVED BORON	0.15
05/09/1951	1381	DISSOLVED CALCIUM	24
05/09/1951	1381	DISSOLVED CHLORIDE	6.2
05/09/1951	1381	DISSOLVED HARDNESS CaCO3 mg/L	101
05/09/1951	1381	DISSOLVED MAGNESIUM	10
05/09/1951	1381	DISSOLVED NITRATE NO3 mg/L	0.4
05/09/1951	1381	DISSOLVED POTASSIUM	1
05/09/1951	1381	DISSOLVED SILICA	22
05/09/1951	1381	DISSOLVED SODIUM	7.5
05/09/1951	1381	DISSOLVED SULFATE SO4 mg/L	13
05/09/1951	1381	DISSOLVED TOTAL ALKALINITY	98
05/09/1951	1381	LAB pH	7.8
05/09/1951	1381	SPECIFIC CONDUCTANCE 25C	229
06/17/1951	5368	DISSOLVED CHLORIDE	1.8
06/17/1951	5368	DISSOLVED HARDNESS CaCO3 mg/L	96
06/17/1951	5368	DISSOLVED TOTAL ALKALINITY	102
06/17/1951	5368	MINERAL TURBIDITY HELLIGE	25
06/17/1951	5368	SPECIFIC CONDUCTANCE 25C	234
07/11/1951	5369	DISSOLVED CHLORIDE	4
07/11/1951	5369	DISSOLVED HARDNESS CaCO3 mg/L	90
07/11/1951	5369	DISSOLVED TOTAL ALKALINITY	95
07/11/1951	5369	LAB pH	7.6
07/11/1951	5369	MINERAL TURBIDITY HELLIGE	25
07/11/1951	5369	SPECIFIC CONDUCTANCE 25C	227
08/15/1951	5370	DISSOLVED CHLORIDE	6
08/15/1951	5370	DISSOLVED HARDNESS CaCO3 mg/L	80
08/15/1951	5370	DISSOLVED TOTAL ALKALINITY	80
08/15/1951	5370	LAB pH	7.2
08/15/1951	5370	MINERAL TURBIDITY HELLIGE	25
08/15/1951	5370	SPECIFIC CONDUCTANCE 25C	192
09/13/1951	2500	DISSOLVED BORON	0.12
09/13/1951	2500	DISSOLVED CALCIUM	13
09/13/1951	2500	DISSOLVED CHLORIDE	3.2
09/13/1951	2500	DISSOLVED FLUORIDE	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/13/1951	2500	DISSOLVED HARDNESS CaCO3 mg/L	69
09/13/1951	2500	DISSOLVED MAGNESIUM	9
09/13/1951	2500	DISSOLVED NITRATE NO3 mg/L	1
09/13/1951	2500	DISSOLVED POTASSIUM	1.2
09/13/1951	2500	DISSOLVED SILICA	25
09/13/1951	2500	DISSOLVED SODIUM	9
09/13/1951	2500	DISSOLVED SULFATE SO4 mg/L	6.2
09/13/1951	2500	DISSOLVED TOTAL ALKALINITY	79
09/13/1951	2500	LAB pH	7
09/13/1951	2500	SPECIFIC CONDUCTANCE 25C	173
10/10/1951	2629	DISSOLVED CHLORIDE	7.5
10/10/1951	2629	DISSOLVED HARDNESS CaCO3 mg/L	81
10/10/1951	2629	DISSOLVED SODIUM	11
10/10/1951	2629	DISSOLVED TOTAL ALKALINITY	87
10/10/1951	2629	LAB pH	7.9
10/10/1951	2629	MINERAL TURBIDITY HELLIGE	5
10/10/1951	2629	SPECIFIC CONDUCTANCE 25C	210
11/15/1951	3017	DISSOLVED CHLORIDE	17
11/15/1951	3017	DISSOLVED HARDNESS CaCO3 mg/L	110
11/15/1951	3017	DISSOLVED SODIUM	15
11/15/1951	3017	DISSOLVED TOTAL ALKALINITY	97
11/15/1951	3017	LAB pH	7.2
11/15/1951	3017	MINERAL TURBIDITY HELLIGE	5
11/15/1951	3017	SPECIFIC CONDUCTANCE 25C	268
01/09/1952	5371	DISSOLVED CHLORIDE	8
01/09/1952	5371	DISSOLVED HARDNESS CaCO3 mg/L	84
01/09/1952	5371	DISSOLVED TOTAL ALKALINITY	79
01/09/1952	5371	LAB pH	7.2
01/09/1952	5371	MINERAL TURBIDITY HELLIGE	40
01/09/1952	5371	SPECIFIC CONDUCTANCE 25C	202
02/13/1952	3861	DISSOLVED CHLORIDE	3.8
02/13/1952	3861	DISSOLVED HARDNESS CaCO3 mg/L	107
02/13/1952	3861	DISSOLVED SODIUM	6.6
02/13/1952	3861	DISSOLVED TOTAL ALKALINITY	101
02/13/1952	3861	LAB pH	7.8
02/13/1952	3861	MINERAL TURBIDITY HELLIGE	50
02/13/1952	3861	SPECIFIC CONDUCTANCE 25C	233
03/11/1952	3938	DISSOLVED CHLORIDE	4.8
03/11/1952	3938	DISSOLVED HARDNESS CaCO3 mg/L	116
03/11/1952	3938	DISSOLVED SODIUM	8.2
03/11/1952	3938	DISSOLVED TOTAL ALKALINITY	106
03/11/1952	3938	LAB pH	8.2
03/11/1952	3938	MINERAL TURBIDITY HELLIGE	15
03/11/1952	3938	SPECIFIC CONDUCTANCE 25C	254
04/18/1952	5372	DISSOLVED CHLORIDE	3
04/18/1952	5372	DISSOLVED HARDNESS CaCO3 mg/L	92
04/18/1952	5372	DISSOLVED TOTAL ALKALINITY	92
04/18/1952	5372	MINERAL TURBIDITY HELLIGE	10
04/18/1952	5372	SPECIFIC CONDUCTANCE 25C	196
05/13/1952	4422	Al mg/L D	0.09
05/13/1952	4422	As mg/L D	0
05/13/1952	4422	CHROMIUM (+6) Dissolved	0

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05/13/1952	4422	Cu mg/L D	0
05/13/1952	4422	DISSOLVED BORON	0.04
05/13/1952	4422	DISSOLVED CALCIUM	20
05/13/1952	4422	DISSOLVED CHLORIDE	3
05/13/1952	4422	DISSOLVED FLUORIDE	0
05/13/1952	4422	DISSOLVED HARDNESS CaCO3 mg/L	83
05/13/1952	4422	DISSOLVED MAGNESIUM	8
05/13/1952	4422	DISSOLVED NITRATE NO3 mg/L	0.5
05/13/1952	4422	DISSOLVED POTASSIUM	0.8
05/13/1952	4422	DISSOLVED SILICA	16
05/13/1952	4422	DISSOLVED SODIUM	5.4
05/13/1952	4422	DISSOLVED SULFATE SO4 mg/L	10
05/13/1952	4422	DISSOLVED TOTAL ALKALINITY	74
05/13/1952	4422	Fe mg/L D	0
05/13/1952	4422	LAB pH	7.8
05/13/1952	4422	Mn mg/L D	0
05/13/1952	4422	Pb mg/L D	0
05/13/1952	4422	SPECIFIC CONDUCTANCE 25C	182
05/13/1952	4422	Zn mg/L D	0
06/12/1952	5373	DISSOLVED CHLORIDE	1
06/12/1952	5373	DISSOLVED HARDNESS CaCO3 mg/L	88
06/12/1952	5373	DISSOLVED TOTAL ALKALINITY	83
06/12/1952	5373	LAB pH	7.6
06/12/1952	5373	MINERAL TURBIDITY HELLIGE	1
06/12/1952	5373	SPECIFIC CONDUCTANCE 25C	199
07/09/1952	5374	DISSOLVED CHLORIDE	5
07/09/1952	5374	DISSOLVED HARDNESS CaCO3 mg/L	94
07/09/1952	5374	DISSOLVED TOTAL ALKALINITY	96
07/09/1952	5374	LAB pH	7.6
07/09/1952	5374	SPECIFIC CONDUCTANCE 25C	218
08/13/1952	5375	DISSOLVED CHLORIDE	6
08/13/1952	5375	DISSOLVED HARDNESS CaCO3 mg/L	102
08/13/1952	5375	DISSOLVED TOTAL ALKALINITY	102
08/13/1952	5375	LAB pH	7.9
08/13/1952	5375	MINERAL TURBIDITY HELLIGE	5
08/13/1952	5375	SPECIFIC CONDUCTANCE 25C	229
09/10/1952	5498	DISSOLVED CHLORIDE	0.6
09/10/1952	5498	DISSOLVED HARDNESS CaCO3 mg/L	50
09/10/1952	5498	DISSOLVED TOTAL ALKALINITY	58
09/10/1952	5498	LAB pH	7.1
09/10/1952	5498	SPECIFIC CONDUCTANCE 25C	137
11/19/1952	5376	DISSOLVED CHLORIDE	19
11/19/1952	5376	DISSOLVED HARDNESS CaCO3 mg/L	112
11/19/1952	5376	DISSOLVED TOTAL ALKALINITY	100
11/19/1952	5376	LAB pH	7.6
11/19/1952	5376	MINERAL TURBIDITY HELLIGE	38
11/19/1952	5376	SPECIFIC CONDUCTANCE 25C	234
12/11/1952	5377	DISSOLVED CHLORIDE	1
12/11/1952	5377	DISSOLVED HARDNESS CaCO3 mg/L	59
12/11/1952	5377	DISSOLVED TOTAL ALKALINITY	52
12/11/1952	5377	LAB pH	7.3
12/11/1952	5377	MINERAL TURBIDITY HELLIGE	115

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12/11/1952	5377	SPECIFIC CONDUCTANCE 25C	158
01/15/1953	6138	DISSOLVED CALCIUM	19
01/15/1953	6138	DISSOLVED CHLORIDE	4
01/15/1953	6138	DISSOLVED HARDNESS CaCO3 mg/L	84
01/15/1953	6138	DISSOLVED MAGNESIUM	8.8
01/15/1953	6138	DISSOLVED POTASSIUM	1
01/15/1953	6138	DISSOLVED SODIUM	6.1
01/15/1953	6138	DISSOLVED TOTAL ALKALINITY	80
01/15/1953	6138	LAB pH	7.5
01/15/1953	6138	SPECIFIC CONDUCTANCE 25C	188
02/19/1953	6510	DISSOLVED CALCIUM	25
02/19/1953	6510	DISSOLVED CHLORIDE	5.8
02/19/1953	6510	DISSOLVED HARDNESS CaCO3 mg/L	104
02/19/1953	6510	DISSOLVED MAGNESIUM	10
02/19/1953	6510	DISSOLVED POTASSIUM	0.8
02/19/1953	6510	DISSOLVED SODIUM	8.7
02/19/1953	6510	DISSOLVED TOTAL ALKALINITY	100
02/19/1953	6510	LAB pH	8.2
02/19/1953	6510	SPECIFIC CONDUCTANCE 25C	233
03/27/1953	6784	DISSOLVED BORON	0.08
03/27/1953	6784	DISSOLVED CALCIUM	23
03/27/1953	6784	DISSOLVED CHLORIDE	5.5
03/27/1953	6784	DISSOLVED HARDNESS CaCO3 mg/L	97
03/27/1953	6784	DISSOLVED MAGNESIUM	9.6
03/27/1953	6784	DISSOLVED SODIUM	6.9
03/27/1953	6784	DISSOLVED TOTAL ALKALINITY	93
03/27/1953	6784	LAB pH	8
03/27/1953	6784	SPECIFIC CONDUCTANCE 25C	211
04/15/1953	7072	DISSOLVED BORON	0.02
04/15/1953	7072	DISSOLVED CALCIUM	23
04/15/1953	7072	DISSOLVED CHLORIDE	5
04/15/1953	7072	DISSOLVED HARDNESS CaCO3 mg/L	96
04/15/1953	7072	DISSOLVED MAGNESIUM	9.3
04/15/1953	7072	DISSOLVED SODIUM	8.2
04/15/1953	7072	DISSOLVED TOTAL ALKALINITY	94
04/15/1953	7072	LAB pH	7.7
04/15/1953	7072	MINERAL TURBIDITY HELLIGE	5
04/15/1953	7072	SPECIFIC CONDUCTANCE 25C	217
05/07/1953	7274	Al mg/L D	0
05/07/1953	7274	As mg/L D	0
05/07/1953	7274	Cr mg/L D	0
05/07/1953	7274	Cu mg/L D	0
05/07/1953	7274	DISSOLVED BORON	0.11
05/07/1953	7274	DISSOLVED CALCIUM	20
05/07/1953	7274	DISSOLVED CHLORIDE	4
05/07/1953	7274	DISSOLVED FLUORIDE	0
05/07/1953	7274	DISSOLVED HARDNESS CaCO3 mg/L	86
05/07/1953	7274	DISSOLVED MAGNESIUM	8.7
05/07/1953	7274	DISSOLVED NITRATE NO3 mg/L	0.2
05/07/1953	7274	DISSOLVED POTASSIUM	0.8
05/07/1953	7274	DISSOLVED SILICA	18
05/07/1953	7274	DISSOLVED SODIUM	6.7

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05/07/1953	7274	DISSOLVED SULFATE SO4 mg/L	9.1
05/07/1953	7274	DISSOLVED TOTAL ALKALINITY	85
05/07/1953	7274	Fe mg/L D	0
05/07/1953	7274	LAB pH	8.2
05/07/1953	7274	MINERAL TURBIDITY HELLIGE	10
05/07/1953	7274	Mn mg/L D	0
05/07/1953	7274	Pb mg/L D	0
05/07/1953	7274	SPECIFIC CONDUCTANCE 25C	186
05/07/1953	7274	Zn mg/L D	0
06/11/1953	5378	DISSOLVED CHLORIDE	5
06/11/1953	5378	DISSOLVED HARDNESS CaCO3 mg/L	134
06/11/1953	5378	DISSOLVED TOTAL ALKALINITY	89
06/11/1953	5378	MINERAL TURBIDITY HELLIGE	25
06/11/1953	5378	SPECIFIC CONDUCTANCE 25C	203
07/09/1953	1955	DISSOLVED BORON	0.08
07/09/1953	1955	DISSOLVED CHLORIDE	4
07/09/1953	1955	DISSOLVED HARDNESS CaCO3 mg/L	94
07/09/1953	1955	DISSOLVED SODIUM	7
07/09/1953	1955	DISSOLVED TOTAL ALKALINITY	89
07/09/1953	1955	LAB pH	7.2
07/09/1953	1955	MINERAL TURBIDITY HELLIGE	2
07/09/1953	1955	SPECIFIC CONDUCTANCE 25C	201
08/10/1953	8946	DISSOLVED BORON	0
08/10/1953	8946	DISSOLVED CALCIUM	21
08/10/1953	8946	DISSOLVED CHLORIDE	7.5
08/10/1953	8946	DISSOLVED HARDNESS CaCO3 mg/L	94
08/10/1953	8946	DISSOLVED MAGNESIUM	10
08/10/1953	8946	DISSOLVED POTASSIUM	1.1
08/10/1953	8946	DISSOLVED SODIUM	8.2
08/10/1953	8946	DISSOLVED TOTAL ALKALINITY	96
08/10/1953	8946	LAB pH	7.4
08/10/1953	8946	MINERAL TURBIDITY HELLIGE	1
08/10/1953	8946	SPECIFIC CONDUCTANCE 25C	214
09/23/1953	9120	Al mg/L D	0.02
09/23/1953	9120	As mg/L D	0
09/23/1953	9120	CHROMIUM (+6) Dissolved	0
09/23/1953	9120	Cu mg/L D	0
09/23/1953	9120	DISSOLVED BORON	0.09
09/23/1953	9120	DISSOLVED CALCIUM	18
09/23/1953	9120	DISSOLVED CHLORIDE	7
09/23/1953	9120	DISSOLVED FLUORIDE	0.1
09/23/1953	9120	DISSOLVED HARDNESS CaCO3 mg/L	86
09/23/1953	9120	DISSOLVED MAGNESIUM	10
09/23/1953	9120	DISSOLVED NITRATE NO3 mg/L	0.2
09/23/1953	9120	DISSOLVED POTASSIUM	1.3
09/23/1953	9120	DISSOLVED SILICA	24
09/23/1953	9120	DISSOLVED SODIUM	8.7
09/23/1953	9120	DISSOLVED SULFATE SO4 mg/L	5.8
09/23/1953	9120	DISSOLVED TOTAL ALKALINITY	93
09/23/1953	9120	Fe mg/L D	0
09/23/1953	9120	LAB pH	7.7
09/23/1953	9120	Mn mg/L D	0

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09/23/1953	9120	Pb mg/L D	0
09/23/1953	9120	SPECIFIC CONDUCTANCE 25C	202
09/23/1953	9120	Zn mg/L D	0
10/07/1953	9786	DISSOLVED BORON	0.07
10/07/1953	9786	DISSOLVED CALCIUM	16
10/07/1953	9786	DISSOLVED CHLORIDE	5
10/07/1953	9786	DISSOLVED HARDNESS CaCO3 mg/L	77
10/07/1953	9786	DISSOLVED MAGNESIUM	9.1
10/07/1953	9786	DISSOLVED POTASSIUM	1.5
10/07/1953	9786	DISSOLVED SODIUM	10
10/07/1953	9786	DISSOLVED TOTAL ALKALINITY	84
10/07/1953	9786	LAB pH	8
10/07/1953	9786	MINERAL TURBIDITY HELLIGE	2
10/07/1953	9786	SPECIFIC CONDUCTANCE 25C	189
11/10/1953	1956	DISSOLVED BORON	0.01
11/10/1953	1956	DISSOLVED CHLORIDE	11
11/10/1953	1956	DISSOLVED HARDNESS CaCO3 mg/L	97
11/10/1953	1956	DISSOLVED SODIUM	9.4
11/10/1953	1956	DISSOLVED TOTAL ALKALINITY	90
11/10/1953	1956	MINERAL TURBIDITY HELLIGE	2
11/10/1953	1956	SPECIFIC CONDUCTANCE 25C	198
12/08/1953	9846	DISSOLVED BORON	0.05
12/08/1953	9846	DISSOLVED CALCIUM	26
12/08/1953	9846	DISSOLVED CHLORIDE	15
12/08/1953	9846	DISSOLVED HARDNESS CaCO3 mg/L	110
12/08/1953	9846	DISSOLVED MAGNESIUM	11
12/08/1953	9846	DISSOLVED POTASSIUM	1
12/08/1953	9846	DISSOLVED SODIUM	12
12/08/1953	9846	DISSOLVED TOTAL ALKALINITY	100
12/08/1953	9846	LAB pH	8
12/08/1953	9846	MINERAL TURBIDITY HELLIGE	9
12/08/1953	9846	SPECIFIC CONDUCTANCE 25C	270
01/12/1954	10259	DISSOLVED BORON	0.14
01/12/1954	10259	DISSOLVED CALCIUM	37
01/12/1954	10259	DISSOLVED CHLORIDE	37
01/12/1954	10259	DISSOLVED HARDNESS CaCO3 mg/L	150
01/12/1954	10259	DISSOLVED MAGNESIUM	14
01/12/1954	10259	DISSOLVED POTASSIUM	0.8
01/12/1954	10259	DISSOLVED SODIUM	18
01/12/1954	10259	DISSOLVED TOTAL ALKALINITY	121
01/12/1954	10259	LAB pH	8.2
01/12/1954	10259	MINERAL TURBIDITY HELLIGE	0
01/12/1954	10259	SPECIFIC CONDUCTANCE 25C	389
02/10/1954	10450	DISSOLVED BORON	0.03
02/10/1954	10450	DISSOLVED CALCIUM	21
02/10/1954	10450	DISSOLVED CHLORIDE	3.8
02/10/1954	10450	DISSOLVED HARDNESS CaCO3 mg/L	91
02/10/1954	10450	DISSOLVED MAGNESIUM	9.3
02/10/1954	10450	DISSOLVED POTASSIUM	0.8
02/10/1954	10450	DISSOLVED SODIUM	6.1
02/10/1954	10450	DISSOLVED TOTAL ALKALINITY	88
02/10/1954	10450	LAB pH	8.2

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02/10/1954	10450	MINERAL TURBIDITY HELLIGE	21
02/10/1954	10450	SPECIFIC CONDUCTANCE 25C	201
03/09/1954	10671	DISSOLVED BORON	0.08
03/09/1954	10671	DISSOLVED CALCIUM	15
03/09/1954	10671	DISSOLVED CHLORIDE	1
03/09/1954	10671	DISSOLVED HARDNESS CaCO3 mg/L	62
03/09/1954	10671	DISSOLVED MAGNESIUM	6
03/09/1954	10671	DISSOLVED POTASSIUM	1.8
03/09/1954	10671	DISSOLVED SODIUM	4.1
03/09/1954	10671	DISSOLVED TOTAL ALKALINITY	61
03/09/1954	10671	LAB pH	7.7
03/09/1954	10671	MINERAL TURBIDITY HELLIGE	264
03/09/1954	10671	SPECIFIC CONDUCTANCE 25C	135
04/15/1954	10994	DISSOLVED BORON	0
04/15/1954	10994	DISSOLVED CALCIUM	23
04/15/1954	10994	DISSOLVED CHLORIDE	3
04/15/1954	10994	DISSOLVED HARDNESS CaCO3 mg/L	103
04/15/1954	10994	DISSOLVED MAGNESIUM	11
04/15/1954	10994	DISSOLVED POTASSIUM	1.1
04/15/1954	10994	DISSOLVED SODIUM	7.4
04/15/1954	10994	DISSOLVED TOTAL ALKALINITY	98
04/15/1954	10994	LAB pH	7.6
04/15/1954	10994	MINERAL TURBIDITY HELLIGE	11
04/15/1954	10994	SPECIFIC CONDUCTANCE 25C	226
05/06/1954	11143	Al mg/L D	0.01
05/06/1954	11143	As mg/L D	0
05/06/1954	11143	CHROMIUM (+6) Dissolved	0
05/06/1954	11143	Cu mg/L D	0
05/06/1954	11143	DISSOLVED BORON	0.01
05/06/1954	11143	DISSOLVED CALCIUM	23
05/06/1954	11143	DISSOLVED CHLORIDE	5.2
05/06/1954	11143	DISSOLVED FLUORIDE	0
05/06/1954	11143	DISSOLVED HARDNESS CaCO3 mg/L	97
05/06/1954	11143	DISSOLVED MAGNESIUM	9.7
05/06/1954	11143	DISSOLVED NITRATE NO3 mg/L	0.4
05/06/1954	11143	DISSOLVED POTASSIUM	1
05/06/1954	11143	DISSOLVED SILICA	20
05/06/1954	11143	DISSOLVED SODIUM	6.7
05/06/1954	11143	DISSOLVED SULFATE SO4 mg/L	12
05/06/1954	11143	DISSOLVED TOTAL ALKALINITY	94
05/06/1954	11143	Fe mg/L D	0.03
05/06/1954	11143	LAB pH	8.2
05/06/1954	11143	MINERAL TURBIDITY HELLIGE	20
05/06/1954	11143	Mn mg/L D	0
05/06/1954	11143	Pb mg/L D	0
05/06/1954	11143	SPECIFIC CONDUCTANCE 25C	216
05/06/1954	11143	Zn mg/L D	0
06/08/1954	11598	DISSOLVED BORON	0.18
06/08/1954	11598	DISSOLVED CALCIUM	26
06/08/1954	11598	DISSOLVED CHLORIDE	6.5
06/08/1954	11598	DISSOLVED HARDNESS CaCO3 mg/L	98
06/08/1954	11598	DISSOLVED MAGNESIUM	8.1

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06/08/1954	11598	DISSOLVED POTASSIUM	1.4
06/08/1954	11598	DISSOLVED SODIUM	7.3
06/08/1954	11598	DISSOLVED TOTAL ALKALINITY	98
06/08/1954	11598	LAB pH	8.3
06/08/1954	11598	MINERAL TURBIDITY HELLIGE	9
06/08/1954	11598	SPECIFIC CONDUCTANCE 25C	216
07/15/1954	11919	DISSOLVED BORON	0.06
07/15/1954	11919	DISSOLVED CALCIUM	23
07/15/1954	11919	DISSOLVED CHLORIDE	6
07/15/1954	11919	DISSOLVED HARDNESS CaCO3 mg/L	103
07/15/1954	11919	DISSOLVED MAGNESIUM	11
07/15/1954	11919	DISSOLVED POTASSIUM	1.2
07/15/1954	11919	DISSOLVED SODIUM	8.4
07/15/1954	11919	DISSOLVED TOTAL ALKALINITY	103
07/15/1954	11919	LAB pH	8
07/15/1954	11919	MINERAL TURBIDITY HELLIGE	1
07/15/1954	11919	SPECIFIC CONDUCTANCE 25C	227
08/10/1954	12022	DISSOLVED BORON	0.02
08/10/1954	12022	DISSOLVED CALCIUM	21
08/10/1954	12022	DISSOLVED CHLORIDE	5
08/10/1954	12022	DISSOLVED HARDNESS CaCO3 mg/L	94
08/10/1954	12022	DISSOLVED MAGNESIUM	10
08/10/1954	12022	DISSOLVED POTASSIUM	1.4
08/10/1954	12022	DISSOLVED SODIUM	8.9
08/10/1954	12022	DISSOLVED TOTAL ALKALINITY	98
08/10/1954	12022	LAB pH	8.1
08/10/1954	12022	MINERAL TURBIDITY HELLIGE	2
08/10/1954	12022	SPECIFIC CONDUCTANCE 25C	219
09/16/1954	12138	Al mg/L D	0
09/16/1954	12138	As mg/L D	0
09/16/1954	12138	CHROMIUM (+6) Dissolved	0
09/16/1954	12138	Cu mg/L D	0
09/16/1954	12138	DISSOLVED BORON	0.03
09/16/1954	12138	DISSOLVED CALCIUM	17
09/16/1954	12138	DISSOLVED CHLORIDE	5
09/16/1954	12138	DISSOLVED FLUORIDE	0.1
09/16/1954	12138	DISSOLVED HARDNESS CaCO3 mg/L	79
09/16/1954	12138	DISSOLVED MAGNESIUM	8.8
09/16/1954	12138	DISSOLVED NITRATE NO3 mg/L	0.4
09/16/1954	12138	DISSOLVED POTASSIUM	1
09/16/1954	12138	DISSOLVED SILICA	23
09/16/1954	12138	DISSOLVED SODIUM	7.7
09/16/1954	12138	DISSOLVED SULFATE SO4 mg/L	6.7
09/16/1954	12138	DISSOLVED TOTAL ALKALINITY	84
09/16/1954	12138	Fe mg/L D	0.01
09/16/1954	12138	LAB pH	7.4
09/16/1954	12138	MINERAL TURBIDITY HELLIGE	2
09/16/1954	12138	Mn mg/L D	0
09/16/1954	12138	Pb mg/L D	0
09/16/1954	12138	SPECIFIC CONDUCTANCE 25C	191
09/16/1954	12138	Zn mg/L D	0.01
10/13/1954	12712	DISSOLVED BORON	0.05

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

10/13/1954	12712	DISSOLVED CALCIUM	18
10/13/1954	12712	DISSOLVED CHLORIDE	7.2
10/13/1954	12712	DISSOLVED HARDNESS CaCO3 mg/L	80
10/13/1954	12712	DISSOLVED MAGNESIUM	8.5
10/13/1954	12712	DISSOLVED POTASSIUM	1.3
10/13/1954	12712	DISSOLVED SODIUM	8.3
10/13/1954	12712	DISSOLVED TOTAL ALKALINITY	82
10/13/1954	12712	LAB pH	7.8
10/13/1954	12712	MINERAL TURBIDITY HELLIGE	18
10/13/1954	12712	SPECIFIC CONDUCTANCE 25C	190
11/10/1954	13147	DISSOLVED BORON	0.09
11/10/1954	13147	DISSOLVED CALCIUM	28
11/10/1954	13147	DISSOLVED CHLORIDE	24
11/10/1954	13147	DISSOLVED HARDNESS CaCO3 mg/L	98
11/10/1954	13147	DISSOLVED MAGNESIUM	6.8
11/10/1954	13147	DISSOLVED POTASSIUM	1.5
11/10/1954	13147	DISSOLVED SODIUM	14
11/10/1954	13147	DISSOLVED TOTAL ALKALINITY	91
11/10/1954	13147	LAB pH	7.7
11/10/1954	13147	MINERAL TURBIDITY HELLIGE	10
11/10/1954	13147	SPECIFIC CONDUCTANCE 25C	292
12/06/1954	13438	DISSOLVED BORON	0.1
12/06/1954	13438	DISSOLVED CALCIUM	8.1
12/06/1954	13438	DISSOLVED CHLORIDE	6.8
12/06/1954	13438	DISSOLVED HARDNESS CaCO3 mg/L	41
12/06/1954	13438	DISSOLVED MAGNESIUM	5.1
12/06/1954	13438	DISSOLVED POTASSIUM	1.5
12/06/1954	13438	DISSOLVED SODIUM	5.6
12/06/1954	13438	DISSOLVED TOTAL ALKALINITY	39
12/06/1954	13438	LAB pH	7.5
12/06/1954	13438	MINERAL TURBIDITY HELLIGE	25
12/06/1954	13438	SPECIFIC CONDUCTANCE 25C	112
01/10/1955	13618	DISSOLVED BORON	0.02
01/10/1955	13618	DISSOLVED CALCIUM	26
01/10/1955	13618	DISSOLVED CHLORIDE	13
01/10/1955	13618	DISSOLVED HARDNESS CaCO3 mg/L	108
01/10/1955	13618	DISSOLVED MAGNESIUM	10
01/10/1955	13618	DISSOLVED POTASSIUM	0.9
01/10/1955	13618	DISSOLVED SODIUM	11
01/10/1955	13618	DISSOLVED TOTAL ALKALINITY	100
01/10/1955	13618	LAB pH	8
01/10/1955	13618	MINERAL TURBIDITY HELLIGE	15
01/10/1955	13618	SPECIFIC CONDUCTANCE 25C	263
02/07/1955	14206	DISSOLVED BORON	0.03
02/07/1955	14206	DISSOLVED CALCIUM	28
02/07/1955	14206	DISSOLVED CHLORIDE	9.5
02/07/1955	14206	DISSOLVED HARDNESS CaCO3 mg/L	121
02/07/1955	14206	DISSOLVED MAGNESIUM	12
02/07/1955	14206	DISSOLVED POTASSIUM	0.8
02/07/1955	14206	DISSOLVED SODIUM	12
02/07/1955	14206	DISSOLVED TOTAL ALKALINITY	113
02/07/1955	14206	LAB pH	7.9

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/07/1955	14206	MINERAL TURBIDITY HELLIGE	1
02/07/1955	14206	SPECIFIC CONDUCTANCE 25C	278
03/03/1955	14501	DISSOLVED BORON	0
03/03/1955	14501	DISSOLVED CALCIUM	27
03/03/1955	14501	DISSOLVED CHLORIDE	11
03/03/1955	14501	DISSOLVED HARDNESS CaCO3 mg/L	116
03/03/1955	14501	DISSOLVED MAGNESIUM	12
03/03/1955	14501	DISSOLVED POTASSIUM	1
03/03/1955	14501	DISSOLVED SODIUM	11
03/03/1955	14501	DISSOLVED TOTAL ALKALINITY	108
03/03/1955	14501	LAB pH	8.3
03/03/1955	14501	MINERAL TURBIDITY HELLIGE	3
03/03/1955	14501	SPECIFIC CONDUCTANCE 25C	263
04/01/1955	14907	DISSOLVED BORON	0.05
04/01/1955	14907	DISSOLVED CALCIUM	24
04/01/1955	14907	DISSOLVED CHLORIDE	9.4
04/01/1955	14907	DISSOLVED HARDNESS CaCO3 mg/L	106
04/01/1955	14907	DISSOLVED MAGNESIUM	11
04/01/1955	14907	DISSOLVED POTASSIUM	0.8
04/01/1955	14907	DISSOLVED SODIUM	9.5
04/01/1955	14907	DISSOLVED TOTAL ALKALINITY	103
04/01/1955	14907	LAB pH	8
04/01/1955	14907	MINERAL TURBIDITY HELLIGE	3
04/01/1955	14907	SPECIFIC CONDUCTANCE 25C	232
05/11/1955	16380	Al mg/L D	0.14
05/11/1955	16380	Cr mg/L D	0
05/11/1955	16380	Cu mg/L D	0
05/11/1955	16380	DISSOLVED BORON	0.16
05/11/1955	16380	DISSOLVED CALCIUM	13
05/11/1955	16380	DISSOLVED CHLORIDE	2.8
05/11/1955	16380	DISSOLVED FLUORIDE	0.2
05/11/1955	16380	DISSOLVED HARDNESS CaCO3 mg/L	63
05/11/1955	16380	DISSOLVED MAGNESIUM	7.4
05/11/1955	16380	DISSOLVED NITRATE NO3 mg/L	1.2
05/11/1955	16380	DISSOLVED ORTHOPHOSPHATE as P	0.21
05/11/1955	16380	DISSOLVED POTASSIUM	2.7
05/11/1955	16380	DISSOLVED SILICA	23
05/11/1955	16380	DISSOLVED SODIUM	7
05/11/1955	16380	DISSOLVED SULFATE SO4 mg/L	9.8
05/11/1955	16380	DISSOLVED TOTAL ALKALINITY	63
05/11/1955	16380	Fe mg/L D	0.02
05/11/1955	16380	LAB pH	7.1
05/11/1955	16380	MINERAL TURBIDITY HELLIGE	1
05/11/1955	16380	Mn mg/L D	0
05/11/1955	16380	NUTRIENT TURBIDITY NOT C,A,E,B	1
05/11/1955	16380	Pb mg/L D	0
05/11/1955	16380	SPECIFIC CONDUCTANCE 25C	150
05/11/1955	16380	Zn mg/L D	0
06/15/1955	15627	DISSOLVED BORON	0.07
06/15/1955	15627	DISSOLVED CALCIUM	21
06/15/1955	15627	DISSOLVED CHLORIDE	6.2
06/15/1955	15627	DISSOLVED HARDNESS CaCO3 mg/L	87

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

06/15/1955	15627	DISSOLVED MAGNESIUM	8.4
06/15/1955	15627	DISSOLVED POTASSIUM	1.7
06/15/1955	15627	DISSOLVED SODIUM	9.3
06/15/1955	15627	DISSOLVED TOTAL ALKALINITY	92
06/15/1955	15627	LAB pH	8.1
06/15/1955	15627	MINERAL TURBIDITY HELLIGE	0
06/15/1955	15627	SPECIFIC CONDUCTANCE 25C	203
07/13/1955	15947	DISSOLVED BORON	0.16
07/13/1955	15947	DISSOLVED CALCIUM	17
07/13/1955	15947	DISSOLVED CHLORIDE	6.5
07/13/1955	15947	DISSOLVED HARDNESS CaCO3 mg/L	92
07/13/1955	15947	DISSOLVED MAGNESIUM	12
07/13/1955	15947	DISSOLVED POTASSIUM	1.2
07/13/1955	15947	DISSOLVED SODIUM	8.7
07/13/1955	15947	DISSOLVED TOTAL ALKALINITY	96
07/13/1955	15947	LAB pH	8.1
07/13/1955	15947	MINERAL TURBIDITY HELLIGE	1
07/13/1955	15947	SPECIFIC CONDUCTANCE 25C	214
07/19/1955	15964	DISSOLVED BORON	0
07/19/1955	15964	DISSOLVED CALCIUM	21
07/19/1955	15964	DISSOLVED CHLORIDE	6.7
07/19/1955	15964	DISSOLVED FLUORIDE	0
07/19/1955	15964	DISSOLVED HARDNESS CaCO3 mg/L	86
07/19/1955	15964	DISSOLVED MAGNESIUM	8.2
07/19/1955	15964	DISSOLVED NITRATE NO3 mg/L	0.5
07/19/1955	15964	DISSOLVED POTASSIUM	1.5
07/19/1955	15964	DISSOLVED SODIUM	8.6
07/19/1955	15964	DISSOLVED SULFATE SO4 mg/L	5.4
07/19/1955	15964	DISSOLVED TOTAL ALKALINITY	92
07/19/1955	15964	LAB pH	7.8
07/19/1955	15964	MINERAL TURBIDITY HELLIGE	1
07/19/1955	15964	SPECIFIC CONDUCTANCE 25C	206
08/17/1955	16426	DISSOLVED BORON	0.08
08/17/1955	16426	DISSOLVED CALCIUM	14
08/17/1955	16426	DISSOLVED CHLORIDE	4
08/17/1955	16426	DISSOLVED HARDNESS CaCO3 mg/L	71
08/17/1955	16426	DISSOLVED MAGNESIUM	8.8
08/17/1955	16426	DISSOLVED POTASSIUM	1.4
08/17/1955	16426	DISSOLVED SODIUM	8.3
08/17/1955	16426	DISSOLVED TOTAL ALKALINITY	81
08/17/1955	16426	LAB pH	7.3
08/17/1955	16426	MINERAL TURBIDITY HELLIGE	1
08/17/1955	16426	SPECIFIC CONDUCTANCE 25C	172
09/14/1955	16671	Al mg/L D	0.02
09/14/1955	16671	As mg/L D	0
09/14/1955	16671	Cr mg/L D	0
09/14/1955	16671	Cu mg/L D	0
09/14/1955	16671	DISSOLVED BORON	0.02
09/14/1955	16671	DISSOLVED CALCIUM	14
09/14/1955	16671	DISSOLVED CHLORIDE	3.5
09/14/1955	16671	DISSOLVED FLUORIDE	0.3
09/14/1955	16671	DISSOLVED HARDNESS CaCO3 mg/L	66

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/14/1955	16671	DISSOLVED MAGNESIUM	7.4
09/14/1955	16671	DISSOLVED NITRATE NO3 mg/L	0.5
09/14/1955	16671	DISSOLVED POTASSIUM	1.8
09/14/1955	16671	DISSOLVED SILICA	27
09/14/1955	16671	DISSOLVED SODIUM	8.3
09/14/1955	16671	DISSOLVED SULFATE SO4 mg/L	4
09/14/1955	16671	DISSOLVED TOTAL ALKALINITY	75
09/14/1955	16671	Fe mg/L D	0.05
09/14/1955	16671	LAB pH	7.2
09/14/1955	16671	MINERAL TURBIDITY HELLIGE	1
09/14/1955	16671	Mn mg/L D	0
09/14/1955	16671	Pb mg/L D	0
09/14/1955	16671	SPECIFIC CONDUCTANCE 25C	165
09/14/1955	16671	Zn mg/L D	0
10/12/1955	17127	DISSOLVED BORON	0
10/12/1955	17127	DISSOLVED CALCIUM	14
10/12/1955	17127	DISSOLVED CHLORIDE	4.1
10/12/1955	17127	DISSOLVED HARDNESS CaCO3 mg/L	72
10/12/1955	17127	DISSOLVED MAGNESIUM	9.1
10/12/1955	17127	DISSOLVED POTASSIUM	1.4
10/12/1955	17127	DISSOLVED SODIUM	8.6
10/12/1955	17127	DISSOLVED TOTAL ALKALINITY	80
10/12/1955	17127	SPECIFIC CONDUCTANCE 25C	181
12/14/1955	17727	DISSOLVED BORON	0
12/14/1955	17727	DISSOLVED CALCIUM	25
12/14/1955	17727	DISSOLVED CHLORIDE	15
12/14/1955	17727	DISSOLVED HARDNESS CaCO3 mg/L	109
12/14/1955	17727	DISSOLVED MAGNESIUM	11
12/14/1955	17727	DISSOLVED POTASSIUM	1
12/14/1955	17727	DISSOLVED SODIUM	11
12/14/1955	17727	DISSOLVED TOTAL ALKALINITY	96
12/14/1955	17727	LAB pH	7.7
12/14/1955	17727	MINERAL TURBIDITY HELLIGE	5
12/14/1955	17727	SPECIFIC CONDUCTANCE 25C	266
01/17/1956	18147	DISSOLVED BORON	0.11
01/17/1956	18147	DISSOLVED CALCIUM	19
01/17/1956	18147	DISSOLVED CHLORIDE	1.5
01/17/1956	18147	DISSOLVED HARDNESS CaCO3 mg/L	80
01/17/1956	18147	DISSOLVED MAGNESIUM	8
01/17/1956	18147	DISSOLVED POTASSIUM	0.9
01/17/1956	18147	DISSOLVED SODIUM	5
01/17/1956	18147	DISSOLVED TOTAL ALKALINITY	77
01/17/1956	18147	LAB pH	7.8
01/17/1956	18147	MINERAL TURBIDITY HELLIGE	0
01/17/1956	18147	SPECIFIC CONDUCTANCE 25C	172
02/07/1956	18389	DISSOLVED BORON	0.01
02/07/1956	18389	DISSOLVED CALCIUM	28
02/07/1956	18389	DISSOLVED CHLORIDE	3.6
02/07/1956	18389	DISSOLVED HARDNESS CaCO3 mg/L	117
02/07/1956	18389	DISSOLVED MAGNESIUM	11
02/07/1956	18389	DISSOLVED POTASSIUM	0.9
02/07/1956	18389	DISSOLVED SODIUM	8.8

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/07/1956	18389	DISSOLVED TOTAL ALKALINITY	113
02/07/1956	18389	LAB pH	8.4
02/07/1956	18389	MINERAL TURBIDITY HELLIGE	20
02/07/1956	18389	SPECIFIC CONDUCTANCE 25C	259
03/08/1956	8379	DISSOLVED BORON	0.02
03/08/1956	8379	DISSOLVED CALCIUM	11
03/08/1956	8379	DISSOLVED CHLORIDE	2.6
03/08/1956	8379	DISSOLVED FLUORIDE	0.1
03/08/1956	8379	DISSOLVED HARDNESS CaCO3 mg/L	50
03/08/1956	8379	DISSOLVED MAGNESIUM	5.6
03/08/1956	8379	DISSOLVED NITRATE NO3 mg/L	5.9
03/08/1956	8379	DISSOLVED POTASSIUM	0.9
03/08/1956	8379	DISSOLVED SILICA	19
03/08/1956	8379	DISSOLVED SODIUM	6.1
03/08/1956	8379	DISSOLVED SULFATE SO4 mg/L	6.2
03/08/1956	8379	DISSOLVED TOTAL ALKALINITY	52
03/08/1956	8379	Fe mg/L D	0.7
03/08/1956	8379	LAB pH	7.6
03/08/1956	8379	SPECIFIC CONDUCTANCE 25C	129
03/13/1956	18489	DISSOLVED BORON	0.03
03/13/1956	18489	DISSOLVED CALCIUM	27
03/13/1956	18489	DISSOLVED CHLORIDE	3.8
03/13/1956	18489	DISSOLVED HARDNESS CaCO3 mg/L	114
03/13/1956	18489	DISSOLVED MAGNESIUM	11
03/13/1956	18489	DISSOLVED POTASSIUM	0.7
03/13/1956	18489	DISSOLVED SODIUM	7.7
03/13/1956	18489	DISSOLVED TOTAL ALKALINITY	110
03/13/1956	18489	LAB pH	8.4
03/13/1956	18489	MINERAL TURBIDITY HELLIGE	15
03/13/1956	18489	SPECIFIC CONDUCTANCE 25C	251
04/10/1956	18754	DISSOLVED BORON	0
04/10/1956	18754	DISSOLVED CALCIUM	25
04/10/1956	18754	DISSOLVED CHLORIDE	3.4
04/10/1956	18754	DISSOLVED HARDNESS CaCO3 mg/L	94
04/10/1956	18754	DISSOLVED MAGNESIUM	7.7
04/10/1956	18754	DISSOLVED POTASSIUM	1.2
04/10/1956	18754	DISSOLVED SODIUM	6.6
04/10/1956	18754	DISSOLVED TOTAL ALKALINITY	98
04/10/1956	18754	LAB pH	7.9
04/10/1956	18754	MINERAL TURBIDITY HELLIGE	25
04/10/1956	18754	SPECIFIC CONDUCTANCE 25C	209
05/08/1956	19004	Al mg/L D	0.06
05/08/1956	19004	As mg/L D	0
05/08/1956	19004	CHROMIUM (+6) Dissolved	0
05/08/1956	19004	Cu mg/L D	0.01
05/08/1956	19004	DISSOLVED BORON	0.03
05/08/1956	19004	DISSOLVED CALCIUM	20
05/08/1956	19004	DISSOLVED CHLORIDE	2.2
05/08/1956	19004	DISSOLVED FLUORIDE	0.2
05/08/1956	19004	DISSOLVED HARDNESS CaCO3 mg/L	89
05/08/1956	19004	DISSOLVED MAGNESIUM	9.6
05/08/1956	19004	DISSOLVED NITRATE NO3 mg/L	0.4

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05/08/1956	19004	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/08/1956	19004	DISSOLVED POTASSIUM	0.8
05/08/1956	19004	DISSOLVED SILICA	18
05/08/1956	19004	DISSOLVED SODIUM	6.6
05/08/1956	19004	DISSOLVED SULFATE SO ₄ mg/L	10
05/08/1956	19004	DISSOLVED TOTAL ALKALINITY	90
05/08/1956	19004	Fe mg/L D	0.08
05/08/1956	19004	LAB pH	7.8
05/08/1956	19004	MINERAL TURBIDITY HELLIGE	75
05/08/1956	19004	Mn mg/L D	0
05/08/1956	19004	NUTRIENT TURBIDITY NOT C,A,E,B	75
05/08/1956	19004	Pb mg/L D	0
05/08/1956	19004	SPECIFIC CONDUCTANCE 25C	196
05/08/1956	19004	Zn mg/L D	0.01
06/12/1956	19285	DISSOLVED BORON	0
06/12/1956	19285	DISSOLVED CALCIUM	21
06/12/1956	19285	DISSOLVED CHLORIDE	4.8
06/12/1956	19285	DISSOLVED HARDNESS CaCO ₃ mg/L	93
06/12/1956	19285	DISSOLVED MAGNESIUM	10
06/12/1956	19285	DISSOLVED POTASSIUM	1.1
06/12/1956	19285	DISSOLVED SODIUM	7.1
06/12/1956	19285	DISSOLVED TOTAL ALKALINITY	94
06/12/1956	19285	MINERAL TURBIDITY HELLIGE	1
06/12/1956	19285	SPECIFIC CONDUCTANCE 25C	209
07/17/1956	19642	DISSOLVED BORON	0.03
07/17/1956	19642	DISSOLVED CALCIUM	23
07/17/1956	19642	DISSOLVED CHLORIDE	6.8
07/17/1956	19642	DISSOLVED HARDNESS CaCO ₃ mg/L	100
07/17/1956	19642	DISSOLVED MAGNESIUM	10
07/17/1956	19642	DISSOLVED POTASSIUM	1.4
07/17/1956	19642	DISSOLVED SODIUM	8.9
07/17/1956	19642	DISSOLVED TOTAL ALKALINITY	105
07/17/1956	19642	LAB pH	7.5
07/17/1956	19642	MINERAL TURBIDITY HELLIGE	2
07/17/1956	19642	SPECIFIC CONDUCTANCE 25C	224
08/14/1956	19801	DISSOLVED BORON	0.13
08/14/1956	19801	DISSOLVED CALCIUM	20
08/14/1956	19801	DISSOLVED CHLORIDE	3.2
08/14/1956	19801	DISSOLVED HARDNESS CaCO ₃ mg/L	91
08/14/1956	19801	DISSOLVED MAGNESIUM	10
08/14/1956	19801	DISSOLVED POTASSIUM	1.5
08/14/1956	19801	DISSOLVED SODIUM	8.6
08/14/1956	19801	DISSOLVED TOTAL ALKALINITY	98
08/14/1956	19801	LAB pH	7.5
08/14/1956	19801	MINERAL TURBIDITY HELLIGE	3
08/14/1956	19801	SPECIFIC CONDUCTANCE 25C	206
09/18/1956	20237	Al mg/L D	0.1
09/18/1956	20237	As mg/L D	0
09/18/1956	20237	CHROMIUM (+6) Dissolved	0
09/18/1956	20237	Cu mg/L D	0.01
09/18/1956	20237	DISSOLVED BORON	0.02
09/18/1956	20237	DISSOLVED CALCIUM	18

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/18/1956	20237	DISSOLVED CHLORIDE	3.8
09/18/1956	20237	DISSOLVED FLUORIDE	0.1
09/18/1956	20237	DISSOLVED HARDNESS CaCO3 mg/L	82
09/18/1956	20237	DISSOLVED MAGNESIUM	9
09/18/1956	20237	DISSOLVED NITRATE NO3 mg/L	0.6
09/18/1956	20237	DISSOLVED POTASSIUM	1.2
09/18/1956	20237	DISSOLVED SILICA	26
09/18/1956	20237	DISSOLVED SODIUM	7.8
09/18/1956	20237	DISSOLVED SULFATE SO4 mg/L	6.1
09/18/1956	20237	DISSOLVED TOTAL ALKALINITY	90
09/18/1956	20237	Fe mg/L D	0.08
09/18/1956	20237	LAB pH	7.5
09/18/1956	20237	MINERAL TURBIDITY HELLIGE	95
09/18/1956	20237	Mn mg/L D	0
09/18/1956	20237	Pb mg/L D	0
09/18/1956	20237	SPECIFIC CONDUCTANCE 25C	187
09/18/1956	20237	Zn mg/L D	0.01
10/16/1956	20804	DISSOLVED BORON	0.01
10/16/1956	20804	DISSOLVED CALCIUM	18
10/16/1956	20804	DISSOLVED CHLORIDE	6.9
10/16/1956	20804	DISSOLVED HARDNESS CaCO3 mg/L	76
10/16/1956	20804	DISSOLVED MAGNESIUM	7.6
10/16/1956	20804	DISSOLVED POTASSIUM	1
10/16/1956	20804	DISSOLVED SODIUM	7.9
10/16/1956	20804	DISSOLVED TOTAL ALKALINITY	83
10/16/1956	20804	LAB pH	7.6
10/16/1956	20804	SPECIFIC CONDUCTANCE 25C	181
11/19/1956	20964	DISSOLVED BORON	0.02
11/19/1956	20964	DISSOLVED CALCIUM	25
11/19/1956	20964	DISSOLVED CHLORIDE	15
11/19/1956	20964	DISSOLVED HARDNESS CaCO3 mg/L	115
11/19/1956	20964	DISSOLVED MAGNESIUM	13
11/19/1956	20964	DISSOLVED POTASSIUM	1
11/19/1956	20964	DISSOLVED SODIUM	12
11/19/1956	20964	DISSOLVED TOTAL ALKALINITY	114
11/19/1956	20964	LAB pH	7.5
11/19/1956	20964	MINERAL TURBIDITY HELLIGE	1
11/19/1956	20964	SPECIFIC CONDUCTANCE 25C	272
12/11/1956	21100	DISSOLVED BORON	0.04
12/11/1956	21100	DISSOLVED CALCIUM	27
12/11/1956	21100	DISSOLVED CHLORIDE	16
12/11/1956	21100	DISSOLVED HARDNESS CaCO3 mg/L	120
12/11/1956	21100	DISSOLVED MAGNESIUM	13
12/11/1956	21100	DISSOLVED POTASSIUM	0.9
12/11/1956	21100	DISSOLVED SODIUM	11
12/11/1956	21100	DISSOLVED TOTAL ALKALINITY	116
12/11/1956	21100	LAB pH	7.6
12/11/1956	21100	MINERAL TURBIDITY HELLIGE	1
12/11/1956	21100	SPECIFIC CONDUCTANCE 25C	279
02/14/1957	21642	DISSOLVED BORON	0.05
02/14/1957	21642	DISSOLVED CALCIUM	28
02/14/1957	21642	DISSOLVED CHLORIDE	22

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/14/1957	21642	DISSOLVED HARDNESS CaCO3 mg/L	124
02/14/1957	21642	DISSOLVED MAGNESIUM	13
02/14/1957	21642	DISSOLVED POTASSIUM	0.9
02/14/1957	21642	DISSOLVED SODIUM	15
02/14/1957	21642	DISSOLVED TOTAL ALKALINITY	108
02/14/1957	21642	LAB pH	7.8
02/14/1957	21642	MINERAL TURBIDITY HELLIGE	3
02/14/1957	21642	SPECIFIC CONDUCTANCE 25C	303
03/13/1957	21734	DISSOLVED BORON	0.07
03/13/1957	21734	DISSOLVED CALCIUM	20
03/13/1957	21734	DISSOLVED CHLORIDE	4.6
03/13/1957	21734	DISSOLVED HARDNESS CaCO3 mg/L	91
03/13/1957	21734	DISSOLVED MAGNESIUM	10
03/13/1957	21734	DISSOLVED POTASSIUM	1.1
03/13/1957	21734	DISSOLVED SODIUM	7.9
03/13/1957	21734	DISSOLVED TOTAL ALKALINITY	89
03/13/1957	21734	LAB pH	7.7
03/13/1957	21734	MINERAL TURBIDITY HELLIGE	50
03/13/1957	21734	SPECIFIC CONDUCTANCE 25C	209
04/09/1957	22005	DISSOLVED BORON	0.02
04/09/1957	22005	DISSOLVED CALCIUM	25
04/09/1957	22005	DISSOLVED CHLORIDE	7.3
04/09/1957	22005	DISSOLVED HARDNESS CaCO3 mg/L	107
04/09/1957	22005	DISSOLVED MAGNESIUM	11
04/09/1957	22005	DISSOLVED POTASSIUM	0.9
04/09/1957	22005	DISSOLVED SODIUM	8.1
04/09/1957	22005	DISSOLVED TOTAL ALKALINITY	100
04/09/1957	22005	LAB pH	7.8
04/09/1957	22005	MINERAL TURBIDITY HELLIGE	2
04/09/1957	22005	SPECIFIC CONDUCTANCE 25C	233
05/07/1957	22215	Al mg/L D	0.16
05/07/1957	22215	As mg/L D	0
05/07/1957	22215	CHROMIUM (+6) Dissolved	0
05/07/1957	22215	Cu mg/L D	0.01
05/07/1957	22215	DISSOLVED BORON	0
05/07/1957	22215	DISSOLVED CALCIUM	23
05/07/1957	22215	DISSOLVED CHLORIDE	7
05/07/1957	22215	DISSOLVED FLUORIDE	0
05/07/1957	22215	DISSOLVED HARDNESS CaCO3 mg/L	96
05/07/1957	22215	DISSOLVED MAGNESIUM	9.4
05/07/1957	22215	DISSOLVED NITRATE NO3 mg/L	0.4
05/07/1957	22215	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/07/1957	22215	DISSOLVED POTASSIUM	0.9
05/07/1957	22215	DISSOLVED SILICA	18
05/07/1957	22215	DISSOLVED SODIUM	7.9
05/07/1957	22215	DISSOLVED SULFATE SO4 mg/L	9.6
05/07/1957	22215	DISSOLVED TOTAL ALKALINITY	94
05/07/1957	22215	Fe mg/L D	0.02
05/07/1957	22215	LAB pH	7.6
05/07/1957	22215	MINERAL TURBIDITY HELLIGE	2
05/07/1957	22215	Mn mg/L D	0
05/07/1957	22215	NUTRIENT TURBIDITY NOT C,A,E,B	2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/07/1957	22215	Pb mg/L D	0
05/07/1957	22215	SPECIFIC CONDUCTANCE 25C	218
05/07/1957	22215	Zn mg/L D	0.02
06/11/1957	22450	DISSOLVED BORON	0.14
06/11/1957	22450	DISSOLVED CALCIUM	23
06/11/1957	22450	DISSOLVED CHLORIDE	6.1
06/11/1957	22450	DISSOLVED HARDNESS CaCO3 mg/L	96
06/11/1957	22450	DISSOLVED MAGNESIUM	9.4
06/11/1957	22450	DISSOLVED POTASSIUM	1
06/11/1957	22450	DISSOLVED SODIUM	6.6
06/11/1957	22450	DISSOLVED TOTAL ALKALINITY	89
06/11/1957	22450	LAB pH	7.6
06/11/1957	22450	MINERAL TURBIDITY HELLIGE	10
06/11/1957	22450	SPECIFIC CONDUCTANCE 25C	204
07/09/1957	22782	DISSOLVED BORON	0.03
07/09/1957	22782	DISSOLVED CHLORIDE	6.1
07/09/1957	22782	DISSOLVED HARDNESS CaCO3 mg/L	92
07/09/1957	22782	DISSOLVED SODIUM	8.2
07/09/1957	22782	DISSOLVED TOTAL ALKALINITY	98
07/09/1957	22782	LAB pH	8.1
07/09/1957	22782	MINERAL TURBIDITY HELLIGE	2
07/09/1957	22782	SPECIFIC CONDUCTANCE 25C	211
08/13/1957	23312	DISSOLVED BORON	0.02
08/13/1957	23312	DISSOLVED CHLORIDE	5
08/13/1957	23312	DISSOLVED HARDNESS CaCO3 mg/L	91
08/13/1957	23312	DISSOLVED SODIUM	8.7
08/13/1957	23312	DISSOLVED TOTAL ALKALINITY	91
08/13/1957	23312	LAB pH	7.8
08/13/1957	23312	SPECIFIC CONDUCTANCE 25C	196
09/17/1957	23863	Al mg/L D	0.04
09/17/1957	23863	As mg/L D	0
09/17/1957	23863	CHROMIUM (+6) Dissolved	0
09/17/1957	23863	Cu mg/L D	0
09/17/1957	23863	DISSOLVED BORON	0
09/17/1957	23863	DISSOLVED CALCIUM	17
09/17/1957	23863	DISSOLVED CHLORIDE	6.4
09/17/1957	23863	DISSOLVED FLUORIDE	0
09/17/1957	23863	DISSOLVED HARDNESS CaCO3 mg/L	78
09/17/1957	23863	DISSOLVED MAGNESIUM	8.8
09/17/1957	23863	DISSOLVED NITRATE NO3 mg/L	0.5
09/17/1957	23863	DISSOLVED ORTHOPHOSPHATE as P	0.03
09/17/1957	23863	DISSOLVED POTASSIUM	1.7
09/17/1957	23863	DISSOLVED SILICA	31
09/17/1957	23863	DISSOLVED SODIUM	8.7
09/17/1957	23863	DISSOLVED SULFATE SO4 mg/L	5.8
09/17/1957	23863	DISSOLVED TOTAL ALKALINITY	85
09/17/1957	23863	Fe mg/L D	0.01
09/17/1957	23863	LAB pH	7.8
09/17/1957	23863	MINERAL TURBIDITY HELLIGE	2
09/17/1957	23863	Mn mg/L D	0
09/17/1957	23863	NUTRIENT TURBIDITY NOT C,A,E,B	2
09/17/1957	23863	Pb mg/L D	0

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09/17/1957	23863	SPECIFIC CONDUCTANCE 25C	190
09/17/1957	23863	Zn mg/L D	0
10/23/1957	24163	DISSOLVED BORON	0.01
10/23/1957	24163	DISSOLVED CHLORIDE	13
10/23/1957	24163	DISSOLVED HARDNESS CaCO3 mg/L	105
10/23/1957	24163	DISSOLVED SODIUM	9.2
10/23/1957	24163	DISSOLVED TOTAL ALKALINITY	98
10/23/1957	24163	LAB pH	7.8
10/23/1957	24163	MINERAL TURBIDITY HELLIGE	5
10/23/1957	24163	SPECIFIC CONDUCTANCE 25C	248
10/24/1957	24275	Al mg/L D	0.2
10/24/1957	24275	As mg/L D	0
10/24/1957	24275	CHROMIUM (+6) Dissolved	0
10/24/1957	24275	Cu mg/L D	0.06
10/24/1957	24275	DISSOLVED BORON	0
10/24/1957	24275	DISSOLVED CALCIUM	18
10/24/1957	24275	DISSOLVED CHLORIDE	10
10/24/1957	24275	DISSOLVED FLUORIDE	0.1
10/24/1957	24275	DISSOLVED HARDNESS CaCO3 mg/L	85
10/24/1957	24275	DISSOLVED MAGNESIUM	9.7
10/24/1957	24275	DISSOLVED NITRATE NO3 mg/L	0.3
10/24/1957	24275	DISSOLVED ORTHOPHOSPHATE as P	0.05
10/24/1957	24275	DISSOLVED POTASSIUM	1.4
10/24/1957	24275	DISSOLVED SILICA	18
10/24/1957	24275	DISSOLVED SODIUM	9.2
10/24/1957	24275	DISSOLVED SULFATE SO4 mg/L	11
10/24/1957	24275	DISSOLVED TOTAL ALKALINITY	78
10/24/1957	24275	Fe mg/L D	0.02
10/24/1957	24275	LAB pH	7.4
10/24/1957	24275	MINERAL TURBIDITY HELLIGE	4
10/24/1957	24275	Mn mg/L D	0
10/24/1957	24275	Pb mg/L D	0
10/24/1957	24275	SPECIFIC CONDUCTANCE 25C	200
10/24/1957	24275	Zn mg/L D	0
11/13/1957	24398	DISSOLVED BORON	0
11/13/1957	24398	DISSOLVED CHLORIDE	15
11/13/1957	24398	DISSOLVED HARDNESS CaCO3 mg/L	112
11/13/1957	24398	DISSOLVED SODIUM	10
11/13/1957	24398	DISSOLVED TOTAL ALKALINITY	107
11/13/1957	24398	LAB pH	8.1
11/13/1957	24398	MINERAL TURBIDITY HELLIGE	2
11/13/1957	24398	SPECIFIC CONDUCTANCE 25C	261
12/19/1957	24731	DISSOLVED BORON	0.2
12/19/1957	24731	DISSOLVED CHLORIDE	7
12/19/1957	24731	DISSOLVED HARDNESS CaCO3 mg/L	98
12/19/1957	24731	DISSOLVED SODIUM	9
12/19/1957	24731	DISSOLVED TOTAL ALKALINITY	89
12/19/1957	24731	LAB pH	7.2
12/19/1957	24731	MINERAL TURBIDITY HELLIGE	40
12/19/1957	24731	SPECIFIC CONDUCTANCE 25C	221
01/16/1958	24851	DISSOLVED BORON	0.14
01/16/1958	24851	DISSOLVED CHLORIDE	4

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/16/1958	24851	DISSOLVED HARDNESS CaCO3 mg/L	98
01/16/1958	24851	DISSOLVED POTASSIUM	1.2
01/16/1958	24851	DISSOLVED SODIUM	8.5
01/16/1958	24851	DISSOLVED TOTAL ALKALINITY	96
01/16/1958	24851	LAB pH	7.7
01/16/1958	24851	MINERAL TURBIDITY HELLIGE	46
01/16/1958	24851	SPECIFIC CONDUCTANCE 25C	224
02/19/1958	25048	DISSOLVED BORON	0
02/19/1958	25048	DISSOLVED CHLORIDE	0.8
02/19/1958	25048	DISSOLVED HARDNESS CaCO3 mg/L	42
02/19/1958	25048	DISSOLVED SODIUM	2.9
02/19/1958	25048	DISSOLVED TOTAL ALKALINITY	41
02/19/1958	25048	LAB pH	7.7
02/19/1958	25048	MINERAL TURBIDITY HELLIGE	200
02/19/1958	25048	SPECIFIC CONDUCTANCE 25C	89
03/12/1958	25159	DISSOLVED BORON	0
03/12/1958	25159	DISSOLVED CHLORIDE	5.3
03/12/1958	25159	DISSOLVED HARDNESS CaCO3 mg/L	114
03/12/1958	25159	DISSOLVED SODIUM	8.1
03/12/1958	25159	DISSOLVED TOTAL ALKALINITY	107
03/12/1958	25159	LAB pH	7.7
03/12/1958	25159	MINERAL TURBIDITY HELLIGE	20
03/12/1958	25159	SPECIFIC CONDUCTANCE 25C	252
04/16/1958	25570	DISSOLVED BORON	0.05
04/16/1958	25570	DISSOLVED CHLORIDE	2.5
04/16/1958	25570	DISSOLVED HARDNESS CaCO3 mg/L	97
04/16/1958	25570	DISSOLVED SODIUM	6.8
04/16/1958	25570	DISSOLVED TOTAL ALKALINITY	98
04/16/1958	25570	LAB pH	7.7
04/16/1958	25570	MINERAL TURBIDITY HELLIGE	35
04/16/1958	25570	SPECIFIC CONDUCTANCE 25C	221
05/13/1958	25856	Al mg/L D	0.01
05/13/1958	25856	As mg/L D	0
05/13/1958	25856	CHROMIUM (+6) Dissolved	0
05/13/1958	25856	Cu mg/L D	0
05/13/1958	25856	DISSOLVED BORON	0.04
05/13/1958	25856	DISSOLVED CALCIUM	20
05/13/1958	25856	DISSOLVED CHLORIDE	4.8
05/13/1958	25856	DISSOLVED FLUORIDE	0
05/13/1958	25856	DISSOLVED HARDNESS CaCO3 mg/L	88
05/13/1958	25856	DISSOLVED MAGNESIUM	9.2
05/13/1958	25856	DISSOLVED NITRATE NO3 mg/L	0.4
05/13/1958	25856	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/13/1958	25856	DISSOLVED POTASSIUM	1.2
05/13/1958	25856	DISSOLVED SILICA	19
05/13/1958	25856	DISSOLVED SODIUM	7.2
05/13/1958	25856	DISSOLVED SULFATE SO4 mg/L	12
05/13/1958	25856	DISSOLVED TOTAL ALKALINITY	85
05/13/1958	25856	Fe mg/L D	0.03
05/13/1958	25856	LAB pH	8
05/13/1958	25856	MINERAL TURBIDITY HELLIGE	15
05/13/1958	25856	Mn mg/L D	0

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05/13/1958	25856	NUTRIENT TURBIDITY NOT C,A,E,B	15
05/13/1958	25856	Pb mg/L D	0
05/13/1958	25856	SPECIFIC CONDUCTANCE 25C	200
05/13/1958	25856	Zn mg/L D	0.06
06/17/1958	26139	DISSOLVED BORON	0
06/17/1958	26139	DISSOLVED CHLORIDE	6
06/17/1958	26139	DISSOLVED HARDNESS CaCO3 mg/L	101
06/17/1958	26139	DISSOLVED SODIUM	7.7
06/17/1958	26139	DISSOLVED TOTAL ALKALINITY	98
06/17/1958	26139	LAB pH	8
06/17/1958	26139	MINERAL TURBIDITY HELLIGE	10
06/17/1958	26139	SPECIFIC CONDUCTANCE 25C	227
07/15/1958	26513	DISSOLVED BORON	0.1
07/15/1958	26513	DISSOLVED CHLORIDE	6.2
07/15/1958	26513	DISSOLVED HARDNESS CaCO3 mg/L	95
07/15/1958	26513	DISSOLVED SODIUM	8.9
07/15/1958	26513	DISSOLVED TOTAL ALKALINITY	103
07/15/1958	26513	LAB pH	7.8
07/15/1958	26513	MINERAL TURBIDITY HELLIGE	1
07/15/1958	26513	SPECIFIC CONDUCTANCE 25C	225
08/12/1958	26945	DISSOLVED BORON	0
08/12/1958	26945	DISSOLVED CHLORIDE	7
08/12/1958	26945	DISSOLVED HARDNESS CaCO3 mg/L	98
08/12/1958	26945	DISSOLVED SODIUM	8.8
08/12/1958	26945	DISSOLVED TOTAL ALKALINITY	101
08/12/1958	26945	LAB pH	7.8
08/12/1958	26945	MINERAL TURBIDITY HELLIGE	3
08/12/1958	26945	SPECIFIC CONDUCTANCE 25C	214
09/08/1958	27636	As mg/L D	0
09/08/1958	27636	Cr mg/L D	0
09/08/1958	27636	Cu mg/L D	0.01
09/08/1958	27636	Fe mg/L D	0.03
09/08/1958	27636	Mn mg/L D	0
09/08/1958	27636	Pb mg/L D	0
09/08/1958	27636	Zn mg/L D	0
09/09/1958	27636	Al mg/L D	0
09/09/1958	27636	DISSOLVED BORON	0
09/09/1958	27636	DISSOLVED CALCIUM	22
09/09/1958	27636	DISSOLVED CHLORIDE	6
09/09/1958	27636	DISSOLVED FLUORIDE	0
09/09/1958	27636	DISSOLVED HARDNESS CaCO3 mg/L	82
09/09/1958	27636	DISSOLVED MAGNESIUM	6.6
09/09/1958	27636	DISSOLVED NITRATE NO3 mg/L	1
09/09/1958	27636	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/09/1958	27636	DISSOLVED POTASSIUM	2.4
09/09/1958	27636	DISSOLVED SILICA	28
09/09/1958	27636	DISSOLVED SODIUM	7.8
09/09/1958	27636	DISSOLVED SULFATE SO4 mg/L	4.8
09/09/1958	27636	DISSOLVED TOTAL ALKALINITY	84
09/09/1958	27636	LAB pH	7.4
09/09/1958	27636	MINERAL TURBIDITY HELLIGE	19
09/09/1958	27636	NUTRIENT TURBIDITY NOT C,A,E,B	19

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09/09/1958	27636	SPECIFIC CONDUCTANCE 25C	184
10/14/1958	28024	DISSOLVED BORON	0.1
10/14/1958	28024	DISSOLVED CHLORIDE	6.6
10/14/1958	28024	DISSOLVED HARDNESS CaCO3 mg/L	73
10/14/1958	28024	DISSOLVED SODIUM	6.9
10/14/1958	28024	DISSOLVED TOTAL ALKALINITY	78
10/14/1958	28024	LAB pH	7.6
10/14/1958	28024	MINERAL TURBIDITY HELLIGE	1
10/14/1958	28024	SPECIFIC CONDUCTANCE 25C	172
11/11/1958	28328	DISSOLVED BORON	0
11/11/1958	28328	DISSOLVED CHLORIDE	10
11/11/1958	28328	DISSOLVED HARDNESS CaCO3 mg/L	92
11/11/1958	28328	DISSOLVED SODIUM	7.9
11/11/1958	28328	DISSOLVED TOTAL ALKALINITY	92
11/11/1958	28328	LAB pH	8
11/11/1958	28328	MINERAL TURBIDITY HELLIGE	30
11/11/1958	28328	SPECIFIC CONDUCTANCE 25C	217
12/04/1958	28532	DISSOLVED BORON	0
12/04/1958	28532	DISSOLVED CHLORIDE	14
12/04/1958	28532	DISSOLVED HARDNESS CaCO3 mg/L	108
12/04/1958	28532	DISSOLVED SODIUM	8.6
12/04/1958	28532	DISSOLVED TOTAL ALKALINITY	100
12/04/1958	28532	LAB pH	8
12/04/1958	28532	MINERAL TURBIDITY HELLIGE	10
12/04/1958	28532	SPECIFIC CONDUCTANCE 25C	246
01/05/1959	28740	DISSOLVED BORON	0
01/05/1959	28740	DISSOLVED CHLORIDE	18
01/05/1959	28740	DISSOLVED HARDNESS CaCO3 mg/L	100
01/05/1959	28740	DISSOLVED SODIUM	8.5
01/05/1959	28740	DISSOLVED TOTAL ALKALINITY	88
01/05/1959	28740	LAB pH	7.5
01/05/1959	28740	MINERAL TURBIDITY HELLIGE	1
01/05/1959	28740	SPECIFIC CONDUCTANCE 25C	246
02/03/1959	28935	DISSOLVED BORON	0.1
02/03/1959	28935	DISSOLVED CHLORIDE	8
02/03/1959	28935	DISSOLVED HARDNESS CaCO3 mg/L	96
02/03/1959	28935	DISSOLVED SODIUM	8.8
02/03/1959	28935	DISSOLVED TOTAL ALKALINITY	90
02/03/1959	28935	LAB pH	7.5
02/03/1959	28935	MINERAL TURBIDITY HELLIGE	2
02/03/1959	28935	SPECIFIC CONDUCTANCE 25C	228
03/13/1959	29472	DISSOLVED BORON	0
03/13/1959	29472	DISSOLVED CHLORIDE	6.5
03/13/1959	29472	DISSOLVED HARDNESS CaCO3 mg/L	94
03/13/1959	29472	DISSOLVED SODIUM	6.5
03/13/1959	29472	DISSOLVED TOTAL ALKALINITY	92
03/13/1959	29472	LAB pH	7.6
03/13/1959	29472	MINERAL TURBIDITY HELLIGE	10
03/13/1959	29472	SPECIFIC CONDUCTANCE 25C	203
04/10/1959	29670	DISSOLVED BORON	0
04/10/1959	29670	DISSOLVED CHLORIDE	6.2
04/10/1959	29670	DISSOLVED HARDNESS CaCO3 mg/L	94

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04/10/1959	29670	DISSOLVED SODIUM	6
04/10/1959	29670	DISSOLVED TOTAL ALKALINITY	85
04/10/1959	29670	LAB pH	7.9
04/10/1959	29670	MINERAL TURBIDITY HELLIGE	25
04/10/1959	29670	SPECIFIC CONDUCTANCE 25C	202
05/04/1959	29970	Al mg/L D	0.01
05/04/1959	29970	As mg/L D	0
05/04/1959	29970	Cr mg/L D	0
05/04/1959	29970	Cu mg/L D	0
05/04/1959	29970	DISSOLVED BORON	0
05/04/1959	29970	DISSOLVED CALCIUM	18
05/04/1959	29970	DISSOLVED CHLORIDE	3.5
05/04/1959	29970	DISSOLVED FLUORIDE	0.1
05/04/1959	29970	DISSOLVED HARDNESS CaCO3 mg/L	82
05/04/1959	29970	DISSOLVED MAGNESIUM	9
05/04/1959	29970	DISSOLVED NITRATE NO3 mg/L	0.9
05/04/1959	29970	DISSOLVED ORTHOPHOSPHATE as P	0.03
05/04/1959	29970	DISSOLVED POTASSIUM	1
05/04/1959	29970	DISSOLVED SILICA	24
05/04/1959	29970	DISSOLVED SODIUM	7.6
05/04/1959	29970	DISSOLVED SULFATE SO4 mg/L	5.8
05/04/1959	29970	DISSOLVED TOTAL ALKALINITY	88
05/04/1959	29970	Fe mg/L D	0.03
05/04/1959	29970	LAB pH	7.5
05/04/1959	29970	MINERAL TURBIDITY HELLIGE	9
05/04/1959	29970	Mn mg/L D	0
05/04/1959	29970	NUTRIENT TURBIDITY NOT C,A,E,B	9
05/04/1959	29970	Pb mg/L D	0
05/04/1959	29970	SPECIFIC CONDUCTANCE 25C	197
05/04/1959	29970	Zn mg/L D	0
06/02/1959	30177	DISSOLVED BORON	0
06/02/1959	30177	DISSOLVED CHLORIDE	8
06/02/1959	30177	DISSOLVED HARDNESS CaCO3 mg/L	90
06/02/1959	30177	DISSOLVED SODIUM	9.4
06/02/1959	30177	DISSOLVED TOTAL ALKALINITY	93
06/02/1959	30177	LAB pH	8.1
06/02/1959	30177	MINERAL TURBIDITY HELLIGE	10
06/02/1959	30177	SPECIFIC CONDUCTANCE 25C	205
07/14/1959	30513	DISSOLVED BORON	0
07/14/1959	30513	DISSOLVED CHLORIDE	4.2
07/14/1959	30513	DISSOLVED HARDNESS CaCO3 mg/L	81
07/14/1959	30513	DISSOLVED SODIUM	8.7
07/14/1959	30513	DISSOLVED TOTAL ALKALINITY	89
07/14/1959	30513	LAB pH	7.9
07/14/1959	30513	MINERAL TURBIDITY HELLIGE	1
07/14/1959	30513	SPECIFIC CONDUCTANCE 25C	184
08/10/1959	30892	DISSOLVED BORON	0
08/10/1959	30892	DISSOLVED CHLORIDE	3.8
08/10/1959	30892	DISSOLVED HARDNESS CaCO3 mg/L	74
08/10/1959	30892	DISSOLVED SODIUM	10
08/10/1959	30892	DISSOLVED TOTAL ALKALINITY	84
08/10/1959	30892	LAB pH	8.2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

08/10/1959	30892	MINERAL TURBIDITY HELLIGE	2
08/10/1959	30892	SPECIFIC CONDUCTANCE 25C	177
09/01/1959	31223	Al mg/L D	0
09/01/1959	31223	As mg/L D	0
09/01/1959	31223	Cr mg/L D	0
09/01/1959	31223	Cu mg/L D	0.01
09/01/1959	31223	DISSOLVED BORON	0
09/01/1959	31223	DISSOLVED CALCIUM	15
09/01/1959	31223	DISSOLVED CHLORIDE	3.4
09/01/1959	31223	DISSOLVED FLUORIDE	0
09/01/1959	31223	DISSOLVED HARDNESS CaCO3 mg/L	72
09/01/1959	31223	DISSOLVED MAGNESIUM	8.4
09/01/1959	31223	DISSOLVED NITRATE NO3 mg/L	0.1
09/01/1959	31223	DISSOLVED ORTHOPHOSPHATE as P	0
09/01/1959	31223	DISSOLVED POTASSIUM	1.7
09/01/1959	31223	DISSOLVED SILICA	27
09/01/1959	31223	DISSOLVED SODIUM	8.6
09/01/1959	31223	DISSOLVED SULFATE SO4 mg/L	4
09/01/1959	31223	DISSOLVED TOTAL ALKALINITY	80
09/01/1959	31223	Fe mg/L D	0.01
09/01/1959	31223	LAB pH	7.6
09/01/1959	31223	MINERAL TURBIDITY HELLIGE	9
09/01/1959	31223	Mn mg/L D	0
09/01/1959	31223	Pb mg/L D	0
09/01/1959	31223	SPECIFIC CONDUCTANCE 25C	173
09/01/1959	31223	Zn mg/L D	0
10/12/1959	31550	DISSOLVED BORON	0
10/12/1959	31550	DISSOLVED CHLORIDE	6
10/12/1959	31550	DISSOLVED HARDNESS CaCO3 mg/L	72
10/12/1959	31550	DISSOLVED SODIUM	13
10/12/1959	31550	DISSOLVED TOTAL ALKALINITY	89
10/12/1959	31550	LAB pH	7.9
10/12/1959	31550	MINERAL TURBIDITY HELLIGE	1
10/12/1959	31550	SPECIFIC CONDUCTANCE 25C	184
11/03/1959	32017	DISSOLVED BORON	0
11/03/1959	32017	DISSOLVED CHLORIDE	4
11/03/1959	32017	DISSOLVED HARDNESS CaCO3 mg/L	72
11/03/1959	32017	DISSOLVED SODIUM	12
11/03/1959	32017	DISSOLVED TOTAL ALKALINITY	87
11/03/1959	32017	LAB pH	7.9
11/03/1959	32017	MINERAL TURBIDITY HELLIGE	3
11/03/1959	32017	SPECIFIC CONDUCTANCE 25C	187
12/01/1959	32323	DISSOLVED BORON	0.1
12/01/1959	32323	DISSOLVED CHLORIDE	7
12/01/1959	32323	DISSOLVED HARDNESS CaCO3 mg/L	80
12/01/1959	32323	DISSOLVED SODIUM	9.5
12/01/1959	32323	DISSOLVED TOTAL ALKALINITY	85
12/01/1959	32323	LAB pH	7.2
12/01/1959	32323	MINERAL TURBIDITY HELLIGE	20
12/01/1959	32323	SPECIFIC CONDUCTANCE 25C	192
01/06/1960	12672	BOD 5-DAY	0.5
01/06/1960	12672	DISSOLVED ORTHOPHOSPHATE as P	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/06/1960	12672	METHYLENE BLUE ACTIVE SUBSTANC	0
01/06/1960	12672	TOTAL PHOSPHORUS as P	0.1
01/12/1960	32667	DISSOLVED BORON	0
01/12/1960	32667	DISSOLVED CHLORIDE	22
01/12/1960	32667	DISSOLVED HARDNESS CaCO3 mg/L	110
01/12/1960	32667	DISSOLVED SODIUM	13
01/12/1960	32667	DISSOLVED TOTAL ALKALINITY	96
01/12/1960	32667	LAB pH	7.5
01/12/1960	32667	MINERAL TURBIDITY HELLIGE	2
01/12/1960	32667	SPECIFIC CONDUCTANCE 25C	270
02/02/1960	32843	DISSOLVED BORON	0
02/02/1960	32843	DISSOLVED CHLORIDE	13
02/02/1960	32843	DISSOLVED HARDNESS CaCO3 mg/L	82
02/02/1960	32843	DISSOLVED SODIUM	6.6
02/02/1960	32843	DISSOLVED TOTAL ALKALINITY	60
02/02/1960	32843	LAB pH	7.3
02/02/1960	32843	MINERAL TURBIDITY HELLIGE	150
02/02/1960	32843	SPECIFIC CONDUCTANCE 25C	176
03/07/1960	33136	DISSOLVED BORON	0.1
03/07/1960	33136	DISSOLVED CHLORIDE	3.5
03/07/1960	33136	DISSOLVED HARDNESS CaCO3 mg/L	60
03/07/1960	33136	DISSOLVED SODIUM	5.1
03/07/1960	33136	DISSOLVED TOTAL ALKALINITY	54
03/07/1960	33136	LAB pH	7.3
03/07/1960	33136	MINERAL TURBIDITY HELLIGE	600
03/07/1960	33136	SPECIFIC CONDUCTANCE 25C	140
04/11/1960	33391	DISSOLVED BORON	0
04/11/1960	33391	DISSOLVED CHLORIDE	8
04/11/1960	33391	DISSOLVED HARDNESS CaCO3 mg/L	96
04/11/1960	33391	DISSOLVED SODIUM	6.4
04/11/1960	33391	DISSOLVED TOTAL ALKALINITY	90
04/11/1960	33391	LAB pH	7.9
04/11/1960	33391	MINERAL TURBIDITY HELLIGE	15
04/11/1960	33391	SPECIFIC CONDUCTANCE 25C	212
05/10/1960	33762	Al mg/L D	0.32
05/10/1960	33762	As mg/L D	0
05/10/1960	33762	Cr mg/L D	0
05/10/1960	33762	Cu mg/L D	0.01
05/10/1960	33762	DISSOLVED BORON	0
05/10/1960	33762	DISSOLVED CALCIUM	22
05/10/1960	33762	DISSOLVED CHLORIDE	9
05/10/1960	33762	DISSOLVED FLUORIDE	0.1
05/10/1960	33762	DISSOLVED HARDNESS CaCO3 mg/L	98
05/10/1960	33762	DISSOLVED MAGNESIUM	10
05/10/1960	33762	DISSOLVED NITRATE NO3 mg/L	0.4
05/10/1960	33762	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/10/1960	33762	DISSOLVED POTASSIUM	1.2
05/10/1960	33762	DISSOLVED SILICA	20
05/10/1960	33762	DISSOLVED SODIUM	8.1
05/10/1960	33762	DISSOLVED SULFATE SO4 mg/L	9
05/10/1960	33762	DISSOLVED TOTAL ALKALINITY	97
05/10/1960	33762	Fe mg/L D	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/10/1960	33762	LAB pH	8
05/10/1960	33762	MINERAL TURBIDITY HELLIGE	15
05/10/1960	33762	Mn mg/L D	0
05/10/1960	33762	NUTRIENT TURBIDITY NOT C,A,E,B	15
05/10/1960	33762	Pb mg/L D	0
05/10/1960	33762	SPECIFIC CONDUCTANCE 25C	216
05/10/1960	33762	Zn mg/L D	0
06/13/1960	34093	DISSOLVED BORON	0.1
06/13/1960	34093	DISSOLVED CHLORIDE	7.5
06/13/1960	34093	DISSOLVED HARDNESS CaCO3 mg/L	94
06/13/1960	34093	DISSOLVED SODIUM	6.7
06/13/1960	34093	DISSOLVED TOTAL ALKALINITY	96
06/13/1960	34093	LAB pH	7.7
06/13/1960	34093	MINERAL TURBIDITY HELLIGE	1
06/13/1960	34093	SPECIFIC CONDUCTANCE 25C	203
07/04/1960	34246	DISSOLVED BORON	0
07/04/1960	34246	DISSOLVED CHLORIDE	4.5
07/04/1960	34246	DISSOLVED HARDNESS CaCO3 mg/L	88
07/04/1960	34246	DISSOLVED SODIUM	7
07/04/1960	34246	DISSOLVED TOTAL ALKALINITY	92
07/04/1960	34246	LAB pH	8.2
07/04/1960	34246	MINERAL TURBIDITY HELLIGE	10
07/04/1960	34246	SPECIFIC CONDUCTANCE 25C	190
08/08/1960	34463	DISSOLVED BORON	0.1
08/08/1960	34463	DISSOLVED CHLORIDE	5.2
08/08/1960	34463	DISSOLVED HARDNESS CaCO3 mg/L	80
08/08/1960	34463	DISSOLVED SODIUM	8.5
08/08/1960	34463	DISSOLVED TOTAL ALKALINITY	86
08/08/1960	34463	LAB pH	7.4
08/08/1960	34463	MINERAL TURBIDITY HELLIGE	2
08/08/1960	34463	SPECIFIC CONDUCTANCE 25C	192
09/05/1960	34688	Al mg/L D	0.01
09/05/1960	34688	As mg/L D	0
09/05/1960	34688	Cr mg/L D	0
09/05/1960	34688	Cu mg/L D	0.05
09/05/1960	34688	DISSOLVED BORON	0.1
09/05/1960	34688	DISSOLVED CALCIUM	16
09/05/1960	34688	DISSOLVED CHLORIDE	3.9
09/05/1960	34688	DISSOLVED FLUORIDE	0
09/05/1960	34688	DISSOLVED HARDNESS CaCO3 mg/L	72
09/05/1960	34688	DISSOLVED MAGNESIUM	7.9
09/05/1960	34688	DISSOLVED NITRATE NO3 mg/L	0
09/05/1960	34688	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/05/1960	34688	DISSOLVED POTASSIUM	1.3
09/05/1960	34688	DISSOLVED SILICA	25
09/05/1960	34688	DISSOLVED SODIUM	9.5
09/05/1960	34688	DISSOLVED SULFATE SO4 mg/L	7
09/05/1960	34688	DISSOLVED TOTAL ALKALINITY	84
09/05/1960	34688	Fe mg/L D	0.05
09/05/1960	34688	LAB pH	7.5
09/05/1960	34688	MINERAL TURBIDITY HELLIGE	7
09/05/1960	34688	Mn mg/L D	0

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09/05/1960	34688	NUTRIENT TURBIDITY NOT C,A,E,B	7
09/05/1960	34688	Pb mg/L D	0
09/05/1960	34688	SPECIFIC CONDUCTANCE 25C	175
09/05/1960	34688	Zn mg/L D	0
10/10/1960	34934	DISSOLVED BORON	0
10/10/1960	34934	DISSOLVED CALCIUM	14
10/10/1960	34934	DISSOLVED CHLORIDE	4.5
10/10/1960	34934	DISSOLVED HARDNESS CaCO3 mg/L	69
10/10/1960	34934	DISSOLVED MAGNESIUM	8.3
10/10/1960	34934	DISSOLVED SODIUM	8.6
10/10/1960	34934	DISSOLVED TOTAL ALKALINITY	77
10/10/1960	34934	LAB pH	7.9
10/10/1960	34934	MINERAL TURBIDITY HELLIGE	1
10/10/1960	34934	SPECIFIC CONDUCTANCE 25C	172
11/07/1960	35204	DISSOLVED BORON	0
11/07/1960	35204	DISSOLVED CHLORIDE	8.9
11/07/1960	35204	DISSOLVED HARDNESS CaCO3 mg/L	75
11/07/1960	35204	DISSOLVED SODIUM	9.9
11/07/1960	35204	DISSOLVED TOTAL ALKALINITY	78
11/07/1960	35204	LAB pH	7.8
11/07/1960	35204	MINERAL TURBIDITY HELLIGE	1
11/07/1960	35204	SPECIFIC CONDUCTANCE 25C	180
11/30/1960	19121	DISSOLVED BORON	0.09
11/30/1960	19121	DISSOLVED CALCIUM	27
11/30/1960	19121	DISSOLVED CHLORIDE	20
11/30/1960	19121	DISSOLVED FLUORIDE	0.1
11/30/1960	19121	DISSOLVED HARDNESS CaCO3 mg/L	117
11/30/1960	19121	DISSOLVED MAGNESIUM	12
11/30/1960	19121	DISSOLVED NITRATE NO3 mg/L	1
11/30/1960	19121	DISSOLVED POTASSIUM	1.2
11/30/1960	19121	DISSOLVED SILICA	17
11/30/1960	19121	DISSOLVED SODIUM	11
11/30/1960	19121	DISSOLVED SULFATE SO4 mg/L	13
11/30/1960	19121	DISSOLVED TOTAL ALKALINITY	101
11/30/1960	19121	LAB pH	8
11/30/1960	19121	SPECIFIC CONDUCTANCE 25C	281
12/12/1960	35528	DISSOLVED BORON	0
12/12/1960	35528	DISSOLVED CHLORIDE	17
12/12/1960	35528	DISSOLVED HARDNESS CaCO3 mg/L	110
12/12/1960	35528	DISSOLVED SODIUM	11
12/12/1960	35528	DISSOLVED TOTAL ALKALINITY	98
12/12/1960	35528	LAB pH	8
12/12/1960	35528	MINERAL TURBIDITY HELLIGE	3
12/12/1960	35528	SPECIFIC CONDUCTANCE 25C	269
01/10/1961	35760	DISSOLVED BORON	0
01/10/1961	35760	DISSOLVED CHLORIDE	13
01/10/1961	35760	DISSOLVED HARDNESS CaCO3 mg/L	122
01/10/1961	35760	DISSOLVED SODIUM	11
01/10/1961	35760	DISSOLVED TOTAL ALKALINITY	119
01/10/1961	35760	LAB pH	7.9
01/10/1961	35760	MINERAL TURBIDITY HELLIGE	2
01/10/1961	35760	SPECIFIC CONDUCTANCE 25C	246

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/13/1961	36020	DISSOLVED BORON	0
02/13/1961	36020	DISSOLVED CHLORIDE	3.2
02/13/1961	36020	DISSOLVED HARDNESS CaCO3 mg/L	86
02/13/1961	36020	DISSOLVED SODIUM	6.6
02/13/1961	36020	DISSOLVED TOTAL ALKALINITY	80
02/13/1961	36020	LAB pH	8.1
02/13/1961	36020	MINERAL TURBIDITY HELLIGE	40
02/13/1961	36020	SPECIFIC CONDUCTANCE 25C	199
03/06/1961	36232	DISSOLVED BORON	0
03/06/1961	36232	DISSOLVED CHLORIDE	6.2
03/06/1961	36232	DISSOLVED HARDNESS CaCO3 mg/L	97
03/06/1961	36232	DISSOLVED SODIUM	10
03/06/1961	36232	DISSOLVED SOLIDS mg/L at 180C	133
03/06/1961	36232	DISSOLVED TOTAL ALKALINITY	93
03/06/1961	36232	LAB pH	7.8
03/06/1961	36232	MINERAL TURBIDITY HELLIGE	2
03/06/1961	36232	SPECIFIC CONDUCTANCE 25C	228
04/10/1961	36560	DISSOLVED BORON	0
04/10/1961	36560	DISSOLVED CHLORIDE	5.5
04/10/1961	36560	DISSOLVED HARDNESS CaCO3 mg/L	102
04/10/1961	36560	DISSOLVED SODIUM	8.3
04/10/1961	36560	DISSOLVED SOLIDS mg/L at 180C	130
04/10/1961	36560	DISSOLVED TOTAL ALKALINITY	98
04/10/1961	36560	LAB pH	8.3
04/10/1961	36560	MINERAL TURBIDITY HELLIGE	2
04/10/1961	36560	SPECIFIC CONDUCTANCE 25C	222
05/08/1961	36876	Al mg/L D	0.01
05/08/1961	36876	As mg/L D	0
05/08/1961	36876	Cr mg/L D	0
05/08/1961	36876	Cu mg/L D	0.01
05/08/1961	36876	DISSOLVED BORON	0
05/08/1961	36876	DISSOLVED CALCIUM	20
05/08/1961	36876	DISSOLVED CHLORIDE	5.5
05/08/1961	36876	DISSOLVED FLUORIDE	0.1
05/08/1961	36876	DISSOLVED HARDNESS CaCO3 mg/L	86
05/08/1961	36876	DISSOLVED MAGNESIUM	8.8
05/08/1961	36876	DISSOLVED NITRATE NO3 mg/L	0.5
05/08/1961	36876	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/08/1961	36876	DISSOLVED POTASSIUM	1.3
05/08/1961	36876	DISSOLVED SILICA	22
05/08/1961	36876	DISSOLVED SODIUM	8.5
05/08/1961	36876	DISSOLVED SULFATE SO4 mg/L	8
05/08/1961	36876	DISSOLVED TOTAL ALKALINITY	88
05/08/1961	36876	Fe mg/L D	0
05/08/1961	36876	LAB pH	7.8
05/08/1961	36876	METHYLENE BLUE ACTIVE SUBSTANC	0
05/08/1961	36876	MINERAL TURBIDITY HELLIGE	4
05/08/1961	36876	Mn mg/L D	0
05/08/1961	36876	NUTRIENT TURBIDITY NOT C,A,E,B	4
05/08/1961	36876	Pb mg/L D	0
05/08/1961	36876	SPECIFIC CONDUCTANCE 25C	191
05/08/1961	36876	Zn mg/L D	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

06/12/1961	37130	DISSOLVED BORON	0
06/12/1961	37130	DISSOLVED CHLORIDE	5.8
06/12/1961	37130	DISSOLVED HARDNESS CaCO3 mg/L	90
06/12/1961	37130	DISSOLVED SODIUM	8.3
06/12/1961	37130	DISSOLVED TOTAL ALKALINITY	87
06/12/1961	37130	LAB pH	7.9
06/12/1961	37130	MINERAL TURBIDITY HELLIGE	5
06/12/1961	37130	SPECIFIC CONDUCTANCE 25C	200
07/10/1961	37288	DISSOLVED BORON	0
07/10/1961	37288	DISSOLVED CHLORIDE	3.8
07/10/1961	37288	DISSOLVED HARDNESS CaCO3 mg/L	87
07/10/1961	37288	DISSOLVED SODIUM	9.1
07/10/1961	37288	DISSOLVED TOTAL ALKALINITY	95
07/10/1961	37288	LAB pH	8.2
07/10/1961	37288	MINERAL TURBIDITY HELLIGE	5
07/10/1961	37288	SPECIFIC CONDUCTANCE 25C	205
08/08/1961	37559	DISSOLVED BORON	0.1
08/08/1961	37559	DISSOLVED CHLORIDE	4.4
08/08/1961	37559	DISSOLVED HARDNESS CaCO3 mg/L	78
08/08/1961	37559	DISSOLVED SODIUM	8.5
08/08/1961	37559	DISSOLVED TOTAL ALKALINITY	84
08/08/1961	37559	LAB pH	8
08/08/1961	37559	MINERAL TURBIDITY HELLIGE	2
08/08/1961	37559	SPECIFIC CONDUCTANCE 25C	184
09/07/1961	37804	Al mg/L D	0
09/07/1961	37804	As mg/L D	0
09/07/1961	37804	Cu mg/L D	0.01
09/07/1961	37804	DISSOLVED BORON	0
09/07/1961	37804	DISSOLVED CALCIUM	16
09/07/1961	37804	DISSOLVED CHLORIDE	4
09/07/1961	37804	DISSOLVED FLUORIDE	0.1
09/07/1961	37804	DISSOLVED HARDNESS CaCO3 mg/L	75
09/07/1961	37804	DISSOLVED MAGNESIUM	8.5
09/07/1961	37804	DISSOLVED NITRATE NO3 mg/L	0.4
09/07/1961	37804	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/07/1961	37804	DISSOLVED POTASSIUM	1.4
09/07/1961	37804	DISSOLVED SILICA	28
09/07/1961	37804	DISSOLVED SODIUM	8.5
09/07/1961	37804	DISSOLVED SULFATE SO4 mg/L	5
09/07/1961	37804	DISSOLVED TOTAL ALKALINITY	81
09/07/1961	37804	Fe mg/L T	0.09
09/07/1961	37804	LAB pH	8
09/07/1961	37804	METHYLENE BLUE ACTIVE SUBSTANC	0
09/07/1961	37804	MINERAL TURBIDITY HELLIGE	4
09/07/1961	37804	Mn mg/L D	0.09
09/07/1961	37804	NUTRIENT TURBIDITY NOT C,A,E,B	4
09/07/1961	37804	Pb mg/L D	0
09/07/1961	37804	SPECIFIC CONDUCTANCE 25C	177
09/07/1961	37804	Zn mg/L D	0
10/05/1961	38009	DISSOLVED BORON	0
10/05/1961	38009	DISSOLVED CHLORIDE	3.2
10/05/1961	38009	DISSOLVED HARDNESS CaCO3 mg/L	76

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

10/05/1961	38009	DISSOLVED SODIUM	7.7
10/05/1961	38009	DISSOLVED TOTAL ALKALINITY	79
10/05/1961	38009	LAB pH	8
10/05/1961	38009	MINERAL TURBIDITY HELLIGE	3
10/05/1961	38009	SPECIFIC CONDUCTANCE 25C	176
11/09/1961	38414	DISSOLVED BORON	0
11/09/1961	38414	DISSOLVED CHLORIDE	5.5
11/09/1961	38414	DISSOLVED HARDNESS CaCO3 mg/L	78
11/09/1961	38414	DISSOLVED SODIUM	8
11/09/1961	38414	DISSOLVED TOTAL ALKALINITY	80
11/09/1961	38414	LAB pH	8
11/09/1961	38414	MINERAL TURBIDITY HELLIGE	6
11/09/1961	38414	SPECIFIC CONDUCTANCE 25C	183
12/07/1961	38625	DISSOLVED BORON	0
12/07/1961	38625	DISSOLVED CHLORIDE	16
12/07/1961	38625	DISSOLVED HARDNESS CaCO3 mg/L	96
12/07/1961	38625	DISSOLVED SODIUM	11
12/07/1961	38625	DISSOLVED TOTAL ALKALINITY	80
12/07/1961	38625	LAB pH	7.7
12/07/1961	38625	MINERAL TURBIDITY HELLIGE	6
12/07/1961	38625	SPECIFIC CONDUCTANCE 25C	237
01/11/1962	38976	DISSOLVED BORON	0
01/11/1962	38976	DISSOLVED CHLORIDE	18
01/11/1962	38976	DISSOLVED HARDNESS CaCO3 mg/L	114
01/11/1962	38976	DISSOLVED SODIUM	12
01/11/1962	38976	DISSOLVED TOTAL ALKALINITY	97
01/11/1962	38976	LAB pH	8
01/11/1962	38976	MINERAL TURBIDITY HELLIGE	1
01/11/1962	38976	SPECIFIC CONDUCTANCE 25C	272
02/09/1962	39203	DISSOLVED BORON	0
02/09/1962	39203	DISSOLVED CHLORIDE	6.4
02/09/1962	39203	DISSOLVED HARDNESS CaCO3 mg/L	70
02/09/1962	39203	DISSOLVED SODIUM	8.6
02/09/1962	39203	DISSOLVED TOTAL ALKALINITY	62
02/09/1962	39203	LAB pH	7.5
02/09/1962	39203	MINERAL TURBIDITY HELLIGE	250
02/09/1962	39203	SPECIFIC CONDUCTANCE 25C	173
03/14/1962	39533	DISSOLVED BORON	0
03/14/1962	39533	DISSOLVED CHLORIDE	7
03/14/1962	39533	DISSOLVED HARDNESS CaCO3 mg/L	104
03/14/1962	39533	DISSOLVED SODIUM	9
03/14/1962	39533	DISSOLVED TOTAL ALKALINITY	95
03/14/1962	39533	LAB pH	7.8
03/14/1962	39533	MINERAL TURBIDITY HELLIGE	10
03/14/1962	39533	SPECIFIC CONDUCTANCE 25C	238
04/11/1962	39811	DISSOLVED BORON	0.1
04/11/1962	39811	DISSOLVED CHLORIDE	7
04/11/1962	39811	DISSOLVED HARDNESS CaCO3 mg/L	79
04/11/1962	39811	DISSOLVED SODIUM	6.4
04/11/1962	39811	DISSOLVED TOTAL ALKALINITY	74
04/11/1962	39811	LAB pH	8.2
04/11/1962	39811	MINERAL TURBIDITY HELLIGE	15

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

04/11/1962	39811	SPECIFIC CONDUCTANCE 25C	177
05/03/1962	39917	DISSOLVED BORON	0.1
05/03/1962	39917	DISSOLVED CALCIUM	21
05/03/1962	39917	DISSOLVED CHLORIDE	6.7
05/03/1962	39917	DISSOLVED FLUORIDE	0.1
05/03/1962	39917	DISSOLVED HARDNESS CaCO3 mg/L	86
05/03/1962	39917	DISSOLVED MAGNESIUM	8.3
05/03/1962	39917	DISSOLVED NITRATE NO3 mg/L	0
05/03/1962	39917	DISSOLVED ORTHOPHOSPHATE as P	0
05/03/1962	39917	DISSOLVED POTASSIUM	1.3
05/03/1962	39917	DISSOLVED SILICA	20
05/03/1962	39917	DISSOLVED SODIUM	8.2
05/03/1962	39917	DISSOLVED SULFATE SO4 mg/L	9
05/03/1962	39917	DISSOLVED TOTAL ALKALINITY	83
05/03/1962	39917	LAB pH	7.9
05/03/1962	39917	MINERAL TURBIDITY HELLIGE	1
05/03/1962	39917	NUTRIENT TURBIDITY NOT C,A,E,B	1
05/03/1962	39917	SPECIFIC CONDUCTANCE 25C	194
06/08/1962	40471	DISSOLVED BORON	0
06/08/1962	40471	DISSOLVED CHLORIDE	5.5
06/08/1962	40471	DISSOLVED HARDNESS CaCO3 mg/L	91
06/08/1962	40471	DISSOLVED SODIUM	7.9
06/08/1962	40471	DISSOLVED TOTAL ALKALINITY	89
06/08/1962	40471	LAB pH	7.8
06/08/1962	40471	MINERAL TURBIDITY HELLIGE	5
06/08/1962	40471	SPECIFIC CONDUCTANCE 25C	201
07/03/1962	40726	DISSOLVED BORON	0
07/03/1962	40726	DISSOLVED CHLORIDE	7.8
07/03/1962	40726	DISSOLVED HARDNESS CaCO3 mg/L	85
07/03/1962	40726	DISSOLVED SODIUM	9.1
07/03/1962	40726	DISSOLVED TOTAL ALKALINITY	92
07/03/1962	40726	LAB pH	8.2
07/03/1962	40726	MINERAL TURBIDITY HELLIGE	3
07/03/1962	40726	SPECIFIC CONDUCTANCE 25C	201
08/02/1962	40953	DISSOLVED BORON	0
08/02/1962	40953	DISSOLVED CHLORIDE	4
08/02/1962	40953	DISSOLVED HARDNESS CaCO3 mg/L	74
08/02/1962	40953	DISSOLVED SODIUM	9.1
08/02/1962	40953	DISSOLVED TOTAL ALKALINITY	81
08/02/1962	40953	LAB pH	7.7
08/02/1962	40953	MINERAL TURBIDITY HELLIGE	1
08/02/1962	40953	SPECIFIC CONDUCTANCE 25C	178
09/14/1962	41192	DISSOLVED CALCIUM	15
09/14/1962	41192	DISSOLVED CHLORIDE	4
09/14/1962	41192	DISSOLVED FLUORIDE	0.1
09/14/1962	41192	DISSOLVED HARDNESS CaCO3 mg/L	73
09/14/1962	41192	DISSOLVED MAGNESIUM	8.8
09/14/1962	41192	DISSOLVED NITRATE NO3 mg/L	0.1
09/14/1962	41192	DISSOLVED ORTHOPHOSPHATE as P	0
09/14/1962	41192	DISSOLVED POTASSIUM	1
09/14/1962	41192	DISSOLVED SILICA	27
09/14/1962	41192	DISSOLVED SODIUM	8.6

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/14/1962	41192	DISSOLVED SOLIDS mg/L at 180C	120
09/14/1962	41192	DISSOLVED SULFATE SO ₄ mg/L	5
09/14/1962	41192	DISSOLVED TOTAL ALKALINITY	81
09/14/1962	41192	LAB pH	8.1
09/14/1962	41192	MINERAL TURBIDITY HELLIGE	5
09/14/1962	41192	NUTRIENT TURBIDITY NOT C,A,E,B	5
09/14/1962	41192	SPECIFIC CONDUCTANCE 25C	174
10/02/1962	41400	DISSOLVED BORON	0
10/02/1962	41400	DISSOLVED CHLORIDE	6.6
10/02/1962	41400	DISSOLVED HARDNESS CaCO ₃ mg/L	71
10/02/1962	41400	DISSOLVED SODIUM	8.6
10/02/1962	41400	DISSOLVED TOTAL ALKALINITY	79
10/02/1962	41400	LAB pH	8
10/02/1962	41400	MINERAL TURBIDITY HELLIGE	3
10/02/1962	41400	SPECIFIC CONDUCTANCE 25C	170
11/01/1962	41704	DISSOLVED BORON	0.1
11/01/1962	41704	DISSOLVED CHLORIDE	12
11/01/1962	41704	DISSOLVED HARDNESS CaCO ₃ mg/L	108
11/01/1962	41704	DISSOLVED SODIUM	9.9
11/01/1962	41704	DISSOLVED TOTAL ALKALINITY	110
11/01/1962	41704	LAB pH	8
11/01/1962	41704	MINERAL TURBIDITY HELLIGE	1
11/01/1962	41704	SPECIFIC CONDUCTANCE 25C	255
12/07/1962	42037	DISSOLVED BORON	0.1
12/07/1962	42037	DISSOLVED CHLORIDE	10
12/07/1962	42037	DISSOLVED HARDNESS CaCO ₃ mg/L	111
12/07/1962	42037	DISSOLVED SODIUM	9.6
12/07/1962	42037	DISSOLVED TOTAL ALKALINITY	104
12/07/1962	42037	LAB pH	8.3
12/07/1962	42037	MINERAL TURBIDITY HELLIGE	10
12/07/1962	42037	SPECIFIC CONDUCTANCE 25C	245
01/04/1963	42284	DISSOLVED BORON	0
01/04/1963	42284	DISSOLVED CHLORIDE	12
01/04/1963	42284	DISSOLVED HARDNESS CaCO ₃ mg/L	116
01/04/1963	42284	DISSOLVED SODIUM	11
01/04/1963	42284	DISSOLVED TOTAL ALKALINITY	107
01/04/1963	42284	LAB pH	8
01/04/1963	42284	MINERAL TURBIDITY HELLIGE	2
01/04/1963	42284	SPECIFIC CONDUCTANCE 25C	267
02/04/1963	42516	DISSOLVED BORON	0
02/04/1963	42516	DISSOLVED CHLORIDE	4.5
02/04/1963	42516	DISSOLVED HARDNESS CaCO ₃ mg/L	81
02/04/1963	42516	DISSOLVED SODIUM	8.7
02/04/1963	42516	DISSOLVED TOTAL ALKALINITY	79
02/04/1963	42516	LAB pH	7.8
02/04/1963	42516	MINERAL TURBIDITY HELLIGE	180
02/04/1963	42516	SPECIFIC CONDUCTANCE 25C	186
03/01/1963	42848	DISSOLVED BORON	0.1
03/01/1963	42848	DISSOLVED CHLORIDE	7.8
03/01/1963	42848	DISSOLVED HARDNESS CaCO ₃ mg/L	117
03/01/1963	42848	DISSOLVED SODIUM	8
03/01/1963	42848	DISSOLVED TOTAL ALKALINITY	113

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/01/1963	42848	LAB pH	8.3
03/01/1963	42848	MINERAL TURBIDITY HELLIGE	6
03/01/1963	42848	SPECIFIC CONDUCTANCE 25C	259
04/05/1963	43095	DISSOLVED BORON	0
04/05/1963	43095	DISSOLVED CHLORIDE	4.4
04/05/1963	43095	DISSOLVED HARDNESS CaCO3 mg/L	107
04/05/1963	43095	DISSOLVED SODIUM	7.4
04/05/1963	43095	DISSOLVED TOTAL ALKALINITY	82
04/05/1963	43095	LAB pH	8.1
04/05/1963	43095	MINERAL TURBIDITY HELLIGE	15
04/05/1963	43095	SPECIFIC CONDUCTANCE 25C	225
05/03/1963	43357	DISSOLVED BORON	0.1
05/03/1963	43357	DISSOLVED CALCIUM	22
05/03/1963	43357	DISSOLVED CHLORIDE	3.8
05/03/1963	43357	DISSOLVED FLUORIDE	0.2
05/03/1963	43357	DISSOLVED HARDNESS CaCO3 mg/L	95
05/03/1963	43357	DISSOLVED MAGNESIUM	9.7
05/03/1963	43357	DISSOLVED NITRATE NO3 mg/L	1.1
05/03/1963	43357	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/03/1963	43357	DISSOLVED POTASSIUM	0.8
05/03/1963	43357	DISSOLVED SILICA	18
05/03/1963	43357	DISSOLVED SODIUM	6.8
05/03/1963	43357	DISSOLVED SOLIDS mg/L at 180C	137
05/03/1963	43357	DISSOLVED SULFATE SO4 mg/L	11
05/03/1963	43357	DISSOLVED TOTAL ALKALINITY	97
05/03/1963	43357	LAB pH	8.4
05/03/1963	43357	MINERAL TURBIDITY HELLIGE	30
05/03/1963	43357	NUTRIENT TURBIDITY NOT C,A,E,B	30
05/03/1963	43357	SPECIFIC CONDUCTANCE 25C	209
06/05/1963	43427	DISSOLVED BORON	0
06/05/1963	43427	DISSOLVED CHLORIDE	7.1
06/05/1963	43427	DISSOLVED HARDNESS CaCO3 mg/L	99
06/05/1963	43427	DISSOLVED SODIUM	7.1
06/05/1963	43427	DISSOLVED TOTAL ALKALINITY	98
06/05/1963	43427	LAB pH	7.9
06/05/1963	43427	MINERAL TURBIDITY HELLIGE	6
06/05/1963	43427	SPECIFIC CONDUCTANCE 25C	213
07/12/1963	43810	DISSOLVED BORON	0
07/12/1963	43810	DISSOLVED CHLORIDE	7.8
07/12/1963	43810	DISSOLVED HARDNESS CaCO3 mg/L	100
07/12/1963	43810	DISSOLVED SODIUM	8.3
07/12/1963	43810	DISSOLVED TOTAL ALKALINITY	105
07/12/1963	43810	LAB pH	8.2
07/12/1963	43810	MINERAL TURBIDITY HELLIGE	2
07/12/1963	43810	SPECIFIC CONDUCTANCE 25C	224
08/05/1963	44200	DISSOLVED BORON	0.1
08/05/1963	44200	DISSOLVED CHLORIDE	4.8
08/05/1963	44200	DISSOLVED HARDNESS CaCO3 mg/L	84
08/05/1963	44200	DISSOLVED SODIUM	8
08/05/1963	44200	DISSOLVED TOTAL ALKALINITY	96
08/05/1963	44200	LAB pH	7.9
08/05/1963	44200	MINERAL TURBIDITY HELLIGE	3

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08/05/1963	44200	SPECIFIC CONDUCTANCE 25C	203
09/12/1963	44451	As mg/L D	0.02
09/12/1963	44451	DISSOLVED BORON	0
09/12/1963	44451	DISSOLVED CALCIUM	17
09/12/1963	44451	DISSOLVED CHLORIDE	5.6
09/12/1963	44451	DISSOLVED FLUORIDE	0.2
09/12/1963	44451	DISSOLVED HARDNESS CaCO3 mg/L	82
09/12/1963	44451	DISSOLVED MAGNESIUM	9.6
09/12/1963	44451	DISSOLVED NITRATE NO3 mg/L	0.9
09/12/1963	44451	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/12/1963	44451	DISSOLVED POTASSIUM	0.9
09/12/1963	44451	DISSOLVED SILICA	27
09/12/1963	44451	DISSOLVED SODIUM	7.8
09/12/1963	44451	DISSOLVED SOLIDS mg/L at 180C	126
09/12/1963	44451	DISSOLVED SULFATE SO4 mg/L	7
09/12/1963	44451	DISSOLVED TOTAL ALKALINITY	87
09/12/1963	44451	LAB pH	8.2
09/12/1963	44451	METHYLENE BLUE ACTIVE SUBSTANC	0
09/12/1963	44451	MINERAL TURBIDITY HELLIGE	2
09/12/1963	44451	NUTRIENT TURBIDITY NOT C,A,E,B	2
09/12/1963	44451	SPECIFIC CONDUCTANCE 25C	190
10/10/1963	44633	DISSOLVED BORON	0
10/10/1963	44633	DISSOLVED CHLORIDE	6.1
10/10/1963	44633	DISSOLVED HARDNESS CaCO3 mg/L	75
10/10/1963	44633	DISSOLVED SODIUM	7.3
10/10/1963	44633	DISSOLVED TOTAL ALKALINITY	80
10/10/1963	44633	LAB pH	7.9
10/10/1963	44633	MINERAL TURBIDITY HELLIGE	10
10/10/1963	44633	SPECIFIC CONDUCTANCE 25C	179
11/07/1963	44931	DISSOLVED BORON	0.1
11/07/1963	44931	DISSOLVED CHLORIDE	25
11/07/1963	44931	DISSOLVED HARDNESS CaCO3 mg/L	118
11/07/1963	44931	DISSOLVED SODIUM	13
11/07/1963	44931	DISSOLVED TOTAL ALKALINITY	100
11/07/1963	44931	LAB pH	8.2
11/07/1963	44931	MINERAL TURBIDITY HELLIGE	15
11/07/1963	44931	SPECIFIC CONDUCTANCE 25C	297
12/05/1963	45096	As mg/L D	0
12/05/1963	45096	DISSOLVED BORON	0
12/05/1963	45096	DISSOLVED CHLORIDE	9.7
12/05/1963	45096	DISSOLVED HARDNESS CaCO3 mg/L	107
12/05/1963	45096	DISSOLVED SODIUM	9
12/05/1963	45096	DISSOLVED TOTAL ALKALINITY	102
12/05/1963	45096	LAB pH	8.2
12/05/1963	45096	MINERAL TURBIDITY HELLIGE	15
12/05/1963	45096	SPECIFIC CONDUCTANCE 25C	244
01/08/1964	45477	DISSOLVED BORON	0
01/08/1964	45477	DISSOLVED CHLORIDE	13
01/08/1964	45477	DISSOLVED HARDNESS CaCO3 mg/L	116
01/08/1964	45477	DISSOLVED SODIUM	11
01/08/1964	45477	DISSOLVED TOTAL ALKALINITY	107
01/08/1964	45477	LAB pH	8.4

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01/08/1964	45477	MINERAL TURBIDITY HELLIGE	2
01/08/1964	45477	SPECIFIC CONDUCTANCE 25C	260
02/05/1964	45705	DISSOLVED BORON	0
02/05/1964	45705	DISSOLVED CHLORIDE	7.3
02/05/1964	45705	DISSOLVED HARDNESS CaCO3 mg/L	108
02/05/1964	45705	DISSOLVED SODIUM	9
02/05/1964	45705	DISSOLVED TOTAL ALKALINITY	104
02/05/1964	45705	LAB pH	8.4
02/05/1964	45705	MINERAL TURBIDITY HELLIGE	6
02/05/1964	45705	SPECIFIC CONDUCTANCE 25C	239
03/03/1964	45945	DISSOLVED BORON	0
03/03/1964	45945	DISSOLVED CHLORIDE	12
03/03/1964	45945	DISSOLVED HARDNESS CaCO3 mg/L	116
03/03/1964	45945	DISSOLVED SODIUM	11
03/03/1964	45945	DISSOLVED TOTAL ALKALINITY	110
03/03/1964	45945	LAB pH	8.4
03/03/1964	45945	MINERAL TURBIDITY HELLIGE	2
03/03/1964	45945	SPECIFIC CONDUCTANCE 25C	264
04/06/1964	46260	DISSOLVED BORON	0
04/06/1964	46260	DISSOLVED CHLORIDE	50
04/06/1964	46260	DISSOLVED HARDNESS CaCO3 mg/L	118
04/06/1964	46260	DISSOLVED SODIUM	10
04/06/1964	46260	DISSOLVED TOTAL ALKALINITY	113
04/06/1964	46260	LAB pH	8.5
04/06/1964	46260	MINERAL TURBIDITY HELLIGE	1
04/06/1964	46260	SPECIFIC CONDUCTANCE 25C	263
05/04/1964	46512	As mg/L D	0
05/04/1964	46512	DISSOLVED BORON	0
05/04/1964	46512	DISSOLVED CALCIUM	23
05/04/1964	46512	DISSOLVED CHLORIDE	11
05/04/1964	46512	DISSOLVED FLUORIDE	0.1
05/04/1964	46512	DISSOLVED HARDNESS CaCO3 mg/L	103
05/04/1964	46512	DISSOLVED MAGNESIUM	11
05/04/1964	46512	DISSOLVED NITRATE NO3 mg/L	0.4
05/04/1964	46512	DISSOLVED ORTHOPHOSPHATE as P	0
05/04/1964	46512	DISSOLVED POTASSIUM	0.7
05/04/1964	46512	DISSOLVED SILICA	18
05/04/1964	46512	DISSOLVED SODIUM	9.1
05/04/1964	46512	DISSOLVED SOLIDS mg/L at 180C	139
05/04/1964	46512	DISSOLVED SULFATE SO4 mg/L	11
05/04/1964	46512	DISSOLVED TOTAL ALKALINITY	100
05/04/1964	46512	LAB pH	8.1
05/04/1964	46512	METHYLENE BLUE ACTIVE SUBSTANC	0
05/04/1964	46512	MINERAL TURBIDITY HELLIGE	1
05/04/1964	46512	NUTRIENT TURBIDITY NOT C,A,E,B	1
05/04/1964	46512	SPECIFIC CONDUCTANCE 25C	239
06/08/1964	46733	DISSOLVED BORON	0
06/08/1964	46733	DISSOLVED CHLORIDE	8.5
06/08/1964	46733	DISSOLVED HARDNESS CaCO3 mg/L	97
06/08/1964	46733	DISSOLVED SODIUM	9.8
06/08/1964	46733	DISSOLVED TOTAL ALKALINITY	98
06/08/1964	46733	LAB pH	8.2

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06/08/1964	46733	MINERAL TURBIDITY HELLIGE	1
06/08/1964	46733	SPECIFIC CONDUCTANCE 25C	223
07/09/1964	46865	DISSOLVED BORON	0
07/09/1964	46865	DISSOLVED CHLORIDE	4.7
07/09/1964	46865	DISSOLVED HARDNESS CaCO3 mg/L	87
07/09/1964	46865	DISSOLVED SODIUM	9.1
07/09/1964	46865	DISSOLVED TOTAL ALKALINITY	92
07/09/1964	46865	LAB pH	8.2
07/09/1964	46865	MINERAL TURBIDITY HELLIGE	2
07/09/1964	46865	SPECIFIC CONDUCTANCE 25C	200
08/03/1964	47203	DISSOLVED BORON	0
08/03/1964	47203	DISSOLVED CHLORIDE	3
08/03/1964	47203	DISSOLVED HARDNESS CaCO3 mg/L	78
08/03/1964	47203	DISSOLVED SODIUM	8.6
08/03/1964	47203	DISSOLVED TOTAL ALKALINITY	87
08/03/1964	47203	LAB pH	8.1
08/03/1964	47203	MINERAL TURBIDITY HELLIGE	2
08/03/1964	47203	SPECIFIC CONDUCTANCE 25C	177
09/04/1964	47508	As mg/L D	0
09/04/1964	47508	DISSOLVED BORON	0
09/04/1964	47508	DISSOLVED CALCIUM	17
09/04/1964	47508	DISSOLVED CHLORIDE	3.2
09/04/1964	47508	DISSOLVED HARDNESS CaCO3 mg/L	75
09/04/1964	47508	DISSOLVED MAGNESIUM	7.9
09/04/1964	47508	DISSOLVED NITRATE NO3 mg/L	1.4
09/04/1964	47508	DISSOLVED ORTHOPHOSPHATE as P	0.03
09/04/1964	47508	DISSOLVED POTASSIUM	1.4
09/04/1964	47508	DISSOLVED SILICA	30
09/04/1964	47508	DISSOLVED SODIUM	8.4
09/04/1964	47508	DISSOLVED SOLIDS mg/L at 180C	110
09/04/1964	47508	DISSOLVED SULFATE SO4 mg/L	7
09/04/1964	47508	DISSOLVED TOTAL ALKALINITY	84
09/04/1964	47508	LAB pH	8
09/04/1964	47508	METHYLENE BLUE ACTIVE SUBSTANC	0
09/04/1964	47508	MINERAL TURBIDITY HELLIGE	1
09/04/1964	47508	NUTRIENT TURBIDITY NOT C,A,E,B	1
09/04/1964	47508	SPECIFIC CONDUCTANCE 25C	179
10/08/1964	47640	DISSOLVED BORON	0.1
10/08/1964	47640	DISSOLVED CHLORIDE	2.7
10/08/1964	47640	DISSOLVED HARDNESS CaCO3 mg/L	75
10/08/1964	47640	DISSOLVED SODIUM	8
10/08/1964	47640	DISSOLVED TOTAL ALKALINITY	84
10/08/1964	47640	LAB pH	8.3
10/08/1964	47640	MINERAL TURBIDITY HELLIGE	2
10/08/1964	47640	SPECIFIC CONDUCTANCE 25C	178
11/09/1964	47830	DISSOLVED BORON	0
11/09/1964	47830	DISSOLVED CHLORIDE	20
11/09/1964	47830	DISSOLVED HARDNESS CaCO3 mg/L	92
11/09/1964	47830	DISSOLVED SODIUM	12
11/09/1964	47830	DISSOLVED TOTAL ALKALINITY	68
11/09/1964	47830	LAB pH	8.1
11/09/1964	47830	MINERAL TURBIDITY HELLIGE	100

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

11/09/1964	47830	SPECIFIC CONDUCTANCE 25C	253
12/10/1964	38046	DISSOLVED BORON	0
12/10/1964	38046	DISSOLVED CHLORIDE	15
12/10/1964	38046	DISSOLVED HARDNESS CaCO3 mg/L	126
12/10/1964	38046	DISSOLVED SODIUM	13
12/10/1964	38046	DISSOLVED TOTAL ALKALINITY	108
12/10/1964	38046	LAB pH	8.4
12/10/1964	38046	MINERAL TURBIDITY HELLIGE	1
12/10/1964	38046	SPECIFIC CONDUCTANCE 25C	305
01/14/1965	48310	DISSOLVED BORON	0.1
01/14/1965	48310	DISSOLVED CHLORIDE	3.3
01/14/1965	48310	DISSOLVED HARDNESS CaCO3 mg/L	102
01/14/1965	48310	DISSOLVED SODIUM	7.7
01/14/1965	48310	DISSOLVED TOTAL ALKALINITY	98
01/14/1965	48310	LAB pH	8.3
01/14/1965	48310	MINERAL TURBIDITY HELLIGE	120
01/14/1965	48310	SPECIFIC CONDUCTANCE 25C	228
02/01/1965	48636	DISSOLVED BORON	0
02/01/1965	48636	DISSOLVED CHLORIDE	3.5
02/01/1965	48636	DISSOLVED HARDNESS CaCO3 mg/L	100
02/01/1965	48636	DISSOLVED SODIUM	5.1
02/01/1965	48636	DISSOLVED TOTAL ALKALINITY	95
02/01/1965	48636	LAB pH	8
02/01/1965	48636	MINERAL TURBIDITY HELLIGE	120
02/01/1965	48636	SPECIFIC CONDUCTANCE 25C	217
03/01/1965	48915	DISSOLVED BORON	0.1
03/01/1965	48915	DISSOLVED CHLORIDE	5.5
03/01/1965	48915	DISSOLVED HARDNESS CaCO3 mg/L	116
03/01/1965	48915	DISSOLVED SODIUM	8.5
03/01/1965	48915	DISSOLVED TOTAL ALKALINITY	107
03/01/1965	48915	LAB pH	8.6
03/01/1965	48915	MINERAL TURBIDITY HELLIGE	45
03/01/1965	48915	SPECIFIC CONDUCTANCE 25C	248
04/05/1965	49166	DISSOLVED BORON	0
04/05/1965	49166	DISSOLVED CHLORIDE	10
04/05/1965	49166	DISSOLVED HARDNESS CaCO3 mg/L	126
04/05/1965	49166	DISSOLVED SODIUM	11
04/05/1965	49166	DISSOLVED TOTAL ALKALINITY	115
04/05/1965	49166	LAB pH	8.3
04/05/1965	49166	MINERAL TURBIDITY HELLIGE	25
04/05/1965	49166	SPECIFIC CONDUCTANCE 25C	283
05/06/1965	49240	As mg/L D	0
05/06/1965	49240	DISSOLVED BORON	0
05/06/1965	49240	DISSOLVED CALCIUM	30
05/06/1965	49240	DISSOLVED CHLORIDE	4.6
05/06/1965	49240	DISSOLVED HARDNESS CaCO3 mg/L	114
05/06/1965	49240	DISSOLVED MAGNESIUM	9.5
05/06/1965	49240	DISSOLVED NITRATE NO3 mg/L	1.2
05/06/1965	49240	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/06/1965	49240	DISSOLVED POTASSIUM	0.7
05/06/1965	49240	DISSOLVED SILICA	18
05/06/1965	49240	DISSOLVED SODIUM	8.2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

05/06/1965	49240	DISSOLVED SOLIDS mg/L at 180C	155
05/06/1965	49240	DISSOLVED SULFATE SO ₄ mg/L	19
05/06/1965	49240	DISSOLVED TOTAL ALKALINITY	108
05/06/1965	49240	LAB pH	8.3
05/06/1965	49240	METHYLENE BLUE ACTIVE SUBSTANC	0
05/06/1965	49240	MINERAL TURBIDITY HELLIGE	15
05/06/1965	49240	NUTRIENT TURBIDITY NOT C,A,E,B	15
05/06/1965	49240	SPECIFIC CONDUCTANCE 25C	250
06/11/1965	49722	DISSOLVED BORON	0.1
06/11/1965	49722	DISSOLVED CHLORIDE	6.7
06/11/1965	49722	DISSOLVED HARDNESS CaCO ₃ mg/L	111
06/11/1965	49722	DISSOLVED SODIUM	8.3
06/11/1965	49722	DISSOLVED SOLIDS mg/L at 180C	0
06/11/1965	49722	DISSOLVED TOTAL ALKALINITY	109
06/11/1965	49722	LAB pH	8
06/11/1965	49722	MINERAL TURBIDITY HELLIGE	2
06/11/1965	49722	SPECIFIC CONDUCTANCE 25C	248
07/12/1965	49829	DISSOLVED BORON	0
07/12/1965	49829	DISSOLVED CHLORIDE	7.2
07/12/1965	49829	DISSOLVED HARDNESS CaCO ₃ mg/L	112
07/12/1965	49829	DISSOLVED SODIUM	8.3
07/12/1965	49829	DISSOLVED SOLIDS mg/L at 180C	0
07/12/1965	49829	DISSOLVED TOTAL ALKALINITY	112
07/12/1965	49829	LAB pH	8.4
07/12/1965	49829	MINERAL TURBIDITY HELLIGE	1
07/12/1965	49829	SPECIFIC CONDUCTANCE 25C	252
08/09/1965	50146	DISSOLVED BORON	0.1
08/09/1965	50146	DISSOLVED CHLORIDE	5.7
08/09/1965	50146	DISSOLVED HARDNESS CaCO ₃ mg/L	98
08/09/1965	50146	DISSOLVED SODIUM	7.3
08/09/1965	50146	DISSOLVED SOLIDS mg/L at 180C	0
08/09/1965	50146	DISSOLVED TOTAL ALKALINITY	100
08/09/1965	50146	LAB pH	8.4
08/09/1965	50146	MINERAL TURBIDITY HELLIGE	1
08/09/1965	50146	SPECIFIC CONDUCTANCE 25C	218
09/13/1965	50517	As mg/L D	0
09/13/1965	50517	DISSOLVED BORON	0
09/13/1965	50517	DISSOLVED CALCIUM	18
09/13/1965	50517	DISSOLVED CHLORIDE	5.8
09/13/1965	50517	DISSOLVED HARDNESS CaCO ₃ mg/L	94
09/13/1965	50517	DISSOLVED MAGNESIUM	12
09/13/1965	50517	DISSOLVED NITRATE NO ₃ mg/L	0.2
09/13/1965	50517	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/13/1965	50517	DISSOLVED POTASSIUM	1.4
09/13/1965	50517	DISSOLVED SILICA	21
09/13/1965	50517	DISSOLVED SODIUM	8.7
09/13/1965	50517	DISSOLVED SOLIDS mg/L at 180C	129
09/13/1965	50517	DISSOLVED SULFATE SO ₄ mg/L	6
09/13/1965	50517	DISSOLVED TOTAL ALKALINITY	100
09/13/1965	50517	LAB pH	7.8
09/13/1965	50517	METHYLENE BLUE ACTIVE SUBSTANC	0
09/13/1965	50517	MINERAL TURBIDITY HELLIGE	1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/13/1965	50517	SPECIFIC CONDUCTANCE 25C	217
10/07/1965	50658	DISSOLVED BORON	0
10/07/1965	50658	DISSOLVED CHLORIDE	4.3
10/07/1965	50658	DISSOLVED HARDNESS CaCO3 mg/L	86
10/07/1965	50658	DISSOLVED SODIUM	7.3
10/07/1965	50658	DISSOLVED SOLIDS mg/L at 180C	0
10/07/1965	50658	DISSOLVED TOTAL ALKALINITY	88
10/07/1965	50658	LAB pH	8.4
10/07/1965	50658	MINERAL TURBIDITY HELLIGE	1
10/07/1965	50658	SPECIFIC CONDUCTANCE 25C	197
11/04/1965	50889	DISSOLVED BORON	0
11/04/1965	50889	DISSOLVED CHLORIDE	7.2
11/04/1965	50889	DISSOLVED HARDNESS CaCO3 mg/L	97
11/04/1965	50889	DISSOLVED SODIUM	8.3
11/04/1965	50889	DISSOLVED SOLIDS mg/L at 180C	0
11/04/1965	50889	DISSOLVED TOTAL ALKALINITY	100
11/04/1965	50889	LAB pH	8.3
11/04/1965	50889	MINERAL TURBIDITY HELLIGE	1
11/04/1965	50889	SPECIFIC CONDUCTANCE 25C	221
12/13/1965	51388	DISSOLVED BORON	0
12/13/1965	51388	DISSOLVED CHLORIDE	12
12/13/1965	51388	DISSOLVED HARDNESS CaCO3 mg/L	112
12/13/1965	51388	DISSOLVED SODIUM	10
12/13/1965	51388	DISSOLVED SOLIDS mg/L at 180C	0
12/13/1965	51388	DISSOLVED TOTAL ALKALINITY	99
12/13/1965	51388	LAB pH	8.3
12/13/1965	51388	MINERAL TURBIDITY HELLIGE	4
12/13/1965	51388	SPECIFIC CONDUCTANCE 25C	258
01/17/1966	51783	DISSOLVED BORON	0
01/17/1966	51783	DISSOLVED CHLORIDE	5.6
01/17/1966	51783	DISSOLVED HARDNESS CaCO3 mg/L	110
01/17/1966	51783	DISSOLVED SODIUM	7.7
01/17/1966	51783	DISSOLVED SOLIDS mg/L at 180C	0
01/17/1966	51783	DISSOLVED TOTAL ALKALINITY	102
01/17/1966	51783	LAB pH	8
01/17/1966	51783	MINERAL TURBIDITY HELLIGE	25
01/17/1966	51783	SPECIFIC CONDUCTANCE 25C	217
02/10/1966	52054	DISSOLVED BORON	0
02/10/1966	52054	DISSOLVED CHLORIDE	5.9
02/10/1966	52054	DISSOLVED HARDNESS CaCO3 mg/L	107
02/10/1966	52054	DISSOLVED SODIUM	9.1
02/10/1966	52054	DISSOLVED SOLIDS mg/L at 180C	0
02/10/1966	52054	DISSOLVED TOTAL ALKALINITY	103
02/10/1966	52054	LAB pH	8.2
02/10/1966	52054	MINERAL TURBIDITY HELLIGE	15
02/10/1966	52054	SPECIFIC CONDUCTANCE 25C	254
03/02/1966	52137	DISSOLVED BORON	0
03/02/1966	52137	DISSOLVED CHLORIDE	4.8
03/02/1966	52137	DISSOLVED HARDNESS CaCO3 mg/L	113
03/02/1966	52137	DISSOLVED SODIUM	9.9
03/02/1966	52137	DISSOLVED SOLIDS mg/L at 180C	0
03/02/1966	52137	DISSOLVED TOTAL ALKALINITY	103

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/02/1966	52137	LAB pH	8.2
03/02/1966	52137	MINERAL TURBIDITY HELLIGE	5
03/02/1966	52137	SPECIFIC CONDUCTANCE 25C	254
04/13/1966	52556	DISSOLVED BORON	0
04/13/1966	52556	DISSOLVED CHLORIDE	2.3
04/13/1966	52556	DISSOLVED HARDNESS CaCO3 mg/L	83
04/13/1966	52556	DISSOLVED SODIUM	6
04/13/1966	52556	DISSOLVED SOLIDS mg/L at 180C	0
04/13/1966	52556	DISSOLVED TOTAL ALKALINITY	80
04/13/1966	52556	LAB pH	8.2
04/13/1966	52556	MINERAL TURBIDITY HELLIGE	25
04/13/1966	52556	SPECIFIC CONDUCTANCE 25C	186
05/02/1966	52923	As mg/L D	0
05/02/1966	52923	DISSOLVED BORON	0
05/02/1966	52923	DISSOLVED CALCIUM	25
05/02/1966	52923	DISSOLVED CHLORIDE	5.2
05/02/1966	52923	DISSOLVED HARDNESS CaCO3 mg/L	101
05/02/1966	52923	DISSOLVED MAGNESIUM	9.4
05/02/1966	52923	DISSOLVED NITRATE NO3 mg/L	0.7
05/02/1966	52923	DISSOLVED ORTHOPHOSPHATE as P	0
05/02/1966	52923	DISSOLVED POTASSIUM	0.8
05/02/1966	52923	DISSOLVED SILICA	16
05/02/1966	52923	DISSOLVED SODIUM	7.1
05/02/1966	52923	DISSOLVED SOLIDS mg/L at 180C	133
05/02/1966	52923	DISSOLVED SULFATE SO4 mg/L	11
05/02/1966	52923	DISSOLVED TOTAL ALKALINITY	100
05/02/1966	52923	LAB pH	8.2
05/02/1966	52923	METHYLENE BLUE ACTIVE SUBSTANC	0
05/02/1966	52923	MINERAL TURBIDITY HELLIGE	2
05/02/1966	52923	SPECIFIC CONDUCTANCE 25C	220
06/02/1966	53271	DISSOLVED BORON	0
06/02/1966	53271	DISSOLVED CHLORIDE	5.2
06/02/1966	53271	DISSOLVED HARDNESS CaCO3 mg/L	92
06/02/1966	53271	DISSOLVED SODIUM	7.4
06/02/1966	53271	DISSOLVED SOLIDS mg/L at 180C	0
06/02/1966	53271	DISSOLVED TOTAL ALKALINITY	94
06/02/1966	53271	LAB pH	8.3
06/02/1966	53271	MINERAL TURBIDITY HELLIGE	1
06/02/1966	53271	SPECIFIC CONDUCTANCE 25C	207
07/06/1966	53451	DISSOLVED BORON	0
07/06/1966	53451	DISSOLVED CHLORIDE	5.8
07/06/1966	53451	DISSOLVED HARDNESS CaCO3 mg/L	103
07/06/1966	53451	DISSOLVED SODIUM	8.7
07/06/1966	53451	DISSOLVED SOLIDS mg/L at 180C	0
07/06/1966	53451	DISSOLVED TOTAL ALKALINITY	105
07/06/1966	53451	LAB pH	8
07/06/1966	53451	MINERAL TURBIDITY HELLIGE	1
07/06/1966	53451	SPECIFIC CONDUCTANCE 25C	232
08/12/1966	53776	DISSOLVED BORON	0.1
08/12/1966	53776	DISSOLVED CHLORIDE	3.2
08/12/1966	53776	DISSOLVED HARDNESS CaCO3 mg/L	88
08/12/1966	53776	DISSOLVED NITRATE NO3 mg/L	0.9

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08/12/1966	53776	DISSOLVED SODIUM	7.9
08/12/1966	53776	DISSOLVED SOLIDS mg/L at 180C	0
08/12/1966	53776	DISSOLVED TOTAL ALKALINITY	91
08/12/1966	53776	LAB pH	8.2
08/12/1966	53776	MINERAL TURBIDITY HELLIGE	3
08/12/1966	53776	SPECIFIC CONDUCTANCE 25C	200
09/01/1966	54021	As mg/L D	0
09/01/1966	54021	DISSOLVED BORON	0
09/01/1966	54021	DISSOLVED CALCIUM	18
09/01/1966	54021	DISSOLVED CHLORIDE	3.2
09/01/1966	54021	DISSOLVED HARDNESS CaCO3 mg/L	86
09/01/1966	54021	DISSOLVED MAGNESIUM	9.8
09/01/1966	54021	DISSOLVED NITRATE NO3 mg/L	0.7
09/01/1966	54021	DISSOLVED ORTHOPHOSPHATE as P	0.02
09/01/1966	54021	DISSOLVED POTASSIUM	1.4
09/01/1966	54021	DISSOLVED SILICA	22
09/01/1966	54021	DISSOLVED SODIUM	7.8
09/01/1966	54021	DISSOLVED SOLIDS mg/L at 180C	125
09/01/1966	54021	DISSOLVED SULFATE SO4 mg/L	7
09/01/1966	54021	DISSOLVED TOTAL ALKALINITY	90
09/01/1966	54021	LAB pH	8.1
09/01/1966	54021	METHYLENE BLUE ACTIVE SUBSTANC	0
09/01/1966	54021	MINERAL TURBIDITY HELLIGE	1
09/01/1966	54021	SPECIFIC CONDUCTANCE 25C	194
10/04/1966	54156	DISSOLVED BORON	0
10/04/1966	54156	DISSOLVED CALCIUM	17
10/04/1966	54156	DISSOLVED CHLORIDE	3.4
10/04/1966	54156	DISSOLVED HARDNESS CaCO3 mg/L	83
10/04/1966	54156	DISSOLVED MAGNESIUM	9.9
10/04/1966	54156	DISSOLVED POTASSIUM	1.2
10/04/1966	54156	DISSOLVED SODIUM	9.7
10/04/1966	54156	DISSOLVED SOLIDS mg/L at 180C	0
10/04/1966	54156	DISSOLVED TOTAL ALKALINITY	89
10/04/1966	54156	LAB pH	8.2
10/04/1966	54156	MINERAL TURBIDITY HELLIGE	1
10/04/1966	54156	SPECIFIC CONDUCTANCE 25C	197
11/02/1966	54373	DISSOLVED BORON	0
11/02/1966	54373	DISSOLVED CALCIUM	12
11/02/1966	54373	DISSOLVED CHLORIDE	2.9
11/02/1966	54373	DISSOLVED HARDNESS CaCO3 mg/L	60
11/02/1966	54373	DISSOLVED MAGNESIUM	7.2
11/02/1966	54373	DISSOLVED POTASSIUM	0.9
11/02/1966	54373	DISSOLVED SODIUM	5.8
11/02/1966	54373	DISSOLVED SOLIDS mg/L at 180C	0
11/02/1966	54373	DISSOLVED TOTAL ALKALINITY	64
11/02/1966	54373	LAB pH	7.9
11/02/1966	54373	MINERAL TURBIDITY HELLIGE	5
11/02/1966	54373	SPECIFIC CONDUCTANCE 25C	141
12/06/1966	54561	DISSOLVED BORON	0
12/06/1966	54561	DISSOLVED CALCIUM	17
12/06/1966	54561	DISSOLVED CHLORIDE	4.5
12/06/1966	54561	DISSOLVED HARDNESS CaCO3 mg/L	74

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

12/06/1966	54561	DISSOLVED MAGNESIUM	7.7
12/06/1966	54561	DISSOLVED POTASSIUM	1.1
12/06/1966	54561	DISSOLVED SODIUM	6.3
12/06/1966	54561	DISSOLVED SOLIDS mg/L at 180C	0
12/06/1966	54561	DISSOLVED TOTAL ALKALINITY	67
12/06/1966	54561	LAB pH	8.1
12/06/1966	54561	MINERAL TURBIDITY HELLIGE	325
12/06/1966	54561	SPECIFIC CONDUCTANCE 25C	175
01/03/1967	54735	DISSOLVED BORON	0.1
01/03/1967	54735	DISSOLVED CALCIUM	25
01/03/1967	54735	DISSOLVED CHLORIDE	9.8
01/03/1967	54735	DISSOLVED HARDNESS CaCO3 mg/L	112
01/03/1967	54735	DISSOLVED MAGNESIUM	12
01/03/1967	54735	DISSOLVED POTASSIUM	0.8
01/03/1967	54735	DISSOLVED SODIUM	9
01/03/1967	54735	DISSOLVED SOLIDS mg/L at 180C	0
01/03/1967	54735	DISSOLVED TOTAL ALKALINITY	103
01/03/1967	54735	LAB pH	8.5
01/03/1967	54735	MINERAL TURBIDITY HELLIGE	2
01/03/1967	54735	SPECIFIC CONDUCTANCE 25C	253
01/26/1967	45607	DISSOLVED BORON	0.1
01/26/1967	45607	DISSOLVED CALCIUM	12
01/26/1967	45607	DISSOLVED CHLORIDE	2.9
01/26/1967	45607	DISSOLVED HARDNESS CaCO3 mg/L	47
01/26/1967	45607	DISSOLVED MAGNESIUM	4.1
01/26/1967	45607	DISSOLVED TOTAL ALKALINITY	36
01/26/1967	45607	LAB pH	7.2
01/26/1967	45607	MINERAL TURBIDITY HELLIGE	1535
01/26/1967	45607	SPECIFIC CONDUCTANCE 25C	114
02/17/1967	54909	DISSOLVED BORON	0
02/17/1967	54909	DISSOLVED CALCIUM	24
02/17/1967	54909	DISSOLVED CHLORIDE	4.2
02/17/1967	54909	DISSOLVED HARDNESS CaCO3 mg/L	105
02/17/1967	54909	DISSOLVED MAGNESIUM	11
02/17/1967	54909	DISSOLVED POTASSIUM	0.9
02/17/1967	54909	DISSOLVED SODIUM	7.6
02/17/1967	54909	DISSOLVED SOLIDS mg/L at 180C	0
02/17/1967	54909	DISSOLVED TOTAL ALKALINITY	100
02/17/1967	54909	LAB pH	8.2
02/17/1967	54909	MINERAL TURBIDITY HELLIGE	15
02/17/1967	54909	SPECIFIC CONDUCTANCE 25C	232
03/06/1967	55195	DISSOLVED BORON	0
03/06/1967	55195	DISSOLVED CALCIUM	26
03/06/1967	55195	DISSOLVED CHLORIDE	6.6
03/06/1967	55195	DISSOLVED HARDNESS CaCO3 mg/L	118
03/06/1967	55195	DISSOLVED MAGNESIUM	13
03/06/1967	55195	DISSOLVED POTASSIUM	0.8
03/06/1967	55195	DISSOLVED SODIUM	8.9
03/06/1967	55195	DISSOLVED SOLIDS mg/L at 180C	0
03/06/1967	55195	DISSOLVED TOTAL ALKALINITY	110
03/06/1967	55195	LAB pH	8.4
03/06/1967	55195	MINERAL TURBIDITY HELLIGE	3

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

03/06/1967	55195	SPECIFIC CONDUCTANCE 25C	258
04/05/1967	55384	DISSOLVED BORON	0
04/05/1967	55384	DISSOLVED CALCIUM	24
04/05/1967	55384	DISSOLVED CHLORIDE	4.2
04/05/1967	55384	DISSOLVED HARDNESS CaCO3 mg/L	105
04/05/1967	55384	DISSOLVED MAGNESIUM	11
04/05/1967	55384	DISSOLVED POTASSIUM	0.8
04/05/1967	55384	DISSOLVED SODIUM	8.7
04/05/1967	55384	DISSOLVED SOLIDS mg/L at 180C	0
04/05/1967	55384	DISSOLVED TOTAL ALKALINITY	103
04/05/1967	55384	LAB pH	8.3
04/05/1967	55384	MINERAL TURBIDITY HELLIGE	50
04/05/1967	55384	SPECIFIC CONDUCTANCE 25C	241
05/04/1967	55512	As mg/L D	0
05/04/1967	55512	DISSOLVED BORON	0
05/04/1967	55512	DISSOLVED CALCIUM	26
05/04/1967	55512	DISSOLVED CHLORIDE	3
05/04/1967	55512	DISSOLVED HARDNESS CaCO3 mg/L	114
05/04/1967	55512	DISSOLVED MAGNESIUM	12
05/04/1967	55512	DISSOLVED NITRATE NO3 mg/L	1.2
05/04/1967	55512	DISSOLVED ORTHOPHOSPHATE as P	0.02
05/04/1967	55512	DISSOLVED POTASSIUM	0.9
05/04/1967	55512	DISSOLVED SILICA	16
05/04/1967	55512	DISSOLVED SODIUM	8.4
05/04/1967	55512	DISSOLVED SOLIDS mg/L at 180C	153
05/04/1967	55512	DISSOLVED SULFATE SO4 mg/L	15
05/04/1967	55512	DISSOLVED TOTAL ALKALINITY	112
05/04/1967	55512	LAB pH	8
05/04/1967	55512	METHYLENE BLUE ACTIVE SUBSTANC	0
05/04/1967	55512	MINERAL TURBIDITY HELLIGE	5
05/04/1967	55512	SPECIFIC CONDUCTANCE 25C	251
05/31/1967	55803	DISSOLVED BORON	0
05/31/1967	55803	DISSOLVED CALCIUM	21
05/31/1967	55803	DISSOLVED CHLORIDE	2.9
05/31/1967	55803	DISSOLVED HARDNESS CaCO3 mg/L	87
05/31/1967	55803	DISSOLVED MAGNESIUM	8.4
05/31/1967	55803	DISSOLVED POTASSIUM	0.9
05/31/1967	55803	DISSOLVED SODIUM	6
05/31/1967	55803	DISSOLVED SOLIDS mg/L at 180C	0
05/31/1967	55803	DISSOLVED TOTAL ALKALINITY	87
05/31/1967	55803	LAB pH	8.1
05/31/1967	55803	MINERAL TURBIDITY HELLIGE	5
05/31/1967	55803	SPECIFIC CONDUCTANCE 25C	190
07/05/1967	48164	DISSOLVED BORON	0
07/05/1967	48164	DISSOLVED CHLORIDE	5.7
07/05/1967	48164	DISSOLVED HARDNESS CaCO3 mg/L	106
07/05/1967	48164	DISSOLVED SODIUM	7.9
07/05/1967	48164	DISSOLVED SOLIDS mg/L at 180C	0
07/05/1967	48164	DISSOLVED TOTAL ALKALINITY	102
07/05/1967	48164	LAB pH	8.1
07/05/1967	48164	MINERAL TURBIDITY HELLIGE	1
07/05/1967	48164	SPECIFIC CONDUCTANCE 25C	231

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

08/04/1967	48774	DISSOLVED BORON	0
08/04/1967	48774	DISSOLVED CHLORIDE	6.3
08/04/1967	48774	DISSOLVED HARDNESS CaCO3 mg/L	111
08/04/1967	48774	DISSOLVED SODIUM	8.8
08/04/1967	48774	DISSOLVED SOLIDS mg/L at 180C	0
08/04/1967	48774	DISSOLVED TOTAL ALKALINITY	112
08/04/1967	48774	LAB pH	8.1
08/04/1967	48774	MINERAL TURBIDITY HELLIGE	1
08/04/1967	48774	SPECIFIC CONDUCTANCE 25C	251
09/06/1967		DISSOLVED BORON	0.1
09/06/1967		DISSOLVED CALCIUM	19
09/06/1967		DISSOLVED CHLORIDE	5.2
09/06/1967		DISSOLVED HARDNESS CaCO3 mg/L	102
09/06/1967		DISSOLVED MAGNESIUM	12
09/06/1967		DISSOLVED NITRATE NO3 mg/L	2.5
09/06/1967		DISSOLVED POTASSIUM	1.5
09/06/1967		DISSOLVED SODIUM	8.6
09/06/1967		DISSOLVED SOLIDS mg/L at 180C	134
09/06/1967		DISSOLVED SULFATE SO4 mg/L	9
09/06/1967		DISSOLVED TOTAL ALKALINITY	102
09/06/1967		LAB pH	8.2
09/06/1967		SPECIFIC CONDUCTANCE 25C	229
10/09/1967	50416	DISSOLVED BORON	0
10/09/1967	50416	DISSOLVED CHLORIDE	8.1
10/09/1967	50416	DISSOLVED HARDNESS CaCO3 mg/L	96
10/09/1967	50416	DISSOLVED SODIUM	8.6
10/09/1967	50416	DISSOLVED SOLIDS mg/L at 180C	0
10/09/1967	50416	DISSOLVED TOTAL ALKALINITY	94
10/09/1967	50416	LAB pH	7.9
10/09/1967	50416	MINERAL TURBIDITY HELLIGE	2
10/09/1967	50416	SPECIFIC CONDUCTANCE 25C	229
11/02/1967	50951	DISSOLVED BORON	0
11/02/1967	50951	DISSOLVED CHLORIDE	9
11/02/1967	50951	DISSOLVED HARDNESS CaCO3 mg/L	108
11/02/1967	50951	DISSOLVED SODIUM	9.1
11/02/1967	50951	DISSOLVED SOLIDS mg/L at 180C	0
11/02/1967	50951	DISSOLVED TOTAL ALKALINITY	106
11/02/1967	50951	LAB pH	8.2
11/02/1967	50951	MINERAL TURBIDITY HELLIGE	3
11/02/1967	50951	SPECIFIC CONDUCTANCE 25C	248
12/11/1967	51253	DISSOLVED BORON	0.1
12/11/1967	51253	DISSOLVED CHLORIDE	24
12/11/1967	51253	DISSOLVED HARDNESS CaCO3 mg/L	153
12/11/1967	51253	DISSOLVED SODIUM	17
12/11/1967	51253	DISSOLVED SOLIDS mg/L at 180C	0
12/11/1967	51253	DISSOLVED TOTAL ALKALINITY	111
12/11/1967	51253	LAB pH	8.1
12/11/1967	51253	MINERAL TURBIDITY HELLIGE	1
12/11/1967	51253	SPECIFIC CONDUCTANCE 25C	374
01/16/1968	51360	DISSOLVED BORON	0
01/16/1968	51360	DISSOLVED CHLORIDE	3.7
01/16/1968	51360	DISSOLVED HARDNESS CaCO3 mg/L	81

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/16/1968	51360	DISSOLVED SODIUM	6.2
01/16/1968	51360	DISSOLVED SOLIDS mg/L at 180C	0
01/16/1968	51360	DISSOLVED TOTAL ALKALINITY	71
01/16/1968	51360	LAB pH	8.1
01/16/1968	51360	MINERAL TURBIDITY HELLIGE	490
01/16/1968	51360	SPECIFIC CONDUCTANCE 25C	185
02/06/1968	51727	DISSOLVED BORON	0
02/06/1968	51727	DISSOLVED CHLORIDE	4.7
02/06/1968	51727	DISSOLVED HARDNESS CaCO3 mg/L	102
02/06/1968	51727	DISSOLVED SODIUM	8.3
02/06/1968	51727	DISSOLVED SOLIDS mg/L at 180C	0
02/06/1968	51727	DISSOLVED TOTAL ALKALINITY	93
02/06/1968	51727	LAB pH	8
02/06/1968	51727	MINERAL TURBIDITY HELLIGE	80
02/06/1968	51727	SPECIFIC CONDUCTANCE 25C	241
03/07/1968	51919	DISSOLVED BORON	0
03/07/1968	51919	DISSOLVED CHLORIDE	5.6
03/07/1968	51919	DISSOLVED HARDNESS CaCO3 mg/L	125
03/07/1968	51919	DISSOLVED SODIUM	7.8
03/07/1968	51919	DISSOLVED SOLIDS mg/L at 180C	0
03/07/1968	51919	DISSOLVED TOTAL ALKALINITY	106
03/07/1968	51919	LAB pH	8.2
03/07/1968	51919	MINERAL TURBIDITY HELLIGE	30
03/07/1968	51919	SPECIFIC CONDUCTANCE 25C	264
04/05/1968	52158	DISSOLVED BORON	0
04/05/1968	52158	DISSOLVED CHLORIDE	5.2
04/05/1968	52158	DISSOLVED HARDNESS CaCO3 mg/L	107
04/05/1968	52158	DISSOLVED SODIUM	7.6
04/05/1968	52158	DISSOLVED SOLIDS mg/L at 180C	0
04/05/1968	52158	DISSOLVED TOTAL ALKALINITY	102
04/05/1968	52158	LAB pH	8.1
04/05/1968	52158	MINERAL TURBIDITY HELLIGE	7
04/05/1968	52158	SPECIFIC CONDUCTANCE 25C	250
05/01/1968	52712	DISSOLVED BORON	0
05/01/1968	52712	DISSOLVED CALCIUM	26
05/01/1968	52712	DISSOLVED CHLORIDE	7.7
05/01/1968	52712	DISSOLVED HARDNESS CaCO3 mg/L	118
05/01/1968	52712	DISSOLVED MAGNESIUM	13
05/01/1968	52712	DISSOLVED NITRATE NO3 mg/L	0.5
05/01/1968	52712	DISSOLVED POTASSIUM	0.5
05/01/1968	52712	DISSOLVED SODIUM	9.9
05/01/1968	52712	DISSOLVED SOLIDS mg/L at 180C	150
05/01/1968	52712	DISSOLVED SULFATE SO4 mg/L	13
05/01/1968	52712	DISSOLVED TOTAL ALKALINITY	112
05/01/1968	52712	LAB pH	8.2
05/01/1968	52712	MINERAL TURBIDITY HELLIGE	1
05/01/1968	52712	SPECIFIC CONDUCTANCE 25C	267
06/13/1968	53328	DISSOLVED BORON	0
06/13/1968	53328	DISSOLVED CHLORIDE	7.8
06/13/1968	53328	DISSOLVED HARDNESS CaCO3 mg/L	111
06/13/1968	53328	DISSOLVED SODIUM	9.2
06/13/1968	53328	DISSOLVED SOLIDS mg/L at 180C	0

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

06/13/1968	53328	DISSOLVED TOTAL ALKALINITY	108
06/13/1968	53328	LAB pH	8.4
06/13/1968	53328	MINERAL TURBIDITY HELLIGE	1
06/13/1968	53328	SPECIFIC CONDUCTANCE 25C	258
07/02/1968	54179	DISSOLVED BORON	0.1
07/02/1968	54179	DISSOLVED CHLORIDE	7.2
07/02/1968	54179	DISSOLVED HARDNESS CaCO3 mg/L	99
07/02/1968	54179	DISSOLVED SODIUM	6.8
07/02/1968	54179	DISSOLVED SOLIDS mg/L at 180C	0
07/02/1968	54179	DISSOLVED TOTAL ALKALINITY	98
07/02/1968	54179	LAB pH	8.6
07/02/1968	54179	MINERAL TURBIDITY HELLIGE	3
07/02/1968	54179	SPECIFIC CONDUCTANCE 25C	229
08/01/1968	54659	DISSOLVED BORON	0
08/01/1968	54659	DISSOLVED CHLORIDE	3.7
08/01/1968	54659	DISSOLVED HARDNESS CaCO3 mg/L	91
08/01/1968	54659	DISSOLVED SODIUM	8.5
08/01/1968	54659	DISSOLVED SOLIDS mg/L at 180C	0
08/01/1968	54659	DISSOLVED TOTAL ALKALINITY	95
08/01/1968	54659	LAB pH	8.7
08/01/1968	54659	MINERAL TURBIDITY HELLIGE	5
08/01/1968	54659	SPECIFIC CONDUCTANCE 25C	206
09/06/1968	55322	DISSOLVED BORON	0
09/06/1968	55322	DISSOLVED CALCIUM	18
09/06/1968	55322	DISSOLVED CHLORIDE	4.9
09/06/1968	55322	DISSOLVED HARDNESS CaCO3 mg/L	91
09/06/1968	55322	DISSOLVED NITRATE NO3 mg/L	0
09/06/1968	55322	DISSOLVED POTASSIUM	1.6
09/06/1968	55322	DISSOLVED SODIUM	8.8
09/06/1968	55322	DISSOLVED SOLIDS mg/L at 180C	127
09/06/1968	55322	DISSOLVED SULFATE SO4 mg/L	6.1
09/06/1968	55322	DISSOLVED TOTAL ALKALINITY	93
09/06/1968	55322	LAB pH	8.2
09/06/1968	55322	MINERAL TURBIDITY HELLIGE	2
09/06/1968	55322	SPECIFIC CONDUCTANCE 25C	212
10/07/1968	55843	DISSOLVED BORON	0
10/07/1968	55843	DISSOLVED CHLORIDE	3.2
10/07/1968	55843	DISSOLVED HARDNESS CaCO3 mg/L	68
10/07/1968	55843	DISSOLVED SODIUM	7.6
10/07/1968	55843	DISSOLVED SOLIDS mg/L at 180C	0
10/07/1968	55843	DISSOLVED TOTAL ALKALINITY	75
10/07/1968	55843	LAB pH	8
10/07/1968	55843	MINERAL TURBIDITY HELLIGE	3
10/07/1968	55843	SPECIFIC CONDUCTANCE 25C	162
11/06/1968	56971	DISSOLVED BORON	0
11/06/1968	56971	DISSOLVED CHLORIDE	20
11/06/1968	56971	DISSOLVED HARDNESS CaCO3 mg/L	131
11/06/1968	56971	DISSOLVED SODIUM	12
11/06/1968	56971	DISSOLVED SOLIDS mg/L at 180C	0
11/06/1968	56971	DISSOLVED TOTAL ALKALINITY	106
11/06/1968	56971	LAB pH	8.4
11/06/1968	56971	MINERAL TURBIDITY HELLIGE	9

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

11/06/1968	56971	SPECIFIC CONDUCTANCE 25C	294
12/05/1968	56975	DISSOLVED BORON	0
12/05/1968	56975	DISSOLVED CHLORIDE	23
12/05/1968	56975	DISSOLVED HARDNESS CaCO3 mg/L	136
12/05/1968	56975	DISSOLVED SODIUM	14
12/05/1968	56975	DISSOLVED SOLIDS mg/L at 180C	0
12/05/1968	56975	DISSOLVED TOTAL ALKALINITY	114
12/05/1968	56975	LAB pH	8.3
12/05/1968	56975	MINERAL TURBIDITY HELLIGE	3
12/05/1968	56975	SPECIFIC CONDUCTANCE 25C	337
01/06/1969	57543	DISSOLVED BORON	0
01/06/1969	57543	DISSOLVED CHLORIDE	4.7
01/06/1969	57543	DISSOLVED HARDNESS CaCO3 mg/L	104
01/06/1969	57543	DISSOLVED SODIUM	8.2
01/06/1969	57543	DISSOLVED SOLIDS mg/L at 180C	0
01/06/1969	57543	DISSOLVED TOTAL ALKALINITY	84
01/06/1969	57543	LAB pH	8.2
01/06/1969	57543	MINERAL TURBIDITY HELLIGE	240
01/06/1969	57543	SPECIFIC CONDUCTANCE 25C	216
02/03/1969	57849	DISSOLVED BORON	0
02/03/1969	57849	DISSOLVED CHLORIDE	4.5
02/03/1969	57849	DISSOLVED HARDNESS CaCO3 mg/L	123
02/03/1969	57849	DISSOLVED SODIUM	8.7
02/03/1969	57849	DISSOLVED SOLIDS mg/L at 180C	0
02/03/1969	57849	DISSOLVED TOTAL ALKALINITY	107
02/03/1969	57849	LAB pH	8.3
02/03/1969	57849	MINERAL TURBIDITY HELLIGE	45
02/03/1969	57849	SPECIFIC CONDUCTANCE 25C	263
03/04/1969	58167	DISSOLVED BORON	0
03/04/1969	58167	DISSOLVED CHLORIDE	3.6
03/04/1969	58167	DISSOLVED HARDNESS CaCO3 mg/L	125
03/04/1969	58167	DISSOLVED SODIUM	8.9
03/04/1969	58167	DISSOLVED SOLIDS mg/L at 180C	0
03/04/1969	58167	DISSOLVED TOTAL ALKALINITY	105
03/04/1969	58167	LAB pH	8.3
03/04/1969	58167	MINERAL TURBIDITY HELLIGE	45
03/04/1969	58167	SPECIFIC CONDUCTANCE 25C	267
04/01/1969	58450	DISSOLVED BORON	0
04/01/1969	58450	DISSOLVED CHLORIDE	2.2
04/01/1969	58450	DISSOLVED HARDNESS CaCO3 mg/L	80
04/01/1969	58450	DISSOLVED SODIUM	4.4
04/01/1969	58450	DISSOLVED SOLIDS mg/L at 180C	0
04/01/1969	58450	DISSOLVED TOTAL ALKALINITY	75
04/01/1969	58450	LAB pH	7.8
04/01/1969	58450	MINERAL TURBIDITY HELLIGE	140
04/01/1969	58450	SPECIFIC CONDUCTANCE 25C	173
05/01/1969	58776	As mg/L D	0
05/01/1969	58776	DISSOLVED BORON	0
05/01/1969	58776	DISSOLVED CALCIUM	18
05/01/1969	58776	DISSOLVED CHLORIDE	4.1
05/01/1969	58776	DISSOLVED HARDNESS CaCO3 mg/L	80
05/01/1969	58776	DISSOLVED MAGNESIUM	8.5

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05/01/1969	58776	DISSOLVED NITRATE NO3 mg/L	0
05/01/1969	58776	DISSOLVED POTASSIUM	0.8
05/01/1969	58776	DISSOLVED SODIUM	4.5
05/01/1969	58776	DISSOLVED SOLIDS mg/L at 180C	92
05/01/1969	58776	DISSOLVED SULFATE SO4 mg/L	10
05/01/1969	58776	DISSOLVED TOTAL ALKALINITY	75
05/01/1969	58776	LAB pH	7.9
05/01/1969	58776	MINERAL TURBIDITY HELLIGE	20
05/01/1969	58776	SPECIFIC CONDUCTANCE 25C	174
06/02/1969	59255	DISSOLVED BORON	0
06/02/1969	59255	DISSOLVED CHLORIDE	5.1
06/02/1969	59255	DISSOLVED HARDNESS CaCO3 mg/L	77
06/02/1969	59255	DISSOLVED SODIUM	5.3
06/02/1969	59255	DISSOLVED SOLIDS mg/L at 180C	0
06/02/1969	59255	DISSOLVED TOTAL ALKALINITY	75
06/02/1969	59255	LAB pH	7.7
06/02/1969	59255	MINERAL TURBIDITY HELLIGE	4
06/02/1969	59255	SPECIFIC CONDUCTANCE 25C	172
07/02/1969	59646	DISSOLVED BORON	0
07/02/1969	59646	DISSOLVED CHLORIDE	6.4
07/02/1969	59646	DISSOLVED HARDNESS CaCO3 mg/L	111
07/02/1969	59646	DISSOLVED SODIUM	7.8
07/02/1969	59646	DISSOLVED SOLIDS mg/L at 180C	0
07/02/1969	59646	DISSOLVED TOTAL ALKALINITY	107
07/02/1969	59646	LAB pH	8.3
07/02/1969	59646	MINERAL TURBIDITY HELLIGE	4
07/02/1969	59646	SPECIFIC CONDUCTANCE 25C	235
08/11/1969	60182	DISSOLVED BORON	0
08/11/1969	60182	DISSOLVED CHLORIDE	5.4
08/11/1969	60182	DISSOLVED HARDNESS CaCO3 mg/L	98
08/11/1969	60182	DISSOLVED SODIUM	7.8
08/11/1969	60182	DISSOLVED SOLIDS mg/L at 180C	0
08/11/1969	60182	DISSOLVED TOTAL ALKALINITY	97
08/11/1969	60182	LAB pH	8
08/11/1969	60182	MINERAL TURBIDITY HELLIGE	7
08/11/1969	60182	SPECIFIC CONDUCTANCE 25C	216
09/03/1969	60722	As mg/L D	0
09/03/1969	60722	DISSOLVED BORON	0
09/03/1969	60722	DISSOLVED CALCIUM	18
09/03/1969	60722	DISSOLVED CHLORIDE	4.5
09/03/1969	60722	DISSOLVED HARDNESS CaCO3 mg/L	87
09/03/1969	60722	DISSOLVED MAGNESIUM	10
09/03/1969	60722	DISSOLVED NITRATE NO3 mg/L	0.2
09/03/1969	60722	DISSOLVED POTASSIUM	0.5
09/03/1969	60722	DISSOLVED SODIUM	6.8
09/03/1969	60722	DISSOLVED SOLIDS mg/L at 180C	96
09/03/1969	60722	DISSOLVED SULFATE SO4 mg/L	5.6
09/03/1969	60722	DISSOLVED TOTAL ALKALINITY	89
09/03/1969	60722	LAB pH	8
09/03/1969	60722	MINERAL TURBIDITY HELLIGE	1
09/03/1969	60722	SPECIFIC CONDUCTANCE 25C	193
10/01/1969	61521	DISSOLVED BORON	0.1

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10/01/1969	61521	DISSOLVED CHLORIDE	4.6
10/01/1969	61521	DISSOLVED HARDNESS CaCO3 mg/L	82
10/01/1969	61521	DISSOLVED SODIUM	6.1
10/01/1969	61521	DISSOLVED TOTAL ALKALINITY	85
10/01/1969	61521	LAB pH	8.1
10/01/1969	61521	MINERAL TURBIDITY HELLIGE	1
10/01/1969	61521	SPECIFIC CONDUCTANCE 25C	197
11/13/1969	62110	DISSOLVED BORON	0.1
11/13/1969	62110	DISSOLVED CHLORIDE	22
11/13/1969	62110	DISSOLVED HARDNESS CaCO3 mg/L	132
11/13/1969	62110	DISSOLVED SODIUM	12
11/13/1969	62110	DISSOLVED SOLIDS mg/L at 180C	0
11/13/1969	62110	DISSOLVED TOTAL ALKALINITY	116
11/13/1969	62110	LAB pH	7.6
11/13/1969	62110	MINERAL TURBIDITY HELLIGE	3
11/13/1969	62110	SPECIFIC CONDUCTANCE 25C	303
12/01/1969	62530	DISSOLVED BORON	0.1
12/01/1969	62530	DISSOLVED CHLORIDE	18
12/01/1969	62530	DISSOLVED HARDNESS CaCO3 mg/L	126
12/01/1969	62530	DISSOLVED SODIUM	12
12/01/1969	62530	DISSOLVED SOLIDS mg/L at 180C	0
12/01/1969	62530	DISSOLVED TOTAL ALKALINITY	112
12/01/1969	62530	LAB pH	7.8
12/01/1969	62530	MINERAL TURBIDITY HELLIGE	1
12/01/1969	62530	SPECIFIC CONDUCTANCE 25C	296
01/07/1970	62883	DISSOLVED BORON	0
01/07/1970	62883	DISSOLVED CHLORIDE	12
01/07/1970	62883	DISSOLVED HARDNESS CaCO3 mg/L	117
01/07/1970	62883	DISSOLVED SODIUM	9.6
01/07/1970	62883	DISSOLVED SOLIDS mg/L at 180C	0
01/07/1970	62883	DISSOLVED TOTAL ALKALINITY	106
01/07/1970	62883	LAB pH	7.7
01/07/1970	62883	MINERAL TURBIDITY HELLIGE	4
01/07/1970	62883	SPECIFIC CONDUCTANCE 25C	268
02/05/1970	63102	DISSOLVED BORON	0
02/05/1970	63102	DISSOLVED CHLORIDE	4.3
02/05/1970	63102	DISSOLVED HARDNESS CaCO3 mg/L	106
02/05/1970	63102	DISSOLVED SODIUM	7.6
02/05/1970	63102	DISSOLVED SOLIDS mg/L at 180C	0
02/05/1970	63102	DISSOLVED TOTAL ALKALINITY	102
02/05/1970	63102	LAB pH	7.6
02/05/1970	63102	MINERAL TURBIDITY HELLIGE	85
02/05/1970	63102	SPECIFIC CONDUCTANCE 25C	229
03/05/1970	63539	DISSOLVED BORON	0.1
03/05/1970	63539	DISSOLVED CHLORIDE	4.1
03/05/1970	63539	DISSOLVED HARDNESS CaCO3 mg/L	86
03/05/1970	63539	DISSOLVED SODIUM	8.7
03/05/1970	63539	DISSOLVED SOLIDS mg/L at 180C	0
03/05/1970	63539	DISSOLVED TOTAL ALKALINITY	79
03/05/1970	63539	LAB pH	7.7
03/05/1970	63539	MINERAL TURBIDITY HELLIGE	160
03/05/1970	63539	SPECIFIC CONDUCTANCE 25C	203

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

04/03/1970	64047	DISSOLVED BORON	0
04/03/1970	64047	DISSOLVED CHLORIDE	5.3
04/03/1970	64047	DISSOLVED HARDNESS CaCO3 mg/L	131
04/03/1970	64047	DISSOLVED SODIUM	9.2
04/03/1970	64047	DISSOLVED SOLIDS mg/L at 180C	0
04/03/1970	64047	DISSOLVED TOTAL ALKALINITY	117
04/03/1970	64047	LAB pH	8.4
04/03/1970	64047	MINERAL TURBIDITY HELLIGE	8
04/03/1970	64047	SPECIFIC CONDUCTANCE 25C	289
05/07/1970	64354	DISSOLVED BORON	0
05/07/1970	64354	DISSOLVED CALCIUM	26
05/07/1970	64354	DISSOLVED CHLORIDE	6.1
05/07/1970	64354	DISSOLVED HARDNESS CaCO3 mg/L	115
05/07/1970	64354	DISSOLVED MAGNESIUM	12
05/07/1970	64354	DISSOLVED NITRATE NO3 mg/L	0.2
05/07/1970	64354	DISSOLVED POTASSIUM	1
05/07/1970	64354	DISSOLVED SODIUM	10
05/07/1970	64354	DISSOLVED SOLIDS mg/L at 180C	132
05/07/1970	64354	DISSOLVED SULFATE SO4 mg/L	18
05/07/1970	64354	DISSOLVED TOTAL ALKALINITY	109
05/07/1970	64354	LAB pH	8.1
05/07/1970	64354	MINERAL TURBIDITY HELLIGE	2
05/07/1970	64354	SPECIFIC CONDUCTANCE 25C	260
06/05/1970	64774	DISSOLVED BORON	0.1
06/05/1970	64774	DISSOLVED CHLORIDE	9
06/05/1970	64774	DISSOLVED HARDNESS CaCO3 mg/L	114
06/05/1970	64774	DISSOLVED SODIUM	8.8
06/05/1970	64774	DISSOLVED SOLIDS mg/L at 180C	0
06/05/1970	64774	DISSOLVED TOTAL ALKALINITY	111
06/05/1970	64774	LAB pH	8
06/05/1970	64774	MINERAL TURBIDITY HELLIGE	2
06/05/1970	64774	SPECIFIC CONDUCTANCE 25C	257
07/03/1970	65349	DISSOLVED BORON	0
07/03/1970	65349	DISSOLVED CHLORIDE	7
07/03/1970	65349	DISSOLVED HARDNESS CaCO3 mg/L	101
07/03/1970	65349	DISSOLVED SODIUM	8.7
07/03/1970	65349	DISSOLVED SOLIDS mg/L at 180C	0
07/03/1970	65349	DISSOLVED TOTAL ALKALINITY	101
07/03/1970	65349	LAB pH	8
07/03/1970	65349	MINERAL TURBIDITY HELLIGE	1
07/03/1970	65349	SPECIFIC CONDUCTANCE 25C	238
08/07/1970	65741	DISSOLVED BORON	0.1
08/07/1970	65741	DISSOLVED CHLORIDE	3.9
08/07/1970	65741	DISSOLVED HARDNESS CaCO3 mg/L	97
08/07/1970	65741	DISSOLVED SODIUM	7.8
08/07/1970	65741	DISSOLVED SOLIDS mg/L at 180C	0
08/07/1970	65741	DISSOLVED TOTAL ALKALINITY	98
08/07/1970	65741	LAB pH	8.1
08/07/1970	65741	MINERAL TURBIDITY HELLIGE	2
08/07/1970	65741	SPECIFIC CONDUCTANCE 25C	210
09/02/1970	66213	DISSOLVED BORON	0.1
09/02/1970	66213	DISSOLVED CHLORIDE	4.1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

09/02/1970	66213	DISSOLVED HARDNESS CaCO3 mg/L	83
09/02/1970	66213	DISSOLVED SODIUM	7.1
09/02/1970	66213	DISSOLVED SOLIDS mg/L at 180C	0
09/02/1970	66213	DISSOLVED TOTAL ALKALINITY	87
09/02/1970	66213	LAB pH	8
09/02/1970	66213	MINERAL TURBIDITY HELLIGE	9
09/02/1970	66213	SPECIFIC CONDUCTANCE 25C	187
10/07/1970	66856	DISSOLVED BORON	0
10/07/1970	66856	DISSOLVED CHLORIDE	3.7
10/07/1970	66856	DISSOLVED HARDNESS CaCO3 mg/L	62
10/07/1970	66856	DISSOLVED SODIUM	6.1
10/07/1970	66856	DISSOLVED TOTAL ALKALINITY	67
10/07/1970	66856	LAB pH	7.5
10/07/1970	66856	MINERAL TURBIDITY HELLIGE	3
10/07/1970	66856	SPECIFIC CONDUCTANCE 25C	146
11/12/1970	67394	DISSOLVED BORON	0.1
11/12/1970	67394	DISSOLVED CALCIUM	29
11/12/1970	67394	DISSOLVED CHLORIDE	18
11/12/1970	67394	DISSOLVED HARDNESS CaCO3 mg/L	126
11/12/1970	67394	DISSOLVED MAGNESIUM	13
11/12/1970	67394	DISSOLVED NITRATE NO3 mg/L	2.8
11/12/1970	67394	DISSOLVED POTASSIUM	1.1
11/12/1970	67394	DISSOLVED SODIUM	14
11/12/1970	67394	DISSOLVED SOLIDS, invalid temp	164
11/12/1970	67394	DISSOLVED SULFATE SO4 mg/L	27
11/12/1970	67394	DISSOLVED TOTAL ALKALINITY	97
11/12/1970	67394	LAB pH	8.3
11/12/1970	67394	MINERAL TURBIDITY HELLIGE	5
11/12/1970	67394	SPECIFIC CONDUCTANCE 25C	306
12/10/1970	67823	DISSOLVED BORON	0
12/10/1970	67823	DISSOLVED CHLORIDE	5
12/10/1970	67823	DISSOLVED HARDNESS CaCO3 mg/L	86
12/10/1970	67823	DISSOLVED SODIUM	7
12/10/1970	67823	DISSOLVED TOTAL ALKALINITY	80
12/10/1970	67823	LAB pH	7.7
12/10/1970	67823	MINERAL TURBIDITY HELLIGE	80
12/10/1970	67823	SPECIFIC CONDUCTANCE 25C	204
01/13/1971	68109	DISSOLVED BORON	0
01/13/1971	68109	DISSOLVED CALCIUM	24
01/13/1971	68109	DISSOLVED CHLORIDE	6.3
01/13/1971	68109	DISSOLVED HARDNESS CaCO3 mg/L	106
01/13/1971	68109	DISSOLVED MAGNESIUM	11
01/13/1971	68109	DISSOLVED NITRATE NO3 mg/L	0.5
01/13/1971	68109	DISSOLVED POTASSIUM	0.8
01/13/1971	68109	DISSOLVED SODIUM	7.8
01/13/1971	68109	DISSOLVED SOLIDS, invalid temp	143
01/13/1971	68109	DISSOLVED SULFATE SO4 mg/L	18
01/13/1971	68109	DISSOLVED TOTAL ALKALINITY	96
01/13/1971	68109	MINERAL TURBIDITY HELLIGE	40
01/13/1971	68109	SPECIFIC CONDUCTANCE 25C	248
02/08/1971	68538	DISSOLVED BORON	0
02/08/1971	68538	DISSOLVED CHLORIDE	6.7

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/08/1971	68538	DISSOLVED HARDNESS CaCO3 mg/L	115
02/08/1971	68538	DISSOLVED SODIUM	7.2
02/08/1971	68538	DISSOLVED TOTAL ALKALINITY	100
02/08/1971	68538	LAB pH	8.2
02/08/1971	68538	MINERAL TURBIDITY HELLIGE	7
02/08/1971	68538	SPECIFIC CONDUCTANCE 25C	237
03/09/1971	68849	DISSOLVED BORON	0.1
03/09/1971	68849	DISSOLVED CHLORIDE	7.9
03/09/1971	68849	DISSOLVED HARDNESS CaCO3 mg/L	118
03/09/1971	68849	DISSOLVED SODIUM	8.6
03/09/1971	68849	DISSOLVED TOTAL ALKALINITY	107
03/09/1971	68849	LAB pH	8.2
03/09/1971	68849	MINERAL TURBIDITY HELLIGE	2
03/09/1971	68849	SPECIFIC CONDUCTANCE 25C	252
04/19/1971	69174	DISSOLVED BORON	0.1
04/19/1971	69174	DISSOLVED CHLORIDE	5.2
04/19/1971	69174	DISSOLVED HARDNESS CaCO3 mg/L	109
04/19/1971	69174	DISSOLVED SODIUM	6.4
04/19/1971	69174	DISSOLVED TOTAL ALKALINITY	101
04/19/1971	69174	LAB pH	7.7
04/19/1971	69174	MINERAL TURBIDITY HELLIGE	6
04/19/1971	69174	SPECIFIC CONDUCTANCE 25C	232
05/24/1971	70119	As mg/L D	0
05/24/1971	70119	Ba mg/L D	0.1
05/24/1971	70119	Cd mg/L D	0
05/24/1971	70119	DISSOLVED BORON	0
05/24/1971	70119	DISSOLVED CHLORIDE	5
05/24/1971	70119	DISSOLVED HARDNESS CaCO3 mg/L	96
05/24/1971	70119	DISSOLVED SODIUM	7
05/24/1971	70119	DISSOLVED TOTAL ALKALINITY	89
05/24/1971	70119	Hg mg/L T	0
05/24/1971	70119	LAB pH	8
05/24/1971	70119	MINERAL TURBIDITY HELLIGE	2
05/24/1971	70119	Pb mg/L D	0
05/24/1971	70119	Se mg/L D	0
05/24/1971	70119	SPECIFIC CONDUCTANCE 25C	214
06/09/1971	70303	DISSOLVED BORON	0
06/09/1971	70303	DISSOLVED CHLORIDE	5.3
06/09/1971	70303	DISSOLVED HARDNESS CaCO3 mg/L	99
06/09/1971	70303	DISSOLVED SODIUM	7.5
06/09/1971	70303	DISSOLVED TOTAL ALKALINITY	93
06/09/1971	70303	LAB pH	7.6
06/09/1971	70303	MINERAL TURBIDITY HELLIGE	2
06/09/1971	70303	SPECIFIC CONDUCTANCE 25C	212
07/14/1971	70811	DISSOLVED BORON	0
07/14/1971	70811	DISSOLVED CHLORIDE	6.7
07/14/1971	70811	DISSOLVED HARDNESS CaCO3 mg/L	113
07/14/1971	70811	DISSOLVED SODIUM	7.6
07/14/1971	70811	DISSOLVED TOTAL ALKALINITY	107
07/14/1971	70811	LAB pH	7.6
07/14/1971	70811	MINERAL TURBIDITY HELLIGE	2
07/14/1971	70811	SPECIFIC CONDUCTANCE 25C	249

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

08/10/1971	71576	DISSOLVED BORON	0.1
08/10/1971	71576	DISSOLVED CHLORIDE	6.6
08/10/1971	71576	DISSOLVED HARDNESS CaCO3 mg/L	108
08/10/1971	71576	DISSOLVED SODIUM	7.6
08/10/1971	71576	DISSOLVED TOTAL ALKALINITY	105
08/10/1971	71576	LAB pH	7.4
08/10/1971	71576	MINERAL TURBIDITY HELLIGE	2
08/10/1971	71576	SPECIFIC CONDUCTANCE 25C	230
09/27/1971	71884	DISSOLVED BORON	0
09/27/1971	71884	DISSOLVED CHLORIDE	4.1
09/27/1971	71884	DISSOLVED HARDNESS CaCO3 mg/L	79
09/27/1971	71884	DISSOLVED SODIUM	7.5
09/27/1971	71884	DISSOLVED TOTAL ALKALINITY	80
09/27/1971	71884	LAB pH	7.5
09/27/1971	71884	MINERAL TURBIDITY HELLIGE	4
09/27/1971	71884	SPECIFIC CONDUCTANCE 25C	182
10/26/1971	135F	MINERAL TURBIDITY HELLIGE	3
11/22/1971	136F	MINERAL TURBIDITY HELLIGE	0
12/07/1971	137F	MINERAL TURBIDITY HELLIGE	2
01/06/1972	73107	DISSOLVED BORON	0
01/06/1972	73107	DISSOLVED CHLORIDE	19
01/06/1972	73107	DISSOLVED HARDNESS CaCO3 mg/L	140
01/06/1972	73107	DISSOLVED SODIUM	17
01/06/1972	73107	DISSOLVED TOTAL ALKALINITY	116
01/06/1972	73107	LAB pH	7.9
01/06/1972	73107	MINERAL TURBIDITY HELLIGE	3
01/06/1972	73107	SPECIFIC CONDUCTANCE 25C	333
02/09/1972	73196	DISSOLVED BORON	0
02/09/1972	73196	DISSOLVED CHLORIDE	12
02/09/1972	73196	DISSOLVED HARDNESS CaCO3 mg/L	128
02/09/1972	73196	DISSOLVED SODIUM	12
02/09/1972	73196	DISSOLVED TOTAL ALKALINITY	111
02/09/1972	73196	LAB pH	8.6
02/09/1972	73196	MINERAL TURBIDITY HELLIGE	3
02/09/1972	73196	SPECIFIC CONDUCTANCE 25C	298
03/02/1972	73491	DISSOLVED BORON	0
03/02/1972	73491	DISSOLVED CHLORIDE	4.4
03/02/1972	73491	DISSOLVED HARDNESS CaCO3 mg/L	88
03/02/1972	73491	DISSOLVED SODIUM	6.4
03/02/1972	73491	DISSOLVED TOTAL ALKALINITY	83
03/02/1972	73491	LAB pH	7.7
03/02/1972	73491	MINERAL TURBIDITY HACH	34
03/02/1972	73491	SPECIFIC CONDUCTANCE 25C	193
04/14/1972	73682	DISSOLVED BORON	0
04/14/1972	73682	DISSOLVED CHLORIDE	5.3
04/14/1972	73682	DISSOLVED HARDNESS CaCO3 mg/L	92
04/14/1972	73682	DISSOLVED SODIUM	7.3
04/14/1972	73682	DISSOLVED TOTAL ALKALINITY	87
04/14/1972	73682	LAB pH	7.8
04/14/1972	73682	MINERAL TURBIDITY HACH	2
04/14/1972	73682	SPECIFIC CONDUCTANCE 25C	208
05/08/1972	138F	MINERAL TURBIDITY HACH	1

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

06/01/1972	139F	MINERAL TURBIDITY HACH	1
07/21/1972	74923	DISSOLVED BORON	0
07/21/1972	74923	DISSOLVED CHLORIDE	5.4
07/21/1972	74923	DISSOLVED HARDNESS CaCO3 mg/L	80
07/21/1972	74923	DISSOLVED SODIUM	7.8
07/21/1972	74923	DISSOLVED TOTAL ALKALINITY	87
07/21/1972	74923	LAB pH	7.3
07/21/1972	74923	MINERAL TURBIDITY HACH	1
07/21/1972	74923	SPECIFIC CONDUCTANCE 25C	199
08/08/1972	140F	MINERAL TURBIDITY HACH	2
09/22/1972	141F	MINERAL TURBIDITY HACH	1
10/16/1972	76351	DISSOLVED BORON	0.1
10/16/1972	76351	DISSOLVED CHLORIDE	32
10/16/1972	76351	DISSOLVED HARDNESS CaCO3 mg/L	122
10/16/1972	76351	DISSOLVED SODIUM	18
10/16/1972	76351	DISSOLVED TOTAL ALKALINITY	95
10/16/1972	76351	LAB pH	7.5
10/16/1972	76351	MINERAL TURBIDITY HACH	25
10/16/1972	76351	SPECIFIC CONDUCTANCE 25C	347
11/24/1972	1835F	MINERAL TURBIDITY HACH	5
12/13/1972	77558	DISSOLVED BORON	0.1
12/13/1972	77558	DISSOLVED CHLORIDE	18
12/13/1972	77558	DISSOLVED HARDNESS CaCO3 mg/L	136
12/13/1972	77558	DISSOLVED SODIUM	14
12/13/1972	77558	DISSOLVED TOTAL ALKALINITY	119
12/13/1972	77558	LAB pH	7.8
12/13/1972	77558	MINERAL TURBIDITY HACH	1
12/13/1972	77558	SPECIFIC CONDUCTANCE 25C	348
01/05/1973	1836F	MINERAL TURBIDITY HACH	2
02/02/1973	1837F	MINERAL TURBIDITY HACH	12
03/23/1973	1838F	MINERAL TURBIDITY HACH	25
04/10/1973	928B	MINERAL TURBIDITY HACH	7
05/18/1973	929B	MINERAL TURBIDITY HACH	8
06/15/1973	930B	DISSOLVED BORON	0
06/15/1973	930B	DISSOLVED CHLORIDE	6.2
06/15/1973	930B	DISSOLVED HARDNESS CaCO3 mg/L	110
06/15/1973	930B	DISSOLVED SODIUM	7.4
06/15/1973	930B	DISSOLVED TOTAL ALKALINITY	107
06/15/1973	930B	LAB pH	7.6
06/15/1973	930B	MINERAL TURBIDITY HACH	1
06/15/1973	930B	SPECIFIC CONDUCTANCE 25C	242
07/17/1973	931B	MINERAL TURBIDITY HACH	2
08/07/1973	932B	MINERAL TURBIDITY HACH	1
09/20/1973	81680	DISSOLVED BORON	0.1
09/20/1973	81680	DISSOLVED CHLORIDE	3
09/20/1973	81680	DISSOLVED HARDNESS CaCO3 mg/L	70
09/20/1973	81680	DISSOLVED SODIUM	6.1
09/20/1973	81680	DISSOLVED TOTAL ALKALINITY	75
09/20/1973	81680	LAB pH	7.7
09/20/1973	81680	MINERAL TURBIDITY HACH	1
09/20/1973	81680	SPECIFIC CONDUCTANCE 25C	165
10/11/1973	237B	MINERAL TURBIDITY HACH	2

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11/12/1973	238B	DISSOLVED BORON	0
11/12/1973	238B	DISSOLVED CALCIUM	17
11/12/1973	238B	DISSOLVED CHLORIDE	4.7
11/12/1973	238B	DISSOLVED HARDNESS CaCO3 mg/L	71
11/12/1973	238B	DISSOLVED MAGNESIUM	6.9
11/12/1973	238B	DISSOLVED NITRATE NO3 mg/L	2.3
11/12/1973	238B	DISSOLVED POTASSIUM	1.4
11/12/1973	238B	DISSOLVED SODIUM	6.2
11/12/1973	238B	DISSOLVED SOLIDS mg/L at 180C	102
11/12/1973	238B	DISSOLVED SULFATE SO4 mg/L	12
11/12/1973	238B	DISSOLVED TOTAL ALKALINITY	62
11/12/1973	238B	LAB pH	8
11/12/1973	238B	MINERAL TURBIDITY HACH	260
11/12/1973	238B	SPECIFIC CONDUCTANCE 25C	166
11/30/1973	BP37	MINERAL TURBIDITY HACH	195
12/06/1973	239B	MINERAL TURBIDITY HACH	10
01/04/1974	240B	MINERAL TURBIDITY HACH	16
01/17/1974	BP38	MINERAL TURBIDITY HACH	630
02/14/1974	241B	MINERAL TURBIDITY HACH	10
03/18/1974	242B	MINERAL TURBIDITY HACH	43
04/18/1974	84734	Cd mg/L T	0
04/18/1974	84734	Cu mg/L T	0.01
04/18/1974	243B	DISSOLVED BORON	0
04/18/1974	243B	DISSOLVED CHLORIDE	3.3
04/18/1974	243B	DISSOLVED HARDNESS CaCO3 mg/L	111
04/18/1974	84734	DISSOLVED NITRATE as N	0.11
04/18/1974	84734	DISSOLVED ORTHOPHOSPHATE as P	0.01
04/18/1974	243B	DISSOLVED SODIUM	8.2
04/18/1974	243B	DISSOLVED TOTAL ALKALINITY	105
04/18/1974	84734	Fe mg/L T	3
04/18/1974	243B	LAB pH	7.9
04/18/1974	243B	MINERAL TURBIDITY HACH	25
04/18/1974	84734	Mn mg/L T	0.06
04/18/1974	84734	NUTRIENT TURBIDITY HACH	25
04/18/1974	84734	Pb mg/L T	0
04/18/1974	243B	SPECIFIC CONDUCTANCE 25C	253
04/18/1974	84734	TOTAL AMMONIA & ORGANIC NITROG	0.1
04/18/1974	84734	TOTAL PHOSPHORUS as P	0.17
04/18/1974	84734	Zn mg/L T	0.01
05/21/1974	244B	MINERAL TURBIDITY HACH	4
06/24/1974	245B	MINERAL TURBIDITY HACH	1
07/16/1974	246B	MINERAL TURBIDITY HACH	2
08/21/1974	247B	MINERAL TURBIDITY HACH	2
09/23/1974	248B	MINERAL TURBIDITY HACH	2
10/11/1974	88214	DISSOLVED BORON	0
10/11/1974	88214	DISSOLVED CHLORIDE	4.6
10/11/1974	88214	DISSOLVED HARDNESS CaCO3 mg/L	97
10/11/1974	88214	DISSOLVED SODIUM	7.3
10/11/1974	88214	DISSOLVED TOTAL ALKALINITY	97
10/11/1974	88214	LAB pH	7.9
10/11/1974	88214	MINERAL TURBIDITY HACH	1
10/11/1974	88214	SPECIFIC CONDUCTANCE 25C	225

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

11/14/1974	187L	MINERAL TURBIDITY HACH	1
12/05/1974	188L	MINERAL TURBIDITY HACH	19
01/15/1975	189L	MINERAL TURBIDITY HACH	2
02/06/1975	89142	DISSOLVED BORON	0.2
02/06/1975	89142	DISSOLVED CALCIUM	12
02/06/1975	89142	DISSOLVED CHLORIDE	8.9
02/06/1975	89142	DISSOLVED HARDNESS CaCO3 mg/L	57
02/06/1975	89142	DISSOLVED MAGNESIUM	6.6
02/06/1975	89142	DISSOLVED NITRATE NO3 mg/L	6
02/06/1975	89142	DISSOLVED POTASSIUM	6.8
02/06/1975	89142	DISSOLVED SODIUM	9
02/06/1975	89142	DISSOLVED SOLIDS mg/L at 180C	124
02/06/1975	89142	DISSOLVED SULFATE SO4 mg/L	15
02/06/1975	89142	DISSOLVED TOTAL ALKALINITY	50
02/06/1975	89142	LAB pH	7.3
02/06/1975	89142	MINERAL TURBIDITY HACH	19
02/06/1975	89142	SPECIFIC CONDUCTANCE 25C	174
03/05/1975	190L	MINERAL TURBIDITY HACH	20
04/21/1975	89649	Cd mg/L T	0
04/21/1975	89649	Cu mg/L T	0
04/21/1975	89649	DISSOLVED BORON	0
04/21/1975	89649	DISSOLVED CHLORIDE	4.2
04/21/1975	89649	DISSOLVED HARDNESS CaCO3 mg/L	100
04/21/1975	89649	DISSOLVED NITRATE as N	0.05
04/21/1975	89649	DISSOLVED ORTHOPHOSPHATE as P	0.01
04/21/1975	89649	DISSOLVED SODIUM	7.6
04/21/1975	89649	DISSOLVED TOTAL ALKALINITY	95
04/21/1975	89649	Fe mg/L T	0.52
04/21/1975	89649	LAB pH	8.1
04/21/1975	89649	MINERAL TURBIDITY HACH	2
04/21/1975	89649	Mn mg/L T	0.02
04/21/1975	89649	NUTRIENT TURBIDITY HACH	2
04/21/1975	89649	Pb mg/L T	0
04/21/1975	89649	SPECIFIC CONDUCTANCE 25C	225
04/21/1975	89649	TOTAL AMMONIA & ORGANIC NITROG	0.1
04/21/1975	89649	TOTAL PHOSPHORUS as P	0.03
04/21/1975	89649	Zn mg/L T	0.01
05/19/1975	191L	MINERAL TURBIDITY HACH	17
06/17/1975	192L	MINERAL TURBIDITY HACH	2
07/22/1975	193L	MINERAL TURBIDITY HACH	2
08/20/1975	194L	MINERAL TURBIDITY HACH	2
09/11/1975	195L	MINERAL TURBIDITY HACH	1
10/17/1975	89G	MINERAL TURBIDITY HACH	3
11/17/1975	90G	MINERAL TURBIDITY HACH	7
12/09/1975	91G	MINERAL TURBIDITY HACH	2
01/14/1976	94737	DISSOLVED BORON	0
01/14/1976	94737	DISSOLVED CHLORIDE	18
01/14/1976	94737	DISSOLVED HARDNESS CaCO3 mg/L	129
01/14/1976	94737	DISSOLVED SODIUM	18
01/14/1976	94737	DISSOLVED TOTAL ALKALINITY	118
01/14/1976	94737	LAB pH	8.3
01/14/1976	94737	MINERAL TURBIDITY HACH	0

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01/14/1976	94737	SPECIFIC CONDUCTANCE 25C	307
02/11/1976	92G	MINERAL TURBIDITY HACH	1
03/11/1976	93G	MINERAL TURBIDITY HACH	3
04/22/1976	95688	Cd mg/L T	0
04/22/1976	95688	Cu mg/L T	0
04/22/1976	95688	DISSOLVED BORON	0
04/22/1976	95688	DISSOLVED CHLORIDE	8.4
04/22/1976	95688	DISSOLVED HARDNESS CaCO3 mg/L	98
04/22/1976	95688	DISSOLVED NITRATE as N	0.02
04/22/1976	95688	DISSOLVED ORTHOPHOSPHATE as P	0.01
04/22/1976	95688	DISSOLVED SODIUM	9.2
04/22/1976	95688	DISSOLVED TOTAL ALKALINITY	97
04/22/1976	95688	Fe mg/L T	0.1
04/22/1976	95688	LAB pH	7.8
04/22/1976	95688	MINERAL TURBIDITY HACH	1
04/22/1976	95688	Mn mg/L T	0.01
04/22/1976	95688	NUTRIENT TURBIDITY HACH	2
04/22/1976	95688	Pb mg/L T	0
04/22/1976	95688	SPECIFIC CONDUCTANCE 25C	225
04/22/1976	95688	TOTAL AMMONIA & ORGANIC NITROG	0.2
04/22/1976	95688	TOTAL PHOSPHORUS as P	0.02
04/22/1976	95688	Zn mg/L T	0
05/20/1976	166S	MINERAL TURBIDITY HACH	2
06/11/1976	97350	DISSOLVED BORON	0
06/11/1976	97350	DISSOLVED CHLORIDE	3.5
06/11/1976	97350	DISSOLVED HARDNESS CaCO3 mg/L	65
06/11/1976	97350	DISSOLVED SODIUM	6.8
06/11/1976	97350	DISSOLVED TOTAL ALKALINITY	66
06/11/1976	97350	LAB pH	8.1
06/11/1976	97350	MINERAL TURBIDITY HACH	2
06/11/1976	97350	SPECIFIC CONDUCTANCE 25C	149
07/23/1976	167S	MINERAL TURBIDITY HACH	2
08/24/1976	168S	MINERAL TURBIDITY HACH	38
09/07/1976	169S	MINERAL TURBIDITY HACH	9
10/18/1976	100305	DISSOLVED BORON	0
10/18/1976	100305	DISSOLVED CHLORIDE	4
10/18/1976	100305	DISSOLVED HARDNESS CaCO3 mg/L	54
10/18/1976	100305	DISSOLVED SODIUM	4.1
10/18/1976	100305	DISSOLVED TOTAL ALKALINITY	52
10/18/1976	100305	LAB pH	8
10/18/1976	100305	MINERAL TURBIDITY HACH	4
10/18/1976	100305	SPECIFIC CONDUCTANCE 25C	120
11/12/1976	170S	MINERAL TURBIDITY HACH	3
12/14/1976	171S	MINERAL TURBIDITY HACH	2
01/17/1977	172S	MINERAL TURBIDITY HACH	3
02/10/1977	101665	DISSOLVED BORON	0
02/10/1977	101665	DISSOLVED CHLORIDE	27
02/10/1977	101665	DISSOLVED HARDNESS CaCO3 mg/L	145
02/10/1977	101665	DISSOLVED SODIUM	15
02/10/1977	101665	DISSOLVED TOTAL ALKALINITY	120
02/10/1977	101665	LAB pH	8.4
02/10/1977	101665	MINERAL TURBIDITY HACH	2

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

02/10/1977	101665	SPECIFIC CONDUCTANCE 25C	345
03/17/1977	102292	DISSOLVED BORON	0.1
03/17/1977	102292	DISSOLVED CHLORIDE	33
03/17/1977	102292	DISSOLVED HARDNESS CaCO3 mg/L	134
03/17/1977	102292	DISSOLVED SODIUM	21
03/17/1977	102292	DISSOLVED TOTAL ALKALINITY	94
03/17/1977	102292	LAB pH	7.2
03/17/1977	102292	MINERAL TURBIDITY HACH	520
03/17/1977	102292	SPECIFIC CONDUCTANCE 25C	370
04/19/1977	69F	MINERAL TURBIDITY HACH	3
05/17/1977	103766	DISSOLVED BORON	0
05/17/1977	103766	DISSOLVED CHLORIDE	20
05/17/1977	103766	DISSOLVED HARDNESS CaCO3 mg/L	133
05/17/1977	103766	DISSOLVED SODIUM	15
05/17/1977	103766	DISSOLVED TOTAL ALKALINITY	122
05/17/1977	103766	LAB pH	8
05/17/1977	103766	MINERAL TURBIDITY HACH	16
05/17/1977	103766	SPECIFIC CONDUCTANCE 25C	326
06/20/1977	104623	DISSOLVED BORON	0
06/20/1977	104623	DISSOLVED CHLORIDE	17
06/20/1977	104623	DISSOLVED HARDNESS CaCO3 mg/L	116
06/20/1977	104623	DISSOLVED SODIUM	12
06/20/1977	104623	DISSOLVED TOTAL ALKALINITY	114
06/20/1977	104623	LAB pH	8.1
06/20/1977	104623	MINERAL TURBIDITY HACH	2
06/20/1977	104623	SPECIFIC CONDUCTANCE 25C	290
07/19/1977	15P	MINERAL TURBIDITY HACH	1
08/16/1977	19B	MINERAL TURBIDITY HACH	2
09/19/1977	108287	DISSOLVED BORON	0.1
09/19/1977	108287	DISSOLVED CHLORIDE	5.3
09/19/1977	108287	DISSOLVED HARDNESS CaCO3 mg/L	92
09/19/1977	108287	DISSOLVED SODIUM	10
09/19/1977	108287	DISSOLVED TOTAL ALKALINITY	94
09/19/1977	108287	LAB pH	8.1
09/19/1977	108287	MINERAL TURBIDITY HACH	28
09/19/1977	108287	SPECIFIC CONDUCTANCE 25C	218
10/14/1977	108679	DISSOLVED NITRATE as N	0.01
10/14/1977	108679	DISSOLVED ORTHOPHOSPHATE as P	0
10/14/1977	54E	MINERAL TURBIDITY HACH	3
10/14/1977	108679	TOTAL AMMONIA & ORGANIC NITROG	0.32
10/14/1977	108679	TOTAL AMMONIA as N	0.02
10/14/1977	108679	TOTAL ORGANIC NITROGEN as N	0.3
10/14/1977	108679	TOTAL PHOSPHORUS as P	0
11/09/1977	22E	MINERAL TURBIDITY HACH	2
12/14/1977	109150	DISSOLVED BORON	0.1
12/14/1977	109150	DISSOLVED CHLORIDE	21
12/14/1977	109150	DISSOLVED HARDNESS CaCO3 mg/L	121
12/14/1977	109150	DISSOLVED NITRATE as N	0.29
12/14/1977	109150	DISSOLVED SODIUM	16
12/14/1977	109150	DISSOLVED TOTAL ALKALINITY	99
12/14/1977	109150	LAB pH	8
12/14/1977	109150	MINERAL TURBIDITY HACH	210

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

12/14/1977	109150	SPECIFIC CONDUCTANCE 25C	315
12/14/1977	109150	TOTAL AMMONIA & ORGANIC NITROG	0.6
12/14/1977	109150	TOTAL PHOSPHORUS as P	0.09
01/10/1978	BP39	MINERAL TURBIDITY HACH	130
01/11/1978	110283	DISSOLVED BORON	0
01/11/1978	110283	DISSOLVED CHLORIDE	4
01/11/1978	110283	DISSOLVED HARDNESS CaCO3 mg/L	69
01/11/1978	110283	DISSOLVED SODIUM	8
01/11/1978	110283	DISSOLVED TOTAL ALKALINITY	61
01/11/1978	110283	LAB pH	8
01/11/1978	110283	MINERAL TURBIDITY HACH	108
01/11/1978	110283	SPECIFIC CONDUCTANCE 25C	172
02/14/1978	110865	DISSOLVED BORON	0
02/14/1978	110865	DISSOLVED CHLORIDE	2.4
02/14/1978	110865	DISSOLVED HARDNESS CaCO3 mg/L	54
02/14/1978	110865	DISSOLVED SODIUM	7
02/14/1978	110865	DISSOLVED TOTAL ALKALINITY	51
02/14/1978	110865	LAB pH	7.5
02/14/1978	110865	MINERAL TURBIDITY HACH	15
02/14/1978	110865	SPECIFIC CONDUCTANCE 25C	140
03/13/1978	551A	MINERAL TURBIDITY HACH	18
04/18/1978	104J	MINERAL TURBIDITY HACH	7
05/16/1978	42F	MINERAL TURBIDITY HACH	4
06/19/1978	25W	MINERAL TURBIDITY HACH	3
07/18/1978	34C	MINERAL TURBIDITY HACH	1
08/18/1978	A15	MINERAL TURBIDITY HACH	1
09/20/1978	6F	MINERAL TURBIDITY HACH	1
10/18/1978	62F	MINERAL TURBIDITY HACH	2
11/17/1978	37E	MINERAL TURBIDITY HACH	1
12/12/1978	J22	MINERAL TURBIDITY HACH	1
01/19/1979	3X38	MINERAL TURBIDITY HACH	6
02/21/1979	117675	DISSOLVED BORON	1.1
02/21/1979	117675	DISSOLVED CALCIUM	4
02/21/1979	117675	DISSOLVED CHLORIDE	3
02/21/1979	117675	DISSOLVED HARDNESS CaCO3 mg/L	18
02/21/1979	117675	DISSOLVED MAGNESIUM	2
02/21/1979	117675	DISSOLVED NITRATE NO3 mg/L	3.9
02/21/1979	117675	DISSOLVED POTASSIUM	5.9
02/21/1979	117675	DISSOLVED SODIUM	4
02/21/1979	117675	DISSOLVED SOLIDS mg/L at 180C	70
02/21/1979	117675	DISSOLVED SULFATE SO4 mg/L	4
02/21/1979	117675	DISSOLVED TOTAL ALKALINITY	23
02/21/1979	117675	LAB pH	7.2
02/21/1979	117675	MINERAL TURBIDITY HACH	72
02/21/1979	117675	SPECIFIC CONDUCTANCE 25C	81
03/20/1979	39	MINERAL TURBIDITY HACH	9
04/23/1979	X11	MINERAL TURBIDITY HACH	8
05/21/1979	X1V	MINERAL TURBIDITY HACH	2
06/20/1979	F28	MINERAL TURBIDITY HACH	2
07/24/1979	120802	DISSOLVED BORON	0
07/24/1979	120802	DISSOLVED CALCIUM	16
07/24/1979	120802	DISSOLVED CHLORIDE	2

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07/24/1979	120802	DISSOLVED HARDNESS CaCO3 mg/L	73
07/24/1979	120802	DISSOLVED MAGNESIUM	8
07/24/1979	120802	DISSOLVED SODIUM	8
07/24/1979	120802	DISSOLVED TOTAL ALKALINITY	76
07/24/1979	120802	LAB pH	7.7
07/24/1979	120802	MINERAL TURBIDITY HACH	1
07/24/1979	120802	SPECIFIC CONDUCTANCE 25C	175
08/17/1979	DF100	MINERAL TURBIDITY HACH	4
09/24/1979	10F	MINERAL TURBIDITY HACH	2
10/19/1979	12B	MINERAL TURBIDITY HACH	1
11/20/1979	X23	MINERAL TURBIDITY HACH	5
12/26/1979	A16	MINERAL TURBIDITY HACH	64
01/14/1980	BP40	MINERAL TURBIDITY HACH	250
01/23/1980	F6	MINERAL TURBIDITY HACH	11
02/22/1980	BP41	MINERAL TURBIDITY HACH	130
02/26/1980	BCD1	MINERAL TURBIDITY HACH	40
03/25/1980	F56	MINERAL TURBIDITY HACH	4
04/22/1980	F106	MINERAL TURBIDITY HACH	3
05/23/1980	FD14	MINERAL TURBIDITY HACH	2
06/20/1980	F6	MINERAL TURBIDITY HACH	2
07/24/1980	N00041	DISSOLVED BORON	0.1
07/24/1980	N00041	DISSOLVED CALCIUM	18
07/24/1980	N00041	DISSOLVED CHLORIDE	5
07/24/1980	N00041	DISSOLVED HARDNESS CaCO3 mg/L	82
07/24/1980	N00041	DISSOLVED MAGNESIUM	9
07/24/1980	N00041	DISSOLVED POTASSIUM	1.4
07/24/1980	N00041	DISSOLVED SODIUM	8
07/24/1980	N00041	DISSOLVED TOTAL ALKALINITY	84
07/24/1980	N00041	LAB pH	7.7
07/24/1980	N00041	MINERAL TURBIDITY HACH	2
07/24/1980	N00041	SPECIFIC CONDUCTANCE 25C	196
08/29/1980	F2	MINERAL TURBIDITY HACH	1
09/30/1980	F47	MINERAL TURBIDITY HACH	1
10/24/1980	N00381	DISSOLVED BORON	0.1
10/24/1980	N00381	DISSOLVED CALCIUM	22
10/24/1980	N00381	DISSOLVED CHLORIDE	9
10/24/1980	N00381	DISSOLVED HARDNESS CaCO3 mg/L	105
10/24/1980	N00381	DISSOLVED MAGNESIUM	12
10/24/1980	N00381	DISSOLVED POTASSIUM	1.3
10/24/1980	N00381	DISSOLVED SODIUM	9
10/24/1980	N00381	DISSOLVED TOTAL ALKALINITY	104
10/24/1980	N00381	LAB pH	8
10/24/1980	N00381	MINERAL TURBIDITY HACH	1
10/24/1980	N00381	SPECIFIC CONDUCTANCE 25C	249
11/12/1980	OK46	MINERAL TURBIDITY HACH	1
12/30/1980	FD20	MINERAL TURBIDITY HACH	1
01/29/1981	N00624	DISSOLVED BORON	0.1
01/29/1981	N00624	DISSOLVED CALCIUM	6
01/29/1981	N00624	DISSOLVED CHLORIDE	3
01/29/1981	N00624	DISSOLVED HARDNESS CaCO3 mg/L	28
01/29/1981	N00624	DISSOLVED MAGNESIUM	3
01/29/1981	N00624	DISSOLVED POTASSIUM	5.6

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01/29/1981	N00624	DISSOLVED SODIUM	4
01/29/1981	N00624	DISSOLVED TOTAL ALKALINITY	23
01/29/1981	N00624	LAB pH	7.2
01/29/1981	N00624	MINERAL TURBIDITY HACH	21
01/29/1981	N00624	SPECIFIC CONDUCTANCE 25C	96
02/26/1981	FD2	MINERAL TURBIDITY HACH	10
03/11/1981	F3	MINERAL TURBIDITY HACH	2
04/01/1981	FA22	MINERAL TURBIDITY HACH	5
05/27/1981	C40	MINERAL TURBIDITY HACH	2
06/17/1981	K02	MINERAL TURBIDITY HACH	2
07/28/1981	F33	MINERAL TURBIDITY HACH	1
08/24/1981	FC23	MINERAL TURBIDITY HACH	3
09/22/1981	FD23	MINERAL TURBIDITY HACH	2
10/27/1981	TK02	MINERAL TURBIDITY HACH	2
11/25/1981	N01633	DISSOLVED BORON	0
11/25/1981	N01633	DISSOLVED CALCIUM	19
11/25/1981	N01633	DISSOLVED CHLORIDE	6
11/25/1981	N01633	DISSOLVED HARDNESS CaCO3 mg/L	80
11/25/1981	N01633	DISSOLVED MAGNESIUM	8
11/25/1981	N01633	DISSOLVED POTASSIUM	1.2
11/25/1981	N01633	DISSOLVED SODIUM	8
11/25/1981	N01633	DISSOLVED TOTAL ALKALINITY	76
11/25/1981	N01633	LAB pH	7.8
11/25/1981	N01633	MINERAL TURBIDITY HACH	65
11/25/1981	N01633	SPECIFIC CONDUCTANCE 25C	199
12/04/1981	SCR65	MINERAL TURBIDITY HACH	4
01/12/1982	NFL04	MINERAL TURBIDITY HACH	9
03/30/1982	N01949	DISSOLVED BORON	0.1
03/30/1982	N01949	DISSOLVED CALCIUM	29
03/30/1982	N01949	DISSOLVED CHLORIDE	5
03/30/1982	N01949	DISSOLVED HARDNESS CaCO3 mg/L	126
03/30/1982	N01949	DISSOLVED MAGNESIUM	13
03/30/1982	N01949	DISSOLVED POTASSIUM	0.9
03/30/1982	N01949	DISSOLVED SODIUM	12
03/30/1982	N01949	DISSOLVED TOTAL ALKALINITY	113
03/30/1982	N01949	LAB pH	8.2
03/30/1982	N01949	MINERAL TURBIDITY HACH	6
03/30/1982	N01949	SPECIFIC CONDUCTANCE 25C	288
04/23/1982	LRG57	MINERAL TURBIDITY HACH	28
05/24/1982	N02090	DISSOLVED BORON	0
05/24/1982	N02090	DISSOLVED CALCIUM	16
05/24/1982	N02090	DISSOLVED CHLORIDE	3
05/24/1982	N02090	DISSOLVED HARDNESS CaCO3 mg/L	69
05/24/1982	N02090	DISSOLVED MAGNESIUM	7
05/24/1982	N02090	DISSOLVED POTASSIUM	1.3
05/24/1982	N02090	DISSOLVED SODIUM	6
05/24/1982	N02090	DISSOLVED TOTAL ALKALINITY	67
05/24/1982	N02090	LAB pH	7.6
05/24/1982	N02090	MINERAL TURBIDITY HACH	4
05/24/1982	N02090	SPECIFIC CONDUCTANCE 25C	166
06/23/1982	FD52	MINERAL TURBIDITY HACH	3
07/21/1982	CS5	MINERAL TURBIDITY HACH	2

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08/25/1982	CS2	MINERAL TURBIDITY HACH	3
09/10/1982	N02316	DISSOLVED BORON	0.1
09/10/1982	N02316	DISSOLVED CALCIUM	40
09/10/1982	N02316	DISSOLVED CHLORIDE	6
09/10/1982	N02316	DISSOLVED HARDNESS CaCO3 mg/L	174
09/10/1982	N02316	DISSOLVED MAGNESIUM	18
09/10/1982	N02316	DISSOLVED POTASSIUM	2.2
09/10/1982	N02316	DISSOLVED SODIUM	10
09/10/1982	N02316	DISSOLVED TOTAL ALKALINITY	178
09/10/1982	N02316	LAB pH	7.9
09/10/1982	N02316	MINERAL TURBIDITY HACH	6
09/10/1982	N02316	SPECIFIC CONDUCTANCE 25C	365
10/26/1982	MTW23	MINERAL TURBIDITY HACH	3
11/16/1982	VDB15	MINERAL TURBIDITY HACH	2
11/16/1982	VDB15	SPECIFIC CONDUCTANCE 25C	307
12/08/1982	ENT21	MINERAL TURBIDITY HACH	5
12/22/1982	N02566	DISSOLVED BORON	0
12/22/1982	N02566	DISSOLVED CALCIUM	6
12/22/1982	N02566	DISSOLVED CHLORIDE	2
12/22/1982	N02566	DISSOLVED HARDNESS CaCO3 mg/L	28
12/22/1982	N02566	DISSOLVED MAGNESIUM	3
12/22/1982	N02566	DISSOLVED POTASSIUM	4.1
12/22/1982	N02566	DISSOLVED SODIUM	4
12/22/1982	N02566	DISSOLVED TOTAL ALKALINITY	25
12/22/1982	N02566	LAB pH	7
12/22/1982	N02566	MINERAL TURBIDITY HACH	20
12/22/1982	N02566	SPECIFIC CONDUCTANCE 25C	87
01/19/1983	N02619	DISSOLVED BORON	0
01/19/1983	N02619	DISSOLVED CALCIUM	4
01/19/1983	N02619	DISSOLVED CHLORIDE	3
01/19/1983	N02619	DISSOLVED HARDNESS CaCO3 mg/L	22
01/19/1983	N02619	DISSOLVED MAGNESIUM	3
01/19/1983	N02619	DISSOLVED POTASSIUM	4.7
01/19/1983	N02619	DISSOLVED SODIUM	4
01/19/1983	N02619	DISSOLVED TOTAL ALKALINITY	18
01/19/1983	N02619	LAB pH	6.5
01/19/1983	N02619	MINERAL TURBIDITY HACH	60
01/19/1983	N02619	SPECIFIC CONDUCTANCE 25C	77
02/09/1983	MWT35	MINERAL TURBIDITY HACH	78
03/01/1983	U70	MINERAL TURBIDITY HACH	670
03/03/1983	A3112	MINERAL TURBIDITY HACH	858
03/16/1983	INV02	MINERAL TURBIDITY HACH	113
04/12/1983	U01	MINERAL TURBIDITY HACH	19
05/11/1983	A52512	MINERAL TURBIDITY HACH	14
06/10/1983	A61313	MINERAL TURBIDITY HACH	37
07/06/1983	PA0712	MINERAL TURBIDITY HACH	3
08/16/1983	A0416	MINERAL TURBIDITY HACH	16
09/26/1983	A035	MINERAL TURBIDITY HACH	2
10/19/1983	P1110	MINERAL TURBIDITY HACH	2
11/15/1983	P211	MINERAL TURBIDITY HACH	8
12/21/1983	A1222	MINERAL TURBIDITY HACH	10
01/23/1984	P2714	MINERAL TURBIDITY HACH	4

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02/23/1984	A22421	MINERAL TURBIDITY HACH	3
03/26/1984	A32719	MINERAL TURBIDITY HACH	2
04/12/1984	P248	MINERAL TURBIDITY HACH	3
05/25/1984	N03876	DISSOLVED BORON	0
05/25/1984	N03876	DISSOLVED CALCIUM	24
05/25/1984	N03876	DISSOLVED CHLORIDE	7
05/25/1984	N03876	DISSOLVED HARDNESS CaCO3 mg/L	105
05/25/1984	N03876	DISSOLVED MAGNESIUM	11
05/25/1984	N03876	DISSOLVED SODIUM	8
05/25/1984	N03876	DISSOLVED TOTAL ALKALINITY	102
05/25/1984	N03876	LAB pH	8
05/25/1984	N03876	MINERAL TURBIDITY HACH	1
05/25/1984	N03876	SPECIFIC CONDUCTANCE 25C	239
06/13/1984	P61438	MINERAL TURBIDITY HACH	2
07/20/1984	P72337	MINERAL TURBIDITY HACH	14
08/08/1984	L413	MINERAL TURBIDITY HACH	1
09/11/1984	P91441	MINERAL TURBIDITY HACH	2
10/24/1984	N04277	DISSOLVED BORON	0
10/24/1984	N04277	DISSOLVED CALCIUM	25
10/24/1984	N04277	DISSOLVED CHLORIDE	17
10/24/1984	N04277	DISSOLVED HARDNESS CaCO3 mg/L	116
10/24/1984	N04277	DISSOLVED MAGNESIUM	13
10/24/1984	N04277	DISSOLVED SODIUM	11
10/24/1984	N04277	DISSOLVED TOTAL ALKALINITY	105
10/24/1984	N04277	LAB pH	8
10/24/1984	N04277	MINERAL TURBIDITY HACH	3
10/24/1984	N04277	SPECIFIC CONDUCTANCE 25C	287
11/21/1984	L1261	MINERAL TURBIDITY HACH	9
12/19/1984	P12215	MINERAL TURBIDITY HACH	3
01/16/1985	P3271	MINERAL TURBIDITY HACH	1
02/14/1985	N04423	DISSOLVED BORON	0
02/14/1985	N04423	DISSOLVED CALCIUM	26
02/14/1985	N04423	DISSOLVED CHLORIDE	7
02/14/1985	N04423	DISSOLVED HARDNESS CaCO3 mg/L	119
02/14/1985	N04423	DISSOLVED MAGNESIUM	13
02/14/1985	N04423	DISSOLVED SODIUM	11
02/14/1985	N04423	DISSOLVED TOTAL ALKALINITY	109
02/14/1985	N04423	LAB pH	8.2
02/14/1985	N04423	MINERAL TURBIDITY HACH	2
02/14/1985	N04423	SPECIFIC CONDUCTANCE 25C	280
03/12/1985	L111	MINERAL TURBIDITY HACH	1
04/17/1985	P4261	MINERAL TURBIDITY HACH	3
05/23/1985	P5283	MINERAL TURBIDITY HACH	3
06/14/1985	P6176	MINERAL TURBIDITY HACH	2
07/25/1985	P7261	MINERAL TURBIDITY HACH	3
08/21/1985	P82314	MINERAL TURBIDITY HACH	2
09/24/1985	P9251	MINERAL TURBIDITY HACH	2
10/24/1985	P10280	MINERAL TURBIDITY HACH	7
11/20/1985	A1118	MINERAL TURBIDITY HACH	2
12/10/1985	N05101	DISSOLVED BORON	0.1
12/10/1985	N05101	DISSOLVED CALCIUM	28
12/10/1985	N05101	DISSOLVED CHLORIDE	19

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12/10/1985	N05101	DISSOLVED HARDNESS CaCO3 mg/L	124
12/10/1985	N05101	DISSOLVED MAGNESIUM	13
12/10/1985	N05101	DISSOLVED SODIUM	14
12/10/1985	N05101	DISSOLVED TOTAL ALKALINITY	104
12/10/1985	N05101	LAB pH	8.2
12/10/1985	N05101	MINERAL TURBIDITY HACH	4
12/10/1985	N05101	SPECIFIC CONDUCTANCE 25C	308
01/09/1986	P0191	MINERAL TURBIDITY HACH	2
02/20/1986	N05229	DISSOLVED BORON	0
02/20/1986	N05229	DISSOLVED CALCIUM	15
02/20/1986	N05229	DISSOLVED CHLORIDE	2
02/20/1986	N05229	DISSOLVED HARDNESS CaCO3 mg/L	70
02/20/1986	N05229	DISSOLVED MAGNESIUM	8
02/20/1986	N05229	DISSOLVED SODIUM	5
02/20/1986	N05229	DISSOLVED TOTAL ALKALINITY	71
02/20/1986	N05229	LAB pH	7.8
02/20/1986	N05229	MINERAL TURBIDITY HACH	196
02/20/1986	N05229	SPECIFIC CONDUCTANCE 25C	160
03/24/1986	P3251	MINERAL TURBIDITY HACH	18
04/10/1986	P4146	MINERAL TURBIDITY HACH	2
05/08/1986	P591	MINERAL TURBIDITY HACH	38
06/18/1986	P6198	MINERAL TURBIDITY HACH	13
07/15/1986	P7161	MINERAL TURBIDITY HACH	3
08/21/1986	N05763	DISSOLVED CALCIUM	19
08/21/1986	N05763	DISSOLVED CHLORIDE	4
08/21/1986	N05763	DISSOLVED HARDNESS CaCO3 mg/L	92
08/21/1986	N05763	DISSOLVED MAGNESIUM	11
08/21/1986	N05763	DISSOLVED SODIUM	8
08/21/1986	N05763	DISSOLVED TOTAL ALKALINITY	94
08/21/1986	N05763	LAB pH	8.3
08/21/1986	N05763	MINERAL TURBIDITY HACH	2
08/21/1986	N05763	SPECIFIC CONDUCTANCE 25C	208
09/17/1986	P9185	MINERAL TURBIDITY HACH	2
10/16/1986	P1029	MINERAL TURBIDITY HACH	2
11/18/1986	P11112	MINERAL TURBIDITY HACH	1
12/17/1986	N05969	DISSOLVED CALCIUM	28
12/17/1986	N05969	DISSOLVED CHLORIDE	23
12/17/1986	N05969	DISSOLVED HARDNESS CaCO3 mg/L	132
12/17/1986	N05969	DISSOLVED MAGNESIUM	15
12/17/1986	N05969	DISSOLVED NITRATE NO3 mg/L	0
12/17/1986	N05969	DISSOLVED SODIUM	10
12/17/1986	N05969	DISSOLVED TOTAL ALKALINITY	122
12/17/1986	N05969	LAB pH	8.1
12/17/1986	N05969	MINERAL TURBIDITY HACH	1
12/17/1986	N05969	SPECIFIC CONDUCTANCE 25C	321
01/13/1987	N06024	DISSOLVED CALCIUM	28
01/13/1987	N06024	DISSOLVED CHLORIDE	20
01/13/1987	N06024	DISSOLVED MAGNESIUM	14
01/13/1987	N06024	DISSOLVED NITRATE NO3 mg/L	0.5
01/13/1987	N06024	DISSOLVED SODIUM	9
01/13/1987	N06024	DISSOLVED TOTAL ALKALINITY	98
01/13/1987	N06024	LAB pH	7.8

*Most results are reported in units of mg/l, with the exception of temperature, pH, EC, turbidity, etc.

01/13/1987	N06024	MINERAL TURBIDITY HACH	1
01/13/1987	N06024	SPECIFIC CONDUCTANCE 25C	323
02/19/1987	P21320	MINERAL TURBIDITY HACH	5
03/16/1987	N06138	DISSOLVED CALCIUM	19
03/16/1987	N06138	DISSOLVED CHLORIDE	4
03/16/1987	N06138	DISSOLVED MAGNESIUM	10
03/16/1987	N06138	DISSOLVED NITRATE NO3 mg/L	1.3
03/16/1987	N06138	DISSOLVED SODIUM	8
03/16/1987	N06138	DISSOLVED TOTAL ALKALINITY	85
03/16/1987	N06138	LAB pH	8.1
03/16/1987	N06138	MINERAL TURBIDITY HACH	17
03/16/1987	N06138	SPECIFIC CONDUCTANCE 25C	190
04/16/1987	N06208	BOD 5-DAY	0.2
04/16/1987	N06208	DISSOLVED CALCIUM	22
04/16/1987	N06208	DISSOLVED CHLORIDE	7
04/16/1987	N06208	DISSOLVED HARDNESS CaCO3 mg/L	96
04/16/1987	N06208	DISSOLVED MAGNESIUM	10
04/16/1987	N06208	DISSOLVED NITRATE AND NITRITE	0.06
04/16/1987	N06208	DISSOLVED POTASSIUM	1
04/16/1987	N06208	DISSOLVED SODIUM	8
04/16/1987	N06208	DISSOLVED SOLIDS mg/L at 180C	142
04/16/1987	N06208	DISSOLVED TOTAL ALKALINITY	98
04/16/1987	N06208	LAB pH	8.2
04/16/1987	N06208	SPECIFIC CONDUCTANCE 25C	241
05/21/1987	A39	MINERAL TURBIDITY HACH	1
06/18/1987	P6828	MINERAL TURBIDITY HACH	1
07/15/1987	P72012	MINERAL TURBIDITY HACH	1
08/18/1987	8200	MINERAL TURBIDITY HACH	1
09/22/1987	P91816	MINERAL TURBIDITY HACH	1
10/20/1987	P10524	MINERAL TURBIDITY HACH	1
11/19/1987	N06683	DISSOLVED CALCIUM	24
11/19/1987	N06683	DISSOLVED CHLORIDE	20
11/19/1987	N06683	DISSOLVED HARDNESS CaCO3 mg/L	118
11/19/1987	N06683	DISSOLVED MAGNESIUM	14
11/19/1987	N06683	DISSOLVED SODIUM	9
11/19/1987	N06683	DISSOLVED TOTAL ALKALINITY	112
11/19/1987	N06683	LAB pH	8.4
11/19/1987	N06683	SPECIFIC CONDUCTANCE 25C	297
12/22/1987	A1218	MINERAL TURBIDITY HACH	2
01/13/1988	P11110	MINERAL TURBIDITY HACH	17
03/18/1988	N07019	DISSOLVED CALCIUM	27
03/18/1988	N07019	DISSOLVED CHLORIDE	9
03/18/1988	N07019	DISSOLVED HARDNESS CaCO3 mg/L	125
03/18/1988	N07019	DISSOLVED MAGNESIUM	14
03/18/1988	N07019	DISSOLVED NITRATE as N	0.04
03/18/1988	N07019	DISSOLVED SODIUM	9
03/18/1988	N07019	DISSOLVED SULFATE SO4 mg/L	15
03/18/1988	N07019	Fe mg/L T	0.1
03/18/1988	N07019	MINERAL TURBIDITY HACH	2
03/18/1988	N07019	TOTAL PHOSPHORUS as P	0.01
05/12/1988	N06987	DISSOLVED CALCIUM	19
05/12/1988	N06987	DISSOLVED CHLORIDE	5

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05/12/1988	N06987	DISSOLVED MAGNESIUM	9
05/12/1988	N06987	DISSOLVED SODIUM	8
05/12/1988	N06987	DISSOLVED TOTAL ALKALINITY	77
05/12/1988	N06987	LAB pH	9
05/12/1988	N06987	MINERAL TURBIDITY HACH	8
05/12/1988	N06987	SPECIFIC CONDUCTANCE 25C	190
09/13/1988	N07303	Al mg/L T	0.105
09/13/1988	N07303	Cu mg/L T	0.028
09/13/1988	N07303	DISSOLVED CALCIUM	19
09/13/1988	N07303	DISSOLVED CHLORIDE	6
09/13/1988	N07303	DISSOLVED HARDNESS CaCO3 mg/L	92
09/13/1988	N07303	DISSOLVED MAGNESIUM	11
09/13/1988	N07303	DISSOLVED NITRATE as N	0.03
09/13/1988	N07303	DISSOLVED SODIUM	10
09/13/1988	N07303	DISSOLVED SULFATE SO4 mg/L	6
09/13/1988	N07303	Fe mg/L T	0.2
09/13/1988	N07303	Mn mg/L T	0.035
09/13/1988	N07303	Ni mg/L T	0.006
09/13/1988	N07303	Pb mg/L T	0.008
09/13/1988	N07303	SPECIFIC CONDUCTANCE 25C	214
09/13/1988	N07303	TOTAL AMMONIA & ORGANIC NITROG	0.6
09/13/1988	N07303	TOTAL PHOSPHORUS as P	0.03
09/13/1988	N07303	Zn mg/L T	0.032
01/23/1989	N07494	DISSOLVED CALCIUM	26
01/23/1989	N07494	DISSOLVED CHLORIDE	9
01/23/1989	N07494	DISSOLVED HARDNESS CaCO3 mg/L	119
01/23/1989	N07494	DISSOLVED MAGNESIUM	13
01/23/1989	N07494	DISSOLVED NITRATE NO3 mg/L	0.2
01/23/1989	N07494	DISSOLVED SODIUM	10
01/23/1989	N07494	DISSOLVED TOTAL ALKALINITY	104
01/23/1989	N07494	MINERAL TURBIDITY HACH	11
01/23/1989	N07494	SPECIFIC CONDUCTANCE 25C	265
03/09/1989	P324	MINERAL TURBIDITY HACH	290
03/21/1989	N07624	Cr mg/L T	0.005
03/21/1989	N07624	DISSOLVED CALCIUM	20
03/21/1989	N07624	DISSOLVED CHLORIDE	3
03/21/1989	N07624	DISSOLVED HARDNESS CaCO3 mg/L	91
03/21/1989	N07624	DISSOLVED MAGNESIUM	10
03/21/1989	N07624	DISSOLVED NITRATE as N	0.05
03/21/1989	N07624	DISSOLVED SODIUM	6
03/21/1989	N07624	DISSOLVED SULFATE SO4 mg/L	11
03/21/1989	N07624	Fe mg/L T	2.4
03/21/1989	N07624	MINERAL TURBIDITY HACH	21
03/21/1989	N07624	Mn mg/L T	0.032
03/21/1989	N07624	Ni mg/L T	0.006
03/21/1989	N07624	NUTRIENT TURBIDITY HACH	21
03/21/1989	N07624	TOTAL AMMONIA & ORGANIC NITROG	0.2
03/21/1989	N07624	TOTAL PHOSPHORUS as P	0.05
03/21/1989	N07624	Zn mg/L T	0.009
05/11/1989	P5121	MINERAL TURBIDITY HACH	2
06/20/1989	N07817	DISSOLVED CALCIUM	22
06/20/1989	N07817	DISSOLVED CHLORIDE	7

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06/20/1989	N07817	DISSOLVED HARDNESS CaCO3 mg/L	100
06/20/1989	N07817	DISSOLVED MAGNESIUM	11
06/20/1989	N07817	DISSOLVED NITRATE NO3 mg/L	1.1
06/20/1989	N07817	DISSOLVED SODIUM	10
06/20/1989	N07817	DISSOLVED TOTAL ALKALINITY	105
06/20/1989	N07817	MINERAL TURBIDITY HACH	1
06/20/1989	N07817	SPECIFIC CONDUCTANCE 25C	239
07/19/1989	P71418	MINERAL TURBIDITY HACH	1
08/15/1989	N07950	DISSOLVED AMMONIA as N	0.03
08/15/1989	N07950	DISSOLVED CALCIUM	21
08/15/1989	N07950	DISSOLVED CHLORIDE	6
08/15/1989	N07950	DISSOLVED HARDNESS CaCO3 mg/L	102
08/15/1989	N07950	DISSOLVED MAGNESIUM	12
08/15/1989	N07950	DISSOLVED NITRATE AND NITRITE	0.02
08/15/1989	N07950	DISSOLVED NITRATE NO3 mg/L	1
08/15/1989	N07950	DISSOLVED POTASSIUM	1.7
08/15/1989	N07950	DISSOLVED SODIUM	9
08/15/1989	N07950	DISSOLVED SOLIDS mg/L at 180C	139
08/15/1989	N07950	DISSOLVED SULFATE SO4 mg/L	7
08/15/1989	N07950	DISSOLVED TOTAL ALKALINITY	104
08/15/1989	N07950	Mn mg/L T	0.013
08/15/1989	N07950	SPECIFIC CONDUCTANCE 25C	229
08/15/1989	N07950	TOTAL AMMONIA & ORGANIC NITROG	0.4
08/15/1989	N07950	TOTAL PHOSPHORUS as P	0.04
08/15/1989	N07950	Zn mg/L T	0.018
10/18/1989	P1027	MINERAL TURBIDITY HACH	1
01/23/1990	P11622	MINERAL TURBIDITY HACH	1
02/22/1990	P2238	MINERAL TURBIDITY HACH	2
03/16/1990	P32113	MINERAL TURBIDITY HACH	1
04/25/1990	N08354	BOD 5-DAY	2.2
04/25/1990	N08354	DISSOLVED CALCIUM	27
04/25/1990	N08354	DISSOLVED CHLORIDE	11
04/25/1990	N08354	DISSOLVED HARDNESS CaCO3 mg/L	121
04/25/1990	N08354	DISSOLVED MAGNESIUM	13
04/25/1990	N08354	DISSOLVED SODIUM	11
04/25/1990	N08354	DISSOLVED SOLIDS mg/L at 180C	156
04/25/1990	N08354	DISSOLVED SULFATE SO4 mg/L	12
04/25/1990	N08354	DISSOLVED TOTAL ALKALINITY	104
04/25/1990	N08354	MINERAL TURBIDITY HACH	1
04/25/1990	N08354	NUTRIENT TURBIDITY HACH	1
04/25/1990	N08354	SPECIFIC CONDUCTANCE 25C	270
07/23/1990	N08548	BOD 5-DAY	1.2
07/23/1990	N08548	DISSOLVED CALCIUM	18
07/23/1990	N08548	DISSOLVED CHLORIDE	6
07/23/1990	N08548	DISSOLVED HARDNESS CaCO3 mg/L	86
07/23/1990	N08548	DISSOLVED MAGNESIUM	10
07/23/1990	N08548	DISSOLVED NITRATE AND NITRITE	0.02
07/23/1990	N08548	DISSOLVED NITRATE NO3 mg/L	1.1
07/23/1990	N08548	DISSOLVED SODIUM	8
07/23/1990	N08548	DISSOLVED TOTAL ALKALINITY	89
07/23/1990	N08548	MINERAL TURBIDITY HACH	2
07/23/1990	N08548	NUTRIENT TURBIDITY HACH	2

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07/23/1990	N08548	SPECIFIC CONDUCTANCE 25C	204
12/12/1990	P1233	MINERAL TURBIDITY HACH	4
02/15/1991	P239	MINERAL TURBIDITY HACH	2
03/14/1991	P3141	MINERAL TURBIDITY HACH	20

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APPENDIX B

FISHERY RESOURCES DATA

APPENDIX B

Fisheries Population Data

TABLE B-1

Population History of Adult Spring-run Chinook Salmon in Beegum Creek

Year	Population Estimate	Notes and References
1973	No estimate	DFG foot survey in early August from the Beegum Gorge campground approximately 6 miles to the HWY 36 bridge. No salmon observed. (Healey, 1974).
1974	No estimate	Foot survey in early August from the Beegum Gorge campground approximately 6 miles to HWY 36 bridge. Three salmon were observed. (Healey, 1974).
1975	No estimate	DFG conducted survey on August 8, at South Fork pool below falls. Three salmon observed. (Healey, 1999).
1976	No survey	
1977	No survey	
1978	No estimate	DFG conducted a survey on May 23, from HWY 36 bridge to 1 mile below falls. No salmon observed. (Healey, 1999).
1979	No estimate	Survey conducted August 22 at South Fork pool below falls. No salmon observed. (Healey, 1999).
1980	No estimate	DFG face mask survey. No salmon observed. (Healey, 1981).
1981	No estimate	DFG face mask survey. No salmon observed. (Healey, 1981).
1982	No estimate	Snorkel survey conducted August 12, in the North Fork pools below the barrier falls. No salmon observed. (Richardson, 1982).
1983-1989	No record	
1990	No estimate	Survey conducted August 14, on the South Fork pools below falls. No salmon observed. (Healey, 1999).
1991	No survey	
1992	No survey	

TABLE B-1

Population History of Adult Spring-run Chinook Salmon in Beegum Creek

Year	Population Estimate	Notes and References
1993	No estimate	South Fork pool below falls surveyed on August 3. One salmon observed. (Healey, 1993).
1994	No survey	
1995	No estimate	Survey conducted approximately 1.5 miles above falls by DFG personnel. Eight salmon observed. (Healey, 1996).
1996	No estimate	Survey conducted by CDFG September 23, at the South Fork pool below the fall. Six salmon observed. (Healey, 1996).
1997	No estimate	CDFG survey from the confluence of the North Fork downstream for about three miles to the falls. No salmon observed. (Healey, 1997).
1998	477	CDFG conducted survey September 3, from the confluence of the North and South Forks downstream to the HWY 36 bridge. 500 adult Chinook were counted. Approximately 90% of the fish were located within pools ranging from 4 to 20 feet in depth. According to CDFG records, this is the highest number of spring chinook observed in Beegum Creek since surveys were initiated in the late 1960's (Healey, 1998). (http://www.r5.fs.fed.us/shastatrinity/fishing/steelhead_snorkel_surveys.htm)
1999	101	Survey conducted in August, from the confluence of the North and South Forks downstream to the HWY 36 bridge. One jack and about 100 adult salmon were counted. (Healey, 1999).

TABLE B-2

Population History of Spring-Run Chinook Salmon, Cottonwood Creek

Year	Population Estimate	Notes and References
1956	No estimate	Spring-run chinook carcasses observed below McCartney dam by Dick Hallock stated in DFG memo dated August 15, 1956.
1957-1959	No record	
1960	No estimate	Four salmon taken by angler from the South Fork. (Hewitt, 1961).
1961	No record	
1962	No estimate	On August 3, a survey was conducted on South Fork by DFG personnel. No salmon observed. (Healey, 1962)
1963	No record	
1964	No record	
1965	No record	
1966	500	CDFG estimates made from existing information and developed by local fishery biologists with best experience and expertise available. (CDFG, 1966).
1967	No record	
1968	500	Average estimate of annual spring-run chinook according to past survey numbers. (Smith and Van Woert, 1970).
1969	No record	
1970	500	Average estimate of annual spring-run chinook according to past survey numbers. (Smith and Van Woert, 1970).
1971	No record	
1972	No estimate	July 13, survey was conducted on South Fork by CDFG personnel. No salmon observed. (Healey, 1972).
1973	No estimate	
1974	No estimate	
1975	No estimate	Snorkel survey conducted in August from Beegum Gorge campground downstream to HWY 36 bridge. At least 2,

TABLE B-2

Population History of Spring-Run Chinook Salmon, Cottonwood Creek

Year	Population Estimate	Notes and References
		possibly 3 salmon were seen. (Brown, 1975).
1976-1977	No survey	It is doubtful anything survived in South Fork during 1976-77, due to sedimentation caused by Skinner mill fire. CDFG and local residents reported a fish kill, which probably resulted in a total loss of salmonid, including spring-run that were present in South Fork. (Richardson, 1982).
1978	No estimate	Snorkel survey performed by FWS and DFG biologist on upper South Fork above Maple Creek. No salmon were observed. (Richardson, 1981-82).
1979	No record	
1980	No record	
1981	No estimate	BLM fisheries biologist saw spring-run chinook in the North Fork in early August. (Richardson, 1982).
1982	No estimate	
1983-1994	No record	
1995	No estimate	
1986	No estimate	
1997	No record	
1998	No estimate	Two snorkel survey conducted on the South Fork from Hammer Place to Shackleford Place. No salmon observed. (Stein, 1998).
1999	No record	

TABLE B-3

Population History of Fall-run Chinook Salmon, Cottonwood Creek

Year	Population Estimate	Notes and References
1953	2790	Four surveys conducted from mouth to 12 miles upstream, October 29 to December 5. Total of 414 carcasses examined. Estimated that 15% of the fish were examined. (Meacham, 1953).
1964	1000	(Brown, 1999)
1955	800	(Brown, 1999)
1956	660	(Brown, 1999)
1957	358	Seven survey trips performed, a total of 43 salmon counted. Estimated that 12% of counted. Most fish were concentrated in two sections of the main stem: (1) near the mouth and (2) about 6 miles above HWY 99 bridge. (Mahoney, 1958).
1958	600	Seven survey trips were performed, a total of 58 salmon counted. Most of the fish were found between the Sacramento River confluence and the HWY 99 bridge. (CDFG, 1958).
1959	3300	Four survey trips were performed from the confluence with the South Fork and the Sacramento River confluence, a total of 666 carcasses were examined. (Mahoney, 1960).
1960	350	(Mahoney, 1962)
1961	1500	Total of 203 carcasses examined between the mouth and ACID canal. (Elwell, 1962).
1962	6000	Spawning fish were observed from the mouth to within 5 miles of old McCartney Dam on South Fork and up the junction of North and Middle Forks. Estimate based on aerial redd counts, no ground surveys conducted. (Menchen, 1963).
1963	3500	Salmon were observed in the South, Middle and North Forks. Estimate based on aerial observation, no ground surveys were performed. (Menchen, 1964).
<i>Data collected prior to 1964 is considered fragmented.</i>		
1964	3450	Two survey trips and one aerial survey performed on December 17. A total of 285 carcasses were examined. (Menchen, 1965).

TABLE B-3

Population History of Fall-run Chinook Salmon, Cottonwood Creek

Year	Population Estimate	Notes and References
1965	900	One survey trip was made, a total of 23 carcasses were examined. Aerial survey on November 29 indicated spawning took place in most sections of the accessible portions of cottonwood Creek with the South Fork containing the largest run. (Menchen, 1966).
1966	2900	Five ground surveys and one aerial survey. Total of 162 carcasses examined. (Menchen, 1967).
1967	600	Two survey trips made on most sections of the Cottonwood Creek drainage. Total of 26 carcasses examined. (Menchen, 1968).
1968	8540	Three survey trips on the North and Middle Forks and the main stem were performed, a total of 279 carcasses and 192 live salmon were counted. (Menchen, 1970).
1969	4967	Nine survey trips were made on the main stem, North Fork (from the bridge above mouth (Sullivan Place) 4 miles to its confluence with the Middle Fork), Middle Fork (from Hickman road gauging station 5 miles to the confluence with the North Fork), and South Fork (Farquhar road 7 miles to the mouth) on November 4 and December 17. A total of 202 carcasses and 300 live salmon were counted. (Menchen, 1970).
1970-75	No estimate	
1976	2427	Ten survey trips from 3 miles above I-5 bridge to confluence with the Sacramento River were made September 9 to January 6, 1977. A total of 364 carcasses and 1,021 redds (some which were probably counted more than once) were observed. (Hoopaugh, 1979).
1977	2256	DFG Anadromous Fisheries Branch conducted carcass surveys on the main stem. <i>Approximately 17,000 fall-run chinook salmon including potential escapement to Cottonwood Creek were trapped at the red Bluff Diversion Dam and relocated during 1977.</i>
	1512	Three survey trips from 6 miles above I-5 bridge to the mouth were performed between November 18 and December 19. A total of 121 carcasses were recovered and 30 redds observed. (Hoopaugh, 1979).
1978	1120	Schaefer Stratified model conducted by DFG Contract Services Section, Red Bluff. Twelve ground surveys from confluence of the North and middle Forks to the mouth were made between October 24 and January 9, 1979. A total of 160 carcasses were examined. Estimated 15% carcass recovery factor. (Richardson, 1982).
1979	No estimate	

TABLE B-3

Population History of Fall-run Chinook Salmon, Cottonwood Creek

Year	Population Estimate	Notes and References
1980-1981	No record	
1982	700	Two aerial surveys were performed October 14 and November 9. A total of 212 redds were counted (105 in the North Fork, 17 in the South Fork and 90 between the mouth of the South Fork and the Sacramento River). (Reavis, 1986b).
1983	1000	One aerial survey on October 27. A total 105 redds were counted (18 in the North Fork, one in the south Fork and 86 between the mouth of the South fork and the Sacramento River). (Reavis, 1986a).
1984	500	Aerial survey of Cottonwood Creek system was made October 27. A total of 81 redds were counted. (Kano and Reavis, 1996).
1985	No estimate	Aerial survey made on February 5, 192 redds were counted. (Kano and Reavis, 1996).
1986	No estimate	Snorkel survey on the South Fork 0.5-1 mile upstream from the confluence with Maple Creek, on September 30. No salmon observed. (Kano and Reavis, 1997b).
1987	No estimate	Aerial survey were made on October 13 and 28 and November 12. A total of 297 redds were counted. (Kano and Reavis, 1997b).
1988-1991	No record	
1991	676	(Brown, 1999).
1992	1585	Four ground surveys made from the double power-line crossing about 10.5 miles upstream, during November 6 to 30. A total of 851 carcasses and 274 redds were counted. Three aerial survey from the mouth into the North Fork were performed. No spawning activity evident in the North Fork. A total of 225 redds were observed. (Kano, 1998).
1993-2000	No record	

TABLE B-4

Population History of Late Fall-run Chinook Salmon, Cottonwood Creek

Year	Population Estimate	Notes and References
1965	No estimate	Survey conducted by DFG, February 23 to March 1. Salmon observed on the lower 5 miles of the South Fork, on the lower 3 miles of the North fork and 9 miles upstream on the Middle Fork. (Puckett, 1979).
1966-1969	No record	
1970-1975	No survey	
1976	No estimate	
1977	No estimate	<i>Impaired upstream passage due to low flow.</i>
1978	No estimate	<i>Impaired upstream passage due to low flow.</i>
1979	300	Population estimate based on analysis of past recorded surveys, primarily due to low flow. (Puckett, 1979).
1980-1981	No record	
1982	<300	Ground survey conducted approximately 18 miles of the Middle Fork, North Fork and Upper main stem on February 2-3. No salmon observe. Aerial survey of entire stream system conducted on February 9. No salmon or redds were observed. Three survey between March 4-26 on approximately 20 miles of the Middle and North Forks and main stem, indicated one live adult salmon on the Upper main stem. (Richardson, 1982). <i>High flows and water turbidity hampered survey effectiveness.</i>
1983	No record	
1984	400	Aerial survey on February 10 revealed 21 redds. (Hallock, 1996).
1985-1991	No record	
1995	No estimate	One aerial survey from the Creek mouth to the I-5 crossing was conducted on December 3. No salmon carcasses or live fish were observed, 2 redds were observed. (Fisher and Harvey, 1998).
1993-2001	No record	

References:

Table-1 Cottonwood Creek- Stocking Records**

Year	Rainbow Trout					Rainbow Trout Catchable					Rainbow Trout Fingerlings			Brown Trout		Total Stock
	NF	SF	MF	CF	Total	NF	MF	SF	CF	Total	MF	SF	Total	MF	Total	
1931														30,000	30,000	30,000
1935					20,000										20,000	40,000
1941							13,000			13,000						13,000
1942	No Record															No Record
1943							15,000			15,000						15,000
1944	No Record															No Record
1945	No Record															No Record
1946		10,000	2,000	20,000	32,000		2,000			2,000						34,000
1947	21,340			5,000	26,340	21,340				21,340						47,680
1948	5,000				5,000	5,000				5,000						10,000
1949	4,000			10,000	14,000	4,000				4,000						18,000
1950	332				332	8,000				8,000						8,332
1951	476			10,010	10,486	9,996				9,996						20,482
1952	630	4,002		5,017	9,649	630				630						10,279
1953	461		18,233	3,800	22,494	461	18,233			18,694						41,188
1954			3,030	4,050	7,080		3,030			3,030						10,110
1955	No Record															No Record
1956			3,263		3,263											3,263
1957							2,335	2,200	950	5,485						5,485
1958						1,605		1,800	900	4,305	5,000		5,000			9,305
1959		2,007	905		2,912				1,015	1,015						3,927
1960							1,201		1,008	2,209		2,800	2,800			5,009
1961						1,329			800	2,129		4,200	4,200			6,329
1962							1,292		1,200	2,492						2,492
1963							1,488			1,488		1,200	1,200			2,688
1964							1,219			1,219		900	900			2,119
1965							505			505	1,500		1,500			2,005
1966							626			626		2,041	2,041			2,667
1967							498			498						498
1968						923				923						923
1969							503	1,402		1,905						1,905
1970							503	700		1,203						1,203
1971							506			506						506
1972							500			500						500
1973							598			598						598
1974							600			600						600
1975							599			599						599
1976							602			602						602
1977							300			300						300
1978							601			601						601
1979							601			601						601
Totals					151,688					131,939					60,000	363,256

** DFG File correspondence

NF = North Fork

MF = Middle Fork

SF = South Fork

CF = Cold Fork

APPENDIX C
WILDLIFE RESOURCES AND
HABITAT TYPES DATA

Species Common Name	Species Scientific Name	Species Type (A, B, F, M, R)	WHR ID Code	WHR Habitat Types Within CCWA																			FEDERAL STATUS	CA STATUS	USFS STATUS	CDF STATUS
				AGR*	BAR	URB	WTM*	AGS	MCP*	MCH	CRC	JPN	RFR*	MRI*	DFR*	WFR*	SMC	MHC	MHW	PPN	VRI	BOP				
American badger	Taxidea taxus	M	M160	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19	Threatened	Endangered, Fully Protected	Sensitive
American beaver	Castor canadensis	M	M112				X	X	X				X	X		X	X	X			X	10				
American coot	Fulica americana	B	B149	X		X	X	X														4				
American crow	Corvus brachyrhynchos	B	B353	X		X		X					X	X	X	X	X	X	X	X	X	13				
American marten	Martes americana	M	M154	X			X					X	X	X	X	X	X		X			10				
American mink	Mustela vison	M	M158										X						X			2				
American white pelican	Pelecanus erythrorhynchos	B	B042		X																	1				
American widgeon	Anas americana	B	B087	X		X	X	X														4				
Baird's sandpiper	Calidris bairdii	B	B648		X																	1				
bald eagle	Haliaeetus leucocephalus	B	B113		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	18				
band-tailed pigeon	Columba fasciata	B	B251	X		X			X	X		X	X	X	X	X	X	X	X	X	X	16	Threatened	Endangered, Fully Protected	Sensitive	
bank swallow	Riparia riparia	B	B342	X	X	X	X	X		X									X			8				
black bear	Ursus americanus	M	M151	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	17	Species of Special Concern			
black swift	Cypseloides niger	B	B279		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	18				
black-tailed jackrabbit	Lepus californicus	M	M051	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19				
blue grouse	Dendragapus obscurus	B	B134					X				X	X	X	X	X	X	X				10				
blue-winged teal	Anas discors	B	B082	X			X	X														3				
bobcat	Lynx rufus	M	M166	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	18				
broad-footed mole	Scapanus latimanus	M	M018	X			X	X				X	X	X	X	X	X	X	X	X	X	15				
brush rabbit	Sylvilagus bachmani	M	M045	X		X		X	X	X	X		X	X	X	X	X	X	X	X	X	15				
bufflehead	Bucephala albeola	B	B103									X	X	X					X			4				
bullfrog	Rana catesbeiana	A	A046	X		X	X	X	X	X	X			X	X	X	X	X	X	X	X	17				
burrowing owl	Athene cunicularia	B	B269	X	X	X	X	X	X	X	X								X	X	X	12				
California gull	Larus californicus	B	B215	X	X	X	X	X														5				
California kangaroo rat	Dipodomys californicus	M	M105	X				X		X						X				X	X	6				
California mountain kingsnake	Lampropeltis zonata	R	R059				X	X	X	X		X	X	X	X	X	X	X	X	X	X	15				
California newt	Taricha torosa	A	A007				X	X		X			X	X	X	X	X	X	X	X	X	12				
California quail	Callipepla californica	B	B140	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	17				
California thrasher	Toxostoma redivivum	B	B398			X			X	X	X		X			X	X	X	X	X	X	10				
California towhee	Pipilo crissalis	B	B484	X		X			X	X	X					X	X	X	X	X	X	12				
California vole	Microtus californicus	M	M134	X		X	X	X	X	X			X	X		X	X	X	X	X	X	15				
Canada goose	Branta canadensis	B	B075	X		X	X	X														4				
Cascades frog	Rana cascadae	A	A042				X					X	X		X	X						5				
cinnamon teal	Anas cyanoptera	B	B083	X			X	X												X		4				
common garter snake	Thamnophis sirtalis	R	R061	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	17				
common goldeneye	Bucephala clangula	B	B101																X			1				
common merganser	Mergus merganser	B	B105			X	X						X						X			4				
common moorhen	Gallinula chloropus	B	B148	X		X																2				
common muskrat	Ondatra zibethicus	M	M139				X						X						X			3				
common snipe	Gallinago gallinago	B	B199	X			X												X			3				
common yellowthroat	Geothlypis trichas	B	B461				X		X				X					X	X			5				
Cooper's hawk	Accipiter cooperii	B	B116	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	18				
coyote	Canis latrans	M	M146	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	20				
dark-eyed junco	Junco hyemalis	B	B512	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	18				
deer mouse	Peromyscus maniculatus	M	M117	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	20				
desert cottontail	Sylvilagus audubonii	M	M047	X		X	X	X	X	X	X								X	X	X	10				
double-crested cormorant	Phalacrocorax auritus	B	B044		X														X			2				
Douglas' squirrel	Tamiasciurus douglasii	M	M079									X	X	X	X	X	X	X				9				
dusky-footed woodrat	Neotoma fuscipes	M	M127				X		X	X	X		X	X	X	X	X	X	X	X	X	14				
eastern fox squirrel	Sciurus niger	M	M078	X		X															X	3				
elk	Cervus elaphus	M	M177	X		X	X	X		X		X		X	X	X	X		X	X	X	15				
ensatina	Ensatina eschscholtzii	P	A012				X		X	X			X	X	X	X	X	X	X	X	X	13				
ermine	Mustela erminea	M	M156	X			X		X			X	X	X	X	X	X	X				12				
Eurasian widgeon	Anas penelope	B	B086			X		X														2				
feral goat	Capra hircus	M	M186					X		X												5				
ferruginous hawk	Buteo regalis	B	B124	X	X		X	X			X								X	X	X	8				
fisher	Martes pennanti	M	M155									X	X	X	X	X	X	X				8				
foothill yellow-legged frog	Rana boylei	A	A043				X	X	X	X	X		X	X	X	X	X	X	X	X	X	15				
gadwall	Anas strepera	B	B085	X			X	X														3				
golden eagle	Aquila chrysaetos	B	B126	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	20				
gopher snake	Pituophis melanoleucus	R	R057	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	18				
gray fox	Urocyon cinereoargenteus	M	M149	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	18				
great blue heron	Ardea herodias	B	B051	X		X	X	X					X	X	X	X	X	X	X	X	X	14				
great egret	Ardea alba	B	B052	X		X	X	X					X	X					X	X	X					

SPECIES TOTALS:		100	31	70	107	100	75	82	65	68	56	106	80	82	87	93	84	91	112	91	87
(A, B, F, M, R)		Agriculturran/Rc Urban et Meadial Grasine Chard Chapedshan frey PIRed Firane Ripuglas IWhite Fili Mixed Hardwoxane Hardderosa y Ripak - DigCak Wod																			

Species Common Name	Species Scientific Name	Species Type (A, B, F, M, R)	WHR ID Code	WHR Habitat Types Within CCWA																			Federal Status	CA Status	USFS Status	CDF Status
				AGR*	BAR	URB	WTM*	AGS	MCP*	MCH	CRC	JPN	RFR*	MRI*	DFR*	WFR*	SMC	MHC	MHW	PPN	VRI	BOP				
* Does not show up as a mapped WHR habitat type within the CCWA due to minimum map unit (mmu) size of GAPVEG of 100 acres, 40 acres for special features (water and wetlands). Minimum map unit size of CALVEG is 2.5 acres.																										
Agriculture																								100		
Barran/Rock																								31		
Urban																								70		
Wet Meadow																								107		
Annual Grassland																								100		
Montane Chaparral																								75		
Mixed Chaparral																								82		
Chamise-Redshank Chap																								65		
Jeffrey Pine																								68		
Red Fir																								56		
Montane Riparian																								106		
Douglas Fir																								80		
White Fir																								82		
Sierran Mixed Conifer																								87		
Montane Hardwood-Coni																								93		
Montane Hardwood																								84		
Ponderosa Pine																								91		
Valley Riparian																								112		
Blue Oak - Digger Pine																								91		
Blue Oak Woodland																								87		

APPENDIX D

SPECIAL-STATUS SPECIES DATA

Special-status Species Legend

Wildlife

Federal

FED = Federal
FT = Federally Threatened
FE = Federally Endangered
FPD = Federally Proposed for Delisting
D = Delisted
C = Candidate
SC = Species of Concern

State = State of California

ST = State Threatened
SE = State Endangered
SOC = Species of Concern
FP = Fully Protected

USFS = U.S. Forest Service

Sens = Sensitive

BLM = U.S. Bureau of Land Management

Sens = Sensitive

Plants

Federal

FED = Federal
FT = Federally Threatened
FE = Federally Endangered
SOC = Species of Concern

State

ST = State Threatened
SE = State Endangered
CE = Candidate Endangered
CR = California Rare
SOC = Species of Concern

CNPS = California Native Plant Society

Codes

List 1B = Rare, Threatened or Endangered in CA and elsewhere

List 2 = Rare, Threatened or Endangered in CA but common elsewhere

List 3 = Plants about which more information is needed

List 4 = a watch list

R-E-D = Rarity-Endangerment-Distribution Code

R - Rarity

1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time

2 = Distributed in a limited number of occurrences, occasionally more if each occurrence is small

3 = Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported

E - Endangerment

1 = Not endangered

2 = Endangered in a portion of its range

3 = Endangered throughout its range

D - Distribution

1 = More or less widespread outside California

2 = Rare outside California

3 = Endemic to California

**TABLE 2 SPECIAL-STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE Cottonwood Creek Watershed
Assessment Project**

*Data Gathered from CNDDDB and USFWS

Species	Fed/state BLM/USFS	General Habitat	Quad Occurrences
Birds			
Aleutian Canada Goose <i>Branta canadensis leucopareia</i>	(D)	Winters on lakes and inland prairies. Forages on natural pastures or those cultivated into grain; loaf on lakes, reservoirs and ponds.	Olinda Mitchell Gulch
American Peregrine Falcon <i>Falco peregrinus anatum</i>	(SC)	Breeds near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, mounds; also human-made structures. Nest consists of a scrape and a depression or ledge in an open site.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Bald Eagle <i>Haliaeetus leucocephalus</i>	FT/SE None/None	Ocean shorelines, Lake margins, and other river courses for both nesting and wintering. Most nests withing one mile of water. Nests in large old-growth, or dominant live tree with open branches. Especially Ponderosa pine. Roosts communally in winter.	Bend Hooker Balls Ferry Cottonwood Igo Bully Choop Mtn. Dubakella Mtn. East Pony Buck Peak West/East Chanchelulla Peak West/East Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Beegum West/East Shasta Bally

Bank Swallow <i>Riparia riparia</i>	-/ST None/None	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, and the ocean to dig nesting hole.	Bend Balls Ferry Blossom Oxbow Bridge Cold Fork Lowrey Olinda Mitchell Gulch Ono East Chickabally Mtn. West Igo
Bell's Sage Sparrow <i>Amphispiza belli belli</i>	(SC)	Nests in hard chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south range. Nests located on the ground beneath a shrub or in a shrub 6-18 inches above the ground. Territories about 50 yards apart.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Ferruginous Hawk <i>Buteo Regalis</i>	(SC)	Inhabits woodlands and grasslands and hunts small mammals from a perch or by kiting; it often perches on poles or on the ground.	Blossom Olinda Mitchell Gulch
Little Willow Flycatcher <i>Empidonax traillii brewsteri</i>	(SC)	Inhabit extensive thickets of low, dense willows on the edge of wet meadows, ponds, or backwaters; 2000-8000 elevation. Requires dense willow thickets for nesting/roosting. Low exposed branches are used for singing posts or hunting perches.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Northern Goshawk <i>Accipiter gentilis</i>	-/SOC None/Sens	In summer, within and in vicinity of coniferous forests, uses old nests, and maintains alternate sites. Usually nests on north slopes, near water, red fir, lodgepole pine, jeffrey pine, and aspens are typical nesting trees.	Bully Chooch Mtn. North Yolla Bolly East/West South Yolla Bolly West/East Chanchelulla Peak East/West Beegum West/East

Northern Spotted Owl <i>Strix occidentalis caurina</i>	FT/ Sens/Sens	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. High multi-story canopy dominated by big trees, many trees with cavities or broken tops, woody debris and space under canopy.	Wildwood Bully Choop Mtn. Chanchelulla Peak West/East Dubakella Mtn. East Beegum West Pony Buck Peak East/West North Yolla Bolly East/West South Yolla Bolly East/West Raglin Ridge Oxbow Bridge Cold Fork Lowrey Ono East Chickabally Mtn. West Beegum West/East Shasta Bolly Igo
Osprey <i>Pandion haliaetus</i>	FT/SE None/None	Ocean shores, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of good fish-producing body of water.	Bend Balls Ferry Cottonwood
Tricolored Blackbird <i>Agelaius tricolor</i>	(SC)	Highly colonial species, most numerous in the central valley and vicinity. Largely endemic to California.	Raglin Ridge Lowrey South Yolla Bolly East
Western Burrowing Owl <i>Athene cunicularia hypugea</i>	(SC)	Found in open dry annual grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals most notably, the California ground squirrel.	Blossom Oxbow Bridge Cold Fork Lowrey Olinda Mitchell Gulch Ono East Chickabally Mtn. West
White-Faced Ibis <i>Plegadis chihi</i>	(SC)	Found in shallow freshwater marshes. Dense tule thickets for nesting interspersed with areas of shallow water for foraging.	Blossom Oxbow Bridge Lowrey Olinda Mitchell Gulch Ono East Igo
Yellow Warbler <i>Dendroica petechia brewsteri</i>	-/SOC None/None	Riparian plant associations, prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging. Also nests in montane shrubbery in open conifer forests.	Lowrey Raglin Ridge

Northwestern Pond Turtle <i>Clemmys marmorata marmorata</i>	-/SOC None/Sens	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nests sites may be found up to 0.5 km from water.	Bend Wildwood Dubakella Mtn. East Pony Buck Peak East Cold Fork Blossom Oxbow Bridge Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Amphibians			
California Red-Legged Frog <i>Rana aurora draytonii</i>	FT/SOC None/Sens	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Lowrey Bully Choop Mtn. Dubakella Mtn. East Pony Buck Peak East Chanchelulla Peak West/East Blossom Oxbow Bridge Cold Fork Raglin Ridge North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Beegum West/East Shasta Bally Igo
Foothill Yellow-Legged Frog <i>Rana boylei</i>	-/SOC None/Sens	Partly-shaded, shallow streams and riffles with rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	Cold Fork Blossom Oxbow Bridge Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Tailed Frog <i>Ascaphus truei</i>	-/SOC None/None	Occurs in montane hardwood-conifer, redwood, Douglas fir, and ponderosa pine habitats. Restricted to perennial montane streams. Tadpoles require water below 15 degrees C.	Chanchelulla Peak West North Yolla Bolly West South Yolla Bolly West Beegum West Shasta Bally

Western Spadefoot Toad <i>Scaphiopus hammondi</i>	(SC)	Occurs primarily in grassland habitats, but can be found in valley and foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey Olinda Mitchell Gulch Ono East Chickabally Mtn. West Shasta Bally Igo
Mammals			
California Wolverine <i>Gulo gulo luteus</i>	(SA)	Found in the north coast mountains and the sierra nevadas. Found in a wide variety of high elevation habitats. Needs a water source. Uses caves or logs for burrows for cover and den area. Hunts in more open areas. Can travel long distances.	North Yolla Bolly East/West South Yolla Bolly West/East Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Fringed Myotis Bat <i>Myotis thysanodes</i>	(SC)	In a wide variety of habitats, optimal habitats are pinyon juniper, valley foothill hardwood, and hardwood conifer. Uses caves, mines, buildings, or crevices for maternity colonies and roosts.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Long-Eared Myotis Bat <i>Myotis evotis</i>	(SC)	Found in all brush, woodland, and forest habitats from sea level to about 9000 ft. Prefers coniferous woodlands and forests. Nursery colonies in buildings, crevices, spaces under bark, and snags. Caves used primarily as night roosts.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo

Long-Legged Myotis Bat <i>Myotis volans</i>	(SC)	Most common in woodland forest habitats above 4000 ft. Trees are important day roosts. Caves and mines are night roosts. Nursery colonies usually under bark or in hollow trees, but occasionally in crevices or buildings.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Pacific Fisher <i>Martes pennanti pacifica</i>	-/SOC None/Sens	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Uses cavities, snags, logs, and rocky areas for cover and denning. Need large areas of mature, dense forest.	Bully Choop Mtn. Chanchelulla Peak East/West Raglin Ridge North Yolla Bolly East/West South Yolla Bolly West/East Beegum West/East Shasta Bally Igo
Pacific Western Big-Eared Bat <i>Corynorhinus townsendii townsendii</i>	(SC)	Humid coastal regions of northern/central California. Roosts in limestone caves, lava tubes, mines, buildings, etc. Will only roost in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to disturbance.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Pale Townsend's Big-Eared Bat <i>Corynorhinus townsendii pallascens</i>	-/ None/Sens	Lives in a wide variety of habitats but most common in mesic sites. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance.	North Yolla Bolly East Blossom Olinda Mitchell Gulch Ono East Chickabally Mtn. West Shasta Bally Igo

San Joaquin Pocket Mouse <i>Perognathus inornatus inornatus</i>	-/ ?/?	Typically found in grasslands and blue oak savannas. Needs friable soils.	Beegum East Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East South Yolla Bolly East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East Beegum East
Small-Footed Myotis Bat <i>Myotis ciliolabrum</i>	(SC)	Most of California except coastal redwood region. Usually solitary; not known to be colonial. From central Mexico north to southern Canada and east to the rocky mountains.	Blossom Oxbow Bridge Lowrey Olinda Mitchell Gulch
Yuma Myotis Bat <i>Myotis yumanensis</i>	(SC)	Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings, or crevices.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bolly Igo
Fish			
Central Valley Steelhead <i>Oncorhynchus mykiss</i>	FT/ ?/?	From the Russian river, south to Sequel Creek and to, but not including, the Pajaro river. Also San Francisco and San Pablo basins.	Pony Buck Peak East Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East

Chinook Salmon <i>Oncorhynchus tshawytscha</i> (winter run)	FE/SE ??	Sacramento river below Keswick dam. Spawns in the sacramento river but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 C for spawning.	Bend Balls Ferry Cottonwood Dubakella Mtn. East Pony Buck Peak East Chanchelulla Peak West Blossom Oxbow Bridge Lowrey Olinda Mitchell Gulch Ono East Shasta Bally Igo
Chinook Salmon <i>Oncorhynchus tshawytscha</i> (spring run)	FT/ST ??	Adult nos depend on pool depth and volume, amount of cover, and proximity to gravel. Water temperatures >27 C lethal to adults. Federal listing refers to pops spawning in Sacramento river and tributaries.	Olinda Beegum East Beegum West Cold Fork Blossom Oxbow Bridge Lowrey Mitchell Gulch Ono East Shasta Bally Igo
Chinook Salmon <i>Oncorhynchus tshawytscha</i> (Fall Run)	(C)	?	Blossom Oxbow Bridge Lowrey Olinda Mitchell Gulch Ono East Shasta Bally Igo
Delta Smelt <i>Hypomesus transpacificus</i>	FT/- ??	Sacramento-San Joaquin delta. Seasonally in Suisun bay, Carquinez strait, and San Pablo bay. Seldom found in salinities >10ppt. Most often in salinities <2ppt.	Bully Choop Mtn. Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo

Green Sturgeon <i>Acipenser medirostris</i>	(SC)	1 st Commonly found in brackish water in a bay environment. Found in estuaries, lower reaches of large rivers and in salt or brackish water off river mouths.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Klamath Mts. Province Steelhead <i>Oncorhynchus mykiss</i>	(C)	?	North Yolla Bolly West Chanchelulla Peak East/West Shasta Bally Igo
Longfin Smelt <i>Spirinchus thaleichthys</i>	(SC)	2 nd Freshwater section of lower delta; streams near the sea, tributaries and streams of a land-locked lake. Sloughs, edges of rivers, and bays. General locations: Suisun bay, Montezuma slough, lower reaches of the Sacramento and San Joaquin rivers, and the delta.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
Northern California Steelhead <i>Oncorhynchus mykiss</i>	(T)	Coastal basins from Redwood creek south to the Gualala river, inclusive. Does not include summer-run steelhead.	South Yolla Bolly West
River Lamprey <i>Lampetra ayresii</i>	(SC)	3 rd Free swimming or benthic; in lower Sacramento-San Joaquin river system, Cache slough, the delta, Suisun bay, Montezuma slough, and Sonoma river.	Blossom Oxbow Bridge Lowrey Olinda Ono East Shasta Bally Igo

Sacramento Splittail <i>Pogonichthys macrolepidotus</i>	FT/-	Endemic to the lakes and rivers of the central valley, but now confined to the delta, Suisun bay, and associated marshes. Slow moving river sections, and dead end sloughs. Require flooded vegetation for spawning and foraging for young.	Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey North Yolla Bolly East/West South Yolla Bolly West/East Olinda Mitchell Gulch Ono East Chickabally Mtn. West Chanchelulla Peak East/West Beegum West/East Shasta Bally Igo
South/North CA Coho Salmon <i>Oncorhynchus kisutch</i>	FT/SE ?/?	Federal listing= populations between Punta Gorda and the San Lorenzo river. State listing= populations south of San Francisco bay. Requires beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water, and sufficient dissolved oxygen.	Bully Choop Mtn. Dubakella Mtn. East Pony Buck Peak West/East Chanchelulla Peak West North Yolla Bolly West South Yolla Bolly West
Antioch Dunes Anthicid Beetle <i>Anthicus antiochensis</i>	(SC)	Common on flowers and foliages as well as on the ground.	Olinda Mitchell Gulch
Leech's Chaetarthrian Water Scavenger Beetle <i>Chaetarthria leechi</i>	+/- ?/?	Known only from hayfork creek, Trinity County.	Wildwood Dubakella Mtn. East
Sacramento Anthicid Beetle <i>Anthicus sacramento</i>	(SC)	Restricted to sand dune areas of the Sacramento-San Joaquin delta. Inhabits sand slipfaces among bamboo and willow.	Olinda Mitchell Gulch
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i>	FT/- ?/?	Occurs only in the central valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference show for "stressed" elderberries.	Bend Balls Ferry Chanchelulla Peak West/East Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey Olinda Mitchell Gulch Ono East Chickabally Mtn. West Beegum West/East Shasta Bally Igo
California Linderella <i>Linderella occidentalis</i>	+/- ?/?	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and TDS.	Balls Ferry Cottonwood Blossom Oxbow Bridge Lowrey Olinda Mitchell Gulch Ono East

Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i>	FT/ ??	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabit small, clean-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	Balis Ferry Blossom Oxbow Bridge Lowrey Olinda Mitchell Gulch Ono East
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i>	FE/ ??	Inhabits vernal pools and swales in the sacramento valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Balis Ferry Blossom Oxbow Bridge Cold Fork Raglin Ridge Lowrey Olinda Mitchell Gulch Ono East Igo

1* www.dfg.ca.gov/mrd/mspcont7.html#coho & www.fishhouse.org/summary/species_summary.cfm?1D=2592

2* <http://elib.cs.berkeley.edu/kopec/tr9/html/sp-longfin-smelt.html>

3* <http://elib.cs.berkeley.edu/kopec/tr9/html/sp-river-lamprey.html>

APPENDIX E

RIPARIAN COMMUNITIES DATA

Cottonwood Creek Riparian Information USDA Forest Stream Surveys

Name	Legal/Date	Riparian	Shade	Comments
Fir Gulch, tributary to Middle Fork Cottonwood Creek	29N 10W S23 (1983)	Alder, Maple, Mixed Conifer	Moderate to Dense	Accessible to Anadromous to barrier .6 miles (15 falls)
North Fork Beegum Creek	28N 10W S32,33,34 (1975)	Alder, Maple, Mixed Conifer	Dense	Barriers identified but unknown access
South Fork Beegum Creek	28N 9,10W S6,18,25 (1975)	Alder, Maple, Mixed Conifer, Oak in low reach	Medium to Dense	Reports of Historic Chinook and Steelhead as recent as 1972 up to 2.5 miles
Middle Fork Beegum Creek	28N 10W S3,4,5,7 (1975)	Alder, Mixed Hardwood, Mixed Conifer, Oak in low reach	Low to Medium in low, Dense in upper reaches	No Barriers, High evidence of mass wasting in channel, Cal Fish Stock RBT1949-1950
Mainstem Beegum Creek	28N 9,10W S1,2,3,5,6 (1975)	Pine, Oak, Manzanita Alder	Low in Gorge, Medium in upper reaches	No barriers, reports of STH in gorge over 25" in July, 1972
South Fork Cottonwood Creek	Wilderness Reach (1975)	Mixed Conifer, Alder, Maple	Medium to Dense	Historic anadromous, but none observed
Cold Fork Creek	27N R9W S17	Alder, Maple Mixed Conifer	Dense	Resident Rainbow present
Middle Fork Cottonwood Creek	29N 9W S19,22,23 (1975)	Alder, Maple Mixed Conifer	Dense	High utilization of Salmonids

Note:

From USDA Forest Service Stream Survey Files

Shasta Trinity National Forest, Headquarters Office

Redding California

APPENDIX F

SOIL RESOURCES DATA

Soils of the Cottonwood Creek Watershed Area

Soils of the Western Mountainous Region

Major Soil Types

Chaix-Corbett-Kanaka (CA154)

This soil association is located in the northern area of the watershed and consists of well drained to excessively drained, medium to coarse sandy loams that were derived from granite and metavolcanic rock. Slopes range from 3 to 75%, but are mostly more than 30% due to the rugged topography of the area. Elevation ranges from 1000 to 6500 feet with an annual precipitation of 30 to 60 inches. Natural vegetative cover is predominantly ponderosa pine, douglas fir, white fir and oak woodland with a shrubby understory. Chaix soils comprise approximately 49% of the association, Corbett soils approximately 28% and Kanaka soils approximately 10%, with other minor components providing the remaining amount. Chaix soils are in warmer areas than Corbett soils and consist of sandy loams and coarse sandy loams. Corbett soils are found at higher elevations on steeper slopes and may be very rocky in areas. Kanaka soils are coarse-textured, sandy loams that may be quite rocky in some areas at higher elevations.

Barpeak-Sheetiron-Marpa (CA104)

These are soils of rugged topography and strongly sloping to very steep, well drained and somewhat excessively drained gravelly and very gravelly loams and clay loams. Slopes range from 50 to 90%, with slopes more than 50% in about 2/3 of the total area. These soils were formed from the underlying sedimentary and metamorphic rocks, such as sandstone, shale and slate. Elevation ranges from 800 to 5000 feet with an annual precipitation range of 30 to 60 inches. Natural vegetation typically consists of hardwood or conifer woodland. Barpeak soils comprise approximately 27% of the association, Sheetiron soils approximately 25% and Marpa soils approximately 12%, with other minor components making up the remaining amount. Barpeak soils are very deep and well drained gravelly loams and were formed in weathered metamorphic rock material. Sheetiron soils are on the upper side slopes and ridge tops at the highest elevations and are derived from metamorphic rock. They are well drained to somewhat excessively drained and have a surface layer of very stony loam to very gravelly loam. Marpa soils are on slopes at lower elevations than Barpeak or Sheetiron, and are well drained with a surface layer of gravelly loam and a subsoil layer of gravelly loam and clay loam.

Heneke-Stonyford-Maymen (CA139)

This soil association is found in the northwestern and western regions of the watershed and consists of shallow to moderately shallow, rocky soils on steep to very steep slopes of 10 to 75%. All of this association is on the eastern edge of the Coast Range Mountains and are underlain by sedimentary, metamorphic and metavolcanic rock such as serpentine and greenstone. All soils are gravelly to gravelly clay loams and are well drained to excessively

drained. The surface layer may be quite stony. Elevation ranges from 1000 to 4500 feet with an annual precipitation range of 20 to 45 inches. Natural vegetation cover consists primarily of shrubs such as chamise, buckbrush, ceanothus, and manzanita, as well as gray pine.

Neuns-Deadwood-Kindig (CA011)

Soils of this association are characterized by gently sloping to very steep rugged terrain with slopes ranging from 9 to 80%, and that were formed from metamorphic rock. Elevation ranges from 2000 to 6000 feet with an annual precipitation of 30 to 60 inches. Neuns soils total approximately 25% of this association, Deadwood soils approximately 25% and Kindig soils approximately 20%, with various other minor components making up the remaining amount. Neuns soils are well-drained, gravelly sandy loams that are moderately deep in some areas and were derived from metamorphosed volcanic rock material. Deadwood soils are shallow loams, somewhat excessively drained, which formed from metamorphosed sedimentary rocks on mountainous uplands. Kindig soils are deep and well drained. Vegetation on this association consists predominantly of coniferous forest.

Deadwood-Dubakella (CA159)

Located in the western region of the watershed, these are soils of mountainous and rugged terrain, with slopes ranging from 10 to 65%. Deadwood soils are shallow loams, somewhat excessively drained that are derived from metasedimentary rocks. They comprise approximately 82% of the association, with Dubakella soils making up the remaining amount of 18%. Dubakella soils are moderately deep and well drained, and formed from serpentinitic metavolcanic rocks. Dubakella soils vary from stony loams to stony clay loams, and in some areas as much as 50% of surface is covered by stones. Rock outcrops are also common. Elevation ranges from 2200 to 6000 feet with an annual precipitation of 20 to 65 inches.

Etsel-Maymen-Parrish (CA138)

This soil association is located along the eastern edge of the Coast Range, where the topography consists of a series of narrow ridges and deep canyons. Soils are shallow or moderately deep, steep to very steep and rocky, and are underlain by sedimentary and metamorphic rock. Elevation ranges between 1000 and 4000 feet, with an annual precipitation of 25 to 45 inches. Vegetation consists of a dense cover of shrubs such as chamise and manzanita, with oaks and gray pine. Etsel soils comprise approximately 34% of the association and are very shallow to shallow, somewhat excessively drained loamy soils that formed from sedimentary rock. Slopes range from 10 to 65%, with rock outcrops comprising up to 25% of the area. Maymen soils are shallow gravelly loams that are derived from sedimentary rock. Parrish soils are moderately deep with a subsoil of clay.

Sheetiron-Goulding-Millich (CA137)

This soil association is found in the extreme southwestern area of the watershed. Elevation ranges between 1500 and 6500 feet, with Millich soils occurring at the higher elevations on foothill and mountain ridge tops and Goulding soils at the lower elevations. Annual precipitation ranges from 25 to 70 inches, with Millich soils found in the drier regions of the area. Sheetiron soils comprise approximately 25% of the association, Goulding approximately 22% and Millich soils approximately 20%, with other minor components

making up the remaining amount. Sheetiron soils consist of well drained, moderately deep, gravelly loams on slopes ranging from 10 to 90%. Goulding soils are stony to gravelly loams that are shallow and somewhat excessively drained. Both Sheetiron and Goulding soils are derived from metamorphic rock material, with Goulding soils formed predominantly from greenstone. Millich soils are sandy loams that contain clayey, montmorillonitic components and were formed from volcanic materials of andesitic rock, tuff and breccia.

Minor Soil Types

Auburn-Goulding-Neuns (CA156)

Soils of this association are found on steep to very steep slopes on the sides of narrow valleys at higher elevations and on the nearly level to gently rolling terrain of broad valleys at lower elevations. Slopes range from 2 to 80% with elevation ranging from 700 to 5000 feet. These soils consist of well-drained gravelly loams, clay loams and very gravelly silty clay loams that are underlain by partly metamorphosed volcanic rocks, such as greenstone. Predominant vegetative cover is shrubby, with grasses, oaks and gray pine also present. Vegetation on Neuns soils are usually mixed conifers, oaks and shrubs. Annual precipitation ranges between 30 and 60 inches. Approximate composition for this association is 32% Auburn soils, 28% Goulding soils, and 13% Neuns soils, with other minor components comprising the remaining amount and varying at different localities. Both Auburn and Goulding soils have a surface layer of loam or clay loam and a subsoil of gravelly clay loam. In some areas, the surface layer of these soils can be stony or rocky. Neuns soils have a surface layer of loam that is underlain by very gravelly silty clay loam.

Chaix-Chawanakee-Dome (CA008)

This soil association consists of loams that were all formed from granitic rocks and with slopes ranging from 5 to 75%. Elevation ranges from 1000 to 7400 feet with an annual precipitation of 24 to 60 inches. Natural vegetative cover consists of mixed conifers, oaks, shrubs and grasses. Chaix soils make up approximately 25% of this association and are sandy loams that are well drained to somewhat excessively drained. Chawanakee soils comprise another 25% and are shallow loamy soils that are somewhat excessively drained. Dome soils total approximately 24% and are deep to very deep, well-drained coarse loams typically found at the higher elevation range for this association.

Ishi Pishi-Dunsmuir-Weitchpec (CA014)

This soil association is also located at the extreme western edge of the watershed and is derived from metamorphic rock materials. Elevation ranges from 400 to 5500 feet, with Ishi Pishi soils found at the lower elevations. Annual precipitation is generally between 30 and 75 inches, although in some areas where Ishi Pishi soils are found, precipitation may reach 100 inches. Slopes range from 5 to 75%, with Dunsmuir soils generally found on lesser slopes. Ishi Pishi soils are predominantly deep, well drained clay loams that are derived from metamorphic serpentinitic rock material, and make up approximately 35% of this association. Dunsmuir soils comprise approximately 20% and are located on old land flows and toe slopes. These soils are deep and well drained, and have a surface layer of fine-textured loam and a subsoil of gravelly loam. Rock outcrops may total up to 10% of the total area within this soil type. Weitchpec soils approximate 15% of the association and are

moderately deep, well drained, and formed from serpentinitic rock materials. Conifers are the dominant vegetation on these soils.

Woodseye-Smokey-Nanny (CA012)

Soils of this association are located in the extreme western section of the watershed at an elevation range between 4000 and 9000 feet. Annual precipitation for this area ranges from 45 to 80 inches, some occurring as snow at the higher elevations. Woodseye soils comprise approximately 35% of the soils of this association and occur on gently sloping to very steep mountainous terrain, with slopes ranging from 0 to 75%. These soils are shallow and well drained, and were derived from metamorphic rocks. Smokey soils are moderately deep and well drained, and were formed from metamorphosed sedimentary rocks. Slopes for these soils range between 5 and 50%. Nanny soils are stony to gravelly loams located on alluvial fans with slopes ranging from 0 to 9%. They are very deep and well drained, and were formed in alluvium derived mostly from igneous rock, particularly andesite. Vegetative cover for these soils is predominantly coniferous forest.

Yollabolly-Rock Outcrop-Freezeout (CA263)

This soil association is found in mountainous terrain, with slopes of 30 to 75%. Yollabolly soils are shallow, excessively drained gravelly stony loams to gravelly loams formed predominantly of metamorphic schist. Freezeout soils are moderately deep and well drained, and were derived from metamorphic and sedimentary rocks. Yollabolly soils comprise approximately 50% of the association, Freezeout soils approximately 8% and rock outcrops approximately 32%, with other minor components making up the remaining amount. Elevation ranges from 5000 to 7000 feet with an annual precipitation of 40 to 70 inches.

Soils of the Central and Eastern Foothills and Flood Plains

Major Soil Types

Millsholm-Sehorn-Lodo (CA147)

Soils of this association occupy a large portion of the central region of the watershed. Consisting of well drained to somewhat excessively drained gravelly loams, silty clays and clay loams, these soils can be found on slopes ranging from 3 to 75% and are underlain by sedimentary and metamorphic rocks. Elevation ranges from 600 to 1800 feet with an annual precipitation of 25 to 40 inches. Vegetation consists of grasses, forbs, oaks and gray pine, except for Sehorn soils, where the vegetative cover is predominantly grassland. Millsholm soils comprise approximately 38% of the association, Sehorn soils approximately 21% and Lodo soils approximately 16%, with other various minor components comprising the remaining amount. Millsholm soils typically are gravelly loams formed from sandstone and conglomerate. The surface layer in some areas may be very rocky. Sehorn soils have a surface layer of silty clay underlain by silty clay loam and can also be quite stony in some areas. Lodo soils are clay loams typically located on mountainous uplands.

Newville-Dibble-Corning (CA140)

This soil association is found in the foothills west of the Sacramento River on high terraces or terrace remnants with slopes ranging from 0-50%, and formed from alluvium and loosely consolidated stratified sedimentary rock, especially sandstone and shale. Newville and Dibble soils are typically fine to medium texture, and in some areas may be high in lime or calcium carbonate content. Newville soils comprise approximately 72% of the association and have a surface layer of gravelly loam and a subsoil of gravelly clay. Dibble soils make up approximately 7% and consist of layers of silty loam or silty clay loam. Corning soils comprise approximately 7% and are found at the lower elevations of this association. Located on slopes ranging from 0 to 30%, Corning soils are deep and well drained, and commonly exhibit hogwallow microrelief. Elevation ranges from 500 to 2000 feet with an annual precipitation of 19 to 30 inches. Natural vegetation consists of grasses and forbs, blue oak, manzanita, buckbrush, interior live oak, and gray pine.

Newtown-Red Bluff-Redding (CA157)

Soils of this association are found on the sides and tops of broad terraces, with slopes ranging from 0 to 50%. These soils consist of well drained and moderately well drained clays and clay loams formed in old gravelly alluvium from mixed sources on high terraces. Newtown soils comprise approximately 47% of this association, Red Bluff soils approximately 33%, and Redding soils approximately 9%, with various minor components comprising the remaining amount. Red Bluff soils are located on the nearly level to gently sloping terrace tops, with Newtown soils on the steeper side slopes. Both soils have a surface layer ranging from stony loam to very gravelly clay loam and a subsoil of brown clay. Redding soils are well drained and contain a hardpan layer. Found on nearly level to gently undulating terrace tops, the landscape takes on a hummocky appearance known as hogwallow microrelief. Elevation for these soils range from 500 to 1000 feet, with an annual precipitation of 25 to 40 inches. Typical vegetation consists of grasses, oaks, shrubs, and gray pine.

Tehama-Hillgate-Arbuckle (CA146)

These soils are very similar to one another and are found on older alluvium deposits on flood plains and low-lying terraces west of the Sacramento River. They are all deep and well drained with a medium-textured surface layer and a finer-textured subsoil layer. Tehama soils are located on fans and terraces with slopes ranging from 0 to 15%. Slopes where Hillgate and Arbuckle soils are found range from 0 to 50%, with Arbuckle soils occurring at the higher elevations. Hillgate soils contain a hardpan layer and Arbuckle soils are gravelly throughout. Elevation ranges from 50 to 1400 feet with an annual precipitation range of 12 to 35 inches. Natural vegetation consists of shrubs, grasses and forbs, and oaks.

Minor Soil Types**Columbia-Vina-Reiff (CA145)**

This soil association consists of very deep, moderately fine-to moderately coarse-textured soils on nearly level low terraces and flood plains of the Sacramento River and Cottonwood Creek. Slopes range from 0 to 17% at elevations between 200 and 1000 feet, and with an annual precipitation range of 19 to 25 inches. These soils formed in alluvium from

sedimentary and igneous rock material. Gravelly layers from channels of abandoned streams may be found. While most of the natural vegetation has been cleared, native vegetation includes sycamore, valley oak, wild grape, elderberry, grasses and forbs. Columbia soils comprise approximately 35% of the association, Vina soils approximately 18% and Reiff soils approximately 13%, with various minor soil components comprising the remaining amount and varying at different localities.

Redding-Corning-Pentz (CA406)

These soils are found predominantly on nearly level to gently sloping terrains on high terraces west of the Sacramento River and, to a lesser extent, along portions of tributaries. Slopes range from 0 to 30%. In most areas where these soils are located, the topography consists of a mound and depression relief known as hogwallow microrelief, which is hummocky in appearance. These soils formed from stratified deposits of alluvium originating from sedimentary and metamorphic rocks of the Coast Range. Elevation generally ranges from 110 to 900 feet with an annual precipitation of 12 to 35 inches. Grasses and forbs are the dominant vegetative cover, but in some areas blue oak and manzanita are also present. Redding soils make up approximately 55% of the association, Corning soils approximately 17%, and Pentz soils approximately 5%, with the remaining composition consisting of other minor soil components. Both Redding and Corning soils are well drained, gravelly loams and have a subsoil of very dense clay, with Redding soils having a cemented hardpan under dense clay. Pentz soils are shallow and well drained, and were formed from weakly consolidated volcanic tuffaceous sediments.

Domid:c	Code:c	Codename:c	Codedesc:c
aashto	A-1		Group Classification A-1 -- Granular materials (35% or less passing No. 200), Stone Fragments, Gravel and Sand.
aashto	A-1-A		Group Classification A-1-A
aashto	A-1-B		Group Classification A-1-B
aashto	A-2		Group Classification A-2 -- Granular materials (35% or less passing No. 200), Silty or Clayey Gravel and Sand.
aashto	A-2-4		Group Classification A-2-4
aashto	A-2-5		Group Classification A-2-5
aashto	A-2-6		Group Classification A-2-6
aashto	A-2-7		Group Classification A-2-7
aashto	A-3		Group Classification A-3 -- Granular materials (35% or less passing No. 200), Fine Sand.
aashto	A-4		Group Classification A-4 -- Silt-Clay Materials (more than 35% passing No. 200), Silty Soils.
aashto	A-5		Group Classification A-5 -- Silt-Clay Materials (more than 35% passing No. 200), Silty Soils.
aashto	A-6		Group Classification A-6 -- Silt-Clay Materials (more than 35% passing No. 200), Clayey Soils.
aashto	A-7		Group Classification A-7 -- Silt-Clay Materials (more than 35% passing No. 200), Clayey Soils.
aashto	A-7-5		Group Classification A-7-5
aashto	A-7-6		Group Classification A-7-6
aashto	A-8		Group Classification A-8
adatafmt	ASCII		ASCII tab delimited or Prelude
adatafmt	FILNR		Fixed length record
aspect	E	East	
aspect	N	North	
aspect	NE	Northeast	
aspect	NW	Northwest	
aspect	S	South	
aspect	SE	Southeast	
aspect	SW	Southwest	
aspect	W	West	
basedata	FLD		Unrectified aerial photography field sheets
basedata	HA		High altitude aerial photos, rectified
basedata	LN		Line maps
basedata	MO		Aerial photo mosaic

Domid:c	Code:c	Codename:c	Codedesc:c
basedata	OR/FULL		Full orthophoto quads
basedata	OR/HALF		Orthophoto 1/2 quads
basedata	OR/OTHR		Orthophoto quad not 7.5 min.
basedata	OR/QTR		Orthophoto 1/4 quads
basedata	OR/THRD		Orthophoto 1/3 quads
basedata	QU-15		USGS 15 minute quad
basedata	QU-7.5		USGS 7.5 minute quad
basedata	SPOTQU		SPOT 7.5 minute quad
cl	1	Capability Class - I	Soils in Class I have few limitations that restrict their use.
cl	2	Capability Class - II	Soils in Class II have some limitations that reduce the choice of plants or require moderate conservation practices.
cl	3	Capability Class - III	Soils in Class III have severe limitations that reduce the choice of plants or require special conservation practices, or both.
cl	4	Capability Class - IV	Soils in Class IV have very severe limitations that restrict the choice of plants, require very careful management, or both.
cl	5	Capability Class - V	Soils in Class V have little or no erosion hazard but have other limitations impractical to remove that limit their use.
cl	6	Capability Class - VI	Soils in Class VI have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, etc.
cl	7	Capability Class - VII	Soils in Class VII have very severe limitations that make them unsuited to cultivation and that restrict their use to grazing, etc.
cl	8	Capability Class - VIII	Soils (and landforms) in Class VIII have limitations that preclude their use for commercial plant production and restrict their use.
compkind	F	Family	
compkind	G	Taxon above family	
compkind	M	Miscellaneous area	
compkind	S	Series	
compkind	T	Taxadjunct	
compkind	V	Variant	
condition	F	Farmable	Soil component is farmable under natural conditions.
condition	W	Wooded	Soil component is wooded under natural conditions.
condition	X	Neither	Soil component is neither farmable nor wooded under natural conditions.
corrode	High	High	
corrode	Low	Low	
corrode	Moderate	Moderate	
cropname	African stargrass	African stargrass	
cropname	Alfalfa hay	Alfalfa hay	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Alfalfa seed	Alfalfa seed	
cropname	Almonds	Almonds	
cropname	Apples	Apples	
cropname	Apricots	Apricots	
cropname	Artichokes	Artichokes	
cropname	Asparagus	Asparagus	
cropname	Avocados	Avocados	
cropname	Bahiagrass	Bahiagrass	
cropname	Bahiagrass hay	Bahiagrass hay	
cropname	Bananas	Bananas	
cropname	Barley	Barley	
cropname	Barley-fallow	Barley-fallow	
cropname	Beans, dry lima	Dry lima beans	
cropname	Beans, dry pinto	Dry pinto beans	
cropname	Beans, other dry	Dry beans	
cropname	Beans, snap	Snap beans	
cropname	Beans, unshelled lima	Unshelled lima beans	
cropname	Beets	Beets	
cropname	Bentgrass seed	Bentgrass seed	
cropname	Bermudagrass-clover hay	Bermudagrass-clover hay	
cropname	Bermudagrass-fescue hay	Bermudagrass-fescue hay	
cropname	Big bluestem	Big bluestem	
cropname	Blackberries	Blackberries	
cropname	Blueberries	Blueberries	
cropname	Bluegrass seed	Bluegrass seed	
cropname	Bluegrass-ladino	Bluegrass-ladino	
cropname	Bluegrass-ladino hay	Bluegrass-ladino hay	
cropname	Bluegrass-trefoil	Bluegrass-trefoil	
cropname	Bluegrass-trefoil hay	Bluegrass-trefoil hay	
cropname	Bluegrass-white clover	Bluegrass-white clover	
cropname	Bluegrass-white clover hay	Bluegrass-white clover hay	
cropname	Breadfruit	Breadfruit	
cropname	Broccoli	Broccoli	
cropname	Bromegrass hay	Bromegrass hay	
cropname	Bromegrass-alfalfa	Bromegrass-alfalfa	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Bromegrass-alfalfa hay	Bromegrass-alfalfa hay	
cropname	Bromegrass-alsike	Bromegrass-alsike	
cropname	Bromegrass-alsike hay	Bromegrass-alsike hay	
cropname	Bromegrass-ladino	Bromegrass-ladino	
cropname	Broomcorn	Broomcorn	
cropname	Brussel sprouts	Brussel sprouts	
cropname	Buckwheat	Buckwheat	
cropname	Buffel grass	Buffel grass	
cropname	Cabbage	Cabbage	
cropname	Cabbage, chinese	Chinese cabbage	
cropname	Cabbage, mustard	Mustard cabbage	
cropname	Canarygrass hay	Canarygrass hay	
cropname	Canarygrass-alsike	Canarygrass-alsike	
cropname	Canarygrass-alsike hay	Canarygrass-alsike hay	
cropname	Canarygrass-ladino	Canarygrass-ladino	
cropname	Canarygrass-ladino hay	Canarygrass-ladino hay	
cropname	Canola, spring	Spring canola	
cropname	Canola, winter	Winter canola	
cropname	Cantaloupe	Cantaloupe	
cropname	Carrots	Carrots	
cropname	Cassava	Cassava	
cropname	Cauliflower	Cauliflower	
cropname	Causian bluegrass	Causian bluegrass	
cropname	Celery	Celery	
cropname	Cherries	Cherries	
cropname	Clover seed	Clover seed	
cropname	Coconuts	Coconuts	
cropname	Coffee	Coffee	
cropname	Common bermudagrass	Common bermudagrass	
cropname	Common bermudagrass hay	Common bermudagrass hay	
cropname	Common ryegrass seed	Common ryegrass seed	
cropname	Cool season grass	Cool season grass	
cropname	Corn	Corn	
cropname	Corn silage	Corn silage	
cropname	Corn, sweet	Sweet corn	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Cotton lint	Cotton lint	
cropname	Cotton lint, pima	Pima cotton lint	
cropname	Cowpeas	Cowpeas	
cropname	Cranberries	Cranberries	
cropname	Crested wheatgrass	Crested wheatgrass	
cropname	Crested wheatgrass-alfalfa hay	Crested wheatgrass-alfalfa hay	
cropname	Cucumbers	Cucumbers	
cropname	Fescue	Fescue	
cropname	Filberts	Filberts	
cropname	Fine fescue seed	Fine fescue seed	
cropname	Flax	Flax	
cropname	Garlic	Garlic	
cropname	Garrisongrass	Garrisongrass	
cropname	Grain sorghum	Grain sorghum	
cropname	Grapefruit	Grapefruit	
cropname	Grapes, table	Table grapes	
cropname	Grapes, wine	Wine grapes	
cropname	Grass hay	Grass hay	
cropname	Grass, seed	Grass seed	
cropname	Grass-clover	Grass-clover	
cropname	Grass-legume hay	Grass-legume hay	
cropname	Green chop	Green chop	
cropname	Green needlegrass	Green needlegrass	
cropname	Guinea grass	Guinea grass	
cropname	Hay crops, annuals	Hay crops, annuals	
cropname	Hops	Hops	
cropname	Improved bermudagrass	Improved bermudagrass	
cropname	Improved bermudagrass hay	Improved bermudagrass hay	
cropname	Indiangrass	Indiangrass	
cropname	Introduced bluestem	Introduced bluestem	
cropname	Johnsongrass	Johnsongrass	
cropname	Kentucky bluegrass	Kentucky bluegrass	
cropname	Kleingrass	Kleingrass	
cropname	Legume hay	Legume hay	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Lemons	Lemons	
cropname	Lentils, dry	Dry lentils	
cropname	Lettuce	Lettuce	
cropname	Limes	Limes	
cropname	Loganberries	Loganberries	
cropname	Macadamia nuts	Macadamia nuts	
cropname	Mangos	Mangos	
cropname	Merkergrass	Merkergrass	
cropname	Millet	Millet	
cropname	Mint, distillate	Distillate mint	
cropname	Molassesgrass	Molassesgrass	
cropname	Mungbeans	Mungbeans	
cropname	Oats	Oats	
cropname	Olives	Olives	
cropname	Onions	Onions	
cropname	Onions, green	Green onions	
cropname	Oranges	Oranges	
cropname	Orchardgrass	Orchardgrass	
cropname	Orchardgrass hay	Orchardgrass hay	
cropname	Orchardgrass seed	Orchardgrass seed	
cropname	Orchardgrass-alfalfa	Orchardgrass-alfalfa	
cropname	Orchardgrass-alfalfa hay	Orchardgrass-alfalfa hay	
cropname	Orchardgrass-alsike	Orchardgrass-alsike	
cropname	Orchardgrass-alsike hay	Orchardgrass-alsike hay	
cropname	Orchardgrass-ladino	Orchardgrass-ladino	
cropname	Orchardgrass-ladino hay	Orchardgrass-ladino hay	
cropname	Orchardgrass-lespedeza	Orchardgrass-lespedeza	
cropname	Orchardgrass-lespedeza hay	Orchardgrass-lespedeza hay	
cropname	Orchardgrass-red clover	Orchardgrass-red clover	
cropname	Orchardgrass-red clover hay	Orchardgrass-red clover hay	
cropname	Orchardgrass-trefoil	Orchardgrass-trefoil	
cropname	Orchardgrass-trefoil hay	Orchardgrass-trefoil hay	
cropname	Pangolagrass	Pangolagrass	
cropname	Papaya	Papaya	
cropname	Paragrass	Paragrass	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Pasture	Pasture	
cropname	Peaches	Peaches	
cropname	Peanuts	Peanuts	
cropname	Pears	Pears	
cropname	Pears, winter	Winter pears	
cropname	Peas, canning	Canning peas	
cropname	Peas, dry	Dry peas	
cropname	Peas, green	Green peas	
cropname	Pecans	Pecans	
cropname	Pepper, black	Black pepper	
cropname	Peppers	Peppers	
cropname	Peppers, dry chili	Dry chili peppers	
cropname	Peppers, fresh chili	Fresh chili peppers	
cropname	Peppers, green	Green peppers	
cropname	Perennial ryegrass seed	Perennial ryegrass seed	
cropname	Pigeonpeas	Pigeonpeas	
cropname	Pineapple	Pineapple	
cropname	Pineapple, ratoon	Ratoon pineapple	
cropname	Pistachios	Pistachios	
cropname	Plantains	Plantains	
cropname	Plums	Plums	
cropname	Potatoes, irish	Irish potatoes	
cropname	Prunes	Prunes	
cropname	Prunes, dry	Dry prunes	
cropname	Pubescent wheatgrass	Pubescent wheatgrass	
cropname	Pumpkins	Pumpkins	
cropname	Raisins	Raisins	
cropname	Raspberries	Raspberries	
cropname	Red clover hay	Red clover hay	
cropname	Red clover seed	Red clover seed	
cropname	Reed canarygrass	Reed canarygrass	
cropname	Rice	Rice	
cropname	Rye	Rye	
cropname	Rye grazeout	Rye grazeout	
cropname	Safflower	Safflower	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Small grains grazeout	Small grains grazeout	
cropname	Small grains hay	Small grains hay	
cropname	Small grains silage	Small grains silage	
cropname	Smooth brome grass	Smooth brome grass	
cropname	Sorghum grazed	Sorghum grazed	
cropname	Sorghum hay	Sorghum hay	
cropname	Sorghum silage	Sorghum silage	
cropname	Soybeans	Soybeans	
cropname	Spinach	Spinach	
cropname	Strawberries	Strawberries	
cropname	Sugar beets	Sugar beets	
cropname	Sugarcane	Sugarcane	
cropname	Sugarcane, 18 month	18-month sugarcane	
cropname	Sugarcane, ratoon	Ratoon sugarcane	
cropname	Sugarcane, spring	Spring sugarcane	
cropname	Sunflower	Sunflowers	
cropname	Sweet potatoes	Sweet potatoes	
cropname	Switchgrass	Switchgrass	
cropname	Tall fescue	Tall fescue	
cropname	Tall fescue hay	Tall fescue hay	
cropname	Tall fescue seed	Tall fescue seed	
cropname	Tall fescue-alfalfa	Tall fescue-alfalfa	
cropname	Tall fescue-alfalfa hay	Tall fescue-alfalfa hay	
cropname	Tall fescue-alsike	Tall fescue-alsike	
cropname	Tall fescue-alsike hay	Tall fescue-alsike hay	
cropname	Tall fescue-ladino	Tall fescue-ladino	
cropname	Tall fescue-ladino hay	Tall fescue-ladino hay	
cropname	Tall fescue-lespedeza	Tall fescue-lespedeza	
cropname	Tall fescue-lespedeza hay	Tall fescue-lespedeza hay	
cropname	Tall fescue-red clover	Tall fescue-red clover	
cropname	Tall fescue-red clover hay	Tall fescue-red clover hay	
cropname	Tall wheatgrass	Tall wheatgrass	
cropname	Tangelos	Tangelos	
cropname	Tangerines	Tangerines	
cropname	Taniers	Taniers	

Domid:c	Code:c	Codename:c	Codedesc:c
cropname	Taro	Taro	
cropname	Timothy-alfalfa	Timothy-alfalfa	
cropname	Timothy-alfalfa hay	Timothy-alfalfa hay	
cropname	Timothy-alsike	Timothy-alsike	
cropname	Timothy-alsike hay	Timothy-alsike hay	
cropname	Timothy-red clover hay	Timothy-red clover hay	
cropname	Tobacco	Tobacco	
cropname	Tomatoes	Tomatoes	
cropname	Trefoil hay	Trefoil hay	
cropname	Trefoil-grass	Trefoil-grass	
cropname	Trefoil-grass hay	Trefoil-grass hay	
cropname	Walnuts	Walnuts	
cropname	Warm season grass	Warm-season grasses	
cropname	Watermelons	Watermelons	
cropname	Weeping lovegrass	Weeping lovegrass	
cropname	Wheat	Wheat	
cropname	Wheat grazeout	Wheat grazeout	
cropname	Wheat, oct-mar	Wheat (October-March)	
cropname	Wheat, spring	Spring wheat	
cropname	Wheat, spring-fallow	Spring wheat - fallow	
cropname	Wheat, winter	Winter wheat	
cropname	Wheat, winter-fallow	Winter wheat - fallow	
cropname	Yams	Yams	
descat	AGR	Agronomic Description	Nontechnical description of use and management of soils for agronomic uses.
descat	ENG	Engineering Description	Nontechnical description of use and management of soils for engineering uses.
descat	RNG	Range Description	Nontechnical description of use and management of soils for range uses.
descat	SO5	SIR Description	Nontechnical description for a soil which is on the Soil Interpretation Record.
descat	SOI	Soil Description	Nontechnical description of soil characteristics.
descat	URB	Urban Description	Nontechnical description of use and management of soils for urban uses.
descat	WLH	Wildlife Description	Nontechnical description of use and management of soils for developing wildlife habitat.
digfmt	DLG	USGS Digital Line Graph-3	
digfmt	GEF	SCS Geographic Exchange Format	
digfmt	OTH	Other format	
drainage	E	Excessively	Soils have very high and high hydraulic conductivity and low water holding

Domid:c	Code:c	Codename:c	Codedesc:c
drainage	MW	Moderately well	capacity. Depth to water table is more than 6 feet.
drainage	P	Poorly	Soils have a layer of low hydraulic conductivity, wet state high in the profile. Depth to water table is 3 to 6 feet.
drainage	SE	Somewhat excessively	Soils may have a saturated zone, a layer of low hydraulic conductivity, or seepage. Depth to water table is less than 1 foot.
drainage	SP	Somewhat poorly	Soils have high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.
drainage	VP	Very poorly	Soils commonly have a layer with low hydraulic conductivity, wet state high in profile, etc. Depth to water table is 1 to 3 feet.
drainage	W	Well	Soils are wet to the surface most of the time. Depth to water table is less than 1 foot, or is ponded.
dstatus	OC	Other than SCS, complete	Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.
dstatus	OP	Other than SCS, partially complete	
dstatus	SC	SCS, complete	
dstatus	SP	SCS, partially complete	
edstat	0		Component and mapunit data has been created for the soil survey area, but it is incomplete or preliminary.
edstat	1		Data records have been completed for each component and mapunit in the soil survey area, but tailoring to local conditions has not been done.
edstat	2		Specified data elements have been reviewed and tailored where needed. The specific data elements that have been reviewed for the soil survey area are listed in the data element named "comments".
edstat	3		The information for all data elements have been reviewed and tailored to local conditions for the soil survey area.
fips	AK	02	
fips	AL	01	
fips	AR	05	
fips	AZ	04	
fips	CA	06	
fips	CO	08	
fips	CT	09	
fips	DE	10	
fips	FL	12	
fips	GA	13	
fips	HI	15	
fips	IA	19	

Domid:c	Code:c	Codename:c	Codedesc:c
fips	ID	16	
fips	IL	17	
fips	IN	18	
fips	KS	20	
fips	KY	21	
fips	LA	22	
fips	MA	25	
fips	MD	24	
fips	ME	23	
fips	MI	26	
fips	MN	27	
fips	MNTC	63	
fips	MO	29	
fips	MS	28	
fips	MT	30	
fips	NC	37	
fips	ND	38	
fips	NE	31	
fips	NENTC	61	
fips	NH	33	
fips	NJ	34	
fips	NM	35	
fips	NV	32	
fips	NY	36	
fips	OH	39	
fips	OK	40	
fips	OR	41	
fips	PA	42	
fips	PR	72	
fips	RI	44	
fips	SC	45	
fips	SD	46	
fips	SNTC	62	
fips	TN	47	
fips	TX	48	

Domid:c	Code:c	Codename:c	Codedesc:c
fips	UT	49	
fips	VA	51	
fips	VT	50	
fips	WA	53	
fips	WI	55	
fips	WNTC	64	
fips	WV	54	
fips	WY	56	
flodur	Brief	Brief	Flood Duration Class - Brief -- Average duration of inundation per flood is 2 to 7 days.
flodur	Long	Long	Flood Duration Class - Long -- Average duration of inundation per flood is 7 days to 1 month.
flodur	Very brief	Very brief	Flood Duration Class - Very brief -- Average duration of inundation per flood is less than 2 days.
flodur	Very long	Very long	Flood Duration Class - Very long -- Average duration of inundation per flood is more than 1 month.
flofreq	COMM	Common	Frequency Class - Common -- Is OCCAS/FREQ
flofreq	FREQ	Frequent	Frequency Class - Frequent -- Flooding is likely to occur often, more than 50 percent chance of flooding in any year (at least 50 times in 100 years).
flofreq	None	None	Frequency Class - None -- Flooding is not likely to occur.
flofreq	OCCAS	Occasional	Frequency Class - Occasional -- Flooding is expected infrequently, 5 to 50 percent chance of flooding in any year (5 to 50 times in 100 years).
flofreq	Rare	Rare	Frequency Class - Rare -- Flooding unlikely but possible, 0 to 5 percent chance of flooding in any year (0 to 5 time in 100 years).
flood	FREQ	Frequent	Frequency Class - Frequent (Hydric Only) -- Flooding is likely to occur often, more than 50 percent chance of flooding in any year (at least 50 times in 100 years).
flood	None	None	Frequency Class - None (Hydric Only) -- Flooding is not likely to occur.
flood	OCCAS	Occasional	Flooding is expected infrequently, 5 to 50 percent chance of floodind in any year (5 to 50 times in 100 years).
flood	Rare	Rare	Frequency Class - Rare (Hydric Only) -- Flooding unlikely but possible, 0 to 5 percent chance of flooding in any year (0 to 5 time in 100 years).
frostact	High	High	
frostact	Low	Low	
frostact	Moderate	Moderate	
frostact	None	None	
geomorph	BS	Backslope	
geomorph	FS	Footslope	

Domid:c	Code:c	Codename:c	Codedesc:c
geomorph	SH	Shoulder	
geomorph	SU	Summit	
geomorph	TS	Toeslope	
grpcode	-	Null value indicator	
grpcode	1	Septic tank absorption fields	
grpcode	10	Local roads and streets	
grpcode	11	Lawns, landscaping, and golf fairways	
grpcode	12	Roadfill	
grpcode	13	Sand	
grpcode	14	Gravel	
grpcode	15	Topsoil	
grpcode	16	Pond reservoir area	
grpcode	17	Embankments, dikes, and levees	
grpcode	18	Aquifer-fed excavated ponds	
grpcode	19	Drainage	
grpcode	2	Sewage lagoons	
grpcode	20	Irrigation	
grpcode	21	Terraces and diversions	
grpcode	22	Grassed waterways	
grpcode	23	Camp areas	
grpcode	24	Picnic areas	
grpcode	25	Playgrounds	
grpcode	26	Paths and trails	
grpcode	3	Trench sanitary landfill	
grpcode	4	Area sanitary landfill	
grpcode	5	Daily cover for landfill	
grpcode	6	Shallow excavations	
grpcode	7	Dwellings without basements	
grpcode	8	Dwellings with basements	
grpcode	9	Small commercial buildings	
grtgroup	AAQAL	albaqualfs	
grtgroup	AAQDU	duraqualfs	
grtgroup	AAQEN	endoaqualfs	
grtgroup	AAQEP	epiaqualfs	
grtgroup	AAQFR	fragiaqualfs	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	AAQGL	glossaqualfs	
grtgroup	AAQKA	kandiaqualfs	
grtgroup	AAQNA	natraqualfs	
grtgroup	AAQOC	ochraqualfs	
grtgroup	AAQPN	plinhaqualfs	
grtgroup	AAQTR	tropaqualfs	
grtgroup	AAQUM	umbraqualfs	
grtgroup	ABOCR	cryoboralfs	
grtgroup	ABOEU	eutroboralfs	
grtgroup	ABOFR	fragiboralfs	
grtgroup	ABOGL	glossoboralfs	
grtgroup	ABONA	natriboralfs	
grtgroup	ABOPA	paleboralfs	
grtgroup	AUDAG	agrudalfs	
grtgroup	AUDFE	ferrudalfs	
grtgroup	AUDFR	fragiudalfs	
grtgroup	AUDFS	fraglossudalfs	
grtgroup	AUDGL	glossudalfs	
grtgroup	AUDHA	hapludalfs	
grtgroup	AUDKA	kandiudalfs	
grtgroup	AUDKH	kanhapludalfs	
grtgroup	AUDNA	natrudalfs	
grtgroup	AUDPA	paleudalfs	
grtgroup	AUDRH	rhodudalfs	
grtgroup	AUDTR	tropudalfs	
grtgroup	AUSDU	durustalfs	
grtgroup	AUSHA	haplustalfs	
grtgroup	AUSKA	kandiustalfs	
grtgroup	AUSKH	kanhaplustalfs	
grtgroup	AUSNA	natrustalfs	
grtgroup	AUSPA	paleustalfs	
grtgroup	AUSPN	plinthustalfs	
grtgroup	AUSRH	rhodustalfs	
grtgroup	AXEDU	durixeralfs	
grtgroup	AXEFR	fragixeralfs	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	AXEHA	haploxeralfs	
grtgroup	AXENA	natrixelarfs	
grtgroup	AXEPA	palexeralfs	
grtgroup	AXEPN	plinthoxeralfs	
grtgroup	AXERH	rhodoxeralfs	
grtgroup	CAQCR	cryaquands	
grtgroup	CAQDU	duraquands	
grtgroup	CAQEN	endoaquands	
grtgroup	CAQEP	epiaquands	
grtgroup	CAQHA	haplaquands	
grtgroup	CAQME	melanaquands	
grtgroup	CAQPK	placaquands	
grtgroup	CAQVI	vitraquands	
grtgroup	CCRFU	fulvicryands	
grtgroup	CCRGE	gelicryands	
grtgroup	CCRHA	haplocryands	
grtgroup	CCRHY	hydrocryands	
grtgroup	CCRME	melanocryands	
grtgroup	CCRVI	vitricryands	
grtgroup	CTOVI	vitritorrands	
grtgroup	CUDDU	durudands	
grtgroup	CUDFU	fulvudands	
grtgroup	CUDHA	hapludands	
grtgroup	CUDHY	hydrudands	
grtgroup	CUDME	melanudands	
grtgroup	CUDPK	placudands	
grtgroup	CUSDU	durustands	
grtgroup	CUSHA	haplustands	
grtgroup	CVIUD	udivitrands	
grtgroup	CVIUS	ustivitrands	
grtgroup	CXEHA	haploxerands	
grtgroup	CXEME	melanoxerands	
grtgroup	CXEVI	vitrixerands	
grtgroup	DARCA	calciargids	
grtgroup	DARDU	durargids	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	DARGY	gypsiargids	
grtgroup	DARHA	haplargids	
grtgroup	DARND	nadurargids	
grtgroup	DARNT	natrargids	
grtgroup	DARPA	paleargids	
grtgroup	DARPT	petroargids	
grtgroup	DCAHA	haplocalcids	
grtgroup	DCAPT	petrocalcids	
grtgroup	DCMAN	anthracambids	
grtgroup	DCMAQ	aquicambids	
grtgroup	DCMHA	haplocambids	
grtgroup	DCMPT	petrocambids	
grtgroup	DCRAR	argicryids	
grtgroup	DCRCA	calcicryids	
grtgroup	DCRGY	gypsicryids	
grtgroup	DCRHA	haplocryids	
grtgroup	DCRPT	petrocryids	
grtgroup	DCRSA	salicryids	
grtgroup	DDUAR	argidurids	
grtgroup	DDUHA	haplodurids	
grtgroup	DDUNA	natridurids	
grtgroup	DGYAR	argigypsids	
grtgroup	DGYCA	calcigypsids	
grtgroup	DGYHA	haplogypsids	
grtgroup	DGYNA	natrigypsids	
grtgroup	DGYPT	petrogypsids	
grtgroup	DORCL	calciorthids	
grtgroup	DORCM	camborthids	
grtgroup	DORDU	durorthids	
grtgroup	DORGY	gypsiorthids	
grtgroup	DORPA	paleorthids	
grtgroup	DORSA	salorthids	
grtgroup	DSLAQ	aquisalids	
grtgroup	DSLHA	haplosalids	
grtgroup	EAQCR	cryaquents	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	EAQEN	endoaquents	
grtgroup	EAQEP	epiaquents	
grtgroup	EAQFL	fluvaquents	
grtgroup	EAQHA	haplaquents	
grtgroup	EAQHY	hydraquents	
grtgroup	EAQPS	psammaquents	
grtgroup	EAQSU	sulfaquents	
grtgroup	EAQTR	tropaquents	
grtgroup	EARAR	arents	
grtgroup	EARTO	torriarents	
grtgroup	EARUD	udarents	
grtgroup	EARUS	ustarents	
grtgroup	EARXE	xerarents	
grtgroup	EFLCR	cryofluvents	
grtgroup	EFLTO	torrifluvents	
grtgroup	EFLTR	tropofluvents	
grtgroup	EFLUD	udifluvents	
grtgroup	EFLUS	ustifluvents	
grtgroup	EFLXE	xerofluvents	
grtgroup	EORCR	cryorthents	
grtgroup	EORTO	torriorthents	
grtgroup	EORTR	troporthents	
grtgroup	EORUD	udorthents	
grtgroup	EORUS	ustorthents	
grtgroup	EORXE	xerorthents	
grtgroup	EPSCR	cryopsamments	
grtgroup	EPSQU	quartzipsamments	
grtgroup	EPSTO	torripsamments	
grtgroup	EPSTR	tropopsamments	
grtgroup	EPSUD	udipsamments	
grtgroup	EPSUS	ustipsamments	
grtgroup	EPSXE	xeropsamments	
grtgroup	HFIBO	borofibrists	
grtgroup	HFICR	cryofibrists	
grtgroup	HFILU	luvifibrists	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	HFIME	medifibrists	
grtgroup	HFISP	sphagnofibrists	
grtgroup	HFITR	tropofibrists	
grtgroup	HFOBO	borofolists	
grtgroup	HFOCR	cryofolists	
grtgroup	HFOME	medifolists	
grtgroup	HFOTR	tropofolists	
grtgroup	HHEBO	borohemists	
grtgroup	HHECR	cryohemists	
grtgroup	HHELU	luvihemists	
grtgroup	HHEME	medihemists	
grtgroup	HHESI	sulfihemists	
grtgroup	HHESO	sulfohemists	
grtgroup	HHETR	tropohemists	
grtgroup	HSABO	borosaprists	
grtgroup	HSACR	cryosaprists	
grtgroup	HSAME	medisaprists	
grtgroup	HSASI	sulfisaprists	
grtgroup	HSASO	sulfosaprists	
grtgroup	HSATR	troposaprists	
grtgroup	IANCR	cryandepts	
grtgroup	IANDU	durandepts	
grtgroup	IANDY	dystrandepts	
grtgroup	IANEU	eutrandepts	
grtgroup	IANHY	hydrandepts	
grtgroup	IANPK	placandepts	
grtgroup	IANVI	vitrandepts	
grtgroup	IAQAN	andaquepts	
grtgroup	IAQCR	cryaquepts	
grtgroup	IAQEN	endoaquepts	
grtgroup	IAQEP	epiaquepts	
grtgroup	IAQFR	fragiaquepts	
grtgroup	IAQHL	halaquepts	
grtgroup	IAQHP	haplaquepts	
grtgroup	IAQHU	humaquepts	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	IAQPK	placaquepts	
grtgroup	IAQPN	plinhaquepts	
grtgroup	IAQSU	sulfaquepts	
grtgroup	IAQTR	tropaquepts	
grtgroup	IOCCR	cryochrepts	
grtgroup	IOCDU	durochrepts	
grtgroup	IOCDY	dystrochrepts	
grtgroup	IOCEU	eutrochrepts	
grtgroup	IOCFR	fragiochrepts	
grtgroup	IOCSU	sulfochrepts	
grtgroup	IOCUS	ustochrepts	
grtgroup	IOCXE	xerochrepts	
grtgroup	IPLPL	plaggepts	
grtgroup	ITRDY	dystropepts	
grtgroup	ITREU	eutropepts	
grtgroup	ITRHU	humitropepts	
grtgroup	ITRSO	sombritropepts	
grtgroup	ITRUS	ustropepts	
grtgroup	IUMCR	cryumbrepts	
grtgroup	IUMFR	fragiumbrepts	
grtgroup	IUMHA	haplumbrepts	
grtgroup	IUMXE	xerumbrepts	
grtgroup	MALAR	argialbolls	
grtgroup	MALNA	natralbolls	
grtgroup	MAQAR	argiaquolls	
grtgroup	MAQCA	calciaquolls	
grtgroup	MAQCR	cryaquolls	
grtgroup	MAQDU	duraquolls	
grtgroup	MAQEN	endoaquolls	
grtgroup	MAQEP	epiaquolls	
grtgroup	MAQHA	haplaquolls	
grtgroup	MAQNA	natraquolls	
grtgroup	MBOAR	argiborolls	
grtgroup	MBOCA	calciborolls	
grtgroup	MBOCR	cryoborolls	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	MBOHA	haploborolls	
grtgroup	MBONA	natriborolls	
grtgroup	MBOPA	paleborolls	
grtgroup	MBOVE	vermiborolls	
grtgroup	MRERE	rendolls	
grtgroup	MUDAR	argiudolls	
grtgroup	MUDCA	calciudolls	
grtgroup	MUDHA	hapludolls	
grtgroup	MUDPA	paleudolls	
grtgroup	MUDVE	vermudolls	
grtgroup	MUSAR	argiustolls	
grtgroup	MUSCA	calciustolls	
grtgroup	MUSDU	durustolls	
grtgroup	MUSHA	haplustolls	
grtgroup	MUSNA	natrustolls	
grtgroup	MUSPA	paleustolls	
grtgroup	MUSVE	vermustolls	
grtgroup	MXEAR	argixerolls	
grtgroup	MXECA	calcixerolls	
grtgroup	MXEDU	durixerolls	
grtgroup	MXEHA	haploxerolls	
grtgroup	MXENA	natrixerolls	
grtgroup	MXEPA	palexerolls	
grtgroup	OAQAC	acraquox	
grtgroup	OAQEU	eutraquox	
grtgroup	OAQGI	gibbsiaquox	
grtgroup	OAQHA	haplaquox	
grtgroup	OAQOC	ochraquox	
grtgroup	OAQPN	plinthaquox	
grtgroup	OAQUM	umbraquox	
grtgroup	OHUAC	acrohumox	
grtgroup	OHUGI	gibbsihumox	
grtgroup	OHUHA	haplohumox	
grtgroup	OHUSO	sombrihumox	
grtgroup	OORAC	acrorthox	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	OOREU	eutrorthox	
grtgroup	OORGI	gibbsiorthox	
grtgroup	OORHA	haplorthox	
grtgroup	OORSO	sombriorthox	
grtgroup	OORUM	umbriorthox	
grtgroup	OPRAC	acroperox	
grtgroup	OPREU	eutroperox	
grtgroup	OPRHA	haploperox	
grtgroup	OPRKA	kandiperox	
grtgroup	OPRSO	sombriperox	
grtgroup	OTOAC	acrotorrox	
grtgroup	OTOEU	eutrotorrox	
grtgroup	OTOHA	haplotorrox	
grtgroup	OTOTO	torrox	
grtgroup	OUDAC	acrudox	
grtgroup	OUDEU	eutrudox	
grtgroup	OUDHA	hapludox	
grtgroup	OUDKA	kandiudox	
grtgroup	OUDSO	sombriudox	
grtgroup	OUSAC	acrustox	
grtgroup	OUSEU	eutrustox	
grtgroup	OUSHA	haplustox	
grtgroup	OUSKA	kandiustox	
grtgroup	OUSSO	sombriustox	
grtgroup	SAQA2	alaquods	
grtgroup	SAQCR	cryaquods	
grtgroup	SAQDU	duraquods	
grtgroup	SAQEN	endoaquods	
grtgroup	SAQEP	epiaquods	
grtgroup	SAQFR	fragiaquods	
grtgroup	SAQHA	haplaquods	
grtgroup	SAQPK	placaquods	
grtgroup	SAQSI	sideraquods	
grtgroup	SAQTR	tropaquods	
grtgroup	SCRDU	duricryods	

Domid:c	Code:c	Codename:c	Codedesc:c
grtgroup	SCRHA	haplocryods	
grtgroup	SCRHU	humicryods	
grtgroup	SCRPK	placocryods	
grtgroup	SFEFE	ferrods	
grtgroup	SHUCR	cryohumods	
grtgroup	SHUDU	durihumods	
grtgroup	SHUFR	fragihumods	
grtgroup	SHUHA	haplohumods	
grtgroup	SHUPK	placohumods	
grtgroup	SHUTR	tropohumods	
grtgroup	SORA2	alorthods	
grtgroup	SORCR	cryorthods	
grtgroup	SORDU	durorthods	
grtgroup	SORFR	fragiorthods	
grtgroup	SORHA	haplorthods	
grtgroup	SORPK	placorthods	
grtgroup	SORTR	troporthods	
grtgroup	UAQAL	albaquults	
grtgroup	UAQEN	endoaquults	
grtgroup	UAQEP	epiaquults	
grtgroup	UAQFR	fragiaquults	
grtgroup	UAQKA	kandiaquults	
grtgroup	UAQKH	kanhaplaquults	
grtgroup	UAQOC	ochraquults	
grtgroup	UAQPA	paleaquults	
grtgroup	UAQPN	plinthaquults	
grtgroup	UAQTR	tropaquults	
grtgroup	UAQUM	umbraquults	
grtgroup	UHUHA	haplohumults	
grtgroup	UHUKA	kandihumults	
grtgroup	UHUKH	kanhaplohumults	
grtgroup	UHUPA	palehumults	
grtgroup	UHUPN	plinthohumults	
grtgroup	UHUSO	sombrihumults	
grtgroup	UHUTR	tropohumults	

Domid:c	Code:c	Codename:c	Codesdesc:c
grtgroup	UUDFR	fragiudults	
grtgroup	UUDHA	hapludults	
grtgroup	UUDKA	kandiudults	
grtgroup	UUDKH	kanhapludults	
grtgroup	UUDPA	paleudults	
grtgroup	UUDPN	plinthudults	
grtgroup	UUDRH	rhodudults	
grtgroup	UUDTR	tropudults	
grtgroup	UUSHA	haplustults	
grtgroup	UUSKA	kandiustults	
grtgroup	UUSKH	kanhaplustults	
grtgroup	UUSPA	paleustults	
grtgroup	UUSPN	plinthustults	
grtgroup	UUSRH	rhodustults	
grtgroup	UXEHA	haploxerults	
grtgroup	UXEPA	palexerults	
grtgroup	VAQCA	calciaquerts	
grtgroup	VAQDU	duraquerts	
grtgroup	VAQDY	dystraquerts	
grtgroup	VAQEN	endoaquerts	
grtgroup	VAQEP	epiaquerts	
grtgroup	VAQNA	natraqerts	
grtgroup	VAQSA	salaquerts	
grtgroup	VCRHA	haplocryerts	
grtgroup	VCRHU	humicryerts	
grtgroup	VTOCA	calcitorrerts	
grtgroup	VTOGY	gypsitorrerts	
grtgroup	VTOHA	haplotorrerts	
grtgroup	VTOSA	salitorrerts	
grtgroup	VTOTO	torrerts	
grtgroup	VUDCH	chromuderts	
grtgroup	VUDDY	dystruderts	
grtgroup	VUDHA	hapluderts	
grtgroup	VUDPE	pelluderts	
grtgroup	VUSCA	calciusterts	

Domid:c	Code:c	Codename:c	Codesdesc:c
grtgroup	VUSCH	chromusterts	
grtgroup	VUSDY	dystrusterts	
grtgroup	VUSGY	gypsiusterts	
grtgroup	VUSHA	haplusterts	
grtgroup	VUSPE	pellusterts	
grtgroup	VUSSA	salusterts	
grtgroup	VXECA	calcixererts	
grtgroup	VXECH	chromoxererts	
grtgroup	VXEDU	durixererts	
grtgroup	VXEHA	haploxererts	
grtgroup	VXEPE	pelloxererts	
helcl	1	Highly Erodible Land	Soil meets the requirements for Highly Erodible Lands.
helcl	2	Potentially Highly Erodible	Range of soil characteristics for the soil as mapped fall are within and outside of the requirements for Highly Erodible Land.
helcl	3	Not Highly Erodible	Soil does not meet the requirements for Highly Erodible Lands.
hydrcrit	1	FSA Hydric Soils Criteria Classification	All Histosols, except Folists.
hydrcrit	2A	FSA Hydric Soils Criteria Classification	Soils in Aquic suborder, Aquic subgroup, Albolls suborder, Salorthids great group, Pell great group of Vertisols, Pachic subgroups, or Cumulic subgroups that are somewhat poorly drained and have a frequently occurring water table less than 0.5 feet from the surface for a significant period (usually 14 consecutive days or more) during the growing season.
hydrcrit	2B1	FSA Hydric Soils Criteria Classification	Soils in Aquic suborder, Aquic subgroup, Albolls suborder, Salorthids great group, Pell great group of Vertisols, Pachic subgroups, or Cumulic subgroups that are poorly drained or very poorly drained and have a frequently occurring water table less than 0.5 feet from the surface for a significant period (usually 14 consecutive days or more) during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches.
hydrcrit	2B2	FSA Hydric Soils Criteria Classification	Soils in Aquic suborder, Aquic subgroup, Albolls suborder, Salorthids great group, Pell great group of Vertisols, Pachic subgroups, or Cumulic subgroups that are poorly drained or very poorly drained and have a frequently occurring water table less than 1.0 feet from the surface for a significant period (usually 14 consecutive days or more) during the growing season if permeability is equal or greater than 6.0 inches/hr in all layers within 20 inches.
hydrcrit	2B3	FSA Hydric Soils Criteria Classification	Soils in Aquic suborder, Aquic subgroup, Albolls suborder, Salorthids great group, Pell great group of Vertisols, Pachic subgroups, or Cumulic subgroups that are poorly drained or very poorly drained and have a frequently occurring water table less than 1.5 feet from the surface for a significant period (usually 14 consecutive days or more) during the growing season if permeability is less than 6.0 inches/hr in any layer within 20 inches.
hydrcrit	3	FSA Hydric Soils Criteria Classification	Soils that are frequently ponded for long duration during the growing season.

Domid:c	Code:c	Codename:c	Codesdesc:c
hydrcrit	4	FSA Hydric Soils Criteria Classification	Soils that are frequently flooded for long or very long duration during the growing season.
hydrcritcomb	1	Histosols	FSA Hydric Soils Criteria Combinations
hydrcritcomb	1,3	Histosols,Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	1,3,4	Histosols,Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	1,4	Histosols,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2A	Mineral,SP	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2A,3	Mineral,SP,Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2A,3,4	Mineral,SP,Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2A,4	Mineral,SP,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1	Mineral,P or VP,Texture	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,2B2	Mineral,P or VP,Texture,Perm>=6.0	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,2B2,3	Mineral,P or VP,Texture,Perm>=6.0,Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,2B2,3,4	Mineral,P or VP,Texture,Perm>=6.0,Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,2B2,4	Mineral,P or VP,Texture,Perm>=6.0in/hr,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,3	Mineral,P or VP,Texture,Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,3,4	Mineral,P or VP,Texture,Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B1,4	Mineral,P or VP,Texture,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B2	Mineral,P or VP,Perm>6.0	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B2,3	Mineral,P or VP,Perm>=6.0,Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B2,3,4	Mineral,P or VP,Perm>=6.0,Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B2,4	Mineral,P or VP,Perm>=6.0,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B3	Mineral,P or VP,Perm<6.0	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B3,3	Mineral,P or VP,Perm<6.0,Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B3,3,4	Mineral,P or VP,Perm<6.0,Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	2B3,4	Mineral,P or VP,Perm<6.0,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	3	Ponding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	3,4	Ponding,Flooding	FSA Hydric Soils Criteria Combinations
hydrcritcomb	4	Flooding	FSA Hydric Soils Criteria Combinations
hydgrp	A	Hydrology Class – A	High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Domid:c	Code:c	Codename:c	Codedesc:c
hydgrp	A/D	Hydrology Class - A/D	Drained/undrained hydrology class of soils that can be drained and are classified
hydgrp	B	Hydrology Class – B	Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
hydgrp	B/D	Hydrology Class - B/D	Drained/undrained hydrology class of soils that can be drained and are classified
hydgrp	C	Hydrology Class – C	Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.
hydgrp	C/D	Hydrology Class - C/D	Drained/undrained hydrology class of soils that can be drained and classified
hydgrp	D	Hydrology Class – D	Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.
hydric	N	No	Soil does not meet the requirements for a hydric soil.
hydric	U	Unranked	Soil has not been ranked with hydric criteria.
hydric	Y	Yes	Soil meets the requirements for a hydric soil.
intnsty	1	First Order Soil Survey	Scale - > 1:15840, Minimum Delineation - 1 ha or less, Consociations and some Complexes.
intnsty	2	Second Order Soil Survey	Scale - 1:12000 TO 1:31680, Minimum Delineation 0.6 to 4 ha, Consociations and Complexes.
intnsty	3	Third Order Soil Survey	Scale - 1:20000 to 1:250000, Minimum Delineation 1.6 to 256 ha, Associations or Complexes.
intnsty	4	Fourth Order Soil Survey	Scale - 1:100000 to 1:1000000, Minimum Delineation 40 to 4000 ha, Associations.
intnsty	5	Fifth Order Soil Survey	Scale - 1:500000 to 1:1000000, Minimum Delineation 1000 to 4000 ha, Associations.
kfact	.02		
kfact	.05		
kfact	.1		
kfact	.10		
kfact	.15		
kfact	.17		
kfact	.2		
kfact	.20		
kfact	.24		
kfact	.28		
kfact	.32		
kfact	.37		
kfact	.43		
kfact	.49		
kfact	.55		

Domid:c	Code:c	Codename:c	Codedesc:c
kfact	.64		
kfact	0.02		
kfact	0.05		
kfact	0.1		
kfact	0.10		
kfact	0.15		
kfact	0.17		
kfact	0.2		
kfact	0.20		
kfact	0.24		
kfact	0.28		
kfact	0.32		
kfact	0.37		
kfact	0.43		
kfact	0.49		
kfact	0.55		
kfact	0.64		
landcat	amindian		
landcat	blm		
landcat	cenwater		
landcat	fs		
landcat	goal		
landcat	nps		
landcat	ononfed		
landcat	otherfed		
landfmlo	AA	Alas	
landfmlo	AF	Alluvial Fan	
landfmlo	AL	Avalanche Chute	
landfmlo	AN	Anticline	
landfmlo	AP	Alluvial Flat	
landfmlo	AR	Arete	
landfmlo	AS	Ash Flow	
landfmlo	AT	Atoll	
landfmlo	AY	Arroyo	
landfmlo	AZ	Backshore	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	BB	Barrier Beach	
landfmlo	BC	Basin Floor	
landfmlo	BD	Basin-Floor Remnant	
landfmlo	BE	Beach	
landfmlo	BF	Barrier Flat	
landfmlo	BG	Beach Ridge	
landfmlo	BI	Barrier Island	
landfmlo	BJ	Bajada	
landfmlo	BL	Ballena	
landfmlo	BM	Berm	
landfmlo	BN	Bluff	
landfmlo	BO	Bog	
landfmlo	BP	Beach Plain	
landfmlo	BQ	Barchan Dune	
landfmlo	BR	Bar	
landfmlo	BS	Backswamp	
landfmlo	BT	Beach Terrace	
landfmlo	BU	Butte	
landfmlo	BV	Ballon	
landfmlo	BW	Block Field	
landfmlo	BX	Block Stream	
landfmlo	BY	Blowout	
landfmlo	BZ	Braided Stream	
landfmlo	CA	Canyon	
landfmlo	CB	Carolina Bay	
landfmlo	CC	Channel	
landfmlo	CD	Caldera	
landfmlo	CE	Coulee	
landfmlo	CF	Crevasse Filling	
landfmlo	CG	Chenier	
landfmlo	CH	Chenier Plain	
landfmlo	CI	Cinder Cone	
landfmlo	CJ	Cliff	
landfmlo	CK	Collapsed Ice-floored Lakebed	
landfmlo	CL	Col	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	CN	Collapsed Ice-walled Lakebed	
landfmlo	CO	Cove	
landfmlo	CP	Coastal Plain	
landfmlo	CQ	Cirque	
landfmlo	CR	Crater (volcanic)	
landfmlo	CS	Collapsed Lake Plain	
landfmlo	CT	Collapsed Outwash Plain	
landfmlo	CU	Cuesta	
landfmlo	CV	Cutoff	
landfmlo	DA	Debris Avalanche	
landfmlo	DB	Deflation Basin	
landfmlo	DC	Delta Plain	
landfmlo	DD	Diapir	
landfmlo	DE	Delta	
landfmlo	DF	Debris Flow	
landfmlo	DK	Dike	
landfmlo	DL	Dipslope	
landfmlo	DM	Disintegration Moraine	
landfmlo	DN	Divide	
landfmlo	DO	Dome	
landfmlo	DP	Depression	
landfmlo	DQ	Drainageway	
landfmlo	DR	Drumlin	
landfmlo	DU	Dune	
landfmlo	DW	Draw	
landfmlo	EF	Earth Flow	
landfmlo	EK	Esker	
landfmlo	EM	End Moraine	
landfmlo	ER	Erosion Remnant	
landfmlo	ES	Escarpment	
landfmlo	FA	Fan Apron	
landfmlo	FB	Fall	
landfmlo	FC	Fan	
landfmlo	FD	Foredune	
landfmlo	FF	Fanhead Trench	

Domid:c	Code:c	Codename:c	Codesdesc:c
landfmlo	FG	Fan Piedmont	
landfmlo	FH	Fan Remnant	
landfmlo	FI	Fan Skirt	
landfmlo	FJ	Fjord	
landfmlo	FK	Fault-line Scarp	
landfmlo	FL	Flat	
landfmlo	FM	Flood-plain Splay	
landfmlo	FN	Fen	
landfmlo	FO	Flood-plain Step	
landfmlo	FP	Flood Plain	
landfmlo	FQ	Fold	
landfmlo	FS	Faceted Spur	
landfmlo	FU	Flute	
landfmlo	FV	Fosse	
landfmlo	FW	Free Face	
landfmlo	FY	Flood-plain Playa	
landfmlo	GA	Gap	
landfmlo	GC	Giant Ripple	
landfmlo	GD	Glacial Drainage Channel	
landfmlo	GL	Glacial Lake (relict)	
landfmlo	GM	Ground Moraine	
landfmlo	GO	Gorge	
landfmlo	GR	Graben	
landfmlo	GT	Gulch	
landfmlo	GV	Gut (valley)	
landfmlo	HB	Highmoor Bog	
landfmlo	HE	Headland	
landfmlo	HI	Hill	
landfmlo	HO	Hogback	
landfmlo	HR	Horn	
landfmlo	HT	Horst	
landfmlo	HV	Hanging Valley	
landfmlo	HW	Headwall	
landfmlo	IB	Intermontane Basin	
landfmlo	ID	Interdune	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	IF	Inset Fan	
landfmlo	IN	Inselberg	
landfmlo	IV	Interfluve	
landfmlo	KA	Kame	
landfmlo	KE	Kettle	
landfmlo	KL	Knoll	
landfmlo	KM	Kame Moraine	
landfmlo	KN	Knob	
landfmlo	KT	Kame Terrace	
landfmlo	LA	Lahar	
landfmlo	LB	Lakebed (relict)	
landfmlo	LC	Lava Flow	
landfmlo	LE	Ledge	
landfmlo	LF	Lakeshore	
landfmlo	LK	Landslide	
landfmlo	LL	Lava Plateau	
landfmlo	LM	Lateral Moraine	
landfmlo	LN	Lava Plain	
landfmlo	LO	Loess Bluff	
landfmlo	LP	Lake Plain	
landfmlo	LQ	Loess Hill	
landfmlo	LR	Longshore Bar (relict)	
landfmlo	LT	Lake Terrace	
landfmlo	LU	Louderback	
landfmlo	LV	Levee (stream)	
landfmlo	LX	Lowmoor Bog	
landfmlo	MA	Marsh	
landfmlo	MB	Meander	
landfmlo	MC	Meandering Channel	
landfmlo	MD	Monadnock	
landfmlo	ME	Mesa	
landfmlo	MF	Mud Flat	
landfmlo	MG	Meander Scroll	
landfmlo	MH	Medial Moraine	
landfmlo	MJ	Monocline	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	MM	Mountain Slope	
landfmlo	MN	Mountain	
landfmlo	MT	Marine Terrace	
landfmlo	MU	Moraine	
landfmlo	MV	Mountain Valley	
landfmlo	MW	Mudflow	
landfmlo	MX	Muskeg	
landfmlo	NL	Natural Levee	
landfmlo	NO	Notch	
landfmlo	NU	Nunatak	
landfmlo	OF	Outwash Fan	
landfmlo	OL	Oxbow Lake (ephemeral)	
landfmlo	OP	Outwash Plain	
landfmlo	OT	Outwash Terrace	
landfmlo	OX	Oxbow	
landfmlo	PA	Paha	
landfmlo	PB	Parabolic Dune	
landfmlo	PD	Parna Dune	
landfmlo	PE	Pediment	
landfmlo	PF	Partial Ballena	
landfmlo	PG	Patterned Ground	
landfmlo	PH	Pothole	
landfmlo	PI	Pingo	
landfmlo	PJ	Peat Plateau	
landfmlo	PK	Peak	
landfmlo	PL	Playa	
landfmlo	PM	Pitted Outwash Plain	
landfmlo	PN	Plain	
landfmlo	PO	Pocosin	
landfmlo	PP	Plug Dome	
landfmlo	PQ	Pluvial Lake (relict)	
landfmlo	PR	Point Bar	
landfmlo	PT	Plateau	
landfmlo	PU	Pressure Ridge (volcanic)	
landfmlo	RA	Raised Beach	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	RB	Raised Bog	
landfmlo	RF	Reef	
landfmlo	RG	Ribbed Fen	
landfmlo	RI	Ridge	
landfmlo	RJ	Rim	
landfmlo	RM	Recessional Moraine	
landfmlo	RN	Roche Moutonnee	
landfmlo	RO	Rock Glacier	
landfmlo	RP	Rotational Landslide	
landfmlo	RS	Scarp Slope	
landfmlo	RT	Sill	
landfmlo	RV	Ravine	
landfmlo	RW	Sand Flow	
landfmlo	RX	Sand Sheet	
landfmlo	RY	Scarp	
landfmlo	RZ	Sea Cliff	
landfmlo	SA	Saddle	
landfmlo	SB	Structural Bench	
landfmlo	SC	Swale	
landfmlo	SD	Seif Dune	
landfmlo	SE	Shoal (relict)	
landfmlo	SF	Shoreline	
landfmlo	SG	Shrub-coppice Dune	
landfmlo	SH	Sinkhole	
landfmlo	SJ	Slide	
landfmlo	SK	Slump	
landfmlo	SL	Slough	
landfmlo	SM	Salt Marsh	
landfmlo	SN	Slump Block	
landfmlo	SP	Spit	
landfmlo	SQ	Spur	
landfmlo	SR	Stack	
landfmlo	SS	Strand Plain	
landfmlo	ST	Steptoe	
landfmlo	SU	Strath Terrace	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	SV	Stratovolcano	
landfmlo	SW	Swamp	
landfmlo	SX	Stream Terrace	
landfmlo	SY	String Bog	
landfmlo	SZ	Syncline	
landfmlo	TA	Terminal Moraine	
landfmlo	TB	Swallow Hole	
landfmlo	TD	Transverse Dune	
landfmlo	TE	Terrace	
landfmlo	TF	Tidal Flat	
landfmlo	TK	Thermokarst Depression	
landfmlo	TO	Tombolo	
landfmlo	TP	Till Plain	
landfmlo	TQ	Tor	
landfmlo	TR	Trough	
landfmlo	TS	Translational Slide	
landfmlo	TV	Tunnel Valley	
landfmlo	UV	U-shaped Valley	
landfmlo	VA	Valley	
landfmlo	VB	Blind Valley	
landfmlo	VC	Volcanic Cone	
landfmlo	VD	Volcanic Dome	
landfmlo	VF	Valley Flat	
landfmlo	VL	Valley Floor	
landfmlo	VO	Volcano	
landfmlo	VS	Valley Side	
landfmlo	VT	Valley Train	
landfmlo	VV	V-shaped Valley	
landfmlo	WA	Wash	
landfmlo	WB	Bay	
landfmlo	WC	Bayou	
landfmlo	WD	Estuary	
landfmlo	WE	Glacial Lake	
landfmlo	WF	Washover Fan	
landfmlo	WG	Wind Gap	

Domid:c	Code:c	Codename:c	Codedesc:c
landfmlo	WH	Gut (channel)	
landfmlo	WI	Lagoon	
landfmlo	WJ	Lake	
landfmlo	WK	Oxbow Lake	
landfmlo	WL	Playa Lake	
landfmlo	WM	Pluvial Lake	
landfmlo	WN	Pothole (lake)	
landfmlo	WO	Proglacial Lake	
landfmlo	WP	Wave-cut Platform	
landfmlo	WQ	Salt Pond	
landfmlo	WR	Shoal	
landfmlo	WS	Slackwater	
landfmlo	WT	Wave-built Terrace	
landfmlo	WU	Slough (permanent water)	
landfmlo	WV	Thermokarst Lake	
landform	BBR	Barrier Bar	
landform	BFL	Backbarrier Flat	
landform	BH	Beach	
landform	BKS	Breaks	
landform	BOG	Bogs, etc.	Bog (less than 100 meters in diameter).
landform	CHN	Abandoned Channel	
landform	CIR	Cirque Basin	
landform	CRA	Crater, etc.	Crater (includes sinkholes and pits).
landform	DOM	Dome or Volcanic Cone	
landform	DRM	Drumlin	
landform	ESC	Escarpment	
landform	FAN	Fan, etc.	Fan, colluvial or alluvial (includes a fan of a pediment slope).
landform	FP	Floodplain	
landform	HOG	Cuesta or Hogback	
landform	HS	Hillside (Mountain Side)	
landform	KMF	Kamefield, etc.	Kamefield (include kettles and eskers).
landform	MOR	Moraine	
landform	MSA	Mesa or Butte (includes a Bench)	
landform	OT	Terrace, etc.	Terrace, outwash, marine or a truncated fan.
landform	PED	Pediment	

Domid:c	Code:c	Codename:c	Codedesc:c
landform	PLN	Broad Plain	
landform	PLY	Playa or Alluvial Flat	
landform	SDU	Sand Dune or Hill	
landform	SL	Sideslope	
landform	SMR	Saltmarsh	
landform	SRG	Low Sand Ridge, nondunal	
landform	ST	Terrace, Stream or Lake	
landform	SWP	Swamp, etc.	Swamp or marsh (peraquic moisture regime).
landform	UD	Upland Drainageways and Depressions	
landform	URG	Upland Ridge	
landform	VS	Valley Filling Sideslopes	
mdatacov	County	Complete county coverage	
mdatacov	OTH	Other format	
mdatacov	QU-7.5	7.5 minute quadrangle	
mdatacov	SECTN	Public land survey sections	
mdatacov	Sheets	Soil survey map sheet	
mdatacov	TWNSHP	Township units	
mdatatyp	C	Grid cell	
mdatatyp	L	Line or vector data	
minalogy	01	unclassified	
minalogy	02	not used	
minalogy	03	allitic	
minalogy	04	calcareous	
minalogy	05	carbonatic	
minalogy	07	clastic	
minalogy	08	coprogenous	
minalogy	09	chloritic	
minalogy	10	diatomaceous	
minalogy	12	ferrihumic	
minalogy	14	ferritic	
minalogy	16	ferruginous	
minalogy	18	gibbsitic	
minalogy	20	glauconitic	
minalogy	22	gypsic	
minalogy	24	halloysitic	

Domid:c	Code:c	Codename:c	Codedesc:c
minalogy	26	illitic	
minalogy	27	illitic (calcareous)	
minalogy	28	kaolinitic	
minalogy	30	marly	
minalogy	32	micaceous	
minalogy	33	micaceous (calcareous)	
minalogy	34	mixed	
minalogy	35	mixed (calcareous)	
minalogy	37	montmorillonitic	
minalogy	38	montmorillonitic (calcareous)	
minalogy	40	oxidic	
minalogy	42	sepiolitic	
minalogy	44	serpentinic	
minalogy	46	siliceous	
minalogy	47	siliceous (calcareous)	
minalogy	48	sesquic	
minalogy	50	vermiculitic	
minalogy	51	vermiculitic (calcareous)	
mlra	1	Northern Pacific Coast Range, Foothills, and Valleys	
mlra	10	Upper Snake River Lava Plains and Hills	
mlra	100	Erie Fruit and Truck Area	
mlra	101	Ontario Plain and Finger Lakes Region	
mlra	102A	Rolling Till Prairie	
mlra	102B	Loess Upland and Till Plains	
mlra	103	Central Iowa and Minnesota Till Prairies	
mlra	104	Eastern Iowa and Minnesota Till Prairies	
mlra	105	Northern Mississippi Valley Loess Hills	
mlra	106	Nebraska and Kansas Loess-Drift Hills	
mlra	107	Iowa and Missouri Deep Loess Hills	
mlra	108	Illinois and Iowa Deep Loess and Drift	
mlra	108A	Illinois and Iowa Deep Loess and Drift, Eastern Part (proposed)	
mlra	108B	Illinois and Iowa Deep Loess and Drift, East Central Part (proposed)	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	108C	Illinois and Iowa Deep Loess and Drift, West Central Part (proposed)	
mlra	108D	Illinois and Iowa Deep Loess and Drift, Western Part (proposed)	
mlra	109	Iowa and Missouri Heavy Till Plain	
mlra	10A	Big and Little Wood River Footslopes and Plains (proposed)	
mlra	11	Snake River Plains	
mlra	110	Northern Illinois and Indiana Heavy Till Plain	
mlra	111	Indiana and Ohio Till Plain	
mlra	112	Cherokee Prairies	
mlra	113	Central Claypan Areas	
mlra	114	Southern Illinois and Indiana Thin Loess and Till Plain	
mlra	115	Central Mississippi Valley Wooded Slopes	
mlra	115A	Central Mississippi Valley Wooded Slopes, Eastern Part (proposed)	
mlra	115B	Central Mississippi Valley Wooded Slopes, Southern Part (proposed)	
mlra	115C	Central Mississippi Valley Wooded Slopes, Northern Part (proposed)	
mlra	116A	Ozark Highland	
mlra	116B	Ozark Border	
mlra	117	Boston Mountains	
mlra	118	Arkansas Valley and Ridges	
mlra	118A	Arkansas Valley and Ridges, Eastern Part (proposed)	
mlra	118B	Arkansas Valley and Ridges, Western Part (proposed)	
mlra	119	Ouachita Mountains	
mlra	11A	Central Snake River Plains (proposed)	
mlra	11B	Upper Snake River Plains (proposed)	
mlra	12	Lost River Valleys and Mountains	
mlra	120	Kentucky and Indiana Sandstone and Shale Hills and Valleys	
mlra	121	Kentucky Bluegrass	
mlra	122	Highland Rim and Pennyroyal	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	123	Nashville Basin	
mlra	124	Western Allegheny Plateau	
mlra	125	Cumberland Plateau and Mountains	
mlra	126	Central Allegheny Plateau	
mlra	127	Eastern Allegheny Plateau and Mountains	
mlra	128	Southern Appalachian Ridges and Valleys	
mlra	129	Sand Mountain	
mlra	13	Eastern Idaho Plateaus	
mlra	130	Blue Ridge	
mlra	131	Southern Mississippi Valley Alluvium	
mlra	133A	Southern Coastal Plain	
mlra	133B	Western Coastal Plain	
mlra	134	Southern Mississippi Valley Silty Uplands	
mlra	135	Alabama, Mississippi, and Arkansas Blackland Prairie	
mlra	136	Southern Piedmont	
mlra	137	Carolina and Georgia Sand Hills	
mlra	138	North-Central Florida Ridge	
mlra	139	Eastern Ohio Till Plain	
mlra	14	Central California Coastal Valleys	
mlra	140	Glaciated Allegheny Plateau and Catskill Mountains	
mlra	141	Tughill Plateau	
mlra	142	St. Lawrence-Champlain Plain	
mlra	143	Northeastern Mountains	
mlra	144A	New England and Eastern New York Upland, Southern Part	
mlra	144B	New England and Eastern New York Upland, Northern Part	
mlra	145	Connecticut Valley	
mlra	146	Aroostock Area	
mlra	147	Northern Appalachian Ridges and Valleys	
mlra	148	Northern Piedmont	
mlra	149A	Northern Coastal Plain	
mlra	149B	Long Island-Cape Cod Coastal Lowland	
mlra	15	Central California Coast Range	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	150A	Gulf Coast Prairies	
mlra	150B	Gulf Coast Saline Prairies	
mlra	151	Gulf Coast Marsh	
mlra	152A	Eastern Gulf Coast Flatwoods	
mlra	152B	Western Gulf Coast Flatwoods	
mlra	153A	Atlantic Coast Flatwoods	
mlra	153B	Tidewater Area	
mlra	153C	Mid-Atlantic Coastal Plain	
mlra	154	South-Central Florida Ridge	
mlra	155	Southern Florida Flatwoods	
mlra	156A	Florida Everglades and Associated Areas	
mlra	156B	Southern Florida Lowlands	
mlra	157	Arid and Semiarid Low Mountain Slopes	
mlra	158	Semiarid and Subhumid Low Mountain Slopes	
mlra	159	Humid and Very Humid Low and Intermediate Mountain Slopes	
mlra	16	California Delta	
mlra	160	Subhumid and Humid Intermediate and High Mountain Slopes	
mlra	161	Lava Flows and Rock Outcrops	
mlra	162	Very Humid Areas on East and West Maui Mountains, Kohala Mountains, and Mount Waialeale	
mlra	163	Alluvial Fans and Coastal Plains	
mlra	164	Rough Mountainous Lands	
mlra	165	Subhumid Intermediate Mountain Slopes	
mlra	166	Very Stony Land and Rock Land	
mlra	167	Humid Low and Intermediate Mountain Slopes	
mlra	168	Southeastern Alaska	
mlra	169	South-Central Alaska Mountains	
mlra	17	Sacramento and San Joaquin Valleys	
mlra	170	Cook Inlet-Susitna Lowland	
mlra	171	Alaska Peninsula and Southwestern Islands	
mlra	172	Cooper River Plateau	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	173	Alaska Range	
mlra	174	Interior Alaska Lowlands	
mlra	175	Kuskokwim Highlands	
mlra	176	Interior Alaska Highlands	
mlra	177	Norton Sound Highlands	
mlra	178	Western Alaska Coastal Plains and Deltas	
mlra	179	Bering Sea Islands	
mlra	18	Sierra Nevada Foothills	
mlra	180	Brooks Range	
mlra	181	Arctic Foothills	
mlra	182	Arctic Coastal Plain	
mlra	19	Southern California Coastal Plain	
mlra	190	Ponape (proposed)	Pacific Basin Area
mlra	191	Kosrae (proposed)	Pacific Basin Area
mlra	192	Marshall Islands (proposed)	Pacific Basin Area
mlra	193	Truk (proposed)	Pacific Basin Area
mlra	194	Yap (proposed)	Pacific Basin Area
mlra	195	Palau (proposed)	Pacific Basin Area
mlra	196	Tutuila, Aunu'u (proposed)	Pacific Basin Area
mlra	197	Tau (proposed)	Pacific Basin Area
mlra	198	Ofu, Olosega (proposed)	Pacific Basin Area
mlra	199	Northern Guam (proposed)	Pacific Basin Area
mlra	2	Willamette and Puget Sound Valleys	
mlra	20	Southern California Mountains	
mlra	200	Southern Guam (proposed)	Pacific Basin Area
mlra	201	Saipan (proposed)	Pacific Basin Area
mlra	202	Aguijan, Tinian (proposed)	Pacific Basin Area
mlra	203	Rota (proposed)	Pacific Basin Area
mlra	21	Klamath and Shasta Valleys and Basins	
mlra	22	Sierra Nevada Range	
mlra	23	Malheur High Plateau	
mlra	24	Humboldt Area	
mlra	25	Owyhee High Plateau	
mlra	26	Carson Basin and Mountains	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	27	Fallon-Lovelock Area	
mlra	270	Humid Mountains and Valleys (proposed)	
mlra	271	Semiarid Mountains and Valleys (proposed)	
mlra	272	Humid Coastal Plains (proposed)	
mlra	273	Semiarid Coastal Plains (proposed)	
mlra	28A	Great Salt Lake Area	
mlra	28B	Central Nevada Basin And Range	
mlra	29	Southern Nevada Basin and Range	
mlra	3	Olympic and Cascade Mountains	
mlra	30	Sonoran Basin and Range	
mlra	31	Imperial Valley	
mlra	32	Northern Intermountain Desertic Basins	
mlra	33	Semiarid Rocky Mountains	
mlra	34	Central Desertic Basins, Mountains, and Plateaus	
mlra	35	Colorado and Green River Plateaus	
mlra	36	New Mexico and Arizona Plateaus and Mesas	
mlra	36A	Western Mesas, Plateaus and Basins (proposed)	
mlra	36B	Western Plateaus and Plains (proposed)	
mlra	37	San Juan River Valley Mesas and Plateaus	
mlra	39	Arizona and New Mexico Mountains	
mlra	4	California Coastal Redwood Belt	
mlra	40	Central Arizona Basin and Range	
mlra	41	Southeastern Arizona Basin and Range	
mlra	42	Southern Desertic Basins, Plains, and Mountains	
mlra	42A	Southern Desert Rio Grande Central Basin (proposed)	
mlra	42B	Southern Desert Basin and Range (proposed)	
mlra	42C	Southern Desert Pecos Basin (proposed)	
mlra	43	Northern Rocky Mountains	
mlra	44	Northern Rocky Mountain Valleys	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	46	Northern Rocky Mountain Foothills	
mlra	47	Wasatch and Uinta Mountains	
mlra	48A	Southern Rocky Mountains	
mlra	48B	Southern Rocky Mountain Parks	
mlra	49	Southern Rocky Mountain Foothills	
mlra	5	Siskiyou-Trinity Area	
mlra	51	High Intermountain Valleys	
mlra	52	Brown Glaciated Plain	
mlra	53A	Northern Dark Brown Glaciated Plains	
mlra	53B	Central Dark Brown Glaciated Plains	
mlra	53C	Southern Dark Brown Glaciated Plains	
mlra	54	Rolling Soft Shale Plain	
mlra	55A	Northern Black Glaciated Plains	
mlra	55B	Central Black Glaciated Plains	
mlra	55C	Southern Black Glaciated Plains	
mlra	56	Red River Valley of the North	
mlra	57	Northern Minnesota Gray Drift	
mlra	58A	Northern Rolling High Plains, Northern Part	
mlra	58B	Northern Rolling High Plains, Southern Part	
mlra	58C	Northern Rolling High Plains, Northeastern Part	
mlra	58D	Northern Rolling High Plains, Eastern Part	
mlra	6	Cascade Mountains, Eastern Slope	
mlra	60A	Pierre Shale Plains and Badlands	
mlra	60B	Pierre Shale Plains, Northern Part	
mlra	61	Black Hills Foot Slopes	
mlra	62	Black Hills	
mlra	63A	Northern Rolling Pierre Shale Plains	
mlra	63B	Southern Rolling Pierre Shale Plains	
mlra	64	Mixed Sandy and Silty Tableland	
mlra	65	Nebraska Sand Hills	
mlra	66	Dakota-Nebraska Eroded Tableland	
mlra	67	Central High Plains	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	69	Upper Arkansas Valley Rolling Plains	
mlra	7	Columbia Basin	
mlra	70	Pecos-Canadian Plains and Valleys	
mlra	70A	Canadian Plains and Valleys (proposed)	
mlra	70B	Upper Pecos Valley (proposed)	
mlra	70C	Central New Mexico Highlands (proposed)	
mlra	70D	Southern Desert Foothills (proposed)	
mlra	70E	Upper Pecos Canadian Breaks and Terraces (proposed)	
mlra	71	Central Nebraska Loess Hills	
mlra	72	Central High Tableland	
mlra	73	Rolling Plains and Breaks	
mlra	74	Central Kansas Sandstone Hills	
mlra	75	Central Loess Plains	
mlra	76	Bluestem Hills	
mlra	77	Southern High Plains	
mlra	77A	Southern High Plains, Northern Part (proposed)	
mlra	77B	Southern High Plains, Northwestern Part (proposed)	
mlra	77C	Southern High Plains, Southern Part (proposed)	
mlra	77D	Southern High Plains, Southwestern Part (proposed)	
mlra	77E	Southern High Plains, Breaks (proposed)	
mlra	78	Central Rolling Red Plains	
mlra	78A	Central Rolling Red Plains, Northern Part (proposed)	
mlra	78B	Central Rolling Red Plains, Western Part (proposed)	
mlra	78C	Central Rolling Red Plains, Eastern Part (proposed)	
mlra	78D	Rolling Limestone Prairie (proposed)	
mlra	79	Great Bend Sand Plains	
mlra	8	Columbia Plateau	
mlra	80A	Central Rolling Red Prairies	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	80B	Texas North-Central Prairies	
mlra	81	Edwards Plateau	
mlra	81A	Edwards Plateau, Western Part (proposed)	
mlra	81B	Edwards Plateau, Central Part (proposed)	
mlra	81C	Edwards Plateau, Eastern Part (proposed)	
mlra	81D	Southern Edwards Plateau (proposed)	
mlra	82	Texas Central Basin	
mlra	82A	Texas Central Basin (proposed)	
mlra	82B	Wichita Mountains (proposed)	
mlra	83A	Northern Rio Grande Plain	
mlra	83B	Western Rio Grande Plain	
mlra	83C	Central Rio Grande Plain	
mlra	83D	Lower Rio Grande Plain	
mlra	84A	Cross Timbers	
mlra	84B	West Cross Timbers	
mlra	84C	East Cross Timbers	
mlra	85	Grand Prairie	
mlra	85A	Grand Prairie (proposed)	
mlra	85B	Arbuckle Mountains (proposed)	
mlra	86	Texas Blackland Prairie	
mlra	86A	Texas Blackland Prairie, Northern Part (proposed)	
mlra	86B	Texas Blackland Prairie, Southern Part (proposed)	
mlra	87	Texas Claypan Area	
mlra	87A	Texas Claypan Area, Southern Part (proposed)	
mlra	87B	Texas Claypan Area, Northern Part (proposed)	
mlra	88	Northern Minnesota Glacial Lake Basins	
mlra	9	Palouse and Nez Perce Prairies	
mlra	90	Central Wisconsin and Minnesota Thin Loess and Till	
mlra	91	Wisconsin and Minnesota Sandy Outwash	

Domid:c	Code:c	Codename:c	Codedesc:c
mlra	92	Superior Lake Plain	
mlra	93	Superior Stony and Rocky Loamy Plains and Hills	
mlra	94A	Northern Michigan and Wisconsin Sandy Drift	
mlra	94B	Michigan Eastern Upper Peninsula Sandy Drift	
mlra	95A	Northeastern Wisconsin Drift Plain	
mlra	95B	Southern Wisconsin and Northern Illinois Drift Plain	
mlra	96	Western Michigan and Northeastern Wisconsin Fruit Belt	
mlra	97	Southwestern Michigan Fruit and Truck Belt	
mlra	98	Southern Michigan and Northern Indiana Drift Plain	
mlra	99	Erie-Huron Lake Plain	
month	APR	Apr	April
month	AUG	Aug	August
month	DEC	Dec	December
month	FEB	Feb	February
month	JAN	Jan	January
month	JUL	Jul	July
month	JUN	Jun	June
month	MAR	Mar	March
month	MAY	May	May
month	NOV	Nov	November
month	OCT	Oct	October
month	SEP	Sep	September
mukind	A	Association	Two or more soils with a repeating pattern.
mukind	C	Consociation	Seventy-five percent (75%) of mapunit within range of taxon.
mukind	U	Undifferentiated Group	Two or more soils that are not continously coterminous.
mukind	X	Complex	Two or more soils that cannot be mapped seperately due to map scale limitations.
noperm	CE	coprogenous earth	Allowable textural code for which no permeability is given.
noperm	CEM	cemented	Allowable textural code for which no permeability is given.
noperm	CIND	cinders	Allowable textural code for which no permeability is given.

Domid:c	Code:c	Codename:c	Codedesc:c
noperm	DE	diotomaceous earth	Allowable textural code for which no permeability is given.
noperm	FB	fibric material	Allowable textural code for which no permeability is given.
noperm	FRAG	fragmental material	Allowable textural code for which no permeability is given.
noperm	G	gravel	Allowable textural code for which no permeability is given.
noperm	GYP	gypsiferous material	Allowable textural code for which no permeability is given.
noperm	HM	hemic material	Allowable textural code for which no permeability is given.
noperm	ICE	ice or frozen soil	Allowable textural code for which no permeability is given.
noperm	IND	indurated	Allowable textural code for which no permeability is given.
noperm	MARL	marl	Allowable textural code for which no permeability is given.
noperm	MPT	mucky-peat	Allowable textural code for which no permeability is given.
noperm	MUCK	muck	Allowable textural code for which no permeability is given.
noperm	Peat	peat	Allowable textural code for which no permeability is given.
noperm	SG	sand and gravel	Allowable textural code for which no permeability is given.
noperm	SP	sapric material	Allowable textural code for which no permeability is given.
noperm	UNK	unknown	Allowable textural code for which no permeability is given.
noperm	UWB	unweathered bedrock	Allowable textural code for which no permeability is given.
noperm	VAR	variable	Allowable textural code for which no permeability is given.
noperm	WB	weathered bedrock	Allowable textural code for which no permeability is given.
onsite	N	No	An on-site determination is not needed to assure this hydric ranking.
onsite	Y	Yes	An on-site determination is needed to assure this hydric ranking.
order	A	Alfisols	
order	C	Andisols	
order	D	Aridisols	
order	E	Entisols	
order	H	Histosols	
order	I	Inceptisols	
order	M	Mollisols	
order	O	Oxisols	
order	S	Spodosols	
order	U	Ultisols	
order	V	Vertisols	
ordsym	A	no limitations or slight limitation	
ordsym	C	clayey soils	
ordsym	D	restricted rooting depth	
ordsym	F	fragmental or skeletal soils	

Domid:c	Code:c	Codename:c	Codedesc:c
ordsym	N	snow pack	
ordsym	R	relief or slope steepness	
ordsym	S	sandy soils	
ordsym	T	toxic substances	
ordsym	W	excessive wetness	
ordsym	X	stoniness or rockiness	
otherfam	01	unclassified	
otherfam	02	not used	
otherfam	04	coated	
otherfam	05	cracked	
otherfam	06	level	
otherfam	08	micro	
otherfam	12	ortstein	
otherfam	14	shallow	
otherfam	15	shallow & uncoated	
otherfam	16	sloping	
otherfam	17	shallow & coated	
otherfam	19	ortstein & shallow	
otherfam	20	uncoated	
otherph	AFFR	annual frost-free rainfall	
otherph	ALKALI	alkali	
otherph	ALL	all	
otherph	Brief	brief	
otherph	CALC surf	calcareous surface	
otherph	Channeled	channeled	
otherph	Coastal	coastal	
otherph	Cold	cold	
otherph	Common	common flooding	
otherph	Cool	cool	
otherph	Depth	depth	
otherph	Dissected	dissected	
otherph	Drained	drained	
otherph	Dry	dry	
otherph	Elev	elevation	
otherph	Eroded	eroded	

Domid:c	Code:c	Codename:c	Codedesc:c
otherph	ETA	evapotranspiration; actual	
otherph	FFS	frost-free	
otherph	FREQ	frequent flooding	
otherph	Gullied	gullied	
otherph	High elev	high elevation	
otherph	High PE	high potential evapotranspiration	
otherph	High PPT	high precipitation	
otherph	HUMMOCKY	hummocky	
otherph	IRR	irrigated	
otherph	Long	long	
otherph	Long FFS	long frost-free season	
otherph	Low ELEV	low elevation	
otherph	Low PE	low potential evapotranspiration	
otherph	Low PPT	low precipitation	
otherph	MAAT	mean annual air temperature	
otherph	MAP	mean annual precipitation	
otherph	MAST	mean annual soil temperature	
otherph	MED PE	medium potential evapotranspiration	
otherph	MED PPT	medium precipitation	
otherph	MOD alkali	moderately alkali	
otherph	MOD deep	moderately deep	
otherph	MOD SAL-ALK	moderately saline-alkali	
otherph	MOD saline	moderately saline	
otherph	MOD temp	moderate temperature	
otherph	MOD thick	moderately thick	
otherph	MOD well DR	moderately well drained	
otherph	Moist	moist	
otherph	NIRR	nonirrigated	
otherph	NONCALC SURF	noncalcareous surface	
otherph	None	no flooding	
otherph	Noneroded	noneroded	
otherph	Nonsaline	nonsaline	
otherph	North	north or east aspect	
otherph	OCCAS	occasional flooding	
otherph	Overwash	overwash	

Domid:c	Code:c	Codename:c	Codedesc:c
otherph	Partially DR	partially drained	
otherph	PE	precipitation effectivity	
otherph	Ponded	ponded	
otherph	Poorly DR	poorly drained	
otherph	Rangeland	rangeland	
otherph	Rare	rare flooding	
otherph	Rocky	rocky	
otherph	SAL-ALK	saline-alkali	
otherph	Saline	saline	
otherph	SER ER	severely eroded	
otherph	Shallow	shallow	
otherph	Short FFS	short frost-free season	
otherph	SLI ALKALI	slight alkali	
otherph	SLI SAL-ALK	slightly saline-alkali	
otherph	SLI SALINE	slightly saline	
otherph	SMD	soil moisture deficit	
otherph	South	south or west aspect	
otherph	STR ALKALI	strongly alkali	
otherph	STR SAL	strongly saline	
otherph	STR SAL-ALK	strongly saline-alkali	
otherph	SUBIRR	subirrigated	
otherph	SW Poorly DR	somewhat poorly drained	
otherph	Thick	thick solum	
otherph	Thick SURF	thick surface	
otherph	Thin SURF	thin surface	
otherph	Undrained	undrained	
otherph	Undulating	undulating	
otherph	V brief	very brief	
otherph	V cold	very cold	
otherph	V long	very long	
otherph	V poorly DR	very poorly drained	
otherph	V rocky	very rocky	
otherph	V shallow	very shallow	
otherph	Warm	warm	
otherph	Well DR	well drained	

Domid:c	Code:c	Codename:c	Codedesc:c
otherph	Wet	wet	
otherph	Winter PPT	winter precipitation	
otherph	Woodland	woodland	
panhard	Thick	Thick	Cemented Pan Class - Thick -- Pan is more than 3 inches if continuously indurated and more than 18 inches if discontinuous or fractured.
panhard	Thin	Thin	Cemented Pan Class - Thin -- Pan is less than 3 inches if continuously indurated and less than 18 inches if discontinuous or fractured.
partsize	001	unclassified	
partsize	002	not used	
partsize	003	cindery	
partsize	004	cindery over sandy or sandy-skeletal	
partsize	005	ashy	
partsize	006	cindery over loamy	
partsize	007	ashy over pumiceous or cindery	
partsize	008	ashy over loamy	
partsize	009	ashy-skeletal	
partsize	010	medial	
partsize	011	medial-skeletal	
partsize	012	medial over pumiceous or cindery	
partsize	013	ashy over loamy-skeletal	
partsize	014	medial over clayey	
partsize	015	cindery over medial-skeletal	
partsize	016	medial over fragmental	
partsize	017	cindery over medial	
partsize	018	medial over loamy	
partsize	019	ashy over medial	
partsize	020	medial over loamy-skeletal	
partsize	021	ashy over sandy or sandy-skeletal	
partsize	022	medial over sandy or sandy-skeletal	
partsize	024	medial over thixotropic	
partsize	026	thixotropic	
partsize	027	thixotropic-skeletal	
partsize	028	thixotropic over fragmental	
partsize	030	thixotropic over sandy or sandy-skeletal	
partsize	032	thixotropic over loamy-skeletal	

Domid:c	Code:c	Codename:c	Codedesc:c
partsize	034	thixotropic over loamy	
partsize	036	fragmental	
partsize	044	sandy-skeletal	
partsize	046	sandy-skeletal over loamy	
partsize	047	sandy-skeletal over clayey	
partsize	050	loamy-skeletal	
partsize	051	loamy-skeletal over fragmental	
partsize	052	loamy-skeletal over sandy or sandy-skeletal	
partsize	054	loamy-skeletal over clayey	
partsize	055	loamy-skeletal or clayey-skeletal	
partsize	056	clayey-skeletal	
partsize	058	clayey-skeletal over sandy or sandy-skeletal	
partsize	062	sandy	
partsize	063	sandy or sandy-skeletal	
partsize	064	sandy over loamy	
partsize	066	sandy over clayey	
partsize	068	loamy	
partsize	072	loamy over sandy or sandy-skeletal	
partsize	080	coarse-loamy	
partsize	082	coarse-loamy over fragmental	
partsize	084	coarse-loamy over sandy or sandy-skeletal	
partsize	086	coarse-loamy over clayey	
partsize	088	coarse-silty	
partsize	090	coarse-silty over fragmental	
partsize	092	coarse-silty over sandy or sandy-skeletal	
partsize	094	coarse-silty over clayey	
partsize	096	fine-loamy	
partsize	097	loamy over pumiceous or cindery	
partsize	098	fine-loamy over fragmental	
partsize	100	fine-loamy over sandy or sandy-skeletal	
partsize	102	fine-loamy over clayey	
partsize	104	ashy over clayey	

Domid:c	Code:c	Codename:c	Codedesc:c
partsize	106	fine-silty	
partsize	108	fine-silty over fragmental	
partsize	110	fine-silty over sandy or sandy-skeletal	
partsize	112	fine-silty over clayey	
partsize	114	clayey	
partsize	116	clayey over fragmental	
partsize	118	clayey over sandy or sandy-skeletal	
partsize	120	clayey over loamy-skeletal	
partsize	122	clayey over fine-silty	
partsize	124	clayey over loamy	
partsize	126	fine	
partsize	134	very-fine	
partsize	136	hydrous	
partsize	138	hydrous-pumiceous	
partsize	140	hydrous-skeletal	
partsize	142	hydrous over clayey	
partsize	144	hydrous over clayey-skeletal	
partsize	146	hydrous over fragmental	
partsize	148	hydrous over loamy	
partsize	150	hydrous over loamy-skeletal	
partsize	152	hydrous over sandy or sandy-skeletal	
partsize	153	ashy-pumiceous	
partsize	154	ashy over medial-skeletal	
partsize	155	medial-pumiceous	
partsize	158	medial over ashy	
partsize	160	medial over clayey-skeletal	
partsize	162	medial over hydrous	
partsize	163	pumiceous	
partsize	164	pumiceous or ashy-pumiceous over sandy or sandy_skeletal	
partsize	165	pumiceous or ashy-pumiceous over loamy	
partsize	166	pumiceous or ashy-pumiceous over medial-skeletal	
partsize	167	pumiceous or ashy-pumiceous over medial	

Domid:c	Code:c	Codename:c	Codedesc:c
partsize	169	ashy-skeletal over fragmental or cindery	
partsize	171	medial-skeletal over fragmental or cindery	
plantcat	F	Forest Understory	
plantcat	R	Rangeland	
pnddur	Brief	brief	Flood Duration Class - Brief (Hydric Only) -- Average duration of inundation per flood is 2 to 7 days.
pnddur	Long	long	Flood Duration Class - Long (Hydric Only) -- Average duration of inundation per flood is 7 days to 1 month.
pnddur	Very brief	very brief	Flood Duration Class - Very brief (Hydric Only) -- Average duration of inundation per flood is less than 2 days.
pnddur	Very long	very long	Flood Duration Class - Very long (Hydric Only) -- Average duration of inundation per flood is more than 1 month.
primfml	0	not prime farmland	Not Prime Farmland.
primfml	1	all areas are prime farmland	All areas are prime farmland.
primfml	2	where drained	Only drained areas are prime farmland.
primfml	3	where protected from flooding or not frequently flooded during the growing season	Only areas protected from flooding or not frequently flooded during the growing season are prime farmland.
primfml	4	where irrigated	Only irrigated areas are prime farmland.
primfml	5	where drained and protected from flooding or not frequently flooded during the growing season	Only drained areas that are either protected from flooding or not frequently flooded during the growing season are prime farmland.
primfml	6	where irrigated and drained	Only irrigated areas that have been drained are prime farmland.
primfml	7	where irrigated and protected from flooding or not frequently flooded during the growing season	Only irrigated areas that are either protected from flooding or not frequently flooded during the growing season are prime farmland.
primfml	8	when subsoiled (completely remove root inhibiting soil layer)	When subsoiled (completely remove root inhibiting soil layer) are prime farmland.
primfml	9	irrigated area that the product of I (soil erodibility) and C (climate factor) does not exceed 60	Only irrigated area that the product of I (soil erodibility) and C (climate factor) does not exceed 60 are prime farmland.
progcatt	incoop	Initial Cooperator	New (initial) acres mapped by NCSS cooperators in indicated fiscal year.
progcatt	incum	Initial Cumulative	Total new (initial) acres mapped in this Soil Survey Area as of end of indicated fiscal year.
progcatt	inscs	Initial SCS	New (initial) acres mapped by SCS personnel in indicated fiscal year.
progcatt	lcacres	Land Category Acres	Number of acres in Soil Survey Area for this land category.
progcatt	upcoop	Updated Cooperator	Updated acres by NCSS cooperators in indicated fiscal year.
progcatt	upcum	Updated Cumulative	Total updated acres mapped in this Soil Survey Area as of end of indicated fiscal year.

Domid:c	Code:c	Codename:c	Codedesc:c
progcst	upscs	Updated SCS	Updated acres by SCS personnel in indicated fiscal year.
rating	-	Null value indicator	
rating	1	Fair	
rating	10	Favorable	
rating	11	Limitation	
rating	2	Good	
rating	3	Moderate	
rating	4	Poor	
rating	5	Severe	
rating	6	Slight	
rating	7	Unsuited	
rating	8	Probable	
rating	9	Improbable	
reaction	01	unclassified	
reaction	02	not used	
reaction	04	acid	
reaction	06	allic	
reaction	08	dysic	
reaction	10	euic	
reaction	12	nonacid	
reaction	14	noncalcareous	
restct	-	null value indicator	
restct	1	area reclaim	
restct	10	dusty	
restct	11	erodes easily	
restct	12	excess sodium	
restct	13	excess humus	
restct	14	excess lime	
restct	15	excess salt	
restct	16	fast intake	
restct	17	favorable	
restct	18	flooding	
restct	19	frost action	
restct	2	cemented pan	
restct	20	hard to pack	

Domid:c	Code:c	Codename:c	Codedesc:c
restct	21	large stones	
restct	22	low strength	
restct	23	no water	
restct	24	not needed	
restct	25	seepage	
restct	26	percs slowly	
restct	27	piping	
restct	28	poor outlets	
restct	3	complex slope	
restct	30	rooting depth	
restct	31	shrink-swell	
restct	32	slope	
restct	33	slow intake	
restct	34	slow refill	
restct	35	small stones	
restct	36	thin layer	
restct	37	too clayey	
restct	38	too sandy	
restct	39	unstable fill	
restct	4	compressible	
restct	40	wetness	
restct	41	excess fines	
restct	42	soil blowing	
restct	43	permafrost	
restct	44	pitting	
restct	45	salty water	
restct	46	subsides	
restct	47	too acid	
restct	48	ponding	
restct	49	excess sulfur	
restct	5	corrosive	
restct	50	poor filter	
restct	51	dense layer	
restct	52	fragile	
restct	53	slippage	

Domid:c	Code:c	Codename:c	Codedesc:c
restct	54	variable	
restct	55	excess gypsum	
restct	56	too arid	
restct	6	cutbanks cave	
restct	7	deep to water	
restct	8	depth to rock	
restct	9	droughty	
rockhard	Hard	Hard	Hardness Class - Hard -- Excavation requires blasting or special equipment.
rockhard	Soft	Soft	Hardness Class - Soft __ Excavation can be made with trenching machines, backhoes, or small rippers.
scl	1		
scl	2C		
scl	2E		
scl	2S		
scl	2W		
scl	3C		
scl	3E		
scl	3S		
scl	3W		
scl	4C		
scl	4E		
scl	4S		
scl	4W		
scl	5C		
scl	5E		
scl	5S		
scl	5W		
scl	6C		
scl	6E		
scl	6S		
scl	6W		
scl	7C		
scl	7E		
scl	7S		
scl	7W		

Domid:c	Code:c	Codename:c	Codedesc:c
scl	8C		
scl	8E		
scl	8S		
scl	8W		
shrinksw	High	High	
shrinksw	Low	Low	
shrinksw	Moderate	Moderate	
shrinksw	Very high	Very high	
slopeshp	All	All shapes	
slopeshp	COC	Concave	Gradient decreasing down slope.
slopeshp	CVX	Convex	Gradient increasing down slope.
slopeshp	PLN	Plane	Gradient linear along slope.
soiltemp	01	Unclassified	
soiltemp	02	Not used	
soiltemp	03	Cryic	
soiltemp	04	Frigid	
soiltemp	06	Hyperthermic	
soiltemp	08	Isofrigid	
soiltemp	10	Isohyperthermic	
soiltemp	12	Isomesic	
soiltemp	14	Isothermic	
soiltemp	16	Mesic	
soiltemp	17	Pergelic	
soiltemp	18	Thermic	
soiltemp	20	Cryic	
soiltemp	22	Pergelic	
spref	L/L	Latitude/Longitude	
spref	STPL	State plane coordinates	
spref	TC/STPL	Table coordinates, state plane	
spref	TC/UTM	Table coordinates, universal transverse mercator	
spref	UTM	Universal transverse mercator	
state	AK	Alaska	
state	AL	Alabama	
state	AR	Arkansas	

Domid:c	Code:c	Codename:c	Codedesc:c
state	AS	American Samoa	
state	AZ	Arizona	
state	CA	California	
state	CO	Colorado	
state	CT	Connecticut	
state	CZ	Canal Zone	
state	DC	District of Columbia	
state	DE	Delaware	
state	FL	Florida	
state	FM	Federated States of Micronesia	
state	FN	Foreign	
state	GA	Georgia	
state	GU	Guam	
state	HI	Hawaii	
state	IA	Iowa	
state	ID	Idaho	
state	IL	Illinois	
state	IN	Indiana	
state	KS	Kansas	
state	KY	Kentucky	
state	LA	Louisiana	
state	MA	Massachusetts	
state	MD	Maryland	
state	ME	Maine	
state	MH	Marshall Islands	
state	MI	Michigan	
state	MN	Minnesota	
state	MO	Missouri	
state	MP	Northern Mariana Islands	
state	MS	Mississippi	
state	MT	Montana	
state	NC	North Carolina	
state	ND	North Dakota	
state	NE	Nebraska	
state	NH	New Hampshire	

Domid:c	Code:c	Codename:c	Codedesc:c
state	NJ	New Jersey	
state	NM	New Mexico	
state	NV	Nevada	
state	NY	New York	
state	OH	Ohio	
state	OK	Oklahoma	
state	OR	Oregon	
state	PA	Pennsylvania	
state	PR	Puerto Rico	
state	PW	Palau	
state	RI	Rhode Island	
state	SC	South Carolina	
state	SD	South Dakota	
state	TN	Tennessee	
state	TX	Texas	
state	UM	U.S. Minor Outlying Islands	
state	UT	Utah	
state	VA	Virginia	
state	VI	Virgin Islands	
state	VT	Vermont	
state	WA	Washington	
state	WI	Wisconsin	
state	WV	West Virginia	
state	WY	Wyoming	
status	D	Out-of-Date	Soil survey does not meet the requirements for a modern soil survey.
status	F	Published	Modern published soil survey.
status	N	Nonproject	Nonproject soil survey.
status	P	Project	Project soil survey.
status	U	Update	Soil survey in process of being update.
storeloc	A	Agency	Federal or state agency
storeloc	N	NCG	SCS National Cartographic Center
storeloc	P	Private	Private sector
storeloc	S	State Office	SCS State Office
subgroup	AA	typic	
subgroup	AB	abruptic	

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	AB04	abruptic aridic	old code - This code is outdated and should no longer be used.
subgroup	AB07	abruptic argiduridic	
subgroup	AB08	abruptic cryic	
subgroup	AB10	abruptic haplic	
subgroup	AB14	abruptic udic	
subgroup	AB16	abruptic xerollic	old code - This code is outdated and should no longer be used.
subgroup	AB18	abruptic xeric	
subgroup	AC	acric	
subgroup	AC05	acric plinthic	old code - This code is outdated and should no longer be used.
subgroup	AE	aeric	
subgroup	AE03	aeric arenic	old code - This code is outdated and should no longer be used.
subgroup	AE05	aeric grossarenic	old code - This code is outdated and should no longer be used.
subgroup	AE06	aeric humic	
subgroup	AE08	aeric mollic	old code - This code is outdated and should no longer be used.
subgroup	AE09	aeric tropic	
subgroup	AE10	aeric umbric	
subgroup	AE12	aeric xeric	old code - This code is outdated and should no longer be used.
subgroup	AE14	aeric chromic vertic	
subgroup	AE16	aeric vertic	
subgroup	AL	albaquic	
subgroup	AL02	albaquultic	
subgroup	AL04	albic	
subgroup	AL08	albic glossic	
subgroup	AL09	albollic	
subgroup	AL10	alfic	
subgroup	AL12	alfic arenic	
subgroup	AL13	alfic andeptic	old code - This code is outdated and should no longer be used.
subgroup	AL14	alfic humic	This code represents two codes. Alfic humic is the current and correct codename. Ruptic-alfic lithic is the outdated codename.
subgroup	AL16	alfic lithic	
subgroup	AL20	alic	
subgroup	AL22	alic aquic	
subgroup	AL24	alic pachic	
subgroup	AL26	alic thaptic	
subgroup	AN	andic	

Domid:c	Code:c	Codename:c	Codesdesc:c
subgroup	AN01	andeptic	old code - This code is outdated and should no longer be used.
subgroup	AN03	andaquic	old code - This code is outdated and should no longer be used.
subgroup	AN06	andic dystric	old code - This code is outdated and should no longer be used.
subgroup	AN08	andic ombroaquic	This code represents two codes. Andic ombroaquic is the current and correct codename. Andic epiaquic is the outdated codename.
subgroup	AN11	andeptic glossoboric	old code - This code is outdated and should no longer be used.
subgroup	AN12	andic udic	old code - This code is outdated and should no longer be used.
subgroup	AN22	andic ustic	old code - This code is outdated and should no longer be used.
subgroup	AN24	andaqueptic	old code - This code is outdated and should no longer be used.
subgroup	AN25	anionic	
subgroup	AN26	anionic aquic	
subgroup	AN28	anthraquic	
subgroup	AN30	anthropic	
subgroup	AQ	aqualfic	
subgroup	AQ01	aquandic	
subgroup	AQ02	aquentic	
subgroup	AQ04	aqueptic	
subgroup	AQ06	aquic	
subgroup	AQ07	aquic anionic	old code - This code is outdated and should no longer be used.
subgroup	AQ08	aquic arenic	
subgroup	AQ10	aquic cumulic	
subgroup	AQ14	aquic duric	
subgroup	AQ15	aquic durinodic	
subgroup	AQ16	aquic durorthidic	old code - This code is outdated and should no longer be used.
subgroup	AQ18	aquic dystric	
subgroup	AQ24	aquic haplic	old code - This code is outdated and should no longer be used.
subgroup	AQ26	aquic lithic	
subgroup	AQ28	aquic petroferic	
subgroup	AQ31	aquic psammentic	old code - This code is outdated and should no longer be used.
subgroup	AQ32	aquodic	
subgroup	AQ34	aquollic	
subgroup	AQ36	aquultic	
subgroup	AQ38	aquertic	
subgroup	AQ40	aquertic chromic	
subgroup	AQ42	aquic natrargidic	

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	AQ44	aquicambidic	
subgroup	AQ46	aquic haploduridic	
subgroup	AR	arenic	
subgroup	AR02	arenic aridic	
subgroup	AR03	arenic orthoxic	old code - This code is outdated and should no longer be used.
subgroup	AR04	arenic plinthaquic	
subgroup	AR06	arenic plinthic	
subgroup	AR08	arenic rhodic	
subgroup	AR10	arenic ultic	
subgroup	AR14	arenic umbric	
subgroup	AR16	arenic ustalfic	old code - This code is outdated and should no longer be used.
subgroup	AR18	arenic ustollic	old code - This code is outdated and should no longer be used.
subgroup	AR22	argiaquic	
subgroup	AR24	argiaquic xeric	
subgroup	AR26	argic	
subgroup	AR27	argixerollic	old code - This code is outdated and should no longer be used.
subgroup	AR28	argic lithic	
subgroup	AR30	argic pachic	
subgroup	AR32	argic vertic	
subgroup	AR33	argidic	old code - This code is outdated and should no longer be used.
subgroup	AR34	aridic	
subgroup	AR36	aridic calcic	
subgroup	AR42	aridic duric	
subgroup	AR50	aridic pachic	old code - This code is outdated and should no longer be used.
subgroup	AR52	aridic petrocalcic	old code - This code is outdated and should no longer be used.
subgroup	AR54	argic ustic	
subgroup	AR56	arenic ustic	
subgroup	AR58	argiduridic	
subgroup	AX	acrudoxic	
subgroup	AX02	acrudoxic hydric	
subgroup	AX03	acrudoxic plinthic	
subgroup	AX04	acrudoxic thaptic	
subgroup	AX06	acrudoxic ultic	
subgroup	AX08	acrudoxic vitric	
subgroup	AX10	acraquoxic	

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	AX12	acrustoxic	
subgroup	BO	boralfic	
subgroup	BO02	boralfic lithic	
subgroup	BO04	boralfic udic	
subgroup	BO06	borollic	old code - This code is outdated and should no longer be used.
subgroup	BO08	borollic glossic	old code - This code is outdated and should no longer be used.
subgroup	BO10	borollic lithic	old code - This code is outdated and should no longer be used.
subgroup	BO12	borollic vertic	old code - This code is outdated and should no longer be used.
subgroup	CA	calcic	
subgroup	CA04	calcic pachic	
subgroup	CA05	calcic udic	
subgroup	CA06	calciorthidic	old code - This code is outdated and should no longer be used.
subgroup	CA10	calcixerollic	
subgroup	CA20	cambic	old code - This code is outdated and should no longer be used.
subgroup	CA22	cambidic	
subgroup	CA24	calcidic	
subgroup	CA26	calciargidic	
subgroup	CH	chromic	
subgroup	CH04	chromic udic	
subgroup	CH06	chromudic	old code - This code is outdated and should no longer be used.
subgroup	CH08	chromic vertic	
subgroup	CR	crylic	
subgroup	CR10	crylic lithic	
subgroup	CR14	crylic pachic	
subgroup	CU	cumulic	
subgroup	CU02	cumulic udic	
subgroup	CU04	cumulic ultic	
subgroup	CU10	cumulic vertic	
subgroup	DU	durargidic	old code - This code is outdated and should no longer be used.
subgroup	DU02	duric	
subgroup	DU04	duric histic	
subgroup	DU05	duric xeric	
subgroup	DU07	duridic	
subgroup	DU08	durixerollic	old code - This code is outdated and should no longer be used.
subgroup	DU10	durixerollic lithic	old code - This code is outdated and should no longer be used.

Domid:c	Code:c	Codename:c	Codesdesc:c
subgroup	DU11	durochreptic	old code - This code is outdated and should no longer be used.
subgroup	DU12	durorthidic	old code - This code is outdated and should no longer be used.
subgroup	DU14	durorthidic xeric	old code - This code is outdated and should no longer be used.
subgroup	DU20	durinodic	
subgroup	DU22	durinodic xeric	
subgroup	DU24	duridic xeric	
subgroup	DY02	dystrie	
subgroup	DY03	dystrie entic	
subgroup	DY04	dystrie fluventic	
subgroup	DY06	dystrie lithic	
subgroup	DY08	dystropeptic	old code - This code is outdated and should no longer be used.
subgroup	DY09	dystrie vitric	
subgroup	EN	entic	
subgroup	EN02	entic lithic	
subgroup	EN04	entic udic	This code represents two codes. Entic udic is the current and correct codename. Ruptic-entic lithic is the outdated codename.
subgroup	EN06	entic ultic	
subgroup	EP	epiaquic	old code - This code is outdated and should no longer be used.
subgroup	EP10	epiaquic orthoxic	old code - This code is outdated and should no longer be used.
subgroup	EU	eutrie	
subgroup	EU02	eutrochreptic	
subgroup	EU04	eutropeptic	
subgroup	EU06	eutrie hydric	
subgroup	EU08	eutrie pachic	
subgroup	EU10	eutrie thaptic	
subgroup	EU12	eutrie vitric	
subgroup	FE	ferrudalfic	
subgroup	FI	fibrie	
subgroup	FI02	fibrie terric	
subgroup	FL02	fluvaquentic	
subgroup	FL04	fluvaquentic vertic	
subgroup	FL06	fluventic	
subgroup	FL12	fluventic umbric	
subgroup	FR10	fragiaquic	
subgroup	FR18	fragic	

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	GL02	glossaquic	
subgroup	GL04	glossic	
subgroup	GL10	glossic udic	
subgroup	GL11	glossic ustic	
subgroup	GL12	glossic ustollic	old code - This code is outdated and should no longer be used.
subgroup	GL14	glossoboralfic	old code - This code is outdated and should no longer be used.
subgroup	GL16	glossoboric	
subgroup	GR	grossarenic	
subgroup	GR01	grossarenic entic	
subgroup	GR04	grossarenic plinthic	
subgroup	GY	gypsic	
subgroup	HA	haplaquodic	old code - This code is outdated and should no longer be used.
subgroup	HA01	haplaquic	old code - This code is outdated and should no longer be used.
subgroup	HA02	haplic	
subgroup	HA04	halic	
subgroup	HA07	haploxerollic	
subgroup	HA09	hapludic	
subgroup	HA12	hapludollic	old code - This code is outdated and should no longer be used.
subgroup	HA16	haplustollic	old code - This code is outdated and should no longer be used.
subgroup	HA18	haplic haploxerollic	
subgroup	HA20	haplic palexerollic	
subgroup	HA22	haplic ustic	
subgroup	HA24	haploduridic	
subgroup	HA25	haploduridic xeric	
subgroup	HA26	haploxeralfic	
subgroup	HA28	haplocalcidic	
subgroup	HE	hemic	
subgroup	HE02	hemic terric	
subgroup	HI	histic	
subgroup	HI02	histic lithic	
subgroup	HI06	histic pergelic	
subgroup	HU	humic	
subgroup	HU02	humic lithic	old code - This code is outdated and should no longer be used.
subgroup	HU05	humic pergelic	
subgroup	HU06	humoxic	old code - This code is outdated and should no longer be used.

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	HU10	humaqueptic	
subgroup	HU15	humic rhodic	
subgroup	HU20	humic xanthic	
subgroup	HU22	humic xeric	
subgroup	HY	hydric	
subgroup	HY02	hydric lithic	
subgroup	HY04	hydric pachic	
subgroup	HY06	hydric thaptic	
subgroup	HY10	hydraquentic	
subgroup	IN	inceptic	
subgroup	KA	kandic	
subgroup	KA02	kandiudalfic	
subgroup	KA04	kandiustalfic	
subgroup	KH	kanhaplic	
subgroup	LE	leptic	
subgroup	LE04	leptic udic	
subgroup	LI	limnic	
subgroup	LI02	lithic	
subgroup	LI04	lithic mollic	
subgroup	LI05	lithic petrocalcic	
subgroup	LI06	lithic ruptic-alfic	
subgroup	LI07	lithic ruptic-argic	
subgroup	LI08	lithic ruptic-entic xerollic	This code represents two codes. Lithic ruptic-entic xerollic is the correct codename. Lithic ruptic-entic is the incorrect codename for LI08, but is the correct codename for LI09.
subgroup	LI09	lithic ruptic-entic	This codename was used for two codes (LI09 and LI08). LI09 is the correct code that should be used with this codename.
subgroup	LI10	lithic udic	old code - This code is outdated and should no longer be used.
subgroup	LI11	lithic ruptic-xerorthentic	
subgroup	LI12	lithic ultic	
subgroup	LI13	lithic ruptic-ultic	
subgroup	LI14	lithic umbric	old code - This code is outdated and should no longer be used.
subgroup	LI15	lithic ruptic-xerochreptic	
subgroup	LI16	lithic ustic	
subgroup	LI18	lithic ustollic	old code - This code is outdated and should no longer be used.

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	LI20	lithic vertic	old code - This code is outdated and should no longer be used.
subgroup	LI22	lithic xeric	
subgroup	LI24	lithic xerollic	old code - This code is outdated and should no longer be used.
subgroup	MO	mollic	
subgroup	NA03	natrargidic	
subgroup	NA05	natraxeralfic	
subgroup	NA06	natric	
subgroup	OC	ochreptic	
subgroup	OM	ombroaquic	
subgroup	OR	orthidic	old code - This code is outdated and should no longer be used.
subgroup	OR01	orthic	old code - This code is outdated and should no longer be used.
subgroup	OR02	orthoxic	old code - This code is outdated and should no longer be used.
subgroup	OX	oxic	
subgroup	OX02	oxyaquic	
subgroup	OX08	oxyaquic vertic	
subgroup	PA	pachic	
subgroup	PA02	pachic udic	
subgroup	PA04	pachic ultic	
subgroup	PA06	pachic vitric	
subgroup	PA08	paleustollic	old code - This code is outdated and should no longer be used.
subgroup	PA10	palexerollic	old code - This code is outdated and should no longer be used.
subgroup	PA20	paralithic vertic	old code - This code is outdated and should no longer be used.
subgroup	PA22	paleargidic	
subgroup	PE	pergelic	
subgroup	PE01	pergelic ruptic-histic	
subgroup	PE02	pergelic sideric	old code - This code is outdated and should no longer be used.
subgroup	PE04	petrocalcic	
subgroup	PE06	petrocalcic ustalfic	old code - This code is outdated and should no longer be used.
subgroup	PE08	petrocalcic ustollic	old code - This code is outdated and should no longer be used.
subgroup	PE14	petrocalcic xerollic	old code - This code is outdated and should no longer be used.
subgroup	PE16	petroferric	
subgroup	PE20	petrogypsic	
subgroup	PE21	petrocalcidic	
subgroup	PE22	petrogypsic ustic	
subgroup	PE24	petronodic	

Domid:c	Code:c	Codename:c	Codesdesc:c
subgroup	PK	placic	
subgroup	PK10	plaggeptic	
subgroup	PK12	plaggic	old code - This code is outdated and should no longer be used.
subgroup	PL	plinhaquic	
subgroup	PL04	plinthic	
subgroup	PL06	plinthudic	
subgroup	PS	psammaquentic	
subgroup	PS02	psammentic	
subgroup	QU	quartzipsammentic	
subgroup	RE	rendollic	
subgroup	RH	rhodic	
subgroup	RU02	ruptic-alfic	
subgroup	RU09	ruptic-lithic	
subgroup	RU11	ruptic-lithic-entic	
subgroup	RU15	ruptic-lithic-xerochreptic	
subgroup	RU17	ruptic-ultic	
subgroup	RU19	ruptic-vertic	
subgroup	SA	salorthidic	old code - This code is outdated and should no longer be used.
subgroup	SA01	salidic	
subgroup	SA02	sapric	
subgroup	SA04	sapric terric	
subgroup	SI	sideric	old code - This code is outdated and should no longer be used.
subgroup	SO	sombric	
subgroup	SO02	sodic	
subgroup	SO04	sombrihumic	old code - This code is outdated and should no longer be used.
subgroup	SO06	sodic ustic	
subgroup	SO08	sodic xeric	
subgroup	SP	sphagnic	
subgroup	SP02	sphagnic terric	
subgroup	SP04	spodic	
subgroup	SU	sulfic	
subgroup	SU02	sulfaqueptic	
subgroup	TE	terric	
subgroup	TH	thaptic	
subgroup	TH04	thapto-histic	

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	TH06	thapto-histic tropic	
subgroup	TO	torrertic	
subgroup	TO02	torrifluventic	
subgroup	TO04	torriorthentic	
subgroup	TO06	torripsammentic	
subgroup	TO10	torroxic	
subgroup	TR	tropaquodic	old code - This code is outdated and should no longer be used.
subgroup	TR02	tropeptic	old code - This code is outdated and should no longer be used.
subgroup	TR04	tropic	
subgroup	U15	humic rhodic	old code - This code is outdated and should no longer be used.
subgroup	UD	udertic	
subgroup	UD01	udalfic	old code - This code is outdated and should no longer be used.
subgroup	UD02	udic	
subgroup	UD03	udollic	
subgroup	UD05	udorthentic	
subgroup	UD07	udandic	
subgroup	UD08	udifluventic	
subgroup	UD10	udoxic	
subgroup	UL	ultic	
subgroup	UL02	ultic vitric	old code - This code is outdated and should no longer be used.
subgroup	UM	umbreptic	
subgroup	UM02	umbric	
subgroup	US	ustalfic	
subgroup	US01	ustandic	
subgroup	US02	ustertic	
subgroup	US04	ustic	
subgroup	US05	ustivitrantic	
subgroup	US06	ustochreptic	old code - This code is outdated and should no longer be used.
subgroup	US08	ustollic	old code - This code is outdated and should no longer be used.
subgroup	US12	ustoxic	
subgroup	US14	ustifluventic	
subgroup	VE	vermic	
subgroup	VE02	vertic	
subgroup	VI	vitric	
subgroup	VI02	vitrandic	

Domid:c	Code:c	Codename:c	Codedesc:c
subgroup	VI04	vitrustandic	old code - This code is outdated and should no longer be used.
subgroup	VI06	vitritorrandic	
subgroup	VI08	vitrixerandic	
subgroup	XA	xanthic	
subgroup	XE	xeralfic	old code - This code is outdated and should no longer be used.
subgroup	XE02	xerertic	
subgroup	XE04	xeric	
subgroup	XE08	xerollic	
subgroup	XE10	xerochreptic	
subgroup	XE14	xerifluventic	
suborder	AAQ	aqualfs	
suborder	ABO	boralfs	
suborder	AUD	udalfs	
suborder	AUS	ustalfs	
suborder	AXE	xeralfs	
suborder	CAQ	aquands	
suborder	CCR	cryands	
suborder	CTO	torrands	
suborder	CUD	udands	
suborder	CUS	ustands	
suborder	CVI	vitrandis	
suborder	CXE	xerands	
suborder	DAR	argids	
suborder	DCA	calcids	
suborder	DCM	cambids	
suborder	DCR	cryids	
suborder	DDU	durids	
suborder	DGY	gypsids	
suborder	DOR	orthids	
suborder	DSL	salids	
suborder	EAQ	aquents	
suborder	EAR	arents	
suborder	EFL	fluvents	
suborder	EOR	orthents	
suborder	EPS	psamments	

Domid:c	Code:c	Codename:c	Codedesc:c
suborder	HFI	fibrists	
suborder	HFO	folists	
suborder	HHE	hemists	
suborder	HSA	saprists	
suborder	IAN	andepts	
suborder	IAQ	aquepts	
suborder	IOC	ochrepts	
suborder	IPL	plaggepts	
suborder	ITR	tropepts	
suborder	IUM	umbrepts	
suborder	MAL	albolis	
suborder	MAQ	aquolls	
suborder	MBO	borolls	
suborder	MRE	rendolls	
suborder	MUD	udolls	
suborder	MUS	ustolls	
suborder	MXE	xerolls	
suborder	OAQ	aquox	
suborder	OHU	humox	
suborder	OOR	orthox	
suborder	OPR	perox	
suborder	OTO	torrox	
suborder	ODU	udox	
suborder	OUS	ustox	
suborder	SAQ	aquods	
suborder	SCR	cryods	
suborder	SFE	ferrods	
suborder	SHU	humods	
suborder	SOR	orthods	
suborder	UAQ	aquults	
suborder	UHU	humults	
suborder	UUD	udults	
suborder	UUS	ustults	
suborder	UXE	xerults	
suborder	VAQ	aquerts	

Domid:c	Code:c	Codename:c	Codedesc:c
suborder	VCR	cryerts	
suborder	VTO	torrerts	
suborder	VUD	uderts	
suborder	VUS	usterts	
suborder	VXE	xererts	
suitcode	E	Existing	Plant exists (is common) on the site.
suitcode	EP	Existing Potential	Plant exists (is commom) on the site and has potential for planting on the site as a tree crop.
suitcode	P	Potential	Plant has potential as a species for planting on the site as a tree crop.
symfmt	Alpha	Alpha or alpha numeric	Map symbols area alpha or alpha and alpha numeric
symfmt	Numbr	Numeric	Map symbols are numeric
texture	APUM	ashy-pumiceous	
texture	ASHY	ashy	
texture	ASK	ashy-skeletal	
texture	BM	bouldery mucky	
texture	BVM	very bouldery mucky	
texture	BXM	extremely bouldery mucky	
texture	BY	bouldery	
texture	BYV	very bouldery	
texture	BYX	extremely bouldery	
texture	C	clay	
texture	CAM	angular cobbly mucky	
texture	CB	cobbly	
texture	CBA	angular cobbly	
texture	CBV	very cobbly	
texture	CBX	extremely cobbly	
texture	CE	coprogenous earth	
texture	CEM	cemented	
texture	CIND	cinders	
texture	CL	clay loam	
texture	CM	cobbly mucky	
texture	CN	channery	
texture	CNDY	cindery	
texture	CNV	very channery	
texture	CNX	extremely channery	

Domid:c	Code:c	Codename:c	Codedesc:c
texture	COS	coarse sand	
texture	COSL	coarse sandy loam	
texture	CR	cherty	
texture	CRC	coarse cherty	
texture	CRV	very cherty	
texture	CRX	extremely cherty	
texture	CVM	very cobbly mucky	
texture	CXM	extremely cobbly mucky	
texture	DE	diatomaceous earth	
texture	FB	fibric material	
texture	FL	flaggy	
texture	FLV	very flaggy	
texture	FLX	extremely flaggy	
texture	FRAG	fragmental material	
texture	FS	fine sand	
texture	FSL	fine sandy loam	
texture	G	gravel	
texture	GCM	coarse gravelly mucky	
texture	GFM	fine gravelly mucky	
texture	GM	gravelly mucky	
texture	GR	gravelly	
texture	GRC	coarse gravelly	
texture	GRF	fine gravelly	
texture	GRV	very gravelly	
texture	GRX	extremely gravelly	
texture	GVM	very gravelly mucky	
texture	GXM	extremely gravelly mucky	
texture	GYP	gypsiferous material	
texture	HM	hemic material	
texture	HPUM	hydrous-pumiceous	
texture	HSK	hydrous-skeletal	
texture	HYDR	hydrous	
texture	ICE	ice or frozen soil	
texture	IND	indurated	
texture	L	loam	

Domid:c	Code:c	Codename:c	Codedesc:c
texture	LCOS	loamy coarse sand	
texture	LFS	loamy fine sand	
texture	LS	loamy sand	
texture	LVFS	loamy very fine sand	
texture	MARL	marl	
texture	MEDL	medial	
texture	MK	mucky	
texture	MPT	mucky-peat	
texture	MPUM	medial-pumiceous	
texture	MSK	medial-skeletal	
texture	MUCK	muck	
texture	PEAT	peat	
texture	PT	peaty	
texture	PUM	pumiceous	
texture	RB	rubblly	
texture	S	sand	
texture	SC	sandy clay	
texture	SCL	sandy clay loam	
texture	SG	sand and gravel	
texture	SH	shaly	
texture	SHV	very shaly	
texture	SHX	extremely shaly	
texture	SI	silt	
texture	SIC	silty clay	
texture	SICL	silty clay loam	
texture	SIL	silt loam	
texture	SL	sandy loam	
texture	SM	stony mucky	
texture	SP	sapric material	
texture	SR	stratified	
texture	ST	stony	
texture	STV	very stony	
texture	STX	extremely stony	
texture	SVM	very stony mucky	
texture	SXM	extremely stony mucky	

Domid:c	Code:c	Codename:c	Codedesc:c
texture	SY	slaty	
texture	SYV	very slaty	
texture	SYX	extremely slaty	
texture	UNK	unknown	
texture	UWB	unweathered bedrock	
texture	VAR	variable	
texture	VFS	very fine sand	
texture	VFSL	very fine sandy loam	
texture	WB	weathered bedrock	
unified	CH	Group Symbol - CH	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.
unified	CL	Group Symbol - CL	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay.
unified	CL-A	Group Symbol - CL-A	Andic suffix for CL.
unified	CL-K	Group Symbol - CL-K	Kaolinitic suffix for CL.
unified	CL-ML	Group Symbol - CL-ML	
unified	CL-O	Group Symbol - CL-O	Oxidic suffix for CL
unified	CL-T	Group Symbol - CL-T	Thixotropic suffix for CL.
unified	GC	Group Symbol - GC	COARSE-GRAINED SOILS ,Gravels, Gravels with fines, Clayey Gravel.
unified	GC-GM	Group Symbol - GC-GM	
unified	GM	Group Symbol - GM	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel.
unified	GM-GC	Group Symbol - GM-GC	
unified	GP	Group Symbol - GP	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel.
unified	GP-GC	Group Symbol - GP-GC	
unified	GP-GM	Group Symbol - GP-GM	
unified	GW	Group Symbol - GW	COARSE-GRAINED SOIILS, Gravels, Clean Gravels, Well-graded gravel.
unified	GW-GC	Group Symbol - GW-GC	
unified	GW-GM	Group Symbol - GW-GM	
unified	MH	Group Symbol - MH	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.
unified	MH-A	Group Symbol - MH-A	Andic suffix for MH.
unified	MH-K	Group Symbol - MH-K	Kaolinitic suffix for MH.
unified	MH-O	Group Symbol - MH-O	Oxidic suffix for MH.
unified	MH-T	Group Symbol - MH-T	Thixotropic suffix for MH.
unified	ML	Group Symbol - ML	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Silt.
unified	ML-A	Group Symbol - ML-A	Andic suffix for ML.
unified	ML-K	Group Symbol - ML-K	Kaolinitic suffix for ML.
unified	ML-O	Group Symbol - ML-O	Oxidic suffix for ML.

Domid:c	Code:c	Codename:c	Codedesc:c
unified	ML-T	Group Symbol - ML-T	Thixotropic suffix for ML.
unified	OH	Group Symbol - OH	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Organic Clay or Organic Silt.
unified	OH-T	Group Symbol - OH-T	Thixotropic suffix for OH.
unified	OL	Group Symbol - OL	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Organic Clay or Organic Silt.
unified	PT	Group Symbol - PT	Highly organic soils, Peat.
unified	SC	Group Symbol - SC	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.
unified	SC-SM	Group Symbol - SC-SM	
unified	SM	Group Symbol - SM	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.
unified	SM-SC	Group Symbol - SM-SC	
unified	SP	Group Symbol - SP	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.
unified	SP-SC	Group Symbol - SP-SC	
unified	SP-SM	Group Symbol - SP-SM	
unified	SW	Group Symbol - SW	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand.
unified	SW-SC	Group Symbol - SW-SC	
unified	SW-SM	Group Symbol - SW-SM	
unitkind	F	family	
unitkind	M	miscellaneous	
unitkind	O	suborder or order	
unitkind	P	family phase	
unitkind	R	great group	
unitkind	S	series	
unitkind	U	subgroup	
unitkind	V	variant	
wdcode	Moderate	Moderate	
wdcode	Severe	Severe	
wdcode	Slight	Slight	
weg	1	Wind Erodibility Group 1	Surface texture - VFS,FS,S,COS. Percent aggregates - 1, Wind erodibility index - 310 t/a/y.
weg	2	Wind Erodibility Group 2	Surface texture - LVFS,LFS,LCOS,Sapric material. Percent aggregates - 10, Wind erodibility index - 134 t/a/y.
weg	3	Wind Erodibility Group 3	Surface texture - VFSL,FSL,SL,COSL. Percent aggregates - 25, Wind erodibility index - 86 t/a/y.
weg	4	Wind Erodibility Group 4	Surface Texture - C,SIC,noncalcareous CL,SICL(>35% CLAY). Percent aggregates - 25, Wind erodibility index - 86 t/a/y.

Domid:c	Code:c	Codename:c	Codedesc:c
weg	4L	Wind Erodibility Group 4L	Surface texture - calcareous L/SIL/CL,SICL. Percent aggregates - 25, Wind Erodibility index - 86 t/a/y.
weg	5	Wind Erodibility Group 5	Surface textue - noncalcareous L/SIL(<20% CLAY),SCL,SC. Percent aggregates - 40, Wind erodibility index - 56 t/a/y.
weg	6	Wind Erodibility Group 6	Surface texture - noncalcareous L/SIL(>20% CLAY),CL(<35% CLAY). Percent aggregates - 45, Wind erodibility index - 48 t/a/y.
weg	7	Wind Erodibility Group 7	Surface texture - SI,noncalcareous SICL(<35% CLAY). Percent aggregates - 50, Wind erodibility index - 38 t/a/y.
weg	8	Wind Erodibility Group 8	Erosion not a problem.
wei	0		
wei	134		
wei	160		
wei	180		
wei	220		
wei	250		
wei	310		
wei	38		
wei	48		
wei	56		
wei	86		
wlcode	Fair	Fair	
wlcode	Good	Good	
wlcode	Poor	Poor	
wlcode	Very poor	Very poor	
wtkind	APPAR	Apparent	Apparent water table -- Water stands in a freshly dug hole.
wtkind	ARTES	Artesian	Artesian water table -- Water with an hydrostatic head below an impermeable layer.
wtkind	Perch	Perched	Perched water table -- Water standing above an unsaturated zone.
yldunits	AUM	AUM*	
yldunits	Boxes	Boxes	
yldunits	BU	Bu	
yldunits	Crates	Crates	
yldunits	CWT	Cwt	
yldunits	LB	Lb	
yldunits	LBS	Lbs	
yldunits	Sacks	Sacks	

Domid:c	Code:c	Codename:c	Codedesc:c
yldunits	Thousands	Thousands	
yldunits	Tons	Tons	

APPENDIX G

VEGETATIVE COVER DATA

CALVEG Vegetation Alliance Descriptions

According to the USDA Forest Service California Vegetation (CALVEG) classification system, the Cottonwood Creek Watershed Area (CCWA) is within the North Coast and Montane Ecological Province. The following alliance descriptions are taken directly from the USDA Forest Service *CalVeg Geobook* vegetation descriptions for this province.

Conifer Forest / Woodland

Within the CCWA area, Conifer Forest/Woodland alliances are primarily found in the mountainous western and northern regions of the watershed, except for the Gray Pine Alliance, which is located primarily throughout the central portion of the watershed. Conifer Forest/Woodland vegetation types comprise approximately 268,274.5 acres or approximately 44.46% of the total vegetation of the CCWA.

Pacific Douglas-Fir Alliance (DF)

Douglas-Fir (*Pseudotsuga menziesii*) is the dominant overstory conifer over a large area in the Klamath Mountains, Northern California Coast, and Northern California Coast Ranges Sections. Elevations are usually below about 5000 ft (1525 m) in the southern area and below about 4500 ft (1372 m) in the northern area. These stands may be adjacent to the Douglas-Fir - Pine and Douglas-Fir - White Fir types. Sugar Pine (*Pinus lambertiana*) is a common hardwood associate in some areas. Tanoak (*Lithocarpus densiflorus* var. *densiflorus*) is the most common associate on mesic sites in the North Coast and Montane Ecological Province. Along western edges of the Klamath Mountains Section, a scattered overstory of Douglas-Fir often exists over a continuous Tanoak understory with occasional Madrones (*Arbutus menziesii*). When Douglas-Fir develops a closed-crown overstory, Tanoak may occur in its shrub form (*L. d.* var. *echinoides*). Canyon Live Oak (*Quercus chrysolepis*) becomes an important hardwood associate on steeper or drier slopes and those underlain by shallow soils. Black Oak (*Quercus kelloggii*) may often associate with this conifer but usually is not abundant. In addition, any of the following tree species may be sparsely present in Douglas-Fir stands: Ponderosa Pine (*Pinus ponderosa*), Incense Cedar (*Calocedrus decurrens*), White Fir (*Abies concolor*), Oregon White Oak (*Quercus garryana*), Bigleaf Maple (*Acer macrophyllum*), California Bay (*Umbellifera californica*), and Tree Chinquapin (*Chrysolepis chrysophylla*). The shrub understory may also be quite diverse, including Huckleberry Oak (*Quercus vaccinifolia*), Salal (*Gaultheria shallon*), California Huckleberry (*Vaccinium ovatum*), California Hazelnut (*Corylus cornuta* var. *californica*), Poison Oak (*Toxicodendron diversilobum*), Oceanspray (*Holodiscus discolor*), Hairy Honeysuckle (*Lonicera hispidula*) and a wide range of other shrubs and forbs.

Douglas-Fir - Pine Alliance (DP)

Douglas-Fir (*Pseudotsuga menziesii*) shares canopy dominance with Ponderosa Pine (*Pinus ponderosa*) at elevations between about 2000 - 5500 ft (610 - 1670 m) in drier sites of the Klamath Mountains and Northern California Coast Ranges Sections, and more rarely in the

eastern sectors of the Northern California Coast Section. Incense Cedar (*Calocedrus decurrens*), Sugar Pine (*Pinus lambertiana*) and White Fir (*Abies concolor*) may occasionally be present as minor elements of the overstory. Pacific Madrone (*Arbutus menziesii*), California Black Oak (*Quercus kelloggii*), Canyon Live Oak (*Quercus chrysolepis*) and Bigleaf Maple (*Acer macrophyllum*) are often present in the understory, while Tanoak (*Lithocarpus densiflorus* var. *densiflorus*) is usually absent. This type may grade into the Mixed Conifer - Pine type in the interior Northern California Coast Ranges as site conditions become more mesic or disturbance factors less significant in the landscape. It is less prominent in the moister, outermost Klamath Mountains area where it intermixes with Pacific Douglas-Fir forests.

Mixed Conifer - Fir Alliance (MF)

White Fir (*Abies concolor*) forms an important but not dominant part of the overstory canopy in this type at elevations between about 4000 - 7000 ft (1220 - 2135 m) in the Klamath Mountains and Northern California Coast Ranges Sections. These stands grade imperceptibly into the Douglas-Fir - White Fir, Mixed Conifer - Pine and Ultramafic Mixed Conifer types, the lower elevations generally having more conifers common to Mixed Conifer - Pine forests such as Douglas-Fir (*Pseudotsuga menziesii*), Ponderosa Pine (*Pinus ponderosa*) and Sugar Pine (*Pinus lambertiana*). White Fir gradually replaces Ponderosa Pine in abundance in this mixture as elevation increases, but Douglas-Fir may remain prominent. Upper elevation mixtures (eg., those greater than about 5500 ft or 1678 m) often have more abundant Jeffrey Pine (*Pinus jeffreyi*), Western White Pine (*Pinus monticola*), Lodgepole Pine (*Pinus contorta* var. *murrayana*) and Red Fir (*Abies magnifica*) components. Incense Cedar (*Calocedrus decurrens*) may be present to the upper elevations of this type, at least in those areas where weathered ultramafic bedrock occurs such as in the southern Trinity Mountains (Rattlesnake Creek Subsection). Few if any hardwoods occur, although Canyon Live Oak (*Quercus chrysolepis*) may be present at the lowest elevations. Pinemat Manzanita (*Arctostaphylos nevadensis*), Mahala Mat (*Ceanothus prostratus*) and Huckleberry Oak (*Quercus vaccinifolia*) are typical shrubs in this type. Mixed Conifer - Fir forests occur adjacent to and below the White Fir type in the Yolla Bolly Mountains and elsewhere.

White Fir Alliance (WF)

Sites dominated by White Fir (*Abies concolor*) in the conifer overstory and understory occur broadly in the Klamath Mountains Section and prominently in the Eastern Franciscan Subsection of the Northern California Coast Ranges. Elevations are usually below 7000 ft (2170 m). The White Fir type usually is found below the Red Fir and above the Mixed Conifer - Fir forests. Ponderosa Pine (*Pinus ponderosa*) and Red Fir (*Abies magnifica*) may be common associates at lower and upper elevations of this Ecological Province, respectively. Understory shrubs and hardwoods are uncommon due to the density of these stands. However, Sadler Oak (*Quercus sadleriana*) and Tree Chinquapin (*Chrysolepis chrysophylla*) may occur in the extreme western areas of these Sections. Shrubs of the Montane Mixed Chaparral and Upper Montane Mixed Shrub Alliances may occasionally be present in forest openings, including Huckleberry Oak (*Quercus vaccinifolia*), Pinemat Manzanita (*Arctostaphylos nevadensis*), Bush Chinquapin (*Chrysolepis sempervirens*), Greenleaf Manzanita (*Arctostaphylos patula*) and Bitter Cherry (*Prunus emarginata*). Shade tolerant shrubs such as Serviceberry (*Amelanchier* spp.), Snowberry (*Symphoricarpos mollis*) and Sticky Currant (*Ribes viscosissimum*) occur under denser canopy conditions.

Jeffrey Pine Alliance (JP)

Jeffrey Pine (*Pinus jeffreyi*) is adapted to a variety of dry, nutrient-poor habitats in the North Coast and Montane Ecological Province. This type identifies stands dominated by this pine, but a variety of other species will occur depending on substrate, elevation and climate. Stunted Jeffrey Pine stands are found at low to middle elevations, usually below 5000 ft (1525 m) on strongly serpentinized peridotite sites in the western Klamath Mountains Section such as in the Smith River area. This mixture often includes scattered Douglas-Fir (*Pseudotsuga menziesii*), Ponderosa Pine (*Pinus ponderosa*), Incense Cedar (*Calocedrus decurrens*), Sugar Pine (*Pinus lambertiana*), Lodgepole Pine (*Pinus contorta* var. *murrayana*) or Western White Pine (*Pinus monticola*) with few if any hardwood species. Associated shrubs on serpentinized substrates include Shrub Canyon Live Oak (*Quercus chrysolepis* var. *nana*), Wedgeleaf Ceanothus (*Ceanothus cuneatus*), Serpentine Macronea (*Happlopappus orphitidis*) and Huckleberry Oak (*Quercus vaccinifolia*). Where the species become more mixed on ultrabasic substrates, this type grades into the Ultramafic Mixed Conifer type. Jeffrey Pine-dominated sites have also been identified further inland in ultramafic areas of the Rattlesnake Creek, Upper Scott Mountains, Trinity Alps and Eastern Klamath Mountains Subsections of the Klamath Mountains Section at elevations up to about 7000 ft (2170 m). These open sites also have a variety of montane conifers, including White Fir (*Abies concolor*). Shrubs such as the above and Pinemat Manzanita (*Arctostaphylos nevadensis*) may occur. In addition, relatively high-elevation Jeffrey Pine areas occur in small open stands in nonserpentinized areas of the Northern California Coast Ranges Section such as in the Yolla Bolly Mountains. They are usually found above 5000 ft (1525 m) in these upper montane areas in association with trees such as Sugar Pine and White Fir and the shrubs Pinemat Manzanita and Huckleberry Oak.

Red Fir Alliance (RF)

Red and Shasta Fir (*Abies magnifica* var. *magnifica* and *A. m.* var. *shastensis*) sites occur in nearly pure stands at elevations above about 4400 ft (1342 m) in the higher montane areas of the Klamath Mountains and Northern California Coast Ranges Sections. Higher elevation conifers such as Mountain Hemlock (*Tsuga mertensiana*), Brewer Spruce (*Picea breweriana*), Western White Pine (*Pinus monticola*) and Whitebark Pine (*Pinus albicaulis*) may be found in association with Red Fir above 7000 feet (2170 m). At lower elevations, Red Fir mixes more with White Fir (*Abies concolor*); it hybridizes and associates with Noble Fir (*Abies procera*) in the Siskiyou and Klamath Mountains. Understory shrub species in this type include Huckleberry Oak (*Quercus vaccinifolia*), Bush Chinquapin (*Chrysolepis sempervirens*) and Snowberry (*Symphoricarpos mollis*). Moist locations have more Mountain Maple (*Acer glabrum*) and Dogwood (*Cornus* spp.) but shrubs, especially in dense Red Fir stands, rarely occur in this type. Pinemat Manzanita (*Arctostaphylos nevadensis*), Greenleaf Manzanita (*Arctostaphylos patula*), Snowbrush (*Ceanothus velutinus*) and Sadler Oak (*Quercus sadleriana*) may be present on more open sites, especially towards the northwest.

Mixed Conifer - Pine Alliance (MP)

No single conifer dominates the overstory of this extensively occurring mixed conifer type. It occurs on non-serpentinized or slightly serpentinized soils at elevations between about 4000 - 6000 ft (1220 - 1830 m) in the North Coast and Montane Ecological Province. It is very common in the Klamath Mountains Section and less abundant in the Northern California

Coast Ranges Section. Ponderosa Pine (*Pinus ponderosa*) and/or Sugar Pine (*Pinus lambertiana*) are prominent in this mixture. Douglas-Fir (*Pseudotsuga menziesii*) often occurs and may be an important component of the mixture in some western areas of the region such as in the Rattlesnake Creek Subsection. Incense Cedar (*Calocedrus decurrens*) is a common associate and White Fir (*Abies concolor*) occurs less commonly. California Black Oak (*Quercus kelloggii*) and the shrub Greenleaf Manzanita (*Arctostaphylos patula*) typically associate on better sites, while Oregon White Oak (*Quercus garryana*), Canyon Live Oak (*Quercus chrysolepis*) and the shrub Whiteleaf Manzanita (*Arctostaphylos viscida*) often occur on harsher sites. Other shrub associates include Poison Oak (*Toxicodendron diversilobum*), Western Redbud (*Cercis occidentalis*), Mountain Whitethorn (*Ceanothus cordulatus*) and California Honeysuckle (*Lonicera hispidula*).

Ponderosa Pine Alliance (PP)

Pure to nearly pure Ponderosa Pine (*Pinus ponderosa*) stands occur in scattered patches below the Mixed Conifer - Pine and above the Northern Mixed Chaparral types of this region. This type is usually found adjacent to the Douglas-Fir - Ponderosa Pine type. Ponderosa Pine may become a dominant conifer on well-drained, often droughty, non-serpentinized soils, such as coarse-textured alluvial sites and southwest-facing or steep slopes. Ponderosa pine-dominated forests are more common in the Northern California Coast Ranges and Klamath Mountains Sections at elevations between about 2500 - 5200 ft (762 - 1586 m). The many minor associates in these open stands include Tanoak (*Lithocarpus densiflorus* var. *densiflorus*) and Pacific Madrone (*Arbutus menziesii*) in the northern area and California Black Oak (*Quercus kelloggii*), Canyon Live Oak (*Quercus chrysolepis*), Oregon White Oak (*Q. garryana*), Douglas-Fir (*Pseudotsuga menziesii*) and White Fir (*Abies concolor*) in various regions. Whiteleaf Manzanita (*Arctostaphylos viscida*) and annual grasses such as *Bromus* spp. may associate with it on alluvial soils. Wedgeleaf Ceanothus (*Ceanothus cuneatus*) may be an important associated shrub in the Klamath Mountains Section. Jeffrey Pine (*Pinus jeffreyi*) appears to hybridize with Ponderosa Pine in areas of weakly or moderately serpentinized rock where the two species co-mingle.

Gray Pine Alliance (PD)

Gray Pine (*Pinus sabiniana*) reaches its northernmost distribution in the Klamath Mountains and Southern Cascades Mountain Sections of California. It is more commonly found along the eastern edges of the Northern California Coast Ranges Section in the North Coast and Montane Ecological Province up to an elevation of about 4200 ft (1280 m) in steep, drier canyons or low-elevation foothills. Stands in which it is the dominant emergent conifer are typically diverse and very open, with a mixture of hardwoods such as Blue Oak (*Quercus douglasii*), Oregon White Oak (*Quercus garryana*), Canyon Live Oak (*Quercus chrysolepis*), Pacific Madrone (*Arbutus menziesii*) and low-elevation chaparral shrubs such as Whiteleaf and Common Manzanita (*Arctostaphylos viscida*, *A. manzanita*) and Wedgeleaf Ceanothus (*Ceanothus cuneatus*). Annual grasslands are sometimes found adjacent to Gray Pine stands and may form the ground layer in very open stands. Gray Pine stands are often associated with ultramafic soils such as in the South Fork of the Salmon River where Jeffrey Pine (*P. jeffreyi*), and Leather Oak (*Quercus durata*) may also be present.

Douglas-Fir - White Fir Alliance (DW)

Upper elevations of the Douglas-Fir (*Pseudotsuga menziesii*) distribution often contain abundant but not dominant White Fir (*Abies concolor*) in the upper canopy, but not enough species diversity to support a mixed conifer type. The type in which both conifers dominate the conifer overstory is generally found between about 2500 - 5400 ft (760 - 1645 m) in the Northern California Coast and Klamath Mountains Sections. Sugar Pine (*Pinus lambertiana*) is often present in minor amounts and Tree Chinquapin (*Chrysolepis chrysophylla*) and Bigleaf Maple (*Acer macrophyllum*) are often understory hardwoods. Shrub or Tree Tanoak (*Lithocarpus densiflorus* var. *echinoides* or *L. d.* var. *densiflorus*) may be present in the western areas along with Sadler Oak (*Quercus sadleriana*). The shrubs California Hazelnut (*Corylus cornuta* var. *californica*) and Pacific Dogwood (*Cornus nuttallii*) are often present as well as an occasional Black or Canyon Live Oak (*Quercus kelloggii*, *Q. chrysolepis*) in these stands. The type grades into the Douglas-Fir, Mixed Conifer - Pine and White Fir types.

Ultramafic Mixed Conifer Alliance (MU)

Low to moderate elevations in ultramafic and serpentized areas in the western Klamath Mountains, Northern California Coast and Northern California Coast Ranges Sections often produce soils low in essential minerals such as calcium and magnesium or have excessive accumulations of heavy metals such as nickel and chromium. These sites vary widely in the degree of serpentization and effects on their overlying plant communities. Small stunted Western White Pine (*Pinus monticola*), Lodgepole Pine (*P. contorta* ssp. *murrayana*) and Jeffrey Pine (*P. jeffreyi*) occur in combinations or in nearly pure open stands on Trinity ophiolite areas of the Upper and Lower Scott Mountains and Eastern Klamath Mountains Subsections, especially on the less-weathered Josephine ophiolite of the Gasquet Mountains. Other common tree associates on ultramafics include Douglas-Fir (*Pseudotsuga menziesii*), Sugar Pine (*Pinus lambertiana*), Incense Cedar (*Calocedrus decurrens*) and Port Orford Cedar (*Cupressus lawsoniana*). Hardwoods are often sparse, but Pacific Madrone (*Arbutus menziesii*) and California Bay (*Umbellularia californica*) may also occupy these sites, in addition to more abundant shrubs such as Pinemat and Whiteleaf Manzanita (*Arctostaphylos nevadensis*, *A. viscida*), Huckleberry and Brewer Oaks (*Quercus vaccinifolia*, *Q. garryana* var. *breweri*), California Coffeeberry (*Rhamnus californica*), Shrub Tanoak (*Lithocarpus densiflorus* var. *echinoides*), Western Azalea (*Rhododendron occidentale*), Boxleaf Silktassel (*Garrya buxifolia*) and Siskiyou Mat (*Ceanothus pumilus*).

Hardwood Forest/Woodland

Hardwood Forest/Woodland vegetation alliances are found primarily in the central and eastern area of the CCWA, and are to a lesser extent also scattered throughout the western mountainous region. These vegetation alliances total approximately 147,690 acres or approximately 24.47% of the total vegetation of the CCWA.

Tanoak (Madrone) Alliance (QT)

The Tanoak (Madrone) Alliance is an association of Tanoak (*Lithocarpus densiflorus*) with or without a Pacific Madrone (*Arbutus menziesii*) component. It is a very common type in the Northern California Coast and Klamath Mountains Sections at elevations from about 500 -

3600 ft (152 - 1098 m) where soils and climate are sufficiently but not excessively moist. Tanoak forms extensive, nearly pure closed-crown hardwood forests in the western, moister regions of the Klamath Mountains up to an elevation of about 2000 ft (915 m). Pacific Madrone becomes dominant in eastern and higher regions up to an elevation of 3600 ft (1098 m) or more. This type is adjacent to the Douglas-Fir type in the west and the Mixed Conifer - Pine type in the eastern areas. Canyon Live Oak (*Quercus chrysolepis*) is a common hardwood associate. Douglas-Fir (*Pseudotsuga menziesii*) is a commonly associated conifer and Tree Chinquapin (*Chrysolepis chrysophylla*) may occur at higher elevations. Other trees and shrubs that are often present in this widely dispersed type include Canyon Live Oak (*Quercus chrysolepis*), Pacific Dogwood (*Cornus nuttallii*), Bigleaf Maple (*Acer macrophyllum*), California Black Oak (*Quercus kelloggii*), California Bay (*Umbellularia californica*), Red Alder (*Alnus rubra*), Port Orford Cedar (*Cupressus lawsoniana*), and Sugar Pine (*Pinus lambertiana*). The rich shrub layer on these sites may include Salal (*Gaultheria shallon*), Poison Oak (*Toxicodendron diversilobum*), California Huckleberry (*Vaccinium ovatum*), California Hazelnut (*Corylus cornuta* var. *californica*), *Rhododendron* spp., Huckleberry Oak (*Quercus vaccinifolia*), Rose (*Rosa* spp.), Honeysuckle (*Lonicera* spp.), Creeping Snowberry (*Symphoricarpos mollis*), Blackberry (*Rubus* spp.), and Oceanspray (*Holodiscus discolor*). In many cases, however, the shrub and herbaceous layers tend to be depauperate due to a dense Tanoak canopy.

Canyon Live Oak Alliance (QC)

Canyon Live Oak (*Quercus chrysolepis*) may develop relatively pure tree (*Q. c.* var. *chrysolepis*) or shrubby (*Q. c.* var. *nana*) stands on very steep and rocky montane slopes. Elevations of this type range up to about 4500 ft (1372 m). Slopes are often south- or southwest-facing. Commonly occurring tree and shrub associates include Shrub Interior Live Oak (*Quercus wislizenii* var. *frutescens*), Douglas-Fir (*Pseudotsuga menziesii*), Pacific Madrone (*Arbutus menziesii*), Gray Pine (*Pinus sabiniana*), and Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) as well as other mid-elevation conifers. Tree Chinquapin (*Chrysolepis chrysophylla*) and Tanoak (*Lithocarpus densiflorus*) may be occasional associates in areas nearest the coast and under more mesic conditions. Canyon Live Oak is widely scattered in the North Coast and Montane Ecological Province, often occurring as a dominant understory tree beneath occasional old-growth Douglas-Fir stands and in proximity to the California Black Oak, Oregon White Oak, Mixed Conifer - Pine, Ponderosa Pine, Douglas-Fir, and Douglas-Fir - Pine types. This oak is sometimes found above 5000 ft (1525 m) within the conifer understory.

Bigleaf Maple Alliance (QM)

Bigleaf Maple (*Acer macrophyllum*) is found in limited areas of the North Coast and Montane Ecological Province (for example, in the Eastern Klamath Mountains, Lower Scott Mountains, North Trinity Mountain and Trinity Mountain - Hayfork Subsections of the Klamath Mountains Section and in the Central Franciscan Subsection of the Northern California Coast Section) in association with the shrubs Pacific Dogwood (*Cornus nuttallii*) and California Hazelnut (*Corylus cornuta*). Boxelder (*Acer negundo*), White Alder (*Alnus rhombifolia*) and Black Cottonwood (*Populus trichocarpa*) are sometimes found in this type as well. These are either well-shaded or riparian areas that maintain moisture during the warm season. Elevations are in the low to moderate elevation ranges: below about 5200 ft (1586 m) in the southern regions and below about 4000 ft (1220 m) in the northern Klamath

Mountains. The type may develop on extremely gravelly or rocky soils in high moisture areas.

California Black Oak Alliance (QK)

California Black Oak (*Quercus kelloggii*) occurs extensively in the North Coast and Montane Ecological Province in an elevation range of about 2000 - 5000 ft (610 - 1525 m). It has been identified prominently in the Eastern Klamath Mountains Subsection (Klamath Mountains Section) and in the Eastern and Central Franciscan Subsections (Northern California Coast Ranges Section). It may develop into relatively pure stands on moderately steep slopes or may associate with Oregon White Oak (*Quercus garryana* var. *garryana*) on drier sites. These stands are commonly found within or below the Douglas-Fir, Mixed Conifer - Pine and Ponderosa Pine types, often as a result of fire or other disturbance, especially in Douglas-Fir areas. Black Oak commonly is a major understory hardwood in those conifer types and also typically grows on better soils than those of the Canyon Live Oak-dominant type.

Commonly associated vegetation includes Ponderosa Pine (*Pinus ponderosa*), Douglas-Fir (*Pseudotsuga menziesii*), various Manzanitas (*Arctostaphylos* spp.), Poison Oak (*Toxicodendron diversilobum*), Bigleaf Maple (*Acer macrophyllum*) and California Buckeye (*Aesculus californica*), with Canyon Live Oak (*Quercus chrysolepis*) often present on poorer sites.

Fremont Cottonwood Alliance (QF)

Stands dominated by Fremont Cottonwood (*Populus fremontii*) occur in limited areas of the North Coast and Montane Ecological Province. This Alliance has been mapped along the Russian River in the Central Franciscan Subsection of the Northern California Coast Ranges Section and elsewhere in small patches. Coast Live Oak (*Quercus agrifolia*), Oregon White Oak (*Quercus garryana*) and occasionally Valley Oak (*Quercus lobata*) are the more important tree associates in this region. Shrubby Willows (*Salix* spp.) also may be present. Agricultural uses, especially vineyards, are often adjacent to this Alliance.

Oregon White Oak Alliance (QG)

The tree form of Oregon White Oak (*Quercus garryana* var. *garryana*) becomes a local canopy dominant in woodlands of the Northern California Coast, Coast Ranges and Klamath Mountains Sections of the North Coast and Montane Ecological Province. This species readily mixes with Black Oak (*Quercus kelloggii*) in this area. It typically occurs at lower montane elevations between about 2000 - 4400 ft (610 - 1342 m). Often developing on poor, exposed or droughty soils such as in inland valleys, foothills or rocky ridges, the Oregon White Oak type also is found in poorly drained areas having occasional standing water or next to stream terraces. On better sites, it is usually out-competed by species such as Douglas-Fir (*Pseudotsuga menziesii*) and California Black Oak. Other associated species include Canyon Live Oak (*Quercus chrysolepis*), Wedgeleaf Ceanothus (*Ceanothus cuneatus*), Whiteleaf Manzanita (*Arctostaphylos viscida*), Poison Oak (*Toxicodendron diversilobum*), Western Redbud (*Cercis occidentalis*) and especially in recently burned areas, Deerbrush (*Ceanothus integerrimus*). Open sites often have a grass understory. The shrub form, Brewer Oak (*Quercus garryana* var. *breweri*), occupies higher elevations on shallow soils (see Brewer Oak Alliance).

Blue Oak Alliance (QD)

Blue Oak (*Quercus douglasii*) dominates this low elevation hardwood type, which occurs sparsely in this area of northern California, generally below about 2700 ft (820 m) within the Northern California Coast Ranges Section. The Blue Oak type is found on western slopes of the Central Valley and in Lake, Sonoma and Napa Counties on rocky and often shallow soils. It grades into the Gray Pine type at its higher elevations. Other tree and shrub associates include Interior Live Oak (*Quercus wislizenii*), Coast Live Oak (*Quercus agrifolia*), Oregon White Oak (*Q. garryana*), California Black Oak (*Q. kelloggii*), annual and perennial grasses and Manzanitas (*Arctostaphylos* spp.).

Interior Live Oak Alliance (QW)

The Interior Live Oak (*Quercus wislizenii*) Alliance occurs mainly in southern areas of the Northern California Coast and Klamath Mountains Sections and scattered throughout the Northern California Coast Ranges Section in this region of the state. It is usually found on often shallow or well drained soils to the north and east of the Coast Live Oak (*Quercus agrifolia*) distribution. Interior Live Oak-dominated sites occur at low elevations in humid areas and in an elevational band adjacent to and above the Blue Oak (*Quercus douglasii*)-dominated type towards the eastern sectors. It often indicates xeric or rocky sites when associated with other hardwood types. Further inland the species may occur at elevations up to about 4600 ft (1400 m). The shrubby form (*Q. w.* var. *frutescens*) may also dominate a site, especially in areas of frequent fires, and may occur up to an elevation of about 6500 ft (1982 m). The Interior Live Oak Alliance often contains stringers of Gray Pine (*Pinus sabiniana*) as well as occasional trees and shrubs such as Canyon Live Oak (*Q. chrysolepis*), California Buckeye (*Aesculus californica*), California Bay (*Umbellularia californica*) and Ponderosa Pine (*Pinus ponderosa*). Interior Live Oak also associates with many chaparral species, including Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) and Coffeeberry (*Rhamnus californica*) and may be adjacent to the Tanoak (*Lithocarpus densiflorus*) (Madrone) Alliance in Mendocino County. It is known to hybridize with California Black Oak (*Q. kelloggii*) and Coast Live Oak (*Q. agrifolia*).

Valley Oak Alliance (QL)

Valley Oak (*Quercus lobata*) occurs in scattered occurrences in the foothill woodlands, valleys and floodplains west of the Sacramento River and on gentle, low elevation montane slopes from Marin and Napa Counties to Mendocino County in the Northern Coast and Montane Ecological Province. The Valley Oak-dominated type has been identified mainly in the Northern California Coast Ranges Section of this area. The oak occurs in California up to about 5600 ft (1700 m) elevation, and is considered a species of concern due to habitat loss and specific germination requirements. Associated species within the type include Blue Oak (*Q. douglasii*), Coast Live Oak (*Q. agrifolia*), Black Oak (*Q. kelloggii*), Interior Live Oak (*Q. wislizenii*), and annual grasses. On steeper slopes, Gray Pine (*Pinus sabiniana*) and California Buckeye (*Aesculus californica*) are the primary associated species.

White Alder Alliance (QE)

White Alder (*Alnus rhombifolia*) replaces Red Alder (*A. rubra*) on inland riparian sites of this region up to an elevation of about 5500 ft (1678 m). This type mainly occurs in well-aerated,

rapidly flowing perennial streams of incised, steep-sided canyons which usually have coarse-textured alluvial deposits. It has been identified sparsely in the Eastern and Central Franciscan Subsections (Northern California Coast Ranges Section) and in the Mount St. Helena Flows and Valleys Subsection (Northern California Coast Section). Other riparian or moist soil species such as Willows (*Salix* spp.), Bigleaf Maple (*Acer macrophyllum*) and Fremont or Black Cottonwood (*Populus fremontii*, *P. trichocarpa*) are less abundant here than in other mixed riparian communities such as the Willow, Cottonwood - Alder or Willow - Alder types. Pacific Douglas-Fir (*Pseudotsuga menziesii*) may also occur as a minor component here. California Wild Rose (*Rosa californica*), Mule Fat (*Baccharis viminea*), Poison Oak (*Toxicodendron diversilobum*) and Snowberry (*Symphoricarpos* spp.) are also likely to be present in White Alder stands. The Mountain or Thinleaf Alder-dominated stands (*A. incana* ssp. *tenuifolia*) usually are found in higher-elevation riparian or very wet interior regions.

Willow - Alder Alliance (QY)

This type includes any species of Willow (*Salix* spp.) combined with White, Red or Mountain Alders (*Anus rhombifolia*, *A. rubra*, *A. incana* ssp. *tenuifolia*) occurring together in stream or seepage areas where neither is clearly dominant in the riparian mixture. It usually occurs in low-elevation scattered riparian areas scattered throughout inland sections of the North Coast and Montane Ecological Province such as the Eastern Franciscan Subsection of the Northern California Coast Ranges Section, and the Upper and Lower Scott Mountains, Upper Salmon Mountains and Trinity Alps Subsections of the Klamath Mountains Section. Common associates include species of Gooseberry and Currant (*Ribes* spp.), Blackberry and other edible berries (*Rubus* spp.), Wild Rose (*Rosa* spp.) and Poison Oak (*Toxicodendron diversilobum*) along with various graminoids and forbs.

Shrubs and Chaparral

Shrubs and Chaparral alliances are primarily found within the CCWA along the foothills or lower elevations of the western mountainous belt. They comprise approximately 99,149.34 acres or 16.43% of the total vegetation within the CCWA.

Chamise Alliance (CA)

Pure stands of Chamise (*Adenostoma fasciculatum*) are very limited in the North Coast and Montane Ecological Province, in which it reaches its northernmost distribution range in Tehama County. Chamise may, however, locally dominate low-elevation, xeric sites in this area due to its vigorous crown-sprouting abilities after ground disturbances such as intense fires. Chamise is especially likely to dominate south-facing slopes below or adjacent to the Northern Mixed Chaparral type. This type is prominent on the east side of the Northern California Coast Ranges Section below about 3000 ft (915 m) elevation. Chaparral species such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*), Shrub Canyon Live Oak (*Quercus chrysolepis* var. *nana*), and Manzanitas (*Arctostaphylos* spp.) may associate on steeper or more mesic locations.

Huckleberry Oak Alliance (CH)

Huckleberry Oak (*Quercus vaccinifolium*) and Pinemat Manzanita (*Arctostaphylos nevadensis*) may occur in combination in this type, but Pinemat Manzanita does not tend to dominate

sites at lower elevations. These relatively low-growing shrubs often occur together in montane, open, dry coniferous slopes and ridges in areas of poor soils. The Huckleberry Oak type usually occupies lower elevations in western mountain areas of Klamath Mountains Section, as low as 3000 ft (915 m) or even less in the Salmon and Siskiyou Mountains Subsections and areas further west. It rises to an elevation range of about 5000 - 7500 ft (1525 - 2288 m) in the Trinity Alps Subsection. This type has less plant diversity than that of the Upper Montane Mixed Shrub type and most often occupies shallow and very coarse soils, especially those derived from ultrabasic and/or granitic rocks. Such conditions restrict the growth of conifers. Minor amounts of Mountain Whitethorn (*Ceanothus cordulatus*) and Greenleaf Manzanita (*Arctostaphylos patula*) often occur here.

Northern Mixed Chaparral Alliance (CQ)

This widespread low-elevation mixed shrub type is usually found below 4000 ft (1220 m) in the Northern Coast and Montane Ecological Province. No single shrub species is dominant. Varying mixtures of Chamise (*Adenostoma fasciculatum*), Wedgeleaf and Lemmon Ceanothus (*Ceanothus cuneatus*, *C. lemmonii*), Common and Whiteleaf Manzanita (*Arctostaphylos manzanita*, *A. viscida*), shrubby California Buckeye (*Aesculus californica*), Birchleaf Mountain Mahogany (*Cercocarpus betuloides*), Huckleberry Oak (*Quercus vaccinifolia*) in the western Klamath Mountains Section, and other shrub oaks such as Scrub, Canyon Live and Sadler Oaks (*Q. berberidifolia*, *Q. chrysolepis* var. *nana*, *Q. sadleriana*), often occur in this type. In western areas, it is sometimes found on poorer or ultramafic sites in proximity to the Chamise and Knobcone Pine types. At higher elevations it is often adjacent to the Montane Mixed Chaparral type, with which it may share species such as Greenleaf Manzanita (*Arctostaphylos patula*) and Deerbrush (*Ceanothus integerrimus*). Redbud (*Cercis occidentalis*), Toyon (*Heteromeles arbutifolia*), Mountain Whitethorn (*Ceanothus cordulatus*) and Gray Pine (*Pinus sabiniana*) are also likely to intermix with the other species in this type, but in minor amounts.

Brewer Oak Alliance (CJ)

Dense Brewer Oak (*Quercus garryana* var. *breweri*) thickets commonly occur in scattered summit areas of the Eastern Franciscan Subsection of the Northern California Coast Ranges Section. This type occurs sparsely on drier, steeper sites in other areas as well, such as in the Eastern Klamath Mountains and the Lower and Upper Scott Mountains Subsections of the Klamath Mountains Section. It generally develops above 4000 ft (1220 m) elevation. In the Trinity Alps (Lower Scott Mountains Subsection), it is often found in an elevational band of about 5000 - 6000 ft (1525 - 1830 m) adjacent to dry grasslands, above tree-sized Oregon White Oak (*Q. g.* var. *garryana*) sites. It grades into the Montane Mixed Chaparral type on poorer, drier or lower elevation sites and into the Mixed Conifer - Pine type on better sites. Other associated species in the Brewer Oak type are trees such as Ponderosa Pine (*Pinus ponderosa*) and White Fir (*Abies concolor*), shrubs such as Huckleberry Oak (*Quercus vaccinifolia*), especially towards the west, Mountain Whitethorn (*Ceanothus cordulatus*) and Greenleaf Manzanita (*Arctostaphylos patula*) and grasses such as California Fescue (*Festuca californica*).

Scrub Oak Alliance (CS)

Scattered areas of shrubby oak species (*Quercus* spp.) occur at elevations generally below 5000 ft (1525 m) where soils are sufficiently deep or shaded in the North Coast and Montane Ecological Province. On serpentine soils, patchy stands of Leather Oak (*Quercus durata*) may develop in chaparral sites of the Eastern and Central Franciscan and Ultrabasic Complex Subsections of the Northern California Coast Ranges Section such as in the Frenzel Creek area. Sadler Oak (*Quercus sadleriana*) may become established after fire and logging in montane areas of the Klamath Mountains Section such as in the Upper Salmon Mountains, Siskiyou and Eastern Klamath Mountains Subsections. Other shrubby oaks such as Canyon Live Oak (*Quercus chrysolepis* var. *nana*) and Interior Live Oak (*Quercus wislizenii* var. *frutescens*) may also occur. The Scrub Oak type has also been identified in interior, scattered locations of the Northern California Coast Section such as in the Coastal and Central Franciscan Subsections. True Scrub Oak (*Quercus berberidifolia*) is rare in the northern part of this Province, reaching its northern limit in eastern Tehama County. Associated species of the Scrub Oak type also include minor amounts of Toyon (*Heteromeles arbutifolia*), Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) and other mesic chaparral species.

Montane Mixed Chaparral Alliance (CX)

A mid-elevation mixed chaparral vegetation type occurs in the general elevation range of 3000 - 6000 ft (915 - 1830 m) in widely scattered areas of the Klamath Mountains and Northern California Coast Ranges Sections. It also occurs sparsely in the Northern California Coast Section. A mixture of shrub species such as Greenleaf Manzanita (*Arctostaphylos patula*), an indicator species of this type, Hoary Manzanita (*A. canescens*), Mountain Whitethorn (*Ceanothus cordulatus*), Snowbrush (*C. velutinus*), Deerbrush (*C. integerrimus*), Shrub Canyon Live Oak (*Quercus chrysolepis* var. *nana*), Bush Chinquapin (*Chrysolepis sempervirens*), and Fremont Silktassel (*Garrya fremontii*) may occur in varying combinations. The type is especially prominent within conifer areas that are steep, south-facing, or are underlain by poorer soils (i.e., shallow, rocky or those derived from serpentinized rock). Stand-replacing fires and other forest disturbances encourage its establishment. Depending on past and present environmental and disturbance factors, several species may become locally dominant such as Snowbrush or Greenleaf Manzanita in this area of the state. These species, including the associated Serviceberry (*Amelanchier* spp.), Gooseberry (*Ribes* spp.) and Snowberry (*Symphoricarpos* spp.) also occur as understory shrubs within the Ponderosa Pine, White Fir, Ponderosa Pine - White Fir, Mixed Conifer - Fir and Mixed Conifer - Pine forest types.

Ultramafic Mixed Shrub Alliance (C1)

Serpentine or ultramafic (i.e., unaltered peridotite, serpentinized peridotite or gabbro) areas of the Klamath Mountains, Northern California Coast Ranges and southern areas of the Northern California Coast Sections may contain a mixture of shrubs and often rare herbaceous plants in low to moderately high montane elevations. These areas vary greatly in degree of barrenness and soil chemistry but typically cannot support open woodlands. The best examples of the Ultramafic Mixed Shrub type are on the less altered Josephine ophiolite (a suite of parent materials, including the above) in the western Klamath Mountains Section. Endemic serpentine shrub and herbaceous plant communities also occur on the Trinity ophiolite, an older serpentinized unit at the southern end of this Section, as

well as in small units of the Northern California Coast Ranges Section. Dubakella, Weitchpec and other soil families underlay these communities. Sites are often adjacent to the more common Ultramafic Mixed Conifer woodland type, in which the associated ultramafic shrubs may form an understory component. Species such as Jepson and Wedgeleaf Ceanothus (*Ceanothus jepsonii*, *C. cuneatus*), Huckleberry Oak (*Quercus vaccinifolia*), California Coffeeberry (*Rhamnus californica*), Creeping Barberry (*Berberis aquifolium* var. *repens*), Dwarf Silktassel (*Garrya buxifolia*), Dwarf Tanoak (*Lithocarpus densiflorus* var. *echinoides*) and Siskiyou Mat (*Ceanothus pumilus*) are likely to be found in the Ultramafic Mixed Shrub type.

Upper Montane Mixed Shrub Alliance (CM)

The Upper Montane Mixed Shrub type is a high-elevation shrub community that occurs in widely scattered conifer openings within White Fir, Red Fir and Subalpine Conifer forests. It has been identified mainly in the Klamath Mountains Section (North Trinity Mountains, Trinity Alps, Eastern Klamath Mountains, Upper Scott Mountains, Red Butte and Scott Bar Mountain Subsections). It also occurs in the Eastern Franciscan Subsection of the Northern California Coast Ranges Section. Elevations are usually above 5000 ft (1525 m) in the west and at least 6000 ft (1830 m) or more in the east. In many cases the species are a mixture of Pinemat Manzanita (*Arctostaphylos nevadensis*), Bush Chinquapin (*Chrysolepis sempervirens*), Shrub Tanoak (*Lithocarpus densiflorus* var. *echinoides*) and Huckleberry Oak (*Quercus vaccinifolia*). Bitter Cherry (*Prunus emarginata*) and Rock Spiraea (*Holodiscus microphyllus*) may occasionally be associated. At lower elevations, Greenleaf Manzanita (*A. patula*) and Snowbrush (*Ceanothus velutinus*) may also be present.

Whiteleaf Manzanita Alliance (CW)

Whiteleaf Manzanita (*Arctostaphylos viscida*) is widespread in northwestern California up to an elevation of about 6000 ft (1850 m). It becomes a dominant shrub in previously fire disturbed, ultramafic, dry, low elevation or south-facing foothills sites in this region, especially in southeastern areas of the Klamath Mountains Section (Eastern Klamath Mountains Subsection) and in the Stony Creek Serpentine Subsection of the Northern California Coast Ranges Section. This type is normally found adjacent to and below Gray Pine, Ponderosa Pine and Douglas-Fir forest and woodland types. It is present, for example, at elevations usually below 2000 ft (610 m) in the Shasta Lake area. Associated shrubs there include Lemmon Ceanothus (*C. lemmonii*) and Redbud (*Cercis occidentalis*). In other areas, Greenleaf Manzanita (*A. patula*), Wedgeleaf Ceanothus (*C. cuneatus*), and on serpentine, Leather Oak (*Quercus durata*) may be associated with the Whiteleaf Manzanita type. Trees such as Canyon Live Oak (*Q. chrysolepis*) or Knobcone Pine (*Pinus attenuata*) may also occur sparsely in the overstory of these open sites.

Wedgeleaf Ceanothus Alliance (CL)

Wedgeleaf Ceanothus (*Ceanothus cuneatus*) is widely distributed throughout California on low elevation chaparral sites and is usually a major component of the Northern Mixed Chaparral type. It becomes locally dominant in widespread areas of the Klamath Mountains Section (Siskiyou and Lower Salmon Mountains, Scott Bar Mountain, Duzel Rock and Forks of Salmon Subsections) below an elevation of about 3000 ft (915 m). These are often disturbed or burned areas. This type grades into the Northern Mixed Chaparral Alliance as well as into Gray Pine and Douglas-Fir woodlands and forests. Shrub Interior Live Oak

(*Quercus wislizenii* var. *frutescens*) and California Bay (*Umbellularia californica*) may be minor associates of the Wedgeleaf Ceanothus Alliance.

Herbaceous

Herbaceous alliances comprise approximately 78,458.14 acres or approximately 13% of the total vegetation of the CCWA. Within the watershed, herbaceous vegetation alliances are found primarily in the low-lying central and eastern areas.

Annual Grass - Forb Alliance (HG)

Small areas of dry grasslands are found scattered at moderately low elevations in the western Klamath Mountains, especially on privately owned lands and in the western Trinity Alps area. In the Northern California Coast Ranges, Northern California Interior Coast Ranges and Northern California Coast Sections, these areas become more extensive on private lands scattered throughout the area and intermix with agriculturally managed sites. Species include introduced and native annual grasses such as Brome (*Bromus* spp.), Bluegrass (*Poa* spp.), Wildoats (*Avena* spp.), Fescue (*Vulpia* spp.), Dogtail (*Cynosurus* spp.), Barley (*Hordeum murinum*), Needlegrass (*Nassella* spp.), Oatgrass (*Danthonia* spp.), and a variety of forbs such as Checker Mallow (*Sidalcea* spp.), Brodiaea (*Brodiaea* spp.), Wild Hyacinth (*Dichelostemma* spp.), Yampah (*Perideridia* spp.) and Mariposa Lily (*Calochortus* spp.). Oregon White Oak (*Quercus garryana*) stands are often found adjacent to some upland annual grasslands.

Wet Meadows (Grass - Sedge - Rush) Alliance (HJ)

Perennially or seasonally wet meadows and grasslands occur on level or gently sloping areas adjacent to perennial streams, seeps, springs and near lakes. They have been identified in the Siskiyou, North Trinity, Snow, and Yolla Bolly Mountains, in Plaskett Meadows and in the Eel River and Letts Creek watersheds, among other areas of the North Coast and Montane Ecological Province. These are usually small sites that are occupied by obligate hydrophytes such as Sedges (*Carex* spp.), Rushes (*Juncus* spp.), Bulrushes (*Scirpus* spp.) as well as perennial grasses such as Bluegrass (*Poa* spp.), Brome (*Bromus* spp.), Fescue (*Festuca* spp.), Oniongrass (*Melica* spp.), and Reedgrass (*Calamagrostis* spp.) These moist sites encourage the development of a rich herbaceous layer that includes such species as Lily (*Lilium* spp.), False Hellebore (*Veratrum* spp.), Shooting Star (*Dodecatheon* spp.), Gentian (*Gentiana* spp.) and Lousewort (*Pedicularis* spp.). Meadow edges often abruptly terminate in upper montane coniferous forest species such as Lodgepole Pine (*Pinus contorta* var. *murrayana*) and Jeffrey Pine (*P. jeffreyi*).

Tule - Cattail Alliance (HT)

Interior marsh sites of northern California that have little brackish influence and are not alkaline are usually dominated by Tule (*Scirpus acutus*) or other Bulrushes (*Scirpus* spp.) and Cattails (*Typha latifolia*, *T. domingensis*, *T. angustifolia*). These have recently been identified in small areas of the Central Franciscan and Coastal Hills - Santa Rosa Plain Subsections of the Northern California Coast Section, and in the Clear Lake Hills and Valleys and Konocti Flows Subsections of the Northern California Coast Ranges Section. These areas are permanently flooded, usually accumulate deep, peaty soils and may occur near river

mouths near the coast and around the margins of lakes and springs further inland. This type may also be adjacent to more saline marshes and may share species of that type, but usually includes more fresh water species such as Umbrella flatsedge (*Cyperus eragrostis*) and Sedges such as *Carex athrostachya*.

Land Use And Non-Vegetated Classes

Vegetation classified as 'Agriculture' in the CALVEG system is found in the eastern region of the CCWA, specifically along Cottonwood Creek, the North Fork of the Cottonwood Creek, and in the Happy Valley area. Agricultural vegetation consist of approximately 6456.37 acres or approximately 1.07% of the total area of the CCWA.

Areas mapped as 'Barren' are located on South Yolla Bolly Mountain, south of Dry Creek in the northeast portion of the CCWA, and include dredge tailings found along Dry Creek, Antelope Creek, Cottonwood Creek, and the South Fork of the Cottonwood Creek in the northeastern and eastern portion of the CCWA. Barren areas comprise approximately 2328.84 acres or approximately .39% of the total area of the CCWA.

Areas mapped as 'Urban' include lands near Wild Horse Mesa, the Foss Ranch and the town of Cottonwood. Urban areas constitute approximately 577.8 acres or approximately .10% of the total area of the CCWA.

Water bodies mapped as 'Water' are scattered throughout the CCWA but are generally located in the central and eastern areas of the watershed. They comprise approximately 502.51 acres or approximately .08% of the total area of the CCWA.

Agriculture (AG)

Agricultural land is used primarily for the production of food and fiber. High-altitude imagery indicates agricultural activity by distinctive geometric field and road patterns on the landscape and traces produced by mechanized equipment. Agricultural land uses include forest landscapes such as orchards as well as non-forested land uses such as vineyards and field crops. Land used exclusively for livestock pasture may, however, be mapped as Annual Grassland in those cases in which land uses are not recognizable.

Barren (BA)

Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography, are labeled as Barren. This category includes mappable landscape units in which surface lithology is dominant, such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It does not include areas considered as modified or developed, as in urban areas.

Urban Or Developed (UB)

This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, cemeteries and the like. In those cases in which the managed landscapes may have a considerable vegetation component, other land use categories may be more appropriate, such as Ornamental Conifer and Hardwood mixtures within city parks.

Water (WA)

Water is labeled in CalVeg mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams and canals of various size, bays and estuaries and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows, Tule-Cattail freshwater marshes, or Pickleweed-Cordgrass saline or mixed marshes. Islands within water bodies may be mapped according to their terrestrial dominant vegetation types.

Reference: USDA Forest Service, *USDA Forest Service Vegetation Data, CalVeg Geobook*, 12/19/00.

APPENDIX H

SEDIMENT DATA (USGS)

Cottonwood Creek Near Cottonwood

Sediment Discharge

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	01-Oct-62	109	ND	4.1
11376000	1963	02-Oct-62	102	ND	3.6
11376000	1963	03-Oct-62	100	ND	3.2
11376000	1963	04-Oct-62	105	ND	3.1
11376000	1963	05-Oct-62	93	ND	2.8
11376000	1963	06-Oct-62	74	ND	2
11376000	1963	07-Oct-62	72	ND	1.9
11376000	1963	08-Oct-62	92	ND	2.2
11376000	1963	09-Oct-62	94	9	2.3
11376000	1963	10-Oct-62	191	150	140
11376000	1963	11-Oct-62	311	ND	180
11376000	1963	12-Oct-62	2500	580	3920
11376000	1963	13-Oct-62	3500	ND	2100
11376000	1963	14-Oct-62	1470	ND	520
11376000	1963	15-Oct-62	1060	ND	260
11376000	1963	16-Oct-62	743	70	140
11376000	1963	17-Oct-62	550	ND	76
11376000	1963	18-Oct-62	445	ND	42
11376000	1963	19-Oct-62	385	ND	26
11376000	1963	20-Oct-62	350	ND	19
11376000	1963	21-Oct-62	326	ND	14
11376000	1963	22-Oct-62	298	ND	11
11376000	1963	23-Oct-62	244	ND	7.9
11376000	1963	24-Oct-62	196	ND	5.3
11376000	1963	25-Oct-62	182	8	3.9
11376000	1963	26-Oct-62	175	ND	2.8
11376000	1963	27-Oct-62	165	ND	1.8
11376000	1963	28-Oct-62	159	4	1.7
11376000	1963	29-Oct-62	153	ND	1.2
11376000	1963	30-Oct-62	143	3	1.2
11376000	1963	31-Oct-62	135	ND	1.1
11376000	1963	01-Nov-62	129	3	1
11376000	1963	02-Nov-62	127	ND	1
11376000	1963	03-Nov-62	125	3	1
11376000	1963	04-Nov-62	121	ND	1
11376000	1963	05-Nov-62	121	ND	1.3
11376000	1963	06-Nov-62	113	4	1.2
11376000	1963	07-Nov-62	111	ND	1.2
11376000	1963	08-Nov-62	107	3	0.9
11376000	1963	09-Nov-62	107	ND	0.6
11376000	1963	10-Nov-62	107	2	0.6
11376000	1963	11-Nov-62	111	ND	0.6
11376000	1963	12-Nov-62	115	ND	0.6
11376000	1963	13-Nov-62	121	3	1
11376000	1963	14-Nov-62	119	ND	0.6

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	15-Nov-62	113	2	0.6
11376000	1963	16-Nov-62	107	ND	0.6
11376000	1963	17-Nov-62	105	ND	0.9
11376000	1963	18-Nov-62	105	3	0.9
11376000	1963	19-Nov-62	105	ND	0.9
11376000	1963	20-Nov-62	109	ND	0.9
11376000	1963	21-Nov-62	107	ND	0.6
11376000	1963	22-Nov-62	107	2	0.6
11376000	1963	23-Nov-62	105	ND	0.6
11376000	1963	24-Nov-62	104	ND	0.8
11376000	1963	25-Nov-62	105	3	0.9
11376000	1963	26-Nov-62	490	110	390
11376000	1963	27-Nov-62	1570	384	1830
11376000	1963	28-Nov-62	716	ND	190
11376000	1963	29-Nov-62	483	28	37
11376000	1963	30-Nov-62	357	ND	12
11376000	1963	01-Dec-62	308	6	5
11376000	1963	02-Dec-62	371	ND	14
11376000	1963	03-Dec-62	3110	628	5830
11376000	1963	04-Dec-62	1430	230	960
11376000	1963	05-Dec-62	946	56	143
11376000	1963	06-Dec-62	721	ND	55
11376000	1963	07-Dec-62	555	15	22
11376000	1963	08-Dec-62	470	ND	13
11376000	1963	09-Dec-62	417	8	9
11376000	1963	10-Dec-62	378	ND	6.1
11376000	1963	11-Dec-62	350	5	4.7
11376000	1963	12-Dec-62	326	ND	4.4
11376000	1963	13-Dec-62	329	10	8.9
11376000	1963	14-Dec-62	371	ND	14
11376000	1963	15-Dec-62	898	161	698
11376000	1963	16-Dec-62	1800	ND	1700
11376000	1963	17-Dec-62	1900	330	1740
11376000	1963	18-Dec-62	1170	ND	470
11376000	1963	19-Dec-62	916	68	168
11376000	1963	20-Dec-62	760	17	35
11376000	1963	21-Dec-62	595	12	19
11376000	1963	22-Dec-62	519	11	15
11376000	1963	23-Dec-62	470	7	8.9
11376000	1963	24-Dec-62	421	7	8
11376000	1963	25-Dec-62	417	5	5.6
11376000	1963	26-Dec-62	371	4	4
11376000	1963	27-Dec-62	343	3	2.8
11376000	1963	28-Dec-62	326	3	2.6
11376000	1963	29-Dec-62	308	2	1.7

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	30-Dec-62	301	ND	1.6
11376000	1963	31-Dec-62	290	3	2.3
11376000	1963	01-Jan-63	280	2	1.5
11376000	1963	02-Jan-63	274	2	1.5
11376000	1963	03-Jan-63	268	2	1.4
11376000	1963	04-Jan-63	256	4	2.8
11376000	1963	05-Jan-63	250	2	1.4
11376000	1963	06-Jan-63	241	2	1.3
11376000	1963	07-Jan-63	232	2	1.3
11376000	1963	08-Jan-63	226	2	1.2
11376000	1963	09-Jan-63	223	2	1.2
11376000	1963	10-Jan-63	217	2	1.2
11376000	1963	11-Jan-63	208	2	1.1
11376000	1963	12-Jan-63	188	5	2.5
11376000	1963	13-Jan-63	172	4	1.9
11376000	1963	14-Jan-63	180	2	1
11376000	1963	15-Jan-63	208	4	2.2
11376000	1963	16-Jan-63	205	2	1.1
11376000	1963	17-Jan-63	193	1	0.5
11376000	1963	18-Jan-63	190	1	0.5
11376000	1963	19-Jan-63	182	1	0.5
11376000	1963	20-Jan-63	178	2	1
11376000	1963	21-Jan-63	178	1	0.5
11376000	1963	22-Jan-63	180	1	0.5
11376000	1963	23-Jan-63	178	2	1
11376000	1963	24-Jan-63	178	8	3.8
11376000	1963	25-Jan-63	172	ND	4.2
11376000	1963	26-Jan-63	172	5	2.3
11376000	1963	27-Jan-63	170	2	0.9
11376000	1963	28-Jan-63	170	2	0.9
11376000	1963	29-Jan-63	180	3	1.5
11376000	1963	30-Jan-63	625	163	549
11376000	1963	31-Jan-63	10100	1870	89200
11376000	1963	01-Feb-63	12600	2180	77800
11376000	1963	02-Feb-63	5340	1800	26000
11376000	1963	03-Feb-63	4070	ND	15000
11376000	1963	04-Feb-63	2990	500	4040
11376000	1963	05-Feb-63	2410	323	2100
11376000	1963	06-Feb-63	1960	209	1110
11376000	1963	07-Feb-63	1700	178	817
11376000	1963	08-Feb-63	1520	187	767
11376000	1963	09-Feb-63	2060	378	3750
11376000	1963	10-Feb-63	7730	2840	62100
11376000	1963	11-Feb-63	4430	872	11000
11376000	1963	12-Feb-63	3750	642	8010

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	13-Feb-63	4860	802	11000
11376000	1963	14-Feb-63	3270	415	3660
11376000	1963	15-Feb-63	2550	ND	2300
11376000	1963	16-Feb-63	2160	320	1870
11376000	1963	17-Feb-63	2170	295	1730
11376000	1963	18-Feb-63	1610	ND	610
11376000	1963	19-Feb-63	1330	ND	220
11376000	1963	20-Feb-63	1150	50	155
11376000	1963	21-Feb-63	994	ND	110
11376000	1963	22-Feb-63	868	ND	91
11376000	1963	23-Feb-63	800	29	63
11376000	1963	24-Feb-63	740	20	40
11376000	1963	25-Feb-63	690	18	34
11376000	1963	26-Feb-63	650	20	35
11376000	1963	27-Feb-63	620	14	23
11376000	1963	28-Feb-63	590	14	22
11376000	1963	01-Mar-63	570	11	17
11376000	1963	02-Mar-63	546	10	15
11376000	1963	03-Mar-63	528	8	11
11376000	1963	04-Mar-63	510	7	9.6
11376000	1963	05-Mar-63	492	6	8
11376000	1963	06-Mar-63	483	6	7.8
11376000	1963	07-Mar-63	474	5	6.4
11376000	1963	08-Mar-63	461	5	6.2
11376000	1963	09-Mar-63	465	4	5
11376000	1963	10-Mar-63	445	3	3.6
11376000	1963	11-Mar-63	425	4	4.6
11376000	1963	12-Mar-63	413	2	2.2
11376000	1963	13-Mar-63	405	4	4.4
11376000	1963	14-Mar-63	405	3	3.3
11376000	1963	15-Mar-63	405	ND	3.3
11376000	1963	16-Mar-63	445	ND	11
11376000	1963	17-Mar-63	474	12	15
11376000	1963	18-Mar-63	421	ND	6.8
11376000	1963	19-Mar-63	405	ND	4.4
11376000	1963	20-Mar-63	405	ND	3.3
11376000	1963	21-Mar-63	405	2	2.2
11376000	1963	22-Mar-63	405	ND	4.4
11376000	1963	23-Mar-63	567	86	141
11376000	1963	24-Mar-63	625	70	123
11376000	1963	25-Mar-63	492	23	31
11376000	1963	26-Mar-63	449	9	11
11376000	1963	27-Mar-63	4070	226	5510
11376000	1963	28-Mar-63	6310	394	7430
11376000	1963	29-Mar-63	3340	190	1710

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	30-Mar-63	2750	140	1040
11376000	1963	31-Mar-63	2520	116	789
11376000	1963	01-Apr-63	2100	81	459
11376000	1963	02-Apr-63	1660	55	247
11376000	1963	03-Apr-63	1520	59	242
11376000	1963	04-Apr-63	1360	40	147
11376000	1963	05-Apr-63	2050	442	4470
11376000	1963	06-Apr-63	5280	1340	19100
11376000	1963	07-Apr-63	4640	975	12200
11376000	1963	08-Apr-63	3910	318	3360
11376000	1963	09-Apr-63	4300	522	6670
11376000	1963	10-Apr-63	3810	210	2160
11376000	1963	11-Apr-63	3190	135	1160
11376000	1963	12-Apr-63	2710	90	659
11376000	1963	13-Apr-63	3230	200	1740
11376000	1963	14-Apr-63	8370	1830	46300
11376000	1963	15-Apr-63	6570	474	8670
11376000	1963	16-Apr-63	4900	258	3410
11376000	1963	17-Apr-63	4050	ND	2100
11376000	1963	18-Apr-63	3450	156	1450
11376000	1963	19-Apr-63	3770	318	3400
11376000	1963	20-Apr-63	2940	95	754
11376000	1963	21-Apr-63	2580	65	453
11376000	1963	22-Apr-63	2680	96	695
11376000	1963	23-Apr-63	2100	52	295
11376000	1963	24-Apr-63	1880	46	233
11376000	1963	25-Apr-63	1900	89	457
11376000	1963	26-Apr-63	2340	163	1030
11376000	1963	27-Apr-63	1680	47	213
11376000	1963	28-Apr-63	1520	42	172
11376000	1963	29-Apr-63	1480	38	152
11376000	1963	30-Apr-63	1470	34	135
11376000	1963	01-May-63	1390	33	124
11376000	1963	02-May-63	1310	28	99
11376000	1963	03-May-63	1320	30	107
11376000	1963	04-May-63	1220	24	79
11376000	1963	05-May-63	1170	27	85
11376000	1963	06-May-63	1200	ND	100
11376000	1963	07-May-63	1270	42	144
11376000	1963	08-May-63	1300	ND	160
11376000	1963	09-May-63	1300	62	218
11376000	1963	10-May-63	1250	ND	180
11376000	1963	11-May-63	1270	38	130
11376000	1963	12-May-63	1150	ND	87
11376000	1963	13-May-63	1020	ND	69

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	14-May-63	968	22	57
11376000	1963	15-May-63	940	ND	61
11376000	1963	16-May-63	900	27	66
11376000	1963	17-May-63	890	ND	58
11376000	1963	18-May-63	890	20	48
11376000	1963	19-May-63	880	ND	50
11376000	1963	20-May-63	880	25	59
11376000	1963	21-May-63	890	ND	72
11376000	1963	22-May-63	895	24	58
11376000	1963	23-May-63	846	ND	43
11376000	1963	24-May-63	812	18	39
11376000	1963	25-May-63	758	ND	35
11376000	1963	26-May-63	710	17	33
11376000	1963	27-May-63	680	ND	31
11376000	1963	28-May-63	640	16	28
11376000	1963	29-May-63	625	ND	25
11376000	1963	30-May-63	640	15	26
11376000	1963	31-May-63	605	ND	28
11376000	1963	01-Jun-63	555	19	28
11376000	1963	02-Jun-63	526	ND	23
11376000	1963	03-Jun-63	498	14	19
11376000	1963	04-Jun-63	472	ND	15
11376000	1963	05-Jun-63	449	11	13
11376000	1963	06-Jun-63	424	ND	13
11376000	1963	07-Jun-63	404	11	12
11376000	1963	08-Jun-63	380	ND	10
11376000	1963	09-Jun-63	350	9	8.5
11376000	1963	10-Jun-63	328	ND	6.2
11376000	1963	11-Jun-63	308	6	5
11376000	1963	12-Jun-63	293	ND	5.5
11376000	1963	13-Jun-63	284	8	6.1
11376000	1963	14-Jun-63	269	ND	7.3
11376000	1963	15-Jun-63	266	12	8.6
11376000	1963	16-Jun-63	272	ND	8.8
11376000	1963	17-Jun-63	272	ND	7.3
11376000	1963	18-Jun-63	269	9	6.5
11376000	1963	19-Jun-63	260	ND	5.6
11376000	1963	20-Jun-63	252	8	5.4
11376000	1963	21-Jun-63	233	ND	4.4
11376000	1963	22-Jun-63	230	6	3.7
11376000	1963	23-Jun-63	235	ND	3.2
11376000	1963	24-Jun-63	228	ND	3.1
11376000	1963	25-Jun-63	217	5	2.9
11376000	1963	26-Jun-63	208	ND	2.8
11376000	1963	27-Jun-63	208	6	3.4

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	28-Jun-63	212	ND	2.9
11376000	1963	29-Jun-63	206	3	1.7
11376000	1963	30-Jun-63	208	ND	2.2
11376000	1963	01-Jul-63	206	ND	2.2
11376000	1963	02-Jul-63	197	5	2.7
11376000	1963	03-Jul-63	191	ND	2.6
11376000	1963	04-Jul-63	185	6	3
11376000	1963	05-Jul-63	182	ND	3.4
11376000	1963	06-Jul-63	182	8	3.9
11376000	1963	07-Jul-63	182	ND	3.9
11376000	1963	08-Jul-63	189	ND	4.1
11376000	1963	09-Jul-63	189	ND	4.1
11376000	1963	10-Jul-63	180	ND	3.4
11376000	1963	11-Jul-63	172	ND	3.3
11376000	1963	12-Jul-63	167	ND	3.2
11376000	1963	13-Jul-63	162	ND	3.1
11376000	1963	14-Jul-63	152	ND	2.9
11376000	1963	15-Jul-63	150	ND	2.8
11376000	1963	16-Jul-63	142	ND	2.7
11376000	1963	17-Jul-63	136	ND	2.9
11376000	1963	18-Jul-63	130	ND	2.8
11376000	1963	19-Jul-63	130	ND	2.8
11376000	1963	20-Jul-63	130	ND	2.8
11376000	1963	21-Jul-63	125	ND	2.7
11376000	1963	22-Jul-63	125	ND	2.7
11376000	1963	23-Jul-63	120	ND	2.6
11376000	1963	24-Jul-63	115	ND	2.5
11376000	1963	25-Jul-63	110	10	3
11376000	1963	26-Jul-63	110	ND	3
11376000	1963	27-Jul-63	106	9	2.6
11376000	1963	28-Jul-63	101	ND	2.5
11376000	1963	29-Jul-63	104	10	2.8
11376000	1963	30-Jul-63	92	ND	2.5
11376000	1963	31-Jul-63	87	8	1.9
11376000	1963	01-Aug-63	92	6	1.5
11376000	1963	02-Aug-63	94	ND	2
11376000	1963	03-Aug-63	90	10	2.4
11376000	1963	04-Aug-63	92	ND	3
11376000	1963	05-Aug-63	94	13	3.3
11376000	1963	06-Aug-63	94	ND	3
11376000	1963	07-Aug-63	87	10	2.3
11376000	1963	08-Aug-63	79	ND	1.9
11376000	1963	09-Aug-63	79	9	1.9
11376000	1963	10-Aug-63	82	ND	2.2
11376000	1963	11-Aug-63	97	11	2.9

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	12-Aug-63	92	ND	2.5
11376000	1963	13-Aug-63	87	9	2.1
11376000	1963	14-Aug-63	87	ND	1.9
11376000	1963	15-Aug-63	90	6	1.5
11376000	1963	16-Aug-63	82	ND	1.3
11376000	1963	17-Aug-63	77	ND	1
11376000	1963	18-Aug-63	77	ND	0.8
11376000	1963	19-Aug-63	71	4	0.8
11376000	1963	20-Aug-63	66	ND	0.9
11376000	1963	21-Aug-63	66	9	1.6
11376000	1963	22-Aug-63	68	ND	1.8
11376000	1963	23-Aug-63	71	11	2.1
11376000	1963	24-Aug-63	77	ND	2.1
11376000	1963	25-Aug-63	77	9	1.9
11376000	1963	26-Aug-63	77	ND	2.1
11376000	1963	27-Aug-63	84	11	2.5
11376000	1963	28-Aug-63	80	ND	2.2
11376000	1963	29-Aug-63	77	8	1.7
11376000	1963	30-Aug-63	70	ND	1.1
11376000	1963	31-Aug-63	71	6	1.2
11376000	1963	01-Sep-63	74	ND	1.4
11376000	1963	02-Sep-63	79	ND	1.9
11376000	1963	03-Sep-63	77	11	2.3
11376000	1963	04-Sep-63	74	5	1
11376000	1963	05-Sep-63	74	10	2
11376000	1963	06-Sep-63	80	ND	2.6
11376000	1963	07-Sep-63	85	15	3.4
11376000	1963	08-Sep-63	80	ND	2.6
11376000	1963	09-Sep-63	79	7	1.5
11376000	1963	10-Sep-63	71	ND	1.3
11376000	1963	11-Sep-63	70	ND	1.7
11376000	1963	12-Sep-63	71	ND	2.1
11376000	1963	13-Sep-63	84	12	2.7
11376000	1963	14-Sep-63	84	ND	2.7
11376000	1963	15-Sep-63	76	11	2.3
11376000	1963	16-Sep-63	79	ND	2.1
11376000	1963	17-Sep-63	85	ND	2.1
11376000	1963	18-Sep-63	85	ND	1.8
11376000	1963	19-Sep-63	87	8	1.9
11376000	1963	20-Sep-63	84	ND	2.7
11376000	1963	21-Sep-63	79	18	3.8
11376000	1963	22-Sep-63	79	ND	3.8
11376000	1963	23-Sep-63	82	13	2.9
11376000	1963	24-Sep-63	87	ND	2.1
11376000	1963	25-Sep-63	88	8	1.9

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1963	26-Sep-63	87	ND	1.9
11376000	1963	27-Sep-63	87	ND	1.9
11376000	1963	28-Sep-63	79	ND	1.7
11376000	1963	29-Sep-63	71	ND	1.5
11376000	1963	30-Sep-63	67	ND	1.4
11376000	1964	01-Oct-63	64	ND	1.6
11376000	1964	02-Oct-63	65	ND	2.5
11376000	1964	03-Oct-63	68	20	3.7
11376000	1964	04-Oct-63	66	ND	4.1
11376000	1964	05-Oct-63	70	24	4.5
11376000	1964	06-Oct-63	72	ND	4.5
11376000	1964	07-Oct-63	74	ND	4.4
11376000	1964	08-Oct-63	78	22	4.6
11376000	1964	09-Oct-63	80	ND	4.8
11376000	1964	10-Oct-63	120	21	6.8
11376000	1964	11-Oct-63	180	ND	7.3
11376000	1964	12-Oct-63	270	6	4.4
11376000	1964	13-Oct-63	180	ND	2.4
11376000	1964	14-Oct-63	110	ND	1.2
11376000	1964	15-Oct-63	103	5	1.4
11376000	1964	16-Oct-63	130	ND	3.9
11376000	1964	17-Oct-63	147	12	4.8
11376000	1964	18-Oct-63	127	ND	2.7
11376000	1964	19-Oct-63	130	6	2.1
11376000	1964	20-Oct-63	127	ND	2.7
11376000	1964	21-Oct-63	123	ND	3.7
11376000	1964	22-Oct-63	119	13	4.2
11376000	1964	23-Oct-63	127	ND	4.8
11376000	1964	24-Oct-63	123	15	5
11376000	1964	25-Oct-63	132	ND	3.9
11376000	1964	26-Oct-63	123	6	2
11376000	1964	27-Oct-63	117	ND	1.6
11376000	1964	28-Oct-63	113	ND	1.8
11376000	1964	29-Oct-63	109	8	2.4
11376000	1964	30-Oct-63	109	ND	1.8
11376000	1964	31-Oct-63	111	4	1.2
11376000	1964	01-Nov-63	107	ND	0.9
11376000	1964	02-Nov-63	107	ND	0.9
11376000	1964	03-Nov-63	111	ND	1.5
11376000	1964	04-Nov-63	199	30	20
11376000	1964	05-Nov-63	292	62	49
11376000	1964	06-Nov-63	279	ND	37
11376000	1964	07-Nov-63	364	46	45
11376000	1964	08-Nov-63	289	ND	28
11376000	1964	09-Nov-63	334	ND	35

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	10-Nov-63	386	ND	35
11376000	1964	11-Nov-63	292	ND	14
11376000	1964	12-Nov-63	247	7	4.7
11376000	1964	13-Nov-63	230	ND	2.5
11376000	1964	14-Nov-63	768	629	1820
11376000	1964	15-Nov-63	1380	660	2700
11376000	1964	16-Nov-63	715	ND	310
11376000	1964	17-Nov-63	530	ND	110
11376000	1964	18-Nov-63	462	ND	37
11376000	1964	19-Nov-63	590	116	344
11376000	1964	20-Nov-63	1010	360	1100
11376000	1964	21-Nov-63	602	50	81
11376000	1964	22-Nov-63	494	ND	33
11376000	1964	23-Nov-63	1430	350	2200
11376000	1964	24-Nov-63	1950	380	2200
11376000	1964	25-Nov-63	1060	ND	370
11376000	1964	26-Nov-63	854	34	78
11376000	1964	27-Nov-63	802	ND	43
11376000	1964	28-Nov-63	695	16	30
11376000	1964	29-Nov-63	602	ND	23
11376000	1964	30-Nov-63	534	14	20
11376000	1964	01-Dec-63	486	ND	22
11376000	1964	02-Dec-63	446	22	26
11376000	1964	03-Dec-63	406	ND	26
11376000	1964	04-Dec-63	378	23	23
11376000	1964	05-Dec-63	361	ND	20
11376000	1964	06-Dec-63	327	20	18
11376000	1964	07-Dec-63	311	ND	12
11376000	1964	08-Dec-63	298	8	6.4
11376000	1964	09-Dec-63	298	ND	7.2
11376000	1964	10-Dec-63	289	ND	7.8
11376000	1964	11-Dec-63	270	ND	8
11376000	1964	12-Dec-63	259	ND	9.1
11376000	1964	13-Dec-63	253	14	9.6
11376000	1964	14-Dec-63	247	12	8
11376000	1964	15-Dec-63	241	ND	6.5
11376000	1964	16-Dec-63	232	ND	6.3
11376000	1964	17-Dec-63	227	ND	6.1
11376000	1964	18-Dec-63	215	ND	5.8
11376000	1964	19-Dec-63	215	ND	6.4
11376000	1964	20-Dec-63	244	12	7.9
11376000	1964	21-Dec-63	259	ND	9.8
11376000	1964	22-Dec-63	244	13	8.6
11376000	1964	23-Dec-63	230	ND	7.5
11376000	1964	24-Dec-63	224	ND	6.7

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	25-Dec-63	215	ND	6.4
11376000	1964	26-Dec-63	213	ND	5.8
11376000	1964	27-Dec-63	213	ND	3.5
11376000	1964	28-Dec-63	227	5	3.1
11376000	1964	29-Dec-63	241	ND	3.9
11376000	1964	30-Dec-63	247	7	4.7
11376000	1964	31-Dec-63	238	ND	4.5
11376000	1964	01-Jan-64	230	ND	3.7
11376000	1964	02-Jan-64	227	ND	3.7
11376000	1964	03-Jan-64	224	6	3.6
11376000	1964	04-Jan-64	215	ND	3.5
11376000	1964	05-Jan-64	208	5	2.8
11376000	1964	06-Jan-64	205	ND	2.2
11376000	1964	07-Jan-64	205	4	2.2
11376000	1964	08-Jan-64	210	ND	2.3
11376000	1964	09-Jan-64	205	3	1.7
11376000	1964	10-Jan-64	202	ND	1.1
11376000	1964	11-Jan-64	200	1	0.5
11376000	1964	12-Jan-64	197	ND	0.5
11376000	1964	13-Jan-64	192	1	0.5
11376000	1964	14-Jan-64	192	ND	1
11376000	1964	15-Jan-64	190	2	1
11376000	1964	16-Jan-64	182	1	0.5
11376000	1964	17-Jan-64	192	3	1.6
11376000	1964	18-Jan-64	273	ND	9.6
11376000	1964	19-Jan-64	327	ND	19
11376000	1964	20-Jan-64	4340	1050	24900
11376000	1964	21-Jan-64	4760	558	8890
11376000	1964	22-Jan-64	1970	150	798
11376000	1964	23-Jan-64	1230	50	166
11376000	1964	24-Jan-64	968	31	81
11376000	1964	25-Jan-64	890	23	55
11376000	1964	26-Jan-64	836	11	25
11376000	1964	27-Jan-64	770	13	27
11376000	1964	28-Jan-64	748	11	22
11376000	1964	29-Jan-64	720	ND	16
11376000	1964	30-Jan-64	720	9	17
11376000	1964	31-Jan-64	700	10	19
11376000	1964	01-Feb-64	710	9	17
11376000	1964	02-Feb-64	764	15	31
11376000	1964	03-Feb-64	720	10	19
11376000	1964	04-Feb-64	675	9	16
11376000	1964	05-Feb-64	645	7	12
11376000	1964	06-Feb-64	630	9	15
11376000	1964	07-Feb-64	598	11	18

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	08-Feb-64	557	6	9
11376000	1964	09-Feb-64	530	4	5.7
11376000	1964	10-Feb-64	510	5	6.9
11376000	1964	11-Feb-64	490	5	6.6
11376000	1964	12-Feb-64	474	5	6.4
11376000	1964	13-Feb-64	450	4	4.9
11376000	1964	14-Feb-64	426	4	4.6
11376000	1964	15-Feb-64	414	5	5.6
11376000	1964	16-Feb-64	400	7	7.6
11376000	1964	17-Feb-64	386	3	3.1
11376000	1964	18-Feb-64	368	4	4
11376000	1964	19-Feb-64	358	3	2.9
11376000	1964	20-Feb-64	344	3	2.8
11376000	1964	21-Feb-64	330	5	4.5
11376000	1964	22-Feb-64	327	3	2.6
11376000	1964	23-Feb-64	314	2	1.7
11376000	1964	24-Feb-64	305	2	1.6
11376000	1964	25-Feb-64	298	3	2.4
11376000	1964	26-Feb-64	282	2	1.5
11376000	1964	27-Feb-64	267	2	1.4
11376000	1964	28-Feb-64	270	2	1.5
11376000	1964	29-Feb-64	270	2	1.5
11376000	1964	01-Mar-64	279	3	2.3
11376000	1964	02-Mar-64	305	2	1.6
11376000	1964	03-Mar-64	282	2	1.5
11376000	1964	04-Mar-64	262	2	1.4
11376000	1964	05-Mar-64	256	2	1.4
11376000	1964	06-Mar-64	253	2	1.4
11376000	1964	07-Mar-64	256	2	1.4
11376000	1964	08-Mar-64	244	2	1.3
11376000	1964	09-Mar-64	238	2	1.3
11376000	1964	10-Mar-64	232	3	1.9
11376000	1964	11-Mar-64	235	3	1.9
11376000	1964	12-Mar-64	321	7	6.1
11376000	1964	13-Mar-64	282	7	5.3
11376000	1964	14-Mar-64	256	3	2.1
11376000	1964	15-Mar-64	244	4	2.6
11376000	1964	16-Mar-64	244	6	4
11376000	1964	17-Mar-64	227	2	1.2
11376000	1964	18-Mar-64	213	4	2.3
11376000	1964	19-Mar-64	215	6	3.5
11376000	1964	20-Mar-64	215	4	2.3
11376000	1964	21-Mar-64	213	2	1.2
11376000	1964	22-Mar-64	230	2	1.2
11376000	1964	23-Mar-64	270	4	2.9

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	24-Mar-64	250	2	1.4
11376000	1964	25-Mar-64	227	2	1.2
11376000	1964	26-Mar-64	213	4	2.3
11376000	1964	27-Mar-64	208	4	2.2
11376000	1964	28-Mar-64	205	5	2.8
11376000	1964	29-Mar-64	208	4	2.2
11376000	1964	30-Mar-64	221	ND	2.4
11376000	1964	31-Mar-64	238	6	3.9
11376000	1964	01-Apr-64	308	ND	5.8
11376000	1964	02-Apr-64	305	7	5.8
11376000	1964	03-Apr-64	264	ND	4.3
11376000	1964	04-Apr-64	247	ND	3.3
11376000	1964	05-Apr-64	232	4	2.5
11376000	1964	06-Apr-64	224	ND	1.8
11376000	1964	07-Apr-64	213	3	1.7
11376000	1964	08-Apr-64	208	ND	2.2
11376000	1964	09-Apr-64	221	5	3
11376000	1964	10-Apr-64	230	ND	4.3
11376000	1964	11-Apr-64	230	ND	5.6
11376000	1964	12-Apr-64	224	10	6
11376000	1964	13-Apr-64	221	ND	4.2
11376000	1964	14-Apr-64	215	4	2.3
11376000	1964	15-Apr-64	218	ND	2.9
11376000	1964	16-Apr-64	238	6	3.9
11376000	1964	17-Apr-64	253	ND	3.4
11376000	1964	18-Apr-64	247	ND	2.7
11376000	1964	19-Apr-64	221	3	1.8
11376000	1964	20-Apr-64	218	ND	1.8
11376000	1964	21-Apr-64	215	4	2.3
11376000	1964	22-Apr-64	215	ND	3.5
11376000	1964	23-Apr-64	213	8	4.6
11376000	1964	24-Apr-64	213	ND	3.5
11376000	1964	25-Apr-64	215	ND	2.9
11376000	1964	26-Apr-64	210	5	2.8
11376000	1964	27-Apr-64	213	ND	2.3
11376000	1964	28-Apr-64	202	4	2.2
11376000	1964	29-Apr-64	205	ND	2.8
11376000	1964	30-Apr-64	218	5	2.9
11376000	1964	01-May-64	205	ND	2.2
11376000	1964	02-May-64	202	3	1.6
11376000	1964	03-May-64	230	4	2.5
11376000	1964	04-May-64	256	ND	3.5
11376000	1964	05-May-64	264	5	3.6
11376000	1964	06-May-64	250	ND	2.7
11376000	1964	07-May-64	215	2	1.2

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	08-May-64	213	ND	1.7
11376000	1964	09-May-64	221	ND	3
11376000	1964	10-May-64	210	7	4
11376000	1964	11-May-64	185	ND	3
11376000	1964	12-May-64	182	4	2
11376000	1964	13-May-64	180	ND	1.9
11376000	1964	14-May-64	178	5	2.4
11376000	1964	15-May-64	180	ND	1.9
11376000	1964	16-May-64	170	ND	1.4
11376000	1964	17-May-64	178	3	1.4
11376000	1964	18-May-64	187	ND	1.5
11376000	1964	19-May-64	180	3	1.5
11376000	1964	20-May-64	168	ND	1.4
11376000	1964	21-May-64	166	3	1.3
11376000	1964	22-May-64	173	ND	1.4
11376000	1964	23-May-64	154	ND	1.2
11376000	1964	24-May-64	159	3	1.3
11376000	1964	25-May-64	159	ND	1.3
11376000	1964	26-May-64	168	3	1.4
11376000	1964	27-May-64	180	ND	1.5
11376000	1964	28-May-64	215	4	2.3
11376000	1964	29-May-64	197	ND	2.1
11376000	1964	30-May-64	185	ND	2
11376000	1964	31-May-64	168	5	2.3
11376000	1964	01-Jun-64	154	ND	0.8
11376000	1964	02-Jun-64	134	1	0.4
11376000	1964	03-Jun-64	145	ND	0.8
11376000	1964	04-Jun-64	138	3	1.1
11376000	1964	05-Jun-64	143	ND	1.2
11376000	1964	06-Jun-64	147	ND	1.2
11376000	1964	07-Jun-64	161	3	1.3
11376000	1964	08-Jun-64	163	ND	1.3
11376000	1964	09-Jun-64	208	14	7.9
11376000	1964	10-Jun-64	224	ND	6.7
11376000	1964	11-Jun-64	215	7	4.1
11376000	1964	12-Jun-64	218	ND	4.1
11376000	1964	13-Jun-64	205	ND	3.9
11376000	1964	14-Jun-64	187	8	4
11376000	1964	15-Jun-64	159	ND	3
11376000	1964	16-Jun-64	130	7	2.5
11376000	1964	17-Jun-64	113	ND	2.1
11376000	1964	18-Jun-64	107	8	2.3
11376000	1964	19-Jun-64	103	ND	1.9
11376000	1964	20-Jun-64	99	ND	1.9
11376000	1964	21-Jun-64	96	6	1.6

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	22-Jun-64	94	ND	1.3
11376000	1964	23-Jun-64	87	5	1.2
11376000	1964	24-Jun-64	78	ND	1.5
11376000	1964	25-Jun-64	66	8	1.4
11376000	1964	26-Jun-64	66	ND	1.6
11376000	1964	27-Jun-64	64	ND	1.6
11376000	1964	28-Jun-64	71	9	1.7
11376000	1964	29-Jun-64	65	ND	1.1
11376000	1964	30-Jun-64	59	4	0.6
11376000	1964	01-Jul-64	59	ND	0.6
11376000	1964	02-Jul-64	58	4	0.6
11376000	1964	03-Jul-64	64	ND	0.7
11376000	1964	04-Jul-64	66	ND	0.7
11376000	1964	05-Jul-64	70	4	0.8
11376000	1964	06-Jul-64	65	ND	0.7
11376000	1964	07-Jul-64	62	ND	0.5
11376000	1964	08-Jul-64	56	ND	0.5
11376000	1964	09-Jul-64	56	3	0.5
11376000	1964	10-Jul-64	58	ND	0.5
11376000	1964	11-Jul-64	62	ND	0.7
11376000	1964	12-Jul-64	58	4	0.6
11376000	1964	13-Jul-64	54	ND	0.6
11376000	1964	14-Jul-64	53	5	0.7
11376000	1964	15-Jul-64	58	10	1.6
11376000	1964	16-Jul-64	59	4	0.6
11376000	1964	17-Jul-64	62	ND	0.5
11376000	1964	18-Jul-64	56	ND	0.3
11376000	1964	19-Jul-64	53	2	0.3
11376000	1964	20-Jul-64	56	ND	0.3
11376000	1964	21-Jul-64	53	2	0.3
11376000	1964	22-Jul-64	49	ND	0.3
11376000	1964	23-Jul-64	50	3	0.4
11376000	1964	24-Jul-64	54	ND	0.3
11376000	1964	25-Jul-64	56	ND	0.3
11376000	1964	26-Jul-64	52	2	0.3
11376000	1964	27-Jul-64	49	ND	0.4
11376000	1964	28-Jul-64	53	4	0.6
11376000	1964	29-Jul-64	56	ND	0.6
11376000	1964	30-Jul-64	52	5	0.7
11376000	1964	31-Jul-64	53	ND	0.7
11376000	1964	01-Aug-64	52	ND	0.8
11376000	1964	02-Aug-64	50	7	0.9
11376000	1964	03-Aug-64	49	ND	0.5
11376000	1964	04-Aug-64	46	2	0.2
11376000	1964	05-Aug-64	45	ND	0.4

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	06-Aug-64	48	5	0.6
11376000	1964	07-Aug-64	50	ND	0.5
11376000	1964	08-Aug-64	52	ND	0.4
11376000	1964	09-Aug-64	49	2	0.3
11376000	1964	10-Aug-64	49	ND	0.3
11376000	1964	11-Aug-64	48	3	0.4
11376000	1964	12-Aug-64	52	ND	0.7
11376000	1964	13-Aug-64	50	7	0.9
11376000	1964	14-Aug-64	46	ND	0.9
11376000	1964	15-Aug-64	45	ND	0.9
11376000	1964	16-Aug-64	45	7	0.9
11376000	1964	17-Aug-64	45	ND	1
11376000	1964	18-Aug-64	41	9	1
11376000	1964	19-Aug-64	46	12	1.5
11376000	1964	20-Aug-64	48	8	1
11376000	1964	21-Aug-64	46	ND	1
11376000	1964	22-Aug-64	44	ND	1.1
11376000	1964	23-Aug-64	45	10	1.2
11376000	1964	24-Aug-64	46	ND	1.2
11376000	1964	25-Aug-64	44	9	1.1
11376000	1964	26-Aug-64	44	ND	1
11376000	1964	27-Aug-64	45	8	1
11376000	1964	28-Aug-64	41	ND	1.1
11376000	1964	29-Aug-64	43	ND	1.9
11376000	1964	30-Aug-64	44	22	2.6
11376000	1964	31-Aug-64	48	ND	2.6
11376000	1964	01-Sep-64	56	14	2.1
11376000	1964	02-Sep-64	59	ND	1.4
11376000	1964	03-Sep-64	62	7	1.2
11376000	1964	04-Sep-64	56	ND	1.1
11376000	1964	05-Sep-64	59	ND	1.3
11376000	1964	06-Sep-64	64	9	1.6
11376000	1964	07-Sep-64	64	ND	1.4
11376000	1964	08-Sep-64	64	8	1.4
11376000	1964	09-Sep-64	54	ND	1.3
11376000	1964	10-Sep-64	54	10	1.5
11376000	1964	11-Sep-64	59	ND	1.4
11376000	1964	12-Sep-64	56	ND	1.2
11376000	1964	13-Sep-64	59	7	1.1
11376000	1964	14-Sep-64	60	ND	1.5
11376000	1964	15-Sep-64	64	10	1.7
11376000	1964	16-Sep-64	58	ND	0.8
11376000	1964	17-Sep-64	56	2	0.3
11376000	1964	18-Sep-64	54	ND	0.3
11376000	1964	19-Sep-64	56	ND	0.3

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1964	20-Sep-64	58	2	0.3
11376000	1964	21-Sep-64	65	ND	0.4
11376000	1964	22-Sep-64	56	2	0.3
11376000	1964	23-Sep-64	60	ND	0.3
11376000	1964	24-Sep-64	54	2	0.3
11376000	1964	25-Sep-64	58	ND	0.5
11376000	1964	26-Sep-64	62	3	0.5
11376000	1964	27-Sep-64	60	1	0.2
11376000	1964	28-Sep-64	68	ND	0.2
11376000	1964	29-Sep-64	58	1	0.2
11376000	1964	30-Sep-64	53	ND	0.1
11376000	1965	01-Oct-64	52	1	0.1
11376000	1965	02-Oct-64	52	ND	0.3
11376000	1965	03-Oct-64	53	ND	0.4
11376000	1965	04-Oct-64	52	3	0.4
11376000	1965	05-Oct-64	50	ND	0.3
11376000	1965	06-Oct-64	54	1	0.1
11376000	1965	07-Oct-64	56	ND	0.2
11376000	1965	08-Oct-64	59	1	0.2
11376000	1965	09-Oct-64	66	ND	0.2
11376000	1965	10-Oct-64	65	ND	0.4
11376000	1965	11-Oct-64	68	2	0.4
11376000	1965	12-Oct-64	73	ND	0.2
11376000	1965	13-Oct-64	70	1	0.2
11376000	1965	14-Oct-64	71	ND	0.2
11376000	1965	15-Oct-64	70	2	0.4
11376000	1965	16-Oct-64	66	ND	0.4
11376000	1965	17-Oct-64	73	ND	0.4
11376000	1965	18-Oct-64	82	3	0.7
11376000	1965	19-Oct-64	70	ND	0.8
11376000	1965	20-Oct-64	66	4	0.7
11376000	1965	21-Oct-64	70	ND	0.8
11376000	1965	22-Oct-64	62	4	0.7
11376000	1965	23-Oct-64	64	ND	0.7
11376000	1965	24-Oct-64	75	ND	0.8
11376000	1965	25-Oct-64	85	4	0.9
11376000	1965	26-Oct-64	96	ND	1
11376000	1965	27-Oct-64	105	5	1.4
11376000	1965	28-Oct-64	130	ND	2.5
11376000	1965	29-Oct-64	187	12	8.1
11376000	1965	30-Oct-64	256	ND	15
11376000	1965	31-Oct-64	197	ND	9.6
11376000	1965	01-Nov-64	180	17	8.3
11376000	1965	02-Nov-64	403	113	126
11376000	1965	03-Nov-64	282	12	9.1

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1965	04-Nov-64	182	ND	2
11376000	1965	05-Nov-64	147	3	1.2
11376000	1965	06-Nov-64	125	ND	1
11376000	1965	07-Nov-64	109	ND	0.9
11376000	1965	08-Nov-64	123	7	2.3
11376000	1965	09-Nov-64	349	57	62
11376000	1965	10-Nov-64	1680	ND	480
11376000	1965	11-Nov-64	1690	ND	480
11376000	1965	12-Nov-64	2180	ND	1100
11376000	1965	13-Nov-64	830	66	148
11376000	1965	14-Nov-64	522	19	27
11376000	1965	15-Nov-64	372	9	9
11376000	1965	16-Nov-64	289	8	6
11376000	1965	17-Nov-64	232	7	4
11376000	1965	18-Nov-64	200	5	3
11376000	1965	19-Nov-64	175	5	2
11376000	1965	20-Nov-64	161	4	2
11376000	1965	21-Nov-64	150	3	1
11376000	1965	22-Nov-64	178	5	2
11376000	1965	23-Nov-64	195	3	2
11376000	1965	24-Nov-64	173	3	1
11376000	1965	25-Nov-64	247	10	9
11376000	1965	26-Nov-64	426	19	22
11376000	1965	27-Nov-64	340	6	6
11376000	1965	28-Nov-64	603	83	201
11376000	1965	29-Nov-64	1210	135	451
11376000	1965	30-Nov-64	872	30	71
11376000	1965	01-Dec-64	1540	266	1110
11376000	1965	02-Dec-64	1380	84	313
11376000	1965	03-Dec-64	1190	52	167
11376000	1965	04-Dec-64	872	20	47
11376000	1965	05-Dec-64	685	11	20
11376000	1965	06-Dec-64	552	7	10
11376000	1965	07-Dec-64	474	6	8
11376000	1965	08-Dec-64	414	5	6
11376000	1965	09-Dec-64	386	4	4
11376000	1965	10-Dec-64	392	4	4
11376000	1965	11-Dec-64	667	36	69
11376000	1965	12-Dec-64	625	14	24
11376000	1965	13-Dec-64	498	5	7
11376000	1965	14-Dec-64	438	4	5
11376000	1965	15-Dec-64	403	4	4
11376000	1965	16-Dec-64	372	2	2
11376000	1965	17-Dec-64	337	3	3
11376000	1965	18-Dec-64	308	ND	3

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1965	19-Dec-64	680	194	492
11376000	1965	20-Dec-64	718	58	117
11376000	1965	21-Dec-64	6940	343	11400
11376000	1965	22-Dec-64	40200	4520	597000
11376000	1965	23-Dec-64	26600	3350	250000
11376000	1965	24-Dec-64	14300	2610	103000
11376000	1965	25-Dec-64	10000	2120	58900
11376000	1965	26-Dec-64	9070	2090	52900
11376000	1965	27-Dec-64	7580	1890	39400
11376000	1965	28-Dec-64	5520	1300	19500
11376000	1965	29-Dec-64	4500	720	8820
11376000	1965	30-Dec-64	4070	478	5280
11376000	1965	31-Dec-64	3720	427	4320
11376000	1965	01-Jan-65	3150	330	2800
11376000	1965	02-Jan-65	2960	409	3270
11376000	1965	03-Jan-65	4240	838	9890
11376000	1965	04-Jan-65	4060	1010	11200
11376000	1965	05-Jan-65	13700	1940	93500
11376000	1965	06-Jan-65	8590	1110	28000
11376000	1965	07-Jan-65	5320	1130	17000
11376000	1965	08-Jan-65	3730	550	5540
11376000	1965	09-Jan-65	3150	330	2810
11376000	1965	10-Jan-65	2910	270	2120
11376000	1965	11-Jan-65	3090	410	3420
11376000	1965	12-Jan-65	3020	280	2280
11376000	1965	13-Jan-65	2840	280	2150
11376000	1965	14-Jan-65	2710	250	1830
11376000	1965	15-Jan-65	2700	270	1970
11376000	1965	16-Jan-65	2730	370	2730
11376000	1965	17-Jan-65	2720	350	2570
11376000	1965	18-Jan-65	2750	490	3640
11376000	1965	19-Jan-65	2850	760	5850
11376000	1965	20-Jan-65	2840	640	4910
11376000	1965	21-Jan-65	2660	480	3450
11376000	1965	22-Jan-65	2390	490	3160
11376000	1965	23-Jan-65	2460	2280	15900
11376000	1965	24-Jan-65	4320	3090	36000
11376000	1965	25-Jan-65	3110	1100	9240
11376000	1965	26-Jan-65	2580	ND	3500
11376000	1965	27-Jan-65	2280	356	2190
11376000	1965	28-Jan-65	2090	285	1610
11376000	1965	29-Jan-65	2000	274	1480
11376000	1965	30-Jan-65	2010	246	1340
11376000	1965	31-Jan-65	2030	127	696
11376000	1965	01-Feb-65	1970	ND	430

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1965	02-Feb-65	1850	75	375
11376000	1965	03-Feb-65	1770	190	908
11376000	1965	04-Feb-65	1670	195	879
11376000	1965	05-Feb-65	1700	ND	690
11376000	1965	06-Feb-65	1650	ND	530
11376000	1965	07-Feb-65	1550	ND	420
11376000	1965	08-Feb-65	1410	90	343
11376000	1965	09-Feb-65	1280	ND	280
11376000	1965	10-Feb-65	1210	75	245
11376000	1965	11-Feb-65	1150	ND	220
11376000	1965	12-Feb-65	1090	65	191
11376000	1965	13-Feb-65	1020	ND	96
11376000	1965	14-Feb-65	992	26	70
11376000	1965	15-Feb-65	950	ND	64
11376000	1965	16-Feb-65	896	27	65
11376000	1965	17-Feb-65	854	ND	58
11376000	1965	18-Feb-65	802	24	52
11376000	1965	19-Feb-65	770	ND	62
11376000	1965	20-Feb-65	748	37	75
11376000	1965	21-Feb-65	748	ND	71
11376000	1965	22-Feb-65	736	34	68
11376000	1965	23-Feb-65	715	ND	42
11376000	1965	24-Feb-65	685	15	28
11376000	1965	25-Feb-65	640	ND	26
11376000	1965	26-Feb-65	611	15	25
11376000	1965	27-Feb-65	814	90	220
11376000	1965	28-Feb-65	872	118	278
11376000	1965	01-Mar-65	718	ND	87
11376000	1965	02-Mar-65	664	13	23
11376000	1965	03-Mar-65	632	ND	15
11376000	1965	04-Mar-65	605	8	13
11376000	1965	05-Mar-65	585	ND	13
11376000	1965	06-Mar-65	600	9	15
11376000	1965	07-Mar-65	615	ND	17
11376000	1965	08-Mar-65	580	ND	16
11376000	1965	09-Mar-65	555	10	15
11376000	1965	10-Mar-65	550	ND	15
11376000	1965	01-Apr-65	452	13	16
11376000	1965	06-May-65	948	34	87
11376000	1965	19-May-65	615	15	25
11376000	1965	20-May-65	605	ND	21
11376000	1965	21-May-65	605	13	21
11376000	1965	22-May-65	620	ND	23
11376000	1965	23-May-65	580	16	25
11376000	1965	24-May-65	545	ND	21

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1965	25-May-65	520	11	15
11376000	1965	26-May-65	502	ND	14
11376000	1965	27-May-65	484	ND	12
11376000	1965	28-May-65	452	ND	10
11376000	1965	29-May-65	448	ND	10
11376000	1965	30-May-65	438	ND	10
11376000	1965	31-May-65	438	ND	10
11376000	1965	16-Jun-65	314	5	4.2
11376000	1965	01-Aug-65	90	ND	1.2
11376000	1965	02-Aug-65	89	ND	1.2
11376000	1965	03-Aug-65	92	ND	1.2
11376000	1965	04-Aug-65	85	5	1.1
11376000	1965	05-Aug-65	84	ND	1.8
11376000	1965	06-Aug-65	82	11	2.4
11376000	1965	07-Aug-65	81	ND	2.4
11376000	1965	08-Aug-65	79	ND	2.1
11376000	1965	09-Aug-65	82	9	2
11376000	1965	10-Aug-65	84	ND	2
11376000	1965	11-Aug-65	93	13	3.3
11376000	1965	12-Aug-65	115	ND	5
11376000	1965	13-Aug-65	120	14	4.5
11376000	1965	14-Aug-65	110	ND	3.9
11376000	1965	15-Aug-65	92	ND	3
11376000	1965	16-Aug-65	85	11	2.5
11376000	1965	17-Aug-65	84	ND	2.5
11376000	1965	18-Aug-65	118	13	4.1
11376000	1965	19-Aug-65	141	ND	4.6
11376000	1965	20-Aug-65	135	10	3.6
11376000	1965	21-Aug-65	129	ND	3.1
11376000	1965	22-Aug-65	102	ND	2.2
11376000	1965	23-Aug-65	105	8	2.3
11376000	1965	24-Aug-65	100	ND	2.2
11376000	1965	25-Aug-65	105	10	2.8
11376000	1965	26-Aug-65	112	ND	3.3
11376000	1965	27-Aug-65	105	12	3.4
11376000	1965	28-Aug-65	84	ND	2.9
11376000	1965	29-Aug-65	87	ND	3.1
11376000	1965	30-Aug-65	89	15	3.6
11376000	1965	31-Aug-65	85	ND	3.2
11376000	1965	01-Sep-65	78	11	2.3
11376000	1965	02-Sep-65	81	ND	2.2
11376000	1965	03-Sep-65	79	11	2.3
11376000	1965	04-Sep-65	81	ND	2.6
11376000	1965	05-Sep-65	77	ND	2.3
11376000	1965	06-Sep-65	77	9	1.9

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1965	07-Sep-65	79	ND	1.9
11376000	1965	08-Sep-65	84	10	2.3
11376000	1965	09-Sep-65	82	ND	2.4
11376000	1965	10-Sep-65	77	11	2.3
11376000	1965	11-Sep-65	74	ND	2.2
11376000	1965	12-Sep-65	77	ND	2.1
11376000	1965	13-Sep-65	75	10	2
11376000	1965	14-Sep-65	72	ND	1.7
11376000	1965	15-Sep-65	72	9	1.7
11376000	1965	16-Sep-65	75	ND	1.8
11376000	1965	17-Sep-65	70	8	1.5
11376000	1965	18-Sep-65	69	ND	1.5
11376000	1965	19-Sep-65	68	ND	1.5
11376000	1965	20-Sep-65	68	8	1.5
11376000	1965	21-Sep-65	70	ND	1.7
11376000	1965	22-Sep-65	71	10	1.9
11376000	1965	23-Sep-65	71	ND	1.9
11376000	1965	24-Sep-65	77	10	2.1
11376000	1965	25-Sep-65	75	ND	2
11376000	1965	26-Sep-65	79	ND	2.1
11376000	1965	27-Sep-65	78	ND	2.1
11376000	1965	28-Sep-65	77	ND	2.1
11376000	1965	29-Sep-65	74	ND	2
11376000	1965	30-Sep-65	77	ND	2.1
11376000	1966	01-Oct-65	93	ND	2.4
11376000	1966	02-Oct-65	110	ND	2.8
11376000	1966	03-Oct-65	95	ND	2.4
11376000	1966	04-Oct-65	92	ND	2.2
11376000	1966	05-Oct-65	110	ND	2.6
11376000	1966	06-Oct-65	95	ND	2.3
11376000	1966	07-Oct-65	89	ND	2
11376000	1966	08-Oct-65	89	ND	1.9
11376000	1966	09-Oct-65	82	ND	1.4
11376000	1966	10-Oct-65	79	5	1.1
11376000	1966	11-Oct-65	82	2	0.4
11376000	1966	12-Oct-65	82	2	0.4
11376000	1966	13-Oct-65	76	2	0.4
11376000	1966	14-Oct-65	92	5	1.2
11376000	1966	15-Oct-65	102	5	1.4
11376000	1966	16-Oct-65	112	5	1.5
11376000	1966	17-Oct-65	118	4	1.3
11376000	1966	18-Oct-65	135	4	1.5
11376000	1966	19-Oct-65	123	4	1.3
11376000	1966	20-Oct-65	129	3	1
11376000	1966	21-Oct-65	138	3	1.1

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	22-Oct-65	120	4	1.3
11376000	1966	23-Oct-65	108	4	1.2
11376000	1966	24-Oct-65	112	4	1.2
11376000	1966	25-Oct-65	108	ND	1.2
11376000	1966	26-Oct-65	108	ND	1.2
11376000	1966	27-Oct-65	102	ND	1.1
11376000	1966	28-Oct-65	98	ND	1
11376000	1966	29-Oct-65	115	ND	1.4
11376000	1966	30-Oct-65	112	ND	1.3
11376000	1966	31-Oct-65	115	ND	1.4
11376000	1966	01-Nov-65	123	ND	1.6
11376000	1966	02-Nov-65	102	ND	1.3
11376000	1966	03-Nov-65	90	ND	1.2
11376000	1966	04-Nov-65	87	ND	1.1
11376000	1966	05-Nov-65	89	ND	1.1
11376000	1966	06-Nov-65	90	ND	1.2
11376000	1966	07-Nov-65	112	ND	2
11376000	1966	08-Nov-65	160	ND	6
11376000	1966	09-Nov-65	199	ND	10
11376000	1966	10-Nov-65	147	ND	5
11376000	1966	11-Nov-65	126	ND	4.5
11376000	1966	12-Nov-65	141	ND	9
11376000	1966	13-Nov-65	449	297	460
11376000	1966	14-Nov-65	1620	925	4100
11376000	1966	15-Nov-65	4520	1040	16000
11376000	1966	16-Nov-65	1220	84	320
11376000	1966	17-Nov-65	1420	221	1700
11376000	1966	18-Nov-65	2350	325	2200
11376000	1966	19-Nov-65	1380	100	373
11376000	1966	20-Nov-65	934	50	126
11376000	1966	21-Nov-65	712	25	48
11376000	1966	22-Nov-65	600	12	19
11376000	1966	23-Nov-65	540	9	13
11376000	1966	24-Nov-65	535	9	13
11376000	1966	25-Nov-65	584	8	13
11376000	1966	26-Nov-65	550	8	12
11376000	1966	27-Nov-65	540	8	12
11376000	1966	28-Nov-65	459	8	9.9
11376000	1966	29-Nov-65	430	8	9.3
11376000	1966	30-Nov-65	410	7	7.7
11376000	1966	01-Dec-65	390	7	7.4
11376000	1966	02-Dec-65	370	7	7
11376000	1966	03-Dec-65	346	7	6.5
11376000	1966	04-Dec-65	342	7	6.5
11376000	1966	05-Dec-65	342	6	5.5

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	06-Dec-65	350	6	5.7
11376000	1966	07-Dec-65	358	6	5.8
11376000	1966	08-Dec-65	346	7	6.5
11376000	1966	09-Dec-65	330	7	6.2
11376000	1966	10-Dec-65	318	8	6.9
11376000	1966	11-Dec-65	306	8	6.6
11376000	1966	12-Dec-65	310	8	6.7
11376000	1966	13-Dec-65	298	7	5.6
11376000	1966	14-Dec-65	280	7	5.3
11376000	1966	15-Dec-65	269	7	5.1
11376000	1966	16-Dec-65	258	7	4.9
11376000	1966	17-Dec-65	248	7	4.7
11376000	1966	18-Dec-65	241	7	4.6
11376000	1966	19-Dec-65	234	7	4.4
11376000	1966	20-Dec-65	227	6	3.7
11376000	1966	21-Dec-65	216	6	3.5
11376000	1966	22-Dec-65	224	6	3.6
11376000	1966	23-Dec-65	213	6	3.5
11376000	1966	24-Dec-65	230	17	11
11376000	1966	25-Dec-65	255	21	14
11376000	1966	26-Dec-65	262	20	14
11376000	1966	27-Dec-65	248	20	13
11376000	1966	28-Dec-65	597	69	230
11376000	1966	29-Dec-65	1300	46	210
11376000	1966	30-Dec-65	746	24	49
11376000	1966	31-Dec-65	630	35	60
11376000	1966	01-Jan-66	540	15	22
11376000	1966	02-Jan-66	482	8	10
11376000	1966	03-Jan-66	468	8	10
11376000	1966	04-Jan-66	6350	1670	48000
11376000	1966	05-Jan-66	9200	3080	81000
11376000	1966	06-Jan-66	4890	1470	20000
11376000	1966	07-Jan-66	3470	469	4500
11376000	1966	08-Jan-66	2750	190	1410
11376000	1966	09-Jan-66	2330	110	692
11376000	1966	10-Jan-66	1840	50	248
11376000	1966	11-Jan-66	1500	28	113
11376000	1966	12-Jan-66	1260	26	88
11376000	1966	13-Jan-66	1120	23	70
11376000	1966	14-Jan-66	1060	21	60
11376000	1966	15-Jan-66	1080	18	52
11376000	1966	16-Jan-66	1110	17	51
11376000	1966	17-Jan-66	1080	16	47
11376000	1966	18-Jan-66	1010	16	44
11376000	1966	19-Jan-66	942	19	48

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	20-Jan-66	878	17	40
11376000	1966	21-Jan-66	810	16	35
11376000	1966	22-Jan-66	781	16	34
11376000	1966	23-Jan-66	746	16	32
11376000	1966	24-Jan-66	706	17	32
11376000	1966	25-Jan-66	673	19	35
11376000	1966	26-Jan-66	648	13	23
11376000	1966	27-Jan-66	630	16	27
11376000	1966	28-Jan-66	600	22	36
11376000	1966	29-Jan-66	636	25	43
11376000	1966	30-Jan-66	1170	127	410
11376000	1966	31-Jan-66	918	100	248
11376000	1966	01-Feb-66	1720	835	5200
11376000	1966	02-Feb-66	1350	120	437
11376000	1966	03-Feb-66	1480	351	2800
11376000	1966	04-Feb-66	5970	2660	45000
11376000	1966	05-Feb-66	3360	684	6700
11376000	1966	06-Feb-66	2640	249	1800
11376000	1966	07-Feb-66	1800	115	559
11376000	1966	08-Feb-66	1440	58	226
11376000	1966	09-Feb-66	1210	40	131
11376000	1966	10-Feb-66	1070	35	101
11376000	1966	11-Feb-66	950	34	87
11376000	1966	12-Feb-66	878	29	69
11376000	1966	13-Feb-66	818	22	49
11376000	1966	14-Feb-66	774	20	42
11376000	1966	15-Feb-66	732	17	34
11376000	1966	16-Feb-66	692	14	26
11376000	1966	17-Feb-66	660	16	29
11376000	1966	18-Feb-66	648	17	30
11376000	1966	19-Feb-66	918	33	91
11376000	1966	20-Feb-66	950	40	104
11376000	1966	21-Feb-66	802	23	50
11376000	1966	22-Feb-66	760	19	39
11376000	1966	23-Feb-66	818	25	55
11376000	1966	24-Feb-66	878	24	57
11376000	1966	25-Feb-66	930	37	110
11376000	1966	26-Feb-66	2000	197	1100
11376000	1966	27-Feb-66	1240	90	301
11376000	1966	28-Feb-66	1090	40	118
11376000	1966	01-Mar-66	1020	29	80
11376000	1966	02-Mar-66	968	26	68
11376000	1966	03-Mar-66	886	23	55
11376000	1966	04-Mar-66	848	22	50
11376000	1966	05-Mar-66	1160	43	140

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	06-Mar-66	1170	47	148
11376000	1966	07-Mar-66	1110	41	123
11376000	1966	08-Mar-66	1080	32	93
11376000	1966	09-Mar-66	1320	104	400
11376000	1966	10-Mar-66	2260	522	3200
11376000	1966	11-Mar-66	2210	301	1810
11376000	1966	12-Mar-66	1950	155	816
11376000	1966	13-Mar-66	1930	140	730
11376000	1966	14-Mar-66	1980	140	748
11376000	1966	15-Mar-66	1930	118	615
11376000	1966	16-Mar-66	1810	61	298
11376000	1966	17-Mar-66	1580	65	277
11376000	1966	18-Mar-66	1420	70	268
11376000	1966	19-Mar-66	1310	62	219
11376000	1966	20-Mar-66	1210	45	147
11376000	1966	21-Mar-66	1140	33	102
11376000	1966	22-Mar-66	1080	36	105
11376000	1966	23-Mar-66	1020	36	99
11376000	1966	24-Mar-66	986	39	104
11376000	1966	25-Mar-66	986	43	114
11376000	1966	26-Mar-66	1030	52	145
11376000	1966	27-Mar-66	1140	102	315
11376000	1966	28-Mar-66	1300	121	425
11376000	1966	29-Mar-66	1410	162	617
11376000	1966	30-Mar-66	1510	203	828
11376000	1966	31-Mar-66	1570	208	882
11376000	1966	01-Apr-66	1630	223	981
11376000	1966	02-Apr-66	1620	155	678
11376000	1966	03-Apr-66	1480	122	488
11376000	1966	04-Apr-66	1350	93	339
11376000	1966	05-Apr-66	1270	80	274
11376000	1966	06-Apr-66	1270	76	261
11376000	1966	07-Apr-66	1230	76	252
11376000	1966	08-Apr-66	1190	75	241
11376000	1966	09-Apr-66	1160	70	219
11376000	1966	10-Apr-66	1190	72	231
11376000	1966	11-Apr-66	1170	65	205
11376000	1966	12-Apr-66	1140	43	132
11376000	1966	13-Apr-66	1040	42	118
11376000	1966	14-Apr-66	938	37	94
11376000	1966	15-Apr-66	874	38	90
11376000	1966	16-Apr-66	874	42	99
11376000	1966	17-Apr-66	914	40	99
11376000	1966	18-Apr-66	898	22	53
11376000	1966	19-Apr-66	826	20	45

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	20-Apr-66	738	18	36
11376000	1966	21-Apr-66	674	16	29
11376000	1966	22-Apr-66	634	14	24
11376000	1966	23-Apr-66	602	12	20
11376000	1966	24-Apr-66	570	11	17
11376000	1966	25-Apr-66	562	11	17
11376000	1966	26-Apr-66	554	10	15
11376000	1966	27-Apr-66	538	10	15
11376000	1966	28-Apr-66	506	10	14
11376000	1966	29-Apr-66	474	10	13
11376000	1966	30-Apr-66	458	10	12
11376000	1966	01-May-66	450	9	11
11376000	1966	02-May-66	426	9	10
11376000	1966	03-May-66	418	9	10
11376000	1966	04-May-66	450	15	18
11376000	1966	05-May-66	466	12	15
11376000	1966	06-May-66	482	12	16
11376000	1966	07-May-66	466	16	20
11376000	1966	08-May-66	450	15	18
11376000	1966	09-May-66	434	14	16
11376000	1966	10-May-66	442	14	17
11376000	1966	11-May-66	458	20	25
11376000	1966	12-May-66	434	19	22
11376000	1966	13-May-66	410	15	17
11376000	1966	14-May-66	378	15	15
11376000	1966	15-May-66	354	16	15
11376000	1966	16-May-66	370	13	13
11376000	1966	17-May-66	338	10	9.1
11376000	1966	18-May-66	324	9	7.9
11376000	1966	19-May-66	318	9	7.7
11376000	1966	20-May-66	306	9	7.4
11376000	1966	21-May-66	300	9	7.3
11376000	1966	22-May-66	306	9	7.4
11376000	1966	23-May-66	300	9	7.3
11376000	1966	24-May-66	288	9	7
11376000	1966	25-May-66	276	9	6.7
11376000	1966	26-May-66	260	9	6.3
11376000	1966	27-May-66	260	9	6.3
11376000	1966	28-May-66	265	10	7.2
11376000	1966	29-May-66	260	13	9.1
11376000	1966	30-May-66	260	12	8.4
11376000	1966	31-May-66	270	12	8.7
11376000	1966	01-Jun-66	276	14	10
11376000	1966	02-Jun-66	260	13	9.1
11376000	1966	03-Jun-66	245	12	7.9

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	04-Jun-66	235	12	7.6
11376000	1966	05-Jun-66	225	13	7.9
11376000	1966	06-Jun-66	230	12	7.5
11376000	1966	07-Jun-66	230	11	6.8
11376000	1966	08-Jun-66	225	10	6.1
11376000	1966	09-Jun-66	220	10	5.9
11376000	1966	10-Jun-66	204	12	6.6
11376000	1966	11-Jun-66	192	12	6.2
11376000	1966	12-Jun-66	184	13	6.5
11376000	1966	13-Jun-66	177	13	6.2
11376000	1966	14-Jun-66	167	13	5.9
11376000	1966	15-Jun-66	154	14	5.8
11376000	1966	16-Jun-66	161	14	6.1
11376000	1966	17-Jun-66	161	14	6.1
11376000	1966	18-Jun-66	146	13	5.1
11376000	1966	19-Jun-66	130	12	4.2
11376000	1966	20-Jun-66	130	11	3.9
11376000	1966	21-Jun-66	140	21	7.9
11376000	1966	22-Jun-66	130	25	8.8
11376000	1966	23-Jun-66	130	23	8.1
11376000	1966	24-Jun-66	133	20	7.2
11376000	1966	25-Jun-66	128	16	5.5
11376000	1966	26-Jun-66	123	13	4.3
11376000	1966	27-Jun-66	117	12	3.8
11376000	1966	28-Jun-66	110	11	3.3
11376000	1966	29-Jun-66	102	11	3
11376000	1966	30-Jun-66	94	11	2.8
11376000	1966	01-Jul-66	92	10	2.5
11376000	1966	02-Jul-66	91	10	2.5
11376000	1966	03-Jul-66	96	9	2.3
11376000	1966	04-Jul-66	102	9	2.5
11376000	1966	05-Jul-66	94	9	2.3
11376000	1966	06-Jul-66	85	9	2.1
11376000	1966	07-Jul-66	81	9	2
11376000	1966	08-Jul-66	83	9	2
11376000	1966	09-Jul-66	85	9	2.1
11376000	1966	10-Jul-66	100	9	2.4
11376000	1966	11-Jul-66	92	9	2.2
11376000	1966	12-Jul-66	89	9	2.2
11376000	1966	13-Jul-66	83	9	2
11376000	1966	14-Jul-66	83	12	2.7
11376000	1966	15-Jul-66	89	15	3.6
11376000	1966	16-Jul-66	79	15	3.2
11376000	1966	17-Jul-66	74	14	2.8
11376000	1966	18-Jul-66	75	14	2.8

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	19-Jul-66	75	14	2.8
11376000	1966	20-Jul-66	72	14	2.7
11376000	1966	21-Jul-66	72	13	2.5
11376000	1966	22-Jul-66	68	13	2.4
11376000	1966	23-Jul-66	54	13	1.9
11376000	1966	24-Jul-66	54	10	1.5
11376000	1966	25-Jul-66	56	7	1.1
11376000	1966	26-Jul-66	53	6	0.9
11376000	1966	27-Jul-66	56	6	0.9
11376000	1966	28-Jul-66	70	12	2.3
11376000	1966	29-Jul-66	66	12	2.1
11376000	1966	30-Jul-66	56	12	1.8
11376000	1966	31-Jul-66	58	10	1.6
11376000	1966	01-Aug-66	68	9	1.7
11376000	1966	02-Aug-66	70	8	1.5
11376000	1966	03-Aug-66	68	10	1.8
11376000	1966	04-Aug-66	68	22	4
11376000	1966	05-Aug-66	56	17	2.6
11376000	1966	06-Aug-66	49	12	1.6
11376000	1966	07-Aug-66	49	12	1.6
11376000	1966	08-Aug-66	42	14	1.6
11376000	1966	09-Aug-66	47	22	2.8
11376000	1966	10-Aug-66	56	18	2.7
11376000	1966	11-Aug-66	51	12	1.7
11376000	1966	12-Aug-66	54	10	1.5
11376000	1966	13-Aug-66	60	9	1.5
11376000	1966	14-Aug-66	68	8	1.5
11376000	1966	15-Aug-66	75	8	1.6
11376000	1966	16-Aug-66	75	7	1.4
11376000	1966	17-Aug-66	60	6	1
11376000	1966	18-Aug-66	54	4	0.6
11376000	1966	19-Aug-66	56	4	0.6
11376000	1966	20-Aug-66	53	5	0.7
11376000	1966	21-Aug-66	56	5	0.8
11376000	1966	22-Aug-66	60	5	0.8
11376000	1966	23-Aug-66	58	4	0.6
11376000	1966	24-Aug-66	70	4	0.8
11376000	1966	25-Aug-66	56	4	0.6
11376000	1966	26-Aug-66	56	4	0.6
11376000	1966	27-Aug-66	66	5	0.9
11376000	1966	28-Aug-66	72	6	1.2
11376000	1966	29-Aug-66	62	7	1.2
11376000	1966	30-Aug-66	60	9	1.5
11376000	1966	31-Aug-66	56	10	1.5
11376000	1966	01-Sep-66	54	11	1.6

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

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Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1966	02-Sep-66	54	12	1.7
11376000	1966	03-Sep-66	54	13	1.9
11376000	1966	04-Sep-66	62	13	2.2
11376000	1966	05-Sep-66	72	12	2.3
11376000	1966	06-Sep-66	68	11	2
11376000	1966	07-Sep-66	66	10	1.8
11376000	1966	08-Sep-66	70	11	2.1
11376000	1966	09-Sep-66	72	12	2.3
11376000	1966	10-Sep-66	68	14	2.6
11376000	1966	11-Sep-66	62	13	2.2
11376000	1966	12-Sep-66	53	12	1.7
11376000	1966	13-Sep-66	53	12	1.7
11376000	1966	14-Sep-66	56	13	2
11376000	1966	15-Sep-66	58	12	1.9
11376000	1966	16-Sep-66	87	11	2.6
11376000	1966	17-Sep-66	83	11	2.5
11376000	1966	18-Sep-66	96	12	3.1
11376000	1966	19-Sep-66	108	12	3.5
11376000	1966	20-Sep-66	98	12	3.2
11376000	1966	21-Sep-66	100	11	3
11376000	1966	22-Sep-66	89	11	2.6
11376000	1966	23-Sep-66	87	11	2.6
11376000	1966	24-Sep-66	75	12	2.4
11376000	1966	25-Sep-66	68	13	2.4
11376000	1966	26-Sep-66	64	14	2.4
11376000	1966	27-Sep-66	54	14	2
11376000	1966	28-Sep-66	64	14	2.4
11376000	1966	29-Sep-66	68	13	2.4
11376000	1966	30-Sep-66	64	13	2.2
11376000	1967	01-Oct-66	64	5	0.9
11376000	1967	02-Oct-66	79	5	1.1
11376000	1967	03-Oct-66	75	5	1
11376000	1967	04-Oct-66	64	5	0.9
11376000	1967	05-Oct-66	60	5	0.8
11376000	1967	06-Oct-66	60	5	0.8
11376000	1967	07-Oct-66	60	5	0.8
11376000	1967	08-Oct-66	64	5	0.9
11376000	1967	09-Oct-66	54	5	0.7
11376000	1967	10-Oct-66	64	5	0.9
11376000	1967	11-Oct-66	75	5	1
11376000	1967	12-Oct-66	72	6	1.2
11376000	1967	13-Oct-66	79	6	1.3
11376000	1967	14-Oct-66	91	5	1.2
11376000	1967	15-Oct-66	89	5	1.2
11376000	1967	16-Oct-66	85	5	1.1

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

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Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	17-Oct-66	85	5	1.1
11376000	1967	18-Oct-66	66	5	0.9
11376000	1967	19-Oct-66	58	4	0.6
11376000	1967	20-Oct-66	54	4	0.6
11376000	1967	21-Oct-66	70	5	0.9
11376000	1967	22-Oct-66	89	6	1.4
11376000	1967	23-Oct-66	87	6	1.4
11376000	1967	24-Oct-66	92	6	1.5
11376000	1967	25-Oct-66	81	5	1.1
11376000	1967	26-Oct-66	72	5	1
11376000	1967	27-Oct-66	83	5	1.1
11376000	1967	28-Oct-66	81	5	1.1
11376000	1967	29-Oct-66	89	ND	1.4
11376000	1967	30-Oct-66	98	ND	1.6
11376000	1967	31-Oct-66	106	ND	1.7
11376000	1967	01-Nov-66	123	ND	2.3
11376000	1967	02-Nov-66	136	ND	2.6
11376000	1967	03-Nov-66	126	ND	2.4
11376000	1967	04-Nov-66	85	ND	1.4
11376000	1967	05-Nov-66	70	ND	1.1
11376000	1967	06-Nov-66	87	ND	1.4
11376000	1967	07-Nov-66	98	8	2.1
11376000	1967	08-Nov-66	77	7	1.5
11376000	1967	09-Nov-66	66	6	1.1
11376000	1967	10-Nov-66	60	5	0.8
11376000	1967	11-Nov-66	60	3	0.5
11376000	1967	12-Nov-66	75	3	0.6
11376000	1967	13-Nov-66	91	4	1
11376000	1967	14-Nov-66	117	8	2.5
11376000	1967	15-Nov-66	442	23	27
11376000	1967	16-Nov-66	754	43	88
11376000	1967	17-Nov-66	538	38	55
11376000	1967	18-Nov-66	288	29	23
11376000	1967	19-Nov-66	276	24	18
11376000	1967	20-Nov-66	1660	790	3540
11376000	1967	21-Nov-66	1880	1000	5080
11376000	1967	22-Nov-66	1410	300	1140
11376000	1967	23-Nov-66	874	65	153
11376000	1967	24-Nov-66	634	37	63
11376000	1967	25-Nov-66	506	19	26
11376000	1967	26-Nov-66	426	12	14
11376000	1967	27-Nov-66	386	10	10
11376000	1967	28-Nov-66	418	90	102
11376000	1967	29-Nov-66	930	250	628
11376000	1967	30-Nov-66	890	100	240

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

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Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	01-Dec-66	1050	ND	850
11376000	1967	02-Dec-66	2850	ND	10000
11376000	1967	03-Dec-66	2850	650	5000
11376000	1967	04-Dec-66	2290	ND	6800
11376000	1967	05-Dec-66	7910	1900	40600
11376000	1967	06-Dec-66	3350	650	5880
11376000	1967	07-Dec-66	2120	245	1400
11376000	1967	08-Dec-66	1620	135	590
11376000	1967	09-Dec-66	1340	105	380
11376000	1967	10-Dec-66	1830	325	1610
11376000	1967	11-Dec-66	1570	130	551
11376000	1967	12-Dec-66	1390	82	308
11376000	1967	13-Dec-66	1560	105	442
11376000	1967	14-Dec-66	1900	120	616
11376000	1967	15-Dec-66	1480	86	344
11376000	1967	16-Dec-66	1230	65	216
11376000	1967	17-Dec-66	1100	50	149
11376000	1967	18-Dec-66	994	34	91
11376000	1967	19-Dec-66	906	26	64
11376000	1967	20-Dec-66	842	20	45
11376000	1967	21-Dec-66	778	17	36
11376000	1967	22-Dec-66	714	16	31
11376000	1967	23-Dec-66	658	14	25
11376000	1967	24-Dec-66	602	11	18
11376000	1967	25-Dec-66	554	8	12
11376000	1967	26-Dec-66	514	7	10
11376000	1967	27-Dec-66	490	6	8
11376000	1967	28-Dec-66	450	6	7
11376000	1967	29-Dec-66	434	5	6
11376000	1967	30-Dec-66	418	5	6
11376000	1967	31-Dec-66	402	5	5
11376000	1967	01-Jan-67	378	5	5
11376000	1967	02-Jan-67	362	5	5
11376000	1967	03-Jan-67	354	5	5
11376000	1967	04-Jan-67	340	5	5
11376000	1967	05-Jan-67	335	4	4
11376000	1967	06-Jan-67	326	4	4
11376000	1967	07-Jan-67	314	3	3
11376000	1967	08-Jan-67	306	3	3
11376000	1967	09-Jan-67	302	3	2
11376000	1967	10-Jan-67	298	3	2
11376000	1967	11-Jan-67	286	3	2
11376000	1967	12-Jan-67	280	3	2
11376000	1967	13-Jan-67	280	3	2
11376000	1967	14-Jan-67	276	4	3

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

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ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	15-Jan-67	276	4	3
11376000	1967	16-Jan-67	272	4	3
11376000	1967	17-Jan-67	269	4	3
11376000	1967	18-Jan-67	262	3	2
11376000	1967	19-Jan-67	258	2	1
11376000	1967	20-Jan-67	1110	344	2350
11376000	1967	21-Jan-67	8470	3000	74200
11376000	1967	22-Jan-67	4710	1540	22100
11376000	1967	23-Jan-67	2110	360	2050
11376000	1967	24-Jan-67	5810	1030	18200
11376000	1967	25-Jan-67	3420	408	3980
11376000	1967	26-Jan-67	9700	1800	56800
11376000	1967	27-Jan-67	5850	890	14500
11376000	1967	28-Jan-67	9880	2000	54900
11376000	1967	29-Jan-67	15600	3600	158000
11376000	1967	30-Jan-67	11200	2600	81900
11376000	1967	31-Jan-67	13100	2700	103000
11376000	1967	01-Feb-67	6620	1010	18100
11376000	1967	02-Feb-67	4540	600	7350
11376000	1967	03-Feb-67	3440	350	3250
11376000	1967	04-Feb-67	2900	250	1960
11376000	1967	05-Feb-67	2620	198	1400
11376000	1967	06-Feb-67	2380	153	983
11376000	1967	07-Feb-67	2200	119	707
11376000	1967	08-Feb-67	2060	95	528
11376000	1967	09-Feb-67	1920	91	472
11376000	1967	10-Feb-67	1800	86	418
11376000	1967	11-Feb-67	1680	78	354
11376000	1967	12-Feb-67	1600	62	268
11376000	1967	13-Feb-67	1550	54	226
11376000	1967	14-Feb-67	1460	51	201
11376000	1967	15-Feb-67	1320	50	178
11376000	1967	16-Feb-67	1230	49	163
11376000	1967	17-Feb-67	1150	47	146
11376000	1967	18-Feb-67	1080	36	105
11376000	1967	19-Feb-67	1020	28	77
11376000	1967	20-Feb-67	938	24	61
11376000	1967	21-Feb-67	882	20	48
11376000	1967	22-Feb-67	834	18	41
11376000	1967	23-Feb-67	789	16	34
11376000	1967	24-Feb-67	747	15	30
11376000	1967	25-Feb-67	733	14	28
11376000	1967	26-Feb-67	681	13	24
11376000	1967	27-Feb-67	649	12	21
11376000	1967	28-Feb-67	621	11	18

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

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Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	01-Mar-67	588	9	14
11376000	1967	02-Mar-67	588	8	13
11376000	1967	03-Mar-67	570	8	12
11376000	1967	04-Mar-67	564	8	12
11376000	1967	05-Mar-67	546	8	12
11376000	1967	06-Mar-67	540	8	12
11376000	1967	07-Mar-67	528	7	10
11376000	1967	08-Mar-67	522	7	9.9
11376000	1967	09-Mar-67	510	6	8.3
11376000	1967	10-Mar-67	558	ND	30
11376000	1967	11-Mar-67	906	ND	120
11376000	1967	12-Mar-67	866	ND	70
11376000	1967	13-Mar-67	954	ND	100
11376000	1967	14-Mar-67	906	45	110
11376000	1967	15-Mar-67	775	20	42
11376000	1967	16-Mar-67	2000	230	1390
11376000	1967	17-Mar-67	2100	199	1130
11376000	1967	18-Mar-67	1640	116	514
11376000	1967	19-Mar-67	1420	89	341
11376000	1967	20-Mar-67	1400	115	435
11376000	1967	21-Mar-67	1550	195	816
11376000	1967	22-Mar-67	1470	114	452
11376000	1967	23-Mar-67	1460	88	347
11376000	1967	24-Mar-67	1400	70	265
11376000	1967	25-Mar-67	1300	51	179
11376000	1967	26-Mar-67	1230	35	116
11376000	1967	27-Mar-67	1160	31	97
11376000	1967	28-Mar-67	1110	29	87
11376000	1967	29-Mar-67	1070	26	75
11376000	1967	30-Mar-67	1060	ND	160
11376000	1967	31-Mar-67	1480	460	1890
11376000	1967	01-Apr-67	2620	780	5760
11376000	1967	02-Apr-67	1600	350	1510
11376000	1967	03-Apr-67	1440	90	350
11376000	1967	04-Apr-67	1400	52	197
11376000	1967	05-Apr-67	1380	37	138
11376000	1967	06-Apr-67	1990	450	3090
11376000	1967	07-Apr-67	2620	575	4070
11376000	1967	08-Apr-67	2010	245	1330
11376000	1967	09-Apr-67	1850	585	2920
11376000	1967	10-Apr-67	1780	510	2450
11376000	1967	11-Apr-67	2390	465	3000
11376000	1967	12-Apr-67	1960	ND	3200
11376000	1967	13-Apr-67	1750	ND	2200
11376000	1967	14-Apr-67	1650	ND	1200

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

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Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	15-Apr-67	1610	ND	870
11376000	1967	16-Apr-67	1480	ND	400
11376000	1967	17-Apr-67	1820	ND	3400
11376000	1967	18-Apr-67	2310	ND	6900
11376000	1967	19-Apr-67	1940	ND	3400
11376000	1967	20-Apr-67	1940	ND	3100
11376000	1967	21-Apr-67	1730	ND	1400
11376000	1967	22-Apr-67	1640	150	664
11376000	1967	23-Apr-67	2010	360	1970
11376000	1967	24-Apr-67	2060	360	2000
11376000	1967	25-Apr-67	2000	169	913
11376000	1967	26-Apr-67	1850	150	749
11376000	1967	27-Apr-67	1930	ND	830
11376000	1967	28-Apr-67	1710	ND	460
11376000	1967	29-Apr-67	1600	85	367
11376000	1967	30-Apr-67	1470	60	238
11376000	1967	01-May-67	1380	58	216
11376000	1967	02-May-67	1320	55	196
11376000	1967	03-May-67	1300	30	105
11376000	1967	04-May-67	1320	37	132
11376000	1967	05-May-67	1390	37	139
11376000	1967	06-May-67	1460	100	394
11376000	1967	07-May-67	1510	110	448
11376000	1967	08-May-67	1700	120	551
11376000	1967	09-May-67	1850	176	879
11376000	1967	10-May-67	1950	180	948
11376000	1967	11-May-67	1590	124	532
11376000	1967	12-May-67	1470	82	325
11376000	1967	13-May-67	1390	46	173
11376000	1967	14-May-67	1330	36	129
11376000	1967	15-May-67	1330	40	144
11376000	1967	16-May-67	1430	51	197
11376000	1967	17-May-67	1510	72	294
11376000	1967	18-May-67	1530	96	397
11376000	1967	19-May-67	1450	106	415
11376000	1967	20-May-67	1390	135	507
11376000	1967	21-May-67	1370	144	533
11376000	1967	22-May-67	1350	107	390
11376000	1967	23-May-67	1320	60	214
11376000	1967	24-May-67	1250	32	108
11376000	1967	25-May-67	1140	26	80
11376000	1967	26-May-67	1040	23	65
11376000	1967	27-May-67	986	24	64
11376000	1967	28-May-67	932	28	70
11376000	1967	29-May-67	890	27	65

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

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Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	30-May-67	842	23	52
11376000	1967	31-May-67	794	20	43
11376000	1967	01-Jun-67	842	18	41
11376000	1967	02-Jun-67	1320	77	291
11376000	1967	03-Jun-67	1220	95	313
11376000	1967	04-Jun-67	1020	61	168
11376000	1967	05-Jun-67	1000	40	108
11376000	1967	06-Jun-67	1020	37	102
11376000	1967	07-Jun-67	926	31	78
11376000	1967	08-Jun-67	860	26	60
11376000	1967	09-Jun-67	812	22	48
11376000	1967	10-Jun-67	770	18	37
11376000	1967	11-Jun-67	715	14	27
11376000	1967	12-Jun-67	675	12	22
11376000	1967	13-Jun-67	710	12	23
11376000	1967	14-Jun-67	625	11	19
11376000	1967	15-Jun-67	575	9	14
11376000	1967	16-Jun-67	545	9	13
11376000	1967	17-Jun-67	535	9	13
11376000	1967	18-Jun-67	530	10	14
11376000	1967	19-Jun-67	530	11	16
11376000	1967	20-Jun-67	520	11	15
11376000	1967	21-Jun-67	500	11	15
11376000	1967	22-Jun-67	470	11	14
11376000	1967	23-Jun-67	430	11	13
11376000	1967	24-Jun-67	410	11	12
11376000	1967	25-Jun-67	390	11	12
11376000	1967	26-Jun-67	380	11	11
11376000	1967	27-Jun-67	370	10	10
11376000	1967	28-Jun-67	360	10	9.7
11376000	1967	29-Jun-67	340	10	9.2
11376000	1967	30-Jun-67	320	10	8.6
11376000	1967	01-Jul-67	310	9	7.5
11376000	1967	02-Jul-67	300	9	7.3
11376000	1967	03-Jul-67	290	9	7
11376000	1967	04-Jul-67	270	5	3.6
11376000	1967	05-Jul-67	250	8	5.4
11376000	1967	06-Jul-67	230	12	7.5
11376000	1967	07-Jul-67	217	9	5.3
11376000	1967	08-Jul-67	206	5	2.8
11376000	1967	09-Jul-67	205	4	2.2
11376000	1967	10-Jul-67	200	4	2.2
11376000	1967	11-Jul-67	195	4	2.1
11376000	1967	12-Jul-67	190	4	2.1
11376000	1967	13-Jul-67	180	4	1.9

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	14-Jul-67	170	4	1.8
11376000	1967	15-Jul-67	165	4	1.8
11376000	1967	16-Jul-67	160	5	2.2
11376000	1967	17-Jul-67	155	6	2.5
11376000	1967	18-Jul-67	150	6	2.4
11376000	1967	19-Jul-67	145	6	2.3
11376000	1967	20-Jul-67	140	5	1.9
11376000	1967	21-Jul-67	135	5	1.8
11376000	1967	22-Jul-67	130	5	1.8
11376000	1967	23-Jul-67	125	5	1.7
11376000	1967	24-Jul-67	120	4	1.3
11376000	1967	25-Jul-67	115	4	1.2
11376000	1967	26-Jul-67	110	3	0.9
11376000	1967	27-Jul-67	108	2	0.6
11376000	1967	28-Jul-67	106	2	0.6
11376000	1967	29-Jul-67	104	1	0.3
11376000	1967	30-Jul-67	102	1	0.3
11376000	1967	31-Jul-67	100	2	0.5
11376000	1967	01-Aug-67	98	2	0.5
11376000	1967	02-Aug-67	96	3	0.8
11376000	1967	03-Aug-67	92	3	0.7
11376000	1967	04-Aug-67	90	4	1
11376000	1967	05-Aug-67	88	4	1
11376000	1967	06-Aug-67	86	4	0.9
11376000	1967	07-Aug-67	84	5	1.1
11376000	1967	08-Aug-67	83	5	1.1
11376000	1967	09-Aug-67	83	5	1.1
11376000	1967	10-Aug-67	82	5	1.1
11376000	1967	11-Aug-67	82	5	1.1
11376000	1967	12-Aug-67	81	6	1.3
11376000	1967	13-Aug-67	80	6	1.3
11376000	1967	14-Aug-67	75	6	1.2
11376000	1967	15-Aug-67	72	6	1.2
11376000	1967	16-Aug-67	70	6	1.1
11376000	1967	17-Aug-67	68	6	1.1
11376000	1967	18-Aug-67	65	7	1.2
11376000	1967	19-Aug-67	63	7	1.2
11376000	1967	20-Aug-67	61	7	1.2
11376000	1967	21-Aug-67	58	7	1.1
11376000	1967	22-Aug-67	56	7	1.1
11376000	1967	23-Aug-67	56	8	1.2
11376000	1967	24-Aug-67	60	8	1.3
11376000	1967	25-Aug-67	64	8	1.4
11376000	1967	26-Aug-67	66	8	1.4
11376000	1967	27-Aug-67	68	8	1.5

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1967	28-Aug-67	68	8	1.5
11376000	1967	29-Aug-67	68	8	1.5
11376000	1967	30-Aug-67	66	8	1.4
11376000	1967	31-Aug-67	62	8	1.3
11376000	1967	01-Sep-67	60	8	1.3
11376000	1967	02-Sep-67	58	8	1.3
11376000	1967	03-Sep-67	56	10	1.5
11376000	1967	04-Sep-67	55	11	1.6
11376000	1967	05-Sep-67	55	12	1.8
11376000	1967	06-Sep-67	55	14	2.1
11376000	1967	07-Sep-67	55	16	2.4
11376000	1967	08-Sep-67	55	14	2.1
11376000	1967	09-Sep-67	55	8	1.2
11376000	1967	10-Sep-67	56	5	0.8
11376000	1967	11-Sep-67	66	6	1.1
11376000	1967	12-Sep-67	68	4	0.7
11376000	1967	13-Sep-67	70	2	0.4
11376000	1967	14-Sep-67	70	5	0.9
11376000	1967	15-Sep-67	70	9	1.7
11376000	1967	16-Sep-67	70	2	0.4
11376000	1967	17-Sep-67	70	2	0.4
11376000	1967	18-Sep-67	70	3	0.6
11376000	1967	19-Sep-67	70	3	0.6
11376000	1967	20-Sep-67	70	4	0.8
11376000	1967	21-Sep-67	72	4	0.8
11376000	1967	22-Sep-67	70	4	0.8
11376000	1967	23-Sep-67	74	4	0.8
11376000	1967	24-Sep-67	80	4	0.9
11376000	1967	25-Sep-67	74	2	0.4
11376000	1967	26-Sep-67	77	2	0.4
11376000	1967	27-Sep-67	91	2	0.5
11376000	1967	28-Sep-67	82	2	0.4
11376000	1967	29-Sep-67	88	2	0.5
11376000	1967	30-Sep-67	78	2	0.4
11376000	1978	01-Nov-77	55	5	0.7
11376000	1978	02-Nov-77	51	4	0.6
11376000	1978	03-Nov-77	46	4	0.5
11376000	1978	04-Nov-77	45	4	0.5
11376000	1978	05-Nov-77	53	4	0.6
11376000	1978	06-Nov-77	59	4	0.6
11376000	1978	07-Nov-77	72	3	0.6
11376000	1978	08-Nov-77	63	3	0.5
11376000	1978	09-Nov-77	55	4	0.6
11376000	1978	10-Nov-77	53	4	0.6
11376000	1978	11-Nov-77	48	4	0.5

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1978	12-Nov-77	47	5	0.6
11376000	1978	13-Nov-77	45	7	0.9
11376000	1978	14-Nov-77	45	5	0.6
11376000	1978	15-Nov-77	45	4	0.5
11376000	1978	16-Nov-77	45	4	0.5
11376000	1978	17-Nov-77	45	4	0.5
11376000	1978	18-Nov-77	45	4	0.5
11376000	1978	19-Nov-77	43	4	0.5
11376000	1978	20-Nov-77	39	4	0.4
11376000	1978	21-Nov-77	75	8	1.6
11376000	1978	22-Nov-77	295	221	430
11376000	1978	23-Nov-77	957	2790	9440
11376000	1978	24-Nov-77	486	120	157
11376000	1978	25-Nov-77	571	190	293
11376000	1978	26-Nov-77	452	65	79
11376000	1978	27-Nov-77	473	95	121
11376000	1978	28-Nov-77	372	45	45
11376000	1978	29-Nov-77	284	20	15
11376000	1978	30-Nov-77	241	12	7.8
11376000	1978	01-Dec-77	220	11	6.5
11376000	1978	02-Dec-77	192	10	5.2
11376000	1978	03-Dec-77	168	10	4.5
11376000	1978	04-Dec-77	147	9	3.6
11376000	1978	05-Dec-77	138	9	3.4
11376000	1978	06-Dec-77	132	8	2.9
11376000	1978	07-Dec-77	125	7	2.4
11376000	1978	08-Dec-77	119	6	1.9
11376000	1978	09-Dec-77	114	5	1.5
11376000	1978	10-Dec-77	108	5	1.5
11376000	1978	11-Dec-77	114	5	1.5
11376000	1978	12-Dec-77	240	12	7.8
11376000	1978	13-Dec-77	278	13	9.8
11376000	1978	14-Dec-77	2080	2400	21300
11376000	1978	15-Dec-77	5310	3180	47900
11376000	1978	16-Dec-77	2290	750	4640
11376000	1978	17-Dec-77	5010	3350	60700
11376000	1978	18-Dec-77	2050	650	3600
11376000	1978	19-Dec-77	1180	195	621
11376000	1978	20-Dec-77	873	88	207
11376000	1978	21-Dec-77	744	65	131
11376000	1978	22-Dec-77	1440	312	1380
11376000	1978	23-Dec-77	7570	4380	142000
11376000	1978	24-Dec-77	2370	440	2820
11376000	1978	25-Dec-77	1460	150	591
11376000	1978	26-Dec-77	1120	95	287

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1978	27-Dec-77	1240	113	378
11376000	1978	28-Dec-77	1580	175	747
11376000	1978	29-Dec-77	1370	136	503
11376000	1978	30-Dec-77	1280	118	408
11376000	1978	31-Dec-77	1090	88	259
11376000	1978	01-Jan-78	929	65	163
11376000	1978	02-Jan-78	1050	82	232
11376000	1978	03-Jan-78	2030	290	1590
11376000	1978	04-Jan-78	3720	1390	28000
11376000	1978	05-Jan-78	8560	2720	65100
11376000	1978	06-Jan-78	4440	1060	13400
11376000	1978	07-Jan-78	2580	460	3200
11376000	1978	08-Jan-78	2940	360	3130
11376000	1978	09-Jan-78	18000	3420	234000
11376000	1978	10-Jan-78	7600	2070	52400
11376000	1978	11-Jan-78	3470	230	2150
11376000	1978	12-Jan-78	2550	135	929
11376000	1978	13-Jan-78	6640	625	13100
11376000	1978	14-Jan-78	18000	3080	189000
11376000	1978	15-Jan-78	16600	2640	147000
11376000	1978	16-Jan-78	22300	4190	298000
11376000	1978	17-Jan-78	15500	2360	107000
11376000	1978	18-Jan-78	9110	1190	29300
11376000	1978	19-Jan-78	11600	1710	69200
11376000	1978	20-Jan-78	6930	677	12900
11376000	1978	21-Jan-78	4620	500	6240
11376000	1978	22-Jan-78	3700	370	3700
11376000	1978	23-Jan-78	2990	285	2300
11376000	1978	24-Jan-78	2660	215	1540
11376000	1978	25-Jan-78	2350	165	1050
11376000	1978	26-Jan-78	2060	122	679
11376000	1978	27-Jan-78	1900	102	523
11376000	1978	28-Jan-78	1780	88	423
11376000	1978	29-Jan-78	1680	78	354
11376000	1978	30-Jan-78	1600	68	294
11376000	1978	31-Jan-78	1520	62	254
11376000	1978	01-Feb-78	1460	56	221
11376000	1978	02-Feb-78	1480	58	232
11376000	1978	03-Feb-78	1360	50	184
11376000	1978	04-Feb-78	1320	45	160
11376000	1978	05-Feb-78	4020	421	7250
11376000	1978	06-Feb-78	6060	635	11400
11376000	1978	07-Feb-78	11400	1590	65300
11376000	1978	08-Feb-78	8300	1070	26100
11376000	1978	09-Feb-78	8550	1120	30000

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1978	10-Feb-78	5350	400	5780
11376000	1978	11-Feb-78	3950	260	2770
11376000	1978	12-Feb-78	5170	571	10100
11376000	1978	13-Feb-78	4710	380	4830
11376000	1978	14-Feb-78	3330	210	1890
11376000	1978	15-Feb-78	2780	152	1140
11376000	1978	16-Feb-78	2420	128	836
11376000	1978	17-Feb-78	2220	112	671
11376000	1978	18-Feb-78	2080	102	573
11376000	1978	19-Feb-78	2020	94	513
11376000	1978	20-Feb-78	2020	94	513
11376000	1978	21-Feb-78	2100	97	550
11376000	1978	22-Feb-78	1980	94	503
11376000	1978	23-Feb-78	1970	87	463
11376000	1978	24-Feb-78	1870	84	424
11376000	1978	25-Feb-78	1810	78	381
11376000	1978	26-Feb-78	1640	70	310
11376000	1978	27-Feb-78	1570	65	276
11376000	1978	28-Feb-78	1530	65	269
11376000	1978	01-Mar-78	1480	68	272
11376000	1978	02-Mar-78	1990	133	1160
11376000	1978	03-Mar-78	4360	486	6720
11376000	1978	04-Mar-78	11700	1700	64600
11376000	1978	05-Mar-78	9420	1240	39600
11376000	1978	06-Mar-78	4960	560	7500
11376000	1978	07-Mar-78	3820	365	3760
11376000	1978	08-Mar-78	13700	2070	93600
11376000	1978	09-Mar-78	12500	1680	63000
11376000	1978	10-Mar-78	6780	709	13600
11376000	1978	11-Mar-78	6820	695	14400
11376000	1978	12-Mar-78	4470	480	5790
11376000	1978	13-Mar-78	3550	350	3350
11376000	1978	14-Mar-78	2930	280	2220
11376000	1978	15-Mar-78	2370	150	960
11376000	1978	16-Mar-78	2130	100	575
11376000	1978	17-Mar-78	2000	73	394
11376000	1978	18-Mar-78	1900	70	359
11376000	1978	19-Mar-78	1810	66	323
11376000	1978	20-Mar-78	1740	64	301
11376000	1978	21-Mar-78	1720	62	288
11376000	1978	22-Mar-78	1860	64	321
11376000	1978	23-Mar-78	1740	68	319
11376000	1978	24-Mar-78	1700	70	321
11376000	1978	25-Mar-78	1560	65	274
11376000	1978	26-Mar-78	1470	58	230

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1978	27-Mar-78	1390	52	195
11376000	1978	28-Mar-78	1340	49	177
11376000	1978	29-Mar-78	1330	48	172
11376000	1978	30-Mar-78	1350	48	175
11376000	1978	31-Mar-78	1440	64	289
11376000	1978	01-Apr-78	3580	459	5150
11376000	1978	02-Apr-78	2180	130	765
11376000	1978	03-Apr-78	1810	118	577
11376000	1978	04-Apr-78	2100	160	907
11376000	1978	05-Apr-78	1650	96	428
11376000	1978	06-Apr-78	3340	263	2730
11376000	1978	07-Apr-78	3150	244	2520
11376000	1978	08-Apr-78	2160	200	1170
11376000	1978	09-Apr-78	1860	120	603
11376000	1978	10-Apr-78	1790	60	290
11376000	1978	11-Apr-78	1660	48	215
11376000	1978	12-Apr-78	1560	40	168
11376000	1978	13-Apr-78	1490	38	153
11376000	1978	14-Apr-78	1440	36	140
11376000	1978	15-Apr-78	1620	48	210
11376000	1978	16-Apr-78	1630	48	211
11376000	1978	17-Apr-78	1390	45	169
11376000	1978	18-Apr-78	1270	42	144
11376000	1978	19-Apr-78	1210	38	124
11376000	1978	20-Apr-78	1220	35	115
11376000	1978	21-Apr-78	1150	35	109
11376000	1978	22-Apr-78	1070	40	116
11376000	1978	23-Apr-78	1030	40	111
11376000	1978	24-Apr-78	982	40	106
11376000	1978	25-Apr-78	1530	70	289
11376000	1978	26-Apr-78	3090	294	3300
11376000	1978	27-Apr-78	1650	80	356
11376000	1978	28-Apr-78	1370	56	207
11376000	1978	29-Apr-78	1240	48	161
11376000	1978	30-Apr-78	1140	42	129
11376000	1978	01-May-78	1080	38	111
11376000	1978	02-May-78	1030	34	95
11376000	1978	03-May-78	975	30	79
11376000	1978	04-May-78	940	26	66
11376000	1978	05-May-78	928	25	63
11376000	1978	06-May-78	893	25	60
11376000	1978	07-May-78	855	25	58
11376000	1978	08-May-78	819	24	53
11376000	1978	09-May-78	813	24	53
11376000	1978	10-May-78	838	23	52

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1978	11-May-78	878	23	55
11376000	1978	12-May-78	836	22	50
11376000	1978	13-May-78	790	20	43
11376000	1978	14-May-78	760	19	39
11376000	1978	15-May-78	765	18	37
11376000	1978	16-May-78	770	16	33
11376000	1978	17-May-78	745	15	30
11376000	1978	18-May-78	735	14	28
11376000	1978	19-May-78	710	13	25
11376000	1978	20-May-78	640	12	21
11376000	1978	21-May-78	605	11	18
11376000	1978	22-May-78	595	10	16
11376000	1978	23-May-78	551	9	13
11376000	1978	24-May-78	550	9	13
11376000	1978	25-May-78	557	8	12
11376000	1978	26-May-78	532	8	11
11376000	1978	27-May-78	501	8	11
11376000	1978	28-May-78	478	8	10
11376000	1978	29-May-78	468	8	10
11376000	1978	30-May-78	460	8	9.9
11376000	1978	31-May-78	467	8	10
11376000	1979	01-Nov-78	123	4	1.3
11376000	1979	02-Nov-78	84	3	0.68
11376000	1979	03-Nov-78	71	3	0.58
11376000	1979	04-Nov-78	71	3	0.58
11376000	1979	05-Nov-78	73	3	0.59
11376000	1979	06-Nov-78	76	4	0.82
11376000	1979	07-Nov-78	80	5	1.1
11376000	1979	08-Nov-78	80	6	1.3
11376000	1979	09-Nov-78	71	7	1.3
11376000	1979	10-Nov-78	77	7	1.5
11376000	1979	11-Nov-78	82	8	1.8
11376000	1979	12-Nov-78	80	9	1.9
11376000	1979	13-Nov-78	83	10	2.2
11376000	1979	14-Nov-78	78	10	2.1
11376000	1979	15-Nov-78	74	8	1.6
11376000	1979	16-Nov-78	74	7	1.4
11376000	1979	17-Nov-78	72	7	1.4
11376000	1979	18-Nov-78	72	6	1.2
11376000	1979	19-Nov-78	72	5	0.97
11376000	1979	20-Nov-78	89	11	2.6
11376000	1979	21-Nov-78	156	52	22
11376000	1979	22-Nov-78	183	26	13
11376000	1979	23-Nov-78	156	6	2.5
11376000	1979	24-Nov-78	127	2	0.69

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1979	25-Nov-78	119	2	0.64
11376000	1979	26-Nov-78	109	2	0.59
11376000	1979	27-Nov-78	104	1	0.28
11376000	1979	28-Nov-78	97	1	0.26
11376000	1979	29-Nov-78	96	2	0.52
11376000	1979	30-Nov-78	93	2	0.5
11376000	1979	01-Dec-78	95	2	0.51
11376000	1979	02-Dec-78	102	2	0.55
11376000	1979	03-Dec-78	101	2	0.55
11376000	1979	04-Dec-78	98	2	0.53
11376000	1979	05-Dec-78	95	1	0.26
11376000	1979	06-Dec-78	94	1	0.25
11376000	1979	07-Dec-78	93	1	0.25
11376000	1979	08-Dec-78	89	2	0.48
11376000	1979	09-Dec-78	87	3	0.7
11376000	1979	10-Dec-78	90	3	0.73
11376000	1979	11-Dec-78	88	3	0.71
11376000	1979	12-Dec-78	89	4	0.96
11376000	1979	13-Dec-78	91	6	1.5
11376000	1979	14-Dec-78	92	7	1.7
11376000	1979	15-Dec-78	93	8	2
11376000	1979	16-Dec-78	89	8	1.9
11376000	1979	17-Dec-78	89	9	2.2
11376000	1979	18-Dec-78	87	10	2.3
11376000	1979	19-Dec-78	86	8	1.9
11376000	1979	20-Dec-78	85	5	1.1
11376000	1979	21-Dec-78	81	3	0.66
11376000	1979	22-Dec-78	79	2	0.43
11376000	1979	23-Dec-78	79	2	0.43
11376000	1979	24-Dec-78	74	2	0.4
11376000	1979	25-Dec-78	72	2	0.39
11376000	1979	26-Dec-78	72	3	0.58
11376000	1979	27-Dec-78	72	3	0.58
11376000	1979	28-Dec-78	72	2	0.39
11376000	1979	29-Dec-78	68	3	0.55
11376000	1979	30-Dec-78	65	3	0.53
11376000	1979	31-Dec-78	59	3	0.48
11376000	1979	01-Jan-79	56	3	0.45
11376000	1979	02-Jan-79	56	3	0.45
11376000	1979	03-Jan-79	61	3	0.49
11376000	1979	04-Jan-79	64	3	0.52
11376000	1979	05-Jan-79	70	3	0.6
11376000	1979	06-Jan-79	69	3	0.6
11376000	1979	07-Jan-79	70	4	0.8
11376000	1979	08-Jan-79	108	24	7

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1979	09-Jan-79	179	33	16
11376000	1979	10-Jan-79	180	15	7.3
11376000	1979	11-Jan-79	2640	1020	9230
11376000	1979	12-Jan-79	1440	190	739
11376000	1979	13-Jan-79	665	45	81
11376000	1979	14-Jan-79	1350	235	1980
11376000	1979	15-Jan-79	5320	986	18300
11376000	1979	16-Jan-79	1390	56	210
11376000	1979	17-Jan-79	782	23	49
11376000	1979	18-Jan-79	548	12	18
11376000	1979	19-Jan-79	422	10	11
11376000	1979	20-Jan-79	357	5	4.8
11376000	1979	21-Jan-79	320	5	4.3
11376000	1979	22-Jan-79	282	5	3.8
11376000	1979	23-Jan-79	277	7	5.2
11376000	1979	24-Jan-79	260	7	4.9
11376000	1979	25-Jan-79	247	6	4
11376000	1979	26-Jan-79	228	4	2.5
11376000	1979	27-Jan-79	211	4	2.3
11376000	1979	28-Jan-79	206	5	2.8
11376000	1979	29-Jan-79	196	5	2.6
11376000	1979	30-Jan-79	179	4	1.9
11376000	1979	31-Jan-79	185	4	2
11376000	1979	01-Feb-79	186	3	1.5
11376000	1979	02-Feb-79	174	3	1.4
11376000	1979	03-Feb-79	165	4	1.8
11376000	1979	04-Feb-79	155	3	1.3
11376000	1979	05-Feb-79	163	3	1.3
11376000	1979	06-Feb-79	156	2	0.8
11376000	1979	07-Feb-79	153	2	0.8
11376000	1979	08-Feb-79	150	2	0.8
11376000	1979	09-Feb-79	146	2	0.8
11376000	1979	10-Feb-79	146	4	1.6
11376000	1979	11-Feb-79	151	6	2.4
11376000	1979	12-Feb-79	171	18	8.3
11376000	1979	13-Feb-79	2390	865	11100
11376000	1979	14-Feb-79	4310	1110	15700
11376000	1979	15-Feb-79	1880	137	778
11376000	1979	16-Feb-79	2820	356	2900
11376000	1979	17-Feb-79	1580	96	410
11376000	1979	18-Feb-79	3450	711	10200
11376000	1979	19-Feb-79	2500	162	1330
11376000	1979	20-Feb-79	4370	1080	23300
11376000	1979	21-Feb-79	4530	351	5130
11376000	1979	22-Feb-79	2650	135	966

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1979	23-Feb-79	2600	115	807
11376000	1979	24-Feb-79	1900	66	339
11376000	1979	25-Feb-79	1400	27	102
11376000	1979	26-Feb-79	1430	21	81
11376000	1979	27-Feb-79	1250	19	64
11376000	1979	28-Feb-79	1510	56	264
11376000	1979	01-Mar-79	2110	104	567
11376000	1979	02-Mar-79	1510	57	232
11376000	1979	03-Mar-79	1270	42	144
11376000	1979	04-Mar-79	1140	30	92
11376000	1979	05-Mar-79	1090	23	68
11376000	1979	06-Mar-79	1330	45	162
11376000	1979	07-Mar-79	1670	141	636
11376000	1979	08-Mar-79	1680	111	503
11376000	1979	09-Mar-79	1520	67	275
11376000	1979	10-Mar-79	1360	42	154
11376000	1979	11-Mar-79	1190	27	87
11376000	1979	12-Mar-79	1220	19	63
11376000	1979	13-Mar-79	1150	20	62
11376000	1979	14-Mar-79	1050	22	62
11376000	1979	15-Mar-79	1100	22	65
11376000	1979	16-Mar-79	1510	81	330
11376000	1979	17-Mar-79	2030	190	1060
11376000	1979	18-Mar-79	1730	75	350
11376000	1979	19-Mar-79	1600	35	151
11376000	1979	20-Mar-79	1340	25	90
11376000	1979	21-Mar-79	1200	24	78
11376000	1979	22-Mar-79	1620	158	661
11376000	1979	23-Mar-79	1170	64	202
11376000	1979	24-Mar-79	1010	16	44
11376000	1979	25-Mar-79	941	13	33
11376000	1979	26-Mar-79	909	11	27
11376000	1979	27-Mar-79	4830	1330	28200
11376000	1979	28-Mar-79	3270	160	1630
11376000	1979	29-Mar-79	2020	33	180
11376000	1979	30-Mar-79	1570	32	136
11376000	1979	31-Mar-79	1330	30	108
11376000	1979	01-Apr-79	1260	29	99
11376000	1979	02-Apr-79	1180	27	86
11376000	1979	03-Apr-79	1090	25	74
11376000	1979	04-Apr-79	1010	22	60
11376000	1979	05-Apr-79	916	20	49
11376000	1979	06-Apr-79	950	28	72
11376000	1979	07-Apr-79	881	21	50
11376000	1979	08-Apr-79	769	16	33

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1979	09-Apr-79	713	12	23
11376000	1979	10-Apr-79	658	10	18
11376000	1979	11-Apr-79	594	9	14
11376000	1979	12-Apr-79	568	9	14
11376000	1979	13-Apr-79	528	9	13
11376000	1979	14-Apr-79	539	9	13
11376000	1979	15-Apr-79	575	9	14
11376000	1979	16-Apr-79	600	8	13
11376000	1979	17-Apr-79	549	8	12
11376000	1979	18-Apr-79	469	8	10
11376000	1979	19-Apr-79	436	9	11
11376000	1979	20-Apr-79	412	9	10
11376000	1979	21-Apr-79	406	9	9.9
11376000	1979	22-Apr-79	403	9	9.8
11376000	1979	23-Apr-79	686	24	62
11376000	1979	24-Apr-79	1330	54	210
11376000	1979	25-Apr-79	818	32	71
11376000	1979	26-Apr-79	774	28	59
11376000	1979	27-Apr-79	1230	75	249
11376000	1979	28-Apr-79	1130	46	140
11376000	1979	29-Apr-79	988	31	83
11376000	1979	30-Apr-79	897	30	73
11376000	1979	01-May-79	878	30	71
11376000	1979	02-May-79	859	29	67
11376000	1979	03-May-79	789	26	55
11376000	1979	04-May-79	745	20	40
11376000	1979	05-May-79	868	31	73
11376000	1979	06-May-79	1140	25	77
11376000	1979	07-May-79	1190	35	112
11376000	1979	08-May-79	1190	37	119
11376000	1979	09-May-79	1040	16	45
11376000	1979	10-May-79	979	13	34
11376000	1979	11-May-79	874	12	28
11376000	1979	12-May-79	824	11	24
11376000	1979	13-May-79	774	11	23
11376000	1979	14-May-79	763	11	23
11376000	1979	15-May-79	748	11	22
11376000	1979	16-May-79	687	11	20
11376000	1979	17-May-79	647	11	19
11376000	1979	18-May-79	621	11	18
11376000	1979	19-May-79	563	10	15
11376000	1979	20-May-79	580	10	16
11376000	1979	21-May-79	575	10	16
11376000	1979	22-May-79	562	10	15
11376000	1979	23-May-79	544	10	15

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1979	24-May-79	535	11	16
11376000	1979	25-May-79	500	11	15
11376000	1979	26-May-79	499	11	15
11376000	1979	27-May-79	434	11	13
11376000	1979	28-May-79	390	11	12
11376000	1979	29-May-79	364	11	11
11376000	1979	30-May-79	349	10	9.4
11376000	1979	31-May-79	320	10	8.6
11376000	1980	01-Nov-79	150	8	3.2
11376000	1980	02-Nov-79	138	8	3
11376000	1980	03-Nov-79	155	9	3.8
11376000	1980	04-Nov-79	372	19	20
11376000	1980	05-Nov-79	272	12	8.8
11376000	1980	06-Nov-79	412	21	32
11376000	1980	07-Nov-79	783	18	38
11376000	1980	08-Nov-79	663	16	29
11376000	1980	09-Nov-79	455	13	16
11376000	1980	10-Nov-79	365	10	9.9
11376000	1980	11-Nov-79	302	7	5.7
11376000	1980	12-Nov-79	269	5	3.6
11376000	1980	13-Nov-79	235	5	3.2
11376000	1980	14-Nov-79	213	5	2.9
11376000	1980	15-Nov-79	190	5	2.6
11376000	1980	16-Nov-79	318	21	35
11376000	1980	17-Nov-79	2060	223	1320
11376000	1980	18-Nov-79	1060	86	246
11376000	1980	19-Nov-79	672	41	74
11376000	1980	20-Nov-79	530	31	44
11376000	1980	21-Nov-79	423	27	31
11376000	1980	22-Nov-79	377	25	25
11376000	1980	23-Nov-79	1130	79	250
11376000	1980	24-Nov-79	1140	98	363
11376000	1980	25-Nov-79	1640	147	651
11376000	1980	26-Nov-79	1450	132	517
11376000	1980	27-Nov-79	1070	80	231
11376000	1980	28-Nov-79	814	25	55
11376000	1980	29-Nov-79	662	8	14
11376000	1980	30-Nov-79	568	6	9.2
11376000	1980	01-Dec-79	507	6	8
11376000	1980	02-Dec-79	463	6	8
11376000	1980	03-Dec-79	421	6	7
11376000	1980	04-Dec-79	387	6	6
11376000	1980	05-Dec-79	361	7	7
11376000	1980	06-Dec-79	333	7	6
11376000	1980	07-Dec-79	312	7	6

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1980	08-Dec-79	293	6	5
11376000	1980	09-Dec-79	277	6	5
11376000	1980	10-Dec-79	262	6	4
11376000	1980	11-Dec-79	245	6	4
11376000	1980	12-Dec-79	231	6	4
11376000	1980	13-Dec-79	223	6	4
11376000	1980	14-Dec-79	215	6	4
11376000	1980	15-Dec-79	207	6	3
11376000	1980	16-Dec-79	198	6	3
11376000	1980	17-Dec-79	193	6	3
11376000	1980	18-Dec-79	188	5	3
11376000	1980	19-Dec-79	187	5	3
11376000	1980	20-Dec-79	228	6	4
11376000	1980	21-Dec-79	323	13	13
11376000	1980	22-Dec-79	428	11	13
11376000	1980	23-Dec-79	1710	397	6280
11376000	1980	24-Dec-79	6630	2130	41000
11376000	1980	25-Dec-79	2690	688	5790
11376000	1980	26-Dec-79	1540	232	965
11376000	1980	27-Dec-79	1040	136	382
11376000	1980	28-Dec-79	788	90	191
11376000	1980	29-Dec-79	669	66	119
11376000	1980	30-Dec-79	3110	636	8990
11376000	1980	31-Dec-79	4340	543	7120
11376000	1980	01-Jan-80	2600	210	1470
11376000	1980	02-Jan-80	1750	135	638
11376000	1980	03-Jan-80	1350	88	321
11376000	1980	04-Jan-80	1130	61	186
11376000	1980	05-Jan-80	1020	47	129
11376000	1980	06-Jan-80	1010	38	104
11376000	1980	07-Jan-80	1000	30	81
11376000	1980	08-Jan-80	930	23	58
11376000	1980	09-Jan-80	841	20	45
11376000	1980	10-Jan-80	902	26	63
11376000	1980	11-Jan-80	946	28	73
11376000	1980	12-Jan-80	5130	1440	27400
11376000	1980	13-Jan-80	11200	2660	88700
11376000	1980	14-Jan-80	11900	3240	108000
11376000	1980	15-Jan-80	6890	1300	26500
11376000	1980	16-Jan-80	4750	355	4550
11376000	1980	17-Jan-80	3520	160	1520
11376000	1980	18-Jan-80	2650	122	873
11376000	1980	19-Jan-80	2040	91	501
11376000	1980	20-Jan-80	1660	76	341
11376000	1980	21-Jan-80	1400	70	265

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1980	22-Jan-80	1210	63	206
11376000	1980	23-Jan-80	1060	52	149
11376000	1980	24-Jan-80	952	45	116
11376000	1980	25-Jan-80	885	38	91
11376000	1980	26-Jan-80	820	33	73
11376000	1980	27-Jan-80	764	26	54
11376000	1980	28-Jan-80	709	19	36
11376000	1980	29-Jan-80	660	16	29
11376000	1980	30-Jan-80	605	13	21
11376000	1980	31-Jan-80	580	12	19
11376000	1980	01-Feb-80	556	12	18
11376000	1980	02-Feb-80	528	12	17
11376000	1980	03-Feb-80	2520	203	2200
11376000	1980	04-Feb-80	2480	155	1110
11376000	1980	05-Feb-80	1530	79	326
11376000	1980	06-Feb-80	1270	46	158
11376000	1980	07-Feb-80	1080	33	96
11376000	1980	08-Feb-80	963	25	65
11376000	1980	09-Feb-80	883	20	48
11376000	1980	10-Feb-80	821	17	38
11376000	1980	11-Feb-80	770	13	27
11376000	1980	12-Feb-80	729	12	24
11376000	1980	13-Feb-80	689	11	20
11376000	1980	14-Feb-80	648	11	19
11376000	1980	15-Feb-80	835	39	200
11376000	1980	16-Feb-80	4510	513	11400
11376000	1980	17-Feb-80	19000	3230	198000
11376000	1980	18-Feb-80	20800	2640	158000
11376000	1980	19-Feb-80	16700	2020	94100
11376000	1980	20-Feb-80	9270	923	24800
11376000	1980	21-Feb-80	10300	845	27900
11376000	1980	22-Feb-80	6920	612	12300
11376000	1980	23-Feb-80	5150	360	5010
11376000	1980	24-Feb-80	4050	227	2480
11376000	1980	25-Feb-80	3610	212	2070
11376000	1980	26-Feb-80	3320	198	1770
11376000	1980	27-Feb-80	3620	246	2800
11376000	1980	28-Feb-80	5900	464	7900
11376000	1980	29-Feb-80	4050	162	1770
11376000	1980	01-Mar-80	3460	136	1270
11376000	1980	02-Mar-80	3150	118	1000
11376000	1980	03-Mar-80	2900	99	775
11376000	1980	04-Mar-80	2660	83	596
11376000	1980	05-Mar-80	4660	508	6390
11376000	1980	06-Mar-80	4900	385	5090

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1980	07-Mar-80	3340	157	1420
11376000	1980	08-Mar-80	2870	118	914
11376000	1980	09-Mar-80	2500	106	715
11376000	1980	10-Mar-80	2240	95	575
11376000	1980	11-Mar-80	2060	89	495
11376000	1980	12-Mar-80	1870	80	404
11376000	1980	13-Mar-80	1660	73	327
11376000	1980	14-Mar-80	1960	118	723
11376000	1980	15-Mar-80	2290	157	1020
11376000	1980	16-Mar-80	1820	61	300
11376000	1980	17-Mar-80	1650	44	196
11376000	1980	18-Mar-80	1560	36	152
11376000	1980	19-Mar-80	1440	31	121
11376000	1980	20-Mar-80	1340	23	83
11376000	1980	21-Mar-80	1260	19	65
11376000	1980	22-Mar-80	1180	19	61
11376000	1980	23-Mar-80	1110	16	48
11376000	1980	24-Mar-80	1060	15	43
11376000	1980	25-Mar-80	1060	16	46
11376000	1980	26-Mar-80	1030	20	56
11376000	1980	27-Mar-80	955	20	52
11376000	1980	28-Mar-80	911	17	42
11376000	1980	29-Mar-80	869	16	38
11376000	1980	30-Mar-80	836	13	29
11376000	1980	31-Mar-80	802	12	26
11376000	1980	01-Apr-80	780	12	25
11376000	1980	02-Apr-80	757	12	25
11376000	1980	03-Apr-80	717	12	23
11376000	1980	04-Apr-80	801	18	39
11376000	1980	05-Apr-80	1340	46	170
11376000	1980	06-Apr-80	1230	37	123
11376000	1980	07-Apr-80	1090	18	53
11376000	1980	08-Apr-80	998	12	32
11376000	1980	09-Apr-80	954	12	31
11376000	1980	10-Apr-80	947	12	31
11376000	1980	11-Apr-80	921	12	30
11376000	1980	12-Apr-80	874	12	28
11376000	1980	13-Apr-80	837	12	27
11376000	1980	14-Apr-80	827	12	27
11376000	1980	15-Apr-80	862	12	28
11376000	1980	16-Apr-80	799	12	26
11376000	1980	17-Apr-80	792	12	26
11376000	1980	18-Apr-80	790	12	26
11376000	1980	19-Apr-80	769	12	25
11376000	1980	20-Apr-80	818	17	38

Cottonwood Creek Near Cottonwood

Sediment Discharge

Station ID: 11376000

Basin Area (sq. mi) 927

Latitude 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q(cfs)	C(mg/L)	L(ton/day)
11376000	1980	21-Apr-80	1010	24	65
11376000	1980	22-Apr-80	871	24	56
11376000	1980	23-Apr-80	797	22	47
11376000	1980	24-Apr-80	808	21	46
11376000	1980	25-Apr-80	779	20	42
11376000	1980	26-Apr-80	733	18	36
11376000	1980	27-Apr-80	718	18	35
11376000	1980	28-Apr-80	686	17	31
11376000	1980	29-Apr-80	685	16	30
11376000	1980	30-Apr-80	622	14	24
11376000	1980	01-May-80	617	14	23
11376000	1980	02-May-80	591	14	22
11376000	1980	03-May-80	582	14	22
11376000	1980	04-May-80	572	13	20
11376000	1980	05-May-80	573	13	20
11376000	1980	06-May-80	564	13	20
11376000	1980	07-May-80	533	13	19
11376000	1980	08-May-80	518	12	17
11376000	1980	09-May-80	611	17	28
11376000	1980	10-May-80	714	22	42
11376000	1980	11-May-80	566	17	26
11376000	1980	12-May-80	499	12	16
11376000	1980	13-May-80	476	10	13
11376000	1980	14-May-80	455	10	12
11376000	1980	15-May-80	442	10	12
11376000	1980	16-May-80	421	10	11
11376000	1980	17-May-80	352	10	9.5
11376000	1980	18-May-80	339	10	9.2
11376000	1980	19-May-80	357	10	9.6
11376000	1980	20-May-80	385	10	10
11376000	1980	21-May-80	353	10	9.5
11376000	1980	22-May-80	345	10	9.3
11376000	1980	23-May-80	381	9	9.3
11376000	1980	24-May-80	387	9	9.4
11376000	1980	25-May-80	398	9	9.7
11376000	1980	26-May-80	394	9	9.6
11376000	1980	27-May-80	375	9	9.1
11376000	1980	28-May-80	345	9	8.4
11376000	1980	29-May-80	335	9	8.1
11376000	1980	30-May-80	326	8	7
11376000	1980	31-May-80	342	8	7.4

Label	Description	Units
Q (cfs)	daily mean streamflow	ft ³ /s
C (mg/L)	daily mean SS concentration	mg/L
L (ton/day)	SS discharge	english short tons/day

Size Distribution of Suspended Materials

Cottonwood Creek Near Cottonwood Size Distribution of Suspended Material

Station Number: 11376000

Basin Area (sq.mi):. 927

Latitude:. 402314

Longitude: 1221415

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11376000	27-NOV-62	1000	ND	ND	ND	ND	ND	98	99	100	ND	ND	ND
11376000	03-DEC-62	1300	ND	ND	ND	ND	ND	97	99	100	ND	ND	ND
11376000	19-APR-63	900	ND	ND	ND	ND	ND	98	99	100	ND	ND	ND
11376000	29-MAR-64	1220	ND	ND	ND	ND	ND	78	85	100	ND	ND	ND
11376000	02-NOV-64	830	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11376000	13-NOV-64	1400	ND	ND	ND	ND	ND	49	51	57	80	100	ND
11376000	01-DEC-64	830	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11376000	28-FEB-65	1155	ND	ND	ND	ND	ND	97	100	ND	ND	ND	ND
11376000	03-JAN-77	1445	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11376000	04-FEB-77	1015	ND	ND	ND	ND	ND	77	ND	ND	ND	ND	ND
11376000	03-MAR-77	1355	ND	ND	ND	ND	ND	83	ND	ND	ND	ND	ND
11376000	17-MAR-77	1130	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11376000	22-MAR-77	930	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11376000	08-APR-77	930	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11376000	12-MAY-77	1330	ND	ND	ND	ND	ND	95	ND	ND	ND	ND	ND
11376000	01-JUN-77	845	ND	ND	ND	ND	ND	85	ND	ND	ND	ND	ND
11376000	01-JUN-77	1530	ND	ND	ND	ND	ND	92	ND	ND	ND	ND	ND
11376000	02-AUG-77	1230	ND	ND	ND	ND	ND	81	ND	ND	ND	ND	ND
11376000	07-SEP-77	1305	ND	ND	ND	ND	ND	76	ND	ND	ND	ND	ND
11376000	20-SEP-77	1245	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11376000	21-SEP-77	1500	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11376000	28-NOV-77	1415	ND	ND	ND	ND	ND	98	100	ND	ND	ND	ND
11376000	15-DEC-77	1122	ND	ND	ND	ND	ND	92	93	95	97	100	ND
11376000	20-DEC-77	1430	ND	ND	ND	ND	ND	96	98	100	ND	ND	ND
11376000	19-JAN-78	1445	ND	ND	ND	ND	ND	59	74	90	98	100	ND
11376000	23-JAN-78	1300	ND	ND	ND	ND	ND	55	67	83	97	100	ND
11376000	08-FEB-78	1315	ND	ND	ND	ND	ND	54	65	85	95	99	100
11376000	06-MAR-78	1315	ND	ND	ND	ND	ND	21	25	36	51	78	96
11376000	08-MAR-78	1130	ND	ND	ND	ND	ND	50	66	84	95	99	100

Cottonwood Creek Near Cottonwood Size Distribution of Suspended Material

Station Number: 11376000

Basin Area (sq.mi):. 927

Latitude:. 402314

Longitude: 1221415

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11376000	08-MAR-78	1350	ND	ND	ND	ND	ND	58	75	90	96	99	100
11376000	10-MAR-78	1110	ND	ND	ND	ND	ND	47	58	78	95	100	ND
11376000	11-JAN-79	1630	ND	ND	ND	ND	ND	80	85	91	99	100	ND
11376000	13-JAN-79	925	ND	ND	ND	ND	ND	ND	92	ND	ND	ND	ND
11376000	15-JAN-79	1100	ND	ND	ND	ND	ND	63	71	82	97	100	ND
11376000	13-FEB-79	1400	ND	ND	ND	ND	ND	93	100	ND	ND	ND	ND
11376000	14-FEB-79	1135	ND	ND	ND	ND	ND	75	80	86	96	100	ND
11376000	18-FEB-79	1500	ND	ND	ND	ND	ND	58	65	75	84	95	100
11376000	20-FEB-79	1730	ND	ND	ND	ND	ND	86	96	100	ND	ND	ND
11376000	02-MAR-79	1200	ND	ND	ND	ND	ND	68	74	86	98	100	ND
11376000	06-APR-79	1215	ND	ND	ND	ND	ND	63	76	89	100	ND	ND
11376000	25-APR-79	1130	ND	ND	ND	ND	ND	86	92	98	100	ND	ND
11376000	26-NOV-79	1430	ND	ND	ND	ND	ND	59	60	64	79	98	100
11376000	26-DEC-79	1145	ND	ND	ND	ND	ND	32	34	37	51	90	100
11376000	12-JAN-80	1355	ND	ND	ND	ND	ND	83	88	93	96	98	100
11376000	12-JAN-80	1540	ND	ND	ND	ND	ND	89	94	97	99	100	ND
11376000	13-JAN-80	925	ND	ND	ND	ND	ND	86	92	96	99	100	ND
11376000	15-JAN-80	1145	ND	ND	ND	ND	ND	78	85	93	99	100	ND
11376000	30-JAN-80	1345	ND	ND	ND	ND	ND	ND	ND	86	ND	ND	ND
11376000	05-FEB-80	1525	ND	ND	ND	ND	ND	72	78	89	99	100	ND
11376000	17-FEB-80	1035	ND	ND	ND	ND	ND	71	83	95	99	100	ND
11376000	18-FEB-80	1035	ND	ND	ND	ND	ND	68	83	96	100	ND	ND
11376000	19-FEB-80	1040	ND	ND	ND	ND	ND	61	79	94	99	100	ND
11376000	05-MAR-80	1500	ND	ND	ND	ND	ND	53	70	85	97	100	ND
11376000	12-MAR-80	1430	ND	ND	ND	ND	ND	59	68	79	96	100	ND
11376000	22-JAN-81	1330	ND	ND	ND	ND	ND	50	64	73	90	99	100
11376000	30-JAN-81	1345	ND	ND	ND	ND	ND	63	73	86	95	100	ND
11376000	17-FEB-81	1015	ND	ND	ND	ND	ND	66	73	88	95	99	100
11376000	17-NOV-81	1315	ND	ND	ND	ND	ND	95	97	98	100	ND	ND
11376000	22-DEC-81	1430	ND	ND	ND	ND	ND	39	48	56	71	96	100
11376000	17-FEB-82	1445	ND	ND	ND	ND	ND	67	78	92	98	100	ND
11376000	01-APR-82	1250	ND	ND	ND	ND	ND	47	57	78	97	100	ND
11376000	17-DEC-82	1015	ND	ND	ND	ND	ND	76	87	94	99	100	ND
11376000	25-JAN-83	1415	ND	ND	ND	ND	ND	62	73	87	97	100	ND

Cottonwood Creek Near Cottonwood Size Distribution of Suspended Material

Station Number: 11376000

Basin Area (sq.mi):. 927

Latitude:. 402314

Longitude: 1221415

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11376000	26-JAN-83	1400	ND	ND	ND	ND	ND	67	83	95	99	100	ND
11376000	27-JAN-83	1545	ND	ND	ND	ND	ND	70	87	96	99	100	ND
11376000	03-FEB-83	1115	ND	ND	ND	ND	ND	55	71	86	95	100	ND
11376000	17-MAR-83	1400	ND	ND	ND	ND	ND	48	58	74	94	100	ND
11376000	24-MAR-83	1330	ND	ND	ND	ND	ND	46	55	81	95	100	ND
11376000	05-APR-83	1015	ND	ND	ND	ND	ND	40	47	62	90	98	100
11376000	03-MAY-83	1010	ND	ND	ND	ND	ND	38	43	58	84	97	100
11376000	09-DEC-83	1050	ND	ND	ND	ND	ND	62	80	91	97	100	ND
11376000	04-JAN-84	1200	ND	ND	ND	ND	ND	56	64	74	95	100	ND
11376000	16-NOV-84	1145	ND	ND	ND	ND	ND	56	62	81	97	100	ND
11376000	28-NOV-84	1100	ND	ND	ND	ND	ND	59	65	75	90	97	99
11376000	08-FEB-85	1215	ND	ND	ND	ND	ND	88	91	96	100	ND	ND

Size Distribution of Bed Materials

Cottonwood Creek Near Cottonwood Size Distribution of Bed Material

Station Number: 11376000

Basin Area (sq.mi):. 927

Latitude:.402314

Longitude:. 1221415

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11376000	10-JAN-78	0	1	3	10	19	27	33	43	57	100	100
11376000	10-JAN-78	0	0	2	7	18	30	40	52	66	100	100
11376000	10-JAN-78	0	1	5	24	46	67	83	95	100	100	100
11376000	10-JAN-78	0	0	2	8	13	22	32	44	63	100	100
11376000	10-JAN-78	0	0	0	1	2	11	36	58	75	100	100
11376000	23-JAN-78	ND	ND	ND	11	33	67	100	100	100	100	100
11376000	23-JAN-78	0	1	23	40	45	51	62	83	100	100	100
11376000	23-JAN-78	0	0	1	4	7	10	19	36	70	100	100
11376000	23-JAN-78	0	0	1	9	11	15	22	35	60	100	100
11376000	23-JAN-78	0	0	0	1	1	2	7	23	41	100	100
11376000	08-MAR-78	0	1	2	5	14	37	61	78	88	100	100
11376000	08-MAR-78	0	1	3	15	50	77	90	94	100	100	100
11376000	08-MAR-78	0	0	1	2	8	27	49	65	75	100	100
11376000	08-MAR-78	0	0	1	9	27	36	45	56	71	100	100
11376000	08-MAR-78	2	5	16	46	70	78	84	100	100	100	100
11376000	15-JAN-79	0	1	4	24	37	51	68	86	100	100	100
11376000	15-JAN-79	0	0	1	42	66	81	92	96	100	100	100
11376000	15-JAN-79	0	0	0	2	8	31	56	72	82	100	100
11376000	15-JAN-79	1	3	4	16	34	58	80	100	100	100	100
11376000	15-JAN-79	0	0	0	0	1	3	10	22	50	100	100
11376000	02-MAR-79	0	0	6	20	65	93	98	100	100	100	100
11376000	02-MAR-79	0	0	1	3	25	63	72	74	79	100	100
11376000	02-MAR-79	0	0	0	5	55	91	98	99	100	100	100
11376000	02-MAR-79	0	0	1	18	51	70	90	100	100	100	100
11376000	02-MAR-79	0	1	5	8	14	27	46	65	79	100	100
11376000	05-DEC-79	0	0	1	5	24	53	70	79	87	100	100
11376000	05-DEC-79	0	0	3	25	59	88	94	98	100	100	100
11376000	05-DEC-79	0	0	4	24	56	73	78	82	95	100	100
11376000	05-DEC-79	0	1	4	22	35	40	44	52	66	100	100

Cottonwood Creek Near Cottonwood Size Distribution of Bed Material

Station Number: 11376000

Basin Area (sq.mi):. 927

Latitude:.402314

Longitude:. 1221415

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11376000	26-DEC-79	0	0	0	5	48	93	100	100	100	100	100
11376000	26-DEC-79	0	0	1	17	74	93	99	100	100	100	100
11376000	26-DEC-79	0	0	0	15	65	84	90	95	100	100	100
11376000	26-DEC-79	0	0	0	4	25	41	54	62	63	100	100
11376000	08-JAN-80	0	0	0	3	15	72	92	96	100	100	100
11376000	08-JAN-80	0	0	0	10	26	39	68	92	100	100	100
11376000	08-JAN-80	0	0	1	6	25	43	61	79	100	100	100
11376000	12-JAN-80	0	1	8	27	52	79	99	100	100	100	100
11376000	12-JAN-80	0	0	0	3	23	57	81	93	100	100	100
11376000	12-JAN-80	0	0	0	1	3	8	20	42	75	100	100
11376000	12-JAN-80	0	0	0	1	10	32	47	59	77	100	100
11376000	15-JAN-80	0	0	1	7	38	59	69	76	87	100	100
11376000	15-JAN-80	0	0	0	3	12	20	30	40	54	100	100
11376000	15-JAN-80	0	0	0	1	14	30	43	57	74	100	100
11376000	15-JAN-80	0	0	0	0	1	3	14	40	96	100	100
11376000	05-FEB-80	0	0	1	18	44	54	57	57	59	67	100
11376000	05-FEB-80	0	0	0	18	51	74	88	95	100	100	100
11376000	05-FEB-80	0	1	4	6	11	30	48	73	88	100	100
11376000	17-FEB-80	0	0	2	8	16	22	28	39	55	100	100
11376000	17-FEB-80	0	0	6	17	38	73	90	96	98	100	100
11376000	17-FEB-80	0	0	1	2	7	18	30	45	72	100	100
11376000	17-FEB-80	0	0	0	0	2	11	28	47	80	100	100
11376000	19-FEB-80	0	0	3	18	40	54	67	78	94	100	100
11376000	19-FEB-80	0	1	18	79	91	93	94	95	98	100	100
11376000	19-FEB-80	0	0	0	1	6	14	22	34	50	71	100
11376000	19-FEB-80	0	0	0	1	3	8	20	40	75	100	100
11376000	05-MAR-80	0	0	1	13	40	79	97	99	100	100	100
11376000	05-MAR-80	0	0	0	5	22	41	63	80	89	100	100
11376000	05-MAR-80	0	0	0	2	7	19	37	65	95	100	100
11376000	05-MAR-80	0	0	0	1	2	6	16	37	83	100	100
11376000	16-NOV-84	ND	ND	27	62	76	91	95	96	100	100	100
11376000	16-NOV-84	0	0	1	53	84	91	97	99	100	100	100
11376000	16-NOV-84	ND	ND	ND	24	59	77	89	96	100	100	100

Cottonwood Creek Near Cottonwood Size Distribution of Bed Material

Station Number: 11376000

Basin Area (sq.mi):. 927

Latitude:.402314

Longitude:. 1221415

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11376000	16-NOV-84	0	0	1	5	12	39	74	92	100	100	100
11376000	28-NOV-84	0	0	1	1	1	1	1	1	1	1	100
11376000	28-NOV-84	0	0	1	23	62	75	81	87	97	100	100
11376000	28-NOV-84	0	1	1	4	13	21	29	48	67	100	100
11376000	28-NOV-84	0	0	1	4	19	58	83	94	100	100	100
11376000	08-FEB-85	0	0	2	7	21	44	61	74	79	100	100
11376000	08-FEB-85	0	0	1	20	35	43	54	65	88	100	100
11376000	08-FEB-85	0	0	0	6	19	37	58	74	83	100	100
11376000	08-FEB-85	0	0	0	2	8	21	34	48	66	100	100
11376000	08-FEB-85	0	0	0	0	1	3	20	58	85	100	100
11376000	09-APR-85	0	0	2	20	36	46	57	65	75	100	100
11376000	09-APR-85	ND	ND	ND	28	71	94	99	100	100	100	100
11376000	09-APR-85	ND	ND	ND	19	49	70	83	88	100	100	100
11376000	09-APR-85	0	0	1	4	5	20	56	90	100	100	100

Cottonwood Creek Near Olinda

Sediment Discharge

Size Distribution of Suspended Material

Cottonwood Creek Near Olinda
Sediment Discharge

Station ID: 11375810

Basin Area (sq. mi): 395

Latitude: 402306

Longitude: 1222831

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1977	20-Jan-77	39	1	0.11
11375810	1977	21-Jan-77	40	1	0.11
11375810	1977	22-Jan-77	41	2	0.22
11375810	1977	23-Jan-77	42	2	0.23
11375810	1977	24-Jan-77	40	2	0.22
11375810	1977	25-Jan-77	37	2	0.2
11375810	1977	26-Jan-77	35	3	0.28
11375810	1977	27-Jan-77	35	3	0.28
11375810	1977	28-Jan-77	35	2	0.19
11375810	1977	29-Jan-77	35	2	0.19
11375810	1977	30-Jan-77	32	1	0.09
11375810	1977	31-Jan-77	30	1	0.08
11375810	1977	01-Feb-77	31	2	0.17
11375810	1977	02-Feb-77	32	3	0.26
11375810	1977	03-Feb-77	31	3	0.25
11375810	1977	04-Feb-77	30	3	0.24
11375810	1977	05-Feb-77	30	2	0.16
11375810	1977	06-Feb-77	30	1	0.08
11375810	1977	07-Feb-77	30	1	0.08
11375810	1977	08-Feb-77	36	1	0.1
11375810	1977	09-Feb-77	47	1	0.13
11375810	1977	10-Feb-77	48	1	0.13
11375810	1977	11-Feb-77	39	1	0.11
11375810	1977	12-Feb-77	73	9	1.9
11375810	1977	13-Feb-77	64	4	0.69
11375810	1977	14-Feb-77	63	3	0.51
11375810	1977	15-Feb-77	57	2	0.31
11375810	1977	16-Feb-77	32	2	0.17
11375810	1977	17-Feb-77	29	3	0.23
11375810	1977	18-Feb-77	27	4	0.29
11375810	1977	19-Feb-77	26	2	0.14
11375810	1977	20-Feb-77	26	1	0.07
11375810	1977	21-Feb-77	37	3	0.3
11375810	1977	22-Feb-77	87	10	2.4
11375810	1977	23-Feb-77	78	4	0.84
11375810	1977	24-Feb-77	79	3	0.64
11375810	1977	25-Feb-77	65	2	0.35
11375810	1977	26-Feb-77	53	2	0.29
11375810	1977	27-Feb-77	47	4	0.51
11375810	1977	28-Feb-77	43	7	0.81
11375810	1977	01-Mar-77	40	7	0.76
11375810	1977	02-Mar-77	40	4	0.43
11375810	1977	03-Mar-77	37	3	0.3

Cottonwood Creek Near Olinda
Sediment Discharge

Station ID: 11375810

Basin Area (sq. mi): 395

Latitude: 402306

Longitude: 1222831

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1977	04-Mar-77	35	3	0.28
11375810	1977	05-Mar-77	35	3	0.28
11375810	1977	06-Mar-77	30	2	0.16
11375810	1977	07-Mar-77	30	1	0.08
11375810	1977	08-Mar-77	30	1	0.08
11375810	1977	09-Mar-77	34	1	0.09
11375810	1977	10-Mar-77	56	5	0.74
11375810	1977	11-Mar-77	53	8	1.1
11375810	1977	12-Mar-77	40	15	1.6
11375810	1977	13-Mar-77	39	9	0.95
11375810	1977	14-Mar-77	40	2	0.22
11375810	1977	15-Mar-77	50	6	0.97
11375810	1977	16-Mar-77	334	656	727
11375810	1977	17-Mar-77	227	212	165
11375810	1977	18-Mar-77	118	23	7.3
11375810	1977	19-Mar-77	98	11	2.9
11375810	1977	20-Mar-77	91	7	1.7
11375810	1977	21-Mar-77	87	5	1.2
11375810	1977	22-Mar-77	85	5	1.1
11375810	1977	23-Mar-77	94	10	2.5
11375810	1977	24-Mar-77	105	27	7.7
11375810	1977	25-Mar-77	104	28	7.9
11375810	1977	26-Mar-77	88	20	4.8
11375810	1977	27-Mar-77	81	14	3.1
11375810	1977	28-Mar-77	83	11	2.5
11375810	1977	29-Mar-77	80	10	2.2
11375810	1977	30-Mar-77	75	11	2.2
11375810	1977	31-Mar-77	68	13	2.4
11375810	1977	01-Apr-77	56	15	2.3
11375810	1977	02-Apr-77	50	14	1.9
11375810	1977	03-Apr-77	48	10	1.3
11375810	1977	04-Apr-77	45	6	0.73
11375810	1977	05-Apr-77	49	4	0.53
11375810	1977	06-Apr-77	61	4	0.66
11375810	1977	07-Apr-77	62	4	0.67
11375810	1977	08-Apr-77	67	7	1.2
11375810	1977	09-Apr-77	68	10	1.8
11375810	1977	10-Apr-77	53	9	1.3
11375810	1977	11-Apr-77	42	8	0.91
11375810	1977	12-Apr-77	35	8	0.76
11375810	1977	13-Apr-77	32	8	0.69
11375810	1977	14-Apr-77	50	8	1.1
11375810	1977	15-Apr-77	95	7	1.8

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Station ID: 11375810

Basin Area (sq. mi): 395

Latitude: 402306

Longitude: 1222831

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1977	16-Apr-77	98	7	1.9
11375810	1977	17-Apr-77	52	6	0.84
11375810	1977	18-Apr-77	37	4	0.4
11375810	1977	19-Apr-77	29	2	0.16
11375810	1977	20-Apr-77	27	2	0.15
11375810	1977	21-Apr-77	30	3	0.24
11375810	1977	22-Apr-77	26	5	0.35
11375810	1977	23-Apr-77	22	8	0.48
11375810	1977	24-Apr-77	18	10	0.49
11375810	1977	25-Apr-77	19	9	0.46
11375810	1977	26-Apr-77	22	6	0.36
11375810	1977	27-Apr-77	24	3	0.19
11375810	1977	28-Apr-77	22	2	0.12
11375810	1977	29-Apr-77	22	2	0.12
11375810	1977	30-Apr-77	27	3	0.22
11375810	1977	01-May-77	57	28	7.1
11375810	1977	02-May-77	131	124	44
11375810	1977	03-May-77	84	45	11
11375810	1977	04-May-77	52	10	1.4
11375810	1977	05-May-77	34	7	0.64
11375810	1977	06-May-77	30	6	0.49
11375810	1977	07-May-77	28	6	0.45
11375810	1977	08-May-77	26	6	0.42
11375810	1977	09-May-77	29	6	0.47
11375810	1977	10-May-77	86	59	15
11375810	1977	11-May-77	138	178	69
11375810	1977	12-May-77	155	60	27
11375810	1977	13-May-77	106	8	2.3
11375810	1977	14-May-77	88	6	1.4
11375810	1977	15-May-77	64	5	0.86
11375810	1977	16-May-77	54	4	0.58
11375810	1977	17-May-77	50	4	0.54
11375810	1977	18-May-77	51	4	0.55
11375810	1977	19-May-77	64	4	0.69
11375810	1977	20-May-77	51	4	0.55
11375810	1977	21-May-77	43	4	0.46
11375810	1977	22-May-77	52	6	1.1
11375810	1977	23-May-77	67	7	1.3
11375810	1977	24-May-77	59	4	0.64
11375810	1977	25-May-77	46	4	0.5
11375810	1977	26-May-77	55	4	0.59
11375810	1977	27-May-77	71	6	1.2
11375810	1977	28-May-77	54	6	0.87

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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1977	29-May-77	42	4	0.45
11375810	1977	30-May-77	39	3	0.32
11375810	1977	31-May-77	39	2	0.21
11375810	1978	01-Oct-77	43	10	1.2
11375810	1978	02-Oct-77	30	8	0.65
11375810	1978	03-Oct-77	26	7	0.49
11375810	1978	04-Oct-77	25	7	0.47
11375810	1978	05-Oct-77	23	7	0.43
11375810	1978	06-Oct-77	23	6	0.37
11375810	1978	07-Oct-77	23	6	0.37
11375810	1978	08-Oct-77	22	6	0.36
11375810	1978	09-Oct-77	22	6	0.36
11375810	1978	10-Oct-77	20	6	0.32
11375810	1978	11-Oct-77	17	5	0.23
11375810	1978	12-Oct-77	11	4	0.12
11375810	1978	13-Oct-77	9.4	3	0.08
11375810	1978	14-Oct-77	9.1	3	0.07
11375810	1978	15-Oct-77	10	4	0.11
11375810	1978	16-Oct-77	11	4	0.12
11375810	1978	17-Oct-77	11	4	0.12
11375810	1978	18-Oct-77	9.9	3	0.08
11375810	1978	19-Oct-77	10	4	0.11
11375810	1978	20-Oct-77	10	4	0.11
11375810	1978	21-Oct-77	9.7	3	0.1
11375810	1978	22-Oct-77	10	3	0.1
11375810	1978	23-Oct-77	9.3	3	0.1
11375810	1978	24-Oct-77	9.7	3	0.1
11375810	1978	25-Oct-77	11	4	0.1
11375810	1978	26-Oct-77	12	4	0.1
11375810	1978	27-Oct-77	13	4	0.1
11375810	1978	28-Oct-77	16	5	0.2
11375810	1978	29-Oct-77	20	5	0.3
11375810	1978	30-Oct-77	33	6	0.5
11375810	1978	31-Oct-77	29	8	0.6
11375810	1978	01-Nov-77	23	6	0.4
11375810	1978	02-Nov-77	19	5	0.3
11375810	1978	03-Nov-77	18	4	0.2
11375810	1978	04-Nov-77	19	9	0.5
11375810	1978	05-Nov-77	31	5	0.4
11375810	1978	06-Nov-77	46	2	0.3
11375810	1978	07-Nov-77	36	4	0.4
11375810	1978	08-Nov-77	27	6	0.4
11375810	1978	09-Nov-77	26	3	0.2

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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1978	10-Nov-77	22	3	0.2
11375810	1978	11-Nov-77	22	8	0.5
11375810	1978	12-Nov-77	22	9	0.5
11375810	1978	13-Nov-77	23	2	0.1
11375810	1978	14-Nov-77	24	2	0.1
11375810	1978	15-Nov-77	21	3	0.2
11375810	1978	16-Nov-77	21	2	0.1
11375810	1978	17-Nov-77	20	3	0.2
11375810	1978	18-Nov-77	19	3	0.2
11375810	1978	19-Nov-77	18	7	0.3
11375810	1978	20-Nov-77	18	16	0.8
11375810	1978	21-Nov-77	36	20	1.9
11375810	1978	22-Nov-77	369	418	681
11375810	1978	23-Nov-77	508	1100	2790
11375810	1978	24-Nov-77	300	115	93
11375810	1978	25-Nov-77	292	90	71
11375810	1978	26-Nov-77	254	32	22
11375810	1978	27-Nov-77	264	11	7.8
11375810	1978	28-Nov-77	190	9	4.6
11375810	1978	29-Nov-77	150	10	4.1
11375810	1978	30-Nov-77	138	12	4.5
11375810	1978	01-Dec-77	129	8	2.8
11375810	1978	02-Dec-77	111	8	2.4
11375810	1978	03-Dec-77	100	9	2.4
11375810	1978	04-Dec-77	91	7	1.7
11375810	1978	05-Dec-77	88	4	1
11375810	1978	06-Dec-77	83	3	0.7
11375810	1978	07-Dec-77	77	7	1.5
11375810	1978	08-Dec-77	74	5	1
11375810	1978	09-Dec-77	66	3	0.5
11375810	1978	10-Dec-77	61	2	0.3
11375810	1978	11-Dec-77	76	9	2.6
11375810	1978	12-Dec-77	193	60	32
11375810	1978	13-Dec-77	151	22	9.4
11375810	1978	14-Dec-77	2240	1940	14600
11375810	1978	15-Dec-77	2330	2000	16700
11375810	1978	16-Dec-77	1340	753	7500
11375810	1978	17-Dec-77	2310	1940	21700
11375810	1978	18-Dec-77	839	160	337
11375810	1978	19-Dec-77	562	60	79
11375810	1978	20-Dec-77	449	34	35
11375810	1978	21-Dec-77	410	235	215
11375810	1978	22-Dec-77	1180	1030	7890

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1978	23-Dec-77	2850	2270	30700
11375810	1978	24-Dec-77	1040	314	882
11375810	1978	25-Dec-77	703	122	232
11375810	1978	26-Dec-77	566	67	102
11375810	1978	27-Dec-77	764	107	221
11375810	1978	28-Dec-77	789	116	247
11375810	1978	29-Dec-77	732	93	184
11375810	1978	30-Dec-77	681	69	127
11375810	1978	31-Dec-77	570	59	91
11375810	1978	01-Jan-78	494	119	159
11375810	1978	02-Jan-78	803	276	693
11375810	1978	03-Jan-78	959	207	536
11375810	1978	04-Jan-78	2390	1860	21700
11375810	1978	05-Jan-78	4100	3080	41300
11375810	1978	06-Jan-78	1790	500	2420
11375810	1978	07-Jan-78	1140	412	1270
11375810	1978	08-Jan-78	1550	794	3790
11375810	1978	09-Jan-78	5730	1950	38900
11375810	1978	10-Jan-78	2940	450	3570
11375810	1978	11-Jan-78	2190	225	1330
11375810	1978	12-Jan-78	2050	180	996
11375810	1978	13-Jan-78	4080	1030	12300
11375810	1978	14-Jan-78	6650	2180	52300
11375810	1978	15-Jan-78	6250	1250	21900
11375810	1978	16-Jan-78	10100	3600	113000
11375810	1978	17-Jan-78	7000	1420	29900
11375810	1978	18-Jan-78	5330	1170	19800
11375810	1978	19-Jan-78	5640	1410	24800
11375810	1978	20-Jan-78	3600	438	4260
11375810	1978	21-Jan-78	2710	292	2140
11375810	1978	22-Jan-78	2160	285	1660
11375810	1978	23-Jan-78	1800	270	1310
11375810	1978	24-Jan-78	1580	145	619
11375810	1978	25-Jan-78	1400	90	340
11375810	1978	26-Jan-78	1260	191	650
11375810	1978	27-Jan-78	1150	374	1160
11375810	1978	28-Jan-78	1060	224	641
11375810	1978	29-Jan-78	981	91	241
11375810	1978	30-Jan-78	920	50	124
11375810	1978	31-Jan-78	864	37	86
11375810	1978	01-Feb-78	871	46	108
11375810	1978	02-Feb-78	934	83	209
11375810	1978	03-Feb-78	825	55	123

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1978	04-Feb-78	765	29	60
11375810	1978	05-Feb-78	2000	1620	11200
11375810	1978	06-Feb-78	2360	1510	9860
11375810	1978	07-Feb-78	4300	1770	26200
11375810	1978	08-Feb-78	3860	1090	13200
11375810	1978	09-Feb-78	3480	1380	13300
11375810	1978	10-Feb-78	2590	756	5290
11375810	1978	11-Feb-78	2190	288	1700
11375810	1978	12-Feb-78	2790	2430	20000
11375810	1978	13-Feb-78	2260	468	2860
11375810	1978	14-Feb-78	1960	250	1320
11375810	1978	15-Feb-78	1770	86	411
11375810	1978	16-Feb-78	1600	54	233
11375810	1978	17-Feb-78	1490	106	426
11375810	1978	18-Feb-78	1390	202	758
11375810	1978	19-Feb-78	1340	154	557
11375810	1978	20-Feb-78	1300	115	404
11375810	1978	21-Feb-78	1260	86	293
11375810	1978	22-Feb-78	1190	67	215
11375810	1978	23-Feb-78	1120	50	151
11375810	1978	24-Feb-78	1050	62	176
11375810	1978	25-Feb-78	987	62	165
11375810	1978	26-Feb-78	911	34	84
11375810	1978	27-Feb-78	843	17	39
11375810	1978	28-Feb-78	782	19	40
11375810	1978	01-Mar-78	727	13	26
11375810	1978	02-Mar-78	1200	77	434
11375810	1978	03-Mar-78	1470	179	766
11375810	1978	04-Mar-78	3860	823	9470
11375810	1978	05-Mar-78	2930	1280	10400
11375810	1978	06-Mar-78	2300	1350	8380
11375810	1978	07-Mar-78	2040	476	2650
11375810	1978	08-Mar-78	6680	1140	23400
11375810	1978	09-Mar-78	5680	1250	20800
11375810	1978	10-Mar-78	3560	374	3590
11375810	1978	11-Mar-78	2710	176	1290
11375810	1978	12-Mar-78	2160	114	665
11375810	1978	13-Mar-78	1870	220	1110
11375810	1978	14-Mar-78	1670	251	1130
11375810	1978	15-Mar-78	1450	223	873
11375810	1978	16-Mar-78	1340	132	478
11375810	1978	17-Mar-78	1240	57	191
11375810	1978	18-Mar-78	1160	69	216

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1978	19-Mar-78	1080	79	230
11375810	1978	20-Mar-78	1010	40	109
11375810	1978	21-Mar-78	1030	33	92
11375810	1978	22-Mar-78	1100	49	146
11375810	1978	23-Mar-78	1040	30	84
11375810	1978	24-Mar-78	969	18	47
11375810	1978	25-Mar-78	897	21	51
11375810	1978	26-Mar-78	830	26	58
11375810	1978	27-Mar-78	756	28	57
11375810	1978	28-Mar-78	731	18	36
11375810	1978	29-Mar-78	714	18	35
11375810	1978	30-Mar-78	743	26	52
11375810	1978	31-Mar-78	1190	358	2280
11375810	1978	01-Apr-78	1890	419	2410
11375810	1978	02-Apr-78	1150	100	310
11375810	1978	03-Apr-78	1070	34	98
11375810	1978	04-Apr-78	1060	28	80
11375810	1978	05-Apr-78	1030	92	256
11375810	1978	06-Apr-78	2160	258	1700
11375810	1978	07-Apr-78	1630	172	757
11375810	1978	08-Apr-78	1350	114	416
11375810	1978	09-Apr-78	1200	48	156
11375810	1978	10-Apr-78	1100	34	101
11375810	1978	11-Apr-78	1020	25	69
11375810	1978	12-Apr-78	959	19	49
11375810	1978	13-Apr-78	916	21	52
11375810	1978	14-Apr-78	898	17	41
11375810	1978	15-Apr-78	992	25	67
11375810	1978	16-Apr-78	911	33	81
11375810	1978	17-Apr-78	828	15	34
11375810	1978	18-Apr-78	788	13	28
11375810	1978	19-Apr-78	776	14	29
11375810	1978	20-Apr-78	776	12	25
11375810	1978	21-Apr-78	729	13	26
11375810	1978	22-Apr-78	693	17	32
11375810	1978	23-Apr-78	659	25	44
11375810	1978	24-Apr-78	620	63	105
11375810	1978	25-Apr-78	1110	129	421
11375810	1978	26-Apr-78	1290	108	435
11375810	1978	27-Apr-78	916	28	69
11375810	1978	28-Apr-78	821	18	40
11375810	1978	29-Apr-78	756	12	24
11375810	1978	30-Apr-78	712	11	21

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1978	01-May-78	671	12	22
11375810	1978	02-May-78	649	12	21
11375810	1978	03-May-78	610	12	20
11375810	1978	04-May-78	589	11	17
11375810	1978	05-May-78	580	9	14
11375810	1978	06-May-78	558	8	12
11375810	1978	07-May-78	536	9	13
11375810	1978	08-May-78	516	8	11
11375810	1978	09-May-78	502	12	16
11375810	1978	10-May-78	490	11	15
11375810	1978	11-May-78	469	8	10
11375810	1978	12-May-78	457	6	7.4
11375810	1978	13-May-78	447	5	6
11375810	1978	14-May-78	437	6	7.1
11375810	1978	15-May-78	438	5	5.9
11375810	1978	16-May-78	424	6	6.9
11375810	1978	17-May-78	397	22	24
11375810	1978	18-May-78	382	24	25
11375810	1978	19-May-78	361	25	24
11375810	1978	20-May-78	330	26	23
11375810	1978	21-May-78	321	26	23
11375810	1978	22-May-78	311	23	19
11375810	1978	23-May-78	284	12	9.2
11375810	1978	24-May-78	280	7	5.3
11375810	1978	25-May-78	279	6	4.5
11375810	1978	26-May-78	268	6	4.3
11375810	1978	27-May-78	256	8	5.5
11375810	1978	28-May-78	243	10	6.6
11375810	1978	29-May-78	236	9	5.7
11375810	1978	30-May-78	226	5	3.1
11375810	1978	31-May-78	220	2	1.2
11375810	1979	01-Nov-78	26	0	0
11375810	1979	02-Nov-78	27	2	0.15
11375810	1979	03-Nov-78	27	4	0.29
11375810	1979	04-Nov-78	26	5	0.35
11375810	1979	05-Nov-78	25	4	0.27
11375810	1979	06-Nov-78	24	4	0.26
11375810	1979	07-Nov-78	22	4	0.24
11375810	1979	08-Nov-78	22	4	0.24
11375810	1979	09-Nov-78	22	4	0.24
11375810	1979	10-Nov-78	21	5	0.28
11375810	1979	11-Nov-78	22	6	0.36
11375810	1979	12-Nov-78	23	6	0.37

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1979	13-Nov-78	35	7	0.66
11375810	1979	14-Nov-78	36	8	0.78
11375810	1979	15-Nov-78	34	5	0.46
11375810	1979	16-Nov-78	30	4	0.32
11375810	1979	17-Nov-78	31	4	0.33
11375810	1979	18-Nov-78	31	3	0.25
11375810	1979	19-Nov-78	38	3	0.31
11375810	1979	20-Nov-78	81	5	1.1
11375810	1979	21-Nov-78	125	10	3.4
11375810	1979	22-Nov-78	116	8	2.5
11375810	1979	23-Nov-78	81	4	0.87
11375810	1979	24-Nov-78	74	2	0.4
11375810	1979	25-Nov-78	66	2	0.36
11375810	1979	26-Nov-78	61	2	0.33
11375810	1979	27-Nov-78	59	2	0.32
11375810	1979	28-Nov-78	58	2	0.31
11375810	1979	29-Nov-78	56	1	0.15
11375810	1979	30-Nov-78	57	1	0.15
11375810	1979	01-Dec-78	64	1	0.17
11375810	1979	02-Dec-78	66	1	0.18
11375810	1979	03-Dec-78	61	1	0.16
11375810	1979	04-Dec-78	52	1	0.14
11375810	1979	05-Dec-78	57	1	0.15
11375810	1979	06-Dec-78	59	1	0.16
11375810	1979	07-Dec-78	52	1	0.14
11375810	1979	08-Dec-78	48	1	0.13
11375810	1979	09-Dec-78	63	1	0.17
11375810	1979	10-Dec-78	59	1	0.16
11375810	1979	11-Dec-78	59	1	0.16
11375810	1979	12-Dec-78	59	2	0.32
11375810	1979	13-Dec-78	59	2	0.32
11375810	1979	14-Dec-78	60	2	0.32
11375810	1979	15-Dec-78	59	2	0.32
11375810	1979	16-Dec-78	59	2	0.32
11375810	1979	17-Dec-78	57	2	0.31
11375810	1979	18-Dec-78	57	2	0.31
11375810	1979	19-Dec-78	59	2	0.32
11375810	1979	20-Dec-78	53	3	0.43
11375810	1979	21-Dec-78	55	3	0.45
11375810	1979	22-Dec-78	60	3	0.49
11375810	1979	23-Dec-78	50	2	0.27
11375810	1979	24-Dec-78	49	2	0.26
11375810	1979	25-Dec-78	46	2	0.25

Cottonwood Creek Near Olinda
Sediment Discharge

Station ID: 11375810

Basin Area (sq. mi): 395

Latitude: 402306

Longitude: 1222831

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1979	26-Dec-78	46	2	0.25
11375810	1979	27-Dec-78	46	2	0.25
11375810	1979	28-Dec-78	42	2	0.23
11375810	1979	29-Dec-78	36	2	0.19
11375810	1979	30-Dec-78	29	2	0.16
11375810	1979	31-Dec-78	28	3	0.23
11375810	1979	01-Jan-79	32	2	0.17
11375810	1979	02-Jan-79	42	2	0.23
11375810	1979	03-Jan-79	50	2	0.27
11375810	1979	04-Jan-79	47	3	0.4
11375810	1979	05-Jan-79	46	4	0.5
11375810	1979	06-Jan-79	45	4	0.5
11375810	1979	07-Jan-79	48	4	0.5
11375810	1979	08-Jan-79	106	6	1.7
11375810	1979	09-Jan-79	162	8	3.5
11375810	1979	10-Jan-79	313	46	86
11375810	1979	11-Jan-79	1930	548	3570
11375810	1979	12-Jan-79	588	95	151
11375810	1979	13-Jan-79	323	15	13
11375810	1979	14-Jan-79	879	271	1420
11375810	1979	15-Jan-79	1640	553	3270
11375810	1979	16-Jan-79	532	105	151
11375810	1979	17-Jan-79	344	54	50
11375810	1979	18-Jan-79	253	24	16
11375810	1979	19-Jan-79	199	10	5.4
11375810	1979	20-Jan-79	162	6	2.6
11375810	1979	21-Jan-79	148	5	2
11375810	1979	22-Jan-79	136	4	1.5
11375810	1979	23-Jan-79	135	4	1.5
11375810	1979	24-Jan-79	120	3	1
11375810	1979	25-Jan-79	114	3	0.9
11375810	1979	26-Jan-79	104	3	0.8
11375810	1979	27-Jan-79	97	3	0.8
11375810	1979	28-Jan-79	97	3	0.8
11375810	1979	29-Jan-79	83	2	0.5
11375810	1979	30-Jan-79	88	2	0.5
11375810	1979	31-Jan-79	97	2	0.5
11375810	1979	01-Feb-79	90	2	0.5
11375810	1979	02-Feb-79	85	2	0.5
11375810	1979	03-Feb-79	79	2	0.4
11375810	1979	04-Feb-79	82	2	0.4
11375810	1979	05-Feb-79	81	2	0.4
11375810	1979	06-Feb-79	78	2	0.4

Cottonwood Creek Near Olinda
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Station ID: 11375810

Basin Area (sq. mi): 395

Latitude: 402306

Longitude: 1222831

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1979	07-Feb-79	71	2	0.4
11375810	1979	08-Feb-79	68	2	0.4
11375810	1979	09-Feb-79	68	3	0.6
11375810	1979	10-Feb-79	71	3	0.6
11375810	1979	11-Feb-79	79	3	0.6
11375810	1979	12-Feb-79	102	4	1.1
11375810	1979	13-Feb-79	2040	1090	7550
11375810	1979	14-Feb-79	1860	594	4200
11375810	1979	15-Feb-79	982	144	491
11375810	1979	16-Feb-79	1210	234	865
11375810	1979	17-Feb-79	717	90	174
11375810	1979	18-Feb-79	2030	590	4630
11375810	1979	19-Feb-79	1080	85	248
11375810	1979	20-Feb-79	2550	1100	12200
11375810	1979	21-Feb-79	1710	216	997
11375810	1979	22-Feb-79	1470	187	812
11375810	1979	23-Feb-79	1130	170	552
11375810	1979	24-Feb-79	803	71	154
11375810	1979	25-Feb-79	652	30	53
11375810	1979	26-Feb-79	724	130	254
11375810	1979	27-Feb-79	618	112	187
11375810	1979	28-Feb-79	849	123	299
11375810	1979	01-Mar-79	921	57	142
11375810	1979	02-Mar-79	714	34	66
11375810	1979	03-Mar-79	632	16	27
11375810	1979	04-Mar-79	562	10	15
11375810	1979	05-Mar-79	540	10	15
11375810	1979	06-Mar-79	686	60	115
11375810	1979	07-Mar-79	843	88	201
11375810	1979	08-Mar-79	817	71	157
11375810	1979	09-Mar-79	745	53	107
11375810	1979	10-Mar-79	665	35	63
11375810	1979	11-Mar-79	621	19	32
11375810	1979	12-Mar-79	601	12	19
11375810	1979	13-Mar-79	552	9	13
11375810	1979	14-Mar-79	521	9	13
11375810	1979	15-Mar-79	646	25	44
11375810	1979	16-Mar-79	1040	95	293
11375810	1979	17-Mar-79	1260	162	684
11375810	1979	18-Mar-79	979	61	161
11375810	1979	19-Mar-79	809	44	96
11375810	1979	20-Mar-79	690	30	56
11375810	1979	21-Mar-79	836	88	427

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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1979	22-Mar-79	841	85	260
11375810	1979	23-Mar-79	610	20	33
11375810	1979	24-Mar-79	545	19	28
11375810	1979	25-Mar-79	511	18	25
11375810	1979	26-Mar-79	497	18	24
11375810	1979	27-Mar-79	2290	670	5620
11375810	1979	28-Mar-79	1470	64	254
11375810	1979	29-Mar-79	1090	48	141
11375810	1979	30-Mar-79	896	39	94
11375810	1979	31-Mar-79	774	32	67
11375810	1979	01-Apr-79	686	27	50
11375810	1979	02-Apr-79	622	20	34
11375810	1979	03-Apr-79	572	13	20
11375810	1979	04-Apr-79	536	13	19
11375810	1979	05-Apr-79	515	10	14
11375810	1979	06-Apr-79	547	10	15
11375810	1979	07-Apr-79	511	10	14
11375810	1979	08-Apr-79	477	10	13
11375810	1979	09-Apr-79	450	10	12
11375810	1979	10-Apr-79	420	10	11
11375810	1979	11-Apr-79	385	10	10
11375810	1979	12-Apr-79	362	10	9.8
11375810	1979	13-Apr-79	349	10	9.4
11375810	1979	14-Apr-79	337	10	9.1
11375810	1979	15-Apr-79	325	10	8.8
11375810	1979	16-Apr-79	329	10	8.9
11375810	1979	17-Apr-79	325	9	7.9
11375810	1979	18-Apr-79	303	8	6.5
11375810	1979	19-Apr-79	290	7	5.5
11375810	1979	20-Apr-79	279	7	5.3
11375810	1979	21-Apr-79	264	6	4.3
11375810	1979	22-Apr-79	272	10	7.3
11375810	1979	23-Apr-79	523	86	237
11375810	1979	24-Apr-79	745	138	341
11375810	1979	25-Apr-79	443	17	20
11375810	1979	26-Apr-79	460	17	21
11375810	1979	27-Apr-79	657	47	83
11375810	1979	28-Apr-79	582	22	35
11375810	1979	29-Apr-79	528	12	17
11375810	1979	30-Apr-79	492	11	15
11375810	1979	01-May-79	488	15	20
11375810	1979	02-May-79	452	10	12
11375810	1979	03-May-79	405	9	9.8

Cottonwood Creek Near Olinda
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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1979	04-May-79	385	9	9.4
11375810	1979	05-May-79	452	17	21
11375810	1979	06-May-79	518	12	17
11375810	1979	07-May-79	588	27	43
11375810	1979	08-May-79	560	17	26
11375810	1979	09-May-79	511	13	18
11375810	1979	10-May-79	476	12	15
11375810	1979	11-May-79	444	11	13
11375810	1979	12-May-79	418	10	11
11375810	1979	13-May-79	394	10	11
11375810	1979	14-May-79	380	9	9.2
11375810	1979	15-May-79	367	8	7.9
11375810	1979	16-May-79	339	8	7.3
11375810	1979	17-May-79	320	8	6.9
11375810	1979	18-May-79	309	8	6.7
11375810	1979	19-May-79	295	8	6.4
11375810	1979	20-May-79	282	8	6.1
11375810	1979	21-May-79	274	8	5.9
11375810	1979	22-May-79	264	8	5.7
11375810	1979	23-May-79	257	7	4.9
11375810	1979	24-May-79	250	7	4.7
11375810	1979	25-May-79	230	7	4.3
11375810	1979	26-May-79	212	6	3.4
11375810	1979	27-May-79	197	6	3.2
11375810	1979	28-May-79	188	5	2.5
11375810	1979	29-May-79	180	4	1.9
11375810	1979	30-May-79	173	3	1.4
11375810	1979	31-May-79	163	3	1.3
11375810	1980	01-Nov-79	57	11	1.7
11375810	1980	02-Nov-79	55	11	1.6
11375810	1980	03-Nov-79	175	64	60
11375810	1980	04-Nov-79	241	35	25
11375810	1980	05-Nov-79	171	12	5.5
11375810	1980	06-Nov-79	506	145	274
11375810	1980	07-Nov-79	537	38	58
11375810	1980	08-Nov-79	339	14	13
11375810	1980	09-Nov-79	240	9	5.8
11375810	1980	10-Nov-79	194	8	4.2
11375810	1980	11-Nov-79	164	6	2.7
11375810	1980	12-Nov-79	146	4	1.6
11375810	1980	13-Nov-79	131	3	1.1
11375810	1980	14-Nov-79	120	3	0.97
11375810	1980	15-Nov-79	112	3	0.91

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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1980	16-Nov-79	582	139	470
11375810	1980	17-Nov-79	988	89	300
11375810	1980	18-Nov-79	445	6	7.2
11375810	1980	19-Nov-79	303	5	4.1
11375810	1980	20-Nov-79	242	5	3.3
11375810	1980	21-Nov-79	210	4	2.3
11375810	1980	22-Nov-79	382	44	114
11375810	1980	23-Nov-79	590	62	120
11375810	1980	24-Nov-79	809	119	298
11375810	1980	25-Nov-79	844	69	164
11375810	1980	26-Nov-79	759	69	150
11375810	1980	27-Nov-79	545	29	43
11375810	1980	28-Nov-79	426	15	17
11375810	1980	29-Nov-79	348	8	7.5
11375810	1980	30-Nov-79	304	6	4.9
11375810	1980	01-Dec-79	275	5	3.7
11375810	1980	02-Dec-79	256	4	2.8
11375810	1980	03-Dec-79	241	4	2.6
11375810	1980	04-Dec-79	224	3	1.8
11375810	1980	05-Dec-79	210	3	1.7
11375810	1980	06-Dec-79	196	3	1.6
11375810	1980	07-Dec-79	184	3	1.5
11375810	1980	08-Dec-79	175	3	1.4
11375810	1980	09-Dec-79	166	2	0.9
11375810	1980	10-Dec-79	157	2	0.9
11375810	1980	11-Dec-79	142	2	0.8
11375810	1980	12-Dec-79	136	2	0.7
11375810	1980	13-Dec-79	131	2	0.7
11375810	1980	14-Dec-79	126	2	0.7
11375810	1980	15-Dec-79	121	2	0.7
11375810	1980	16-Dec-79	117	2	0.6
11375810	1980	17-Dec-79	114	2	0.6
11375810	1980	18-Dec-79	111	2	0.6
11375810	1980	19-Dec-79	121	5	1.6
11375810	1980	20-Dec-79	163	7	3.1
11375810	1980	21-Dec-79	309	24	23
11375810	1980	22-Dec-79	276	15	11
11375810	1980	23-Dec-79	1650	472	4740
11375810	1980	24-Dec-79	2290	431	3110
11375810	1980	25-Dec-79	1030	150	417
11375810	1980	26-Dec-79	726	60	118
11375810	1980	27-Dec-79	518	37	52
11375810	1980	28-Dec-79	415	26	29

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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1980	29-Dec-79	365	23	23
11375810	1980	30-Dec-79	1620	1020	7560
11375810	1980	31-Dec-79	1390	309	1190
11375810	1980	01-Jan-80	1050	167	473
11375810	1980	02-Jan-80	801	69	149
11375810	1980	03-Jan-80	656	45	80
11375810	1980	04-Jan-80	590	31	49
11375810	1980	05-Jan-80	557	28	42
11375810	1980	06-Jan-80	560	27	41
11375810	1980	07-Jan-80	550	24	36
11375810	1980	08-Jan-80	519	22	31
11375810	1980	09-Jan-80	491	22	29
11375810	1980	10-Jan-80	558	26	39
11375810	1980	11-Jan-80	614	40	66
11375810	1980	12-Jan-80	2940	1140	10700
11375810	1980	13-Jan-80	5340	1630	26000
11375810	1980	14-Jan-80	4520	956	12300
11375810	1980	15-Jan-80	2850	477	3670
11375810	1980	16-Jan-80	2160	304	1770
11375810	1980	17-Jan-80	1640	199	881
11375810	1980	18-Jan-80	1330	133	478
11375810	1980	19-Jan-80	1140	110	339
11375810	1980	20-Jan-80	997	94	253
11375810	1980	21-Jan-80	884	55	131
11375810	1980	22-Jan-80	797	27	58
11375810	1980	23-Jan-80	720	19	37
11375810	1980	24-Jan-80	660	17	30
11375810	1980	25-Jan-80	613	14	23
11375810	1980	26-Jan-80	569	12	18
11375810	1980	27-Jan-80	532	10	14
11375810	1980	28-Jan-80	499	9	12
11375810	1980	29-Jan-80	471	8	10
11375810	1980	30-Jan-80	438	8	9.5
11375810	1980	31-Jan-80	417	7	7.9
11375810	1980	01-Feb-80	396	7	7.5
11375810	1980	02-Feb-80	381	7	7.2
11375810	1980	03-Feb-80	1620	160	947
11375810	1980	04-Feb-80	1010	72	196
11375810	1980	05-Feb-80	754	44	90
11375810	1980	06-Feb-80	671	25	45
11375810	1980	07-Feb-80	587	16	25
11375810	1980	08-Feb-80	539	11	16
11375810	1980	09-Feb-80	503	10	14

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Station ID: 11375810

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1980	10-Feb-80	476	10	13
11375810	1980	11-Feb-80	451	9	11
11375810	1980	12-Feb-80	428	9	10
11375810	1980	13-Feb-80	404	9	9.8
11375810	1980	14-Feb-80	373	8	8.1
11375810	1980	15-Feb-80	827	84	426
11375810	1980	16-Feb-80	2860	398	6980
11375810	1980	17-Feb-80	8630	1770	57800
11375810	1980	18-Feb-80	8350	1400	34000
11375810	1980	19-Feb-80	6030	675	11000
11375810	1980	20-Feb-80	4080	450	4960
11375810	1980	21-Feb-80	4370	369	4350
11375810	1980	22-Feb-80	3620	445	4650
11375810	1980	23-Feb-80	2810	340	2580
11375810	1980	24-Feb-80	2330	270	1700
11375810	1980	25-Feb-80	2040	216	1190
11375810	1980	26-Feb-80	1810	169	826
11375810	1980	27-Feb-80	2140	386	2920
11375810	1980	28-Feb-80	2840	335	2750
11375810	1980	29-Feb-80	2190	128	757
11375810	1980	01-Mar-80	1870	117	591
11375810	1980	02-Mar-80	1710	107	494
11375810	1980	03-Mar-80	1560	99	417
11375810	1980	04-Mar-80	1430	98	378
11375810	1980	05-Mar-80	2560	298	2540
11375810	1980	06-Mar-80	2580	212	1740
11375810	1980	07-Mar-80	1730	92	430
11375810	1980	08-Mar-80	1510	88	359
11375810	1980	09-Mar-80	1350	80	292
11375810	1980	10-Mar-80	1240	67	224
11375810	1980	11-Mar-80	1150	55	171
11375810	1980	12-Mar-80	1040	45	126
11375810	1980	13-Mar-80	929	40	100
11375810	1980	14-Mar-80	1140	67	221
11375810	1980	15-Mar-80	1080	67	195
11375810	1980	16-Mar-80	939	45	114
11375810	1980	17-Mar-80	878	32	76
11375810	1980	18-Mar-80	827	26	58
11375810	1980	19-Mar-80	768	22	46
11375810	1980	20-Mar-80	722	18	35
11375810	1980	21-Mar-80	687	17	32
11375810	1980	22-Mar-80	643	16	28
11375810	1980	23-Mar-80	612	15	25

Cottonwood Creek Near Olinda
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Station ID: 11375810

Basin Area (sq. mi): 395

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1980	24-Mar-80	586	15	24
11375810	1980	25-Mar-80	589	18	29
11375810	1980	26-Mar-80	559	13	20
11375810	1980	27-Mar-80	530	11	16
11375810	1980	28-Mar-80	508	10	14
11375810	1980	29-Mar-80	490	10	13
11375810	1980	30-Mar-80	474	9	12
11375810	1980	31-Mar-80	465	9	11
11375810	1980	01-Apr-80	449	9	11
11375810	1980	02-Apr-80	437	8	9.4
11375810	1980	03-Apr-80	412	8	8.9
11375810	1980	04-Apr-80	452	13	16
11375810	1980	05-Apr-80	783	46	102
11375810	1980	06-Apr-80	638	20	34
11375810	1980	07-Apr-80	569	12	18
11375810	1980	08-Apr-80	536	11	16
11375810	1980	09-Apr-80	521	9	13
11375810	1980	10-Apr-80	517	8	11
11375810	1980	11-Apr-80	494	8	11
11375810	1980	12-Apr-80	476	8	10
11375810	1980	13-Apr-80	462	7	8.7
11375810	1980	14-Apr-80	455	7	8.6
11375810	1980	15-Apr-80	443	7	8.4
11375810	1980	16-Apr-80	420	7	7.9
11375810	1980	17-Apr-80	409	7	7.7
11375810	1980	18-Apr-80	397	7	7.5
11375810	1980	19-Apr-80	386	7	7.3
11375810	1980	20-Apr-80	428	10	12
11375810	1980	21-Apr-80	430	10	12
11375810	1980	22-Apr-80	394	8	8.5
11375810	1980	23-Apr-80	375	8	8.1
11375810	1980	24-Apr-80	366	8	7.9
11375810	1980	25-Apr-80	352	8	7.6
11375810	1980	26-Apr-80	343	8	7.4
11375810	1980	27-Apr-80	334	8	7.2
11375810	1980	28-Apr-80	326	8	7
11375810	1980	29-Apr-80	312	9	7.6
11375810	1980	30-Apr-80	273	9	6.6
11375810	1980	01-May-80	258	8	5.6
11375810	1980	02-May-80	249	7	4.7
11375810	1980	03-May-80	239	6	3.9
11375810	1980	04-May-80	233	4	2.5
11375810	1980	05-May-80	229	3	1.9

Cottonwood Creek Near Olinda

Sediment Discharge

Station ID: 11375810

Basin Area (sq. mi): 395

Latitude: 402306

Longitude: 1222831

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375810	1980	06-May-80	223	3	1.8
11375810	1980	07-May-80	216	3	1.7
11375810	1980	08-May-80	213	3	1.7
11375810	1980	09-May-80	237	6	3.8
11375810	1980	10-May-80	244	8	5.3
11375810	1980	11-May-80	219	5	3
11375810	1980	12-May-80	217	5	2.9
11375810	1980	13-May-80	209	5	2.8
11375810	1980	14-May-80	208	5	2.8
11375810	1980	15-May-80	199	5	2.7
11375810	1980	16-May-80	192	5	2.6
11375810	1980	17-May-80	179	5	2.4
11375810	1980	18-May-80	176	5	2.4
11375810	1980	19-May-80	171	4	1.8
11375810	1980	20-May-80	191	4	2.1
11375810	1980	21-May-80	179	4	1.9
11375810	1980	22-May-80	172	4	1.9
11375810	1980	23-May-80	172	4	1.9
11375810	1980	24-May-80	171	3	1.4
11375810	1980	25-May-80	166	3	1.3
11375810	1980	26-May-80	165	3	1.3
11375810	1980	27-May-80	162	3	1.3
11375810	1980	28-May-80	159	3	1.3
11375810	1980	29-May-80	156	3	1.3
11375810	1980	30-May-80	155	3	1.3
11375810	1980	31-May-80	155	3	1.3

Label	Description	Units
Q (cfs)	daily mean streamflow	ft ³ /s
C (mg/L)	daily mean SS concentration	mg/L
L (ton/day)	SS discharge	english short tons/day

Size Distribution of Suspended Material

Size Distribution of Suspended Material

Station Number: 11375810

Basin Area (sq.mi): 395

Latitude: 402306

Longitude: 1222831

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11375810	03-JAN-77	1225	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11375810	16-MAR-77	915	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11375810	16-MAR-77	1010	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11375810	16-MAR-77	1420	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11375810	16-MAR-77	1800	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11375810	23-NOV-77	1055	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11375810	14-DEC-77	1515	ND	ND	ND	ND	ND	86	90	93	96	99	100
11375810	09-JAN-78	1125	ND	ND	ND	ND	ND	76	84	92	97	99	100
11375810	14-JAN-78	1540	ND	ND	ND	ND	ND	69	79	87	96	99	100
11375810	16-JAN-78	815	ND	ND	ND	ND	ND	98	100	ND	ND	ND	ND
11375810	19-JAN-78	1115	ND	ND	ND	ND	ND	54	65	81	96	100	ND
11375810	08-FEB-78	1015	ND	ND	ND	ND	ND	47	54	66	90	99	100
11375810	09-MAR-78	1510	ND	ND	ND	ND	ND	58	69	82	94	99	100
11375810	07-APR-78	1100	ND	ND	ND	ND	ND	52	56	70	93	100	ND
11375810	15-JAN-79	1305	ND	ND	ND	ND	ND	84	87	90	96	100	ND
11375810	18-FEB-79	1045	ND	ND	ND	ND	ND	91	97	100	ND	ND	ND
11375810	21-FEB-79	1400	ND	ND	ND	ND	ND	72	78	85	96	100	ND
11375810	02-MAR-79	1535	ND	ND	ND	ND	ND	70	74	82	100	ND	ND
11375810	27-MAR-79	1425	ND	ND	ND	ND	ND	92	98	99	100	ND	ND
11375810	12-JAN-80	1405	ND	ND	ND	ND	ND	86	91	96	99	100	ND
11375810	13-JAN-80	1120	ND	ND	ND	ND	ND	78	85	92	96	98	100
11375810	15-JAN-80	1410	ND	ND	ND	ND	ND	77	83	88	97	100	ND
11375810	22-JAN-80	1545	ND	ND	ND	ND	ND	87	93	100	ND	ND	ND
11375810	06-FEB-80	1445	ND	ND	ND	ND	ND	76	86	98	100	ND	ND
11375810	17-FEB-80	1310	ND	ND	ND	ND	ND	73	81	89	99	100	ND
11375810	18-FEB-80	1145	ND	ND	ND	ND	ND	66	76	86	95	99	100
11375810	12-MAR-80	1045	ND	ND	ND	ND	ND	60	68	77	100	ND	ND
11375810	03-DEC-80	1330	ND	ND	ND	ND	ND	89	93	97	99	100	ND
11375810	23-JAN-81	1515	ND	ND	ND	ND	ND	78	85	91	99	100	ND
11375810	28-JAN-81	1545	ND	ND	ND	ND	ND	75	83	93	99	100	ND
11375810	30-JAN-81	1045	ND	ND	ND	ND	ND	60	67	78	93	100	ND
11375810	04-MAR-81	1300	ND	ND	ND	ND	ND	86	91	97	100	ND	ND
11375810	25-MAR-81	1250	ND	ND	ND	ND	ND	76	81	91	99	100	ND
11375810	18-NOV-81	1155	ND	ND	ND	ND	ND	79	85	92	98	100	ND
11375810	18-FEB-82	930	ND	ND	ND	ND	ND	52	59	71	95	100	ND
11375810	26-JAN-83	1030	ND	ND	ND	ND	ND	64	77	91	97	99	100
11375810	28-JAN-83	1045	ND	ND	ND	ND	ND	63	74	89	98	100	ND
11375810	31-JAN-83	1100	ND	ND	ND	ND	ND	58	65	78	94	99	100
11375810	10-FEB-83	1200	ND	ND	ND	ND	ND	59	70	85	96	99	100
11375810	01-MAR-83	1100	ND	ND	ND	ND	ND	75	87	96	99	100	ND
11375810	03-MAR-83	1130	ND	ND	ND	ND	ND	72	87	96	99	100	ND
11375810	16-MAR-83	1015	ND	ND	ND	ND	ND	39	45	65	93	99	100
11375810	24-MAR-83	1015	ND	ND	ND	ND	ND	35	40	53	75	88	94
11375810	04-APR-83	1015	ND	ND	ND	ND	ND	40	45	57	83	100	ND
11375810	02-MAY-83	1100	ND	ND	ND	ND	ND	34	39	50	82	100	ND
11375810	22-DEC-83	1530	ND	ND	ND	ND	ND	63	72	86	96	99	100

Size Distribution of Bed Material

Cottonwood Creek Near Olinda

Size Distribution of Bed Material

Station Number:11375810

Basin Area (sq.mi): 395

Latitude:.402306

Longitude: 1222831

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11375810	05-JAN-78	0	0	1	8	18	47	75	91	100	100	100
11375810	05-JAN-78	0	0	0	8	18	33	51	68	81	100	100
11375810	05-JAN-78	0	0	1	10	28	46	62	74	88	100	100
11375810	05-JAN-78	0	0	0	0	1	3	12	34	64	75	100
11375810	05-JAN-78	0	0	1	2	3	10	24	39	77	100	100
11375810	03-MAR-78	0	0	0	0	4	30	64	83	100	100	100
11375810	03-MAR-78	0	0	1	19	45	73	86	92	100	100	100
11375810	03-MAR-78	0	0	1	16	55	83	92	96	100	100	100
11375810	03-MAR-78	0	0	1	30	86	96	98	100	100	100	100
11375810	03-MAR-78	0	0	3	32	94	99	100	100	100	100	100
11375810	04-DEC-79	0	1	2	3	13	31	44	55	77	100	100
11375810	04-DEC-79	0	0	2	8	17	35	52	66	89	100	100
11375810	04-DEC-79	0	0	1	15	34	48	64	81	96	100	100
11375810	04-DEC-79	0	0	2	26	41	59	73	84	100	100	100
11375810	04-DEC-79	0	0	1	9	34	52	62	69	79	100	100
11375810	07-JAN-80	0	0	0	0	3	11	21	31	52	100	100
11375810	07-JAN-80	0	0	0	14	23	37	59	81	100	100	100
11375810	07-JAN-80	0	0	1	6	21	34	45	57	76	100	100
11375810	07-JAN-80	0	0	1	9	18	48	65	73	82	100	100
11375810	07-JAN-80	0	1	2	12	27	38	51	70	96	100	100
11375810	12-JAN-80	0	0	0	0	7	32	49	64	81	100	100
11375810	12-JAN-80	0	0	0	1	14	43	64	77	97	100	100
11375810	12-JAN-80	0	0	0	2	9	18	23	32	52	100	100
11375810	12-JAN-80	0	0	0	2	11	31	51	66	71	71	100
11375810	12-JAN-80	0	0	1	5	16	26	32	39	58	76	100
11375810	13-JAN-80	0	0	0	0	0	1	1	4	27	100	100
11375810	13-JAN-80	0	0	0	0	0	0	0	0	0	2	100
11375810	13-JAN-80	0	0	0	0	0	0	0	0	0	0	100
11375810	13-JAN-80	0	0	0	3	17	41	59	74	92	100	100
11375810	13-JAN-80	0	0	0	11	54	84	94	98	98	100	100
11375810	15-JAN-80	0	0	0	5	50	89	98	100	100	100	100
11375810	15-JAN-80	0	0	0	5	33	61	76	87	96	100	100
11375810	15-JAN-80	0	0	0	7	20	32	48	67	84	100	100
11375810	15-JAN-80	0	0	0	8	45	77	87	94	100	100	100
11375810	15-JAN-80	0	0	0	0	0	0	1	9	53	100	100
11375810	06-FEB-80	0	0	1	7	34	60	75	86	98	100	100
11375810	06-FEB-80	0	0	1	12	35	67	88	97	100	100	100
11375810	06-FEB-80	0	0	0	2	24	73	95	99	100	100	100
11375810	06-FEB-80	0	0	1	8	25	34	45	59	79	100	100
11375810	06-FEB-80	0	0	0	4	18	25	36	53	85	100	100
11375810	18-FEB-80	0	1	1	4	8	16	23	38	100	100	100

Cottonwood Creek Near Olinda **Size Distribution of Bed Material**

Station Number:11375810

Basin Area (sq.mi): 395

Latitude:.402306

Longitude: 1222831

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11375810	18-FEB-80	0	0	0	2	7	10	14	16	18	100	100
11375810	18-FEB-80	0	0	0	2	9	15	19	28	45	100	100
11375810	18-FEB-80	0	0	0	1	3	9	17	40	72	100	100
11375810	18-FEB-80	0	0	0	0	0	0	0	1	12	100	100
11375810	05-MAR-80	0	0	2	17	57	76	84	91	100	100	100
11375810	05-MAR-80	0	0	3	49	94	99	100	100	100	100	100
11375810	05-MAR-80	0	0	0	8	42	73	95	99	100	100	100
11375810	05-MAR-80	0	0	0	5	24	39	52	63	71	71	100
11375810	05-MAR-80	0	0	0	1	15	31	48	69	98	100	100

South Fork Cottonwood Creek Near Ono

Sediment Discharge

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870

Basin Area (sq. mi) 371

Latitude 401934

Longitude: 1222640

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1977	20-Jan-77	16	5	0.22
11375870	1977	21-Jan-77	17	5	0.23
11375870	1977	22-Jan-77	18	5	0.24
11375870	1977	23-Jan-77	18	5	0.24
11375870	1977	24-Jan-77	18	5	0.24
11375870	1977	25-Jan-77	16	5	0.22
11375870	1977	26-Jan-77	15	4	0.16
11375870	1977	27-Jan-77	14	3	0.11
11375870	1977	28-Jan-77	14	3	0.11
11375870	1977	29-Jan-77	13	4	0.14
11375870	1977	30-Jan-77	13	4	0.14
11375870	1977	31-Jan-77	13	4	0.14
11375870	1977	01-Feb-77	13	3	0.11
11375870	1977	02-Feb-77	13	3	0.11
11375870	1977	03-Feb-77	12	3	0.1
11375870	1977	04-Feb-77	12	3	0.1
11375870	1977	05-Feb-77	12	3	0.1
11375870	1977	06-Feb-77	12	3	0.1
11375870	1977	07-Feb-77	12	3	0.1
11375870	1977	08-Feb-77	14	4	0.15
11375870	1977	09-Feb-77	15	4	0.16
11375870	1977	10-Feb-77	17	4	0.18
11375870	1977	11-Feb-77	17	4	0.18
11375870	1977	12-Feb-77	16	5	0.22
11375870	1977	13-Feb-77	14	6	0.23
11375870	1977	14-Feb-77	14	5	0.19
11375870	1977	15-Feb-77	13	4	0.14
11375870	1977	16-Feb-77	13	4	0.14
11375870	1977	17-Feb-77	13	5	0.18
11375870	1977	18-Feb-77	13	4	0.14
11375870	1977	19-Feb-77	13	4	0.14
11375870	1977	20-Feb-77	12	3	0.1
11375870	1977	21-Feb-77	15	4	0.16
11375870	1977	22-Feb-77	70	279	56
11375870	1977	23-Feb-77	58	106	17
11375870	1977	24-Feb-77	43	67	7.8
11375870	1977	25-Feb-77	37	46	4.6
11375870	1977	26-Feb-77	31	29	2.4
11375870	1977	27-Feb-77	26	20	1.4
11375870	1977	28-Feb-77	24	18	1.2
11375870	1977	01-Mar-77	22	17	1
11375870	1977	02-Mar-77	23	16	0.99
11375870	1977	03-Mar-77	22	14	0.83
11375870	1977	04-Mar-77	20	13	0.7
11375870	1977	05-Mar-77	20	12	0.65

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870

Basin Area (sq. mi) 371

Latitude 401934

Longitude: 1222640

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1977	06-Mar-77	19	11	0.56
11375870	1977	07-Mar-77	18	10	0.49
11375870	1977	08-Mar-77	18	10	0.49
11375870	1977	09-Mar-77	20	12	0.65
11375870	1977	10-Mar-77	28	18	1.4
11375870	1977	11-Mar-77	34	19	1.7
11375870	1977	12-Mar-77	28	17	1.3
11375870	1977	13-Mar-77	25	17	1.1
11375870	1977	14-Mar-77	25	16	1.1
11375870	1977	15-Mar-77	31	18	1.5
11375870	1977	16-Mar-77	269	1220	1350
11375870	1977	17-Mar-77	270	970	865
11375870	1977	18-Mar-77	146	315	130
11375870	1977	19-Mar-77	91	140	34
11375870	1977	20-Mar-77	75	131	27
11375870	1977	21-Mar-77	67	134	24
11375870	1977	22-Mar-77	62	156	26
11375870	1977	23-Mar-77	73	228	45
11375870	1977	24-Mar-77	84	236	54
11375870	1977	25-Mar-77	77	159	33
11375870	1977	26-Mar-77	60	113	18
11375870	1977	27-Mar-77	54	112	16
11375870	1977	28-Mar-77	59	113	18
11375870	1977	29-Mar-77	55	104	15
11375870	1977	30-Mar-77	48	88	11
11375870	1977	31-Mar-77	43	74	8.6
11375870	1977	01-Apr-77	38	69	7.1
11375870	1977	02-Apr-77	34	57	5.2
11375870	1977	03-Apr-77	32	47	4.1
11375870	1977	04-Apr-77	31	45	3.8
11375870	1977	05-Apr-77	35	57	5.4
11375870	1977	06-Apr-77	52	111	16
11375870	1977	07-Apr-77	58	121	19
11375870	1977	08-Apr-77	63	155	26
11375870	1977	09-Apr-77	71	170	33
11375870	1977	10-Apr-77	56	990	150
11375870	1977	11-Apr-77	45	255	31
11375870	1977	12-Apr-77	38	108	11
11375870	1977	13-Apr-77	34	97	8.9
11375870	1977	14-Apr-77	32	95	8.2
11375870	1977	15-Apr-77	30	85	6.9
11375870	1977	16-Apr-77	27	71	5.2
11375870	1977	17-Apr-77	27	53	3.9
11375870	1977	18-Apr-77	27	40	2.9
11375870	1977	19-Apr-77	25	34	2.3

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870
 Basin Area (sq. mi) 371
 Latitude 401934
 Longitude: 1222640
 ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1977	20-Apr-77	24	30	1.9
11375870	1977	21-Apr-77	23	23	1.4
11375870	1977	22-Apr-77	21	23	1.3
11375870	1977	23-Apr-77	21	22	1.2
11375870	1977	24-Apr-77	22	19	1.1
11375870	1977	25-Apr-77	22	16	0.95
11375870	1977	26-Apr-77	23	11	0.68
11375870	1977	27-Apr-77	23	10	0.62
11375870	1977	28-Apr-77	22	11	0.65
11375870	1977	29-Apr-77	22	12	0.71
11375870	1977	30-Apr-77	23	12	0.75
11375870	1977	01-May-77	37	40	4.3
11375870	1977	02-May-77	55	190	28
11375870	1977	03-May-77	48	670	87
11375870	1977	04-May-77	38	157	16
11375870	1977	05-May-77	32	74	6.4
11375870	1977	06-May-77	27	47	3.4
11375870	1977	07-May-77	26	34	2.4
11375870	1977	08-May-77	25	29	2
11375870	1977	09-May-77	27	31	2.3
11375870	1977	10-May-77	33	41	3.7
11375870	1977	11-May-77	51	70	7.9
11375870	1977	12-May-77	87	1030	263
11375870	1977	13-May-77	61	379	62
11375870	1977	14-May-77	48	250	32
11375870	1977	15-May-77	39	183	19
11375870	1977	16-May-77	34	131	12
11375870	1977	17-May-77	30	107	8.7
11375870	1977	18-May-77	28	111	8.4
11375870	1977	19-May-77	36	139	14
11375870	1977	20-May-77	38	144	15
11375870	1977	21-May-77	30	135	11
11375870	1977	22-May-77	28	123	9.3
11375870	1977	23-May-77	54	190	28
11375870	1977	24-May-77	44	880	105
11375870	1977	25-May-77	33	400	36
11375870	1977	26-May-77	31	210	18
11375870	1977	27-May-77	33	195	17
11375870	1977	28-May-77	31	226	19
11375870	1977	29-May-77	26	236	17
11375870	1977	30-May-77	23	166	10
11375870	1977	31-May-77	21	113	6.4
11375870	1978	01-Nov-77	0	0	0
11375870	1978	02-Nov-77	0	0	0
11375870	1978	03-Nov-77	0	0	0

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870
 Basin Area (sq. mi) 371
 Latitude 401934
 Longitude: 1222640
 ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1978	04-Nov-77	0	0	0
11375870	1978	05-Nov-77	0	0	0
11375870	1978	06-Nov-77	0	0	0
11375870	1978	07-Nov-77	0	0	0
11375870	1978	08-Nov-77	0	0	0
11375870	1978	09-Nov-77	0	0	0
11375870	1978	10-Nov-77	0	0	0
11375870	1978	11-Nov-77	0	0	0
11375870	1978	12-Nov-77	0	0	0
11375870	1978	13-Nov-77	0	0	0
11375870	1978	14-Nov-77	0	0	0
11375870	1978	15-Nov-77	0	0	0
11375870	1978	16-Nov-77	0	0	0
11375870	1978	17-Nov-77	0	0	0
11375870	1978	18-Nov-77	0	0	0
11375870	1978	19-Nov-77	0	0	0
11375870	1978	20-Nov-77	0	0	0
11375870	1978	21-Nov-77	4	0	0
11375870	1978	22-Nov-77	304	1760	2920
11375870	1978	23-Nov-77	365	3100	5930
11375870	1978	24-Nov-77	178	300	144
11375870	1978	25-Nov-77	257	792	550
11375870	1978	26-Nov-77	192	392	203
11375870	1978	27-Nov-77	163	262	115
11375870	1978	28-Nov-77	112	108	33
11375870	1978	29-Nov-77	82	88	19
11375870	1978	30-Nov-77	70	68	13
11375870	1978	01-Dec-77	61	47	7.7
11375870	1978	02-Dec-77	52	25	3.5
11375870	1978	03-Dec-77	46	20	2.5
11375870	1978	04-Dec-77	42	15	1.7
11375870	1978	05-Dec-77	39	10	1.1
11375870	1978	06-Dec-77	38	9	0.92
11375870	1978	07-Dec-77	35	8	0.76
11375870	1978	08-Dec-77	33	7	0.62
11375870	1978	09-Dec-77	31	6	1
11375870	1978	10-Dec-77	29	5	0
11375870	1978	11-Dec-77	33	7	1
11375870	1978	12-Dec-77	128	147	59
11375870	1978	13-Dec-77	99	162	43
11375870	1978	14-Dec-77	836	3060	10800
11375870	1978	15-Dec-77	2190	4290	28500
11375870	1978	16-Dec-77	805	1050	2630
11375870	1978	17-Dec-77	1540	2180	11100
11375870	1978	18-Dec-77	798	850	1830

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1978	19-Dec-77	457	400	494
11375870	1978	20-Dec-77	286	205	158
11375870	1978	21-Dec-77	241	170	111
11375870	1978	22-Dec-77	1060	1980	17200
11375870	1978	23-Dec-77	2320	5160	53700
11375870	1978	24-Dec-77	874	1100	2600
11375870	1978	25-Dec-77	590	594	946
11375870	1978	26-Dec-77	437	380	448
11375870	1978	27-Dec-77	613	700	1160
11375870	1978	28-Dec-77	805	1010	2200
11375870	1978	29-Dec-77	623	700	1180
11375870	1978	30-Dec-77	559	525	792
11375870	1978	31-Dec-77	464	400	501
11375870	1978	01-Jan-78	387	254	265
11375870	1978	02-Jan-78	593	553	1360
11375870	1978	03-Jan-78	947	1250	3200
11375870	1978	04-Jan-78	2080	3450	28700
11375870	1978	05-Jan-78	2610	5180	38300
11375870	1978	06-Jan-78	1360	1950	7160
11375870	1978	07-Jan-78	877	932	2210
11375870	1978	08-Jan-78	1040	800	2250
11375870	1978	09-Jan-78	6470	6300	175000
11375870	1978	10-Jan-78	2740	2160	16000
11375870	1978	11-Jan-78	1440	1080	4200
11375870	1978	12-Jan-78	1130	706	2150
11375870	1978	13-Jan-78	2680	1880	15800
11375870	1978	14-Jan-78	7040	5650	127000
11375870	1978	15-Jan-78	5180	3820	56500
11375870	1978	16-Jan-78	7340	6300	142000
11375870	1978	17-Jan-78	4130	3000	33500
11375870	1978	18-Jan-78	2800	1430	12100
11375870	1978	19-Jan-78	2510	1290	10100
11375870	1978	20-Jan-78	1550	730	3060
11375870	1978	21-Jan-78	1220	500	1650
11375870	1978	22-Jan-78	1000	392	1060
11375870	1978	23-Jan-78	835	370	834
11375870	1978	24-Jan-78	694	280	525
11375870	1978	25-Jan-78	627	170	288
11375870	1978	26-Jan-78	569	125	192
11375870	1978	27-Jan-78	520	112	157
11375870	1978	28-Jan-78	482	90	117
11375870	1978	29-Jan-78	457	64	79
11375870	1978	30-Jan-78	433	57	67
11375870	1978	31-Jan-78	410	45	50
11375870	1978	01-Feb-78	394	42	45

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1978	02-Feb-78	451	55	67
11375870	1978	03-Feb-78	445	78	94
11375870	1978	04-Feb-78	433	95	111
11375870	1978	05-Feb-78	1940	756	5460
11375870	1978	06-Feb-78	2090	911	5540
11375870	1978	07-Feb-78	4350	2520	37200
11375870	1978	08-Feb-78	3060	1570	15300
11375870	1978	09-Feb-78	2570	1120	9120
11375870	1978	10-Feb-78	1500	410	1660
11375870	1978	11-Feb-78	1120	272	823
11375870	1978	12-Feb-78	1920	652	4280
11375870	1978	13-Feb-78	1280	252	916
11375870	1978	14-Feb-78	1020	144	397
11375870	1978	15-Feb-78	855	119	275
11375870	1978	16-Feb-78	756	92	188
11375870	1978	17-Feb-78	684	74	137
11375870	1978	18-Feb-78	619	75	125
11375870	1978	19-Feb-78	638	109	188
11375870	1978	20-Feb-78	672	132	240
11375870	1978	21-Feb-78	704	160	304
11375870	1978	22-Feb-78	750	187	379
11375870	1978	23-Feb-78	752	157	319
11375870	1978	24-Feb-78	725	136	266
11375870	1978	25-Feb-78	685	121	224
11375870	1978	26-Feb-78	616	90	150
11375870	1978	27-Feb-78	567	82	126
11375870	1978	28-Feb-78	502	82	111
11375870	1978	01-Mar-78	459	82	102
11375870	1978	02-Mar-78	774	207	643
11375870	1978	03-Mar-78	1230	359	1570
11375870	1978	04-Mar-78	3140	1550	17500
11375870	1978	05-Mar-78	1710	589	3240
11375870	1978	06-Mar-78	1050	290	822
11375870	1978	07-Mar-78	926	205	513
11375870	1978	08-Mar-78	2330	892	5960
11375870	1978	09-Mar-78	2230	787	4550
11375870	1978	10-Mar-78	1500	457	1940
11375870	1978	11-Mar-78	1200	306	1000
11375870	1978	12-Mar-78	992	182	487
11375870	1978	13-Mar-78	858	140	324
11375870	1978	14-Mar-78	765	123	254
11375870	1978	15-Mar-78	672	120	218
11375870	1978	16-Mar-78	601	95	154
11375870	1978	17-Mar-78	550	60	89
11375870	1978	18-Mar-78	530	70	100

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11375870	1978	19-Mar-78	512	80	111
11375870	1978	20-Mar-78	510	85	117
11375870	1978	21-Mar-78	530	100	143
11375870	1978	22-Mar-78	582	150	236
11375870	1978	23-Mar-78	554	125	187
11375870	1978	24-Mar-78	536	100	145
11375870	1978	25-Mar-78	468	85	107
11375870	1978	26-Mar-78	436	60	71
11375870	1978	27-Mar-78	443	58	69
11375870	1978	28-Mar-78	441	56	67
11375870	1978	29-Mar-78	449	60	73
11375870	1978	30-Mar-78	462	70	87
11375870	1978	31-Mar-78	518	87	135
11375870	1978	01-Apr-78	1020	259	792
11375870	1978	02-Apr-78	604	135	220
11375870	1978	03-Apr-78	501	80	108
11375870	1978	04-Apr-78	635	120	229
11375870	1978	05-Apr-78	466	71	106
11375870	1978	06-Apr-78	827	183	447
11375870	1978	07-Apr-78	794	167	387
11375870	1978	08-Apr-78	528	90	128
11375870	1978	09-Apr-78	478	67	86
11375870	1978	10-Apr-78	449	56	68
11375870	1978	11-Apr-78	442	57	68
11375870	1978	12-Apr-78	432	50	58
11375870	1978	13-Apr-78	413	43	48
11375870	1978	14-Apr-78	399	44	47
11375870	1978	15-Apr-78	441	71	85
11375870	1978	16-Apr-78	403	41	45
11375870	1978	17-Apr-78	361	41	40
11375870	1978	18-Apr-78	326	22	19
11375870	1978	19-Apr-78	311	32	27
11375870	1978	20-Apr-78	321	38	33
11375870	1978	21-Apr-78	301	24	20
11375870	1978	22-Apr-78	282	22	17
11375870	1978	23-Apr-78	269	27	20
11375870	1978	24-Apr-78	262	23	16
11375870	1978	25-Apr-78	507	103	296
11375870	1978	26-Apr-78	685	145	360
11375870	1978	27-Apr-78	355	37	35
11375870	1978	28-Apr-78	325	37	32
11375870	1978	29-Apr-78	303	28	23
11375870	1978	30-Apr-78	298	25	20
11375870	1978	01-May-78	298	14	11
11375870	1978	02-May-78	288	16	12

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11375870	1978	03-May-78	291	25	20
11375870	1978	04-May-78	295	25	20
11375870	1978	05-May-78	291	25	20
11375870	1978	06-May-78	278	26	20
11375870	1978	07-May-78	262	26	18
11375870	1978	08-May-78	252	26	18
11375870	1978	09-May-78	261	30	21
11375870	1978	10-May-78	276	34	25
11375870	1978	11-May-78	277	28	21
11375870	1978	12-May-78	268	23	17
11375870	1978	13-May-78	269	22	16
11375870	1978	14-May-78	277	21	16
11375870	1978	15-May-78	285	33	25
11375870	1978	16-May-78	265	38	27
11375870	1978	17-May-78	242	17	11
11375870	1978	18-May-78	227	14	8.6
11375870	1978	19-May-78	222	13	7.8
11375870	1978	20-May-78	224	16	9.7
11375870	1978	21-May-78	235	21	13
11375870	1978	22-May-78	240	24	16
11375870	1978	23-May-78	230	15	9.3
11375870	1978	24-May-78	215	10	5.8
11375870	1978	25-May-78	201	9	4.9
11375870	1978	26-May-78	187	7	3.5
11375870	1978	27-May-78	177	8	3.8
11375870	1978	28-May-78	176	8	3.8
11375870	1978	29-May-78	179	7	3.4
11375870	1978	30-May-78	187	9	4.5
11375870	1978	31-May-78	191	10	5.2
11375870	1979	01-Nov-78	5.3	2	0.03
11375870	1979	02-Nov-78	5.7	2	0.03
11375870	1979	03-Nov-78	6	2	0.03
11375870	1979	04-Nov-78	6.2	2	0.03
11375870	1979	05-Nov-78	6.9	2	0.04
11375870	1979	06-Nov-78	7.1	2	0.04
11375870	1979	07-Nov-78	7.1	2	0.04
11375870	1979	08-Nov-78	7.1	2	0.04
11375870	1979	09-Nov-78	7	2	0.04
11375870	1979	10-Nov-78	6.7	1	0.02
11375870	1979	11-Nov-78	6.9	1	0.02
11375870	1979	12-Nov-78	7.3	1	0.02
11375870	1979	13-Nov-78	8	1	0.02
11375870	1979	14-Nov-78	8.2	2	0.04
11375870	1979	15-Nov-78	8.4	2	0.05
11375870	1979	16-Nov-78	8.4	2	0.05

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1979	17-Nov-78	8.9	2	0.05
11375870	1979	18-Nov-78	9.4	2	0.05
11375870	1979	19-Nov-78	11	2	0.06
11375870	1979	20-Nov-78	13	3	0.11
11375870	1979	21-Nov-78	29	24	1.8
11375870	1979	22-Nov-78	51	17	2.3
11375870	1979	23-Nov-78	39	11	1.2
11375870	1979	24-Nov-78	28	7	0.53
11375870	1979	25-Nov-78	22	4	0.24
11375870	1979	26-Nov-78	20	3	0.16
11375870	1979	27-Nov-78	18	2	0.1
11375870	1979	28-Nov-78	18	2	0.1
11375870	1979	29-Nov-78	16	2	0.09
11375870	1979	30-Nov-78	17	1	0.05
11375870	1979	01-Dec-78	20	1	0.05
11375870	1979	02-Dec-78	20	1	0.05
11375870	1979	03-Dec-78	21	1	0.06
11375870	1979	04-Dec-78	20	2	0.11
11375870	1979	05-Dec-78	18	2	0.1
11375870	1979	06-Dec-78	18	2	0.1
11375870	1979	07-Dec-78	17	2	0.09
11375870	1979	08-Dec-78	14	2	0.08
11375870	1979	09-Dec-78	12	2	0.06
11375870	1979	10-Dec-78	15	2	0.08
11375870	1979	11-Dec-78	16	1	0.04
11375870	1979	12-Dec-78	16	1	0.04
11375870	1979	13-Dec-78	17	1	0.05
11375870	1979	14-Dec-78	17	2	0.09
11375870	1979	15-Dec-78	14	2	0.08
11375870	1979	16-Dec-78	15	3	0.12
11375870	1979	17-Dec-78	16	2	0.09
11375870	1979	18-Dec-78	15	2	0.08
11375870	1979	19-Dec-78	15	2	0.08
11375870	1979	20-Dec-78	15	2	0.08
11375870	1979	21-Dec-78	12	2	0.06
11375870	1979	22-Dec-78	14	2	0.08
11375870	1979	23-Dec-78	15	2	0.08
11375870	1979	24-Dec-78	16	2	0.09
11375870	1979	25-Dec-78	16	2	0.09
11375870	1979	26-Dec-78	15	1	0.04
11375870	1979	27-Dec-78	15	1	0.04
11375870	1979	28-Dec-78	15	1	0.04
11375870	1979	29-Dec-78	15	1	0.04
11375870	1979	30-Dec-78	12	1	0.03
11375870	1979	31-Dec-78	9.1	1	0.02

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11375870	1979	01-Jan-79	9.5	1	0.03
11375870	1979	02-Jan-79	11	1	0.03
11375870	1979	03-Jan-79	13	1	0.04
11375870	1979	04-Jan-79	15	1	0.04
11375870	1979	05-Jan-79	17	1	0.05
11375870	1979	06-Jan-79	17	1	0.05
11375870	1979	07-Jan-79	19	2	0.1
11375870	1979	08-Jan-79	40	11	1.3
11375870	1979	09-Jan-79	73	34	7.1
11375870	1979	10-Jan-79	58	28	4.4
11375870	1979	11-Jan-79	793	1940	5360
11375870	1979	12-Jan-79	407	396	641
11375870	1979	13-Jan-79	159	52	22
11375870	1979	14-Jan-79	616	332	1440
11375870	1979	15-Jan-79	1110	376	1520
11375870	1979	16-Jan-79	307	31	26
11375870	1979	17-Jan-79	158	12	5.1
11375870	1979	18-Jan-79	111	8	2.4
11375870	1979	19-Jan-79	90	5	1.2
11375870	1979	20-Jan-79	86	4	0.93
11375870	1979	21-Jan-79	74	3	0.6
11375870	1979	22-Jan-79	69	2	0.37
11375870	1979	23-Jan-79	65	2	0.35
11375870	1979	24-Jan-79	61	2	0.33
11375870	1979	25-Jan-79	58	1	0.16
11375870	1979	26-Jan-79	51	1	0.14
11375870	1979	27-Jan-79	45	1	0.12
11375870	1979	28-Jan-79	49	1	0.13
11375870	1979	29-Jan-79	43	0	0
11375870	1979	30-Jan-79	39	0	0
11375870	1979	31-Jan-79	47	1	0.13
11375870	1979	01-Feb-79	46	1	0.12
11375870	1979	02-Feb-79	41	1	0.11
11375870	1979	03-Feb-79	38	1	0.1
11375870	1979	04-Feb-79	37	1	0.1
11375870	1979	05-Feb-79	41	1	0.11
11375870	1979	06-Feb-79	39	1	0.11
11375870	1979	07-Feb-79	39	1	0.11
11375870	1979	08-Feb-79	39	1	0.11
11375870	1979	09-Feb-79	39	1	0.11
11375870	1979	10-Feb-79	39	1	0.11
11375870	1979	11-Feb-79	40	1	0.11
11375870	1979	12-Feb-79	51	1	0.14
11375870	1979	13-Feb-79	1100	1330	4970
11375870	1979	14-Feb-79	1440	659	2990

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1979	15-Feb-79	749	186	399
11375870	1979	16-Feb-79	829	136	317
11375870	1979	17-Feb-79	419	55	62
11375870	1979	18-Feb-79	874	212	696
11375870	1979	19-Feb-79	586	64	101
11375870	1979	20-Feb-79	848	271	902
11375870	1979	21-Feb-79	678	87	159
11375870	1979	22-Feb-79	462	56	74
11375870	1979	23-Feb-79	492	78	115
11375870	1979	24-Feb-79	297	32	26
11375870	1979	25-Feb-79	221	24	14
11375870	1979	26-Feb-79	215	17	9.9
11375870	1979	27-Feb-79	194	13	6.8
11375870	1979	28-Feb-79	281	57	68
11375870	1979	01-Mar-79	575	163	266
11375870	1979	02-Mar-79	353	53	51
11375870	1979	03-Mar-79	270	22	16
11375870	1979	04-Mar-79	257	19	13
11375870	1979	05-Mar-79	302	44	36
11375870	1979	06-Mar-79	532	315	493
11375870	1979	07-Mar-79	745	416	837
11375870	1979	08-Mar-79	748	248	501
11375870	1979	09-Mar-79	661	174	311
11375870	1979	10-Mar-79	520	114	160
11375870	1979	11-Mar-79	467	84	106
11375870	1979	12-Mar-79	429	64	74
11375870	1979	13-Mar-79	377	50	51
11375870	1979	14-Mar-79	329	40	36
11375870	1979	15-Mar-79	340	42	39
11375870	1979	16-Mar-79	374	48	48
11375870	1979	17-Mar-79	554	133	210
11375870	1979	18-Mar-79	424	89	102
11375870	1979	19-Mar-79	422	75	85
11375870	1979	20-Mar-79	356	71	68
11375870	1979	21-Mar-79	305	68	56
11375870	1979	22-Mar-79	282	65	49
11375870	1979	23-Mar-79	239	60	39
11375870	1979	24-Mar-79	220	58	34
11375870	1979	25-Mar-79	205	54	30
11375870	1979	26-Mar-79	206	51	28
11375870	1979	27-Mar-79	2510	1430	14900
11375870	1979	28-Mar-79	916	404	1150
11375870	1979	29-Mar-79	562	110	167
11375870	1979	30-Mar-79	434	61	71
11375870	1979	31-Mar-79	365	36	35

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Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1979	01-Apr-79	322	23	20
11375870	1979	02-Apr-79	291	18	14
11375870	1979	03-Apr-79	265	15	11
11375870	1979	04-Apr-79	248	12	8
11375870	1979	05-Apr-79	243	10	6.6
11375870	1979	06-Apr-79	282	20	15
11375870	1979	07-Apr-79	257	24	17
11375870	1979	08-Apr-79	227	19	12
11375870	1979	09-Apr-79	211	14	8
11375870	1979	10-Apr-79	199	10	5.4
11375870	1979	11-Apr-79	191	8	4.1
11375870	1979	12-Apr-79	180	6	2.9
11375870	1979	13-Apr-79	175	5	2.4
11375870	1979	14-Apr-79	173	4	1.9
11375870	1979	15-Apr-79	172	5	2.3
11375870	1979	16-Apr-79	179	5	2.4
11375870	1979	17-Apr-79	180	5	2.4
11375870	1979	18-Apr-79	162	5	2.2
11375870	1979	19-Apr-79	150	4	1.6
11375870	1979	20-Apr-79	142	4	1.5
11375870	1979	21-Apr-79	135	4	1.5
11375870	1979	22-Apr-79	140	7	2.8
11375870	1979	23-Apr-79	208	48	36
11375870	1979	24-Apr-79	304	148	143
11375870	1979	25-Apr-79	169	17	7.8
11375870	1979	26-Apr-79	190	33	24
11375870	1979	27-Apr-79	405	217	245
11375870	1979	28-Apr-79	317	43	37
11375870	1979	29-Apr-79	271	26	19
11375870	1979	30-Apr-79	247	21	14
11375870	1979	01-May-79	250	20	13
11375870	1979	02-May-79	245	17	11
11375870	1979	03-May-79	224	16	9.7
11375870	1979	04-May-79	223	15	9
11375870	1979	05-May-79	253	37	29
11375870	1979	06-May-79	393	143	155
11375870	1979	07-May-79	372	60	60
11375870	1979	08-May-79	331	31	28
11375870	1979	09-May-79	283	22	17
11375870	1979	10-May-79	253	18	12
11375870	1979	11-May-79	232	14	8.8
11375870	1979	12-May-79	220	13	7.7
11375870	1979	13-May-79	215	13	7.5
11375870	1979	14-May-79	220	16	9.5
11375870	1979	15-May-79	230	19	12

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870
 Basin Area (sq. mi) 371
 Latitude 401934
 Longitude: 1222640
 ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1979	16-May-79	227	19	12
11375870	1979	17-May-79	218	16	9.4
11375870	1979	18-May-79	212	15	8.6
11375870	1979	19-May-79	213	16	9.2
11375870	1979	20-May-79	207	18	10
11375870	1979	21-May-79	204	19	10
11375870	1979	22-May-79	203	18	9.9
11375870	1979	23-May-79	190	14	7.2
11375870	1979	24-May-79	192	86	44
11375870	1979	25-May-79	157	81	34
11375870	1979	26-May-79	143	43	17
11375870	1979	27-May-79	133	28	10
11375870	1979	28-May-79	123	21	7
11375870	1979	29-May-79	112	16	4.8
11375870	1979	30-May-79	103	14	3.9
11375870	1979	31-May-79	95	12	3.1
11375870	1980	01-Nov-79	40	2	0.22
11375870	1980	02-Nov-79	38	3	0.31
11375870	1980	03-Nov-79	46	6	0.75
11375870	1980	04-Nov-79	55	3	0.45
11375870	1980	05-Nov-79	51	2	0.28
11375870	1980	06-Nov-79	61	4	0.66
11375870	1980	07-Nov-79	207	48	29
11375870	1980	08-Nov-79	172	17	8.3
11375870	1980	09-Nov-79	107	6	1.7
11375870	1980	10-Nov-79	81	3	0.66
11375870	1980	11-Nov-79	67	3	0.54
11375870	1980	12-Nov-79	59	3	0.48
11375870	1980	13-Nov-79	53	2	0.29
11375870	1980	14-Nov-79	49	2	0.26
11375870	1980	15-Nov-79	46	3	0.37
11375870	1980	16-Nov-79	115	36	41
11375870	1980	17-Nov-79	720	419	939
11375870	1980	18-Nov-79	338	45	41
11375870	1980	19-Nov-79	217	13	7.6
11375870	1980	20-Nov-79	163	5	2.2
11375870	1980	21-Nov-79	132	4	1.4
11375870	1980	22-Nov-79	124	6	2.1
11375870	1980	23-Nov-79	362	97	102
11375870	1980	24-Nov-79	406	111	152
11375870	1980	25-Nov-79	545	236	373
11375870	1980	26-Nov-79	553	133	207
11375870	1980	27-Nov-79	404	45	49
11375870	1980	28-Nov-79	302	20	16
11375870	1980	29-Nov-79	241	10	6.5

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870
 Basin Area (sq. mi) 371
 Latitude 401934
 Longitude: 1222640
 ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1980	30-Nov-79	203	7	3.8
11375870	1980	01-Dec-79	174	5	2.3
11375870	1980	02-Dec-79	153	4	1.7
11375870	1980	03-Dec-79	138	3	1.1
11375870	1980	04-Dec-79	125	3	1
11375870	1980	05-Dec-79	115	3	0.9
11375870	1980	06-Dec-79	108	3	0.9
11375870	1980	07-Dec-79	103	2	0.6
11375870	1980	08-Dec-79	96	2	0.5
11375870	1980	09-Dec-79	90	1	0.2
11375870	1980	10-Dec-79	86	1	0.2
11375870	1980	11-Dec-79	83	0	0
11375870	1980	12-Dec-79	79	0	0
11375870	1980	13-Dec-79	78	1	0.2
11375870	1980	14-Dec-79	76	1	0.2
11375870	1980	15-Dec-79	73	1	0.2
11375870	1980	16-Dec-79	72	1	0.2
11375870	1980	17-Dec-79	70	1	0.2
11375870	1980	18-Dec-79	69	2	0.4
11375870	1980	19-Dec-79	69	2	0.4
11375870	1980	20-Dec-79	76	2	0.4
11375870	1980	21-Dec-79	93	4	1
11375870	1980	22-Dec-79	109	4	1.2
11375870	1980	23-Dec-79	635	213	1020
11375870	1980	24-Dec-79	1050	281	969
11375870	1980	25-Dec-79	453	110	135
11375870	1980	26-Dec-79	321	80	69
11375870	1980	27-Dec-79	220	55	33
11375870	1980	28-Dec-79	169	43	20
11375870	1980	29-Dec-79	146	37	15
11375870	1980	30-Dec-79	1170	560	2940
11375870	1980	31-Dec-79	1710	723	3790
11375870	1980	01-Jan-80	934	168	424
11375870	1980	02-Jan-80	591	110	176
11375870	1980	03-Jan-80	441	62	74
11375870	1980	04-Jan-80	363	30	29
11375870	1980	05-Jan-80	334	18	16
11375870	1980	06-Jan-80	347	25	23
11375870	1980	07-Jan-80	355	25	24
11375870	1980	08-Jan-80	326	25	22
11375870	1980	09-Jan-80	289	23	18
11375870	1980	10-Jan-80	327	43	38
11375870	1980	11-Jan-80	348	36	36
11375870	1980	12-Jan-80	3030	2940	29100
11375870	1980	13-Jan-80	5690	4020	66000

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870

Basin Area (sq. mi) 371

Latitude 401934

Longitude: 1222640

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1980	14-Jan-80	4830	3230	44300
11375870	1980	15-Jan-80	2620	1800	12700
11375870	1980	16-Jan-80	1670	950	4280
11375870	1980	17-Jan-80	1200	550	1780
11375870	1980	18-Jan-80	900	360	875
11375870	1980	19-Jan-80	704	240	456
11375870	1980	20-Jan-80	581	130	204
11375870	1980	21-Jan-80	494	85	113
11375870	1980	22-Jan-80	436	70	82
11375870	1980	23-Jan-80	392	50	53
11375870	1980	24-Jan-80	358	42	41
11375870	1980	25-Jan-80	336	35	32
11375870	1980	26-Jan-80	313	27	23
11375870	1980	27-Jan-80	294	21	17
11375870	1980	28-Jan-80	278	14	11
11375870	1980	29-Jan-80	261	13	9.2
11375870	1980	30-Jan-80	238	10	6.4
11375870	1980	31-Jan-80	235	10	6.3
11375870	1980	01-Feb-80	224	9	5.4
11375870	1980	02-Feb-80	214	9	5.2
11375870	1980	03-Feb-80	1080	333	1420
11375870	1980	04-Feb-80	961	286	812
11375870	1980	05-Feb-80	649	102	179
11375870	1980	06-Feb-80	509	75	103
11375870	1980	07-Feb-80	435	55	65
11375870	1980	08-Feb-80	397	40	43
11375870	1980	09-Feb-80	362	35	34
11375870	1980	10-Feb-80	337	33	30
11375870	1980	11-Feb-80	316	25	21
11375870	1980	12-Feb-80	298	20	16
11375870	1980	13-Feb-80	284	16	12
11375870	1980	14-Feb-80	268	13	9.4
11375870	1980	15-Feb-80	527	113	313
11375870	1980	16-Feb-80	2860	2140	34100
11375870	1980	17-Feb-80	6710	3750	81000
11375870	1980	18-Feb-80	6010	3110	51400
11375870	1980	19-Feb-80	4740	2180	29600
11375870	1980	20-Feb-80	2500	1420	9850
11375870	1980	21-Feb-80	2930	1080	11000
11375870	1980	22-Feb-80	1700	644	2990
11375870	1980	23-Feb-80	1330	510	1830
11375870	1980	24-Feb-80	1090	300	883
11375870	1980	25-Feb-80	962	210	545
11375870	1980	26-Feb-80	872	180	424
11375870	1980	27-Feb-80	1080	319	1100

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870

Basin Area (sq. mi) 371

Latitude 401934

Longitude: 1222640

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1980	28-Feb-80	1410	541	2140
11375870	1980	29-Feb-80	1080	260	758
11375870	1980	01-Mar-80	933	180	453
11375870	1980	02-Mar-80	835	130	293
11375870	1980	03-Mar-80	759	110	225
11375870	1980	04-Mar-80	702	110	208
11375870	1980	05-Mar-80	1420	732	3650
11375870	1980	06-Mar-80	1040	180	505
11375870	1980	07-Mar-80	853	135	311
11375870	1980	08-Mar-80	783	105	222
11375870	1980	09-Mar-80	708	95	182
11375870	1980	10-Mar-80	647	80	140
11375870	1980	11-Mar-80	605	70	114
11375870	1980	12-Mar-80	551	65	97
11375870	1980	13-Mar-80	510	55	76
11375870	1980	14-Mar-80	576	92	159
11375870	1980	15-Mar-80	628	125	209
11375870	1980	16-Mar-80	537	80	618
11375870	1980	17-Mar-80	492	55	996
11375870	1980	18-Mar-80	462	32	40
11375870	1980	19-Mar-80	426	22	25
11375870	1980	20-Mar-80	397	18	19
11375870	1980	21-Mar-80	376	15	15
11375870	1980	22-Mar-80	354	14	13
11375870	1980	23-Mar-80	336	13	12
11375870	1980	24-Mar-80	319	12	10
11375870	1980	25-Mar-80	320	12	10
11375870	1980	26-Mar-80	304	10	8.2
11375870	1980	27-Mar-80	283	9	6.9
11375870	1980	28-Mar-80	265	8	5.7
11375870	1980	29-Mar-80	253	7	4.8
11375870	1980	30-Mar-80	242	7	4.6
11375870	1980	31-Mar-80	235	7	4.4
11375870	1980	01-Apr-80	227	7	4.3
11375870	1980	02-Apr-80	224	7	4.2
11375870	1980	03-Apr-80	216	7	4.1
11375870	1980	04-Apr-80	234	18	11
11375870	1980	05-Apr-80	316	28	24
11375870	1980	06-Apr-80	287	20	15
11375870	1980	07-Apr-80	259	20	14
11375870	1980	08-Apr-80	240	18	12
11375870	1980	09-Apr-80	231	18	11
11375870	1980	10-Apr-80	245	20	13
11375870	1980	11-Apr-80	241	20	13
11375870	1980	12-Apr-80	232	20	13

South Fork Cottonwood Creek Near Olinda **Sediment Discharge**

Station ID: 11375870
 Basin Area (sq. mi) 371
 Latitude 401934
 Longitude: 1222640
 ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1980	13-Apr-80	232	20	13
11375870	1980	14-Apr-80	241	20	13
11375870	1980	15-Apr-80	244	20	13
11375870	1980	16-Apr-80	234	19	12
11375870	1980	17-Apr-80	236	19	12
11375870	1980	18-Apr-80	242	18	12
11375870	1980	19-Apr-80	248	18	12
11375870	1980	20-Apr-80	283	25	19
11375870	1980	21-Apr-80	318	25	21
11375870	1980	22-Apr-80	272	20	15
11375870	1980	23-Apr-80	246	20	13
11375870	1980	24-Apr-80	236	20	13
11375870	1980	25-Apr-80	231	20	12
11375870	1980	26-Apr-80	235	20	13
11375870	1980	27-Apr-80	229	19	12
11375870	1980	28-Apr-80	227	19	12
11375870	1980	29-Apr-80	232	19	12
11375870	1980	30-Apr-80	228	19	12
11375870	1980	01-May-80	218	19	11
11375870	1980	02-May-80	209	18	10
11375870	1980	03-May-80	207	18	10
11375870	1980	04-May-80	211	17	9.7
11375870	1980	05-May-80	215	15	8.7
11375870	1980	06-May-80	209	15	8.5
11375870	1980	07-May-80	199	15	8.1
11375870	1980	08-May-80	190	15	7.7
11375870	1980	09-May-80	191	15	7.7
11375870	1980	10-May-80	190	15	7.7
11375870	1980	11-May-80	171	14	6.5
11375870	1980	12-May-80	162	14	6.1
11375870	1980	13-May-80	157	13	5.5
11375870	1980	14-May-80	153	13	5.4
11375870	1980	15-May-80	144	12	4.7
11375870	1980	16-May-80	135	12	4.4
11375870	1980	17-May-80	132	11	3.9
11375870	1980	18-May-80	129	11	3.8
11375870	1980	19-May-80	132	11	3.9
11375870	1980	20-May-80	140	10	3.8
11375870	1980	21-May-80	149	10	4
11375870	1980	22-May-80	149	10	4
11375870	1980	23-May-80	145	9	3.5
11375870	1980	24-May-80	138	9	3.4
11375870	1980	25-May-80	130	9	3.2
11375870	1980	26-May-80	121	9	2.9
11375870	1980	27-May-80	114	8	2.5

South Fork Cottonwood Creek Near Olinda Sediment Discharge

Station ID: 11375870

Basin Area (sq. mi) 371

Latitude 401934

Longitude: 1222640

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375870	1980	28-May-80	108	8	2.3
11375870	1980	29-May-80	104	8	2.2
11375870	1980	30-May-80	101	8	2.2
11375870	1980	31-May-80	99	7	1.9

Label	Description	Units
Q (cfs)	daily mean streamflow	ft ³ /s
C (mg/L)	daily mean SS concentration	mg/L
L (ton/day)	SS discharge	english short tons/day

Size Distribution of Suspended Material

South Fork Cottonwood Creek Near Olinda **Size Distribution of Suspended Material**

Station Number: 11375870

Basin Area (sq.mi): 371

Latitude: 401934

Longitude: 1222640

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11375870	03-JAN-77	850	ND	ND	ND	ND	ND	99	ND	ND	ND	ND	ND
11375870	03-FEB-77	1115	ND	ND	ND	ND	ND	87	ND	ND	ND	ND	ND
11375870	16-MAR-77	1020	ND	ND	ND	ND	ND	99	ND	ND	ND	ND	ND
11375870	16-MAR-77	1215	ND	ND	ND	ND	ND	96	99	100	ND	ND	ND
11375870	17-MAR-77	1400	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11375870	11-MAY-77	1305	ND	ND	ND	ND	ND	90	ND	ND	ND	ND	ND
11375870	01-JUN-77	1200	ND	ND	ND	ND	ND	94	ND	ND	ND	ND	ND
11375870	23-NOV-77	1255	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11375870	02-DEC-77	835	ND	ND	ND	ND	ND	98	ND	ND	ND	ND	ND
11375870	14-DEC-77	1145	ND	ND	ND	ND	ND	97	98	99	100	ND	ND
11375870	23-DEC-77	1115	ND	ND	ND	ND	ND	92	96	98	100	ND	ND
11375870	09-JAN-78	1216	ND	ND	ND	ND	ND	77	88	98	100	ND	ND
11375870	10-JAN-78	1520	ND	ND	ND	ND	ND	78	87	94	99	100	ND
11375870	14-JAN-78	1316	ND	ND	ND	ND	ND	74	94	100	ND	ND	ND
11375870	03-MAR-78	1510	ND	ND	ND	ND	ND	68	78	91	100	ND	ND
11375870	09-MAR-78	1045	ND	ND	ND	ND	ND	67	77	90	99	100	ND
11375870	07-APR-78	1340	ND	ND	ND	ND	ND	86	90	94	100	ND	ND
11375870	08-SEP-78	1645	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11375870	09-JAN-79	925	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11375870	11-JAN-79	1045	ND	ND	ND	ND	ND	94	97	99	100	ND	ND
11375870	11-JAN-79	1400	ND	ND	ND	ND	ND	95	98	100	ND	ND	ND
11375870	13-FEB-79	1400	ND	ND	ND	ND	ND	92	97	100	ND	ND	ND
11375870	14-FEB-79	820	ND	ND	ND	ND	ND	85	93	99	100	ND	ND
11375870	14-FEB-79	1115	ND	ND	ND	ND	ND	83	87	92	99	100	ND
11375870	20-FEB-79	1500	ND	ND	ND	ND	ND	79	92	99	100	ND	ND
11375870	07-MAR-79	1140	ND	ND	ND	ND	ND	86	92	98	100	ND	ND
11375870	22-MAR-79	1000	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
11375870	22-MAR-79	1110	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11375870	27-MAR-79	1310	ND	ND	ND	ND	ND	95	99	100	ND	ND	ND
11375870	05-APR-79	1000	ND	ND	ND	ND	ND	82	ND	ND	ND	ND	ND
11375870	24-APR-79	1215	ND	ND	ND	ND	ND	98	99	99	100	ND	ND
11375870	26-NOV-79	1440	ND	ND	ND	ND	ND	87	91	97	100	ND	ND
11375870	26-DEC-79	1255	ND	ND	ND	ND	ND	99	100	ND	ND	ND	ND
11375870	07-JAN-80	1140	ND	ND	ND	ND	ND	84	89	96	100	ND	ND
11375870	13-JAN-80	1640	ND	ND	ND	ND	ND	75	86	96	99	100	ND
11375870	16-JAN-80	1615	ND	ND	ND	ND	ND	58	86	93	99	100	ND
11375870	06-FEB-80	1155	ND	ND	ND	ND	ND	84	90	97	100	ND	ND
11375870	17-FEB-80	1700	ND	ND	ND	ND	ND	59	74	87	96	99	100
11375870	18-FEB-80	1525	ND	ND	ND	ND	ND	74	85	96	99	100	ND
11375870	04-MAR-80	1200	ND	ND	ND	ND	ND	58	67	82	99	100	ND
11375870	23-JAN-81	1150	ND	ND	ND	ND	ND	66	75	85	92	100	ND
11375870	30-JAN-81	1220	ND	ND	ND	ND	ND	70	79	90	100	ND	ND

South Fork Cottonwood Creek Near Olinda
Size Distribution of Suspended Material

Station Number: 11375870

Basin Area (sq.mi): 371

Latitude: 401934

Longitude: 1222640

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11375870	17-NOV-81	1255	ND	ND	ND	ND	ND	71	ND	ND	ND	ND	ND
11375870	19-DEC-81	1500	ND	ND	ND	ND	ND	64	ND	ND	ND	ND	ND
11375870	20-DEC-81	1400	ND	ND	ND	ND	ND	69	ND	ND	ND	ND	ND
11375870	18-FEB-82	1230	ND	ND	ND	ND	ND	61	74	88	98	99	100
11375870	12-DEC-82	1015	ND	ND	ND	ND	ND	66	76	88	96	99	100
11375870	27-JAN-83	1230	ND	ND	ND	ND	ND	69	87	97	100	ND	ND
11375870	02-FEB-83	1015	ND	ND	ND	ND	ND	57	65	81	95	97	100
11375870	14-MAR-83	1040	ND	ND	ND	ND	ND	53	63	78	89	93	98
11375870	24-MAR-83	1045	ND	ND	ND	ND	ND	55	61	73	93	100	ND
11375870	06-APR-83	1000	ND	ND	ND	ND	ND	59	64	76	98	100	ND
11375870	22-DEC-83	1015	ND	ND	ND	ND	ND	66	76	88	96	99	100

Size Distribution of Bed Material

South Fork Cottonwood Creek Near Olinda **Size Distribution of Bed Material**

Station Number: 11375870

Basin Area (sq.mi): 371

Latitude: 401934

Longitude: 1222640

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11375870	08-FEB-78	0	1	8	47	57	61	68	81	100	100	100
11375870	08-FEB-78	0	0	2	25	71	91	96	98	100	100	100
11375870	08-FEB-78	0	0	1	5	10	14	23	55	91	100	100
11375870	08-FEB-78	0	0	1	5	19	38	56	80	100	100	100
11375870	08-FEB-78	0	0	0	0	0	1	3	10	39	100	100
11375870	09-MAR-78	0	0	0	0	1	3	13	35	75	75	100
11375870	09-MAR-78	0	0	0	0	0	1	1	2	20	42	100
11375870	09-MAR-78	0	0	0	1	2	4	14	43	82	100	100
11375870	09-MAR-78	0	0	1	7	18	26	37	47	53	100	100
11375870	09-MAR-78	0	2	9	48	74	85	97	100	100	100	100
11375870	11-JAN-79	0	0	1	2	6	12	20	41	74	100	100
11375870	11-JAN-79	0	1	1	4	12	22	33	46	64	100	100
11375870	11-JAN-79	0	0	0	2	8	22	43	68	92	100	100
11375870	11-JAN-79	4	9	16	22	36	56	82	100	100	100	100
11375870	11-JAN-79	0	0	0	10	19	29	51	83	100	100	100
11375870	14-FEB-79	0	0	0	0	0	1	1	2	12	100	100
11375870	14-FEB-79	0	1	1	2	9	27	47	78	100	100	100
11375870	14-FEB-79	0	0	1	6	14	24	35	51	79	100	100
11375870	14-FEB-79	0	0	1	14	25	32	45	65	93	100	100
11375870	14-FEB-79	2	4	5	35	56	70	84	100	100	100	100
11375870	07-MAR-79	0	0	1	2	5	14	20	27	34	52	100
11375870	07-MAR-79	0	0	1	3	7	16	26	36	66	100	100
11375870	07-MAR-79	0	0	1	2	3	6	11	30	56	100	100
11375870	07-MAR-79	0	0	6	43	55	63	72	84	92	100	100
11375870	07-MAR-79	5	10	20	55	70	85	100	100	100	100	100
11375870	24-APR-79	0	0	0	1	1	2	4	8	19	52	100
11375870	24-APR-79	0	0	1	4	5	7	10	18	29	65	100
11375870	24-APR-79	0	0	1	11	25	40	61	92	100	100	100
11375870	24-APR-79	0	0	2	18	54	79	93	100	100	100	100
11375870	24-APR-79	0	0	1	7	12	17	24	39	56	83	100
11375870	04-DEC-79	1	4	17	35	40	49	59	65	70	100	100
11375870	04-DEC-79	2	3	10	48	73	93	99	100	100	100	100
11375870	04-DEC-79	0	1	2	9	24	41	58	77	98	100	100
11375870	04-DEC-79	1	2	6	21	32	46	64	83	99	100	100
11375870	04-DEC-79	0	1	5	20	35	56	79	90	100	100	100
11375870	06-FEB-80	0	0	1	1	2	5	9	16	28	100	100
11375870	06-FEB-80	0	0	0	4	11	18	24	36	50	60	100
11375870	06-FEB-80	0	0	0	2	6	9	12	19	26	38	100
11375870	06-FEB-80	0	0	2	7	16	27	35	44	63	77	100
11375870	06-FEB-80	0	0	3	11	20	26	32	44	66	80	100
11375870	18-FEB-80	0	0	0	0	0	3	23	74	94	100	100
11375870	18-FEB-80	0	0	0	0	1	3	7	13	37	48	100

South Fork Cottonwood Creek Near Olinda
Size Distribution of Bed Material

Station Number: 11375870

Basin Area (sq.mi): 371

Latitude: 401934

Longitude: 1222640

ND indicates missing data

Station Number	Date	Sieve 0.062	Sieve 0.125	Sieve 0.25	Sieve 0.5	Sieve 1	Sieve 2	Sieve 4	Sieve 8	Sieve 16	Sieve 32	Sieve 64
11375870	18-FEB-80	0	1	1	4	8	14	20	42	100	100	100
11375870	18-FEB-80	0	0	1	1	1	2	4	9	56	100	100
11375870	18-FEB-80	0	0	5	23	36	49	66	84	98	100	100
11375870	04-MAR-80	0	5	15	30	45	65	95	100	100	100	100
11375870	04-MAR-80	0	0	0	1	2	5	12	22	44	100	100
11375870	04-MAR-80	0	0	1	6	14	19	25	39	64	100	100
11375870	04-MAR-80	0	0	1	14	33	47	68	92	100	100	100
11375870	04-MAR-80	0	0	1	10	40	64	86	99	100	100	100

Middle Fork Cottonwood Creek Near Ono

Sediment Discharge

Middle Fork Cottonwood Creek Near Ono Sediment Discharge

Station ID: 11374400

Basin Area (sq. mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11374400	1965	12-Nov-64	334	64	64
11374400	1965	13-Nov-64	189	25	13
11374400	1965	14-Nov-64	110	13	3.9
11374400	1965	15-Nov-64	78	7	1.5
11374400	1965	16-Nov-64	65	5	0.9
11374400	1965	17-Nov-64	55	3	0.4
11374400	1965	18-Nov-64	49	3	0.4
11374400	1965	19-Nov-64	44	3	0.4
11374400	1965	20-Nov-64	41	2	0.2
11374400	1965	21-Nov-64	40	2	0.2
11374400	1965	22-Nov-64	61	6	1
11374400	1965	23-Nov-64	53	4	0.6
11374400	1965	24-Nov-64	52	2	0.3
11374400	1965	25-Nov-64	107	19	7
11374400	1965	26-Nov-64	128	ND	9
11374400	1965	27-Nov-64	100	19	5
11374400	1965	28-Nov-64	277	82	93
11374400	1965	29-Nov-64	383	85	97
11374400	1965	30-Nov-64	309	40	44
11374400	1965	01-Dec-64	626	196	349
11374400	1965	02-Dec-64	520	83	117
11374400	1965	03-Dec-64	383	ND	44
11374400	1965	04-Dec-64	264	19	14
11374400	1965	05-Dec-64	204	12	7
11374400	1965	06-Dec-64	166	9	4
11374400	1965	07-Dec-64	142	6	2
11374400	1965	08-Dec-64	124	ND	1
11374400	1965	09-Dec-64	122	ND	1
11374400	1965	10-Dec-64	126	6	3
11374400	1965	11-Dec-64	245	53	37
11374400	1965	12-Dec-64	184	ND	8
11374400	1965	13-Dec-64	149	ND	3
11374400	1965	14-Dec-64	132	ND	1
11374400	1965	15-Dec-64	124	ND	1
11374400	1965	16-Dec-64	110	2	1
11374400	1965	17-Dec-64	99	2	1
11374400	1965	18-Dec-64	92	ND	1
11374400	1965	19-Dec-64	156	51	25
11374400	1965	20-Dec-64	211	60	36
11374400	1965	21-Dec-64	3930	3100	53000
11374400	1965	22-Dec-64	11000	10000	297000
11374400	1965	23-Dec-64	7500	6000	122000
11374400	1965	24-Dec-64	3640	4700	46200
11374400	1965	25-Dec-64	2800	ND	26000
11374400	1965	26-Dec-64	2610	3100	23000

Middle Fork Cottonwood Creek Near Ono Sediment Discharge

Station ID: 11374400

Basin Area (sq. mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11374400	1965	27-Dec-64	2530	1900	13000
11374400	1965	28-Dec-64	1840	1220	6060
11374400	1965	29-Dec-64	1340	820	2970
11374400	1965	30-Dec-64	1190	670	2150
11374400	1965	31-Dec-64	1040	500	1400
11374400	1965	01-Jan-65	910	ND	810
11374400	1965	02-Jan-65	871	ND	710
11374400	1965	03-Jan-65	964	ND	1300
11374400	1965	04-Jan-65	936	ND	1500
11374400	1965	05-Jan-65	3070	3010	30500
11374400	1965	06-Jan-65	2500	ND	6400
11374400	1965	07-Jan-65	1880	ND	5100
11374400	1965	08-Jan-65	1270	ND	2700
11374400	1965	09-Jan-65	1090	550	1620
11374400	1965	10-Jan-65	1030	ND	780
11374400	1965	11-Jan-65	1110	ND	1200
11374400	1965	12-Jan-65	1130	435	1330
11374400	1965	13-Jan-65	1090	ND	1200
11374400	1965	14-Jan-65	1030	380	1060
11374400	1965	15-Jan-65	1050	ND	1100
11374400	1965	16-Jan-65	1090	410	1210
11374400	1965	17-Jan-65	1070	ND	1200
11374400	1965	18-Jan-65	1080	ND	1300
11374400	1965	19-Jan-65	1110	ND	1400
11374400	1965	20-Jan-65	1090	510	1500
11374400	1965	21-Jan-65	1000	ND	1400
11374400	1965	22-Jan-65	907	ND	1100
11374400	1965	23-Jan-65	1240	849	3910
11374400	1965	24-Jan-65	2020	1850	10100
11374400	1965	25-Jan-65	1280	ND	3100
11374400	1965	26-Jan-65	1070	ND	2300
11374400	1965	27-Jan-65	922	ND	1700
11374400	1965	28-Jan-65	805	ND	1300
11374400	1965	29-Jan-65	754	ND	1000
11374400	1965	30-Jan-65	775	ND	840
11374400	1965	31-Jan-65	775	ND	630
11374400	1966	19-Nov-65	231	66	41
11374400	1966	20-Nov-65	167	33	15
11374400	1966	21-Nov-65	136	13	4.8
11374400	1966	22-Nov-65	122	9	3
11374400	1966	23-Nov-65	115	8	2.5
11374400	1966	24-Nov-65	126	8	2.7
11374400	1966	25-Nov-65	140	17	6.4
11374400	1966	26-Nov-65	136	18	6.6
11374400	1966	27-Nov-65	127	15	5.1

Middle Fork Cottonwood Creek Near Ono Sediment Discharge

Station ID: 11374400

Basin Area (sq. mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11374400	1966	28-Nov-65	108	9	2.6
11374400	1966	29-Nov-65	99	6	1.6
11374400	1966	30-Nov-65	94	4	1
11374400	1966	01-Dec-65	87	5	1.2
11374400	1966	02-Dec-65	81	6	1.3
11374400	1966	03-Dec-65	76	4	0.8
11374400	1966	04-Dec-65	75	3	0.6
11374400	1966	05-Dec-65	75	3	0.6
11374400	1966	06-Dec-65	81	4	0.9
11374400	1966	07-Dec-65	83	4	0.9
11374400	1966	08-Dec-65	81	3	0.7
11374400	1966	09-Dec-65	77	3	0.6
11374400	1966	10-Dec-65	72	2	0.4
11374400	1966	11-Dec-65	70	1	0.2
11374400	1966	12-Dec-65	71	1	0.2
11374400	1966	13-Dec-65	66	2	0.4
11374400	1966	14-Dec-65	62	1	0.2
11374400	1966	15-Dec-65	59	1	0.2
11374400	1966	16-Dec-65	56	1	0.2
11374400	1966	17-Dec-65	53	2	0.3
11374400	1966	18-Dec-65	52	2	0.3
11374400	1966	19-Dec-65	52	2	0.3
11374400	1966	20-Dec-65	47	3	0.4
11374400	1966	21-Dec-65	50	3	0.4
11374400	1966	22-Dec-65	50	3	0.4
11374400	1966	23-Dec-65	44	3	0.4
11374400	1966	24-Dec-65	53	3	0.4
11374400	1966	25-Dec-65	61	3	0.5
11374400	1966	26-Dec-65	60	3	0.5
11374400	1966	27-Dec-65	57	3	0.5
11374400	1966	28-Dec-65	274	ND	385
11374400	1966	29-Dec-65	297	ND	140
11374400	1966	30-Dec-65	180	33	16
11374400	1966	31-Dec-65	169	21	9.6
11374400	1966	01-Jan-66	146	18	7.1
11374400	1966	02-Jan-66	133	19	6.8
11374400	1966	03-Jan-66	151	62	35
11374400	1966	04-Jan-66	2660	2480	19500
11374400	1966	05-Jan-66	2300	1090	7280
11374400	1966	06-Jan-66	1440	530	2060
11374400	1966	07-Jan-66	948	340	870
11374400	1966	08-Jan-66	762	190	391
11374400	1966	09-Jan-66	695	168	315
11374400	1966	10-Jan-66	572	116	179
11374400	1966	11-Jan-66	472	83	106

Middle Fork Cottonwood Creek Near Ono Sediment Discharge

Station ID: 11374400

Basin Area (sq. mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11374400	1966	12-Jan-66	372	68	68
11374400	1966	13-Jan-66	320	69	60
11374400	1966	14-Jan-66	320	71	61
11374400	1966	15-Jan-66	392	ND	80
11374400	1966	16-Jan-66	432	ND	90
11374400	1966	17-Jan-66	396	ND	75
11374400	1966	18-Jan-66	346	ND	50
11374400	1966	19-Jan-66	300	ND	35
11374400	1966	20-Jan-66	264	39	28
11374400	1966	21-Jan-66	244	39	26
11374400	1966	22-Jan-66	228	40	25
11374400	1966	23-Jan-66	213	42	24
11374400	1966	24-Jan-66	201	44	24
11374400	1966	25-Jan-66	190	44	23
11374400	1966	26-Jan-66	183	44	22
11374400	1966	27-Jan-66	175	44	21
11374400	1966	28-Jan-66	168	44	20
11374400	1966	29-Jan-66	208	ND	30
11374400	1966	30-Jan-66	316	ND	40
11374400	1966	31-Jan-66	276	ND	30
11374400	1966	01-Feb-66	500	ND	200
11374400	1966	02-Feb-66	349	72	68
11374400	1966	03-Feb-66	579	294	860
11374400	1966	04-Feb-66	1160	707	2330
11374400	1966	05-Feb-66	772	315	657
11374400	1966	06-Feb-66	653	185	326
11374400	1966	07-Feb-66	552	110	164
11374400	1966	08-Feb-66	458	71	88
11374400	1966	09-Feb-66	378	59	60
11374400	1966	10-Feb-66	327	50	44
11374400	1966	11-Feb-66	297	44	35
11374400	1966	12-Feb-66	284	40	31
11374400	1966	13-Feb-66	264	35	25
11374400	1966	14-Feb-66	251	31	21
11374400	1966	15-Feb-66	237	27	17
11374400	1966	16-Feb-66	226	28	17
11374400	1966	17-Feb-66	220	31	18
11374400	1966	18-Feb-66	219	32	19
11374400	1966	19-Feb-66	343	134	142
11374400	1966	20-Feb-66	289	51	40
11374400	1966	21-Feb-66	273	35	26
11374400	1966	22-Feb-66	276	30	22
11374400	1966	23-Feb-66	295	30	24
11374400	1966	24-Feb-66	313	35	30
11374400	1966	25-Feb-66	380	ND	120

Middle Fork Cottonwood Creek Near Ono Sediment Discharge

Station ID: 11374400

Basin Area (sq. mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11374400	1966	26-Feb-66	410	71	86
11374400	1966	27-Feb-66	329	40	36
11374400	1966	28-Feb-66	309	36	30
11374400	1966	01-Mar-66	299	32	26
11374400	1966	02-Mar-66	288	28	22
11374400	1966	03-Mar-66	268	24	17
11374400	1966	04-Mar-66	259	21	15
11374400	1966	05-Mar-66	361	ND	90
11374400	1966	06-Mar-66	343	ND	45
11374400	1966	07-Mar-66	367	48	48
11374400	1966	08-Mar-66	422	73	83
11374400	1966	09-Mar-66	684	258	532
11374400	1966	10-Mar-66	1130	626	1910
11374400	1966	11-Mar-66	934	282	711
11374400	1966	12-Mar-66	778	230	483
11374400	1966	13-Mar-66	789	248	528
11374400	1966	14-Mar-66	805	236	513
11374400	1966	15-Mar-66	763	175	361
11374400	1966	16-Mar-66	681	128	235
11374400	1966	17-Mar-66	597	100	161
11374400	1966	18-Mar-66	532	80	115
11374400	1966	19-Mar-66	482	82	107
11374400	1966	20-Mar-66	432	83	97
11374400	1966	21-Mar-66	400	80	86
11374400	1966	22-Mar-66	370	73	73
11374400	1966	23-Mar-66	353	67	64
11374400	1966	24-Mar-66	350	63	60
11374400	1966	25-Mar-66	375	62	63
11374400	1966	26-Mar-66	428	76	88
11374400	1966	27-Mar-66	510	86	118
11374400	1966	28-Mar-66	570	101	155
11374400	1966	29-Mar-66	591	115	184
11374400	1966	30-Mar-66	612	130	215
11374400	1966	31-Mar-66	613	147	243
11374400	1966	01-Apr-66	623	153	257
11374400	1966	02-Apr-66	588	109	173
11374400	1966	03-Apr-66	521	82	115
11374400	1966	04-Apr-66	473	72	92
11374400	1966	05-Apr-66	435	63	74
11374400	1966	06-Apr-66	419	55	62
11374400	1966	07-Apr-66	410	47	52
11374400	1966	08-Apr-66	385	37	38
11374400	1966	09-Apr-66	352	32	30
11374400	1966	10-Apr-66	356	34	33
11374400	1966	11-Apr-66	363	58	57

Middle Fork Cottonwood Creek Near Ono Sediment Discharge

Station ID: 11374400

Basin Area (sq. mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11374400	1966	12-Apr-66	365	55	54
11374400	1966	13-Apr-66	308	38	32
11374400	1966	14-Apr-66	271	36	26
11374400	1966	15-Apr-66	252	34	23
11374400	1966	16-Apr-66	255	36	25
11374400	1966	17-Apr-66	262	35	25
11374400	1966	18-Apr-66	244	24	16
11374400	1966	19-Apr-66	221	21	13
11374400	1966	20-Apr-66	203	20	11
11374400	1966	21-Apr-66	189	20	10
11374400	1966	22-Apr-66	178	19	9.1
11374400	1966	23-Apr-66	171	18	8.3
11374400	1966	24-Apr-66	167	17	7.7
11374400	1966	25-Apr-66	165	15	6.7
11374400	1966	26-Apr-66	160	13	5.6
11374400	1966	27-Apr-66	152	11	4.5
11374400	1966	28-Apr-66	145	10	3.9
11374400	1966	29-Apr-66	138	9	3.4
11374400	1966	30-Apr-66	132	8	2.9

Label	Description	Units
Q (cfs)	daily mean streamflow	ft ³ /s
C (mg/L)	daily mean SS concentration	mg/L
L (ton/day)	SS discharge	english short tons/day

Size Distribution of Suspended Material

Middle Fork Cottonwood Creek Near Ono **Size Distribution of Suspended Material**

Station Number: 11374400

Basin Area (sq.mi): 244

Latitude: 402203

Longitude: 1223419

ND indicates missing data

Station Number	Date	Time	0.002 mm	0.004 mm	0.008 mm	0.016 mm	0.031 mm	0.062 mm	0.125 mm	0.25 mm	0.50 mm	1 mm	2 mm
11374400	26-NOV-62	1630	ND	ND	ND	ND	ND	99	99	100	ND	ND	ND
11374400	15-DEC-62	1200	ND	ND	ND	ND	ND	97	98	100	ND	ND	ND
11374400	01-FEB-63	1100	ND	ND	ND	ND	ND	98	100	ND	ND	ND	ND
11374400	21-JAN-64	1000	ND	ND	ND	ND	ND	89	95	99	100	ND	ND
11374400	21-JAN-64	1130	ND	ND	ND	ND	ND	92	97	98	100	ND	ND
11374400	27-MAR-64	1320	ND	ND	ND	ND	ND	79	89	100	ND	ND	ND
11374400	12-NOV-64	1550	ND	ND	ND	ND	ND	94	97	98	100	ND	ND
11374400	01-DEC-64	1500	ND	ND	ND	ND	ND	85	88	91	96	99	100
11374400	01-MAR-68	1050	ND	ND	ND	ND	ND	69	72	84	96	100	ND
11374400	13-JAN-69	1240	ND	ND	ND	ND	ND	63	71	81	88	91	100
11374400	30-JAN-69	1100	ND	ND	ND	ND	ND	45	51	63	83	94	100
11374400	05-MAR-69	1500	ND	ND	ND	ND	ND	27	35	45	62	91	100

Size Distribution of Bed Material

Middle Fork Cottonwood Creek Near Ono
Size Distribution of Bed Material

no data

Combined Data (11-3758.1 and 11-3758.7)

Sediment Discharge

Combined Data (11-3758.1 and 11-3758.7)
Sediment Discharge

Station ID: 11375871

Basin Area (sq. mi):

Latitude: 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375871	1978	01-Nov-77	23	ND	0.37
11375871	1978	02-Nov-77	19	ND	0.26
11375871	1978	03-Nov-77	18	ND	0.19
11375871	1978	04-Nov-77	19	ND	0.46
11375871	1978	05-Nov-77	31	ND	0.42
11375871	1978	06-Nov-77	46	ND	0.25
11375871	1978	07-Nov-77	36	ND	0.39
11375871	1978	08-Nov-77	27	ND	0.44
11375871	1978	09-Nov-77	26	ND	0.21
11375871	1978	10-Nov-77	22	ND	0.18
11375871	1978	11-Nov-77	22	ND	0.48
11375871	1978	12-Nov-77	22	ND	0.53
11375871	1978	13-Nov-77	23	ND	0.12
11375871	1978	14-Nov-77	24	ND	0.13
11375871	1978	15-Nov-77	21	ND	0.17
11375871	1978	16-Nov-77	21	ND	0.11
11375871	1978	17-Nov-77	20	ND	0.16
11375871	1978	18-Nov-77	19	ND	0.15
11375871	1978	19-Nov-77	18	ND	0.34
11375871	1978	20-Nov-77	18	ND	0.78
11375871	1978	21-Nov-77	40	ND	1.9
11375871	1978	22-Nov-77	673	ND	3600
11375871	1978	23-Nov-77	873	ND	8720
11375871	1978	24-Nov-77	478	ND	237
11375871	1978	25-Nov-77	549	ND	621
11375871	1978	26-Nov-77	446	ND	225
11375871	1978	27-Nov-77	427	ND	123
11375871	1978	28-Nov-77	302	ND	38
11375871	1978	29-Nov-77	232	ND	23
11375871	1978	30-Nov-77	208	ND	18
11375871	1978	01-Dec-77	190	ND	11
11375871	1978	02-Dec-77	163	ND	6
11375871	1978	03-Dec-77	146	ND	5
11375871	1978	04-Dec-77	133	ND	3
11375871	1978	05-Dec-77	127	ND	2
11375871	1978	06-Dec-77	121	ND	2
11375871	1978	07-Dec-77	112	ND	2
11375871	1978	08-Dec-77	107	ND	2
11375871	1978	09-Dec-77	97	ND	1
11375871	1978	10-Dec-77	90	ND	1
11375871	1978	11-Dec-77	109	ND	3
11375871	1978	12-Dec-77	321	ND	91
11375871	1978	13-Dec-77	250	ND	52
11375871	1978	14-Dec-77	3080	ND	25400
11375871	1978	15-Dec-77	4520	ND	45200

Combined Data (11-3758.1 and 11-3758.7)
Sediment Discharge

Station ID: 11375871

Basin Area (sq. mi):

Latitude: 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375871	1978	16-Dec-77	2150	ND	10100
11375871	1978	17-Dec-77	3850	ND	32800
11375871	1978	18-Dec-77	1640	ND	2170
11375871	1978	19-Dec-77	1020	ND	573
11375871	1978	20-Dec-77	735	ND	193
11375871	1978	21-Dec-77	651	ND	326
11375871	1978	22-Dec-77	2240	ND	25100
11375871	1978	23-Dec-77	5170	ND	84400
11375871	1978	24-Dec-77	1910	ND	3480
11375871	1978	25-Dec-77	1290	ND	1180
11375871	1978	26-Dec-77	1000	ND	550
11375871	1978	27-Dec-77	1380	ND	1380
11375871	1978	28-Dec-77	1590	ND	2450
11375871	1978	29-Dec-77	1360	ND	1360
11375871	1978	30-Dec-77	1240	ND	919
11375871	1978	31-Dec-77	1030	ND	592
11375871	1978	01-Jan-78	881	ND	424
11375871	1978	02-Jan-78	1400	ND	2050
11375871	1978	03-Jan-78	1910	ND	3740
11375871	1978	04-Jan-78	4470	ND	50400
11375871	1978	05-Jan-78	6710	ND	79600
11375871	1978	06-Jan-78	3150	ND	9580
11375871	1978	07-Jan-78	2020	ND	3480
11375871	1978	08-Jan-78	2590	ND	6040
11375871	1978	09-Jan-78	12200	ND	214000
11375871	1978	10-Jan-78	5680	ND	19600
11375871	1978	11-Jan-78	3630	ND	5530
11375871	1978	12-Jan-78	3180	ND	3150
11375871	1978	13-Jan-78	6760	ND	28100
11375871	1978	14-Jan-78	13700	ND	179000
11375871	1978	15-Jan-78	11400	ND	78400
11375871	1978	16-Jan-78	17400	ND	255000
11375871	1978	17-Jan-78	11100	ND	63400
11375871	1978	18-Jan-78	8130	ND	31900
11375871	1978	19-Jan-78	8150	ND	34900
11375871	1978	20-Jan-78	5150	ND	7320
11375871	1978	21-Jan-78	3930	ND	3790
11375871	1978	22-Jan-78	3160	ND	2720
11375871	1978	23-Jan-78	2640	ND	2140
11375871	1978	24-Jan-78	2270	ND	1140
11375871	1978	25-Jan-78	2030	ND	628
11375871	1978	26-Jan-78	1830	ND	842
11375871	1978	27-Jan-78	1670	ND	1320
11375871	1978	28-Jan-78	1540	ND	758
11375871	1978	29-Jan-78	1440	ND	320

Combined Data (11-3758.1 and 11-3758.7)
Sediment Discharge

Station ID: 11375871

Basin Area (sq. mi):

Latitude: 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375871	1978	30-Jan-78	1350	ND	191
11375871	1978	31-Jan-78	1270	ND	136
11375871	1978	01-Feb-78	1270	ND	153
11375871	1978	02-Feb-78	1390	ND	276
11375871	1978	03-Feb-78	1270	ND	217
11375871	1978	04-Feb-78	1200	ND	171
11375871	1978	05-Feb-78	3940	ND	16700
11375871	1978	06-Feb-78	4450	ND	15400
11375871	1978	07-Feb-78	8650	ND	63400
11375871	1978	08-Feb-78	6920	ND	28500
11375871	1978	09-Feb-78	6050	ND	22400
11375871	1978	10-Feb-78	4090	ND	6950
11375871	1978	11-Feb-78	3310	ND	2520
11375871	1978	12-Feb-78	4710	ND	24300
11375871	1978	13-Feb-78	3540	ND	3780
11375871	1978	14-Feb-78	2980	ND	1720
11375871	1978	15-Feb-78	2630	ND	686
11375871	1978	16-Feb-78	2360	ND	421
11375871	1978	17-Feb-78	2170	ND	563
11375871	1978	18-Feb-78	2010	ND	883
11375871	1978	19-Feb-78	1980	ND	745
11375871	1978	20-Feb-78	1970	ND	644
11375871	1978	21-Feb-78	1960	ND	597
11375871	1978	22-Feb-78	1940	ND	594
11375871	1978	23-Feb-78	1870	ND	470
11375871	1978	24-Feb-78	1780	ND	442
11375871	1978	25-Feb-78	1670	ND	389
11375871	1978	26-Feb-78	1530	ND	234
11375871	1978	27-Feb-78	1410	ND	165
11375871	1978	28-Feb-78	1280	ND	151
11375871	1978	01-Mar-78	1190	ND	128
11375871	1978	02-Mar-78	1970	ND	1080
11375871	1978	03-Mar-78	2700	ND	2340
11375871	1978	04-Mar-78	7000	ND	27000
11375871	1978	05-Mar-78	4640	ND	13600
11375871	1978	06-Mar-78	3350	ND	9200
11375871	1978	07-Mar-78	2970	ND	3160
11375871	1978	08-Mar-78	9010	ND	29400
11375871	1978	09-Mar-78	7910	ND	25400
11375871	1978	10-Mar-78	5060	ND	5530
11375871	1978	11-Mar-78	3910	ND	2290
11375871	1978	12-Mar-78	3150	ND	1150
11375871	1978	13-Mar-78	2730	ND	1430
11375871	1978	14-Mar-78	2440	ND	1380
11375871	1978	15-Mar-78	2120	ND	1090

Combined Data (11-3758.1 and 11-3758.7)
Sediment Discharge

Station ID: 11375871

Basin Area (sq. mi):

Latitude: 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375871	1978	16-Mar-78	1940	ND	632
11375871	1978	17-Mar-78	1790	ND	280
11375871	1978	18-Mar-78	1690	ND	316
11375871	1978	19-Mar-78	1590	ND	341
11375871	1978	20-Mar-78	1520	ND	226
11375871	1978	21-Mar-78	1560	ND	235
11375871	1978	22-Mar-78	1680	ND	382
11375871	1978	23-Mar-78	1590	ND	271
11375871	1978	24-Mar-78	1510	ND	192
11375871	1978	25-Mar-78	1370	ND	158
11375871	1978	26-Mar-78	1270	ND	129
11375871	1978	27-Mar-78	1200	ND	126
11375871	1978	28-Mar-78	1170	ND	103
11375871	1978	29-Mar-78	1160	ND	108
11375871	1978	30-Mar-78	1210	ND	139
11375871	1978	31-Mar-78	1710	ND	2420
11375871	1978	01-Apr-78	2910	ND	3200
11375871	1978	02-Apr-78	1750	ND	530
11375871	1978	03-Apr-78	1570	ND	206
11375871	1978	04-Apr-78	1700	ND	309
11375871	1978	05-Apr-78	1500	ND	362
11375871	1978	06-Apr-78	2990	ND	2150
11375871	1978	07-Apr-78	2420	ND	1140
11375871	1978	08-Apr-78	1880	ND	544
11375871	1978	09-Apr-78	1680	ND	242
11375871	1978	10-Apr-78	1550	ND	169
11375871	1978	11-Apr-78	1460	ND	137
11375871	1978	12-Apr-78	1390	ND	107
11375871	1978	13-Apr-78	1330	ND	100
11375871	1978	14-Apr-78	1300	ND	88
11375871	1978	15-Apr-78	1430	ND	152
11375871	1978	16-Apr-78	1310	ND	126
11375871	1978	17-Apr-78	1190	ND	74
11375871	1978	18-Apr-78	1110	ND	47
11375871	1978	19-Apr-78	1090	ND	56
11375871	1978	20-Apr-78	1100	ND	58
11375871	1978	21-Apr-78	1030	ND	46
11375871	1978	22-Apr-78	975	ND	49
11375871	1978	23-Apr-78	928	ND	64
11375871	1978	24-Apr-78	882	ND	121
11375871	1978	25-Apr-78	1620	ND	717
11375871	1978	26-Apr-78	1980	ND	795
11375871	1978	27-Apr-78	1270	ND	104
11375871	1978	28-Apr-78	1150	ND	72
11375871	1978	29-Apr-78	1060	ND	47

Combined Data (11-3758.1 and 11-3758.7)
Sediment Discharge

Station ID: 11375871

Basin Area (sq. mi):

Latitude: 402314

Longitude: 1221415

ND indicates missing data

Station ID	Water Year	Date	Q (cfs)	C (mg/L)	L (ton/day)
11375871	1978	30-Apr-78	1010	ND	41
11375871	1978	01-May-78	969	ND	33
11375871	1978	02-May-78	937	ND	33
11375871	1978	03-May-78	901	ND	40
11375871	1978	04-May-78	884	ND	37
11375871	1978	05-May-78	871	ND	34
11375871	1978	06-May-78	836	ND	32
11375871	1978	07-May-78	798	ND	31
11375871	1978	08-May-78	768	ND	29
11375871	1978	09-May-78	763	ND	37
11375871	1978	10-May-78	766	ND	40
11375871	1978	11-May-78	746	ND	31
11375871	1978	12-May-78	725	ND	24
11375871	1978	13-May-78	716	ND	22
11375871	1978	14-May-78	714	ND	23
11375871	1978	15-May-78	723	ND	31
11375871	1978	16-May-78	689	ND	34
11375871	1978	17-May-78	639	ND	35
11375871	1978	18-May-78	609	ND	34
11375871	1978	19-May-78	583	ND	32
11375871	1978	20-May-78	554	ND	33
11375871	1978	21-May-78	556	ND	36
11375871	1978	22-May-78	551	ND	35
11375871	1978	23-May-78	514	ND	19
11375871	1978	24-May-78	495	ND	11
11375871	1978	25-May-78	480	ND	9.4
11375871	1978	26-May-78	455	ND	7.8
11375871	1978	27-May-78	433	ND	9.3
11375871	1978	28-May-78	419	ND	10
11375871	1978	29-May-78	415	ND	9.1
11375871	1978	30-May-78	413	ND	7.6
11375871	1978	31-May-78	411	ND	6.4

Label	Description	Units
Q (cfs)	daily mean streamflow	ft ³ /s
C (mg/L)	daily mean SS concentration	mg/L
L (ton/day)	SS discharge	english short tons/day

Size Distribution of Suspended Material

Combined Data (11-3758.1 and 11-3758.7)
Size Distribution of Suspended Material

no data

Size Distribution of Bed Material

Combined Data (11-3758.1 and 11-3758.7)
Size Distribution of Bed Material

no data

APPENDIX I
LIST OF AVAILABLE TIMBER
HARVEST DOCUMENTS

1/6/01

Harvest Documents by Legal Description

From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
92-266-TRI4		1,439	3	31 N	8 W	MD	ATHP
			11	31 N	8 W	MD	ATHP
			33	31 N	8 W	MD	ATHP
92-304-TRI4		58	5	31 N	8 W	MD	ATHP
			9	31 N	8 W	MD	ATHP
93-209-SHA4		1,283	27	31 N	8 W	MD	ATHP
			28	31 N	8 W	MD	ATHP
			33	31 N	8 W	MD	ATHP
			34	31 N	8 W	MD	ATHP
93-379-TRI4		772	6	31 N	8 W	MD	ATHP
93-414-SHA4		106	29	31 N	8 W	MD	ATHP
94-052-TRI4	3-FORKS	1,196	5	31 N	8 W	MD	ATHP
			6	31 N	8 W	MD	ATHP
			7	31 N	8 W	MD	ATHP
			8	31 N	8 W	MD	ATHP
94-391-TRI4	UPPER GRASS VALLEY CREEK	122	2	31 N	8 W	MD	ATHP
			10	31 N	8 W	MD	ATHP
95-219-SHA4	COLD SPRINGS	365	29	31 N	8 W	MD	ATHP
			32	31 N	8 W	MD	ATHP
			33	31 N	8 W	MD	ATHP
97-377-TRI4	BLUENOSE PEAK	317	20	31 N	8 W	MD	ATHP
99-184-TRI4	BULLY CHOOP	140	8	31 N	8 W	MD	ATHP
99-232-SHA4	MOON FORK	3,318	2	31 N	8 W	MD	ATHP
			12	31 N	8 W	MD	ATHP
			14	31 N	8 W	MD	ATHP
			24	31 N	8 W	MD	ATHP
			25	31 N	8 W	MD	ATHP
			26	31 N	8 W	MD	ATHP
			36	31 N	8 W	MD	ATHP
00-141-TRI4	PARADISE PEAK	103	2	31 N	8 W	MD	ATHP
			10	31 N	8 W	MD	ATHP

List of Harvest Documents at 31N 8W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-00-141-TRI4	PARADISE PEAK	103	Shelterwood Removal	103
2-92-266-TRI4		1,439	Rehabilitation	21
		1,439	Selection	169
		1,439	Shelterwood Prep	249
		1,439	Shelterwood Removal	1,000
2-92-304-TRI4		58	Alternative (other)	58
2-93-209-SHA4		1,283	Commercial Thinning	279
		1,283	Alternative (other)	434
		1,283	Seed Tree Removal	570
2-93-379-TRI4		772	Sanitation Salvage	40
		772	Clearcutting	45
		772	Shelterwood Removal	75
		772	Alternative (other)	612
2-93-414-SHA4		106	Alternative (other)	43
		106	Shelterwood Removal	63
2-94-052-TRI4	3-FORKS	1,196	Shelterwood Prep	24
		1,196	Sanitation Salvage	59
		1,196	Clearcutting	116
		1,196	Shelterwood Removal	450
		1,196	Alternative (other)	547
2-94-391-TRI4	UPPER GRASS VALLEY CREEK	122	Commercial Thinning	4
		122	Sanitation Salvage	12
		122	Selection	20
		122	Alternative (other)	86
2-95-219-SHA4	COLD SPRINGS	365	Commercial Thinning	8
		365	Clearcutting	13
		365	Shelterwood Removal	155
		365	Selection	189
2-97-377-TRI4	BLUENOSE PEAK	317	Clearcutting	6
		317	Alternative (Shelterwood Reml)	311
2-99-184-TRI4	BULLY CHOOP	140	Clearcutting	5
		140	Alternative (Shelterwood Reml)	135
2-99-232-SHA4	MOON FORK	3,318	Commercial Thinning	16
		3,318	Alternative (Comm'l Thinning)	475
		3,318	Selection	976
		3,318	Alternative (other)	1,814
Total Number of HDs:		12		

1/6/01

Harvest Documents by Legal Description

From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
92-123-SHA4	RAINBOW LAKE	322	30	31 N	7 W	MD	ATHP
94-151-SHA4		800	23	31 N	7 W	MD	ATHP
			26	31 N	7 W	MD	ATHP
94-161-SHA4	CARLSON - ONO	440	26	31 N	7 W	MD	ATHP
			27	31 N	7 W	MD	ATHP
94-485-SHA4	LITTLE BALLY	1,852	3	31 N	7 W	MD	ATHP
			4	31 N	7 W	MD	ATHP
			5	31 N	7 W	MD	ATHP
			8	31 N	7 W	MD	ATHP
			9	31 N	7 W	MD	ATHP
			16	31 N	7 W	MD	ATHP
96-100-SHA4	COTTONWOOD CREEK I	1,212	4	31 N	7 W	MD	ATHP
			8	31 N	7 W	MD	ATHP
			9	31 N	7 W	MD	ATHP
			16	31 N	7 W	MD	ATHP
96-380-SHA4	NORTH FORK COTTONWOOD CR II	1,555	9	31 N	7 W	MD	ATHP
			10	31 N	7 W	MD	ATHP
			16	31 N	7 W	MD	ATHP
			21	31 N	7 W	MD	ATHP
99-232-SHA4	MOON FORK	3,318	6	31 N	7 W	MD	ATHP
			8	31 N	7 W	MD	ATHP
			18	31 N	7 W	MD	ATHP
			19	31 N	7 W	MD	ATHP
			20	31 N	7 W	MD	ATHP
			30	31 N	7 W	MD	ATHP
			31	31 N	7 W	MD	ATHP
96-028-SHA4		2,764	8	31 N	7 W	MD	ATHP
			9	31 N	7 W	MD	ATHP
			10	31 N	7 W	MD	ATHP
			16	31 N	7 W	MD	ATHP
			21	31 N	7 W	MD	ATHP

List of Harvest Documents at 31N 7W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-92-123-SHA4	RAINBOW LAKE	322	Alternative (other)	322
2-94-151-SHA4		800	Selection	800
2-94-161-SHA4	CARLSON - ONO	440	Alternative (other)	440
2-94-485-SHA4	LITTLE BALLY	1,852	Selection	41
		1,852	Alternative (Sanitation Salv')	1,811
2-96-028-SHA4		2,764	Selection	242
		2,764	Alternative (Shw'd Rem/C Thin)	2,518
2-96-100-SHA4	COTTONWOOD CREEK I	1,212	Selection	14
		1,212	Alternative (other)	1,198
2-96-380-SHA4	NORTH FORK COTTONWOOD	1,555	Selection	203
		1,555	Alternative (other)	1,352
2-99-232-SHA4	MOON FORK	3,318	Commercial Thinning	16
		3,318	Alternative (Comm'l Thinning)	475
		3,318	Selection	976
		3,318	Alternative (other)	1,814
Total Number of HDs:		8		

1/6/01

Harvest Documents by Legal Description
From Year: 1990

<u>Harvest Document</u>	<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
91-078-SHA4	164	9	31 N	6 W	MD	ATHP
		15	31 N	6 W	MD	ATHP
		16	31 N	6 W	MD	ATHP
93-041-SHA4	30	17	31 N	6 W	MD	ATHP
98-333-SHA4	16	13	31 N	6 W	MD	ATHP
		24	31 N	6 W	MD	ATHP

RANCLAND PROPERTIES

List of Harvest Documents at 31N 6W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-91-078-SHA4		164	Shelterwood Removal	15
		164	Rehabilitation	149
2-93-041-SHA4		30	Shelterwood Removal	10
		30	Transition	20
2-98-333-SHA4	RANCLAND PROPERTIES	16	Rehabilitation	16
Total Number of HDs:	<u>3</u>			

Harvest Documents by Legal Description

From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
91-002-TRI4		897	3	30 N	9 W	MD	ATHP
			4	30 N	9 W	MD	ATHP
			5	30 N	9 W	MD	ATHP
			7	30 N	9 W	MD	ATHP
			8	30 N	9 W	MD	ATHP
91-133-SHA4		620	12	30 N	9 W	MD	ATHP
95-311-SHA4	PLATINA - DEER LICK SPRINGS ROAD	140	30	30 N	9 W	MD	ATHP
97-041-SHA4	COAST THP / ELSBREE / DEER LICK	14	3	30 N	9 W	MD	ATHP
			4	30 N	9 W	MD	ATHP
97-149-SHA4	AALFS / ANKER	328	14	30 N	9 W	MD	ATHP
			15	30 N	9 W	MD	ATHP
			23	30 N	9 W	MD	ATHP
97-377-TRI4	BLUENOSE PEAK	317	8	30 N	9 W	MD	ATHP
			9	30 N	9 W	MD	ATHP
97-389-TRI4	HORNET SPRINGS	30	4	30 N	9 W	MD	ATHP
97-388-SHA4	HELL ROARING GULCH	96	11	30 N	9 W	MD	ATHP
97NTMP-4	DOUGLAS TRUST	92	6	30 N	9 W	MD	NTMP
			7	30 N	9 W	MD	NTMP
97NTMP-4-1			6	30 N	9 W	MD	NTMP
			7	30 N	9 W	MD	NTMP
98-255-SHA4	CUTTHROAT GULCH	116	11	30 N	9 W	MD	ATHP
97NTMP-4-2	DOUGLAS TRUST	92	7	30 N	9 W	MD	NTMP
			6	30 N	9 W	MD	NTMP
97-105-SHA4	ANDERSON SPRING RIDGE	328	14	30 N	9 W	MD	ATHP
			15	30 N	9 W	MD	ATHP
			23	30 N	9 W	MD	ATHP
00-284-SHA4	DUNCAN CREEK	213	1	30 N	9 W	MD	ATHP
01-198-TRI4	CHISEL	556	2	30 N	9 W	MD	ATHP
			3	30 N	9 W	MD	ATHP
			4	30 N	9 W	MD	ATHP
			5	30 N	9 W	MD	ATHP
			9	30 N	9 W	MD	ATHP

List of Harvest Documents at 30N 9W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-00-284-SHA4	DUNCAN CREEK	213	Alternative (Shelterwood Reml)	213
2-01-198-TRI4	CHISEL	556	Commercial Thinning	5
		556	Shelterwood Removal	21
		556	Alternative (Comm'l Thinning)	62
		556	Selection	108
		556	Clearcutting	360
2-91-002-TRI4		897	Clearcutting	12
		897	Shelterwood Removal	885
2-91-133-SHA4		620	Alternative (other)	620
2-95-311-SHA4	PLATINA - DEER LICK SPRING	140	Shelterwood Removal	140
2-97-041-SHA4	COAST THP / ELSBREE / DEER	14	Shelterwood Removal	2
		14	Clearcutting	12
2-97-105-SHA4	ANDERSON SPRING RIDGE	328	Seed Tree Removal	111
		328	Shelterwood Removal	217
2-97-149-SHA4	AALFS / ANKER	328	Selection	10
		328	Seed Tree Removal	109
		328	Shelterwood Removal	209
2-97-377-TRI4	BLUENOSE PEAK	317	Clearcutting	6
		317	Alternative (Shelterwood Reml)	311
2-97-388-SHA4	HELL ROARING GULCH	96	Shelterwood Removal	96
2-97-389-TRI4	HORNET SPRINGS	30	Alternative (Clearcutting)	30
2-97NTMP-4	DOUGLAS TRUST	92	Non Industrial Timber Mgt Plan	92
2-97NTMP-4-1	DOUGLAS TRUST	92	Sanitation Salvage	92
2-97NTMP-4-2	DOUGLAS TRUST	92	Sanitation Salvage	92
2-98-255-SHA4	CUTTHROAT GULCH	116	Rehabilitation	23
		116	Shelterwood Removal	93
Total Number of HDs:		15		

1/6/01

Harvest Documents by Legal Description
From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
91-021-SHA4		22	14	30 N	8 W	MD	ATHP
93-209-SHA4		1,283	3	30 N	8 W	MD	ATHP
			4	30 N	8 W	MD	ATHP
00-290-SHA4	BAKER BEAR	228	5	30 N	8 W	MD	ATHP
			7	30 N	8 W	MD	ATHP
00-284-SHA4	DUNCAN CREEK	213	6	30 N	8 W	MD	ATHP
			6	30 N	8 W	MD	ATHP
			8	30 N	8 W	MD	ATHP
			8	30 N	8 W	MD	ATHP

List of Harvest Documents at 30N 8W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-00-284-SHA4	DUNCAN CREEK	213	Alternative (Shelterwood Reml)	213
2-00-290-SHA4	BAKER BEAR	228	Alternative (Shelterwood Reml)	228
2-91-021-SHA4		22	Shelterwood Removal	22
2-93-209-SHA4		1,283	Commercial Thinning	279
		1,283	Alternative (other)	434
		1,283	Seed Tree Removal	570
Total Number of HDs: <u>4</u>				

1/6/01

Harvest Documents by Legal Description
From Year: 1990

30N 7W M06m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 30N 7W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
Total Number of HDs:	<u>0</u>			

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 30N 6W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>

1/6/01

Harvest Documents by Legal Description
From Year: 1990

30N 5W M03m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 30N 5W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>			

1/6/01

Harvest Documents by Legal Description
From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
-93-134-SHA4	CODY - BASIN GULCH / PLATINA	35	22	29 N	10 W	MD	ATHP
-96-116-SHA4	PLATINA - BASIN GULCH	39	16	29 N	10 W	MD	ATHP
-96-204-TRI4		17	7	29 N	10 W	MD	ATHP
-91NTMP-1	BOWMAN BLEILE PRIELIPP SANDBURG	250	22	29 N	10 W	MD	NTMP
-91NTMP-1-1	BOWMAN BLEILE PRIELIPP SANDBERG	274	22	29 N	10 W	MD	NTMP
-99-118-TRI4	MCFARLAND RIDGE	40	18	29 N	10 W	MD	ATHP
-99-097-SHA4	OLIPHANT	80	20	29 N	10 W	MD	ATHP
			21	29 N	10 W	MD	ATHP
-99-099-SHA4	SUNDAY GULCH	82	24	29 N	10 W	MD	ATHP
-91NTMP-1-6	IMPERIALE, IMPERIALE & LOMBARDO	100	22	29 N	10 W	MD	NTMP
-91NTMP-1-2	BOWMAN BLEILE PRIELIPP SANDBERG	264	22	29 N	10 W	MD	NTMP

List of Harvest Documents at 29N 10W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-91NTMP-1	BOWMAN BLEILE PRIELIPP SA	250	Non Industrial Timber Mgt Plan	250
2-91NTMP-1-1	BOWMAN BLEILE PRIELIPP SA	274	Sanitation Salvage	104
		274	Selection	170
2-91NTMP-1-2	BOWMAN BLEILE PRIELIPP SA	264	Selection	104
		264	Sanitation Salvage	160
2-91NTMP-1-6	IMPERIALE, IMPERIALE & LON	100	Group Selection	100
		100	Selection	100
2-93-134-SHA4	CODY - BASIN GULCH / PLATT	35	Sanitation Salvage	8
		35	Alternative (other)	27
2-96-116-SHA4	PLATINA - BASIN GULCH	39	Clearcutting	15
		39	Shelterwood Removal	24
2-96-204-TRI4		17	Commercial Thinning	4
		17	Shelterwood Removal	13
2-99-097-SHA4	OLIPHANT	80	Shelterwood Removal	6
		80	Group Selection	74
2-99-099-SHA4	SUNDAY GULCH	82	Alternative (Shelterwood Reml)	82
2-99-118-TRI4	MCFARLAND RIDGE	40	Alternative (Selection)	40
Total Number of HDs:		10		

1/6/01

Harvest Documents by Legal Description
From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
92-352-SHA4		56	19	29 N	9 W	MD	ATHP
95-086-SHA4	PLATINA - HART	5	18	29 N	9 W	MD	ATHP
95-168-SHA4	KNOB GULCH	17	5	29 N	9 W	MD	ATHP
96-032-SHA4	PLATINA - JENKINS	27	18	29 N	9 W	MD	ATHP
			19	29 N	9 W	MD	ATHP
96-117-SHA4	PLATINA - HWY 36	121	18	29 N	9 W	MD	ATHP
96-140-SHA4	PLATINA - UPPER COTTONWOOD	27	20	29 N	9 W	MD	ATHP

List of Harvest Documents at 29N 9W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-92-352-SHA4		56	Shelterwood Removal	56
2-95-086-SHA4	PLATINA - HART	5	Clearcutting	5
2-95-168-SHA4	KNOB GULCH	17	Alternative (other)	17
2-96-032-SHA4	PLATINA - JENKINS	27	Selection	4
		27	Shelterwood Removal	6
		27	Clearcutting	17
2-96-117-SHA4	PLATINA - HWY 36	121	Clearcutting	15
		121	Shelterwood Removal	39
		121	Seed Tree Removal	67
2-96-140-SHA4	PLATINA - UPPER COTTONWO	27	Clearcutting	5
		27	Shelterwood Removal	22
Total Number of HDs:		<u>6</u>		

1/6/01

Harvest Documents by Legal Description
From Year: 1990

29N 8W MUBM

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

11/06/01

List of Harvest Documents at 29N 8W in MD from 1991

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>			

1/6/01

Harvest Documents by Legal Description
From Year: 1990

29N 7W m08m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 29N 7W in MD from 1991

11/06/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>

1/7/01

Harvest Documents by Legal Description
From Year: 1990

29N 5W m03m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 29N 6W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
Total Number of HDs:	<u>0</u>			

1/7/01

Harvest Documents by Legal Description
From Year: 1990

29N 4W m08m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 29N 4W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:

0

7/01

Harvest Documents by Legal Description
From Year: 1990

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

93-347-TRI4

160

32

28 N

10 W

MD

ATHP

99-312-TEH5

BEEGUM

80

36

28 N

10 W

MD

ATHP

List of Harvest Documents at 28N 10W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-93-347-TRI4		160	Alternative (other)	160
2-99-312-TEH5	BEEGUM	80	Shelterwood Removal	80
Total Number of HDs:	<u>2</u>			

1/7/01

Harvest Documents by Legal Description
From Year: 1990

<u>Harvest Document</u>		<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
-92-352-SHA4		56	19	29 N	9 W	MD	ATHP
-95-086-SHA4	PLATINA - HART	5	18	29 N	9 W	MD	ATHP
-95-168-SHA4	KNOB GULCH	17	5	29 N	9 W	MD	ATHP
-96-032-SHA4	PLATINA - JENKINS	27	18	29 N	9 W	MD	ATHP
			19	29 N	9 W	MD	ATHP
-96-117-SHA4	PLATINA - HWY 36	121	18	29 N	9 W	MD	ATHP
-96-140-SHA4	PLATINA - UPPER COTTONWOOD	27	20	29 N	9 W	MD	ATHP

List of Harvest Documents at 28N 9W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-93-285-TEH5		107	Rehabilitation	107
2-93NTMP-2	BEBENSEE SCHOENHEIDE	1,196	Non Industrial Timber Mgt Plan	1,196
2-98-116-TEH5	BEEGUM	421	Seed Tree Removal	129
		421	Rehabilitation	292
2-98-182-TEH5	MENDONSA-WESTON RANCH	75	Seed Tree Seed	1
		75	Rehabilitation	2
		75	Clearcutting	3
		75	Shelterwood Removal	69
2-99-134-TEH5	WELLS CREEK	550	Rehabilitation	18
		550	Alternative (Shelterwood Reml)	115
		550	Shelterwood Removal	348
Total Number of HDs:		<u>5</u>		

Harvest Documents by Legal Description
From Year: 1990

26N 8W m08m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 28N 8W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>

1/7/01

Harvest Documents by Legal Description
From Year: 1990

38N 7W m08m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 28N 7W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
Total Number of HDs:		<u>0</u>		

1/7/01

Harvest Documents by Legal Description
From Year: 1990

28N 6W m08m

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 28N 6W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>			

1/7/01

Harvest Documents by Legal Description
From Year: 1990

28N 5W M08M

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 28N 5W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>

1/7/01

Harvest Documents by Legal Description
From Year: 1990

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

95-218-TEH5

640

16

27 N

9 W

MD

ATHP

List of Harvest Documents at 27N 9W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-95-218-TEH5		640	Shelterwood Removal	640
Total Number of HDs:	<u>1</u>			

1/7/01

Harvest Documents by Legal Description
From Year: 1990

<u>Harvest Document</u>	<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
91-026-TEH5	462	31	27 N	8 W	MD	ATHP
95-127-TEH5	40	30	27 N	8 W	MD	ATHP
95-131-TEH5	43	30	27 N	8 W	MD	ATHP

List of Harvest Documents at 27N 8W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-91-026-TEH5		462	Shelterwood Removal	462
2-95-127-TEH5		40	Alternative (other)	40
2-95-131-TEH5		43	Shelterwood Removal	3
		43	Seed Tree Seed	7
		43	Alternative (other)	33
Total Number of HDs:	<u><u>3</u></u>			

1/7/01

Harvest Documents by Legal Description
From Year: 1990

27N 7W M08M

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 27N 7W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
Total Number of HDs:	<u> </u>			0

1/7/01

Harvest Documents by Legal Description
From Year: 1990

27N 6W 108M

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 27N 6W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u> </u>	0		

1/7/01

Harvest Documents by Legal Description
From Year: 1990

26N 9W MDBM

Harvest Document

Acres

Section

Township

Range

Baseline

HD Type

List of Harvest Documents at 26N 9W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>

Total Number of HDs:	<u>0</u>			

7/01

Harvest Documents by Legal Description

From Year: 1990

<u>Harvest Document</u>	<u>Acres</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Baseline</u>	<u>HD Type</u>
92-258-TEHS	1,190	32	26 N	8 W	MD	ATHP
92-309-TEHS	140	16	26 N	8 W	MD	ATHP
93-240-TEHS	559	22	26 N	8 W	MD	ATHP
		31	26 N	8 W	MD	ATHP
		34	26 N	8 W	MD	ATHP
94-043-TEHS	160	15	26 N	8 W	MD	ATHP
94-475-TEHS	480	31	26 N	8 W	MD	ATHP
99-121-TEHS	1,192	35	26 N	8 W	MD	ATHP
99-177-TEHS	1,665	19	26 N	8 W	MD	ATHP
		31	26 N	8 W	MD	ATHP
		33	26 N	8 W	MD	ATHP
99-181-TEHS	1,373	21	26 N	8 W	MD	ATHP
99-269-TEHS	1,746	23	26 N	8 W	MD	ATHP
		25	26 N	8 W	MD	ATHP
		27	26 N	8 W	MD	ATHP
		35	26 N	8 W	MD	ATHP
		15	26 N	8 W	MD	ATHP

List of Harvest Documents at 26N 8W in MD from 1991

11/07/01

<u>Label</u>	<u>Description</u>	<u>HD Acres</u>	<u>Silviculture Type</u>	<u>Acreage</u>
2-92-258-TEH5		1,190	Shelterwood Removal	1,190
2-92-309-TEH5		140	Shelterwood Removal	140
2-93-240-TEH5		559	Rehabilitation	25
		559	Shelterwood Removal	534
2-94-043-TEH5		160	Seed Tree Removal	160
2-94-475-TEH5		480	Selection	480
2-99-121-TEH5	WHISKY RIDGE	1,192	Group Selection	21
		1,192	Sanitation Salvage	60
		1,192	Shelterwood Removal	1,111
2-99-177-TEH5	SULPHUR CREEK	1,665	Alternative (Shelterwood Reml)	1,665
2-99-181-TEH5	CRANE MILLS HELICOPTER	1,373	Selection	514
		1,373	Shelterwood Removal	859
2-99-269-TEH5	ELKHORN RIDGE	1,746	Commercial Thinning	85
		1,746	Alternative (Shelterwood Reml)	1,661

Total Number of HDs: 9