Ground-Water Resources of the Lower Yellowstone River Area: Dawson, Fallon, Prairie, Richland, and Wibaux Counties, Montana

Part A—Descriptive Overview and Basic Data

Larry N. Smith, John I. LaFave, Thomas W. Patton,
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Montana Ground-Water Assessment Atlas No. 1

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Part A * Descriptive Overview and Basic Data

by

Larry N. Smith
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* The atlas is published in two parts: Part A contains a descriptive overview of the study area, basic data, and an illustrated glossary to introduce and explain many specialized terms used in the text; Part B contains the 10 maps referenced in this document. The maps offer expanded discussions about many aspects of the hydrogeology of the Lower Yellowstone River Area. Parts A and B are published separately and each map in Part B is also available individually.

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*Note: Maps in Part B are published separately and may be obtained from Montana Bureau of Mines and Geology Publication Sales Office.

Preface

The Montana Ground-Water Assessment Act

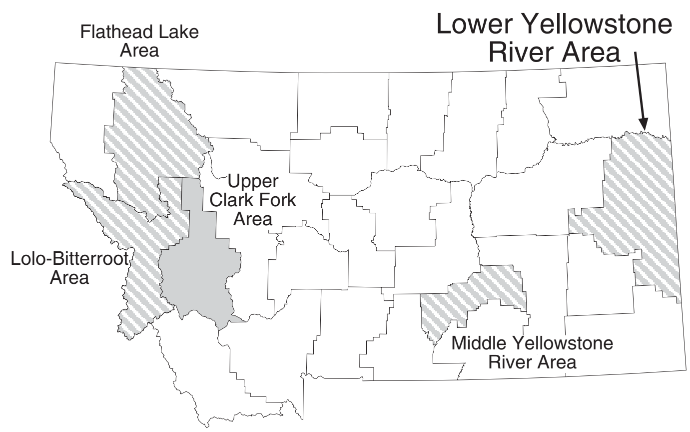
In response to concerns about management of ground water in Montana, the 1989 Legislature instructed the Environmental Quality Council (EQC) to evaluate the state's ground-water programs. The EQC task force identified major problems in managing ground water that were attributable to insufficient data and lack of systematic data collection. The task force recommended implementing long-term monitoring, systematic characterization of ground-water resources, and creating a computerized data base. Following these recommendations, the 1991 Legislature passed the Montana Ground-Water Assessment Act (85-2-901 *et seq.,* MCA) to improve the quality of decisions related to ground-water management, protection, and development within the public and private sectors. The Act established three programs at the Montana Bureau of Mines and Geology to address ground-water information needs in Montana:

- ❖ the ground-water monitoring program: to provide long-term records of water quality and water levels for the state's major aquifers;
- ❖ the ground-water information center (GWIC): to provide readily accessible information about ground water to land users, well drillers, and local, state, and federal agencies; and
- ❖ the ground-water characterization program: to map the distribution of and document the water quality and water-yielding properties of individual aquifers in specific areas of the state.

Program implementation is overseen by the Ground-Water Assessment Steering Committee. The Steering Committee consists of representatives from water agencies in state and federal government, and representatives from local governments and water user groups. The committee also provides a forum through which units of state, federal, and local government can coordinate functions of ground-water research.

Montana Ground-Water Assessment Atlas Series

This atlas is the first in a series that will systematically describe Montana's hydrogeologic framework. The figure below shows the characterization area boundaries as defined by the Ground-Water Assessment Program Steering Committee and active study areas at the time of this report; an atlas is planned for each area. Each atlas is published in two parts: Part A contains a descriptive overview of the study area, basic data, and an illustrated glossary to introduce and explain many specialized terms used in the text; Part B contains the maps referenced in Part A. The maps offer expanded discussions about many aspects of the hydrogeology of the Lower Yellowstone River Area. Parts A and B are published separately, and each map in Part B is also available individually. The overview and maps are intended for interested citizens and others who often make decisions about ground-water use but who are not necessarily specialists in the field of hydrogeology.



Ground-Water Characterization Program studies are ongoing throughout the state. The Lower Yellowstone River Area is the subject of this report. Areas given a high priority by the Ground-Water Assessment Program Steering Committee are gray. Areas where Ground-Water Characterization studies were in progress at the time of publication are ruled.

Summary

All ground water used for domestic, municipal, or stock-water supplies in the Lower Yellowstone River Area occurs in the sedimentary rock units above the Pierre Shale. The area can be divided into three hydrologic units:

1) a Shallow Hydrologic Unit composed of aquifers within 200 feet of the land surface;
2) a Deep Hydrologic Unit composed of aquifers at depths greater than 200 feet below the land surface in the lower part of Fort Union Formation and the upper part of the Hell Creek Formation; and
3) the Fox Hills–lower Hell Creek aquifer.

Ground-water flow in the Shallow Hydrologic Unit is characterized by local flow systems where ground water moves from drainage divides toward nearby valley bottoms. In the Deep Hydrologic Unit, ground-water flow is characterized by intermediate to regional flow patterns; the highest ground-water altitudes coincide with regional topographic highs and the lowest altitudes with regional topographic lows. The Fox Hills–lower Hell Creek aquifer is regional and occurs at depths from 600 to 1,600 feet below land surface throughout most of the study area. Mudstones in the Hell Creek Formation confine the upper part of the aquifer, and the Pierre Shale confines its base. Water is under artesian conditions, and at lower altitudes, such as in the Yellowstone River Valley, flowing wells are common.

Ground water from the three hydrologic units is used throughout the study area for domestic and stock-watering purposes; a few towns use the Fox Hills–lower Hell Creek aquifer for municipal water supply. Aquifers in the Shallow Hydrologic Unit are the most utilized and are generally the most productive; yields average about 35 gallons per minute (gpm) from the unconsolidated deposits and about 10 gpm in the Fort Union aquifers. Wells completed in the Deep Hydrologic Unit yield less than 15 gpm. Reported well yields in the Fox Hills–lower Hell Creek aquifer are also generally less than 15 gpm, but well drillers report that some wells yield as much as 100 gpm.

Most ground water in the Lower Yellowstone River Area is mineralized (high dissolved constituents); the average concentration of dissolved constituents in each unit is greater than 1,400 milligrams per liter (mg/L). The Shallow Hydrologic Unit has the greatest variability in dissolved constituents, from less than 500 to more than 5,000 mg/L, because of the variety of near-surface geologic materials, the differing lengths of ground-water flow paths, and the dissimilar recharge sources. The median dissolved-constituent concentration of 2,150 mg/L in the Deep Hydrologic Unit is higher than in other units, but the overall variability in water quality is less than that of the Shallow Hydrologic Unit. The decrease in variability in the Deep Hydrologic Unit suggests that it is a more chemically stable system. The most uniform water within the study area is in the Fox Hills–lower Hell Creek aquifer; concentrations of dissolved constituents are generally between 1,000 and 2,500 mg/L.

Nitrate concentrations in ground water of the Lower Yellowstone River Area are generally low, and only in the Shallow Hydrologic Unit was nitrate detected above the maximum contaminant level of 10 mg/L as nitrogen (mg/L-N). About 7% of the 303 samples from the Shallow Hydrologic Unit that were evaluated for this study had nitrate concentrations greater than 10 mg/L-N. Tritium, an indicator of water that has been recharged within the last 50 years, was detected in 15 of 22 samples. Of those 15 samples, 13 also had detectable nitrate. The coincidence of tritium and nitrate in the Shallow Hydrologic Unit shows that areas where water has been recharged within the last 50 years are more susceptible to contamination.

Introduction

The Lower Yellowstone River Area ground-water characterization study (Dawson, Fallon, Prairie, Richland, and Wibaux counties) was conducted as part of the Montana Ground-Water Assessment Program by the Montana Bureau of Mines and Geology (MBMG). The objectives of the characterization study were to 1) describe the extent, thickness, and water-bearing properties of the area's aquifers and 2) describe the chemical characteristics of the water in the aquifers. Ground water is a vital resource in the Lower Yellowstone River Area where most of the farms, ranches, and municipalities rely on wells as sources of drinking water. The basic information presented in this report should help local landowners and public officials make decisions about ground-water development, protection, and management.

Purpose and Scope

Parts A and B of this hydrogeologic atlas present baseline hydrogeologic data and water-quality data in interpretative and descriptive forms. This text and the maps in Part B summarize and/or interpret basic geologic and hydrogeologic conditions for the project area. This report describes in detail three hydrologic units:

1) a Shallow Hydrologic Unit that consists of all aquifers and non-aquifers within 200 feet of the land surface,
2) a Deep Hydrologic Unit defined as all aquifers and non-aquifers that occur at depths greater than 200 feet below land surface and lie stratigraphically above the regionally extensive claystone and shale in the upper Hell Creek Formation, and
3) the Fox Hills–lower Hell Creek aquifer that consists of near-continuous sandstone found in the lower part of the Hell Creek Formation and most of the Fox Hills Formation.

Because additional information is continually being generated as new wells are drilled, water levels are measured, and water samples are analyzed, the maps in Part B showing potentiometric surfaces and dissolved constituents should be considered as portraying conditions at the end of 1996. The data used to compile these maps are stored in the Ground-Water Information Center (GWIC) data base and are continually updated. Because the GWIC data base allows for automated storage and retrieval, up-to-date information can be used to enhance the information presented here.

Copies of the individual maps in Part B are available through the MBMG, either as paper or electronic images, or as digital map coverages. The coverages have also been made available for distribution by the Montana Natural Resource Information System (NRIS) at the State Library in Helena.

Previous Investigations

Previous studies pertaining to ground-water resources in the area have focused on the major alluvial valleys, the hydrogeology associated with coal deposits, and ground-water and water-level changes in the Fox Hills–lower Hell Creek aquifer. The ground-water resources of the Yellowstone River valley between Miles City and Glendive were evaluated by Torrey and Swenson (1951), and between Glendive and Sidney by Torrey and Kohout (1956). Moulder *et al.* (1958) studied problems associated with irrigation drainage in the Yellowstone River valley. Hopkins and Tilstra (1966) made a reconnaissance investigation of ground water in the alluvium along the Missouri River. Stoner and Lewis (1980), Slagle (1983), and Slagle *et al.* (1984) presented regional overviews of the water resources in the Fort Union coal region. The hydrology of the Bloomfield coal tract was evaluated by Cannon (1983) and the Wibaux-Beach lignite deposit by Horak (1983). Levings (1982) compiled a regional potentiometric surface map for the Fox Hills–lower Hell Creek aquifer. The ground-water resources near the Cedar Creek Anticline and the impact of industrial withdrawals from the Fox Hills–lower Hell Creek aquifer were evaluated by Taylor (1965) and Coffin *et al.* (1977). Downey and Dinwiddie (1988) and Taylor (1978) presented overviews of the deep regional aquifers present beneath the Pierre Shale.

Methods of Investigation

Descriptive logs of water wells in the GWIC data base were analyzed, and source aquifers were determined for more than 8,500 wells. Water well logs and geophysical logs from oil and gas wells were used to prepare maps showing the location, depth, and thickness of the principal aquifers. Most of the field work for this study was conducted during the summer and fall of 1995; some preliminary data were collected in 1993 and 1994. Program staff visited more than 1,400 wells to measure water levels, specific capacities, and basic water-quality parameters (temperature, pH, and specific conductance). Ground-water samples from 145 wells and eight surface-water sites were collected for analysis of major cations and anions, and trace metals. Aquifer hydraulic characteristics were estimated from two aquifer tests and eight slug tests. Hydrogeologic maps were prepared from the data collected during the field phase of this study and also from historical data in the GWIC data base. Water levels were measured quarterly over a period of about two years in a network of 60 wells across the study area. Water-level recorders monitored water levels daily in 16 wells.

Description of Study Area

The study area comprises Dawson, Fallon, Prairie, Richland, and Wibaux counties and covers approximately 8,700 square miles (figure 1); it is part of the Northern Great Plains physiographic province. Flood plains and raised benches (stream terraces) characterize the topography along the Yellowstone and Missouri rivers and their major tributaries. Most of the area contains open expanses of rolling prairie that range between being slightly entrenched by intermittent streams and being strongly dissected into badland topography. There are a few, large, nearly planar stream terraces in the uplands. Areas of greatest relief are the badlands east and south of Glendive. The highest point, at about 3,580 feet above mean sea level, is Big Sheep Mountain in northern Prairie County. The lowest point, at about 1,865 feet, is in the northeast corner of the study area along the Missouri River where it leaves Montana.

Three major rivers drain the study area. The Yellowstone River bisects it from southwest to northeast and drains most of the

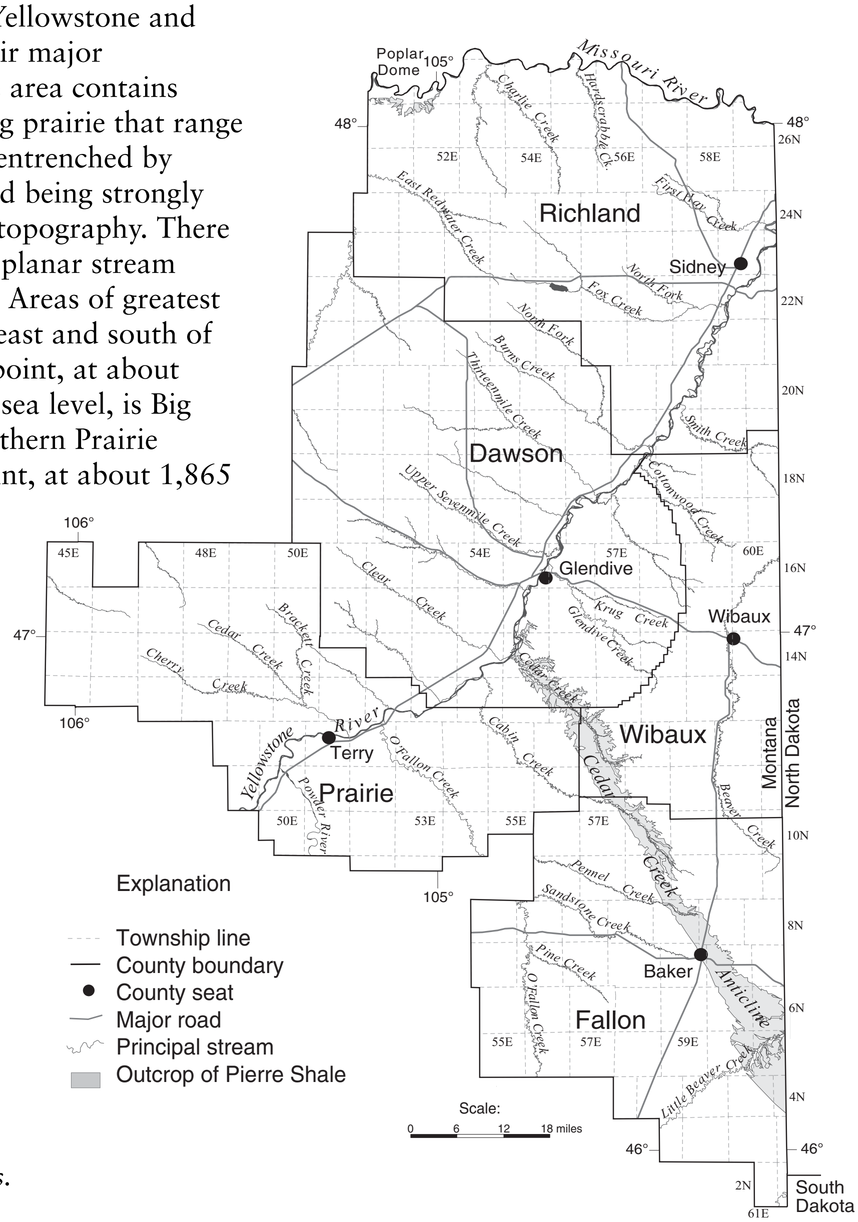


Figure 1. The Lower Yellowstone River Area covers five counties in southeast Montana that are drained by the Missouri and Yellowstone rivers and their tributaries.

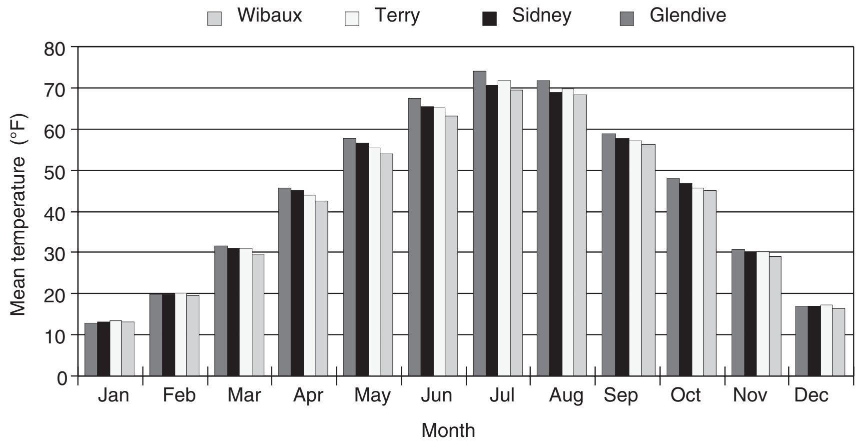


Figure 2. Monthly mean temperatures for major communities in the area range from about 70° in July and August to 12° F in January.

Station	Period of Record	Mean Annual Precipitation (inches)	
Baker	1922 - 1996	14.11	Average = 13.54
Glendive	1911 - 1996	13.5	
Sidney	1949 - 1996	13.78	
Terry	1949 - 1996	11.86	
Wibaux	1941 - 1996	14.47	

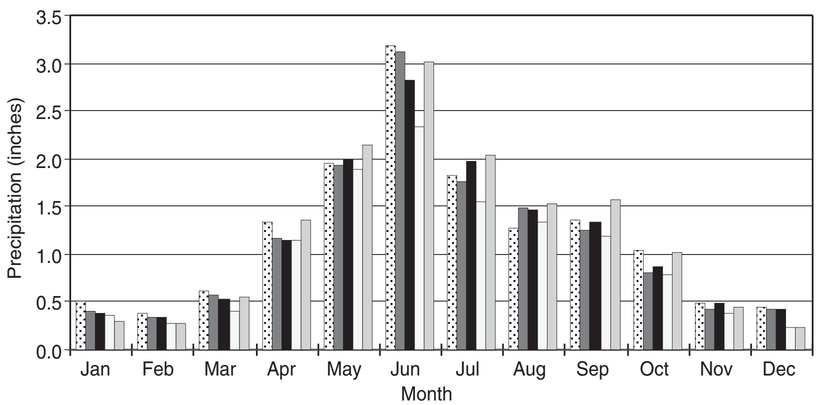


Figure 3. Most of the precipitation falls during the warm months of May through August.

area (5,991 square miles). The Missouri River drains the northern part of the study area, whereas Beaver and Little Beaver creeks, which are tributaries to the Little Missouri River, drain the southeast part.

Cultural Features

The population of the study area in 1995 was about 24,960 people; the principal centers are the towns of Glendive and Sidney (U.S. Census 1997). The rest of the area is primarily rural with an average population density of less than three persons per square mile. Principal industries are livestock ranching, farming, and oil and gas production. About 84% of the land is used for farming or ranching; one coal mine is active in the area.

Climate

The climate is semiarid, continental, and is characterized by warm summers and cold dry winters. Mean monthly temperatures (30-year mean records) at Glendive range from a low of about 13°F for January, to a high of 74°F for July (figure 2). Extreme temperatures commonly range from -30°F in the winter to more than 100°F in the summer (Holder and Pescador 1976). Mean annual precipitation reported at five long-term stations ranges from a low of about 12 inches/year at Terry to an annual high of 14.5 inches/year at Wibaux (figure 3). The combined mean annual precipitation at all of the stations is about 13.5 inches/year. Most of the precipitation (almost 80%) falls as rainfall in the six months from April through September. Mean monthly precipitation ranges from a low of 0.23 inches in December at Wibaux and Terry to a high of 3.18 inches for June at Baker.

Water Use

Predominant uses of fresh water in the area are—in order of decreasing volume—irrigation, public water supply, livestock, industrial, commercial, private-system domestic, mining, and cooling for electrical power production (figure 4). Although ground water was estimated to have supplied less than 2% of the water used during 1990, it accounted for about 62% of the water used for domestic purposes (Solley *et al.* 1993). Other than at Glendive, where surface water from the Yellowstone River supplies the community, all domestic supplies and most water for livestock come from ground water.

Estimated total water use for 1990 was about a half-million acre-feet for the year, of which about 7,800 acre-feet were ground water (Solley *et al.* 1993). The 1990 estimated total for surface and ground water used equals only about 5% of the average annual discharge of the Yellowstone River at Sidney.

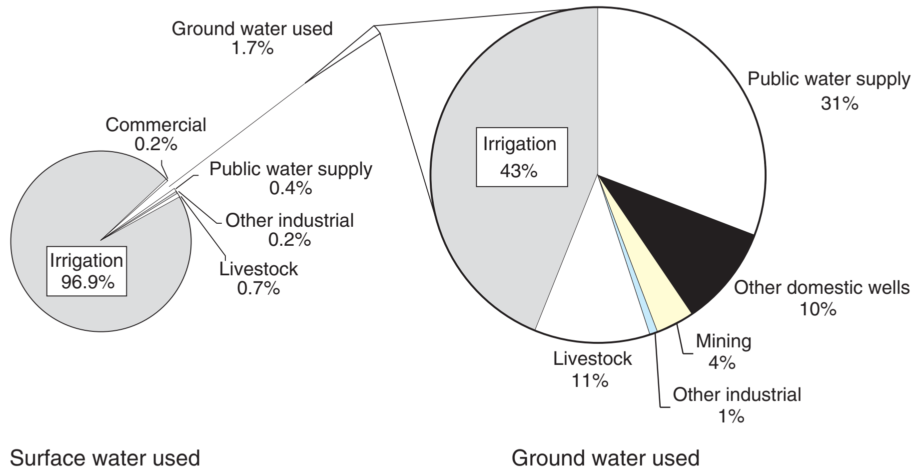


Figure 4. Estimated freshwater-usage statistics for 1990 show that ground water accounts for only 1.7% of all water used in the area. Most of it is used for domestic, livestock, and irrigation supplies (data from Solley et al. *1993).*

Water Balance

A water balance is a measure of the water gains and losses, and changes in storage of a hydrologic system over time. The water balance is based on the concept that surface water, ground water, and atmospheric water are linked by inflows and outflows across their boundaries. An annual water balance accounts for the distribution of water within an area and defines pathways by which water enters and leaves. The water-balance calculation relates precipitation (P), surface-water runoff (R), ground-water flow (U), evapotranspiration (ET), changes in ground-water storage (ΔS_g) and changes in surface-water storage (ΔS_s) as summarized by the following equation:

$$P \pm U \pm (\Delta S_g \pm \Delta S_s) = R + ET$$

A gross indication of the water balance for the part of the study area in the Yellowstone River watershed can be made by assuming that over the long term ground-water inflows are equal to outflows (U = 0), and that there is no change in ground-water or surface-water storage ($\Delta S_g = \Delta S_s = 0$); precipitation minus runoff should then be about equal to evapotranspiration. Runoff from the study area, as determined from long-term gaging records at Miles City and Locate (inflow), and Sidney (outflow)(figure 5), is small relative to the total flows in the Yellowstone (figure 6). The negligible runoff from the area suggests that most of the water received from precipitation is returned to the atmosphere as evaporation and transpiration (uptake through plants). This is reasonable given the semi-arid climate. It is interesting to note that the surface-water runoff varies seasonally; on average, from May through September, more surface water is entering the area than leaving (figure 6). This corresponds to the time when water is being drawn from the Yellowstone River for the Buffalo Rapids Irrigation Project and the Lower Yellowstone Irrigation Project. As noted above, irrigation is the predominant use of water in the area. The irrigation withdrawals, which are typically in excess of 300,000 acre-feet per year, more than account for the discrepancy between the surface-water inflow and outflow.

Geologic Framework

Eastern Montana has been periodically covered by seas during geologic time. When inland seas covered eastern Montana, mud and sand were transported into the seas by streams. The mud and sand deposited during the last marine inundation now make up the Pierre and Fox Hills formations, respectively. When the seas receded, streams continued to carry sediment into the basin. On recession of the last sea from what is now Montana, streams deposited sand and mud that later became the Hell Creek and Fort Union formations.

The study area is on the southwestern flank of the Williston Basin, a structural basin centered in northwestern North Dakota that developed from downwarping of the Earth's crust (figure 7). The basin was active for many millions of years, preserving sediment that over geologic time became rocks. Near the western extent of the basin, stresses associated with mountain building in what is now the Rocky Mountains uplifted rocks along two smaller structures: the northwest southeast–oriented Cedar Creek Anticline, which bisects the study area, and the

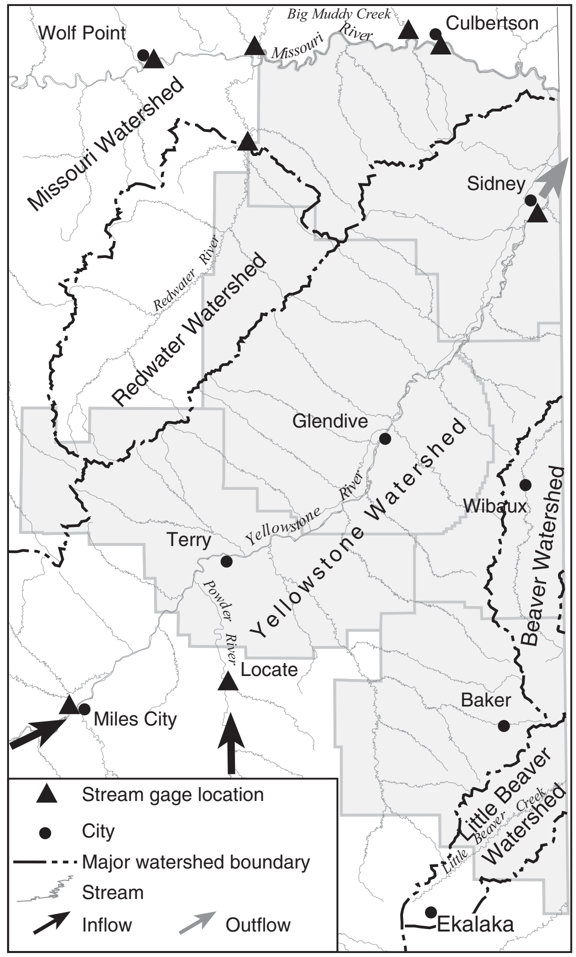


Figure 5. Streamflow is gaged by the U.S. Geological Survey at several sites on the Missouri and Yellowstone rivers and their tributaries.

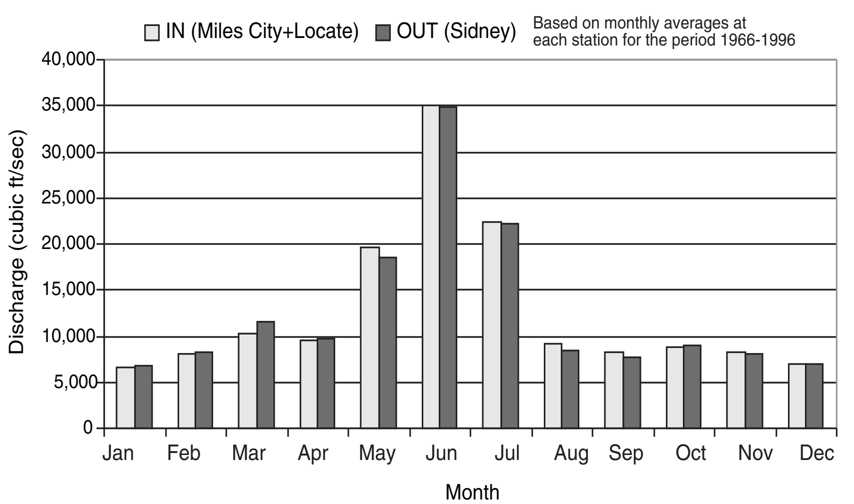


Figure 6. The Yellowstone River gains little water as it flows through the study area, suggesting that most of the precipitation received in the watershed is returned to the atmosphere by evaporation or transpiration. During the summer months, it appears that the Yellowstone River loses water as it flows through the study area. Irrigation withdrawals, which are typically in excess of 300,000 acre-feet per year, more than account for the discrepancy between the inflow and outflow.

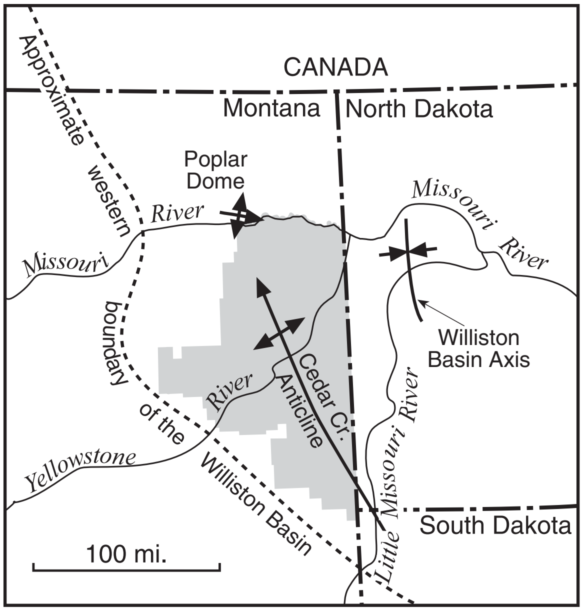


*Figure 7. The Lower Yellowstone River Area is in a geological structure known as the Williston Basin. Bold lines show the trends of smaller structures; arrows show the general dips of bedrock near the structures (*modified from *Cherven and Jacob 1985).*

Poplar Dome, a dominantly east west–oriented feature in the northwesternmost part of the area (figure 7). Bedding in bedrock dips away from the axes of Cedar Creek Anticline and Poplar Dome. Regional uplift of the Great Plains and Rocky Mountain area and drainage adjustments, resulting from glaciation, caused streams to downcut and develop the modern landscape of broad valley floors and low-relief uplands. Erosion of the Fort Union, Hell Creek, and Fox Hills formations along the axes of the Cedar Creek Anticline and the Poplar Dome has exposed the Pierre Shale (locally called the Bearpaw Shale on the Poplar Dome). The distribution of the geologic units across the study area and in cross-section profiles is shown on Map 1 of Part B.

The distribution and physical properties of geologic units affect the availability, movement, and quality of ground water. The geologic units in eastern Montana that contain usable ground water are unconsolidated alluvial and terrace deposits within the major stream valleys and the sedimentary strata that lie above the Pierre Shale (figure 8). Deep regional aquifers are present beneath the Pierre Shale; however, the water in these aquifers is too saline to be used as a potable supply.

Stratigraphy

The geologic units exposed at the surface of the study area range from Upper Cretaceous to Quaternary. The older units, Pierre, Fox Hills, and Hell Creek formations, are at or close to the land surface near the Poplar Dome and the Cedar Creek Anticline. The Tertiary Fort Union Formation is exposed at the land surface over most of the study area. The youngest units are the unconsolidated alluvium and terrace deposits associated with the major river valleys. Stratigraphic relationships, thicknesses, lithologic contacts, and bedding are summarized in figure 8.

Unconsolidated Deposits

Sand, silt, gravel, and clay deposits along major river valleys and beneath upland benches (stream terraces) that flank the Yellowstone River are unconsolidated and generally permeable to ground water (figures 9a, b). Deposits on upland benches, ranging from tens to many hundreds of feet in altitude above modern streams, are mostly separated from deposits along river valleys by bedrock. The distribution and thickness of unconsolidated deposits can be important in considering the sensitivity to contamination of shallow ground water. Thicknesses of unconsolidated deposits range from 0 to more than 100 feet along the Yellowstone River valley. Unconsolidated deposits are typically coarsest and have the greatest permeability near their basal erosional contacts with consolidated bedrock. Glacial till is present on most of the upland surfaces in the northern part of the area. The till is generally less than 15 feet thick but may be as much as 100 feet

System	Age (millions of years)	Stratigraphic Unit		Thickness (ft)	Description
Quaternary		Quaternary unconsolidated deposits		0 - ~100	Sand, silt, gravel, and clay within major river valleys; alluvium, colluvium, and glacial lake silts and clays.
Tertiary		Quaternary or Tertiary unconsolidated deposits		0 - ~200	Sand, silt, gravel, and clay underlying terraces above river valleys; includes alluvium, till, and minor amounts of eolian and lake sediment.
	~5	*unconformity*			Surfaces of erosion
	55	Fort Union Formation		as much as 1,600	**Lithology:** yellow, orange, buff, and light gray, fine-grained sandstone, siltstone, mudstone, and shale; coal and coaly shale beds; red beds of clinker (broken and collapsed rock fused by naturally burned coal beds) form resistant ridges; few, thin limestone beds. **Bedding:** sandstone and mudstone beds are as much as 100 feet thick and are discontinuous across distances of hundreds of feet to one mile; some coal beds may be continuous across areas of townships.
Upper Cretaceous	65	Hell Creek Formation		200 - 900	**Lithology:** gray and brown, silty shale, mudstone, fine- and medium-grained sandstone, and few thin coal beds; clays have strong swelling properties. **Bedding:** in the lower third of the formation, sandstone beds as much as 100 feet thick are continuous or interconnected across distances of many miles; in the upper two-thirds of the formation, sandstone beds as much as 50 feet thick are discontinuous across distances of hundreds of feet to one mile locally.
	68	Fox Hills Formation	Colgate Member	60 - 400	**Lithology:** light gray and white, fine- and medium-grained sandstone with small amount of coaly mudstone. **Bedding:** sandstone is a 30-80 foot-thick, sheet-like bed across much of the study area.
			unnamed lower member		**Lithology:** brownish gray, sandy shale, siltstone, and fine-grained sandstone; average grain-size decreases downward; sandstones are less permeable than Colgate Member. **Bedding:** sandstones thicken upward from a few inches to as much as 50 feet.
	75	Pierre Shale (or Bearpaw Shale on Poplar Dome)		1,300 - 3,000	**Lithology:** dark gray, swelling shale with few, thin, fine-grained sandstone and siltstone beds. **Bedding:** sandstone beds are inches to a few feet thick and laterally continuous over large areas; sandstones about 1,000 feet below the surface near the Cedar Creek Anticline are less than 10 feet thick.

*Figure 8. Geologic units above the Pierre Shale contain potable water (*modified from *McKenna* et al. *1994).*

thick in some major valleys. The distribution and thickness of unconsolidated deposits is discussed more on Map 2 of Part B.

Fort Union Formation

The Fort Union Formation is exposed across most of the study area and contains beds of fine- and medium-grained sandstone, siltstone, mudstone, coal, and clinker (figure 10). Easterly flowing streams that drained the then rising Rocky Mountains deposited the sedimentary units within the study area. The Fort Union contains major coal resources in the northern Great Plains.

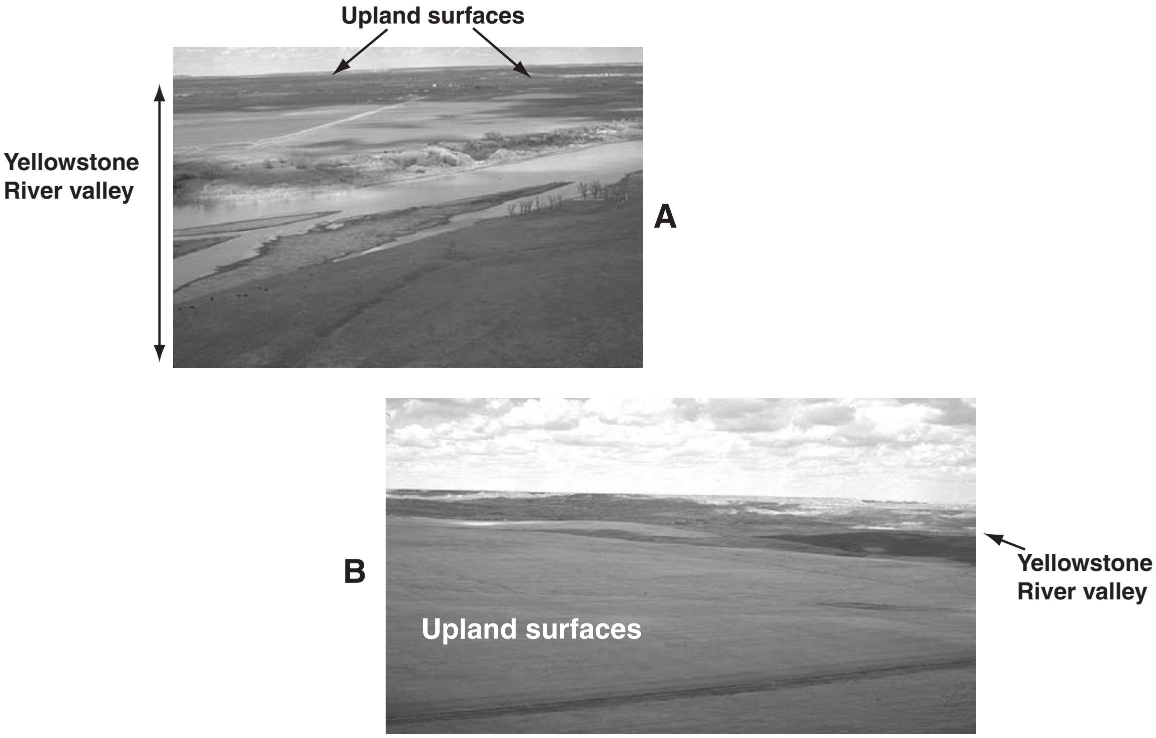


Figure 9. The Yellowstone River valley contains sand and gravel–dominated deposits adjacent to the river (A) *and in upland areas* (B), *which represent older positions of the valley floor.*

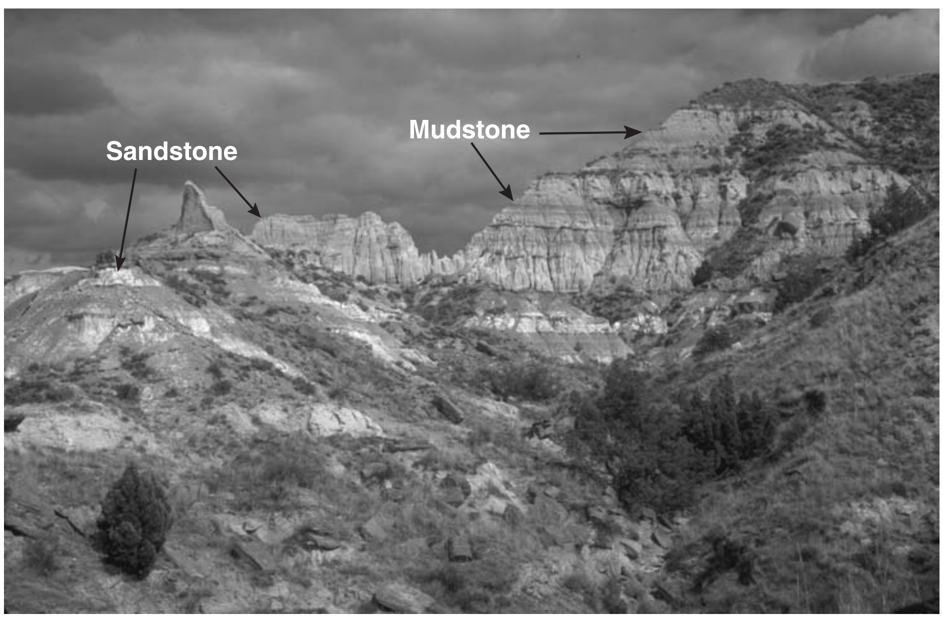


Figure 10. Sandstones and mudstones of the Fort Union Formation are exposed over large areas in eastern Montana; this view is to the east in T. 18 N., R. 57 E., section 14.

Sandstone and mudstone beds in the Fort Union Formation are as much as 100 feet thick and a few hundred feet to a mile wide (figure 8). Some coal beds may be continuous across several townships. Many coal beds in the Fort Union have burned along outcrops to form clinker beds of bright red, broken, and fused rocks. Exposed beds of clinker typically cover areas less than one-half square mile, are resistant to erosion, highly permeable to water, and crop out mainly along ridges. Their high permeability and position in uplands make clinker beds ready conduits for ground-water recharge.

Hell Creek Formation

The Hell Creek Formation is made up of silty shale, mudstone, fine- and medium-grained sandstones, and few thin coals (figure 11). The Hell Creek contains less sandstone

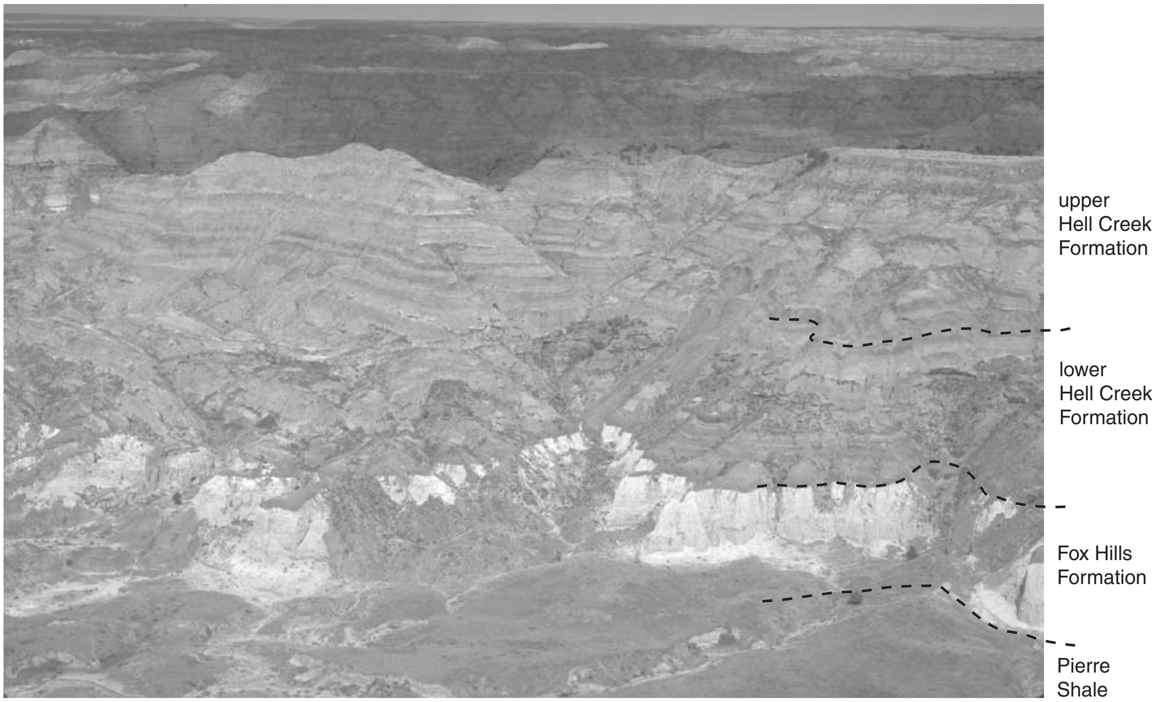


Figure 11. Gray and brown mudstones, siltstones, and sandstones dominate the Hell Creek Formation. Sandstone beds are more prominent in the lower part of the Hell Creek Formation than in the upper part. Geologic contacts between units are shown on this aerial photograph of the rock units where they are uplifted along the northern flank of the Cedar Creek Anticline in T. 15 N., R. 55 W.

and coal and more mudstone than the overlying Fort Union Formation. The Hell Creek within the study area accumulated by stream deposition in laterally migrating channel belts and on flood plains along the western flank of the Williston Basin.

Aquifer materials within the formation are sandstone beds; the majority of which occurs within the lower third of the unit (figure 12). These sandstone beds can be as much as 100 feet thick (figure 13) and are continuous or interconnected over many miles. The upper two-thirds of the formation is composed mostly of mudstone with minor amounts of sandstone, and generally acts as a confining bed that impedes water movement between aquifers above and below; the few sandstone beds are less prevalent, thinner, and more discontinuous than in the lower Hell Creek, but locally produce water. The top of the sandstone-dominated portion of the lower Hell Creek Formation defines the top of the Fox Hills–lower Hell Creek aquifer.

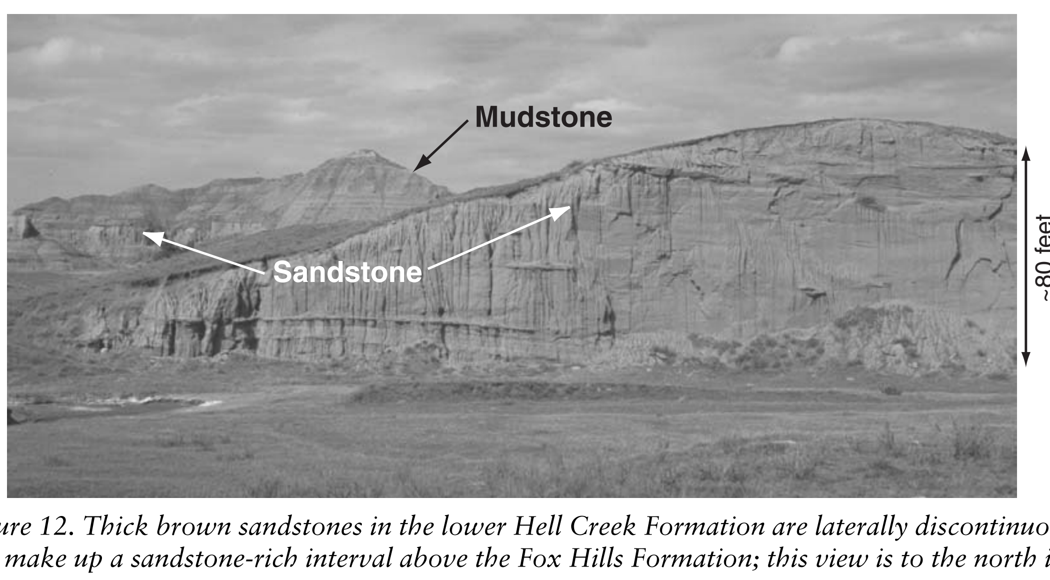


Figure 12. Thick brown sandstones in the lower Hell Creek Formation are laterally discontinuous but make up a sandstone-rich interval above the Fox Hills Formation; this view is to the north in T. 14 N., R. 56 E., section 21.

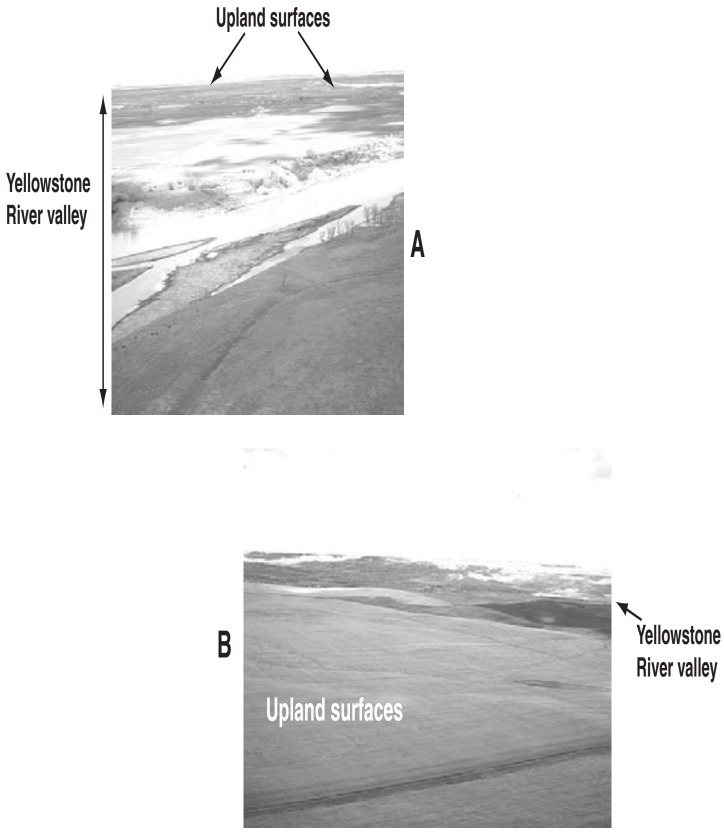


Figure 13. White sandstone of the Colgate Member of the Fox Hills Formation forms a distinctive cliff south of Glendive. Sandstones in the Fox Hills and lower part of the Hell Creek Formation make up the Fox Hills–lower Hell Creek aquifer; this view is to the east in T. 15 N., R. 55 E., section 22; railroad embankment and tracks in foreground show scale.

Fox Hills Formation

The Fox Hills Formation contains 70–350 feet of interbedded fine- and medium-grained sandstone, sandy shale, siltstone, and minor carbonaceous shale. The unit was deposited as the last inland sea retreated northeastward and out of Montana during the Cretaceous Period. A white sandstone bed in the upper part of the unit, the Colgate Member (figure 8), forms a distinctive cliff along the flanks of the Cedar Creek Anticline in the area southeast of Glendive (figures 11 and 13). The sandstone is a 30–150-foot-thick, sheet-like bed that is nearly continuous across study area. The Fox Hills is exposed at the land surface in narrow bands around the Cedar Creek Anticline and Poplar Dome. Sandstones of the lower Hell Creek Formation in some places occupy channels that were cut into the Fox Hills Formation during Hell Creek time. The presence of sandstones at the contact between the two formations allows ground water to flow easily across the formation boundary in many areas. The sandstones of the lower Hell Creek and Fox Hills formations are important drilling targets for wells in parts of the Lower Yellowstone River Area. Maps 3 and 4 of Part B provide more detail about depths and thickness of the Fox Hills–lower Hell Creek aquifer.

Pierre Shale

The marine Pierre Shale in east-central Montana comprises 1,300–2,600 feet of shale with a few thin sandstone and siltstone beds. The sandstone beds are in the upper part of the Pierre and at stratigraphic positions that are laterally equivalent to the Eagle and Judith River formations of central Montana. Pierre Shale is exposed in valleys along the axes of the Cedar Creek Anticline (figure 7) and the Poplar Dome, where its gray appearance and its moisture-sensitive swelling character (figure 8) are evident along outcrops and roads. Although the Pierre generally marks the base of potable water aquifers in the study area, a few sandstones, which are about 10 feet thick along the axis of the Cedar Creek Anticline, produce potable water to wells at depths of 1,000–1,900 feet.

Hydrologic Units

Aquifer and non-aquifer materials that form three definable hydrologic units occur within the geologic framework. The relationships between the hydrologic units and the geologic framework are illustrated and discussed on Map 1 of Part B. The units, shown schematically in figure 14, are as follows:

- a Shallow Hydrologic Unit: aquifers and non-aquifers within 200 feet of the land surface;
- a Deep Hydrologic Unit: aquifers and non-aquifers that occur at depths greater than 200 feet below land surface but lie stratigraphically above the regionally extensive claystone and shale in the upper Hell Creek Formation; and
- the Fox Hills–lower Hell Creek aquifer: near-continuous sandstone deposits found in the lower part of the Hell Creek Formation and in most of the Fox Hills Formation.

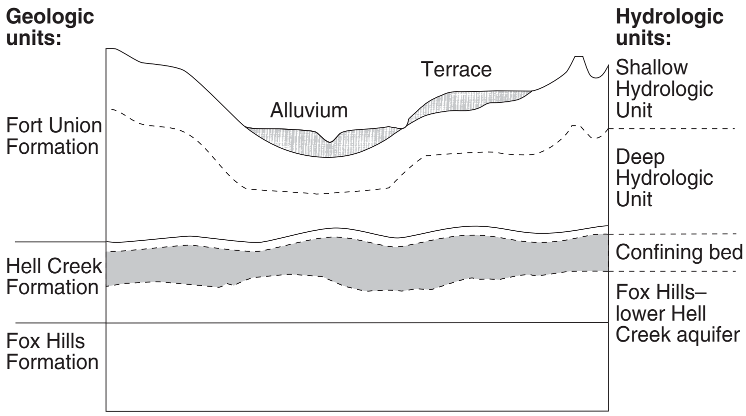


Figure 14. Generalized cross section that shows relationships between geologic and hydrologic units. Names of the hydrologic units only partly reflect the names of the associated geologic units.

About 7,400 wells (about 70% of all wells in the area) are completed in the Shallow Hydrologic Unit, making it the most utilized ground-water source within the Lower Yellowstone River Area (figure 15). Reported well yields are varied, reflecting the changing nature of the aquifers, well construction, and intended water use. In the unconsolidated sand and gravel aquifers, yields average about 35 gpm. However, yields from aquifers in the Fort Union and Hell Creek formations average about 10 gpm. Ground water from the Shallow Hydrologic Unit is used for domestic, stock, and irrigation purposes. Well locations in the Shallow Hydrologic Unit are concentrated along the Yellowstone River valley and are uniformly distributed over the remaining parts of the area (figure 15).

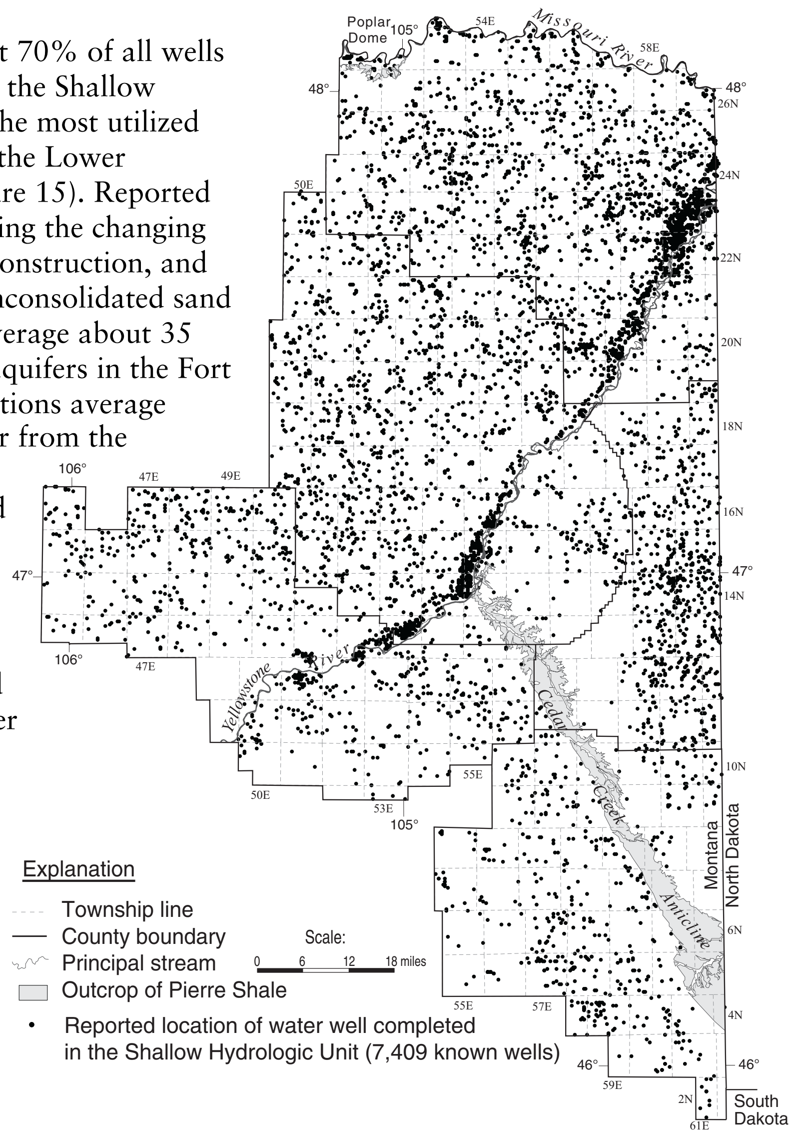


Figure 15. Away from population centers and the Yellowstone River valley, the distribution of wells completed in the Shallow Hydrologic Unit is relatively uniform.

About 900 wells (about 12%) are completed in the Deep Hydrologic Unit. Ground water from this unit is used primarily for domestic and stock-water purposes. Most reported well yields are less than 15 gpm. Wells in the Deep Hydrologic Unit are distributed uniformly throughout the study area (figure 16).

The Fox Hills–lower Hell Creek aquifer is essentially the deepest potable-water aquifer in the area. About 1,000 wells (about 10%) are completed in the aquifer. Ground water from the aquifer is used primarily for domestic and stock-water purposes; however, the towns of Baker, Lambert, and Richey rely on it for municipal water supply (figure 17). Reported well yields average less than 15 gpm, but drillers have reported that some wells yield as much as 100 gpm. Most wells are located along and south of the Yellowstone River valley (figure 17). Few wells are north of the river because the aquifer is generally more than 1,000 feet below land surface, and the potentiometric surface is lower than south of the river; thus, well installation and pumping costs are relatively high.

Occurrence and Movement of Ground Water

Shallow Hydrologic Unit

Ground-water flow in the Shallow Hydrologic Unit is characterized by many local flow systems where ground water moves from local drainage divides (topographic highs) toward nearby valley bottoms. The water table closely mimics the land-surface topography. Water enters (recharges) the Shallow Hydrologic Unit primarily by infiltration of precipitation; lesser quantities of recharge result from stream losses into the aquifer, leakage from irrigation ditches, and irrigation water lost by percolation through fields. Places where ground water discharges from the Shallow Hydrologic Unit include springs and seeps along valley bottoms and sides, reaches of perennial streams that gain water, vegetative cover (by transpiration) in valley bottoms, flow into deeper aquifers, and water wells. Ground-water flow in the Shallow Hydrologic Unit is discussed more extensively on Map 5 of Part B.

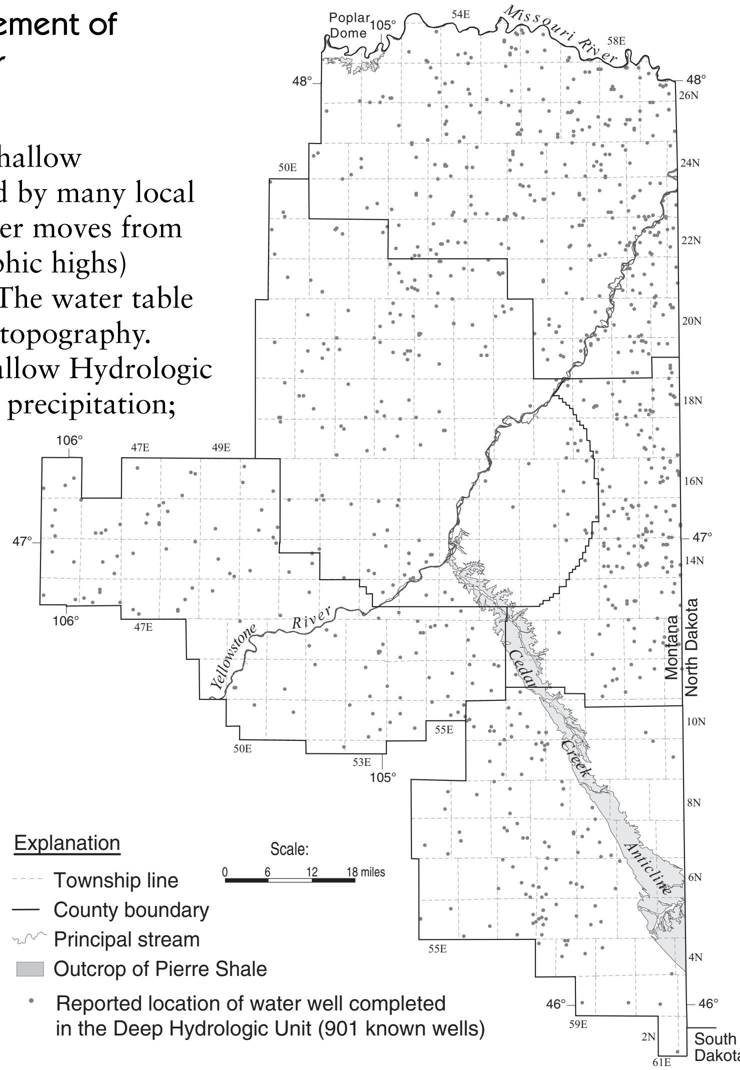


Figure 16. The distribution of wells in the Deep Hydrologic Unit shows a lower density than that of the Shallow Hydrologic Unit.

Deep Hydrologic Unit

In the Deep Hydrologic Unit, intermediate to regional flow patterns characterize ground-water movement. The potentiometric surface of the Deep Hydrologic Unit is a subdued representation of the topography; the highest ground-water altitudes coincide with the regional topographic highs and the lowest altitudes with the regional topographic lows. Ground-water flow is predominately away from major drainage divides, such as the Big Sheep Mountain area in northern Prairie County and toward the Yellowstone and Missouri rivers. Downward leakage from the Shallow Hydrologic Unit and higherpressured leakage from the Fox Hills–lower Hell Creek aquifer recharge the Deep Hydrologic Unit. Prominent surface recharge areas are northern Prairie County (near Big Sheep Mountain) and southeast Fallon County where the potentiometric surface is more than 3,000 feet above sea level. Upward flow from the Fox Hills–lower Hell Creek aquifer recharges the Deep Hydrologic Unit in topographically low areas. Discharge areas coincide with the major stream valleys, such as along the Yellowstone and Missouri rivers and where Little Beaver Creek exits the study area. Ground-water movement in the Deep Hydrologic Unit is discussed more extensively on Map 6 of Part B.

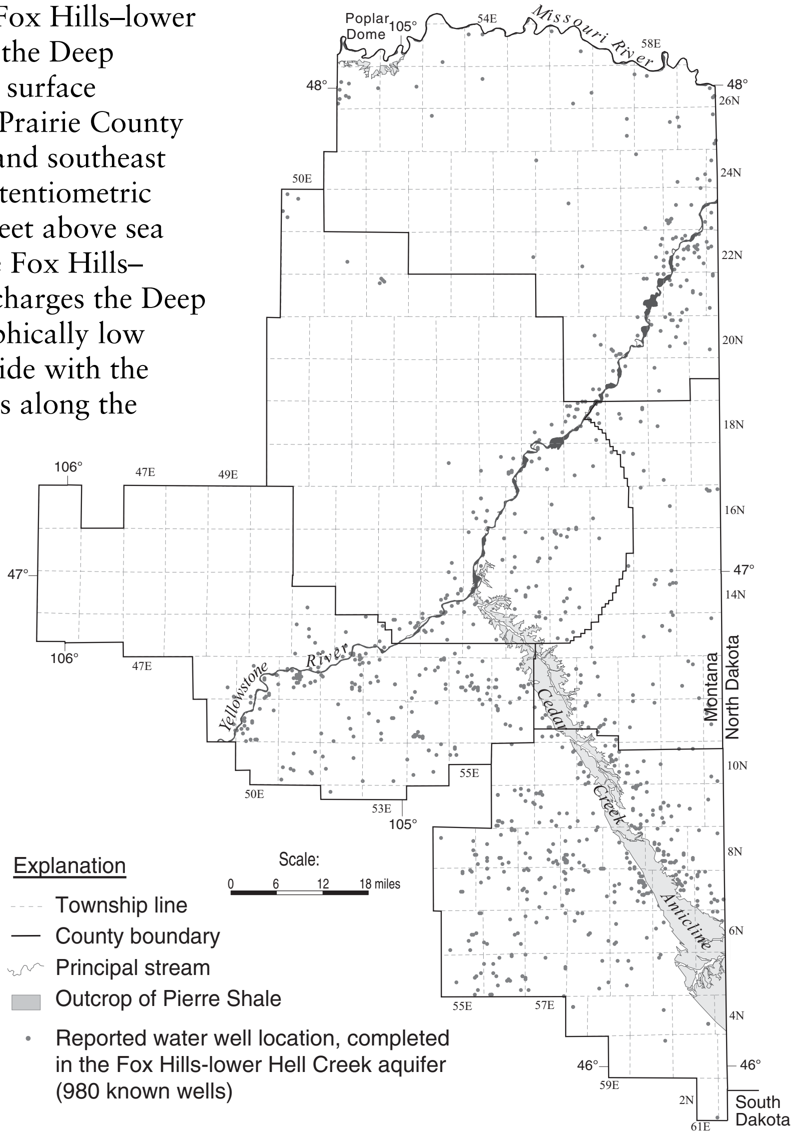


Figure 17. Most of the wells completed in the Fox Hills–lower Hell Creek aquifer are near or south of the Yellowstone River. Flowing wells in the Yellowstone River valley are common.

Fox Hills–Lower Hell Creek Aquifer

The Fox Hills–lower Hell Creek aquifer occurs at depths of 600 to 1,600 feet below land surface throughout most of the study area, except near the Cedar Creek Anticline and the Poplar Dome (figure 17). Mudstones in the Hell Creek Formation confine the top of the aquifer, and the Pierre Shale confines the base of the aquifer. Water levels in wells completed in the aquifer will rise above the top of the aquifer under artesian pressure, and in low areas—such as the Yellowstone River valley—flowing wells are common. Under most of the area, ground water in the aquifer is flowing regionally from upland recharge areas south of the study area toward the Yellowstone River; the flow is basically parallel to the axis of the Cedar Creek Anticline. In the northern part of the study area the regional flow is toward the Missouri River. Outcrops on the southwest side of the Cedar Creek Anticline, where the aquifer is exposed at land surface, do not appear to be significant sources of recharge. The wider exposures of the aquifer on the east side of the anticline may result in some recharge. This conclusion is suggested by the potentiometric surface sloping to the north, away from the northeast flank of the anticline. In topographically high areas, recharge also occurs by slow downward leakage from overlying aquifers through the confining mudstones of the Hell Creek Formation. Ground water discharges from the aquifer to wells and in topographically lower areas, by upward leakage to shallower aquifers and streams. Ground-water flow in the Fox Hills–lower Hell Creek aquifer is discussed more fully on Map 7 of Part B.

Water-Level Fluctuations

Aquifers act as natural water-storage reservoirs. Because ground-water levels fluctuate in response to addition or withdrawal of water in an aquifer, monitoring water levels can provide an indication of the amount of water in storage and demonstrate the cycles of aquifer recharge and discharge. The determining elements for ground-water recharge are 1) whether snowmelt or rainfall can percolate below the land surface before it evaporates, and 2) whether the percolating water can get beneath the root zone before being consumed by plants. In most years, recharge occurs primarily in areas where surficial materials have the highest permeabilities, such as sandy soils, beds of unconsolidated sand and gravel on terraces or flood plains, or clinker beds and summer-fallowed fields. Intermittent drainages and coulees also represent areas where surface water may be lost to the subsurface. In the semi-arid climate of the Lower Yellowstone River Area, where potential evapotranspiration rates exceed annual precipitation, the conditions for recharge are generally unfavorable across the entire landscape.

For this study, water levels were monitored quarterly from a network of 60 wells; water-level recorders were placed in 16 additional wells. The recorders collected hourly measurements that were consolidated to daily averages. Wells completed in each of the hydrologic units were monitored.

Shallow Hydrologic Unit

In the Shallow Hydrologic Unit, water levels were measured in 15 wells; their records show changes over time scales of seasons to years. Some records began in the late 1970s or early 1980s under other projects and show that little long-term change has occurred since then (figure 18, wells 8, 10, 12, 14, and 15). The long-term record for well 3 (figure 18) shows a slight rising trend, about two feet. Well 7 (figure 18) declined about 15 feet but has since risen about five feet in the last few years.

Long-term water levels often follow climatic trends, provided that they are not influenced by local water usage. Water levels in shallow wells may rise and fall, lagging behind the cumulative departure from average precipitation. Periods of above-normal precipitation are generally reflected by periods of positive cumulative departure and rising water levels; periods of below normal precipitation produce negative cumulative departures and declining water levels (figure 18: wells 7, 11, and 14; figure 19). The long-term trends represent cumulative changes in aquifer storage in response to changes in precipitation that, in turn, result in changes in recharge and discharge to the ground-water system. Mid-1990s water levels in many wells are similar to those of the 1970s. This shows that overall change in ground-water storage within the Shallow Hydrologic Unit is negligible and can be considered zero in water-balance calculations.

Seasonal fluctuations in water levels are evident in 7 of the 15 wells shown on figure 18. More detailed hydrographs for the seven wells are also shown in figure 20. Seasonal fluctuations are most apparent in wells 1, 2, 5, 9, and 10 and ranged between about 2 and 7 feet annually (figures 19, 20). Water levels are typically highest in the spring when recharge from snowmelt and precipitation peaks. Water levels decline during the summer months when recharge rates decline, and they are lowest in the winter months when snow stores potential recharge at the land surface. One shallow well in the Missouri River flood plain showed apparently erratic water-level movement but when compared to water releases from Fort Peck Dam, much of the water-level change corresponds to changes in river discharge (figure 18, well 4; figure 21).

Deep Hydrologic Unit

In the Deep Hydrologic Unit, water levels in wells do not show the seasonal changes, and fluctuations are generally smaller than those in wells completed in the Shallow Hydrologic Unit. Aquifers in the Deep Hydrologic Unit are more vertically distant from conditions that enhance deep percolation and are recharged primarily by slow leakage from overlying aquifers. The slow leakage dampens seasonal fluctuations, so water-level changes are usually less than one foot per year (figure 22). About half the water-level

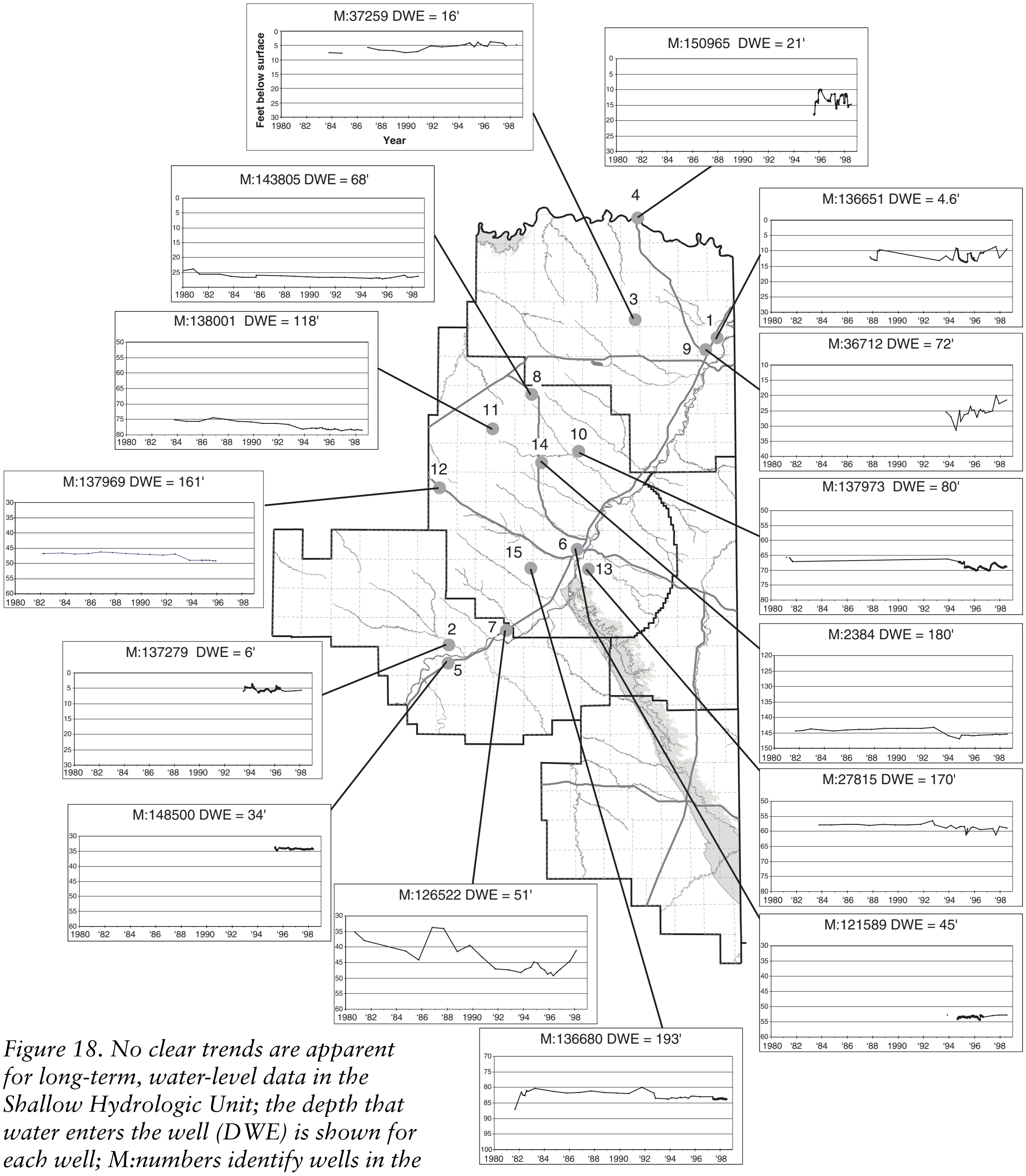


Figure 18. No clear trends are apparent for long-term, water-level data in the Shallow Hydrologic Unit; the depth that water enters the well (DWE) is shown for each well; M:numbers identify wells in the GWIC data base at MBMG. Water levels are in feet below land surface.

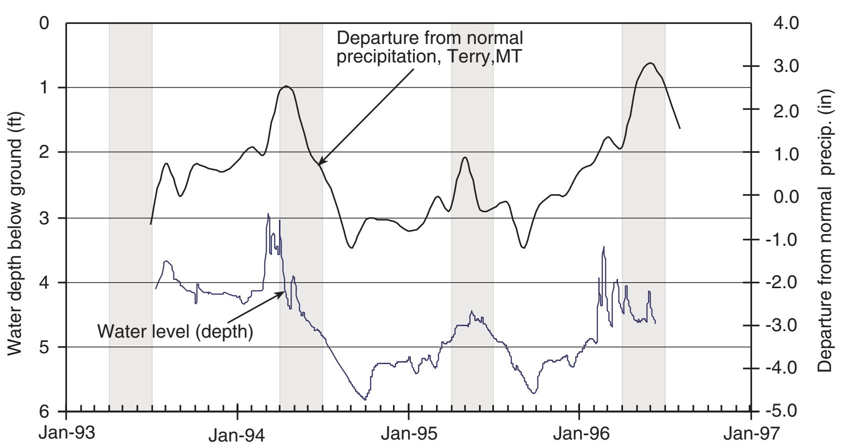


Figure 19. In the shallowest well, well 2, there is a close correlation with precipitation as departure from normal, and ground-water levels. The periods of April–June, denoting the spring seasons, are shaded.

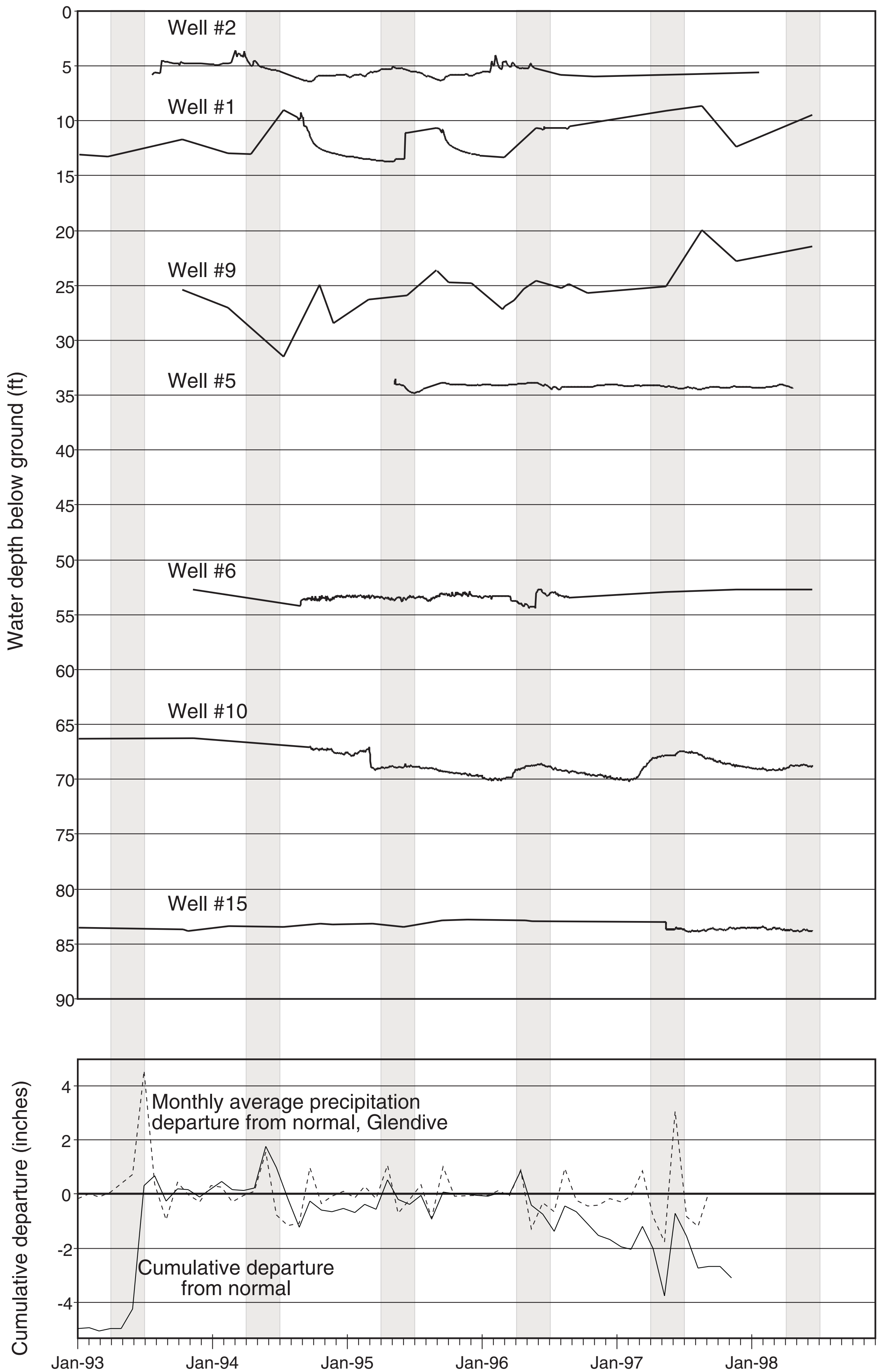


Figure 20. Ground-water levels rise in the shallow wells during the spring, reflecting recharge from melting snow and high stream flows; seasonal fluctuations are not apparent in the deepest well (number 15).

records from the Deep Hydrologic Unit show less than five feet of water-level change since the early 1980s (figure 22, wells 16, 18, 20, 21, and 22). Records from these wells show that water levels generally remain the same, indicating that little change in ground-water storage has occurred during the last 15 years. Two wells showed falling water levels that may have resulted from the deficit in cumulative precipitation that occurred in the 1980s (figure 22, wells 17 and 19). Conversely, the record from well 17 shows that water levels have risen since about 1995, when precipitation generally has been above normal.

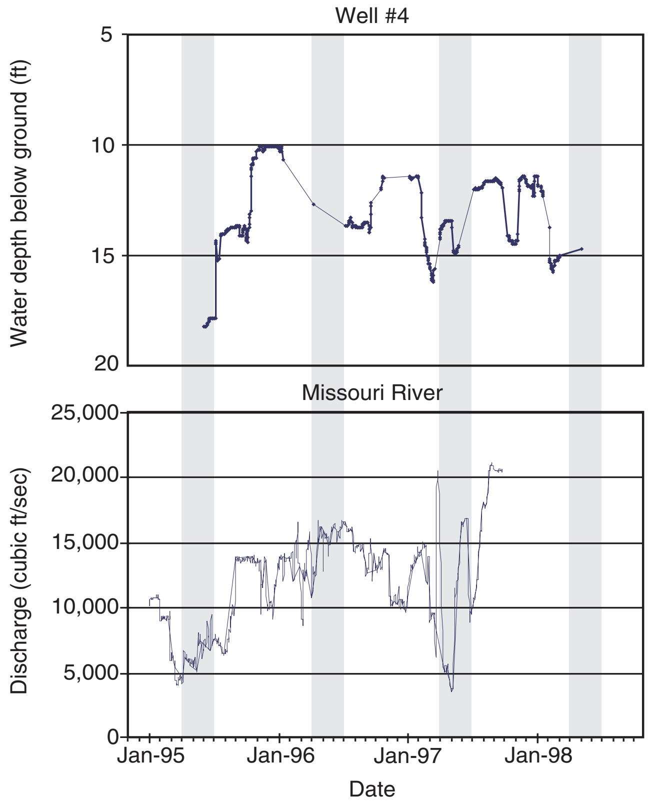


Figure 21. Comparison of water levels in well number 4, with flows in the Missouri River shows a good correspondence where water-level data are continuous.

The deepest observation well in the Deep Hydrologic Unit shows a steadily decreasing water level from its initial condition as a flowing artesian well (well 23, figure 22). The water-level history of this well is less like that of its shallower neighbor (well 18) and more like a deeper well at the site, well 24 in figure 23. Well 23 apparently is completed in a confined portion of the Deep Hydrologic Unit that acts more like the underlying Fox Hills–lower Hell Creek aquifer. Well 23 shows that the relationship between the Deep Hydrologic Unit and the Fox Hills–lower Hell Creek aquifer is gradational and that wells near the bottom of the Deep Hydrologic Unit may behave progressively more like wells in the underlying aquifer.

Fox Hills–Lower Hell Creek Aquifer

Water-level records for wells in the Fox Hills–lower Hell Creek aquifer show no obvious responses to climatic conditions but show that industrial water use and the practice of allowing wells to flow unrestricted may have impacted artesian pressures. Long-term, water-level records for wells in the Fox Hills–lower Hell Creek aquifer are rare, and those that exist are clustered near industrial pumping locations dating from the 1960s (figure 23, wells 25, 26, 27, 28, and 29). Well 24 is distant from the pumped area and its downward water-level trend may be related to other factors such as aquifer development near Terry and/or flowing wells along the Yellowstone River valley. Across most of the study area, the Fox Hills–lower Hell Creek aquifer is confined, *i.e.,* under artesian conditions. When allowed to flow or when pumped, confined aquifers release less water for a given change in water level than do unconfined aquifers. Therefore, the water-level declines caused by the withdrawal of large volumes are more pronounced across larger areas in confined aquifers than they are in unconfined aquifers.

Declining water levels in the Fox Hills–lower Hell Creek aquifer are locally important. Near Terry, Montana, water levels have declined steadily since the 1970s at a rate of about one foot per year (figure 23, well 24). Long-term declines in water levels suggest that more water is being removed from the aquifer than is being recharged. The undesirable effects of declining water levels include cessation of flowing conditions, the need to install pumps in wells, or the need to lower existing pump intakes in wells. Unrestricted discharge from flowing wells, a process that bleeds pressure from the aquifer, may aggravate the declining

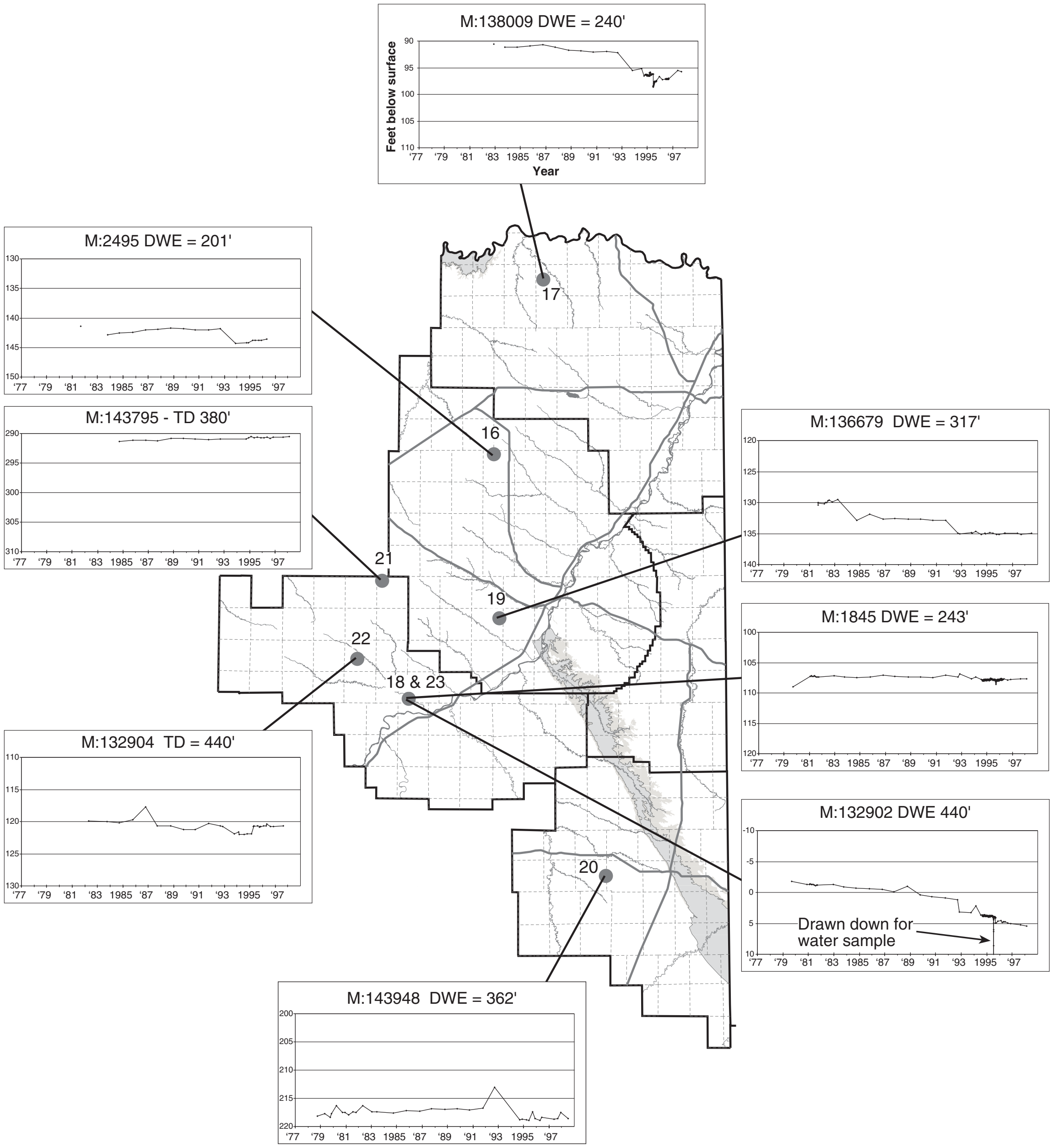


Figure 22. Water levels in wells completed in the Deep Hydrologic Unit show little fluctuation and do not react to annual recharge/discharge cycles. Water levels are in feet below land surface.

water levels in the Terry area. Conservation measures, such as restricting or plugging freely flowing wells, may help stem the rate of water-level decline.

The effects of overdraft from the Fox Hills–lower Hell Creek aquifer resulted in the first controlled ground-water area in Montana near the South Pine oil field (figure 23). Water-level records for wells 25, 26, 27, 28, and 29 show the effects of the pumping. In the early 1960s, near the South Pine oil field between Glendive and Baker, ground water was pumped from the Fox Hills–lower Hell Creek aquifer at a cumulative rate of about 450 gpm and injected into much deeper oil-producing formations to enhance secondary oil recovery. The withdrawals resulted in water-level declines (figure 23, well 29) that affected many surrounding stock and domestic wells and caused many landowner complaints. Montana created the South Pine Controlled Ground Water Area in 1967 to limit the pumping from the aquifer; this slowed the rate of water-level decline (Taylor 1965, Coffin *et al.* 1977). Between 1975 and 1977, the industrial wells used for the oil recovery operation were phased out of production and water levels in the area began to recover; however, water levels are still about 40 feet below the 1962 levels, and the recovery appears to have ended in about 1994. Because industrial pumping no longer occurs, this substantial net change in water levels between 1962 and 1994 must be attributed to other factors, such as domestic and agricultural usage or reduced recharge due to long-term climate change. Interestingly, the 40-foot net decline in the South Pine Area would be approximately matched by decline in well 24 near Terry for the same period of record.

Aquifer Testing and Hydraulic Properties

Aquifer tests were performed to quantitatively assess the hydraulic properties of aquifers in the Shallow Hydrologic Unit. The hydraulic properties provide a measure of an aquifer's ability to store and transmit water. They are of interest because they can be used in models and with other tools to predict ground-water flow rates and responses to development. The test used to determine hydraulic properties involves measuring water levels in pumping and observation wells for long periods; however, these tests are expensive to conduct and only provide data about conditions near the wells involved. Aquifer-test data included here and compiled from other sources may help planners to properly develop new water supplies.

The basic principle of an aquifer test is to "stress" an aquifer by adding or removing water from a well and monitoring the subsequent responses of water levels in the aquifer in or near

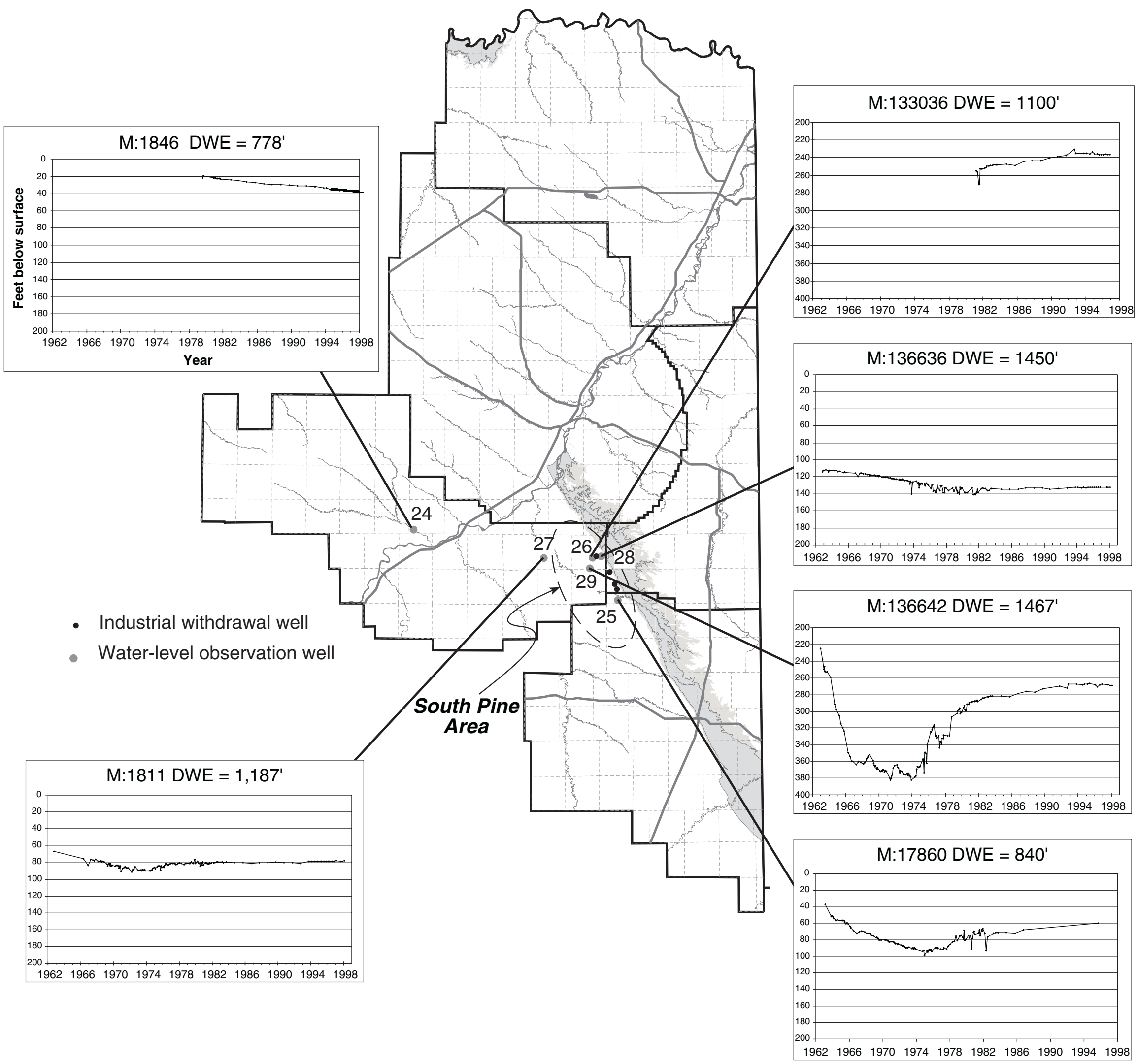


Figure 23. Long-term water-level declines and subsequent partial recovery in the Fox Hills–lower Hell Creek aquifer are evident in the South Pine Area and near Terry. Water levels are in feet below land surface.

the pumping well. By measuring the changes in water levels against time, the hydraulic properties that relate to the aquifer's ability to transmit and store water may be determined.

The simplest method of assessing hydraulic properties is to calculate the specific capacity of wells completed in the aquifer. Specific capacity is the rate of discharge per unit of drawdown. The test involves pumping a well at a constant rate and determining the drawdown, the difference between the static water level and the pumping water level, during a specific time, for example, one-half of an hour. Results are usually as gallons per minute per foot (gpm/ft). Under certain assumptions specific-capacity data can be used to estimate transmissivity and hydraulic conductivity. However, in practice, many factors affect measurements of specific capacity besides the transmissivity of the aquifer, including variations in discharge, the efficiency of the well, and the test duration.

Program staff made specific-capacity measurements at 506 wells during this study. For each of the hydrologic units, the range of measured values is large and strongly skewed toward low values (figure 24). The median value for each hydrologic unit shows that the Shallow Hydrologic Unit produces about twice as much water per foot of drawdown as either the Deep Hydrologic Unit or the Fox Hills–lower Hell Creek aquifer. In general, the higher specific capacities in the Shallow Hydrologic Unit are due to wells completed in unconsolidated units, which showed a median value of about 2.5 gpm/ft (figure 24).

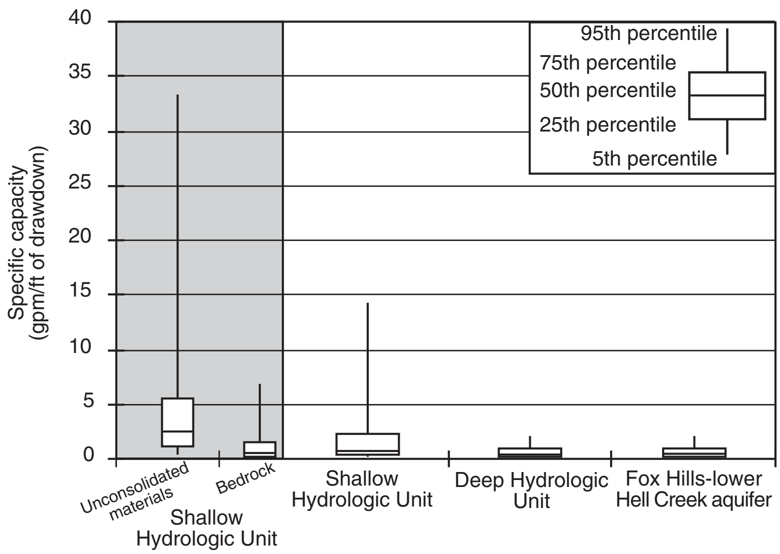


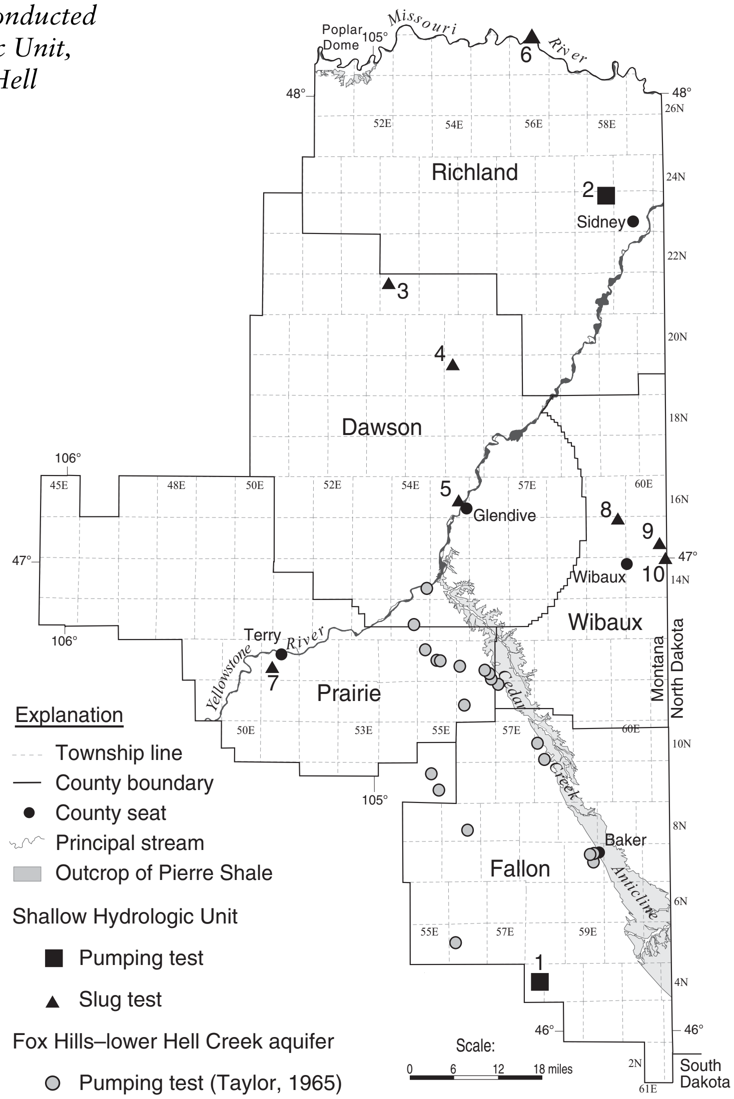
Figure 24. Specific capacity of a well relates its yield to the amount of drawdown; wells with higher specific capacities are more productive. The highest specific capacities and the greatest variability were found in wells completed in unconsolidated deposits. The lowest specific capacities were found in wells completed in the bedrock aquifers.

More precise measurements of hydraulic properties in the Shallow Hydrologic Unit were made during constant-rate aquifer tests at two locations and single well "slug tests" at eight other locations (figure 25). Aquifer transmissivity, which measures of the capacity of an aquifer to transmit water through its entire thickness, and aquifer storativity, a measure of the aquifer's capacity to store water, were determined from the aquifer tests. Hydraulic conductivity, which describes the rate at which water can move through a unit cross section of aquifer material, was determined from the slug tests. Hydraulic conductivity multiplied by the aquifer thickness is equivalent to transmissivity.

Both of the constant-rate tests were performed in September 1995. The first was conducted at a site about six miles southwest of Willard in Fallon County; the second was at a site about six miles northwest of Sidney in Richland County (figure 25 sites 1 and 2). Both tests were conducted on wells that were less than 130 feet deep and completed in the Fort Union Formation. During each test, the well was pumped at a constant rate for about 72 hours; periodic water-level measurements were simultaneously made in the pumping well and two or three observation wells. Data from the tests were analyzed by means of the Cooper and Jacob (1946) method, and the test results are summarized on table 1.

The two constant-rate tests produced transmissivity values ranging from about 2,400 to 24,000 gpd/ft, reflecting the variable composition of the Fort Union Formation. The

Figure 25. Aquifer tests have been conducted at 10 sites in the Shallow Hydrologic Unit, and 20 sites in the Fox Hills–lower Hell Creek aquifer.



transmissivity values from the test site near Willard were three to four times higher than the values from the site near Sidney. The sedimentary rocks composing the aquifer near the Willard site are predominately fine- to medium-grained sandstone; at the Sidney site the aquifer contained more silt- and clay-sized material.

Slug tests were performed on eight wells completed in the Shallow Hydrologic Unit (figure 25): two of the wells were completed in alluvium, one in the upper Hell Creek Formation, and the remainder were completed in the Fort Union Formation. Slug tests were done by quickly displacing water from each well and monitoring the recovery of the water level back to static conditions. The slug-test data were analyzed using the Bouwer and Rice (1976) method; the results are summarized on table 2. Hydraulic conductivities ranged from 0.1 to 75 feet per day (ft/day). Alluvial wells produced the greater values; hydraulic conductivities for all of the wells tested in the Fort Union Formation were less than one ft/day.

Because of differences in aquifer composition and thickness in the Shallow Hydrologic Unit, the aquifer coefficients in tables 1 and 2 should be applied only close to each tested well. The coefficients are useful as guides to evaluate the effects of pumping and to show the range of conditions present but should not be applied broadly to large areas.

Program staff did not conduct hydrogeologic tests in the Deep Hydrologic Unit or Fox Hills–lower Hell Creek aquifer. However, Taylor (1965) performed 20 aquifer tests in the Fox Hills–lower Hell Creek aquifer from which transmissivity values were calculated. Taylor (1965) conducted all these tests in the area along the west side of the Cedar Creek Anticline (figure 25). The transmissivity values ranged from 320 to 3,000 gpd/ft, and averaged 1,330 gpd/ft. Storativity values determined from four of the tests ranged from 4.6×10^{-5} to 7.1×10^{-4}, and averaged 3.8×10^{-4}. These results compare favorably with other aquifer tests done in the Fox Hills–lower Hell Creek aquifer in North Dakota (Groenewold *et al.* 1979) and in the Powder River Basin of Wyoming (Henderson 1985).

Ground-Water Quality

Ground-Water Sampling

A principal objective of this study was to document water quality in each of the hydrologic units. To accomplish this, 146 water wells were sampled during the fall of

Table 1. An aquifer test performed in the Shallow Hydrologic Unit near Willard gave higher transmissivities values than a similar test near Sidney.

Results from test near Willard

Well	Cooper-Jacob T (gpd/ft)	Recovery T (gpd/ft)	S (pumping)	Distance Drawdown T (gpd/ft) at 4,000 min.	Distance Drawdown S at 4,000 min.
Well M:16809	14,000	10,900	---	---	---
MW-1 (r = 19 ft)	10,400	13,200	---	---	---
MW-2 (r = 43 ft)	11,200	16,000	0.005	---	---
MW-3 (r = 78 ft)	9,400	24,900	0.04	---	---
Average	11,200	16,200	0.02	3,600	0.13

Results from test near Sidney

Well	Cooper-Jacob T (gpd/ft)	Recovery T (gpd/ft)	S (pumping)
Well M:36423	---	---	---
MW-1 (r = 20 ft)	2,530	5,780	0.001
MW-2 (r = 42 ft)	2,380	3,680	0.001
Average	2,460	4,730	0.001

T = Transmissivity in gallons per foot per day
S = Storativity
r = distance from the pumping well

Table 2. Slug tests from wells in the unconsolidated deposits and a well completed in the Hell Creek Formation gave the highest hydraulic conductivity values.

Well	Location	Total Depth (ft)	Hydraulic Conductivity K (ft/day)	Aquifer Materials
M:143805	T.21N., R.53E., sec. 08 DABB	68	0.66	Fort Union
M:137973	T.19N., R.55E., sec. 08 DDDA	105	0.50	Fort Union
M:121589	T.16N., R.55E., sec. 27 ADCB	70	5.39	Hell Creek
M:150965	T.27N., R.56E., sec. 03 BDBB	21	2.23	Alluvium
M:148543	T.12N., R.51E., sec. 21 DADD	67	75.60	Alluvium
M:137987	T.15N., R.59E., sec. 02 AAAA	155	0.01	Fort Union
M:142636	T.15N., R.60E., sec. 26 BBBB	170	0.06	Fort Union
M:143800	T.14N., R.61E., sec. 06 CCAA	155	0.33	Fort Union

1994 and summer of 1995. Sample sites were selected to obtain a uniform areal distribution of samples and to obtain samples along ground-water flow paths. Most of the samples (90) were collected from the Shallow Hydrologic Unit. The remainder was divided equally between the Deep Hydrologic Unit and the Fox Hills–lower Hell Creek aquifer (28 from each). Existing domestic, stock, public supply, and monitoring wells were sampled. Samples were collected for analysis of major ions and trace metals; field measurements of specific conductance, pH, and water temperature were also obtained from each of the sampled wells. To ensure acquisition of a representative sample, each well was pumped before sample collection until the field parameters stabilized and at least three well-casing volumes of water were removed. Analyses were performed by the MBMG's Analytical Laboratory. Samples were also collected from selected wells for analysis of environmental isotopes, carbon-14, carbon-13, deuterium, oxygen-18, and tritium. The tritium analyses were conducted by the University of Waterloo Environmental Isotope Laboratory; all others were done by Geochron Laboratory. The analytical results are presented in appendixes C and D.

For quality assurance, 12 sets of duplicate samples, field blanks, and equipment blanks were collected. Comparisons of major-ion results for the duplicate samples are shown on figure 26. There is good agreement among the duplicate samples, indicating good laboratory accuracy. The results from the equipment and field blanks were below or near detection limits, showing that the field equipment and sample handling did not alter the samples.

The results from an additional 323 historical ground-water analyses also were used to evaluate ground-water quality. The historical analyses, which are stored in the GWIC data base at the MBMG, were reviewed for completeness and charge balance. The charge balances between cations and anions of each historical analysis were within 5% of each other. Most of the historical samples were collected since 1970, but some were collected as early as 1947. The geographic distribution of analyses and additional information regarding ground-water quality in each of the hydrologic units is presented on maps 8, 9, and 10 of Part B.

Dissolved Constituents

The concentration of dissolved constituents provides a general indicator of water quality. The dissolved-constituents value is the sum of the major cations (Na, Ca, K, Mg, Mn, and Fe) and anions (HCO_3, CO_3, SO_4, Cl, SiO_3, NO_3, and F) expressed in milligrams per liter (mg/L). The inclusion of trace metals is unecessary because of their negligible contribution to the total. Values of dissolved constituents differ slightly from total dissolved solids (TDS), which is another commonly reported indicator. Total dissolved solids are traditionally measured by weighing the residue remaining after evaporating a known volume of water. However, during evaporation about half of the bicarbonate (HCO_3) is converted to carbon dioxide (CO_2), which escapes to the atmosphere and does not appear in the dissolved solids residue (Hem 1992). Therefore, TDS underestimates the total dissolved-ion concentration in a solution, especially where bicarbonate concentrations are high. For this report, the actual concentrations reported for the major constituents are summed and reported as dissolved constituents (rather than TDS); this provides a more accurate measure of the total ions in solution.

Shallow Hydrologic Unit

The Shallow Hydrologic Unit has the greatest variability in dissolved constituents; the lowest (less than 500 mg/L) and highest (greater than 5,000 mg/L) concentrations were detected in this unit (figure 27); the average was 1,670 mg/L. Variability in the concentration of dissolved constituents reflects the heterogeneity of near-surface geologic materials, the different lengths of ground-water flow paths, and to a lesser extent, the variety of recharge sources to the Shallow Hydrologic Unit.

Deep Hydrologic Unit

In the Deep Hydrologic Unit the dissolved-constituent concentrations are generally higher but are less variable than those in the Shallow Hydrologic Unit (figure 27). Dissolved-constituent concentrations ranged from about 1,000 to 3,300 mg/L, with an average of about 2,100 mg/L. The decrease in variability in the Deep Hydrologic Unit suggests a more chemically stable system.

Fox Hills–lower Hell Creek Aquifer

The most uniform quality water within the study area comes from the Fox Hills–lower Hell Creek aquifer (figure 27). Concentrations of dissolved constituents are generally between about 1,000 and 2,500 mg/L with an average of about 1,460 mg/L, suggesting a higher degree of chemical stability when compared with the Shallow or Deep Hydrologic units.

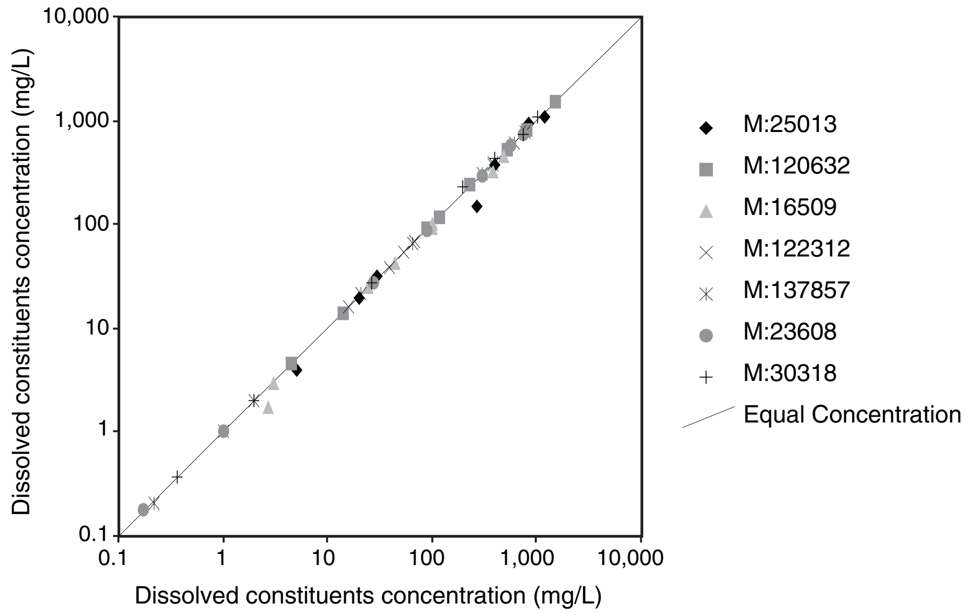


Figure 26. Comparison of major-ion results shows good agreement among duplicate samples, indicating good laboratory accuracy.

Major-Ion Chemistry

The relative concentrations of major ions in the three units can be compared using the information presented in figures 28 and 29. The Shallow Hydrologic Unit exhibits the most variability in ionic concentrations while the Deep Hydrologic Unit and the Fox Hills–lower Hell Creek aquifer are much more uniform. As water moves through an aquifer, from areas of recharge to areas of discharge, concentrations of dissolved constituents generally increase. Additionally, as water moves down a flow path the relative concentrations between the major cations and anions will change due to reactions with the aquifer materials. The ground-water chemistry evolves between the Shallow and Deep Hydrologic units from a calcium-magnesium, sulfate-bicarbonate (Ca-Mg-SO_4-HCO_3) type water with diverse dissolved-constituents content, between about 500 and 5,000 mg/L, to a predominately sodium-bicarbonate (Na-HCO_3) type water with dissolved constituents uniformly between about 1,000 and 3,000 mg/L. A trilinear plot (figure 29) of the major ion concentrations graphically shows this evolution of the average water types for the three hydrologic units.

Most ground water originates from precipitation that infiltrates through the soil into the underlying aquifers. Recharge water is relatively "pure" with low total dissolved

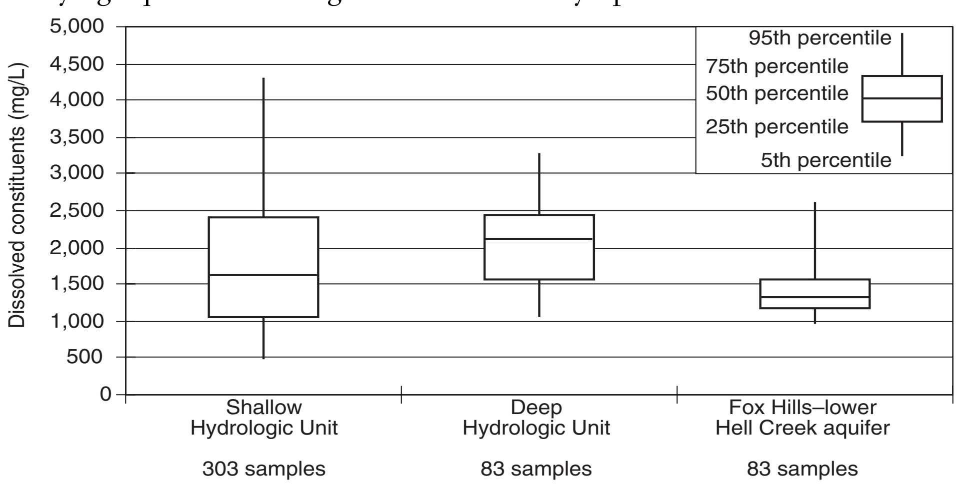


Figure 27. Dissolved-constituent concentrations are most variable in the Shallow Hydrologic Unit; the variability decreases with depth. Average concentrations are lowest in Fox Hills–lower Hell Creek aquifer.

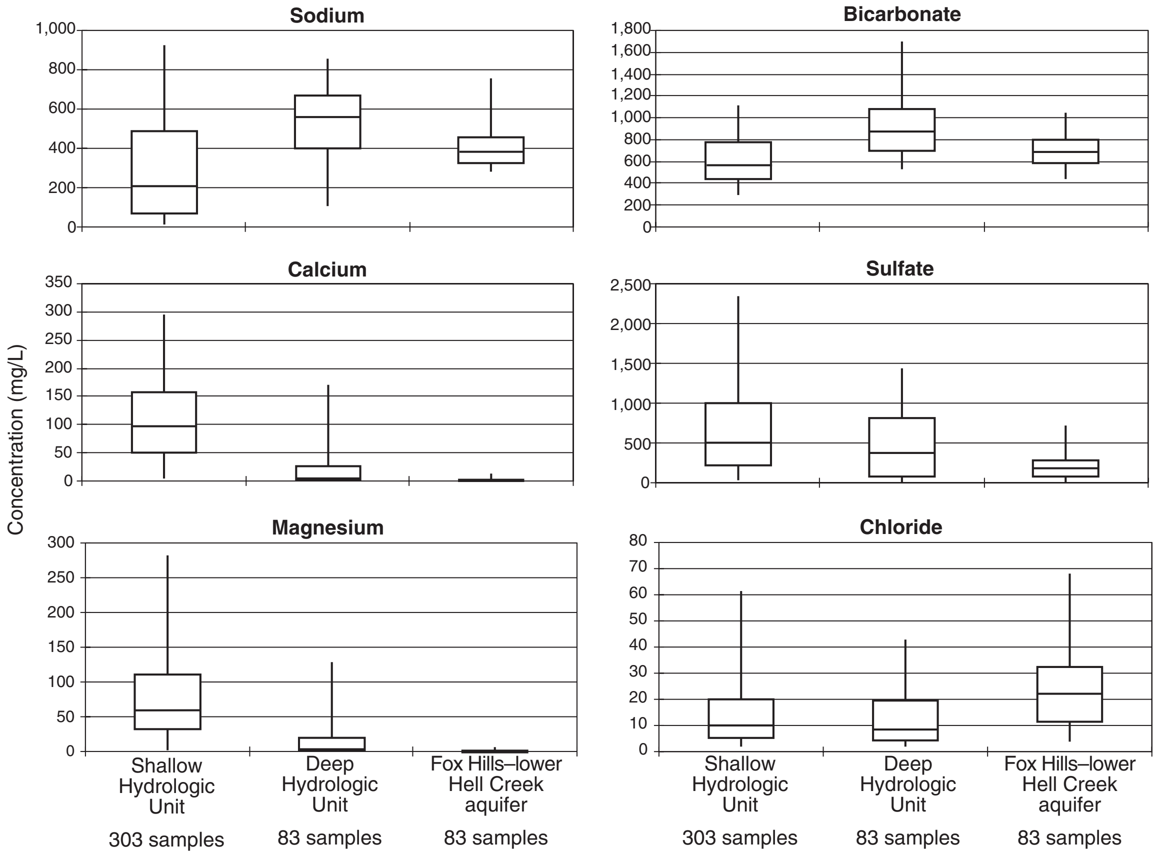


Figure 28. Differences in the concentrations of individual ions are apparent in the three hydrologic units. Concentrations of calcium, magnesium, and sulfate are highest in the Shallow Hydrologic Unit and decrease with depth. Sodium and bicarbonate are generally higher in the Deep Hydrologic Unit and the Fox Hills–lower Hell Creek aquifer. Symbols described in figure 27.

constituents. The calcium-magnesium, sulfate-bicarbonate type water in the shallow ground water is the result of dissolution of carbonate minerals such as calcite ($CaCO_3$) and dolomite [$CaMg(CO_3)_2$], and dissolution of gypsum or anhydrite ($CaSO_4$). Oxidation of sulfide minerals, such as pyrite (FeS_2) also may contribute sulfate to the shallow ground water. Geochemical changes occur as water moves from shallow zones to deeper zones. The evolution of ground-water chemistry to a sodium-bicarbonate type water is primarily controlled by three reactions: ion exchange, dissolution of carbonate minerals, and sulfate reduction. Generalized forms of these chemical reactions are as follows:

Ion exchange:

$$(Ca^{+2} \text{ or } Mg^{+2})_{\text{in solution}} + 2Na^{+}_{\text{exchangeable}} <=> (Ca^{+2} \text{ or } Mg^{+2})_{\text{exchangeable}} + 2Na^{+}_{\text{in solution}}$$

Dissolution of carbonate minerals:

$$CaCO_{3\ \text{solid}} + H^{+}_{\text{in solution}} => Ca^{+2}_{\text{in solution}} + HCO^{-}_{3\ \text{in solution}}$$

Sulfate reduction:

$$SO^{-2}_{4\ \text{in solution}} + 2CH_2O_{\text{solid organic matter}} \longrightarrow 2\ HCO^{-}_{3\ \text{in solution}} + H_2S_{\text{gas}}$$

With ion-exchange reactions, clay minerals in aquifers act as natural water softeners; removing calcium and magnesium from solution in exchange for sodium. Figure 28 shows that calcium and magnesium, while abundant in Shallow Hydrologic Unit aquifers, are much less common in the Deep Hydrologic Unit, and virtually absent in the Fox Hills–lower Hell Creek aquifer. The removal of calcium from solution by ion exchange keeps the water

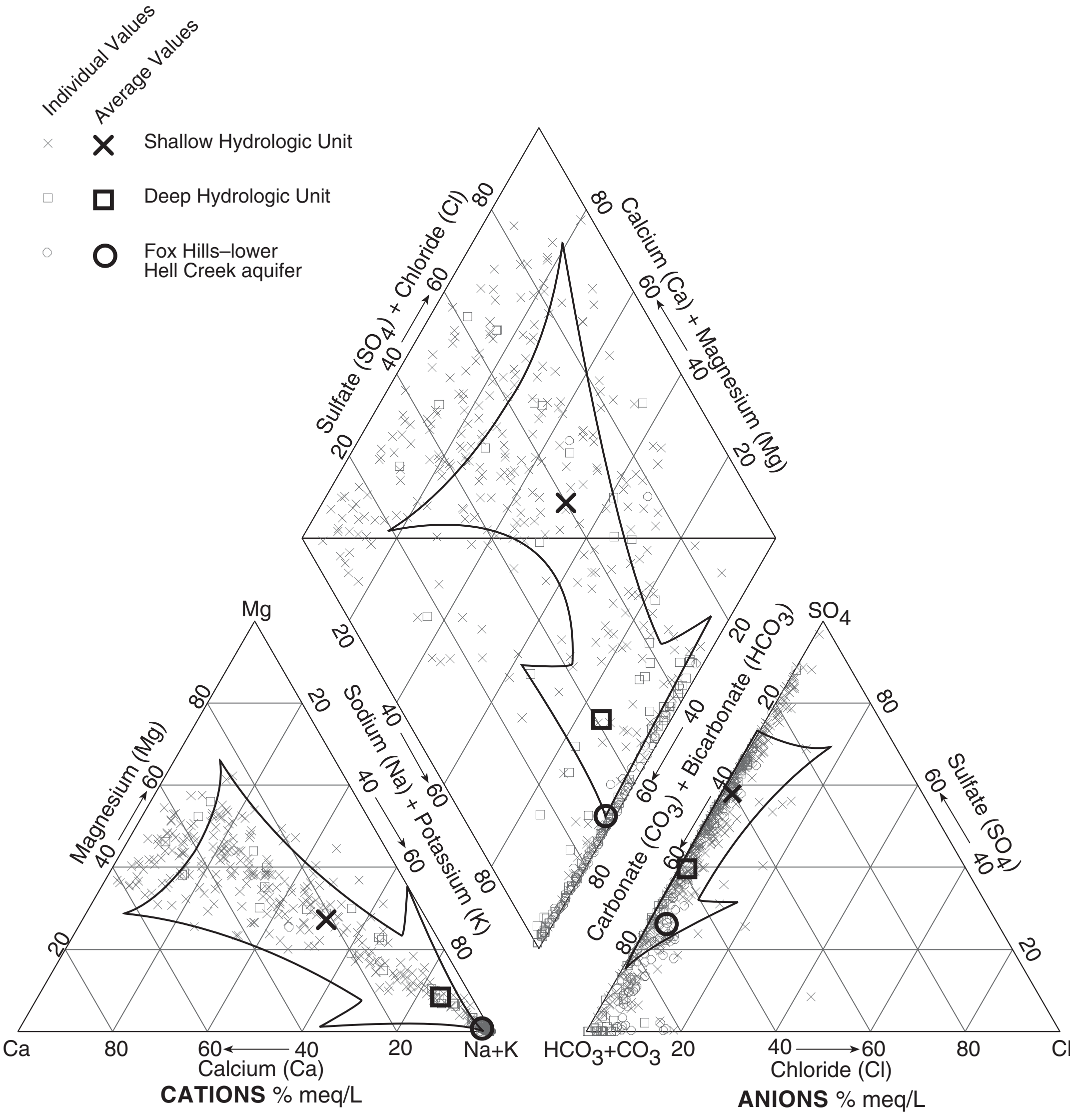


Figure 29. A trilinear plot (Piper plot), with all data points and the average values for the three hydrologic units, shows how ground water evolves from a calcium-magnesium-sulfate water (Shallow Hydrologic Unit) to one with little magnesium and sulfate and a greater concentration of sodium and bicarbonate (Fox Hills–lower Hell Creek aquifer). Note that although individual values are highly variable, average values show trends from the Shallow Hydrologic Unit to the Fox Hills–lower Hell Creek aquifer (indicated by arrows).

undersaturated with respect to carbonate minerals present in the aquifer materials, allowing the carbonate minerals to continue to dissolve. Dissolution of carbonates increases bicarbonate in solution. Consequently, as water moves down the flow path, it acquires sodium, but calcium and magnesium are lost to the clay minerals, and bicarbonate is added to the water. Other studies have described similar chemical evolution in the Fort Union Formation of the Powder River Basin in southeastern Montana (Lee 1981).

Ground water in the Fox Hills–lower Hell Creek aquifer contains predominately sodium and bicarbonate with less sulfate and slightly more chloride than water from overlying aquifers (figure 28). Sulfate reduction appears to play an important role in reducing sulfate concentrations in the Fox Hills–lower Hell Creek aquifer. Bacteria catalyze organic matter in the aquifer and chemically reduce sulfate concentrations while increasing the amount of bicarbonate in solution; where the process is active sulfate concentrations can be reduced to negligible amounts. The reaction also produces hydrogen sulfide (H_2S). The presence of hydrogen sulfide (a rotten-egg odor) in water from parts of the Fox Hills–lower Hell Creek aquifer is an indicator of sulfide reduction.

Nitrate and Fluoride

Nitrate (NO_3) is an essential nutrient for plant life, yet it is a potentially toxic pollutant when present in drinking water at excessive concentrations. Pregnant women and infants less than one year of age are most at risk for nitrate poisoning if they ingest water or formula prepared with water containing nitrate concentrations in excess of 10 mg/L-N. Nitrate poisoning can result in methemoglobinemia, or blue-baby syndrome, in which the ability of the baby's blood supply to carry oxygen is reduced to the point that suffocation occurs. Nitrate has natural as well as human-related sources. However, where nitrate contamination of ground water has been identified, it is usually related to a known or suspected surficial nitrogen source (Madison and Brunett 1984). Significant human sources of nitrate include septic systems, agricultural activities (fertilizers, irrigation, dry-land farming, livestock wastes), land disposal of wastes, and industrial wastes. Natural sources of nitrate include fixation of nitrogen in the soil and nitrogen-rich geologic deposits (generally shales). Nitrate enters the ground-water system by leaching of surface or near-surface sources. Aquifers close to the land surface may lack protective overlying low-permeability materials and are susceptible to contamination from surface sources.

Nitrate, reported as nitrogen (N), concentrations in ground water of the Lower Yellowstone River Area are generally low. Most samples from the Deep Hydrologic Unit and the Fox Hills–lower Hell Creek aquifer had nitrate concentrations either below the analytical detection limit or below 1.0 mg/L-N (figure 30). The highest concentrations were found in water from the Shallow Hydrologic Unit where 21 samples (7% of the total) exceeded the recommended health limit of 10 mg/L-N. Wells that produced water with nitrate concentrations greater than the recommended health limit all draw water from within 70 feet of the land surface. The general lack of nitrate in deeper aquifers suggests that nitrate is not derived from geologic materials but comes from surface sources.

Chronic exposure to high concentrations (greater than 4.0 mg/L) of fluoride in drinking water may cause mottling of tooth enamel or skeletal damage (Driscoll 1986). However, small amounts of fluoride (usually less than 2.5 mg/L) in drinking water are beneficial, and it is added to many water supplies in the United States. Fluoride concentrations (figure 30) for the three hydrologic units were lowest in the Shallow Hydrologic Unit, and higher in the Deep Hydrologic Unit and the Fox Hills–lower Hell Creek aquifer. All samples containing fluoride from the Shallow Hydrologic Unit were below 4.0 mg/L. In the Deep Hydrologic Unit and Fox Hills–lower Hell Creek aquifer, average concentrations of fluoride were below the health limit; however, 14% of the samples from these two units did have fluoride concentrations greater than 4.0 mg/L, and 38% were greater than 2.0 mg/L. The maximum concentration detected was 5.7 mg/L. Dissolution of fluoride-bearing minerals is the likely source of fluoride in ground water.

Isotopes

Isotopes of hydrogen, oxygen, and carbon in ground water can be useful tools in determining residence times, delineating flow paths, and tracing or marking recharge sources when integrated with other hydrogeologic and chemical data. In the Lower Yellowstone River Area, isotopes were used to assess ground-water age and recharge sources in the Shallow Hydrologic Unit and Fox Hills–lower Hell Creek aquifer.

Tritium

Tritium is a naturally occurring radioactive isotope of hydrogen that has a half-life of 12.43 years. It is produced in the upper atmosphere where it is incorporated into water molecules and, therefore, is present in precipitation and water that recharges aquifers. Tritium concentrations are measured in tritium units (TU), where one TU is equal to one tritium atom in 10^{18} atoms of hydrogen. Before the atmospheric testing of nuclear weapons in 1952, concentrations of tritium in precipitation were about 2–8 TU (Plummer *et al.* 1993). Atmospheric testing of nuclear weapons between 1952 and 1963 injected large amounts of tritium into the atmosphere, overwhelming the natural production of tritium; concentrations

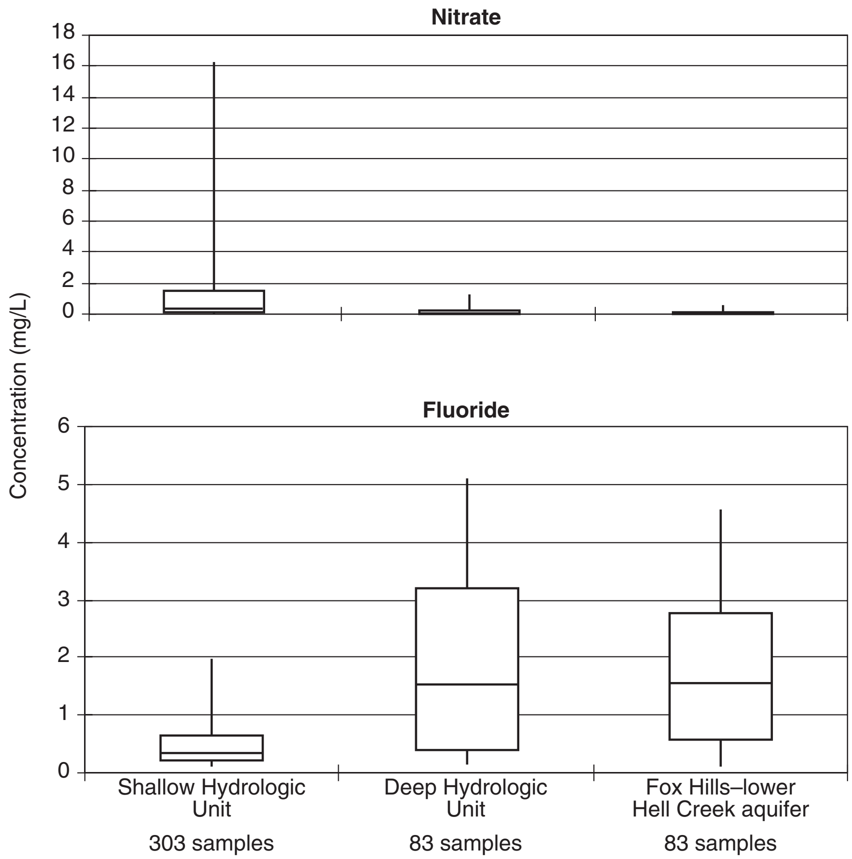


Figure 30. Nitrate concentration were highest in the Shallow Hydrologic Unit, although the average concentration of all samples was less than 1.0 mg/L-N, 7% of the samples had concentrations greater than 10 mg/L-N. In the Deep Hydrologic Unit and Fox Hills–lower Hell Creek aquifer nitrate generally was undetected above 1.0 mg/L. Fluoride concentrations were highest in the Deep Hydrologic Unit and Fox Hills–lower Hell Creek aquifer. Symbols described in figure 27.

of more than 10,000 TUs in precipitation were measured in North America (Hendry 1988). Because of its short half-life, bomb-derived tritium is an ideal marker of recent (post-1952) ground-water recharge. Ground water recharged by precipitation before 1952 will have tritium concentrations reduced to less than about 1.0 TU because of radioactive decay, which is at or below the analytical detection limit. Therefore, a ground-water sample with detectable tritium (>0.8 TU) must have been recharged since 1952 and would be considered "modern." Tritium-free ground water infers recharge before 1952 and is considered "sub-modern" or older (Clark and Fritz 1997).

In the Shallow Hydrologic Unit, 22 samples were collected for tritium analysis (figure 31). Tritium was detected in 15 of the 22 samples; concentrations ranged from 5.5 to 49.8 TU. The data show that ground-water age increases with depth. Tritium was detected in all sampled wells completed within 60 feet of land surface, and in some wells completed at depths between 60 and 80 feet, none of the wells completed at depths greater than 80 feet had detectable tritium (figure 32). Ground water within about 60 feet of the land surface appears to have been recharged since 1952; deeper ground water (>80 feet) is older, recharged before atmospheric nuclear testing.

The Relationship of Tritium to Nitrate in the Shallow Hydrologic Unit

Sample results for tritium and nitrate from the Shallow Hydrologic Unit show a correspondence between tritium detection and the presence of nitrate. As expected, "modern" water (recharged after 1952) contains nitrate more frequently than "sub modern" water (recharged before 1952). Of the 15 samples with detectable tritium, 13 had detectable nitrate concentrations that ranged between 0.25 and 44.4 mg/L-N. Of the seven samples with no detectable tritium (pre-1952 water), only two had detectable nitrate levels, and the concentrations were low, less than 1.0 mg/L-N (figure 33). This association between tritium and nitrate shows that ground-water age may be useful for assessing the sensitivity of an aquifer to contamination.

Aquifer Sensitivity

Aquifer sensitivity describes the potential for an aquifer to be contaminated based on its intrinsic geologic and hydrogeologic characteristics; it is a measure of the relative quickness with which a contaminant applied on or near the land surface could infiltrate to the aquifer of interest (for this report the aquifer of interest is the uppermost aquifer or the water table). The faster water moves from the land surface to the water table, the more sensitive the aquifer is to potential contamination. The recognition of potentially sensitive ground-water areas is a critical first step in preventing ground-water contamination. Preventing contamination is less costly and easier than cleaning up the contamination after the fact.

The primary factors in assessing aquifer sensitivity are depth to the water table and the permeability of geologic material in the unsaturated zone above the water table. Areas characterized by rapid infiltration and a shallow water table are more sensitive than others. Examples of such areas would be terraces and/or flood plains with sandy soils, or sand and gravel at the surface. Areas with poorly drained soils and/or low-permeability material in the unsaturated zone will restrict infiltration of water, and any associated contamination, providing a protective layer to underlying aquifers; thus the sensitivity in these areas is lower. Also, a deep water table affords more of an opportunity for contaminants to be naturally attenuated or "filtered" before reaching the aquifer.

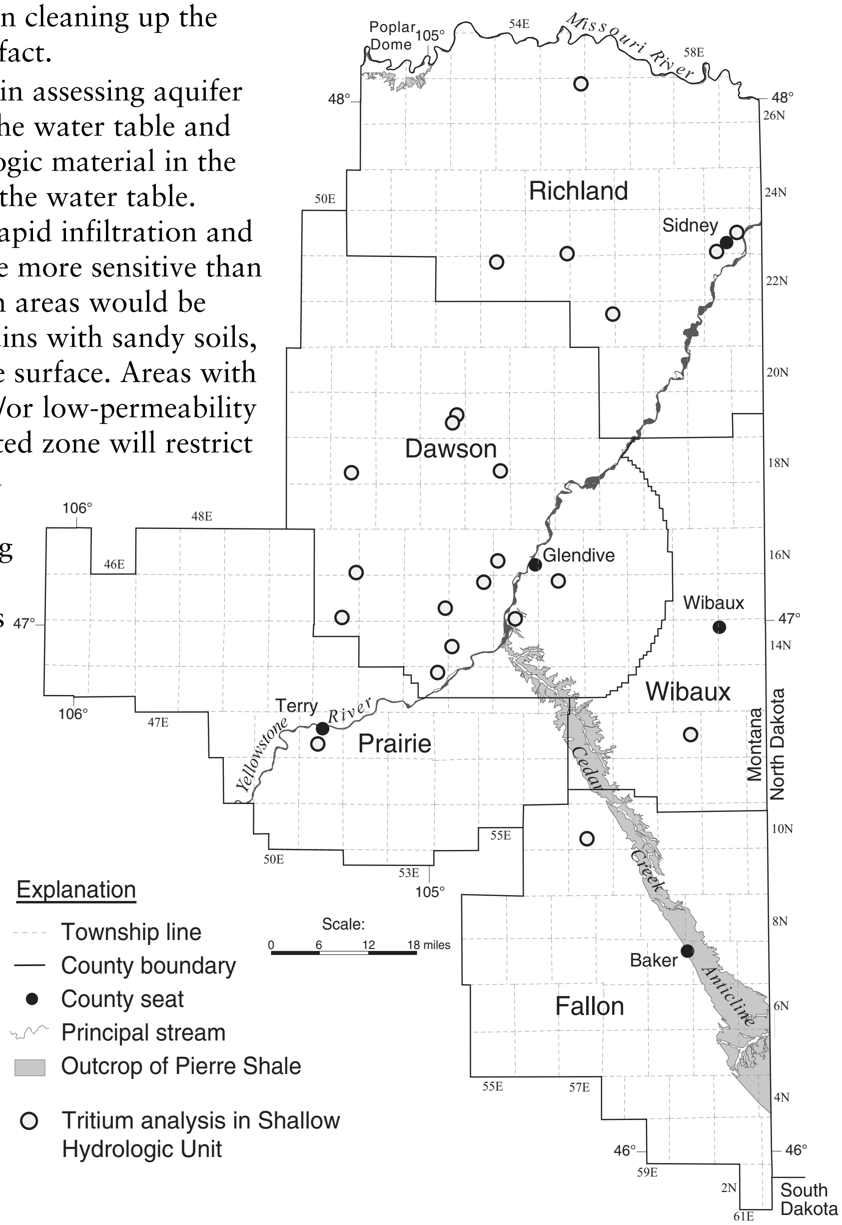


Figure 31. Tritium samples were collected from 22 wells in the Shallow Hydrologic Unit.

The following procedure, outlined schematically in figure 34, can be used to compare the relative sensitivity of broad areas given the range of conditions present in the study area. The procedure only considers the physical hydrogeologic characteristics of the study area. The steps are as follows:

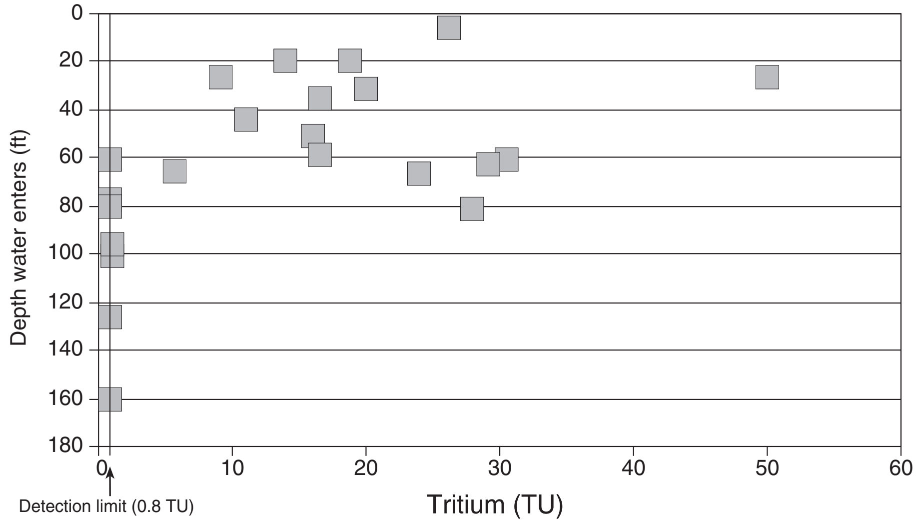


Figure 32. Ground water within about 80 feet of the land surface appears to have been recharged since 1952; deeper ground water (>80 feet) is older, recharged before atmospheric nuclear testing.

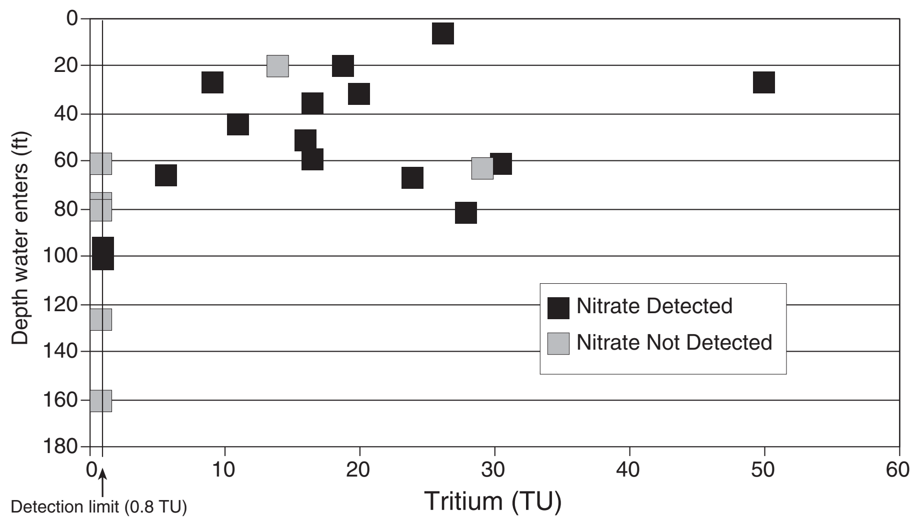
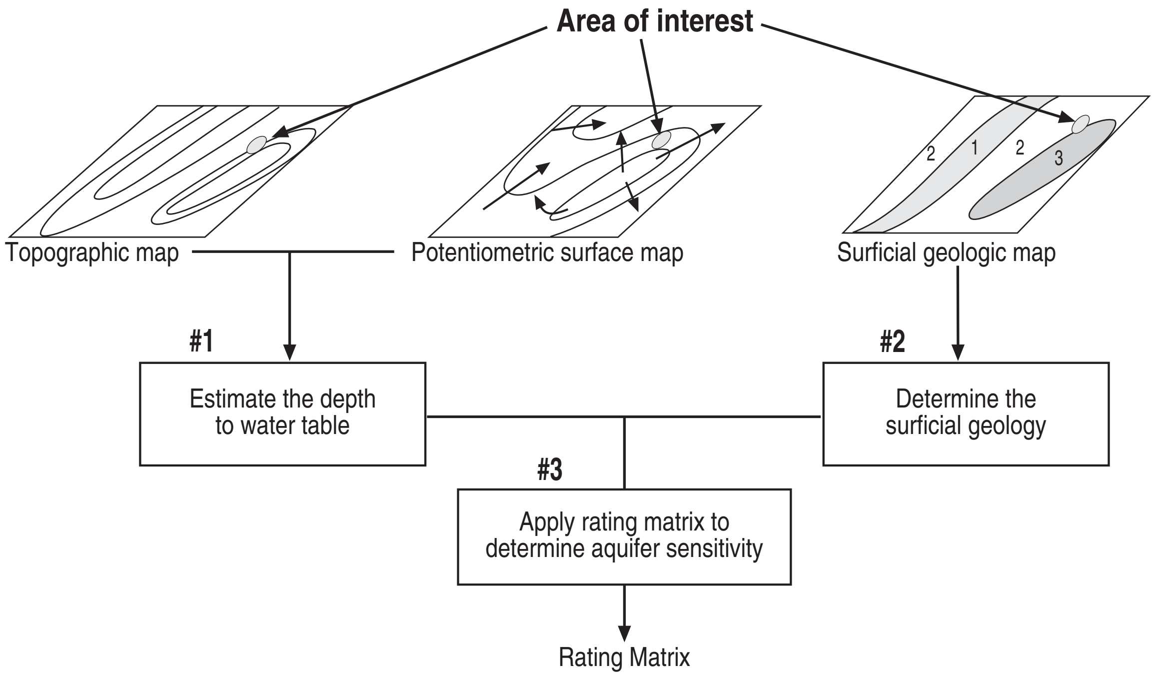


Figure 33. Nitrate occurs in most of the water that also had tritium but rarely in older water, suggesting that young water, within 80 feet of the land surface, is most susceptible to nitrate contamination.

1) **Estimate depth to water.** If there are shallow wells in the area of interest the depth to water can be measured or there may be records of measurements in the GWIC data base. If site-specific data do not exist, the depth to water could be estimated by subtracting the water-table altitude, shown on Map 5 of Part B, from the land surface altitude as determined from a topographic map. It should be noted that using Map 5 and a topographic map will give a regional, rather than site-specific, perspective of the depth to water.

2) **Determine the surficial geology.** If site-specific data for near-surface geologic conditions are available, such as lithologic descriptions from well logs, assess whether the materials contain much sand and gravel (permeable), or silt and clay (less permeable). If site-specific data are unavailable, use a geologic map to assess the type and thickness of surficial materials. As discussed in the Geologic Framework portion of this report, the materials in the surficial deposits are variable but usually, unconsolidated deposits are more permeable than consolidated deposits, and the Pierre Shale is the least permeable of the consolidated units. Therefore, an area with unconsolidated sand and gravel at the land surface would be more sensitive than an area with consolidated bedrock (Fort Union and Hell Creek formations) or clay-rich sediment at the surface.

3) **Judge the sensitivity.** With the information generated in steps 1 and 2, a relative assessment of aquifer sensitivity can be made using the rating matrix presented in figure 34. Three classifications (low, medium, and high) of sensitivity are presented based on subdivisions of the depth to water and the surficial geology. A depth to water of 60 feet was determined to be an appropriate cutoff based on tritium and nitrate data collected for this study. The geologic subdivisions are based on the relative permeability of the unconsolidated deposits compared to the consolidated bedrock formations. The classifications are relative terms and not absolute indicators of aquifer sensitivity.



Depth to water	Geology		
	1 Sand & Gravel	2 Fort Union	3 Pierre Shale
< 60 ft.	High	Med	Low
> 60 ft.	Med	Med	Low

Figure 34. The primary factors in assessing aquifer sensitivity are depth to the water table, and the permeability of geologic material in the unsaturated zone above the water table. Data derived from various maps can be combined to assess the sensitivity of an aquifer to contamination.

This method of evaluating sensitivity provides a generalized assessment that addresses the relative potential for vertical movement of contaminants to the water table. It must be recognized that the factors that affect aquifer sensitivity often vary considerably over short distances and the accuracy of any assessment will depend on the amount and quality of available data. Projects that require precise resolution of aquifer sensitivity will require site-specific investigation. For more-detailed discussions and procedures concerning aquifer sensitivity see Vrba and Zoporozec (1994), Aller *et al.* (1985), and National Research Council (1993).

Carbon, Hydrogen, and Oxygen Isotopes in the Fox Hills–Lower Hell Creek Aquifer

Ground water from the Fox Hills–lower Hell Creek aquifer was sampled for carbon-14, carbon-13, tritium, deuterium, and oxygen-18 to assess the sources and flow rates of ground water in the aquifer. Samples were collected along two transects that follow regional flow paths: 1) a southern transect, a line of five wells about parallel to the west side of the Cedar Creek Anticline from south of Baker to the Yellowstone River near

Terry; and 2) a northern transect, 4 wells along a line from Circle to Sidney. One additional well was sampled near the aquifer's outcrop in the northwestern part of the study area (figure 35).

Carbon-14 is a naturally occurring, radioactive isotope of carbon (C) produced in the upper atmosphere and has a half-life of about 5,700 years. Carbon atoms (99% are carbon-12 and the remaining atoms are carbon-13 and carbon-14) combine with oxygen to form carbon dioxide (CO_2) which travels throughout the atmosphere and biosphere. Carbon dioxide containing carbon-14 travels throughout the atmosphere and biosphere in the same way as CO_2 that contains other carbon isotopes (Bowman 1990). A dynamic equilibrium between the formation and decay of carbon-14 results in a constant amount of carbon-14 in the atmosphere and biosphere.

Recharge waters dissolve atmospheric carbon-14, present in the soil-zone CO_2, and move it through the unsaturated zone. As ground water moves below the water table and is cut off from soil-zone CO_2, no new carbon-14 can be added to the water. The radioactive carbon at this point in the system is part of the carbonate and bicarbonate anions in solution. Radioactive decay will cause the carbon-14 content of the carbon in these anions to decline at a known rate. The basic principle of carbon-14 dating of ground water is to measure the carbon-14 activity in the dissolved inorganic carbon (HCO_3^- and CO_3^{2-}) and relate that activity to an age. If soil-zone CO_2 were, in fact, the only source of dissolved inorganic carbon in ground water, then the technique could be used to assign accurate numerical dates (ages) to the water. Unfortunately, other processes add old, nonradioactive carbon to ground water, such as dissolution of carbonate minerals where the carbon has been locked up in molecules remote from the atmosphere for long periods. The added "dead carbon" dilutes the concentration of carbon-14, increasing the apparent ground-water age. Because of the complexity of the carbon chemistry in the Fox Hills–lower Hell Creek aquifer, no attempt was made to correct the numerical ages by accounting for added carbon-12.

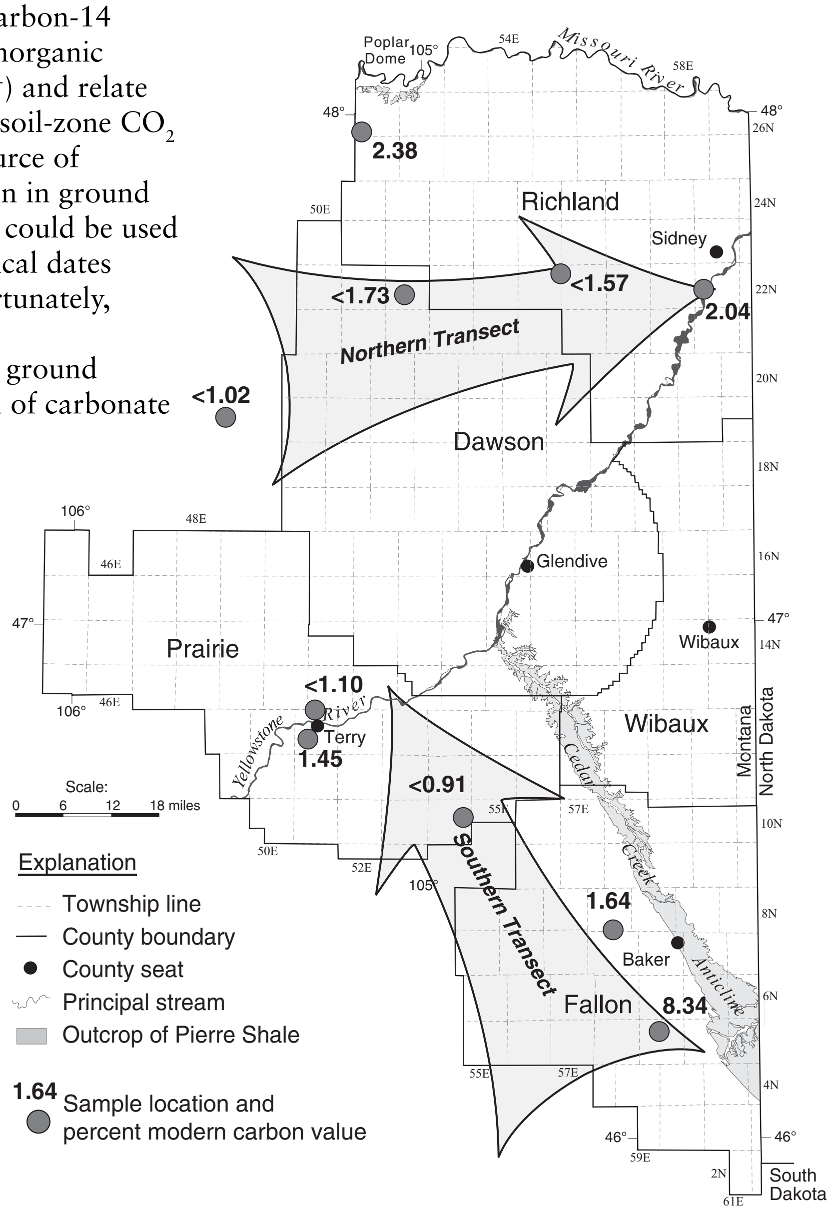


Figure 35. Samples for carbon-14, oxygen-18, deuterium, and tritium analyses were collected from the Fox Hills–lower Hell Creek aquifer along two transects of ground-water flow (arrows). The low to non-detectable concentrations of modern carbon show that the ground water is very old.

However, the measured values of carbon-14 can still convey significant information about relative ground-water ages between pairs of samples along flow directions.

Carbon-14 is measured as percent modern carbon (PMC) relative to a 1950 A.D. standard (Bowman 1990). Of the 10 samples, only five had detectable levels of carbon-14 activity; the results ranged from 1.5 to 8.3 PMC, yielding uncorrected ages of greater than 10,000 years. The water with the highest PMC content (youngest water) was obtained from the farthest upgradient well in the southern transect, completed near the Cedar Creek Anticline at a depth of a 1,010 feet below the surface (figure 35). In each transect, samples from the farthest downgradient wells—close to presumed discharge areas—contained detectable carbon-14 activity, whereas samples from wells immediately upgradient contained no detectable carbon-14 activity, suggesting a possible mixing of younger water with old water at the discharge areas. None of the 10 samples contained tritium. The lack of detectable tritium and the low to non-detectable carbon-14 activities suggest that water in the Fox Hills–lower Hell Creek aquifer is very old—with most of the water in the aquifer recharged more than 10,000 years before present.

Stable isotopes of oxygen and hydrogen (oxygen-18 and deuterium) were also analyzed in the 10 samples. Concentrations of each are reported as delta (δ) values in per mil (parts per thousand) relative to a standard known as Vienna standard mean ocean water (VSMOW). A positive delta value means that the sample contains more of the isotope than the standard; a negative value means that the sample contains less of the isotope than the standard.

When water evaporates from the ocean, the water vapor will be depleted in oxygen-18 (^{18}O) and deuterium (D) when compared to the ocean water. As air masses are transported away from the oceans the isotopic character of the water vapor will change as a result of condensation, freezing, melting, and evaporation. The two main factors that affect isotopic content of precipitation are condensation temperature and the amount of water that has already condensed relative to the initial amount of water in the air mass. The isotopic composition of water that condenses at cooler temperatures (often associated with higher altitudes, higher latitudes, or cooler climatic conditions) is lighter than water that condenses at warmer temperatures (often associated with lower altitudes, lower latitudes, or warmer climatic conditions). Therefore, at a given locality the $\delta^{18}O$ and δD in the precipitation will depend on factors such as distance from the ocean, altitude, and temperature. Because the isotopic composition of ground water generally reflects the average isotopic composition of precipitation in a recharge area, spatial and temporal variations in the isotopic content of precipitation can be useful in evaluating ground-water recharge sources. Craig (1961) observed another useful relationship, namely that values of $\delta^{18}O$ and δD of precipitation from around the world plot linearly along a line known as the global meteoric water line (figure 36). Ground water that originates as precipitation should also plot along the global meteoric water line. The departure of $\delta^{18}O$ and δD values from the meteoric water line may suggest that the water has been subject to evaporation or geothermal processes.

The $\delta^{18}O$ and δD values from all nine Fox Hills–lower Hell Creek aquifer samples plot near the meteoric water line; δD ranged from -149 to -137 and the $\delta^{18}O$ ranged from -20 to -17.8. However, the results from each transect plot in separate groups (figure 36). Samples from the southern transect are isotopically lighter (more negative) than those from the northern transect. The geographical variation of hydrogen and oxygen isotopes suggests different recharge conditions for the two areas. The difference between the two groups implies that ground water in the southern transect was recharged at higher altitudes, such as the Black Hills area, and/or cooler temperatures than the water from the northern transect.

Comparison of the water sampled from the Fox Hills–lower Hell Creek aquifer to modern precipitation (figure 36) shows that the ground water is considerably lighter isotopically than modern precipitation at Flagstaff, Arizona ($\delta^{18}O$ ranges from -6.2 to -12.9 per mil), and slightly lighter, or comparable to, precipitation at Edmonton, Alberta ($\delta^{18}O$ ranges from -17 to -19.5 per mil). Based on the worldwide distribution of $\delta^{18}O$ in modern precipitation (Clark and Fritz 1997), the concentrations of precipitation in eastern

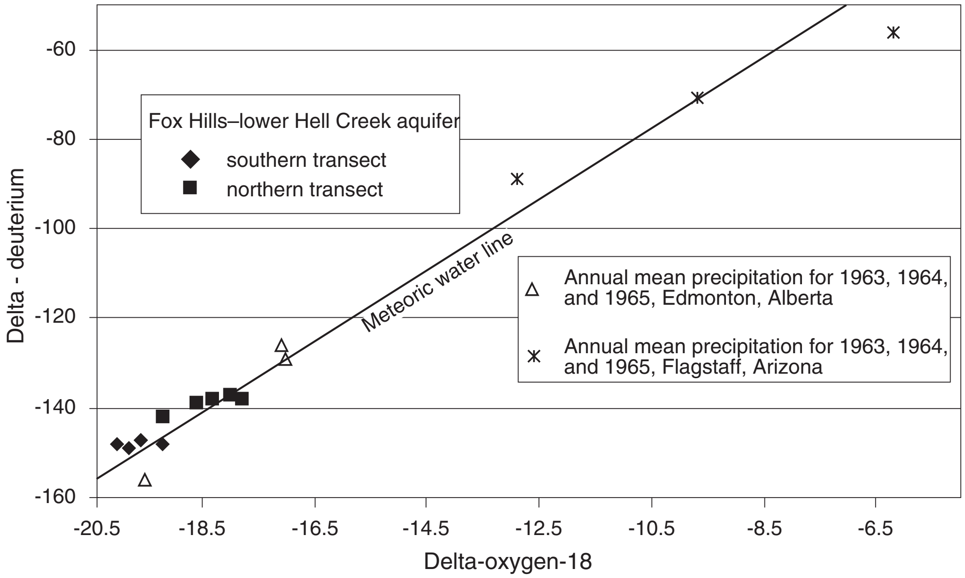


Figure 36. The delta oxygen-18 and deuterium concentrations from the Fox Hills–lower Hell Creek aquifer plot along the meteoric water line. However, samples from the southern transect are isotopically lighter than those from the northern transect suggesting different recharge conditions for the two areas. All the samples are significantly more negative than modern precipitation at Flagstaff, Arizona, and slightly more negative, or comparable to, modern precipitation at Edmonton, Alberta. Precipitation data from the International Atomic Energy Agency Global Network of Isotopes in Precipitation data base.

Montana should be 2–3 per mil heavier than Flagstaff and 2–3 per mil lighter than Edmonton. The isotopically lighter water in the Fox Hills–lower Hell Creek aquifer is consistent with being very old and having possibly been recharged during the cooler climatic conditions present during the last glaciation (Pleistocene Epoch—more than 10,000 years before present).

Conclusions

Ground water is an important resource in the Lower Yellowstone River Area; most farms, ranches, and many municipalities rely on it for domestic use and stock watering. The climate of the area is semi-arid, characterized by hot, dry summers and cold winters. The average annual precipitation is about 13.5 inches, most of which is returned to the atmosphere by evaporation or transpiration. Ground water occurs in three hydrologic units: a Shallow Hydrologic Unit composed of aquifers within 200 feet of the land surface; a Deep Hydrologic Unit composed of aquifers at depths greater than 200 feet below the land surface in the Fort Union Formation and the upper part of the Hell Creek Formation; and the Fox Hills–lower Hell Creek aquifer.

The majority of the wells are completed in the Shallow Hydrologic Unit, which is capable of providing adequate supplies of ground water throughout most of the area. Ground-water flow in the Shallow Hydrologic Unit is characterized by local flow systems where ground water moves from drainage divides toward nearby valley bottoms. Water quality and well yields are variable, reflecting the variable nature of the aquifers in the Shallow Hydrologic Unit. Dissolved constituents range from less than 500 to more than 5,000 mg/L. Nitrate was detected above the maximum contaminant level of 10 mg/L-N in 7% of the wells sampled from Shallow Hydrologic Unit. Sand and gravel aquifers within 60 feet of the land surface are the most sensitive to contamination as determined from tritium and nitrate analyses, and permeability. Well yields average about 35 gpm from the unconsolidated deposits, and about 10 gpm in the Fort Union aquifers.

The Deep Hydrologic Unit is characterized by intermediate to regional ground-water flow patterns with movement generally towards the Yellowstone and Missouri rivers. The ground water is used primarily for stock and domestic purposes, and well yields are generally less than 15 gpm. Although the average concentration of dissolved constituents is higher than the other units the overall chemical composition of the water is relatively consistent suggesting that the Deep Hydrologic Unit is a chemically stable system.

The Fox Hills–lower Hell Creek aquifer underlies most of the study area at depths of 600 to 1,600 feet below land surface. Water in the aquifer is under artesian conditions, and in the Yellowstone River valley, flowing wells are common. Reported well yields are generally less than 15 gpm, but some wells reportedly yield as much as 100 gpm. Water quality in the Fox Hills–lower Hell Creek aquifer is generally good. The water is soft with sodium and bicarbonate the dominant ions in solution, and concentrations of dissolved constituents typically between about 1,000 and 2,500 mg/L. Long-term, water-level declines in the Fox Hills–lower Hell Creek aquifer suggest that the aquifer is being threatened from overdraft. This situation is aggravated by unrestricted discharge from flowing wells, a process that bleeds pressure from the aquifer, and results in lowered water levels. Conservation measures such as restricting or plugging freely flowing wells may help stem the rate of water-level decline. Based on the carbon-14, oxygen-18, and deuterium analyses the water in the Fox Hills–lower Hell Creek aquifer is more than 10,000 years old.

Acknowledgements

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Glossary

(Modified from Gary *et al.* 1972)

Alluvium-Sand, gravel, outwash, silt, or clay deposited during recent geological time by a stream or other form of running water.

Anion-See Ion.

Aquifer-Geologic materials that have sufficient permeability to yield usable quantities of water to wells and springs. Spaces between the sedimentary grains (pore spaces), or openings along fractures, provide the volume (porosity) that store and transmit water within aquifers (figure 37). Aquifers are either unconfined or confined. The water table forms the upper surface of an unconfined aquifer; below the water table the pore spaces of the aquifer are completely water saturated. A layer of low-permeability material such as clay or shale marks the upper surface of a confined aquifer. This low-permeability layer is called the confining unit. Below the confining unit the aquifer is completely saturated, and the water is under pressure (figure 38).

Artesian Aquifer-An artesian or confined aquifer contains water that is under pressure. To be classified as artesian, the pressure must be adequate to cause the water level in a well to rise above the top of the aquifer (figure 38). Flowing wells, or flowing artesian conditions, occur in areas where the potentiometric surface is higher than the land surface (figure 39).

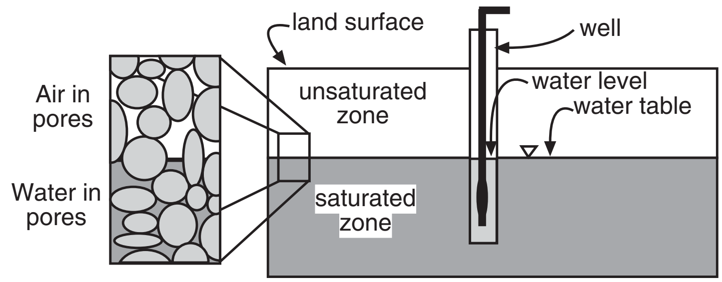


Figure 37. In the unsaturated zone, the pores (openings between grains of sand, silt, clay, and cracks within rocks) contain both air and water. In the saturated zone the pores are completely filled with water. The water table is the upper surface of the saturated zone. Wells completed in unconfined aquifers are commonly referred to as water-table wells.

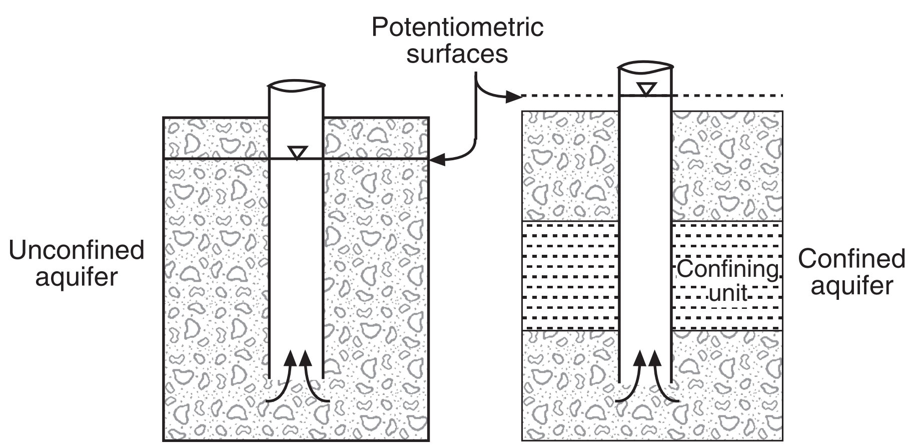


Figure 38. In an unconfined aquifer, the water table represents the upper boundary of the aquifer. Therefore, water-level changes in an unconfined aquifer will change the saturated thickness of the aquifer. In a confined aquifer, the water level in a well will rise to the potentiometric surface, above the top of the aquifer. The water-level changes in a confined aquifer do not change the saturated thickness.

Bedrock-A general term for consolidated geologic material (rock) that underlies soil or other unconsolidated material.

Carbon-14-A naturally occurring radioactive isotope of carbon, denoted as ^{14}C, with a half life of 5,730 years. Carbon-14, with 6 protons and 8 neutrons, is heavy relative to the most common isotope of carbon (^{12}C).

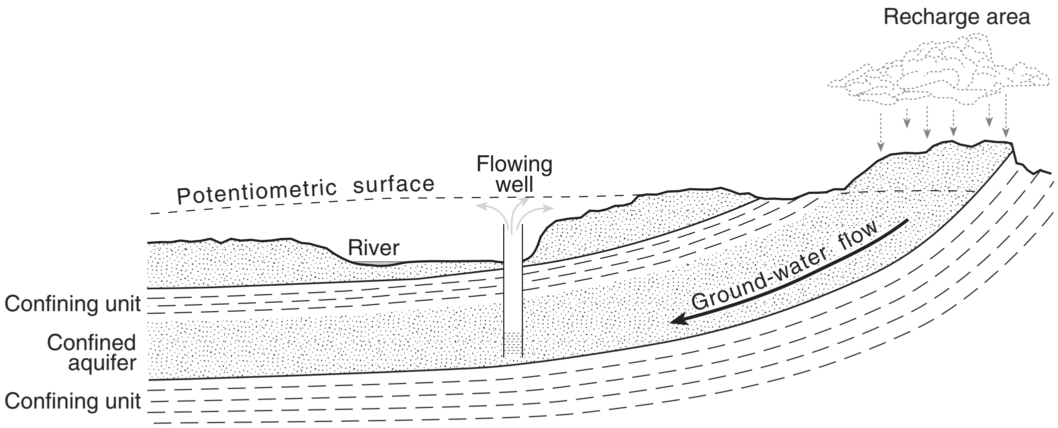


Figure 39. Artesian conditions develop in confined aquifers when the aquifer, overlain by a low-permeability unit, dips or tilts away from the its recharge area. Water percolates down to the water table in the recharge area and moves beneath the confining unit. The artesian pressure is caused by the difference in the level of the water table in the recharge area and the top of the aquifer. Flowing wells, or flowing artesian conditions, occur in areas where the potentiometric surface is higher than the land surface.

Cation-See **Ion**

Cone of Depression-See **Well Hydraulics**

Confined Aquifer-See **Aquifer**

Cumulative Departure-Cumulative departure from average precipitation is calculated by determining the cumulative difference between the measured monthly precipitation for a month and the average monthly precipitation for that month for the entire period of record. Increasing (positive) cumulative departure indicates periods of greater than average monthly precipitation.

Deuterium-A stable isotope of hydrogen, with one neutron and one proton, denoted as D or ^{2}H. Deuterium has approximately twice the mass of the most common isotope of hydrogen, protium (^{1}H).

Discharge Area-An area where ground water is released from an aquifer, generally characterized by water moving toward the land surface. Springs or gaining streams (figure 40) may occur in ground-water discharge areas.

Dissolved Constituents-The quantity of dissolved material in a sample of water expressed as milligrams per liter. The value is calculated by summation of the measured constituents,

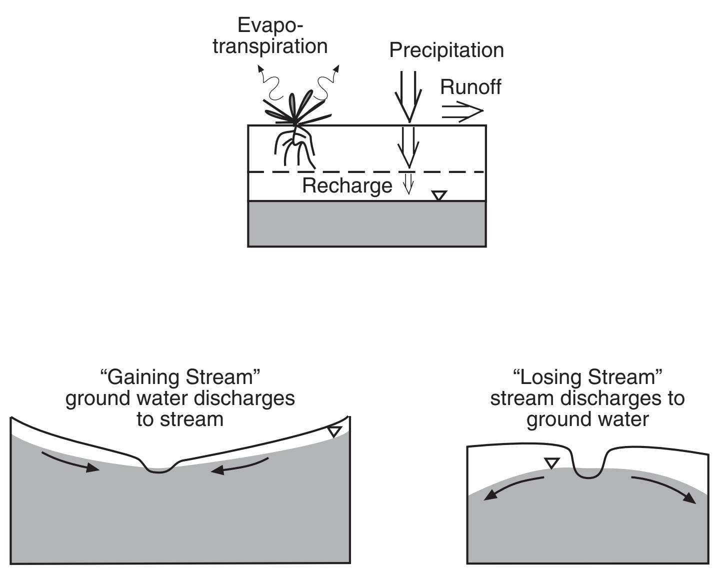


Figure 40. Water that percolates through the unsaturated zone to the water table is said to recharge an aquifer. Recharge can also occur from surface water bodies where the water levels in streams are higher than in neighboring aquifers, for example, as in a losing stream that only flows seasonally or in response to rainfall. In contrast, in a gaining stream streamflow is maintained by ground-water discharge.

which include major cations (Na, Ca, K, Mg, Mn, Fe) and anions (HCO_3, CO_3, SO_4, Cl, SiO_3, NO_3, F) expressed in milligrams per liter (mg/L).

Flow System-The aquifers and confining beds that control the flow of ground water in an area compose the ground-water flow system (figure 39). Ground water flows through aquifers from recharge areas, which commonly coincide with areas of high topography, to discharge areas in the topographically low areas. The relative length and duration of the ground-water flow-paths are used to classify ground-water systems. A regional system generally consists of deep ground-water circulation between the highest surface drainage divides and the largest river valleys. Local and intermediate flow systems consist of shallow ground-water flow between adjacent recharge and discharge areas superimposed on or within a regional flow system.

Ground Water-Strictly speaking, all water below land surface is "ground water." The water table defines the boundary between the unsaturated (air in pores) and saturated zones (water in pores) (figure 37). It is the water from saturated zones that supplies water to wells (and springs) which will be called ground water in this atlas.

GWIC-Ground Water Information Center-repository for water well logs and ground-water information at the Montana Bureau of Mines and Geology, 1300 W. Park St, Butte, MT 59701, (406) 496-4336, GWIC@mbmgsun.mtech.edu

Hydraulic Conductivity-Measure of the rate at which water is transmitted through a unit cross-sectional area of an aquifer; often called "permeability." The higher the hydraulic conductivity (the more permeable) of the aquifer, the higher the well yields will be. The hydraulic conductivity of geologic material ranges over about 14 orders of magnitude (figure 41).

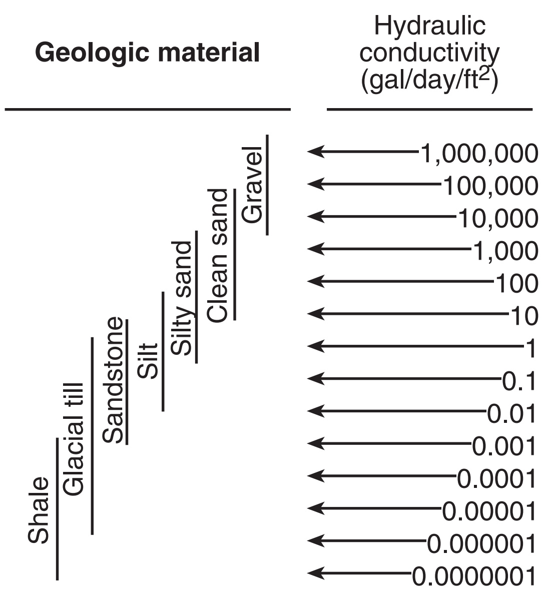


Figure 41. The range of hydraulic conductivity values for typical geologic materials ranges over several orders of magnitude. Hydraulic conductivities not only differ in different rock types but may also vary from place to place in the same rock, depending on local variations in permeability (modified from Freeze and Cherry 1979).

Hydrologic Cycle-The constant circulation of water between the ocean, atmosphere, and land is called the hydrologic cycle. The concept of the hydrologic cycle provides a framework for understanding the occurrence and distribution of water on the earth. The important features of the hydrologic cycle are highlighted on figure 42. The hydrologic cycle is a natural system powered by the sun. Evaporation from the ocean, other surface bodies of water and shallow ground water, and transpiration from plants, brings "clean" water (because most dissolved constituents are left behind) into the atmosphere where clouds may form. The clouds return water to the land and ocean as precipitation (rain, snow, sleet, and hail). Precipitation may follow many different pathways. Some may be intercepted by plants, may evaporate, may infiltrate the ground surface, or may run off (overland flow). The water that infiltrates the ground contributes to the ground-water part of the cycle. Ground water flows through the earth until it discharges to a stream, spring, lake, or ocean. Runoff occurs when the rate of infiltration is exceeded. This water contributes directly to streams, lakes or other bodies of surface water. Water reaching streams flows to the ocean where it is available for evaporation again, perpetuating the cycle.

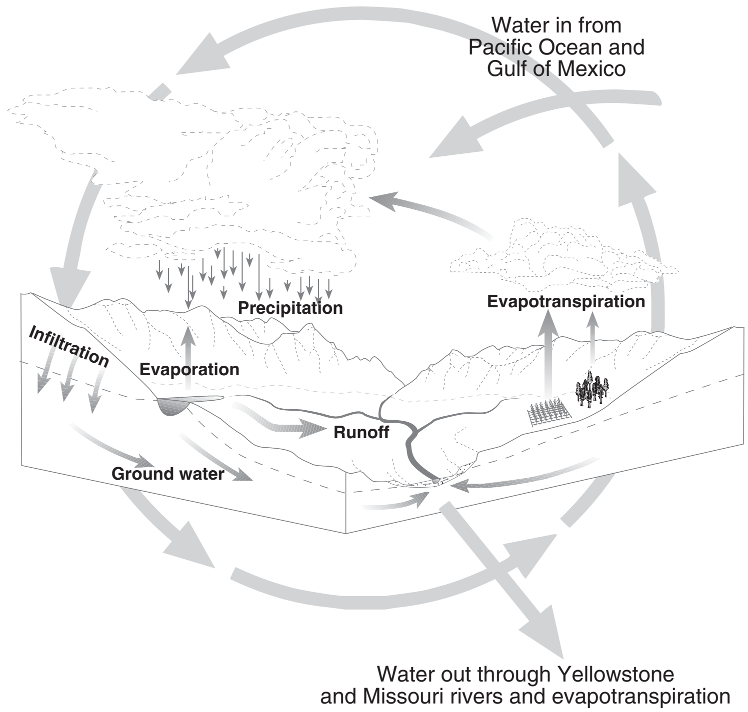


Figure 42. The constant circulation of water between the ocean, atmosphere, and land is referred to as the hydrologic cycle. In the Lower Yellowstone River Area, most of precipitation that enters the area is returned to the atmosphere by evaporation and evapotranspiration.

Hydrologic Unit-A body of geologic materials that functions regionally as a water-yielding unit.

Ion-An atom or group of atoms that carries a positive (cation) or negative (anion) electric charge. Atoms in liquid solutions are typically ions; the atoms are said to have been ionized.

Isotopes-Atoms of the same element that differ in mass because of differing numbers of neutrons in their nuclei. Although isotopes of the same substance have most of the same chemical properties, their different atomic weights allow them to be separated. For example, oxygen-18 is heavier than oxygen-16, so water molecules containing oxygen-16 evaporate from a water body at a greater rate. Globally distributed isotopes that occur in nature are called environmental isotopes.

Overdraft-Long-term withdrawal of water in excess of long-term recharge.

Oxygen-18-A stable isotope of oxygen, denoted as ^{18}O, with 8 protons and 10 neutrons. Oxygen-18 is heavy relative to the common isotope of oxygen (^{16}O).

Permeability-The capacity of a geologic material to transmit fluid (water in this report); also called hydraulic conductivity.

Potentiometric Surface-A surface defined by the level to which water will rise in tightly cased wells (figures 37, 38). The water table is a potentiometric surface for an unconfined aquifer.

Radioactive Half-Life-The time over which half of a radioactive material decays to another elementary material—from a parent to a daughter product.

Recharge Area-An area where an aquifer receives water, characterized by movement of water downward into deeper parts of an aquifer (figure 39).

Sediment-Solid fragments of rocks deposited in layers on the Earth's surface. Commonly classified by grain size (clay, silt, sand, gravel) and mineral composition (*e.g.*, quartz, carbonate, etc.).

Storativity-The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head. In an unconfined aquifer the storativity is nearly equivalent to how much water a mass of saturated geologic material will yield by gravity drainage.

Surface Water-Water at the Earth's surface, including snow, ice, and water in lakes streams, rivers, and oceans.

Transmissivity-The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient. Transmissivity is equivalent to the hydraulic conductivity times the aquifer thickness.

Tritium-A naturally occurring radioactive isotope of hydrogen, denoted as ^3H, with a half life of 12.43 years. Tritium, with 1 proton and 2 neutrons, has approximately three times the mass of the most common isotope of hydrogen, protium (^1H).

Unconfined Aquifer-See **Aquifer**

Unconsolidated-Sediment that is not generally cemented or otherwise bound together.

Unsaturated Zone-The subsurface area above the water table where the pores are filled by air or partly by water and partly by air.

Water Table-The upper surface of an unconfined aquifer, where the pressure of the water is equal to atmospheric pressure. Below the water table the pore spaces are completely saturated.

Well-A borehole drilled to produce ground water, or monitor ground-water levels or quality. A properly designed production well—for domestic, stock-watering or municipal purposes—should produce good-quality, sand-free water with proper protection from contamination. The basic elements of a properly constructed well are shown below (figure 43).

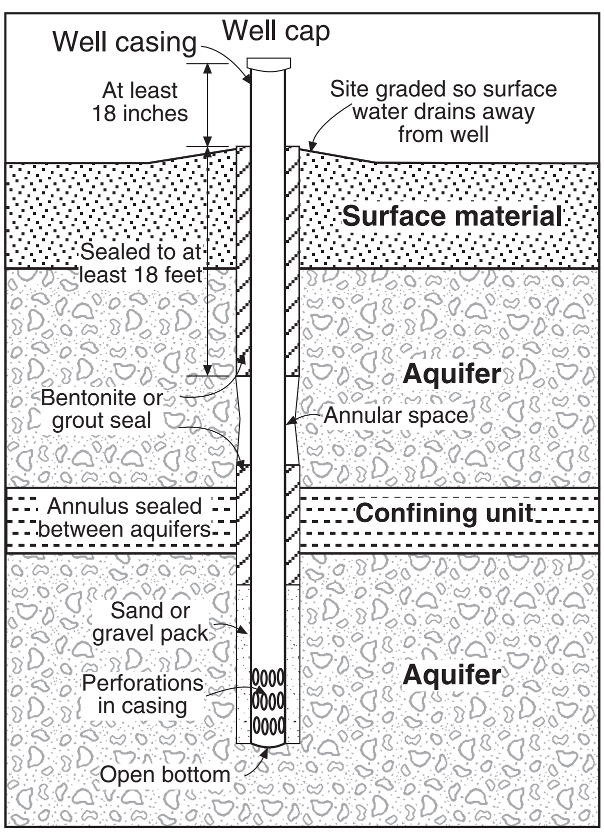


Figure 43. Properly constructed wells are completed in single aquifers. To protect ground-water quality and maintain artesian pressures, wells should not serve as conduits from the surface to ground water or connect separate aquifers.

Well Hydraulics-The withdrawal of water from a well causes the water level within the well to drop below the static water level in the surrounding aquifer. The lowering of the water level in the well induces ground-water to move from the aquifer to the well. As pumping continues, the water level in the well and the surrounding aquifer continues to decline until the rate of inflow equals the rate of withdrawal. The radial decline in the water level surrounding a well in response to pumping is called the cone of depression, the limit of the cone of depression is called the zone of influence. The geographic area containing ground water that flows toward the well is the zone of capture (figure 44).

Wellhead Protection Area-Zone around a public water supply that is delineated based on geologic and hydraulic factors and is managed to prevent contamination of the water supply. The area typically includes the zone of capture within about a mile of the well (figure 44).

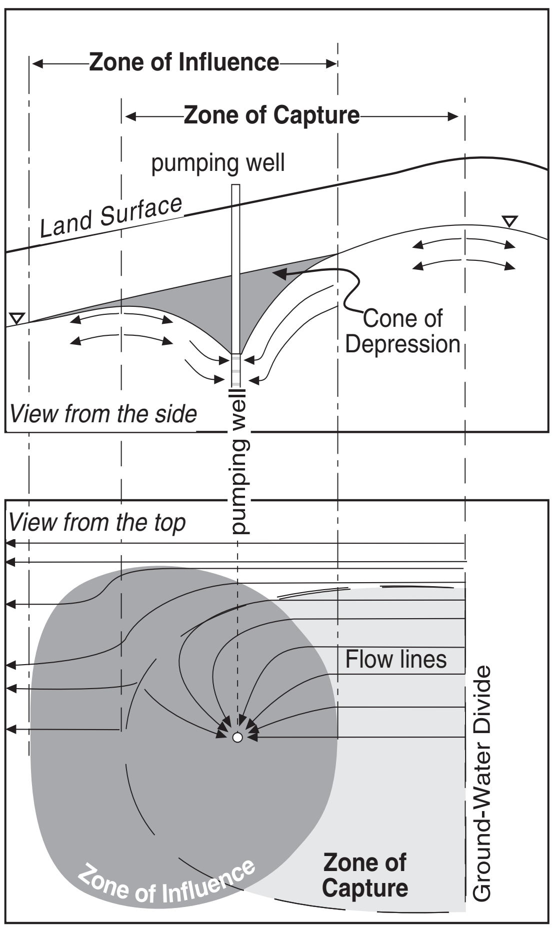


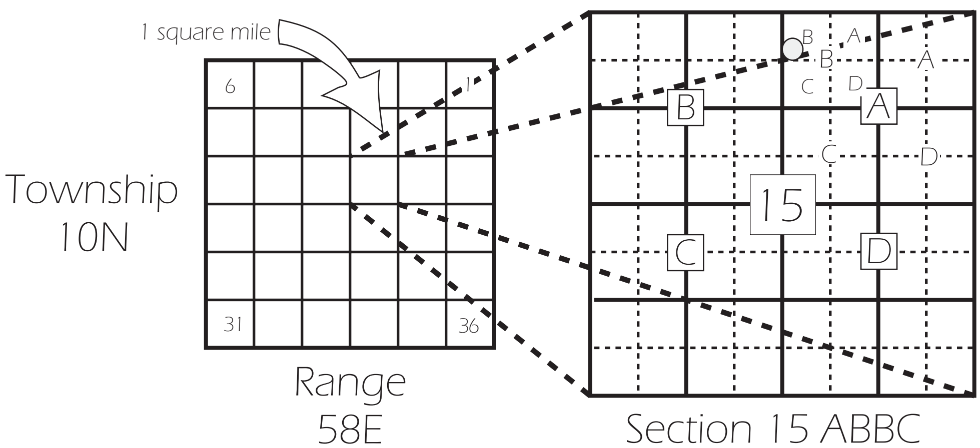
Figure 44. Withdrawal of ground water will temporarily depress the water level (potentiometric surface) in the region surrounding the well creating a "cone of depression." The dimensions of the cone of depression, zone of influence, and zone of contribution depend on hydraulic characteristics of the aquifer, potentiometric surface, and discharge rate of the well.

Appendix A
Site Location System for Points in the Public Land Survey System

How to Locate a Well on a Map using GWIC Locations

For example, find well number M:35209, located in 10N 58E section 15 ABBC.

To locate the well in the township, range, and section, read the tract (ABCD) designations from left to right, largest tract to smallest tract. Beginning in the center of the section, travel to the 'A' in the center of the northeast quarter. From there, travel to the 'B' in the center of the northwest quarter of the northeast quarter. From there, travel to the 'B' in the northwest quarter of the northwest quarter of the northeast quarter. From there, travel to the 'C' or southwest quarter of the northwest quarter of the northwest quarter of the northwast quarter of section 15.



Appendix B
List of Inventoried Wells

SHU = Shallow Hydrologic Unit
DHU = Deep Hydrologic Unit
FHHC = Fox Hills–Lower Hell Creek Aquifer
SWL = Static Water Level in Well
* Indicates a Well that was Part of the
Water-Level Monitoring Network

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:14510	02N 61E 10 DABC	SHU	3,057	160	42	31.50	3,026	51.3	10.3	4,290	3,861
M:1166	02N 61E 23 DABB	DHU	3,095	270	270	90.71	3,004	51.6	9.1	1,617	
M:14520	02N 61E 23 DABB	SHU	3,080	125	125	95.55	2,984	53.2	8.4	2,880	2,592
M:1167	02N 61E 36 DADC	FHHC	2,980	500	374	-41.27	3,021	50.9	9.2	926	
M:1251	03N 59E 23 CCCC	DHU	3,340	340	340	113.41	3,227	54.9	9.0	1,715	
M:15656	03N 60E 26 AABA	DHU	3,360	200	200	116.00	3,244	52.5	9.1	1,827	
M:15661	03N 60E 34 ABAD	SHU	3,380	100	40	40.39	3,340	50.2	7.2	999	899
M:15678	03N 61E 14 CDDB	SHU	3,100	150	150	63.85	3,036	50.0	7.9	2,080	1,872
M:15681	03N 61E 15 DCAC	SHU	3,120	150	150	50.60	3,069	51.6	9.5	2,130	1,917
M:15684	03N 61E 22 CAAA	SHU	3,150	135	135	33.50	3,117	51.6	7.7	3,190	2,871
M:15686	03N 61E 23 BBAC	SHU	3,120	110	110	65.15	3,055	51.8	7.5	1,284	1,156
M:16468	04N 58E 10 DDAD	FHHC	3,160	920	820	163.20	2,997	55.9	9.2	1,182	1,064
M:16471	04N 58E 12 CDDD	SHU	3,190	76	76						
M:152204	04N 58E 13 BAAD	SHU	3,200	49	44	31.41	3,169				
M:152205	04N 58E 13 BAAD	SHU	3,200	53	48	29.08	3,171				
M:152207	04N 58E 13 BAAD	SHU	3,200	49	44	31.53	3,168				
M:16509	04N 58E 13 BADD	SHU	3,200	80	50	31.05	3,169	51.1	7.3	701	
M:16508	04N 58E 13 BADD	SHU	3,205	75	65	31.25	3,174				
M:16510	04N 58E 13 BDAD	SHU	3,220	80	70						
M:16477	04N 58E 24 CBAA	SHU	3,210	35	15	11.40	3,199	48.6	7.6	951	856
M:16514	04N 59E 17 DADD	SHU	3,260	165	165	91.60	3,168	51.1	7.4	708	
M:16521	04N 59E 20 BBDB	SHU	3,355	32	32	22.70	3,332				
M:16538	04N 60E 12 DDDC	DHU	3,110	200	200	78.54	3,031	53.2	8.6	3,590	3,231
M:16542	04N 60E 14 AACC	SHU	3,110	67	67	17.71	3,092	51.3	7.5	834	751
M:16553	04N 61E 04 BDDD	SHU	3,055	125	125	33.53	3,021				
M:16554	04N 61E 08 DDBB	SHU	3,065	180	180						
M:16556	04N 61E 10 CCCC	SHU	3,062	100	80	33.68	3,028	49.3	8.5	2,020	1,818
M:16557	04N 61E 15 BBDB	SHU	3,045	67	67						
M:143954	04N 61E 15 BBDB	SHU	3,045	89	89	26.52	3,018				
M:16559	04N 61E 16 BADC	SHU	3,073	140	100	21.03	3,052	50.4	8.2	836	752
M:16563	04N 61E 23 BCCC	SHU	3,112	120	80	57.76	3,054				
M:16570	04N 61E 30 DBAC	SHU	3,245	154	114	98.85	3,146	50.9	7.3	891	
M:17453	05N 55E 11 ADAD	DHU	2,875	500	500			54.3	9.2	1,397	1,257
M:17458	05N 55E 21 CCDB	FHHC	2,980	920	790	140.15	2,840	57.0	9.3	1,079	971
M:17459	05N 55E 23 AADB	FHHC	2,880	1,080	1,080	37.50	2,843				
M:17465	05N 56E 07 ACBD	DHU	2,820	500	500	-10.26	2,830	55.6	9.2	1,183	1,065
M:700206	05N 56E 07 BCBC	FHHC	2,835			-4.87	2,840	53.2	9.1	1,472	1,325
M:131087	05N 56E 10 ADCC	DHU	2,920	570	510	45.20	2,875				
M:152209	05N 56E 18 ADCC	SHU	2,823	20	20	2.74	2,820				
M:17473	05N 56E 22 CAAD	FHHC	2,860	580	580	-2.86	2,863	59.9	9.2	1,103	993
M:126738	05N 56E 24 ADAD	FHHC	2,940	700	640	7.40	2,933				
M:151486	05N 56E 26 AABD	FHHC	2,900	350	350	-3.36	2,903	55.2	9.1	1,220	1,098
M:700211	05N 56E 31 DADB	FHHC	2,885	300	300	-7.98	2,893	56.1	9.3	1,085	977
M:700212	05N 56E 32 CBAA	FHHC	2,880	500	500	-10.33	2,890	56.1	9.3	1,110	
M:1431	05N 57E 04 ADDB	FHHC	3,020	910	811	105.26	2,915	56.5	9.1	1,203	
M:17485	05N 57E 04 CCDA	SHU	2,940	20	20	9.70	2,930	44.4	7.3		
M:17493	05N 57E 10 BDAD	DHU	3,000	600	540	75.60	2,924				
M:17496	05N 57E 11 BADB	SHU	3,080	96	81	59.50	3,021	50.0	7.2	1,976	
M:17499	05N 57E 14 BABC	SHU	3,080	115	90	63.40	3,017				
M:17513	05N 57E 28 DAAB	SHU	3,075	40	40	28.22	3,047	48.7	7.5	1,389	
M:152189	05N 57E 33 CCCA	DHU	2,980	580	580	16.20	2,964	57.7	9.2	1,071	964
M:700217	05N 57E 34 BCCD	DHU	3,020	200	200	51.95	2,968				
M:17518*	05N 58E 02 DCDB	SHU	3,325	180	180	133.95	3,191				
M:17530	05N 58E 02 DDDD	FHHC	3,380	1,235	1,215	298.10	3,082	55.6	9.4	1,228	1,105
M:131088	05N 58E 03 CCBB	DHU	3,190	320	270	191.21	2,999				
M:143950	05N 58E 03 CCBC	SHU	3,190	55	55	12.55	3,177				
M:17523	05N 58E 04 DACB	SHU	3,175	20	20	11.59	3,163				
M:17541	05N 58E 24 DDCB	FHHC	3,300	1,420	1,180	284.20	3,016	59.9	9.2	1,284	1,156
M:17549	05N 58E 34 ADAD	SHU	3,300	125	125	53.40	3,247	52.2	7.0	1,380	1,242
M:17551	05N 59E 01 DDDB	SHU	3,110	130	130	83.50	3,027	49.5	8.6	1,748	
M:17562	05N 59E 09 ABAB	FHHC	3,250	1,065	1,010			60.6	8.9	1,958	
M:700225	05N 59E 09 ABAC	DHU	3,250	200	200	107.20	3,143	52.7	6.7	1,285	1,157
M:17567	05N 59E 15 DBBA	SHU	3,220	125	98	77.50	3,143	53.6	6.8	2,300	
M:17580	05N 59E 28 BDCA	FHHC	3,242	900	900	94.91	3,147				
M:149892	05N 59E 33 BBBD	SHU	3,170	45	45	13.21	3,157	49.1	7.5	877	789

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:700229	05N 60E 06 ADDD	FHHC	3,110	180	180	53.50	3,057	51.6	8.3	1,910	1,719
M:17590	05N 60E 07 BCCC	DHU	3,150	200	200	112.00	3,038				
M:17592	05N 60E 17 BBBC	SHU	3,160	110	110	31.55	3,128	53.6	7.9	602	542
M:17596	05N 60E 18 AAAA	SHU	3,160	100	100	76.58	3,083				
M:700231	05N 60E 21 DBDD	SHU	3,050	110	110	30.90	3,019				
M:19031	06N 55E 19 DADB	SHU	2,905	140	140	33.42	2,872				
M:700237	06N 55E 26 BBBB	FHHC	2,892	900	900			55.4	9.1	1,164	1,048
M:19035	06N 55E 35 BCBA	FHHC	2,895	900	900			54.3	8.9	1,429	1,286
M:19044	06N 56E 19 CADB	DHU	2,740	300	300	-22.39	2,762	53.4	9.1	1,400	1,260
M:19048	06N 56E 30 BBBC	FHHC	2,803	950	950	4.71	2,798	61.2	9.4	1,167	1,050
M:152198	06N 56E 30 BCCC	DHU	2,787			-6.82	2,794	51.3	6.8	2,680	2,412
M:19049	06N 56E 31 CCCD	DHU	2,840	500	500			59.9	9.2	1,276	1,148
M:152199	06N 57E 11 DADC	SHU	2,952	88	88	41.88	2,910				
M:125681	06N 57E 22 DABB	DHU	3,200	320	260	245.50	2,955				
M:19071	06N 57E 31 ADCB	SHU	2,990	100	100	62.11	2,928	50.0	7.3	2,050	1,845
M:19072	06N 57E 31 CCCC	FHHC	2,892	1,060	503	17.14	2,875	56.7	9.1	1,273	1,146
M:700249	06N 57E 33 BDDC	SHU	3,049	100	100			50.2	7.7	3,060	2,754
M:19077	06N 58E 04 AAAC	DHU	2,907	410	350	-20.30	2,927	53.4	8.8	2,720	2,448
M:700251	06N 58E 04 BBDC	FHHC	2,952	750	750	60.74	2,891	61.7	9.1	1,416	1,274
M:19104	06N 59E 04 AAAC	DHU	3,095	360	360	122.28	2,973				
M:19117	06N 59E 25 DACA	DHU	3,162	228	228	146.80	3,015	50.7	8.8	2,250	2,025
M:19126	06N 59E 36 ADAA	SHU	3,136	150	150	128.62	3,007	53.8	8.8	1,855	1,670
M:19127	06N 60E 08 DBAA	FHHC	3,195	300	295	199.58	2,995	52.0		4,190	
M:152196	06N 60E 32 CCCB	SHU	3,100	110	110	84.65	3,015	50.7	8.5	1,588	1,429
M:19132	06N 60E 33 DCAD	SHU	3,058	100	80	18.87	3,039	48.7	8.2	1,224	1,102
M:19112	06N 61E 03 BBAA	FHHC	2,942	60	40			57.6	7.3	1,298	1,168
M:19136	06N 61E 04 ABAD	FHHC	2,962	50	50	22.20	2,940	48.7	7.7	1,728	1,555
M:21960	07N 55E 03 DADA	FHHC	2,880	1,050	1,050	208.02	2,672	60.6	9.1	1,473	1,326
M:20418	07N 55E 17 CAAA	SHU	2,850	40	30	16.34	2,834	49.1	7.6	2,880	2,592
M:20424	07N 55E 30 DDDD	DHU	2,912	640	640			55.8	8.7	1,657	
M:20429	07N 55E 36 ACAC	DHU	2,720	445	385	-16.66	2,737	51.8	9.2	1,410	1,269
M:700269	07N 56E 05 BAAA	FHHC	2,620	640	640	-16.92	2,637	57.4	9.2	1,322	1,190
M:700270	07N 56E 08 ABDD	FHHC	2,650	350	350	-44.48	2,694	58.5	9.2	1,260	1,134
M:20434	07N 56E 12 DDCA	SHU	2,832	147	147	28.42	2,804				
M:20436	07N 56E 14 DCAC	FHHC	2,700	810	810	-29.37	2,729	61.0	9.2	1,228	1,105
M:700272	07N 56E 25 CDAC	SHU	2,790			1.76	2,788				
M:20445	07N 56E 32 BBAA	SHU	2,685	140	120	-13.25	2,698	50.4	8.5	2,290	2,061
M:20451	07N 57E 06 ABDC	FHHC	2,760	790	750	30.57	2,729	57.0	8.9	2,050	1,845
M:700275	07N 57E 10 CBBC	FHHC	2,875	1,000	1,000	91.85	2,783	55.4	9.1	1,447	1,302
M:700274	07N 57E 10 CBBD	SHU	2,865			5.86	2,859	47.7	7.4	2,880	2,592
M:700276	07N 57E 16 ABBA	DHU	2,880	200	200	87.85	2,792	50.4	8.7	3,100	2,790
M:152210	07N 57E 16 ABBA	SHU	2,880	60	60	26.60	2,853				
M:20459	07N 57E 18 DCCD	FHHC	2,740	875	855	-14.10	2,754	59.4	9.4	1,205	1,085
M:20460	07N 57E 20 BBDD	FHHC	2,820	920	920	47.42	2,773	62.6	9.3	1,311	1,180
M:143948*	07N 57E 24 BBCB	DHU	3,045	362	362	216.57	2,828				
M:20471	07N 58E 01 DCDC	DHU	2,905	275	275	39.07	2,866				
M:20470	07N 58E 01 DCDC	DHU	2,905	460	440	60.05	2,845	61.5	8.1	2,190	1,971
M:20475	07N 58E 06 BDAA	FHHC	2,785	940	940	5.96	2,779	62.6	9.2	1,490	1,341
M:20483	07N 58E 12 DCCD	DHU	2,870	320	320	10.13	2,860				
M:152211	07N 58E 12 DDDC	DHU	2,910	450	450	28.06	2,882	54.5	9.0	2,130	1,917
M:122895	07N 58E 20 CACA	DHU	2,850	301	260			63.3	8.1	5,520	4,968
M:20495	07N 58E 29 AABC	DHU	2,840	400	400	-41.58	2,882	53.4	8.8	2,890	2,601
M:20505	07N 59E 02 CDDA	FHHC	2,960	201	165						
M:136790	07N 59E 02 DCCA	FHHC	2,990	220	200						
M:152212	07N 59E 07 DAAA	DHU	2,895	300	300	-27.29	2,922	52.9	9.0	2,000	1,800
M:700292	07N 59E 08 CABC	DHU	2,895	201	201	-16.86	2,912	51.6	9.0	2,070	
M:151967	07N 59E 10 ADDD	SHU	2,940	52	52	36.37	2,904	50.5	7.1	2,130	1,917
M:151968	07N 59E 24 BDCD	FHHC	3,060	375	375	169.40	2,891	54.7	9.0	1,601	1,441
M:700303	07N 59E 24 BDDA	DHU	3,010	255	255	105.92	2,904	51.4	7.8	1,337	1,203
M:152213	07N 59E 25 ADCD	DHU	3,022	240	240	92.06	2,930	52.7	8.5	2,060	1,854
M:20564	07N 59E 27 DAAB	FHHC	3,010	450	450	55.30	2,955	54.9	8.7	2,620	2,358
M:700307	07N 59E 27 DAAB	SHU	3,010	175	175	30.00	2,980	54.5	8.9	2,560	2,304
M:151969	07N 60E 03 CCCC	SHU	3,020	78	78	24.10	2,996	49.1	7.4	673	606
M:20590	07N 60E 10 DAAC	FHHC	3,055	100	100	28.01	3,027	48.9	6.4	932	
M:20600	07N 60E 25 BACB	SHU	3,028	40	40	10.53	3,017	50.0	7.0	1,780	

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (umhos)	Sum of Dissolved Constituents
M:1627	07N 61E 06 DCBB	FHHC	3,155	308	308			53.4	8.9	1,573	
M:152214	07N 61E 07 BAAA	FHHC	3,185	330	330	195.40	2,990	52.0	8.5	825	743
M:20609	07N 61E 16 CABB	FHHC	3,145	200	200	150.63	2,994	53.2	7.1	935	842
M:151654	07N 61E 31 ABCC	FHHC	3,030			15.81	3,014				
M:21952	08N 55E 07 AAAA	DHU	2,770	338	338			52.7	7.2	2,620	2,358
M:149889	08N 55E 07 AAAA	SHU	2,790	50	50	5.91	2,784				
M:143798	08N 55E 11 AAAA	SHU	2,682	40	40	31.39	2,651				
M:21956	08N 55E 13 ABBD	FHHC	2,590	870	870	-22.79	2,613	63.1	10.1	1,237	1,113
M:143797	08N 55E 24 ACBC	SHU	2,623	15	15	9.60	2,613				
M:143796	08N 55E 24 ACBC	FHHC	2,623	800	800						
M:143799	08N 55E 25 AADA	FHHC	2,706	800	800						
M:21962	08N 56E 01 BCBC	FHHC	2,610	900	900	-15.28	2,625	59.0	9.1	1,439	1,295
M:21963	08N 56E 01 DDCD	DHU	2,630	460	460	-12.97	2,643	53.8	8.6	2,100	
M:700322	08N 56E 10 ABCC	FHHC	2,730	1,100	1,100						
M:700323	08N 56E 15 DAAA	DHU	2,780	200	200						
M:21965	08N 56E 17 BDDA	FHHC	2,570	730	730	-51.51	2,622	59.0	9.2	1,260	1,134
M:21972	08N 56E 27 BCDA	FHHC	2,667	940	760	-12.75	2,680	56.1	9.3	1,340	1,206
M:21976	08N 56E 29 CBBC	SHU	2,600	157	117			52.5	9.6	1,259	1,133
M:21978	08N 56E 29 DDCA	SHU	2,690	220	170	94.14	2,596	59.4	8.7	1,870	1,683
M:700328	08N 57E 05 CCAD	FHHC	2,685	900	628	-9.59	2,695	61.0	9.1	1,395	1,256
M:700329	08N 57E 06 DBCC	DHU	2,650	400	400			59.7	9.1	1,491	1,342
M:700332	08N 57E 10 CCBB	DHU	2,715	300	300	32.23	2,683				
M:1678	08N 57E 14 DABA	SHU	2,775	110	110						
M:700334	08N 57E 14 DABA	SHU	2,775	120	85						
M:700335	08N 57E 14 DABA	FHHC	2,775	1,000	1,000	47.41	2,728	61.0	9.2	1,609	1,448
M:21998	08N 57E 26 CCDA	DHU	2,705	441	378	-7.78	2,713	53.1	8.8	1,670	
M:22002	08N 57E 34 AADA	SHU	2,740	92	92	61.17	2,679	50.2	8.5	2,100	
M:22005	08N 58E 02 AADD	FHHC	2,820	1,087	1,087	50.00	2,770	59.0	8.8	1,611	1,450
M:22015	08N 58E 10 DDBC	FHHC	2,890	985	985	60.00	2,830	52.2	9.1	1,555	1,400
M:22016	08N 58E 11 DDDD	SHU	2,960	120	100	42.11	2,918	51.6	7.3	1,713	
M:22025	08N 58E 26 DCCD	DHU	2,810	525	525	-12.24	2,822	54.1	9.1	252	227
M:22030	08N 58E 31 CAAA	SHU	2,755	100	95	28.62	2,726				
M:22039	08N 58E 34 BD	FHHC	2,845	800	520			58.1	9.1	1,535	
M:22040	08N 58E 35 CAAD	DHU	2,790	300	220			48.2	8.7	1,745	1,571
M:22044*	08N 59E 02 AACD	FHHC	3,043	80	80	33.53	3,009				
M:700348	08N 59E 07 CDCD	SHU	2,890	63	63	12.60	2,877	47.7	8.2	1,925	1,733
M:143949	08N 59E 10 CDBD	SHU	2,920	40	40	13.57	2,906				
M:22050	08N 59E 12 BAAD	FHHC	2,984	25	25	7.24	2,977				
M:151658	08N 59E 31 CCCB	FHHC	2,880	700	700	43.29	2,837	74.5	9.2	1,160	1,044
M:22063	08N 59E 35 CBAC	DHU	3,080	360	360	94.69	2,985	52.9	8.2	2,780	2,502
M:151655	08N 59E 35 DCCB	FHHC	3,160	500	500	226.41	2,934				
M:152243	08N 60E 22 CCDD	FHHC	3,130	175	175	98.46	3,032	50.0	7.4	930	837
M:22091	08N 60E 24 CDDD	FHHC	3,150	240	191	162.84	2,987	51.4	8.8	1,553	1,398
M:22107	08N 61E 05 ACAD	FHHC	2,950	205	205	111.63	2,838	49.8	8.5	2,400	2,160
M:152247	08N 61E 30 ADBD	FHHC	3,090	220	220	105.20	2,985	51.8	8.2	3,830	3,447
M:22111	08N 61E 31 CACD	SHU	3,150	40	40	12.41	3,138				
M:22913	09N 52E 01 DDCC	DHU	2,801	311	311			52.7	7.3	2,200	1,980
M:22914	09N 52E 05 CABD	FHHC	2,860	1,220	1,020	441.54	2,418	61.3	9.6	1,303	1,173
M:22917	09N 53E 07 DDDA	SHU	2,758	32	32	20.32	2,738	46.0	7.7	926	833
M:22918	09N 53E 08 BBCB	SHU	2,711	10	10	4.90	2,706	46.2	7.5	2,260	2,034
M:22919	09N 53E 08 BBCC	DHU	2,716	743	743			58.3	9.3	1,252	1,127
M:22920	09N 53E 10 ADCD	SHU	2,774	90	90			51.1	7.6	740	
M:22979	09N 56E 15 AABA	SHU	2,690	100	70			58.3	7.2	2,420	2,178
M:22982	09N 56E 24 DCCB	SHU	2,770	40	40	6.61	2,763				
M:22983	09N 56E 28 DDBC	FHHC	2,650	1,060	1,060	31.38	2,619	59.9	9.0	1,436	1,292
M:22987	09N 56E 32 BAAD	FHHC	2,590	870	870	-11.97	2,602	57.2	9.0	1,746	1,571
M:22986	09N 56E 32 BDAC	DHU	2,590	652	652			57.7	8.6	3,080	2,772
M:22995	09N 57E 07 BBAA	FHHC	2,690	840	840	48.25	2,642	55.2	8.7	3,200	2,880
M:22996	09N 57E 08 ADBA	SHU	2,740	60	55	17.11	2,723				
M:22997	09N 57E 08 BCBC	SHU	2,730	80	50	24.51	2,705	48.6	7.2	6,140	5,526
M:23021	09N 57E 33 BAAB	DHU	2,785	380	320	47.98	2,737	55.2	8.6	1,950	1,755
M:23022	09N 57E 35 DDDA	FHHC	2,875	960	960	132.74	2,742	56.8	8.8	1,659	1,493
M:130084	09N 58E 04 ACDB	DHU	2,900	260	240	175.54	2,724	52.9	6.5	3,490	3,141
M:700371	09N 58E 27 CCAD	DHU	2,950	482	482	182.38	2,768	55.9	8.4	2,400	2,160
M:23032	09N 58E 32 ADBB	SHU	2,890	120	100	88.02	2,802				

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:23042	09N 59E 05 ADAB	FHHC	2,865	100	60	24.32	2,841	60.4	8.9	1,811	1,630
M:151412	09N 59E 18 AAAA	SHU	2,835	15	15	5.97	2,829				
M:23056	09N 59E 33 DDDD	FHHC	3,055	92	72	55.12	3,000	51.8	8.1	1,232	1,109
M:151339	09N 60E 02 BCBA	DHU	3,135	220	220	6.17	3,129	50.5	7.0	1,640	1,476
M:23074	09N 60E 30 CBBB	FHHC	3,145	540	540	221.42	2,924	54.7	8.6	1,810	1,629
M:139758	09N 61E 17 CADA	SHU	3,100	180	142			50.7	6.9	1,644	1,480
M:151484	09N 61E 18 BAAD	FHHC	3,240	840	840			56.8	8.5	2,770	2,493
M:23527	10N 49E 03 BBBA	FHHC	2,258	600	600	-76.92	2,335	59.0	9.3	1,188	1,069
M:23572	10N 50E 03 BBDC	SHU	2,440	930	120						
M:149455	10N 50E 04 ABBA	SHU	2,452					49.5	7.4	756	680
M:149456	10N 50E 04 DCAC	SHU	2,462					54.3	7.8	484	436
M:149460	10N 50E 06 BDDC	SHU	2,480					52.7	7.8	409	368
M:149457	10N 50E 07 AACC	SHU	2,438					53.6	7.6	495	446
M:149459	10N 50E 07 CCCD	SHU	2,428					51.8	7.8	432	389
M:149458	10N 50E 07 DAAB	SHU	2,406					48.0	7.5	774	697
M:137857	10N 51E 08 DAAB	FHHC	2,361	660	475	-2.31	2,363	59.4	9.2	1,270	
M:23577	10N 51E 11 ADAA	FHHC	2,448	750	420	68.77	2,379	56.7	9.2	1,403	1,263
M:23578	10N 51E 11 CCCD	DHU	2,638	270	270			54.1	9.0	882	794
M:700002	10N 51E 19 ACCB	FHHC	2,312	420	420			58.6	9.3	1,261	1,135
M:23581	10N 51E 20 DBCD	FHHC	2,328	492	420	-21.08	2,349	60.3	9.1	1,295	1,166
M:700003	10N 51E 20 DDAB	FHHC	2,356			-5.81	2,362	59.2	9.2	1,314	1,183
M:23582	10N 51E 23 ADBC	SHU	2,535	132	40						
M:700004	10N 51E 26 BABB	FHHC	2,641	980	980			63.3	9.0	1,345	1,211
M:121085	10N 52E 07 CCCA	FHHC	2,518	760	655			55.4	9.5	1,394	1,255
M:23588	10N 52E 10 BADD	SHU	2,779	240	80	70.49	2,709	54.5	7.7	927	834
M:23589	10N 52E 11 BBCA	SHU	2,740	25	25	19.06	2,721	50.7	7.4	1,840	1,656
M:149569	10N 52E 11 BBCB	SHU	2,749	43	43			59.2	7.5	1,483	1,335
M:23590	10N 52E 12 AADA	SHU	2,600	12	12	4.64	2,595	55.6	7.6	1,970	1,773
M:23592	10N 52E 14 BAAA	FHHC	2,716	1,050	635	293.84	2,422	61.7	9.0	1,457	1,311
M:23593	10N 52E 19 DBBA	FHHC	2,795	1,020	940			61.7	9.3	1,304	1,174
M:23596	10N 52E 36 AACC	FHHC	2,825	930	850			57.0	9.2	1,250	1,125
M:149618	10N 53E 04 BCAA	SHU	2,500	20	20	5.77	2,494				
M:145579	10N 53E 04 BDAC	SHU	2,453	210	70	68.25	2,385	53.2	8.3	3,520	3,168
M:149453	10N 53E 11 CCCA	DHU	2,773	400	400						
M:700005	10N 53E 13 ADAD	FHHC	2,550	905	905			52.3	9.4	1,216	1,094
M:151282	10N 53E 17 ABAA	SHU	2,539	105	105	80.83	2,458				
M:23600	10N 53E 17 BBBD	SHU	2,588	160	160	27.53	2,560				
M:149454	10N 53E 34 AADC	FHHC	2,700	1,000	1,000			63.9	9.2	1,246	1,121
M:149379	10N 53E 35 DBDC	SHU	2,675	50	50	45.48	2,630	51.6	7.8	2,140	1,926
M:23608	10N 54E 11 CBBD	FHHC	2,470	1,081	825			67.5	9.2	1,223	
M:23613	10N 54E 22 DDCB	FHHC	2,430	750	750	-3.70	2,434	57.2	9.3	1,353	1,218
M:23617	10N 54E 29 DACB	SHU	2,710	149	115	91.70	2,618				
M:23619	10N 54E 36 BCCC	DHU	2,450	350	350	-3.20	2,453	56.3	9.1	1,792	1,613
M:23626	10N 55E 08 CBCA	FHHC	2,510	1,066	1,066			67.8	9.1	1,413	1,272
M:23644	10N 56E 04 AACC	FHHC	2,610	1,100	1,100						
M:23653	10N 56E 22 DDDD	DHU	2,710	200	200	104.85	2,605				
M:78875	10N 56E 26 CACB	DHU	2,730	310	263	119.59	2,610				
M:23660	10N 56E 33 DDDB	SHU	2,630	140	140	35.03	2,595				
M:23663	10N 57E 06 CDCD	SHU	2,650	140	140						
M:23667	10N 57E 12 ACBA	FHHC	2,710	153	135	96.57	2,613	52.9	7.6	1,734	1,561
M:23668	10N 57E 16 BBAA	DHU	2,710	400	400	53.59	2,656				
M:23671	10N 57E 22 CDCC	DHU	2,870	322	322	64.19	2,806	47.8	7.5	1,820	
M:23672	10N 57E 23 BDAB	SHU	2,830	260	190	113.14	2,717	54.5	7.2	2,000	1,800
M:23677	10N 57E 28 DDAC	SHU	2,800	160	100	58.32	2,742	48.0	7.5	1,456	
M:23690	10N 58E 13 ACCB	FHHC	2,832	85	85	42.55	2,789	49.6	8.0	3,080	2,772
M:23699	10N 58E 18 CDDD	FHHC	2,870	150	150	122.61	2,747	53.8	7.9	2,790	2,511
M:23701	10N 58E 25 AAAD	FHHC	2,860	96	96	65.22	2,795	60.3	7.4	2,150	
M:122404	10N 59E 11 AABC	DHU	3,070	460	440	321.17	2,749	57.4	9.0	2,450	2,205
M:23715	10N 59E 11 AABC	SHU	3,070	65	65	47.50	3,023				
M:23723	10N 59E 19 AAAA	FHHC	2,852	110	110	45.79	2,806	50.4	8.9	1,297	1,167
M:23729	10N 59E 29 BDBB	FHHC	2,980	140	110	96.25	2,884	55.2	8.5	1,890	1,701
M:78872	10N 59E 34 BAAC	DHU	3,030	240	220	183.88	2,846				
M:23732	10N 59E 34 DABC	FHHC	2,970	160	140	124.97	2,845				
M:23739	10N 60E 02 CDDD	FHHC	3,045	680	617	344.29	2,701	58.8	9.2	1,920	1,728
M:23748	10N 60E 10 ABBA	SHU	3,025	44	44	8.82	3,016	52.7	7.8	3,260	2,934

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:23754	10N 60E 16 CCAB	SHU	3,080	40	6	44.85	3,035				
M:151411	10N 60E 21 BAAC	SHU	3,041	45	45	17.85	3,023	50.7	7.4	2,800	2,520
M:122405	10N 60E 22 BDCA	SHU	3,050	80	55	18.97	3,031				
M:23765	10N 60E 34 CDDD	SHU	3,190	170	170	68.41	3,122	52.9	9.1	2,646	2,381
M:23772	10N 61E 05 BAAA	SHU	3,175	170	63			48.9	7.6	766	689
M:23771	10N 61E 05 BAAD	SHU	3,174	80	80	70.71	3,103				
M:23780	10N 61E 20 ABAD	SHU	3,261	120	120	99.83	3,161	49.8	6.7	1,226	
M:120964	10N 61E 30 DDDA	FHHC	3,122	1,000	678	381.78	2,740	64.6	8.8	2,540	2,286
M:700012	11N 49E 24 BDDD	FHHC	2,264	650	650			56.5	9.3	1,306	1,175
M:700014	11N 49E 25 ADBA	FHHC	2,248	466	466	-40.36	2,288	56.7	9.4	1,179	1,061
M:24069	11N 50E 03 CBBB	DHU	2,220	240	240			49.5	9.2	1,430	1,287
M:700015	11N 50E 05 ADBC	FHHC	2,244			-3.28	2,247	54.9	9.4	1,206	1,085
M:149428	11N 50E 07 DCAC	FHHC	2,314					59.0	9.3	1,179	1,061
M:149348	11N 50E 10 BACB	FHHC	2,252	600	600	-30.07	2,282	54.0	9.1	1,237	1,113
M:24074	11N 50E 12 AAAA	SHU	2,566	148	128			53.6	7.7	546	491
M:149469	11N 50E 12 BDCC	SHU	2,410					54.3	7.2	518	466
M:149431	11N 50E 13 CAAB	SHU	2,276					55.4	7.9	661	595
M:131101	11N 50E 16 CCDB	FHHC	2,269	620	557	-60.17	2,329	53.8	9.3	1,184	1,066
M:149468	11N 50E 22 CBBA	SHU	2,438					53.2	7.5	428	385
M:149467	11N 50E 28 DCDC	SHU	2,586					54.7	7.6	427	384
M:149349	11N 50E 30 DADC	FHHC	2,265	650	650	-55.59	2,321	56.3	9.2	1,188	
M:149465	11N 50E 31 DDAB	SHU	2,466					56.5	7.6	389	350
M:149466	11N 50E 32 ADCA	SHU	2,475					52.2	7.3	470	423
M:24096	11N 50E 32 ADDD	FHHC	2,472	801	740			58.8	9.2	1,184	1,066
M:149461	11N 50E 33 CAAB	SHU	2,421					56.8	7.4	464	418
M:149462	11N 50E 33 CACA	SHU	2,540					53.2	7.5	615	554
M:149464	11N 50E 33 DADD	SHU	2,460					55.4	7.5	380	342
M:149463	11N 50E 33 DBCD	SHU	2,446					54.3	7.7	498	448
M:149298	11N 50E 33 DBDB	FHHC	2,421	750	750	76.96	2,344	53.6	9.2	1,177	1,059
M:24102	11N 51E 08 ACDB	SHU	2,503	84	66			53.2	7.9	395	356
M:24101	11N 51E 08 BBBD	SHU	2,521	150	150						
M:24104	11N 51E 09 DADD	SHU	2,588	130	130			53.1	7.9	404	364
M:24109	11N 51E 15 CBCC	SHU	2,546	80	80			51.1	8.3	457	411
M:24111	11N 51E 21 CDDD	SHU	2,608	144	123	115.14	2,493				
M:24114	11N 51E 25 BCCA	SHU	2,609	20	20	11.01	2,598	47.3	7.9	1,927	1,734
M:24115	11N 51E 26 CBBC	SHU	2,613	180	140	65.17	2,548	61.3	9.0	1,408	
M:24122	11N 52E 09 CDBC	SHU	2,610	80	41			49.6	7.7	2,640	2,376
M:24123	11N 52E 10 DDBA	SHU	2,523	169	145						
M:24124	11N 52E 15 ADBC	FHHC	2,535	1,003	850			53.4	9.2	1,592	1,433
M:24128	11N 52E 23 CCDB	SHU	2,560	22	22			45.1	7.6	2,800	2,520
M:24129	11N 52E 26 ACAA	SHU	2,520	11	11	3.40	2,517	53.2	7.3		
M:24136	11N 52E 35 ABBC	FHHC	2,563	870	776			59.5	9.1	1,365	1,229
M:24139	11N 53E 01 CCAC	FHHC	2,379	960	870			61.3	8.8	1,824	1,642
M:24148	11N 53E 31 AADA	SHU	2,499	11	11			60.8	7.3	2,970	2,673
M:700019	11N 53E 33 BDBD	FHHC	2,436	998	998	0.23	2,436				
M:24150	11N 53E 35 BABA	SHU	2,518	10	10	4.16	2,514				
M:24162*	11N 54E 20 ABBC	SHU	2,518	135	135	86.23	2,432				
M:24164	11N 54E 28 CCAC	FHHC	2,490	1,080	1,080	61.60	2,428	61.5	9.2	1,382	1,244
M:1780	11N 54E 30 DDAD	DHU	2,350	710	710	-63.14	2,413	60.1	9.1	1,298	
M:24168	11N 54E 32 ABBC	DHU	2,350	670	635	-62.06	2,412	59.5	9.1	1,363	1,227
M:24170	11N 54E 33 CBBD	DHU	2,370	420	420	-18.17	2,388	55.0	9.2	1,698	
M:700028	11N 55E 02 ABCA	SHU	2,450	98	98	51.55	2,398				
M:151971	11N 55E 14 BBBB	SHU	2,510	30	30	17.95	2,492			3,700	3,330
M:24198	11N 56E 13 BBCD	SHU	2,610	139	79	71.25	2,539	51.4	7.8	3,330	2,997
M:24199	11N 56E 14 BCDA	SHU	2,550	162	78						
M:24203	11N 56E 20 BCCA	DHU	2,510	400	400	42.78	2,467	58.1	9.1	1,510	1,359
M:24202	11N 56E 21 ACDC	FHHC	2,510	1,165	1,165	9.95	2,500	54.7	8.1	2,190	1,971
M:24207	11N 56E 23 CCCC	FHHC	2,500	882	609	4.91	2,495	58.3	8.2	2,510	2,259
M:24209	11N 56E 29 BBBD	SHU	2,530	30	30	5.92	2,524				
M:24218	11N 57E 07 CDAA	SHU	2,650	190	190	140.91	2,509	56.1	6.8	2,860	2,574
M:1784	11N 57E 21 CBAC	FHHC	2,690	710	710	132.28	2,558				
M:24229	11N 57E 28 DCCB	FHHC	2,610	920	812	61.91	2,548	57.2	8.7	1,837	
M:1786*	11N 57E 32 BBBD	FHHC	2,610	980	840	60.31	2,550				
M:24234	11N 57E 32 DCCD	SHU	2,650	140	140	48.88	2,601				
M:24236	11N 58E 02 DBAB	SHU	2,820	172	148	149.72	2,670	52.3	7.4	2,500	2,250

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:24237	11N 58E 05 ACBC	FHHC	2,673	80	60	71.73	2,601	52.9	8.9	1,980	
M:24239	11N 58E 11 ACAD	SHU	2,828	220	170	159.11	2,669	53.1	8.7	3,200	2,880
M:151656	11N 58E 22 DBBC	FHHC	2,778	76	76	56.16	2,722	53.4	8.0	2,000	1,800
M:24245	11N 58E 28 ADDD	FHHC	2,734	56	56	21.07	2,713				
M:151970	11N 59E 11 BADD	SHU	2,940	90	90	14.42	2,926	47.1	7.8	5,550	4,995
M:24257	11N 59E 14 DDCB	DHU	2,990	300	240	67.69	2,922	47.8	9.3	3,010	2,709
M:700954	11N 59E 29 DBAB	DHU	3,190	536	536			58.3	9.3	1,710	1,539
M:128516	11N 60E 09 CBDB	SHU	3,100	200	160	72.39	3,028				
M:24301	11N 60E 33 DADD	SHU	3,070	25	2	9.98	3,060	47.5	7.9	4,330	3,897
M:122902	11N 60E 34 CBCB	DHU	3,090	560	499	327.43	2,763	56.3	9.0	2,220	1,998
M:1790	11N 61E 06 DDAC	FHHC	3,050	940	800			58.1	9.0	2,280	
M:24322	11N 61E 09 DBAB	DHU	3,050	460	425	287.99	2,762	56.8	8.9	2,180	1,962
M:149345	12N 49E 36 CAAD	FHHC	2,316			-37.96	2,354	57.7	9.2	1,190	1,071
M:24621	12N 50E 13 DBBB	FHHC	2,200	616	584	-50.61	2,251	57.7	9.0	1,320	1,188
M:24624	12N 50E 22 AABB	FHHC	2,222	488	488	-80.39	2,302	56.5	9.4	1,355	1,220
M:143559	12N 51E 02 BBCA	SHU	2,239	13	3	4.72	2,234	59.9	7.4	4,260	3,834
M:143561	12N 51E 03 AAAA	SHU	2,245	17	7	3.68	2,241				
M:24622	12N 51E 15 CBBD	SHU	2,245	30	30			51.4	7.4	2,340	2,106
M:24646	12N 51E 15 CBDB	FHHC	2,245	706	706	-28.31	2,273	51.3	9.0	1,470	
M:152669	12N 51E 16 CAAC	SHU	2,242	29	29	9.81	2,232	50.9	7.3	1,303	1,173
M:24659	12N 51E 16 DBDA	FHHC	2,250	736	680	-22.59	2,273	54.5	9.2	1,330	
M:24689	12N 51E 16 DCBD	SHU	2,252	25	21			51.6	9.1	1,220	1,098
M:139793*	12N 51E 16 DCDC	SHU	2,250	27	27	16.24	2,234				
M:143794	12N 51E 21 DACD	SHU	2,275	17	17						
M:148500*	12N 51E 21 DADD	SHU	2,270	39	34	33.21	2,237	57.9	7.4	1,146	
M:24754	12N 51E 24 BBCA	FHHC	2,268	529	500			59.5	9.1	1,270	1,143
M:24753	12N 51E 24 BBCD	SHU	2,268	57	48	8.71	2,259				
M:148627	12N 51E 25 ABDC	SHU	2,422					50.4	7.9	581	523
M:24755*	12N 51E 27 BBCC	SHU	2,303	90	70	65.36	2,238				
M:148619	12N 51E 28 ACAD	SHU	2,320	109	109	72.44	2,248				
M:151496	12N 52E 01 ABBB	FHHC	2,222	900	900	-65.41	2,287	63.0	9.1	1,377	1,239
M:24757	12N 52E 01 ABBB	SHU	2,222	35	32	29.50	2,193	54.7	7.3	1,388	1,249
M:151281	12N 52E 01 DBCC	SHU	2,263	95	95			53.1	7.6	970	873
M:700057	12N 52E 06 BAAA	FHHC	2,228			-60.57	2,289	58.3	9.4	1,427	1,284
M:24770	12N 52E 19 DCCB	DHU	2,551	300	300						
M:700059	12N 52E 23 DBDA	FHHC	2,220	800	800	-63.06	2,283	56.5	9.0	1,492	1,343
M:24777	12N 52E 27 CCBD	SHU	2,440	110	85			49.1	7.9	537	
M:148620	12N 52E 29 BAAD	SHU	2,552	125	125	105.72	2,446	53.1	8.1	832	749
M:24779	12N 52E 30 ABBB	SHU	2,551	150	150						
M:151277	12N 52E 30 ADDD	UNK	2,545								
M:24780	12N 52E 31 BABA	SHU	2,542	170	170						
M:149901	12N 53E 20 ADAA	SHU	2,521	95	95	65.90	2,455				
M:149886	12N 53E 20 ADAA	FHHC	2,521	1,190	1,190	187.20	2,334	57.9	9.4	1,344	1,210
M:24798	12N 53E 21 BDDB	SHU	2,482	117	97	41.82	2,440	52.3	8.8	1,768	1,591
M:149900	12N 53E 26 DDAD	DHU	2,614	260	260	227.04	2,387				
M:24809	12N 54E 01 BABB	FHHC	2,239	1,020	888	-52.00	2,291	62.2	9.1	1,460	1,314
M:151481	12N 54E 01 BBAD	SHU	2,243	12	12	6.44	2,237	54.5	7.6		
M:24820	12N 54E 08 BCCA	SHU	2,419	151	109	44.81	2,374	51.1	7.7	774	697
M:151495	12N 54E 11 BACA	FHHC	2,330	1,140	1,140	-3.37	2,333	59.4	9.3	1,420	1,278
M:151487	12N 54E 26 DCCD	SHU	2,451	39	39	26.84	2,424	50.0	6.9	3,380	3,042
M:1810	12N 55E 16 DBBB	FHHC	2,319	920	920	-39.08	2,358	60.1	9.3	1,540	
M:143791*	12N 55E 18 CDAA	SHU	2,491	63	63	43.59	2,447				
M:1811*	12N 55E 20 DCCD	FHHC	2,477	1,187	1,187	79.17	2,398				
M:151993	12N 55E 22 BCBD	SHU	2,337	21	21	19.68	2,317	48.9	7.4	4,690	4,221
M:24862*	12N 55E 25 CDCC	FHHC	2,442	1,275	1,275	43.64	2,398				
M:24866	12N 55E 26 ABDA	SHU	2,381	66	46	9.32	2,372				
M:151497	12N 55E 26 BBBA	FHHC	2,363	1,200	1,200	-65.68	2,429	57.4	9.4	1,570	1,413
M:700080*	12N 55E 27 BDAA	FHHC	2,355	1,000	1,000	-16.18	2,371	61.9	9.0	1,580	1,422
M:151975	12N 56E 08 BBDB	DHU	2,585	360	360	270.49	2,315	54.1	7.7	3,000	2,700
M:133036*	12N 56E 23 CCDA	FHHC	2,672	1,449	1,100	235.46	2,437				
M:24882*	12N 56E 23 DCCA	FHHC	2,715	1,195	985	267.38	2,448				
M:136636*	12N 56E 24 CABD	FHHC	2,654	1,450	1,450	133.21	2,521				
M:24886	12N 56E 29 ACBA	SHU	2,498	125	125	46.39	2,452	48.7	7.6	3,580	3,222
M:24888	12N 56E 32 BCDB	FHHC	2,522	1,180	960			66.0	9.1	1,630	1,467
M:136642*	12N 56E 34 DAAC	FHHC	2,710	1,467	1,467	267.61	2,442				

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M:24896	12N 58E 04 DBBA	FHHC	2,842	480	420	270.45	2,572				
M:24899	12N 58E 12 BDCC	SHU	2,821	140	108	21.18	2,800				
M:24901	12N 58E 16 AACB	DHU	2,822	360	335	230.93	2,591	60.4	9.1	1,970	1,773
M:24903*	12N 58E 19 DACB	FHHC	2,638	100	80	23.35	2,615				
M:138133*	12N 58E 19 DACB	FHHC	2,638			23.58	2,614				
M:24909	12N 58E 34 BBDC	FHHC	2,711	160	120	79.02	2,632				
M:24927	12N 59E 14 ADAC	SHU	2,901	60	60	31.14	2,870	48.7	7.3	2,280	
M:24931	12N 59E 19 BADA	SHU	2,975	126	126	105.34	2,870	51.6	7.9	3,450	3,105
M:142658	12N 59E 23 DAAC	FHHC	2,922	710	636	327.00	2,595	59.0	8.7	2,610	
M:24941	12N 59E 32 AADA	FHHC	3,123	650	650	487.91	2,635	59.7	9.1	1,798	
M:151657	12N 60E 03 DAAA	FHHC	2,935	900	900	379.15	2,556	59.5	9.5	1,876	1,688
M:1817	12N 60E 18 ACCC	SHU	2,830	160	160	31.01	2,799	48.7	7.7	3,140	
M:25010	12N 60E 36 CACA	FHHC	2,995	900	820	402.68	2,592	61.2	9.0	1,867	1,680
M:25013	12N 61E 09 CBCC	DHU	2,964	280	216	140.90	2,823	51.6	7.9	2,580	
M:131103	12N 61E 33 DCBA	SHU	2,931	55	35	13.58	2,917	48.2	7.4	1,554	1,399
M:148616	13N 45E 06 ADCC	SHU	2,718	170	170	11.26	2,707	49.1	8.6	3,050	2,745
M:700101	13N 47E 02 BCCC	SHU	2,941			20.37	2,921	47.7	7.5	714	643
M:700102	13N 47E 03 CABB	SHU	2,985			7.36	2,978				
M:25344	13N 47E 05 BADC	SHU	3,060	90	36	42.23	3,018	47.7	7.1	2,310	2,079
M:700104	13N 47E 07 ABBD	SHU	3,159	160	160						
M:25346	13N 47E 15 CABC	SHU	3,070	230	194	192.14	2,878	53.8	8.5	2,260	2,034
M:700111	13N 48E 08 DCAA	SHU	2,740	90	90	11.32	2,729	43.9	7.9	2,570	
M:149452	13N 48E 11 ADAD	DHU	2,665	355	355			51.1	8.8	1,852	1,667
M:151288	13N 48E 11 CCCB	UNK	2,699								
M:700113	13N 48E 20 CDDC	UNK	2,812					50.0	8.1	3,240	2,916
M:25355	13N 48E 22 AAAC	DHU	2,760	360	260						
M:25358	13N 48E 29 CBCA	SHU	2,898	205	80						
M:700115	13N 48E 33 BBBC	DHU	2,860			214.10	2,646				
M:25359	13N 49E 02 CCDB	SHU	2,641	149	120			49.3	7.8	2,470	2,223
M:25363	13N 49E 18 DBAD	SHU	2,620	102	62	16.98	2,603	53.2	7.6	4,090	3,681
M:1843	13N 49E 18 DBAD	SHU	2,620	104	18	58.95	2,561				
M:25365	13N 49E 29 AADD	SHU	2,633	245	60	64.22	2,569	50.0	7.6	4,760	4,284
M:149570	13N 50E 01 CBCA	UNK	2,533					50.0	8.4	4,520	4,068
M:149619	13N 50E 05 BCAC	SHU	2,527	69	69	28.91	2,498	57.2	8.3	2,690	2,421
M:25367	13N 50E 09 CCAD	SHU	2,456	136	122	18.66	2,437				
M:1844	13N 50E 10 CDDC	SHU	2,450	104	12	28.33	2,422				
M:149623	13N 50E 12 CDCD	SHU	2,460	28	28	18.27	2,442	49.8	7.7	2,300	2,070
M:149624	13N 50E 29 ABBD	SHU	2,491	130	130	59.43	2,432				
M:149660	13N 50E 36 DABD	SHU	2,390	98	98	27.34	2,363				
M:137279*	13N 51E 31 ABDD	SHU	2,285	18	6	4.78	2,280	57.6		4,080	
M:151994*	13N 51E 31 BCDA	SHU	2,342	118	118	61.30	2,281	38.3	8.7	4,570	4,113
M:132902*	13N 51E 31 BCDD	DHU	2,342	565	440						
M:1845*	13N 51E 31 BCDD	DHU	2,343	340	243	107.00	2,236	56.7	8.3	2,120	
M:1846*	13N 51E 31 BDCB	FHHC	2,341	973	778	34.70	2,306	61.9	9.0	1,240	
M:143577	13N 51E 32 BCCD	SHU	2,273	13	3	6.47	2,266				
M:143588	13N 51E 33 CDDA	SHU	2,282	90	90	46.88	2,235				
M:1848	13N 52E 05 CACA	SHU	2,501	177	105	103.89	2,397	51.3	6.9	2,730	
M:25385	13N 52E 14 ABAA	SHU	2,390	80	30	29.51	2,360	50.9	7.8	896	806
M:140757	13N 52E 25 BDAC	FHHC	2,141	611	611	-71.19	2,212	54.0	7.6	1,180	
M:25399	13N 52E 33 CAAB	FHHC	2,175	650	650	-12.56	2,188	58.3	9.1	1,469	1,322
M:151280	13N 52E 36 ADDB	SHU	2,158	21	21	12.52	2,145	49.8	7.9	1,729	1,556
M:25443	13N 53E 02 CCAB	SHU	2,241	94	72						
M:702103	13N 53E 02 DDCD	SHU	2,210	43	43	29.39	2,181	53.4	7.4	1,374	
M:25444	13N 53E 04 CBAC	FHHC	2,310	1,294	875	6.11	2,304		8.9	1,314	1,183
M:136361*	13N 53E 15 BCCC	SHU	2,170	35	35	14.73	2,155				
M:126522*	13N 53E 18 ABAA	SHU	2,310	60	51	47.30	2,263				
M:149888	13N 53E 19 CBBC	FHHC	2,225	980	980	-56.39	2,281	60.8	9.2	1,290	1,161
M:1854	13N 53E 30 DABC	FHHC	2,171	780	610	-108.76	2,280	61.5	9.2	1,392	
M:25485	13N 53E 35 BBCB	SHU	2,511	113	113	106.20	2,405	52.7	7.9	810	
M:25492	13N 54E 30 ACCC	SHU	2,504	131	110	105.38	2,399	51.6	7.7	642	578
M:25506	13N 54E 34 CCDB	FHHC	2,228	994	893	-81.61	2,310	60.6	9.3	1,480	1,332
M:702004	13N 55E 23 DBBB	FHHC	2,659	290	290	251.16	2,408				
M:25502	13N 55E 25 DDAD	SHU	2,470	96	96	41.88	2,428	50.4	8.6	2,740	2,466
M:25503	13N 55E 27 CACB	DHU	2,490	283	221	205.62	2,284				
M:25504	13N 55E 30 DBBA	FHHC	2,360	1,180	1,180	38.37	2,322	63.3	9.1	1,510	1,359

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:702109	13N 56E 01 BDAD	FHHC	2,684	221	221	180.51	2,503	54.3	7.3	606	545
M:25509	13N 56E 02 ACAA	FHHC	2,680	243	218	183.99	2,496				
M:702112	13N 56E 02 BBDD	FHHC	2,684	260	260						
M:151748	13N 57E 20 BBDD	FHHC	2,700	195	195	165.83	2,534	52.0	7.6	991	892
M:25521	13N 57E 21 CDCB	FHHC	2,518	65	65	48.18	2,535	50.0	7.6	1,740	1,566
M:25539	13N 58E 32 CACC	SHU	2,683	180	140	130.86	2,552	50.9	9.0	2,360	2,124
M:25543	13N 59E 01 ABBB	SHU	2,737	95	95	35.87	2,701	50.0	7.3	1,380	1,242
M:25542	13N 59E 01 BAAA	FHHC	2,738	900	900	310.99	2,427	58.6	9.1	2,040	1,836
M:151995	13N 59E 10 CCDA	SHU	2,872	31	31	23.84	2,848				
M:1857	13N 59E 10 DAAA	FHHC	2,791	980	980	320.07	2,471	59.9	9.1	2,020	
M:25556	13N 59E 13 BCBB	FHHC	2,765	960	715	294.78	2,470	61.0	9.2	1,870	1,683
M:1858	13N 59E 29 AAAA	DHU	3,103	400	300	118.84	2,984	50.9	7.6	3,450	
M:25583	13N 59E 32 BDAC	SHU	2,943	68	45	46.53	2,896				
M:25591	13N 60E 02 DAAB	FHHC	2,840	1,086	1,008			60.6	9.0	2,160	1,944
M:1859	13N 60E 06 CBBB	SHU	2,739	80	80	13.15	2,726	48.9	8.0	2,460	
M:700963	13N 60E 24 BBCD	SHU	2,790	180	180	22.86	2,767	49.5	8.0	1,420	1,278
M:26153	14N 45E 01 DBCD	SHU	2,901	196	136	93.79	2,807				
M:26154	14N 46E 06 ADBA	SHU	2,922	280	180			50.0	8.1	2,340	2,106
M:26157	14N 46E 19 ADDC	SHU	3,003	210	126						
M:26158	14N 46E 19 DBAB	SHU	3,060	170	130	133.26	2,927				
M:1895	14N 47E 04 ADCC	SHU	2,999	146	116			50.0	7.5	2,074	
M:26165	14N 47E 05 CCBA	SHU	2,979	205	189			47.7	7.6	3,050	2,745
M:26166	14N 47E 08 BDDC	SHU	3,000	98	88			47.5	7.5	2,020	1,818
M:152670	14N 47E 14 DDAC	SHU	2,835	84	84	34.12	2,801	50.5	7.3	2,760	2,484
M:26169	14N 47E 14 DDAC	SHU	2,835	80	80	36.00	2,799				
M:148629	14N 47E 15 DDDA	SHU	2,880	160	160			49.1	9.0	2,500	2,250
M:700155	14N 47E 17 AADB	DHU	3,040	228	228			49.6	7.8	2,750	2,475
M:152672	14N 47E 20 CBAD	SHU	3,001	22	22	8.00	2,993	51.8	6.7	2,240	2,016
M:700156	14N 47E 20 CBDB	SHU	3,001	12	12	8.40	2,993	40.1	7.7	2,180	1,962
M:700158	14N 47E 20 DCCB	SHU	3,002	140	140			48.2	7.9	2,620	2,358
M:700157	14N 47E 20 DDCC	SHU	2,978	30	30	19.50	2,959				
M:149478	14N 47E 28 BBBA	SHU	2,962	12	12			42.4	7.6	1,628	1,465
M:700161	14N 47E 32 CCBC	SHU	3,040	12	12			43.3	7.6	1,085	977
M:26174	14N 47E 33 CCBD	SHU	2,998	88	75			47.3	7.4	1,304	1,174
M:26175	14N 47E 35 ADDD	SHU	2,861	130	108			48.6	8.5	2,160	1,944
M:106213	14N 48E 01 BDAB	DHU	2,817	380	290	156.51	2,660	49.8	7.8	2,750	2,475
M:26176	14N 48E 01 BDDA	SHU	2,800	164	132						
M:26178	14N 48E 05 CACD	SHU	3,076	196	176			48.9	7.2	1,303	1,173
M:700162	14N 48E 08 BCCD	DHU	2,997	213	201			48.7	7.6	1,259	1,133
M:26181	14N 48E 18 AABD	SHU	2,907	152	134			48.2	7.8	1,047	942
M:152671	14N 48E 19 CDCA	SHU	2,822	144	144	90.02	2,732				
M:148628	14N 48E 26 AADB	SHU	2,712	80	80	60.33	2,652	57.6	8.8	3,230	2,907
M:26185	14N 48E 29 DACB	SHU	2,780	64	40	31.17	2,749	51.4	7.4	1,024	922
M:26186	14N 48E 32 AAAA	SHU	2,748	45	45						
M:1896	14N 48E 33 ABBC	SHU	2,722	69	33						
M:149451	14N 48E 34 DCAB	UNK	2,800								
M:130089	14N 49E 11 DBCC	SHU	2,722	20	13	10.45	2,712	44.6	7.9	1,434	1,291
M:132904*	14N 49E 21 AAAA	DHU	2,702	440	440	120.72	2,581				
M:26191	14N 49E 25 DDCD	SHU	2,590	55	55			46.9	7.8	1,598	1,438
M:1897	14N 49E 28 ADAC	SHU	2,693	55	40	43.66	2,649	49.8	7.4	616	
M:26193	14N 49E 35 ABDC	DHU	2,695	240	200			48.6	7.7	6,860	6,174
M:26194	14N 49E 36 CACA	SHU	2,680	232	114			48.4	8.7	5,060	4,554
M:149626	14N 50E 04 DBCB	DHU	2,756			166.35	2,590	52.0	9.5	1,858	1,672
M:149629	14N 50E 08 ABCA	SHU	2,703			92.40	2,611	50.4	8.1	5,230	4,707
M:149668	14N 50E 10 DCBB	SHU	2,657	22	22	8.02	2,649				
M:148630	14N 50E 20 DDCB	SHU	2,640	120	120			49.5	8.9	2,050	1,845
M:143792	14N 50E 24 DDCD	SHU	2,790	188	188	102.56	2,687				
M:143793	14N 50E 24 DDCD	SHU	2,790	400	120	104.47	2,686	54.5	7.0	2,910	
M:149666	14N 50E 27 BCAB	SHU	2,555	85	85	25.61	2,529				
M:149664	14N 50E 28 BDDB	SHU	2,635	125	125	69.74	2,565	55.8	7.9		
M:1898	14N 50E 29 DBCD	DHU	2,700	276	235						
M:26201	14N 50E 34 AAAB	SHU	2,520	92	72						
M:149662	14N 50E 36 BADC	SHU	2,620			107.82	2,512	51.8	8.8	3,200	2,880
M:26204	14N 51E 03 AAAD	SHU	2,680	105	65	28.05	2,652				
M:26226	14N 52E 02 AAAA	SHU	2,801	100	87	45.62	2,755	49.3	7.7	455	410

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M:702156	14N 52E 18 CCAB	SHU	2,903	134	134	119.93	2,783				
M:702116	14N 52E 34 DBCD	SHU	2,622	19	19	17.75	2,604				
M:151279	14N 52E 34 DBCD	SHU	2,622	60	60	23.50	2,599				
M:702117	14N 52E 34 DBCD	DHU	2,622	200	200	125.34	2,497				
M:26255	14N 53E 11 CDAA	SHU	2,494	35	14			52.5	7.1	749	674
M:26265	14N 53E 29 DBCC	DHU	2,580	200	200						
M:26264	14N 53E 29 DBCC	SHU	2,580	260	93	185.38	2,395	55.9	7.5	468	
M:26266	14N 53E 29 DBCC	SHU	2,580	80	80						
M:26283	14N 54E 18 BCCA	SHU	2,510	50	50			51.1	7.8	1,403	
M:26291	14N 54E 22 BDDD	FHHC	2,182	1,100	960	-65.90	2,248	64.2	9.0	1,390	1,251
M:152202	14N 54E 30 CBCD	SHU	2,298	110	110			51.3	9.3	1,283	1,155
M:144620	14N 54E 34 DAD	UNK	2,145								
M:152201	14N 55E 04 CDDB	SHU	2,080	18	18	11.12	2,069	52.2	7.5	2,590	2,331
M:702197	14N 55E 04 DCBD	SHU	2,096	40	40	26.25	2,070				
M:26310	14N 55E 05 CBBC	SHU	2,130	31	19	18.81	2,111				
M:702211	14N 55E 06 BBBB	SHU	2,175			20.17	2,155	50.9	7.5	1,433	1,290
M:26319	14N 55E 29 ACDC	FHHC	2,160	570	570	20.94	2,139				
M:144392	14N 55E 31 CBBB	FHHC	2,210	1,010	1,010			65.8	9.3	1,255	
M:144619	14N 55E 31 CBBB	FHHC	2,205	1,010	1,010			65.8	9.3	1,255	1,130
M:26325	14N 56E 17 BDDC	FHHC	2,540	248	240	201.17	2,339				
M:702142	14N 56E 21 ABAD	FHHC	2,415	66	66	57.06	2,358				
M:26332	14N 57E 03 DBCA	SHU	2,347	85	65	37.47	2,310	50.7	8.1	3,090	2,781
M:152200	14N 57E 09 BADA	SHU	2,324	22	22	16.80	2,307	54.7	8.3	1,678	1,510
M:702164	14N 57E 15 BCBB	FHHC	2,379	101	101	64.96	2,314				
M:702132	14N 57E 21 ACCC	FHHC	2,481	199	199	141.90	2,339				
M:151749	14N 57E 26 CDCB	FHHC	2,462	165	165	89.91	2,372				
M:702119	14N 57E 33 BDCC	FHHC	2,538	104	104	80.61	2,457				
M:26346	14N 58E 11 CBAA	SHU	2,680	128	128	66.92	2,613	49.1	8.8	2,140	1,926
M:26348	14N 58E 22 AACC	DHU	2,639	253	213	112.87	2,526				
M:26356	14N 59E 02 BCBD	SHU	2,740	159	103	79.48	2,661				
M:26358	14N 59E 03 DCDC	SHU	2,751	160	160	88.84	2,662				
M:26374	14N 59E 10 BBAB	FHHC	2,783	1,000	1,000			59.0	9.1	1,980	1,782
M:151972	14N 59E 18 BCAB	SHU	2,794	81	81	82.50	2,712				
M:26419	14N 59E 27 DAAA	SHU	2,798	120	120	83.75	2,714				
M:26428	14N 59E 33 ADAD	SHU	2,860	10	10	7.68	2,852				
M:26437	14N 60E 02 CCCA	DHU	2,768	240	240	152.29	2,616	53.2	8.6	3,090	2,781
M:700977	14N 60E 02 CCCC	SHU	2,757	180	180	125.69	2,631	54.7	8.6	3,090	2,781
M:26463	14N 60E 10 AAAA	SHU	2,735	40	40	10.12	2,725	46.0	7.7	3,130	2,817
M:136678*	14N 60E 26 BAA	SHU	2,804	114	108	41.98	2,762				
M:26495	14N 60E 29 ABCC	SHU	2,775	106	106	37.02	2,738	49.1	7.4	2,300	2,070
M:127943	14N 60E 30 BBBA	DHU	2,758	260	245	48.57	2,709	51.8	8.7	2,190	
M:143800	14N 61E 06 CCAA	SHU	2,739	155	155	51.14	2,688				
M:143801	14N 61E 06 CCAA	SHU	2,739	124	124	47.47	2,692				
M:151271	15N 45E 04 CDAB	SHU	2,707	160	160	44.50	2,663	48.7	8.6	2,780	2,502
M:151270	15N 45E 04 CDAB	SHU	2,707	98	98	35.58	2,671				
M:132669	15N 45E 05 DBDB	SHU	2,702	55	25	28.76	2,673				
M:27503	15N 45E 10 DCDC	SHU	2,728	180	120	66.69	2,661	49.6	8.7	2,310	2,079
M:132714	15N 45E 14 DACD	SHU	2,764	160	126	25.55	2,738	52.0	6.9		
M:132726	15N 45E 14 DACD	SHU	2,764	84	25	24.69	2,739	63.5	7.1	3,200	
M:132715	15N 45E 14 DACD	SHU	2,764	180	110	25.88	2,738				
M:700171	15N 45E 24 CDDA	SHU	2,802	69	69	39.44	2,763				
M:148621	15N 45E 27 BDDB	DHU	2,943			195.94	2,747	53.2	8.4	3,700	3,330
M:151283	15N 45E 34 DCAD	UNK	2,844					51.6	7.2	3,740	3,366
M:27511	15N 46E 03 BDAA	SHU	2,842	68	28	25.15	2,817				
M:143790*	15N 46E 04 BBBC	SHU	2,895	164	164	110.10	2,785				
M:27515	15N 46E 12 BBAC	SHU	2,945	181	125	65.20	2,880				
M:27516	15N 46E 12 BBAC	SHU	2,945	89	69	39.31	2,906				
M:149369	15N 46E 16 BDDA	SHU	2,940	110	110	80.79	2,859	48.9	7.3	2,490	2,241
M:27519	15N 46E 17 CCBD	SHU	2,819	122	55						
M:149285	15N 46E 18 CDBD	SHU	2,782	54	54	35.34	2,747				
M:27520	15N 46E 19 CBDA	SHU	2,825	138	68			49.3	8.4	2,480	2,232
M:27523	15N 46E 23 ABAA	SHU	3,070	273	150	162.06	2,908				
M:700177	15N 46E 24 DDAB	DHU	3,192	380	360						
M:27508	15N 46E 31 BBBB	SHU	2,870	140	105			50.0	7.4	2,780	2,502
M:130097	15N 46E 33 BDAB	SHU	2,938	207	167			48.0	7.8	2,310	2,079

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M:27530	15N 47E 01 DDDD	DHU	3,070	207	207	19.91	3,050				
M:27531	15N 47E 02 BBBC	SHU	3,040	89	69	58.41	2,982	48.0	7.3	4,320	3,888
M:27533	15N 47E 05 CBBA	DHU	2,947	1,200	1,200						
M:27539	15N 47E 11 ABBC	SHU	3,122	76	54	22.89	3,099				
M:27545	15N 47E 18 BACD	SHU	3,015	300	102	99.31	2,916				
M:27542	15N 47E 18 DABA	SHU	3,082	151	130	89.98	2,992	55.0	6.6	2,120	1,908
M:151285	15N 47E 18 DABA	SHU	3,082	89	89	80.63	3,001				
M:27546	15N 47E 19 DACB	SHU	3,209	220	190	134.33	3,075	52.9	7.3	1,340	1,206
M:27555	15N 48E 04 CABB	SHU	3,239	12	12	4.22	3,235				
M:145264	15N 48E 04 CABB	SHU	3,239	52	32	7.04	3,232				
M:27556	15N 48E 04 CDDD	SHU	3,197	35	35	6.29	3,191				
M:27560	15N 48E 08 ADBB	SHU	3,219	44	22	13.79	3,205				
M:27563	15N 48E 10 ADAD	SHU	3,203	110	110			46.6	7.6	811	730
M:27562	15N 48E 10 CDCB	SHU	3,152	67	67	40.09	3,112	47.1	7.9	563	
M:151278	15N 48E 15 ACBC	SHU	3,158	80	80			47.5	7.5	788	709
M:27570	15N 48E 17 DACB	SHU	3,212	257	190	137.79	3,074				
M:27574	15N 48E 24 BBAD	SHU	3,000	148	119	31.07	2,969	52.3	7.7	1,860	1,674
M:151275	15N 48E 24 CABD	SHU	2,955	157	157	101.86	2,853	48.4	8.1	1,120	1,008
M:143945	15N 48E 30 CDBB	SHU	3,360	160	160						
M:151274	15N 48E 31 CABC	SHU	3,139	58	58	40.78	3,098	48.2	7.9	784	706
M:27575	15N 48E 34 DBCB	SHU	2,895	42	40	16.95	2,878				
M:27579	15N 49E 13 CBBD	SHU	3,038	40	10	13.39	3,025	44.1	7.5	1,150	1,035
M:149280	15N 49E 14 AADC	SHU	3,055	45	45	13.87	3,041	43.3	7.8	1,060	954
M:27581	15N 49E 14 BCAA	SHU	3,127	151	51	73.50	3,054	47.5	7.8	1,040	936
M:152194	15N 49E 14 BCAA	SHU	3,127	140	140	94.37	3,033				
M:27580	15N 49E 14 BCAC	SHU	3,139	420	135	91.46	3,048				
M:27582	15N 49E 18 CBBD	SHU	2,979	50	30	17.56	2,961	45.9	7.3	2,110	1,899
M:27583	15N 49E 21 CABA	SHU	2,945	55	55	28.17	2,917	50.2	7.9		
M:152673	15N 49E 21 CACC	SHU	2,950	56	56	44.08	2,906	50.5	6.8	1,313	1,182
M:27585	15N 49E 22 CBCC	SHU	2,940	116	116			48.2	7.7	1,837	1,653
M:27552	15N 49E 28 ACAB	SHU	2,890	25	25			42.4	7.6	1,295	1,166
M:27587	15N 49E 28 ACBA	SHU	2,901	40	40	21.85	2,879	47.3	7.4	1,916	1,724
M:27589	15N 49E 28 BDAC	DHU	2,949	261	221			48.4	8.2	3,470	3,123
M:145265	15N 50E 03 BBBC	SHU	2,960	70	50	27.07	2,933	49.3	7.8	1,210	1,089
M:149289	15N 50E 03 BCBA	SHU	2,941	35	35	19.25	2,922	55.9	7.6	1,330	1,197
M:1990	15N 50E 17 CAAA	SHU	3,057	121	104	80.95	2,976				
M:27607	15N 50E 19 BBBA	SHU	2,960	110	96	35.82	2,924	49.1	7.9	1,214	1,093
M:27608	15N 50E 19 DBCB	SHU	2,920	98	15	10.88	2,909	47.8	7.3	1,962	1,766
M:131737	15N 50E 19 DDAB	SHU	2,885	180	35	16.33	2,869				
M:138949	15N 50E 20 CCDA	SHU	2,883	67	15	6.95	2,876	46.0	7.7	1,630	1,467
M:27611	15N 50E 23 AACC	SHU	2,857	50	38	25.64	2,831	49.3	7.8	1,893	
M:700179	15N 50E 23 CDDD	SHU	2,935	212	186	91.60	2,843	50.4	7.8	1,730	1,557
M:27612	15N 50E 24 BABC	SHU	2,830	40	40			46.4	7.8	1,690	1,521
M:27613	15N 50E 24 BBAA	SHU	2,835	40	40	14.87	2,820	46.0	7.8	1,610	1,449
M:27615	15N 50E 25 ABAD	DHU	2,862	266	224						
M:27620	15N 50E 31 DDDD	SHU	2,807	190	170	109.38	2,698	51.8	8.3	2,910	
M:149284	15N 50E 32 CDBA	SHU	2,810	170	170	135.44	2,675				
M:27627	15N 51E 05 DCBD	SHU	2,859	144	144	82.05	2,777				
M:27630	15N 51E 06 ACCD	SHU	2,850	35	35	7.06	2,843	44.6	7.6	1,200	1,080
M:27629	15N 51E 06 ACCD	SHU	2,845	31	31	7.57	2,837				
M:27650	15N 51E 34 ABCA	SHU	2,671	88	77	35.21	2,636	48.6	7.7	2,600	
M:27655	15N 52E 04 BCCB	SHU	2,720	93	88	34.50	2,686				
M:27663	15N 52E 09 BAAA	SHU	2,790	160	80	66.58	2,723				
M:27670	15N 52E 17 DDBD	SHU	2,802	163	152	136.08	2,666	52.7	7.9	2,080	1,872
M:27671	15N 52E 18 ADBB	SHU	2,804	158	138	116.12	2,688				
M:27686	15N 52E 35 BBCD	SHU	2,828	34	22	19.28	2,809				
M:136679*	15N 53E 12 ABAB	DHU	2,608	317	317	133.05	2,475				
M:136680*	15N 53E 12 ABAB	SHU	2,608	193	193	82.13	2,526				
M:138227	15N 53E 12 ABAB	SHU	2,608			80.43	2,528				
M:130335	15N 53E 25 DAAB	SHU	2,550	68	58	55.91	2,494	48.9	7.5	587	
M:148598	15N 53E 25 DABD	SHU	2,540	116	116	56.18	2,484				
M:130336	15N 53E 25 DACD	SHU	2,530	120	100	27.07	2,503	50.0	7.5	725	653
M:143804*	15N 53E 26 CABC	DHU	2,515	221	221	78.37	2,437				
M:143803*	15N 53E 26 DABC	SHU	2,540	41	41	33.54	2,506				
M:138225	15N 53E 34 AABA	SHU	2,467			32.12	2,435	48.4	8.5	1,412	1,271

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:27717	15N 53E 34 DBA	SHU	2,550	50	50	37.10	2,513	49.3	7.8	1,251	
M:148617	15N 54E 02 DABC	SHU	2,470	84	84	51.42	2,419	49.1	7.8	576	518
M:27719	15N 54E 02 DACD	DHU	2,460	345	273	266.59	2,193	55.8	9.2	943	
M:27720	15N 54E 02 DADB	SHU	2,460	150	95	62.06	2,398	52.3	8.0	559	
M:140722	15N 54E 10 BBBA	SHU	2,500	75	75	26.00	2,474				
M:128162	15N 54E 20 DCBB	SHU	2,515	60	40	28.85	2,486	49.1	7.8	715	644
M:27724	15N 54E 23 DDCD	SHU	2,410	176	164	137.20	2,273	55.2	7.0	409	368
M:27725	15N 54E 24 ACBD	SHU	2,240	25	25	10.28	2,230	52.5	7.8	742	668
M:27726	15N 54E 24 ACBD	SHU	2,240	25	25						
M:27727	15N 54E 24 DAAB	SHU	2,210	14	12						
M:27730	15N 54E 24 DAAC	SHU	2,210	90	70						
M:137984	15N 54E 24 DAAD	SHU	2,200			5.70	2,194	54.5	7.1	740	666
M:27728	15N 54E 24 DAAD	SHU	2,200	122	82	6.88	2,193				
M:27729	15N 54E 24 DAAD	SHU	2,210	22	8						
M:27743	15N 54E 36 ACAB	SHU	2,200	33	29			53.4		1,128	1,015
M:27742	15N 54E 36 ACAC	SHU	2,200	62	62			52.7	7.5	1,637	1,473
M:27797	15N 55E 06 ACAA	FHHC	2,318	330	310	200.09	2,118	53.6	9.4	1,046	941
M:27801	15N 55E 08 ACBB	SHU	2,190	148	118	60.53	2,129	53.8	9.3	979	881
M:27811	15N 55E 11 BBDA	SHU	2,190	170	160	126.20	2,064	52.9	7.8	2,490	
M:27813	15N 55E 11 BCCD	SHU	2,160	140	120	77.43	2,083				
M:27814	15N 55E 11 DDDC	SHU	2,210	200	180	106.93	2,103	51.6	8.7	2,070	1,863
M:27815*	15N 55E 12 ABDC	SHU	2,160	785	170	60.60	2,099	54.0	8.9	2,040	
M:140931	15N 55E 16 BCCA	SHU	2,130	17	17						
M:140932	15N 55E 17 AADD	SHU	2,130	52	52	15.50	2,115				
M:27831	15N 55E 19 CADA	SHU	2,183	29	24	10.40	2,173	50.5	7.7	850	765
M:27836	15N 55E 20 DDDD	SHU	2,130	28	22						
M:152660	15N 55E 22 CACA	SHU	2,110	40	40	34.77	2,075	50.9	8.3	2,120	
M:27857	15N 55E 30 BDAA	SHU	2,170	50	31	24.62	2,145	53.4	7.6	895	
M:151193	15N 55E 30 BDAC	SHU	2,180	40	40	8.25	2,172				
M:152197	15N 55E 30 BDBC	SHU	2,190	40	40	10.47	2,180	50.2	8.0	850	765
M:27869	15N 55E 33 BBBB	SHU	2,075	24	19			52.7	7.0	2,240	
M:140721	15N 56E 18 ACAB	SHU	2,460			4.20	2,456	41.4	7.8	2,981	2,683
M:27885	15N 57E 04 BCBC	SHU	2,403	95	80	29.82	2,373	48.7	7.5	4,900	
M:137985	15N 57E 04 DCCA	FHHC	2,442	262	262			49.8	7.9	7,040	6,336
M:27886	15N 57E 04 DCCA	SHU	2,438			13.12	2,425				
M:137986	15N 58E 17 ADCD	SHU	2,592			67.20	2,525				
M:27920	15N 58E 26 DABD	SHU	2,680	50	50	13.60	2,666				
M:27921	15N 58E 28 CADC	DHU	2,593	700	700			57.9	8.8	1,850	1,665
M:137987*	15N 59E 02 AAAA	SHU	2,758	155	155	61.47	2,697				
M:137988	15N 59E 02 DDAA	UNK	2,682					49.8	8.4	3,050	2,745
M:132760	15N 59E 02 DDCC	DHU	2,704	275	264			44.8	8.3	2,600	2,340
M:27926	15N 59E 03 ADAA	DHU	2,740	260	240						
M:27932	15N 59E 10 ACDB	DHU	2,715	270	240						
M:142635	15N 59E 12 DADA	SHU	2,710	150	150	120.43	2,590				
M:27954	15N 59E 24 CDBD	SHU	2,595	120	100	11.66	2,583	49.6	8.6	2,210	1,989
M:140719	15N 59E 34 ADAC	UNK	2,727			66.50	2,661				
M:27989	15N 60E 18 ABDD	SHU	2,557	110	80	-13.20	2,570	47.5	7.0	2,510	
M:27990	15N 60E 18 DBBB	SHU	2,562	90	90	-4.37	2,566	47.3	8.0	2,400	2,160
M:143802	15N 60E 18 DDDD	UNK	2,650								
M:27995	15N 60E 20 DDAB	DHU	2,650	260	240	76.20	2,574	50.0	8.2	3,050	2,745
M:149898	15N 60E 22 DDBC	SHU	2,660	24	24	11.81	2,648	50.5	7.7	1,660	1,494
M:142789	15N 60E 26 AAAB	SHU	2,730	38	38						
M:152305	15N 60E 26 BBBB	SHU	2,710	58	53						
M:142636*	15N 60E 26 BBBB	SHU	2,715	170	170	45.30	2,670				
M:142788	15N 60E 32 ABBB	SHU	2,750	50	50						
M:143944	15N 60E 32 ABBB	SHU	2,750	51	51						
M:701007	15N 60E 35 DCCC	DHU	2,765	354	354	171.48	2,594				
M:701008	15N 60E 35 DCCC	SHU	2,765	138	138	69.98	2,695				
M:701009	15N 61E 30 AAAA	DHU	2,655	299	299	84.55	2,570				
M:701010	15N 61E 30 AAAA	SHU	2,655	66	66	37.86	2,617				
M:701011	15N 61E 30 CCCC	SHU	2,700	120	120	37.21	2,663				
M:141005	16N 45E 03 BCAD	SHU	2,650	100	75	40.98	2,609	49.3	7.5	2,950	2,655
M:149287	16N 45E 03 BCDB	SHU	2,648	72	72	27.31	2,621				
M:28738	16N 45E 06 BABD	SHU	2,695	165	147						
M:134411	16N 45E 14 DDDA	SHU	2,750	153	105	82.07	2,668	49.8	7.3	4,220	3,798

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M:28741	16N 45E 14 DDDD	DHU	2,745	315	315	114.52	2,630	52.5	9.0	2,090	1,881
M:132736	16N 45E 20 ABAD	SHU	2,710	168	153	59.05	2,651				
M:132738*	16N 45E 20 CBDB	SHU	2,690	145	105	46.84	2,643				
M:132737*	16N 45E 20 CBDB	SHU	2,690	145	115	46.64	2,643				
M:28745	16N 45E 22 DCCD	DHU	2,905	400	400						
M:700189	16N 45E 26 AAAC	SHU	2,805	100	100	52.50	2,753				
M:132740	16N 45E 29 DCCC	SHU	2,770	172	154	95.32	2,675				
M:28748	16N 45E 30 BDDA	SHU	2,664	120	120	36.31	2,628				
M:28747	16N 45E 30 BDDA	DHU	2,664	400	400	101.80	2,562	50.9	8.9	2,450	2,205
M:132741	16N 45E 34 ACAA	SHU	2,750	141	141	44.96	2,705				
M:140883	16N 47E 08 ABAB	SHU	2,780	75	75			49.1	7.7	3,100	2,790
M:28793	16N 47E 09 ACC	DHU	2,920	360	300			53.6	7.3	3,700	3,330
M:28803	16N 47E 15 CBA	SHU	2,825	112	102	54.85	2,770				
M:28804	16N 47E 16 DBAA	SHU	2,819	64	36	24.47	2,795	47.3	7.7	3,000	2,700
M:143807	16N 47E 21 DAAD	SHU	2,850	60	60						
M:28818	16N 47E 34 DAAD	SHU	3,042	92	72			48.4	7.1	2,160	1,944
M:28833	16N 48E 12 CCAA	SHU	3,039	40	40	20.36	3,019				
M:28835	16N 48E 13 BACB	DHU	3,077	217	217	183.13	2,894	52.0	7.4	1,200	1,080
M:149615	16N 48E 23 AACC	SHU	3,090	24	24	19.73	3,070	53.1	7.4	1,410	1,269
M:149578	16N 48E 23 AADB	SHU	3,077					50.9	7.8	686	617
M:28848	16N 48E 32 CBDC	SHU	3,121	146	124	111.84	3,009	49.6	7.6	1,450	1,305
M:28849	16N 48E 32 CCCC	SHU	3,117	160	100	116.70	3,000				
M:28851	16N 48E 33 ABBD	SHU	3,143	148	122	89.61	3,053	50.4	7.1	2,510	2,259
M:149340	16N 48E 34 BACD	SHU	3,190	121	121	97.52	3,092	49.5	7.2	1,470	1,323
M:28855	16N 49E 05 ABAB	SHU	2,964	70	70			47.8	7.4	1,170	1,053
M:700191	16N 49E 07 ADBD	SHU	3,041	136	136	93.59	2,947	48.6	7.5	960	864
M:28858	16N 49E 11 DACC	SHU	3,095	168	40	20.87	3,074	50.5	7.8	1,220	1,098
M:28860	16N 49E 13 DACC	SHU	3,262	159	148	64.98	3,197				
M:149283	16N 49E 20 BDBB	SHU	3,405	166	166	81.69	3,323				
M:149282	16N 49E 21 AABA	SHU	3,287	44	44	9.58	3,277	42.8	7.9	860	774
M:149281	16N 49E 21 AADA	SHU	3,272	72	72	23.09	3,249				
M:28880	16N 50E 03 CDDA	SHU	3,169	210	170			47.3	7.6	1,460	1,314
M:28881	16N 50E 04 DDAD	SHU	3,207	47	29	4.35	3,203	47.3	7.4	976	878
M:28883	16N 50E 05 BCDD	SHU	3,368	170	128	64.40	3,304				
M:143795*	16N 50E 06 DDCD	DHU	3,290	380	380	290.98	2,999				
M:28888	16N 50E 15 BCBD	SHU	3,199	148	136	62.31	3,137	47.7	7.5	1,020	918
M:28891	16N 50E 19 ABBB	SHU	3,255	200	69	67.56	3,187				
M:149290	16N 50E 19 BAAA	SHU	3,219	70	70	17.53	3,201				
M:149288	16N 50E 20 BCDD	SHU	3,202	116	116	85.55	3,116	49.6	7.2	1,251	
M:28893	16N 50E 25 CCBC	DHU	2,949	268	268	37.01	2,912				
M:149291	16N 50E 34 CBDA	SHU	2,972	88	88	19.67	2,952	46.9	8.0	1,780	1,602
M:28898	16N 50E 36 DAAB	SHU	2,895	60	54			46.8	7.5	1,330	1,197
M:28907	16N 51E 07 ACDC	SHU	2,930	83	73	35.07	2,895	48.6	7.3	1,309	
M:28909	16N 51E 09 DADD	SHU	2,853	58	38	41.31	2,812	49.6	7.1	1,239	1,115
M:143806	16N 51E 10 BBBC	SHU	2,830	31	31	8.47	2,822	48.0	7.3	1,577	
M:2066	16N 51E 12 ABBA	SHU	2,881	120	120	74.56	2,806	50.7	7.5	922	
M:28929	16N 51E 31 BCDB	SHU	2,900	45	45	12.37	2,888	48.9	7.7	1,100	990
M:28930	16N 51E 31 CCCA	SHU	2,878	130	45	33.34	2,845	50.7	7.8	1,230	1,107
M:149292	16N 51E 31 CCCA	SHU	2,878	20	20	14.62	2,863				
M:28931	16N 51E 32 CDDB	DHU	2,953	238	238	167.41	2,786				
M:28932	16N 51E 33 DCCC	SHU	2,859	38	30	9.34	2,850				
M:28933	16N 51E 36 DABD	SHU	2,795	82	61	35.79	2,759	48.9	7.0	3,030	
M:138223*	16N 51E 36 DCCC	DHU	2,880	202	202	152.11	2,728				
M:129199	16N 52E 01 ADDA	SHU	2,575	140	120	27.98	2,547	47.1	7.1	2,240	2,016
M:28935	16N 52E 02 BBDC	SHU	2,630	121	101	38.83	2,591	48.6	9.4	1,175	1,058
M:2067	16N 52E 06 DDAB	SHU	2,761	41	41	5.26	2,756	44.6	7.3	1,550	
M:2068	16N 52E 18 ABBB	SHU	2,799	53	33	24.03	2,775	48.7	7.8	1,003	
M:28952	16N 52E 22 BDCD	SHU	2,775	120	60	42.41	2,733				
M:28962	16N 52E 32 ADCC	SHU	2,700	118	77	42.11	2,658	47.8	6.9	2,680	2,412
M:149293	16N 52E 32 CCAA	SHU	2,739	90	90	46.38	2,693	50.7	7.4	2,870	2,583
M:138220	16N 53E 03 CCAB	SHU	2,520			30.36	2,490	49.1	6.9	3,030	2,727
M:28987	16N 53E 20 ADCB	SHU	2,742	132	122	15.90	2,726				
M:28988	16N 53E 27 CADD	SHU	2,790	108	83	61.54	2,728	48.0	8.1	291	262
M:28994	16N 54E 04 DDCB	SHU	2,585	16	16	10.67	2,574				
M:28995	16N 54E 05 AAAA	SHU	2,670	180	180	96.18	2,574				

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M:29001	16N 54E 11 DBBA	SHU	2,530	107	107						
M:138216	16N 54E 12 CBDB	SHU	2,502			53.34	2,449				
M:29007	16N 54E 28 BBAC	SHU	2,367	120	90	28.69	2,338	50.0	8.1	3,150	2,835
M:29011	16N 54E 35 BBDD	SHU	2,280	150	110	62.20	2,218	50.4	8.5	1,336	
M:29035	16N 55E 08 BADD	SHU	2,238	62	62						
M:29039	16N 55E 09 BABC	SHU	2,170	133	133	55.53	2,114	51.1	8.6	2,260	2,034
M:29041	16N 55E 09 BBAC	SHU	2,190	125	50	54.39	2,136				
M:29042	16N 55E 10 CBAA	SHU	2,190	81	70	93.83	2,096				
M:29057	16N 55E 12 ABAA	SHU	2,065	117	97	11.25	2,054	50.4	8.8	1,733	1,560
M:702375	16N 55E 12 ABBB	SHU	2,075	30	30	10.02	2,065	50.4	6.8	3,460	
M:148181	16N 55E 19 BABD	DHU	2,456	204	204	148.38	2,308	53.2	8.9	1,591	1,432
M:29072	16N 55E 19 BADB	SHU	2,456	126	126	56.61	2,399	52.2	8.5	749	
M:29077	16N 55E 22 BDCD	DHU	2,170	231	210	103.80	2,066	52.2	8.9	1,311	1,180
M:29115*	16N 55E 26 CBCC	SHU	2,050	30	27	11.04	2,039				
M:121589*	16N 55E 27 ADCB	SHU	2,105	70	45	51.80	2,053				
M:137983	16N 55E 27 BBDD	DHU	2,130	240	240	82.73	2,047	52.5	9.1	1,352	1,217
M:29195	16N 55E 28 BDBB	SHU	2,163	111	92	47.66	2,115	50.9	9.1	1,167	1,050
M:29205	16N 55E 28 DDCB	SHU	2,120	40	34	28.91	2,091	52.2	7.3	1,171	1,054
M:148631	16N 55E 31 DDBD	SHU	2,190	80	68	52.69	2,137	50.5	8.2	1,138	
M:129200	16N 55E 32 BCDD	SHU	2,163	120	100	43.70	2,119	53.6	8.8	1,762	1,586
M:29230	16N 55E 33 ABBB	SHU	2,130	180	180	79.03	2,051	50.5	8.5	1,834	1,651
M:29229	16N 55E 33 ADBC	SHU	2,120	203	120	56.10	2,064	51.6	9.2	1,302	1,172
M:129627	16N 55E 34 ABA	SHU	2,058	20	5	13.17	2,045				
M:29266	16N 55E 34 BADB	SHU	2,060	125	105	10.40	2,050				
M:29273	16N 55E 34 BBCB	SHU	2,090	100	60						
M:29270	16N 55E 34 BBCB	SHU	2,095	24	18	10.09	2,085				
M:29312	16N 55E 35 BDBC	SHU	2,050	21	9	7.93	2,042				
M:29318	16N 55E 36 BBBA	SHU	2,085	38	34			51.3	8.5	2,390	2,151
M:29320	16N 56E 02 CCDC	SHU	2,410	140	120	99.90	2,310	54.0		434	391
M:29331	16N 56E 07 BABB	SHU	2,055	220	145			51.1	8.8	1,679	1,511
M:29332	16N 56E 07 BABB	SHU	2,055	21	17	5.05	2,050				
M:29333	16N 56E 07 BBBC	DHU	2,060	220	200	-11.64	2,072	50.9	8.8	1,681	1,513
M:29339	16N 56E 18 DACA	DHU	2,070	300	260	11.93	2,058	52.7	9.0	1,780	1,602
M:29371	16N 56E 34 BDCB	SHU	2,188	186	146	35.68	2,152	55.8	9.1	2,390	2,151
M:29370	16N 56E 34 BDCB	SHU	2,190	135	135	37.60	2,152				
M:29376	16N 56E 35 BDAA	SHU	2,210	152	120	46.57	2,163	51.6	9.0	1,768	1,591
M:29392	16N 57E 34 DDDB	SHU	2,600	20	20	6.44	2,594				
M:29393	16N 57E 34 DDDC	FHHC	2,621	340	340			56.5	8.4	1,899	1,709
M:29406	16N 58E 23 DDCC	SHU	2,435	120	120	1.25	2,434				
M:137989	16N 58E 24 DCDD	UNK	2,528								
M:29408	16N 58E 26 AAAA	SHU	2,488	132	132			49.5	8.6	1,780	1,602
M:120632	16N 58E 30 DCAD	DHU	2,575	315	275	186.30	2,389	48.2	7.1	1,918	
M:29414	16N 59E 08 BDAD	SHU	2,470	50	50	18.80	2,451				
M:137990	16N 59E 20 BCCC	UNK	2,542					51.8	8.4	2,080	1,872
M:29430	16N 59E 22 CCAB	SHU	2,559	170	170	51.45	2,508	49.8	8.1	2,390	2,151
M:29436	16N 59E 27 BAAA	SHU	2,568	74	74	34.35	2,534				
M:127954	16N 59E 30 DCAB	DHU	2,490	310	298	96.13	2,394	52.5	8.5	2,020	1,818
M:29448	16N 60E 06 ADDD	SHU	2,483			24.65	2,459				
M:122938	16N 60E 06 ADDD	SHU	2,484	140	20	24.65	2,459				
M:140720	16N 60E 06 DDBA	UNK	2,535			65.80	2,469				
M:29464	16N 60E 20 CBBC	DHU	2,645	500	420	43.96	2,601	48.7	6.5	2,680	2,412
M:137991	16N 60E 20 CBBC	UNK	2,643			44.10	2,599				
M:29468	16N 60E 22 ADCB	DHU	2,499	370	370	43.60	2,455	51.1	8.6	2,730	2,457
M:144621	16N 60E 34 BBCC	UNK	2,500					48.4	8.7	2,400	2,160
M:144397	16N 60E 34 BBCC	UNK	2,500					49.3	8.7	2,400	
M:30207	17N 50E 02 DBDC	SHU	3,012	192	152	89.77	2,922				
M:148182	17N 50E 02 DBDC	SHU	3,012	200	180	25.18	2,987	47.1	6.3	2,190	1,971
M:30208	17N 50E 03 ADBD	DHU	3,115	277	267	209.24	2,906	50.5	7.6	932	839
M:30209	17N 50E 24 AACB	SHU	2,911	77	57	30.66	2,880				
M:30210	17N 50E 24 BCCD	SHU	2,947	98	80	36.60	2,910	46.9	7.4	1,150	1,035
M:30211	17N 50E 24 CBBB	SHU	2,942	96	76	33.49	2,909	50.0	7.4	1,230	1,107
M:30213	17N 50E 26 CCCD	SHU	2,918	24	24	7.31	2,911	49.3	7.5	1,930	1,737
M:30219	17N 50E 28 BAAB	SHU	2,983	50	50	14.23	2,969	45.5	7.5	559	503
M:30232	17N 51E 05 CBDA	SHU	2,858	32	20			45.7	7.7	716	644
M:30235	17N 51E 06 DBDA	SHU	2,875	80	80	13.27	2,862	46.2	7.3	1,480	1,332

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:30240	17N 51E 11 BACD	DHU	2,880	220	210	108.03	2,772				
M:133059	17N 51E 11 BACD	SHU	2,881	125	111	107.87	2,773	50.5	7.1	1,850	1,665
M:702409	17N 51E 13 BADB	SHU	2,777	42	42			50.4	7.3	1,130	1,017
M:30243	17N 51E 13 DDDD	SHU	2,698	56	42	21.37	2,677	50.9	7.6	1,730	1,557
M:149616	17N 51E 14 DCDD	SHU	2,716	45	45	12.62	2,703	48.0	7.4	2,420	2,178
M:30245	17N 51E 25 DCBC	SHU	2,741	90	90	26.07	2,715				
M:30250	17N 51E 32 BBAA	SHU	3,025	216	196	169.26	2,856	49.3	7.1	2,210	1,989
M:30251	17N 51E 35 DCAD	SHU	2,730	42	42	26.11	2,704				
M:702421	17N 52E 01 DDDD	SHU	2,540	26	26	8.61	2,531	46.4	8.0	707	636
M:133192	17N 52E 03 BBCC	SHU	2,610	200	180	59.21	2,551				
M:30266	17N 52E 12 CBAB	SHU	2,587	36	36	26.47	2,561	46.4	8.0	1,186	1,067
M:30272	17N 52E 20 CDDD	SHU	2,645	28	21	16.60	2,628	47.5	7.4	2,830	2,547
M:30275	17N 52E 25 DABD	SHU	2,664	116	106	93.62	2,570	50.2	7.1	3,410	3,069
M:30276	17N 52E 26 DDAA	DHU	2,685	300	280			51.6	8.7	2,200	1,980
M:30280	17N 52E 33 BABA	SHU	2,610	85	60	17.73	2,592	47.3	8.6	1,674	1,507
M:30281	17N 52E 34 CDAC	SHU	2,658	115	115	78.97	2,579	50.2	7.6	3,300	2,970
M:702422	17N 53E 01 CBAD	SHU	2,585	133	133	83.11	2,502				
M:149438	17N 53E 06 DAAD	SHU	2,529	80	80	36.33	2,493				
M:127030	17N 53E 08 CBCC	SHU	2,543	140	120	35.98	2,507	47.5	8.2	3,560	3,204
M:702410	17N 53E 13 BACB	SHU	2,425	33	33	21.81	2,403	50.0	7.9	2,550	2,295
M:137915	17N 53E 13 BBAD	SHU	2,425	200	100	26.48	2,399	49.1	8.1	2,400	2,160
M:30286	17N 53E 13 BBDD	SHU	2,423	40	20	16.22	2,407	48.2	7.7	3,270	2,943
M:30292	17N 53E 18 CABB	SHU	2,638	108	108	82.42	2,556				
M:702392	17N 53E 28 CCAA	SHU	2,680	140	140	86.21	2,594				
M:30296	17N 53E 31 ACDA	SHU	2,568	60	60	24.51	2,543	53.8	7.7	756	680
M:30297	17N 53E 36 BCAB	SHU	2,760	120	120	21.05	2,739				
M:30301	17N 54E 14 ADDD	SHU	2,545	100	80	19.27	2,526	48.2	7.7	891	802
M:30304	17N 54E 17 ACDC	FHHC	2,520	840	760						
M:138214	17N 54E 19 DAAA	SHU	2,363			13.60	2,349	51.4	7.4	3,370	
M:149144	17N 54E 19 DAAC	SHU	2,345	10	10			45.9	7.6	2,270	
M:149425	17N 54E 19 DAAC	SHU	2,345	10	10			45.9	7.6	2,270	2,043
M:137916	17N 54E 20 CBCC	DHU	2,352	248	248			54.0	8.9	1,615	1,454
M:149372	17N 54E 29 ACDB	SHU	2,340	125	125	86.41	2,254	53.2	8.8	2,400	
M:30309	17N 54E 29 ACDD	SHU	2,340	120	105	86.61	2,253				
M:30317	17N 55E 05 DBAD	SHU	2,240	80	35	10.30	2,230	48.2	7.4	2,310	2,079
M:121673	17N 55E 10 CBDC	FHHC	2,160	720	540	38.77	2,121				
M:30318	17N 55E 11 DDDB	FHHC	2,075	600	550	-24.31	2,099	58.8	8.8	1,754	
M:140723	17N 55E 14 CDDD	SHU	2,120	90	90	49.42	2,071				
M:30333	17N 55E 23 DBBB	FHHC	2,083	660	527	-12.33	2,095	55.0	8.9	1,868	1,681
M:30332	17N 55E 23 DBDD	DHU	2,070	320	300	38.77	2,031	54.0	9.0	1,679	1,511
M:138210	17N 55E 26 BBAC	FHHC	2,083			-5.14	2,088	55.0	8.9	1,675	1,508
M:30344	17N 56E 04 CABA	FHHC	2,020	520	470			55.6	8.8	1,775	1,598
M:30345	17N 56E 07 CBAD	SHU	2,052	54	42	35.04	2,017	48.7	8.5	1,620	1,458
M:30346	17N 56E 09 DCCB	FHHC	2,060	620	560			57.4	8.7	1,809	1,628
M:137992	17N 56E 17 BDAA	FHHC	2,024			-100.68	2,125	55.4	9.3	2,170	1,953
M:137993	17N 57E 02 DCCC	SHU	2,434			18.98	2,415				
M:137994	17N 57E 13 AADB	DHU	2,374			194.93	2,179				
M:30359	17N 57E 23 BBAB	FHHC	2,216	920	840	4.48	2,212	52.2	9.3	1,929	1,736
M:30360	17N 57E 24 CBBD	DHU	2,331	385	280			52.3	8.4	2,150	1,935
M:30367	17N 58E 07 ABDC	FHHC	2,201	840	756	-7.47	2,208	58.6	8.7	1,774	1,597
M:30381	17N 58E 24 CCAB	FHHC	2,305	1,025	1,025			61.0	7.9	1,765	1,589
M:30388	17N 59E 04 CCBC	DHU	2,470	350	350			52.7	8.7	1,870	1,683
M:30394	17N 59E 08 CDBB	SHU	2,378	140	100	45.15	2,333	46.0	6.9	3,580	3,222
M:149414	17N 59E 26 BBCB	SHU	2,490	80	80			60.6	7.4	1,019	
M:134417	17N 59E 26 DAAC	DHU	2,587	225	205	161.00	2,426	51.3	8.7	2,430	
M:30413	17N 59E 33 BBCB	FHHC	2,418	1,020	1,020			56.1	8.7	1,332	1,199
M:30417	17N 60E 08 ADCB	SHU	2,362	18	18			47.5	7.1	3,030	2,727
M:31399	18N 50E 02 ACCB	DHU	2,805	258	248						
M:31400	18N 50E 02 BCCC	SHU	2,780	145	130						
M:31398	18N 50E 02 DBDA	SHU	2,855	110	104						
M:123443	18N 50E 03 DBBA	SHU	2,765	75	60						
M:137968	18N 50E 04 ABD	SHU	2,790			48.31	2,742				
M:31401	18N 50E 04 ABDD	SHU	2,785	100	78	49.35	2,736				
M:137969*	18N 50E 16 CBBB	SHU	2,785	161	161	46.80	2,738				
M:31413	18N 50E 34 DDAD	SHU	3,030	168	168	51.05	2,979				

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:702428	18N 50E 34 DDAD	DHU	3,030	355	355	198.62	2,831	52.5	7.7	1,350	1,215
M:702427	18N 50E 34 DDBA	SHU	2,998	22	22	8.53	2,989				
M:137970	18N 51E 07 BC	DHU	3,010			177.48	2,833				
M:133061	18N 51E 09 BAAB	SHU	2,974	80	47	21.14	2,953				
M:122312	18N 51E 15 ADDB	SHU	2,910	165	105	29.92	2,880	49.6	7.4	690	
M:31433	18N 51E 17 BDDB	SHU	3,025	120	110	96.67	2,928				
M:31434	18N 51E 18 ADCD	DHU	3,076	267	267	219.50	2,857				
M:31439	18N 51E 28 ADDA	DHU	2,902	308	308	137.39	2,765	51.4	8.4	1,440	1,296
M:147040	18N 51E 28 CDAD	SHU	2,876	80	70	28.59	2,847	49.1	7.6	1,030	927
M:149897	18N 51E 28 CDAD	SHU	2,870	41	41	29.77	2,840	51.6	7.4	1,080	972
M:31440	18N 51E 28 DDDA	SHU	2,860	36	36	24.84	2,835				
M:122313	18N 51E 28 DDDD	SHU	2,865	95	65	23.01	2,842	49.6	7.3	1,750	
M:149286	18N 51E 28 DDDD	SHU	2,860	60	60	24.96	2,835				
M:133062	18N 51E 32 ABAA	SHU	2,920	112	82	59.38	2,861	48.2	7.3	749	
M:149617	18N 51E 34 ADDC	SHU	2,803			18.94	2,784	48.9	7.2	1,210	1,089
M:131785	18N 52E 04 BBCC	SHU	2,595	69	58	13.31	2,582				
M:137971	18N 52E 14 CCCB	SHU	2,665	78	78	73.35	2,592				
M:31476	18N 52E 25 DCDB	SHU	2,563	117	32	13.01	2,550				
M:31477	18N 52E 26 BBBA	SHU	2,645	100	60	30.55	2,614				
M:137895	18N 52E 36 BABD	SHU	2,695	195	170						
M:31501	18N 53E 01 DDDA	SHU	2,652	86	86	59.52	2,592				
M:31496	18N 53E 19 DDBA	SHU	2,536	126	126	12.63	2,523				
M:137896	18N 53E 24 AABB	SHU	2,635	340	160	6.25	2,629				
M:31497	18N 53E 30 CDAD	DHU	2,638	244	244			51.8	8.8	1,775	1,598
M:149386	18N 53E 32 ABAB	UNK	2,498			-10.87	2,509	47.1	7.9	2,030	1,827
M:702426	18N 53E 35 CCCD	DHU	2,633	212	212	152.41	2,481				
M:31513	18N 54E 26 BCCC	SHU	2,450	83	63	18.24	2,432	51.6	7.5	1,207	
M:149356	18N 54E 26 CABC	SHU	2,440	34	34	12.24	2,428	45.0	7.5	1,565	
M:31514	18N 54E 26 CCBB	DHU	2,430	230	215	109.30	2,321	52.7	8.6	2,350	
M:31517	18N 54E 32 ACCB	SHU	2,775	197	147	100.04	2,675				
M:2221	18N 55E 02 BCBB	SHU	2,365	120	120	59.23	2,306				
M:31521	18N 55E 14 ADBC	SHU	2,402	137	126	38.83	2,363				
M:31527	18N 55E 22 CDAD	SHU	2,375	57	49	20.46	2,355				
M:31528	18N 55E 23 BCDD	SHU	2,418	109	99	87.26	2,331				
M:31534	18N 55E 27 BBBA	SHU	2,343	28	19	9.16	2,334	51.8	7.3	746	671
M:31536	18N 55E 28 AAAD	SHU	2,355	74	60			48.2	7.5	889	800
M:31538	18N 55E 29 AACD	SHU	2,454	167	147	55.10	2,399				
M:2223	18N 56E 04 CABA	SHU	2,430	104	104			50.0	7.7	906	
M:138004	18N 56E 04 DCCA	SHU	2,425	130	30	81.16	2,344				
M:2224	18N 56E 04 DCDA	SHU	2,425	170	44			49.5	7.1	1,225	
M:31564	18N 56E 25 ADBA	SHU	2,010	170	140	-16.26	2,026	53.1	8.6	2,290	
M:31565	18N 56E 25 ADBA	FHHC	2,010	580	555			56.3	8.8	1,749	
M:31567	18N 56E 33 ACBA	FHHC	2,075	582	522	-15.86	2,091	58.5	8.9	1,620	
M:31575	18N 57E 04 AABB	SHU	1,995	40	26	8.37	1,987	48.6	7.6	2,870	
M:135684	18N 57E 04 DCCD	SHU	2,005	40	34	10.20	1,995				
M:145844	18N 57E 09 CABC	SHU	2,020	18	18	8.00	2,012	55.2	7.6	1,007	
M:31588	18N 57E 09 CABC	SHU	2,000	33	15	9.55	1,990				
M:2231	18N 57E 11 DACB	FHHC	2,055	688	660			59.9	8.4	1,877	
M:137996	18N 57E 15 ACBA	FHHC	2,028			-119.76	2,148	58.1	8.7	1,816	1,634
M:137997	18N 57E 35 CAAA	SHU	2,320	26	26	12.40	2,308	47.3	7.1	5,880	5,292
M:31629	18N 58E 36 BCCC	SHU	2,458	120	120	37.30	2,421	60.8	7.0	2,380	
M:31630	18N 58E 36 DDCA	SHU	2,465	145	145	127.96	2,337				
M:31633	18N 59E 20 BCDC	DHU	2,322	500	220	38.98	2,283	51.4	6.9	3,260	
M:31634	18N 59E 20 BCDC	FHHC	2,322	1,286	1,200			60.8	8.8	1,795	
M:31639	18N 59E 32 BAAA	SHU	2,400	160	100	61.93	2,338	47.7	6.8	5,510	4,959
M:31640	18N 59E 32 DACC	DHU	2,520	260	220	96.51	2,423	49.8	6.8	3,500	
M:31648	18N 60E 09 ADDA	DHU	2,400	470	470	128.02	2,272				
M:31652	18N 60E 16 ACCB	DHU	2,285	230	200	73.08	2,212				
M:31653*	18N 60E 17 BDDC	SHU	2,260	140	140	63.53	2,196				
M:31656	18N 60E 20 DCDD	SHU	2,254					48.6	8.2	1,926	1,733
M:31658	18N 60E 28 BAAB	SHU	2,272	140	140	42.40	2,230				
M:137972	18N 60E 29 ABAA	SHU	2,262	133	133	31.68	2,230				
M:32531	19N 50E 12 DDBA	SHU	2,640	37	32	12.98	2,627	47.1	7.0	2,370	
M:32539	19N 50E 28 BABA	SHU	2,640	45	30	22.78	2,617	47.8	6.9	2,250	2,025
M:32561	19N 51E 24 DAAA	SHU	2,795	117	102	62.70	2,732				

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (μmhos)	Sum of Dissolved Constituents
M:32565	19N 51E 29 CBDD	SHU	2,955	116	46	45.43	2,910				
M:32566	19N 51E 29 CBDD	DHU	2,955	240	219	172.93	2,782				
M:32573	19N 52E 08 CDAD	SHU	2,855	174	154						
M:32574	19N 52E 09 CDDC	SHU	2,955	190	190	128.08	2,827				
M:32585	19N 52E 24 DAAC	SHU	2,850	80	80	51.55	2,798				
M:32612	19N 53E 13 CCCD	DHU	2,625	408	393	283.46	2,342	54.7	8.4	1,930	
M:32621	19N 53E 17 CCBB	SHU	2,700	122	107	55.42	2,645				
M:32629	19N 53E 23 AAAA	SHU	2,625	47	25	21.10	2,604	47.8	7.3	3,360	
M:32630	19N 53E 23 CAAA	SHU	2,710	190	160	137.91	2,572	50.5	7.5	1,253	
M:2384*	19N 53E 24 CCDC	SHU	2,715	220	180	143.37	2,572				
M:32638	19N 53E 32 DDDA	SHU	2,685	62	48	51.01	2,634	48.9	7.1	843	759
M:32639	19N 53E 32 DDDD	SHU	2,685	147	124						
M:32647	19N 54E 11 CCCC	SHU	2,490	24	16	13.11	2,477				
M:32661	19N 54E 22 DAAC	DHU	2,615	320	280	129.35	2,486				
M:137973*	19N 55E 08 DDDA	SHU	2,585	105	80	66.57	2,518	54.1	7.1	751	
M:32686	19N 55E 20 CADD	SHU	2,410	69	69			47.1	7.4	973	876
M:32685	19N 55E 20 DCBB	SHU	2,405	20	20	7.31	2,398				
M:32691	19N 55E 29 BCBC	SHU	2,508	90	55			47.8	7.4	814	733
M:140718	19N 56E 02 CCDA	DHU	2,240					44.6	7.0	2,650	2,385
M:137974	19N 56E 06 ABCD	DHU	2,505			153.07	2,352				
M:32697	19N 56E 10 DABC	SHU	2,180	42	15	6.70	2,173				
M:2389	19N 56E 26 CBCA	SHU	2,410	120	120			48.2	7.7	1,539	
M:32708	19N 56E 26 DDDD	SHU	2,397	61	46	38.18	2,359				
M:32717	19N 56E 35 BBBB	SHU	2,405	51	24	39.45	2,366				
M:32723	19N 57E 02 BABB	SHU	2,150	113	95						
M:32728	19N 57E 11 BADB	SHU	2,100	80	60			49.8	7.7	465	419
M:32729	19N 57E 11 CCCD	SHU	2,210	196	196						
M:137975	19N 57E 21 BABB	DHU	2,245	200	200	165.61	2,079	51.4	7.2	1,068	
M:149265	19N 57E 24 ACCC	SHU	1,960	180	180			50.9	8.4	2,390	2,151
M:32737	19N 57E 24 CCDD	SHU	1,975	118	114	10.62	1,964	47.7	7.3	1,813	1,632
M:32738	19N 57E 26 ADAA	FHHC	2,000	770	723	-140.15	2,140	60.4	8.7	1,654	1,489
M:32739	19N 57E 26 ADAA	SHU	2,000	42	26			50.0	7.3	4,200	3,780
M:149279	19N 57E 26 BCAB	FHHC	2,040	800	800	-97.02	2,137	56.8	8.9	1,827	1,644
M:52740	19N 57E 26 DCDD	SHU	1,980	35	35			51.6	7.5	1,950	1,755
M:32741	19N 57E 33 DCAD	FHHC	2,040	740	705	-71.61	2,112	56.1	8.9	1,874	1,687
M:32743	19N 57E 35 ABAC	SHU	2,000	20	15	10.97	1,989	46.4	7.4	2,050	
M:137998	19N 58E 05 BAAB	UNK	1,970					51.4	7.1	1,401	1,261
M:32752	19N 58E 07 AADA	DHU	1,965	875	840			59.2	8.5	1,877	1,689
M:2391	19N 58E 08 CBDB	FHHC	1,961	840	800	-167.48	2,128			1,791	
M:137999	19N 58E 18 DAAD	SHU	2,000	55	55				7.3	798	718
M:137995	19N 59E 34 ADBB	SHU	2,115			49.40	2,066	51.4	8.6	1,732	
M:32796	19N 60E 28 ABDD	SHU	2,294	180	160	104.79	2,189				
M:32797	19N 60E 28 ADCD	DHU	2,247	230	207	76.72	2,170	50.0	8.4	2,080	1,872
M:32800	19N 60E 32 ABAB	SHU	2,200	110	80	37.18	2,163	48.2	8.5	2,350	2,115
M:32803	19N 60E 34 BBCB	DHU	2,236	240	240	44.47	2,192	46.4	7.8	3,560	3,204
M:33994	20N 50E 14 CABA	SHU	2,460	55	55	30.14	2,430				
M:33995	20N 50E 14 CACD	SHU	2,460	59	49	5.91	2,454	52.7	6.9	2,100	1,890
M:33999	20N 50E 18 BDCA	SHU	2,455	164	156	81.60	2,373				
M:2494	20N 50E 18 CDDA	SHU	2,430	120	105						
M:34007	20N 50E 22 BCAD	SHU	2,465	44	40	27.00	2,438	47.3	7.3	3,010	2,709
M:34021	20N 51E 32 BCAD	SHU	2,622	116	40	42.50	2,580	46.6	7.1	984	886
M:138001*	20N 52E 17 BBBB	SHU	2,660	180	118	76.05	2,584				
M:137981	20N 52E 20 DBDD	SHU	2,790			91.24	2,699				
M:2495*	20N 53E 04 DAAA	DHU	2,790	280	201	141.89	2,648				
M:2496*	20N 53E 14 BBCC	DHU	2,745	206	206	87.78	2,657				
M:137977	20N 53E 20 BCBD	SHU	2,785			16.70	2,768				
M:2498	20N 53E 22 BCCC	DHU	2,780	240	220	106.36	2,674				
M:129240	20N 53E 32 DBBC	SHU	2,735	192	92	13.27	2,722				
M:34062	20N 54E 01 CBCC	SHU	2,690	88	68	53.03	2,637	47.1	7.3	1,813	1,632
M:34064	20N 54E 02 DADD	SHU	2,685	68	57	48.70	2,636				
M:34073	20N 54E 10 BAAA	DHU	2,775	300	280						
M:34086	20N 54E 31 AADA	SHU	2,680	240	90	75.56	2,604	48.2	6.7	3,230	
M:34087	20N 54E 31 AADC	DHU	2,695	310	235	130.00	2,565	50.7	7.6	3,250	
M:137980	20N 55E 06 BBBB	DHU	2,682	255	255	51.24	2,631				
M:2508*	20N 55E 32 AAAA	SHU	2,698	200	170	155.46	2,543				

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:2509	20N 55E 32 AAAA	SHU	2,690	112	82						
M:34158	20N 56E 24 CBDA	SHU	2,242	87	87	28.44	2,214	46.4	7.4	4,310	3,879
M:149477	20N 57E 02 DDAA	SHU	2,260	155	155	79.83	2,180				
M:700416	20N 57E 16 CDDD	DHU	2,380	273	273	230.48	2,150	52.0	8.4	2,360	2,124
M:2521	20N 57E 21 DCCB	DHU	2,370	392	392			48.7	8.7	2,190	
M:34203	20N 57E 24 CDBC	FHHC	2,130	1,110	1,050	-12.90	2,143	59.2	8.8	1,766	1,589
M:34224	20N 57E 30 ADDD	SHU	2,290	160	160			47.3	7.5	4,740	4,266
M:149473	20N 57E 30 DAAD	SHU	2,280	86	86	27.61	2,252	49.8	6.4	2,310	2,079
M:149476	20N 57E 30 DAAD	SHU	2,280					45.1	6.2	2,300	2,070
M:700420	20N 57E 30 DDAB	SHU	2,280	60	60	29.01	2,251	46.8	7.3	1,592	1,433
M:34259	20N 58E 14 DBCD	FHHC	1,935	1,247	1,117	-165.70	2,101	58.3	8.7	1,977	1,779
M:34263	20N 58E 19 ACDD	SHU	2,030	30	30	4.81	2,025	43.0	7.3		
M:140642	20N 58E 21 BBCB	SHU	1,990	38	38	27.26	1,963	50.5	7.4	1,249	
M:34274	20N 58E 28 BCDD	SHU	1,965	31	19	11.10	1,954	56.5	7.4	873	786
M:34279	20N 58E 29 DBDB	SHU	1,985	56	50	11.91	1,973				
M:34310	20N 58E 32 ADAD	SHU	1,990	32	25	20.07	1,970				
M:34306	20N 58E 32 ADAD	FHHC	1,980	1,008	950	-154.77	2,135	53.6	9.0	1,936	1,742
M:34293	20N 58E 32 ADDA	SHU	1,980	28	22	19.09	1,961	50.4	7.3	1,262	1,136
M:34303	20N 58E 32 ADDC	SHU	1,983	32	25	21.60	1,961	50.0	7.4	1,304	1,174
M:34326	20N 58E 33 BBDA	SHU	1,975	85	65	21.48	1,954	53.8	7.3	1,476	1,328
M:127032	20N 58E 33 BCAD	SHU	1,970	110	103	16.36	1,954	53.2	7.4	1,452	1,307
M:34348	20N 59E 24 CADC	FHHC	2,148	1,362	1,302	-4.70	2,153	52.3	8.7	1,793	1,614
M:702542	21N 50E 36 ABBB	SHU	2,465	44	44	38.92	2,426	50.2	7.2	2,120	1,908
M:149896	21N 50E 36 ACBB	SHU	2,510	112	112	61.93	2,448	55.0	7.1	2,210	1,989
M:149895	21N 51E 14 BABD	SHU	2,420	90	90	25.62	2,394	50.4	7.1	2,880	2,592
M:126581	21N 51E 19 BAAB	DHU	2,440	225	215	63.05	2,377	52.9	7.4	3,760	3,384
M:2626	21N 52E 17 CABC	SHU	2,470	38	38	16.30	2,454	48.2	7.4	1,038	
M:35050	21N 52E 32 DDAD	SHU	2,583	176	168	76.03	2,507	52.5	8.2	1,730	1,557
M:35064	21N 53E 06 CAAB	SHU	2,620	100	100	69.03	2,551	50.9	7.4	3,260	2,934
M:35065	21N 53E 06 CAAB	DHU	2,628	250	250	130.40	2,498	50.7	8.8	3,210	2,889
M:143805*	21N 53E 08 DABB	SHU	2,710	68	68	25.90	2,684	50.5	6.8	3,130	
M:35066	21N 53E 09 ADBD	SHU	2,780	90	90			49.5	7.8	1,664	1,498
M:35067	21N 53E 09 ADBD	SHU	2,780	196	196			50.0	7.5	1,746	1,571
M:136480	21N 53E 14 BBBC	SHU	2,875	13	13	4.13	2,871				
M:136482	21N 53E 14 BCBB	SHU	2,895	43	43	30.44	2,865				
M:136483	21N 53E 14 BCCC	SHU	2,920	43	43	27.05	2,893				
M:136521	21N 53E 14 CBBC	SHU	2,925	38	38	21.90	2,903				
M:136523	21N 53E 15 AAAC	SHU	2,875	13	13	4.05	2,871				
M:35073	21N 53E 17 ABAB	SHU	2,780	310	130	103.83	2,676				
M:149657	21N 53E 17 ABAB	DHU	2,780	310	310	221.76	2,558	53.1	7.6	2,050	1,845
M:2627	21N 53E 22 DAAB	SHU	2,870	128	128	59.05	2,811	47.3	7.0	2,100	
M:35090	21N 54E 08 DCCC	SHU	2,810	42	18	7.40	2,803	47.8	7.4	1,234	1,111
M:702566	21N 54E 12 BDDD	DHU	2,567	238	238			53.2	8.6	1,930	1,737
M:2630	21N 54E 22 CBDD	SHU	2,785	85	85	47.78	2,737	50.5	7.3	836	
M:2632	21N 54E 32 ABBB	DHU	2,750	250	250	87.01	2,663				
M:702538	21N 54E 33 DCAC	SHU	2,675	103	103			52.7	7.2	1,138	1,024
M:35099	21N 54E 34 CDCD	SHU	2,780	50	50	34.30	2,746	47.8	7.3	1,165	1,049
M:35100	21N 55E 01 BBBD	SHU	2,720	90	90	70.92	2,649	49.3	7.8	443	399
M:702573	21N 55E 02 AADD	SHU	2,730	101	101	57.70	2,672	48.2	8.1	639	575
M:35112	21N 55E 16 DCAC	SHU	2,385	20	20	9.93	2,375	50.0	7.3	955	860
M:35111	21N 55E 16 DCAC	SHU	2,395	35	35	13.51	2,381	46.2	7.3	2,310	2,079
M:149412	21N 55E 30 CAAB	SHU	2,755	20	20	15.45	2,740	48.6	7.8	587	528
M:35120	21N 55E 34 AACD	SHU	2,580	115	65	56.54	2,523				
M:121770	21N 55E 34 DBBC	SHU	2,725	120	100			50.7	7.9	588	529
M:151326	21N 56E 08 BAAB	SHU	2,700	60	60			51.3	7.3	1,470	1,323
M:700487	21N 56E 10 BDBA	SHU	2,610	169	169	86.22	2,524	46.6	7.4	737	663
M:142075	21N 56E 12 CCBD	SHU	2,460	95	80	42.34	2,418	47.7	7.5	602	542
M:126755	21N 56E 12 CDCB	SHU	2,440	75	66	20.13	2,420	48.6	7.4	678	
M:149366	21N 56E 18 CDDB	SHU	2,700	37	37	31.60	2,668				
M:149450	21N 56E 19 CADA	SHU	2,580					50.7	7.8	702	632
M:700494	21N 57E 14 CDCC	SHU	2,220	85	85			51.3	7.5	1,130	
M:142678	21N 57E 15 BAAB	SHU	2,320	210	198	111.40	2,209	49.8	7.2	1,438	
M:35160	21N 57E 26 CCAA	SHU	2,220	65	65	52.46	2,168	48.2	7.2	733	660
M:35162	21N 57E 29 DDDB	SHU	2,340	60	60			50.9	7.7	793	714
M:35167	21N 57E 33 AADD	SHU	2,280	125	125			50.4	7.6	1,126	1,013

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (μmhos)	Sum of Dissolved Constituents
M:35168	21N 57E 34 DBAC	SHU	2,260	100	100			53.2	7.2	1,819	1,637
M:35171	21N 57E 35 CBBD	SHU	2,217	155	135			51.8	7.8	1,428	1,285
M:35175	21N 58E 02 ADAA	SHU	1,920	50	44	11.81	1,908	48.0	7.7	1,674	1,507
M:35183	21N 58E 10 AABB	SHU	1,980	51	51	12.67	1,967	50.5	7.3	767	
M:35188	21N 58E 14 BBBA	SHU	1,940	68	64	38.02	1,902	56.3	7.4	834	751
M:150350	21N 58E 15 DBAD	SHU	1,960	26	26	19.85	1,940	43.7	7.8	997	897
M:35189	21N 58E 15 DBBB	SHU	1,965	68	48	15.53	1,949	52.9	7.2	1,107	996
M:35205	21N 58E 15 DBDB	SHU	1,950	35	35	21.50	1,929	52.2	7.3	1,018	916
M:138000	21N 58E 15 DCBA	SHU	1,949			20.40	1,929	50.9	7.3	1,024	922
M:35218	21N 58E 21 CDCA	SHU	1,964	96	87	8.33	1,956	49.5	8.7	1,757	1,581
M:35228	21N 58E 33 CDDB	FHHC	1,933	990	945	-180.03	2,113	61.2	8.8	1,937	1,743
M:35238	21N 59E 06 DDAA	FHHC	1,930	1,222	1,198	-127.98	2,058		8.3	1,615	1,454
M:35241	21N 59E 07 BCDB	DHU	1,910	490	490	-40.92	1,951	53.6	8.3		
M:35244	21N 59E 08 BCD	FHHC	1,970	1,270	1,240	-103.64	2,074	62.2	8.8	1,735	1,562
M:35254	21N 59E 17 CBBB	DHU	1,938	290	270	-16.52	1,955	52.9	8.3		
M:122414	21N 60E 19 BCAA	SHU	2,170	300	170	112.45	2,058	49.6			
M:35553	22N 50E 08 DBAA	SHU	2,375	208	193			53.4	8.2	2,800	2,520
M:35556	22N 50E 24 ABCA	SHU	2,350	120	68	46.73	2,303				
M:702579	22N 50E 29 CCCB	SHU	2,235	22	22	14.60	2,220	48.0	7.9	3,040	2,736
M:122319	22N 50E 31 CCCA	SHU	2,290	180	158	58.35	2,232	52.7	8.3	2,780	2,502
M:149891	22N 50E 32 BBCB	DHU	2,250	200	200	34.10	2,216	52.7	8.4	2,800	2,520
M:35558	22N 50E 35 AADA	SHU	2,315	56	51	32.50	2,283	48.9	7.2		
M:146197	22N 51E 05 AAAA	SHU	2,379	200	190	126.68	2,252	52.5	8.2	4,950	4,455
M:146776	22N 51E 13 BBDB	SHU	2,435	160	150	105.29	2,330	51.6	8.0	3,610	3,249
M:35566	22N 51E 27 BABD	FHHC	2,320	1,220	1,220	213.40	2,107		8.4		
M:35568	22N 52E 04 CCDD	SHU	2,390	28	28						
M:35575	22N 52E 16 AABB	SHU	2,420	36	32	18.18	2,402	51.1	7.3	4,480	4,032
M:35580	22N 52E 25 BCCC	SHU	2,512	160	152	88.45	2,424	53.6	8.7	2,530	2,277
M:35583	22N 52E 29 ADDD	FHHC	2,500	1,201	1,201			72.7	8.7	1,733	
M:700552	22N 53E 23 ABDD	SHU	2,553	109	109	76.49	2,477				
M:700553	22N 53E 26 BAAA	DHU	2,685	201	201	178.11	2,507	52.7	7.2	2,300	2,070
M:35597	22N 53E 29 BDB	DHU	2,620	200	200	107.77	2,512				
M:35598	22N 53E 30 BADB	SHU	2,560	110	110	77.80	2,482				
M:139763	22N 54E 03 DACA	SHU	2,415	113	93	35.09	2,380	50.4	7.0	3,430	3,087
M:35606*	22N 54E 04 DADA	SHU	2,390	28	20	5.45	2,385	44.8	7.8	1,064	
M:141511	22N 54E 06 DABD	DHU	2,365	240	240	24.98	2,340	48.9	7.9	3,220	2,898
M:141512	22N 54E 18 ACBC	SHU	2,520	121	121	83.68	2,436				
M:122416	22N 54E 23 ACDC	DHU	2,580	320	260			52.0	7.2	3,220	2,898
M:149295	22N 54E 24 ACDD	DHU	2,490	200	200	100.45	2,390				
M:149422	22N 54E 25 ADDA	SHU	2,470	150	150			52.5	7.3	3,110	2,799
M:35619	22N 55E 01 CDCA	FHHC	2,500	1,530	1,386			65.3	8.9	1,845	
M:35643	22N 55E 13 BCCC	SHU	2,400	68	60	53.63	2,346	48.0	6.9	4,390	3,951
M:700562	22N 55E 23 ADBD	SHU	2,394	56	56	21.45	2,373	47.5	7.0	5,140	4,626
M:35648	22N 55E 24 CBCB	SHU	2,390	34	34	6.83	2,383	38.7	7.7	3,750	3,375
M:35649	22N 55E 24 CBCB	DHU	2,390	310	310			52.2	8.7	1,836	1,652
M:35658	22N 56E 02 AAAA	SHU	2,520	180	160	119.14	2,401	48.9	7.3	1,847	1,662
M:35664	22N 56E 12 CADC	SHU	2,480	60	35	20.85	2,459				
M:35666	22N 56E 12 CADC	SHU	2,480	33	20	16.00	2,464				
M:35667	22N 56E 12 CADC	SHU	2,480	140	120			48.9	7.1	1,923	1,731
M:2767	22N 56E 15 BDCC	SHU	2,420	150	150	98.01	2,322	49.3	7.3	1,014	
M:35670	22N 56E 17 BBCB	SHU	2,320	40	32	6.91	2,313	45.0	7.1	5,500	4,950
M:149383	22N 56E 17 BCBA	SHU	2,340			12.33	2,328	45.7	7.1	3,430	3,087
M:151273	22N 56E 18 AABC	SHU	2,330	13	13	5.60	2,324				
M:151272	22N 56E 18 AACC	SHU	2,330	21	21	14.59	2,315				
M:35672	22N 56E 18 BABD	SHU	2,345	26	26	17.85	2,327				
M:149482	22N 56E 22 CADA	SHU	2,300	48	48	11.50	2,289	47.8	7.2	330	297
M:35674	22N 56E 30 CBDD	SHU	2,530	105	105	68.18	2,462				
M:35688	22N 57E 10 AACB	DHU	2,320	205	205	97.85	2,222	50.5	7.6	1,762	
M:35687	22N 57E 10 AACB	SHU	2,320	38	38	18.20	2,302	45.3	7.7	1,054	949
M:35689	22N 57E 14 DBCB	SHU	2,200	41	41						
M:152195	22N 57E 14 DBCB	SHU	2,200	75	75	10.97	2,189	47.5	7.2	1,776	1,598
M:35717*	22N 58E 10 CCCC	SHU	2,180	135	124	70.10	2,110				
M:35725	22N 58E 12 ABAA	FHHC	2,020	1,267	1,237	-36.15	2,056	57.9	8.8	1,923	1,731
M:35738	22N 58E 12 DCCC	FHHC	1,980	1,140	1,117			56.8	8.7	1,884	1,696
M:35739	22N 58E 12 DDDC	SHU	1,930	120	102	27.79	1,902	50.7	7.7	1,109	998

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:35740	22N 58E 13 BBAB	SHU	2,020	140	100	50.43	1,970	48.6	8.6	2,250	2,025
M:2770	22N 58E 13 CCDD	SHU	1,950	40	40	29.99	1,920	50.9	7.7	1,100	
M:700577	22N 58E 19 BDCB	SHU	2,100	30	30			42.1	7.5	2,070	1,863
M:35748	22N 58E 23 DAAA	FHHC	1,960	1,260	1,235			52.0	8.7	1,869	1,682
M:148624	22N 58E 35 DADB	SHU	1,940					42.8	7.7	1,047	942
M:35771	22N 58E 36 AAAB	FHHC	1,910	1,134	1,050			62.2	8.8	1,654	1,489
M:35941	22N 58E 36 ABAB	SHU	1,920	55	49	10.53	1,909	47.5	7.8	1,441	1,297
M:35773	22N 58E 36 DDDC	FHHC	1,920	1,120	1,080			63.5	8.8	1,681	1,513
M:149652	22N 59E 05 CDDD	SHU	1,940	36	36	6.40	1,934	47.3	7.6	1,152	1,037
M:35874	22N 59E 15 ACCA	SHU	1,940	56	56	25.54	1,914				
M:79510	22N 59E 16 DABC	FHHC	1,910	1,380	1,194	-110.07	2,020	61.9	8.7	1,723	
M:35881	22N 59E 16 DABC	SHU	1,910	50	40	13.29	1,897				
M:35890	22N 59E 18 DCCB	FHHC	1,940	1,286	1,170			62.2	8.8	1,785	
M:35899	22N 59E 20 DAAD	UNK	1,940			-106.26	2,046				
M:35917	22N 59E 28 CBCB	FHHC	1,965	1,172	1,105	-86.46	2,051	67.1	8.7	1,874	1,687
M:35918	22N 59E 28 CBCB	SHU	1,965	110	110	35.65	1,929				
M:148618	22N 59E 30 CCCB	SHU	1,910	155	155	-9.29	1,919	49.1	8.5	2,260	2,034
M:126584	22N 59E 31 BDCC	SHU	1,910	50	43	9.15	1,901	45.5	7.8	2,170	1,953
M:702618	23N 50E 04 DCBA	SHU	2,407	96	96	36.00	2,371				
M:702610	23N 50E 27 ADAD	SHU	2,260	66	66	46.88	2,213				
M:36243	23N 50E 30 BBAB	SHU	2,367	108	95	46.72	2,320	53.4	7.5	1,241	1,117
M:129246	23N 51E 04 BAAA	SHU	2,205	56	40	12.30	2,193	51.3	7.7	2,250	2,025
M:149894	23N 51E 12 ABDC	SHU	2,264	160	160	20.90	2,243	49.5	7.8	2,920	2,628
M:700642	23N 51E 12 DABB	SHU	2,286	39	39	15.41	2,271				
M:36251*	23N 51E 20 BBBD	SHU	2,225	176	176	26.97	2,198				
M:700650	23N 51E 34 DDCA	SHU	2,455	88	88	59.60	2,395	50.0	6.8	3,220	2,898
M:700651	23N 52E 07 CDBD	SHU	2,294	43	43	9.42	2,285	46.2	7.6	3,860	3,474
M:2911	23N 52E 18 BDAC	SHU	2,335	190	190	50.12	2,285	51.1	8.9	2,220	
M:2912	23N 52E 22 CAAB	SHU	2,335	11	11	3.11	2,332				
M:36267	23N 52E 32 DCCD	SHU	2,360	30	30	5.61	2,354	47.7	8.1	3,740	3,366
M:36268	23N 52E 32 DCDD	SHU	2,375	170	170			52.7	8.8	2,200	1,980
M:700665	23N 53E 01 ABAA	SHU	2,350	20	20	3.75	2,346				
M:36270	23N 53E 01 ABAC	SHU	2,350	40	40	13.25	2,337				
M:36271	23N 53E 10 DDDD	SHU	2,335	78	78			48.2	7.7	3,350	
M:36272	23N 53E 13 DDDA	SHU	2,430	65	65	25.50	2,405				
M:2914	23N 53E 14 BAAB	SHU	2,360	177	177	68.50	2,292	50.9	8.6	3,310	
M:700670	23N 53E 14 BBAC	SHU	2,350	24	24	10.34	2,340				
M:700671	23N 53E 14 BBDA	DHU	2,370	325	325	87.25	2,283	53.4	8.8	3,040	
M:149420	23N 53E 21 CDAC	SHU	2,335	80	80			48.9	8.1	3,860	3,474
M:139771	23N 53E 27 BBDA	SHU	2,335	80	60			49.3	7.5	4,200	3,780
M:700674	23N 53E 27 BBDA	SHU	2,335	26	26	18.77	2,316				
M:700682	23N 54E 18 ADBD	SHU	2,523	196	196			49.6	7.3	1,296	1,166
M:700684	23N 54E 18 CAAD	DHU	2,465	200	200	106.83	2,358	49.3	7.3	1,449	1,304
M:700688	23N 54E 32 CABB	SHU	2,425	66	66	39.28	2,386				
M:121097	23N 54E 34 ABDA	DHU	2,565	300	270	177.76	2,387	51.6	7.5	2,100	1,890
M:36295	23N 55E 06 ABAA	SHU	2,540	90	50	52.77	2,487	47.7	6.9	3,590	3,231
M:36304	23N 55E 15 DDAA	SHU	2,435	45	45			46.9	7.5	1,262	1,136
M:133191	23N 55E 27 ADDB	SHU	2,449	135	124	66.23	2,383	47.8	8.1	3,540	3,186
M:36330	23N 55E 34 AABB	SHU	2,470	80	44	43.45	2,427	46.9	7.2	1,696	1,526
M:148623	23N 55E 36 DCDA	DHU	2,360	280	280	38.20	2,322	47.7	8.8	2,500	2,250
M:148498	23N 55E 36 DCDA	DHU	2,360	210	210	35.57	2,324	48.2	8.9	2,060	
M:36336	23N 55E 36 DDCC	SHU	2,350	30	30	18.00	2,332	47.5	7.5	2,570	
M:36349	23N 56E 11 DCCB	FHHC	2,600	1,760	1,716			58.3	8.9	1,950	1,755
M:121774	23N 56E 13 DCDB	DHU	2,660	552	520			51.6	7.2	2,210	1,989
M:149382	23N 56E 20 ADDA	SHU	2,420	48	48	24.70	2,395				
M:36355	23N 56E 21 BCCA	SHU	2,420	75	75	30.60	2,389	46.0	7.2	2,120	1,908
M:36358	23N 56E 23 BBCA	DHU	2,440	438	438			52.2	8.6	1,782	1,604
M:36360	23N 56E 28 ABBB	SHU	2,460	70	50	42.10	2,418				
M:36376	23N 57E 08 ACBB	SHU	2,400	44	44	19.37	2,381	47.5	7.4	895	806
M:2921	23N 57E 10 ACAC	SHU	2,360	34	34	19.95	2,340	50.5	7.5	629	
M:149314	23N 57E 14 ADAD	DHU	2,300	200	200	26.40	2,274	48.0	7.1	2,060	1,854
M:36387	23N 57E 14 ADDB	SHU	2,300	43	32			48.0	7.2	1,232	1,109
M:2923	23N 57E 22 DDDA	SHU	2,360	100	100	11.85	2,348	44.6	7.9	919	
M:148615	23N 57E 23 DBCD	SHU	2,326	50	50	11.93	2,314	47.7	7.5	791	712
M:148625	23N 57E 32 ADDD	SHU	2,580					43.9	7.9	481	433

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M:148626	23N 57E 32 BBAB	SHU	2,580					43.9	7.5	496	446
M:151284	23N 57E 34 BABB	SHU	2,500					50.9	7.3	2,030	1,827
M:36421	23N 58E 02 CADC	SHU	2,255	160	160	15.81	2,239				
M:36423*	23N 58E 02 CBDC	SHU	2,249	126	126	28.52	2,220	49.6	7.5	1,729	
M:152203	23N 58E 02 CBDC	SHU	2,249	31	31	27.52	2,221				
M:151485	23N 58E 02 CBDC	SHU	2,249	44	44	28.11	2,221				
M:36436	23N 58E 05 DDAA	SHU	2,305	93	25			51.3	9.4	2,840	2,556
M:36447	23N 58E 10 CDCB	SHU	2,220	25	25	18.40	2,202	45.1	7.3	2,950	2,655
M:36459	23N 58E 14 ABCC	SHU	2,180	60	38	38.26	2,142				
M:2926	23N 58E 18 ACBB	SHU	2,280	40	20	20.83	2,259	47.5	7.7	1,837	
M:36466	23N 58E 19 BABB	SHU	2,260	124	124	20.06	2,240	48.0	7.3	2,400	2,160
M:36467	23N 58E 19 BABB	SHU	2,260	24	24	10.68	2,249	44.4	7.7	3,190	2,871
M:36487	23N 58E 34 BDDB	FHHC	2,240	1,540	1,446	177.80	2,062	58.3	8.8	1,931	1,738
M:36499	23N 59E 01 BBAA	SHU	1,910	78	68	26.66	1,883	49.5	8.5	2,420	2,178
M:146788	23N 59E 01 DCCB	FHHC	1,900	280	255			51.3	7.6	3,080	2,772
M:122067	23N 59E 08 CDDD	SHU	2,160	28	22	26.95	2,133				
M:700709	23N 59E 12 ACAD	SHU	1,900	36	36	11.10	1,889	48.0	7.6	1,096	986
M:2927	23N 59E 13 CCCC	SHU	1,910	83	83	16.85	1,893	45.9	9.1	975	
M:136651*	23N 59E 15 ADBCB	SHU	1,917	19	5	8.83	1,909	52.5	7.5	1,080	
M:36643	23N 59E 29 BABB	SHU	1,990	140	120	43.50	1,947	50.5	8.5	2,620	2,358
M:36647	23N 59E 29 BBCC	FHHC	2,030	1,420	1,315	-33.94	2,064	54.5	8.8	1,918	1,726
M:36666	23N 59E 30 DADC	SHU	2,000	123	123	48.76	1,951	50.9	8.1	2,010	1,809
M:36668	23N 59E 30 DADD	FHHC	1,980	1,265	1,214	-67.22	2,047	57.4	9.0	1,740	1,566
M:36693	23N 59E 32 AADA	SHU	1,945	40	25	10.61	1,934	50.5	7.6	1,435	
M:132774	23N 59E 32 ADDC	SHU	1,947	102	67	12.57	1,935	57.2	7.1	502	
M:36707	23N 59E 32 BABC	SHU	1,963	110	103	23.46	1,940	49.1	7.5	1,240	
M:36706	23N 59E 32 BABD	SHU	1,962	47	25	27.08	1,935	50.2	7.5	879	
M:36711	23N 59E 32 CBBA	SHU	1,970	80	74	23.40	1,947				
M:36712*	23N 59E 32 CBBB	SHU	1,969	95	72	24.33	1,945	50.7	7.5	1,100	
M:700762	23N 59E 32 DDDB	SHU	1,940	23	23			52.2	7.7	947	852
M:36756	23N 59E 33 BDBA	SHU	1,943	45	45	14.64	1,928				
M:700779	23N 60E 18 AABD	SHU	1,890	68	68	12.75	1,877				
M:36785	23N 60E 19 ADBA	FHHC	1,900	1,290	1,240	-48.04	1,948	64.9	8.7	2,140	1,926
M:36788	23N 60E 20 ABBD	SHU	1,920	80	80	31.72	1,888	53.4	7.1	4,940	4,446
M:37141	24N 51E 08 CBDB	SHU	2,283	202	182	148.95	2,134				
M:37143	24N 51E 18 DABB	DHU	2,323	423	423	212.09	2,111				
M:149893	24N 51E 29 ACD	SHU	2,205	40	30	12.21	2,193				
M:37156	24N 52E 28 BABB	SHU	2,300	104	98	25.76	2,274	49.1	8.3	3,820	3,438
M:37161	24N 52E 29 ABDB	SHU	2,337	36	12	26.91	2,310	47.7	7.4	809	728
M:37166	24N 53E 01 DABD	SHU	2,335	55	55	25.15	2,310	46.9	7.5	2,350	2,115
M:37169	24N 53E 06 DAAA	SHU	2,389	178	101	88.85	2,300				
M:37170	24N 53E 08 CAAD	SHU	2,295	75	75	20.26	2,275				
M:37171	24N 53E 08 CCDD	SHU	2,297	32	32	19.65	2,277				
M:37167	24N 53E 09 BABB	SHU	2,310	49	28	13.79	2,296				
M:37178	24N 53E 14 CBAA	SHU	2,335	31	31						
M:3010	24N 53E 15 CCCD	SHU	2,285	30	30	13.30	2,272				
M:149440	24N 53E 24 DCDA	SHU	2,330	160	160	88.60	2,241	49.8	8.5	3,140	2,826
M:37181	24N 53E 25 CBBD	SHU	2,310	40	40	13.19	2,297				
M:37185	24N 54E 06 CBB	SHU	2,340	200	190	27.21	2,313				
M:37186	24N 54E 06 CBB	SHU	2,340	60	40	27.87	2,312				
M:37187	24N 54E 07 BCCA	SHU	2,365	40	30			46.4	7.5	1,786	1,607
M:37190	24N 54E 09 BBBA	SHU	2,325	61	61	25.60	2,299				
M:3011	24N 54E 09 CDBC	SHU	2,355	40	40	16.00	2,339				
M:121101	24N 54E 15 BBAA	SHU	2,365	90	61	27.86	2,337	47.3	7.5	5,100	4,590
M:149296	24N 54E 20 BCCC	SHU	2,400	170	160	106.80	2,293	59.7	8.3	3,630	3,267
M:37200	24N 54E 20 BCCC	SHU	2,390	35	35	19.44	2,371	48.2	7.5	4,810	4,329
M:700809	24N 54E 23 DABA	SHU	2,500	129	129	81.04	2,419				
M:700810	24N 54E 29 CAAB	SHU	2,420	190	190	50.92	2,369				
M:700812	24N 54E 30 DCBD	SHU	2,340	50	50	47.70	2,292	46.8	7.2	4,580	4,122
M:37217	24N 55E 01 CAAA	SHU	2,260	34	34	10.25	2,250	46.9	7.5	3,740	3,366
M:149481	24N 55E 03 DCDD	SHU	2,255	35	35	1.34	2,254	46.6	7.0	3,260	2,934
M:149480	24N 55E 11 CCAC	SHU	2,315	120	120	74.82	2,240	50.0	8.2	3,030	2,727
M:37232	24N 55E 14 BBBB	SHU	2,320	83	75	33.10	2,287	49.6	7.1	2,400	2,160
M:37249	24N 56E 01 DDAB	DHU	2,440	495	495	202.09	2,238	54.1	8.3	3,370	3,033
M:37248	24N 56E 01 DDCA	SHU	2,460	56	56	31.04	2,429	50.0	6.8	2,830	2,547

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (umhos)	Sum of Dissolved Constituents
M:149413	24N 56E 07 DDBB	DHU	2,320	260	250	96.95	2,223	51.3	8.3	3,050	2,745
M:37259*	24N 56E 25 DDAC	SHU	2,460	60	16	4.58	2,455				
M:139776	24N 57E 15 BBC	SHU	2,360	140	130	28.99	2,331	47.3	7.2	3,890	
M:37309	24N 57E 36 BCAA	SHU	2,310	40	20	6.90	2,303	44.6	7.7	6,830	6,147
M:37310	24N 57E 36 DBAA	DHU	2,340	355	339	204.42	2,136	57.0	8.5	3,060	2,754
M:37319	24N 58E 09 BABB	FHHC	2,275	1,720	1,660						
M:135631	24N 58E 20 DBAB	DHU	2,320	260	220			50.5	8.3	3,050	2,745
M:37331	24N 58E 27 BBCB	SHU	2,260	60	60	18.90	2,241	47.3	7.2	2,510	2,259
M:149342	24N 58E 28 AAAB	SHU	2,240	160	160	33.80	2,206	49.6	7.3	1,852	1,667
M:37340	24N 58E 33 AAAD	SHU	2,300	186	186	82.00	2,218	49.8	7.2	2,600	2,340
M:37349	24N 59E 03 ABBA	DHU	2,160	310	310	144.13	2,016	52.7	8.4	3,100	
M:3027	24N 59E 03 ADAA	SHU	2,140	90	46	37.70	2,102	48.4	7.5	1,104	
M:37353	24N 59E 04 ABAB	SHU	2,080	36	12	10.41	2,070	45.9	7.1	3,520	3,168
M:149358	24N 59E 10 CDBD	SHU	2,100	57	57	23.75	2,076	46.4	7.0	1,735	1,562
M:37366	24N 59E 17 ACDA	SHU	2,160	65	65	32.26	2,128	50.7	7.5	605	545
M:37379	24N 59E 25 CDCC	SHU	1,930	100	86	31.34	1,899	50.0	8.6	2,410	2,169
M:37383	24N 59E 26 DADC	FHHC	1,950	1,348	1,302	-96.45	2,046	65.5	8.7	2,090	1,881
M:37384	24N 59E 28 CCDC	FHHC	2,100	1,480	1,410	44.36	2,056	54.0	8.7	1,994	1,795
M:37385	24N 59E 29 AACA	SHU	2,160	65	65	46.11	2,114				
M:37386	24N 59E 30 DBBD	SHU	2,060	52	20	15.32	2,045				
M:3029	24N 59E 33 CADA	SHU	2,020	61	55	23.20	1,997	48.2	7.1	1,443	
M:3031	24N 60E 07 ABAD	DHU	2,100	472	472	245.57	1,854				
M:136625	24N 60E 17 AABC	SHU	1,905	27	27	16.85	1,888				
M:37462	24N 60E 30 CAAA	SHU	1,895	40	35	8.09	1,887	46.6	7.7	1,653	1,488
M:146781	24N 60E 30 DCDD	SHU	1,890	37	28	14.48	1,876	52.9	7.5	1,871	1,684
M:37856	25N 51E 03 ACDB	SHU	2,255	30	30	16.41	2,239	50.9	8.0	3,500	3,150
M:37857	25N 51E 03 ACDB	SHU	2,255	40	40	9.40	2,246	46.0	7.5	4,380	3,942
M:37858	25N 51E 04 BBCB	SHU	2,390	72	72	14.80	2,375				
M:149417	25N 51E 10 BAAD	SHU	2,240	130	130			62.1	8.3	2,450	2,205
M:149439	25N 51E 10 BADA	SHU	2,230	47	47	3.30	2,227	54.1	8.1	3,520	3,168
M:37875	25N 51E 20 CBDB	SHU	2,102	28	22	20.88	2,081	48.6	7.5	3,870	
M:149639	25N 51E 34 DCBC	SHU	2,290			33.07	2,257				
M:37881	25N 52E 05 CCBD	SHU	2,310	203	175	53.12	2,257	49.1	8.3	5,230	4,707
M:37887	25N 52E 13 AADA	SHU	2,325	48	48	18.41	2,307				
M:37896	25N 52E 22 CDCA	SHU	2,315	70	40	35.26	2,280	49.1	7.6	2,180	1,962
M:3063	25N 52E 27 BABB	SHU	2,295	40	20	16.90	2,278	49.5	7.8	2,100	
M:37909	25N 52E 30 ADCC	SHU	2,290	168	160	34.70	2,255				
M:37911	25N 52E 31 CCDA	SHU	2,210	73	55	46.49	2,164	49.8	7.8	3,700	3,330
M:37910	25N 52E 31 CCDD	SHU	2,170	120	105	18.55	2,151	49.8	8.2	4,600	4,140
M:151287	25N 52E 36 AADC	SHU	2,370			56.67	2,313				
M:37920	25N 53E 07 CDAC	SHU	2,285	32	32	14.56	2,270				
M:37948	25N 53E 34 AAAD	SHU	2,290	20	20	15.64	2,274	46.8	7.6	871	784
M:140089	25N 53E 35 BCAC	SHU	2,295	95	85	29.55	2,265	48.7	7.4	3,420	3,078
M:37952	25N 53E 35 BCBC	DHU	2,290	380	310	80.60	2,209	52.2	8.6	2,830	2,547
M:37950	25N 53E 35 BCCA	DHU	2,290	280	280	57.96	2,232	51.8	8.6	2,740	2,466
M:37955	25N 54E 02 BAAA	DHU	2,180	262	252	52.45	2,128	52.0	8.8	2,960	2,664
M:37957	25N 54E 05 BCBB	SHU	2,195	40	10	5.80	2,189	45.5	7.9	2,590	2,331
M:37967	25N 54E 17 CCCC	SHU	2,245	31	22	11.70	2,233	46.0	9.5	2,500	2,250
M:37970	25N 54E 18 DCDA	DHU	2,320	258	238			46.6	7.5	4,350	3,915
M:37974	25N 54E 20 BACB	SHU	2,240	40	15	6.50	2,234	45.7	7.9	4,530	4,077
M:139781	25N 54E 20 BDBD	SHU	2,245	160	120	9.09	2,236				
M:3069	25N 54E 30 DAAA	DHU	2,315	665	665			55.2	8.5	2,680	
M:38000	25N 54E 36 ABBB	SHU	2,265	60	50	16.27	2,249	50.5	7.4	3,340	3,006
M:3070	25N 55E 03 BDAC	SHU	2,317	203	152	78.13	2,239	50.7	7.2	2,720	
M:38017	25N 55E 25 ACBA	DHU	2,330	210	202	91.65	2,238	50.7	8.5	3,300	2,970
M:38021	25N 55E 25 DAAA	DHU	2,350	242	213	107.53	2,242	51.8	8.4	2,860	2,574
M:38029	25N 56E 02 CDDD	SHU	2,205	60	60	21.52	2,183				
M:38030	25N 56E 02 DCCC	SHU	2,195	61	61	9.23	2,186	48.6	7.2	6,760	6,084
M:3073	25N 56E 11 BAAB	DHU	2,245	280	280	154.70	2,090	53.2	8.6	3,300	
M:38041	25N 56E 18 DCDB	SHU	2,260	295	107	66.02	2,194	52.2	7.0	4,000	3,600
M:38043	25N 56E 19 CCCA	DHU	2,450	500	440	301.94	2,148	56.8	8.7	2,620	2,358
M:38057	25N 57E 02 BDBB	SHU	2,300	38	22	8.66	2,291	46.6	7.5	3,900	3,510
M:38067	25N 57E 11 ADBC	FHHC	2,305	1,815	1,775			66.4	8.7	2,200	1,980
M:38083	25N 57E 28 BBBB	SHU	2,320	55	55	15.93	2,304	44.6	7.6	3,040	2,736
M:3075	25N 57E 29 AAAD	DHU	2,330	818	818	242.95	2,087	59.9	8.4	2,220	

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (µmhos)	Sum of Dissolved Constituents
M:38090	25N 57E 29 DDAA	DHU	2,310	301	301	173.08	2,137	53.1	8.5	2,940	2,646
M:38096	25N 57E 32 DDCD	DHU	2,295	250	250	92.54	2,202	50.0	8.0	3,080	2,772
M:38095	25N 57E 32 DDCD	SHU	2,295	28	28	6.56	2,288	45.3	7.1	4,240	3,816
M:38101	25N 58E 03 BBCA	SHU	2,090	80	75	26.50	2,064	46.8	7.5	4,390	3,951
M:38113	25N 58E 12 CDDD	FHHC	2,050	1,500	1,400	-74.38	2,124	54.0	8.9	2,100	1,890
M:700826	25N 58E 21 DDDC	SHU	2,225	149	141	76.11	2,149	48.9	8.2	2,970	2,673
M:148597	25N 58E 22 AABD	DHU	2,160	326	326	137.07	2,023	50.4	8.6	2,900	2,610
M:38144	25N 58E 36 CAAC	SHU	2,095	27	20	13.20	2,082				
M:152190	25N 59E 06 BAAA	SHU	2,065	35	35	9.85	2,055	46.6	7.3	4,160	3,744
M:38151	25N 59E 07 BBCB	FHHC	2,050	1,505	1,410	-32.79	2,083	53.6	8.7	2,110	1,899
M:148596	25N 59E 18 AAAA	SHU	2,010	50	50	10.30	2,000	46.0	7.6	2,650	2,385
M:128170	25N 59E 18 AAAA	SHU	2,005	200	183	9.51	1,995	48.0	8.5	2,870	2,583
M:38161	25N 59E 18 CABC	FHHC	2,040	1,488	1,446			46.9	8.7	1,836	1,652
M:38169	25N 59E 25 BBBB	SHU	1,935	24	24	18.30	1,917				
M:38180	25N 59E 30 DDDA	SHU	2,155	120	100	19.62	2,135	50.7	7.7	3,720	3,348
M:128171	25N 59E 32 AADA	SHU	2,160	156	145	69.38	2,091	45.7	7.8	1,930	1,737
M:3110*	25N 59E 33 DCBD	SHU	2,168	72	65	64.50	2,104				
M:141510	26N 51E 23 ADAC	SHU	2,140	93	93	27.55	2,112				
M:38542	26N 51E 30 BDCC	FHHC	2,260	311	311			56.3	8.4	3,070	
M:38543	26N 51E 30 BDDC	SHU	2,250	42	42	2.05	2,248	53.1	7.0		
M:38546	26N 51E 33 DACB	SHU	2,380	149	149	24.46	2,356				
M:128173	26N 51E 34 ADDD	SHU	2,285	100	90	26.88	2,258	49.5	7.7		
M:3220	26N 52E 05 ACCB	SHU	2,000	90	80						
M:143947	26N 52E 13 CBAD	SHU	2,238	26	26	7.66	2,230				
M:121169	26N 52E 14 DAAD	FHHC	2,250	353	342	234.87	2,015	55.0	8.9	1,860	1,674
M:145622	26N 52E 26 DCDD	SHU	2,270	85	72	17.99	2,252	49.6	7.1	2,060	
M:38563	26N 52E 26 DDCC	SHU	2,270	36	36	7.42	2,263	49.6	7.4	2,530	2,277
M:38565	26N 52E 26 DDCC	SHU	2,275	121	121	12.02	2,263	49.8	7.5	2,440	2,196
M:38568	26N 52E 27 CDCC	DHU	2,345	353	353			57.2	8.9	1,850	1,665
M:149353	26N 52E 34 ABBB	SHU	2,335	150	150	34.30	2,301	50.2	7.3	2,580	2,322
M:38575	26N 52E 35 ABBB	SHU	2,290	52	30	15.63	2,274	51.6	7.3	2,960	2,664
M:38576	26N 52E 35 BADA	DHU	2,300	260	240	108.76	2,191	53.8	8.5	4,500	
M:38578	26N 53E 07 DACC	SHU	2,170	103	25	18.51	2,151	48.4	7.5	1,570	1,413
M:38580	26N 53E 09 CCAD	SHU	2,100	71	65	4.22	2,096	48.6	7.8	4,280	3,852
M:38585	26N 53E 20 DAAD	SHU	2,170	54	54	16.70	2,153				
M:38587	26N 53E 21 BCDA	SHU	2,145	59	59	15.04	2,130	47.3	7.5	3,470	3,123
M:38586	26N 53E 21 BDCA	SHU	2,135	35	35	13.40	2,122	45.3	7.6	3,590	3,231
M:121170	26N 53E 27 ABCB	SHU	2,240	205	195			50.2	8.4	4,300	3,870
M:38594	26N 54E 03 DCAA	SHU	2,130	40	35	25.33	2,105	47.8	7.2		
M:38597	26N 54E 09 CACB	SHU	2,065	185	160	-1.80	2,067	50.7	8.7	2,330	2,097
M:38599	26N 54E 09 CADB	FHHC	2,075	885	885	55.64	2,019	62.4	8.9	1,950	1,755
M:138009*	26N 54E 17 DCAA	DHU	2,195	240	240	93.40	2,102	56.1	8.3	3,110	
M:149294	26N 54E 21 AAAD	SHU	2,175			60.76	2,114	50.2	7.2	3,140	2,826
M:38604	26N 54E 21 DDAA	SHU	2,150	55	55	30.61	2,119	49.3	7.1	1,920	1,728
M:38608	26N 54E 23 CCBA	SHU	2,115	43	25	9.58	2,105	50.2	7.3	2,360	2,124
M:124343	26N 54E 23 CCBC	DHU	2,115	300	244			57.9	8.6	2,420	2,178
M:123529	26N 54E 32 ADDD	SHU	2,155	160	136	3.18	2,152				
M:38616	26N 54E 34 BACD	SHU	2,145	40	12			42.8	7.3	1,200	1,080
M:38618	26N 55E 01 ABCA	SHU	1,995	87	80	2.95	1,992	48.2	8.3	3,980	
M:38628	26N 55E 25 BDAC	SHU	2,110	210	190	32.45	2,078	55.4	8.8	3,400	3,060
M:38630	26N 55E 26 DBAD	SHU	2,145	100	55	26.20	2,119	54.9	8.6	3,120	2,808
M:38631	26N 55E 27 DCDD	SHU	2,260	115	103	75.70	2,184	52.9	7.3	2,770	2,493
M:38635	26N 55E 30 CCCD	SHU	2,135	60	34	13.37	2,122	48.9	7.2	2,010	1,809
M:38641	26N 55E 32 CBCC	SHU	2,165	20	14	6.72	2,158			5,300	4,770
M:38644	26N 56E 03 CBAB	DHU	2,090	296	296			64.6	8.8	3,980	3,582
M:149437	26N 56E 03 CBAC	SHU	2,090	80	80	44.01	2,046	50.7	7.7	5,210	4,689
M:38650	26N 56E 13 BCDD	SHU	2,105	125	115	69.61	2,035				
M:38662	26N 56E 24 DADB	FHHC	2,230	860	760	87.52	2,142	59.4	8.3	2,430	2,187
M:38671	26N 56E 31 CCCC	DHU	2,140	325	325	21.22	2,119	51.3	8.6	2,830	2,547
M:38678	26N 57E 01 BBAD	SHU	1,910	88	82	25.01	1,885	48.0	7.5	6,010	5,409
M:38712	26N 57E 01 DDDC	FHHC	1,915	1,335	1,293	-109.76	2,025	73.4	8.7	2,110	1,899
M:38681	26N 57E 11 BDBA	DHU	2,140	300	300	168.86	1,971				
M:38688	26N 57E 18 ADAB	DHU	2,225	582	582	272.68	1,952	57.2	8.5	2,040	1,836
M:38693	26N 57E 19 BBCA	SHU	2,175	140	124	54.11	2,121	48.6	6.9	3,110	
M:38703	26N 57E 32 CCBB	SHU	2,250	70	70			48.6	7.9	2,080	1,872

Site Number	Location	Hydrologic Unit	Altitude (ft)	Total Depth (ft)	Depth Water Enters (ft)	SWL Depth (ft)	SWL Elevation (ft)	Inventoried Temperature (deg F)	Field pH	Field Conductivity (μmhos)	Sum of Dissolved Constituents
M:38713	26N 58E 08 ACAB	FHHC	1,895	1,434	1,370	-153.61	2,049	43.2	8.6	1,752	1,577
M:125716	26N 58E 27 CCDD	DHU	2,110	300	273	118.85	1,991	49.3	8.2	2,340	
M:38739	26N 59E 22 DADD	SHU	1,890	36	36			64.0	8.2	2,140	1,926
M:3232	26N 59E 22 DBDD	SHU	1,905	212	184	37.71	1,867	50.2	8.6	2,980	
M:38742	26N 59E 23 ABCA	FHHC	1,880	1,430	1,385	-186.10	2,066	60.4	8.6	1,800	1,620
M:149479	26N 59E 24 CBCC	SHU	1,880			11.73	1,868				
M:38755	26N 59E 26 ADDD	FHHC	1,878	1,442	1,387			62.4	8.7	2,370	2,133
M:38756	26N 59E 29 CDDC	SHU	2,115	30	30	5.64	2,109				
M:3234	26N 59E 32 BAAA	SHU	2,110	185	185	118.01	1,992	48.2	8.7	2,600	
M:700853	27N 51E 27 BCBC	SHU	1,960	60	60	26.29	1,934	58.5	6.9		
M:39372	27N 51E 30 ACCD	SHU	1,955	53	47			50.2	7.5	3,480	3,132
M:39373	27N 51E 33 AADA	SHU	1,975	90	80	37.30	1,938				
M:39374	27N 51E 35 DDCB	SHU	1,985	79	74	42.45	1,943	51.3	7.8	3,010	2,709
M:39377	27N 52E 28 ABCA	SHU	1,940	94	94	15.55	1,924	46.9	7.7	2,640	2,376
M:700873	27N 52E 32 ADCC	SHU	1,975	100	100			53.2	7.0		
M:39381	27N 53E 04 BBCA	SHU	1,955	92	92	25.40	1,930	52.3	8.8		
M:149887	27N 53E 10 BCCA	SHU	1,965	100	100	44.37	1,921	49.1	7.6		
M:39392	27N 53E 29 DDBB	SHU	2,020	65	65	15.71	2,004				
M:39395	27N 53E 34 AAAA	SHU	2,085	30	30	7.01	2,078				
M:121112	27N 53E 34 ADCD	DHU	2,180	240	200	116.95	2,063	51.4	8.2		
M:121114	27N 53E 35 CBBA	DHU	2,120	250	215	84.64	2,035				
M:3355	27N 54E 07 BADD	FHHC	1,935	684	684	-54.10	1,989	64.0	8.7		
M:700893	27N 54E 08 BDBD	SHU	1,950	98	98	42.76	1,907				
M:39400	27N 54E 09 BACC	FHHC	1,922	900	795	-70.74	1,993	52.0	8.7		
M:121115	27N 54E 20 CDBC	SHU	2,080	140	125	39.31	2,041				
M:39406	27N 54E 32 CBCD	DHU	2,045	815	815			55.4	8.6		
M:700906	27N 55E 12 BCBC	SHU	1,920	48	48	15.06	1,905				
M:39415	27N 55E 22 AABC	SHU	1,960	32	32	4.61	1,955	49.3	7.7	4,320	3,888
M:3362	27N 55E 23 DDBD	DHU	2,045	563	563	-15.80	2,061	54.0	8.5	2,570	
M:39418	27N 55E 24 CDBA	DHU	1,995	443	443	66.56	1,928				
M:39421	27N 55E 26 CDAA	SHU	1,985	78	38	24.11	1,961				
M:150965*	27N 56E 03 BDBB	SHU	1,902	21	21	15.69	1,886				
M:700921*	27N 56E 03 CCAD	SHU	1,908	75	68	19.02	1,889				
M:39424	27N 56E 06 CCCB	FHHC	1,905			-53.98	1,959	54.0	8.4	2,700	2,430
M:700924	27N 56E 07 ACBC	SHU	1,905	20	20	14.21	1,891				
M:39436	27N 56E 22 DCBD	SHU	2,015	70	70	25.40	1,990				
M:39438	27N 56E 22 DDDC	SHU	2,030	67	67	34.70	1,995				
M:149644	27N 56E 23 CDBA	FHHC	2,205			148.39	2,057	67.8	8.8	2,170	1,953
M:39444	27N 56E 32 BDAC	SHU	2,090	50	50	35.40	2,055				
M:39445*	27N 56E 34 AABC	SHU	2,075	118	90	38.40	2,037				
M:700933	27N 57E 32 BAAC	DHU	1,940	490	490			59.4	8.3	2,490	2,241
M:39452	27N 57E 32 BCDA	DHU	1,960	490	490	3.32	1,957				
M:40198	28N 53E 32 ADDC	SHU	1,930	114	114			49.1	8.6	1,914	1,723
M:148595	28N 53E 32 ADDD	SHU	1,930	60	60	13.67	1,916	48.9	8.6	1,822	

Appendix C
Inorganic Water-Quality Data

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1976Q0957	M:1166	02N 61E 23 DABB	DHU	370	0.6	1.2	0.2	0.05	0.01	7.3	11.0	0.90	603	45.6	229	0.01	963	1,269	495	4	82.4	9.02	1,537
1976Q0956	M:1167	02N 61E 36 DADC	FHHC	215	0.5	0.8	0.1	0.03	0.01	10.6	9.1	0.50	397	36.0	57	0.14	525	727	385	2	60.3	9.10	875
1976Q0962	M:1251	03N 59E 23 CCCC	DHU	375	0.8	1.5	0.3	0.03	<.01	8.2	2.8	0.30	686	38.4	185	0.36	951	1,299	563	5	73.1	8.88	1,538
1996Q0578	M:15656	03N 60E 26 AABA	DHU	408	0.5	1.7	0.3	0.55	0.01	9.2	3.0	0.50	609	56.8	285	0.13	1,065	1,374	501	6	75.2	8.97	1,680
1996Q0371	M:16509	04N 58E 13 BADD	SHU	91	1.6	42.4	24.4	0.14	0.09	19.9	2.5	0.20	320	17.8	100	1.75	459	621	263	206	2.7	8.04	721
1996Q0372	M:16509	04N 58E 13 BADD	SHU	101	1.8	43.6	24.6	0.14	0.09	19.7	2.5	0.20	384	0.0	100	2.75	485	680	315	210	3.0	8.20	716
1976Q0954	M:1362	04N 59E 10 DBBB	SHU	472	1.5	8.5	3.1	0.12	0.01	7.9	3.2	0.20	576	14.4	552	0.01	1,346	1,639	472	34	35.2	8.63	2,024
1996Q0544	M:16514	04N 59E 17 DADD	SHU	92	1.9	38.6	20.6	0.61	0.02	18.7	1.5	0.30	360	0.0	85	0.13	436	619	295	181	3.0	7.95	692
1996Q0583	M:16570	04N 61E 30 DBAC	SHU	19	3.5	82.1	62.4	0.36	0.17	12.4	3.0	0.60	424	0.0	138	3.50	534	749	347	462	0.4	7.90	863
1976Q0955	M:1363	04N 61E 31 DDD	SHU	160	9.2	150.0	64.0	1.85	0.16	14.1	3.1	0.20	587	0.0	496	0.01	1,188	1,486	481	638	2.8	7.21	1,657
1963Q0013	M:1430	05N 56E 17 DD	FHHC	247	0.8	0.3	0.6	0.08	0.05	14.0	2.9	0.60	522	0.0	103	0.05	627	891	428	3	59.9	8.00	997
1996Q0546	M:700212	05N 56E 32 CBAA	FHHC	249	0.6	1.0	0.2	0.02	0.01	10.3	2.0	0.70	426	51.8	100	0.13	625	841	436	3	60.1	9.14	1,046
1976Q0953	M:1431	05N 57E 04 ADDB	FHHC	278	0.8	1.0	0.2	0.05	0.01	9.6	4.3	1.00	528	47.5	100	0.01	702	970	512	3	66.4	9.10	1,106
1996Q0540	M:1431	05N 57E 04 ADDB	FHHC	285	0.9	1.2	0.3	0.05	0.01	11.3	4.0	0.20	540	43.2	100	0.13	713	987	515	4	61.2	9.03	1,107
1996Q0542	M:17496	05N 57E 11 BADB	SHU	223	5.1	144.0	93.0	1.20	0.16	4.8	3.0	0.10	704	20.8	600	0.13	1,442	1,799	577	742	3.6	8.46	1,868
1996Q0576	M:17513	05N 57E 28 DAAB	SHU	64	3.1	95.6	73.2	0.06	0.12	16.9	90.0	0.90	400	0.0	150	20.00	711	914	328	540	1.2	7.43	1,212
1996Q0541	M:17551	05N 59E 01 DDDB	SHU	425	1.1	2.3	0.5	0.09	0.01	13.5	5.0	0.20	737	69.6	200	0.13	1,080	1,454	606	8	65.9	8.81	1,645
1996Q0115	M:17562	05N 59E 09 ABAB	FHHC	521	1.3	3.6	0.7	0.05	0.01	12.2	4.5	0.54	813	82.8	350	0.13	1,376	1,789	804	12	65.9	8.79	2,090
1996Q0545	M:17567	05N 59E 15 DBBA	SHU	259	6.1	197.5	104.1	2.60	0.57	14.5	5.5	0.80	548	0.0	1,000	0.13	1,861	2,139	450	922	3.7	7.96	2,170
1976Q0924	M:1432	05N 59E 18 AAAB	FHHC	282	0.8	1.1	0.1	0.08	0.01	11.3	9.3	0.50	436	34.1	197	0.47	751	973	414	3	69.1	9.12	1,165
1976Q0923	M:1433	05N 59E 30 AAA	SHU	458	1.1	2.7	0.5	0.06	0.01	9.9	2.4	0.60	611	24.5	433	0.38	1,234	1,544	501	9	67.2	8.81	1,875
1976Q0922	M:1434	05N 60E 17 BCB	SHU	59	1.7	39.3	15.7	<.01	0.01	15.6	6.4	0.20	289	0.0	29	2.60	312	458	237	163	2.0	7.98	523
1963Q0021	M:1563	06N 56E 31 BC	DHU	260	0.8	0.6	0.4	0.03	0.00	12.0	6.2	0.40	468	14.0	126	0.02	651	888	384	3	63.8	8.40	1,030
1976Q0921	M:1564	06N 59E 11 CAD	SHU	766	2.0	5.9	1.7	<.01	0.02	8.9	0.5	0.80	1,003	20.2	798	0.50	2,099	2,608	823	22	71.5	8.54	3,057
1996Q0543	M:19127	06N 60E 08 DBAA	FHHC	827	5.6	160.5	109.7	6.80	0.14	32.5	7.5	0.10	716	0.0	2,000	0.13	3,502	3,865	587	852	12.3	7.13	3,710
1996Q0575	M:20424	07N 55E 30 DDDD	DHU	412	1.2	1.5	0.6	0.07	0.01	8.0	8.5	5.00	972	44.4	8	0.13	968	1,461	798	6	72.1	8.69	1,528
1996Q0562	M:700292	07N 59E 08 CABC	DHU	476	1.2	2.5	0.7	0.04	0.01	9.2	8.0	1.00	752	39.6	337	0.13	1,246	1,628	618	9	69.3	8.72	1,885
1962Q0007	M:1620	07N 59E 11 CB	FHHC	421	0.0	0.1	0.1				16.0		525	108.0	272		1,076	1,342	611	0	225.3	8.40	1,560
1976Q0530	M:1621	07N 59E 11 CCAB	FHHC	372	0.9	2.4	0.3	0.01	0.01	9.9	7.0	0.50	642	14.4	254	0.10	978	1,303	550	7	60.2	8.86	1,591
1976Q0529	M:1622	07N 59E 11 CDB	FHHC	380	0.9	2.2	0.5	0.03	0.01	9.0	12.2	0.50	610	33.6	268	0.10	1,007	1,317	557	8	60.2	8.95	1,638
1976Q0532	M:1623	07N 59E 11 DCA	FHHC	380	0.9	2.2	0.1	0.02	0.01	9.0	21.6	0.30	510	32.6	321	0.60	1,020	1,279	473	6	68.1	8.98	1,629
1976Q0528	M:1624	07N 59E 11 DCB	FHHC	374	0.9	2.3	0.1	0.02	0.01	9.0	16.9	0.40	534	37.4	280	0.20	984	1,255	500	6	65.6	8.96	1,638
1976Q0531	M:1625	07N 59E 14 AAC	FHHC	384	1.0	2.4	0.4	0.02	0.01	10.7	9.3	0.20	605	27.4	299	0.10	1,033	1,340	542	8	60.5	8.72	1,630
1976Q0920	M:1626	07N 59E 24 DCBB	FHHC	344	0.9	1.3	0.3	0.21	0.02	14.0	5.0	0.30	485	9.6	339	0.10	953	1,199	413	4	70.7	8.58	1,434
1996Q0519	M:20590	07N 60E 10 DAAC	FHHC	98	4.3	58.9	30.4	0.27	0.81	36.7	12.0	0.50	186	0.0	300	3.00	637	731	153	272	2.6	7.08	874
1996Q0523	M:20600	07N 60E 25 BACB	SHU	122	5.8	273.7	110.7	<.003	0.03	18.9	30.0	0.20	345	0.0	950	27.50	1,709	1,884	283	1,139	1.6	7.63	1,957
1976Q0925	M:1627	07N 61E 06 DCBB	FHHC	370	1.5	1.7	0.6	0.06	0.01	11.4	0.5	0.10	482	15.4	383	0.20	1,022	1,267	421	7	62.1	8.82	1,552
1996Q0574	M:21963	08N 56E 01 DDCD	DHU	559	1.6	2.9	1.5	0.06	0.00	7.6	10.0	3.00	1,071	105.6	150	0.13	1,369	1,912	880	13	66.4	8.98	2,060
1976Q0964	M:1678	08N 57E 14 DABA	SHU	276	5.1	206.0	145.0	0.05	0.57	12.2	18.6	0.05	705	0.0	1,047	7.40	2,065	2,423	578	1,111	3.6	7.45	2,675
1996Q0525	M:21998	08N 57E 26 CCDA	DHU	449	1.2	2.5	0.6	0.23	0.01	7.1	11.0	4.00	966	80.0	35	0.13	1,067	1,557	794	9	66.2	8.76	1,604

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1996Q0520	M:22002	08N 57E 34 AADA	SHU	530	1.8	3.9	1.9	0.08	0.03	9.0	10.0	4.00	1,314	22.0	33	0.13	1,262	1,928	1,078	18	55.0	8.46	1,872
1996Q0577	M:22016	08N 58E 11 DDDD	SHU	117	6.8	173.8	96.1	1.90	0.73	17.9	20.0	1.00	370	0.0	737	0.13	1,355	1,543	304	830	1.8	7.79	1,668
1996Q0582	M:22016	08N 58E 11 DDDD	SHU	111	6.6	165.4	92.5	1.90	0.70	17.2	20.0	1.00	371	0.0	689	<.25	1,288	1,477	304	794	1.7	7.18	1,666
1963Q0014	M:1680	08N 58E 30 BD	FHHC	365	1.0	1.7	0.2	0.01	0.01	12.0	38.0	0.90	575	50.0	165	0.05	917	1,209	555	5	70.6	8.40	1,450
1978Q0143	M:22031	08N 58E 30 CAA	FHHC	344	0.9	1.8	0.3	<.01	<.01	11.2	10.5	0.80	630	35.5	167	0.41	883	1,202	576	6	62.5	8.87	1,433
1978Q0144	M:1681	08N 58E 30 DCDB	FHHC	346	1.0	1.8	0.3	<.01	<.01	10.7	15.0	0.90	648	35.8	137	0.28	868	1,197	591	6	62.9	8.86	1,426
1996Q0117	M:22039	08N 58E 34 BD	FHHC	390	0.9	2.0	0.4	0.03	0.01	11.6	25.0	0.89	627	41.6	250	0.13	1,031	1,349	584	7	65.5	8.91	1,599
1975Q0021	M:1682	08N 60E 15 ABB	SHU	77	6.2	76.0	58.0	<.01	0.12	15.1	7.6	0.20	390	0.0	253	1.20	686	884	320	429	1.6	8.01	1,033
1996Q0040	M:22920	09N 53E 10 ADCD	SHU	9	3.3	97.3	35.9	0.06	0.15	13.9	16.0	0.12	339	0.0	80	9.50	433	605	278	391	0.2	7.53	763
1976Q0963	M:1736	09N 56E 36 ABB	DHU	444	6.3	129.0	74.0	1.65	0.03	13.8	6.2	0.05	575	0.0	1,086	0.05	2,045	2,336	472	627	7.7	7.57	2,724
1976Q0926	M:1737	09N 59E 33 DCC	SHU	57	2.8	35.6	21.1	<.01	0.12	13.7	4.3	0.40	322	0.0	32	0.20	326	489	264	176	1.9	7.86	543
1976Q0928	M:1738	09N 60E 08 CBB	SHU	105	5.5	212.0	131.0	3.93	0.94	19.7	10.4	0.20	230	0.0	1,065	0.05	1,666	1,782	188	1,069	1.4	6.54	2,036
1976Q0927	M:1739	09N 60E 19 AAA	SHU	235	13.0	385.0	275.0	8.70	2.33	33.4	16.8	0.10	77	0.0	2,488	0.05	3,496	3,535	63	2,093	2.2	5.68	3,752
1996Q0042	M:137857	10N 51E 08 DAAB	FHHC	303	0.7	1.0	0.2	0.01	<.002	10.5	21.0	1.48	618	57.6	65	0.13	766	1,079	603	3	71.5	9.04	1,272
1996Q0118	M:23608	10N 54E 11 CBBD	FHHC	299	0.9	0.9	0.2	0.01	0.01	10.8	27.5	1.30	565	52.8	88	0.13	759	1,046	551	3	75.2	8.91	1,228
1996Q0522	M:23671	10N 57E 22 CDCC	DHU	37	5.7	200.4	123.1	1.30	0.17	13.9	4.0	0.20	511	0.0	650	0.13	1,287	1,547	419	1,007	0.5	8.05	1,639
1996Q0521	M:23677	10N 57E 28 DDAC	SHU	189	6.2	127.4	77.9	2.00	0.04	12.7	4.0	0.20	497	15.9	600	0.75	1,281	1,533	408	639	3.3	8.34	1,620
1972Q0071	M:1758	10N 58E 18 CD	FHHC	650	2.0	9.6	2.5	0.01	<.01	17.4	6.1	0.10	1,032	0.0	573	0.72	1,770	2,293	846	34	48.3	8.02	2,800
1962Q0008	M:1759	10N 58E 18 CDDD	FHHC	765	0.0	9.0	4.0				16.0		1,098	0.0	749		2,084	2,641	901	39	53.3	7.60	2,940
1996Q0559	M:23701	10N 58E 25 AAAD	FHHC	502	2.8	12.1	6.2	0.04	0.10	12.8	6.0	0.10	905	0.0	378	2.25	1,368	1,828	742	56	29.3	8.17	1,939
1958Q0008	M:1760	10N 58E 32 DB	FHHC	877	0.0	13.0	5.0				14.0		1,049	60.0	942		2,428	2,960	960	53	52.4	8.70	3,050
1961Q0004	M:1761	10N 58E 32 DB	FHHC	840	0.0	8.0	3.0				40.0		793	108.0	934		2,324	2,726	831	32	64.3	8.30	3,400
1996Q0579	M:23780	10N 61E 20 ABAD	SHU	91	8.5	85.0	65.1	2.70	0.35	20.4	4.5	0.60	461	0.0	300	0.13	805	1,039	378	480	1.8	7.98	1,183
1948Q0013	M:1773	11N 49E 36 DA	SHU	544	3.6	16.0	7.4	0.16		22.0	96.0	1.00	780	0.0	414	14.46	1,503	1,899	640	70	28.2	8.00	2,410
1996Q0045	M:149349	11N 50E 30 DADC	FHHC	301	0.6	0.9	0.2	0.04	<.002	9.7	37.5	2.11	668	51.6	10	0.13	743	1,082	634	3	73.8	9.02	1,262
1996Q0047	M:24115	11N 51E 26 CBBC	SHU	341	1.6	5.1	1.8	0.04	0.01	8.5	8.0	2.08	746	0.0	163	0.13	900	1,278	612	20	33.0	8.62	1,418
1963Q0016	M:1775	11N 54E 29 CA	FHHC	315	0.8	1.8	0.4	0.02	<.01	11.0	16.0	1.50	645	22.0	85	0.02	771	1,099	566	6	55.3	8.60	1,240
1976Q1348	M:1776	11N 54E 29 CACB	FHHC	308	0.9	1.0	0.2	0.12	<.01	9.8	20.5	1.70	611	38.4	80	0.01	762	1,072	565	3	73.6	9.02	1,255
1976Q1349	M:1777	11N 54E 29 CACD	FHHC	306	0.9	1.0	0.2	0.13	<.01	9.7	15.5	1.60	608	41.8	82	0.10	758	1,067	568	3	73.1	9.02	1,247
1976Q1345	M:1778	11N 54E 29 CBCD	DHU	360	1.3	1.4	0.4	0.07	0.02	9.8	22.0	2.50	799	28.8	61	0.33	881	1,286	656	5	69.1	8.83	1,422
1976Q1346	M:1779	11N 54E 29 CBDC	FHHC	301	0.9	1.0	0.1	0.04	<.01	9.8	25.0	1.40	597	41.8	70	0.01	745	1,048	559	3	76.8	9.00	1,222
1976Q1347	M:1780	11N 54E 30 DDAD	DHU	306	0.9	1.0	0.2	0.13	<.01	9.8	19.5	1.50	610	39.8	82	0.01	761	1,070	501	3	73.1	9.02	1,235
1996Q0581	M:24170	11N 54E 33 CBBD	DHU	431	1.2	1.6	0.6	0.07	0.00	9.2	20.0	5.00	1,025	39.6	1	0.13	1,014	1,534	841	7	72.7	8.70	1,610
1962Q0009	M:1781	11N 55E 02 AC	FHHC	376	0.0	0.1	0.1				32.0		476	132.0	156		930	1,172	611	0	201.2	8.40	1,460
1963Q0019	M:1782	11N 56E 02 CA	DHU	187	6.8	140.0	124.0	0.01	0.01	14.0	3.8	0.00	523	0.0	778	0.27	1,512	1,777	429	860	2.8	7.80	2,020
1962Q0010	M:1783	11N 57E 17 BC	FHHC	375	0.0	0.1	0.1				20.0		573	84.0	171		932	1,223	610	0	200.6	8.40	1,340
1961Q0005	M:1784	11N 57E 21 CBAC	FHHC	507	0.0	5.0	1.0				20.0		293	72.0	704		1,453	1,602	360	17	54.1	8.70	2,060
1957Q0013	M:1785	11N 57E 21 CDBB	FHHC	581	0.0	12.0	0.0				34.0		607	0.0	720		1,646	1,954	498	30	46.2	8.00	2,420
1996Q0587	M:24229	11N 57E 28 DCCB	FHHC	431	0.9	1.8	0.5	0.04	0.00	11.7	8.0	1.60	802	39.6	200	0.13	1,090	1,497	723	6	73.9	8.84	1,658
1962Q0016	M:1786	11N 57E 32 BBBD	FHHC	443	0.0	0.1	0.1				14.0		683	108.0	197		1,098	1,445	740	0	237.0	8.40	1,590

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1996Q0563	M:24237	11N 58E 05 ACBC	FHHC	476	1.1	2.2	0.4	0.01	0.01	10.3	7.0	0.10	883	62.4	198	0.13	1,192	1,640	829	7	77.5	8.67	1,789
1982Q0033	M:1787	11N 59E 01 BCBC	FHHC	427	0.1	2.0	0.6	0.09	0.02	6.1	25.5	1.40	695	50.4	252	0.02	1,108	1,460	654	7	68.0	8.86	1,765
1982Q0034	M:1788	11N 59E 01 BCCB	SHU	450	4.0	61.3	29.2	0.28	0.06	12.7	4.2	0.31	843	0.0	614	0.24	1,592	2,019	691	273	11.9	8.28	2,378
1982Q0044	M:1789	11N 59E 21 D	DHU	502	0.8	2.6	0.6	0.30	0.01	10.7	8.0	0.85	927	26.4	322	0.02	1,331	1,801	761	9	73.0	8.74	2,038
1982Q0038	M:1790	11N 61E 06 DDAC	FHHC	493	0.8	2.5	0.6	0.12	0.01	12.9	10.9	1.50	797	26.4	403	0.07	1,344	1,749	698	9	72.7	8.57	2,044
1994Q0738	M:137223	12N 51E 02 BBCB	SHU	745	12.5	192.0	118.0	0.01	0.00	19.2	33.9	0.43	468	0.0	2,109	0.13	3,461	3,698	384	965	10.4	7.44	4,240
1996Q0114	M:24646	12N 51E 15 CBDB	FHHC	320	1.0	1.1	0.3	0.07	0.01	9.5	22.5	2.29	682	57.6	40	0.13	790	1,137	656	4	70.7	8.97	1,299
1948Q0014	M:1806	12N 51E 16 AC	SHU	146	5.6	98.0	55.0	6.00		29.0	13.0	0.40	576	0.0	302	0.38	939	1,231	472	471	2.9	7.60	1,380
1948Q0016	M:1808	12N 51E 16 CD	FHHC	319	1.2	4.0	0.3	0.06		14.0	34.0	1.20	704	39.0	9	0.43	769	1,126	642	11	41.4	8.70	1,350
1995Q0316	M:24659	12N 51E 16 DBDA	FHHC	317	1.2	1.0	0.2	0.02	<.002	9.8	30.0	2.07	670	52.8	23	0.13	768	1,108	638	3	75.1	9.00	1,291
1995Q0641	M:148500	12N 51E 21 DADD	SHU	90	9.1	97.0	47.8	0.02	0.02	31.0	18.0	0.50	490	0.0	200	3.25	738	987	402	439	1.9	7.38	1,115
1994Q0824	M:137726	12N 51E 33 AAAA	SHU	564	9.6	94.1	59.5	0.01	0.14	16.0	30.7	0.37	463	0.0	1,270	0.13	2,273	2,507	380	480	11.2	7.57	3,120
1996Q0052	M:24777	12N 52E 27 CCBD	SHU	16	3.8	60.5	20.6	<.003	<.002	14.5	1.5	0.19	312	0.0	13	0.13	283	441	256	236	0.4	7.21	512
1962Q0015	M:1809	12N 55E 15 BC	FHHC	387	0.0	2.0	1.0				30.0		561	120.0	143		959	1,244	660	9	55.8	8.50	1,370
1962Q0014	M:1810	12N 55E 16 DBBB	FHHC	376	0.0	0.1	0.1				30.0		573	132.0	82		902	1,193	690	0	201.2	8.50	1,380
1962Q0013	M:1811	12N 55E 20 DCCD	FHHC	372	0.0	0.1	0.1				24.0		549	120.0	120		906	1,185	650	0	199.0	8.50	1,350
1962Q0012	M:1812	12N 55E 21 DD	FHHC	457	0.0	0.1	0.1				22.0		817	132.0	70		1,083	1,498	890	0	244.5	8.40	1,390
1963Q0018	M:1813	12N 55E 35 AC	SHU	480	1.6	4.2	1.3	0.14	0.09	11.0	12.0	0.60	558	0.0	565	0.09	1,351	1,634	458	16	52.5	8.10	2,050
1958Q0009	M:1814	12N 56E 10 ACDA	FHHC	688	0.0	13.0	3.0				20.0		1,013	72.0	542		1,837	2,351	951	45	44.7	9.00	2,410
1952Q0007	M:1815	12N 56E 26 AB	FHHC	462	0.0	0.0	0.0				28.0		970	0.0	163		1,131	1,623	796			8.00	1,360
1982Q0043	M:1816	12N 59E 03 ACAA	SHU	507	1.4	6.1	3.3	0.05	0.01	8.5	2.5	0.90	972	33.6	310	0.25	1,352	1,846	798	29	41.1	8.73	2,087
1996Q0555	M:24927	12N 59E 14 ADAC	SHU	248	6.0	219.8	95.8	0.20	0.05	10.8	40.0	0.20	824	0.0	680	15.00	1,722	2,140	676	943	3.5	8.07	2,270
1996Q0560	M:142658	12N 59E 23 DAAC	FHHC	636	1.8	4.2	1.5	0.62	0.02	9.6	5.0	1.20	778	33.6	673	0.13	1,750	2,145	694	17	67.8	8.68	2,420
1996Q0558	M:24941	12N 59E 32 AADA	FHHC	391	1.1	2.1	0.5	0.02	0.01	11.0	4.0	0.10	733	44.4	172	0.13	987	1,359	675	7	62.5	8.43	1,830
1982Q0209	M:1817	12N 60E 18 ACCC	SHU	564	6.0	80.8	42.4	0.47	0.18	12.5	1.8	0.52	724	0.0	959	0.11	2,025	2,392	594	376	12.7	7.63	2,743
1996Q0553	M:25013	12N 61E 09 CBCC	DHU	379	4.2	30.6	19.8	0.37	0.01	10.9	4.0	0.50	932	28.8	150	0.13	1,087	1,560	765	158	13.1	8.21	2,400
1996Q0039	M:700111	13N 48E 08 DCAA	SHU	521	16.5	199.2	172.5	0.17	0.01	10.9	65.0	0.20	492	0.0	1,750	8.00	2,986	3,235	404	1,207	6.5	7.71	3,400
1980Q2495	M:1843	13N 49E 18 DBAD	SHU	1,080	5.7	155.0	216.0	0.06	0.01	9.6	16.1	0.62	582	0.0	3,010	3.95	4,784	5,079	477	1,276	13.2	8.14	6,189
1980Q2494	M:1844	13N 50E 10 CDDC	SHU	669	5.7	133.0	82.0	0.07	0.01	15.3	12.1	0.99	636	0.0	1,550	0.09	2,782	3,105	522	670	11.3	8.18	3,664
1994Q0739	M:137279	13N 51E 31 ABDD	SHU	725	11.4	153.0	116.0	0.02	<.002	15.7	32.6	0.46	622	0.0	1,797	0.13	3,158	3,473	510	860	10.8	7.73	4,020
1979Q3535	M:1845	13N 51E 31 BCDD	DHU	633	2.2	3.8	1.5	0.05	0.00	8.2	43.6	1.80	1,429	61.4	36	0.02	1,495	2,220	1,173	16	69.6	8.67	2,314
1996Q0366	M:1845	13N 51E 31 BCDD	DHU	603	1.8	2.9	1.3	0.20	0.01	8.3	30.0	1.30	1,392	84.0	1	0.13	1,419	2,125	1,143	13	74.0	8.56	2,140
1979Q3173	M:1846	13N 51E 31 BDCB	FHHC	321	0.8	1.3	0.2	0.05	<.01	10.3	29.1	2.70	684	51.8	8	0.01	762	1,109	647	4	69.2	8.86	1,270
1996Q0367	M:1846	13N 51E 31 BDCB	FHHC	319	0.9	0.9	0.2	0.05	0.00	9.7	30.0	2.00	664	59.2	8	0.13	757	1,094	643	3	78.7	9.07	1,270
1994Q0823	M:137725	13N 51E 32 CAAA	SHU	998	15.6	227.0	135.0	0.12	0.28	21.5	37.0	0.47	638	0.0	2,621	0.13	4,370	4,694	523	1,122	13.0	7.39	5,340
1994Q0825	M:137724	13N 51E 32 CDDC	SHU	527	9.3	119.0	79.2	0.02	0.01	17.3	29.7	0.42	593	0.0	1,202	0.13	2,276	2,577	486	623	9.2	7.67	3,070
1980Q2504	M:1847	13N 51E 34 AADA	FHHC	320	0.9	1.1	0.4	0.05	0.00	11.8	36.9	2.50	800	0.0	3	0.01	771	1,177	656	4	66.4	8.78	1,357
1980Q2482	M:1848	13N 52E 05 CACA	SHU	277	8.5	297.0	170.0	5.40	0.43	13.5	9.6	0.14	724	0.0	1,434	0.16	2,573	2,940	594	1,441	3.2	7.29	3,218
1951Q0010	M:140757	13N 52E 25 BDAC	FHHC	374	1.3	2.0	0.7	0.00		6.3	19.0	3.00	756	52.0	71	0.14	902	1,285	707	8	58.0	8.80	1,440
1948Q0017	M:1849	13N 52E 34 CA	SHU	149	4.4	33.0	17.0	0.06		26.0	8.0	0.40	440	0.0	102	0.50	557	780	361	152	5.3	7.90	914

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1996Q0567	M:702103	13N 53E 02 DDCD	SHU	86	5.8	118.6	86.5	0.01	<.002	25.6	10.5	0.40	367	0.0	458	15.00	987	1,173	301	652	1.5	7.49	1,419
1950Q0002	M:140758	13N 53E 10 DBC	SHU	415	19.0	224.0	321.0	0.29		24.0	20.0	0.80	459	0.0	2,130	57.38	3,438	3,670	376	1,881	4.2	7.70	4,120
1995Q5007	M:151962	13N 53E 11 AAA	SHU	93	25.8	76.7	71.4	<.2	<.1		10.5	0.50	412	0.0	354		834	1,043	338	485	1.8	6.30	1,550
1995Q5008	M:151963	13N 53E 11 AAA	SHU	99	3.2	150.0	169.0	<.2	<.1		34.8	0.50	768	0.0	578		1,412	1,802	630	1,070	1.3	6.30	1,320
1995Q5001	M:151956	13N 53E 11 ABB	SHU	90	5.8	108.0	74.1	<.2	<.1		17.2	0.50	345	0.0	397		862	1,037	283	575	1.6	5.60	1,100
1995Q5002	M:151957	13N 53E 11 ABB	SHU	87	4.5	123.0	117.0	<.2	<.1		15.8	0.50	874	0.0	257		1,035	1,479	717	789	1.4	6.01	1,240
1995Q5003	M:151958	13N 53E 11 ABD	SHU	154	9.6	153.0	129.0	<.2	<.1		24.7	0.50	659	0.0	593		1,388	1,722	540	913	2.2	5.85	1,550
1995Q5004	M:151959	13N 53E 11 ABD	SHU	104	7.3	157.0	119.0	<.2	<.1		25.2	0.50	650	0.0	457		1,190	1,520	533	882	1.5	5.70	1,410
1995Q5000	M:151955	13N 53E 11 ACC	SHU	127	6.8	181.0	131.0	<.2	<.1		29.4	0.50	617	0.0	604		1,383	1,696	506	991	1.8	6.03	1,540
1995Q5006	M:151961	13N 53E 11 ADA	SHU	85	5.3	125.0	103.0	<.2	<.1		21.6	0.50	680	0.0	292		967	1,312	558	736	1.4	6.20	1,230
1948Q0019	M:1852	13N 53E 11 CD	SHU	576	6.4	233.0	255.0	0.20		15.0	63.0	0.90	646	0.0	2,220	4.97	3,693	4,020	530	1,631	6.2	7.70	4,410
1948Q0021	M:1853	13N 53E 11 DAA	SHU	547	14.0	305.0	470.0	0.20		28.0	94.0	0.90	376	0.0	3,140	25.98	4,810	5,001	308	2,696	4.6	8.00	5,410
1995Q5005	M:151960	13N 53E 11 DAB	SHU	128	7.4	86.7	66.1	<.2	<.1		14.2	0.50	477	0.0	373		910	1,152	391	489	2.5	6.30	1,130
1995Q5009	M:151964	13N 53E 11 DBA	SHU	101	8.8	135.0	109.0	<.2	<.1		24.0	0.50	604	0.0	482		1,157	1,464	495	786	1.6	7.20	1,230
1995Q5010	M:151965	13N 53E 11 DDB	SHU	90	6.3	96.9	117.0	<.2	<.1		19.9	0.50	667	0.0	325		984	1,323	547	724	1.5	6.80	1,250
1951Q0011	M:140759	13N 53E 12 ACB	SHU	472	18.0	265.0	360.0	0.56		23.0	46.0	0.80	530	0.0	2,430	43.15	3,920	4,189	435	2,143	4.4	7.50	4,660
1995Q5011	M:151966	13N 53E 12 BCC	SHU	92	7.2	88.3	99.9	<.2	<.1		20.2	0.50	577	0.0	308		900	1,193	473	632	1.6	6.25	1,170
1951Q0012	M:140760	13N 53E 15 AAC	SHU	464	12.0	357.0	283.0	6.90		20.0	31.0	0.70	368	0.0	2,600	0.11	3,956	4,143	302	2,056	4.5	7.20	4,460
1951Q0013	M:140761	13N 53E 15 DAD	SHU	237	7.4	104.0	85.0	1.00		22.0	7.5	0.50	383	0.0	775	0.14	1,428	1,623	314	610	4.2	7.50	1,980
1951Q0014	M:140774	13N 53E 29 ACB	SHU	327	9.3	89.0	103.0			21.0	41.0	0.80	578	0.0	825	2.48	1,703	1,997	474	646	5.6	7.60	2,370
1979Q3462	M:1854	13N 53E 30 DABC	FHHC	330	0.8	1.2	0.3	0.03	0.00	10.6	16.7	2.00	670	50.9	60	0.47	803	1,143	634	4	69.8	8.86	1,317
1996Q0573	M:25485	13N 53E 35 BBCB	SHU	41	6.0	75.4	35.0	<.003	<.002	25.0	19.0	0.30	348	0.0	94	5.00	472	649	286	332	1.0	7.93	767
1982Q0082	M:1855	13N 54E 10 BB	FHHC	328	0.1	1.1	0.1	0.00	0.00	14.0	25.9	2.60	687	34.8	69	0.22	814	1,163	622	3	80.3	8.92	1,284
1963Q0017	M:1856	13N 55E 18 DCC	SHU	106	8.1	190.0	172.0	0.00	0.00	11.0	3.0	0.00	413	0.0	1,000	0.01	1,694	1,903	339	1,182	1.3	7.80	2,130
1982Q0039	M:1857	13N 59E 10 DAAA	FHHC	446	0.5	1.9	0.4	0.04	0.01	12.0	15.2	1.70	758	0.0	329	0.05	1,180	1,565	622	6	76.8	8.02	1,829
1996Q0561	M:1857	13N 59E 10 DAAA	FHHC	457	1.1	2.0	0.5	0.04	0.01	11.8	20.0	1.10	641	45.6	355	0.13	1,210	1,535	602	7	76.0	8.80	1,792
1976Q1320	M:1858	13N 59E 29 AAAA	DHU	745	5.8	54.5	31.0	0.51	0.11	11.3	20.0	0.40	895	0.0	1,054	0.10	2,363	2,817	734	264	20.0	7.71	3,219
1996Q0557	M:1858	13N 59E 29 AAAA	DHU	694	7.8	134.4	78.2	2.20	0.28	14.9	8.5	0.50	731	40.8	1,450	0.13	2,791	3,162	600	657	11.8	8.43	3,200
1976Q1319	M:1859	13N 60E 06 CBBB	SHU	208	5.9	62.0	47.5	1.34	0.31	17.3	3.5	0.30	532	0.0	357	0.01	966	1,235	436	350	4.8	7.57	1,444
1980Q2505	M:1895	14N 47E 04 ADCC	SHU	155	8.8	268.0	279.0	3.72	0.12	15.4	10.4	0.20	978	0.0	1,393	0.04	2,616	3,112	802	1,818	1.6	7.55	3,222
1980Q2506	M:1896	14N 48E 33 ABBC	SHU	653	7.0	285.0	215.0	1.60	0.56	14.3	19.1	0.35	791	0.0	2,310	0.10	3,896	4,297	649	1,597	7.1	7.79	4,651
1980Q2496	M:1897	14N 49E 28 ADAC	SHU	22	4.0	86.7	36.9	0.01	0.01	8.9	4.2	0.12	352	0.0	108	1.40	446	624	289	368	0.5	8.14	761
1996Q0044	M:143793	14N 50E 24 DDCD	SHU	421	10.7	167.3	153.3	0.21	0.12	13.4	6.5	0.15	1,224	0.0	1,000	0.13	2,375	2,996	1,004	1,049	5.7	6.92	2,890
1980Q2493	M:1898	14N 50E 29 DBCD	DHU	668	2.2	5.2	2.8	0.14	0.01	7.5	9.7	2.51	708	0.0	840	0.06	1,887	2,246	581	25	58.7	8.32	2,869
1996Q0049	M:26264	14N 53E 29 DBCC	SHU	18	2.3	47.8	26.3	0.01	<.002	15.8	6.5	0.22	286	0.0	28	0.13	285	430	235	228	0.5	7.70	499
1981Q0455	M:1900	14N 54E 08 CDDC	DHU	323	0.6	8.6	4.6	<.002	0.00	8.1	8.0	2.64	731	5.3	123	0.01	844	1,215	600	40	22.1	8.37	1,447
1996Q0568	M:26283	14N 54E 18 BCCA	SHU	53	5.3	92.1	94.0	<.003	<.002	22.1	178.0	0.20	342	0.0	47	44.50	705	879	281	617	0.9	8.19	1,356
1951Q0016	M:140879	14N 54E 23 BDC	SHU	433	9.8	74.0	78.0			27.0	18.0	0.60	741	0.0	750	0.27	1,756	2,132	608	506	8.4	7.70	2,530
1950Q0005	M:140886	14N 54E 28 DD	SHU	910	9.2	200.0	102.0	6.20		20.0	35.0	0.80	1,070	0.0	1,970	0.66	3,781	4,324	878	919	13.1	7.30	4,550
1979Q3465	M:1903	14N 54E 29 ACCA	FHHC	325	0.9	0.6	0.2	0.08	0.00	12.0	23.5	2.10	724	26.4	46	0.02	793	1,161	638	2	92.8	8.83	1,290

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1950Q0006	M:140887	14N 54E 33 BA	SHU	420	7.0	70.0	103.0	3.40		20.0	17.0	0.80	600	0.0	975	0.77	1,913	2,217	492	599	7.5	8.10	2,580
1950Q0007	M:140887	14N 54E 33 BA	SHU	422	7.4	103.0	106.0	0.30		20.0	18.0	0.80	702	0.0	995	0.93	2,019	2,375	576	693	7.0	7.80	2,660
1950Q0008	M:140888	14N 54E 33 BC	SHU	450	8.9	81.0	58.0	2.60		22.0	13.0	0.80	644	0.0	795	0.11	1,749	2,075	528	441	9.3	7.60	2,460
1948Q0025	M:1904	14N 54E 33 CB	DHU	733	4.8	4.5	2.0	0.02		11.0	24.0	1.40	1,950	0.0	2	0.20	1,744	2,733	1,599	19	72.3	7.90	2,580
1950Q0009	M:140900	14N 54E 33 CD	SHU	153	6.1	74.0	58.0			20.0	13.0	0.80	509	0.0	304	2.94	883	1,141	417	424	3.2	7.50	1,310
1950Q0010	M:140901	14N 54E 33 DA	SHU	376	7.8	87.0	62.0	4.10		22.0	17.0	1.00	736	0.0	624	1.69	1,565	1,939	604	472	7.5	7.60	2,180
1963Q0022	M:1905	14N 54E 34 CB	FHHC	340	0.8	1.2	0.2	0.04	0.00	13.0	23.0	2.50	706	33.0	54	0.02	816	1,174	634	4	75.7	8.50	1,300
1948Q0026	M:1906	14N 55E 07 DC	SHU	266	2.8	18.0	14.0	0.20		26.0	16.0	1.10	506	0.0	244	1.13	838	1,095	415	103	11.4	7.40	1,360
1951Q0020	M:140924	14N 55E 18 CCC	SHU	568	8.4	44.0	36.0			19.0	17.0	1.20	721	0.0	885	0.25	1,934	2,300	591	258	15.4	7.90	2,830
1995Q0317	M:144392	14N 55E 31 CBBB	FHHC	322	1.4	1.0	0.3	0.03	0.00	11.8	30.0	2.17	684	67.2	45	0.13	819	1,166	673	4	74.7	8.96	1,315
1974Q0301	M:1907	14N 59E 10 CDAD	SHU	36	4.1	107.0	66.0			9.5	6.2	0.30	418	0.0	246	0.05	681	893	343	539	0.7	7.47	1,000
1976Q1321	M:1908	14N 59E 15 ABBB	SHU	158	10.3	190.0	157.0	7.70	0.24	12.2	8.5	0.05	628	0.0	924	0.13	1,778	2,096	515	1,121	2.1	7.33	2,305
1996Q0556	M:127943	14N 60E 30 BBBA	DHU	515	1.7	3.8	2.1	0.02	0.01	7.9	4.5	0.50	824	38.4	380	0.13	1,360	1,777	676	18	52.6	8.68	2,010
1995Q0633	M:132726	15N 45E 14 DACD	SHU	553	10.3	238.0	197.8	4.70	0.48	16.9	11.0	0.14	848	0.0	1,750	2.25	3,204	3,634	695	1,408	6.4	7.39	3,490
1995Q0634	M:132715	15N 45E 14 DACD	SHU	553	9.4	195.0	178.0	0.17	0.41	10.3	8.5	0.12	813	0.0	1,750	0.13	3,105	3,517	666	1,220	6.9	7.00	3,420
1980Q2492	M:1987	15N 47E 05 ADCD	SHU	89	9.4	262.0	283.0	4.00	0.07	17.8	6.9	0.14	736	0.0	1,390	2.04	2,427	2,800	604	1,819	0.9	7.57	2,931
1996Q0043	M:27562	15N 48E 10 CDCB	SHU	4	2.5	56.7	32.9	0.06	0.01	9.4	1.5	0.14	305	0.0	38	0.75	295	450	250	277	0.1	8.04	530
1980Q2488	M:1988	15N 48E 22 ADCC	SHU	62	5.7	110.0	82.7	0.53	0.12	15.3	6.7	0.13	462	0.0	352	0.16	863	1,097	379	615	1.1	7.78	1,213
1980Q2489	M:1990	15N 50E 17 CAAA	SHU	93	6.7	107.0	91.5	1.07	0.07	14.1	5.8	0.18	570	0.0	350	1.36	952	1,241	468	644	1.6	7.78	1,421
1996Q0046	M:27611	15N 50E 23 AACC	SHU	366	5.3	74.2	50.0	0.08	0.10	10.5	5.5	0.98	871	0.0	500	0.13	1,442	1,884	714	391	8.1	7.52	1,893
1995Q0456	M:27620	15N 50E 31 DDDD	SHU	667	3.8	22.3	23.8	0.01	0.06	0.7	10.0	0.99	650	0.0	1,000	1.25	2,050	2,380	533	154	23.4	8.13	2,780
1980Q2507	M:1991	15N 50E 35 ACCA	SHU	54	4.4	103.0	49.8	2.18	0.23	9.3	5.0	0.10	434	0.0	216	0.58	658	878	356	462	1.1	7.36	1,009
1995Q0454	M:27650	15N 51E 34 ABCA	SHU	604	5.3	39.0	26.4	0.27	0.04	0.8	10.0	0.35	823	0.0	850	0.13	1,931	2,349	675	206	18.3	7.64	2,560
1995Q0445	M:130335	15N 53E 25 DAAB	SHU	17	3.6	57.5	33.5	0.01	<.002	2.2	30.0	0.16	229	0.0	100	1.75	358	475	188	281	0.4	7.75	604
1995Q0446	M:130335	15N 53E 25 DAAB	SHU	17	3.4	57.9	33.4	0.01	<.002	2.1	30.0	0.16	230	0.0	100	1.75	359	476	189	282	0.4	7.77	604
1995Q0452	M:27717	15N 53E 34 DBA	SHU	219	3.4	35.8	21.6	0.01	<.002	1.4	10.0	0.37	472	0.0	250	0.75	774	1,014	387	178	7.1	7.99	1,188
1995Q0451	M:27719	15N 54E 02 DACD	DHU	232	1.1	0.7	0.2	0.01	0.00	1.1	5.0	0.39	444	48.5	50	0.13	553	778	365	3	60.2	9.09	964
1995Q0453	M:27720	15N 54E 02 DADB	SHU	38	4.3	38.1	31.1	0.02	0.22	1.6	20.0	0.34	244	0.0	50	0.50	304	428	200	223	1.1	7.76	582
1995Q0449	M:27811	15N 55E 11 BBDA	SHU	674	3.0	5.5	1.5	0.14	0.02	1.2	10.0	0.46	1,334	0.0	400	0.13	1,742	2,419	1,094	20	65.7	7.83	2,510
1995Q0492	M:27815	15N 55E 12 ABDC	SHU	486	2.0	2.6	0.7	0.05	0.01	7.8	8.5	1.69	946	46.8	218	0.13	1,240	1,720	776	9	69.8	8.90	1,903
1951Q0025	M:140930	15N 55E 16 BAB	SHU	300	6.9	70.0	40.0	0.06		28.0	42.0	0.60	508	0.0	490	8.58	1,236	1,494	417	339	7.1	7.80	1,850
1950Q0013	M:140931	15N 55E 16 BCCA	SHU	218	15.0	101.0	84.0	0.49		25.0	41.0	0.60	579	0.0	505	8.81	1,284	1,578	475	598	3.9	7.90	1,850
1951Q0026	M:140932	15N 55E 17 AADD	SHU	193	7.2	96.0	58.0	0.64		25.0	33.0	0.40	512	0.0	418	1.67	1,085	1,345	420	478	3.8	7.80	1,590
1996Q0566	M:152660	15N 55E 22 CACA	SHU	506	5.1	23.6	11.4	0.00	<.002	21.8	8.0	0.50	809	0.0	500	2.00	1,476	1,886	663	106	21.4	8.27	2,110
1996Q0569	M:27857	15N 55E 30 BDAA	SHU	72	3.3	107.3	47.1	0.00	<.002	20.0	11.0	0.80	418	0.0	250	0.50	718	930	343	462	1.5	7.68	1,058
1996Q0585	M:27857	15N 55E 30 BDAA	SHU	63	3.2	103.1	45.4	0.00	<.002	19.1	11.0	0.80	424	0.0	210	0.50	665	880	348	444	1.3	7.61	1,056
1996Q0370	M:151193	15N 55E 30 BDAC	SHU	625	3.6	21.6	8.6	0.01	0.12	10.4	0.5	0.60	956	27.2	600	0.13	1,768	2,253	784	89	28.8	8.50	2,290
1950Q0012	M:140927	15N 55E 31 CBB	SHU	90	6.6	83.0	62.0	0.51		27.0	13.0	0.20	485	0.0	212	6.78	740	986	398	462	1.8	8.10	1,110
1951Q0023	M:140928	15N 55E 31 DAA	SHU	172	9.2	95.0	78.0	1.60		25.0	17.0	0.50	576	0.0	425	0.14	1,107	1,399	472	558	3.2	7.40	1,610
1995Q0483	M:27869	15N 55E 33 BBBB	SHU	301	6.0	185.7	68.3	0.03	0.12	14.5	37.5	0.30	527	0.0	1,000	1.00	1,874	2,141	432	745	4.8	7.40	2,170

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1995Q0488	M:27885	15N 57E 04 BCBC	SHU	911	9.9	272.0	250.8	0.06	0.01	12.6	22.5	0.36	628	0.0	3,150	3.50	4,942	5,261	515	1,711	9.6	7.29	4,850
1995Q0487	M:27989	15N 60E 18 ABDD	SHU	494	5.3	67.2	44.7	0.48	0.14	10.1	8.0	0.24	659	0.0	850	0.13	1,805	2,139	540	352	11.5	7.53	2,260
1976Q1313	M:1994	15N 60E 18 ADAA	SHU	1,740	8.3	95.0	62.0	0.80	0.17	9.8	19.0	0.20	1,764	0.0	2,698	0.90	5,503	6,398	1,447	492	34.1	7.42	7,032
1976Q1317	M:1995	15N 60E 22 CCCD	SHU	534	6.5	77.0	55.0	3.30	0.07	9.6	4.0	0.40	814	0.0	870	0.17	1,961	2,374	667	419	11.4	7.60	2,804
1975Q1202	M:2062	16N 45E 05 AABC	SHU	848	4.3	15.7	12.2	0.02	<.01	6.8	7.8	0.40	944	0.0	1,146	0.70	2,506	2,985	774	89	39.0	8.10	3,411
1980Q2490	M:2063	16N 47E 06 ADAA	SHU	166	6.3	216.0	230.0	0.03	0.01	14.3	19.9	0.18	411	0.0	1,450	3.48	2,309	2,518	337	1,486	1.9	7.44	
1982Q0047	M:2064	16N 47E 10 AACA	SHU	618	2.2	9.6	5.8	0.02	0.01	6.9	8.2	1.10	637	9.6	848	0.16	1,823	2,147	523	48	38.9	8.48	2,652
1980Q2483	M:2065	16N 49E 16 DDDD	SHU	9	2.0	66.8	29.8	0.08	0.08	13.2	3.9	0.75	349	0.0	20	0.02	317	494	286	289	0.2	7.80	549
1996Q0050	M:149288	16N 50E 20 BCDD	SHU	28	4.4	157.7	103.8	0.02	0.53	14.6	5.5	0.20	695	0.0	300	0.13	959	1,311	570	821	0.4	7.10	1,339
1995Q0450	M:28907	16N 51E 07 ACDC	SHU	76	5.3	94.9	82.6	0.61	0.06	1.5	10.0	0.19	491	0.0	300	0.13	803	1,052	403	577	1.4	7.28	1,142
1995Q0583	M:143806	16N 51E 10 BBBC	SHU	65	5.6	201.5	148.4	3.30	0.22	18.0	30.0	0.21	490	0.0	850	0.13	1,564	1,812	402	1,114	0.9	7.40	1,737
1982Q0037	M:2066	16N 51E 12 ABBA	SHU	13	4.0	104.0	62.6	1.03	0.12	16.8	0.9	0.04	600	0.0	57	0.01	555	859	492	517	0.3	7.98	929
1995Q0444	M:28933	16N 51E 36 DABD	SHU	300	12.0	191.0	172.0	3.00	0.06	1.2	10.0	0.08	882	0.0	1,090	0.13	2,214	2,661	723	1,185	3.8	7.48	2,670
1982Q0035	M:2067	16N 52E 06 DDAB	SHU	39	2.9	181.0	103.0	1.54	0.37	14.0	3.6	0.15	754	0.0	340	0.01	1,057	1,439	618	876	0.6	7.69	1,561
1982Q0036	M:2068	16N 52E 18 ABBB	SHU	16	3.0	106.0	61.6	0.56	0.05	11.5	18.4	0.09	503	0.0	117	1.30	583	838	413	518	0.3	7.72	929
1974Q0049	M:2069	16N 53E 14 CC	SHU	200	4.4	41.0	106.0	<.01	0.02	11.3	8.4	0.30	616	0.0	451	0.30	1,126	1,439	505	539	3.8	7.98	1,350
1995Q0571	M:29011	16N 54E 35 BBDD	SHU	291	1.1	8.3	7.7	0.01	0.01	9.2	6.0	1.07	661	0.0	150	0.13	800	1,135	542	52	17.5	8.82	1,258
1949Q0006	M:140622	16N 55E 01 DC	SHU	424	2.4	10.0	5.2	0.04		16.0	39.0		746	49.0	176	0.45	1,090	1,468	613	46	27.1	8.70	1,610
1949Q0026	M:140623	16N 55E 02 DC	SHU	400	7.2	107.0	60.0	0.22		22.1	5.8	0.20	682	0.0	812	0.05	1,751	2,097	559	514	7.7	7.50	2,430
1996Q0570	M:702375	16N 55E 12 ABBB	SHU	579	7.1	158.5	94.7	3.00	0.52	19.5	30.0	0.10	623	0.0	1,450	0.13	2,650	2,966	511	786	9.0	7.97	3,040
1995Q0457	M:148181	16N 55E 19 BABD	DHU	394	1.9	1.6	0.5	0.02	0.00	0.8	20.0	4.40	877	34.4	100	0.13	990	1,435	720	6	69.6	8.67	1,522
1995Q0455	M:29072	16N 55E 19 BADB	SHU	182	1.8	2.3	1.1	0.03	0.00	0.9	10.0	0.93	439	4.8	50	0.13	461	683	360	10	24.8	8.34	764
1951Q0027	M:140935	16N 55E 26 CCC	SHU	262	4.8	59.0	21.0	0.13		19.0	19.0	0.90	576	0.0	305	0.20	975	1,267	472	234	7.5	7.50	1,480
1995Q0486	M:148631	16N 55E 31 DDBD	SHU	218	2.2	19.0	10.6	0.12	0.02	8.3	5.5	0.51	550	0.0	150	0.13	685	964	451	91	10.0	8.10	1,088
1949Q0005	M:29310	16N 55E 35 AB	SHU	478	0.8	2.0	6.1	0.14		17.0	14.0	2.40	852	59.0	216	0.86	1,216	1,648	700	30	37.9	8.60	1,770
1976Q1328	M:2070	16N 58E 28 DB	SHU	414	4.6	49.8	33.8	1.58	0.10	10.1	4.5	0.20	662	0.0	608	0.01	1,452	1,788	543	263	11.1	7.56	2,125
1995Q0526	M:120632	16N 58E 30 DCAD	DHU	90	4.8	237.8	119.1	0.56	0.13	8.5	14.0	0.28	528	0.0	800	4.50	1,540	1,808	433	1,084	1.2	7.23	1,787
1976Q1316	M:2071	16N 60E 02 DBCA	FHHC	502	1.8	2.4	0.5	0.35	0.01	23.3	48.5	4.50	1,229	4.3	0	0.43	1,194	1,817	1,015	8	77.0	8.32	1,860
1995Q0324	M:144397	16N 60E 34 BBCC	SHU	647	3.0	4.8	3.0	0.04	0.01	8.6	6.0	0.77	714	25.2	750	<.25	1,800	2,162	586	25	56.9	8.38	2,410
1995Q0458	M:148182	17N 50E 02 DBDC	SHU	50	7.2	207.9	209.1	3.10	0.07	1.6	10.0	0.19	467	0.0	1,000	0.13	1,709	1,946	383	1,380	0.6	7.40	1,990
1982Q0078	M:2152	17N 52E 10 AAA	SHU	63	3.1	175.0	89.0	0.01	0.56	12.7	6.1	0.20	449	0.0	521	5.50	1,097	1,325	368	803	1.0	7.44	1,413
1982Q0081	M:2153	17N 52E 10 AAA	SHU	93	2.8	182.0	177.0	0.03	0.03	15.5	72.6	0.20	519	0.0	643	48.90	1,491	1,754	426	1,183	1.2	7.50	2,034
1982Q0080	M:2154	17N 52E 10 BB	SHU	444	10.4	144.0	145.0	3.80	0.54	8.1	7.5	0.31	855	0.0	1,130	0.01	2,315	2,749	701	956	6.3	7.29	2,917
1982Q0079	M:2155	17N 52E 10 CA	SHU	137	4.8	96.4	81.5	2.31	0.06	10.4	2.7	0.20	832	0.0	195	0.10	940	1,362	682	576	2.5	7.61	1,419
1995Q0578	M:138214	17N 54E 19 DAAA	SHU	553	10.1	106.2	115.7	0.19	0.05	11.0	12.0	0.56	628	0.0	1,350	<.25	2,468	2,787	515	741	8.8	7.42	3,020
1995Q0574	M:149144	17N 54E 19 DAAC	SHU	595	9.4	128.0	136.9	0.42	0.02	10.4	15.0	0.48	642	0.0	1,500	0.13	2,712	3,037	526	883	8.7	7.55	3,220
1995Q0652	M:149372	17N 54E 29 ACDB	SHU	628	1.8	3.2	1.3	0.01	0.00	16.7	37.5	2.68	1,120	94.8	300	0.13	1,637	2,206	920	13	74.8	8.77	2,410
1995Q0579	M:30318	17N 55E 11 DDDB	FHHC	395	1.0	1.5	0.4	0.00	<.002	9.7	27.0	2.72	735	40.8	200	0.13	1,040	1,413	671	5	75.1	8.84	1,659
1949Q0013	M:140631	17N 55E 34 AD	SHU	448	10.0	39.0	59.0	5.00		17.0	31.0		444	0.0	832	0.54	1,660	1,886	364	340	10.6	7.90	2,290
1995Q0657	M:149414	17N 59E 26 BBCB	SHU	38	3.9	129.1	56.1	0.80	0.33	13.9	3.0	0.21	480	0.0	250	0.13	732	975	393	553	0.7	7.31	1,033

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1995Q0655	M:134417	17N 59E 26 DAAC	DHU	553	2.1	8.0	4.6	0.05	0.01	7.4	3.5	0.46	674	18.0	700	0.13	1,630	1,972	553	39	38.6	8.57	2,240
1976Q1315	M:2156	17N 59E 26 DBA	DHU	648	2.6	8.4	5.0	0.07	0.02	8.2	5.0	0.40	876	4.3	708		1,821	2,266	719	42	43.7	8.35	2,726
1995Q0479	M:122312	18N 51E 15 ADDB	SHU	16	2.7	66.5	39.2	0.49	0.03	17.8	2.0	0.20	375	0.0	53	0.13	382	572	307	327	0.4	7.52	660
1995Q0480	M:122312	18N 51E 15 ADDB	SHU	16	2.8	67.6	39.5	0.49	0.03	18.0	2.0	0.20	378	0.0	53	<.25	386	577	310	331	0.4	7.55	661
1995Q0491	M:122313	18N 51E 28 DDDD	SHU	31	4.7	200.9	123.7	0.36	0.67	15.6	15.0	0.21	584	0.0	600	10.00	1,290	1,587	479	1,011	0.4	7.23	1,621
1995Q0478	M:133062	18N 51E 32 ABAA	SHU	14	3.0	105.5	52.1	0.22	0.26	15.2	1.5	0.23	419	0.0	150	0.13	549	762	344	478	0.3	7.35	891
1995Q0581	M:31513	18N 54E 26 BCCC	SHU	126	3.9	81.2	54.0	1.30	0.19	15.6	9.0	0.36	484	0.0	325	0.13	855	1,100	397	425	2.7	7.52	1,224
1995Q0572	M:149356	18N 54E 26 CABC	SHU	178	4.5	116.1	75.3	0.93	0.08	15.5	12.0	0.31	559	0.0	550	0.13	1,228	1,511	458	600	3.2	7.44	1,572
1995Q0582	M:31514	18N 54E 26 CCBB	DHU	614	1.9	2.5	1.6	0.12	0.01	6.8	35.0	2.02	1,660	0.0	1	0.13	1,482	2,324	1,362	13	74.6	8.39	2,300
1976Q1186	M:2221	18N 55E 02 BCBB	SHU	422	2.1	5.9	3.1	0.23	0.01	7.1	7.0	1.30	895	11.0	163	0.20	1,063	1,518	734	27	35.0	8.38	1,692
1982Q0085	M:2222	18N 56E 04 BCCA	SHU	113	3.1	27.8	22.4	0.18	0.05	14.6	9.2	0.63	362	0.0	92	0.16	461	645	297	162	3.9	7.94	713
1982Q0084	M:2223	18N 56E 04 CABA	SHU	140	9.0	137.0	143.0	0.01	0.01	17.2	101.0	0.33	387	0.0	546	59.40	1,344	1,540	317	931	2.0	7.42	1,933
1982Q0083	M:2224	18N 56E 04 DCDA	SHU	106	3.3	86.3	57.9	1.38	0.09	16.9	3.1	0.22	725	0.0	95	0.01	727	1,095	595	454	2.2	7.11	1,137
1995Q0536	M:31565	18N 56E 25 ADBA	FHHC	391	1.4	1.7	0.5	0.01	0.00	11.1	32.5	2.93	664	0.0	250	0.13	1,018	1,355	544	6	68.7	7.65	1,721
1995Q0535	M:31564	18N 56E 25 ADBA	SHU	608	1.8	2.4	1.0	0.08	0.00	7.7	40.0	1.86	1,415	46.8	3	0.13	1,407	2,125	1,161	10	83.8	8.78	2,220
1995Q0320	M:31567	18N 56E 33 ACBA	FHHC	401	1.9	1.4	0.5	0.04	<.002	10.3	30.0	3.76	764	39.0	200	0.25	1,065	1,453	692	5	74.5	8.80	1,683
1995Q0532	M:31567	18N 56E 33 ACBA	FHHC	400	1.2	1.4	0.4	0.04	<.002	10.3	27.5	3.70	761	37.6	188	0.13	1,044	1,430	686	5	76.3	8.75	1,634
1949Q0027	M:31568	18N 56E 34 AB	SHU	148	4.0	56.0	71.0	0.31		17.0	4.0	0.40	472	0.0	356	0.09	889	1,129	387	432	3.1	7.80	1,260
1982Q0031	M:2225	18N 57E 03 ABBB	DHU	612	0.4	2.0	0.9	0.09	0.00	6.8	32.5	2.40	1,596	0.0	0	0.01	1,443	2,253	1,309	9	90.3	8.08	2,363
1995Q0529	M:31575	18N 57E 04 AABB	SHU	685	7.8	98.2	116.5	8.50	0.78	18.6	70.0	0.75	1,238	0.0	1,100	0.13	2,716	3,344	1,016	725	11.1	7.54	3,280
1981Q1391	M:2227	18N 57E 05 DDCC	FHHC	433	1.0	1.6	0.4	0.08	0.00	10.1	42.8	4.45	799	36.0	218	0.05	1,141	1,547	715	6	79.4	8.80	1,883
1981Q1388	M:2228	18N 57E 06 BDDA	FHHC	441	0.6	1.7	0.4	0.04	0.00	11.4	39.8	3.85	549	136.0	214	0.01	1,119	1,398	677	6	79.1	8.72	1,764
1981Q1387	M:2229	18N 57E 06 CCCB	SHU	210	5.6	126.0	69.5	1.72	0.21	10.7	4.2	0.24	1,000	0.0	247	0.03	1,168	1,675	820	601	3.7	7.23	1,769
1981Q1390	M:2230	18N 57E 07 DCCA	FHHC	448	0.9	1.6	0.4	0.03	0.00	10.8	36.7	3.76	744	42.0	219	0.01	1,130	1,507	680	6	82.1	8.85	1,718
1995Q0525	M:145844	18N 57E 09 CABC	SHU	85	5.8	92.3	31.4	0.15	0.72	17.2	20.0	0.39	342	0.0	250	0.13	671	845	280	360	2.0	7.61	977
1976Q1280	M:2231	18N 57E 11 DACB	FHHC	448	1.4	1.8	0.4	0.02	<.01	11.1	48.5	4.40	825	34.6	176	0.01	1,133	1,552	735	6	78.7	8.78	1,788
1981Q1392	M:2232	18N 57E 17 ABBB	FHHC	436	1.0	1.6	0.5	0.03	0.00	10.6	39.5	4.25	742	61.2	210	0.01	1,130	1,507	711	6	77.1	8.92	1,877
1981Q1389	M:2226	18N 57E5 AADB	FHHC	441	0.9	1.6	0.4	0.04	0.00	10.2	41.6	4.49	765	36.0	216	0.02	1,129	1,517	687	6	80.8	8.80	1,848
1976Q1279	M:2233	18N 58E 15 BDAC	SHU	508	1.6	2.2	1.2	0.77	0.01	7.0	8.5	3.10	811	17.3	386	0.01	1,335	1,747	665	10	68.4	8.57	2,079
1995Q0656	M:31629	18N 58E 36 BCCC	SHU	234	6.2	218.5	159.7	0.21	0.19	12.6	7.5	0.17	682	0.0	1,200	0.25	2,175	2,521	559	1,203	2.9	7.07	2,440
1995Q0576	M:31633	18N 59E 20 BCDC	DHU	377	7.4	173.6	130.0	0.10	0.28	12.8	7.0	0.19	761	0.0	1,200	0.13	2,283	2,670	624	969	5.3	6.89	2,670
1995Q0573	M:31634	18N 59E 20 BCDC	FHHC	413	1.2	1.9	0.4	0.03	0.00	14.4	50.0	3.50	724	35.2	200	0.13	1,076	1,444	652	6	70.5	8.87	1,771
1995Q0575	M:31640	18N 59E 32 DACC	DHU	338	10.0	262.4	185.4	3.70	0.24	11.6	5.5	0.14	887	0.0	1,400	0.13	2,654	3,104	727	1,418	3.9	6.87	3,020
1976Q1281	M:31642	18N 59E 36 BDDBD	DHU	690	2.7	10.5	5.8	0.10	0.03	7.8	9.0	1.30	588	13.9	977	0.01	2,007	2,305	482	50	42.4	8.58	3,045
1976Q1284	M:2235	18N 60E 04 DAAC	SHU	1,195	7.2	102.0	66.0	0.80	0.08	9.0	9.0	0.40	1,346	0.0	1,945	0.20	3,998	4,681	1,104	526	22.7	7.45	5,328
1982Q0041	M:2381	19N 50E 12 CD	SHU	327	6.4	91.3	77.5	0.50	0.05	9.6	5.2	0.30	638	0.0	759	0.28	1,591	1,915	523	547	6.1	7.81	2,192
1982Q0042	M:2382	19N 50E 12 CD	SHU	308	6.5	94.2	86.3	5.59	0.08	9.4	3.4	0.23	734	0.0	716	0.07	1,591	1,964	602	590	5.5	8.02	2,183
1995Q0651	M:32531	19N 50E 12 DDBA	SHU	295	9.3	134.4	128.0	1.29	0.06	11.2	4.5	0.15	666	0.0	1,000	0.13	1,912	2,250	546	862	4.4	7.61	2,310
1974Q0050	M:2383	19N 52E 07 AC	SHU	32	7.9	362.0	286.0	0.01	0.34	13.2	29.0	0.10	1,014	0.0	1,154	18.40	2,402	2,917	832	2,081	0.3	7.64	2,770
1995Q0585	M:32612	19N 53E 13 CCCD	DHU	568	1.8	2.2	1.8	0.01	<.002	7.6	25.0	2.62	1,503	19.2	15	0.13	1,384	2,147	1,233	13	68.8	8.41	2,140

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1995Q0584	M:32629	19N 53E 23 AAAA	SHU	222	5.9	322.0	360.7	<.003	0.01	10.6	40.0	0.21	477	0.0	2,250	23.75	3,470	3,712	391	2,289	2.0	8.11	3,310
1995Q0586	M:32630	19N 53E 23 CAAA	SHU	118	7.7	91.6	77.4	1.10	0.12	14.4	3.0	0.31	607	0.0	350	0.13	963	1,271	498	547	2.2	7.49	1,277
1981Q1703	M:2384	19N 53E 24 CCDC	SHU	379	8.5	163.0	165.0	1.92	0.07	14.6	7.5	0.18	1,230	0.0	858	0.07	2,204	2,828	1,009	1,086	5.0	7.70	3,007
1995Q0638	M:137973	19N 55E 08 DDDA	SHU	13	3.3	80.9	63.7	0.68	0.15	22.5	2.0	0.65	531	0.0	38	0.13	486	755	435	464	0.3	7.28	784
1976Q1285	M:2389	19N 56E 26 CBCA	SHU	61	7.4	165.0	122.0	0.05	0.01	22.3	84.0	0.20	389	0.0	483	32.70	1,169	1,366	319	914	0.9	7.70	1,768
1995Q0653	M:137975	19N 57E 21 BABB	DHU	102	4.2	85.9	46.3	3.11	0.18	30.2	4.0	0.54	658	0.0	100	0.13	701	1,034	539	405	2.2	7.88	1,073
1949Q0014	M:140641	19N 57E 26 AD	SHU	211	6.4	87.0	66.0	0.32		25.0	20.0		292	0.0	628	6.55	1,194	1,342	239	489	4.2	7.70	1,630
1996Q0571	M:32743	19N 57E 35 ABAC	SHU	165	9.3	126.0	52.0	0.01	<.002	21.4	20.0	0.20	435	0.0	485	2.75	1,096	1,317	357	529	3.1	7.89	1,491
1976Q1318	M:2390	19N 58E 03 DBBB	DHU	730	2.3	2.8	1.3	0.10	0.01	7.9	61.0	2.40	1,839	5.3	0	0.13	1,719	2,652	1,508	12	90.4	8.35	2,636
1985Q0945	M:2391	19N 58E 08 CBDB	FHHC	457	0.8	1.5	0.4	0.01	0.00	13.4	50.0	1.60	773	38.0	223	0.03	1,167	1,559	697	5	85.6	8.74	1,886
1976Q1282	M:2392	19N 60E 17 CD	SHU	332	11.2	418.0	290.0	3.67	0.42	11.0	11.0	0.20	736	0.0	2,225	0.10	3,666	4,039	604	2,237	3.1	6.88	4,130
1975Q1649	M:2494	20N 50E 18 CDDA	SHU	99	5.1	97.5	69.0	<.01	0.02	10.1	2.7	0.30	405	0.0	386	0.70	869	1,075	332	527	1.9	7.94	1,283
1981Q1709	M:2495	20N 53E 04 DAAA	DHU	59	9.1	139.0	151.0	0.20	0.04	18.2	4.2	0.02	734	0.0	472	0.04	1,215	1,587	602	969	0.8	8.12	1,762
1981Q0265	M:2496	20N 53E 14 BBCC	DHU	155	8.8	142.0	134.0	0.07	0.13	16.3	3.4	0.66	747	0.0	578	12.90	1,419	1,798	613	906	2.2	7.51	2,062
1981Q0266	M:2497	20N 53E 20 CCCC	DHU	445	2.3	6.2	3.7	0.06	0.01	7.3	2.9	0.78	397	7.2	646	0.12	1,317	1,519	326	31	34.9	8.52	2,089
1981Q1707	M:2498	20N 53E 22 BCCC	DHU	532	5.5	23.7	19.5	<.002	0.06	7.4	4.6	0.16	695	0.0	677	0.12	1,612	1,965	570	139	19.6	8.25	2,451
1976Q1085	M:2499	20N 53E 26 AAAD	SHU	97	5.1	297.0	180.0	0.13	0.51	9.6	22.0	0.20	418	0.0	1,246	0.20	2,063	2,275	343	1,482	1.1	7.36	2,509
1976Q1163	M:2502	20N 54E 02 BCAA	SHU	50	8.5	286.0	190.0	0.87	0.88	14.1	8.4	0.05	615	0.0	1,028	0.20	1,889	2,201	504	1,496	0.6	7.22	2,368
1982Q0045	M:2504	20N 54E 13 DCCC	SHU	15	1.6	36.4	18.8	<.002	<.001	14.6	2.4	0.33	222	0.0	9	1.49	209	322	182	168	0.5	8.11	360
1982Q0046	M:2505	20N 54E 13 DCDD	SHU	8	1.6	62.1	23.5	<.002	<.001	16.0	7.2	0.09	234	0.0	21	14.90	270	389	192	252	0.2	8.09	501
1995Q0481	M:34086	20N 54E 31 AADA	SHU	151	8.4	301.0	300.0	2.00	0.24	17.3	10.0	0.12	999	0.0	1,450	0.13	2,732	3,239	820	1,986	1.5	6.93	3,020
1995Q0484	M:34087	20N 54E 31 AADC	DHU	820	6.5	38.1	33.6	0.36	0.04	8.3	6.0	0.30	1,201	0.0	1,100	0.13	2,604	3,213	985	233	23.3	7.79	3,390
1976Q1164	M:2506	20N 55E 19 DBCD	SHU	13	2.1	56.5	37.5	0.03	<.01	15.1	14.2	0.20	268	0.0	16	19.60	307	443	220	295	0.3	7.67	620
1981Q1705	M:2508	20N 55E 32 AAAA	SHU	203	4.6	48.6	43.9	0.06	0.05	14.1	5.1	0.09	627	0.0	220	0.29	849	1,167	514	302	5.1	7.95	1,334
1981Q1706	M:2509	20N 55E 32 AAAA	SHU	12	2.3	37.9	31.1	<.002	0.05	14.9	3.5	0.59	311	0.0	17	0.30	273	431	255	223	0.4	8.03	519
1985Q1059	M:2512	20N 56E 05 BCAD	SHU	4	1.8	52.1	24.3	<.002	0.02	14.5	1.1	0.20	278	0.0	8	0.91	244	385	228	230	0.1	7.87	430
1985Q1055	M:2513	20N 56E 08 DDCD	DHU	401	4.3	8.4	7.8	0.02	0.03	10.2	2.5	0.80	825	0.0	233	0.33	1,075	1,493	677	53	24.0	8.01	1,626
1985Q1056	M:2514	20N 56E 08 DDCD	SHU	53	6.0	164.0	130.0	0.61	0.20	23.0	2.9	0.10	849	0.0	348	0.31	1,146	1,577	696	945	0.8	6.88	1,651
1985Q1058	M:2517	20N 56E 18 AAAD	SHU	56	4.7	102.0	84.7	<.002	0.07	17.5	2.6	0.30	560	0.0	250	0.13	794	1,078	459	603	1.0	7.26	1,195
1976Q1185	M:2518	20N 56E 24 CBDB	SHU	550	9.7	66.5	59.0	1.64	0.07	12.6	6.0	1.10	911	0.0	811	1.80	1,968	2,430	747	409	11.8	7.58	2,827
1976Q1314	M:2521	20N 57E 21 DCCB	DHU	524	1.9	2.1	1.3	0.16	0.01	8.8	3.8	3.20	996	21.1	298	0.25	1,355	1,860	817	11	70.1	8.50	2,126
1949Q0015	M:140642	20N 58E 21 BBCB	SHU	218	2.4	98.0	90.0	0.17		30.0	8.0	0.60	694	0.0	456	0.86	1,246	1,598	569	615	3.8	8.00	1,720
1949Q0016	M:140643	20N 58E 32 AC	SHU	51	5.6	84.0	33.0	4.70		27.0	10.0		268	0.0	204	0.14	551	687	220	346	1.2	7.40	778
1975Q1648	M:2625	21N 51E 14 CBBB	SHU	495	8.4	163.4	124.3	<.01	0.15	11.0	5.3	0.50	726	0.0	1,368	1.90	2,536	2,904	596	920	7.1	8.16	3,232
1976Q1157	M:2626	21N 52E 17 CABC	SHU	108	3.4	38.5	45.0	3.47	0.08	7.9	18.0	0.30	552	0.0	62	0.01	559	839	453	281	2.8	7.56	888
1976Q5000	M:143805	21N 53E 08 DABB	SHU	67	8.5	270.0	240.0	0.83	0.46	16.0	6.4	0.10	651	0.0	1,200	0.01	2,130	2,461	534	1,662	0.7		
1995Q0639	M:143805	21N 53E 08 DABB	SHU	67	5.7	366.6	293.0	0.35	0.26	14.3	22.5	0.24	481	0.0	1,800	0.13	2,807	3,051	394	2,121	0.6	6.98	2,850
1976Q1084	M:2627	21N 53E 22 DAAB	SHU	12	4.1	176.0	77.0	0.07	<.01	14.2	14.0	0.20	577	0.0	282	3.00	867	1,160	473	756	0.2	7.26	1,297
1981Q1710	M:2628	21N 53E 29 ADAD	SHU	78	5.8	99.8	92.1	0.68	0.09	14.6	3.4	0.02	608	0.0	278	0.04	872	1,180	499	628	1.4	8.13	1,316
1976Q1184	M:2629	21N 54E 04 BCCB	DHU	444	2.0	3.3	1.9	0.03	0.01	8.1	10.0	1.40	632	10.1	402	0.10	1,194	1,515	518	16	48.2	8.44	1,869

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1976Q1189	M:2630	21N 54E 22 CBDD	SHU	23	3.3	72.5	44.0	0.03	0.01	13.0	11.6	0.20	405	0.0	52	3.90	424	629	332	362	0.5	7.52	733
1981Q0264	M:2632	21N 54E 32 ABBB	DHU	32	5.9	93.2	82.9	0.07	0.15	18.7	2.5	0.21	575	0.0	185	0.05	704	996	472	574	0.6	7.72	1,115
1976Q1192	M:2633	21N 55E 14 ABAD	DHU	860	6.7	68.4	57.6	0.38	0.06	6.8	18.0	0.30	922	0.0	1,451	0.05	2,924	3,392	756	408	18.5	7.85	3,969
1995Q0530	M:126755	21N 56E 12 CDCB	SHU	10	3.2	82.9	32.7	0.02	0.01	14.5	5.0	0.22	373	0.0	48	0.50	381	570	306	342	0.2	7.53	641
1976Q1161	M:2634	21N 56E 26 BAAC	SHU	15	2.7	47.0	33.0	0.11	0.04	14.3	2.1	0.30	334	0.0	14	0.27	293	462	274	253	0.4	7.80	519
1985Q1180	M:2635	21N 56E 32 DDAC	SHU	823	2.5	7.1	4.9	0.09	0.01	7.2	6.7	2.00	1,064	0.0	903	0.65	2,281	2,821	873	38	58.2	8.70	3,380
1976Q1162	M:2636	21N 57E 10 CDDD	DHU	200	5.4	33.4	38.0	2.40	0.04	11.3	2.6	0.40	569	0.0	204	0.40	778	1,067	466	240	5.6	7.50	1,220
1995Q0644	M:700494	21N 57E 14 CDCC	SHU	39	4.1	128.1	85.8	0.12	0.07	13.7	10.5	0.31	448	0.0	350	0.13	852	1,079	367	673	0.7	7.40	1,230
1995Q0654	M:142678	21N 57E 15 BAAB	SHU	143	6.0	79.3	67.5	0.09	0.07	14.8	4.0	0.25	623	0.0	300	0.13	922	1,239	511	476	2.9	7.60	1,334
1976Q1187	M:2637	21N 58E 03 CBBC	FHHC	442	1.5	1.6	0.3	0.02	0.01	12.8	101.0	5.30	913	38.4	19	0.01	1,072	1,535	812	5	84.1	8.81	1,762
1995Q0658	M:35183	21N 58E 10 AABB	SHU	34	4.3	66.4	37.3	0.34	0.07	24.2	3.0	0.33	401	0.0	100	0.13	467	670	329	319	0.8	7.43	694
1949Q0018	M:140670	21N 59E 05 BAA	SHU	695	14.0	50.0	74.0	0.06		26.0	9.8	1.20	852	0.0	1,180	0.11	2,470	2,902	699	429	14.6	7.60	3,560
1976Q1193	M:2638	21N 59E 30 BBCA	SHU	715	2.5	2.5	2.0	0.15	0.01	7.1	24.5	3.40	1,851	0.0	0	0.05	1,669	2,608	1,518	14	81.8	8.13	2,614
1975Q1651	M:2758	22N 50E 29 CCDB	SHU	250	5.1	26.3	67.5	0.20	<.01	14.0	111.0	0.40	348	61.4	354	0.40	1,062	1,238	287	344	5.9	8.68	1,653
1975Q1784	M:2759	22N 51E 01 ADDA	SHU	116	4.9	110.7	120.1	5.60	0.15	8.6	6.4		446	0.0	642	0.20	1,235	1,461	366	771	1.8	7.41	1,699
1975Q1546	M:2760	22N 51E 10 ADDA	SHU	618	2.2	3.7	2.5	0.01	<.01	6.2	12.9	2.70	665	33.6	691	0.60	1,700	2,038	546	20	60.8	8.53	2,601
1975Q1655	M:2761	22N 52E 25 CBCA	SHU	1,325	6.0	39.0	30.3	0.02	0.04	6.2	5.8	0.40	619	0.0	2,617	1.80	4,336	4,650	507	222	38.7	8.03	5,312
1996Q0123	M:35583	22N 52E 29 ADDD	FHHC	480	1.4	1.5	0.4	0.10	0.01	11.8	70.0	3.80	1,057	50.4	3	0.13	1,140	1,676	951	5	89.8	8.74	1,708
1975Q1654	M:2762	22N 52E 30 DCCD	SHU	37	7.2	68.0	100.1	<.01	<.01	10.2	12.2	0.10	464	0.0	240	13.30	716	951	380	582	0.7	7.84	1,137
1975Q1696	M:2763	22N 53E 22 BDCB	SHU	628	11.4	146.9	117.0	0.01	0.06	9.2	4.8		713	0.0	1,577	0.40	2,846	3,208	585	848	9.4	7.93	3,704
1995Q0482	M:35606	22N 54E 04 DADA	SHU	24	4.3	144.9	108.1	0.01	0.14	9.1	2.0	0.20	549	0.0	400	0.13	964	1,242	450	807	0.4	7.58	1,295
1976Q1190	M:2764	22N 54E 32 BAAC	DHU	261	6.7	93.0	79.5	1.65	0.03	13.6	5.0	0.20	686	0.0	527	0.01	1,326	1,674	563	559	4.8	7.34	1,954
1996Q0120	M:35619	22N 55E 01 CDCA	FHHC	441	1.5	1.6	0.4	0.02	0.00	12.8	70.0	4.60	821	43.2	175	0.13	1,155	1,572	746	6	81.0	8.77	1,821
1976Q1191	M:2765	22N 55E 32 ABDB	SHU	925	18.7	402.0	358.0	5.06	0.37	12.0	12.0	0.05	1,043	0.0	3,452	0.17	5,700	6,229	856	2,477	8.1	7.06	6,445
1976Q1160	M:2767	22N 56E 15 BDCC	SHU	29	5.0	100.0	65.0	4.42	0.21	12.8	8.5	0.10	421	0.0	218	0.16	651	864	345	517	0.6	7.49	1,011
1995Q0646	M:35688	22N 57E 10 AACB	DHU	368	4.8	27.0	23.7	0.39	0.03	9.0	5.0	0.22	817	0.0	300	0.13	1,141	1,555	670	165	12.5	7.85	1,716
1976Q1188	M:2768	22N 58E 09 BABB	SHU	96	10.7	147.0	236.0	0.46	0.17	7.5	129.5	0.20	350	0.0	1,001	2.60	1,803	1,981	287	1,338	1.1	7.78	2,484
1981Q1829	M:2770	22N 58E 13 CCDD	SHU	58	4.1	54.5	40.1	0.01	0.00	15.0	10.6	0.55	286	0.0	165	0.06	489	634	235	301	1.5	7.75	792
1981Q1828	M:2773	22N 58E 14 DBAC	SHU	567	3.8	16.8	14.8	0.13	0.01	7.2	5.9	1.94	871	0.0	558	0.04	1,605	2,047	714	103	24.3	8.16	2,473
1949Q0007	M:140676	22N 59E 02 DA	DHU	857	2.4	3.0	7.4	0.15		16.0	71.0	2.00	2,080	57.0	2	0.05	2,042	3,098	1,707	38	60.5	8.30	2,960
1989Q1434	M:890965	22N 59E 07 AADB	SHU	149	9.5	68.4	110.0	0.08	0.06	23.3	32.3	1.85	603	7.2	352	3.17	1,054	1,360	495	624	2.6	8.43	1,603
1976Q1159	M:2775	22N 59E 13 CCBB	DHU	660	2.6	2.7	2.0	0.27	<.01	7.0	24.0	4.10	1,736	0.0	0	0.17	1,558	2,439	1,424	15	74.2	8.08	2,414
1997Q0205	M:79510	22N 59E 16 DABC	FHHC	467	1.2	1.5	0.4	0.05	<.002	14.5	113.0	5.90	917	58.0	<2.5	<.05	1,113	1,578	753	5	89.1	8.60	1,705
1949Q0019	M:140681	22N 59E 16 DCB	SHU	31	4.0	108.0	45.0	0.06		18.0	7.0	0.40	453	0.0	128	0.54	565	795	372	455	0.6	7.00	873
1996Q0122	M:35890	22N 59E 18 DCCB	FHHC	480	1.4	1.5	0.4	0.10	0.01	11.9	120.0	4.70	961	51.6	3	0.13	1,145	1,633	875	5	91.7	8.75	1,756
1949Q0020	M:140686	22N 59E 19 AB	SHU	226	4.0	124.0	84.0	8.10		23.0	13.0	0.60	648	0.0	588	0.05	1,390	1,719	531	655	3.8	7.50	1,830
1949Q0008	M:140691	22N 59E 30 BB	DHU	602	10.0	6.0	6.6	0.06		14.0	17.0	3.20	1,490	89.0	10	0.11	1,492	2,248	1,224	42	40.4	8.20	2,400
1949Q0009	M:140709	22N 59E 34 CA	SHU	30	2.4	100.0	46.0	9.90		15.0	1.0	0.20	532	0.0	66	0.05	533	803	436	439	0.6	7.50	803
1975Q1652	M:2906	23N 50E 14 CACB	SHU	460	4.8	50.8	45.5	<.01	<.01	8.9	8.2	0.20	772	0.0	677	2.80	1,638	2,029	633	314	11.3	8.14	23,740
1975Q1653	M:2907	23N 50E 14 CACC	SHU	436	4.6	58.6	42.7	0.01	0.04	8.1	4.9	1.30	806	0.0	612	0.90	1,566	1,975	661	322	10.6	7.98	2,173

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1975Q1702	M:2908	23N 51E 04 ABBB	SHU	460	4.6	45.6	36.8	<.01	0.16	12.9	7.6	1.00	761	0.0	641	0.20	1,585	1,971	624	265	12.3	8.06	2,292
1975Q1699	M:2909	23N 51E 13 ABAB	SHU	594	3.7	32.2	22.2	0.06	<.01	5.3	8.3	1.00	1,058	24.0	536	1.00	1,749	2,286	868	172	19.7	8.54	2,560
1975Q1700	M:2911	23N 52E 18 BDAC	SHU	514	1.7	2.2	1.4	<.01	<.01	6.6	12.1	4.00	1,138	38.4	100	0.70	1,242	1,819	934	11	66.7	8.49	1,939
1975Q1785	M:2910	23N 52E 18 BDAC	SHU	1,025	5.1	15.1	13.8	0.06	0.02	6.6	11.7	1.00	1,415	0.0	1,148	1.60	2,925	3,643	1,161	95	45.9	8.23	4,091
1975Q1701	M:2912	23N 52E 22 CAAB	SHU	120	3.5	104.1	78.2	<.01	<.01	11.1	3.4		483	0.0	442	0.30	1,000	1,245	396	582	2.2	7.95	1,339
1979Q0427	M:2913	23N 52E 28 AA	DHU	765	2.8	4.5	3.1	0.11	0.01	7.6	0.0	3.10	930	19.2	899	1.30	2,164	2,636	763	24	68.0	8.57	3,164
1995Q0647	M:36271	23N 53E 10 DDDD	SHU	676	5.1	65.5	40.6	0.35	0.09	9.1	4.5	0.68	1,025	0.0	1,000	0.13	2,307	2,827	841	331	16.2	7.87	2,800
1975Q1697	M:2914	23N 53E 14 BAAB	SHU	775	2.8	5.8	5.3	0.25	<.01	6.5	1.5	1.00	1,050	14.4	861	1.10	2,192	2,725	861	36	56.0	8.38	3,117
1995Q0648	M:700671	23N 53E 14 BBDA	DHU	781	2.8	5.8	4.3	0.63	0.01	7.3	8.0	2.10	963	0.0	1,000	0.13	2,286	2,774	790	32	59.9	7.83	3,030
1975Q1698	M:2915	23N 54E 18 ADDA	SHU	3	1.8	85.1	31.4	0.08	<.01	7.9	2.3		395	0.0	30	1.20	357	557	324	342	0.1	8.16	600
1980Q2536	M:2917	23N 55E 33 AACD	SHU	10	2.3	93.5	36.2	3.63	0.37	12.9	2.3	0.37	399	0.0	75	1.02	435	637	327	382	0.2	7.64	706
1990Q0170	M:2917	23N 55E 33 AACD	SHU	13	3.0	112.0	45.7	3.57	0.44	14.2	5.5	0.18	386	0.0	166	0.36	554	750	317	468	0.3	7.23	872
1995Q0485	M:148498	23N 55E 36 DCDA	DHU	667	3.5	5.6	3.6	0.41	0.02	8.0	8.0	2.60	720	26.4	800	0.13	1,880	2,245	591	29	54.1	8.68	2,350
1995Q0490	M:36336	23N 55E 36 DDCC	SHU	180	18.2	237.1	294.4	0.01	0.08	11.5	32.5	0.36	530	0.0	1,750	18.75	2,804	3,073	434	1,804	1.9	7.42	2,790
1996Q0565	M:36336	23N 55E 36 DDCC	SHU	212	19.2	244.5	294.2	<.003	0.10	11.6	30.0	0.50	517	0.0	1,710	17.50	2,794	3,056	424	1,821	2.2	7.75	2,950
1979Q0420	M:2918	23N 56E 09 BAA	DHU	545	2.1	3.3	2.2	0.05	0.01	8.3	0.6	4.10	829	16.8	448	0.70	1,440	1,860	680	17	57.0	8.55	2,199
1979Q0421	M:2919	23N 56E 15 BD	DHU	497	1.9	2.7	1.8	0.34	0.01	7.9	0.0	3.80	872	21.6	318	0.80	1,285	1,728	716	14	57.5	8.65	1,995
1979Q0466	M:2920	23N 56E 32 BBBC	DHU	691	5.5	30.7	27.8	0.03	0.03	8.2	7.4	0.40	888	0.0	968	0.31	2,177	2,627	728	191	21.8	8.15	3,084
1984Q0042	M:2921	23N 57E 10 ACAC	SHU	7	2.5	78.0	28.5	0.04	0.02	11.3	3.1	0.10	332	0.0	54	0.76	349	518	272	312	0.2	8.13	580
1979Q0419	M:2922	23N 57E 14 ADAD	DHU	629	3.8	13.1	11.4	0.13	0.01	8.7	5.0	0.30	868	0.0	743	1.90	1,844	2,284	712	80	30.7	8.14	2,698
1980Q2599	M:2923	23N 57E 22 DDDA	SHU	17	5.6	104.0	50.7	4.13	0.46	17.8	17.3	0.20	503	0.0	70	0.03	535	790	413	468	0.3	7.81	889
1995Q0635	M:36423	23N 58E 02 CBDC	SHU	104	12.5	161.3	112.1	0.37	0.03	22.6	120.0	0.17	389	0.0	600	8.75	1,333	1,530	319	864	1.5	7.54	1,750
1984Q0923	M:2926	23N 58E 18 ACBB	SHU	85	6.7	172.0	158.0	0.47	0.28	10.4	3.9	0.20	647	0.0	708	0.01	1,463	1,792	531	1,080	1.1	7.06	2,137
1949Q0010	M:140710	23N 59E 02 AB	SHU	578	7.2	6.5	6.0	1.00		10.0	17.0	1.80	912	28.0	436	0.54	1,541	2,004	748	41	39.3	8.30	2,380
1949Q0012	M:140711	23N 59E 08 DD	SHU	4	0.8	63.0	23.0	0.11		18.0	10.0		246	0.0	16	5.65	261	386	202	252	0.1	7.60	447
1949Q0021	M:140712	23N 59E 11 BA	SHU	197	8.0	55.0	80.0			24.0	12.0	0.80	635	0.0	332	0.50	1,022	1,344	521	467	4.0	7.80	1,520
1980Q2610	M:2927	23N 59E 13 CCCC	SHU	72	10.2	94.3	49.6	2.73	0.30	27.6	9.2	0.64	435	0.0	230	0.01	710	931	357	440	1.5	7.66	1,075
1996Q0564	M:2927	23N 59E 13 CCCC	SHU	55	9.1	90.2	53.8	1.24	0.41	27.8	11.0	0.40	424	0.0	210	0.13	668	883	348	447	1.1	8.14	1,001
1995Q0636	M:136651	23N 59E 15 ADBCB	SHU	110	5.6	80.7	48.1	0.00	0.01	1.8	30.0	0.64	503	0.0	225	0.75	750	1,005	412	399	2.4	7.54	1,087
1995Q0637	M:136651	23N 59E 15 ADBCB	SHU	125	5.9	82.0	55.2	0.01	<.002	23.1	25.0	0.66	545	0.0	220	<.25	805	1,082	447	432	2.6	7.41	1,081
1980Q2600	M:2976	23N 59E 22 BCCB	SHU	619	2.2	3.9	2.1	0.13	0.01	5.8	12.7	2.64	894	60.0	500	0.06	1,649	2,103	734	18	62.8	8.76	2,531
1980Q2596	M:2977	23N 59E 29 BBBB	SHU	341	2.3	12.4	18.3	0.09	0.01	7.1	7.6	1.74	584	8.4	340	1.72	1,028	1,325	479	106	14.4	8.54	1,610
1996Q0711	M:36648	23N 59E 29 BDDD	SHU	62	4.1	46.2	38.3	1.40	0.15	10.5	16.3	0.50	311	0.0	134	0.03	466	624	255	273	1.6	7.63	836
1949Q0022	M:140713	23N 59E 31 AA	SHU	40	0.8	55.0	56.0	0.42		19.0	4.0	0.20	342	0.0	164	0.63	509	682	281	368	0.9	7.80	746
1995Q0527	M:36693	23N 59E 32 AADA	SHU	75	8.0	111.0	88.2	0.69	0.46	24.9	20.0	0.22	470	0.0	400	0.25	960	1,199	386	640	1.3	7.61	1,297
1949Q0023	M:140714	23N 59E 32 AD	SHU	59	3.2	65.0	56.0	2.60		26.0	6.0	0.20	348	0.0	208	0.09	598	774	285	393	1.3	7.60	847
1996Q0703	M:132774	23N 59E 32 ADDC	SHU	52	5.9	74.0	58.0	2.60	0.24	21.3	18.0	0.50	373	0.0	212	0.03	628	817	306	424	1.1	7.37	994
1996Q0710	M:36707	23N 59E 32 BABC	SHU	77	6.1	109.0	93.0	2.50	0.21	17.8	23.4	0.50	416	0.0	447	0.03	981	1,193	342	655	1.3	7.62	1,310
1996Q0709	M:36706	23N 59E 32 BABD	SHU	66	4.7	67.2	43.5	<.003	0.09	20.1	20.0	0.50	375	0.0	150	1.35	558	748	308	347	1.6	7.49	906
1981Q1090	M:2978	23N 59E 34 DAAC	SHU	53	4.4	98.5	30.6	0.35	0.52	14.9	11.7	0.33	309	0.0	199	2.21	568	724	253	372	1.2	7.91	886

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1949Q0024	M:140716	23N 60E 07 AD	SHU	173	11.0	158.0	69.0	10.00		21.0	19.0	0.20	843	0.0	332	0.00	1,208	1,636	691	679	2.9	7.30	1,810
1949Q0025	M:140717	23N 60E 19 CA	SHU	940	14.0	103.0	69.0	8.40		22.0	18.0	0.60	1,020	0.0	1,660	1.40	3,339	3,856	837	541	17.6	7.70	4,180
1975Q1693	M:3009	24N 52E 28 BBAD	DHU	1,210	8.9	275.5	347.8	0.03	0.05	13.7	11.5	0.20	684	0.0	4,074	2.83	6,282	6,629	561	2,119	11.4	7.82	6,972
1975Q1650	M:3008	24N 52E 28 BBAD	SHU	317	1.9	49.1	115.4	0.01	0.02	10.5	26.5	0.05	443	0.0	811	22.60	1,572	1,797	363	598	5.6	8.18	2,252
1975Q1694	M:3010	24N 53E 15 CCCD	SHU	46	3.4	114.8	82.6	<.01	<.01	10.1	3.0		405	0.0	385	2.90	847	1,052	332	627	0.8	7.98	1,235
1975Q1695	M:3011	24N 54E 09 CDBC	SHU	227	8.9	169.4	162.5	0.01	1.20	10.3	15.3		683	0.0	1,007	0.20	1,939	2,285	560	1,092	3.0	7.89	2,393
1980Q2602	M:3012	24N 54E 12 ADCB	SHU	565	6.7	51.2	39.6	0.05	0.01	7.9	8.4	0.23	855	0.0	787	0.52	1,888	2,322	701	291	14.4	8.21	2,792
1979Q0467	M:3013	24N 54E 21 DDB	DHU	664	2.3	4.0	2.8	0.07	<.01	8.8	1.6	3.50	768	18.2	769	0.40	1,853	2,243	630	22	62.3	8.43	2,700
1981Q0094	M:3014	24N 54E 32 C	SHU	14	3.4	84.9	62.8	<.002	0.04	13.7	4.4	0.22	436	10.6	120	0.82	529	751	358	470	0.3	8.49	964
1980Q2601	M:3019	24N 55E 04 DADD	SHU	288	7.4	178.0	125.0	1.44	1.20	8.8	10.8	0.56	592	0.0	1,080	0.33	2,022	2,322	486	959	4.1	7.88	2,701
1980Q2535	M:3020	24N 55E 33 ACCD	SHU	21	6.2	109.0	73.9	3.82	0.23	16.8	1.1	0.29	526	0.0	209	0.01	701	968	431	576	0.4	7.96	1,052
1979Q0397	M:3021	24N 56E 19 AB	DHU	606	2.3	4.3	3.3	0.09	0.01	7.7	15.5	1.80	732	19.2	646	0.05	1,667	2,038	601	24	53.5	8.59	2,538
1995Q0537	M:139776	24N 57E 15 BBC	SHU	331	15.9	364.0	285.5	4.70	0.42	12.8	4.5	0.25	597	0.0	2,380	0.13	3,693	3,995	489	2,084	3.2	7.43	3,420
1979Q0465	M:3023	24N 57E 21 DD	DHU	504	2.0	2.7	1.7	0.09	<.01	9.2	0.0	5.70	922	30.7	296	0.20	1,306	1,774	757	14	59.2	8.55	2,061
1979Q0431	M:3024	24N 58E 12 DDAC	DHU	613	2.5	2.6	2.0	0.31	0.01	8.2	3.0	4.10	1,469	60.0	1	0.05	1,420	2,165	1,206	15	69.5	8.64	2,254
1981Q2095	M:3025	24N 58E 14 BBBB	SHU	467	5.0	26.0	26.7	2.16	0.05	7.6	4.3	0.23	566	0.0	715	0.45	1,533	1,820	464	175	15.4	7.89	2,233
1981Q2096	M:3026	24N 58E 15 AAAA	SHU	1,027	7.5	84.3	99.0	0.03	0.06	7.1	12.8	0.27	1,250	0.0	1,820	0.72	3,675	4,309	1,025	618	18.0	7.77	4,754
1995Q0650	M:37349	24N 59E 03 ABBA	DHU	695	2.9	5.4	4.3	0.03	0.01	7.3	12.0	2.89	772	39.6	900	0.13	2,050	2,442	634	31	54.2	8.51	2,690
1980Q2611	M:3027	24N 59E 03 ADAA	SHU	37	2.9	188.0	115.0	0.03	0.14	12.2	13.3	0.42	556	0.0	530	1.32	1,175	1,457	456	943	0.5	7.55	1,608
1980Q2597	M:3029	24N 59E 33 CADA	SHU	146	5.5	76.9	41.3	4.80	0.11	17.7	6.8	0.51	450	0.0	300	0.13	822	1,050	369	362	3.3	8.03	1,270
1981Q0397	M:3030	24N 59E 33 DDDD	SHU	62	6.7	126.0	74.7	3.82	0.19	19.6	7.8	0.32	591	0.0	286	0.08	878	1,178	485	622	1.1	7.80	1,350
1979Q0396	M:3031	24N 60E 07 ABAD	DHU	628	2.4	2.6	2.3	0.07	<.01	8.6	21.0	4.60	1,537	40.8	0	0.05	1,468	2,248	1,261	16	68.4	8.59	2,284
1995Q0321	M:37875	25N 51E 20 CBDB	SHU	794	6.1	103.2	97.3	0.01	0.01	12.5	6.5	0.75	971	0.0	1,500	3.75	3,002	3,495	796	658	13.5	7.48	3,660
1980Q2591	M:3062	25N 52E 05 CCAC	SHU	275	5.7	218.0	137.0	0.04	3.10	12.3	17.4	0.16	672	0.0	1,120	0.65	2,120	2,461	551	1,108	3.6	7.78	2,777
1975Q1736	M:3063	25N 52E 27 BABB	SHU	131	4.3	159.1	102.1	0.01	0.01	13.0	3.5		475	0.0	648	3.80	1,299	1,540	390	818	2.0	7.75	1,708
1980Q2593	M:3064	25N 53E 07 CCAD	SHU	154	4.8	230.0	118.0	0.02	0.00	15.0	12.2	0.11	462	0.0	980	0.45	1,742	1,977	379	1,060	2.1	8.07	2,255
1975Q1735	M:3065	25N 53E 32 DBCD	DHU	606	2.0	2.8	2.2	0.03	<.01	8.1	33.4	4.00	1,138	18.7	363	0.70	1,601	2,178	933	16	65.8	8.42	2,449
1979Q0469	M:3066	25N 53E 32 DBCD	DHU	632	2.1	3.1	2.1	0.05	<.01	7.9	15.8	4.50	1,078	48.0	399	0.30	1,646	2,193	885	16	68.0	8.70	2,488
1975Q1806	M:3067	25N 53E 33 CABA	SHU	18	4.0	177.5	80.8	0.13	0.02	10.3	7.2		504	0.0	387	1.10	933	1,189	413	776	0.3	7.58	1,330
1980Q2592	M:3068	25N 54E 19 BBCA	SHU	36	3.6	214.0	108.0	0.39	0.85	14.6	9.4	0.11	553	0.0	560	1.45	1,221	1,502	454	979	0.5	7.91	1,687
1979Q0457	M:3069	25N 54E 30 DAAA	DHU	675	2.4	3.0	1.8	0.07	<.01	9.4	27.9	3.40	1,706	37.9	0	0.01	1,602	2,467	1,400	15	76.1	8.40	2,569
1979Q0575	M:3070	25N 55E 03 BDAC	SHU	246	9.3	188.0	155.0	2.77	0.20	14.4	1.7	0.10	954	0.0	837	0.80	1,925	2,409	782	1,107	3.2	7.13	2,504
1980Q2534	M:3071	25N 55E 09 BAAA	SHU	270	5.2	440.0	445.0	2.17	0.56	17.1	1.7	0.23	473	0.0	2,971	0.48	4,387	4,627	388	2,930	2.2	7.59	4,590
1980Q2594	M:3072	25N 56E 08 BDDB	SHU	978	6.4	337.0	492.0	0.01	0.20	12.1	23.0	0.26	786	0.0	4,175	0.51	6,412	6,811	645	2,867	8.0	7.88	7,232
1980Q2598	M:3073	25N 56E 11 BAAB	DHU	806	2.5	8.5	5.6	0.10	0.02	7.2	18.9	1.52	711	0.0	1,120	0.13	2,321	2,682	583	44	52.7	8.51	3,390
1980Q2512	M:3074	25N 57E 09 BBDA	SHU	22	3.6	63.2	30.9	0.03	0.00	13.6	4.8	0.25	327	0.0	56	1.49	357	523	268	285	0.6	7.90	595
1979Q0468	M:3075	25N 57E 29 AAAD	DHU	599	2.4	2.4	1.4	0.46	<.01	10.2	4.5	5.30	1,519	31.2	0	0.10	1,405	2,176	1,246	12	76.0	8.46	2,219
1979Q0482	M:3076	25N 58E 24 CCCB	DHU	658	2.5	4.9	3.7	0.08	<.01	7.7	8.7	2.60	690	0.0	850	0.30	1,878	2,228	566	27	54.6	8.09	2,773
1980Q2606	M:3078	25N 58E 27 CCBD	SHU	422	16.4	323.0	264.0	15.50	0.67	9.9	21.1	0.23	966	0.0	2,110	0.03	3,659	4,149	792	1,893	4.2	7.25	4,265
1980Q2608	M:3079	25N 59E 11 BADB	DHU	648	2.4	2.6	2.5	0.34	0.01	7.7	16.9	4.31	854	0.0	650	0.01	1,755	2,189	700	17	68.8	8.43	2,638

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1988Q0743	M:3088	25N 59E 33 CDAA	SHU	11	3.0	51.8	19.3	0.02	0.07	18.4	10.8	0.10	243	0.0	12	3.42	249	372	199	209	0.3	7.83	447
1988Q0744	M:3100	25N 59E 33 CDAB	SHU	9	2.9	49.6	17.7	0.03	0.24	16.1	3.1	0.10	252	0.0	8	0.72	232	359	207	197	0.3	7.88	413
1987Q0919	M:3101	25N 59E 33 CDCA	SHU	10	4.5	59.4	31.4	0.02	0.07	20.0	5.4	0.20	290	0.0	20	6.44	301	448	238	278	0.3	7.83	503
1988Q0741	M:3110	25N 59E 33 DCBD	SHU	34	5.7	97.9	35.0	0.00	<.001	27.6	21.0	0.10	373	0.0	58	18.50	481	670	306	389	0.7	8.21	1,047
1980Q2542	M:3219	26N 51E 02 AABA	SHU	511	3.5	82.8	45.8	0.02	0.01	14.6	11.8	0.60	578	0.0	982	3.77	1,941	2,234	474	395	11.2	7.76	2,513
1996Q0119	M:38542	26N 51E 30 BDCC	FHHC	969	2.0	4.3	1.9	0.00	0.01	11.4	6.0	1.50	1,574	152.0	550	0.13	2,473	3,272	1,544	19	97.9	8.33	2,980
1980Q2544	M:3220	26N 52E 05 ACCB	SHU	571	4.1	162.0	82.0	0.08	0.01	12.4	24.5	0.60	518	0.0	1,440	7.73	2,560	2,823	425	742	9.1	7.82	3,428
1981Q2039	M:3221	26N 52E 13 CBAD	SHU	389	6.3	228.0	200.0	0.02	0.04	18.8	19.8	0.40	783	0.0	1,500	1.01	2,749	3,146	642	1,393	4.5	7.20	3,358
1995Q0649	M:145622	26N 52E 26 DCDD	SHU	252	6.4	183.8	120.1	5.50	0.15	16.8	6.5	0.32	863	0.0	850	0.13	1,866	2,304	707	953	3.6	7.50	2,330
1980Q2532	M:3222	26N 52E 26 DDCC	SHU	65	1.8	108.0	123.0	0.40	0.35	15.0	7.3	0.33	556	0.0	440	3.25	1,038	1,320	456	776	1.0	7.93	1,488
1980Q2607	M:3223	26N 52E 35 ABBC	DHU	1,111	2.7	9.7	4.2	0.09	0.02	6.9	28.0	1.67	1,130	0.0	1,440	0.19	3,161	3,735	927	42	75.0	8.36	4,551
1995Q0645	M:38576	26N 52E 35 BADA	DHU	1,104	3.3	9.7	5.0	0.04	0.01	7.9	22.5	1.30	1,093	0.0	1,500	0.13	3,192	3,747	897	45	71.8	8.20	4,030
1980Q2531	M:3224	26N 54E 03 DCAB	SHU	135	7.2	167.0	109.0	5.78	0.27	14.9	5.2	1.16	714	0.0	552	0.06	1,350	1,713	586	866	2.0	7.85	1,939
1995Q0640	M:138009	26N 54E 17 DCAA	DHU	817	3.7	9.9	7.0	2.39	0.07	9.9	22.5	0.15	1,031	0.0	1,000	0.13	2,381	2,904	846	54	48.6	8.18	3,090
1995Q0534	M:38618	26N 55E 01 ABCA	SHU	960	3.8	19.3	12.2	0.27	0.01	8.1	11.0	1.01	872	0.0	1,440	0.13	2,886	3,328	715	98	42.1	8.01	3,590
1979Q0500	M:3225	26N 55E 19 BAAC	SHU	347	14.4	310.0	440.0	2.42	0.32	9.7	13.6	0.05	1,005	0.0	2,358	7.20	3,998	4,508	824	2,585	3.0	7.41	4,498
1979Q0483	M:3226	26N 56E 20 CBDA	SHU	936	6.8	70.6	74.0	0.08	0.15	8.3	7.1	0.10	1,011	0.0	1,637	1.10	3,239	3,752	829	481	18.6	7.91	4,286
1979Q0486	M:3227	26N 57E 17 ADAA	DHU	545	2.2	2.3	1.5	0.20	0.02	10.2	2.9	5.40	1,267	25.9	86	0.72	1,306	1,949	1,040	12	68.7	8.57	2,071
1995Q0533	M:38693	26N 57E 19 BBCA	SHU	316	11.6	233.5	169.3	2.10	0.16	10.4	3.5	0.21	878	0.0	1,255	0.13	2,435	2,881	720	1,280	3.9	7.20	2,750
1980Q2609	M:3229	26N 58E 15 ADDC	SHU	713	2.6	6.5	4.4	0.03	0.01	7.4	14.1	4.06	826	0.0	910	0.22	2,069	2,488	677	34	53.0	8.40	3,030
1979Q0484	M:3230	26N 58E 21 CCCC	DHU	675	9.2	108.0	122.0	0.55	0.05	8.1	6.9	0.20	939	0.0	1,431	1.10	2,825	3,301	770	772	10.6	7.66	3,698
1995Q0531	M:125716	26N 58E 27 CCDD	DHU	683	3.2	16.5	9.2	0.11	0.02	7.9	11.0	2.20	704	0.0	1,000	0.13	2,080	2,437	577	79	33.4	8.00	2,720
1980Q2603	M:3232	26N 59E 22 DBDD	SHU	688	2.7	10.1	7.1	0.07	0.03	6.2	16.1	4.82	1,009	0.0	672	0.27	1,904	2,416	828	54	40.6	8.45	2,794
1979Q0490	M:3233	26N 59E 26 CADC	DHU	551	2.3	2.3	2.5	0.11	<.01	6.0	3.4	5.40	1,118	25.4	217	0.68	1,367	1,934	917	16	59.9	8.52	2,133
1980Q2604	M:3234	26N 59E 32 BAAA	SHU	879	3.2	9.2	6.8	0.01	0.01	6.7	3.4	2.36	1,147	0.0	974	0.54	2,450	3,032	941	51	53.6	8.45	3,639
1980Q2543	M:3347	27N 51E 27 CBBB	SHU	1,076	7.7	217.0	77.2	15.02	0.71	14.9	41.0	0.70	956	0.0	2,345	0.07	4,266	4,751	784	860	16.0	7.71	5,296
1963Q0038	M:3348	27N 51E 29 ABB	SHU	617	9.2	7.1	23.0	0.26	0.03	2.9	16.0	0.60	588	20.0	900	2.94	1,889	2,187	483	112	25.3	8.40	2,930
1980Q2612	M:3349	27N 51E 29 BBCB	SHU	418	4.6	54.5	31.8	2.71	0.63	17.2	17.3	1.01	599	0.0	660	0.01	1,503	1,807	491	267	11.1	7.92	2,195
1980Q2546	M:3351	27N 53E 03 DBAA	SHU	617	3.5	10.1	29.6	0.03	0.02	2.9	36.5	0.81	789	68.4	670	0.06	1,828	2,228	648	147	22.1	9.02	2,699
1980Q2524	M:3353	27N 53E 20 CCDC	DHU	480	0.7	1.9	0.6	0.06	0.00	10.1	84.1	5.10	946	80.4	22	0.02	1,151	1,631	777	7	77.8	8.69	1,905
1980Q2545	M:3354	27N 53E 34 AAAA	SHU	1,256	4.6	31.8	21.9	0.34	0.03	7.5	26.1	1.30	1,488	0.0	1,620	0.07	3,703	4,458	1,220	170	42.0	8.09	4,989
1947Q0032	M:3355	27N 54E 07 BADD	FHHC	463	5.2	6.8	2.0	0.10		16.0	116.0	4.80	884	59.0	6	0.50	1,115	1,563	823	25	40.1	8.50	1,950
1980Q2547	M:3356	27N 54E 12 CCAC	SHU	214	5.1	106.0	64.6	0.05	0.01	18.6	6.3	0.28	432	0.0	609	2.55	1,239	1,459	354	531	4.0	7.87	1,652
1980Q2548	M:3357	27N 54E 12 CCAD	SHU	866	2.7	10.6	6.2	0.76	0.02	6.5	24.0	1.71	694	0.0	1,300	0.42	2,561	2,913	569	52	52.3	8.34	3,634
1947Q0034	M:3362	27N 55E 23 DDBD	DHU	727	18.0	9.8	4.6	0.05		10.0	44.0	3.20	1,580	131.0	16	0.05	1,742	2,544	1,298	43	48.0	8.70	2,770
1996Q0369	M:150965	27N 56E 03 BDBB	SHU	120	4.9	131.0	44.1	4.80	1.70	19.6	20.0	0.40	488	0.0	350	0.13	937	1,184	400	509	2.3	8.30	1,298
1964Q0038	M:3363	27N 56E 03 CAB	SHU	448	8.2	204.0	95.0	0.32		18.0	16.0	0.80	948	0.0	1,060	0.02	2,317	2,798	778	900	6.5	7.50	3,050
1980Q2533	M:3366	27N 56E 22 DCBD	SHU	1,537	7.5	127.0	79.0	0.13	0.09	8.9	20.8	0.98	902	0.0	3,220	0.47	5,446	5,904	740	642	26.4	8.10	6,740
1980Q2595	M:3367	27N 56E 32 CCBA	SHU	1,084	7.0	2.2	3.7	0.07	0.00	0.8	9.2	0.32	673	708.0	627	1.73	2,776	3,117	564	21	103.6	10.07	4,479
1963Q0029	M:3454	28N 53E 29 DAC	SHU	518	1.5	4.6	1.1	0.09	0.02	11.0	112.0	5.40	1,050	32.0	27	0.05	1,230	1,763	862	16	56.3	8.50	1,990

Lab Number	Site Number	Location	Hydrologic Unit	Na (Sodium) (mg/L)	K (Potassium) (mg/L)	Ca (Calcium) (mg/L)	Mg (Magnesium) (mg/L)	Fe (Iron) (mg/L)	Mn (Manganese) (mg/L)	Si (Silica) (mg/L)	Cl (Chloride) (mg/L)	F (Fluoride) (mg/L)	HCO3 (Bicarbonate) (mg/L)	CO3 (Carbonate) (mg/L)	SO4 (Sulphate) (mg/L)	Nitrate as N (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Constituents (mg/L)	Alkalinity	Hardness	Sodium Adsorbtion Ratio	Lab pH	Lab Specific Conductance
1996Q0572	M:148595	28N 53E 32 ADDD	SHU	493	1.3	1.9	0.7	0.19	0.03	10.2	140.0	5.00	988	37.2	3	0.13	1,176	1,678	811	8	77.8	8.68	1,875
1980Q2549	M:3459	28N 53E 32 DABC	SHU	433	4.9	82.9	34.9	3.18	0.16	18.0	109.0	1.44	1,032	0.0	300	0.07	1,496	2,020	846	351	10.1	7.80	2,284
1947Q0043	M:3469	28N 55E 33 DA	SHU	467	14.0	229.0	103.0	3.60		12.0	26.0	0.05	1,190	0.0	971	1.40	2,413	3,017	976	996	6.4	7.10	3,230
Additional Data																							
1996Q0041	M:149455	10N 50E 04 ABBA	SPG	42	3.8	37.3	16.7	0.04	0.03	25.4	5.0	0.27	263	0.0	33	<.25	292	426	216	162	1.4	8.14	493
1995Q0315	M:144391	11N 57E 35 ADCA	STR	343	7.6	38.2	15.4	0.09	0.04	11.0	150.0	0.47	193	0.0	500	1.25	1,163	1,261	158	159	11.9	7.95	1,749
1995Q0314	M:144390	12N 52E 03 DAAA	STR	588	10.0	86.8	82.8	0.01	0.01	6.4	20.0	0.51	493	0.0	1,400	<.25	2,438	2,688	404	558	10.8	8.30	2,880
1994Q0740	M:137281	13N 51E 31 ABDA	STR	785	13.6	117.0	108.0	0.01	0.01	14.2	34.1	0.42	619	0.0	1,801	<.25	3,178	3,492	508	737	12.6	8.33	4,070
1995Q0323	M:144396	13N 54E 03 ADBC	STR	674	17.1	106.6	53.3	0.01	0.15	10.3	640.0	0.46	386	0.0	750	0.75	2,442	2,638	316	486	13.3	8.19	3,460
1995Q0325	M:144396	13N 54E 03 ADBC	STR	668	17.0	107.8	53.3	0.02	0.15	10.4	680.0	0.45	349	0.0	800	1.00	2,510	2,687	286	489	13.1	8.09	3,510
1980Q2499	M:1989	15N 49E 05 BBCD	UNK	14	2.8	82.2	43.9	1.13	0.18	15.2	9.1	0.39	406	0.0	71		440	646	333	386	0.3	7.89	737
1995Q0326	M:144398	15N 55E 04 AACC	STR	279	3.6	36.2	25.6	0.02	0.03	10.8	20.0	0.60	578	9.6	300	0.25	971	1,264	474	196	8.7	8.34	1,402
1995Q0313	M:144399	16N 56E 29 BBBD	STR	493	5.3	18.2	6.1	0.17	0.01	9.4	7.5	0.89	782	76.8	400	0.50	1,404	1,801	643	71	25.6	8.89	1,945
1995Q0322	M:144395	16N 60E 27 BBAC	STR	375	9.7	95.9	87.5	0.02	0.05	6.6	10.0	1.29	470	0.0	1,000	<.25	1,818	2,057	385	600	6.7	8.08	2,290
1995Q0319	M:144394	19N 57E 26 CBCD	STR	240	8.7	84.6	102.2	0.02	0.01	12.0	9.0	0.60	575	16.8	700	<.25	1,456	1,748	472	632	4.2	8.34	1,920
1995Q0489	M:137995	19N 59E 34 ADBB	UNK	435	2.4	1.9	1.1	0.02	0.01	7.2	10.0	0.36	903	32.8	200	<.25	1,136	1,594	741	9	62.2	8.71	1,701
1976Q1283	M:2639	21N 60E 29 BABA	UNK	1,475	4.7	19.8	15.5	1.73	0.05	7.8	18.0	1.20	1,393	0.0	2,038		4,268	4,975	1,143	113	60.3	8.08	5,743
1995Q0318	M:144393	25N 51E 20 CBBD	STR	1,084	11.8	61.8	115.8	0.03	0.02	3.8	12.5	0.68	960	33.6	2,000	0.25	3,797	4,284	788	631	18.8	8.50	4,510

Appendix D
Isotope Data

Lab Number	Site Number	Location		Hydrologic Unit	Tritium (TU)*	+/-	C-14 (PMC)**	+/-	Delta D	Delta O-18
1996Q0115	M:17562	05N 59E 09 ABAB	01	FHHC	<0.8	0.5	8.34	0.48	-147	-19.6
1996Q0519	M:20590	07N 60E 10 DAAC	01	FHHC	2.3	0.3				
1996Q0117	M:22039	08N 58E 34 BD	01	FHHC	<0.8	0.6	1.64	0.69	-149	-19.8
1996Q0116	M:23608	10N 54E 11 CBBD	01	FHHC	<0.8	0.5	<0.91		-148	-20.0
1996Q0521	M:23677	10N 57E 28 DDAC	01	FHHC	<0.8	0.3				
1996Q0563	M:24237	11N 58E 05 ACBC	01	FHHC	<0.8	0.3				
1996Q0114	M:24646	12N 51E 15 CBDB	01	FHHC	<0.8	0.5	1.45	0.69	-147	-19.6
1995Q0641	M:148500	12N 51E 21 DADD	02	SHU	16.4	1.3				
1996Q0555	M:24927	12N 59E 14 ADAC	02	SHU	30.3	2.1				
1996Q0366	M:1845	13N 51E 31 BCDD	02	DHU	<0.8	0.4	<0.87		-146	-19.2
1996Q0367	M:1846	13N 51E 31 BDCB	01	FHHC	<0.8	0.4	<1.10		-148	-19.2
1996Q0567	M:702103	13N 53E 02 DDCD	01	SHU	10.9	0.8				
1996Q0568	M:26283	14N 54E 18 BCCA	01	SHU	15.9	1.1				
1995Q0454	M:27650	15N 51E 34 ABCA	01	SHU	<0.8	0.4				
1995Q0445	M:130335	15N 53E 25 DAAB	01	SHU	16.3	1.2				
1995Q0451	M:27719	15N 54E 02 DACD	01	DHU	<0.8	0.5				
1995Q0453	M:27720	15N 54E 02 DADB	01	SHU	<0.8	0.5				
1995Q0483	M:27869	15N 55E 33 BBBB	01	SHU	18.6	1.4				
1995Q0488	M:27885	15N 57E 04 BCBC	01	SHU	27.8	1.9				
1995Q0444	M:28933	16N 51E 36 DABD	01	SHU	<0.8	0.5				
1995Q0457	M:148181	16N 55E 19 BABD	01	DHU	<0.8	0.3				
1995Q0455	M:29072	16N 55E 19 BADB	01	SHU	<0.8	0.3				
1995Q0526	M:120632	16N 58E 30 DCAD	01	DHU	20.2	1.4				
1995Q0491	M:122313	18N 51E 28 DDDD	01	SHU	5.5	0.5				
1995Q0581	M:31513	18N 54E 26 BCCC	01	SHU	29.2	2.0				
1996Q0121	M:32476	19N 48E 10 DACA	01	FHHC	<0.8	0.5	<1.02		-138	-17.8
1995Q0584	M:32629	19N 53E 23 AAAA	01	SHU	8.9	0.7				
1995Q0586	M:32630	19N 53E 23 CAAA	01	SHU	<0.8	0.3				
1995Q0530	M:126755	21N 56E 12 CDCB	01	SHU	23.8	1.7				
1996Q0123	M:35583	22N 52E 29 ADDD	04	FHHC	<0.8	0.5	<1.73		-138	-18.3
1995Q0482	M:35606	22N 54E 04 DADA	01	SHU	13.9	1.0				
1996Q0120	M:35619	22N 55E 01 CDCA	01	FHHC	<0.8	0.5	<1.57		-142	-19.2
1996Q0122	M:35890	22N 59E 18 DCCB	01	FHHC	<0.8	0.4	2.04	1.67	-139	-18.6
1995Q0490	M:36336	23N 55E 36 DDCC	01	SHU	19.9	1.4				
1995Q0636	M:136651	23N 59E 15 ADBCE	01	SHU	26.1	1.9				
1995Q0527	M:36693	23N 59E 32 AADA	01	SHU	49.8	3.4				
1996Q0119	M:38542	26N 51E 30 BDCC	02	FHHC	<0.8	0.5	2.38	0.62	-137	-18.0
1995Q0534	M:38618	26N 55E 01 ABCA	01	SHU	<0.8	0.3				

* TU Tritium Units

** PMC Percent Modern Carbon