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Precipitation, Streamflow, Suspended-Sediment, and Water-Quality Data for the U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado, 1966–2015

Open-File Report 2017–1072

U.S. Department of the Interior
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Conversion Factors

U.S. customary units to International System of Units

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
	Mass	
ton per day (ton/d)	0.9072	metric ton per day

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32.$$

Datum

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Elevation, as used in this report, refers to distance above the vertical datum.

Supplemental Information

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25 °C).

Concentrations of chemical constituents in water are given in either milligrams per liter (mg/L) or micrograms per liter (µg/L).

Abbreviations

AGFC	U.S. Army Garrison Fort Carson
CDPHE	Colorado Department of Public Health and Environment
DSTM	Defined substrate test method
NWIS	National Water Information System
PCMS	Piñon Canyon Maneuver Site
TVS	table value standard
USGS	U.S. Geological Survey

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Abstract

The U.S. Army Garrison Fort Carson (AGFC) and the Piñon Canyon Maneuver Site (PCMS) are facilities operated by the U.S. Department of the Army in southern Colorado. The U.S. Geological Survey, in cooperation with the U.S. Department of the Army, established a hydrologic and water-quality data-collection network at the AGFC in June 1978 and at the PCMS in October 1982. The data-collection networks are designed to assess the quantity and quality of water resources and monitor the effects of military training activities on streamflow and water quality. Two preexisting U.S. Geological Survey streamgages at the PCMS were incorporated into the data-collection network at the time it was established, providing periods of record that begin as early as 1966. This report presents and summarizes precipitation, streamflow, suspended-sediment, and water-quality data from 34 U.S. Geological Survey sites on or near the AGFC and the PCMS for the period of record at each site. (Streamflow data are presented as discharge in cubic feet per second.)

At AGFC, daily sum precipitation ranged from 0 to 11.85 inches, daily mean discharge ranged from 0 to 836 cubic feet per second, and daily mean suspended-sediment discharge ranged from 0 to 39,900 tons per day. With the exception of total (unfiltered) mercury and filtered sulfate at two sites and filtered manganese at three sites, 95th percentile trace element concentrations and median total (unfiltered) metal concentrations were less than regulatory numeric standards for all samples. However, individual water-quality results occasionally exceeded respective regulatory numeric standards.

At the PCMS, daily sum precipitation ranged from 0 to 4.59 inches, daily mean discharge ranged from 0 to 4,190 cubic feet per second, and daily mean suspended-sediment discharge ranged from 0 to 21,100 tons per day. Water-quality results, 95th percentile trace element concentrations, and median total (unfiltered) metal concentrations were less than regulatory numeric standards for most properties and constituents except for filtered chloride at one site, filtered sulfate at six sites, filtered phosphorus at one site, filtered manganese at three sites, and total (unfiltered) iron at three sites. Individual water-quality values also occasionally exceeded respective regulatory numeric standards.

Introduction

The U.S. Army Garrison Fort Carson (AGFC) and the Piñon Canyon Maneuver Site (PCMS) are facilities operated by the U.S. Department of the Army in southern Colorado. The AGFC is a 215-square-mile installation located between the cities of Colorado Springs and Pueblo in parts of El Paso, Pueblo, and Fremont Counties, Colorado (fig. 1). The PCMS is a 381-square-mile training site associated with the AGFC that is located about 25 miles northeast of the city of Trinidad in Las Animas County, Colorado (fig. 2). The U.S. Geological Survey (USGS), in cooperation with the U.S. Department of the Army, established a hydrologic and water-quality data-collection network at AGFC in June 1978 (Leonard, 1984) and at PCMS in October 1982 (von Guerard and others, 1987, 1993) to assess the quantity and quality of water resources and monitor the effects of military training activities on streamflow and water quality. At PCMS, two preexisting USGS streamgages were incorporated into the data-collection network at the time it was established, providing periods of record that begin as early as 1966 (von Guerard and others, 1987). The original networks consisted of 17 streamgages at AGFC and 11 streamgages and 4 precipitation sites at PCMS. Subsequent to establishment of the original networks, data-collection sites have been added or removed to meet changing data needs. The current (through water year 2015) networks consist of 12 sites at AGFC and 14 sites at PCMS for precipitation, streamflow, suspended-sediment, or water-quality data collection.

Spatial and temporal variations in precipitation, streamflow, and suspended-sediment loads were previously assessed for AGFC for the period 2008–2012 (Brown, 2014) and for PCMS for 1983–2007 (Stevens and others, 2008) and 2008–2012 (Brown, 2014). However, a summary of precipitation, streamflow, suspended-sediment, and water-quality data for the period of record at selected sites on or near AGFC and PCMS was needed to compare conditions through time and evaluate the effectiveness of management practices implemented by the U.S. Army to reduce the effects of military training activities on streamflow, sediment loads, and water quality.

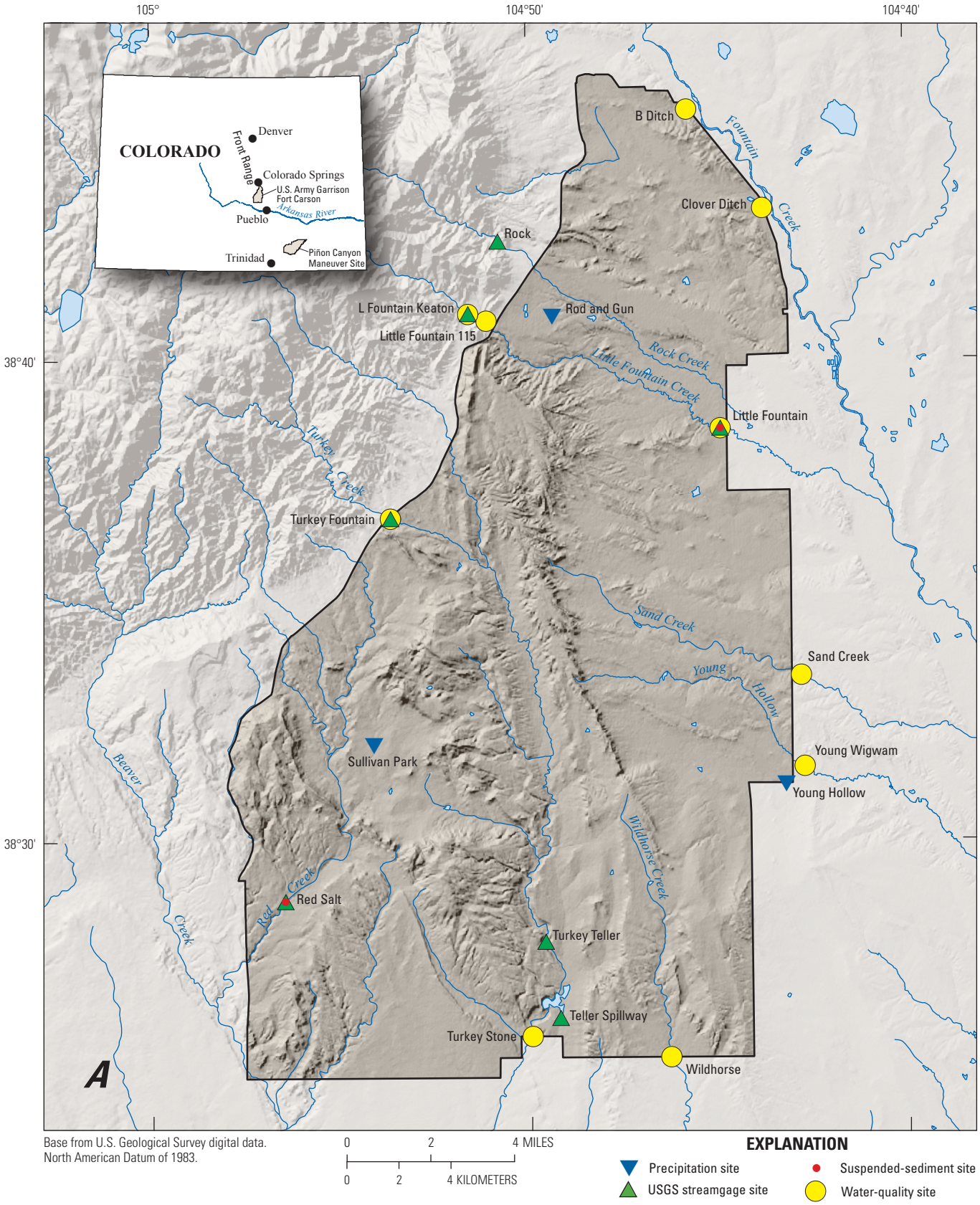

Figure 1. Locations of U.S. Geological Survey precipitation, streamflow, suspended-sediment, and water-quality data-collection sites at U.S. Army Garrison Fort Carson, Colorado.

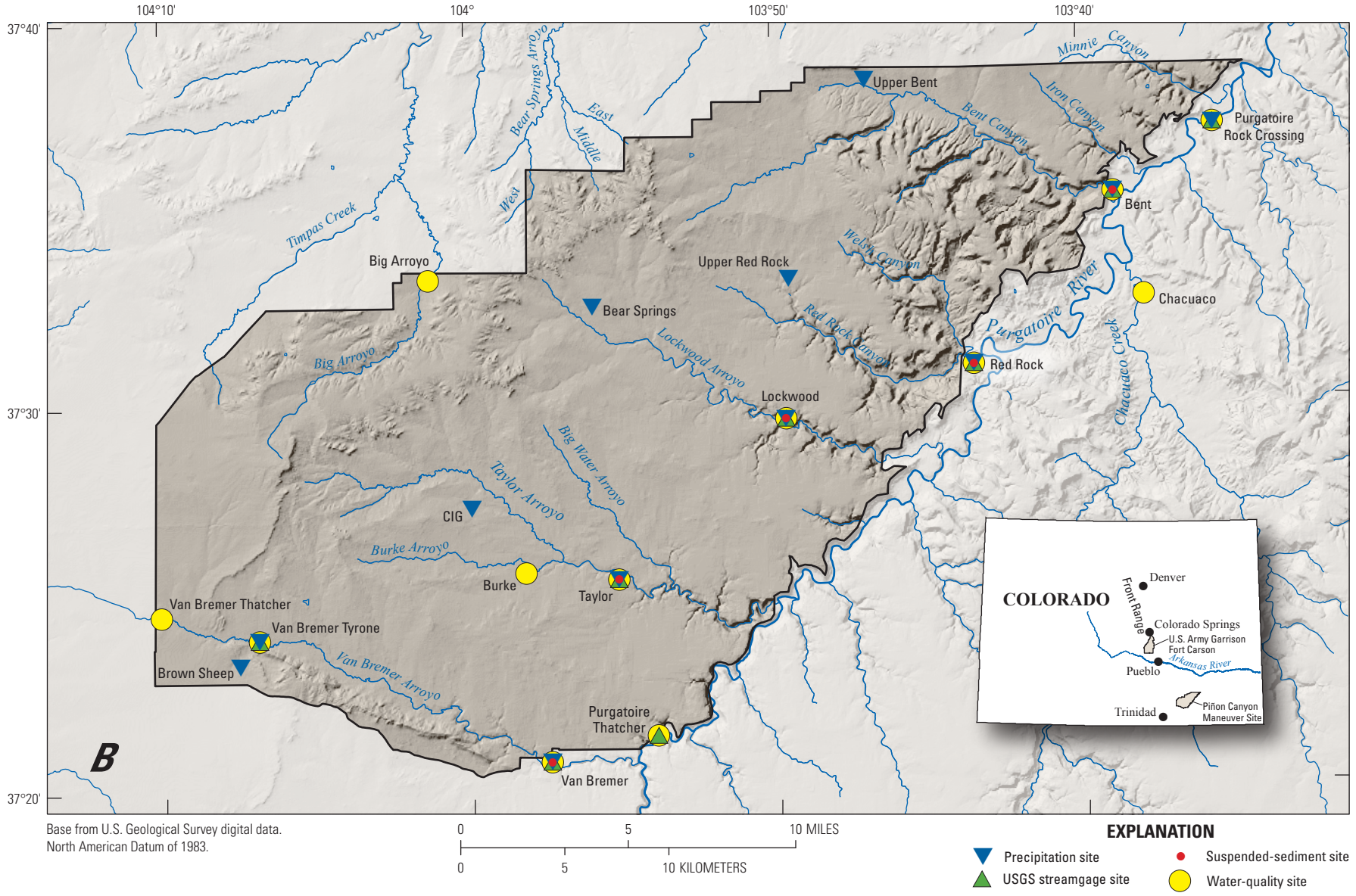

Figure 2. Locations of U.S. Geological Survey precipitation, streamflow, suspended-sediment, and water-quality data-collection sites at Piñon Canyon Maneuver Site, Colorado.

Purpose and Scope

This report presents and summarizes precipitation, streamflow, suspended-sediment, and water-quality data from selected USGS sites on or near AGFC and PCMS for the period of record at each site. For sites associated with AGFC, the period of record ranges from 1978 to 2015. For sites associated with PCMS, the period of record generally ranges from 1982 to 2015, except for preexisting sites with records beginning in 1966. Where applicable, water-quality data at each site are compared to regulatory numeric standards for surface waters of Colorado and the Arkansas River Basin.

Description of Study Areas

The following sections briefly describe the landscape, geology, and hydrology of the AGFC and the PCMS.

U.S. Army Garrison Fort Carson

The AGFC lies at the base of the Rocky Mountain Front Range with land-surface elevations ranging from about 5,400 to 6,900 feet (ft) (Leonard, 1984). The northern and eastern parts of the AGFC are characterized by dissected plains and terraces with local relief ranging from 10 to 50 ft, whereas the western part is characterized by deep canyons, hills, and hogbacks of sedimentary rocks with local relief of 50–600 ft (Leonard, 1984). The AGFC lies within the Arkansas River Basin with streams that drain either southward to the Arkansas River or southeastward to Fountain Creek (fig. 1). The southwestern and south-central parts of the AGFC are drained by Red Creek, Beaver Creek, Turkey Creek, and Wildhorse Creek and their tributaries. Primary drainages in the northern and eastern parts of the AGFC include Rock Creek, Little Fountain Creek, Sand Creek, and other smaller tributaries of Fountain Creek (Leonard, 1984).

Piñon Canyon Maneuver Site

The PCMS consists of rangeland and canyons located about 150 miles southeast of AGFC. The site is bounded generally by uplands or hills on the west and north, a hogback on the south, and the canyon of the Purgatoire River on the east (Stevens and others, 2008). Land-surface elevations range from 5,905 ft at the northwest edge of PCMS to 4,350 ft along the Purgatoire River at the northeast edge of the site (von Guerard and others, 1987). Rock and cliffs are exposed along the 400- to 500-ft-deep canyon of the Purgatoire River that forms the eastern boundary of the site. About 96 percent of PCMS drains south and east through incised valleys created by tributaries of the Purgatoire River, whereas the remaining 4 percent drains north and east into the Timpas Creek watershed (von Guerard and others, 1987). Primary drainages to the Purgatoire River within the PCMS include Minnie Canyon, Iron Canyon, Bent Canyon, Welsh Canyon, Red Rock Canyon, Lockwood Arroyo, Taylor Arroyo, and Van Bremer Arroyo. Primary drainages to the Timpas Creek watershed within PCMS include Timpas Creek, Big Arroyo, and the east, middle, and west forks of Bear Springs Arroyo (fig. 2).

Methods

Precipitation, streamflow, suspended-sediment, and water-quality data presented in this report were collected at a total of 34 USGS sites on or near AGFC and PCMS for the period of record at each site (table 1). Streamflow data are presented as discharge in cubic feet per second. The term "water year," as used in this report, represents the 12-month period beginning October 1 of any given year and ending September 30 of the subsequent year. For the sake of brevity, short names are often used to identify sites in this report (table 1). Where applicable, the short-name convention is the same as used by Brown (2014) and Stevens and others (2008).

All data were collected and processed according to standard USGS methods, protocols, and quality-control measures applicable at the time of collection. Precipitation data were collected in accordance with procedures described in the USGS Office of Surface Water's Technical Memorandum No. 2006.01 (USGS, 2009). Prior to 2006, precipitation sites were maintained following Water Science Center guidelines. Discharge (streamflow) data were collected using methods presented by Buchanan and Somers (1969), Rantz and others (1982a, b), Kennedy (1983), and Turnipseed and Sauer (2010). Suspended-sediment data were collected using procedures described by Edwards and Glysson (1988) and Rasmussen and others (2009). Water-quality data were collected using techniques presented by Brown and others (1970), Horowitz and others (1994), and USGS (variously dated).

Data Compilation

Data presented in this report were compiled from the USGS National Water Information System (NWIS) for 17 sites associated with AGFC and 17 sites associated with PCMS (figs. 1 and 2). Of these, 15 sites include precipitation data, 15 sites include discharge data, 7 sites include suspended-sediment data, and 22 sites include water-quality data (table 1). Selected sites include those in the current data-collection networks and sites of interest with historical data.

Data in this report were collected from 1966 to 2015. The period of record for each site represents the full period over which data were collected through water year 2015 (until September 30, 2015) for precipitation, discharge, and suspended sediment, and through calendar year 2015 for water quality. However, the period of record for each site varies because of available data. For sites with seasonal or intermittent data, the full period of record still is presented to show the temporal distribution of available data.

Table 1. Summary of available precipitation, streamflow, suspended-sediment, and water-quality data for selected sites at the U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, 1966–2015.

[USGS, U.S. Geological Survey; CDPHE, Colorado Department of Public Health and Environment; CO, Colorado; Apr.–Oct., April to October; UAB, Upper Arkansas River Basin; ab, above; Res, Reservoir; nr, near; FCB, Fountain Creek Basin; MAB, Middle Arkansas River Basin; abv, above; LAB, Lower Arkansas River Basin bl, below]

USGS site number	Site name	Short name	Status[1]	Data type	Operation	Record start	Record end	Number of values[2]	CDPHE Arkansas River Basin, stream segment[3]
U.S. Army Garrison Fort Carson									
07099085	Red Creek above Salt Canyon at Fort Carson, CO	Red Salt	Current	Streamflow	Apr.-Oct.	4/1/2015	9/30/2015	183	
				Suspended sediment	Apr.-Oct.	5/8/2015	8/14/2015	58	
07099215	Turkey Creek near Fountain, CO	Turkey Fountain	Current	Streamflow	Apr.-Oct.	5/25/1978	10/14/2012	8,187	
				Water quality	Periodic	4/12/1979	6/16/2015	117	UAB, 14d
07099230	Turkey Creek ab Teller Res near Stone City, CO	Turkey Teller		Streamflow	Apr.-Oct.	5/18/1978	10/15/2012	11,984	
07099235	Turkey Creek nr Stone City, CO	Turkey Stone	Current	Water quality	Year round	3/9/1979	6/1/2015	162	UAB, 14d
07099238	Teller Reservoir Spillway near Stone City, CO	Teller Spillway		Streamflow	Apr.-Oct.	10/20/2000	9/30/2012	3,154	
07105780	B Ditch Drain near Security, CO	B Ditch		Water quality	Year round	4/2/1981	10/20/1988	121	FCB, 4
07105820	Clover Ditch Drain near Widefield, CO	Clover Ditch		Water quality	Year round	4/1/1981	1/18/1990	159	FCB, 4
07105920	L Fountain C ab Keaton Re, nr Fort Carson, CO	L Fountain Keaton		Streamflow	Year round	5/23/1978	9/30/1998	4,916	
				Water quality	Periodic	4/21/1978	10/1/1998	108	FCB, 4
07105940	Little Fountain Creek near Fountain, CO	Little Fountain	Current	Streamflow	Year round	5/23/1978	9/30/2015	4,146	
				Suspended sediment	Year round	9/12/2013	9/30/2015	447	
				Water quality	Periodic	4/12/1979	9/23/2015	452	FCB, 4
07105945	Rock Creek above Fort Carson Reservation, CO	Rock	Current	Streamflow	Year round	5/19/1978	9/30/2015	13,649	
382532104461801	Wildhorse Creek near Stone City at Ft Carson, CO	Wildhorse	Current	Water quality	Periodic	5/8/2015	5/8/2015	1	MAB, 4a
383109104431301	Young Hollow Meteorologic Station at Fort Carson, CO	Young Hollow	Current	Precipitation	Year round	5/5/1999	9/30/2015	5,415	
383130104424201	Young Hollow below Fort Carson near Wigwam, CO	Young Wigwam	Current	Water quality	Periodic	6/16/2015	6/16/2015	1	FCB, 4
383159104540701	Sullivan Park Met Station at Fort Carson, CO	Sullivan Park	Current	Precipitation	Year round	5/5/1999	9/30/2015	5,747	
383325104424801	Sand Creek below Fort Carson near Wigwam, CO	Sand Creek	Current	Water quality	Periodic	8/3/2013	6/16/2015	4	FCB, 4
384048104510401	Little Fountain Creek abv Hwy 115 at Fort Carson, CO	Little Fountain 115	Current	Water quality	Periodic	8/3/2013	5/5/2015	4	FCB, 4
384053104492001	Rod and Gun Meteorologic Station at Fort Carson, CO	Rod and Gun	Current	Precipitation	Year round	5/21/1999	9/30/2015	5,670	
Piñon Canyon Maneuver Site									
07120620	Big Arroyo near Thatcher, CO	Big Arroyo	Current	Water quality	Periodic	8/1/1983	4/30/1999	58	LAB, 2a
07126130	Van Bremer Arroyo near Thatcher, CO	Van Bremer Thatcher	Current	Water quality	Periodic	7/23/1985	7/23/1985	1	LAB, 9a
07126140	Van Bremer Arroyo near Tyrone, CO	Van Bremer Tyrone		Precipitation	Apr.-Oct.	6/12/1993	10/16/2004	2,404	
				Streamflow	Year round	5/21/1985	11/16/2004	6,109	
				Water quality	Periodic	11/15/1985	7/1/2008	42	LAB, 9a
07126200	Van Bremer Arroyo near Model, CO	Van Bremer	Current	Precipitation	Apr.-Oct.	6/18/1993	9/30/2015	4,758	
				Streamflow	Year round	7/1/1966	9/30/2015	17,082	
				Suspended sediment	Periodic	6/12/1999	8/14/2015	240	
				Water quality	Periodic	7/7/1966	12/9/2015	610	LAB, 9a
07126300	Purgatoire River near Thatcher, CO	Purgatoire Thatcher	Current	Streamflow	Year round	1/1/2011	9/30/2015	1,734	
				Water quality	Periodic	8/10/1966	12/9/2015	639	LAB, 7
07126320	Burke Arroyo Tributary near Thatcher, CO	Burke		Water quality	Periodic	8/19/1984	6/1/1986	11	LAB, 2a
07126325	Taylor Arroyo bl Rock Crossing, nr Thatcher, CO	Taylor	Current	Precipitation	Apr.-Oct.	5/4/1999	9/30/2015	3,500	
				Streamflow	Apr.-Oct.	3/18/1983	9/30/2015	9,212	
				Suspended sediment	Apr.-Oct.	4/21/1983	7/22/2015	373	
				Water quality	Periodic	6/7/1983	7/21/2015	159	LAB, 2a
07126390	Lockwood Canyon Creek near Thatcher, CO	Lockwood	Current	Precipitation	Apr.-Oct.	5/14/1999	9/30/2015	3,479	
				Streamflow	Apr.-Oct.	4/21/1983	9/30/2015	7,149	
				Suspended sediment	Periodic	5/14/1999	8/12/2014	68	
				Water quality	Periodic	6/2/1983	8/12/2014	87	LAB, 2a
07126415	Red Rock Canyon Creek at Mouth nr Thatcher, CO	Red Rock	Current	Precipitation	Apr.-Oct.	4/28/2000	9/30/2015	3,086	
				Streamflow	Apr.-Oct.	5/26/1983	9/30/2015	5,993	
				Suspended sediment	Periodic	6/13/2002	7/9/2015	286	
				Water quality	Periodic	7/23/1985	6/11/2015	109	LAB, 2a
07126470	Chacuaco Creek at Mouth near Timpas, CO	Chacuaco		Water quality	Periodic	7/11/1984	7/9/1992	22	LAB, 9a
07126480	Bent Canyon Creek at Mouth near Timpas, CO	Bent	Current	Precipitation	Apr.-Oct.	6/6/2000	9/30/2015	3,262	
				Streamflow	Apr.-Oct.	10/1/1983	9/30/2015	5,460	
				Suspended sediment	Periodic	7/15/1984	8/14/2015	108	
				Water quality	Periodic	7/6/2009	8/14/2015	160	LAB, 2a
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	Current	Precipitation	Apr.-Oct.	4/29/1999	9/30/2004	1,118	
				Streamflow	Apr.-Oct.	6/1/1983	9/30/2015	10,147	
				Water quality	Periodic	10/15/1982	11/23/2015	472	LAB, 7
372319104073301	Brown Sheep Camp Met Station near Tyrone, CO	Brown Sheep	Current	Precipitation	Year round	6/9/1999	9/30/2015	5,755	
372721103595601	CIG Pipeline South Met. Station near Simpson, CO	CIG[4]	Current	Precipitation	Year round	7/8/1983	9/30/2015	11,142	
373232103555201	Bear Springs Hills Met Station near Houghton, CO	Bear Springs[5]	Current	Precipitation	Year round	8/1/1983	9/30/2015	10,799	
373315103493101	Upper Red Rock Canyon Met Station nr Houghton, CO	Upper Red Rock[6]	Current	Precipitation	Year round	8/11/1983	9/30/2015	10,806	
373823103465601	Upper Bent Canyon Met Station nr Delhi, CO	Upper Bent[7]	Current	Precipitation	Year round	7/8/1983	9/30/2015	11,005	

[1] Sites indicated as "Current" are part of the current (through water year 2015) networks.

[2] Streamflow values are daily mean discharge values, suspended-sediment values are daily mean suspended-sediment discharge values, water quality values are samples, and precipitation values are daily sum values.

[3] From Colorado Department of Public Health and Environment (2016). The notations 14d, 4, 4a, 2a, 9a, and 7 refer to stream segments defined in Regulation 32—Classification of Numeric Standards for Arkansas River Basin.

[4] Site known as "Taylor precipitation gage" in von Guerard and others (1993).

[5] Site known as "Lochwood precipitation gage" in von Guerard and others (1993).

[6] Site known as "Red Rock precipitation gage" in von Guerard and others (1993).

[7] Site known as "Bent Canyon precipitation gage" in von Guerard and others (1993).

The water-quality properties and constituents compiled for each site are based on the constituent list for the current AGFC and PCMS sampling plan for the water-quality networks but vary on the basis of available data (William Payne, USGS, written commun., 2016). Constituents with regulatory numeric standards for the surface waters of Colorado (Regulation 31) and the Arkansas River Basin (Regulation 32) set by the Colorado Department of Public Health and Environment (CDPHE) were also included (CDPHE, 2013, 2016). Acid-neutralizing capacity and hardness also were compiled for comparison among samples. The sampling plan for the current networks includes measurements of water-quality field properties (water temperature, pH, specific conductance, and dissolved oxygen concentration) and sample collection for analysis of dissolved solids, major ions (calcium, sodium, potassium, magnesium, silica, chloride, sulfate, and fluoride), dissolved (filtered) nutrients (nitrate plus nitrite, as nitrogen; ammonia, as nitrogen; phosphorus; and orthophosphate, as phosphorus), total (unfiltered) nutrients (ammonia, as nitrogen; total nitrogen; and phosphorus), dissolved (filtered) trace elements (aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, mercury, selenium, silver, uranium, and zinc), and *Escherichia coli* bacteria. In addition, the following water-quality constituents having numeric standards were compiled on the basis of regulatory stream segment (CDPHE, 2013, 2016): total (unfiltered) trace elements (arsenic, beryllium, cadmium, chromium, copper, iron, lead, mercury, molybdenum, nickel, selenium, and zinc), and dissolved (filtered) chromium (VI).

Data Presentation

Because of the large volume of data collected during the periods of record for sites at AGFC and PCMS, only summary statistics are presented in this report. Precipitation data are presented as daily sum values in inches. Discharge and suspended-sediment discharge data are presented as daily mean values from continuous records in cubic feet per second and tons per day, respectively. Summary statistics for each water-quality property or constituent were computed using the Water-Quality System subroutine of NWIS (Dupré and others, 2013). In cases where greater than 5 percent of the total number of values for a property or constituent were censored (that is, below the detection limit), the subroutine estimated values below the detection limit by using a log-probability regression procedure. Estimated values below the detection limit and measured values above the detection limit were then used by the subroutine to compute summary statistics for the property or constituent. The method is fully described in Dupré and others, 2013.

The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent. If the total number of values (above and below the detection limit) was greater than 1 and less than or equal to 5, only the maximum and minimum were computed, and if the number of values above the detection limit was less than 5, the estimated values were considered unreliable and were not computed. If the total number of values was equal to 1, only the maximum was reported. If the maximum was equal to 0.0, only the maximum was reported regardless of the number of values (Dupré and others, 2013).

Where applicable, CDPHE acute and chronic numeric standards for surface waters of Colorado and the Arkansas River Basin (CDPHE, 2013, 2016) are given along with the summary statistics for comparison purposes. These numeric water-quality standards apply to all flowing and standing waters within the Arkansas River Basin; apply to physical, biological, and chemical characteristics; and were set based on the designated beneficial uses of the water. All sites in this report are classified as Aquatic Life Warm Class 1 or 2 except for two sites classified as Aquatic Life Cold Water Class 2 in stream segment 14d in the Upper Arkansas River Basin (table 1). An acute standard represents the concentration not to be exceeded for either a single sample or the calculated average of all samples collected during a 1-day period, whereas a chronic standard represents the concentration not to be exceeded for either a single representative sample or the calculated average of all samples collected during a 30-day period. The regulations define "existing quality" as the numeric value that represents the quality of a water body, and it is used for comparison with the water-quality standard of the 85th percentile for total ammonia, nitrate, and filtered metals and the median for total recoverable metals (CDPHE, 2013). For this report, the 95th percentile was used for comparison with water-quality standards for filtered trace elements as a more conservative approach and the median for total recoverable metals.

Graphs of individual data values are presented in appendixes 1–4. Graphs of daily sum precipitation (appendix 1), daily mean discharge (appendix 2), and daily mean suspended-sediment discharge (appendix 3) for the periods of record for selected sites were all generated from the USGS NWIS website (https://doi.org/10.5066/F7P55KJN).

Scatter plots of water-quality data in appendix 4 are presented only for those constituents that have regulatory numeric standards at sites where more than two samples were collected. In cases where the concentration of a water-quality constituent was less than the analytical reporting limit, the constituent concentration was considered "censored" and plotted at the level of the analytical reporting limit. A single constituent can have more than one analytical reporting limit as a result of analytical procedures changing through time. Some constituents have table value standards (TVSs) rather than fixed regulatory numeric standards (CDPHE, 2013, 2016). The TVSs vary on the basis of another water-quality property, such as pH and water temperature for ammonia or hardness for trace elements. For this report, TVSs were computed for sites with a mean hardness, median pH, and mean

water temperature for the period of record. Using equations summarized in Colorado Water Quality Control Commission Regulations 31 and 32, the mean hardness was used to compute the TVSs for select trace elements, and median pH and mean water temperature were used to compute the TVS for ammonia. Hardness values used in TVS equations cannot be greater than 400 milligrams per liter (mg/L) (CDPHE, 2013, 2016); consequently, 400 mg/L was used for those sites with a mean hardness concentration greater than 400 mg/L.

Quality Assurance

Quality-control data were collected to assess the precision and accuracy of sample-collection procedures and laboratory analyses (USGS, variously dated). Quality-control samples consisted of 10 equipment blank samples, 6 field blank samples, and 16 replicate samples. Results for the equipment and field blank samples and sequential replicate samples are listed in table 2.

During processing of bacteria samples, equipment blanks were collected to help verify that none of the processing equipment introduced appreciable amounts of bacteria to the samples. All of the bacteria equipment blank concentrations were nondetects, indicating that the equipment did not introduce any contamination to the bacteria samples. Field blanks were collected to ensure that the collection, processing, or transporting procedures in the field did not contaminate the samples. The field blank results indicate that sample-collection and handling procedures did not introduce appreciable contamination to the samples, with a few exceptions. In four of the six field samples collected, filtered chloride concentrations were greater than the detection limit (table 2*A*). All of the detections were minimal with a maximum chloride concentration of 0.054 mg/L. The chloride concentrations in the water-quality samples were at much higher concentrations, so the effect on the sample concentrations from these detections would be minimal.

Sequential replicate samples were collected to measure the variation in results originating from sampling and analytical methods. Of the 16 replicates collected, 11 were bacteria sample replicates (table 2*B*). The relative percent difference was calculated as the absolute difference between the replicate and associated sample concentrations divided by the average of the two values, multiplied by 100. A relative percent difference was not computed for a replicated constituent if the paired results were censored as estimated or less than their associated detection limit. Relative percent differences of 10 percent or less indicate good agreement between paired results if the concentrations are sufficiently large compared to their associated detection limits. Relative percent differences for replicates with small concentrations are often large; differences between small concentrations result in large relative percent differences. Overall, the magnitude of the relative percent differences was within 10 percent for most constituents; the relative percent difference for six paired results were greater than 10 percent. The mean combined relative percent difference of all of the constituent results was 6.27 percent. The quality-control data indicate that the data are reproducible, unbiased, and of sufficient quality.

Hydrologic Data

The following sections summarize the hydrologic data from selected USGS sites on or near AGFC and PCMS for the period of record at each site. All data for precipitation, streamflow, suspended sediment, and water quality can be accessed at the USGS NWIS website (https://doi.org/10.5066/F7P55KJN) using the USGS site numbers provided in table 1. Where applicable, water-quality data at each site are compared to regulatory numeric standards for surface waters of Colorado and the Arkansas River Basin (CDPHE, 2013, 2016).

U.S. Army Garrison Fort Carson

Precipitation

Daily sum precipitation data (table 3; appendix 1) are presented for three sites at AGFC—Young Hollow, Sullivan Park, and Rod and Gun (fig. 1). Collection of precipitation data at each site began in May 1999 and continued through September 2015. Daily precipitation ranged from a minimum of 0 inches (in.) at each site to a maximum of 11.85 in. at Rod and Gun in September 2013, which was a new Colorado record for daily rainfall (Kimbrough and Holmes, 2015). During September 9–16, 2013, as much as 12–20 in. of rain fell in the foothills of the Front Range of the southern Rocky Mountains and adjacent plains near Colorado Springs, Colorado, and extending north to the Colorado-Wyoming border, causing major flooding in the South Platte and Fountain Creek River Basins (Kimbrough and Holmes, 2015). Mean precipitation for the period of record was 0.03 in. at Young Hollow, 0.04 in. at Sullivan Park, and 0.05 in. at Rod and Gun (table 3).

Streamflow

Daily mean discharge data are presented for seven sites at AGFC (table 4; fig. 1). Red Salt, Turkey Fountain, Turkey Teller, and Teller Spillway are operated seasonally from April to October, whereas L Fountain Keaton, Little Fountain, and Rock are operated year round. Discharge data were collected for various periods of record at the sites from May 1978 to September 2015 (table 1). Streamflow at each site generally is intermittent or ephemeral with periods of no flow followed by periods of increased flow (appendix 2). Daily mean discharge (table 4) ranged from 0 cubic feet per second (ft^3/s) at all sites to a maximum of 836 ft^3/s at a seasonally operated site, Turkey Teller (table 4).

Table 2. Results of water analyses for quality-control samples collected for sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado. (*A*) Blank sample results. (*B*) Paired replicate sample results.

[USGS, U.S. Geological Survey; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; CO, Colorado; <, less than; abv, above; mg/L, milligrams per liter; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; --, no data; nr, near]

(A)

USGS site number	Site name	Short name	Sample date and time	Type of sample	*Escherichia coli*, DSTM (MPN/100 mL)
U.S. Army Garrison Fort Carson					
07099215	Turkey Creek near Fountain, CO	Turkey Fountain	5/5/2015 1944	Equipment blank	<1
383325104424801	Sand Creek below Fort Carson near Wigwam, CO	Sand Creek	7/29/2014 2214	Equipment blank	<1
384048104510401	Little Fountain Creek abv Hwy 115 at Fort Carson, CO	Little Fountain 115	7/30/2014 2229	Equipment blank	<1

USGS site number	Site name	Short name	Sample date and time	Type of sample	Ammonia, filtered (mg/L as N)	Nitrate + nitrite, filtered (mg/L as N)	Phosphorus, filtered (mg/L as P)	Chloride, filtered (mg/L)	Sulfate, filtered (mg/L)	Arsenic, filtered (µg/L)	Cadmium, filtered (µg/L)	Chromium, filtered (µg/L)	Copper, filtered (µg/L)	Iron, filtered (µg/L)	Lead, filtered (µg/L)
Piñon Canyon Maneuver Site															
07126200	Van Bremer Arroyo near Model, CO	Van Bremer	3/19/2014 1444	Field blank	<0.01	<0.04	<0.02	0.054	<0.02	<0.1	<0.03	<0.3	<0.8	<4.0	<0.04
07126200			8/20/2014 1444	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126200			11/21/2014 1129	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126200			9/9/2015 1614	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126300	Purgatoire River near Thatcher, CO.	Purgatoire Thatcher	5/20/2013 1214	Field blank	<0.01	<0.04	<0.02	<0.06	<0.09	<0.04	<0.016	<0.07	<0.8	<4.0	<0.025
07126300			5/21/2014 1114	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126300			11/25/2014 1229	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126300			9/9/2015 1259	Field blank	<0.01	<0.04	<0.02	<0.02	<0.02	<0.1	<0.03	<0.3	<0.8	<4.0	<0.04
07126325	Taylor Arroyo bl Rock Crossing, nr Thatcher, CO	Taylor	5/19/2015 1329	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	8/21/2014 1144	Field blank	<0.01	<0.04	<0.02	0.036	<0.02	<0.1	<0.03	<0.3	<0.8	<4.0	<0.04
07126485			3/24/2015 1359	Field blank	<0.01	<0.04	<0.02	0.034	<0.02	<0.1	<0.03	<0.3	<0.8	<4.0	<0.04
07126485			5/28/2015 1229	Equipment blank	--	--	--	--	--	--	--	--	--	--	--
07126485			9/8/2015 1544	Field blank	<0.01	<0.04	<0.02	0.025	<0.02	<0.1	<0.03	<0.3	<0.8	<4.0	<0.04

USGS site number	Short name	Sample date and time	Manganese, filtered (µg/L)	Nickel, filtered (µg/L)	Silver, filtered (µg/L)	Zinc, filtered (µg/L)	Selenium, filtered (µg/L)	*Escherichia coli*, DSTM (MPN/100 mL)
07126200	Van Bremer	3/19/2014 1444	<0.4	<0.2	<0.02	<2.0	<0.05	--
07126200		8/20/2014 1444	--	--	--	--	--	<1
07126200		11/21/2014 1129	--	--	--	--	--	<1
07126200		9/9/2015 1614	--	--	--	--	--	<1
07126300	Purgatoire Thatcher	5/20/2013 1214	<0.15	<0.09	<0.005	<1.4	<0.03	--
07126300		5/21/2014 1114	--	--	--	--	--	<1
07126300		11/25/2014 1229	--	--	--	--	--	<1
07126300		9/9/2015 1259	<0.4	<0.2	<0.02	<2.0	<0.05	--
07126325	Taylor	5/19/2015 1329	--	--	--	--	--	<1
07126485	Purgatoire Rock Crossing	8/21/2014 1144	<0.4	<0.2	<0.02	<2.0	<0.05	--
07126485		3/24/2015 1359	<0.4	<0.2	<0.02	<2.0	<0.05	--
07126485		5/28/2015 1229	--	--	--	--	--	<1
07126485		9/8/2015 1544	<0.4	<0.2	<0.02	<2.0	<0.05	--

Table 2. Results of water analyses for quality-control samples collected for sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado. (*A*) Blank sample results. (*B*) Paired replicate sample results.—Continued

[USGS, U.S. Geological Survey; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; CO, Colorado; <, less than; abv, above; mg/L, milligrams per liter; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; --, no data; nr, near]

(B)

USGS site number	Site name	Short name	Sample date and time	Type of sample	*Escherichia coli*, DSTM (MPN/100 mL)
U.S. Army Garrison Fort Carson					
07099235	Turkey Creek nr Stone City, CO	Turkey Stone	6/1/2015 1345	Sample	9.7
07099235			*6/1/2015 1346*	*Replicate*	*11*
07105940	Little Fountain Creek near Fountain, CO	Little Fountain	5/6/2015 1045	Sample	170
07105940			*5/6/2015 1046*	*Replicate*	*85*
382532104461801	Wildhorse Creek near Stone City at Ft Carson, CO	Wildhorse	5/8/2015 1245	Sample	860
382532104461801			*5/8/2015 1246*	*Replicate*	*660*
383130104424201	Young Hollow below Fort Carson near Wigwam, CO	Young Wigwam	6/16/2015 1145	Sample	1200
383130104424201			*6/16/2015 1146*	*Replicate*	*960*

Piñon Canyon Maneuver Site

USGS site number	Site name	Short name	Sample date and time	Type of sample	Ammonia, filtered (mg/L as N)	Nitrate + nitrite, filtered (mg/L as N)	Phosphorus, filtered (mg/L as P)	Chloride, filtered (mg/L)	Sulfate, filtered (mg/L)	Arsenic, filtered (µg/L)	Cadmium, filtered (µg/L)	Chromium, filtered (µg/L)	Copper, filtered (µg/L)	Iron, filtered (µg/L)	Lead, filtered (µg/L)	Manganese, filtered (µg/L)
07126300	Purgatoire River near Thatcher, CO	Purgatoire Thatcher	8/20/2014 1130	Sample	<0.01	0.12	<0.02	33.90	961.39	0.86	<0.03	<0.3	1.10	<8	<0.04	7.63
07126300			*8/20/2014 1131*	*Replicate*	*<0.01*	*0.11*	*<0.02*	*35.50*	*1,012*	*0.88*	*<0.03*	*<0.3*	*1.12*	*<8*	*<0.04*	*7.50*
07126300	Purgatoire River near Thatcher, CO	Purgatoire Thatcher	11/25/2014 1230	Sample	0.05	0.64	<0.02	57.54	1,468	0.40	<0.06	<0.6	<1.6	14	<0.08	73.0
07126300			*11/25/2014 1231*	*Replicate*	*0.05*	*0.64*	*<0.02*	*56.01*	*1,424*	*0.39*	*<0.06*	*<0.6*	*<1.6*	*14*	*<0.08*	*71.6*
07126300	Purgatoire River near Thatcher, CO	Purgatoire Thatcher	3/23/2015 1415	Sample	0.02	0.67	<0.02	14.58	462.0	1.02	<0.12	<1.2	<3.2	19	<0.16	12.6
07126300			*3/23/2015 1416*	*Replicate*	*0.02*	*0.66*	*<0.02*	*15.05*	*477.0*	*0.60*	*0.04*	*<0.3*	*1.99*	*21*	*<0.04*	*12.4*
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	3/27/2013 1545	Sample	0.02	<0.04	<0.02	52.13	1,721	0.89	<0.032	<0.14	<1.6	25	<0.05	65.4
07126485			*3/27/2013 1546*	*Replicate*	*0.01*	*<0.04*	*<0.02*	*52.08*	*1,714*	*0.88*	*<.048*	*<0.21*	*<2.4*	*25*	*<0.075*	*66.7*
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	5/28/2015 1230	Sample	0.06	0.63	<0.02	33.51	862.6	1.20	0.03	<0.3	1.43	7	<0.04	85.6
07126485			*5/28/2015 1231*	*Replicate*	*0.06*	*0.63*	*<0.02*	*33.35*	*860.6*	*0.92*	*<0.09*	*<0.9*	*<2.4*	*6*	*<0.12*	*81.7*

USGS site number	Short name	Sample date and time	Type of sample	Nickel, filtered (µg/L)	Silver, filtered (µg/L)	Zinc, filtered (µg/L)	Selenium, filtered (µg/L)
07126300	Purgatoire Thatcher	8/20/2014 1130	Sample	3.32	<0.02	<2.0	3.66
07126300		*8/20/2014 1131*	*Replicate*	*3.37*	*<0.02*	*<2.0*	*3.76*
07126300	Purgatoire Thatcher	11/25/2014 1230	Sample	5.44	<0.04	<4.0	2.89
07126300		*11/25/2014 1231*	*Replicate*	*6.05*	*<0.04*	*<4.0*	*3.02*
07126300	Purgatoire Thatcher	3/23/2015 1415	Sample	3.78	<0.08	<8.0	3.31
07126300		*3/23/2015 1416*	*Replicate*	*3.42*	*<0.02*	*<2.0*	*3.10*
07126485	Purgatoire Rock Crossing	3/27/2013 1545	Sample	2.84	<0.01	<2.8	3.66
07126485		*3/27/2013 1546*	*Replicate*	*2.69*	*<0.015*	*<4.2*	*3.16*
07126485	Purgatoire Rock Crossing	5/28/2015 1230	Sample	2.97	<0.02	<2.0	4.39
07126485		*5/28/2015 1231*	*Replicate*	*2.66*	*<0.06*	*<6.0*	*4.44*

Table 2. Results of water analyses for quality-control samples collected for sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado. (*A*) Blank sample results. (*B*) Paired replicate sample results.—Continued

[USGS, U.S. Geological Survey; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; CO, Colorado; <, less than; abv, above; mg/L, milligrams per liter; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; --, no data; nr, near]

USGS site number	Site name	Short name	Sample date and time	Type of sample	*Escherichia coli*, DSTM (MPN/100 mL)
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	5/20/2014 1245	Sample	36
07126485			*5/20/2014 1246*	*Replicate*	*36*
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	8/21/2014 1145	Sample	2
07126485			*8/21/2014 1146*	*Replicate*	*2*
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	11/24/2014 1545	Sample	7.4
07126485			*11/24/2014 1546*	*Replicate*	*8.5*
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	3/24/2015 1400	Sample	10
07126485			*3/24/2015 1401*	*Replicate*	*<10*
07126485	Purgatoire River at Rock Crossing nr Timpas, CO	Purgatoire Rock Crossing	9/8/2015 1545	Sample	<10
07126485			*9/8/2015 1546*	*Replicate*	*10*
07126200	Van Bremer Arroyo near Model, CO	Van Bremer	5/19/2014 1145	Sample	3
07126200			*5/19/2014 1146*	*Replicate*	*1*
07126200	Van Bremer Arroyo near Model, CO	Van Bremer	3/23/2015 1630	Sample	<1
07126200			*3/23/2015 1631*	*Replicate*	*<1*

Table 3. Statistical summary of daily sum precipitation for the period of record for selected sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado.

[USGS, U.S. Geological Survey; in., inches]

USGS site number	Short name	Number of measurements	Maximum (in.)	Minimum (in.)	Mean (in.)
U.S. Army Garrison Fort Carsor					
383109104431301	Young Hollow	5,415	4.53	0.00	0.03
383159104540701	Sullivan Park	5,747	5.44	0.00	0.04
384053104492001	Rod and Gun	5,670	11.85	0.00	0.05
Piñon Canyon Maneuver Site					
07126140	Van Bremer Tyrone	2,404	3.00	0.00	0.05
07126200	Van Bremer	4,758	2.67	0.00	0.05
07126325	Taylor	3,500	3.23	0.00	0.04
07126390	Lockwood	3,479	2.80	0.00	0.05
07126415	Red Rock	3,086	2.41	0.00	0.05
07126480	Bent	3,262	2.69	0.00	0.05
07126485	Purgatoire Rock Crossing	1,118	2.11	0.00	0.05
372319104073301	Brown Sheep	5,755	3.63	0.00	0.03
372721103595601	CIG[1]	11,142	4.59	0.00	0.03
373232103555201	Bear Springs [2]	10,574	2.99	0.00	0.03
373315103493101	Upper Red Rock [3]	10,806	3.44	0.00	0.04
373823103465601	Upper Bent [4]	11,005	3.44	0.00	0.04

[1]Site known as "Taylor precipitation gage" in von Guerard and others (1993).

[2]Site known as "Lochwood precipitation gage" in von Guerard and others (1993).

[3]Site known as "Red Rock precipitation gage" in von Guerard and others (1993).

[4]Site known as "Bent Canyon precipitation gage" in von Guerard and others (1993).

Table 4. Statistical summary of daily mean discharge for the period of record for selected sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado.

[USGS, U.S. Geological Survey; ft^3/s, cubic foot per second]

USGS site number	Short name	Number of measurements	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)
U.S. Army Garrison Fort Carson					
07099085	Red Salt	183	16	0	1.0
07099215	Turkey Fountain	8,187	380	0	1.9
07099230	Turkey Teller	11,984	836	0	2.9
07099238	Teller Spillway	3,154	3.0	0	0.01
07105920	L Fountain Keaton	4,916	550	0	6.2
07105940	Little Fountain	4,146	478	0	6.3
07105945	Rock	13,649	397	0	2.3
Piñon Canyon Maneuver Site					
07126140	Van Bremer Tyrone	6,109	171	0	0.82
07126200	Van Bremer	17,082	802	0	1.5
07126300	Purgatoire Thatcher	1,734	3,920	0	30
07126325	Taylor	9,212	472	0	0.45
07126390	Lockwood	7,149	264	0	0.22
07126415	Red Rock	5,993	181	0	0.54
07126480	Bent	5,460	149	0	0.22
07126485	Purgatoire Rock Crossing	10,147	4,190	0	64

Suspended Sediment

Daily mean suspended-sediment discharge data (table 5; appendix 3) are presented for two sites at AGFC—Red Salt and Little Fountain (fig. 1). Suspended-sediment discharge data were collected at Red Salt from May 2015 to August 2015 and at Little Fountain from September 2013 to September 2015. Suspended-sediment discharge ranged from a minimum of 0 tons per day (ton/d) at both sites to a maximum of 315 ton/d at Red Salt and 39,900 ton/d at Little Fountain. Mean suspended-sediment discharge was 28 ton/d at Red Salt and 237 ton/d at Little Fountain.

Water Quality

Water-quality data are presented for 10 sites at AGFC (table 6; fig. 1). The number of water-quality samples collected from sites at AGFC ranged from 1 at Wildhorse and Young Wigwam to 452 at Little Fountain (table 1). Maximum, minimum, mean, and estimated percentile values for each water-quality property or constituent are presented in table 6 along with applicable numeric standards established by the CDPHE. In appendix 4, individual water-quality results are shown graphically relative to applicable numeric standards represented by a red line. With the exception of total (unfiltered) mercury at B Ditch and Clover Ditch; filtered manganese water-supply standard at B Ditch, Clover Ditch, and Little Fountain; and filtered sulfate at Clover Ditch and Little Fountain, 95th percentile trace element concentrations and median total (unfiltered) metal concentrations were less than regulatory numeric standards for all samples (table 6). The filtered manganese 95th percentile concentration exceeded the water-supply standard of 50 micrograms per liter for the three sites but not the TVS computed for each site (table 6). However, individual water-quality results occasionally exceeded respective regulatory numeric standards (appendix 4).

Piñon Canyon Maneuver Site

Precipitation

Precipitation data (table 3; appendix 1) are presented for 12 sites at PCMS (table 1; fig. 2). Collection of precipitation data at CIG, Bear Springs, Upper Red Rock, and Upper Bent began in 1983 and continued through the end of the reporting period (September 2015). Collection of precipitation data at other sites began between 1993 and 2000 and continued until 2004 or through the end of the reporting period (table 1). Daily precipitation ranged from a minimum of 0 in. at each site to a maximum of 4.59 in. at CIG in July 1998 (table 1; appendix 1). Mean precipitation for the period of record ranged from 0.03 in. at Brown Sheep, CIG, and Bear Springs to 0.05 in. at Van Bremer Tyrone, Van Bremer, Lockwood, Red Rock, Bent, and Purgatoire Rock Crossing (table 3).

Table 5. Statistical summary of daily mean suspended-sediment discharge for the period of record for selected sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado.

[USGS, U.S. Geological Survey; ton/d, ton per day]

USGS site number	Short name	Number of measurements	Maximum (ton/d)	Minimum (ton/d)	Mean (ton/d)
U.S. Army Garrison Fort Carson					
07099085	Red Salt	58	315	0	28
07105940	Little Fountain	447	39,900	0	237
Piñon Canyon Maneuver Site					
07126200	Van Bremer	240	4,910	0	86
07126325	Taylor	373	12,700	0	214
07126390	Lockwood	68	992	0	65
07126415	Red Rock	286	7,620	0	140
07126480	Bent	108	21,100	0	389

Streamflow

Daily mean discharge data at PCMS are presented for eight sites (table 4; fig. 2). Taylor, Lockwood, Red Rock, Bent, and Purgatoire Rock Crossing are operated seasonally from April to October, whereas Van Bremer Tyrone, Van Bremer, and Purgatoire Thatcher are operated year round. Streamflow data were collected for various periods of record at the sites from July 1966 to September 2015 (table 1). With the exception of Purgatoire Thatcher and Purgatoire Rock Crossing, streamflow at each site generally is intermittent or ephemeral with periods of no flow followed by periods of increased flow (appendix 2). Daily mean discharge ranged from 0 ft^3/s at all sites to a maximum of 4,190 ft^3/s at a seasonally operated site, Purgatoire Rock Crossing (table 4).

Suspended Sediment

Daily mean suspended-sediment discharge data (table 5; appendix 3) are presented for five sites at PCMS—Van Bremer, Taylor, Lockwood, Red Rock, and Bent (fig. 2). Suspended-sediment discharge data were collected seasonally from April to October at Taylor for the period April 1983 to July 2015 (table 1). Suspended-sediment discharge data were collected periodically at Van Bremer, Lockwood, Red Rock, and Bent for periods ranging from July 1984 to August 2015. Suspended-sediment discharge ranged from a minimum of 0 ton/d at each site to a maximum of 21,100 ton/d with a mean of 389 ton/d at Bent (table 5).

Water Quality

Water-quality data are presented for 12 sites at PCMS (table 7; fig. 2). The number of water-quality samples collected from sites at PCMS ranged from 1 at Van Bremer Thatcher to 639 at Purgatoire Thatcher (table 1). Maximum, minimum, mean, and estimated percentile values for each water-quality property or constituent are presented in table 7 along with applicable numeric standards established by the CDPHE. Individual water-quality results are shown graphically relative to applicable numeric standards, represented by a red line, in appendix 4. Water-quality results, 95th percentile trace element concentrations, and median total (unfiltered) metal concentrations were less than regulatory numeric standards for most properties and constituents except for filtered chloride at Van Bremer Tyrone; filtered sulfate at Big Arroyo, Van Bremer Tyrone, Van Bremer, Taylor, Lockwood, and Chacuaco; filtered phosphorus at Chacuaco; filtered manganese at Van Bremer Tyrone, Van Bremer, and Lockwood; and total (unfiltered) iron median concentration at Purgatoire Thatcher, Chacuaco, and Purgatoire Rock Crossing. The filtered manganese 95th percentile concentration exceeded the water-supply standard of 50 micrograms per liter for the three sites (Van Bremer Tyrone, Van Bremer, and Lockwood) (table 7). Individual water-quality results also occasionally exceeded respective regulatory numeric standards (appendix 4).

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Nov.–Mar., November to March; Apr.–Oct., April to October; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; SiO_2, silica; N, nitrogen; P, phosphorus; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; µg/L, micrograms per liter; Dec.–Feb., December to February; Mar.–Nov., March to November; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; WS, water-supply standard; AB, above; RE, reservoir; NR, near; TVS, table value standard; CR, creek; ABV, above]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
			USGS 07099215 TURKEY CREEK NEAR FOUNTAIN, CO (Turkey Fountain) APRIL 1979 to JUNE 2015									
00061	Discharge, instantaneous (ft^3/s)	114	188	0.00	7.38	33.8	3.63	0.990	0.250	0.020	--	--
00300	Dissolved oxygen (mg/L)	11	10.0	5.7	8.10	10.00	9.10	8.50	6.80	5.70	--	6.0 7.0 (spawning)
00400	pH, field (standard units)	12	8.4	7.0	--	8.40	8.00	7.80	7.40	7.00	6.5–9.0	--
00095	Specific conductance (µS/cm at 25°C)	113	1,400	94	242.0	379.0	261.0	226.0	189.0	122.0	--	--
00010	Temperature (°C)	114	28.0	0.0	13.30	24.90	17.50	13.30	8.90	2.00	13.0 (Nov.–Mar.) 23.9 (Apr.–Oct.)	9.0 (Nov.–Mar.) 18.3 (Apr.–Oct.)
70300	Dissolved solids, dried at 180 °C (mg/L)	3	111	88	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	12	110	37.8	75.80	110.00	94.30	76.00	57.70	37.80	--	--
00915	Calcium, filtered (mg/L)	12	28.0	10.0	19.50	28.00	24.00	19.00	14.70	10.00	--	--
00925	Magnesium, filtered (mg/L) Potassium,	12	10.0	3.10	6.600	10.000	8.280	6.600	5.080	3.100	--	--
00935	filtered (mg/L)	12	5.52	1.50	2.160	5.520	2.190	1.800	1.600	1.500	--	--
00930	Sodium, filtered (mg/L)	12	15.0	5.23	9.950	15.00	12.00	9.900	7.690	5.230	--	--
00410	ANC, unfiltered, field (mg/L as $CaCO_3$)	5	99	51	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	12	3.9	1.3	2.70	3.90	3.40	2.60	2.20	1.30	--	--
00950	Fluoride, filtered (mg/L)	11	0.70	0.36	0.530	0.700	0.600	0.500	0.440	0.360	--	--
00955	Silica, filtered (mg/L as SiO_2)	12	21.0	9.38	16.00	21.00	18.90	16.50	13.30	9.400	--	--
00945	Sulfate, filtered (mg/L)	12	37.0	--	*18.93	*37.00	*30.75	*15.85	*8.89	*5.22	--	--
00608	Ammonia, filtered (mg/L as N)	3	0.10	0.01	--	--	--	--	--	--	--	--
00610	Ammonia, unfiltered (mg/L as N)	3	0.17	0.02	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	12	3.06	0.110	0.736	3.060	1.300	0.310	0.142	0.110	--	--
00671	Orthophosphate, filtered (mg/L as P)	4	0.139	0.040	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	12	0.15	0.010	0.043	0.150	0.050	0.040	0.012	0.010	--	0.11
50468	*Escherichia coli*, DSTM (MPN/100 mL)	3	3,100	62	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L) Barium,	3	282	190	--	--	--	--	--	--	--	--
01005	filtered (µg/L)	3	52.7	19.2	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	3	0.033	0.032	--	--	--	--	--	--	--	--
01012	Beryllium, unfiltered, recoverable (µg/L)	2	--	--	--	--	--	--	--	--	--	100
01025	Cadmium, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01027	Cadmium, unfiltered (µg/L)	2	--	--	--	--	--	--	--	--	--	10

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
01030	Chromium, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	3	0.434	0.240	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	3	5.3	2.4	--	--	--	--	--	--	--	--
01042	Copper, unfiltered, recoverable (µg/L)	2	0	--	--	--	--	--	--	--	--	200
01046	Iron, filtered (µg/L)	12	570	--	*114.7	*570.0	*220.8	*25.0	*9.08	*1.45	--	--
01049	Lead, filtered (µg/L)	3	0.189	0.157	--	--	--	--	--	--	--	--
01051	Lead, unfiltered, recoverable (µg/L)	2	--	--	--	--	--	--	--	--	--	100
01056	Manganese, filtered (µg/L)	12	--	--	--	--	--	--	--	--	--	--
01060	Molybdenum, filtered (µg/L)	3	14.8	2.47	--	--	--	--	--	--	--	--
01062	Molybdenum, unfiltered, recoverable (µg/L)	2	4	2	--	--	--	--	--	--	--	160
01065	Nickel, filtered (µg/L)	3	0.95	0.54	--	--	--	--	--	--	--	--
01067	Nickel, unfiltered, recoverable (µg/L)	2	0	--	--	--	--	--	--	--	--	200
01075	Silver, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01090	Zinc, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01092	Zinc, unfiltered, recoverable (µg/L)	2	20	10	--	--	--	--	--	--	--	2,000
01095	Antimony, filtered (µg/L)	3	0.140	0.092	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	3	0.76	0.37	--	--	--	--	--	--	--	--
01002	Arsenic, unfiltered (µg/L)	2	--	--	--	--	--	--	--	--	--	100
01145	Selenium, filtered (µg/L)	3	1.2	0.58	--	--	--	--	--	--	--	--
01147	Selenium, unfiltered (µg/L)	2	--	--	--	--	--	--	--	--	--	20
22703	Uranium, filtered (µg/L)	3	20.4	2.25	--	--	--	--	--	--	--	--
	USGS 07099235 TURKEY CREEK NEAR STONE CITY, CO (Turkey Stone) March 1979 to June 2015											
00061	Discharge, instantaneous (ft^3/s)	151	62	0.01	2.01	11.0	0.580	0.160	0.040	0.020	--	--
00300	Dissolved oxygen (mg/L)	2	10.0	7.9	--	--	--	--	--	--	--	6.0 7.0 (spawning)
00400	pH, field (standard units)	2	8.1	7.9	--	--	--	--	--	--	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	150	2,860	339	1,136	1,894	1,350	1,170	792.0	438.0	--	--
00010	Temperature (°C)	151	28.0	0.0	12.60	23.00	17.50	12.50	7.50	2.00	13.0 (Nov.–Mar.) 23.9 (Apr.–Oct.)	9.0 (Nov.–Mar.) 18.3 (Apr.–Oct.)
70300	Dissolved solids, dried at 180 °C (mg/L)	2	1,190	232	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	2	784	166	--	--	--	--	--	--	--	--
00915	Calcium, filtered (mg/L)	2	219	47.9	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	2	57.7	11.2	--	--	--	--	--	--	--	--

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00935	Potassium, filtered (mg/L)	2	8.00	3.62	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	2	53.6	12.3	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	2	17.4	6.4	--	--	--	--	--	--	--	--
00950	Fluoride, filtered (mg/L)	2	0.82	0.48	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L as SiO_2)	2	16.6	10.4	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	2	565	63.2	--	--	--	--	--	--	--	--
00608	Ammonia, filtered (mg/L as N)	2	0.07	0.01	--	--	--	--	--	--	--	--
00610	Ammonia, unfiltered (mg/L as N)	2	0.10	0.03	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	2	2.27	0.146	--	--	--	--	--	--	--	--
00671	Orthophosphate, filtered (mg/L as P)	2	0.020	0.008	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	2	--	--	--	--	--	--	--	--	--	0.11
00665	Phosphorus, unfiltered (mg/L as P)	2	0.078	0.029	--	--	--	--	--	--	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	2	10	1	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	2	70.5	49.4	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01030	Chromium, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	2	0.437	0.233	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01046	Iron, filtered (µg/L)	2	56	11.8	--	--	--	--	--	--	--	--
01049	Lead, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01056	Manganese, filtered (µg/L)	2	330	32	--	--	--	--	--	--	--	--
01060	Molybdenum, filtered (µg/L)	2	14.2	3.99	--	--	--	--	--	--	--	--
01065	Nickel, filtered (µg/L)	2	2.3	0.96	--	--	--	--	--	--	--	--
01075	Silver, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01090	Zinc, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01095	Antimony, filtered (µg/L)	2	0.171	0.128	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	2	0.81	0.81	--	--	--	--	--	--	--	--
01145	Selenium, filtered (µg/L)	2	11.3	1.5	--	--	--	--	--	--	--	--
22703	Uranium, filtered (µg/L)	2	32.0	7.08	--	--	--	--	--	--	--	--
	USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO (B Ditch) April 1981 to October 1988											
00061	Discharge, instantaneous (ft^3/s)	120	43	0.04	0.700	1.08	0.360	0.210	0.150	0.070	--	--

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00300	Dissolved oxygen (mg/L)	84	15.8	4.0	10.80	15.00	12.90	11.00	9.10	6.40	--	5.0
00400	pH, field (standard units)	83	8.6	7.3	--	8.30	8.20	8.10	8.00	7.50	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	115	8,250	1,620	5,190	7,696	6,440	5,050	4,000	2,700	--	--
00010	Temperature (°C)	120	32.0	0.0	13.60	27.00	22.00	13.30	4.00	0.00	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
00515	Dissolved solids, dried at 105 °C (mg/L)	25	7,170	1,300	4,226	7,014	4,700	4,080	3,340	1,777	--	--
00900	Hardness (mg/L as $CaCO_3$)	8	2,200	460	1,350	2,200	1,800	1,290	1,020	460.0	--	--
00915	Calcium, filtered (mg/L)	8	330	120	220.0	330.0	278.0	215.0	163.0	120.0	--	--
00925	Magnesium, filtered (mg/L)	8	340	39.0	197.0	340.0	273.0	190.0	148.0	39.00	--	--
00935	Potassium, filtered (mg/L)	4	9.20	5.80	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	4	800	560	--	--	--	--	--	--	--	--
90410	ANC, unfiltered, field (mg/L as $CaCO_3$)	10	490	240	361.0	490.0	430.0	345.0	292.0	240.0	--	--
00940	Chloride, filtered (mg/L)	17	190	50.0	90.60	190.0	115.0	82.00	63.00	50.00	--	250
00950	Fluoride, filtered (mg/L)	4	1.30	1.10	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L as SiO_2)	4	12.0	5.10	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	4	2,500	1,700	--	--	--	--	--	--	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	4	0.21	0.10	--	--	--	--	--	--	6.9[2]	2.0 (Apr. 1–Aug. 31) 7.5 (Sep. 1–Mar. 31)[2]
00610	Ammonia, unfiltered (mg/L as N)	84	4.2	0.04	0.200	0.520	0.170	0.110	0.070	0.040	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	4	25.0	4.10	--	--	--	--	--	--	--	--
00618	Nitrate, filtered (mg/L as N)	4	25.0	2.40	--	--	--	--	--	--	10	--
00613	Nitrite, filtered (mg/L as N)	4	1.70	0.030	--	--	--	--	--	--	--	0.5
00671	Orthophosphate, filtered (mg/L as P)	1	0.020	--	--	--	--	--	--	--	--	--
00665	Phosphorus, unfiltered (mg/L as P)	4	0.060	0.040	--	--	--	--	--	--	--	--
00600	Total nitrogen, unfiltered (mg/L)	85	61	1.70	22.9	50.7	31.0	19.0	12.5	7.35	--	--
01032	Chromium(VI), filtered (µg/L)	6	--	--	--	--	--	--	--	--	16	11
01030	Chromium, filtered (µg/L)	6	10	0.0	8.33	10.0	10.0	10.0	7.50	0.00	--	50 (WS)
01046	Iron, filtered (µg/L)	8	90	20.0	45.0	90.0	75.0	30.0	22.5	20.0	--	300 (WS)
01045	Iron, unfiltered, recoverable (µg/L)	6	1,200	200	500	1,200	773	365	230	200	--	1,000
01056	Manganese, filtered (µg/L)	8	370	20	154.0	370.0	220.0	140.0	55.00	20.00	4,740[2]	2,620[2] or 50 (WS)
71900	Mercury, unfiltered, recoverable (µg/L)	6	0.3	--	*0.16	*0.30	*0.23	*0.15	*0.09	*0.05	--	0.01
	USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO (Clover Ditch) April 1981 to January 1990											
00061	Discharge, instantaneous (ft^3/s)	130	56	1.0	5.40	8.17	5.18	4.30	3.50	2.41	--	--

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00300	Dissolved oxygen (mg/L)	119	12.2	4.7	8.30	11.00	9.80	8.60	6.70	5.20	--	5.0
00400	pH, field (standard units)	117	8.7	7.0	--	8.40	8.10	8.00	7.80	7.30	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	153	1,780	650	1,400	1,653	1,505	1,420	1,305	1,085	--	--
00010	Temperature (°C)	157	28.5	1.5	15.20	25.10	21.00	14.50	9.50	5.00	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
00515	Dissolved solids, dried at 105 °C (mg/L)	19	1,190	818	992.0	1,190	1,110	1,000	867.0	818.0	--	--
00900	Hardness (mg/L as $CaCO_3$)	11	430	290	369.0	430.0	419.0	388.0	310.0	290.0	--	--
00915	Calcium, filtered (mg/L)	11	100	69.0	85.90	100.0	100.0	86.00	73.00	69.00	--	--
00925	Magnesium, filtered (mg/L)	11	44.0	29.0	37.50	44.00	42.00	41.00	32.00	29.00	--	--
00935	Potassium, filtered (mg/L)	7	8.00	6.70	7.640	8.400	8.200	7.700	7.200	6.700	--	--
00930	Sodium, filtered (mg/L)	7	190	140	163.0	190.0	170.0	160.0	150.0	140.0	--	--
90410	ANC, unfiltered, field (mg/L as $CaCO_3$)	19	241	120	189.0	241.0	210.0	183.0	160.0	120.0	--	--
00940	Chloride, filtered (mg/L)	12	63.0	35.0	47.60	63.00	57.80	45.00	39.50	35.00	--	250
00950	Fluoride, filtered (mg/L)	7	1.90	0.80	1.300	1.900	1.700	1.300	1.000	0.800	--	--
00955	Silica, filtered (mg/L as SiO_2)	7	16.0	10.0	13.10	16.00	16.00	12.00	11.00	10.00	--	--
00945	Sulfate, filtered (mg/L)	7	520	360	463.0	520.0	520.0	490.0	370.0	360.0	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	3	16	1.20	--	--	--	--	--	--	8.4[2]	2.3 (Apr. 1–Aug. 31) 6.8 (Sep. 1–Mar. 31)[2]
00610	Ammonia, unfiltered (mg/L as N)	119	21	0.06	7.06	14.0	10.0	6.70	3.60	1.40	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	4	3.80	2.00	--	--	--	--	--	--	--	--
00618	Nitrate, filtered (mg/L as N)	4	2.70	1.60	--	--	--	--	--	--	10	--
00613	Nitrite, filtered (mg/L as N)	3	--	--	--	--	--	--	--	--	--	0.5
00665	Phosphorus, unfiltered (mg/L as P)	4	7.50	4.80	--	--	--	--	--	--	--	--
00600	Total nitrogen, unfiltered (mg/L)	117	28	3.70	15.4	23.1	19.0	15.0	12.0	7.67	--	--
01025	Cadmium, filtered (µg/L)	6	--	--	--	--	--	--	--	--	8.5[2]	1.1[2]
01032	Chromium (VI), filtered (µg/L)	15	--	--	--	--	--	--	--	--	16	11
01030	Chromium, filtered (µg/L)	21	20	--	*3.10	*19.0	*3.64	*1.54	*0.524	*0.185	--	--
01040	Copper, filtered (µg/L)	6	6.0	--	*4.59	*6.00	*6.00	*4.50	*3.39	*3.00	46[2]	27[2]
01046	Iron, filtered (µg/L)	16	220	20.0	55.1	220.0	60.0	50.0	30.0	20.0	--	300 (WS)
01045	Iron, unfiltered, recoverable (µg/L)	21	14,000	180	2,190	13,600	1,650	510	335	185	--	1,000
01049	Lead, filtered (µg/L)	6	--	--	--	--	--	--	--	--	260[2]	10[2]
01056	Manganese, filtered (µg/L)	11	140	50	87.30	140.0	110.0	90.00	60.00	50.00	4,610[2]	2,550[2] or 50 (WS)
71900	Mercury, unfiltered, recoverable (µg/L)	15	0.3	--	*0.14	*0.30	*0.20	*0.10	*0.10	*0.05	--	0.01
01065	Nickel, filtered (µg/L)	6	6.0	2.0	3.50	6.00	4.50	3.00	2.80	2.00	1,410[2]	160[2]
01090	Zinc, filtered (µg/L)	6	32	8.0	25.3	32.0	31.3	28.5	20.0	8.00	520[2]	400[2]

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Nov.–Mar., November to March; Apr.–Oct., April to October; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; SiO_2, silica; N, nitrogen; P, phosphorus; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; µg/L, micrograms per liter; Dec.–Feb., December to February; Mar.–Nov., March to November; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; WS, water-supply standard; AB, above; RE, reservoir; NR, near; TVS, table value standard; CR, creek; ABV, above]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
	USGS 07105920 L FOUNTAIN C AB KEATON RE, NR FORT CARSON, CO (L Fountain Keaton) April 1978 to October 1998											
00061	Discharge, instantaneous (ft^3/s)	105	124	0.24	9.33	50.2	8.75	1.90	1.10	0.590	--	--
00300	Dissolved oxygen (mg/L)	10	11.2	7.2	8.70	11.20	9.70	8.50	7.60	7.20	--	5.0
00400	pH, field (standard units)	14	8.0	6.5	--	8.00	7.70	7.20	7.00	6.50	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	107	750	63	114.0	172.0	125.0	108.0	88.0	66.0	--	--
00010	Temperature (°C)	107	20.5	0.0	8.30	17.60	13.50	8.00	3.00	0.50	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
00900	Hardness (mg/L as $CaCO_3$)	13	53.00	25.00	34.50	53.00	37.50	33.00	32.00	25.00	--	--
00915	Calcium, filtered (mg/L)	13	15.0	8.00	10.20	15.00	11.00	9.800	9.250	8.000	--	--
00925	Magnesium, filtered (mg/L)	13	3.80	0.90	2.162	3.800	2.400	2.000	1.900	0.900	--	--
00935	Potassium, filtered (mg/L)	13	2.00	1.00	1.420	2.000	1.600	1.400	1.200	1.000	--	--
00930	Sodium, filtered (mg/L)	13	6.70	3.80	4.950	6.700	5.850	4.700	4.000	3.800	--	--
00410	ANC, unfiltered, field (mg/L as $CaCO_3$)	9	43	14	25.0	43.0	30.0	27.0	18.0	14.0	--	--
90410	ANC, unfiltered, field (mg/L as $CaCO_3$)	4	32	27	--	--	--	--	--	--	--	
00940	Chloride, filtered (mg/L)	13	4.2	0.5	1.40	4.20	1.40	1.20	0.95	0.50	--	250
00950	Fluoride, filtered (mg/L)	13	3.20	2.60	2.900	3.200	3.000	2.900	2.700	2.600	--	--
00955	Silica, filtered (mg/L as SiO_2)	13	15.0	10.0	12.60	15.00	13.50	13.00	12.00	10.00	--	--
00945	Sulfate, filtered (mg/L)	13	16.0	--	*11.56	*16.00	*15.00	*11.00	*9.35	*6.92	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	1	--	--	--	--	--	--	--	--	29.5 [2]	5.4 (Apr. 1–Aug. 31) 10.6 (Sep. 1–Mar. 31) [2]
00631	Nitrate + nitrite, filtered (mg/L as N)	13	0.150	--	*0.050	*0.150	*0.062	*0.040	*0.024	*0.010	--	--
00618	Nitrate, filtered (mg/L as N)	1	--	--	--	--	--	--	--	--	10	--
00613	Nitrite, filtered (mg/L as N)	1	--	--	--	--	--	--	--	--	--	0.5
00671	Orthophosphate, filtered (mg/L as P)	3	--	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	13	0.060	--	*0.012	*0.060	*0.010	*0.010	*0.002	*0.001	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	1	--	--	--	--	--	--	--	--	--	--
00600	Total nitrogen, unfiltered (mg/L)	1.0	0.24	--	--	--	--	--	--	--	--	--
01106	Aluminum, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	1	300	--	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01046	Iron, filtered (µg/L)	13	70	--	*31.9	*70.0	*45.0	*30.0	*16.0	*9.66	--	300 (WS)
01045	Iron, unfiltered, recoverable (µg/L)	4	2,000	60	--	--	--	--	--	--	--	1,000
01056	Manganese, filtered (µg/L)	13	--	--	--	--	--	--	--	--	2,090 [2]	1,160 [2] or 50 (WS)

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Nov.–Mar., November to March; Apr.–Oct., April to October; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; SiO_2, silica; N, nitrogen; P, phosphorus; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; µg/L, micrograms per liter; Dec.–Feb., December to February; Mar.–Nov., March to November; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; WS, water-supply standard; AB, above; RE, reservoir; NR, near; TVS, table value standard; CR, creek; ABV, above]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
71900	Mercury, unfiltered, recoverable (µg/L)	4	--	--	--	--	--	--	--	--	--	0.01
01060	Molybdenum, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01062	Molybdenum, unfiltered, recoverable (µg/L)	4	42	2	--	--	--	--	--	--	--	160
01065	Nickel, filtered (µg/L)	1	0.0	--	--	--	--	--	--	--	190[2]	21[2]
01000	Arsenic, filtered (µg/L)	1	2.0	--	--	--	--	--	--	--	340	--
01002	Arsenic, unfiltered (µg/L)	4	--	--	--	--	--	--	--	--	--	0.02–10
01020	Boron, filtered (µg/L)	1	0.0	--	--	--	--	--	--	--	--	0.75
01145	Selenium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	18.4	4.6
	USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO (Little Fountain) April 1979 to June 2016											
00061	Discharge, instantaneous (ft^3/s)	89	278	0.13	25.4	185.0	15.0	1.70	0.390	0.220	--	--
00300	Dissolved oxygen (mg/L)	8	9.7	6.6	8.50	9.70	9.50	8.80	7.70	6.60	--	5.0
00400	pH, field (standard units)	9	8.2	7.5	--	8.20	8.20	8.10	7.80	7.50	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	63	3,750	200	1,664	3,200	2,600	1,750	590	264	--	--
00010	Temperature (°C)	62	28.0	0.5	13.40	23.50	18.50	13.00	9.00	0.60	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	3	2,390	161	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	10	1,150	97.4	483.0	1,150	818.0	370.0	125.0	97.40	--	--
00915	Calcium, filtered (mg/L)	10	272	30.5	125.0	272.0	210.0	94.00	35.50	30.50	--	--
00925	Magnesium, filtered (mg/L)	10	115	5.16	41.00	115.0	64.50	32.50	8.130	5.160	--	--
00935	Potassium, filtered (mg/L)	10	9.20	1.70	3.770	9.200	4.840	3.460	1.990	1.700	--	--
00930	Sodium, filtered (mg/L)	10	302	8.42	91.20	302.0	143.0	64.50	17.50	8.420	--	--
00410	ANC, unfiltered, field (mg/L as $CaCO_3$)	7	190	49	94.0	190.0	120.0	80.0	53.0	49.0	--	--
00940	Chloride, filtered (mg/L)	10	25.0	2.3	10.00	25.20	15.80	8.00	3.10	2.30	--	250
00950	Fluoride, filtered (mg/L)	10	3.00	1.00	2.300	3.000	2.800	2.400	2.000	1.000	--	--
00955	Silica, filtered (mg/L as SiO_2)	10	13.0	4.40	10.60	13.00	12.40	11.80	9.300	4.400	--	--
00945	Sulfate, filtered (mg/L)	10	1,330	56.0	499.0	1,330	888.0	375.0	92.00	56.00	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	5	--	--	--	--	--	--	--	--	6.9[2]	2.0 (Apr. 1–Aug. 31) 7.6 (Sep. 1–Mar. 31)[2]
00610	Ammonia, unfiltered (mg/L as N)	5	0.06	0.02	--	--	--	--	--	--	--	
00631	Nitrate + nitrite, filtered (mg/L as N)	10	1.80	0.070	0.522	1.800	0.740	0.235	0.142	0.070	--	--
00671	Orthophosphate, filtered (mg/L as P)	4	--	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	10	0.020	--	*0.012	*0.020	*0.014	*0.010	*0.009	*0.006	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	5	3.47	0.009	--	--	--	--	--	--	--	--

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00600	Total nitrogen, unfiltered (mg/L)	2.0	3.8	0.750	--	--	--	--	--	--	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	3	370	29	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	3	106	18.5	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	3	0.133	0.062	--	--	--	--	--	--	9.2[2]	1.2[2]
01030	Chromium, filtered (µg/L)	3	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	3	2.73	0.368	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	3	--	--	--	--	--	--	--	--	50[2]	29[2]
01046	Iron, filtered (µg/L)	10	101	--	*47.3	*101.0	*67.5	*35.2	*23.7	*16.9	--	300 (WS)
01045	Iron, unfiltered, recoverable (µg/L)	2	97,000	2,000	--	--	--	--	--	--	--	1,000
01049	Lead, filtered (µg/L)	3	--	--	--	--	--	--	--	--	280[2]	11[2]
01056	Manganese, filtered (µg/L)	10	777	--	*133.5	*777.0	*125.0	*40.00	*16.10	*2.49	4,740[2]	2,620[2] or 50 (WS)
71900	Mercury, unfiltered, recoverable (µg/L)	2	0	0.2	--	--	--	--	--	--	--	0.01
01060	Molybdenum, filtered (µg/L)	3	23.8	3.4	--	--	--	--	--	--	--	--
01062	Molybdenum, unfiltered, recoverable (µg/L)	2	22	4	--	--	--	--	--	--	--	160
01065	Nickel, filtered (µg/L)	3	12.7	1.3	--	--	--	--	--	--	1,510[2]	170[2]
01075	Silver, filtered (µg/L)	3	--	--	--	--	--	--	--	--	22[2]	3.5[2]
01090	Zinc, filtered (µg/L)	3	--	--	--	--	--	--	--	--	560[2]	430[2]
01095	Antimony, filtered (µg/L)	3	0.477	0.247	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	3	1.1	0.63	--	--	--	--	--	--	340	--
01002	Arsenic, unfiltered (µg/L)	2	2	1	--	--	--	--	--	--	--	10
01145	Selenium, filtered (µg/L)	3	38.6	2.8	--	--	--	--	--	--	18.4	4.6
22703	Uranium, filtered (µg/L)	3	32.4	2.40	--	--	--	--	--	--	--	--
	USGS 382532104461801 WILDHORSE CREEK NEAR STONE CITY AT FT CARSON, CO (Wildhorse) May 2015 to May 2015											
00061	Discharge, instantaneous (ft^3/s)	1	0.02	--	--	--	--	--	--	--	--	--
00300	Dissolved oxygen (mg/L)	1	8.4	--	--	--	--	--	--	--	--	5.0
00400	pH, field (standard units)	1	7.9	--	--	--	--	--	--	--	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	1	259	--	--	--	--	--	--	--	--	--
00010	Temperature (°C)	1	13.5	--	--	--	--	--	--	--	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	1	898	--	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	1	153	--	--	--	--	--	--	--	--	--

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00915	Calcium, filtered (mg/L)	1	48.4	--	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	1	7.90	--	--	--	--	--	--	--	--	--
00935	Potassium, filtered (mg/L)	1	13.9	--	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	1	2.27	--	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	1	27.8	--	--	--	--	--	--	--	--	--
00950	Fluoride, filtered (mg/L)	1	0.21	--	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L as SiO_2)	1	17.4	--	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	1	18.0	--	--	--	--	--	--	--	--	--
00608	Ammonia, filtered (mg/L as N)	1	--	--	--	--	--	--	--	--	TVS	TVS
00610	Ammonia, unfiltered (mg/L as N)	1	0.11	--	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	1	0.903	--	--	--	--	--	--	--	--	--
00671	Orthophosphate, filtered (mg/L as P)	1	0.155	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	1	0.48	--	--	--	--	--	--	--	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	1	3.00	--	--	--	--	--	--	--	--	
50468	*Escherichia coli*, DSTM (MPN/100 mL)	1	860	--	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L)	1	765	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	1	105	--	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	1	0.102	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	1	0.308	--	--	--	--	--	--	--	TVS	TVS
01030	Chromium, filtered (µg/L)	1	0.54	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	1	1.52	--	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	1	3.6	--	--	--	--	--	--	--	TVS	TVS
01046	Iron, filtered (µg/L)	1	1,350	--	--	--	--	--	--	--	--	--
01049	Lead, filtered (µg/L)	1	3.01	--	--	--	--	--	--	--	TVS	TVS
01056	Manganese, filtered (µg/L)	1	59.1	--	--	--	--	--	--	--	TVS	TVS
01060	Molybdenum, filtered (µg/L)	1	1.28	--	--	--	--	--	--	--	--	--
01065	Nickel, filtered (µg/L)	1	2.4	--	--	--	--	--	--	--	TVS	TVS
01075	Silver, filtered (µg/L)	1	--	--	--	--	--	--	--	--	TVS	TVS
01090	Zinc, filtered (µg/L)	1	5.9	--	--	--	--	--	--	--	--	--
01095	Antimony, filtered (µg/L)	1	0.264	--	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	1	2.2	--	--	--	--	--	--	--	340	--
01145	Selenium, filtered (µg/L)	1	1.4	--	--	--	--	--	--	--	2,376	2,110
22703	Uranium, filtered (µg/L)	1	0.706	--	--	--	--	--	--	--	--	--

USGS 383130104424201 YOUNG HOLLOW BELOW FORT CARSON NEAR WIGWAM, CO

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Nov.–Mar., November to March; Apr.–Oct., April to October; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; SiO_2, silica; N, nitrogen; P, phosphorus; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; µg/L, micrograms per liter; Dec.–Feb., December to February; Mar.–Nov., March to November; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; WS, water-supply standard; AB, above; RE, reservoir; NR, near; TVS, table value standard; CR, creek; ABV, above]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
					(Young Wigwam) June 2015 to June 2015							
00061	Discharge, instantaneous (ft^3/s)	1	0.73	--	--	--	--	--	--	--	--	--
00300	Dissolved oxygen (mg/L)	1	7.1	--	--	--	--	--	--	--	--	5.0
00400	pH, field (standard units)	1	8.1	--	--	--	--	--	--	--	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	1	2,530	--	--	--	--	--	--	--	--	--
00010	Temperature (°C)	1	21.9	--	--	--	--	--	--	--	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	1	2,210	--	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	1	1,210	--	--	--	--	--	--	--	--	--
00915	Calcium, filtered (mg/L)	1	289.0	--	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	1	120	--	--	--	--	--	--	--	--	--
00935	Potassium, filtered (mg/L)	1	18.0	--	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	1	265	--	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	1	19.6	--	--	--	--	--	--	--	--	250
00950	Fluoride, filtered (mg/L)	1	0.40	--	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L as SiO_2)	1	12.7	--	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	1	1,220	--	--	--	--	--	--	--	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	1	0.01	--	--	--	--	--	--	--	TVS	TVS
00610	Ammonia, unfiltered (mg/L as N)	1	0.04	--	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	1	0.416	--	--	--	--	--	--	--	--	--
00671	Orthophosphate, filtered (mg/L as P)	1	0.054	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	1	0.06	--	--	--	--	--	--	--	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	1	0.228	--	--	--	--	--	--	--	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	1	1,200	--	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	1	81.1	--	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	1	0.176	--	--	--	--	--	--	--	TVS	TVS
01030	Chromium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	1	0.860	--	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	1	5.6	--	--	--	--	--	--	--	TVS	TVS
01046	Iron, filtered (µg/L)	1	10	--	--	--	--	--	--	--	--	300 (WS)
01049	Lead, filtered (µg/L)	1	--	--	--	--	--	--	--	--	TVS	TVS

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Nov.–Mar., November to March; Apr.–Oct., April to October; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; SiO_2, silica; N, nitrogen; P, phosphorus; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; µg/L, micrograms per liter; Dec.–Feb., December to February; Mar.–Nov., March to November; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; WS, water-supply standard; AB, above; RE, reservoir; NR, near; TVS, table value standard; CR, creek; ABV, above]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
01056	Manganese, filtered (µg/L)	1	19.8	--	--	--	--	--	--	--	TVS	TVS or 50 (WS)
01060	Molybdenum, filtered (µg/L)	1	12.4	--	--	--	--	--	--	--	--	--
01065	Nickel, filtered (µg/L)	1	6.7	--	--	--	--	--	--	--	TVS	TVS
01075	Silver, filtered (µg/L)	1	--	--	--	--	--	--	--	--	TVS	TVS
01090	Zinc, filtered (µg/L)	1	--	--	--	--	--	--	--	--	TVS	TVS
01095	Antimony, filtered (µg/L)	1	0.467	--	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	1	2.0	--	--	--	--	--	--	--	340	--
01145	Selenium, filtered (µg/L)	1	21.4	--	--	--	--	--	--	--	18.4	4.6
22703	Uranium, filtered (µg/L)	1	9.81	--	--	--	--	--	--	--	--	--
	USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO (Sand Creek) August 2013 to June 2015											
00061	Discharge, instantaneous (ft^3/s)	4	360	0.25	--	--	--	--	--	--	--	--
00300	Dissolved oxygen (mg/L)	4	8.0	5.2	--	--	--	--	--	--	--	5.0
00400	pH, field (standard units)	4	8.2	8.0	--	--	--	--	--	--	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	4	2,420	415	--	--	--	--	--	--	--	--
00010	Temperature (°C)	4	24.4	10.6	--	--	--	--	--	--	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	4	1,980	301	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	4	916	143	--	--	--	--	--	--	--	--
00915	Calcium, filtered (mg/L)	4	234	42.5	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	4	80.7	8.90	--	--	--	--	--	--	--	--
00935	Potassium, filtered (mg/L)	4	16.0	7.15	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	4	250	34.4	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	4	65.9	10.9	--	--	--	--	--	--	--	250
00950	Fluoride, filtered (mg/L)	4	0.30	0.09	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L as SiO_2)	4	12.9	4.20	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	4	1,030	149	--	--	--	--	--	--	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	4	0.13	0.02	--	--	--	--	--	--	5.7[2]	0.9 (Apr. 1–Aug. 31) 3.8 (Sep. 1–Mar. 31)[2]
00610	Ammonia, unfiltered (mg/L as N)	4	0.45	0.03	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	4	1.68	0.259	--	--	--	--	--	--	--	--
00671	Orthophosphate, filtered (mg/L as P)	4	0.063	0.013	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	4	--	--	--	--	--	--	--	--	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	4	14.6	0.058	--	--	--	--	--	--	--	--

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Nov.–Mar., November to March; Apr.–Oct., April to October; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; SiO_2, silica; N, nitrogen; P, phosphorus; DSTM, defined substrate test method; MPN, most probable number; mL, milliliter; µg/L, micrograms per liter; Dec.–Feb., December to February; Mar.–Nov., March to November; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; WS, water-supply standard; AB, above; RE, reservoir; NR, near; TVS, table value standard; CR, creek; ABV, above]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
50468	*Escherichia coli*, DSTM (MPN/100 mL)	4	1,600	150	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L)	4	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	4	257	70.7	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	4	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	4	0.179	0.061	--	--	--	--	--	--	9.2[2]	1.2[2]
01030	Chromium, filtered (µg/L)	4	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	4	1.49	0.389	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	4	3.9	1.5	--	--	--	--	--	--	50[2]	29[2]
01046	Iron, filtered (µg/L)	4	228	11.5	--	--	--	--	--	--	--	300 (WS)
01049	Lead, filtered (µg/L)	4	--	--	--	--	--	--	--	--	280[2]	11[2]
01056	Manganese, filtered (µg/L)	4	120	2.61	--	--	--	--	--	--	4,740[2]	2,620[2] or 50 (WS)
01060	Molybdenum, filtered (µg/L)	4	18.7	2.84	--	--	--	--	--	--	--	--
01065	Nickel, filtered (µg/L)	4	6.0	0.90	--	--	--	--	--	--	1,510[2]	170[2]
01075	Silver, filtered (µg/L)	4	--	--	--	--	--	--	--	--	22[2]	3.5[2]
01090	Zinc, filtered (µg/L)	4	--	--	--	--	--	--	--	--	560[2]	430[2]
01095	Antimony, filtered (µg/L)	4	0.728	0.326	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	4	2.5	1.0	--	--	--	--	--	--	340	
01145	Selenium, filtered (µg/L)	4	74.5	1.1	--	--	--	--	--	--	18.4	4.6
22703	Uranium, filtered (µg/L)	4	11.1	1.20	--	--	--	--	--	--	--	--
	USGS 384048104510401 LITTLE FOUNTAIN CR ABV HWY 115 AT FORT CARSON, CO (Little Fountain 115) August 2013 to May 2015											
00061	Discharge, instantaneous (ft^3/s)	4	325	0.24	--	--	--	--	--	--	--	--
00300	Dissolved oxygen (mg/L)	4	10.2	7.0	--	--	--	--	--	--	--	5.0
00400	pH, field (standard units)	4	8.3	7.7	--	--	--	--	--	--	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	4	150	71	--	--	--	--	--	--	--	--
00010	Temperature (°C)	4	20.1	5.5	--	--	--	--	--	--	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	4	97	63	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	4	61.3	28.3	--	--	--	--	--	--	--	--
00915	Calcium, filtered (mg/L)	4	18.6	8.32	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	4	3.59	1.83	--	--	--	--	--	--	--	--
00935	Potassium, filtered (mg/L)	4	2.32	1.62	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	4	8.34	2.83	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	4	3.2	1.1	--	--	--	--	--	--	--	250

Table 6. Statistical summary of selected water-quality data for sites at U.S. Army Garrison Fort Carson, Colorado.—Continued

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NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT [1]
						95%	75%	50% (Median)	25%	5%		
00950	Fluoride, filtered (mg/L)	4	3.10	1.90	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L as SiO_2)	4	12.9	9.40	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	4	10.2	6.96	--	--	--	--	--	--	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	4	--	--	--	--	--	--	--	--	4.7[2]	1.0 (Apr. 1–Aug. 31) 5.0 (Sep. 1–Mar. 31) [2]
00610	Ammonia, unfiltered (mg/L as N)	4	--	--	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	4	--	--	--	--	--	--	--	--	--	--
00671	Orthophosphate, filtered (mg/L as P)	4	--	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	4	--	--	--	--	--	--	--	--	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	4	0.725	0.009	--	--	--	--	--	--	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	4	--	--	--	--	--	--	--	--	--	126
01106	Aluminum, filtered (µg/L)	4	285	15.9	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	4	34.8	15.9	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	4	0.294	0.044	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	4	--	--	--	--	--	--	--	--	1.8[2]	0.3[2]
01030	Chromium, filtered (µg/L)	4	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	4	0.442	0.113	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	4	--	--	--	--	--	--	--	--	8.5[2]	6.0[2]
01046	Iron, filtered (µg/L)	4	363	76.0	--	--	--	--	--	--	--	300 (WS)
01049	Lead, filtered (µg/L)	4	--	--	--	--	--	--	--	--	38[2]	1.5[2]
01056	Manganese, filtered (µg/L)	4	334	6.66	--	--	--	--	--	--	2,540[2]	1,400[2] or 50 (WS)
01060	Molybdenum, filtered (µg/L)	4	2.03	0.816	--	--	--	--	--	--	--	--
01065	Nickel, filtered (µg/L)	4	0.99	0.25	--	--	--	--	--	--	310[2]	34[2]
01075	Silver, filtered (µg/L)	4	--	--	--	--	--	--	--	--	0.9[2]	0.1[2]
01090	Zinc, filtered (µg/L)	4	--	--	--	--	--	--	--	--	100[2]	78[2]
01095	Antimony, filtered (µg/L)	4	0.117	0.030	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	4	0.34	0.14	--	--	--	--	--	--	340	--
01145	Selenium, filtered (µg/L)	4	0.30	0.12	--	--	--	--	--	--	18.4	4.6
22703	Uranium, filtered (µg/L)	4	3.42	0.609	--	--	--	--	--	--	--	--

[1] From Colorado Department of Public Health and Environment (2013, 2016).

[2] TVS computed with equations for ammonia and trace metals in Regulation 31 and 32 (Colorado Department of Public Health and Environment, 2013, 2106).

*This value is estimated by using a log-probability regression to predict the values of data below the detection limit.

Shaded values exceed CDPHE numeric standard (Colorado Department of Public Health and Environment, 2013, 2016).

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
	USGS 07120620 BIG ARROYO NEAR THATCHER, CO (Big Arroyo) August 1983 to April 1999											
00061	Discharge, instantaneous (ft^3/s)	49	760	0.15	80.0	655.0	31.5	13.0	4.10	1.12	--	--
00300	Dissolved oxygen (mg/L)	2	12.2	9.0	--	--	--	--	--	--	--	5.0
00403	pH, lab (standard units)	20	8.4	7.6	--	8.39	8.10	7.90	7.83	7.60	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	14	820	280	493.3	820.0	537.5	487.5	373	280.0	--	--
00010	Temperature (°C)	26	20.0	3.5	17.08	20.00	19.00	19.00	17.88	4.73	15.9 (Dec.–Feb.) 31.8 (Mar.–Nov.)	14.3 (Dec.–Feb.) 28.7 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	13	565	185	308.6	565.0	357.0	306.0	223	185.0	--	--
00900	Hardness (mg/L as $CaCO_3$)	20	589	55.7	210.8	582.4	251.3	162.5	125.8	57.15	--	--
00915	Calcium, filtered (mg/L)	20	180	18.0	66.25	178.0	75.75	52.00	40.00	18.50	--	--
00925	Magnesium, filtered (mg/L)	20	34.0	2.60	11.02	33.60	12.75	8.050	6.23	2.650	--	--
00935	Potassium, filtered (mg/L)	20	7.90	3.70	5.980	7.875	6.750	6.400	5.200	3.75	--	--
00930	Sodium, filtered (mg/L)	20	88.0	20.0	40.50	86.85	50.00	36.00	29.00	20.3	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	19	155	35	62.8	155	76.0	50.0	39.0	35.0	--	--
00940	Chloride, filtered (mg/L)	20	15.0	4.5	6.760	14.71	7.200	6.25	5.73	4.500	--	250
00950	Fluoride, filtered (mg/L)	20	0.70	0.30	0.465	0.700	0.500	0.400	0.400	0.31	--	--
00955	Silica, filtered (mg/L)	20	11.0	4.00	6.985	10.92	7.375	6.550	6.400	4.080	--	--
00945	Sulfate, filtered (mg/L)	20	750	70.0	248.3	739.5	270.0	200.0	138	70.80	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	20	0.790	--	*0.523	*0.789	*0.728	*0.550	*0.340	*0.199	--	--
00666	Phosphorus, filtered (mg/L as P)	20	0.11	0.010	0.034	0.107	0.040	0.030	0.020	0.010	--	0.17
01027	Cadmium, unfiltered (µg/L)	2	--	--	--	--	--	--	--	--	5.0	--
01030	Chromium, filtered (µg/L)	2	--	--	--	--	--	--	--	--	--	--
01042	Copper, unfiltered, recoverable (µg/L)	2	410	390	--	--	--	--	--	--	--	200
01046	Iron, filtered (µg/L)	20	540	0.0	55.10	517.0	59.75	20.00	10.00	0.00	--	300 (WS)
01051	Lead, unfiltered, recoverable (µg/L)	2	200	200	--	--	--	--	--	--	50	100
01056	Manganese, filtered (µg/L)	20	40	--	*11.30	*40.00	*12.50	*7.000	*5.750	*1.991	--	50 (WS)

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
01092	Zinc, unfiltered, recoverable (µg/L)	2	1,500	1,400	--	--	--	--	--	--	--	2,000
	USGS 07126130 VAN BREMER ARROYO NEAR THATCHER, CO (Van Bremer Thatcher) July 1985 to July 1985											
00403	pH, lab (standard units)	1	7.6	--	--	--	--	--	--	--	6.5–9.0	--
70300	Dissolved solids, dried at 180 °C (mg/L)	1	2,090	--	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	1	987	--	--	--	--	--	--	--	--	--
00915	Calcium, filtered (mg/L)	1	260	--	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	1	82.0	--	--	--	--	--	--	--	--	--
00935	Potassium, filtered (mg/L)	1	11.0	--	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	1	250	--	--	--	--	--	--	--	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	1	98.0	--	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	1	60.0	--	--	--	--	--	--	--	--	250
00950	Fluoride, filtered (mg/L)	1	0.60	--	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L)	1	8.5	--	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	1	1,400	--	--	--	--	--	--	--	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	1	1.50	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	1	0.01	--	--	--	--	--	--	--	--	0.17
01046	Iron, filtered (µg/L)	1	30	--	--	--	--	--	--	--	--	300 (WS)
01056	Manganese, filtered (µg/L)	1	50	--	--	--	--	--	--	--	TVS	TVS or 50 (WS)
	USGS 07126140 VAN BREMER ARROYO NEAR TYRONE, CO (Van Bremer Tyrone) November 1985 to July 2008											
00061	Discharge, instantaneous (ft^3/s)	42	230	0.01	9.47	40.3	5.80	0.570	0.040	0.010	--	--
00300	Dissolved oxygen (mg/L)	13	12.8	6.2	8.9	12.8	10.9	9.2	6.9	6.2	--	5.0
00400	pH, field (standard units)	14	8.7	7.9	--	8.70	8.40	8.15	8.00	7.90	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	38	15,500	920	6,257	14,550	9,650	5,825	2,195	1,253	--	--
00010	Temperature (°C)	39	26.1	0.0	11.16	23.80	18.30	13.00	3.00	0.00	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
70300	Dissolved solids, dried at 180 °C (mg/L)	17	11,600	634	5,135	11,600	8,515	4,750	1,545	634.0	--	--
00900	Hardness (mg/L as $CaCO_3$)	17	3,900	254	1,779	3,900	2,885	1,550	623.5	254.0	--	--
00915	Calcium, filtered (mg/L)	17	410	57.0	227.4	410.0	330.0	180.0	150.0	57.00	--	--
00925	Magnesium, filtered (mg/L)	17	710	27.0	294.1	710.0	525.0	270.0	79.00	27.00	--	--
00935	Potassium, filtered (mg/L)	17	31.0	4.30	13.09	31.00	19.00	10.00	6.500	4.300	--	--
00930	Sodium, filtered (mg/L)	17	1,700	73.0	838.5	1,700	1,550	700.0	240.0	73.00	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	17	330	71.0	226.8	330	302.5	224.0	175	71.0	--	--
00940	Chloride, filtered (mg/L)	17	770	14.0	315	770.0	510.0	300.0	85.50	14.00	--	250
00950	Fluoride, filtered (mg/L)	17	0.80	0.20	0.506	0.800	0.700	0.500	0.350	0.200	--	--
00955	Silica, filtered (mg/L)	17	26.0	0.6	9.982	26.00	12.50	8.700	6.250	0.600	--	--
00945	Sulfate, filtered (mg/L)	17	6,400	330	2,909	6,400	4,950	2,600	875.0	330.0	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	16	19.0	--	*4.500	*19.00	*6.400	*3.350	*0.733	*0.196	--	--
00666	Phosphorus, filtered (mg/L as P)	17	0.30	--	*0.056	*0.300	*0.070	*0.030	*0.010	*0.003	--	0.17
01046	Iron, filtered (µg/L)	17	150	18.0	72.12	150.0	99.50	60.00	40.00	18.00	--	300 (WS)
01056	Manganese, filtered (µg/L)	17	140	3.00	59.00	140.0	75.00	60.00	31.00	3.00	4,740 [2]	2,620 [2] or 50 (WS)
	USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO (Van Bremer) July 1966 to December 2015											
00061	Discharge, instantaneous (ft^3/s)	386	2,240	0.02	47.3	205.0	1.50	0.180	0.108	0.060	--	--
00300	Dissolved oxygen (mg/L)	28	11.0	4.9	7.5	10.8	8.7	7.4	6.2	4.9	--	5.0
00400	pH, field (standard units)	31	8.3	7.4	--	8.24	7.90	7.80	7.70	7.46	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	224	4,460	115	1,842	2,308	2,018	1,850	1,623	893.8	--	--
00010	Temperature (°C)	326	30.9	1.0	15.9	26.50	22.00	17.00	9.00	4.00	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	37	3,730	416	1,536	3,163	1,725	1,540	1,215	453	--	--
00900	Hardness (mg/L as $CaCO_3$)	41	1270	176	702.9	1,212	848.5	750.0	574.5	277.5	--	--
00915	Calcium, filtered (mg/L)	41	210	44	152.1	203.6	180.0	160.0	135.0	72.10	--	--
00925	Magnesium, filtered (mg/L)	41	180	15	78.38	173.0	96.00	82.20	58.00	15.10	--	--
00935	Potassium, filtered (mg/L)	41	19	1.1	11.55	16.84	12.60	11.30	10.00	7.180	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00930	Sodium, filtered (mg/L)	41	660	24	183.3	489.0	205.0	170.0	135	28.10	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	28	282	78	204.4	281.6	254.5	226.5	154.8	78.5	--	--
00940	Chloride, filtered (mg/L)	41	220	8.9	44.87	180.0	42.40	34.00	25.00	9.480	--	250
00950	Fluoride, filtered (mg/L)	41	1.4	0.3	0.754	1.054	0.915	0.840	0.500	0.300	--	--
00955	Silica, filtered (mg/L)	41	14	5	8.364	13.00	9.185	7.800	7.140	5.510	--	--
00945	Sulfate, filtered (mg/L)	41	2,100	200	803.7	1,680	914.5	800.0	631.0	232.0	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	13	0.06	--	*0.032	*0.060	*0.045	*0.030	*0.020	*0.011	12.1	2.9 (Apr. 1–Aug. 31) 6.5 (Sep. 1–Mar. 31) [2]
00610	Ammonia, unfiltered (mg/L as N)	13	0.07	--	*0.045	*0.070	*0.065	*0.040	*0.030	*0.019	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	41	3.80	--	*0.213	*2.030	*0.033	*0.003	*0.000	*0.000	--	--
00671	Orthophosphate, filtered (mg/L as P)	13	--	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	41	0.48	--	*0.027	*0.078	*0.020	*0.009	*0.004	*0.001	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	13	0.116	--	*0.026	*0.116	*0.022	*0.011	*0.009	*0.002	--	--
00600	Total nitrogen, unfiltered (mg/L)	1	8.6	--	--	--	--	--	--	--	--	126
50468	*Escherichia coli*, DSTM (MPN/100 mL)	12	130	--	*13.7	*130	*7.3	*1.0	*0.2	*0.0	--	--
01106	Aluminum, filtered (µg/L)	13	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	13	127	22.8	46.55	127.0	59.85	35.00	27.3	22.80	--	--
01010	Beryllium, filtered (µg/L)	13	0.035	--	*0.019	*0.035	*0.023	*0.017	*0.014	*0.012	--	--
01025	Cadmium, filtered (µg/L)	13	--	--	--	--	--	--	--	--	9.2 [2]	1.2 [2]
01030	Chromium, filtered (µg/L)	13	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	13	1.34	0.521	1.026	1.340	1.310	1.120	0.8	0.52	--	--
01040	Copper, filtered (µg/L)	13	--	--	--	--	--	--	--	--	50 [2]	29 [2]
01042	Copper, unfiltered, recoverable (µg/L)	1	37	--	--	--	--	--	--	--	--	--
01046	Iron, filtered (µg/L)	41	280	8.0	70.84	255.6	81.50	42.00	24.50	8.20	--	300 (WS)
01045	Iron, unfiltered, recoverable (µg/L)	1	9,700	--	--	--	--	--	--	--	--	1,000
01049	Lead, filtered (µg/L)	13	--	--	--	--	--	--	--	--	280 [2]	10 [2]
01056	Manganese, filtered (µg/L)	41	267	5.00	100.0	227.0	133	110.0	44.3	12.40	4,740 [2]	2,620 [2] or 50 (WS)
71900	Mercury, unfiltered, recoverable (µg/L)	1	--	--	--	--	--	--	--	--	--	0.01
01060	Molybdenum, filtered (µg/L)	13	5.81	2.92	3.730	5.810	3.795	3.630	3.44	2.920	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
01065	Nickel, filtered (µg/L)	13	4.5	2.1	3.12	4.50	3.65	3.30	2.25	2.10	1,510 [2]	170 [2]
01075	Silver, filtered (µg/L)	13	--	--	--	--	--	--	--	--	22 [2]	3.5 [2]
01090	Zinc, filtered (µg/L)	13	--	--	--	--	--	--	--	--	560 [2]	430 [2]
01095	Antimony, filtered (µg/L)	13	0.245	--	*0.086	*0.245	*0.097	*0.072	*0.056	*0.031	--	--
01000	Arsenic, filtered (µg/L)	13	1.8	0.57	0.922	1.80	0.980	0.860	0.77	0.570	340	--
01002	Arsenic, unfiltered (µg/L)	1	3	--	--	--	--	--	--	--	--	0.02
01145	Selenium, filtered (µg/L)	13	3.2	0.08	0.405	3.20	0.230	0.180	0.14	0.080	18.4	4.6
22703	Uranium, filtered (µg/L)	13	1.42	0.623	1.018	1.420	1.190	1.020	0.900	0.62	--	--
	USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO (Purgatoire Thatcher) August 1966 to December 2015											
00061	Discharge, instantaneous (ft^3/s)	514	1,580	0.05	106.3	505.3	62.0	30.0	13.0	1.38	--	--
00300	Dissolved oxygen (mg/L)	50	13.7	7.0	9.5	13.0	10.7	9.2	7.9	7.0	--	5.0
00400	pH, field (standard units)	49	8.8	7.4	--	8.55	8.40	8.30	8.00	7.55	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	220	8,000	19	2,713	4,729	3,500	2,800	1,785	872	--	--
00010	Temperature (°C)	358	30.0	0.0	13.70	26.50	21.00	14.60	5.50	0.00	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	58	3,850	352	1,983	3,500	2,788	1,995	1,198	484.1	--	--
00900	Hardness (mg/L as $CaCO_3$)	68	1,900	187	1,029	1,833	1,458	1,065	572.3	274.0	--	--
00915	Calcium, filtered (mg/L)	68	350	47.0	198.4	340.0	270.0	200.5	120.0	61.90	--	--
00925	Magnesium, filtered (mg/L)	68	250	17.0	129.5	245.5	190.0	132.5	64.8	25.04	--	--
00935	Potassium, filtered (mg/L)	68	14.3	2.30	5.307	8.417	5.900	5.000	4.43	2.800	--	--
00930	Sodium, filtered (mg/L)	68	380	24.0	165.6	290.6	237.5	178.0	93.00	42.2	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	56	286	56.0	162.9	250.5	199.8	162.5	124.8	65.3	--	--
00940	Chloride, filtered (mg/L)	68	81.4	4.8	28.71	66.69	40.00	27.00	10.3	6.790	--	--
00950	Fluoride, filtered (mg/L)	68	0.93	0.20	0.438	0.617	0.500	0.410	0.400	0.29	--	--
00955	Silica, filtered (mg/L)	68	15.0	2.17	8.247	13.00	9.800	8.400	6.550	2.73	--	--
00945	Sulfate, filtered (mg/L)	69	2,400	160	1,188	2,155	1,750	1,120	630.0	250.0	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
00608	Ammonia, filtered (mg/L as N)	13	0.1	--	*0.019	*0.100	*0.025	*0.010	*0.002	*0.00	4.7[2]	1.4(Apr. 1–Aug. 31) 7.5 (Sep. 1–Mar. 31)[2]
00610	Ammonia, unfiltered (mg/L as N)	13	0.08	--	*0.031	*0.080	*0.040	*0.030	*0.018	*0.011	--	--
01145	Selenium, filtered (µg/L)	13	3.2	0.08	0.405	3.20	0.230	0.180	0.14	0.08	18.4	4.6
22703	Uranium, filtered (µg/L)	13	1.42	0.623	1.018	1.420	1.190	1.020	0.900	0.62	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	12	2,800	--	*251	*2,800	*17.8	*2.0	*0.3	*0.0	--	126
01106	Aluminum, filtered (µg/L)	13	--	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	13	107	24.8	52.23	107.0	69.80	46.20	31.10	24.80	--	--
01010	Beryllium, filtered (µg/L)	13	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	13	--	--	--	--	--	--	--	--	9.2[2]	1.2[2]
01030	Chromium, filtered (µg/L)	43	20	--	*2.010	*18.00	*1.000	*0.173	*0.064	*0.011	--	--
01035	Cobalt, filtered (µg/L)	13	0.960	0.407	0.713	0.960	0.863	0.723	0.58	0.41	--	--
01040	Copper, filtered (µg/L)	13	--	--	--	--	--	--	--	--	50[2]	29[2]
01046	Iron, filtered (µg/L)	68	250	--	*45.51	*192.0	*50.00	*30.00	*17.00	*6.81	--	--
01045	Iron, unfiltered, recoverable (µg/L)	29	440,000	40	71,900	380,000	115,000	1,800	450	100	--	1,000
01049	Lead, filtered (µg/L)	13	--	--	--	--	--	--	--	--	280[2]	10[2]
01056	Manganese, filtered (µg/L)	69	154	--	*30.28	*85.20	*45.85	*20.00	*9.00	*1.507	4,740[2]	2,620[2]
01060	Molybdenum, filtered (µg/L)	13	7.83	2.67	4.522	7.830	5.745	4.490	3.11	2.670	--	--
01065	Nickel, filtered (µg/L)	13	5.9	2.1	3.32	5.90	3.65	3.10	2.40	2.10	1,510[2]	170[2]
01075	Silver, filtered (µg/L)	13	--	--	--	--	--	--	--	--	22[2]	3.5[2]
01090	Zinc, filtered (µg/L)	13	--	--	--	--	--	--	--	--	560[2]	430[2]
01095	Antimony, filtered (µg/L)	13	0.386	--	*0.206	*0.386	*0.298	*0.193	*0.108	*0.081	--	--
01000	Arsenic, filtered (µg/L)	13	1.5	--	*0.728	*1.50	*0.980	*0.650	*0.440	*0.330	340	--
01145	Selenium, filtered (µg/L)	13	3.7	1.5	2.62	3.70	3.20	2.70	1.75	1.50	18.4	4.6
22703	Uranium, filtered (µg/L)	20	18.5	1.6	10.37	18.48	15.65	10.80	5.66	1.62	--	--
		USGS 07126320 BURKE ARROYO TRIBUTARY NEAR THATCHER, CO (Burke) August 1984 to June 1986										
00061	Discharge, instantaneous (ft^3/s)	10	5.7	0.10	1.76	5.70	3.48	0.865	0.338	0.100	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00403	pH, lab (standard units)	10	8.0	7.4	--	8.00	8.00	7.85	7.68	7.40	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	5	250	62	--	--	--	--	--	--	--	--
00010	Temperature (°C)	2	12.5	12.5	--	--	--	--	--	--	15.9 (Dec.–Feb.) 31.8 (Mar.–Nov.)	14.3 (Dec.–Feb.) 28.7 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	9	165	58	111.0	165.0	144.5	110.0	81.00	58.00	--	--
00900	Hardness (mg/L as $CaCO_3$)	10	111	23.6	57.39	111.0	74.58	56.50	28.93	23.60	--	--
00915	Calcium, filtered (mg/L)	10	37.0	8.3	19.19	37.00	24.75	19.00	9.65	8.30	--	--
00925	Magnesium, filtered (mg/L)	10	4.50	0.700	2.290	4.500	3.100	2.250	1.18	0.7	--	--
00935	Potassium, filtered (mg/L)	10	8.70	3.30	5.530	8.700	6.400	5.350	4.48	3.300	--	--
00930	Sodium, filtered (mg/L)	10	6.60	0.40	1.540	6.600	1.875	0.700	0.700	0.400	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	9	76.0	23.0	42.1	76.0	66.0	31.0	28.0	23.0	--	--
00940	Chloride, filtered (mg/L)	10	9.6	0.3	2.170	9.600	2.175	1.600	0.650	0.300	--	250
00950	Fluoride, filtered (mg/L)	10	0.30	--	*0.152	*0.300	*0.200	*0.150	*0.092	*0.055	--	--
00955	Silica, filtered (mg/L)	10	7.90	3.50	5.120	7.900	6.125	4.900	4.050	3.500	--	--
00945	Sulfate, filtered (mg/L)	10	82.0	6.2	30.68	82.00	42.25	27.00	9.900	6.200	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	10	0.420	0.110	0.221	0.420	0.267	0.200	0.14	0.110	--	--
00666	Phosphorus, filtered (mg/L as P)	10	0.150	0.07	0.104	0.150	0.130	0.105	0.080	0.070	--	0.17
01046	Iron, filtered (µg/L)	9	130	0.00	50.44	130.0	81.50	40.00	22.00	0.00	--	300 (WS)
01056	Manganese, filtered (µg/L)	10	--	--	--	--	--	--	--	--	--	50 (WS)
	USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO (Taylor) June 1983 to July 2015											
00061	Discharge, instantaneous (ft^3/s)	125	455	0.01	32.1	220.0	20.0	3.10	0.800	0.030	--	--
00300	Dissolved oxygen (mg/L)	4	8.5	6.2	--	--	--	--	--	--	--	5.0
00403	pH, lab (standard units)	29	8.3	7.5	--	8.30	7.90	7.80	7.65	7.50	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	15	2,400	140	971.1	2,400	1,720	920.0	233.0	140.0	--	--
00010	Temperature (°C)	29	28.0	9.0	20.49	27.25	24.75	22.50	16.60	9.00	15.9 (Dec.–Feb.) 31.8 (Mar.–Nov.)	14.3 (Dec.–Feb.) 28.7 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	26	2,330	92	846.4	2,190	1,318	885.5	139.0	93.1	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
00900	Hardness (mg/L as $CaCO_3$)	29	1,320	56	524.2	1,225	892.0	569.0	96.80	56.65	--	--
00915	Calcium, filtered (mg/L)	29	370	19.0	155.2	345.0	260.0	180.0	33.00	19.00	--	--
00925	Magnesium, filtered (mg/L)	29	96.0	2.00	33.18	90.50	51.00	31.00	3.500	2.100	--	--
00935	Potassium, filtered (mg/L)	29	18.0	3.00	8.241	16.00	11.00	8.190	4.750	3.000	--	--
00930	Sodium, filtered (mg/L)	29	110	1.09	33.07	101.0	50.00	31.00	4.400	1.2	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	28	101	27	59.1	96.1	73.8	55.5	48.0	29.3	--	--
00940	Chloride, filtered (mg/L)	29	11.0	0.83	3.487	9.200	4.250	2.700	2.000	0.92	--	250
00950	Fluoride, filtered (mg/L)	29	0.70	0.09	0.382	0.700	0.550	0.400	0.200	0.1	--	--
00955	Silica, filtered (mg/L)	29	7.60	2.40	5.476	7.550	6.100	5.600	5.100	3.000	--	--
00945	Sulfate, filtered (mg/L)	29	1,500	20.2	515.9	1,350	925.0	530.0	54.00	25.10	--	250 (WS)
00608	Ammonia, filtered (mg/L as N)	1	--	--	--	--	--	--	--	--	--	--
00610	Ammonia, unfiltered (mg/L as N)	1	--	--	--	--	--	--	--	--	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	29	2.80	0.260	0.965	2.700	1.100	0.770	0.63	0.280	--	--
00671	Orthophosphate, filtered (mg/L as P)	1	0.087	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	29	0.100	0.010	0.032	0.095	0.040	0.020	0.010	0.010	--	0.17
00665	Phosphorus, unfiltered (mg/L as P)	1	0.800	--	--	--	--	--	--	--	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	1	440	--	--	--	--	--	--	--	--	630
01106	Aluminum, filtered (µg/L)	1	140	--	--	--	--	--	--	--	--	--
01005	Barium, filtered (µg/L)	1	38.7	--	--	--	--	--	--	--	--	--
01010	Beryllium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01030	Chromium, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01035	Cobalt, filtered (µg/L)	1	0.829	--	--	--	--	--	--	--	--	--
01040	Copper, filtered (µg/L)	1	1.7	--	--	--	--	--	--	--	--	--
01046	Iron, filtered (µg/L)	29	130	7.0	37.74	107.5	55.00	30.00	17.00	7.50	--	300 (WS)
01049	Lead, filtered (µg/L)	1	0.1	--	--	--	--	--	--	--	--	--
01056	Manganese, filtered (µg/L)	29	50	--	*13.32	*46.00	*20.00	*7.000	*3.600	*0.925	--	50 (WS)
01060	Molybdenum, filtered (µg/L)	1	1.48	--	--	--	--	--	--	--	--	--
01065	Nickel, filtered (µg/L)	1	1.2	--	--	--	--	--	--	--	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
01075	Silver, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01090	Zinc, filtered (µg/L)	1	--	--	--	--	--	--	--	--	--	--
01095	Antimony, filtered (µg/L)	1	0.134	--	--	--	--	--	--	--	--	--
01000	Arsenic, filtered (µg/L)	1	0.67	--	--	--	--	--	--	--	--	--
01145	Selenium, filtered (µg/L)	1	0.45	--	--	--	--	--	--	--	--	--
22703	Uranium, filtered (µg/L)	1	0.282	--	--	--	--	--	--	--	--	--
	USGS 07126390 LOCKWOOD CANYON CREEK, NEAR THATCHER, CO (Lockwood) June 1983 to August 2014											
00061	Discharge, instantaneous (ft^3/s)	76	396	0.01	43.0	259.2	46.5	13.0	0.907	0.010	--	--
00300	Dissolved oxygen (mg/L)	9	11.8	6.2	9.2	11.8	11.0	8.8	7.5	6.2	--	5.0
00400	pH, field (standard units)	10	8.1	7.8	--	8.10	8.00	7.95	7.90	7.80	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	21	3,500	630	2,616	3,498	3,355	3,050	2,305	633.0	--	--
00010	Temperature (°C)	27	29.0	0.0	13.75	27.32	20.50	14.00	5.50	0.16	15.9 (Dec.–Feb.) 31.8 (Mar.–Nov.)	14.3 (Dec.–Feb.) 28.7 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	15	3,300	322	2,126	3,300	2,940	2,580	766.0	322.0	--	--
00900	Hardness (mg/L as $CaCO_3$)	16	1,620	197	1,099	1,620	1,513	1,280	574.8	197.0	--	--
00915	Calcium, filtered (mg/L)	16	370	59	258.4	370.0	320.0	305.0	155.0	59.00	--	--
00925	Magnesium, filtered (mg/L)	16	180	12	110.3	180.0	160.0	125.0	45.50	12.00	--	--
00935	Potassium, filtered (mg/L)	16	11	5.8	8.888	11.00	9.975	9.500	7.83	5.800	--	--
00930	Sodium, filtered (mg/L)	16	280	17	170.3	280.0	235.0	200.0	83.00	17.00	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	16	297	71.0	155.0	297.0	189.0	147	89.8	71.0	--	--
00940	Chloride, filtered (mg/L)	16	44	3.3	24.45	44.00	34.00	26.50	10.20	3.300	--	250
00950	Fluoride, filtered (mg/L)	16	0.8	0.2	0.544	0.800	0.675	0.600	0.350	0.200	--	--
00955	Silica, filtered (mg/L)	16	18	1.3	7.562	18.00	11.75	7.050	2.68	1.300	--	--
00945	Sulfate, filtered (mg/L)	16	2,000	180	1,282	2,000	1,600	1,550	655.0	180.0	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	16	0.920	--	*0.174	*0.920	*0.230	*0.055	*0.017	*0.004	--	--
00666	Phosphorus, filtered (mg/L as P)	16	0.05	--	*0.023	*0.050	*0.037	*0.020	*0.010	*0.005	--	0.17
01046	Iron, filtered (µg/L)	16	280	18.0	61.13	280.0	60.00	45.00	32.50	18.00	--	300 (WS)

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

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						95%	75%	50% (Median)	25%	5%		
01056	Manganese, filtered (µg/L)	16	380	10	84.56	380.0	147.5	40.00	20.00	10.00	--	50 (WS)
	USGS 07126415 RED ROCK CANYON CREEK AT MOUTH, NR THATCHER, CO (Red Rock) July 1985 to June 2015											
00061	Discharge, instantaneous (ft^3/s)	22	752	0.11	133.4	715.6	170.3	69.0	11.0	0.186	--	--
00300	Dissolved oxygen (mg/L)	2	10.2	7.8	--	--	--	--	--	--	--	5.0
00400	pH, field (standard units)	1	8.0	--	--	--	--	--	--	--	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	9	2,090	169	526.6	2,090	488.5	376.0	190.0	169.0	--	--
00010	Temperature (°C)	6	24.0	14.5	18.50	24.00	21.75	18.00	15.25	14.50	15.9 (Dec.–Feb.) 31.8 (Mar.–Nov.)	14.3 (Dec.–Feb.) 28.7 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	3	1,800	154	--	--	--	--	--	--	--	--
00900	Hardness (mg/L as $CaCO_3$)	3	845	64.0	--	--	--	--	--	--	--	--
00915	Calcium, filtered (mg/L)	3	180	22.0	--	--	--	--	--	--	--	--
00925	Magnesium, filtered (mg/L)	3	96.0	2.20	--	--	--	--	--	--	--	--
00935	Potassium, filtered (mg/L)	3	11.0	3.60	--	--	--	--	--	--	--	--
00930	Sodium, filtered (mg/L)	3	170	4.10	--	--	--	--	--	--	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	3	170	69	--	--	--	--	--	--	--	--
00940	Chloride, filtered (mg/L)	3	20.0	0.9	--	--	--	--	--	--	--	250
00950	Fluoride, filtered (mg/L)	3	--	--	--	--	--	--	--	--	--	--
00955	Silica, filtered (mg/L)	3	15.0	4.50	--	--	--	--	--	--	--	--
00945	Sulfate, filtered (mg/L)	3	990	49.0	--	--	--	--	--	--	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	3	0.430	0.280	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	3	0.08	0.01	--	--	--	--	--	--	--	0.17
01046	Iron, filtered (µg/L)	3	52.0	10	--	--	--	--	--	--	--	300 (WS)
01056	Manganese, filtered (µg/L)	3	30	4.00	--	--	--	--	--	--	--	50 (WS)
	USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO (Chacuaco) July 1984 to July 1992											
00061	Discharge, instantaneous (ft^3/s)	20	268	0.12	57.9	263.4	69.5	45.0	5.53	0.142	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
00300	Dissolved oxygen (mg/L)	2	10.6	6.2	--	--	--	--	--	--	--	5.0
00400	pH, field (standard units)	7	8.4	7.7	--	8.40	8.40	8.30	8.10	7.70	6.5–9.5	--
00095	Specific conductance (µS/cm at 25 °C)	8	1,000	280	581.8	1,000	940.0	482.0	293	280.0	--	--
00010	Temperature (°C)	9	35.0	11.0	21.56	35.00	28.00	20.00	14.50	11.00	14.3 (Dec–.Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	9	722	126	320.6	722.0	547.5	197.0	174.0	126.0	--	--
00900	Hardness (mg/L as $CaCO_3$)	9	448	77.3	197.5	448.0	340.5	114.0	112.0	77.30	--	--
00915	Calcium, filtered (mg/L)	9	140	25.0	60.78	140.0	102.5	35.00	34.00	25.00	--	--
00925	Magnesium, filtered (mg/L)	9	36.0	3.60	11.11	36.00	14.50	6.600	5.850	3.600	--	--
00935	Potassium, filtered (mg/L)	8	7.00	3.30	4.762	7.000	5.325	4.400	4.23	3.300	--	--
00930	Sodium, filtered (mg/L)	9	48.0	4.60	15.37	48.00	24.00	9.000	5.800	4.600	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	8	165	40.0	84.4	165.0	89.0	80.5	65.8	40.0	--	--
00940	Chloride, filtered (mg/L)	9	10.0	1.9	3.411	10.00	3.350	2.500	2.250	1.900	--	250
00950	Fluoride, filtered (mg/L)	9	0.50	0.10	0.222	0.500	0.200	0.200	0.200	0.100	--	--
00955	Silica, filtered (mg/L)	9	12.0	5.20	6.744	12.00	7.450	5.600	5.400	5.200	--	--
00945	Sulfate, filtered (mg/L)	9	390	54.0	155.1	390.0	280.0	80.00	71.50	54.00	--	250 (WS)
00631	Nitrate + nitrite, filtered (mg/L as N)	9	0.770	0.180	0.531	0.770	0.655	0.570	0.430	0.180	--	--
00666	Phosphorus, filtered (mg/L as P)	8	0.32	0.010	0.105	0.320	0.147	0.080	0.04	0.010	--	0.17
01027	Cadmium, filtered (µg/L)	8	--	--	--	--	--	--	--	--	5.0[2]	0.8[2]
01030	Chromium, filtered (µg/L)	8	--	--	--	--	--	--	--	--	--	--
01046	Iron, filtered (µg/L)	9	65.0	6.0	30.22	65.00	59.50	10.00	7.50	6.00	--	300 (WS)
01045	Iron, unfiltered, recoverable (µg/L)	8	70,000	1,000	33,500	70,000	58,000	38,500	2,580	1,000	--	1,000
01056	Manganese, filtered (µg/L)	9	42.0	3.00	17.56	42.00	33.50	13.00	5.000	3.000	--	50 (WS)
22703	Uranium, filtered (µg/L)	4	2.2	1.0	--	--	--	--	--	--	--	--
	USGS 07126480 BENT CANYON CREEK AT MOUTH NEAR TIMPAS, CO. (Bent) July 2009 to August 2015											
00061	Discharge, instantaneous (ft^3/s)	69	883	1.4	120.2	525.5	166.5	37.0	7.95	3.85	--	--
00010	Temperature (°C)	1	28.5	--	--	--	--	--	--	--	15.9 (Dec.–Feb.) 31.8 (Mar.–Nov.)	14.3 (Dec.–Feb.) 28.7 (Mar.–Nov.)

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
		USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CC (Purgatoire Rock Crossing) October 1982 to November 2015										
00061	Discharge, instantaneous (ft^3/s)	468	3,600	0.14	173.3	847.1	117.5	40.5	24.0	4.88	--	--
00300	Dissolved oxygen (mg/L)	45	13.0	5.6	8.7	11.9	10.1	8.6	7.4	5.8	--	5.0
00400	pH, field (standard units)	53	9.1	7.2	--	8.50	8.40	8.30	8.10	7.68	6.5–9.0	--
00095	Specific conductance (µS/cm at 25 °C)	172	4,190	441	2,359	3,541	3,245	2,320	1,583	703.0	--	--
00010	Temperature (°C)	225	31.5	0.0	16.66	28.00	24.00	18.00	10.25	1.00	14.3 (Dec.–Feb.) 28.6 (Mar.–Nov.)	13.8 (Dec.–Feb.) 27.5 (Mar.–Nov.)
70300	Dissolved solids, dried at 180 °C (mg/L)	58	3,420	341	1,976	3,363	2,910	1,990	1,050	363	--	--
00900	Hardness (mg/L as $CaCO_3$)	68	1,840	169	1,042	1,726	1,545	1,025	603.3	216.3	--	--
00915	Calcium, filtered (mg/L)	68	340	43.0	206.6	325.5	290.0	213.0	140.0	53.70	--	--
00925	Magnesium, filtered (mg/L)	69	240	15.0	129.1	225.0	194.0	123.0	63.00	18.00	--	--
00935	Potassium, filtered (mg/L)	69	8.90	2.50	5.493	8.075	6.315	5.300	4.700	3.000	--	--
00930	Sodium, filtered (mg/L)	69	310	17.0	165.8	270.0	243.0	180.0	85.00	26.00	--	--
90410	ANC, unfiltered, lab (mg/L as $CaCO_3$)	57	257	65	156.8	220.6	182.5	160.0	129.5	99.7	--	--
00940	Chloride, filtered (mg/L)	69	68.3	4.3	27.78	56.80	37.85	28.00	13.00	6.200	--	--
00950	Fluoride, filtered (mg/L)	69	1.2	0.10	0.411	0.500	0.500	0.400	0.350	0.200	--	--
00955	Silica, filtered (mg/L)	69	15.0	1.56	7.710	13.00	9.150	7.700	5.950	3.520	--	--
00945	Sulfate, filtered (mg/L)	69	2,200	150	1,191	2,100	1,710	1,200	640.0	195.0	--	--
00608	Ammonia, filtered (mg/L as N)	11	0.07	--	*0.036	*0.070	*0.060	*0.030	*0.020	*0.007	4.7	1.3 (Apr. 1–Aug. 31) 6.2 (Sep. 1–Mar. 31) [2]
00610	Ammonia, unfiltered (mg/L as N)	10	0.14	--	*0.049	*0.140	*0.060	*0.035	*0.027	*0.010	--	--
00631	Nitrate + nitrite, filtered (mg/L as N)	68	0.830	--	*0.264	*0.722	*0.440	*0.145	*0.071	*0.029	--	--
00671	Orthophosphate, filtered (mg/L as P)	11	--	--	--	--	--	--	--	--	--	--
00666	Phosphorus, filtered (mg/L as P)	68	0.25	--	*0.021	*0.061	*0.020	*0.010	*0.006	*0.002	--	--
00665	Phosphorus, unfiltered (mg/L as P)	11	11.7	0.016	1.153	11.70	0.090	0.066	0.03	0.02	--	--
50468	*Escherichia coli*, DSTM (MPN/100 mL)	11	3,900	--	*369	*3,900	*36.0	*7.0	*0.8	*0.0	--	126
01106	Aluminum, filtered (µg/L)	11	--	--	--	--	--	--	--	--	--	--

Table 7. Statistical summary of selected water-quality data for sites at Piñon Canyon Maneuver Site, Colorado.—Continued

[The criteria by which the program computed the summary statistics were based on the number of values for a property or constituent (Dupré and others, 2013). See the "Data Presentation" section of this report for more explanation on the method. NWIS, National Water Information System; %, percent; CDPHE, Colorado Department of Public Health and Environment; DM, daily maximum temperature; MWAT, maximum weekly average temperature; USGS, U.S. Geological Survey; CO, Colorado; ft^3/s, cubic foot per second; --, no data; mg/L, milligrams per liter; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; Dec.–Feb., December to February; Mar.–Nov., March to November; $CaCO_3$, calcium carbonate; ANC, acid-neutralizing capacity; WS, water-supply standard; N, nitrogen; P, phosphorus; µg/L, micrograms per liter; TVS, table value standard; Apr. 1–Aug. 31, April 1 to August 31; Sep. 1–Mar. 31, September 1 to March 31; DSTM, defined substrate test method; MPN, most probable number; BL, below; NR, near]

NWIS parameter code	Property or constituent (reporting units)	Number of values	Maximum	Minimum	Mean	Percent of samples in which values were less than or equal to those shown					CDPHE numeric standard, acute or DM [1]	CDPHE numeric standard, chronic or MWAT[1]
						95%	75%	50% (Median)	25%	5%		
01005	Barium, filtered (µg/L)	11	175	28.8	74.29	175.0	102.0	59.60	33.30	28.80	--	--
01010	Beryllium, filtered (µg/L)	11	--	--	--	--	--	--	--	--	--	--
01025	Cadmium, filtered (µg/L)	11	--	--	--	--	--	--	--	--	9.2[2]	1.2[2]
01030	Chromium, filtered (µg/L)	44	20	--	*2.545	*17.50	*1.889	*0.351	*0.105	*0.018	--	--
01035	Cobalt, filtered (µg/L)	11	1.11	0.465	0.803	1.110	0.937	0.882	0.62	0.47	--	--
01040	Copper, filtered (µg/L)	11	--	--	--	--	--	--	--	--	50[2]	29[2]
01046	Iron, filtered (µg/L)	69	290	5.9	37.27	100.0	40.00	27.00	14.15	7.85	--	--
01045	Iron, unfiltered, recoverable (µg/L)	33	590,000	160	109,000	464,000	220,000	9,500	795	160	--	1,000
01049	Lead, filtered (µg/L)	11	--	--	--	--	--	--	--	--	280[2]	10[2]
01056	Manganese, filtered (µg/L)	69	260	0.00	40.50	147.5	60.00	30.00	10.00	1.000	4,740[2]	2,620[2]
01060	Molybdenum, filtered (µg/L)	11	11.0	4.19	6.957	11.00	9.240	6.030	5.220	4.190	--	--
01065	Nickel, filtered (µg/L)	11	6.2	2.5	3.97	6.20	4.90	3.90	3.00	2.50	1,510[2]	170[2]
01075	Silver, filtered (µg/L)	11	--	--	--	--	--	--	--	--	22[2]	3.5[2]
01090	Zinc, filtered (µg/L)	11	--	--	--	--	--	--	--	--	560[2]	430[2]
01095	Antimony, filtered (µg/L)	11	0.608	0.106	0.256	0.608	0.37	0.221	0.14	0.11	--	--
01000	Arsenic, filtered (µg/L)	11	1.5	0.56	0.943	1.50	1.20	0.890	0.670	0.560	340	--
01145	Selenium, filtered (µg/L)	11	4.4	1.4	3.06	4.40	3.70	3.20	2.80	1.40	18.4	4.6
22703	Uranium, filtered (µg/L)	19	19.0	2.2	10.61	19.00	15.00	11.10	6.100	2.200	--	--

[1]From Colorado Department of Public Health and Environment (2013, 2016).

[2]TVS computed with equations for ammonia and trace metals in Regulation 31 and 32 (Colorado Department of Public Health and Environment, 2013, 2106).

*This value is estimated by using a log-probability regression to predict the values of data below the detection limit.

Shaded median values exceed CDPHE numeric standard (Colorado Department of Public Health and Environment, 2013, 2016).

Summary

The U.S. Army Garrison Fort Carson (AGFC) and the Piñon Canyon Maneuver Site (PCMS) are facilities operated by the U.S. Department of the Army in southern Colorado. The U.S. Geological Survey (USGS), in cooperation with the U.S. Department of the Army, established a hydrologic and water-quality data-collection network at AGFC in June 1978 and at PCMS in October 1982 to assess the quantity and quality of water resources and monitor the effects of military training activities on streamflow and water quality. At PCMS, two preexisting USGS streamgages that provide data beginning as early as 1966 were incorporated into the data-collection network at the time it was established. This report presents and summarizes precipitation, streamflow, suspended-sediment, and water-quality data from 34 USGS sites on or near AGFC and PCMS for the period of record at each site. Streamflow data are presented as discharge in cubic feet per second. Data were compiled from the USGS National Water Information System for 17 sites at AGFC and 17 sites at PCMS. Of these, 15 sites include precipitation data, 15 sites include discharge data, 7 sites include suspended-sediment data, and 22 sites include water-quality data. Selected sites include those in the current data-collection networks and sites of interest with historical data.

Data presented in this report were collected from 1966 to 2015. The period of record for each site represents the full period over which data were collected. Precipitation, discharge, and suspended-sediment data were collected through water year 2015 (until September 30, 2015) and water-quality data were collected through calendar year 2015. The water-quality properties and constituents compiled for each site are based on the constituent list for the current sampling plan for the water-quality networks at AGFC and PCMS but vary because of differences in available data. Constituents with regulatory numeric standards for the surface waters of Colorado (Regulation 31) and the Arkansas River Basin (Regulation 32) set by the Colorado Department of Public Health and Environment (CDPHE) were also included. Where applicable, CDPHE acute and chronic numeric standards for surface waters of Colorado are given along with the summary statistics for comparison purposes. For this report, the 95th percentile was used for comparison with water-quality standards for filtered trace elements as a more conservative approach and the median for total recoverable metals.

Daily sum precipitation at AGFC ranged from a minimum of 0 inches (in.) at each site to a maximum of 11.85 in. at Rod and Gun in September 2013, which was a new Colorado record for daily rainfall. Mean precipitation for the period of record was 0.03 in. at Young Hollow, 0.04 in. at Sullivan Park, and 0.05 in. at Rod and Gun. Daily mean discharge at AGFC ranged from 0 cubic feet per second (ft^3/s) at all sites to a maximum of 836 ft^3/s at a seasonally operated site, Turkey Teller. Suspended-sediment discharge at AGFC ranged from a minimum of 0 tons per day (ton/d) at both sites to a maximum of 315 ton/d at Red Salt and 39,900 ton/d at Little Fountain. Mean suspended-sediment discharge was 28 ton/d at Red Salt and 237 ton/d at Little Fountain. With the exception of total (unfiltered) mercury at B Ditch and Clover Ditch; filtered manganese water-supply standard at B Ditch, Clover Ditch, and Little Fountain; and filtered sulfate at Clover Ditch and Little Fountain, 95th percentile trace element concentrations and median total (unfiltered) metal concentrations were less than CDPHE regulatory numeric standards for all samples. However, individual water-quality results occasionally exceeded respective regulatory numeric standards.

Daily precipitation at PCMS ranged from a minimum of 0 in. at each site to a maximum of 4.59 in. at CIG in July 1998. Mean precipitation for the period of record ranged from 0.03 in. at Brown Sheep, CIG, and Bear Springs to 0.05 in. at Van Bremer Tyrone, Van Bremer, Lockwood, Red Rock, Bent, and Purgatoire Rock Crossing. Daily mean discharge at PCMS ranged from 0 ft^3/s at all sites to a maximum of 4,190 ft^3/s at a seasonally operated site, Purgatoire Rock Crossing. Suspended-sediment discharge at PCMS ranged from a minimum of 0 ton/d at each site to a maximum of 21,100 ton/d with a mean of 389 ton/d at Bent. Water-quality results, 95th percentile trace element concentrations, and median total (unfiltered) metal concentrations were less than CDPHE regulatory numeric standards for most properties and constituents except for filtered chloride at Van Bremer Tyrone; filtered sulfate at Big Arroyo, Van Bremer Tyrone, Van Bremer, Taylor, Lockwood, and Chacuaco; filtered phosphorus at Chacuaco; filtered manganese at Van Bremer Tyrone, Van Bremer, and Lockwood; and total (unfiltered) iron median concentration at Purgatoire Thatcher, Chacuaco, and Purgatoire Rock Crossing. Individual water-quality results also occasionally exceeded respective regulatory numeric standards.

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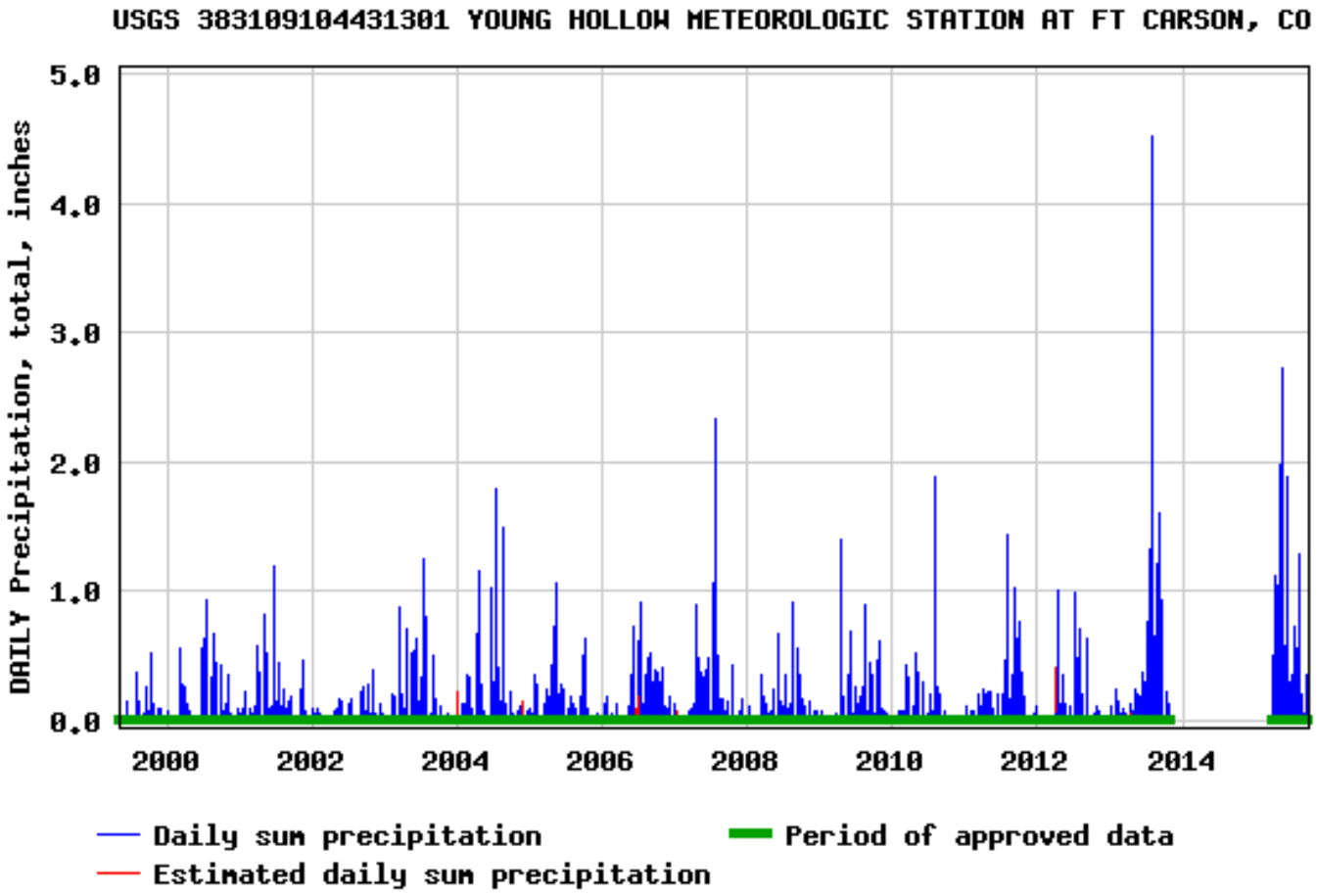
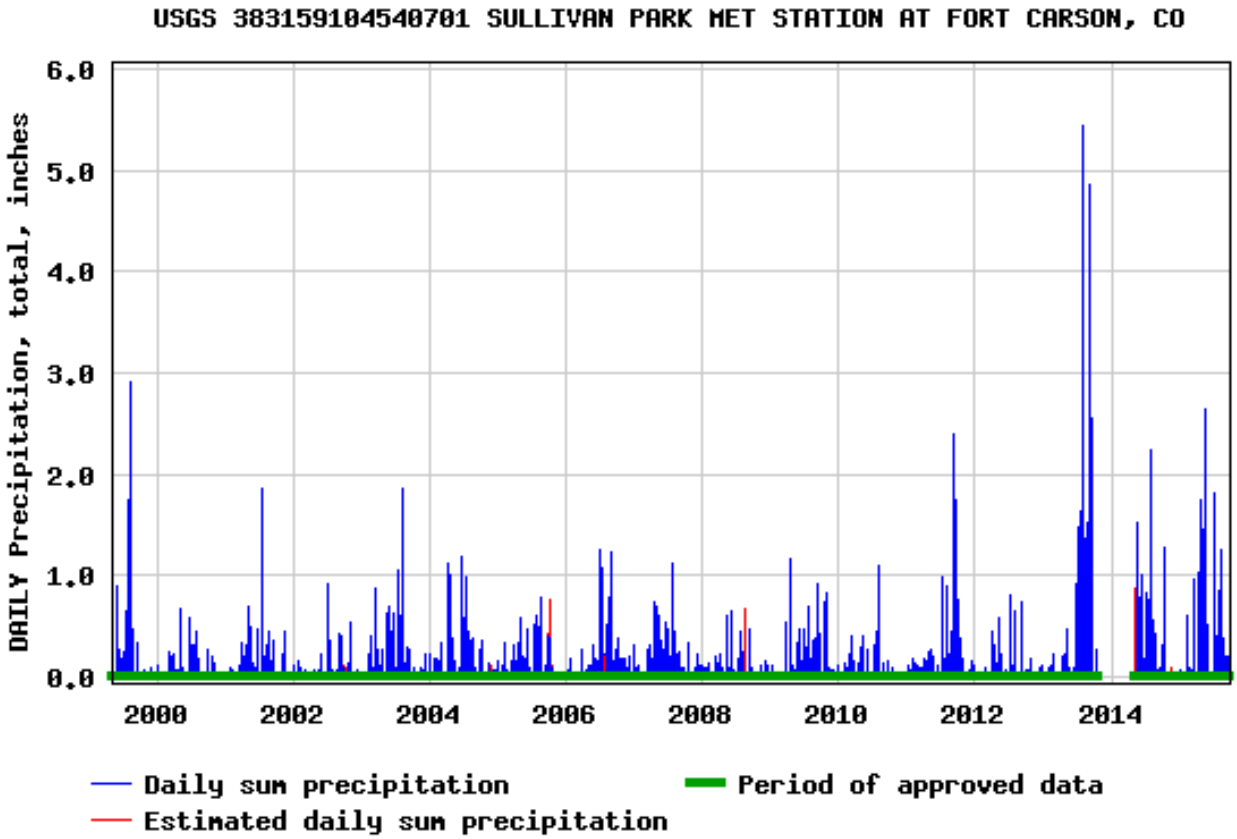
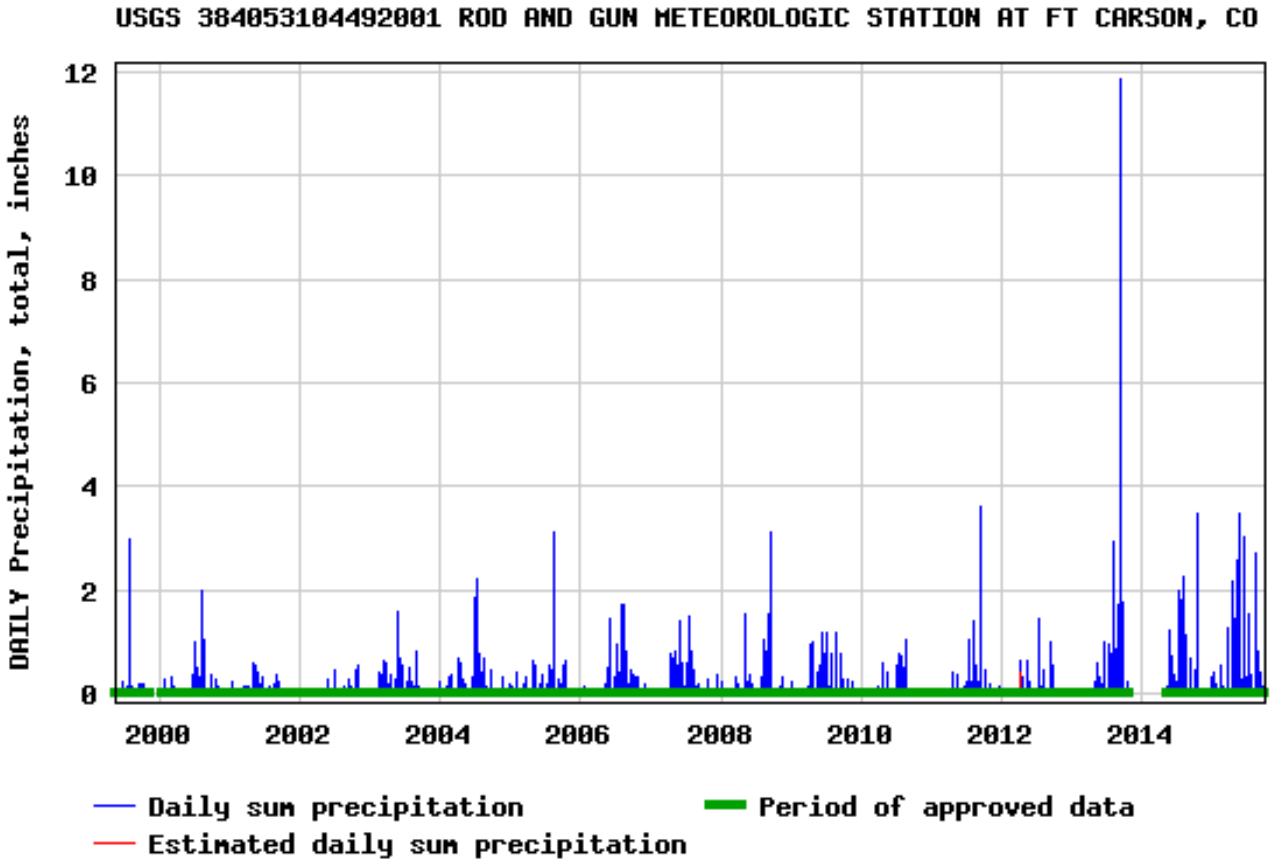
Appendix 1. Daily Sum Precipitation for the Period of Record for Selected Sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado

Appendix 1 presents graphs generated from the U.S. Geological Survey National Water Information System website (https://doi.org/10.5066/F7P55KJN). For an explanation of terms refer to the U.S. Geological Survey website at https://wdr.water.usgs.gov/current/documentation.html.

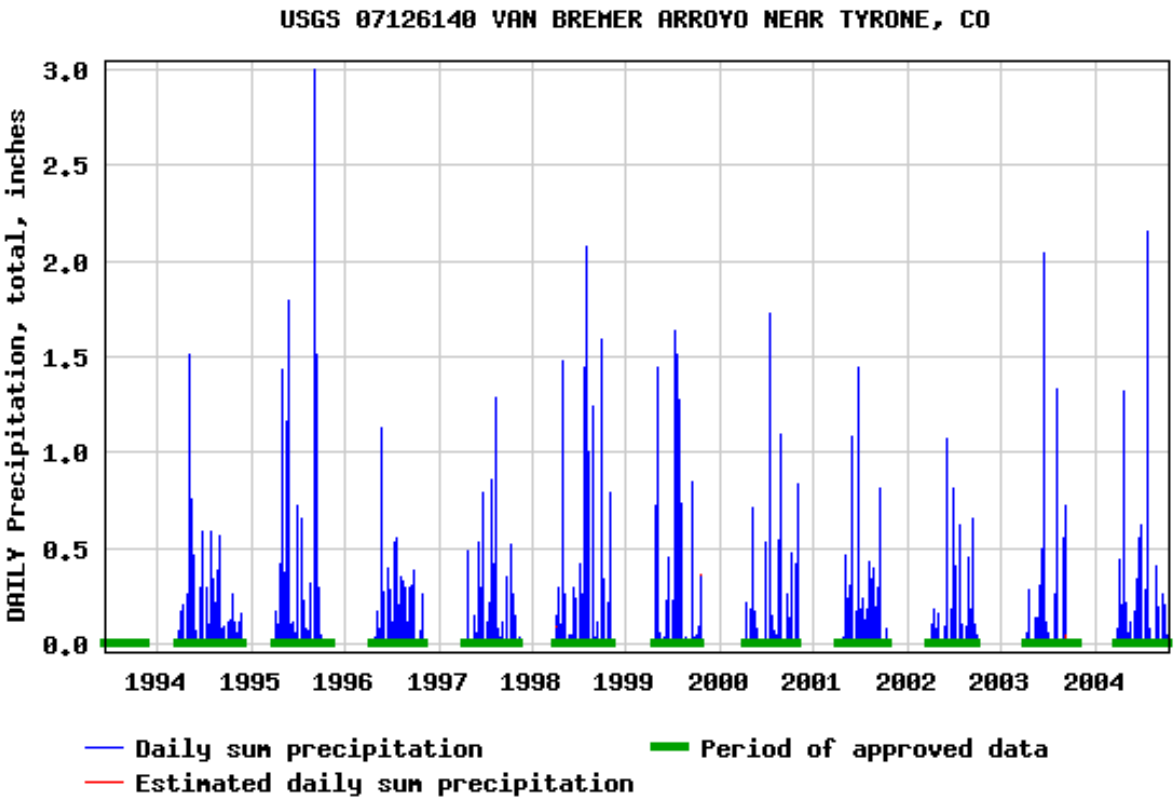
U.S. Army Garrison Fort Carson

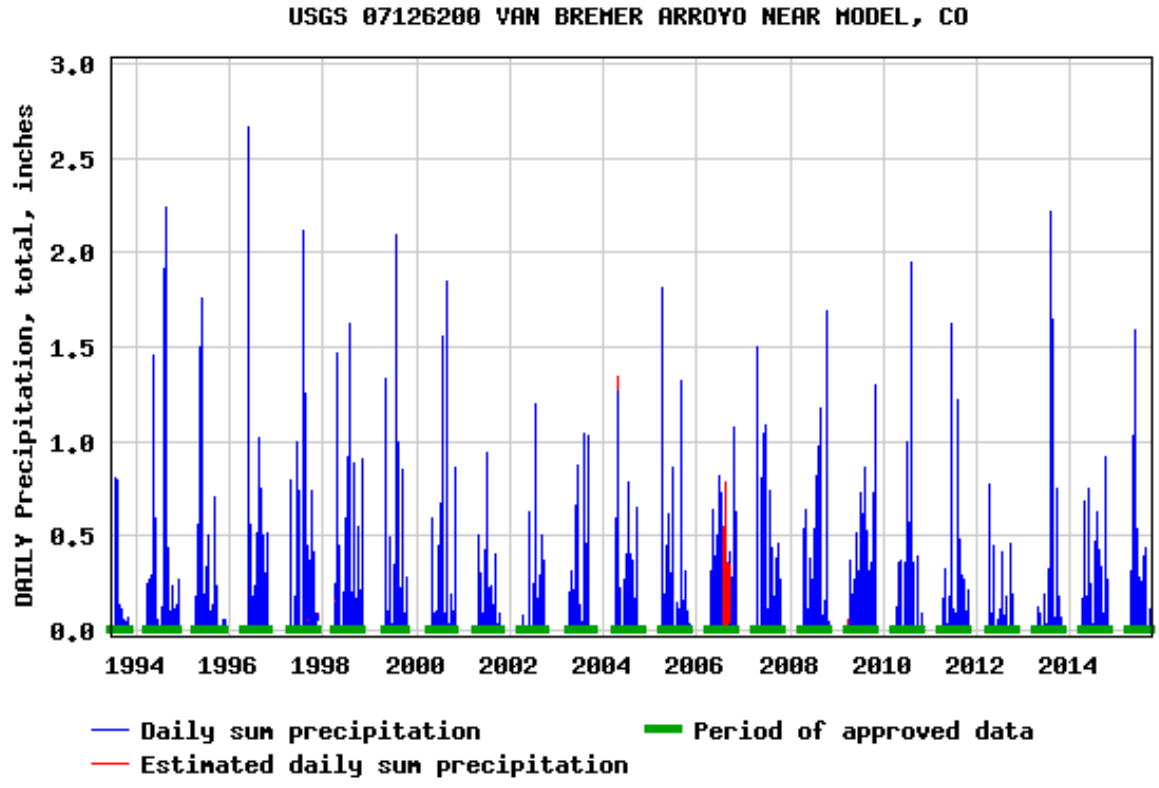


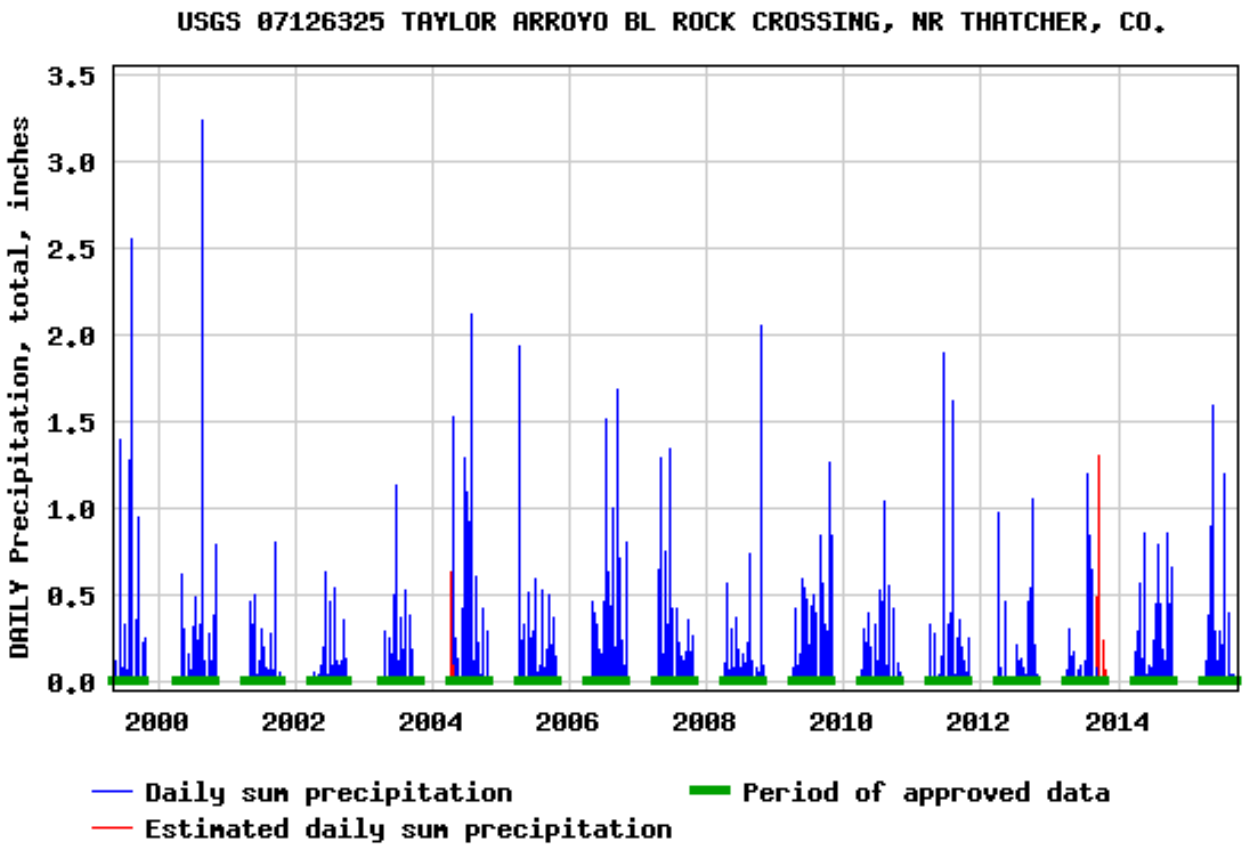

USGS 383159104540701 SULLIVAN PARK MET STATION AT FORT CARSON, CO
DAILY Precipitation, total, inches
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2000
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

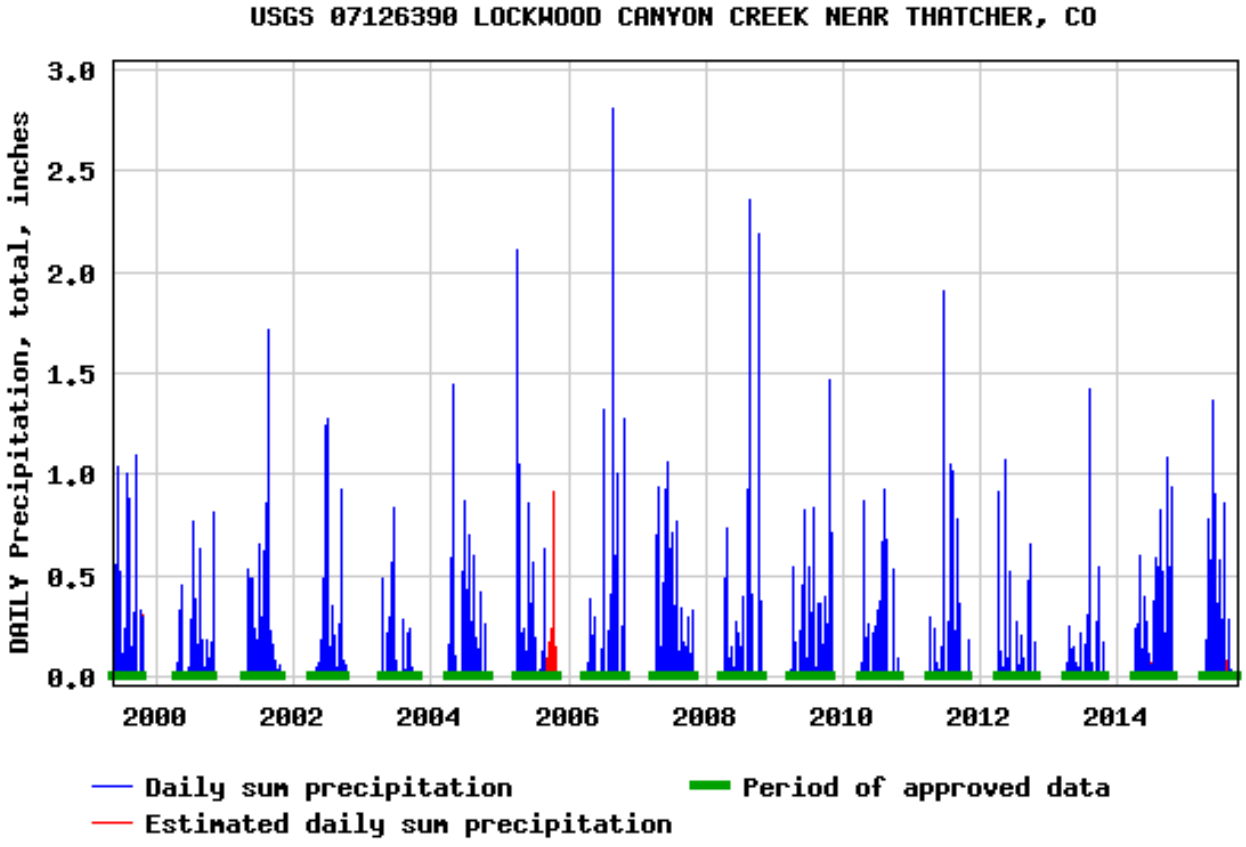

USGS 384053104492001 ROD AND GUN METEOROLOGIC STATION AT FT CARSON, CO
DAILY Precipitation, total, inches
12
10
8
6
4
2
0
2000
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

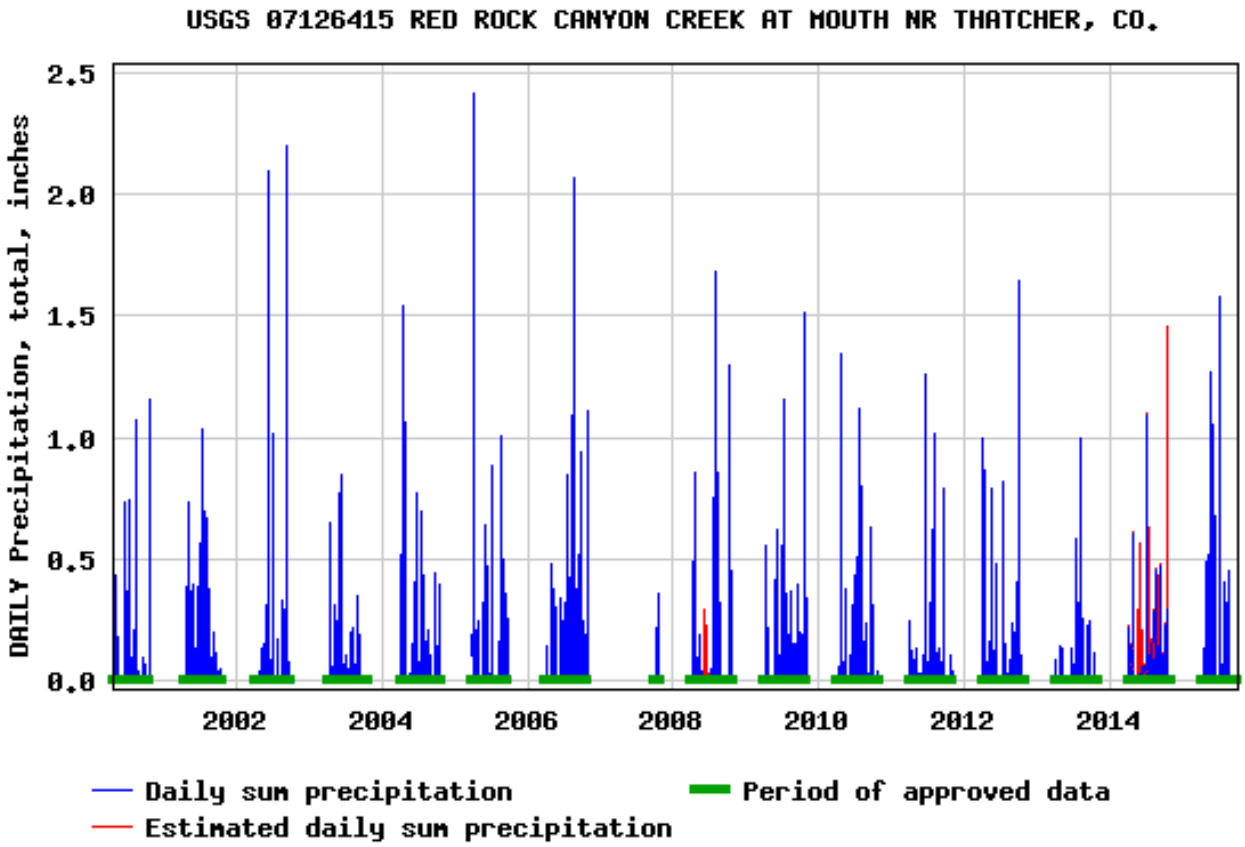
Piñon Canyon Maneuver Site

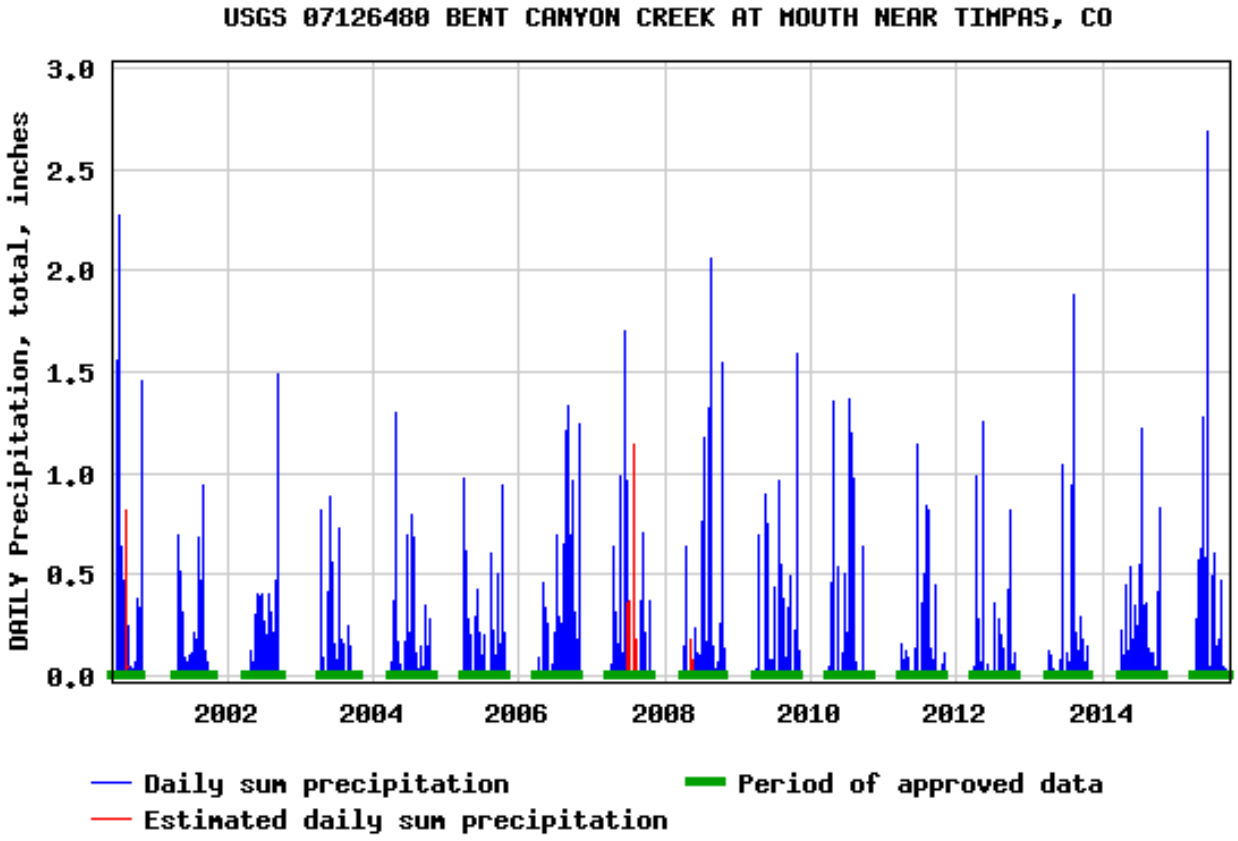


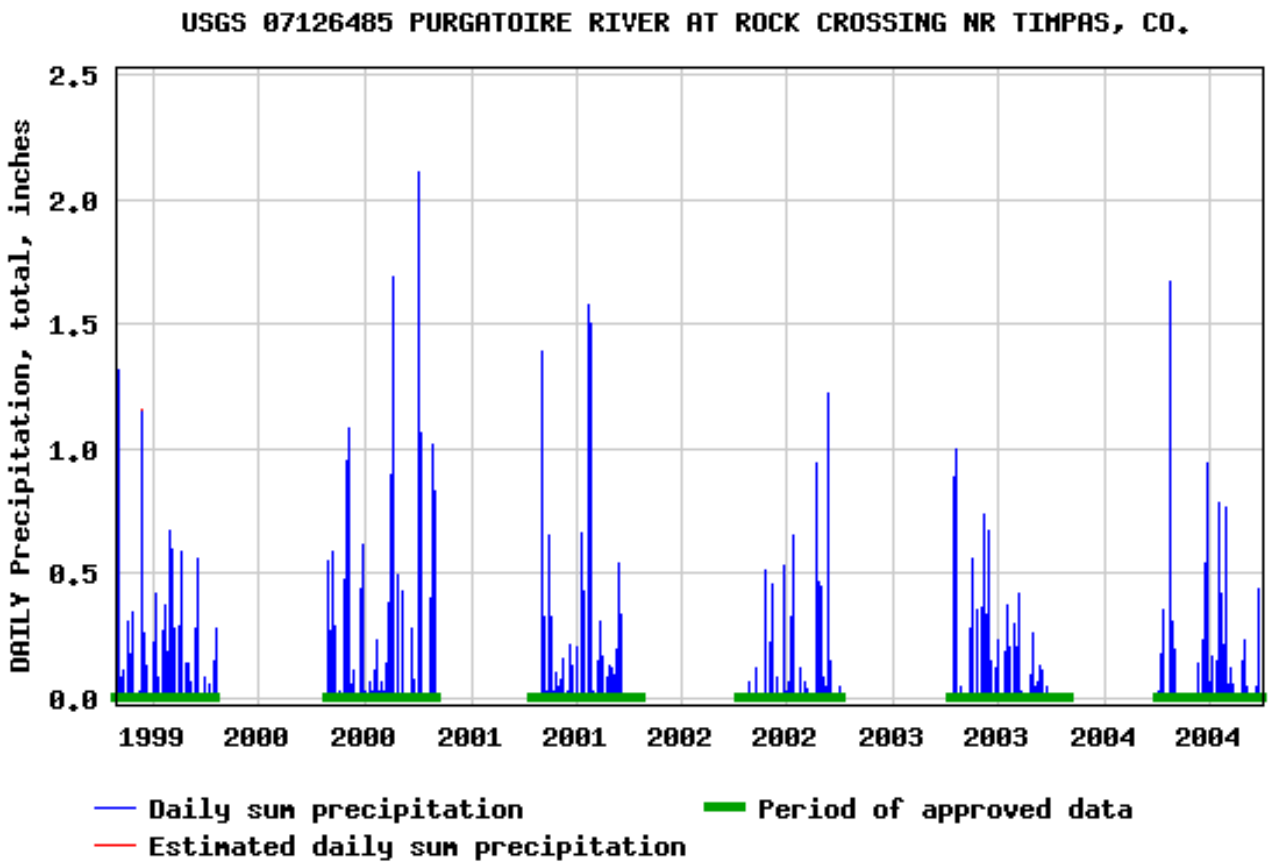


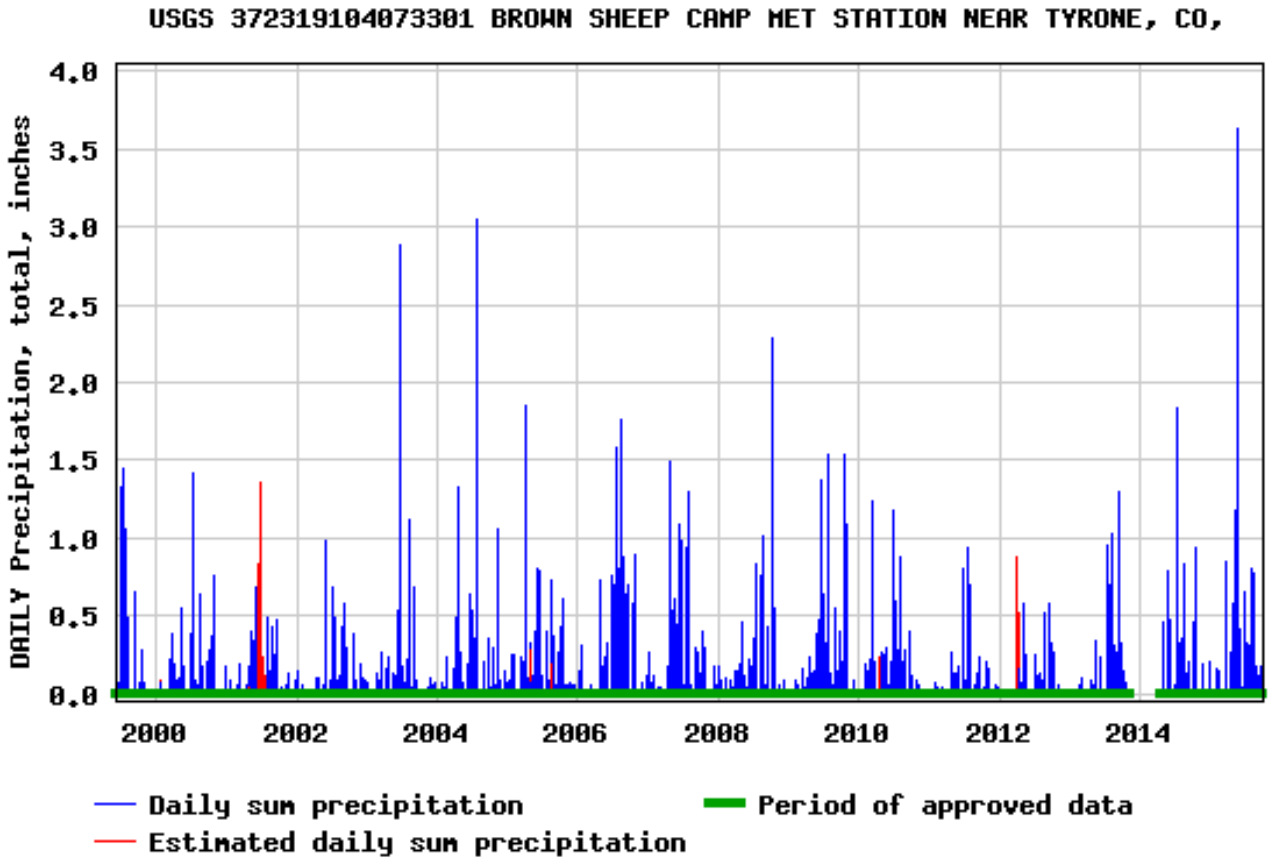

USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
DAILY Precipitation, total, inches
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2000
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

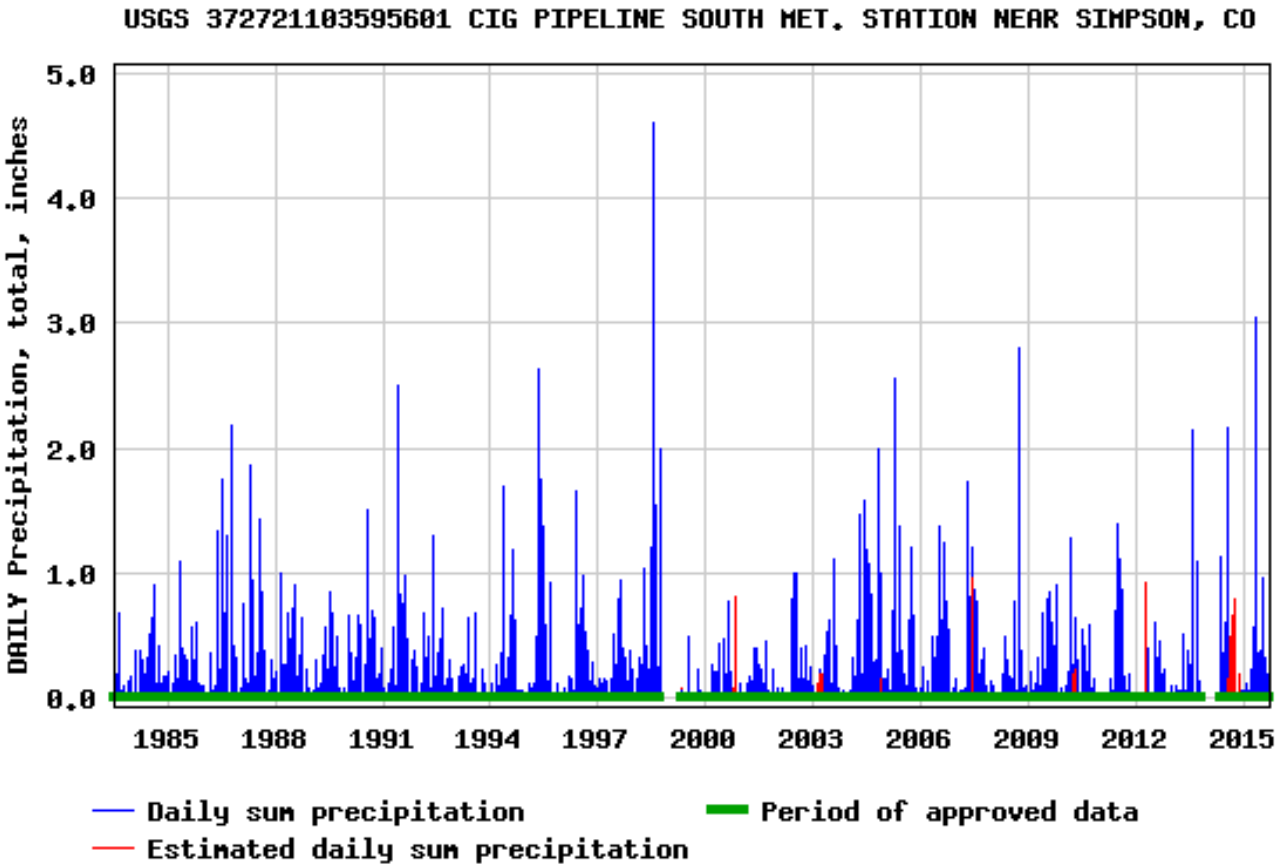

USGS 07126390 LOCKWOOD CANYON CREEK NEAR THATCHER, CO
DAILY Precipitation, total, inches
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2000
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

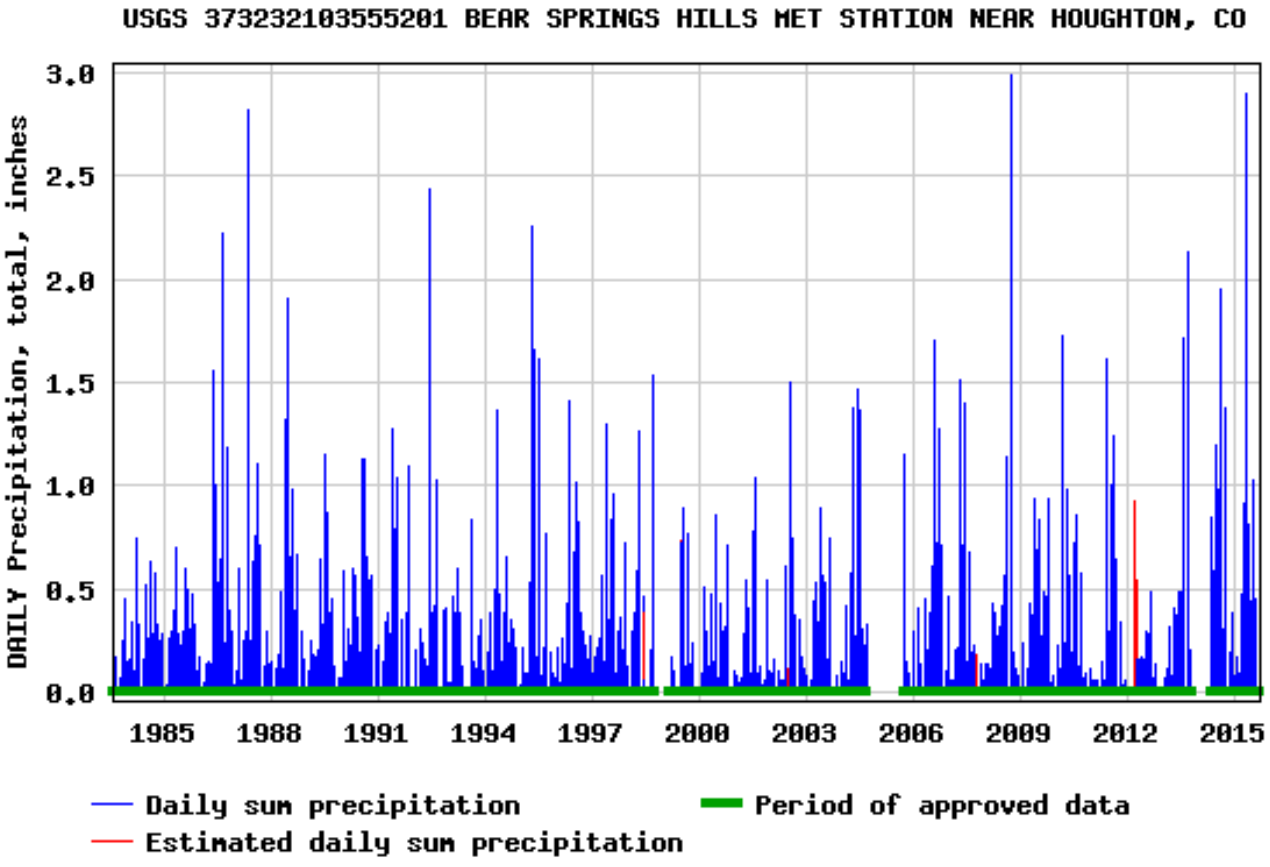

USGS 07126415 RED ROCK CANYON CREEK AT MOUTH NR THATCHER, CO.
DAILY Precipitation, total, inches
2.5
2.0
1.5
1.0
0.5
0.0
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

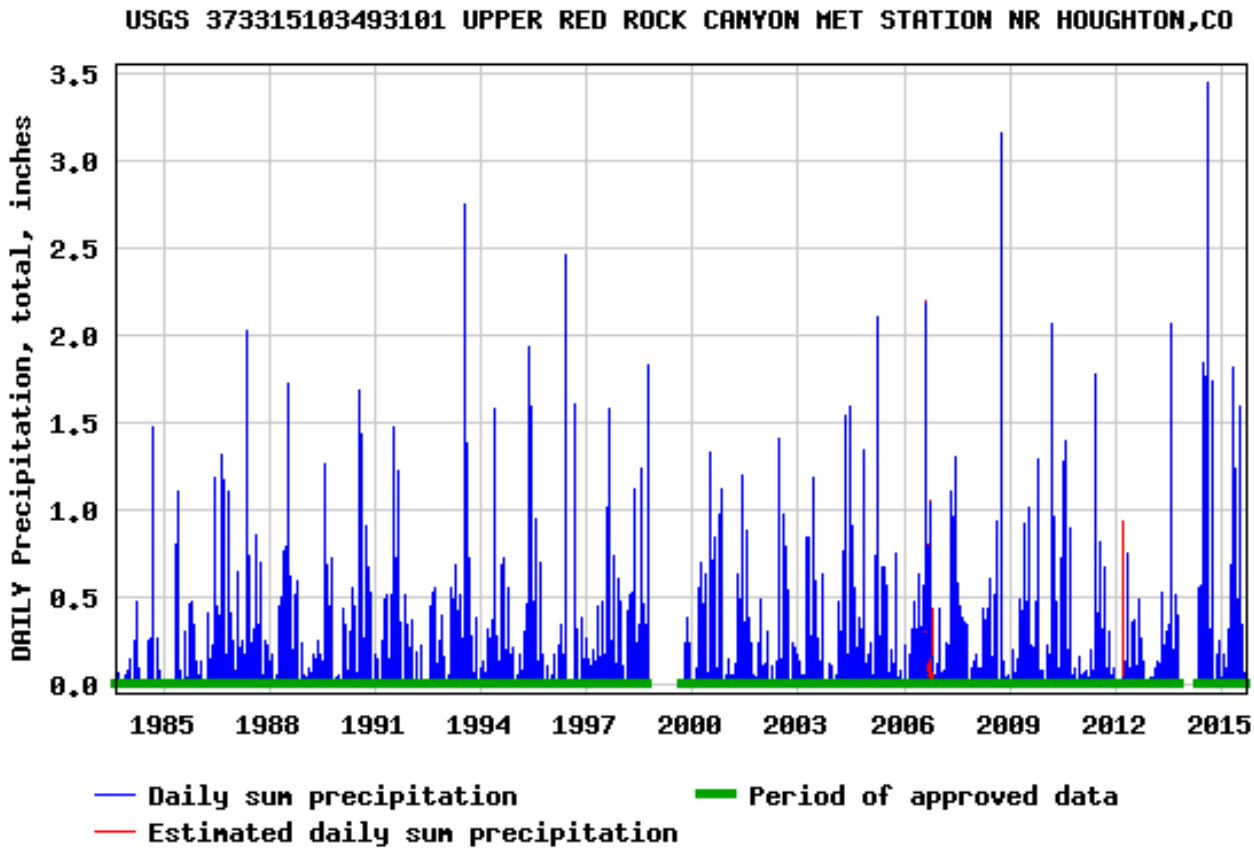

USGS 07126480 BENT CANYON CREEK AT MOUTH NEAR TIMPAS, CO
DAILY Precipitation, total, inches
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

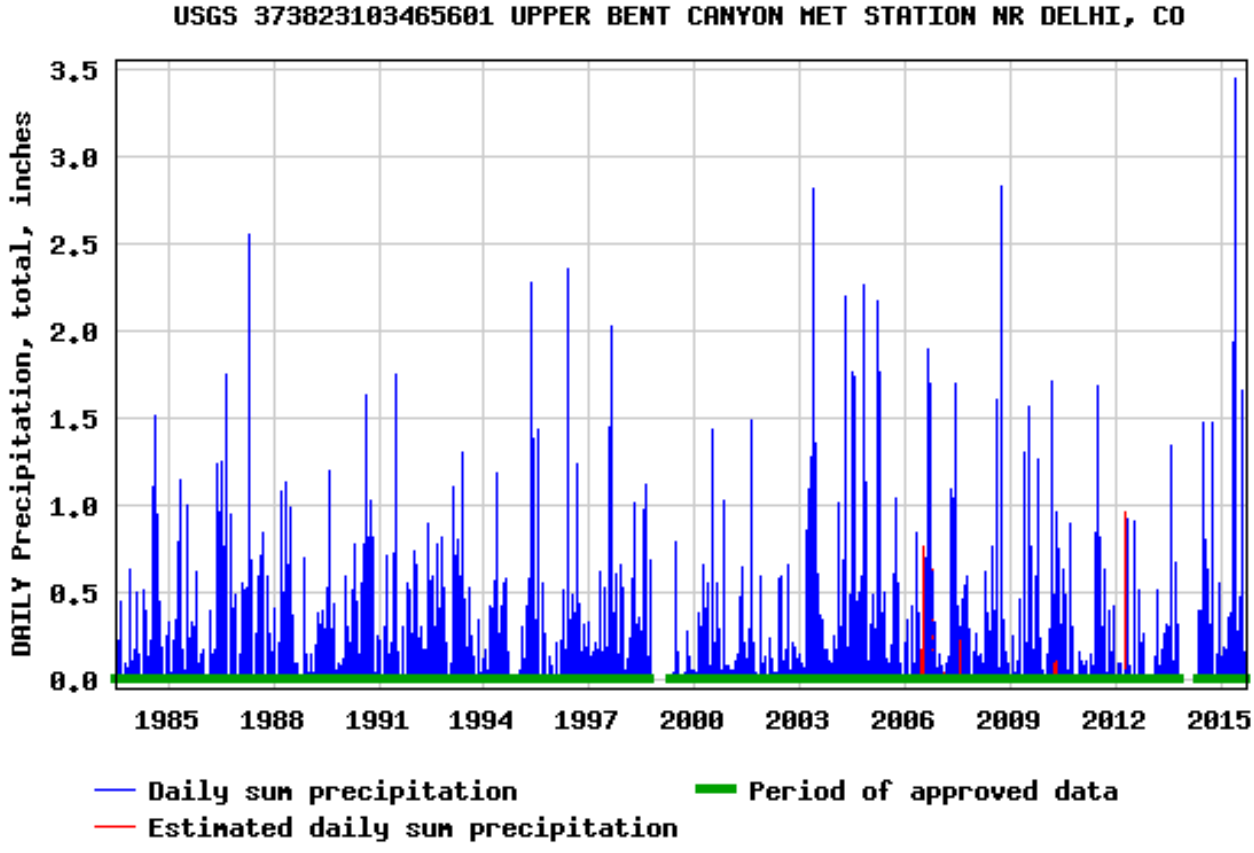

USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CO.
DAILY Precipitation, total, inches
2.5
2.0
1.5
1.0
0.5
0.0
1999
2000
2000
2001
2001
2002
2002
2003
2003
2004
2004
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data


USGS 372319104073301 BROWN SHEEP CAMP MET STATION NEAR TYRONE, CO,
DAILY Precipitation, total, inches
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2000
2002
2004
2006
2008
2010
2012
2014
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data


USGS 372721103595601 CIG PIPELINE SOUTH MET. STATION NEAR SIMPSON, CO
DAILY Precipitation, total, inches
5.0
4.0
3.0
2.0
1.0
0.0
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data


USGS 373232103555201 BEAR SPRINGS HILLS MET STATION NEAR HOUGHTON, CO
DAILY Precipitation, total, inches
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily sum precipitation
Estimated daily sum precipitation
Period of approved data

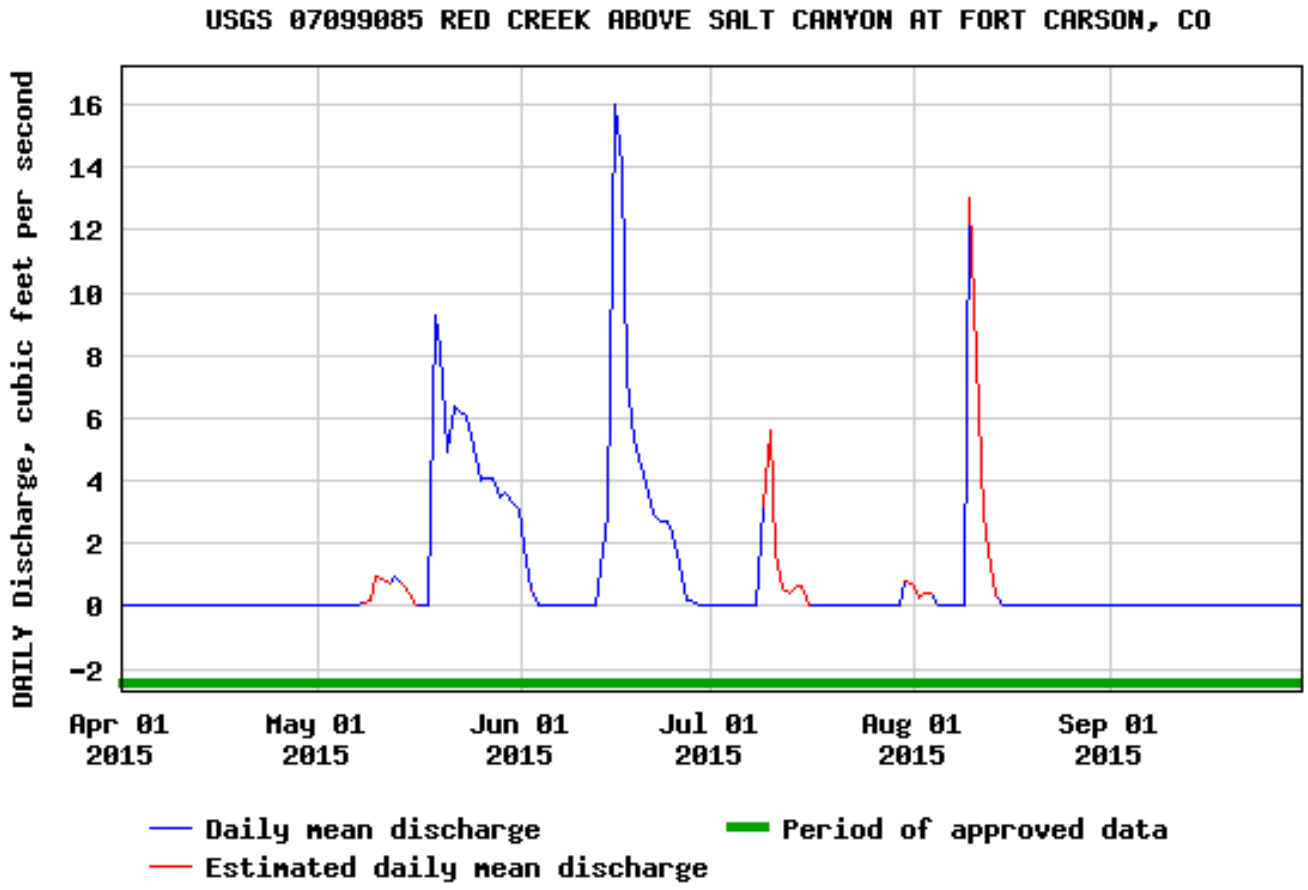

USGS 373315103493101 UPPER RED ROCK CANYON MET STATION NR HOUGHTON,CO
DAILY Precipitation, total, inches
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily sum precipitation
Period of approved data
Estimated daily sum precipitation

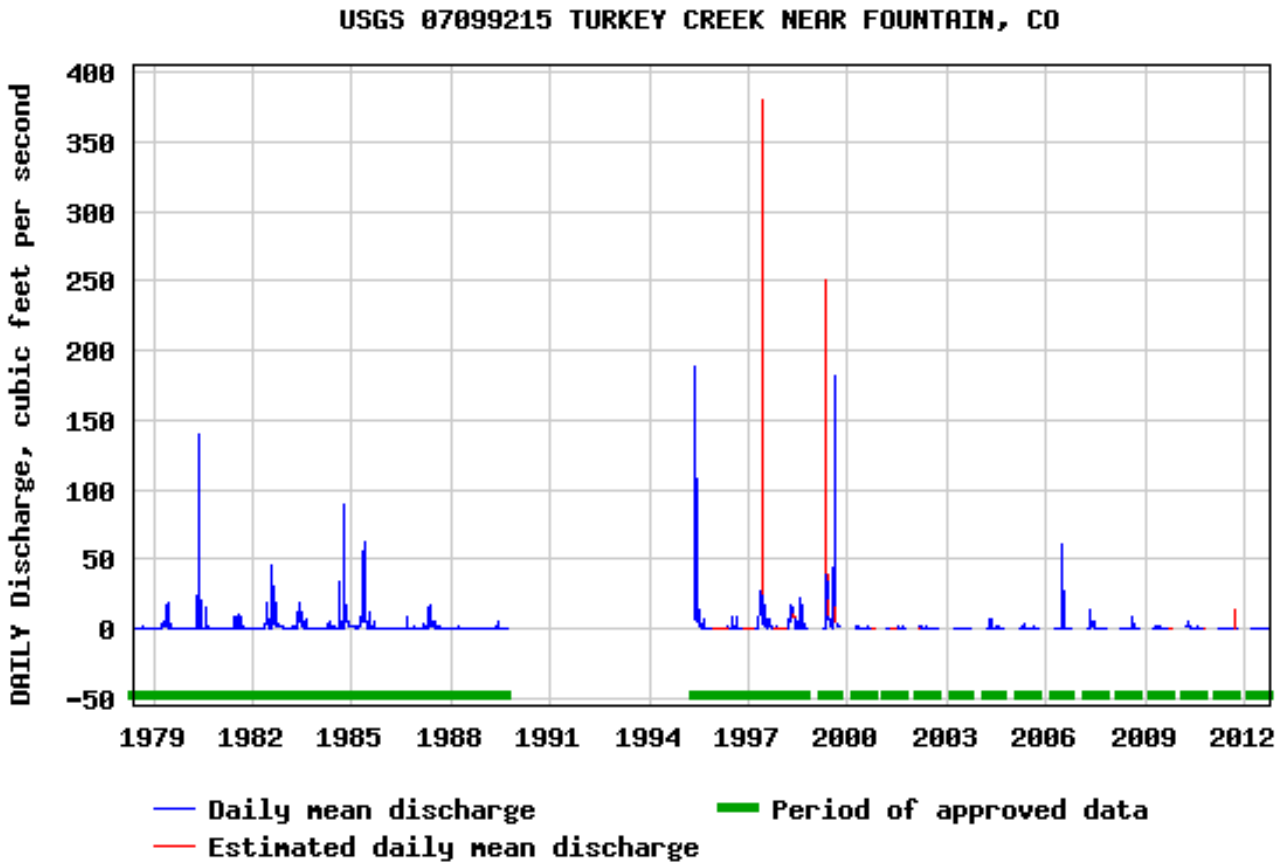

USGS 373823103465601 UPPER BENT CANYON MET STATION NR DELHI, CO
DAILY Precipitation, total, inches
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily sum precipitation
Period of approved data
Estimated daily sum precipitation

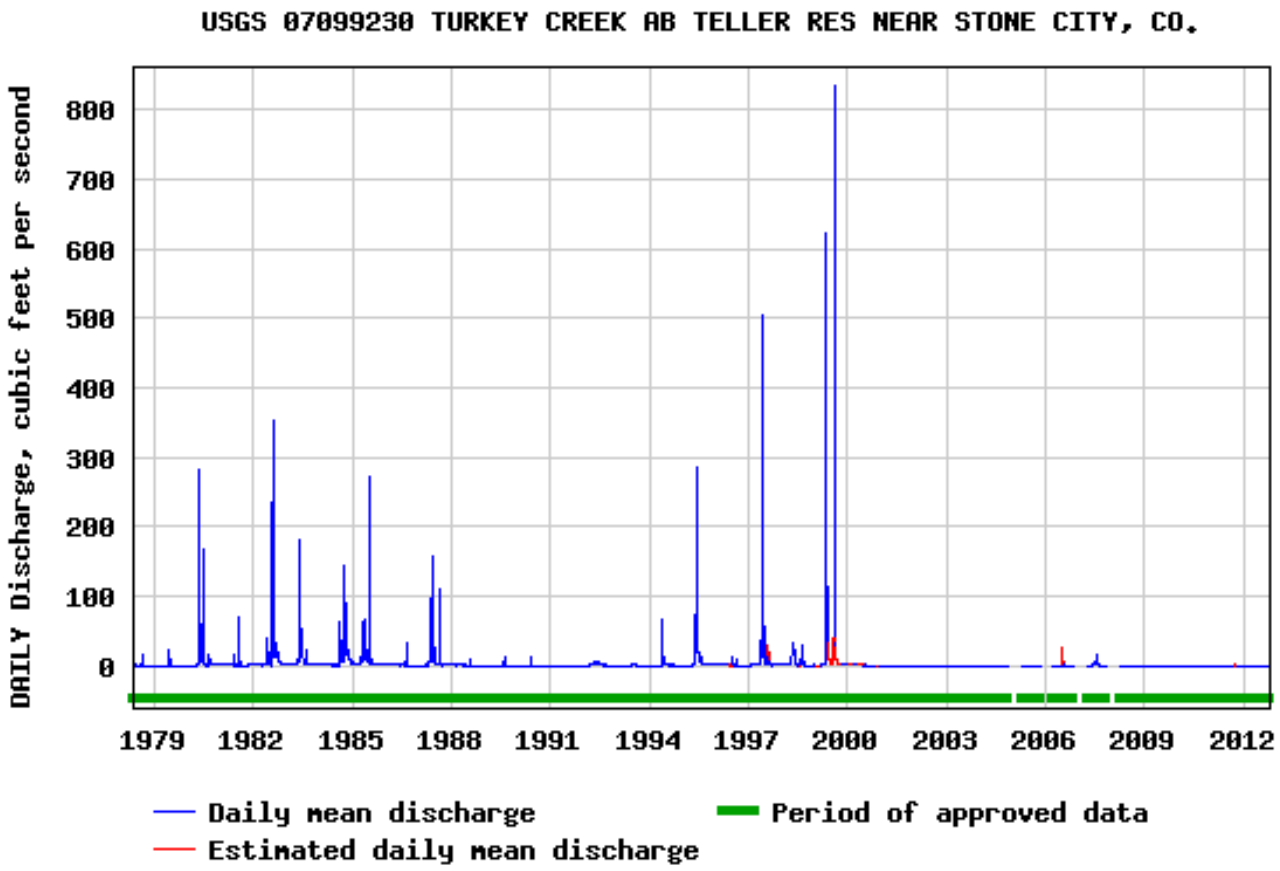
Appendix 2. Daily Mean Discharge for the Period of Record for Selected Sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado

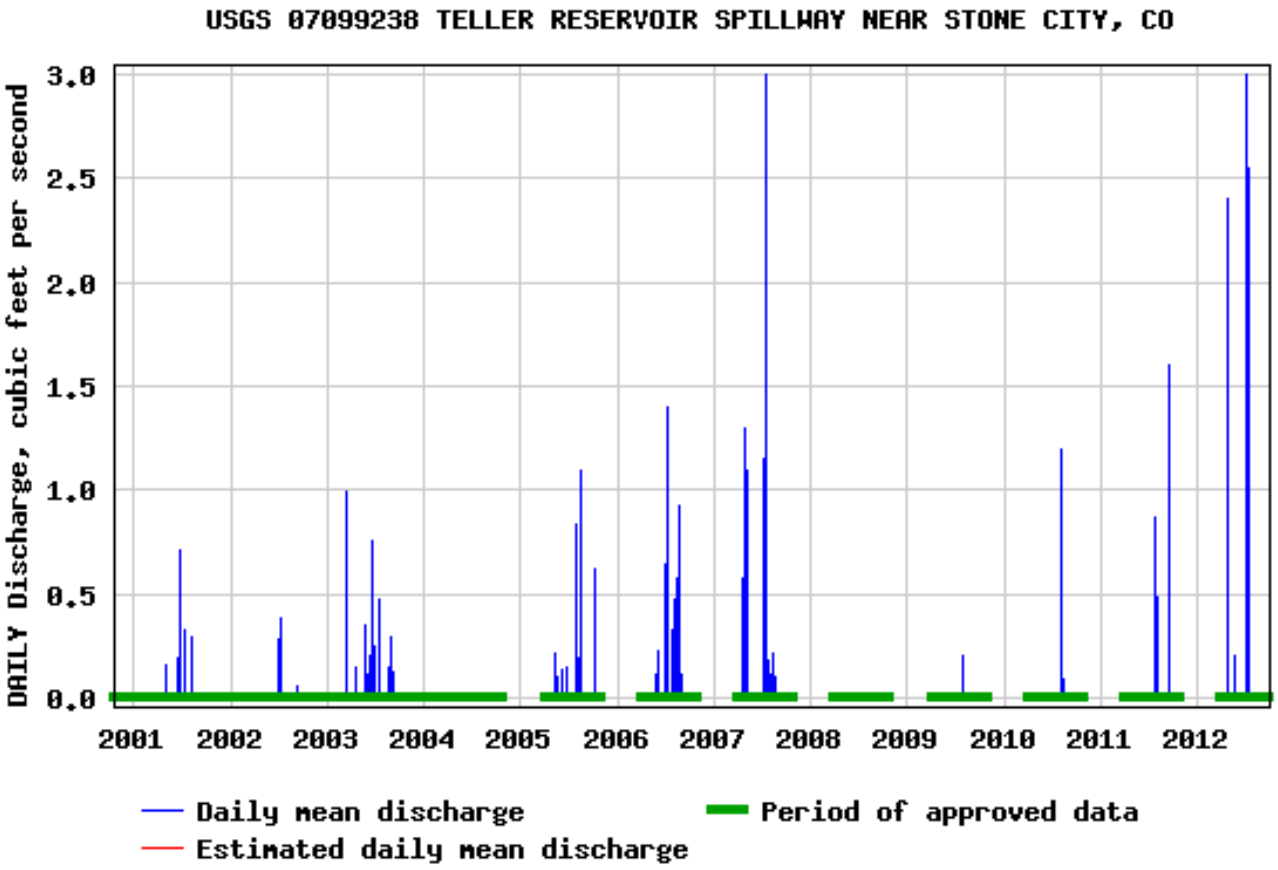
Appendix 2 presents graphs generated from the U.S. Geological Survey National Water Information System website (https://doi.org/10.5066/F7P55KJN). For an explanation of terms refer to the U.S. Geological Survey website at https://wdr.water.usgs.gov/current/documentation.html.

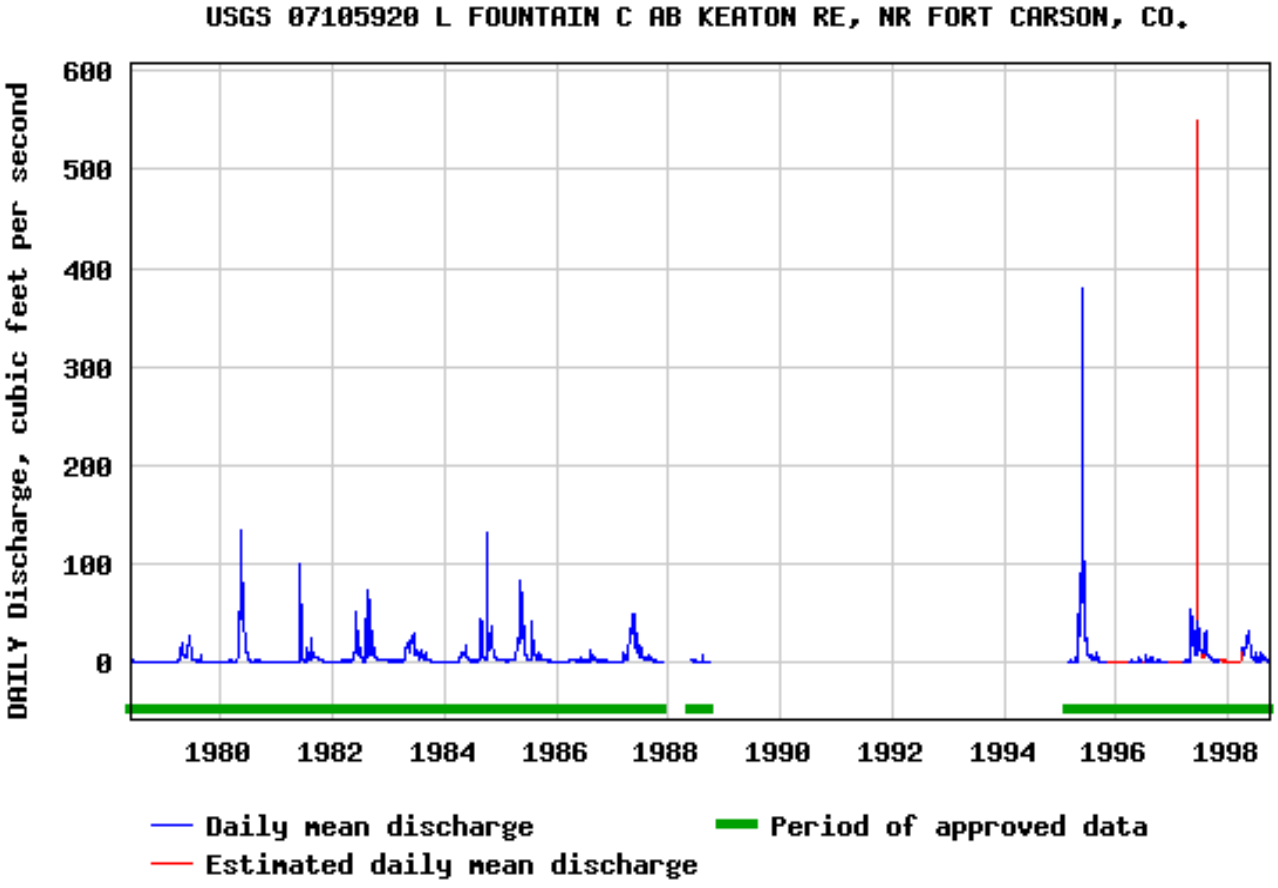
U.S. Army Garrison Fort Carson

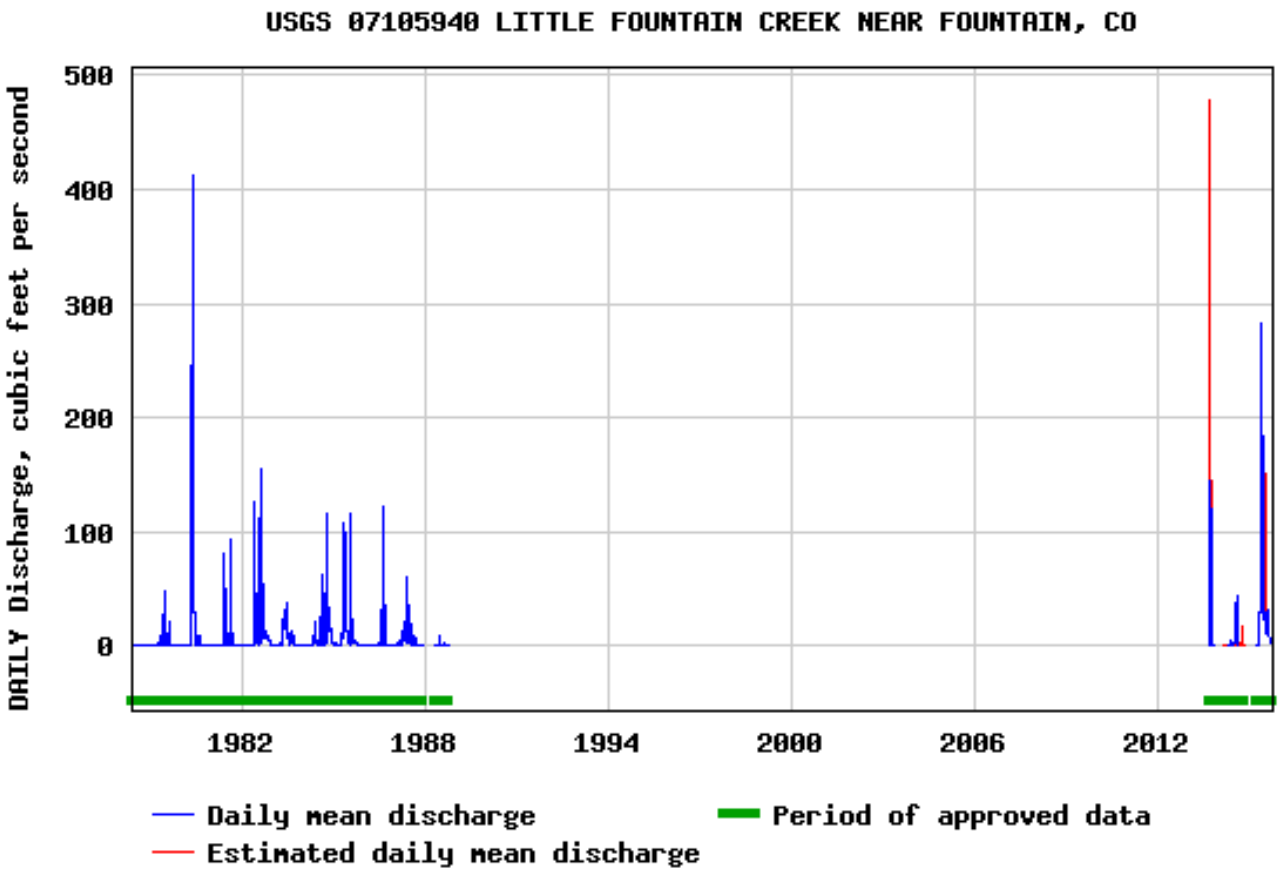


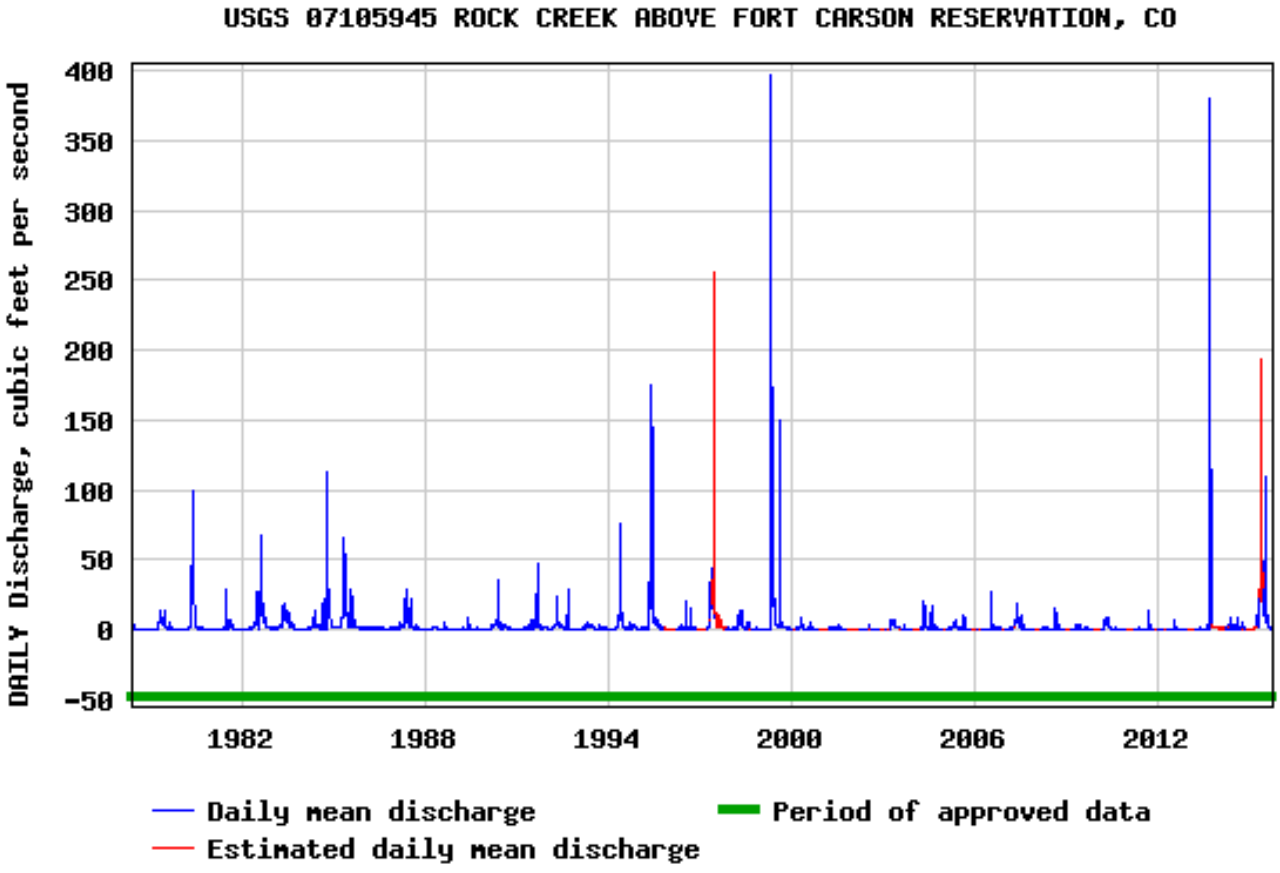

USGS 07099215 TURKEY CREEK NEAR FOUNTAIN, CO
DAILY Discharge, cubic feet per second
400
350
300
250
200
150
100
50
0
-50
1979
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
Daily mean discharge
Estimated daily mean discharge
Period of approved data


USGS 07099230 TURKEY CREEK AB TELLER RES NEAR STONE CITY, CO.
DAILY Discharge, cubic feet per second
800
700
600
500
400
300
200
100
0
1979
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
Daily mean discharge
Estimated daily mean discharge
Period of approved data

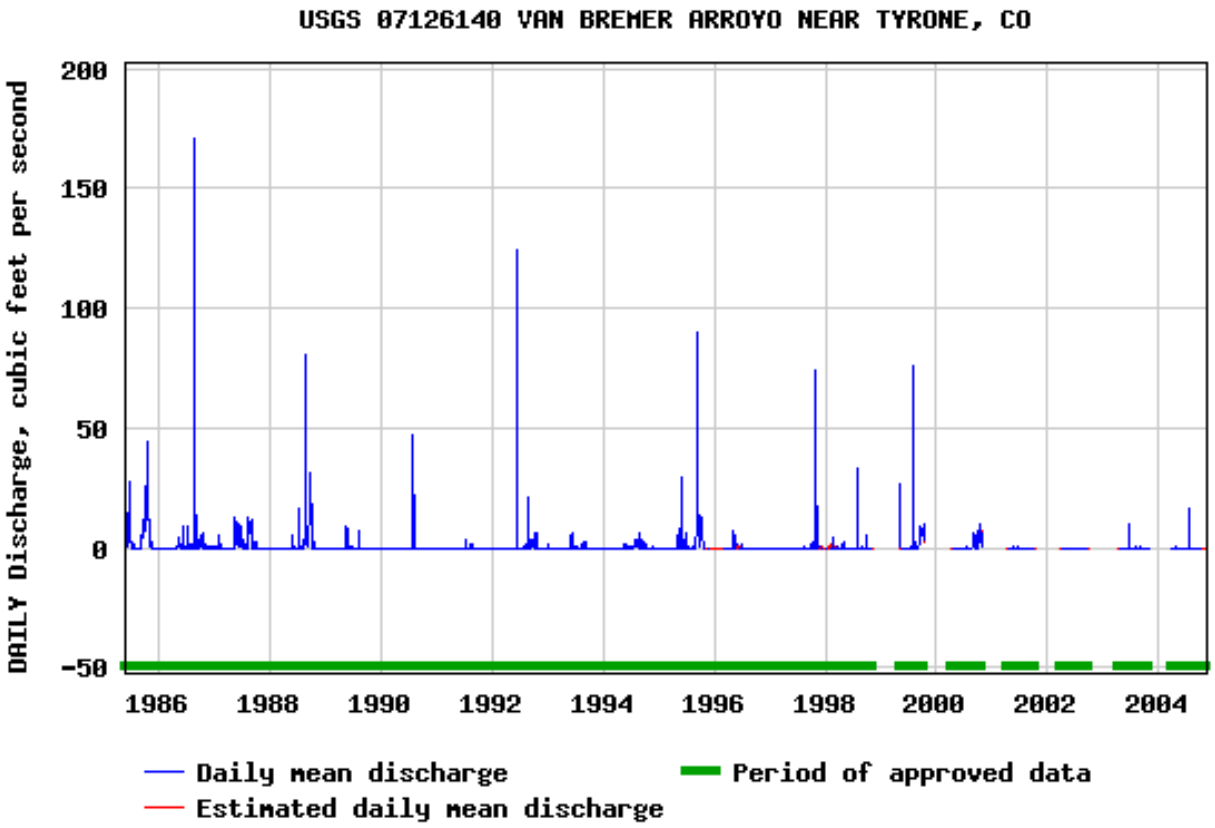

USGS 07099238 TELLER RESERVOIR SPILLWAY NEAR STONE CITY, CO
DAILY Discharge, cubic feet per second
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Daily mean discharge
Estimated daily mean discharge
Period of approved data

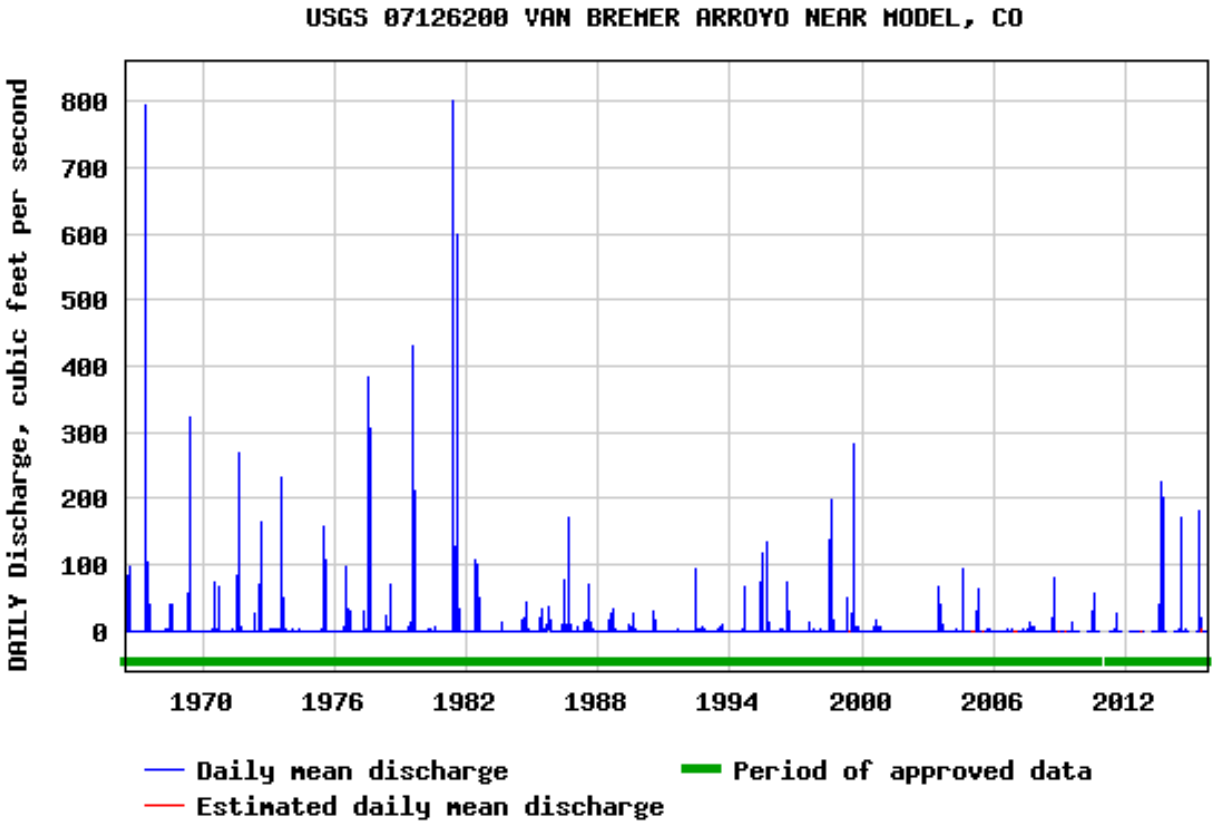

USGS 07105920 L FOUNTAIN C AB KEATON RE, NR FORT CARSON, CO.
DAILY Discharge, cubic feet per second
600
500
400
300
200
100
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
Daily mean discharge
Estimated daily mean discharge
Period of approved data

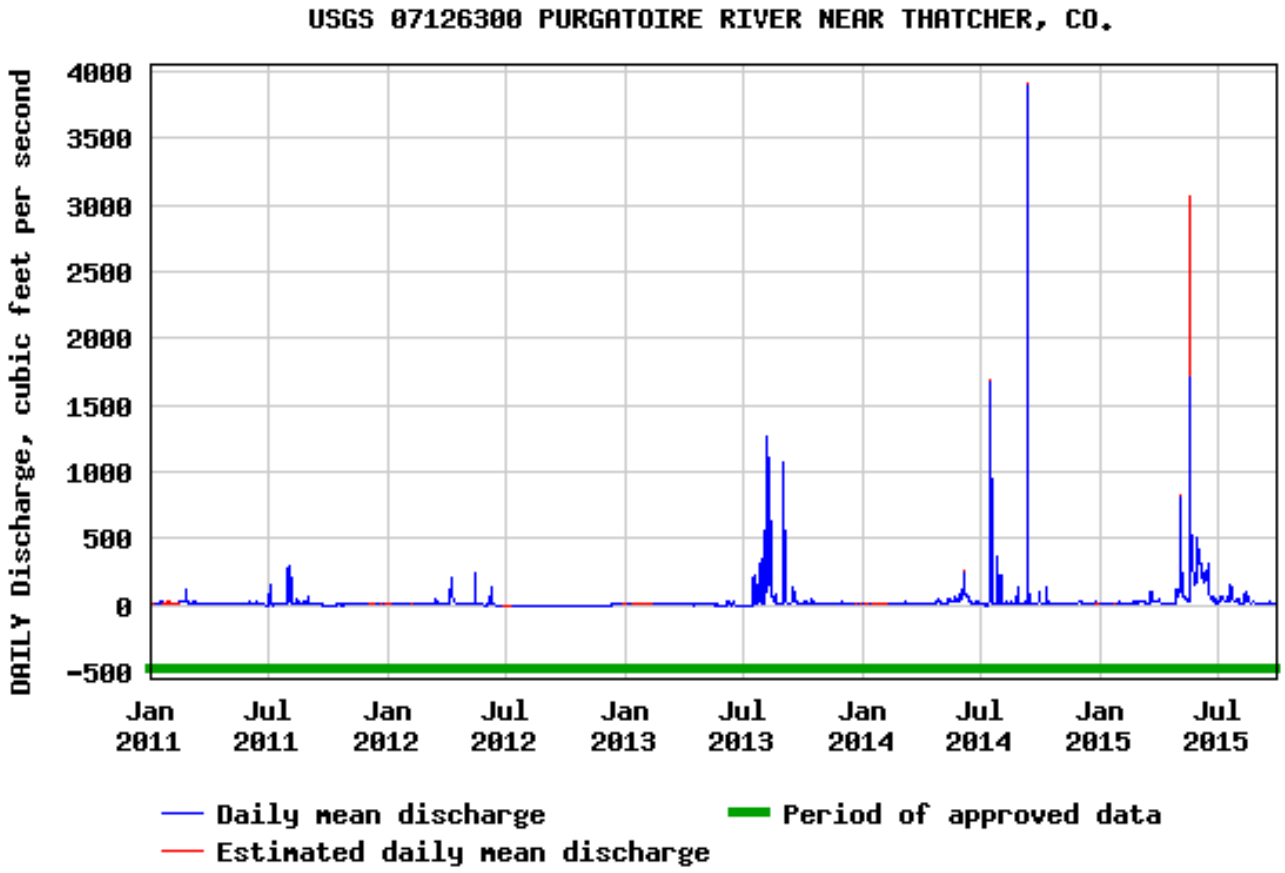

USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
DAILY Discharge, cubic feet per second
500
400
300
200
100
0
1982
1988
1994
2000
2006
2012
Daily mean discharge
Estimated daily mean discharge
Period of approved data

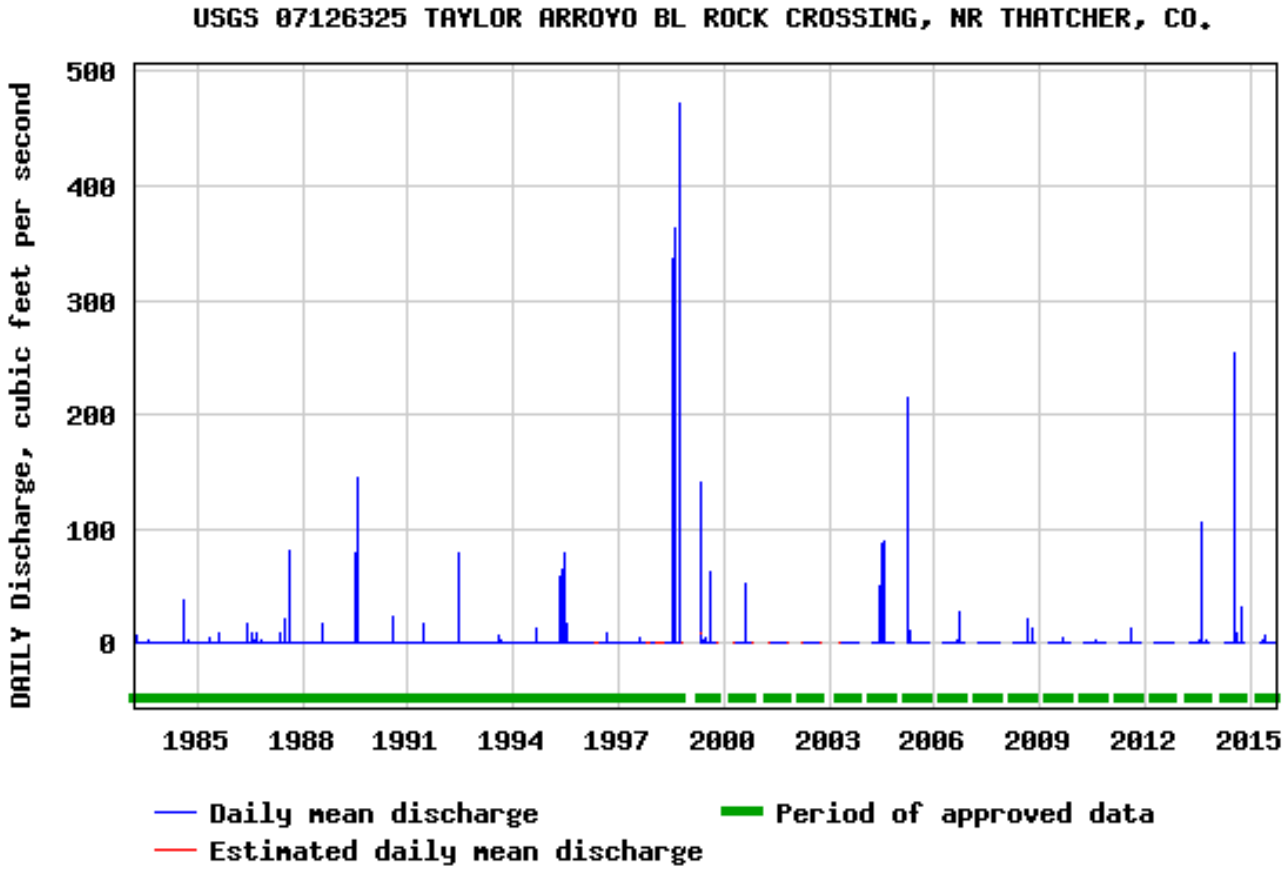

USGS 07105945 ROCK CREEK ABOVE FORT CARSON RESERVATION, CO
DAILY Discharge, cubic feet per second
400
350
300
250
200
150
100
50
0
-50
1982
1988
1994
2000
2006
2012
Daily mean discharge
Estimated daily mean discharge
Period of approved data

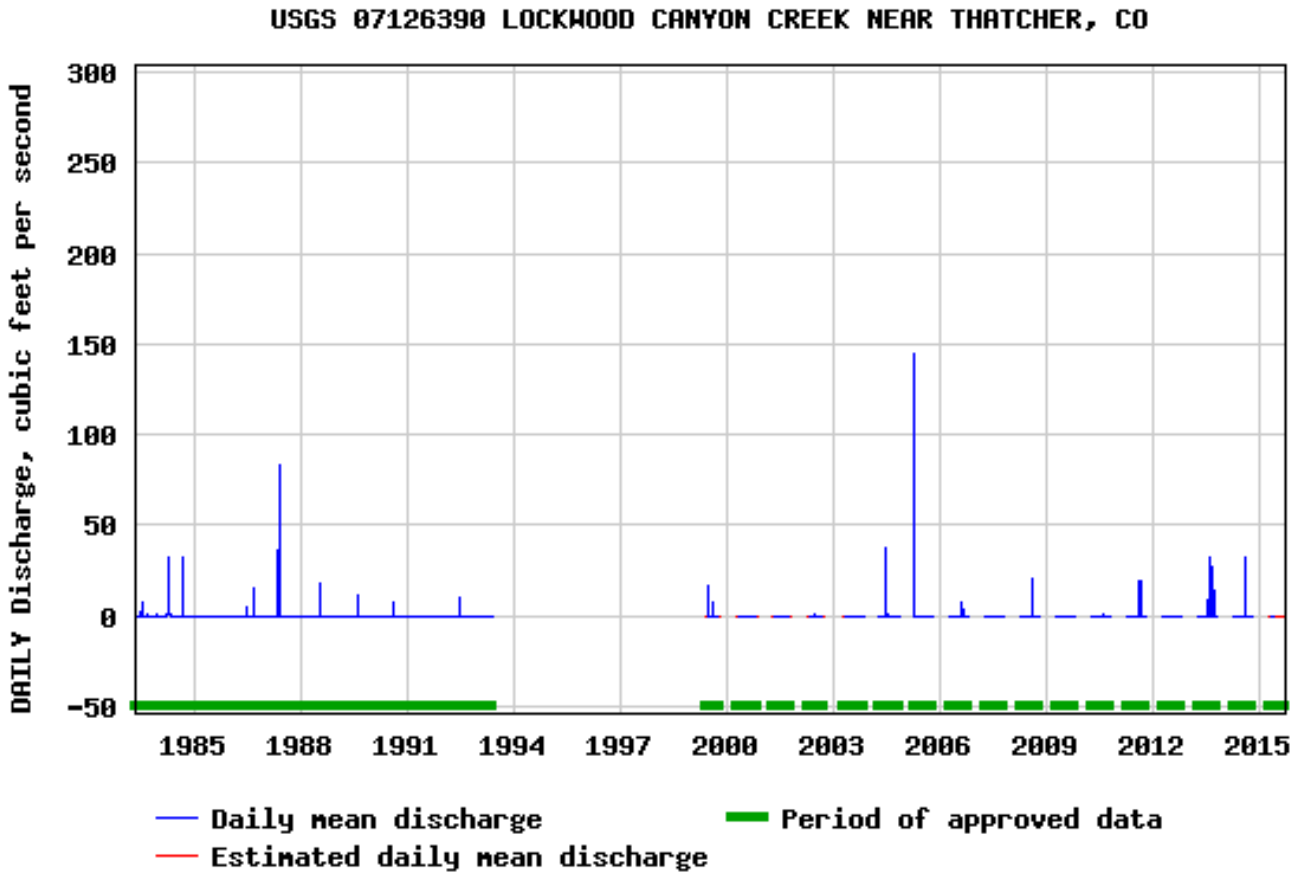
Piñon Canyon Maneuver Site

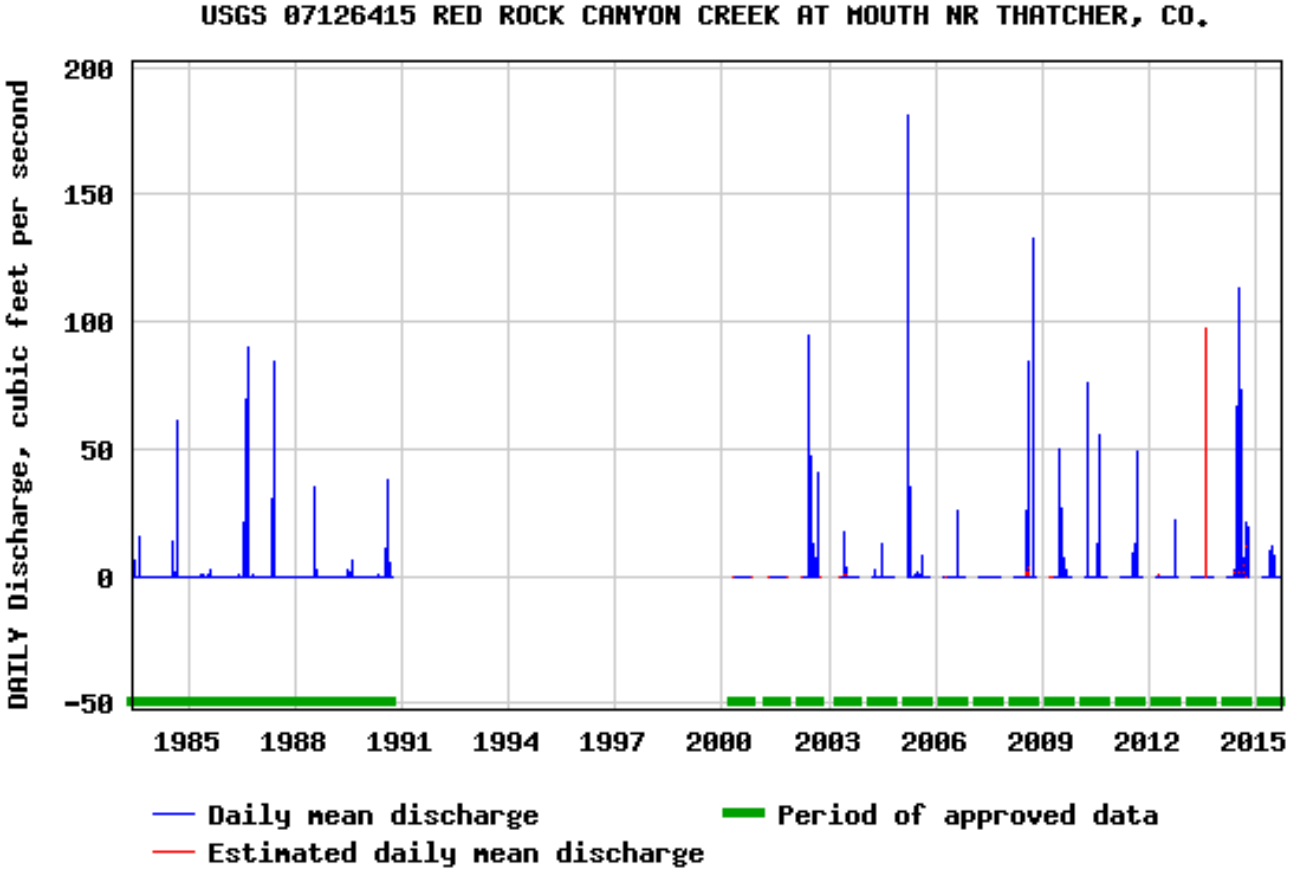


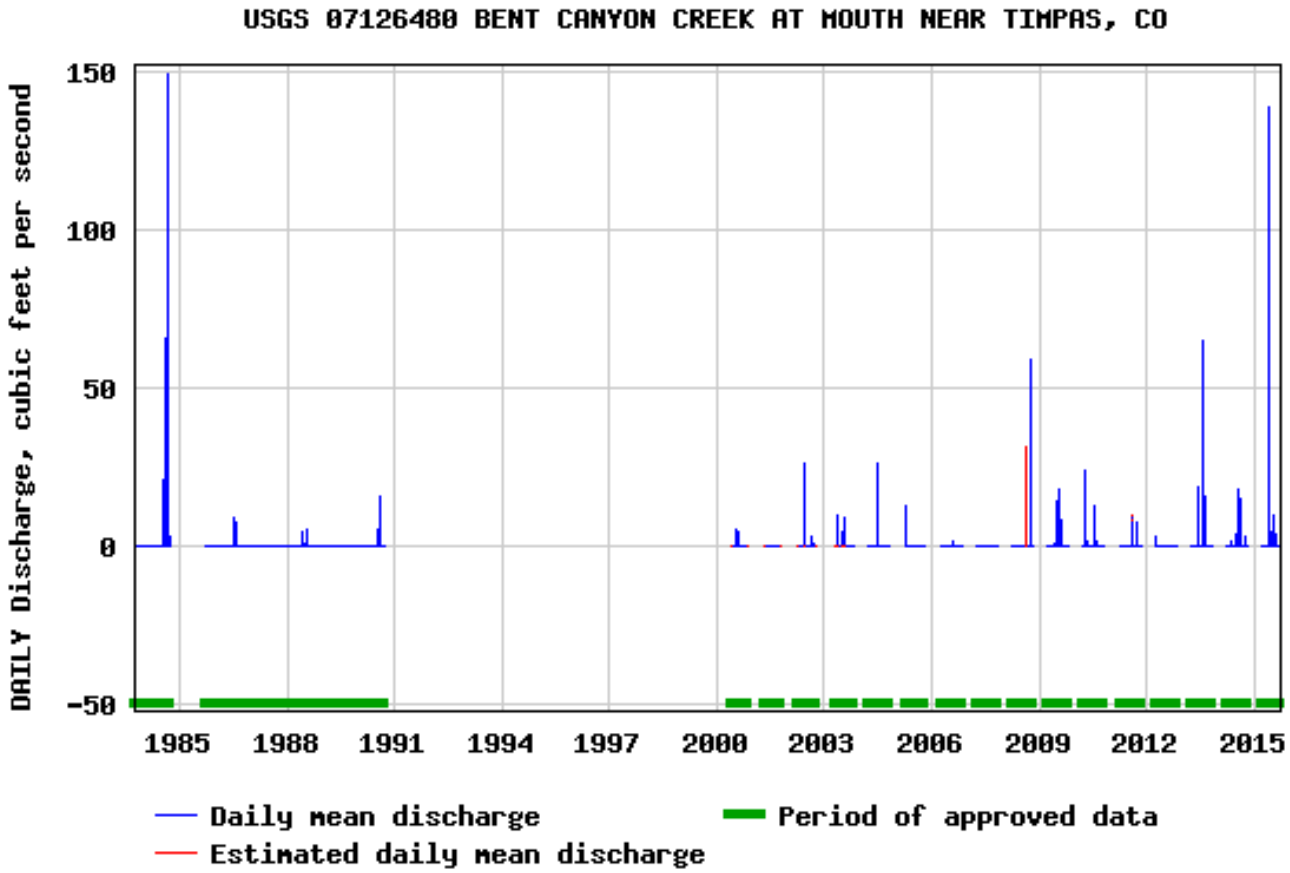


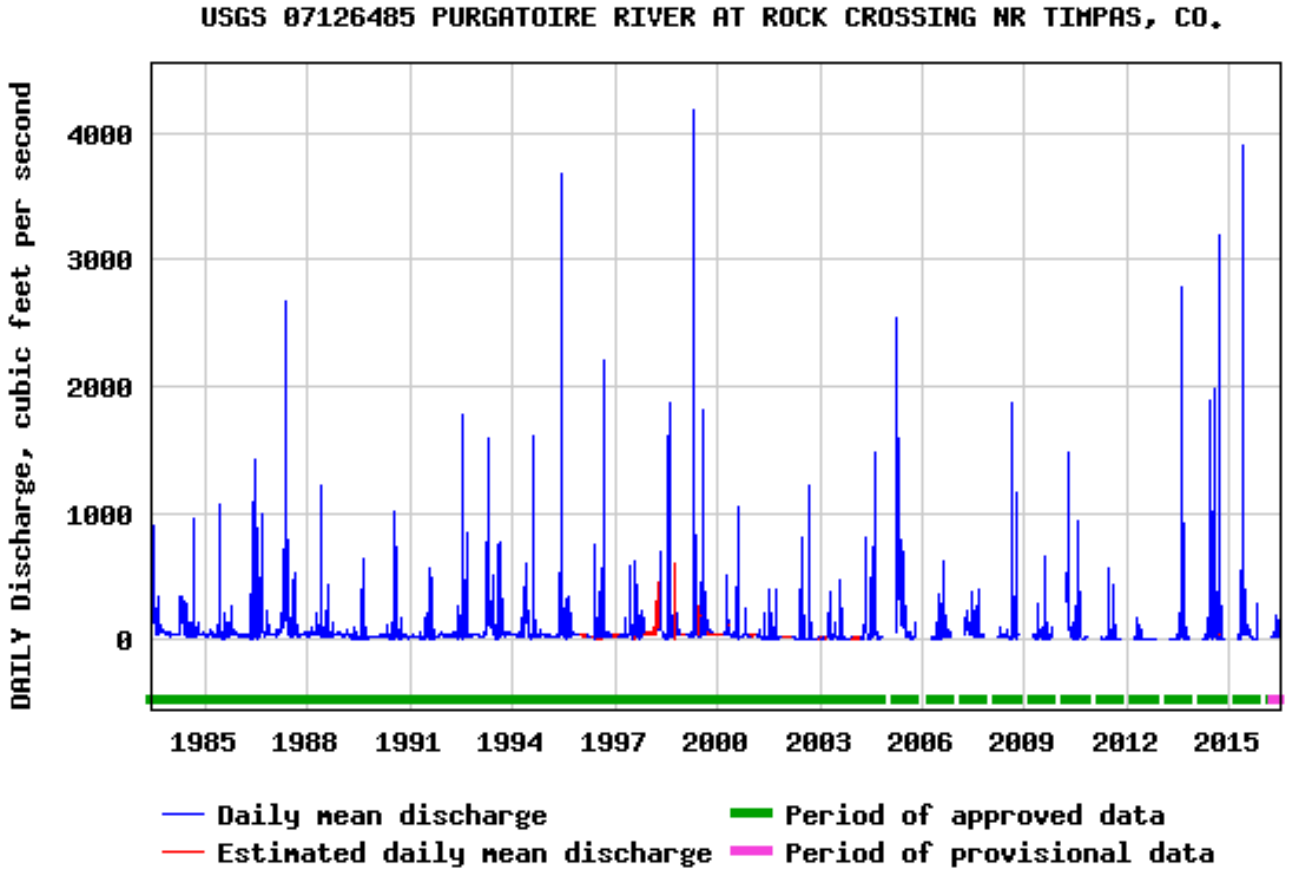

USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
DAILY Discharge, cubic feet per second
4000
3500
3000
2500
2000
1500
1000
500
0
-500
Jan 2011
Jul 2011
Jan 2012
Jul 2012
Jan 2013
Jul 2013
Jan 2014
Jul 2014
Jan 2015
Jul 2015
Daily mean discharge
Estimated daily mean discharge
Period of approved data


USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
DAILY Discharge, cubic feet per second
500
400
300
200
100
0
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean discharge
Estimated daily mean discharge
Period of approved data


USGS 07126390 LOCKWOOD CANYON CREEK NEAR THATCHER, CO
DAILY Discharge, cubic feet per second
300
250
200
150
100
50
0
-50
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean discharge
Estimated daily mean discharge
Period of approved data


USGS 07126415 RED ROCK CANYON CREEK AT MOUTH NR THATCHER, CO.
DAILY Discharge, cubic feet per second
200
150
100
50
0
-50
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean discharge
Estimated daily mean discharge
Period of approved data

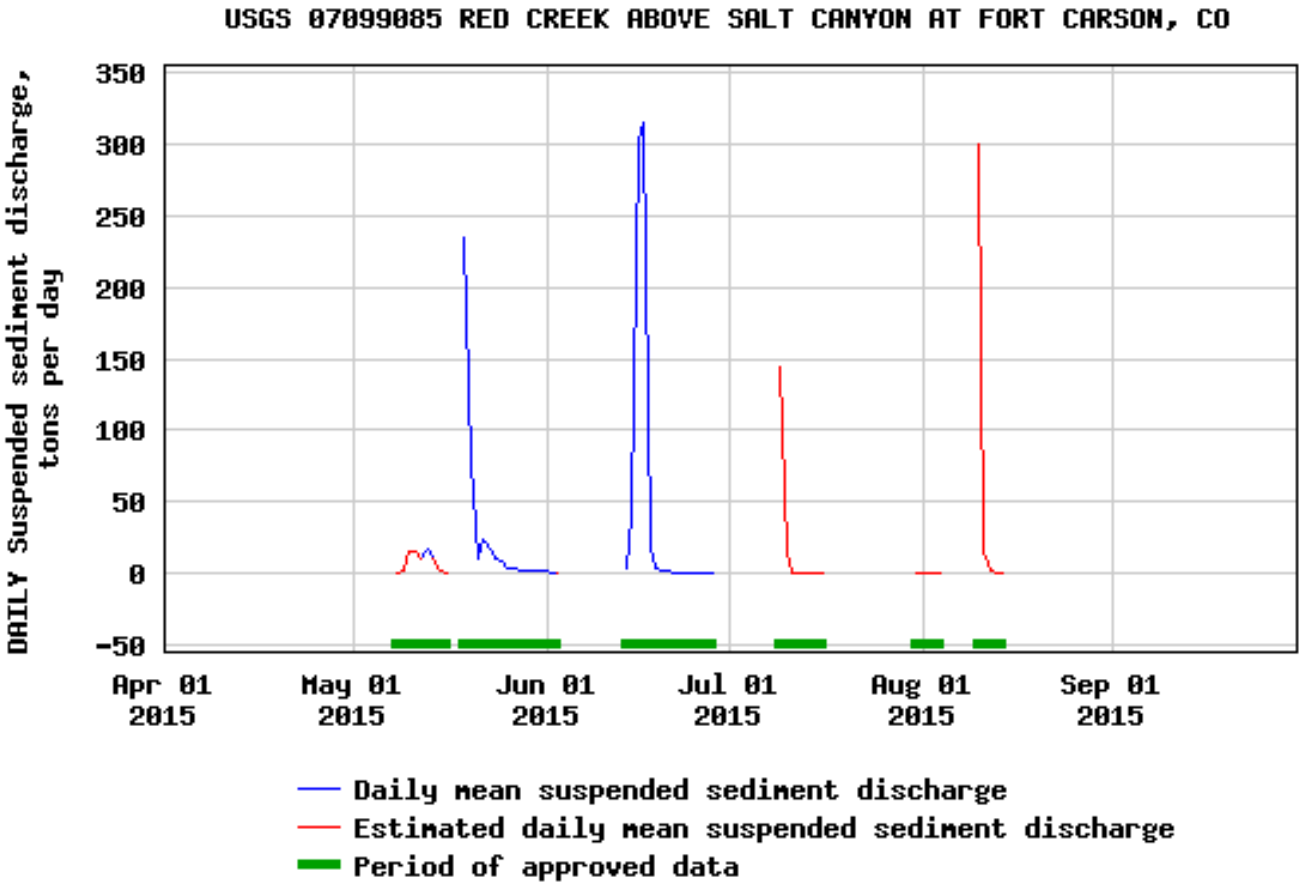

USGS 07126480 BENT CANYON CREEK AT MOUTH NEAR TIMPAS, CO
DAILY Discharge, cubic feet per second
150
100
50
0
-50
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean discharge
Estimated daily mean discharge
Period of approved data

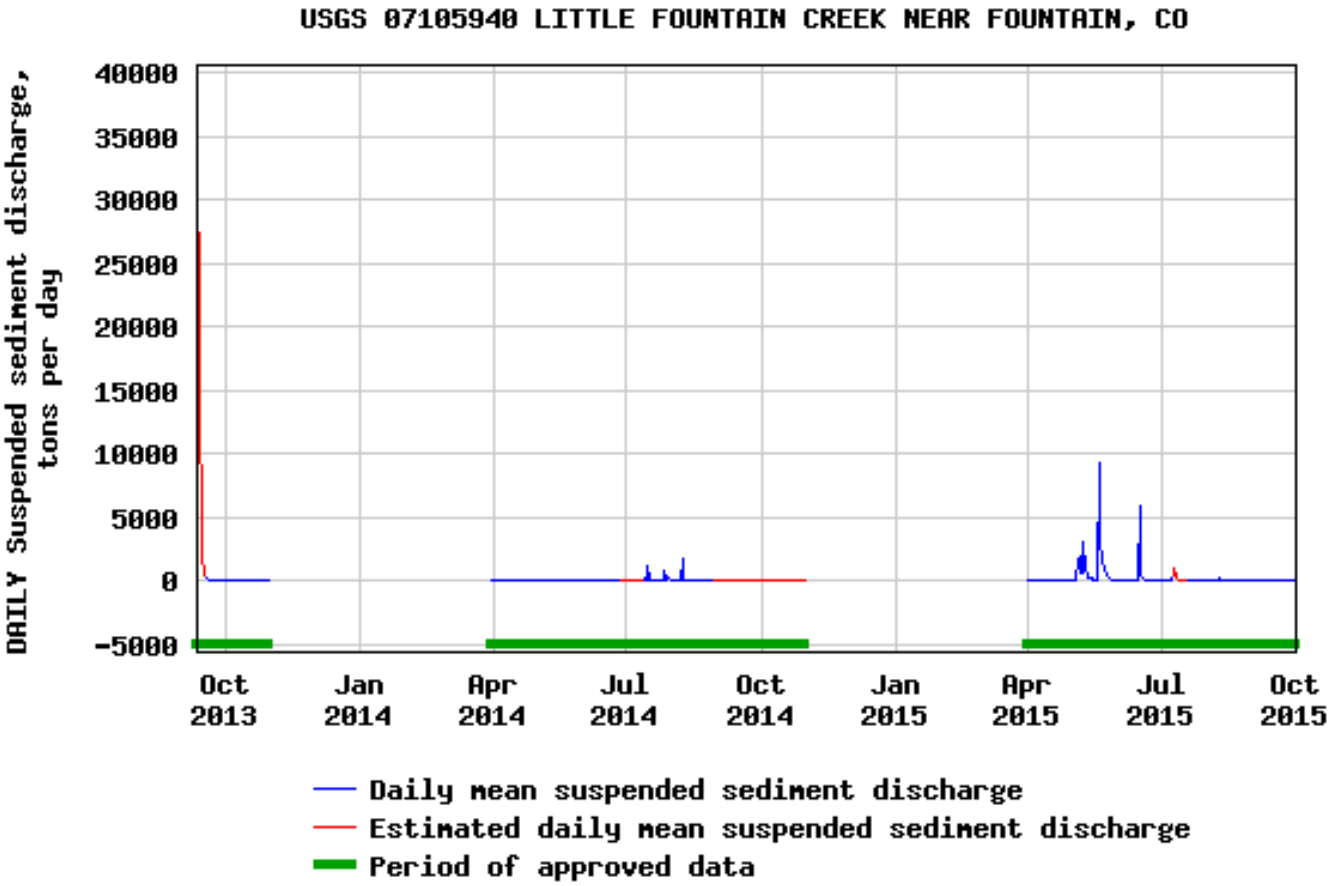

USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CO.
DAILY Discharge, cubic feet per second
4000
3000
2000
1000
0
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean discharge
Estimated daily mean discharge
Period of approved data
Period of provisional data

Appendix 3. Daily Mean Suspended-Sediment Discharge for the Period of Record for Selected Sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado

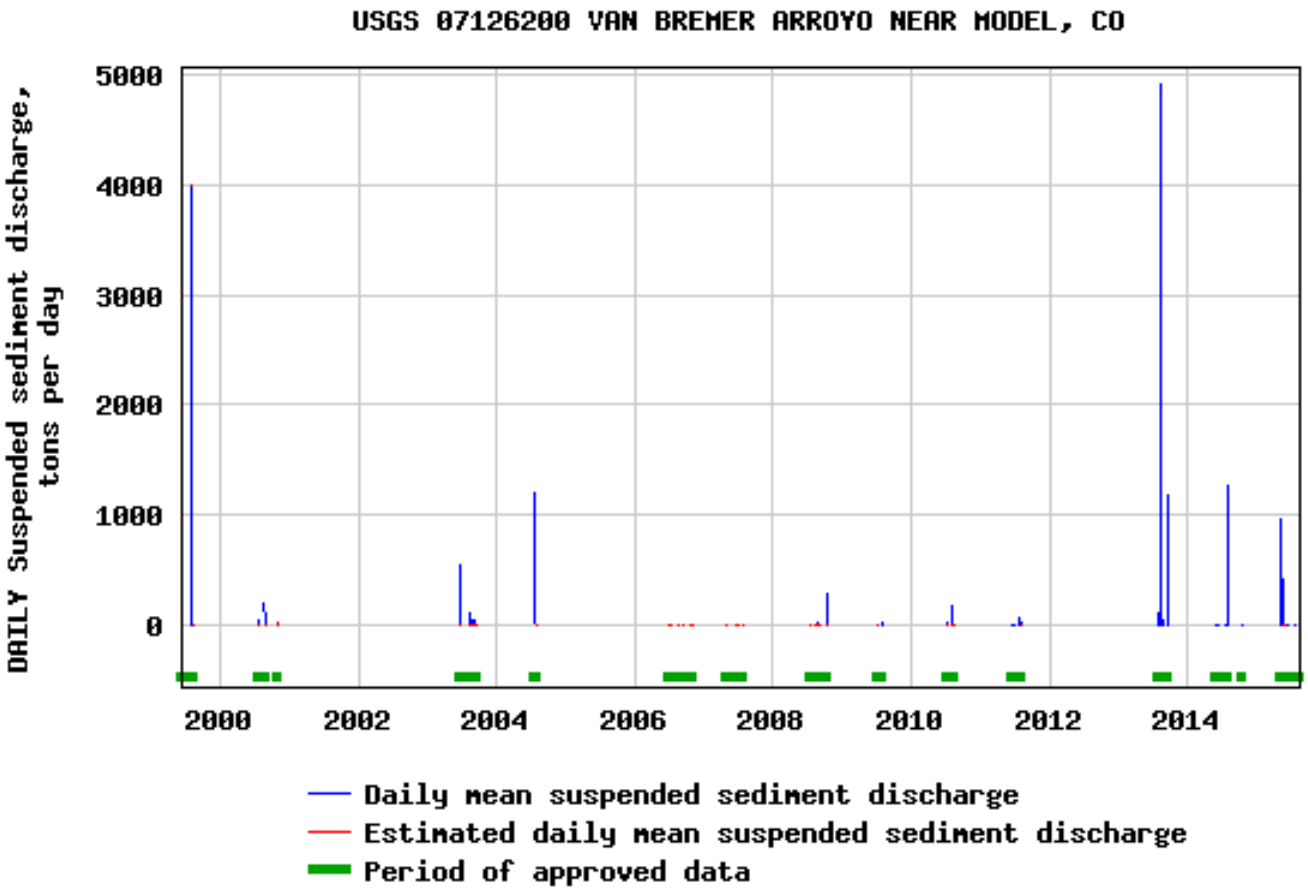
Appendix 3 presents graphs generated from the U.S. Geological Survey National Water Information System website (https://doi.org/10.5066/F7P55KJN). For an explanation of terms refer to the U.S. Geological Survey website at https://wdr.water.usgs.gov/current/documentation.html.

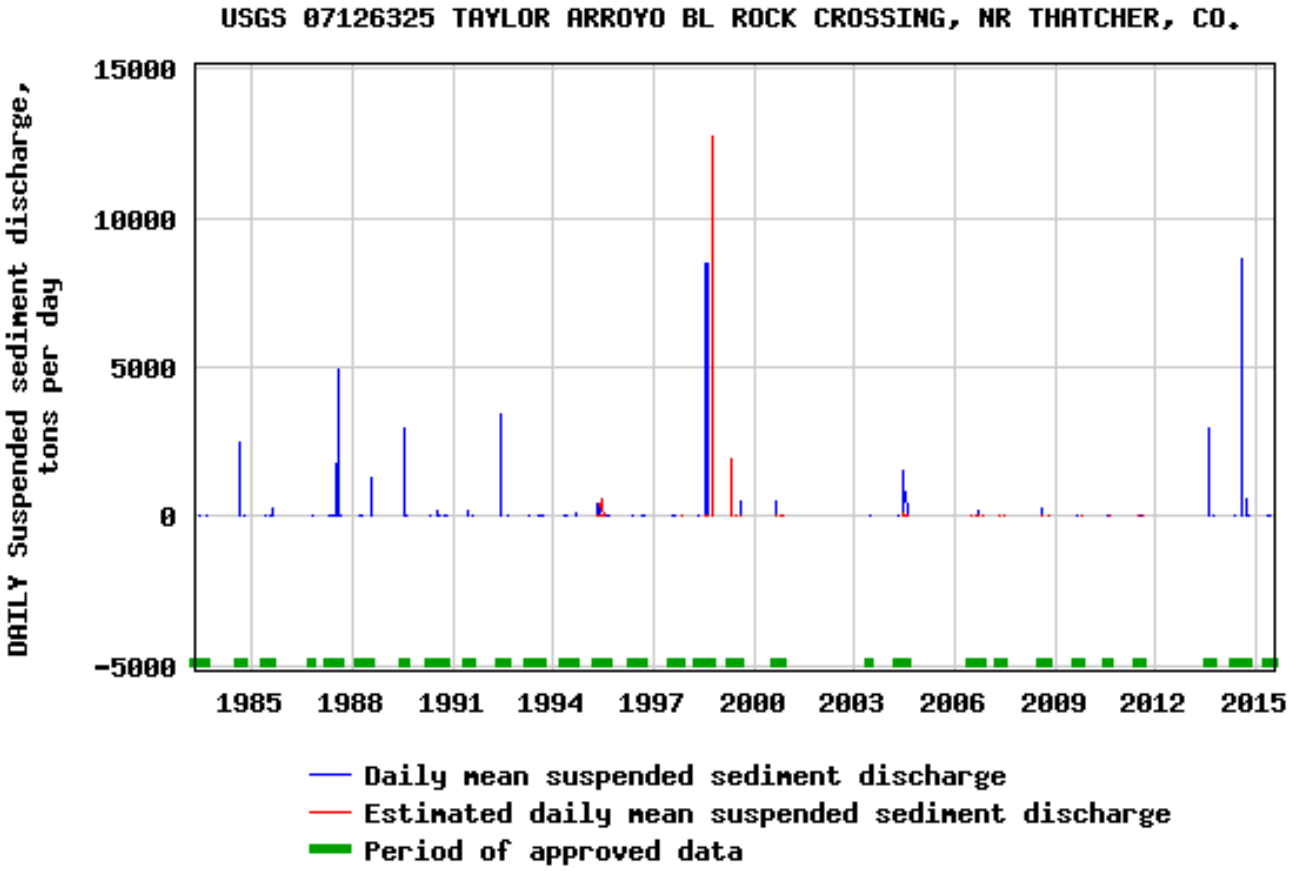
U.S. Army Garrison Fort Carson

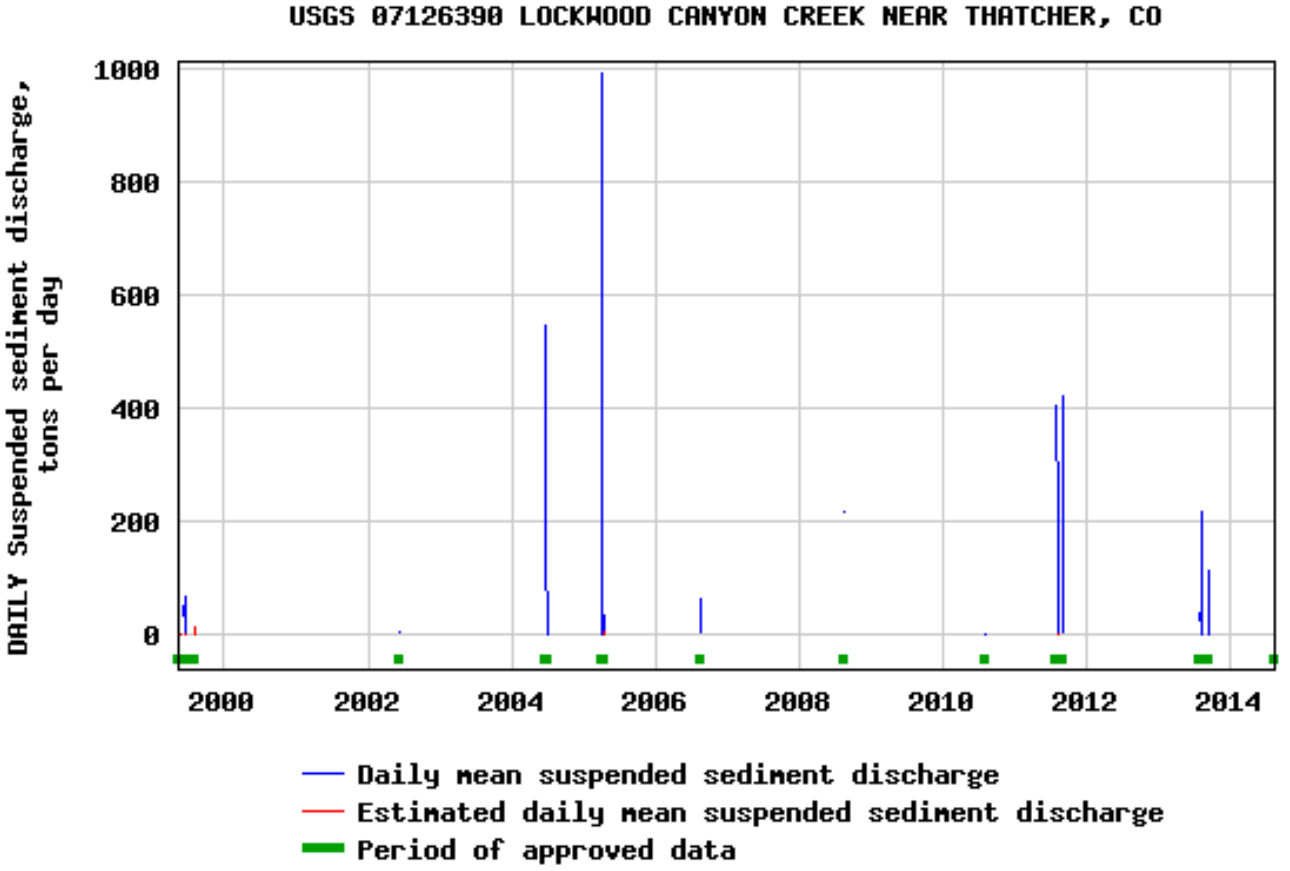


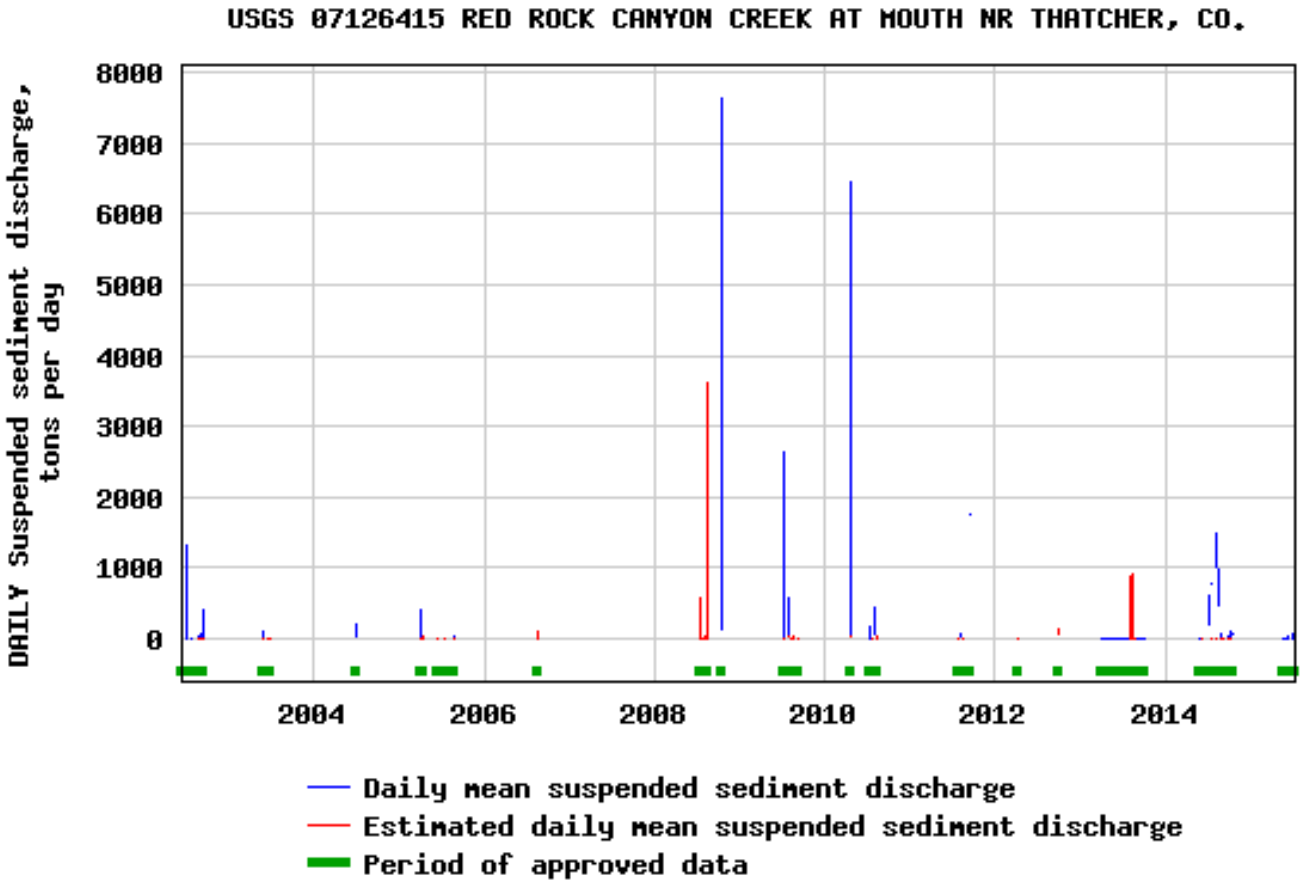

USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
DAILY Suspended sediment discharge, tons per day
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
Oct 2013
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Daily mean suspended sediment discharge
Estimated daily mean suspended sediment discharge
Period of approved data

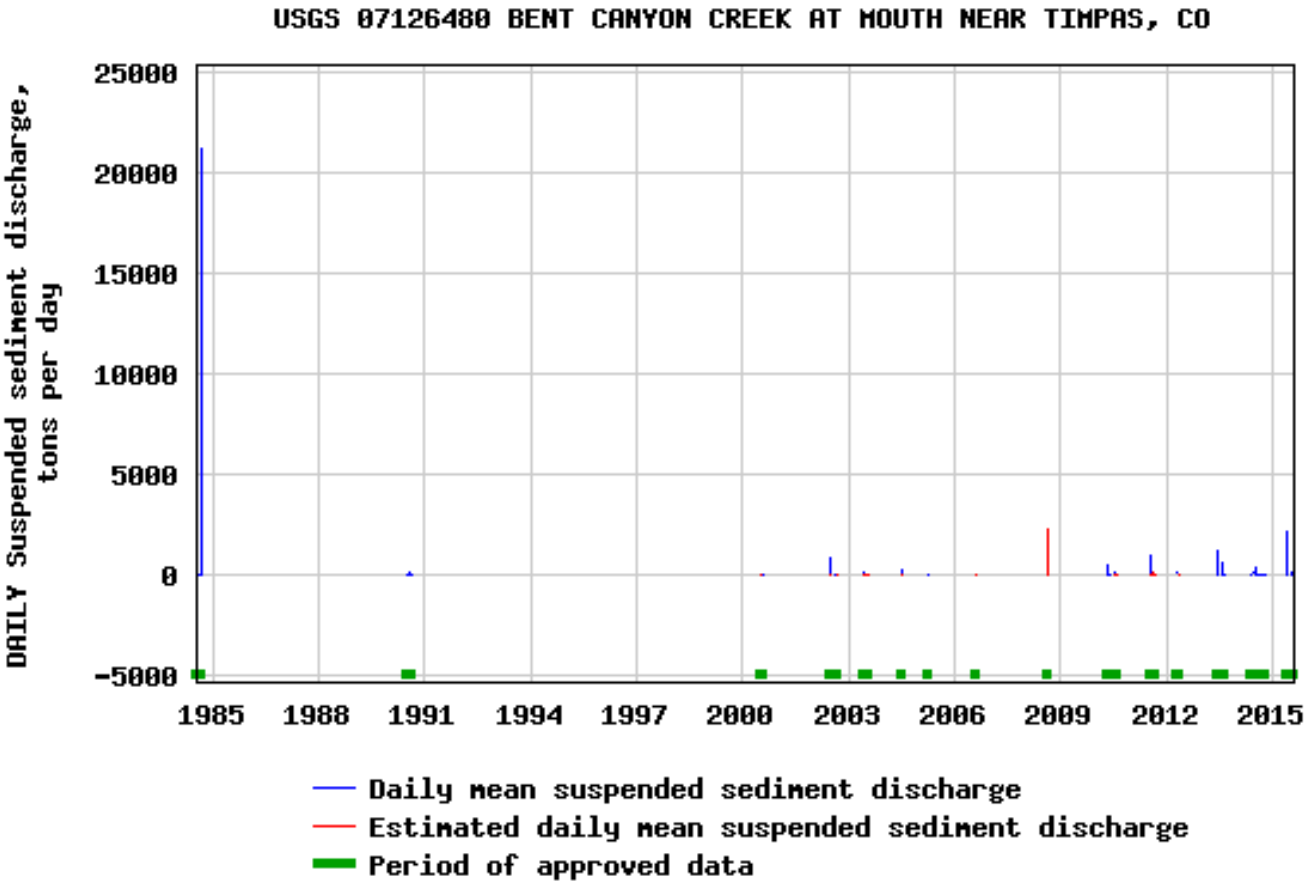
Piñon Canyon Maneuver Site




USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
DAILY Suspended sediment discharge, tons per day
15000
10000
5000
0
-5000
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean suspended sediment discharge
Estimated daily mean suspended sediment discharge
Period of approved data


USGS 07126390 LOCKWOOD CANYON CREEK NEAR THATCHER, CO
DAILY Suspended sediment discharge, tons per day
1000
800
600
400
200
0
2000
2002
2004
2006
2008
2010
2012
2014
Daily mean suspended sediment discharge
Estimated daily mean suspended sediment discharge
Period of approved data

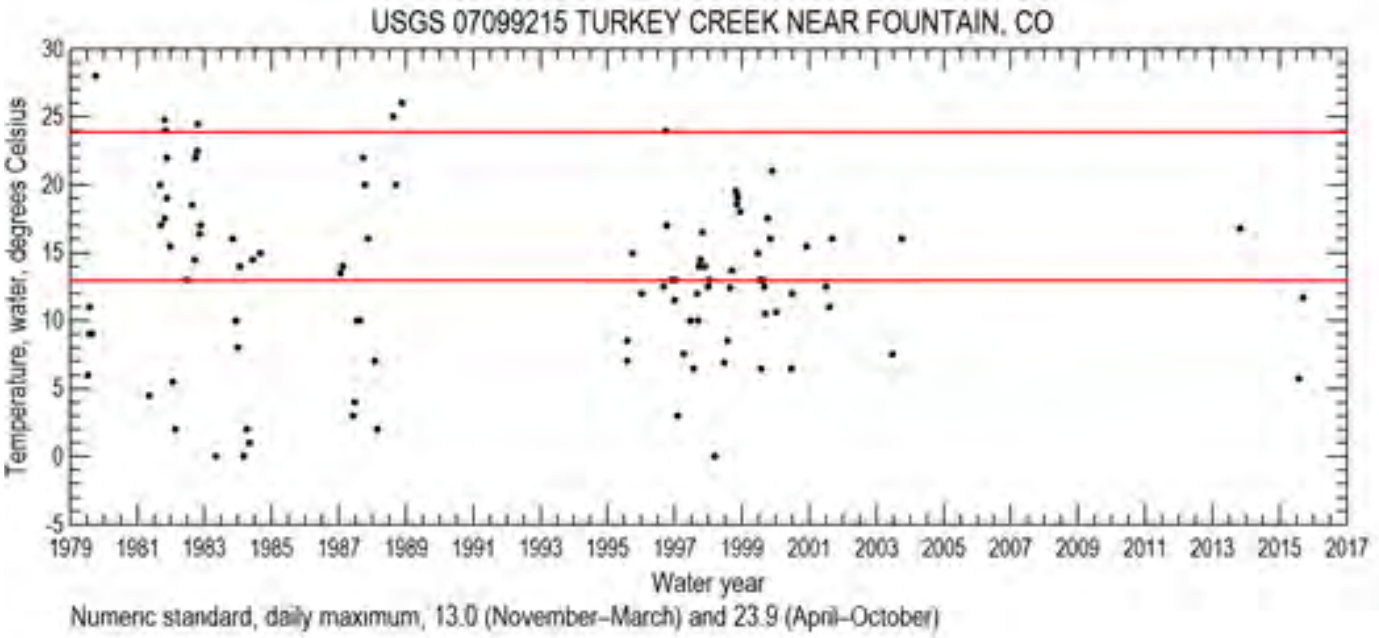

USGS 07126415 RED ROCK CANYON CREEK AT MOUTH NR THATCHER, CO.
DAILY Suspended sediment discharge, tons per day
8000
7000
6000
5000
4000
3000
2000
1000
0
2004
2006
2008
2010
2012
2014
Daily mean suspended sediment discharge
Estimated daily mean suspended sediment discharge
Period of approved data

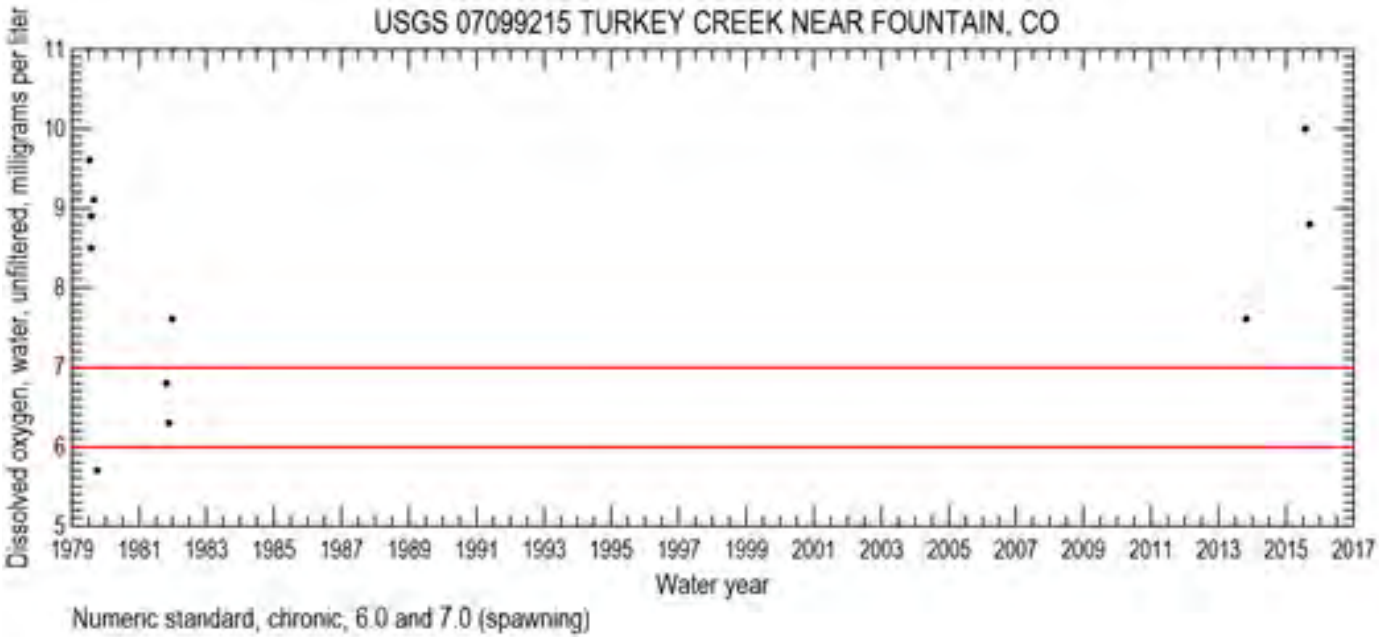

USGS 07126480 BENT CANYON CREEK AT MOUTH NEAR TIMPAS, CO
DAILY Suspended sediment discharge, tons per day
25000
20000
15000
10000
5000
0
-5000
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
Daily mean suspended sediment discharge
Estimated daily mean suspended sediment discharge
Period of approved data

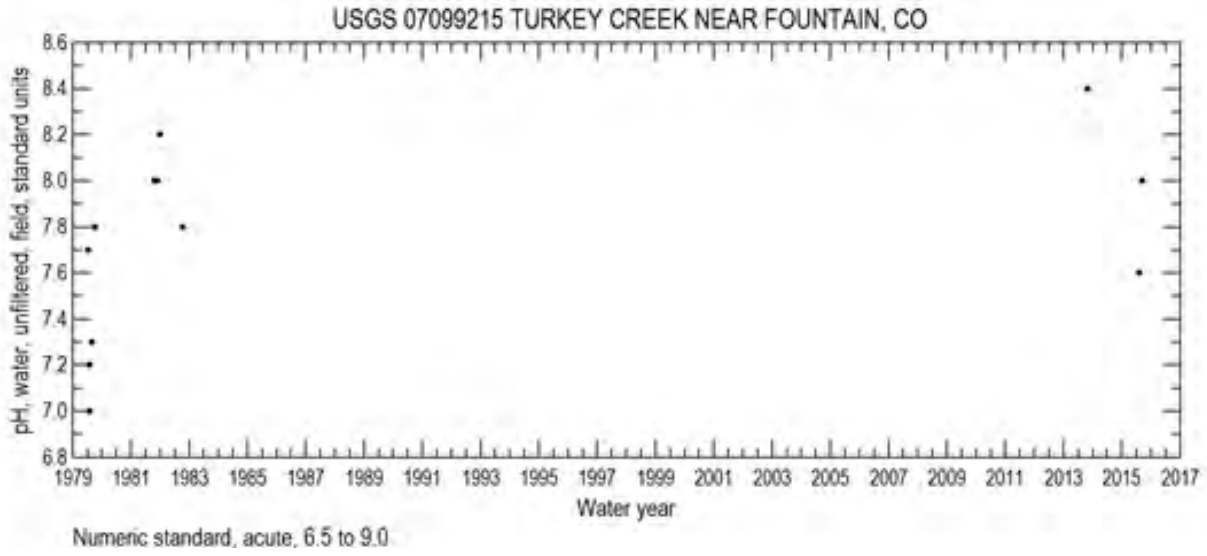
Appendix 4. Selected Water-Quality Data for the Period of Record for Selected Sites at U.S. Army Garrison Fort Carson and Piñon Canyon Maneuver Site, Colorado

Appendix 4 presents scatter plots of water-quality data for those constituents that have regulatory numeric standards at sites where more than two samples were collected. [Numeric standards (Colorado Department of Public Health and Environment, 2013, 2016) are represented by a red line when concentrations are within scale. Censored values are represented by an open circle.]

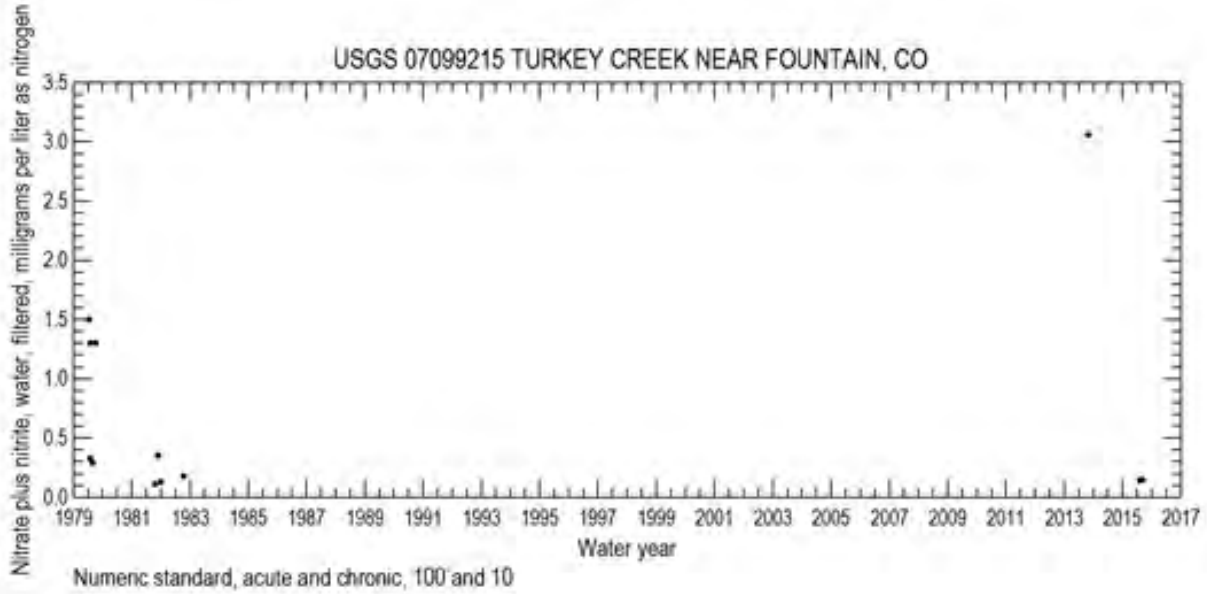
U.S. Army Garrison Fort Carson



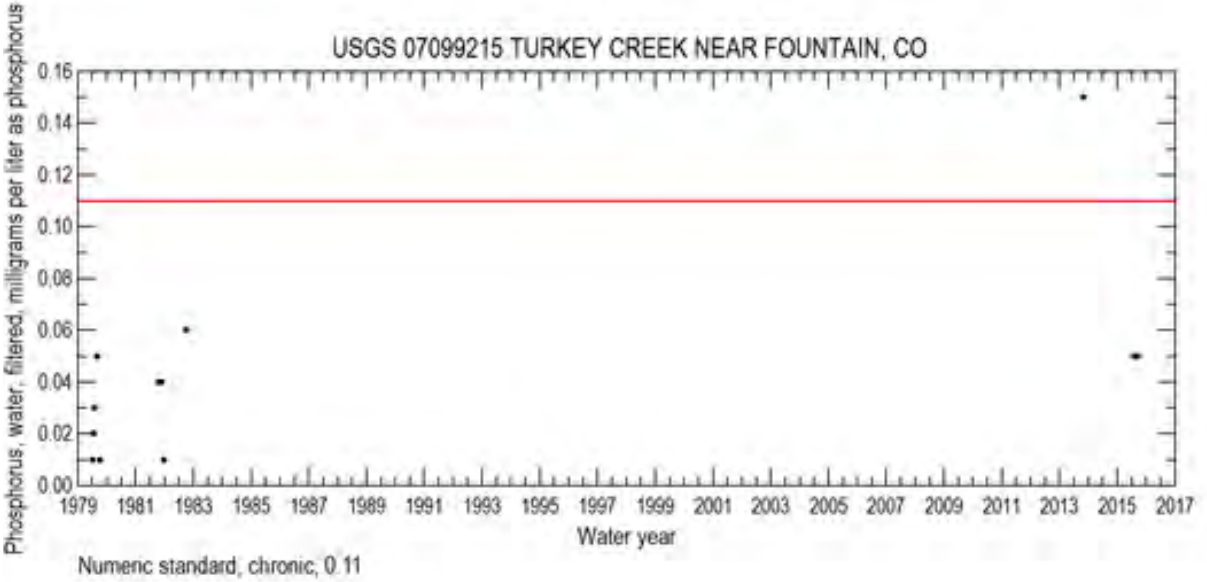




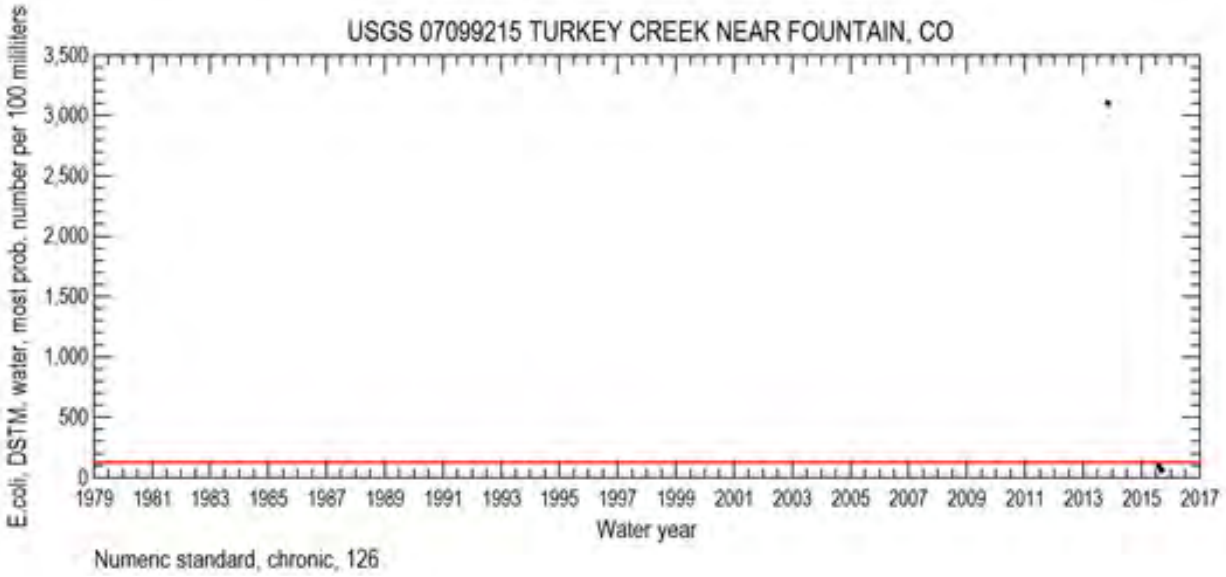
Numeric standard, acute, 6.5 to 9.0

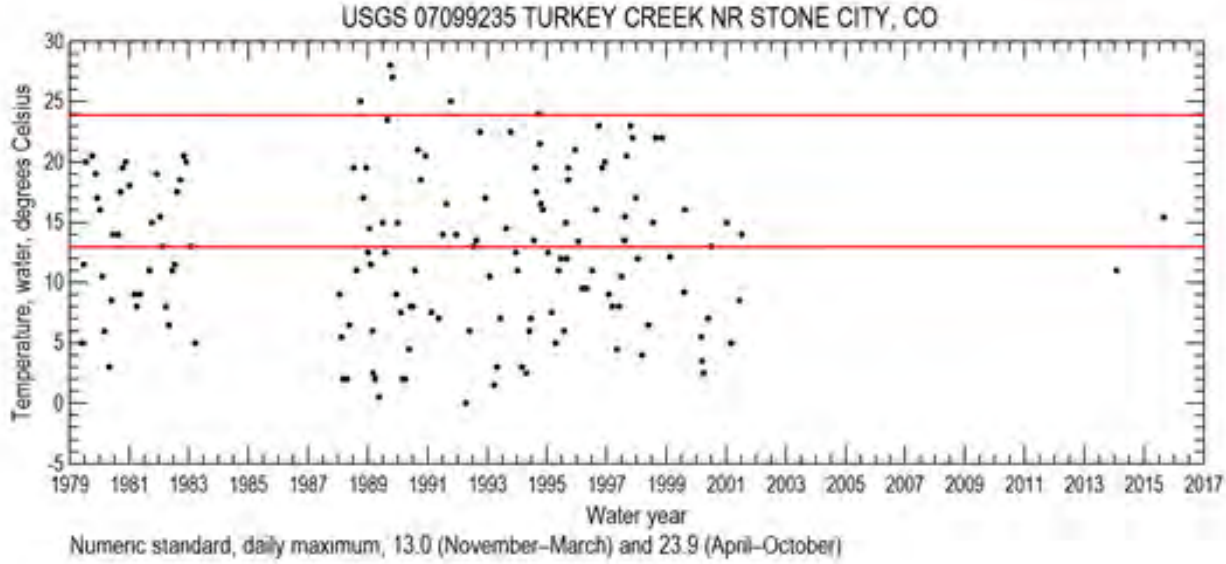


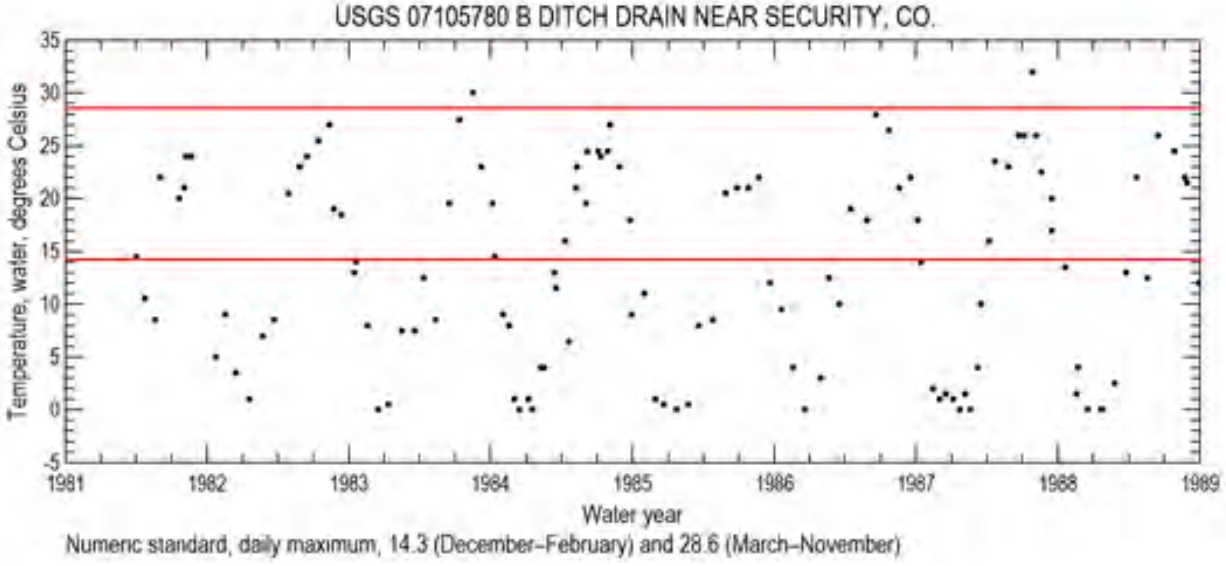
Numeric standard, acute and chronic, 100 and 10

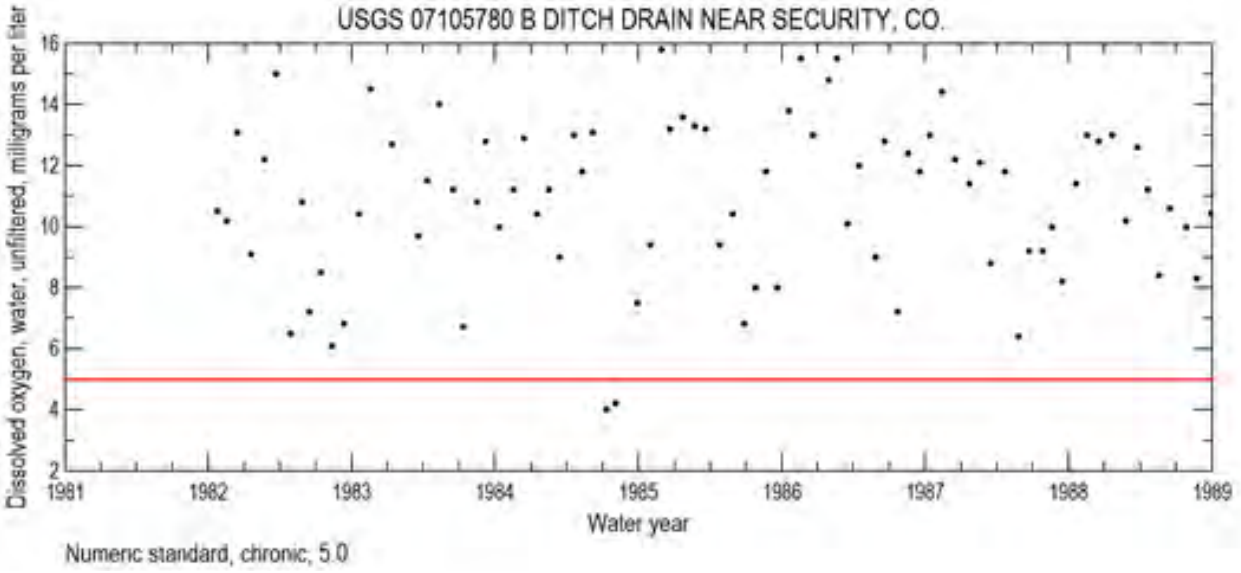


Numeric standard, chronic, 0.11

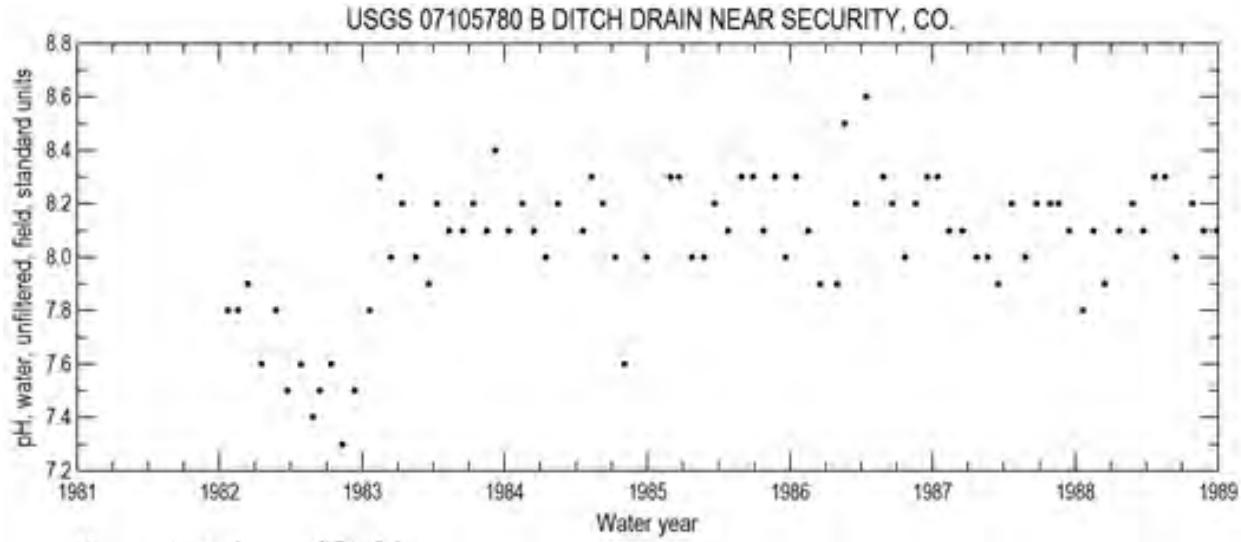

USGS 07099215 TURKEY CREEK NEAR FOUNTAIN, CO
E.coli, DSTM, water, most prob. number per 100 milliliters
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, chronic, 126


USGS 07099235 TURKEY CREEK NR STONE CITY, CO
Temperature, water, degrees Celsius
30
25
20
15
10
5
0
-5
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, daily maximum, 13.0 (November–March) and 23.9 (April–October)

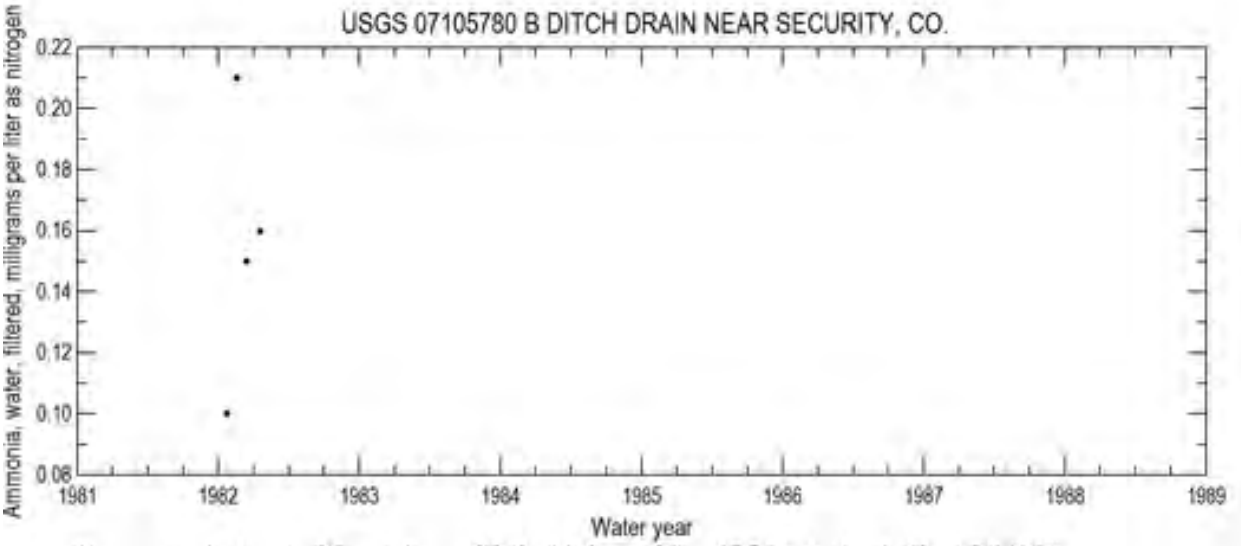

USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Temperature, water, degrees Celsius
35
30
25
20
15
10
5
0
-5
1981 1982 1983 1984 1985 1986 1987 1988 1989
Water year
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



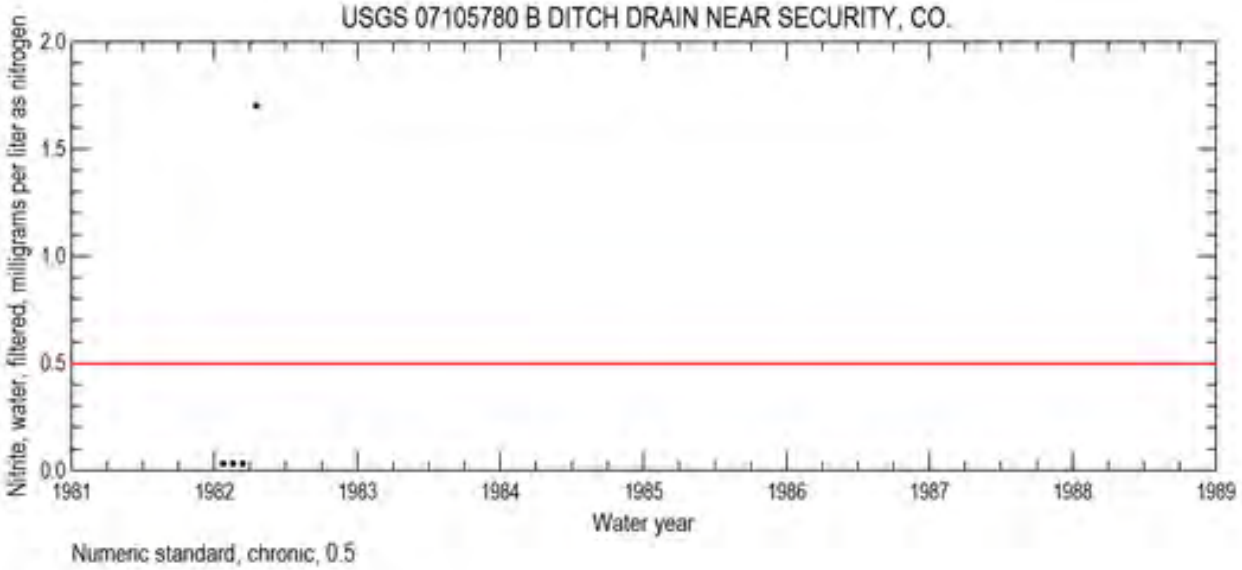
Numeric standard, chronic, 5.0

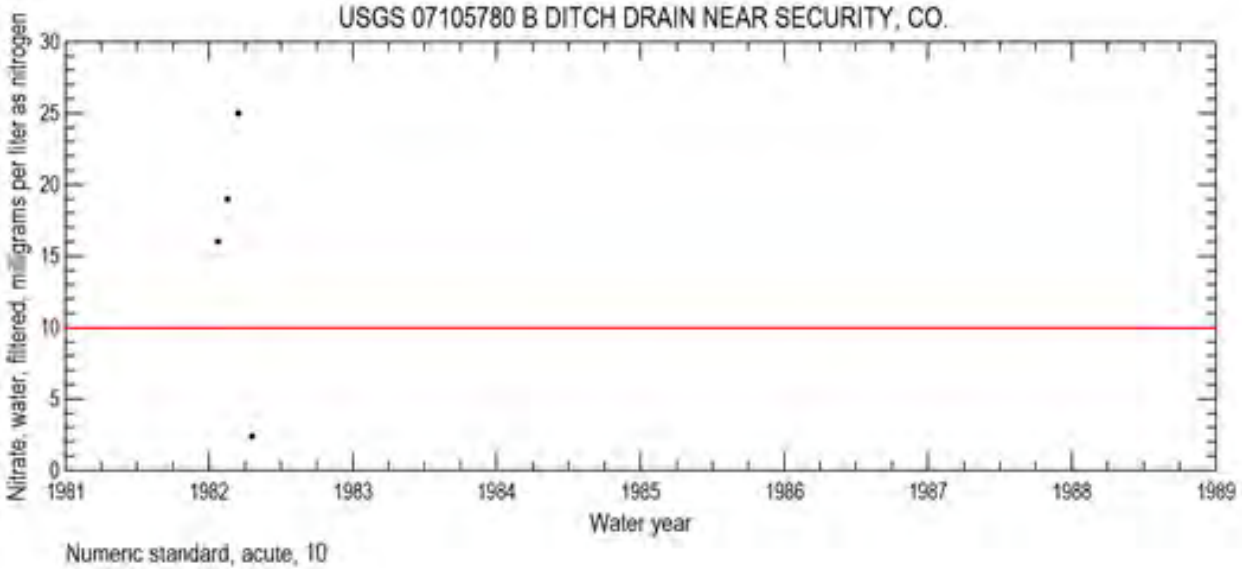


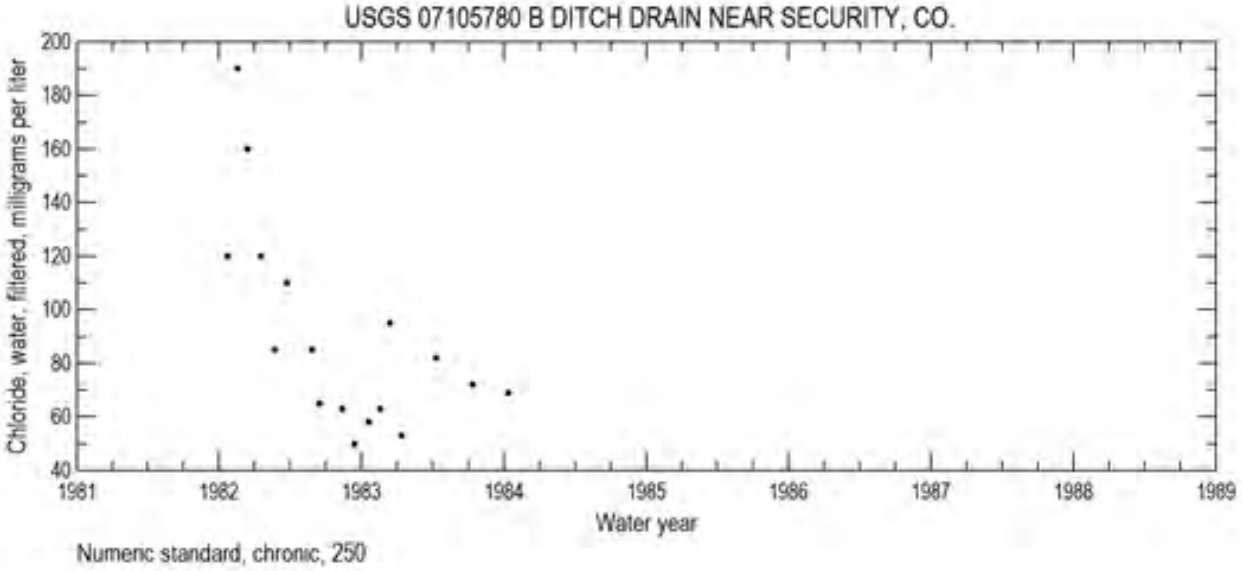
Numeric standard, acute, 6.5 to 9.0

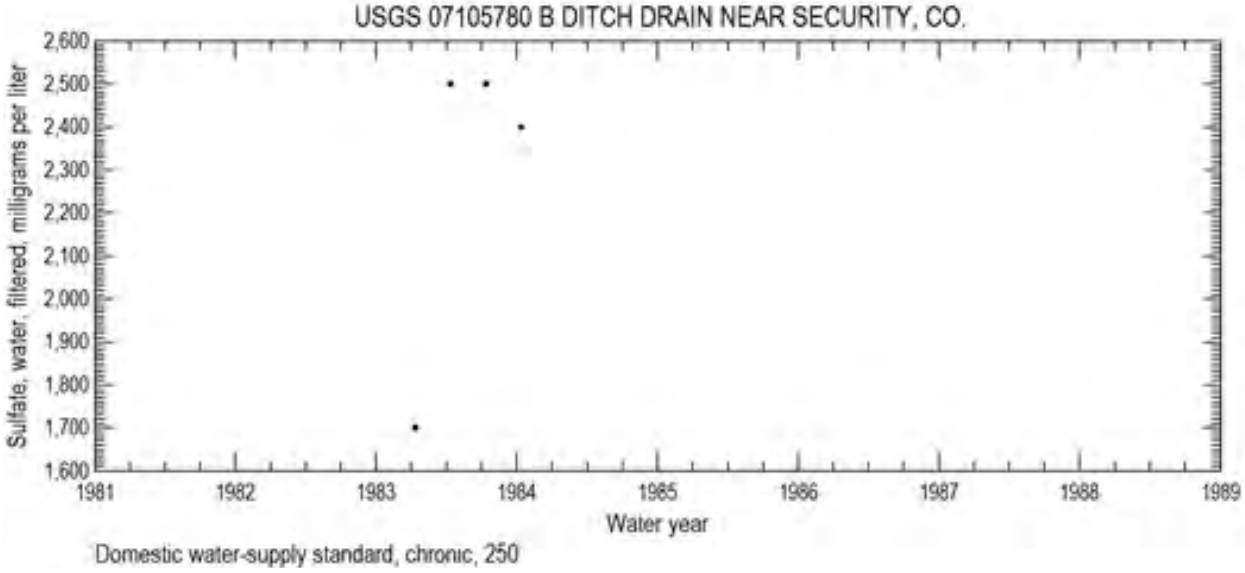


Numeric standard, acute, 6.9, and chronic, 2.0 (April 1- August 31) and 7.5 (September 1 - March 31) (TVS)

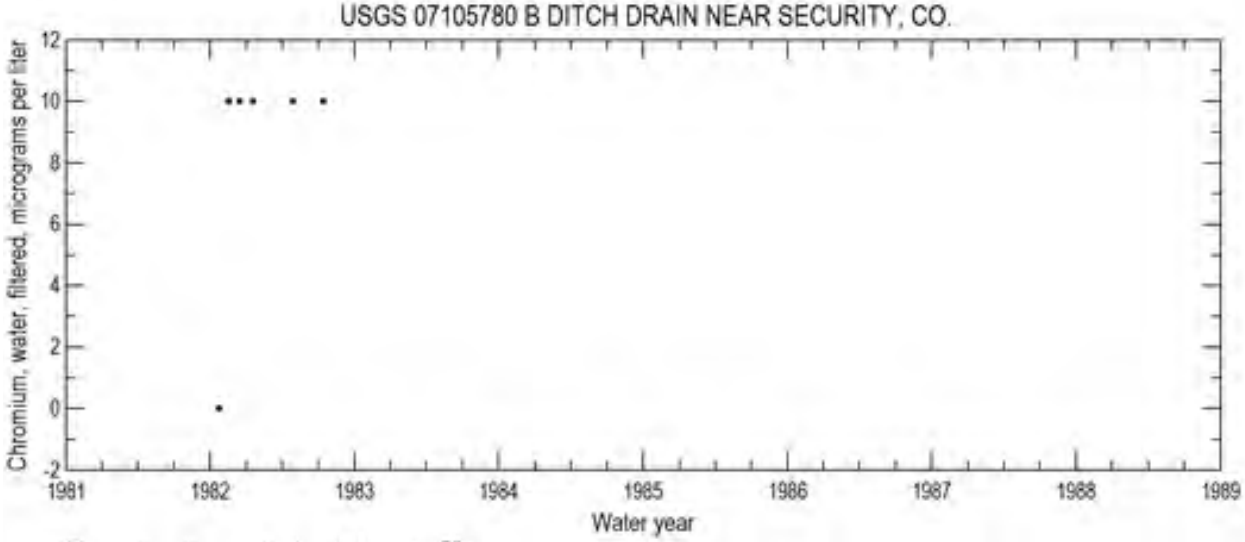

USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Nitrite, water, filtered, milligrams per liter as nitrogen
2.0
1.5
1.0
0.5
0.0
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, chronic, 0.5


USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Nitrate, water, filtered, milligrams per liter as nitrogen
30
25
20
15
10
5
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, acute, 10

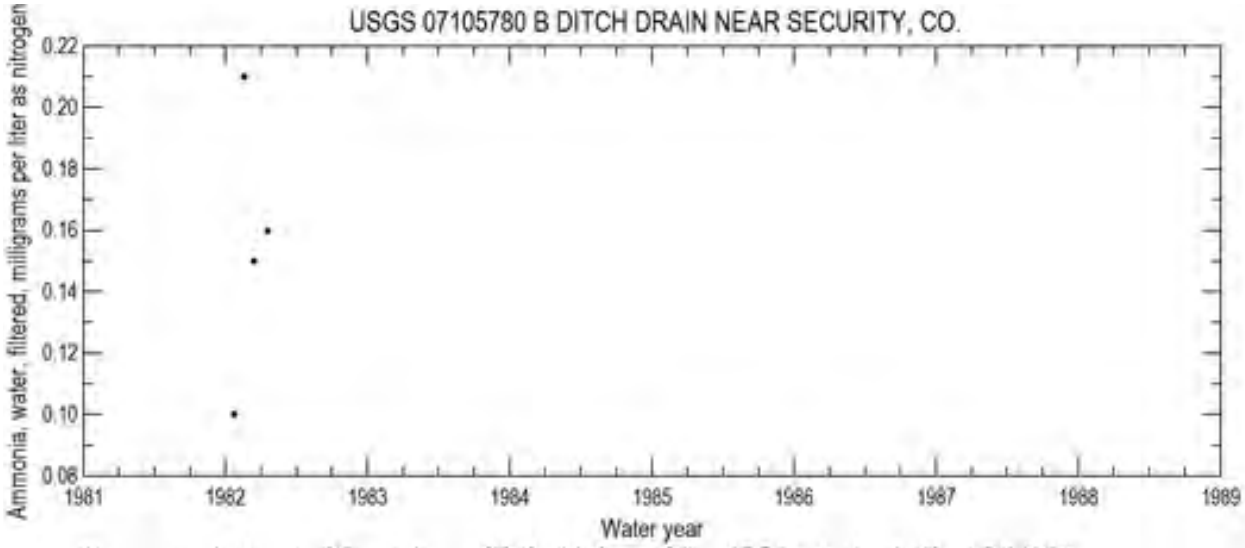

USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Chloride, water, filtered, milligrams per liter
200
180
160
140
120
100
80
60
40
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, chronic, 250



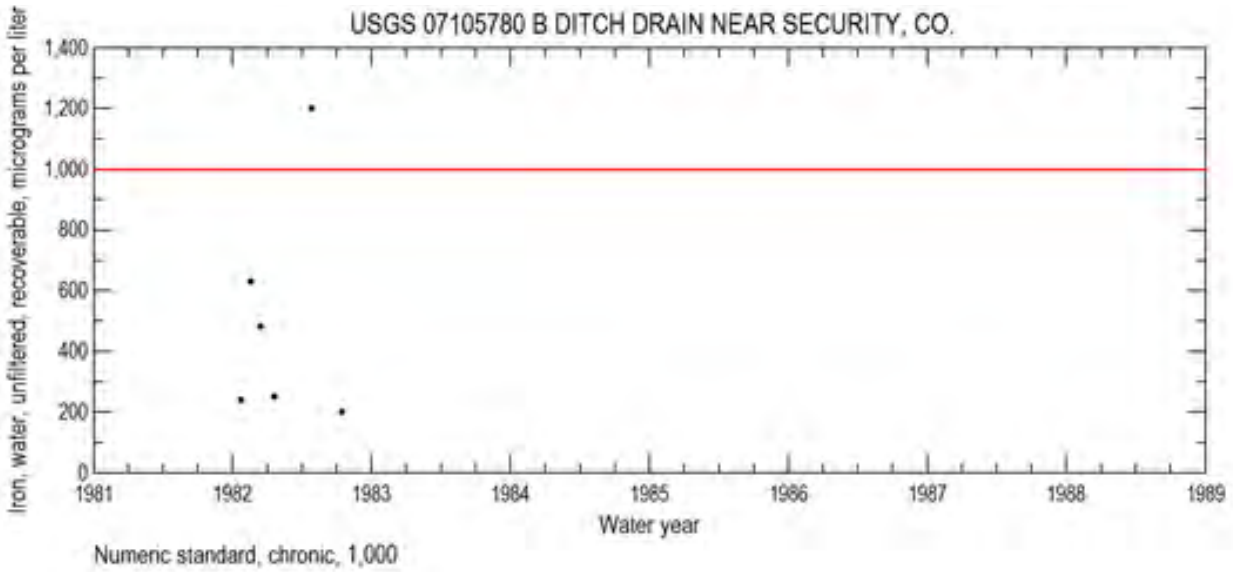
Domestic water-supply standard, chronic, 250

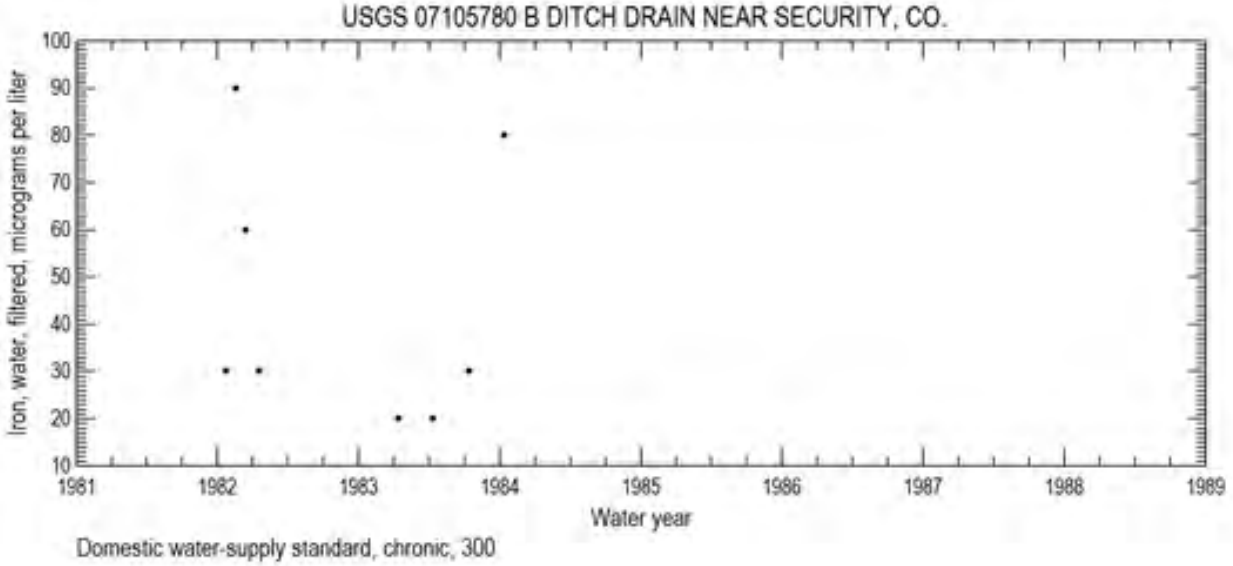


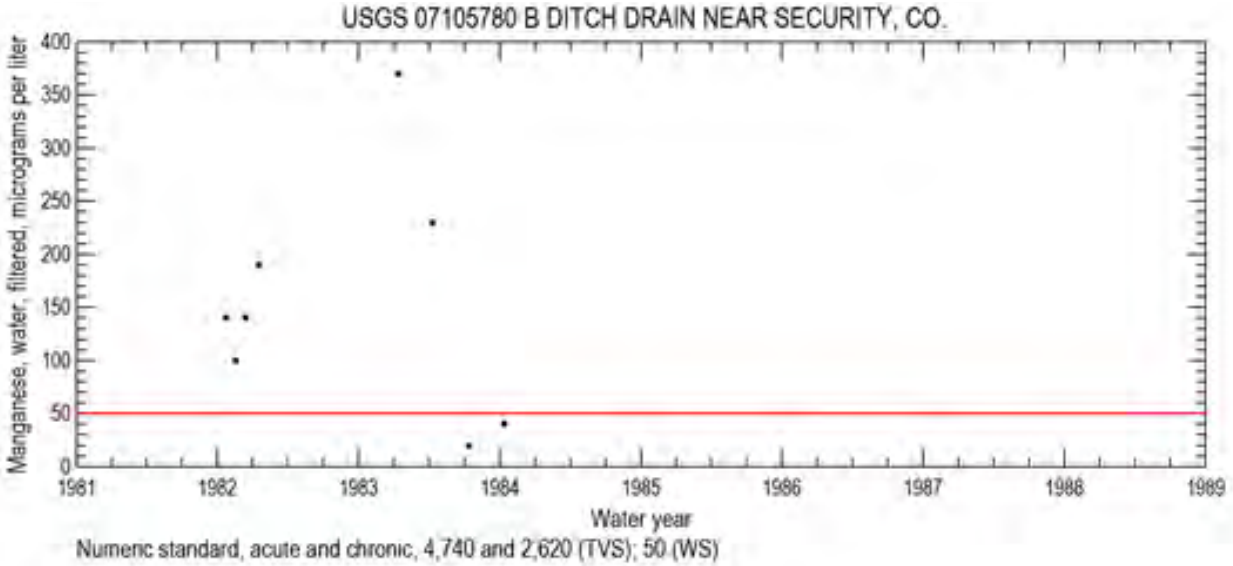
Domestic water-supply standard, acute, 50

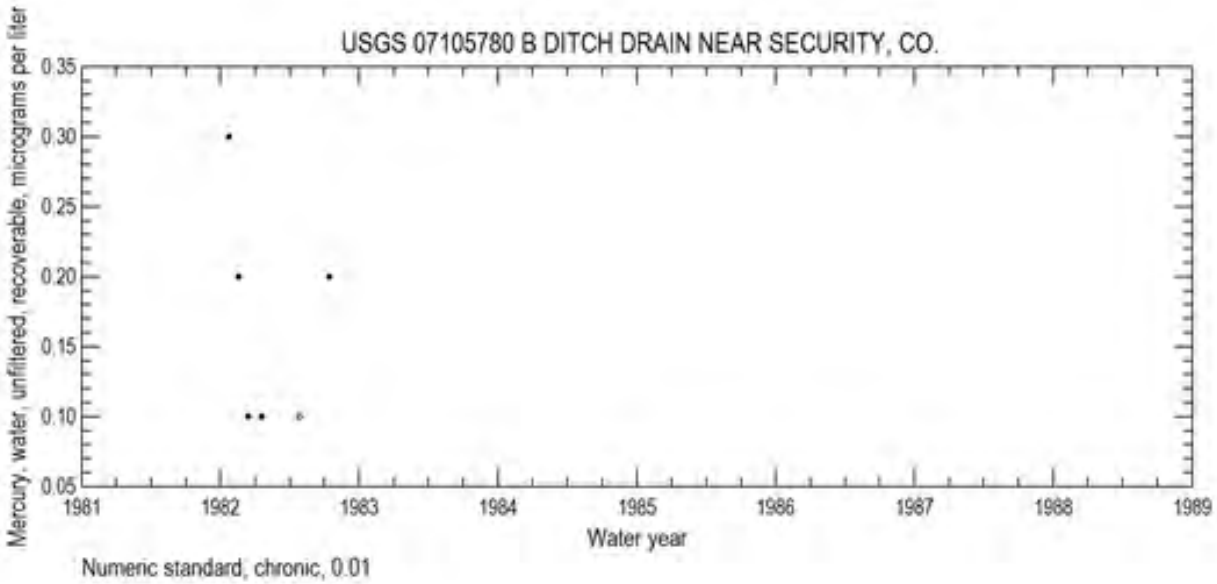


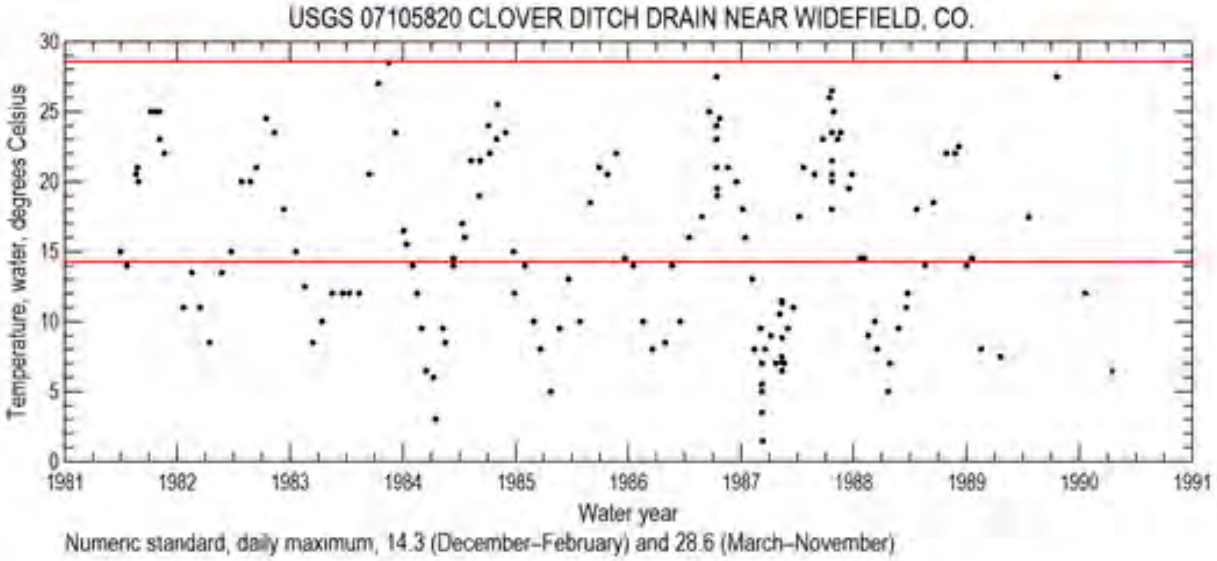
Numeric standard, acute, 6.9, and chronic, 2.0 (April 1- August 31) and 7.5 (September 1 - March 31) (TVS)

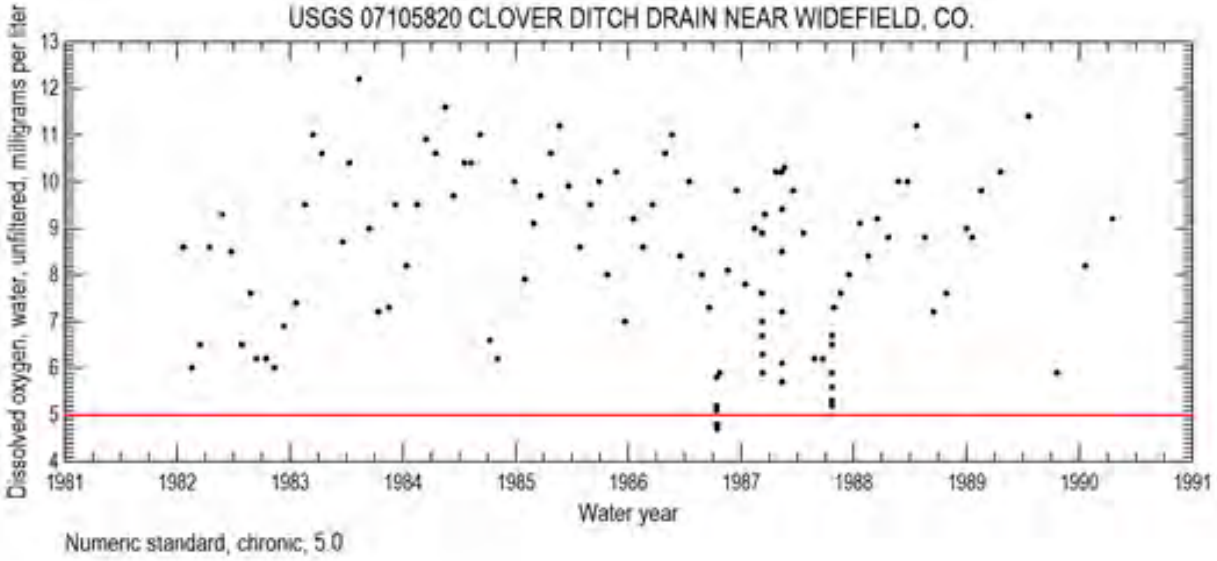

USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Iron, water, unfiltered, recoverable, micrograms per liter
1,400
1,200
1,000
800
600
400
200
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, chronic, 1,000

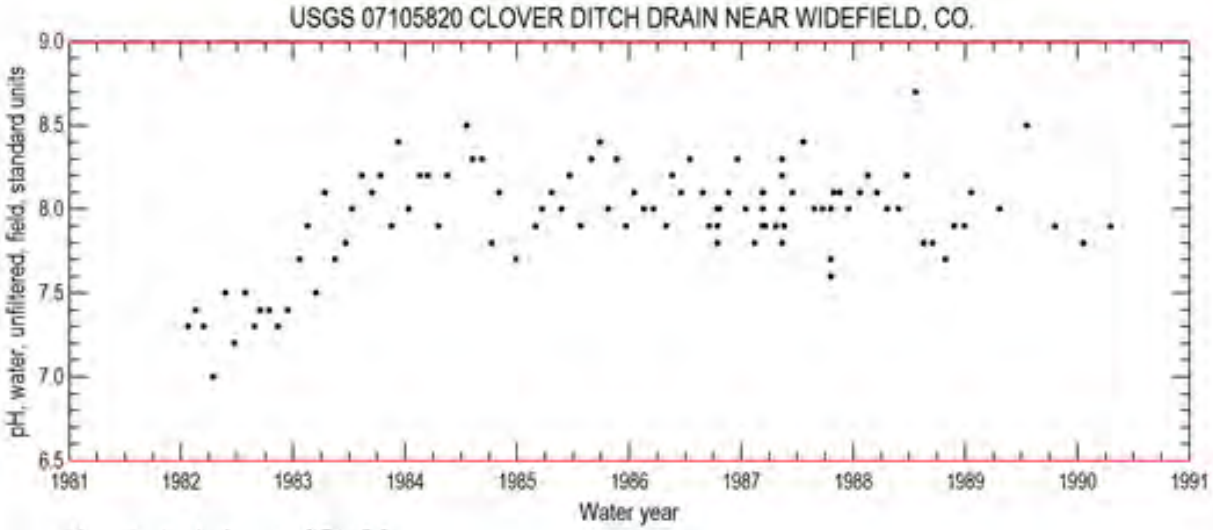

USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Iron, water, filtered, micrograms per liter
100
90
80
70
60
50
40
30
20
10
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Domestic water-supply standard, chronic, 300


USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Manganese, water, filtered, micrograms per liter
400
350
300
250
200
150
100
50
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS); 50 (WS)

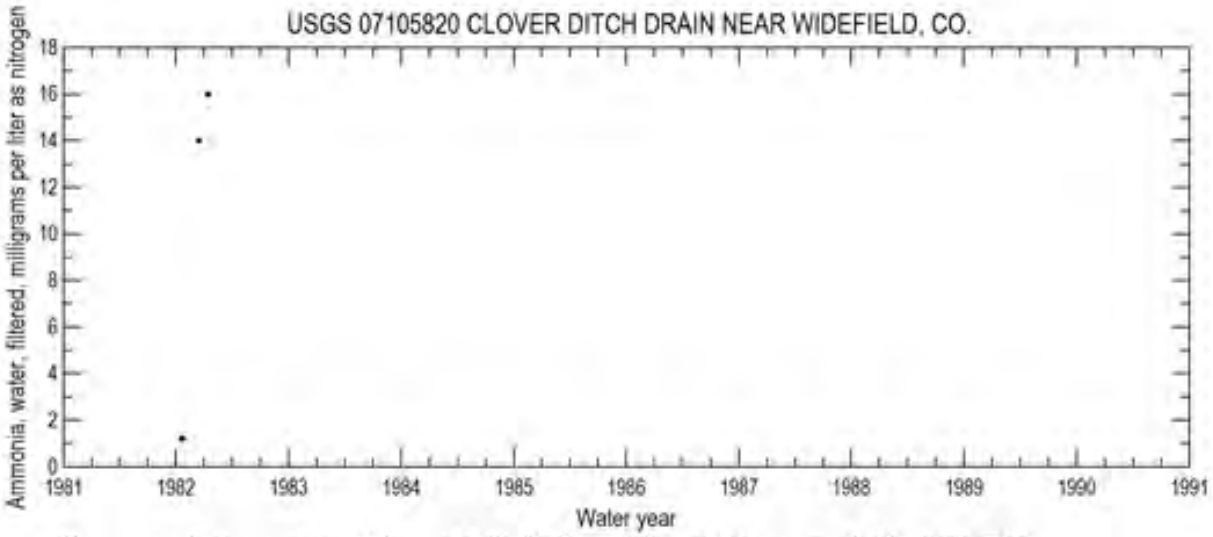

USGS 07105780 B DITCH DRAIN NEAR SECURITY, CO.
Mercury, water, unfiltered, recoverable, micrograms per liter
0.35
0.30
0.25
0.20
0.15
0.10
0.05
1981
1982
1983
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, chronic, 0.01


USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Temperature, water, degrees Celsius
30
25
20
15
10
5
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)

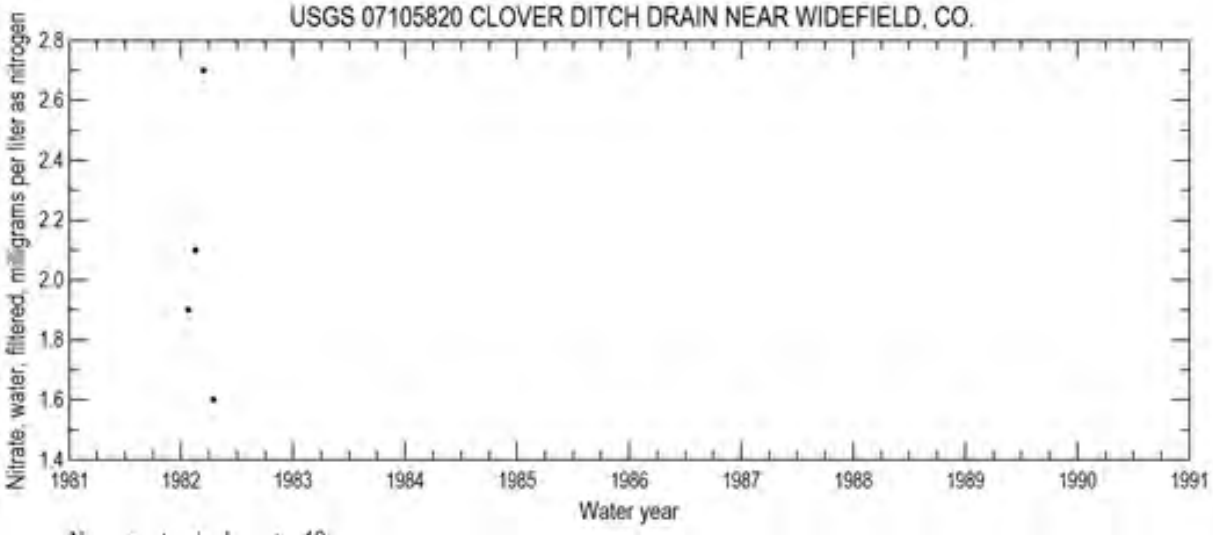

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Dissolved oxygen, water, unfiltered, milligrams per liter
13
12
11
10
9
8
7
6
5
4
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, chronic, 5.0



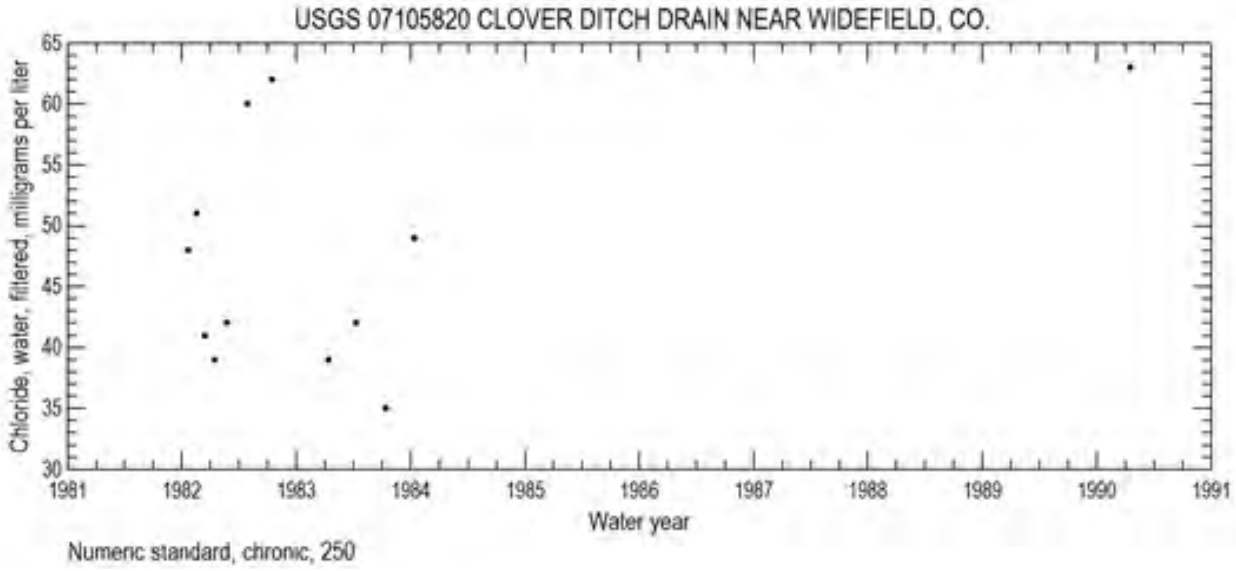
Numeric standard, acute, 6.5 to 9.0

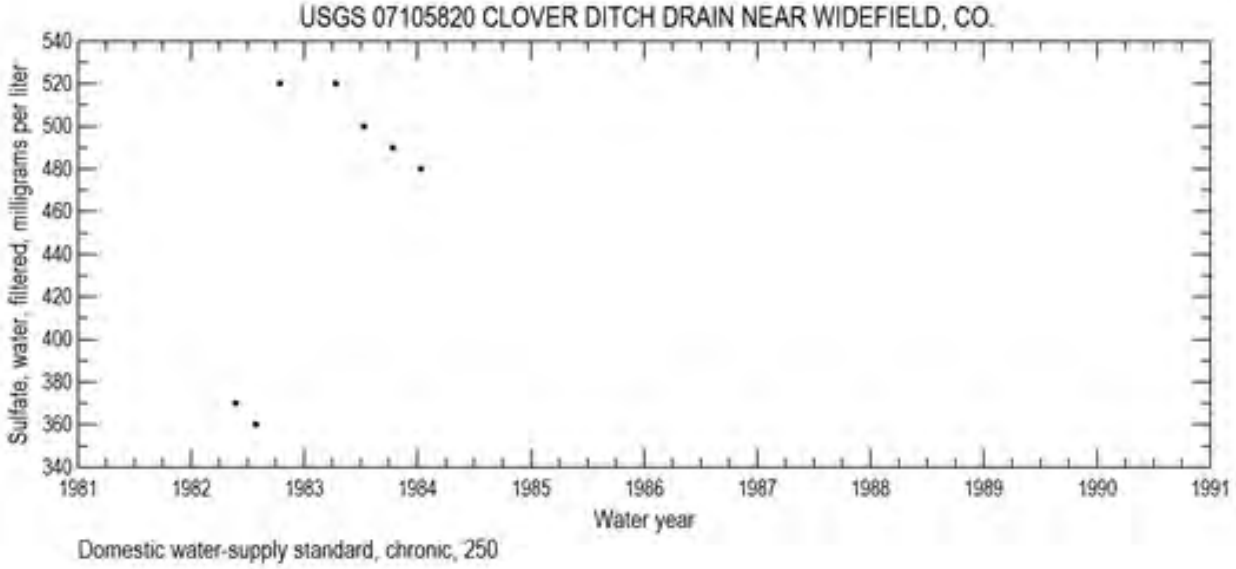


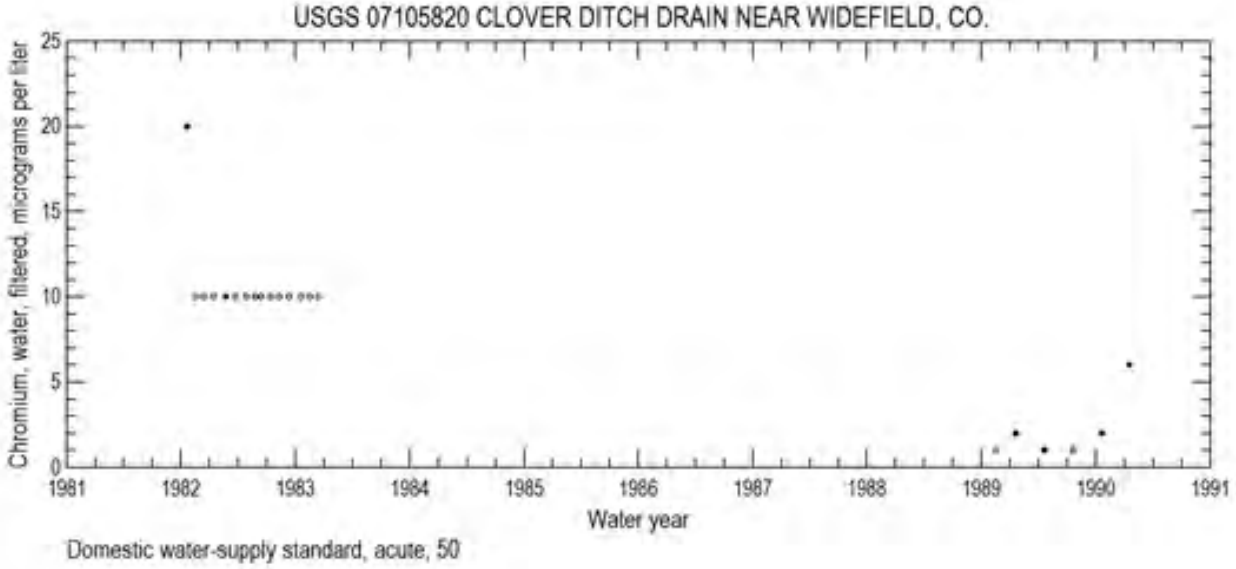
Numeric standard, acute, 8.4, and chronic, 2.3 (April 1 - August 31) and 6.8 (September 1 - March 31) (TVS)

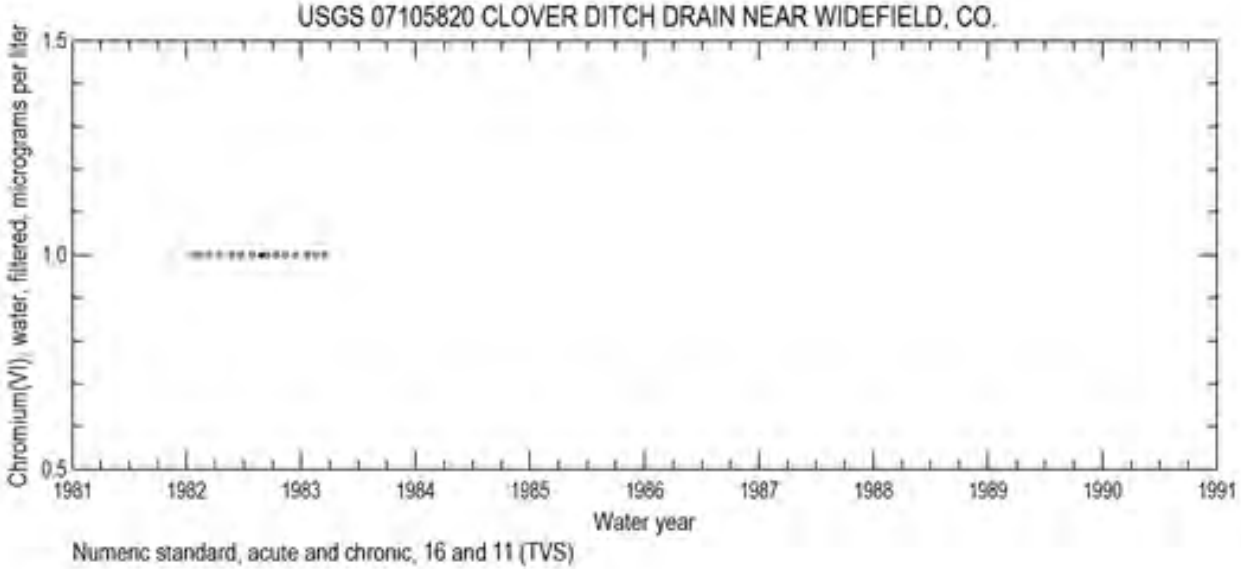


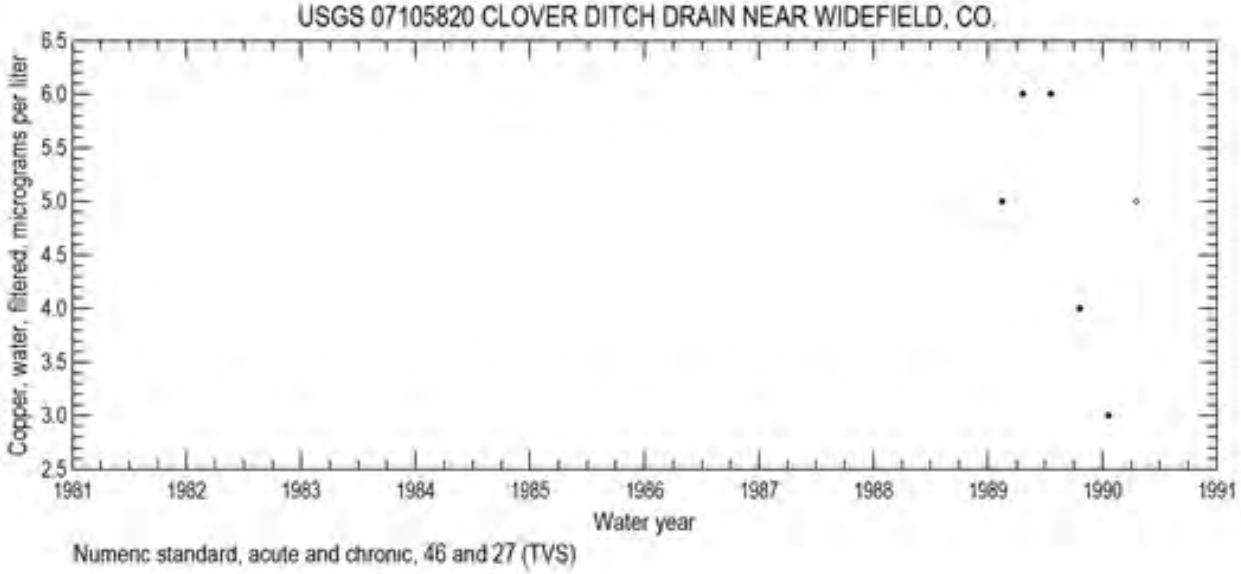
Numeric standard, acute, 10

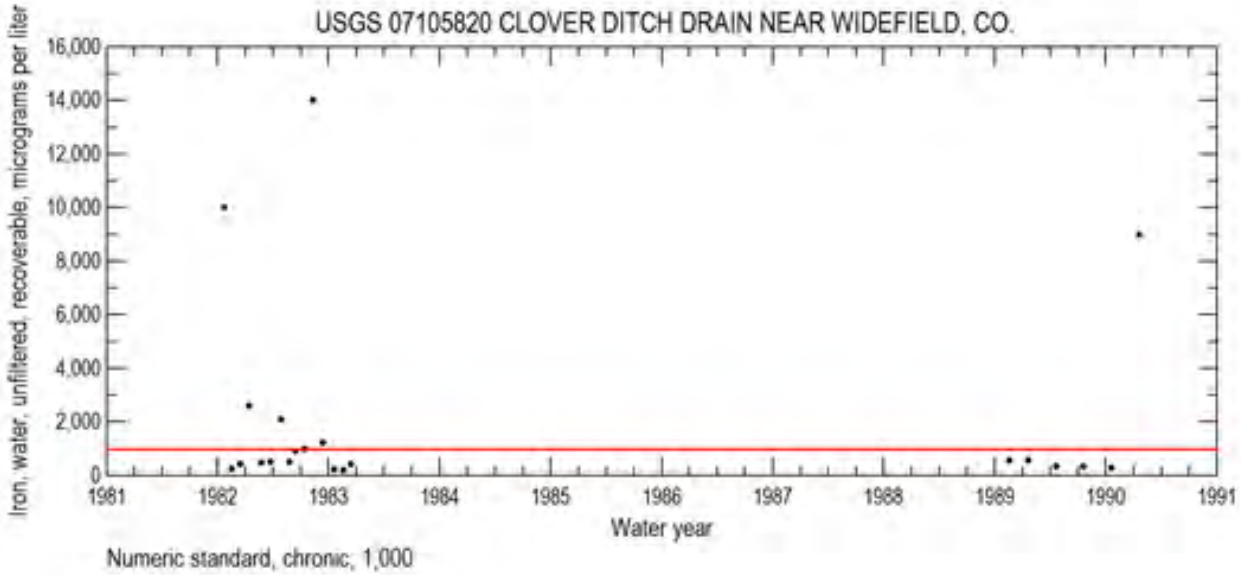

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Chloride, water, filtered, milligrams per liter
65
60
55
50
45
40
35
30
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, chronic, 250

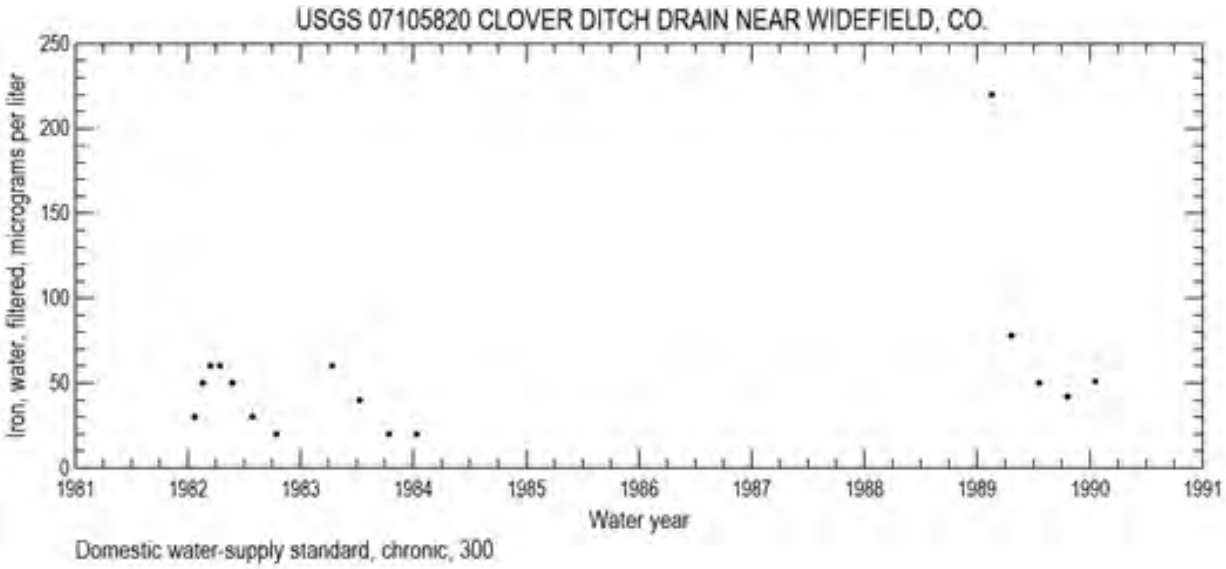

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Sulfate, water, filtered, milligrams per liter
540
520
500
480
460
440
420
400
380
360
340
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Domestic water-supply standard, chronic, 250

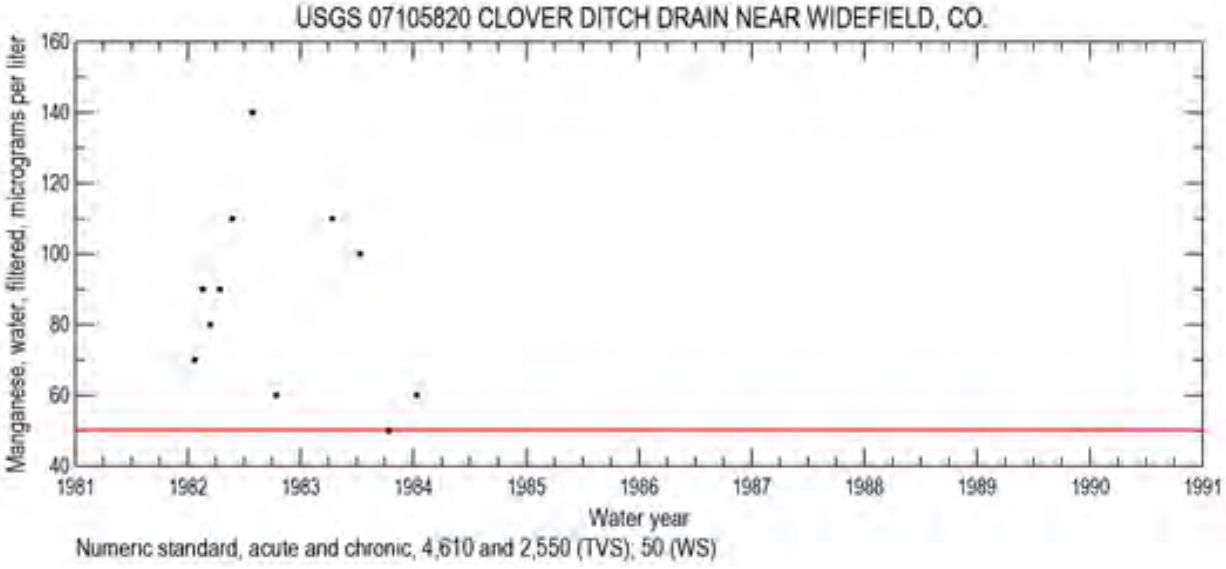

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Chromium, water, filtered, micrograms per liter
25
20
15
10
5
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Domestic water-supply standard, acute, 50

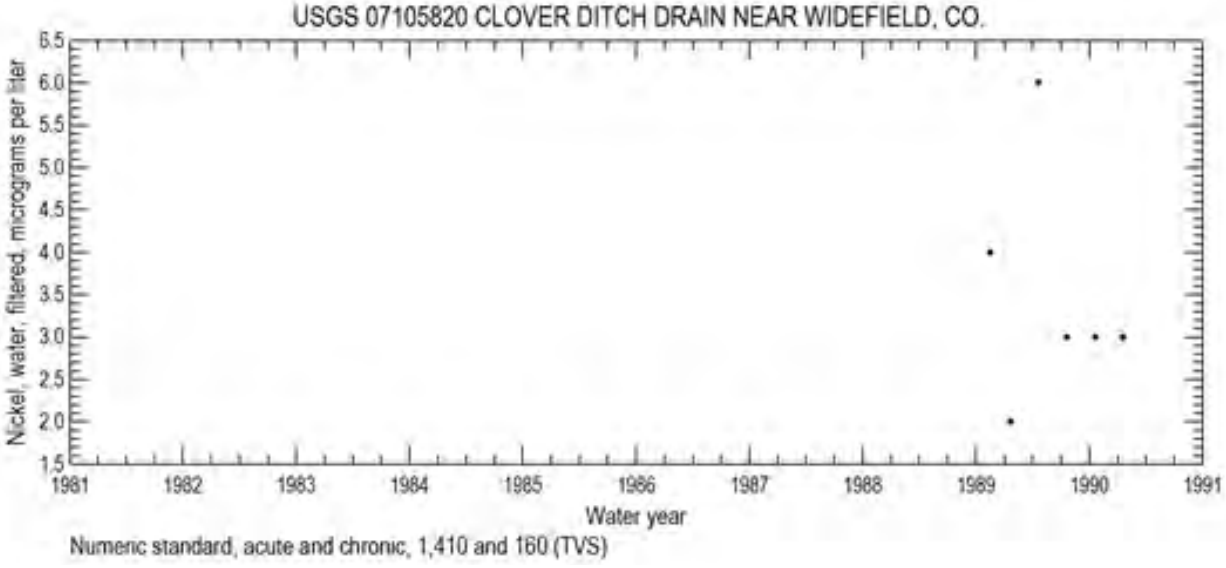

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Chromium(VI), water, filtered, micrograms per liter
1.5
1.0
0.5
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, acute and chronic, 16 and 11 (TVS)

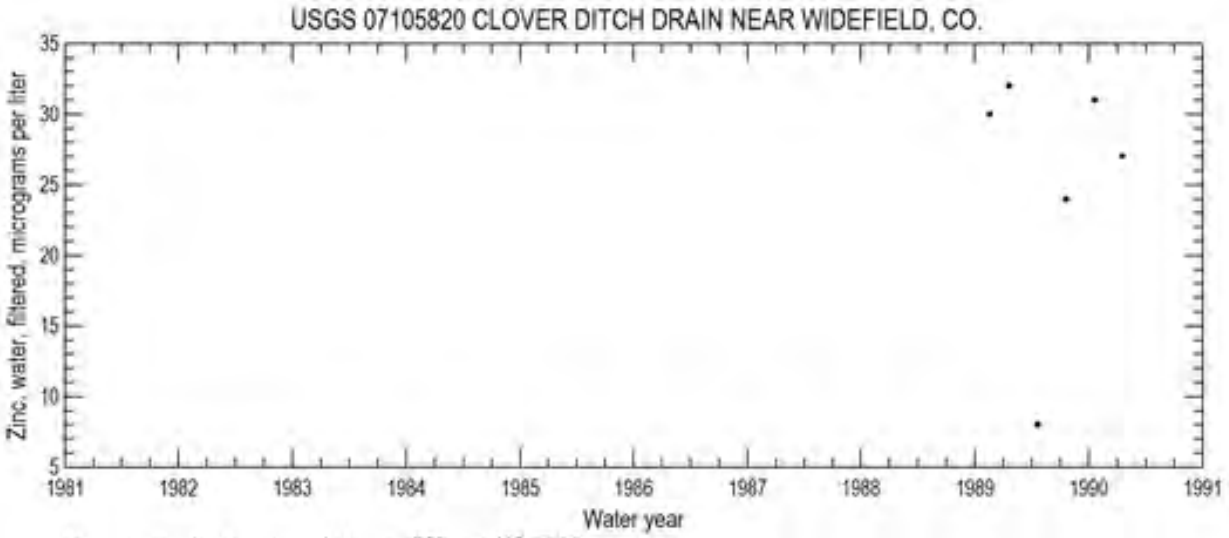

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Copper, water, filtered, micrograms per liter
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, acute and chronic, 46 and 27 (TVS)


USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Iron, water, unfiltered, recoverable, micrograms per liter
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, chronic, 1,000

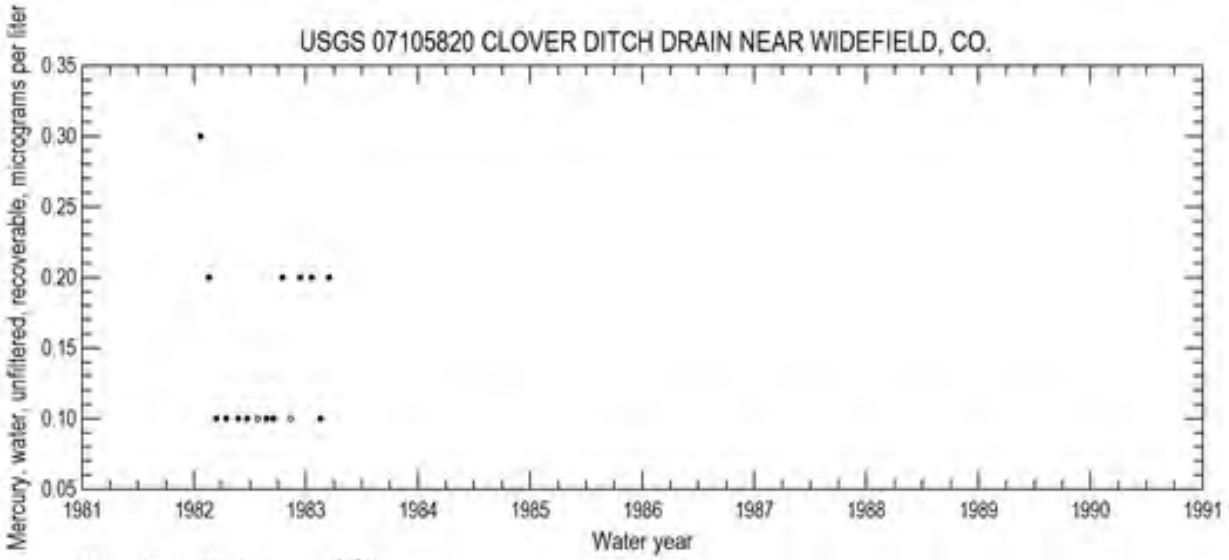

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Iron, water, filtered, micrograms per liter
250
200
150
100
50
0
1961
1962
1963
1964
1985
1986
1987
1988
1989
1990
1991
Water year
Domestic water-supply standard, chronic, 300


USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Manganese, water, filtered, micrograms per liter
160
140
120
100
80
60
40
1961
1962
1963
1964
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, acute and chronic, 4,610 and 2,550 (TVS); 50 (WS)

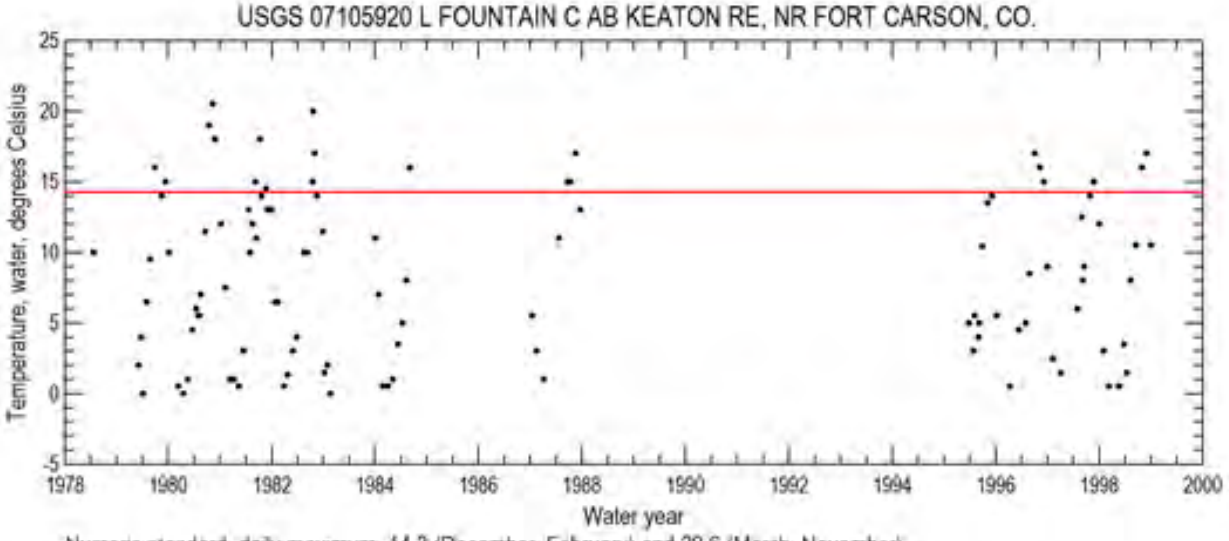

USGS 07105820 CLOVER DITCH DRAIN NEAR WIDEFIELD, CO.
Nickel, water, filtered, micrograms per liter
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, acute and chronic, 1,410 and 160 (TVS)



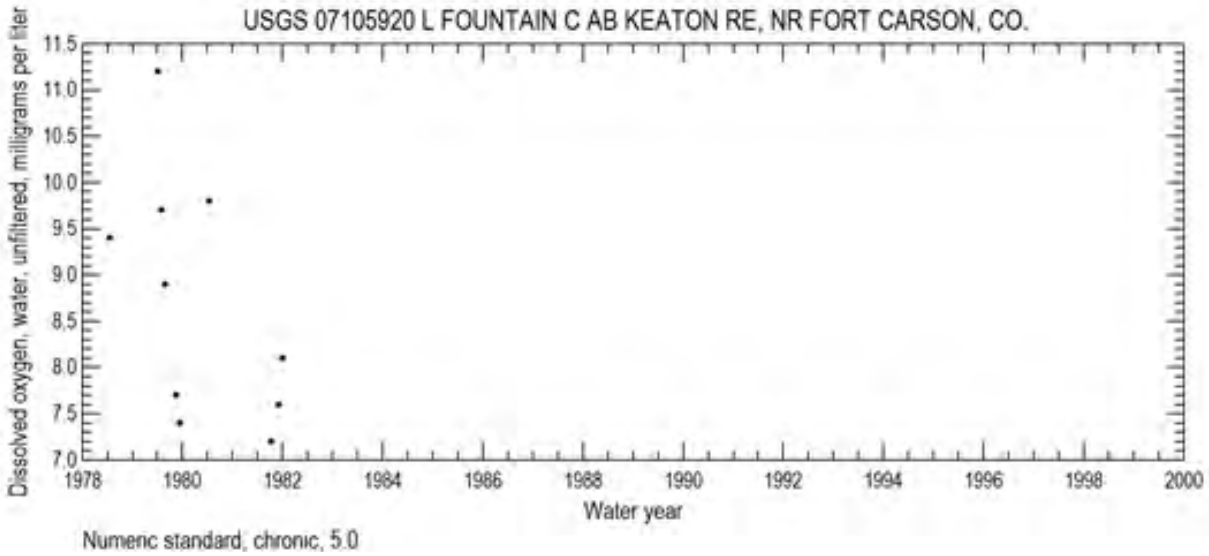
Numeric standard, acute and chronic, 520 and 400 (TVS)



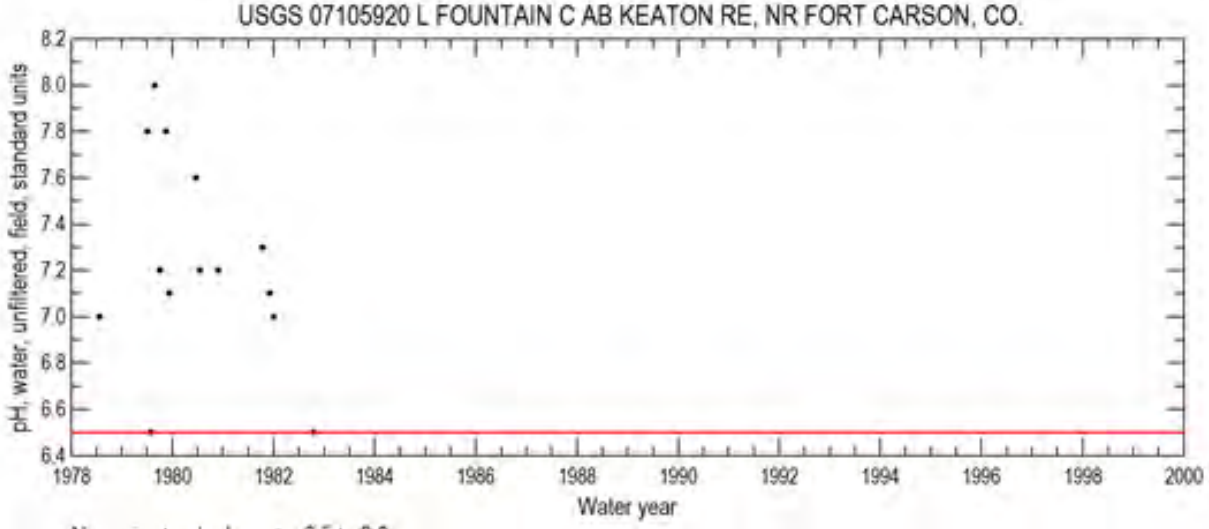
Numeric standard, chronic, 0.01



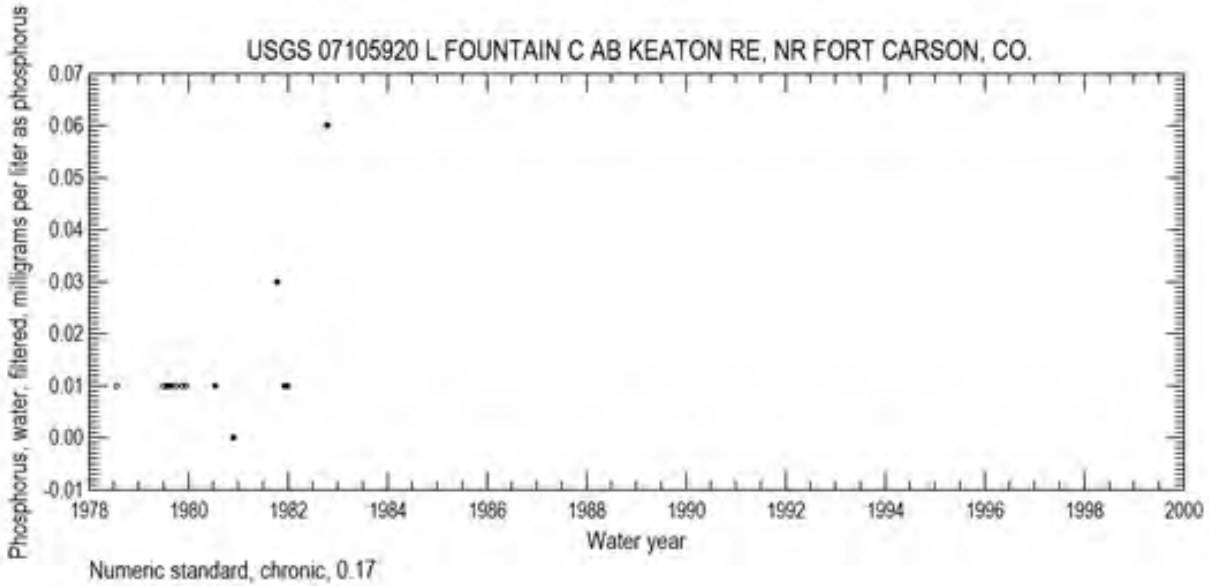
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



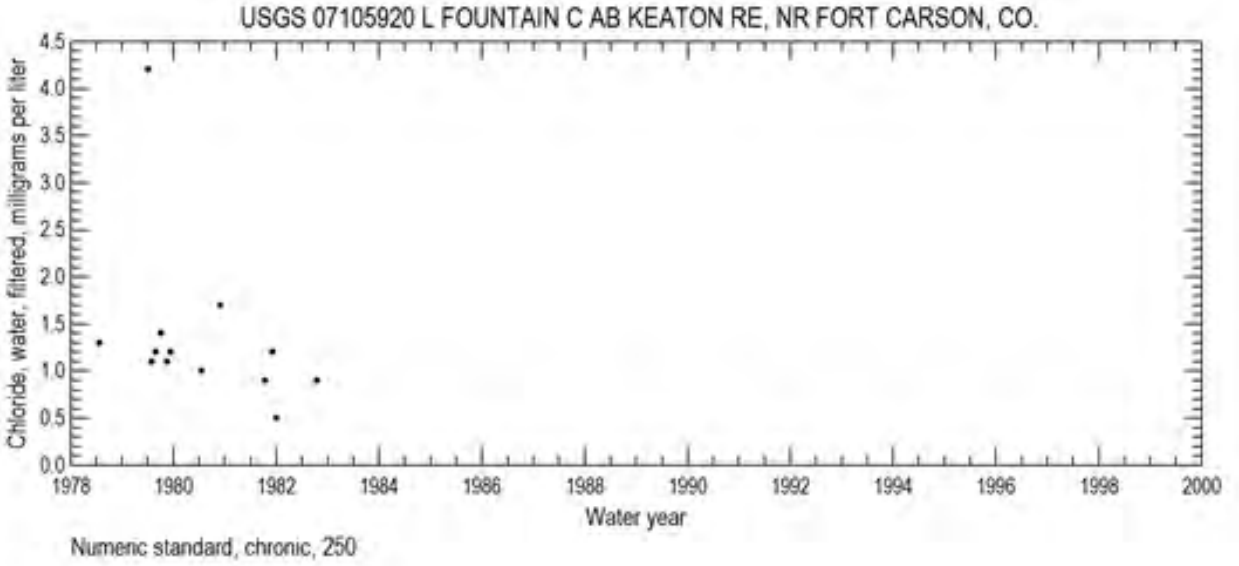
Numeric standard, chronic, 5.0

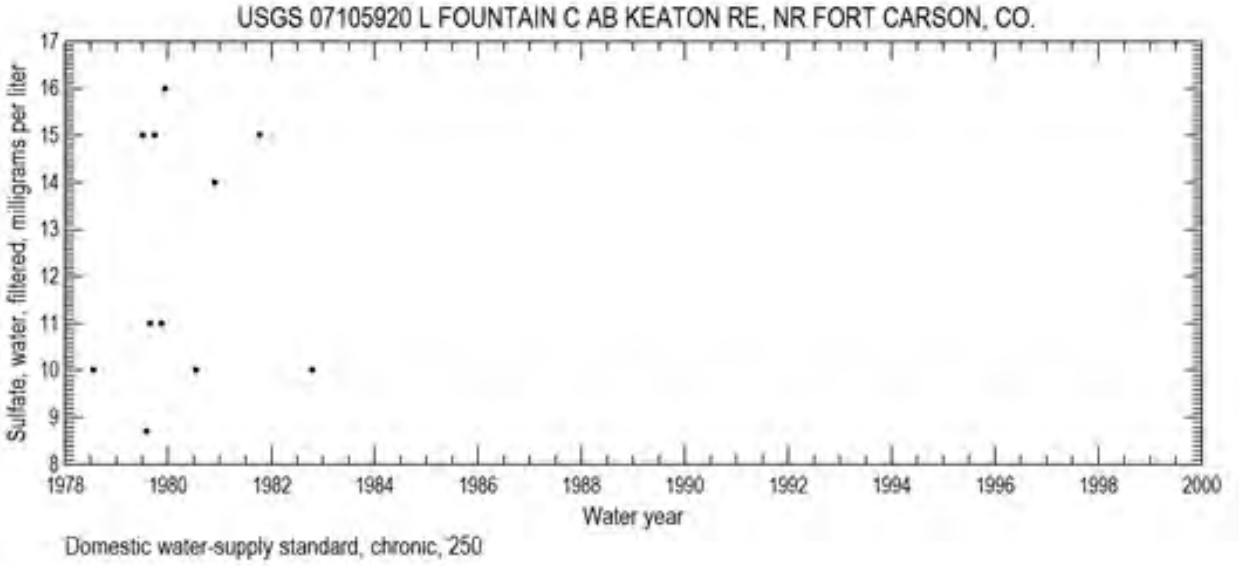


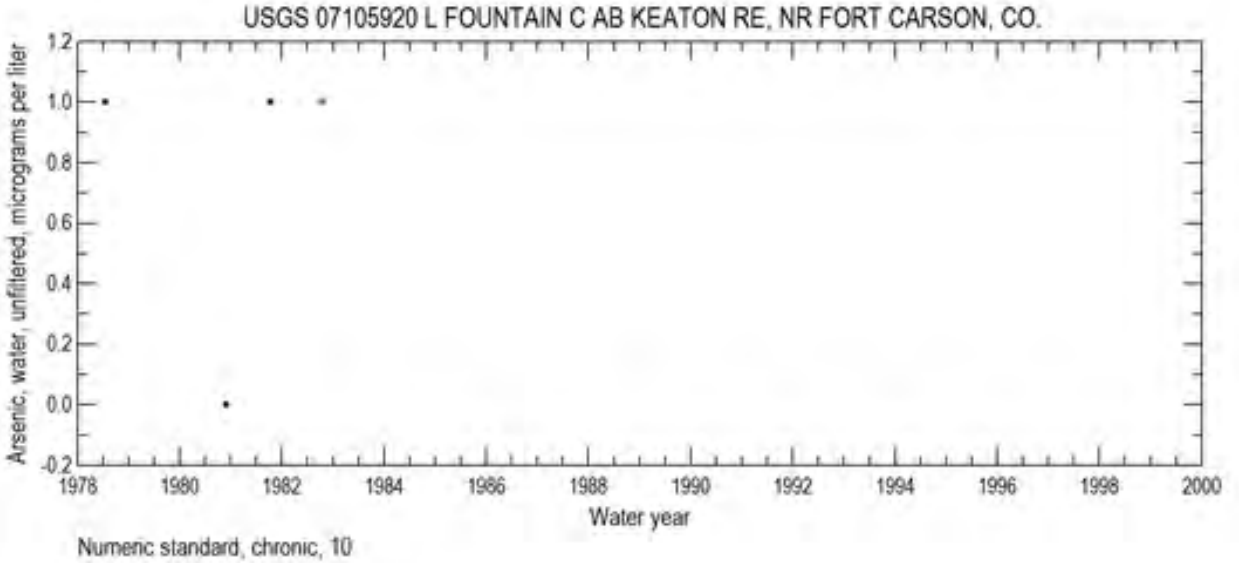
Numeric standard, acute, 6.5 to 9.0

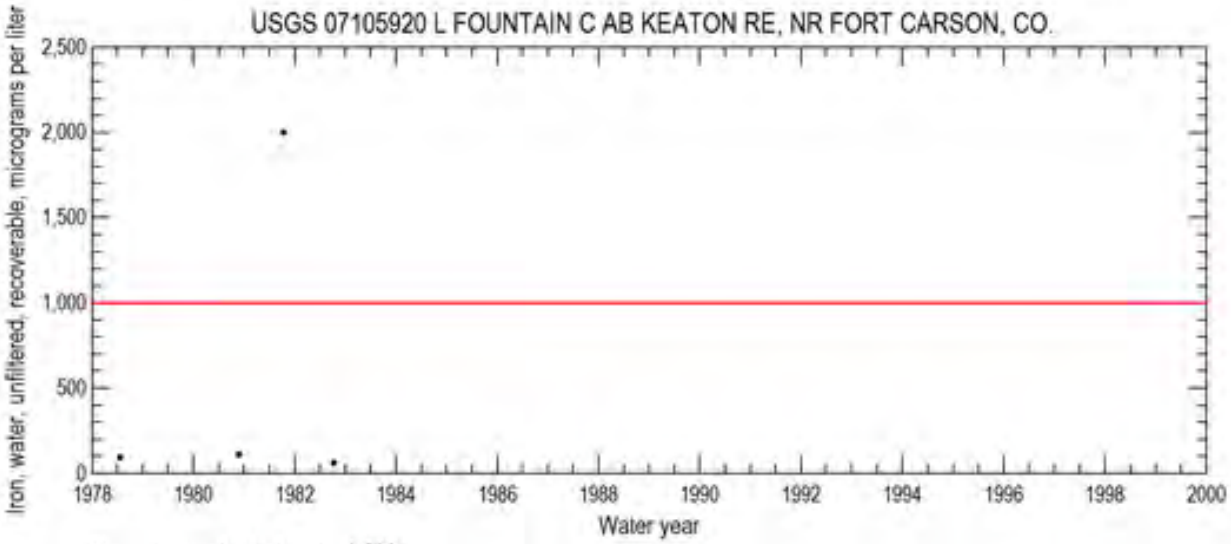


Numeric standard, chronic, 0.17

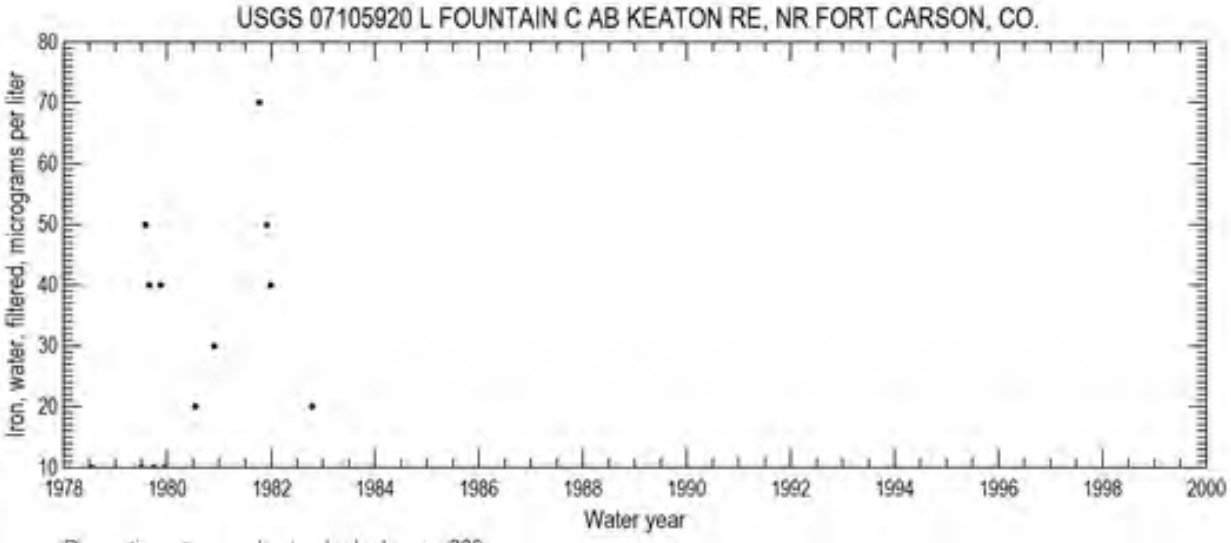

USGS 07105920 L FOUNTAIN C AB KEATON RE, NR FORT CARSON, CO.
Chloride, water, filtered, milligrams per liter
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Water year
Numeric standard, chronic, 250


USGS 07105920 L FOUNTAIN C AB KEATON RE, NR FORT CARSON, CO.
Sulfate, water, filtered, milligrams per liter
17
16
15
14
13
12
11
10
9
8
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Water year
Domestic water-supply standard, chronic, 250

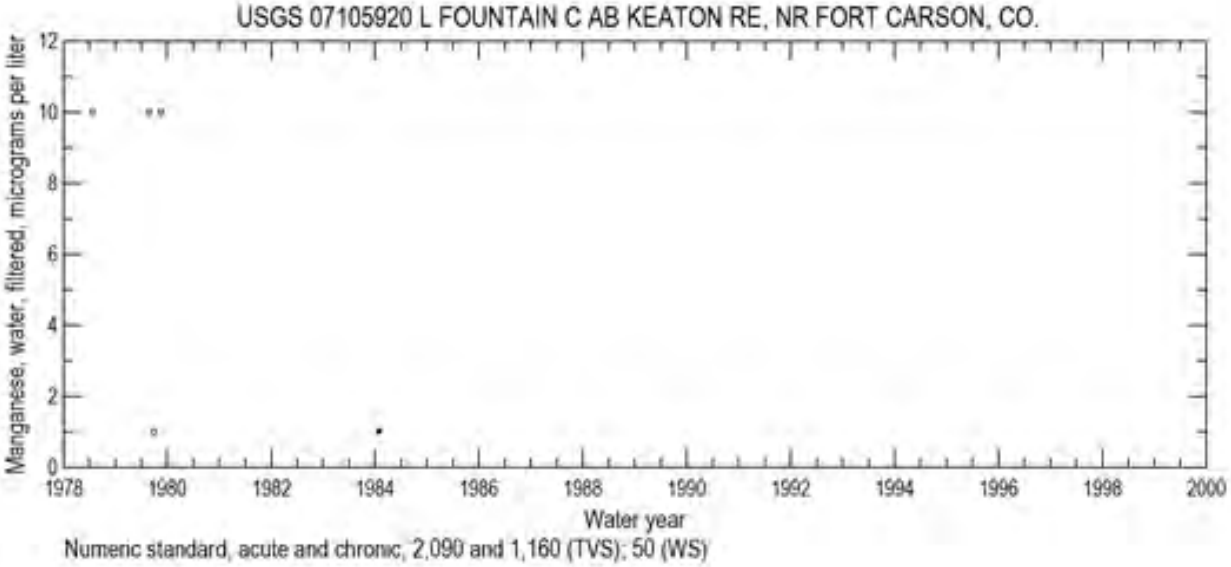

USGS 07105920 L FOUNTAIN C AB KEATON RE, NR FORT CARSON, CO.
Arsenic, water, unfiltered, micrograms per liter
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Water year
Numeric standard, chronic, 10



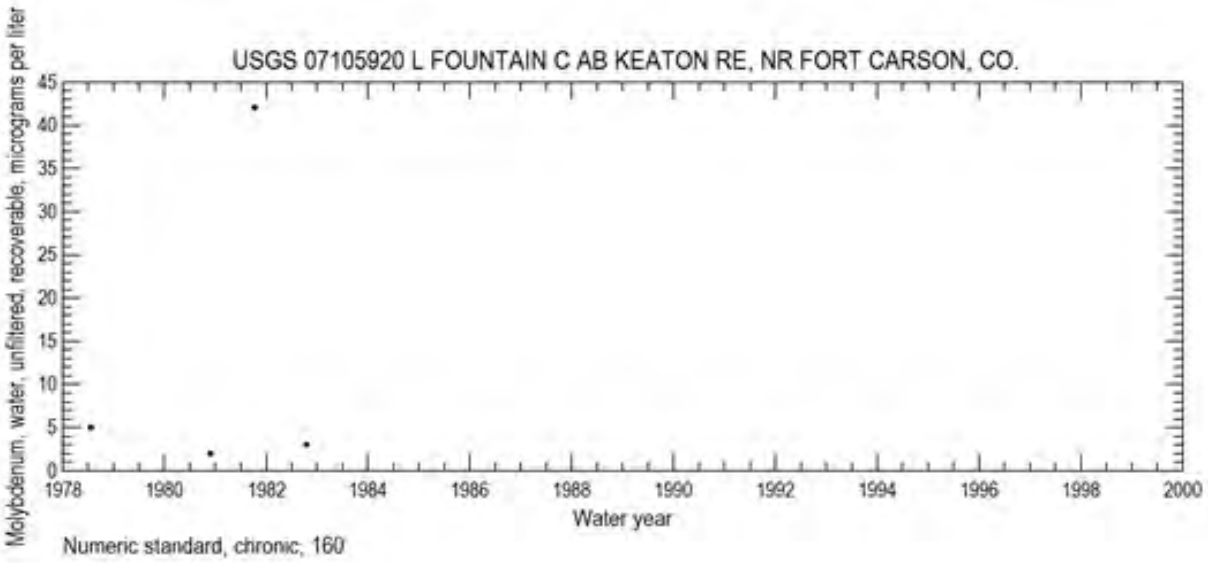
Numenc standard, chronic, 1,000



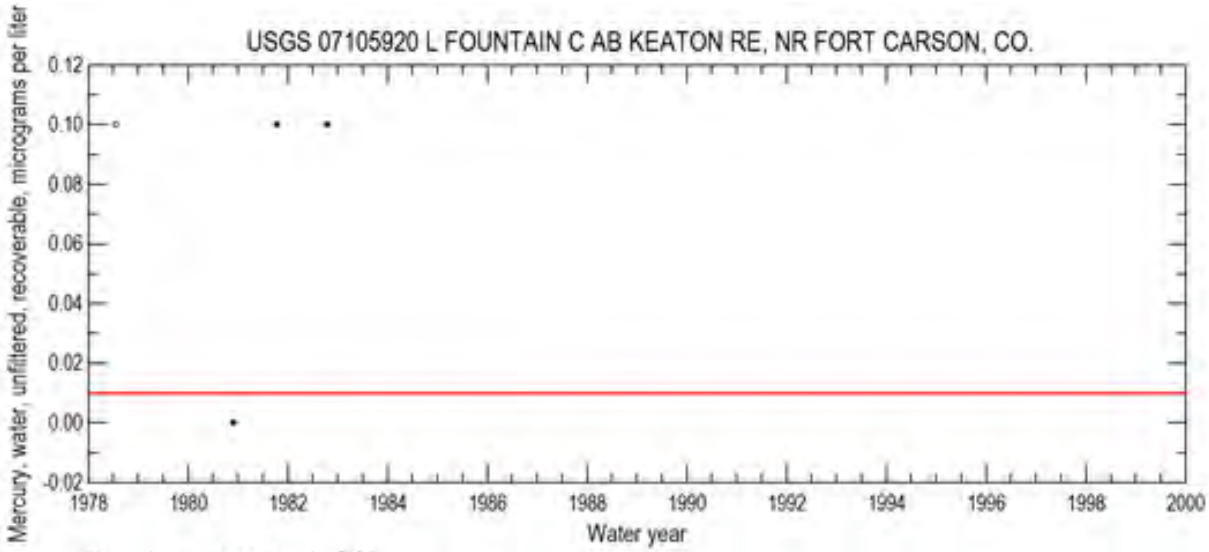
Domestic water-supply standard, chronic, 300



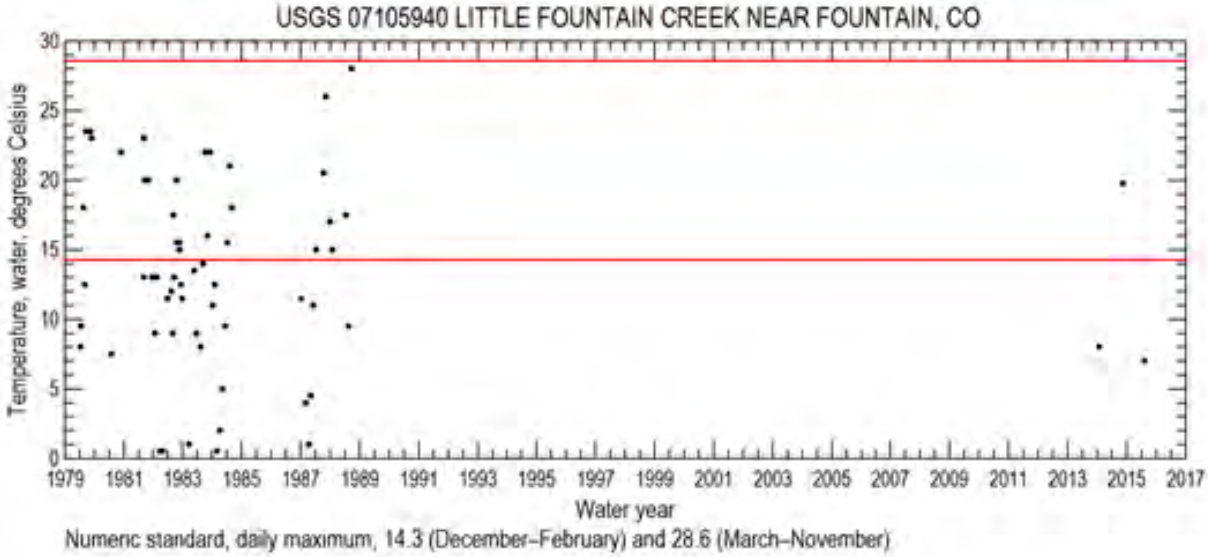
Numeric standard, acute and chronic, 2,090 and 1,160 (TVS); 50 (WS)



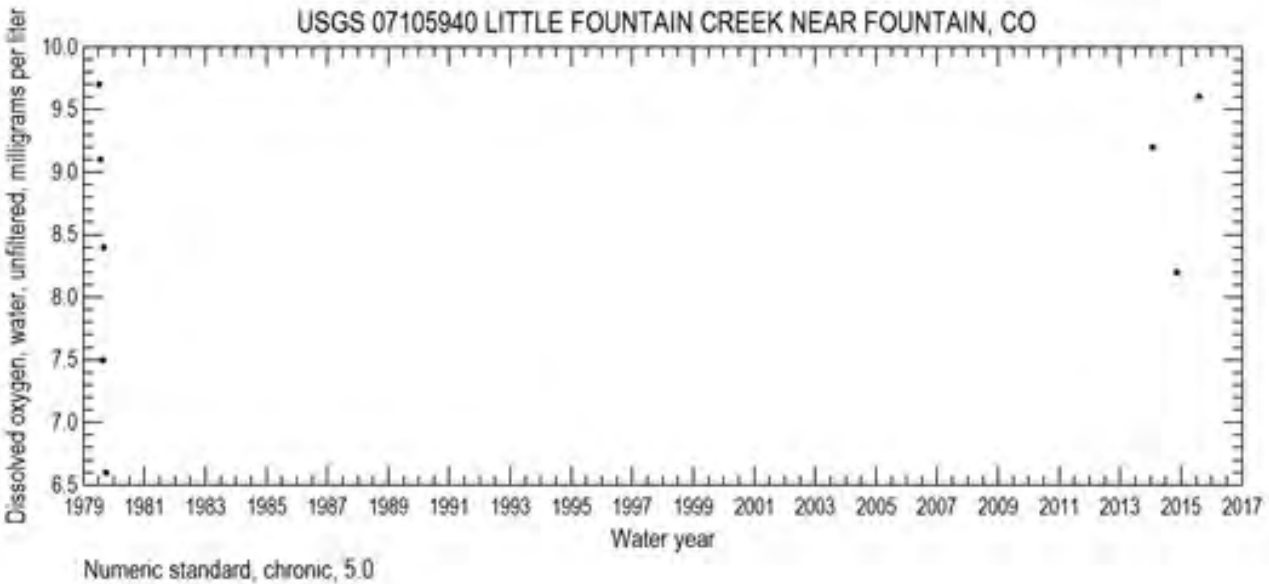
Numeric standard, chronic, 160



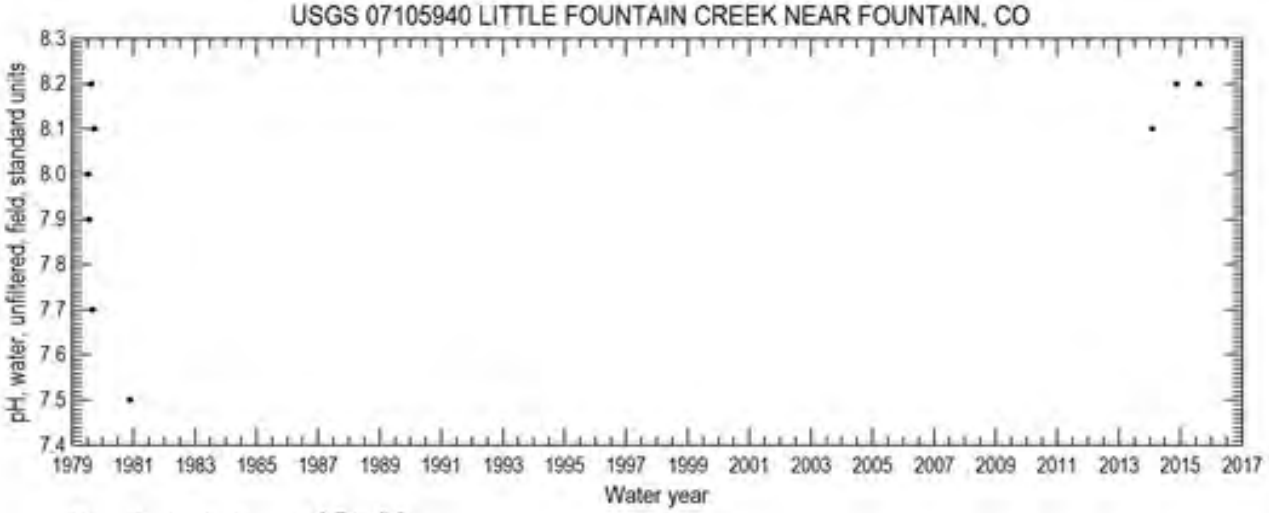
Numeric standard, chronic, 0.01



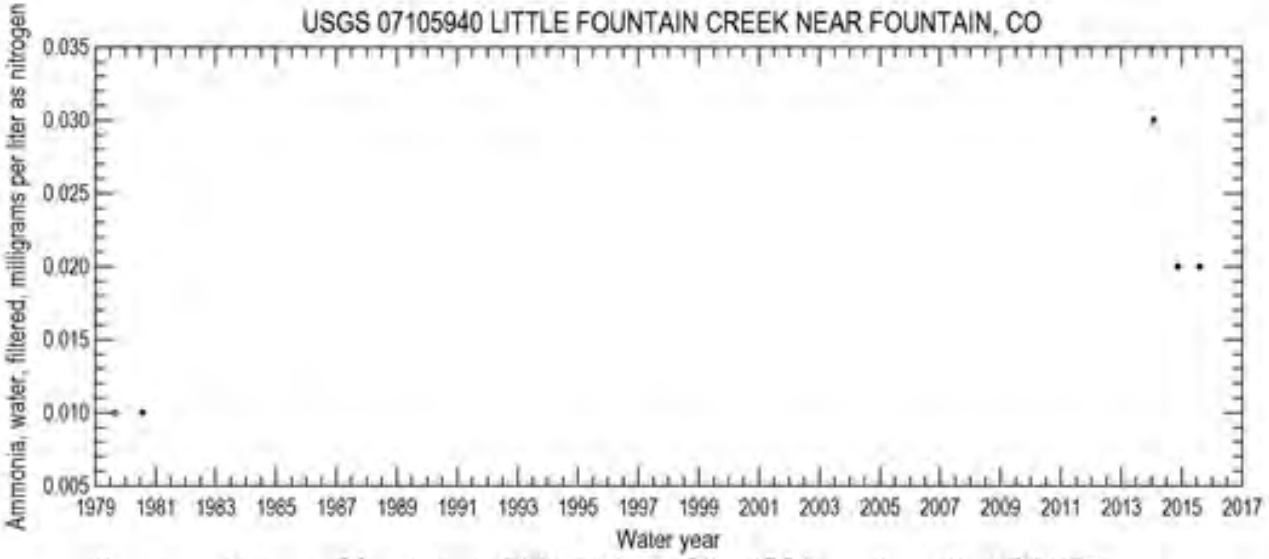
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



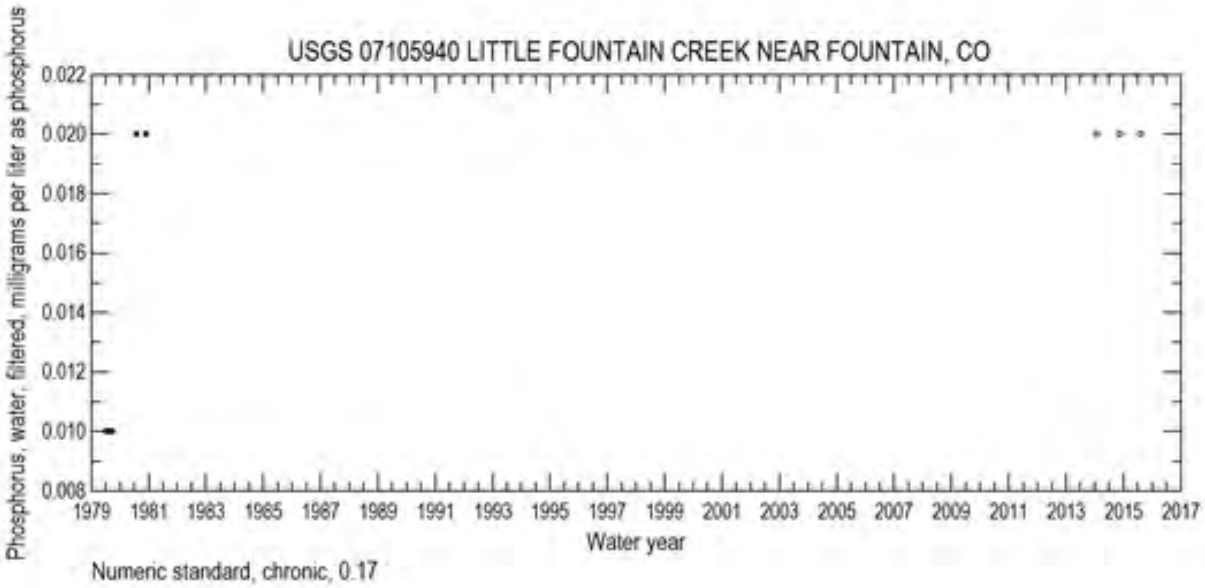
Numeric standard, chronic, 5.0

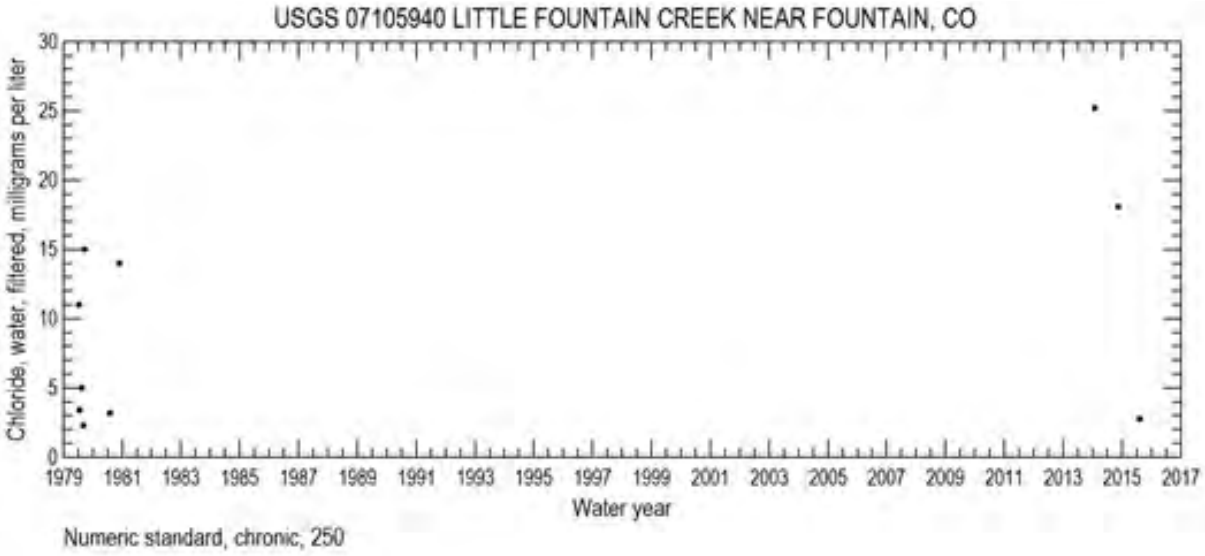


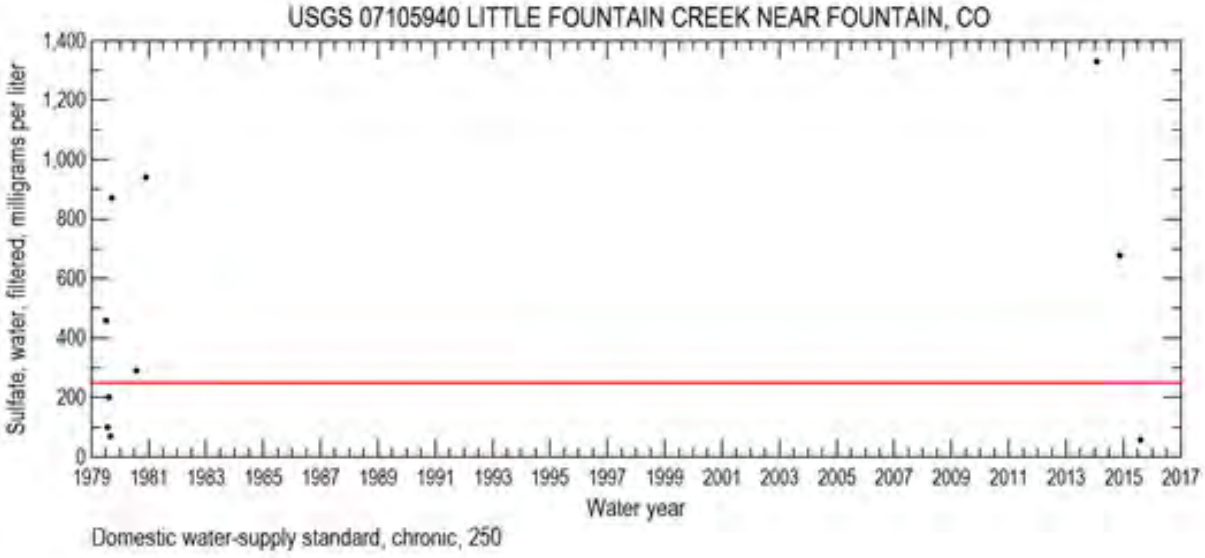
Numeric standard, acute, 6.5 to 9.0

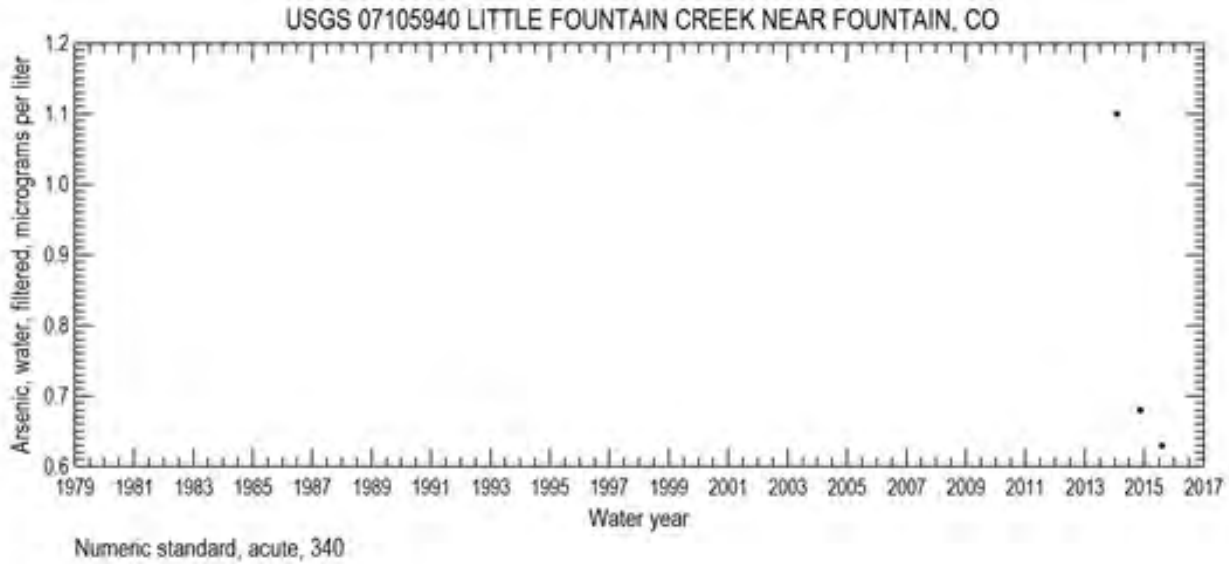


Numeric standard, acute, 6.9, and chronic, 2.0 (April 1 - August 31) and 7.6 (September 1 - March 31) (TVS)

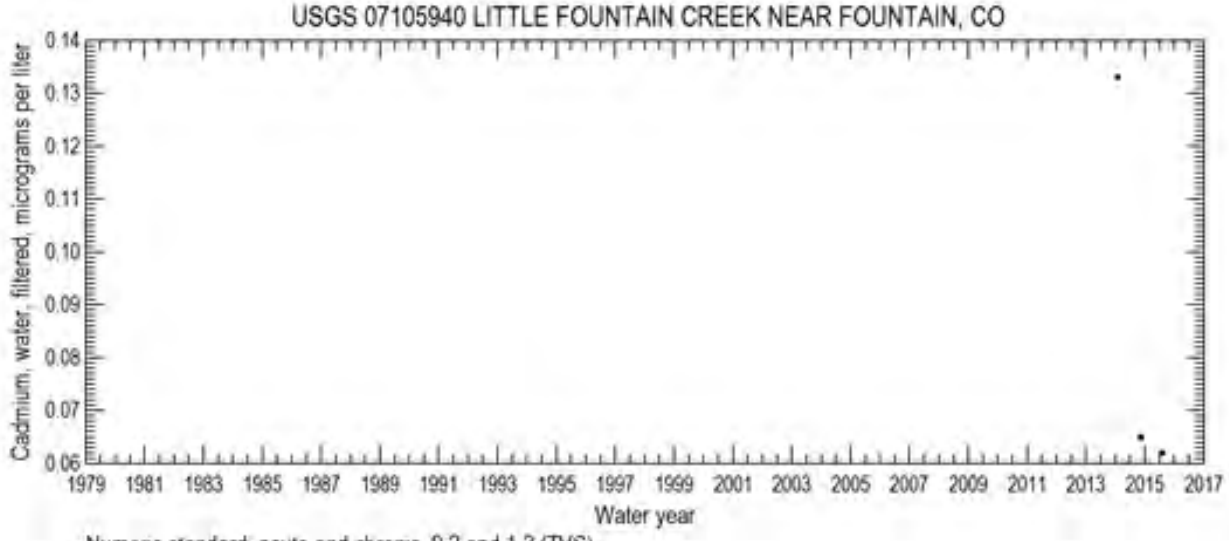

USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
Phosphorus, water, filtered, milligrams per liter as phosphorus
0.022
0.020
0.018
0.016
0.014
0.012
0.010
0.008
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, chronic, 0.17


USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
Chloride, water, filtered, milligrams per liter
30
25
20
15
10
5
0
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, chronic, 250

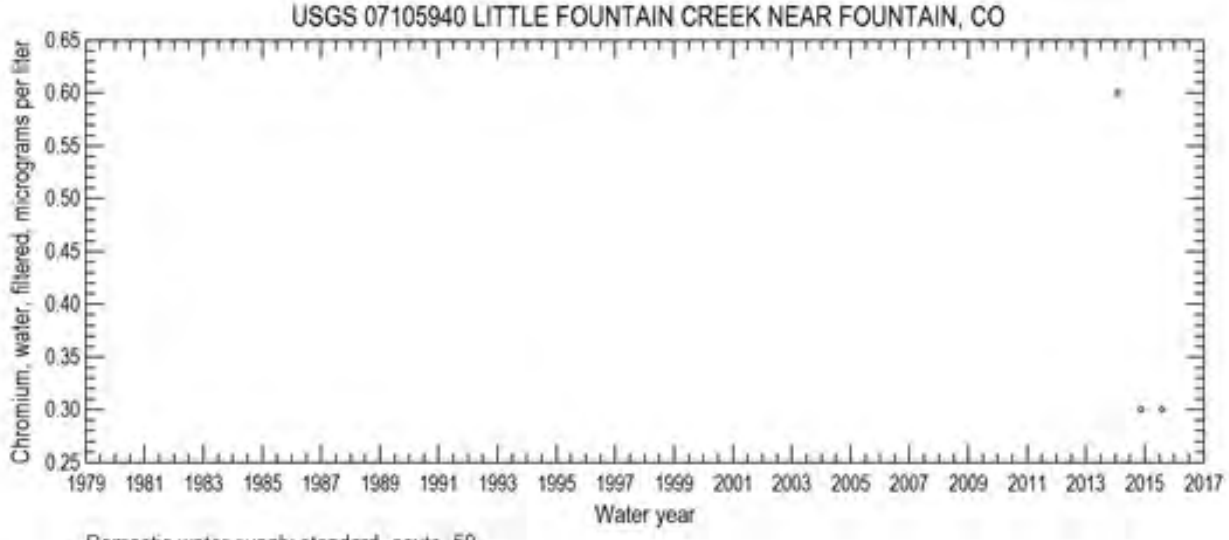

USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
Sulfate, water, filtered, milligrams per liter
1,400
1,200
1,000
800
600
400
200
0
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Domestic water-supply standard, chronic, 250



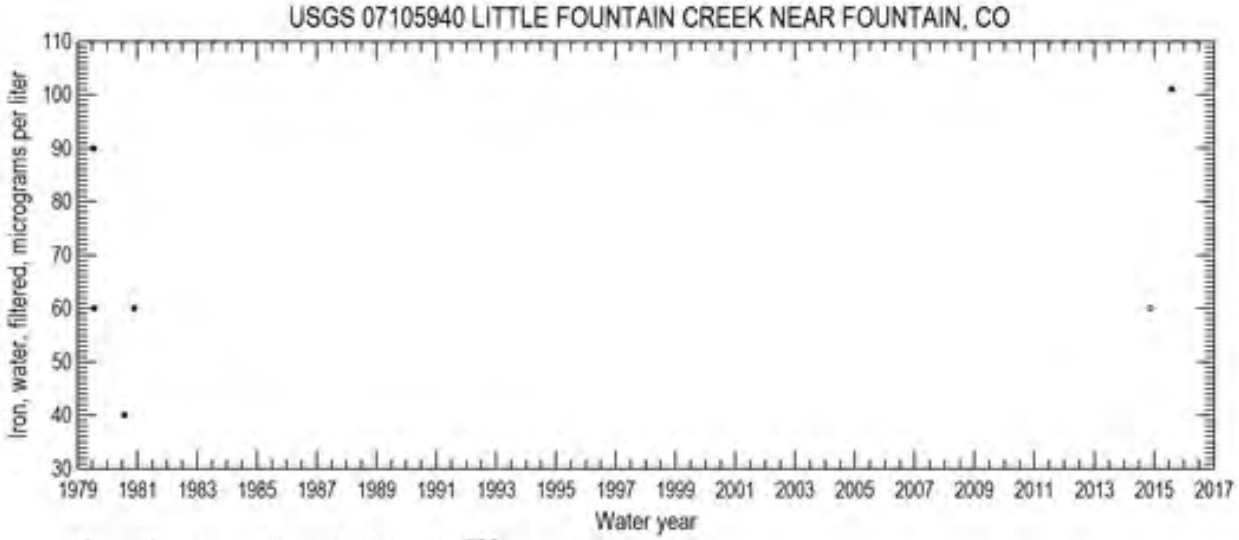
Numeric standard, acute, 340

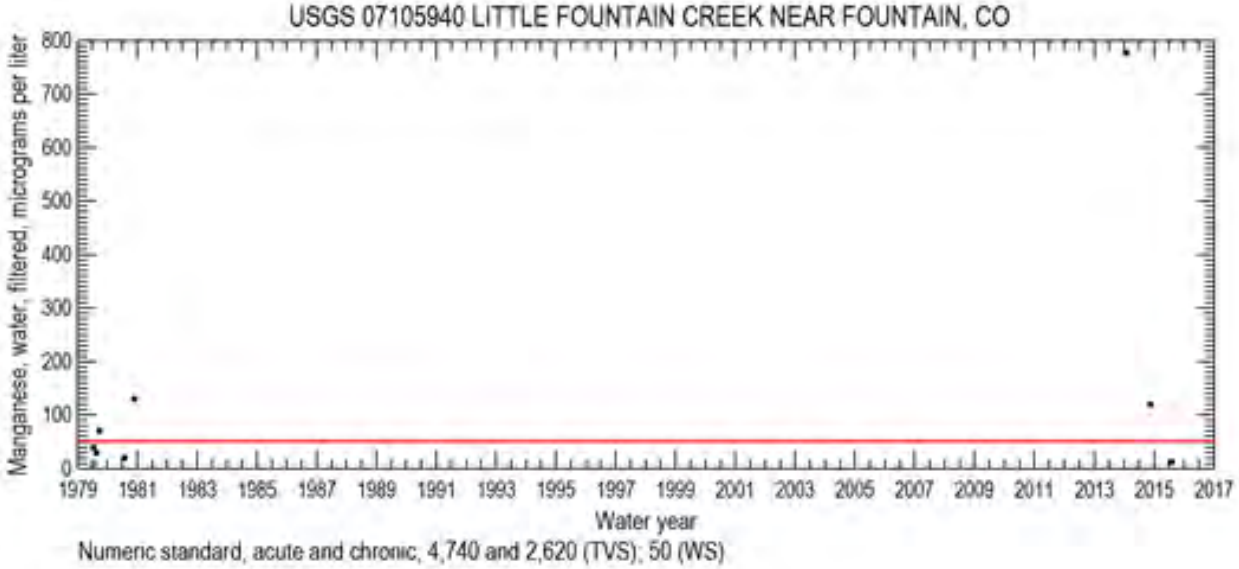


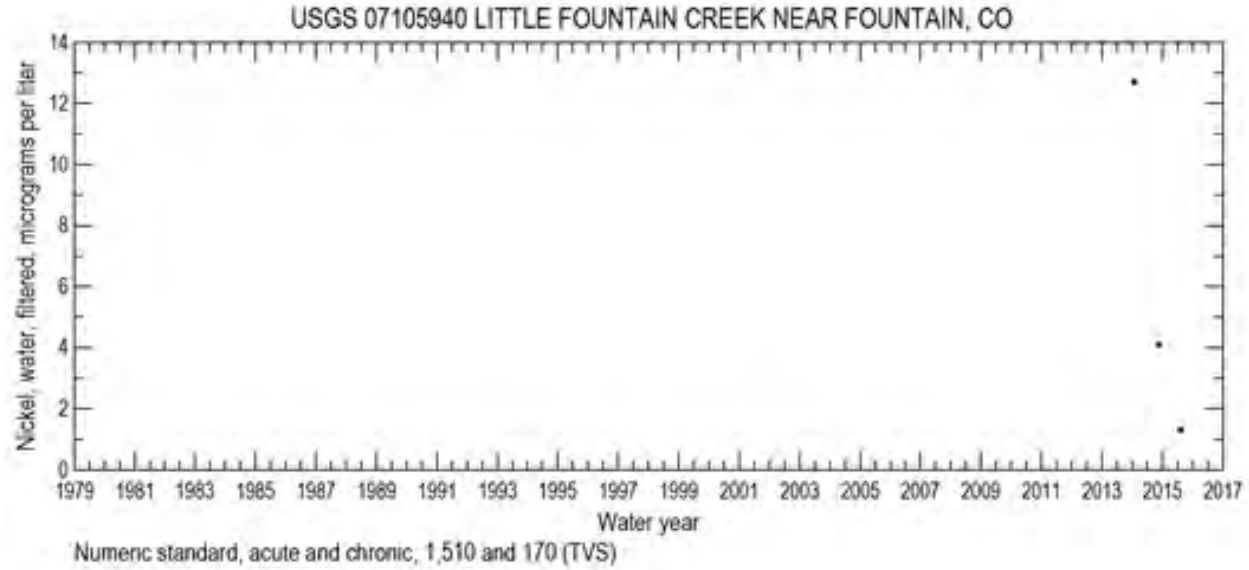
Numeric standard, acute and chronic, 9.2 and 1.2 (TVS)

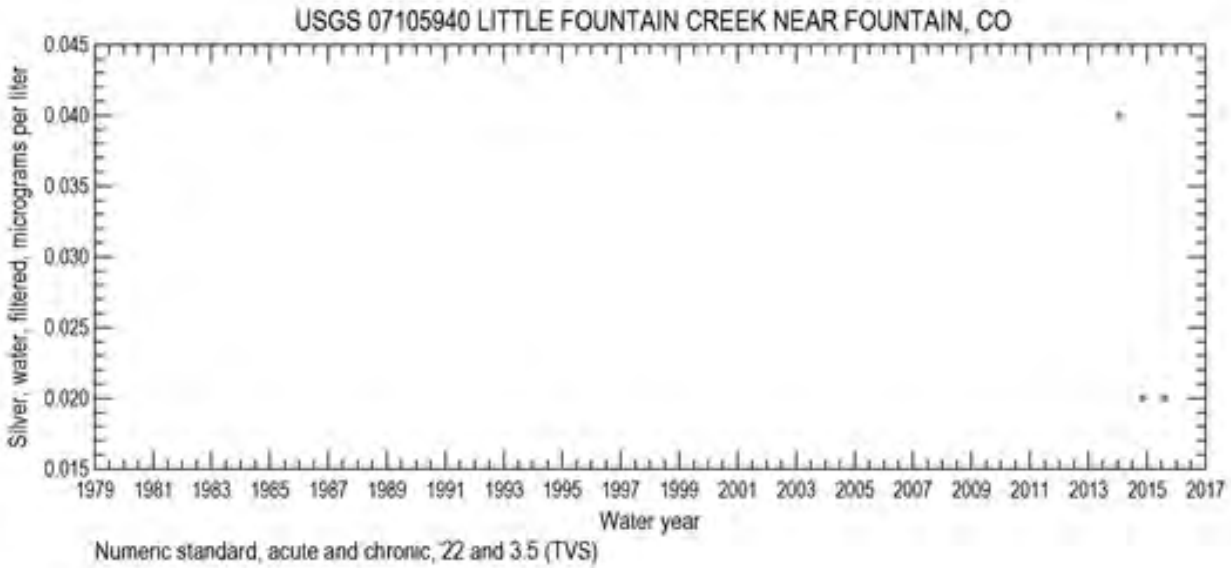


Domestic water-supply standard, acute, 50

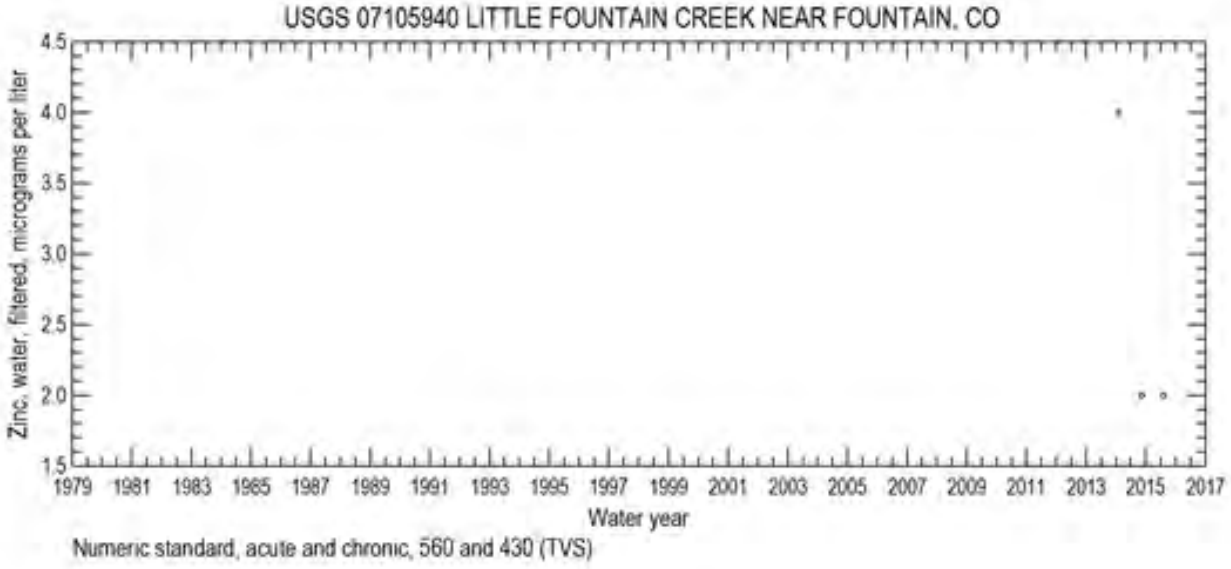

USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
Iron, water, filtered, micrograms per liter
110
100
90
80
70
60
50
40
30
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Domestic water-supply standard, chronic, 300


USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
Manganese, water, filtered, micrograms per liter
800
700
600
500
400
300
200
100
0
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS); 50 (WS)

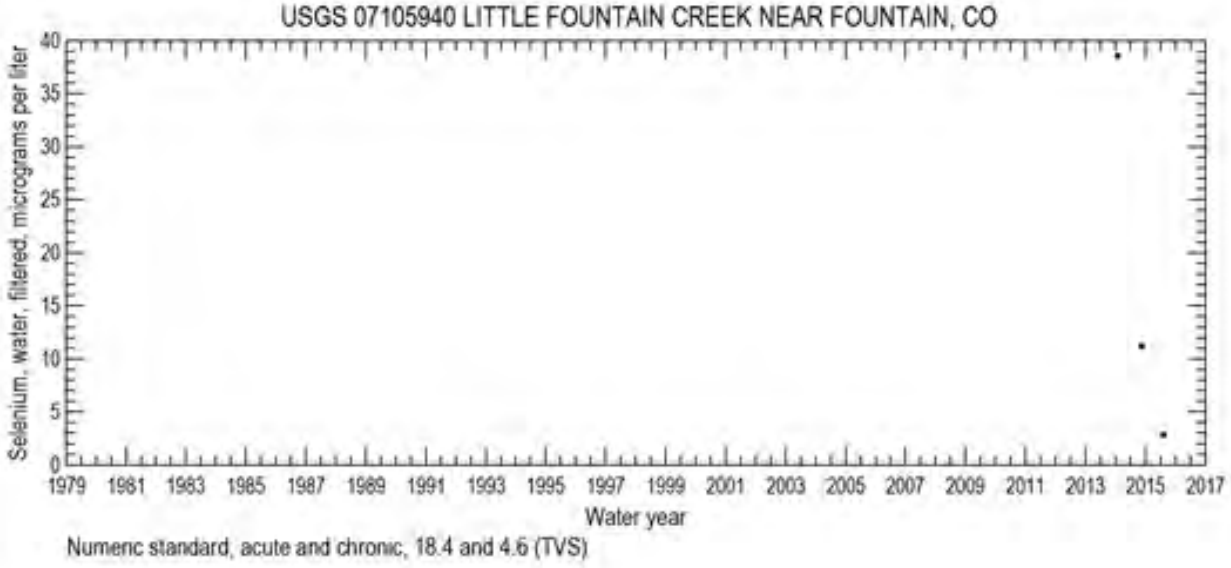

USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
Nickel, water, filtered, micrograms per liter
14
12
10
8
6
4
2
0
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, acute and chronic, 1,510 and 170 (TVS)



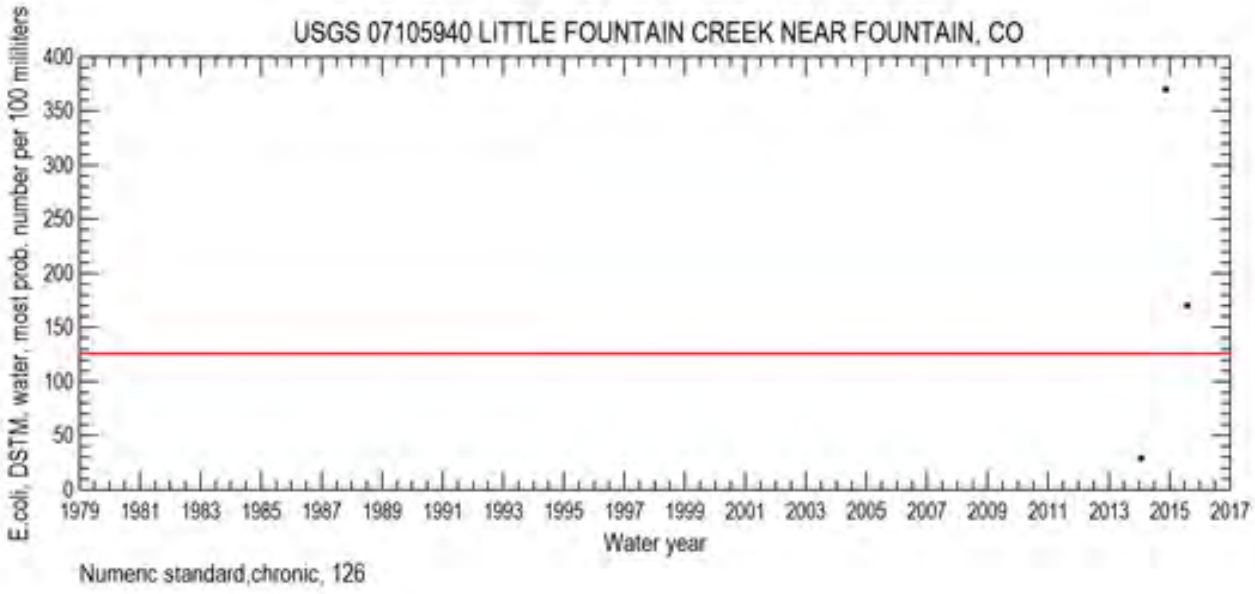
Numeric standard, acute and chronic, 22 and 3.5 (TVS)

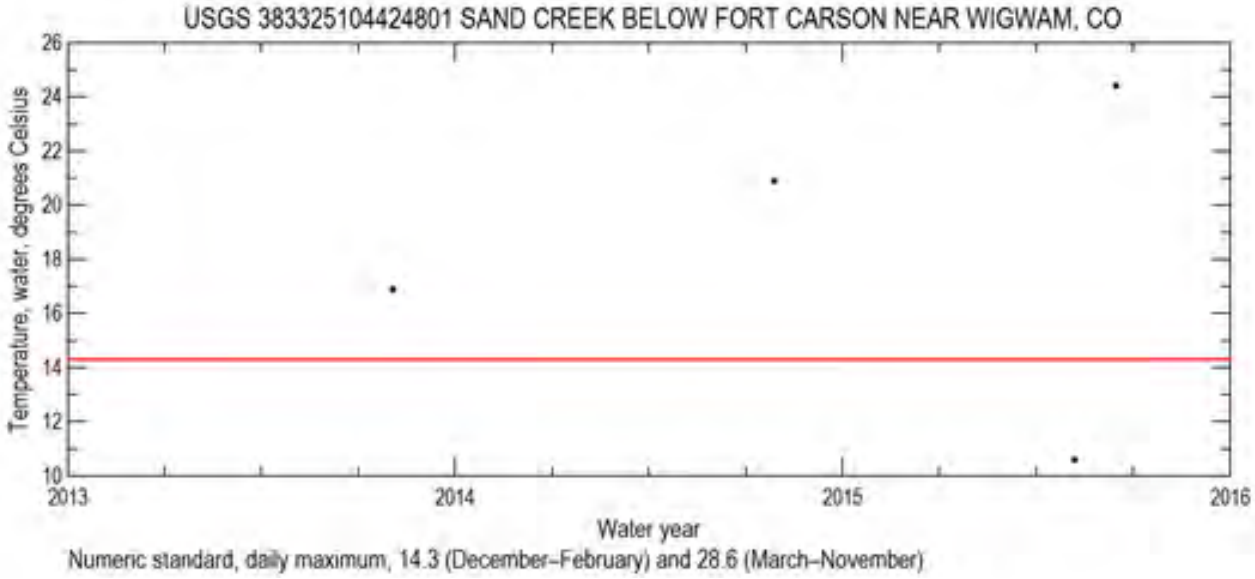


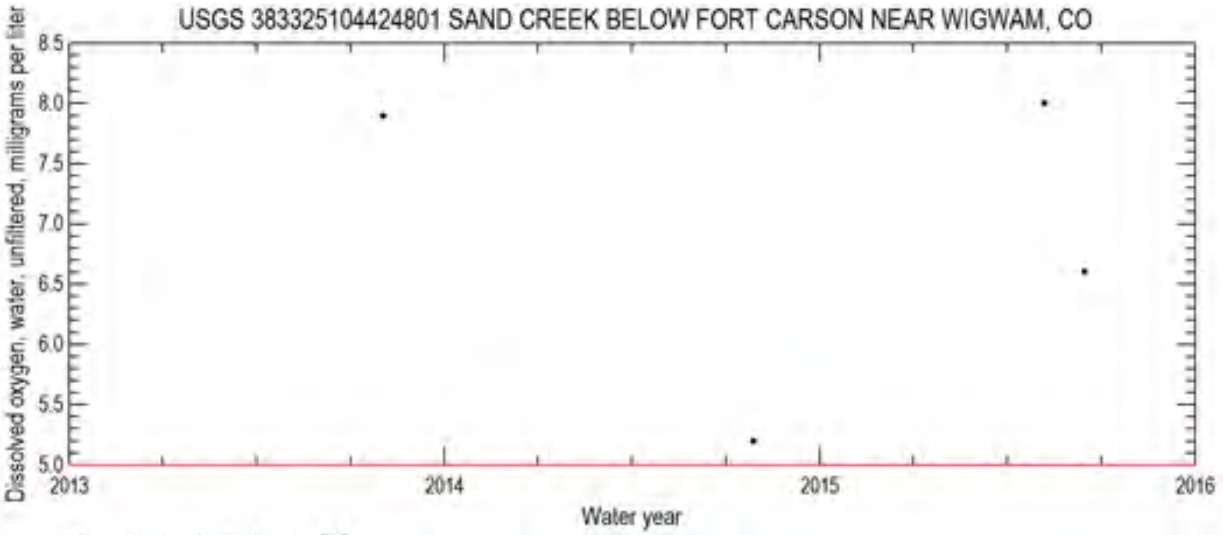
Numeric standard, acute and chronic, 560 and 430 (TVS)



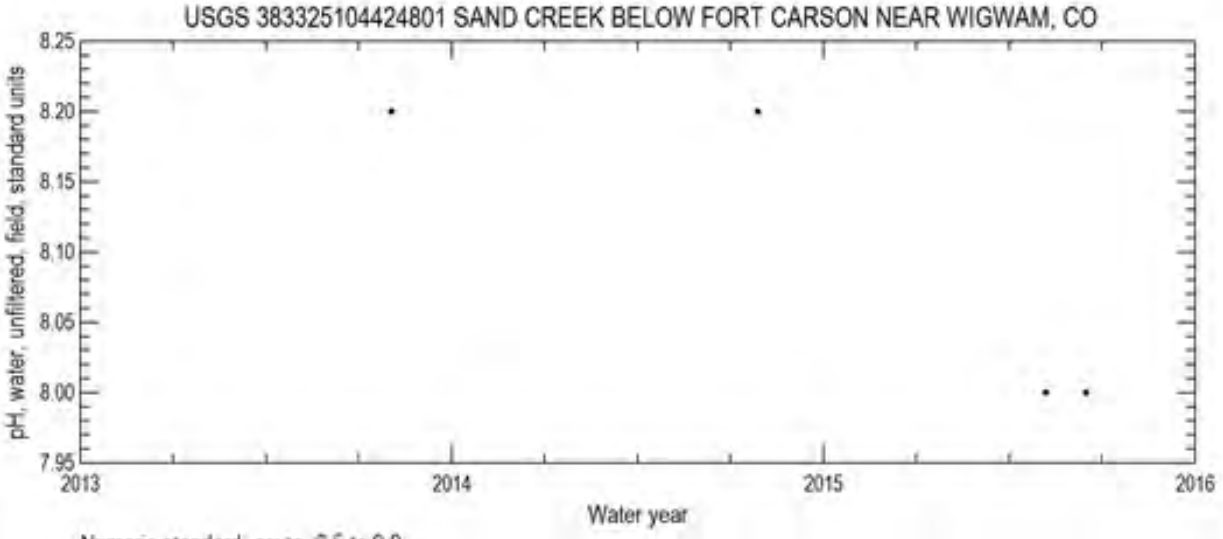
Numeric standard, acute and chronic, 18.4 and 4.6 (TVS)


USGS 07105940 LITTLE FOUNTAIN CREEK NEAR FOUNTAIN, CO
E.coli, DSTM, water, most prob. number per 100 milliliters
400
350
300
250
200
150
100
50
0
1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard,chronic, 126

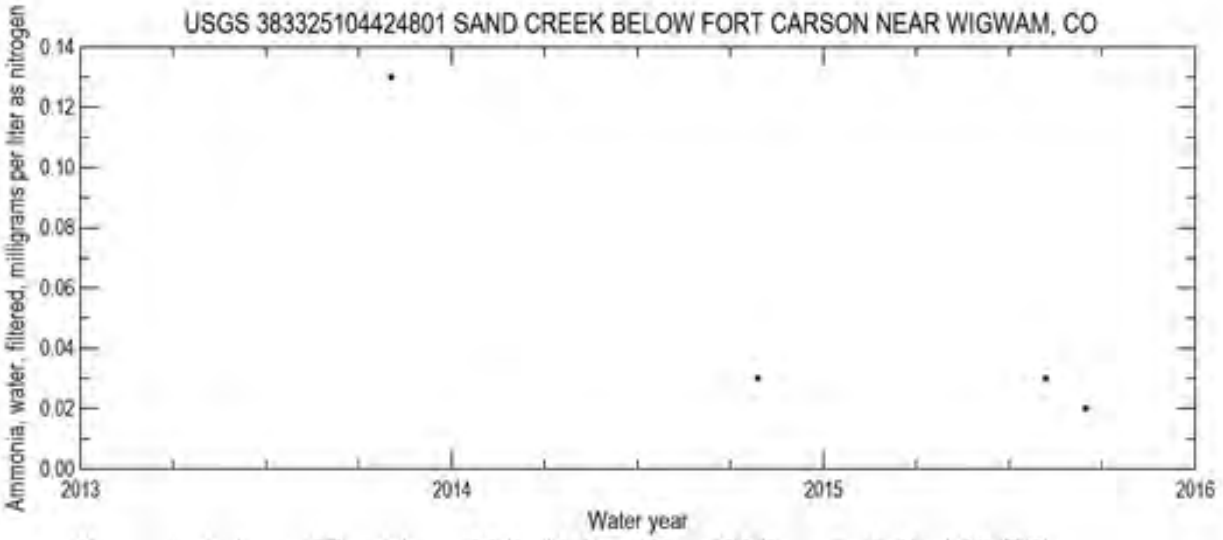

USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
Temperature, water, degrees Celsius
26
24
22
20
18
16
14
12
10
2013
2014
2015
2016
Water year
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



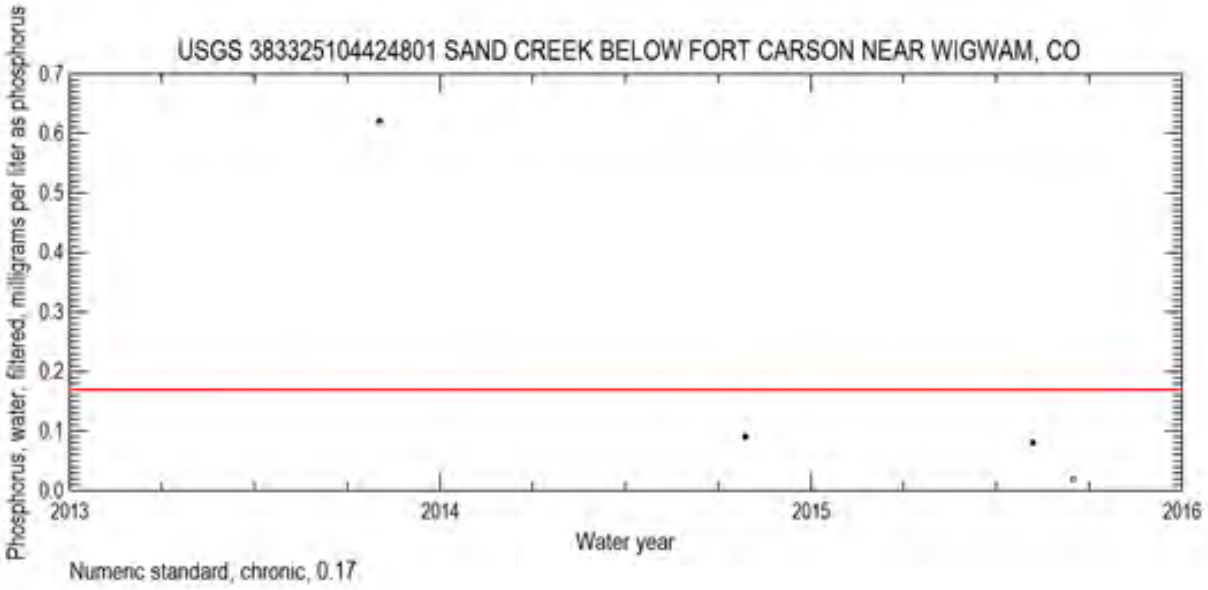
Numeric standard, chronic, 5.0

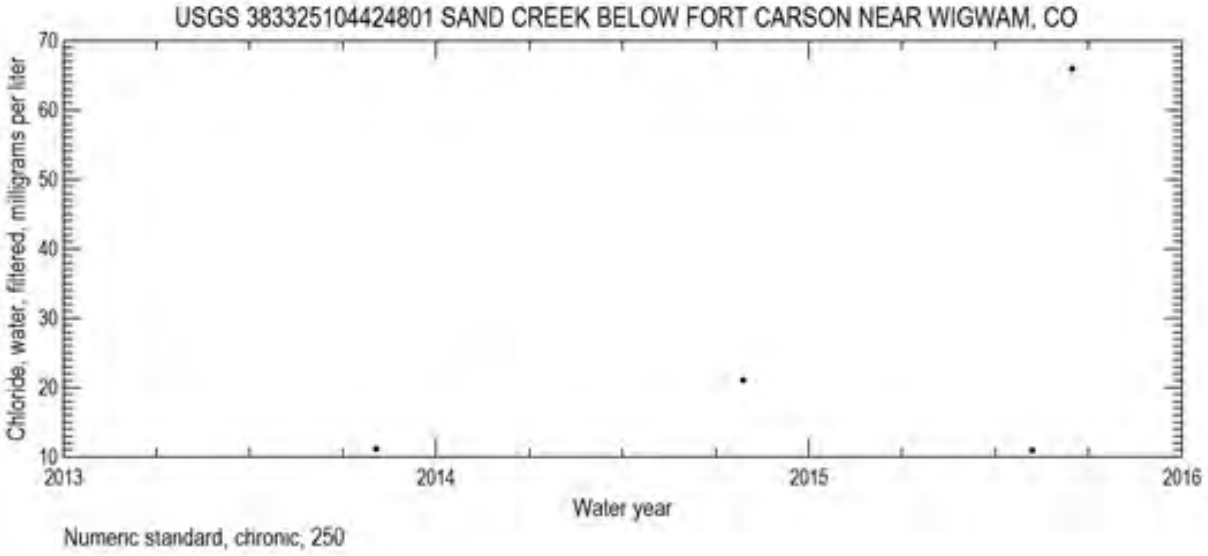


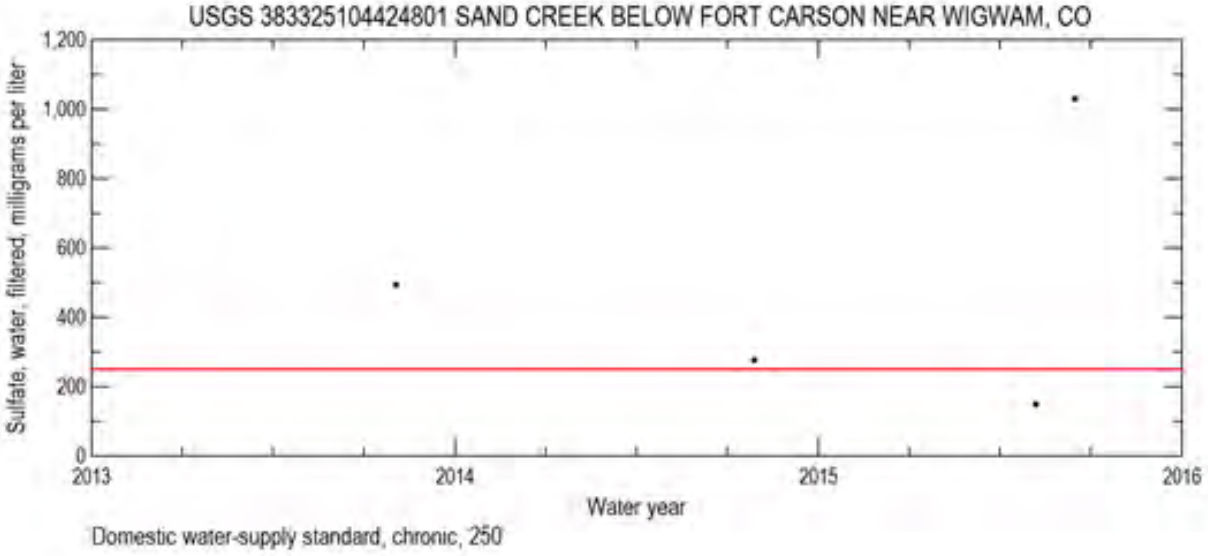
Numeric standard, acute, 6.5 to 9.0

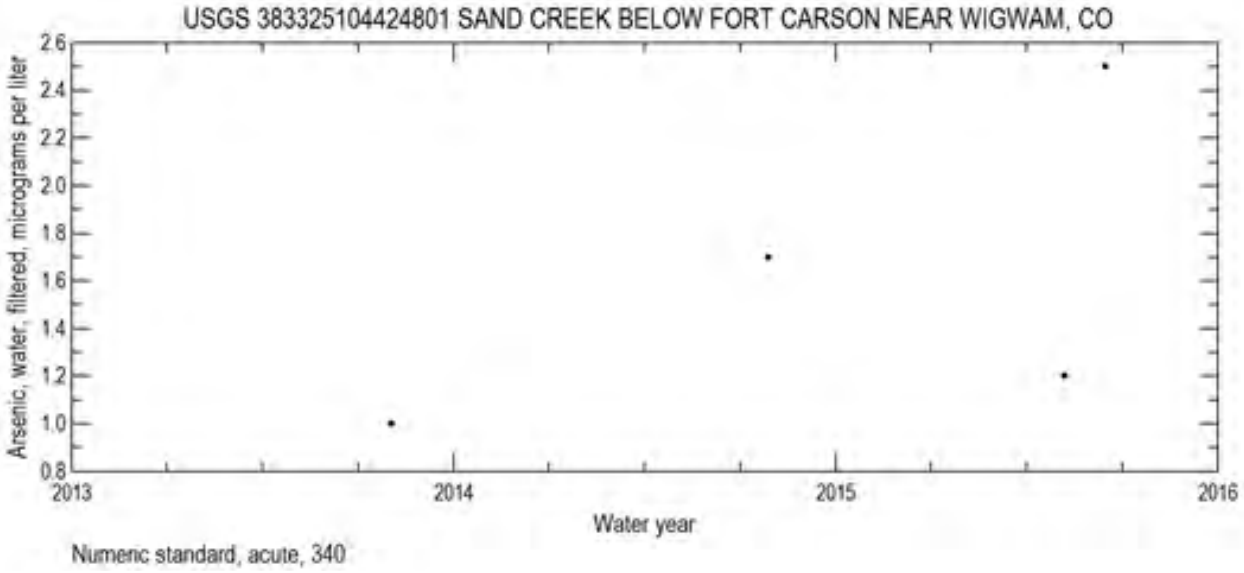


Numeric standard, acute, 5.7, and chronic, 0.9 (April 1- August 31) and 3.8 (September 1 - March 31) (TVS)

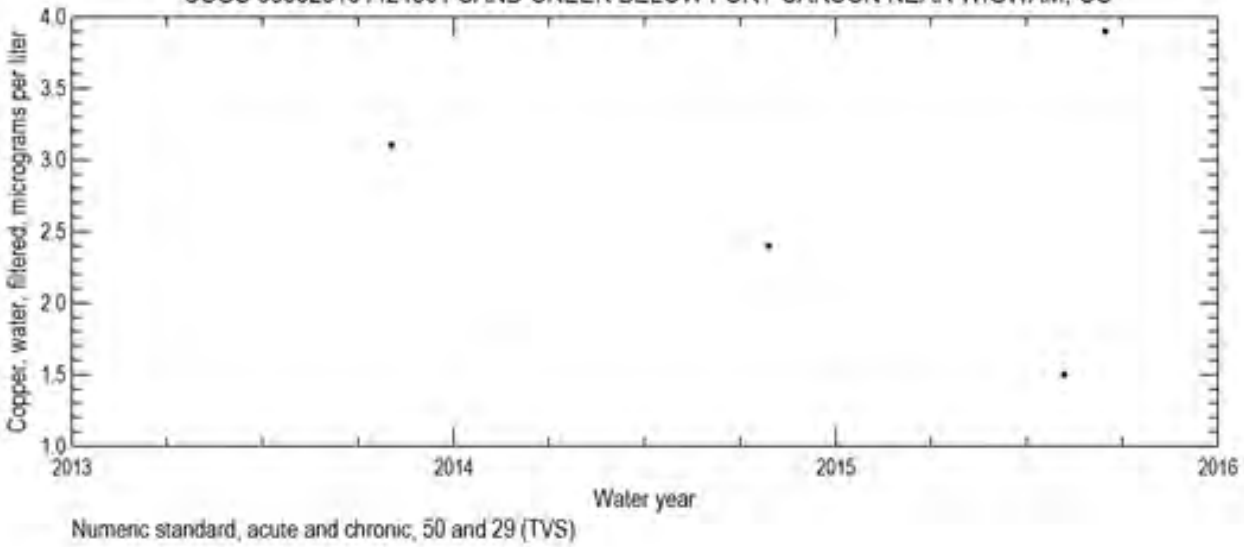

USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
Phosphorus, water, filtered, milligrams per liter as phosphorus
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
2013
2014
2015
2016
Water year
Numeric standard, chronic, 0.17


USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
Chloride, water, filtered, milligrams per liter
70
60
50
40
30
20
10
2013
2014
2015
2016
Water year
Numeric standard, chronic, 250

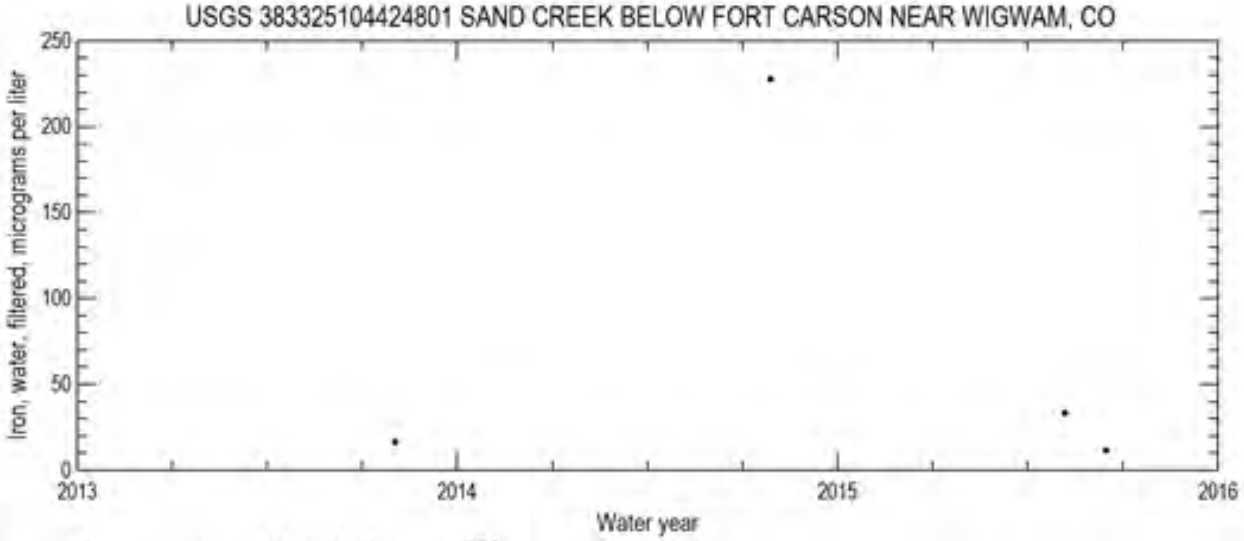

USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
Sulfate, water, filtered, milligrams per liter
1,200
1,000
800
600
400
200
0
2013
2014
2015
2016
Water year
Domestic water-supply standard, chronic, 250



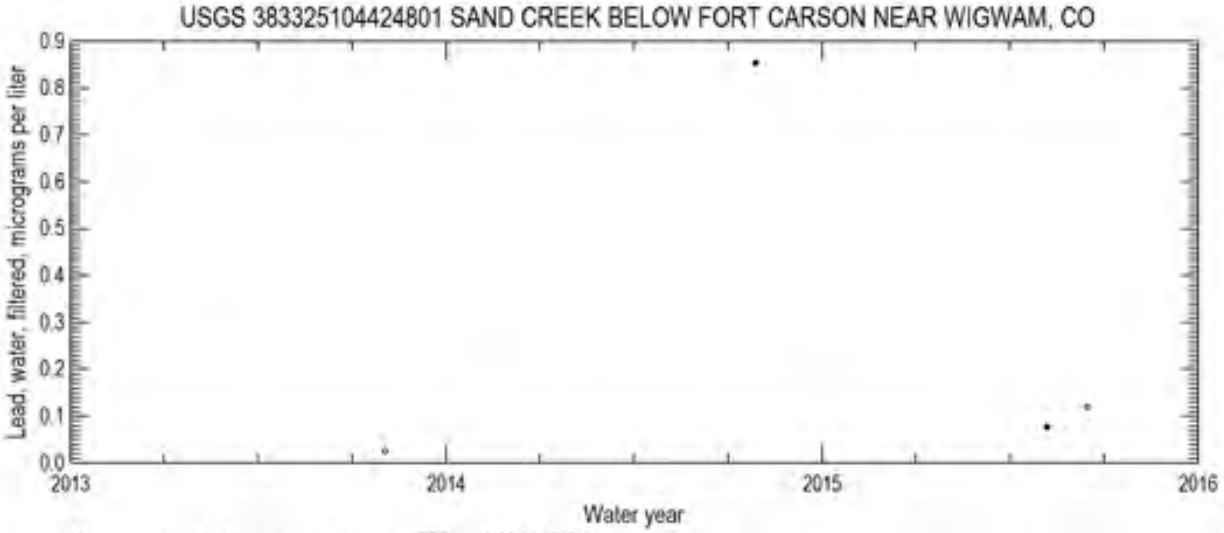
Numeric standard, acute, 340



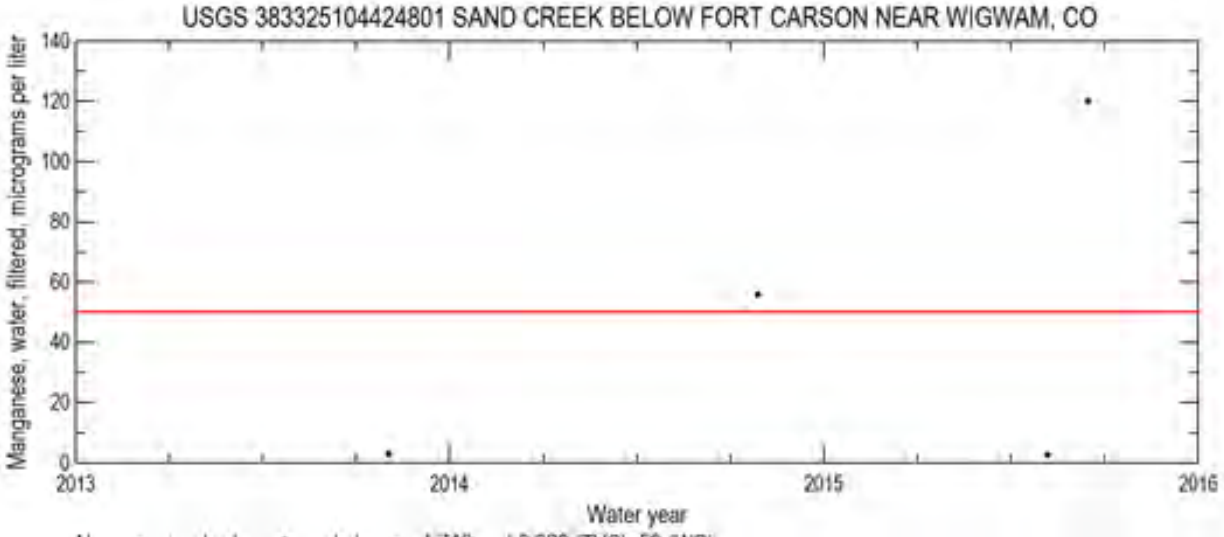
Numeric standard, acute and chronic, 50 and 29 (TVS)



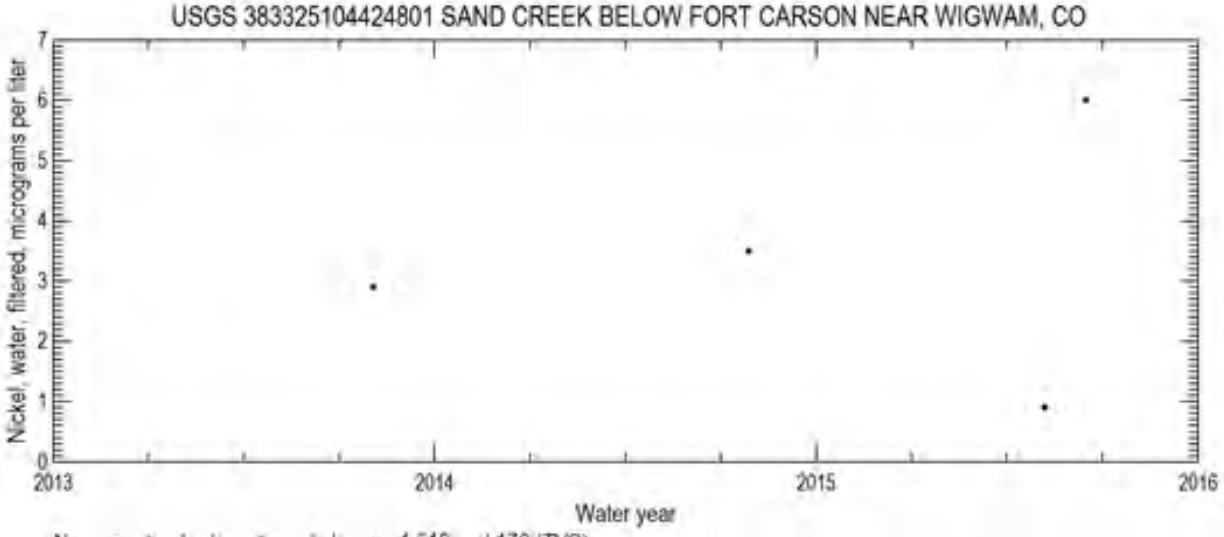
Domestic water-supply standard, chronic, 300



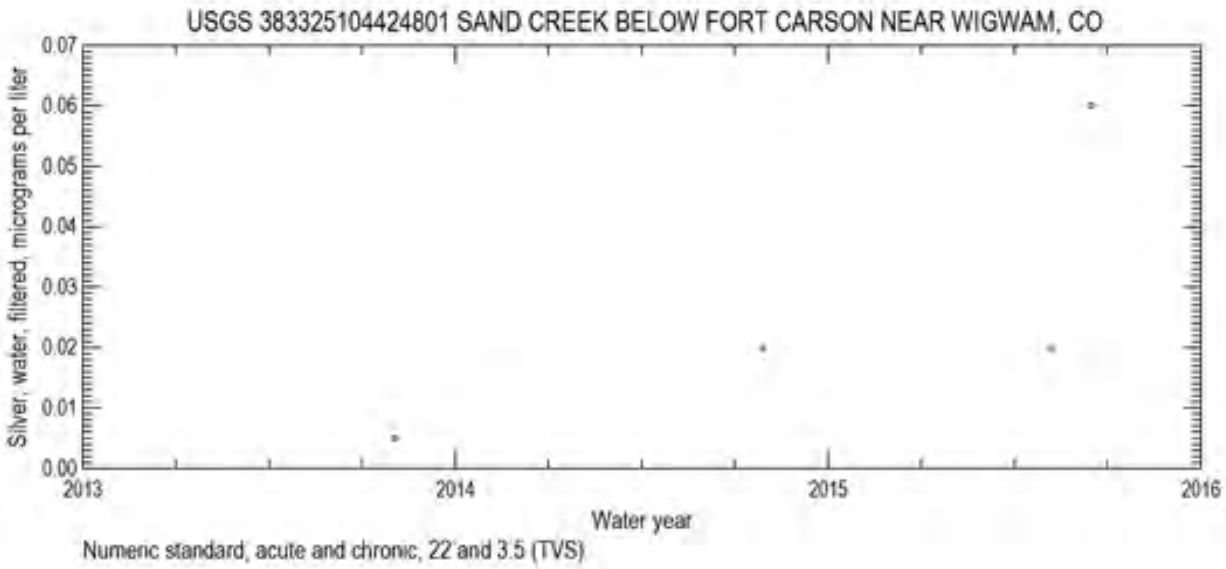
Numeric standard, acute and chronic, 280 and 11 (TVS)

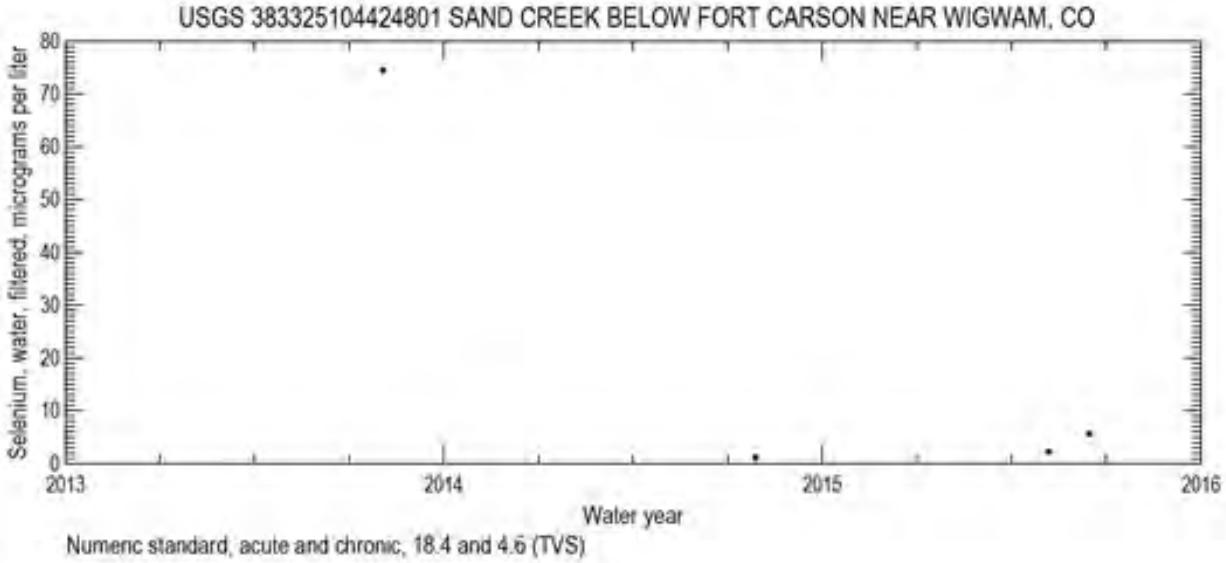


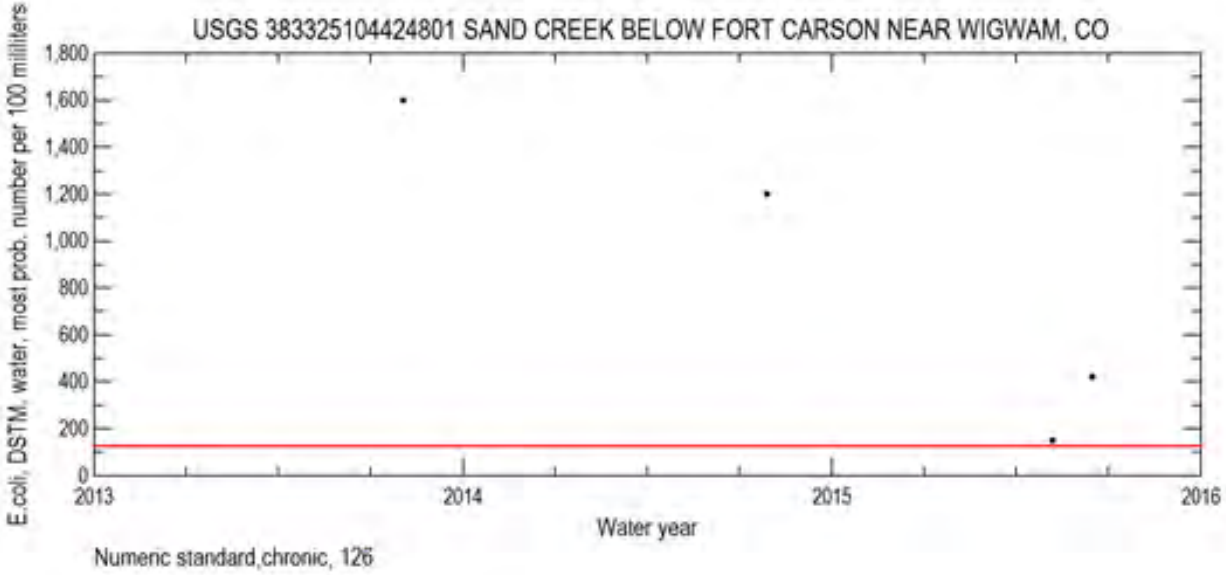
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS); 50 (WS)

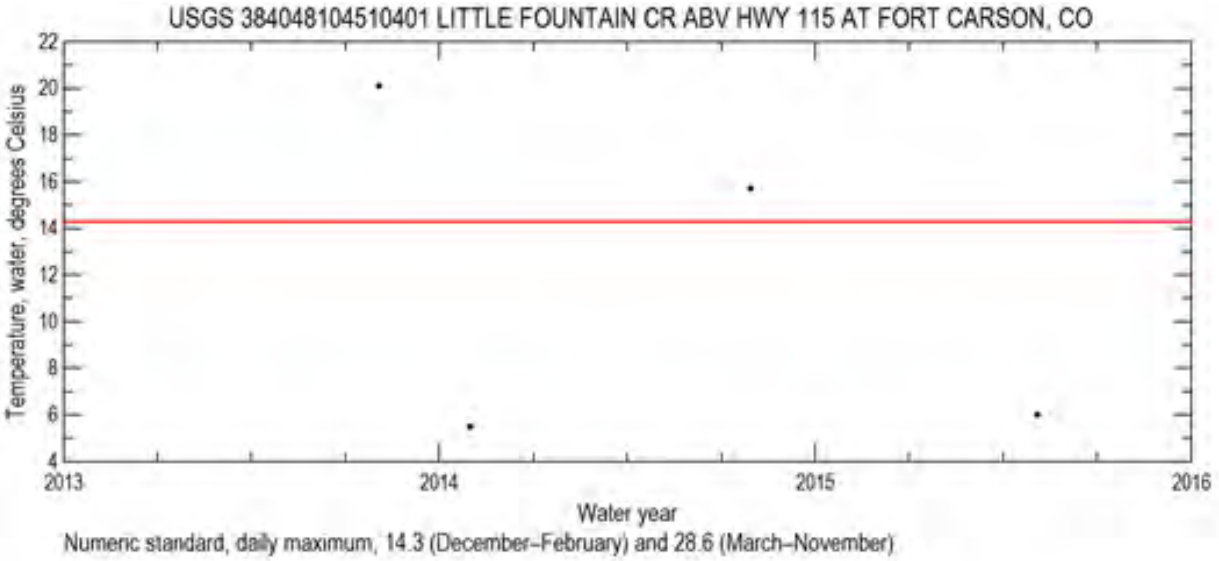


Numeric standard, acute and chronic, 1,510 and 170 (TVS)

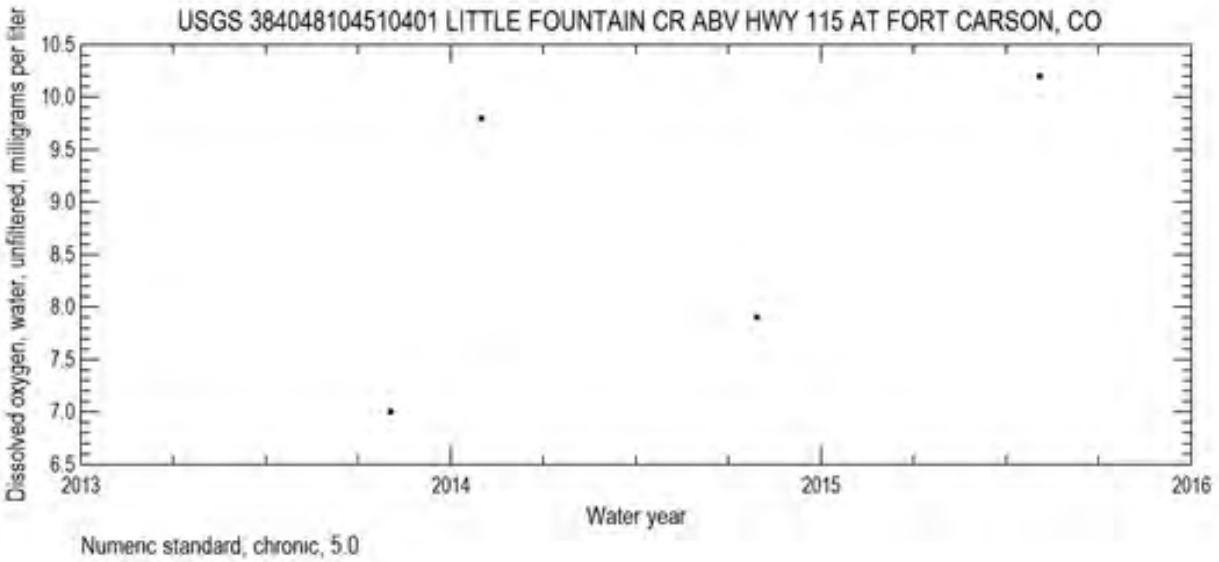

USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
Silver, water, filtered, micrograms per liter
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
2013
2014
2015
2016
Water year
Numeric standard, acute and chronic, 22 and 3.5 (TVS)


USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
Selenium, water, filtered, micrograms per liter
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
Water year
Numeric standard, acute and chronic, 18.4 and 4.6 (TVS)

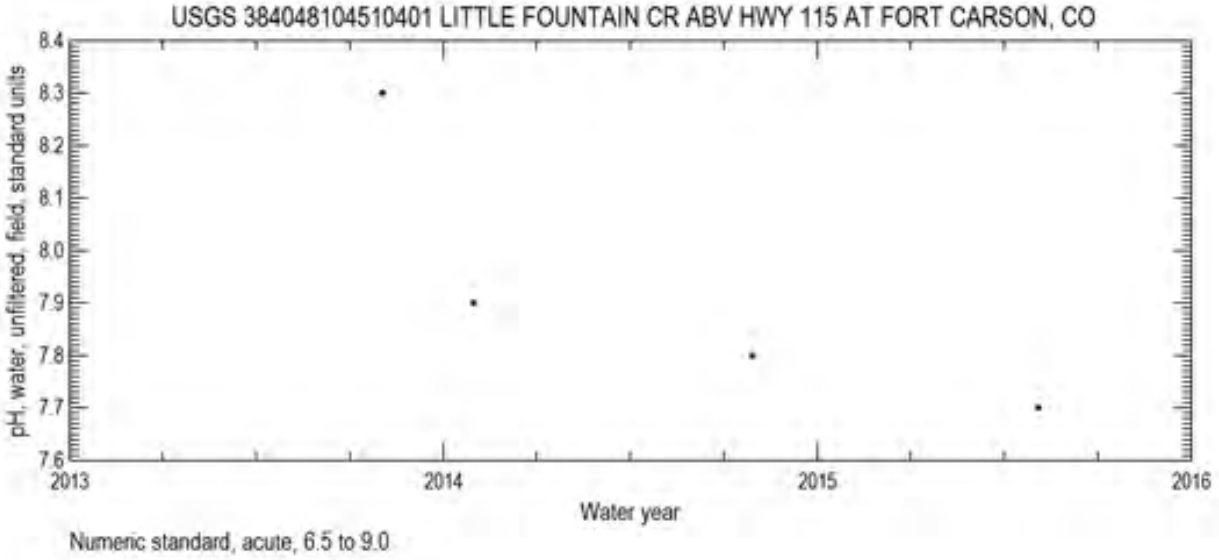

USGS 383325104424801 SAND CREEK BELOW FORT CARSON NEAR WIGWAM, CO
E.coli, DSTM, water, most prob. number per 100 milliliters
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2013
2014
2015
2016
Water year
Numeric standard,chronic, 126



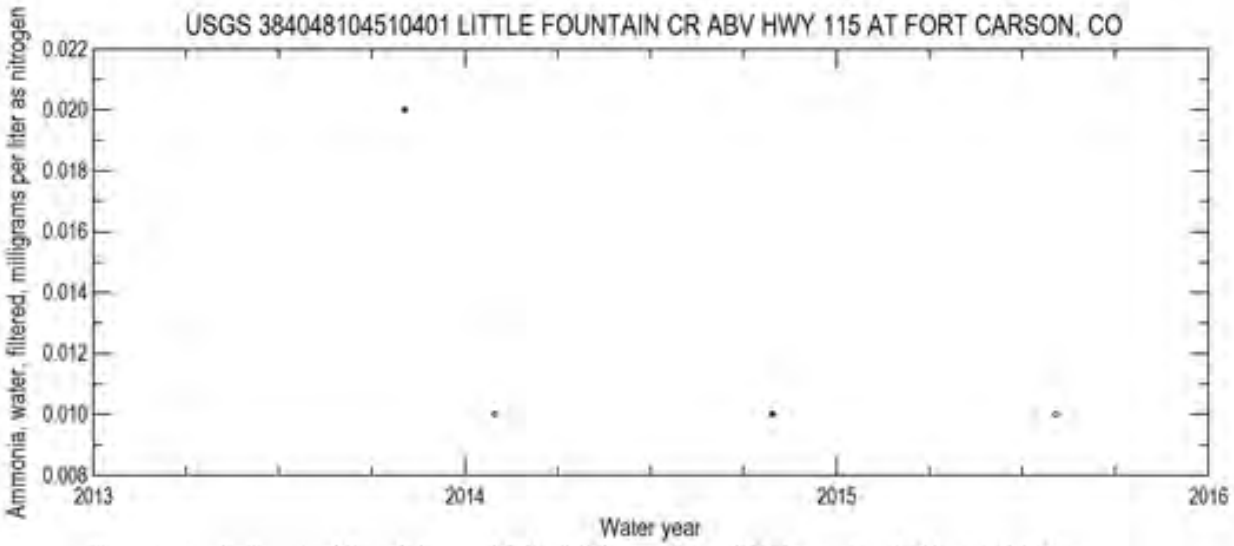
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



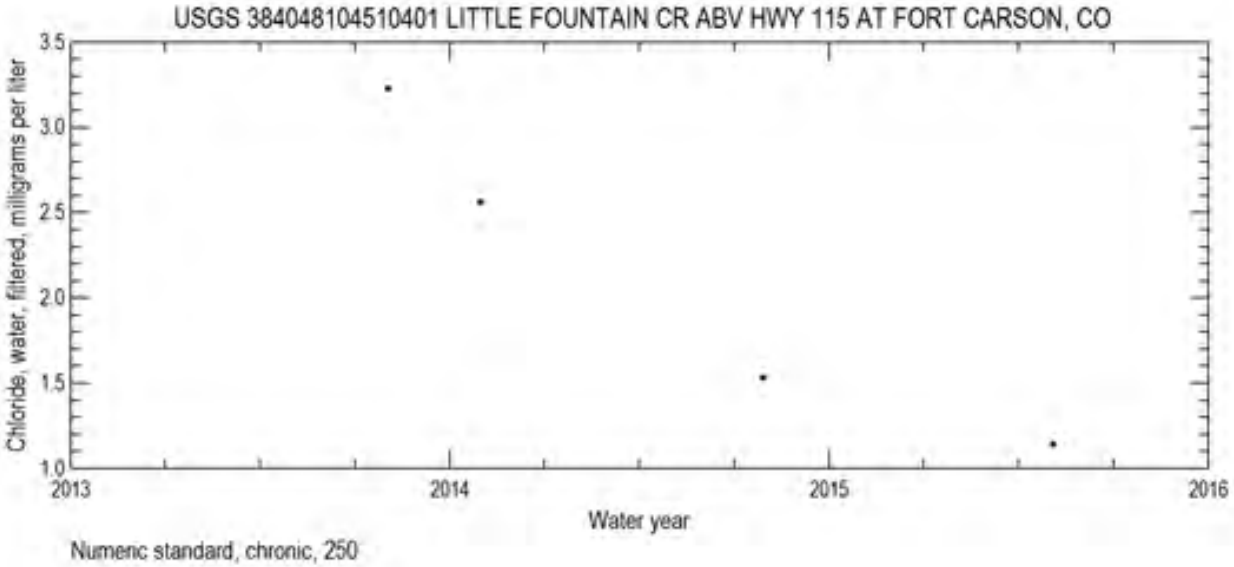
Numeric standard, chronic, 5.0



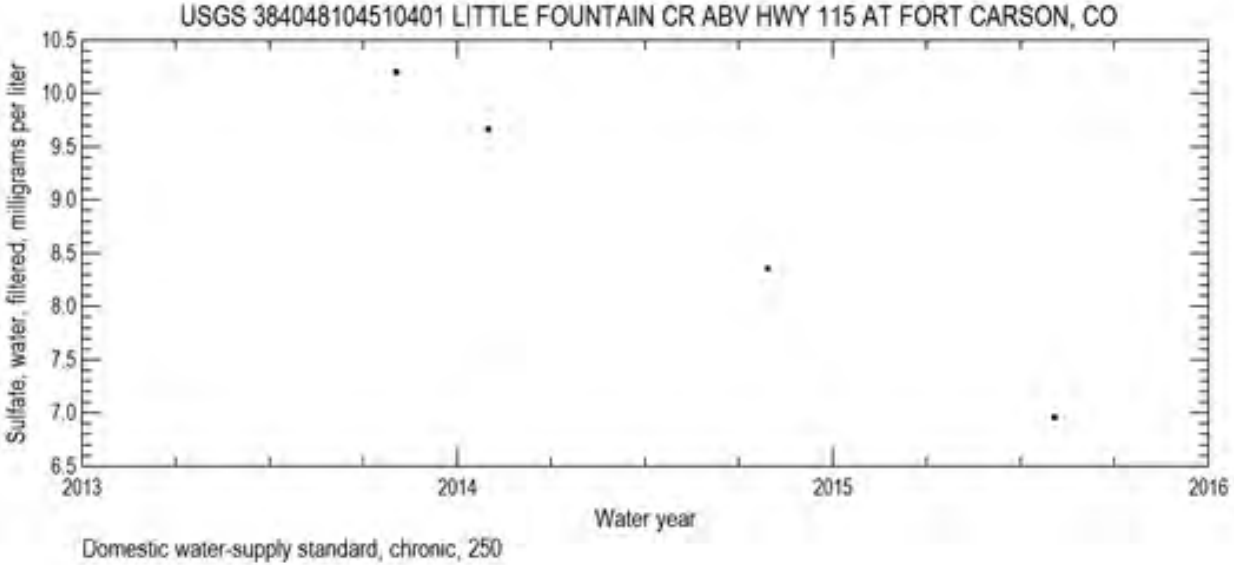
Numeric standard, acute, 6.5 to 9.0



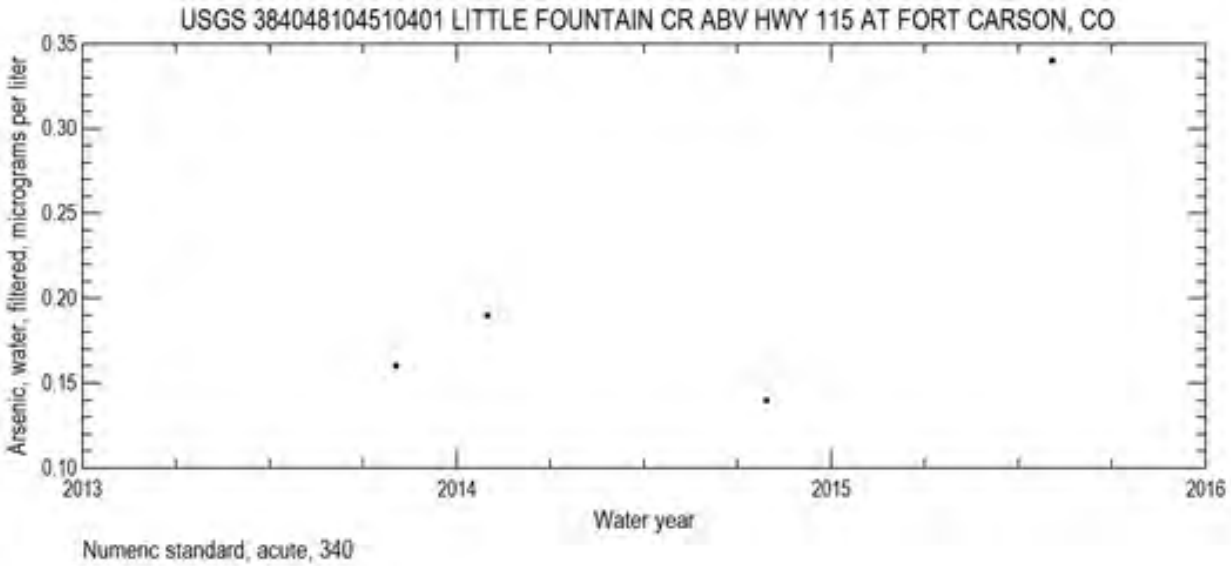
Numeric standard, acute, 4.7, and chronic, 1.0 (April 1- August 31) and 5.0 (September 1 - March 31) (TVS)



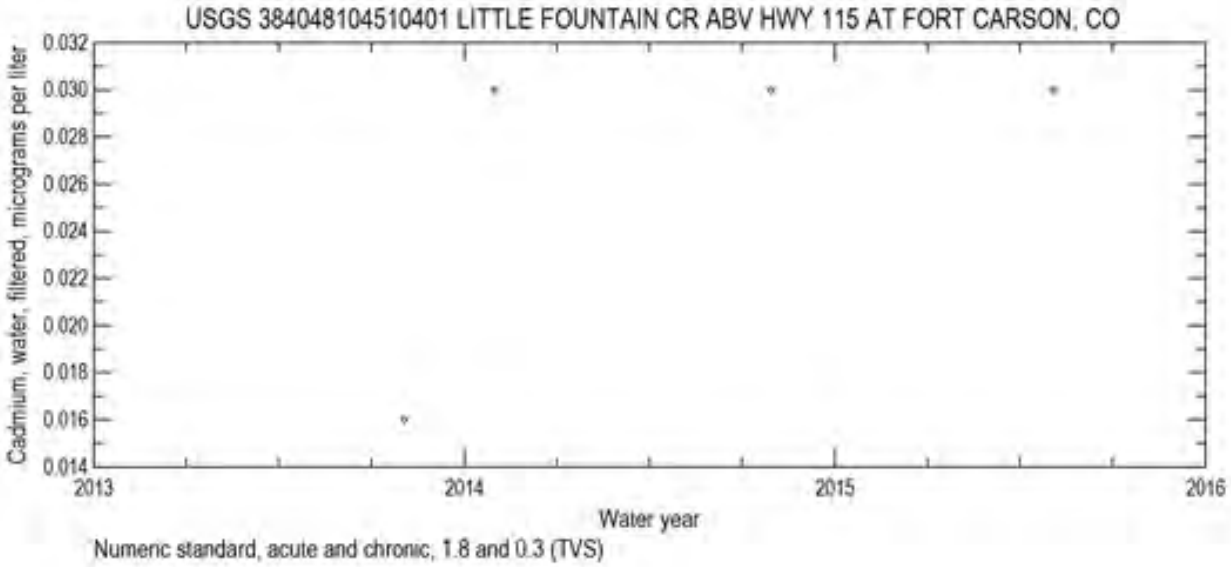
Numeric standard, chronic, 250



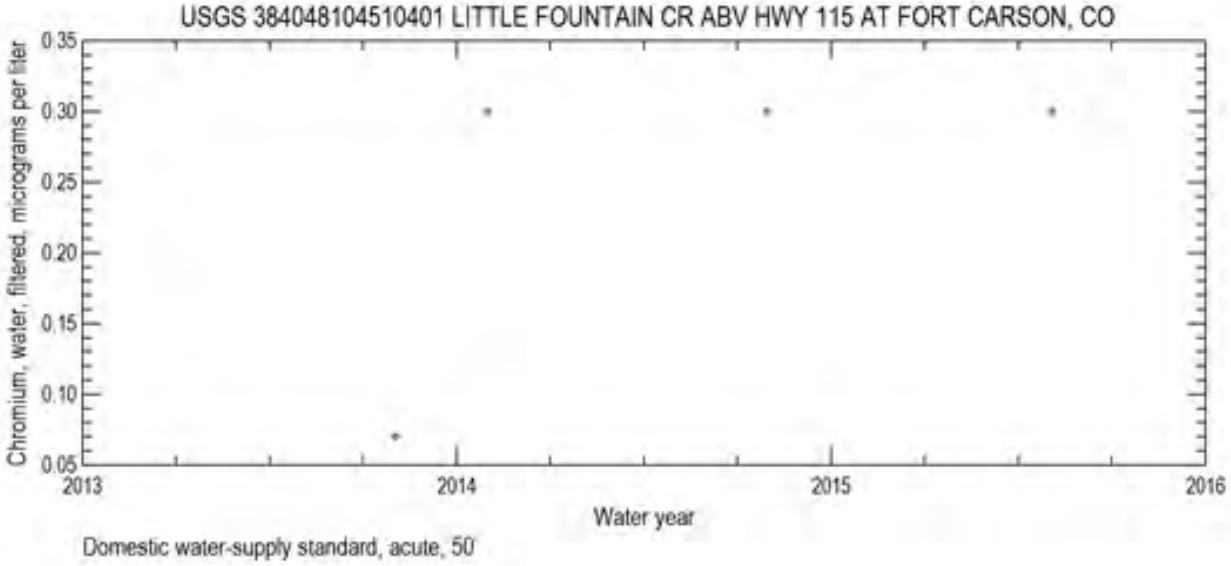
Domestic water-supply standard, chronic, 250



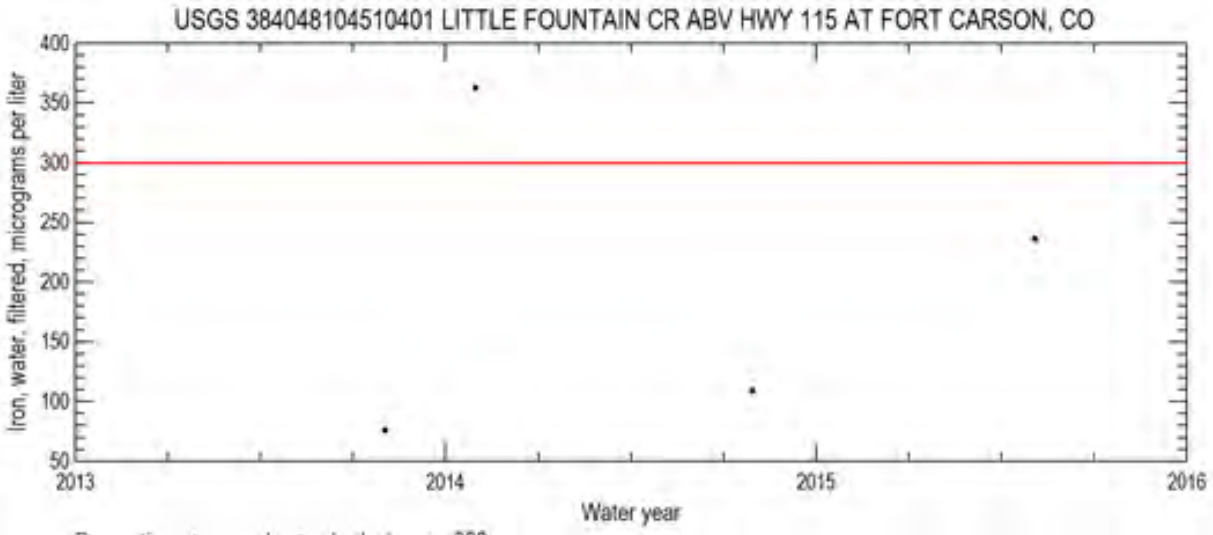
Numeric standard, acute, 340

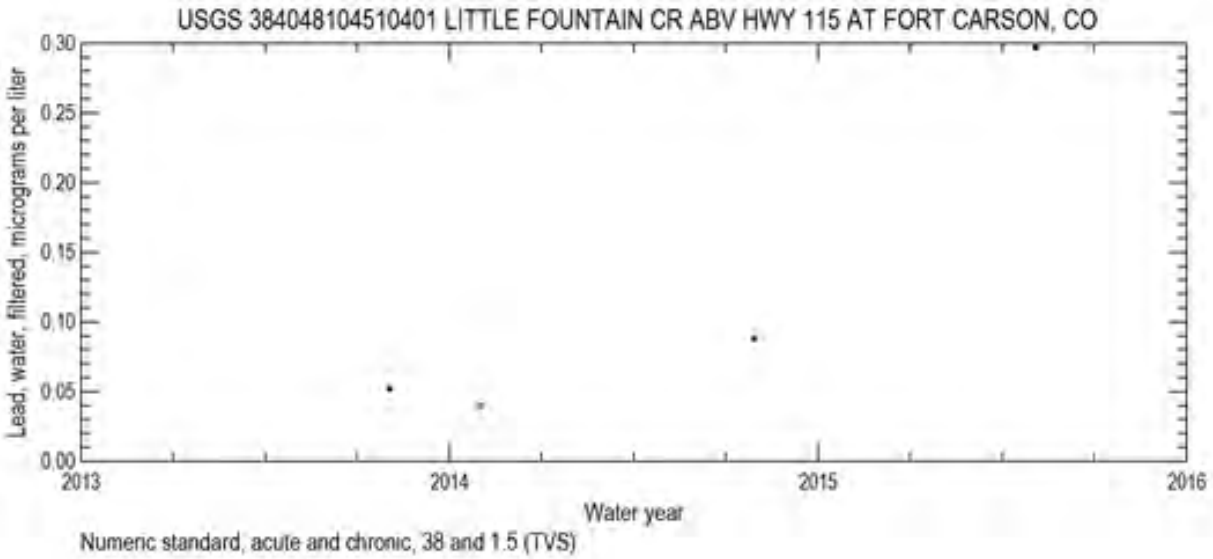


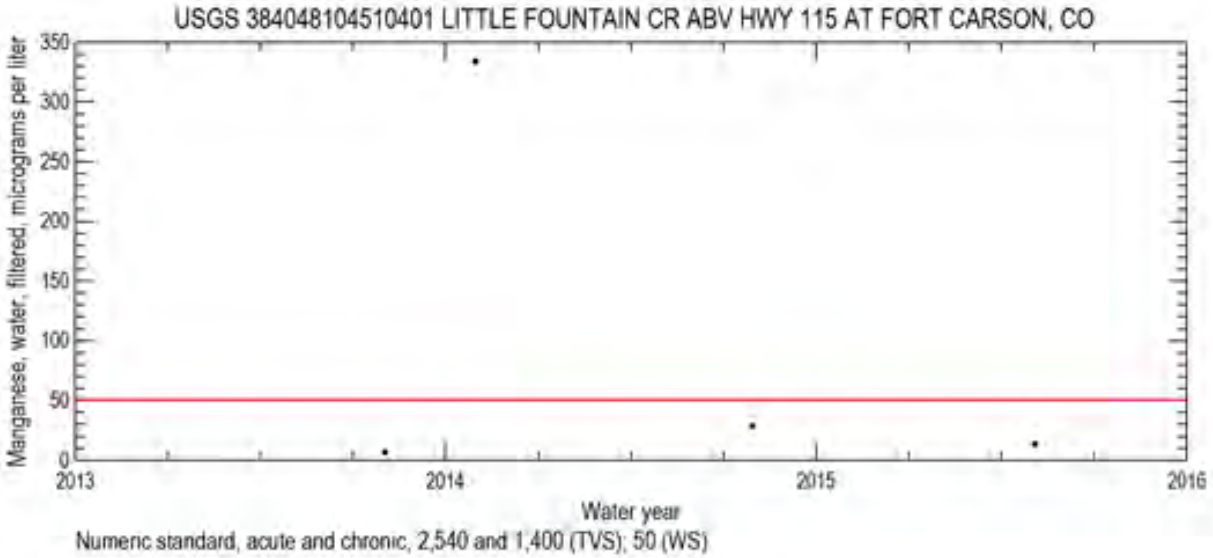
Numeric standard, acute and chronic, 1.8 and 0.3 (TVS)

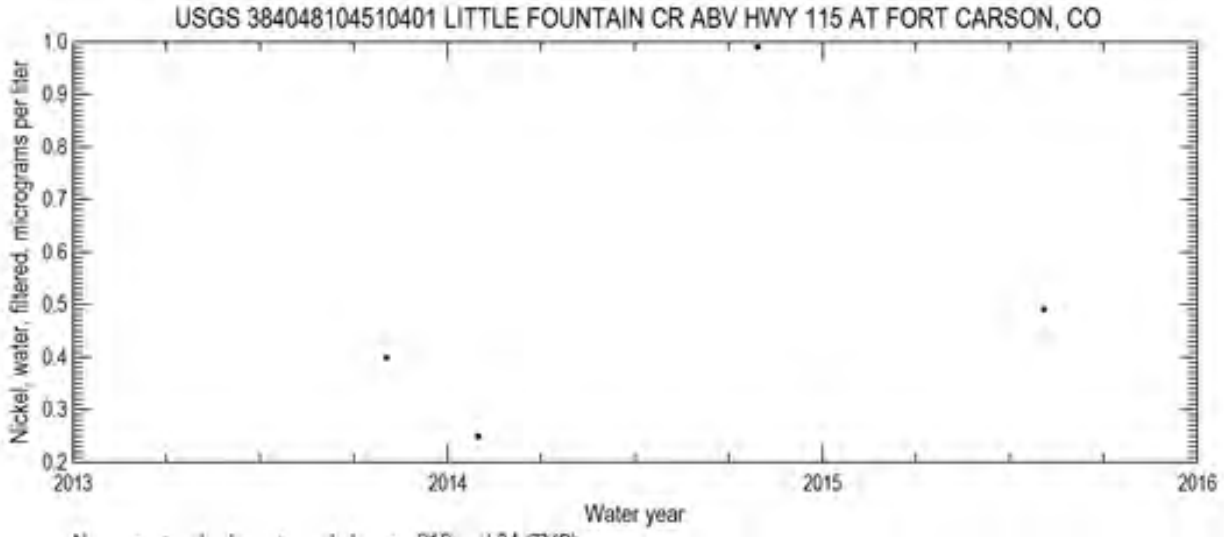


Domestic water-supply standard, acute, 50

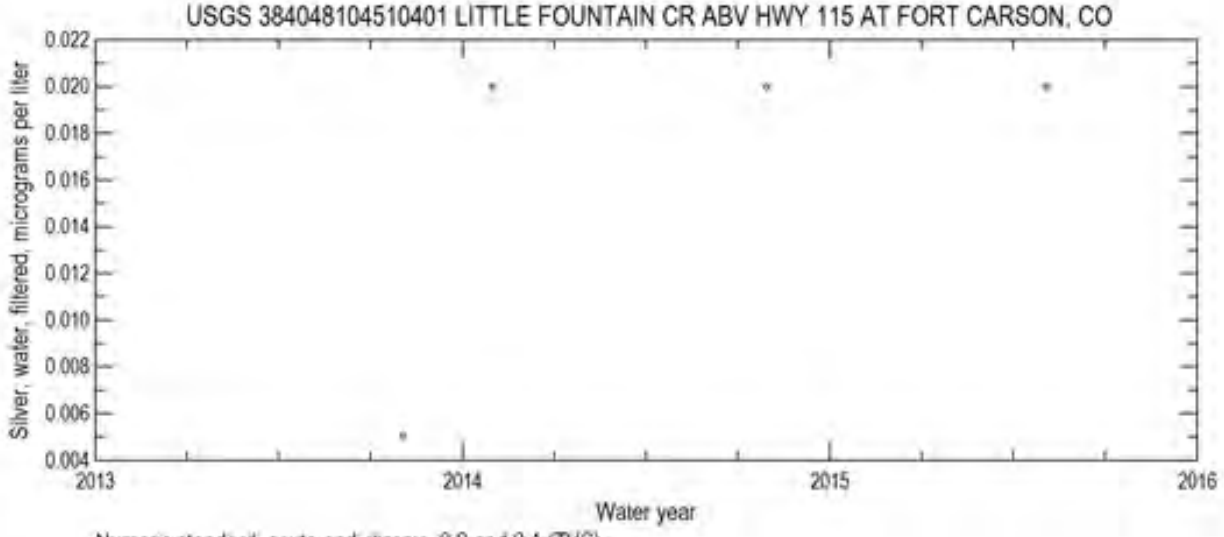

USGS 384048104510401 LITTLE FOUNTAIN CR ABV HWY 115 AT FORT CARSON, CO
Iron, water, filtered, micrograms per liter
400
350
300
250
200
150
100
50
2013
2014
2015
2016
Water year
Domestic water-supply standard, chronic, 300


USGS 384048104510401 LITTLE FOUNTAIN CR ABV HWY 115 AT FORT CARSON, CO
Lead, water, filtered, micrograms per liter
0.30
0.25
0.20
0.15
0.10
0.05
0.00
2013
2014
2015
2016
Water year
Numeric standard, acute and chronic, 38 and 1.5 (TVS)

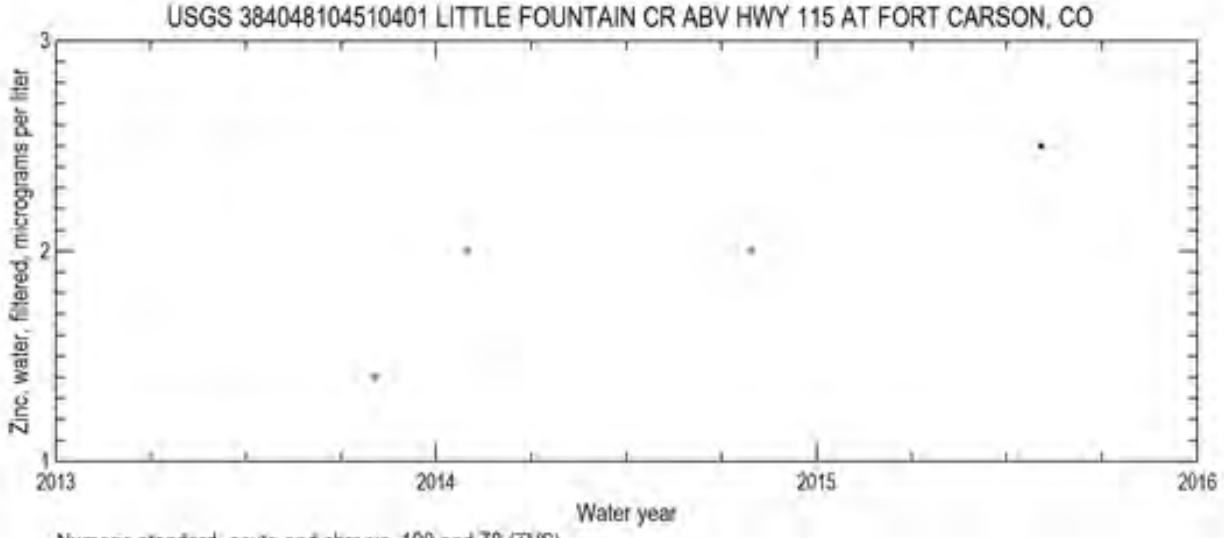

USGS 384048104510401 LITTLE FOUNTAIN CR ABV HWY 115 AT FORT CARSON, CO
Manganese, water, filtered, micrograms per liter
350
300
250
200
150
100
50
0
2013
2014
2015
2016
Water year
Numeric standard, acute and chronic, 2,540 and 1,400 (TVS); 50 (WS)



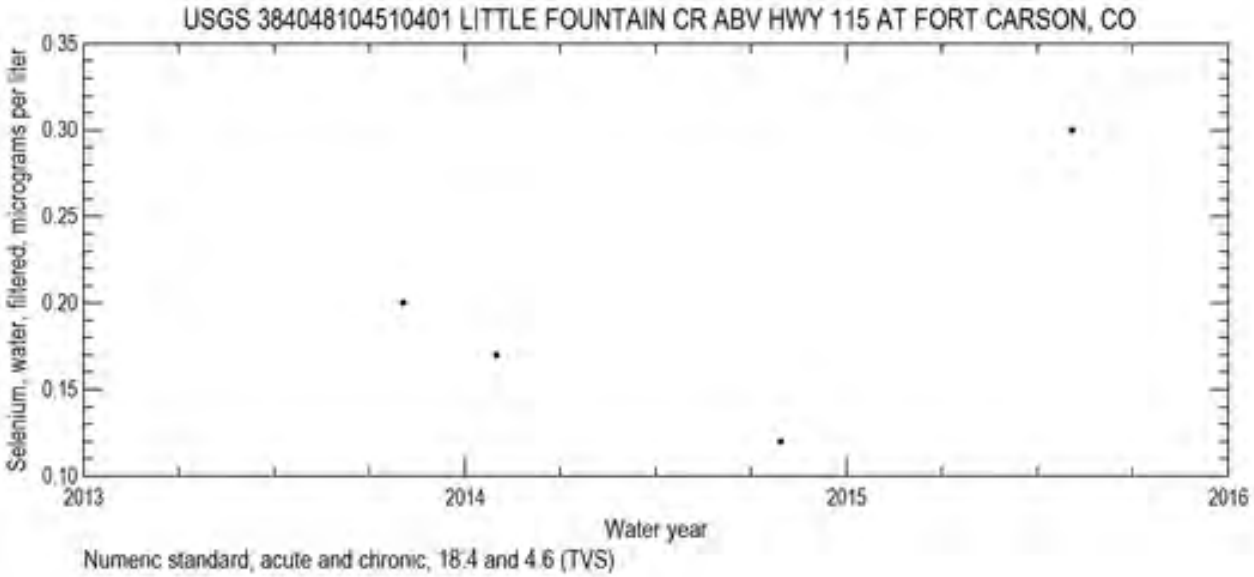
Numeric standard, acute and chronic, 310 and 34 (TVS)

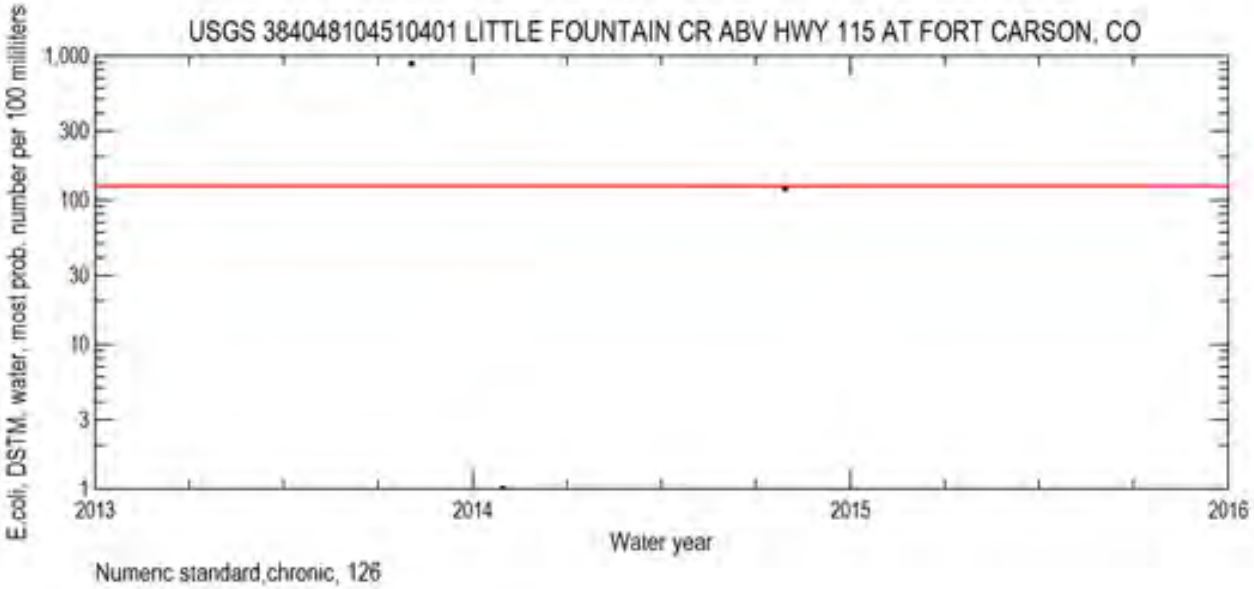


Numeric standard, acute and chronic, 0.9 and 0.1 (TVS)

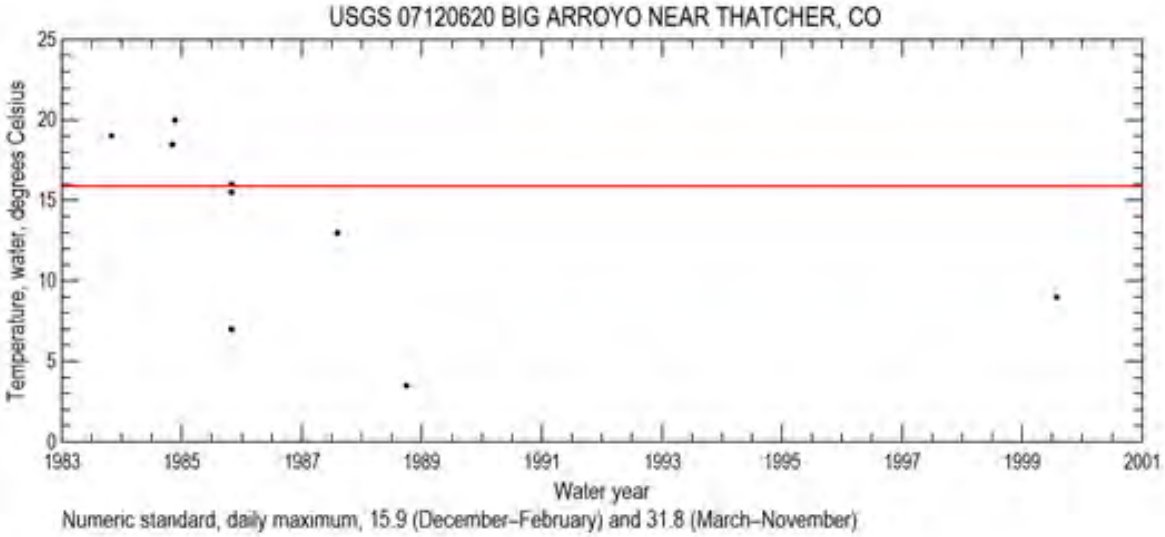


Numeric standard, acute and chronic, 100 and 78 (TVS)

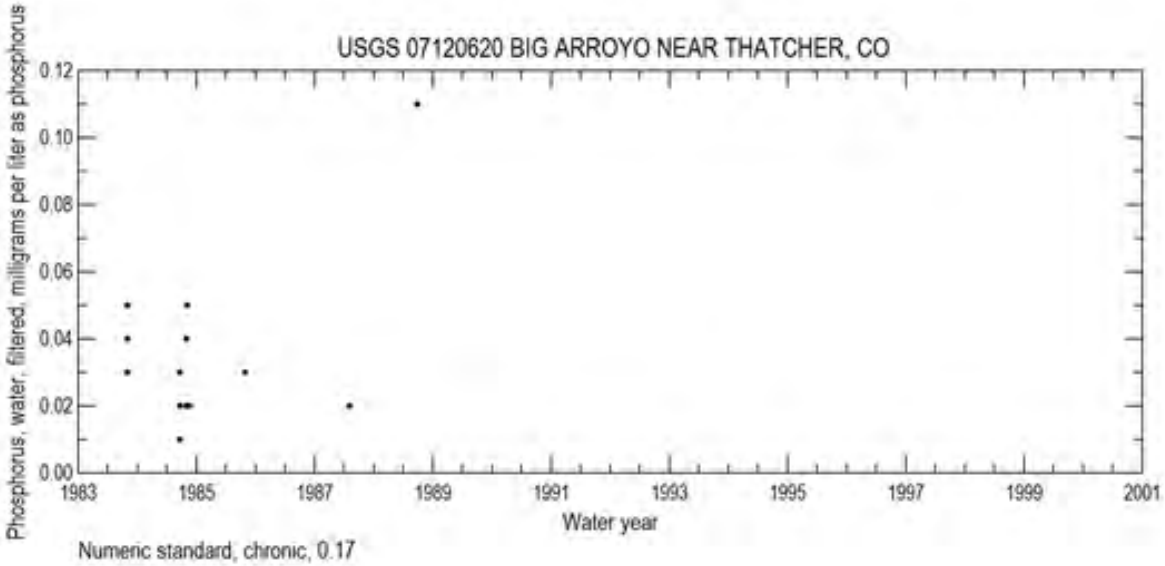

USGS 384048104510401 LITTLE FOUNTAIN CR ABV HWY 115 AT FORT CARSON, CO
Selenium, water, filtered, micrograms per liter
0.35
0.30
0.25
0.20
0.15
0.10
2013
2014
2015
2016
Water year
Numeric standard, acute and chronic, 18.4 and 4.6 (TVS)


USGS 384048104510401 LITTLE FOUNTAIN CR ABV HWY 115 AT FORT CARSON, CO
E.coli, DSTM, water, most prob. number per 100 milliliters
1,000
300
100
30
10
3
1
2013
2014
2015
2016
Water year
Numeric standard,chronic, 126

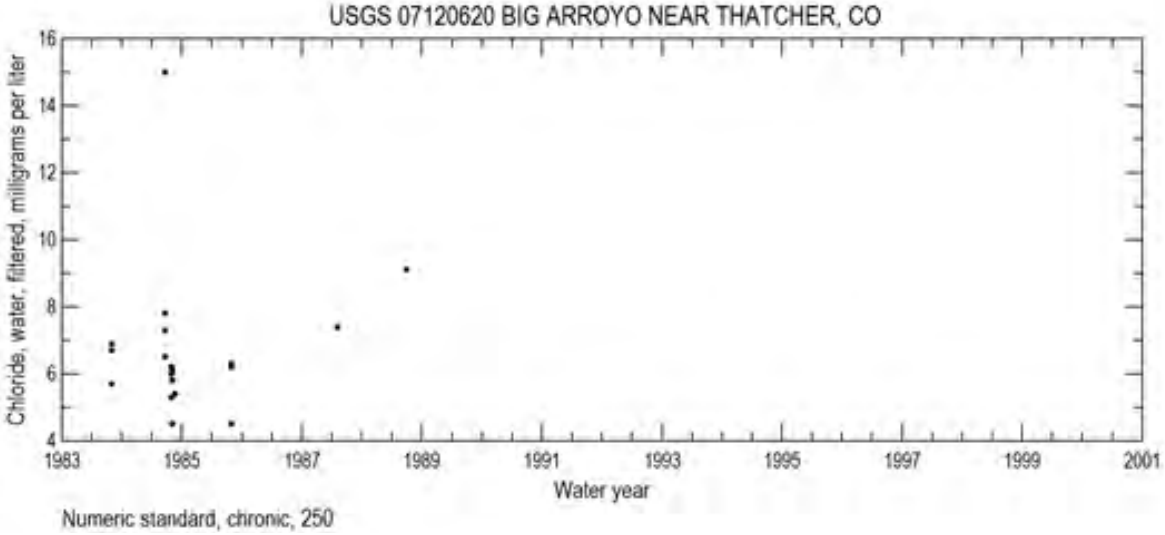
Piñon Canyon Maneuver Site



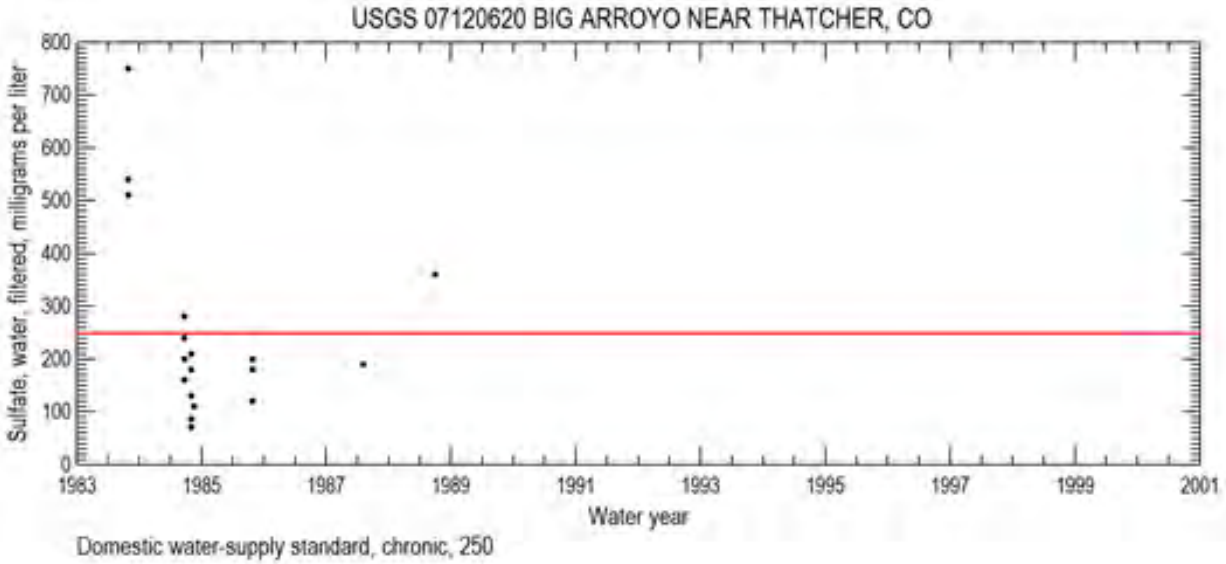
Numeric standard, daily maximum, 15.9 (December–February) and 31.8 (March–November)

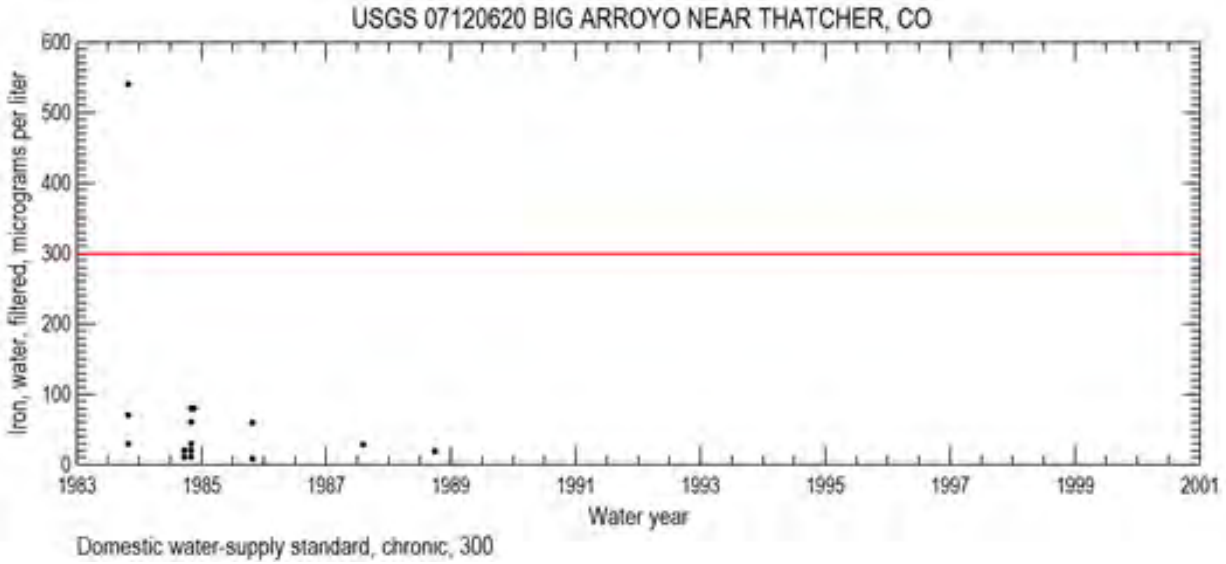


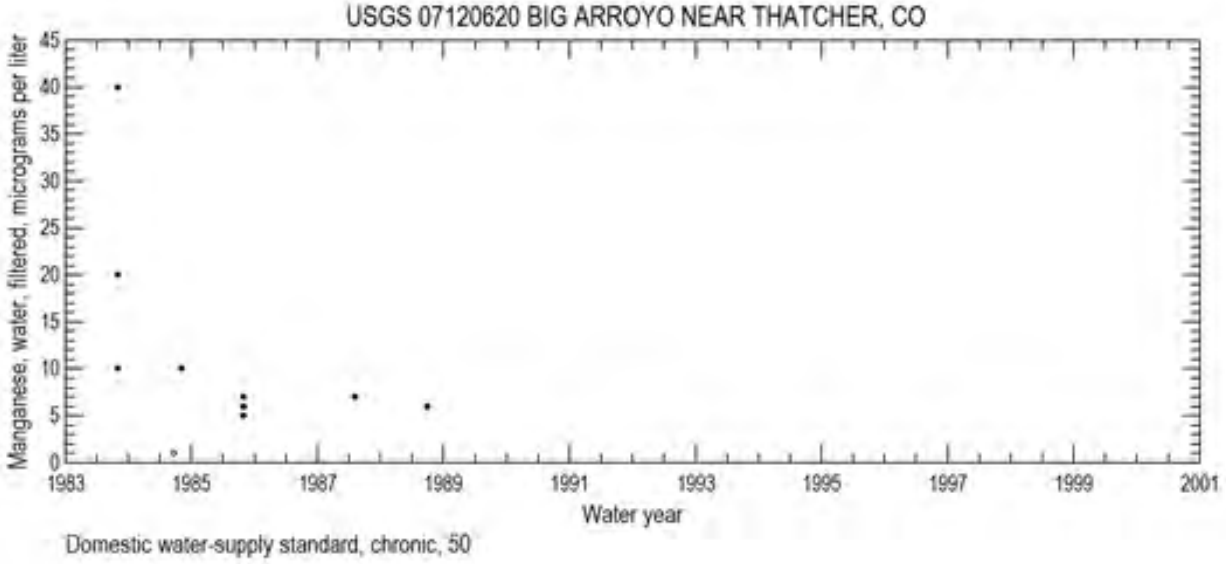
Numeric standard, chronic, 0.17

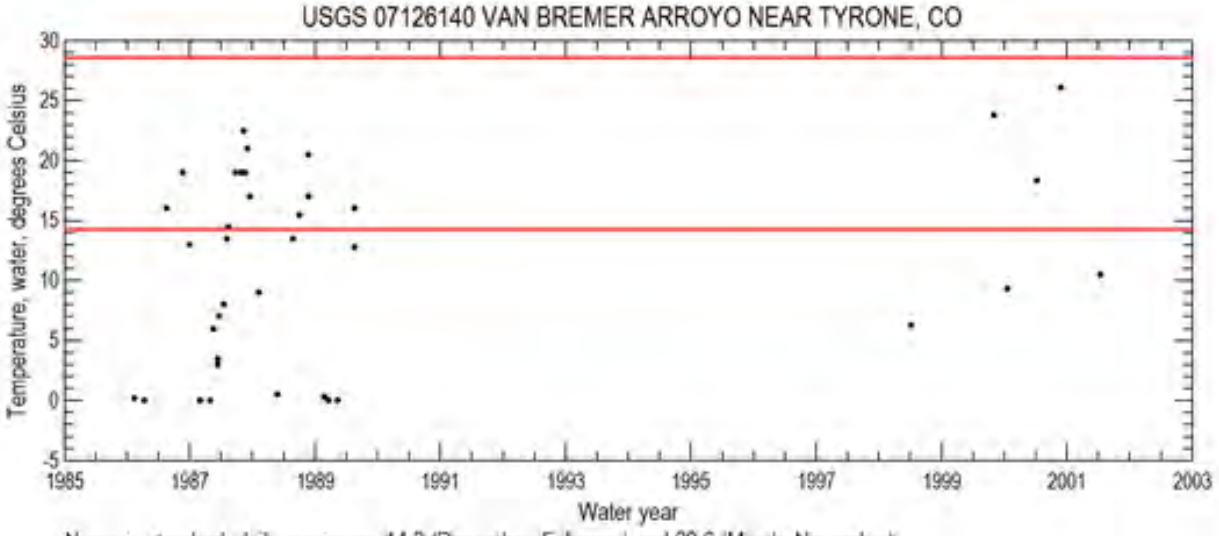


Numeric standard, chronic, 250

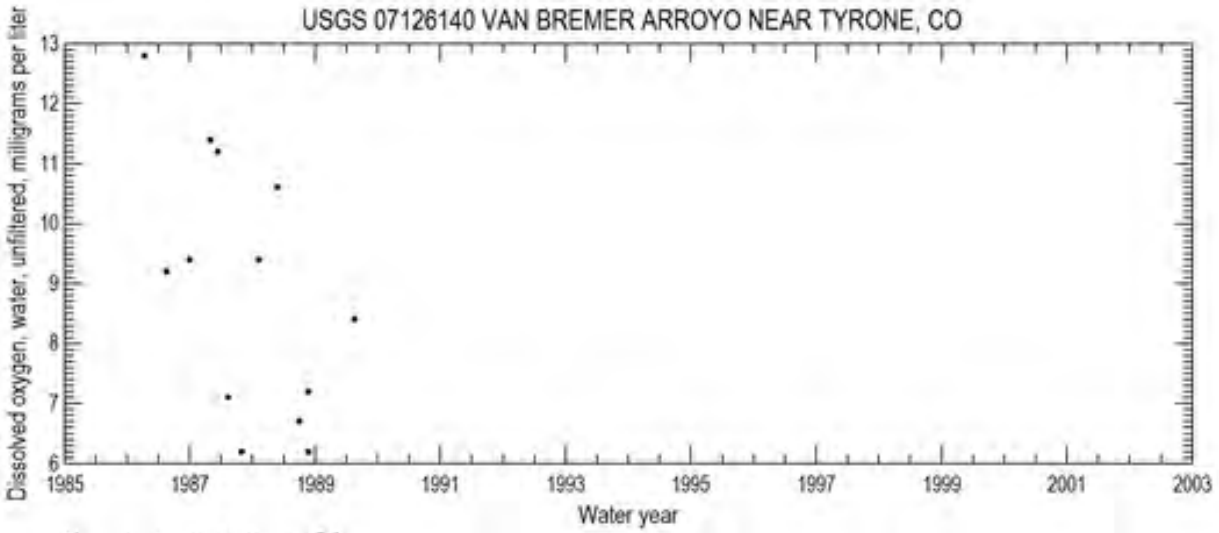

USGS 07120620 BIG ARROYO NEAR THATCHER, CO
Sulfate, water, filtered, milligrams per liter
800
700
600
500
400
300
200
100
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
Water year
Domestic water-supply standard, chronic, 250


USGS 07120620 BIG ARROYO NEAR THATCHER, CO
Iron, water, filtered, micrograms per liter
600
500
400
300
200
100
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
Water year
Domestic water-supply standard, chronic, 300

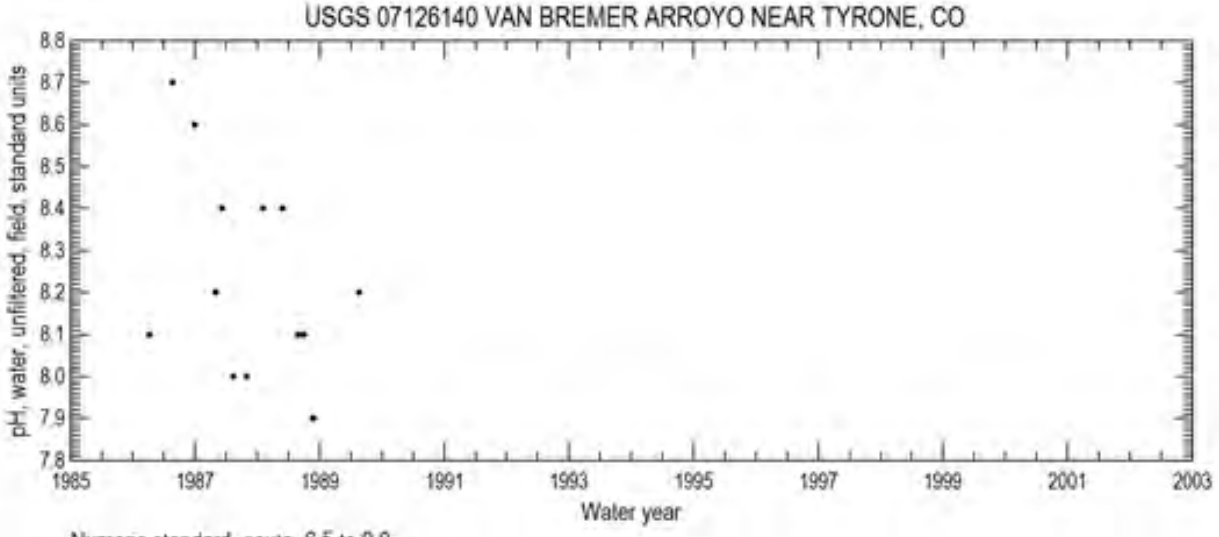

USGS 07120620 BIG ARROYO NEAR THATCHER, CO
Manganese, water, filtered, micrograms per liter
45
40
35
30
25
20
15
10
5
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
Water year
Domestic water-supply standard, chronic, 50



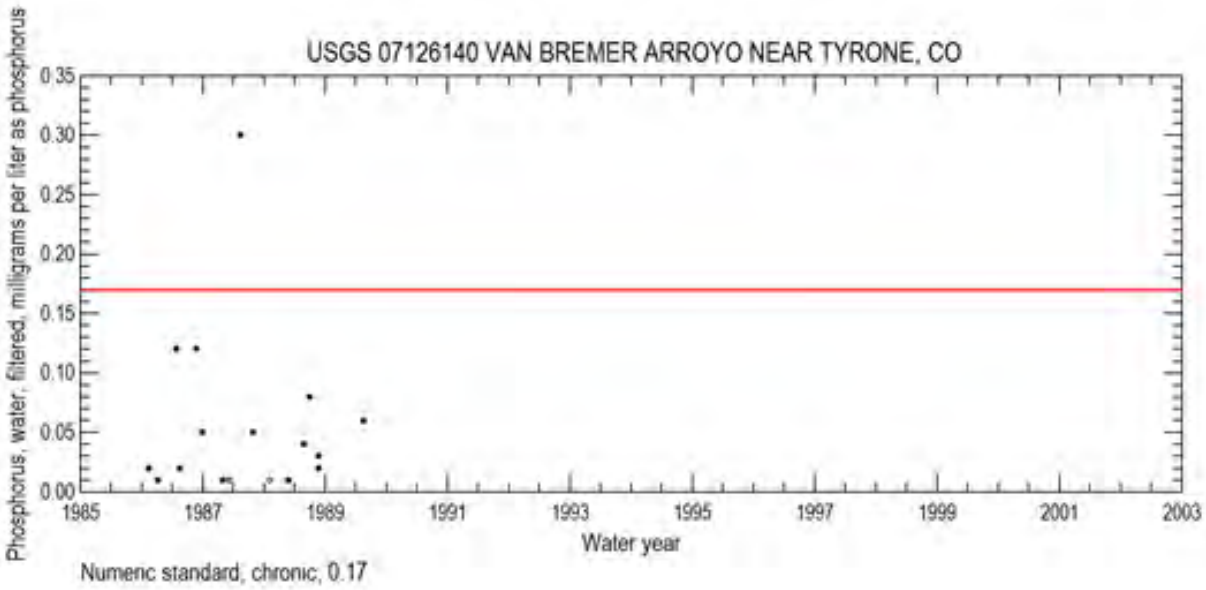
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)

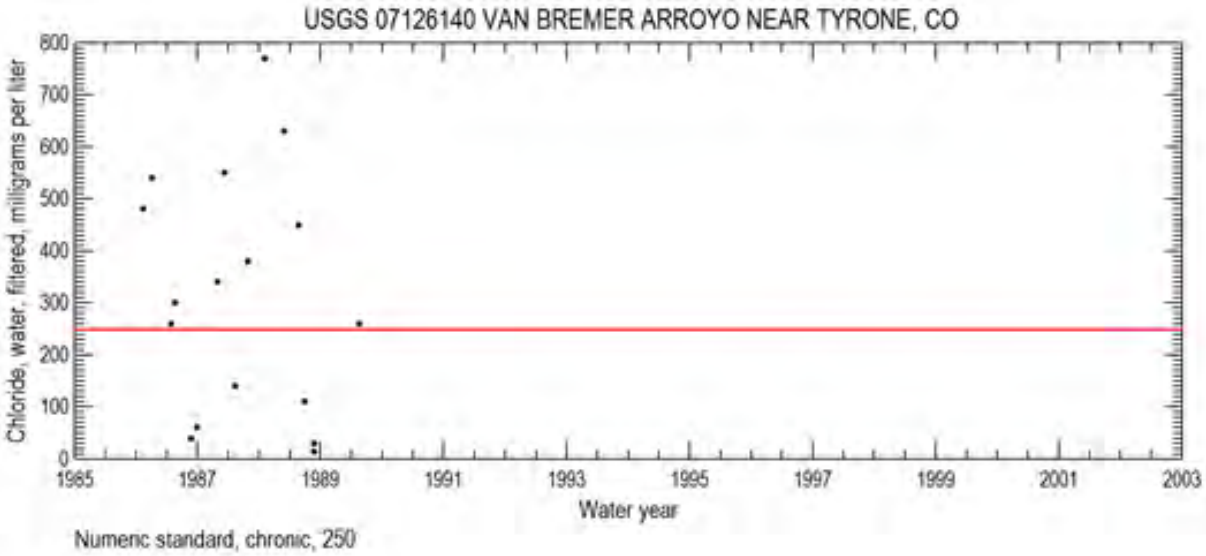


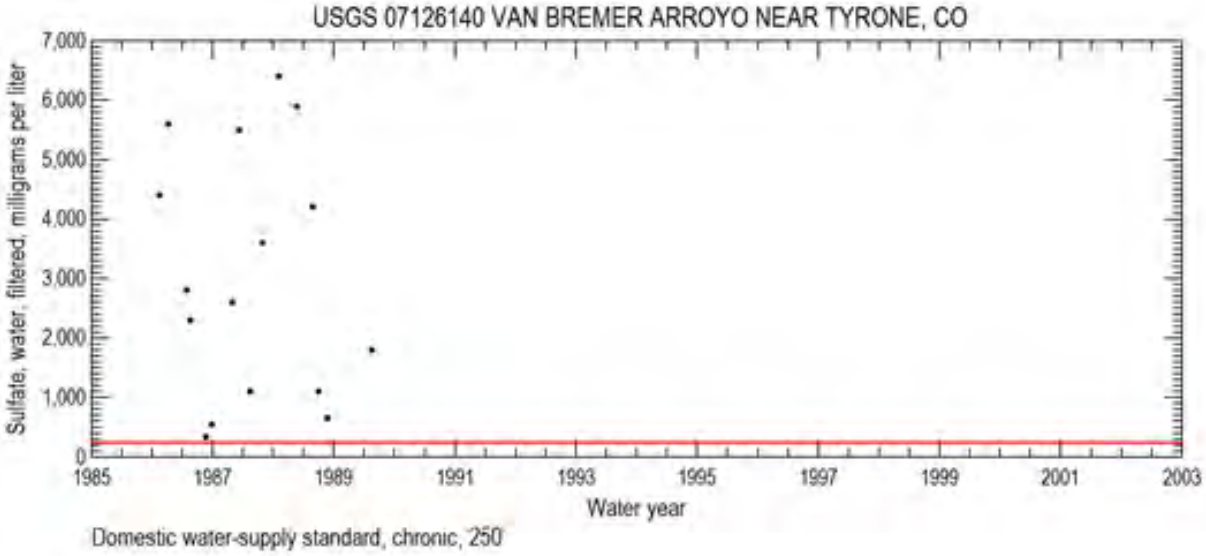
Numeric standard, chronic, 5.0

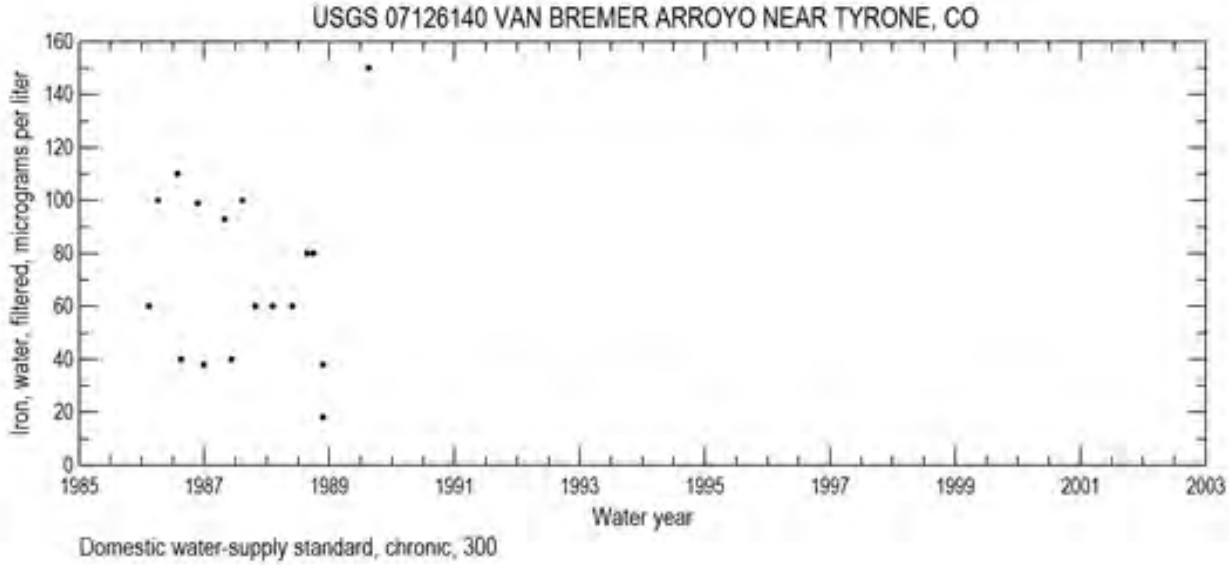


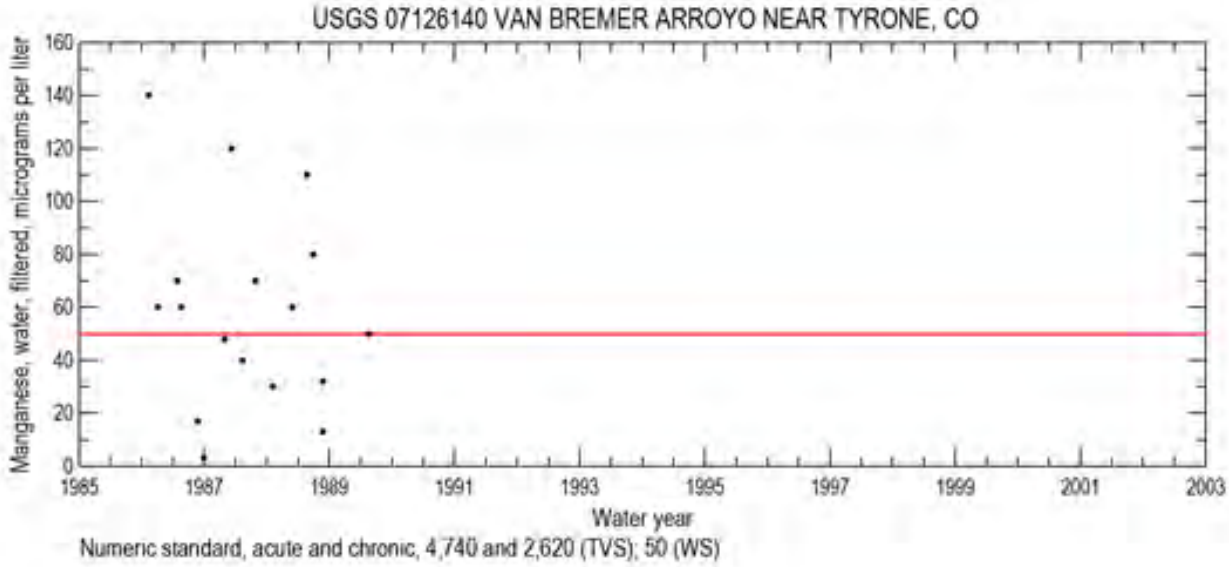
Numeric standard, acute, 6.5 to 9.0

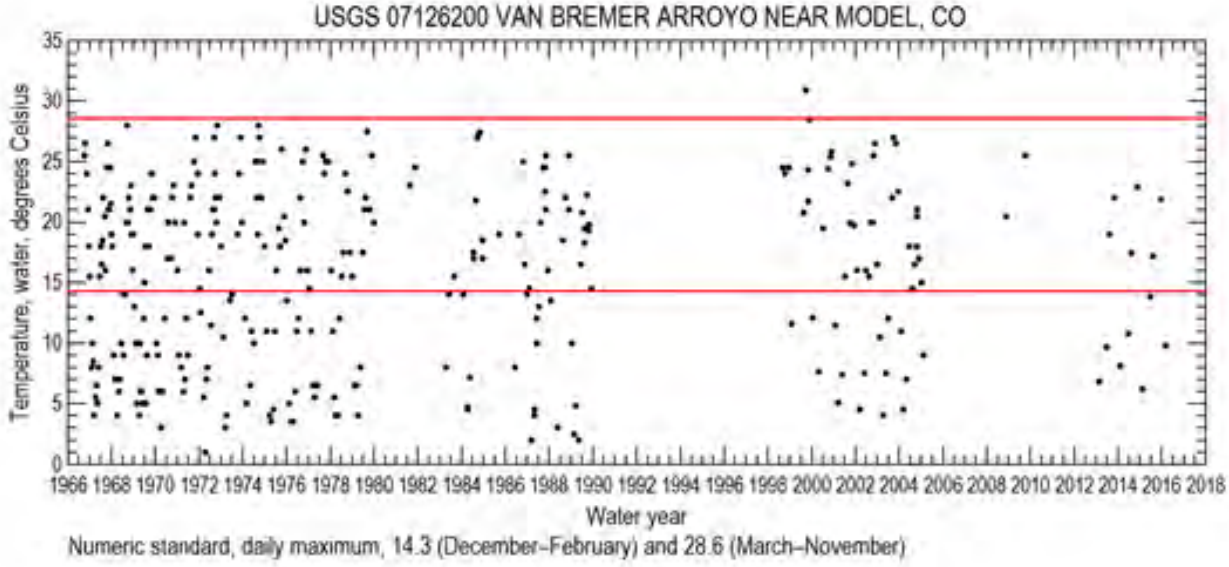

USGS 07126140 VAN BREMER ARROYO NEAR TYRONE, CO
Phosphorus, water, filtered, milligrams per liter as phosphorus
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Numeric standard, chronic, 0.17

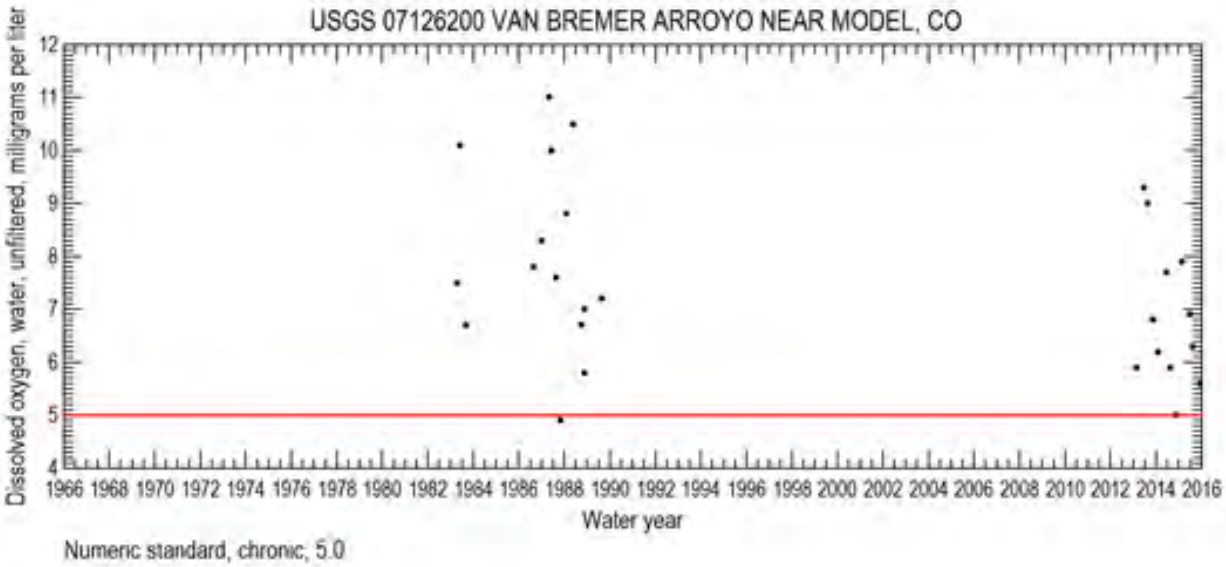

USGS 07126140 VAN BREMER ARROYO NEAR TYRONE, CO
Chloride, water, filtered, milligrams per liter
800
700
600
500
400
300
200
100
0
1965
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Numeric standard, chronic, 250


USGS 07126140 VAN BREMER ARROYO NEAR TYRONE, CO
Sulfate, water, filtered, milligrams per liter
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Domestic water-supply standard, chronic, 250

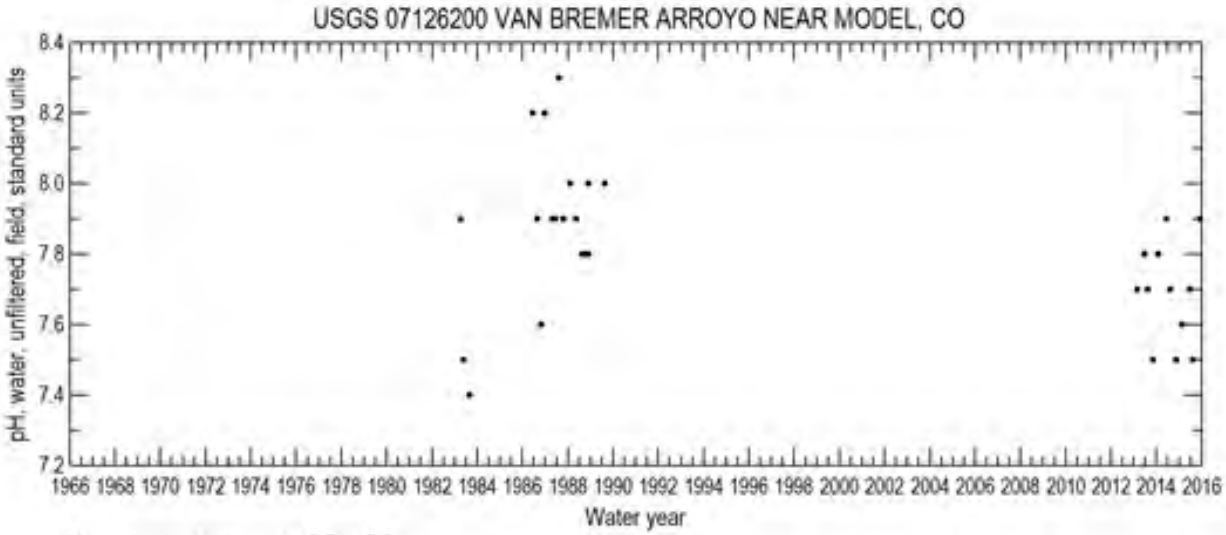

USGS 07126140 VAN BREMER ARROYO NEAR TYRONE, CO
Iron, water, filtered, micrograms per liter
0
20
40
60
80
100
120
140
160
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Domestic water-supply standard, chronic, 300


USGS 07126140 VAN BREMER ARROYO NEAR TYRONE, CO
Manganese, water, filtered, micrograms per liter
0
20
40
60
80
100
120
140
160
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS); 50 (WS)

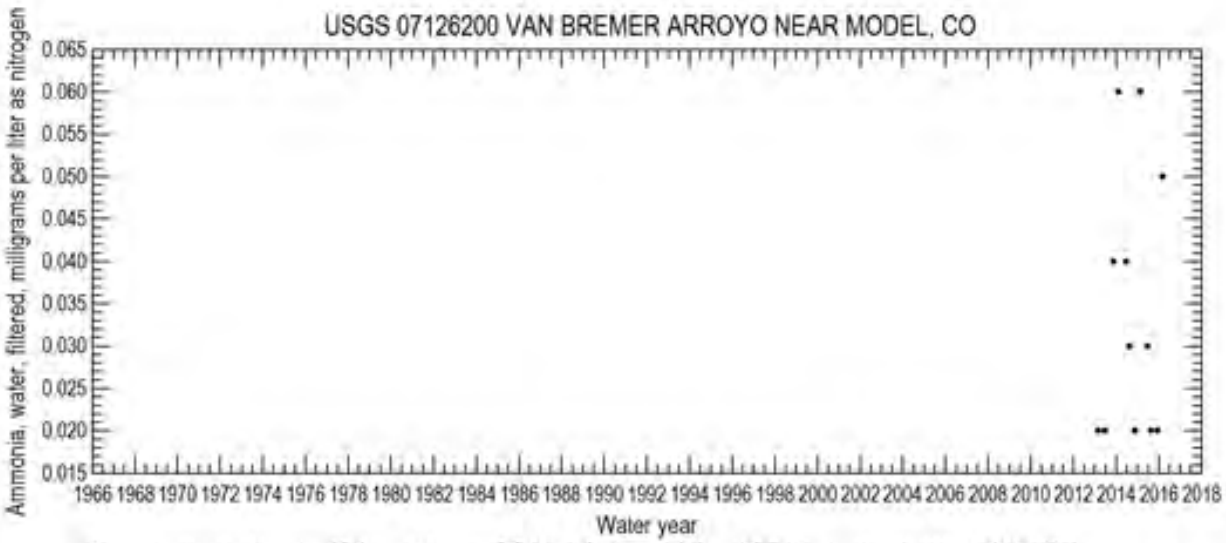

USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Temperature, water, degrees Celsius
0
5
10
15
20
25
30
35
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



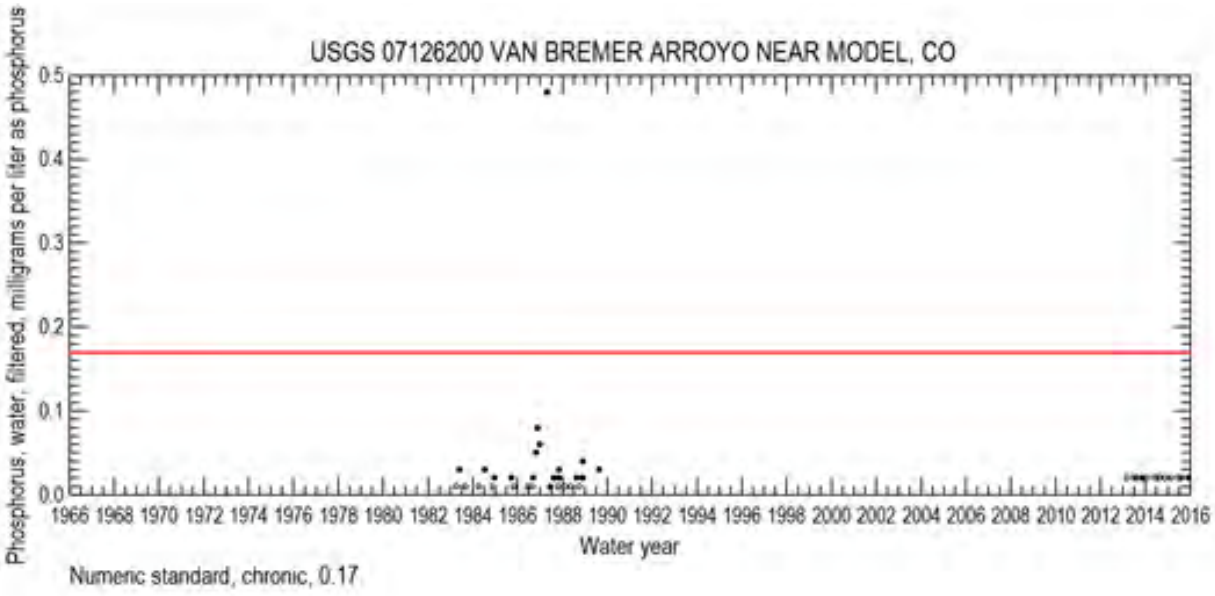
Numeric standard, chronic, 5.0

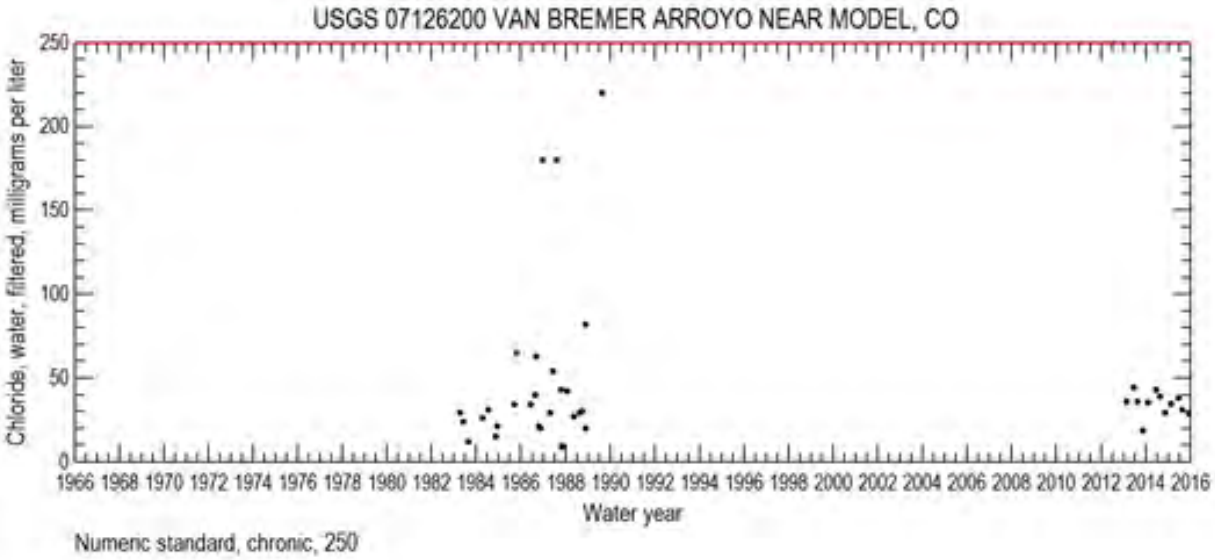


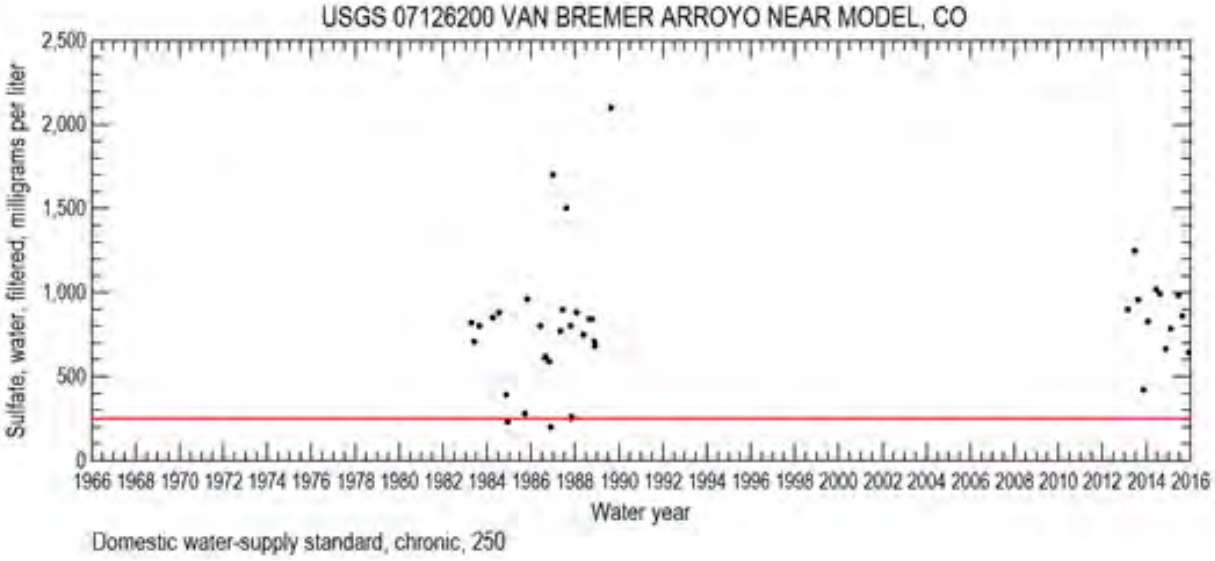
Numeric standard, acute, 6.5 to 9.0

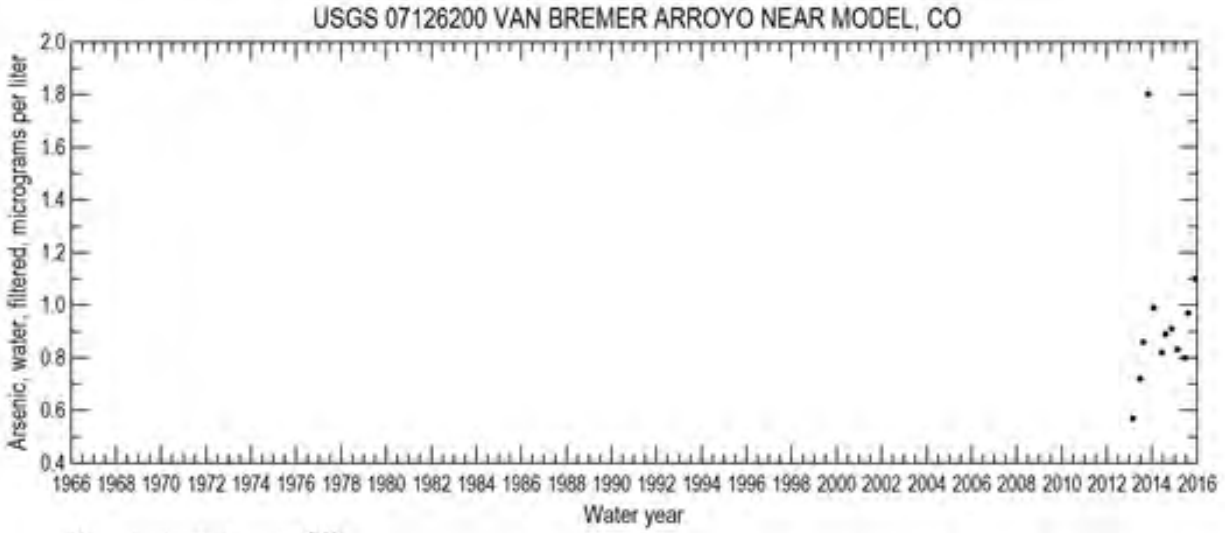


Numeric standard, acute, 12.1, and chronic, 2.9 (April 1- August 31) and 6.5 (September 1 - March 31) (TVS)

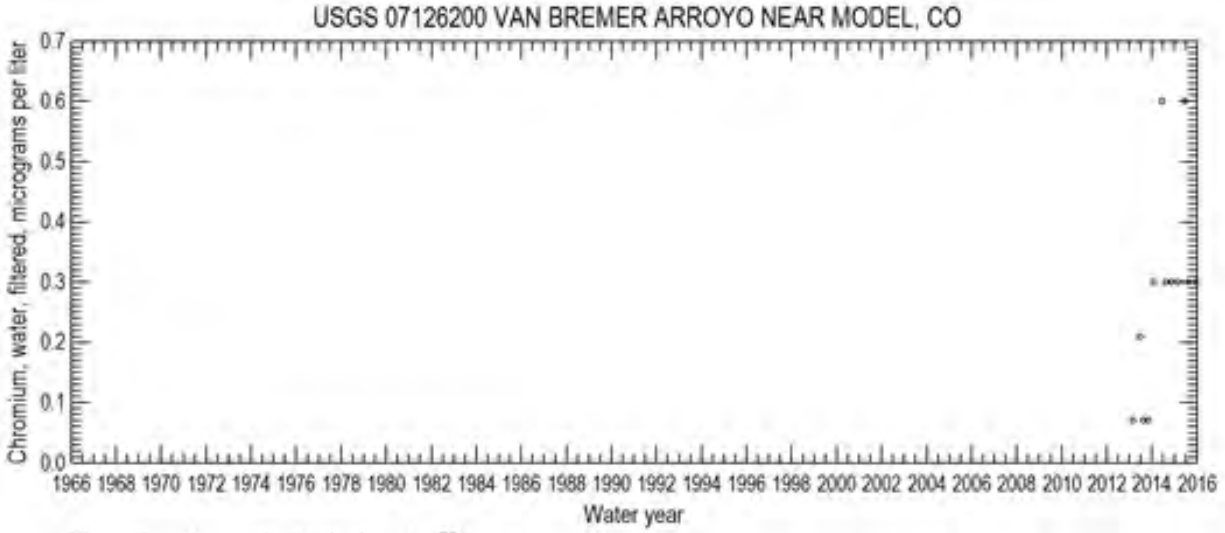

USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Phosphorus, water, filtered, milligrams per liter as phosphorus
0.5
0.4
0.3
0.2
0.1
0.0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
Water year
Numeric standard, chronic, 0.17


USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Chloride, water, filtered, milligrams per liter
250
200
150
100
50
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
Water year
Numeric standard, chronic, 250

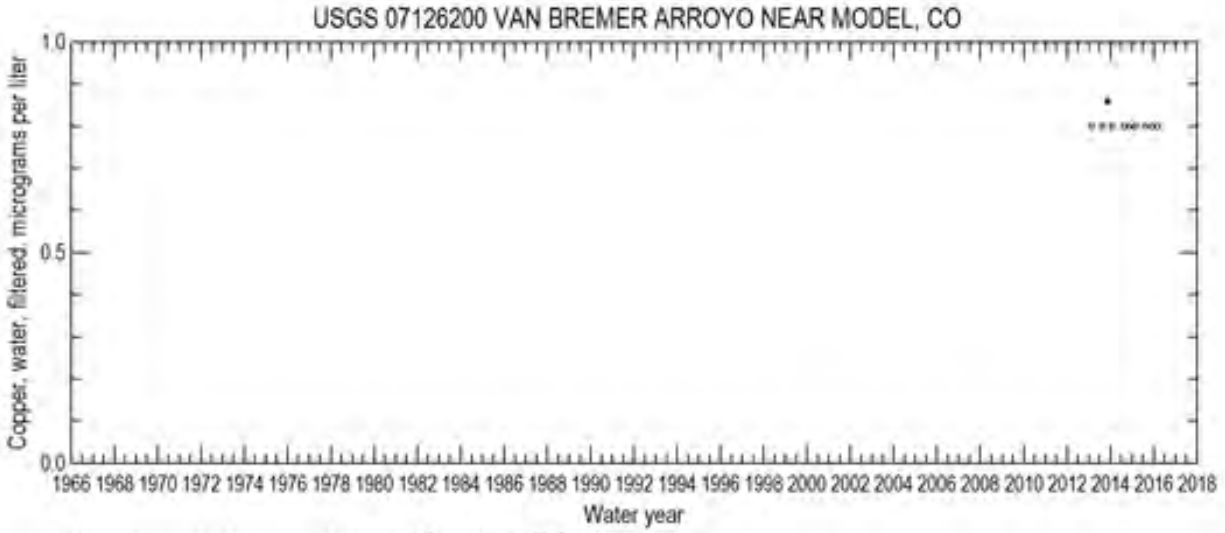

USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Sulfate, water, filtered, milligrams per liter
2,500
2,000
1,500
1,000
500
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
Water year
Domestic water-supply standard, chronic, 250



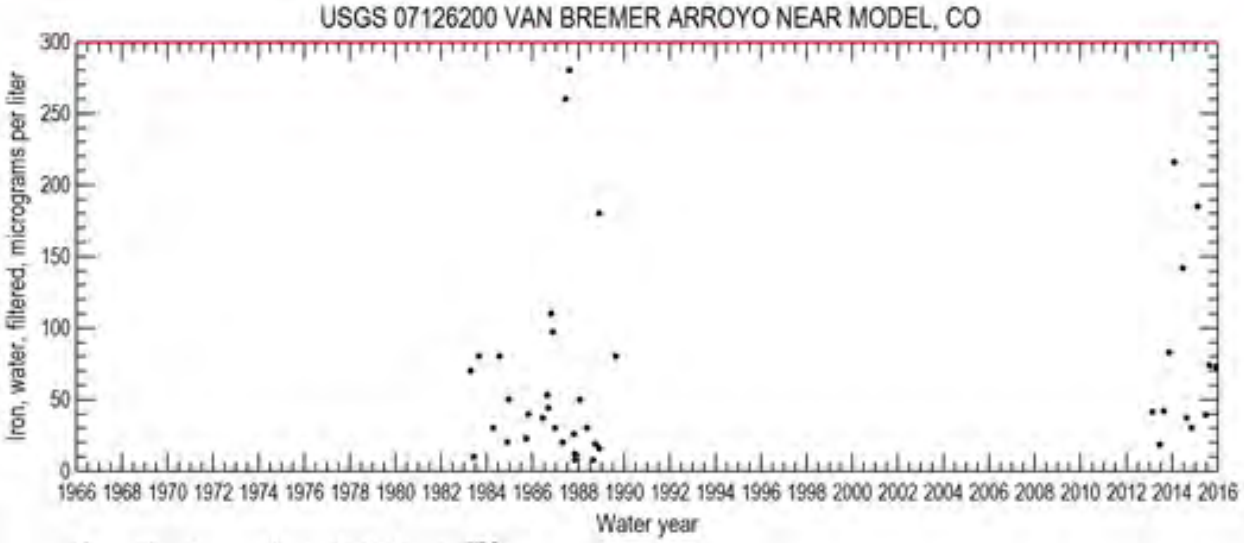
Numeric standard, acute, 340

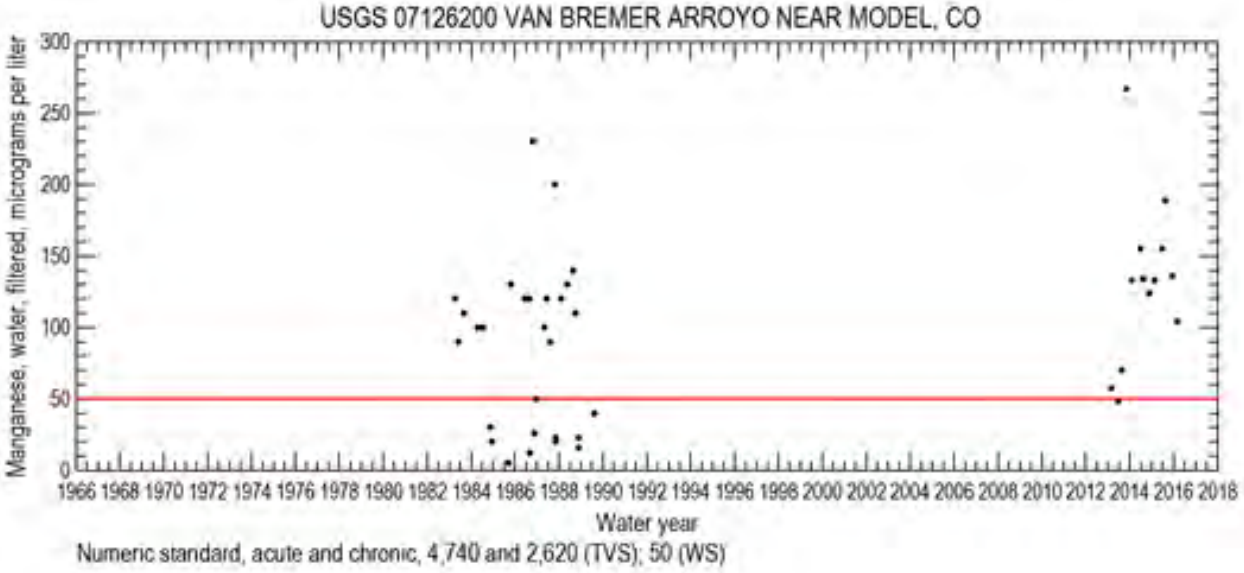


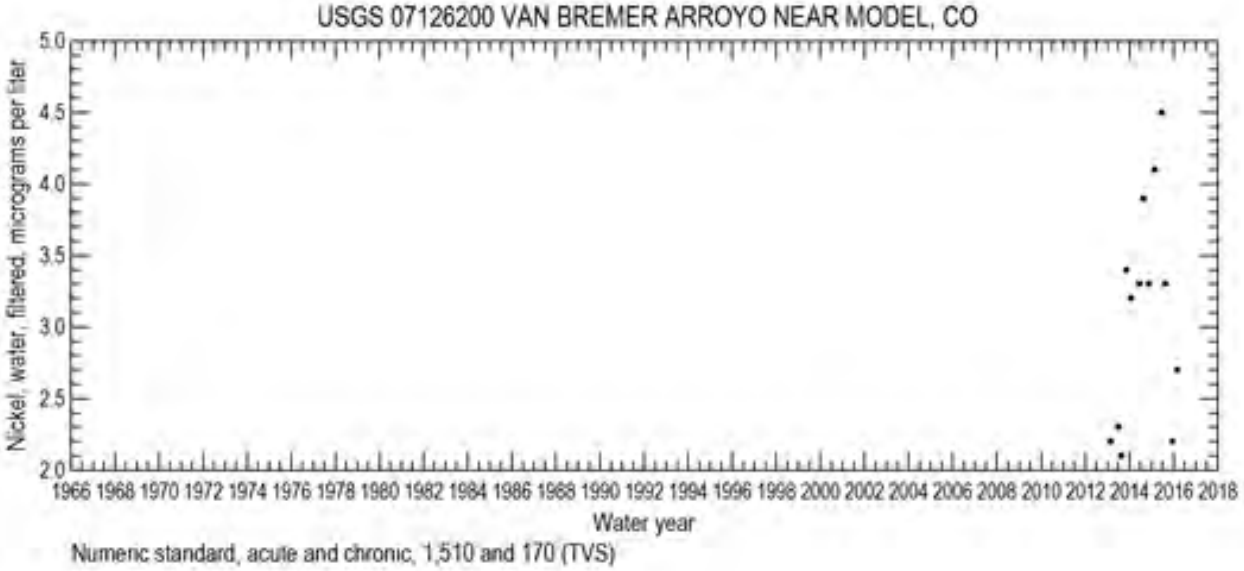
Domestic water-supply standard, acute, 50

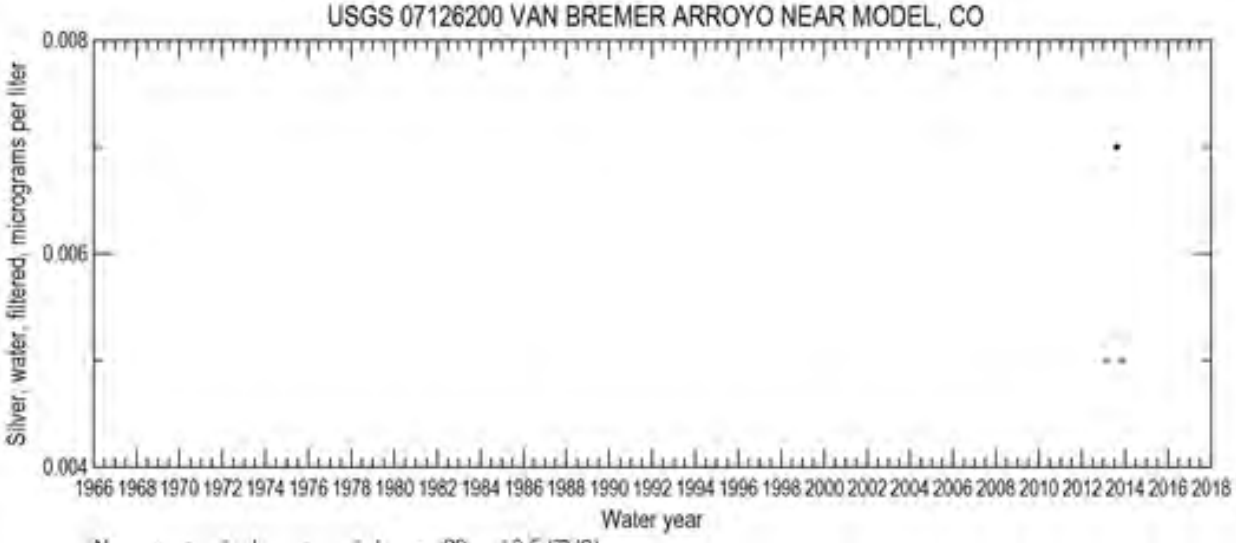


Numeric standard, acute and chronic, 50 and 29 (TVS)

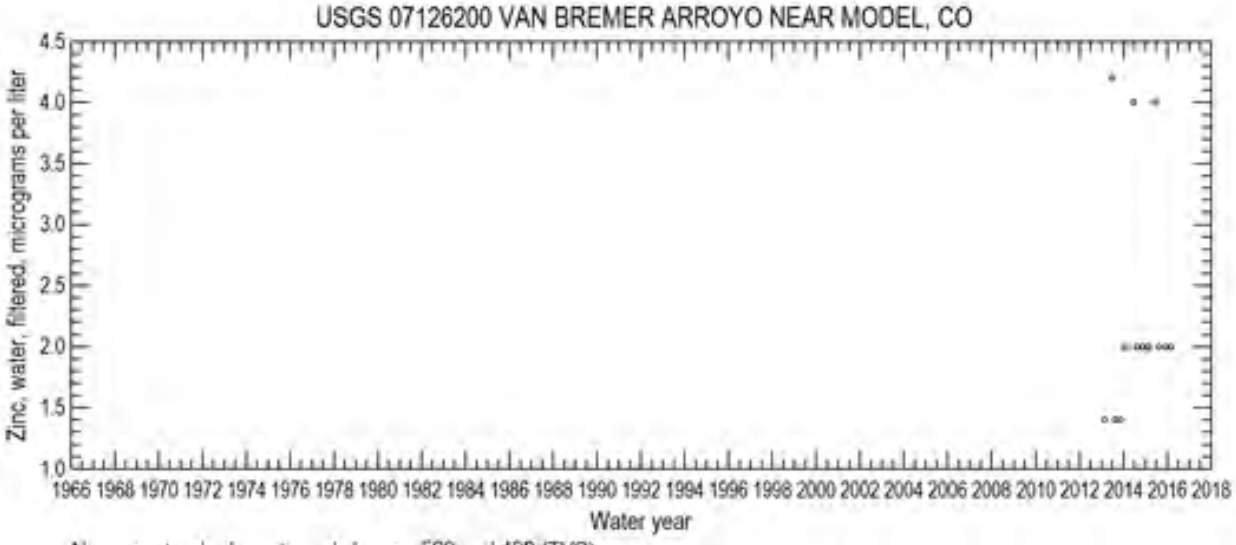

USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Iron, water, filtered, micrograms per liter
300
250
200
150
100
50
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
Water year
Domestic water-supply standard, chronic, 300


USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Manganese, water, filtered, micrograms per liter
300
250
200
150
100
50
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS); 50 (WS)

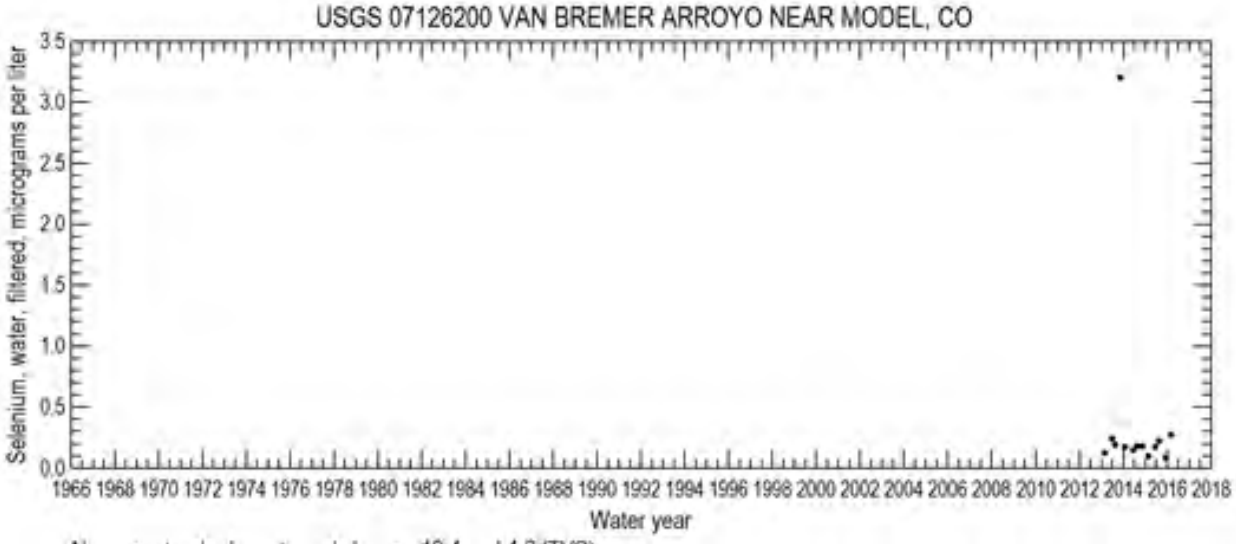

USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
Nickel, water, filtered, micrograms per liter
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, acute and chronic, 1,510 and 170 (TVS)



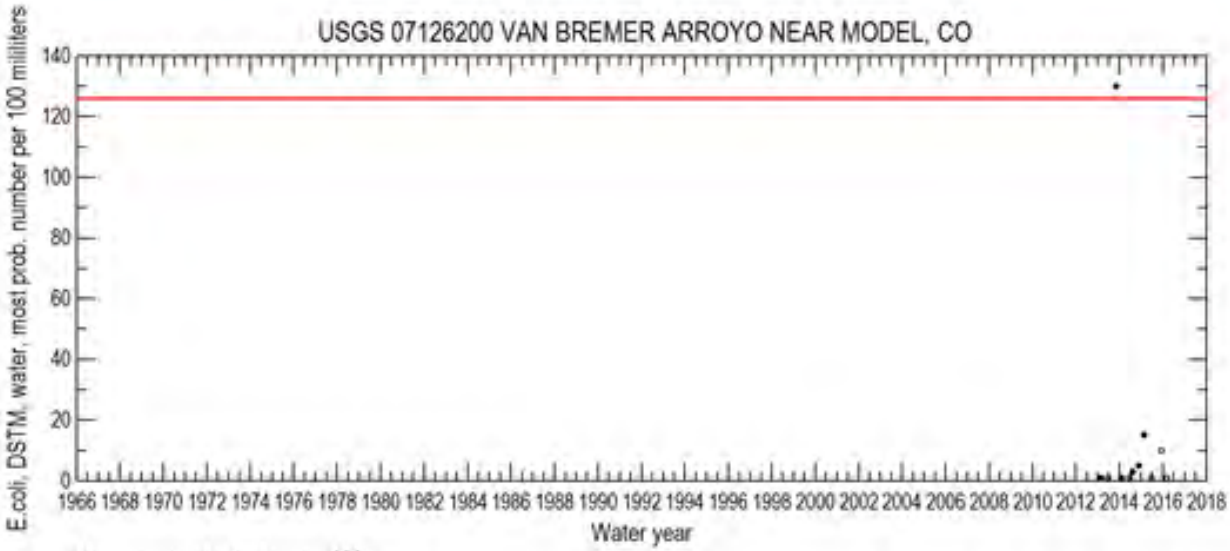
Numeric standard, acute and chronic, 22 and 3.5 (TVS)

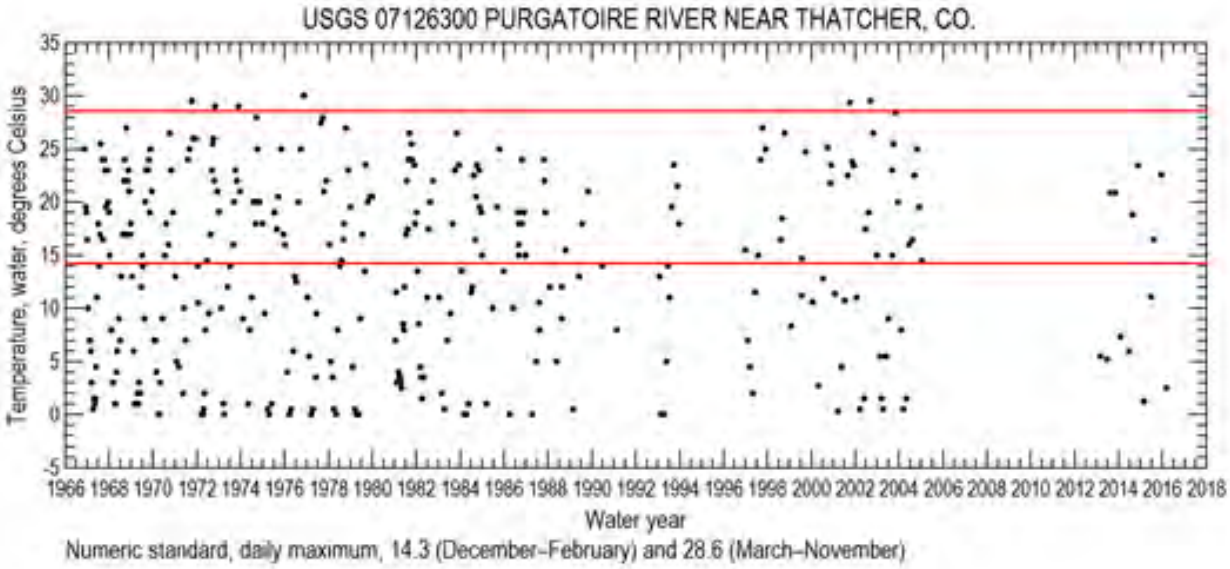


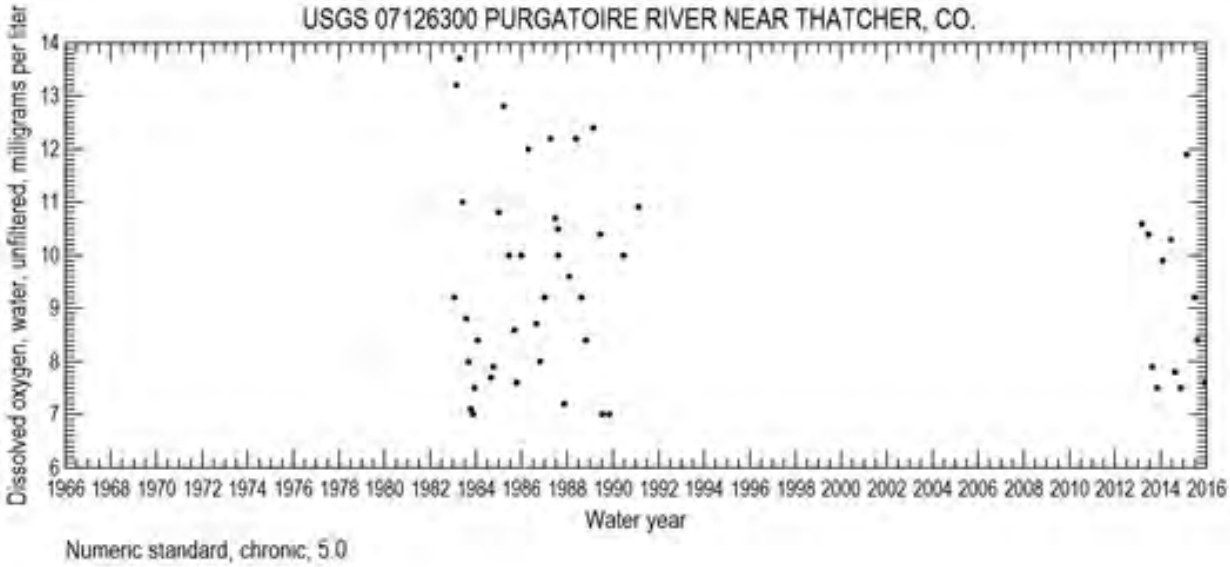
Numeric standard, acute and chronic, 560 and 430 (TVS)

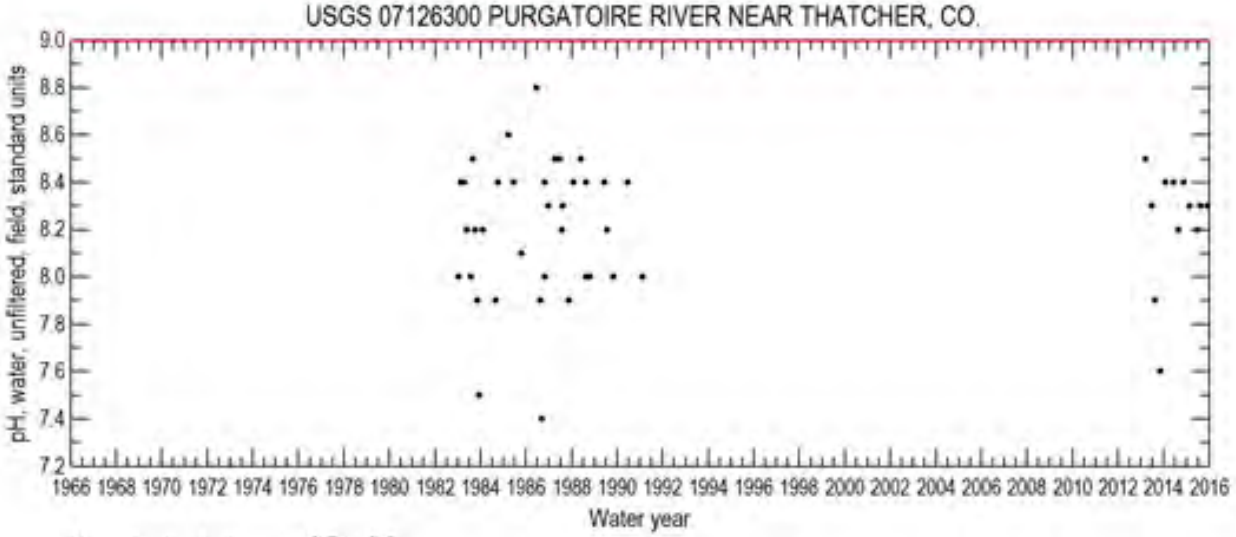


Numeric standard, acute and chronic, 18.4 and 4.6 (TVS)

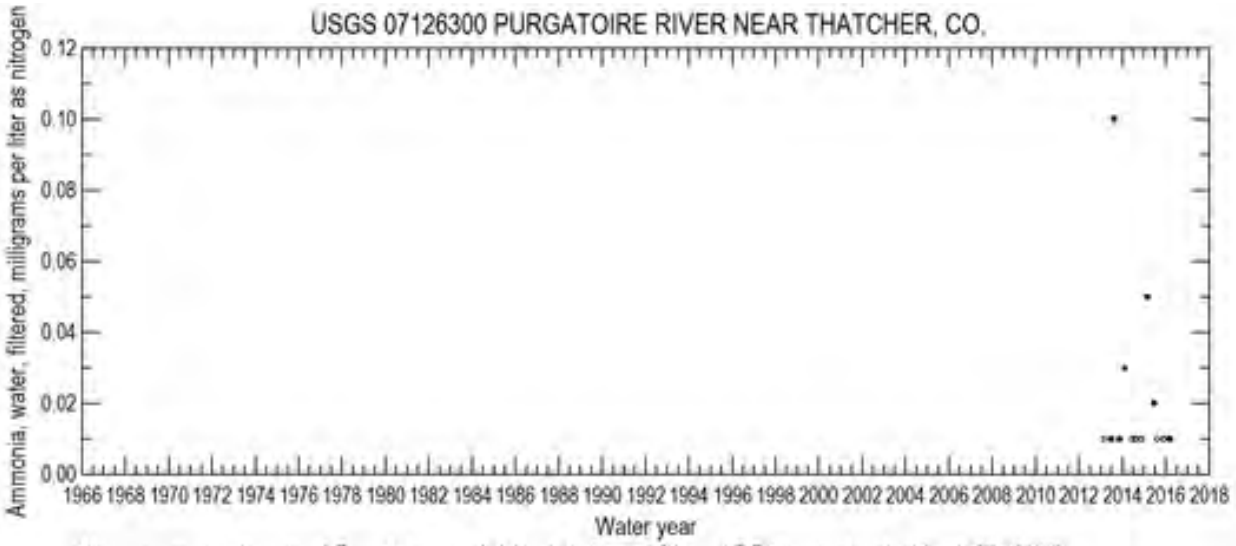

USGS 07126200 VAN BREMER ARROYO NEAR MODEL, CO
E.coli, DSTM, water, most prob. number per 100 milliliters
140
120
100
80
60
40
20
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, chronic, 126


USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
Temperature, water, degrees Celsius
35
30
25
20
15
10
5
0
-5
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)

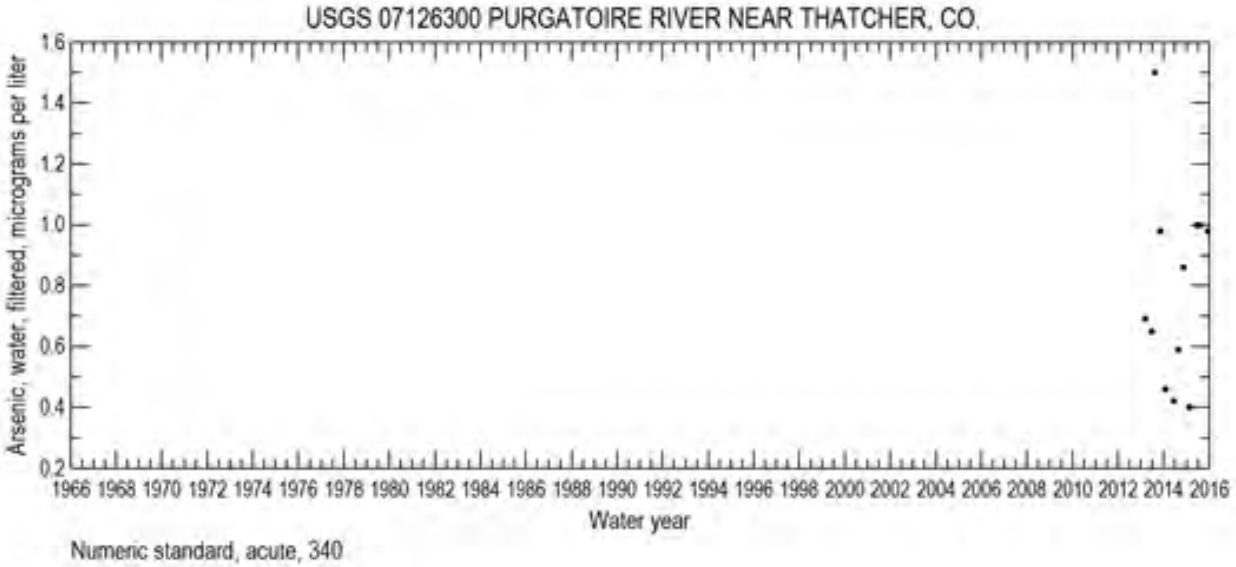

USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
Dissolved oxygen, water, unfiltered, milligrams per liter
14
13
12
11
10
9
8
7
6
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
Water year
Numeric standard, chronic, 5.0



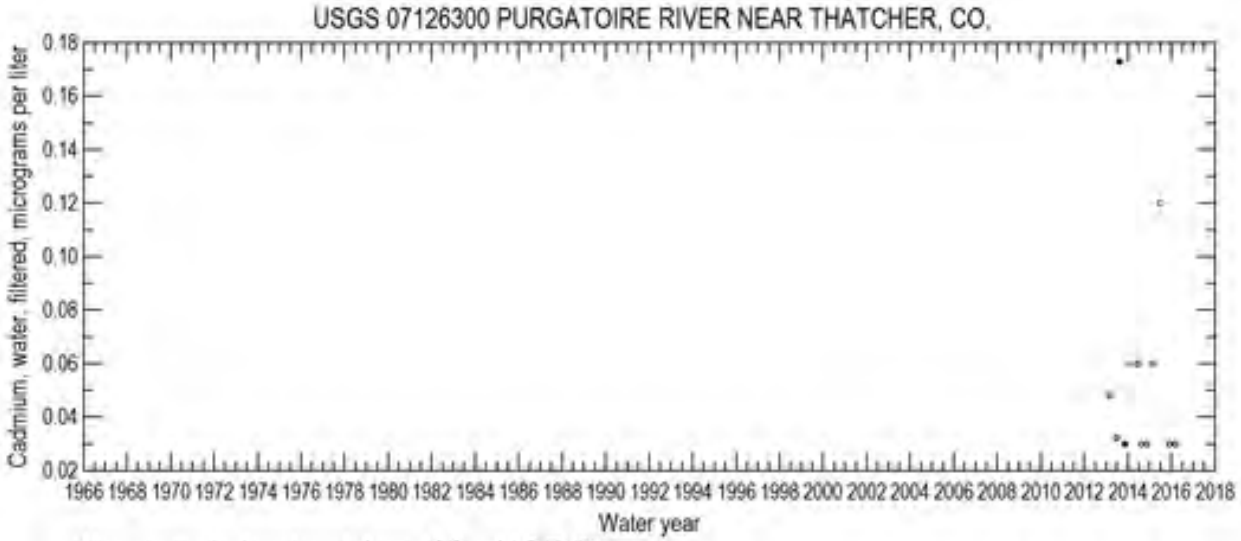
Numeric standard, acute, 6.5 to 9.0



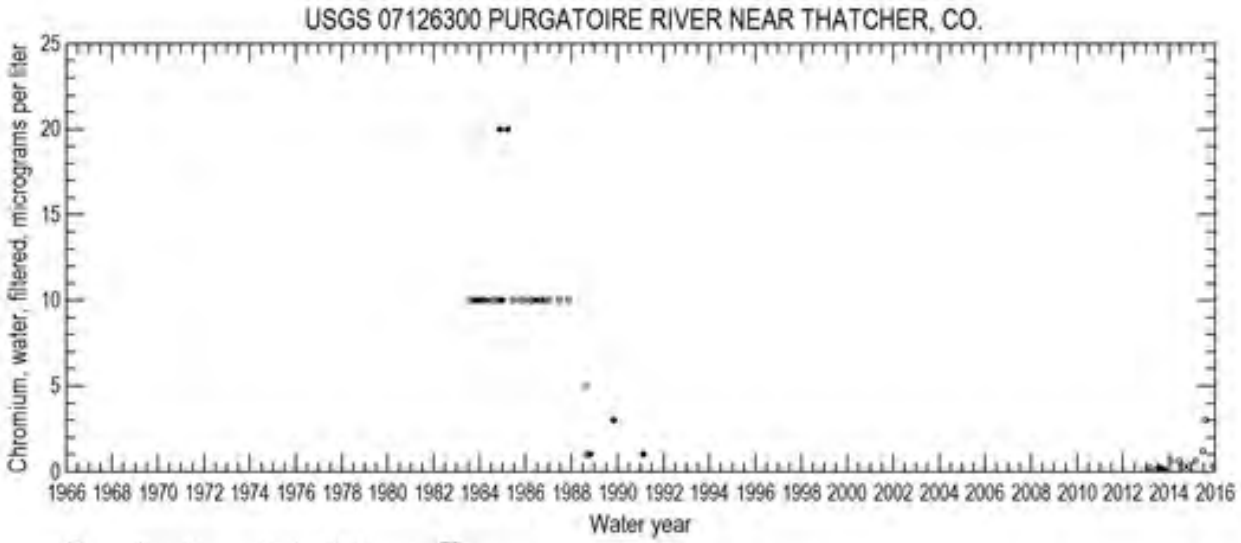
Numeric standard, acute, 4.7, and chronic, 1.4 (April 1- August 31) and 7.5 (September 1 - March 31) (TVS)



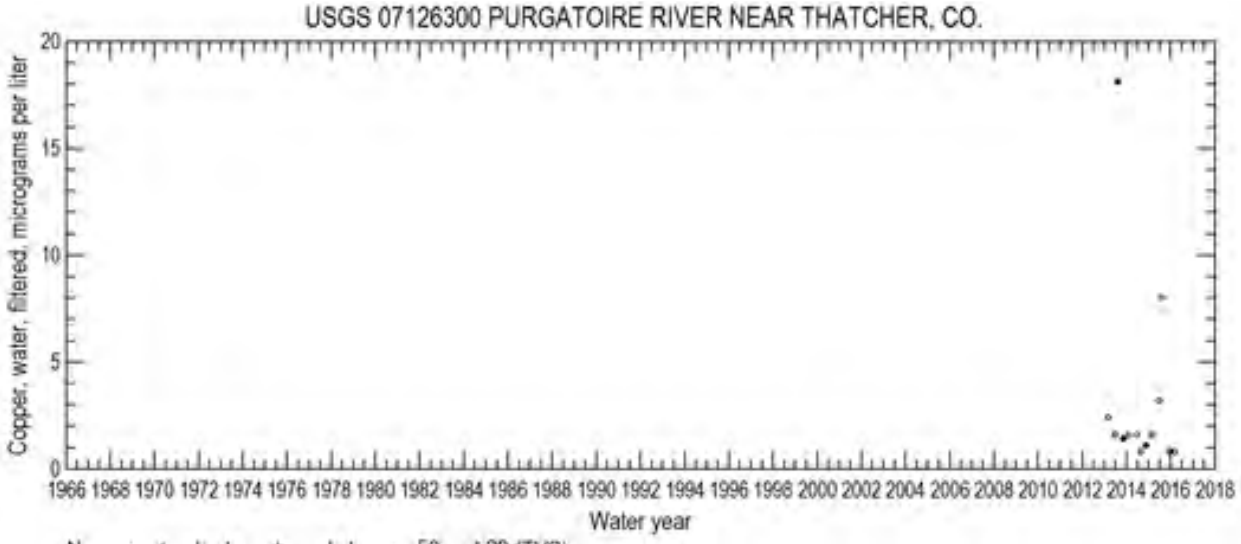
Numeric standard, acute, 340



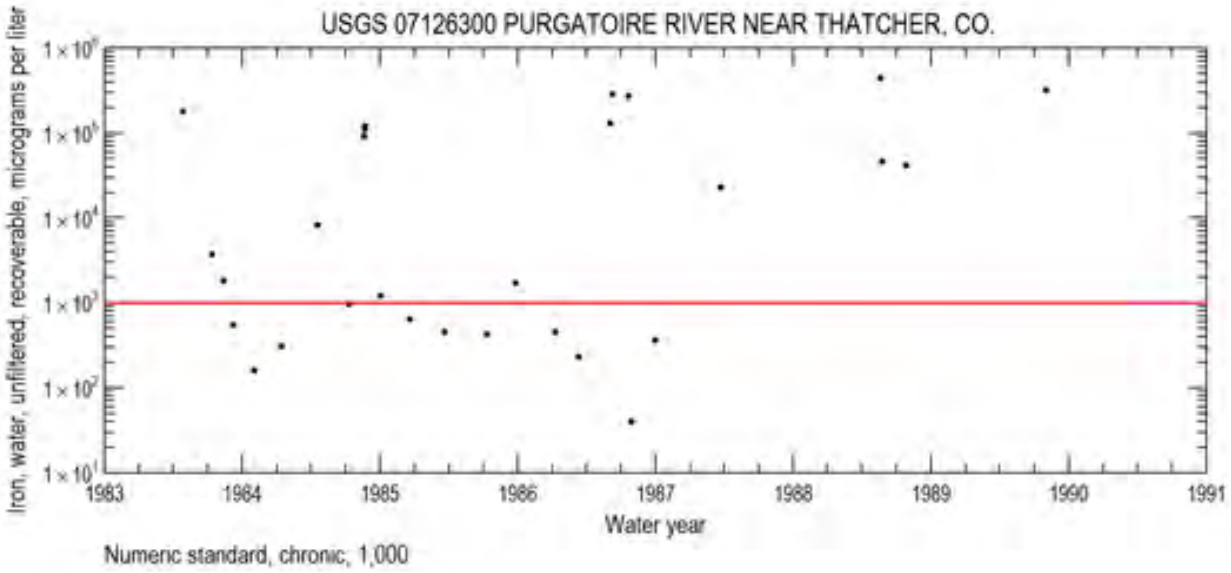
Numeric standard, acute and chronic, 9.2 and 1.2 (TVS)

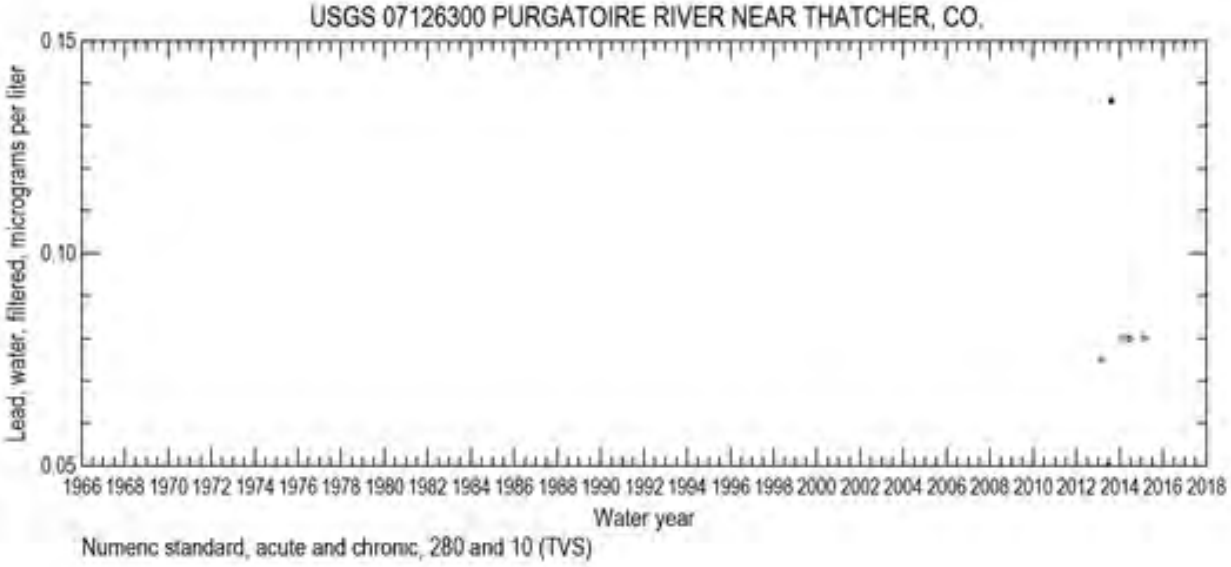


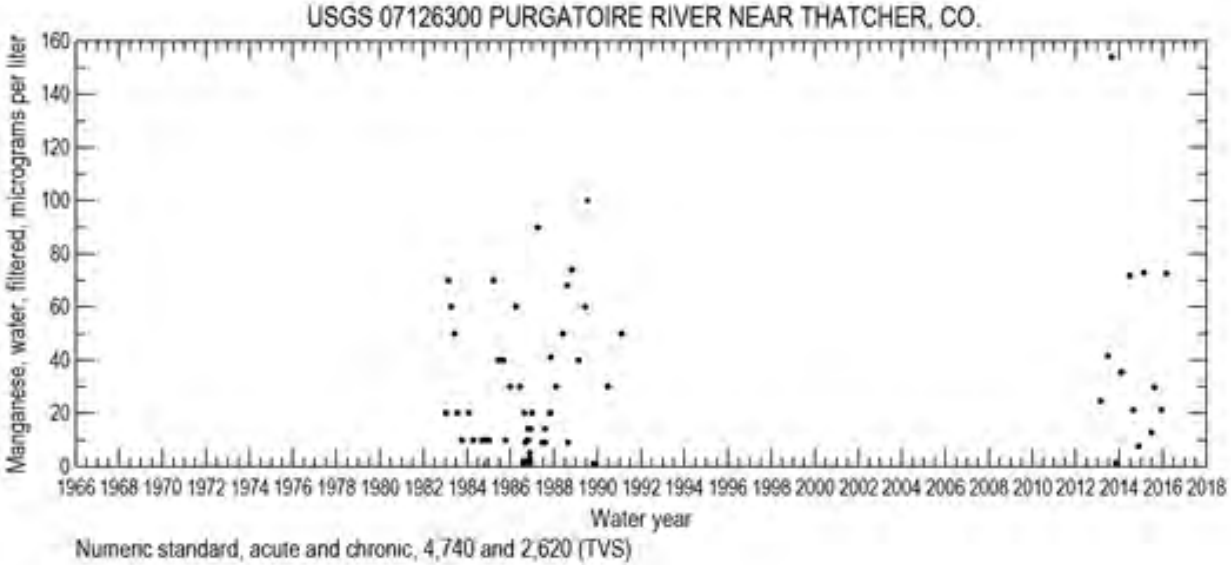
Domestic water-supply standard, acute, 50

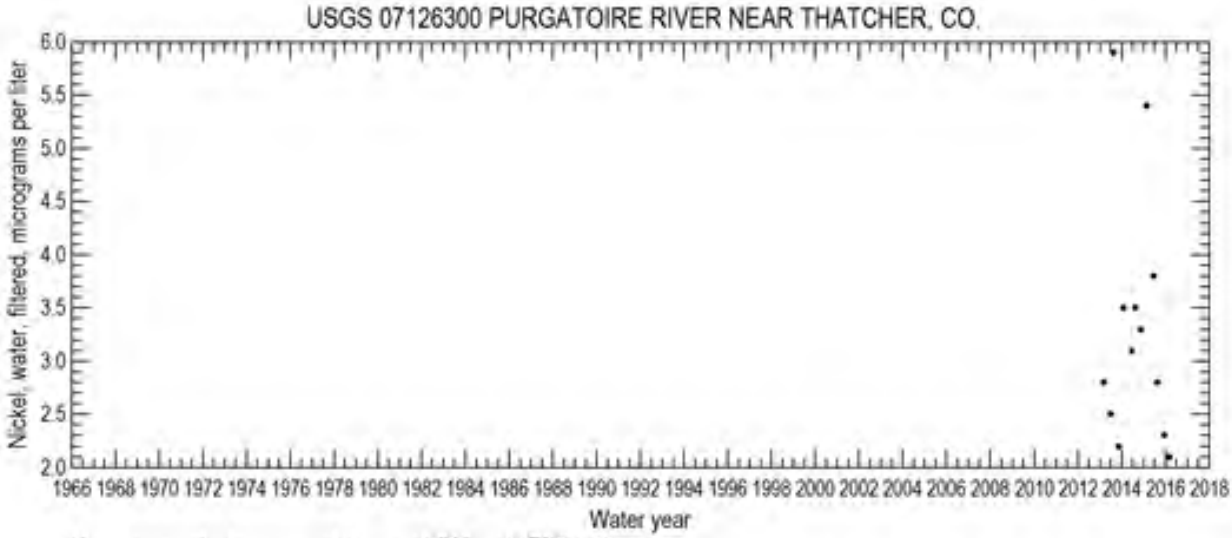


Numeric standard, acute and chronic, 50 and 29 (TVS)

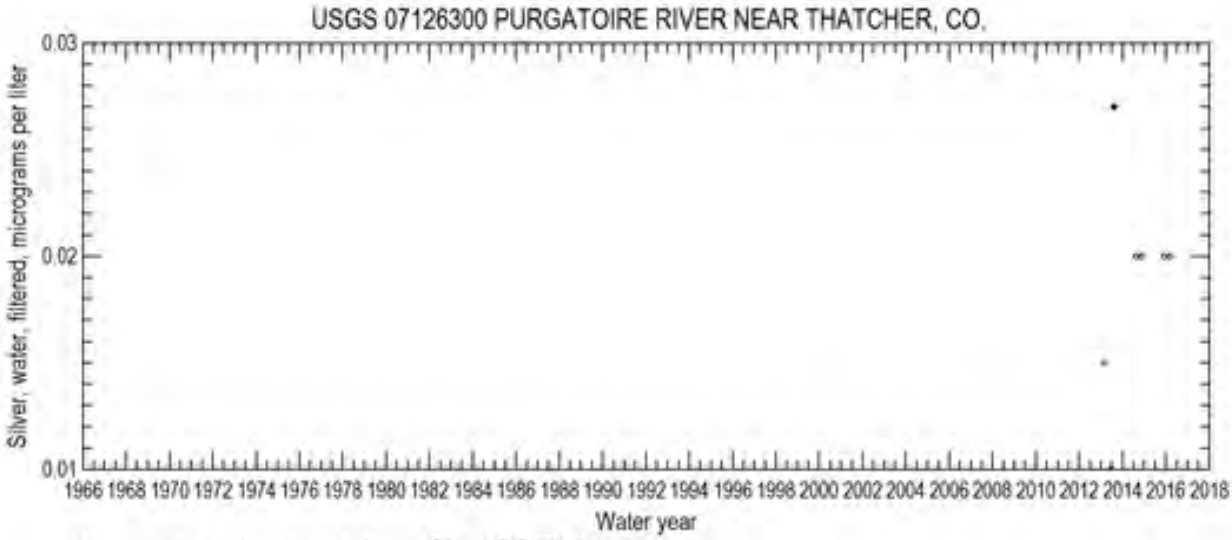

USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
Iron, water, unfiltered, recoverable, micrograms per liter
1 × 10⁶
1 × 10⁵
1 × 10⁴
1 × 10³
1 × 10²
1 × 10¹
1983
1984
1985
1986
1987
1988
1989
1990
1991
Water year
Numeric standard, chronic, 1,000


USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
Lead, water, filtered, micrograms per liter
0.15
0.10
0.05
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, acute and chronic, 280 and 10 (TVS)

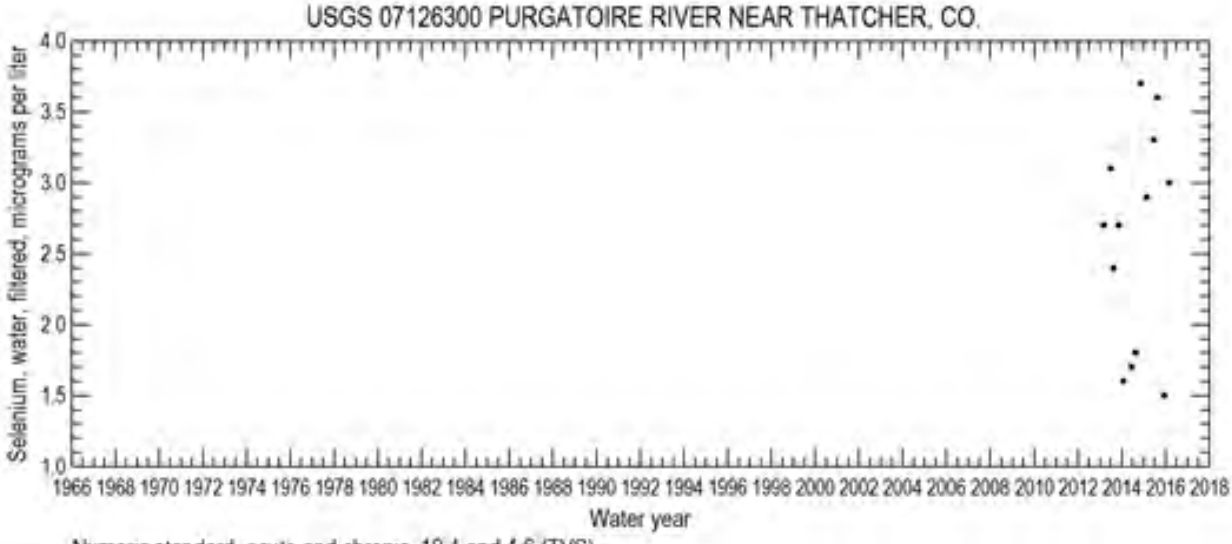

USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
Manganese, water, filtered, micrograms per liter
160
140
120
100
80
60
40
20
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS)



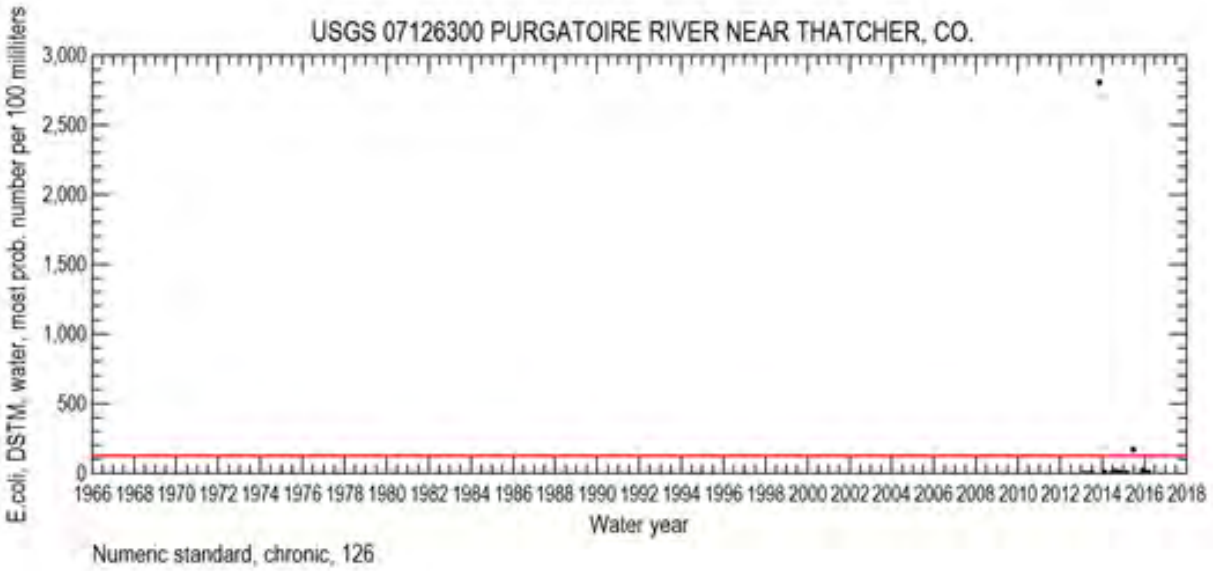
Numeric standard, acute and chronic, 1,510 and 170 (TVS)

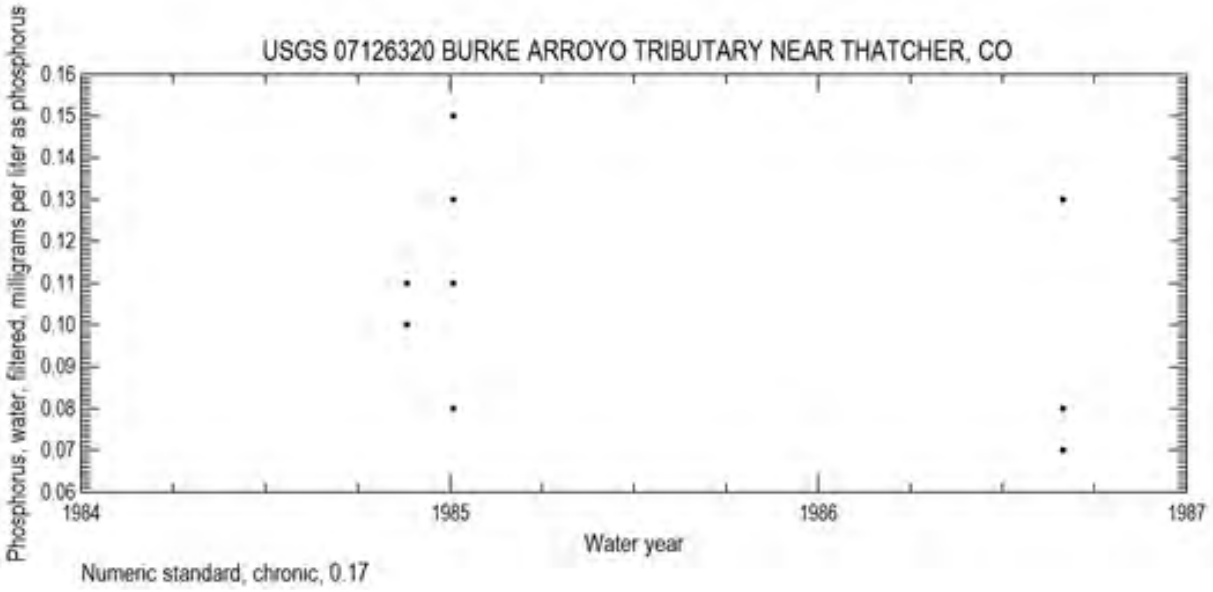


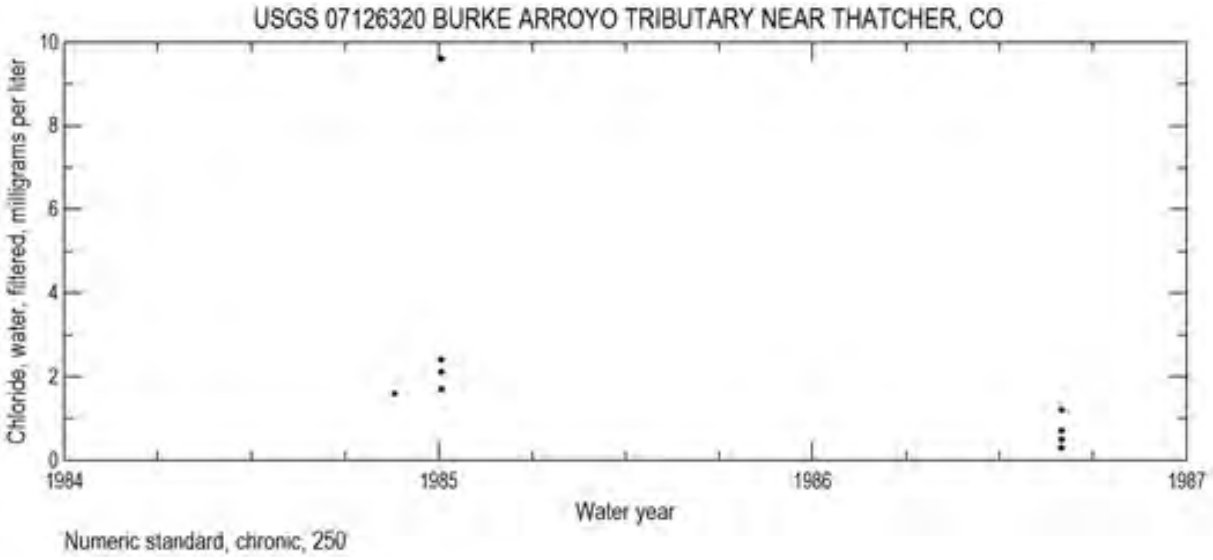
Numeric standard, acute and chronic, 22 and 3.5 (TVS)

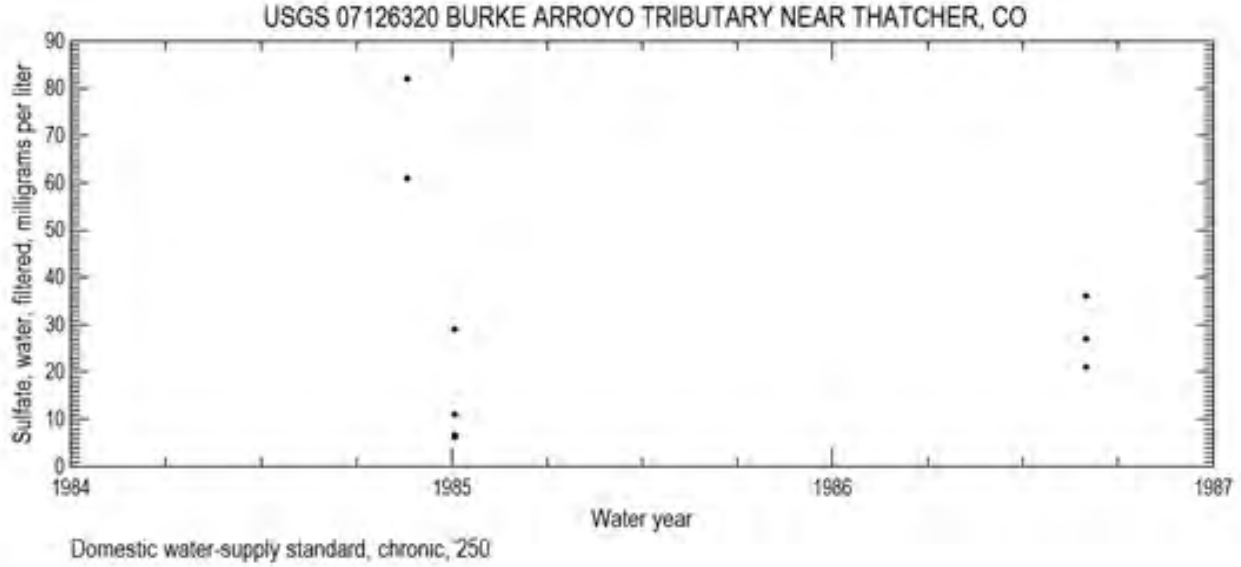


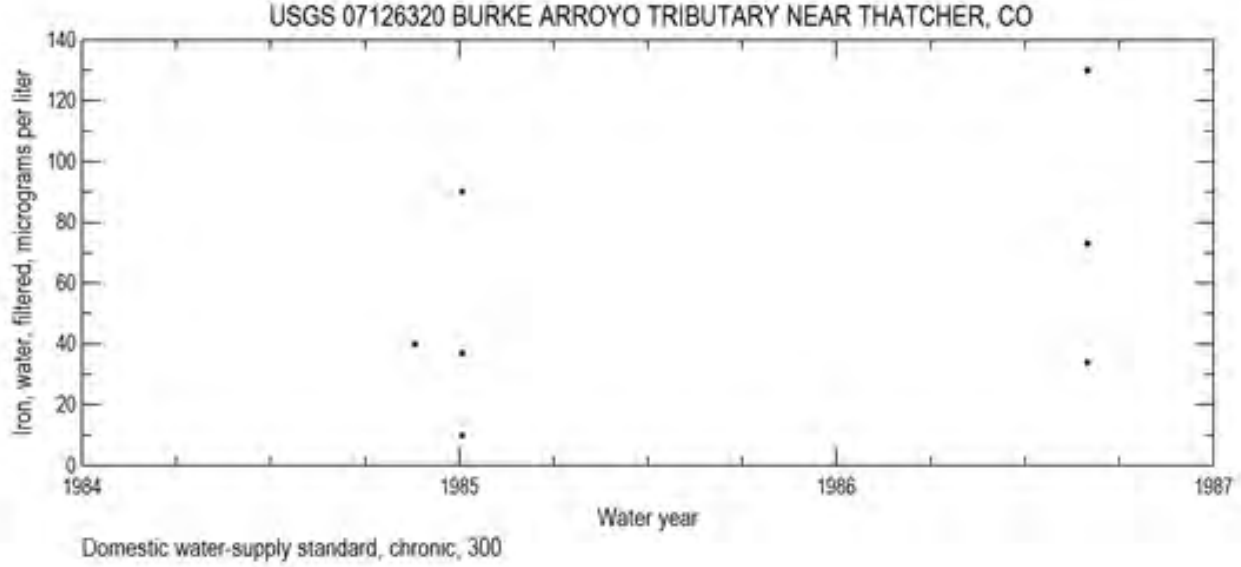
Numeric standard, acute and chronic, 18.4 and 4.6 (TVS)

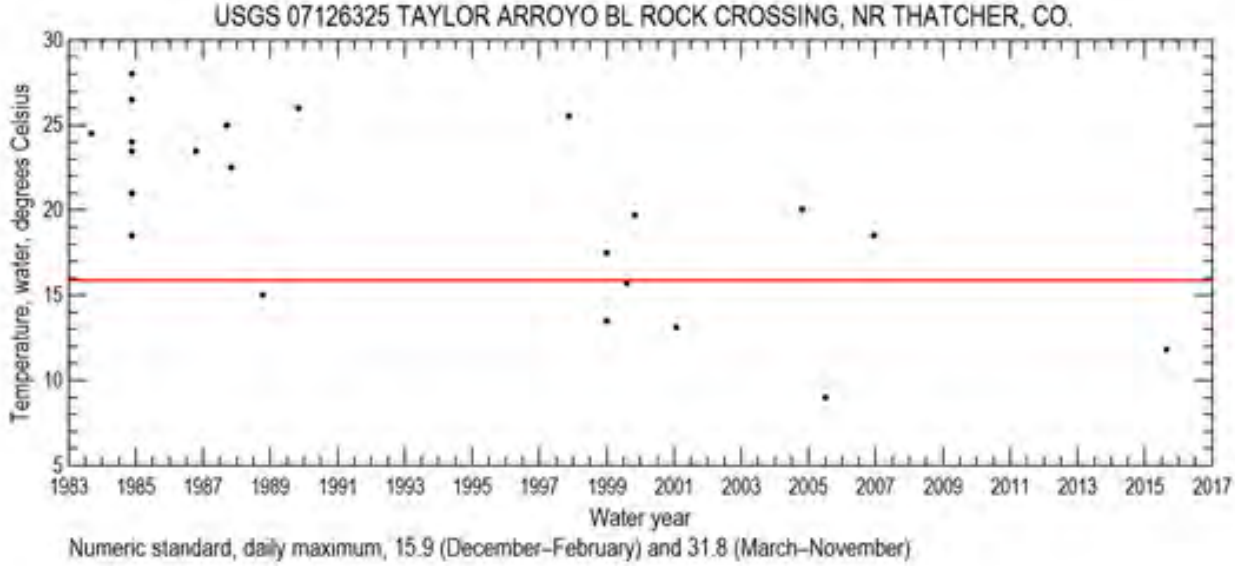

USGS 07126300 PURGATOIRE RIVER NEAR THATCHER, CO.
E.coli, DSTM, water, most prob. number per 100 milliliters
3,000
2,500
2,000
1,500
1,000
500
0
1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, chronic, 126

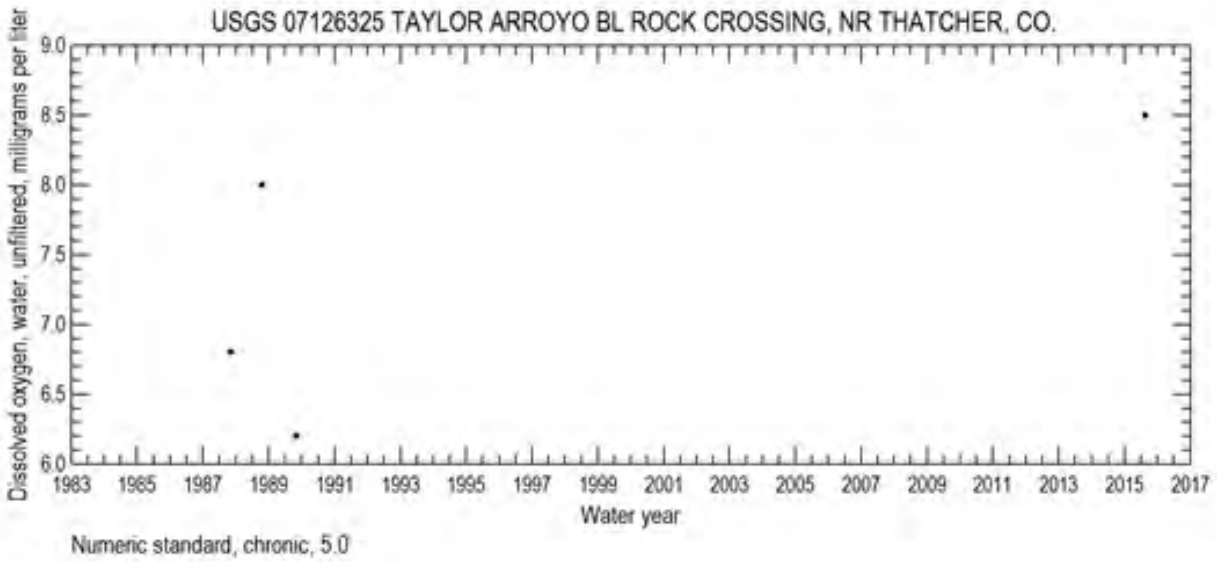

USGS 07126320 BURKE ARROYO TRIBUTARY NEAR THATCHER, CO
Phosphorus, water, filtered, milligrams per liter as phosphorus
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
1984
1985
1986
1987
Water year
Numeric standard, chronic, 0.17

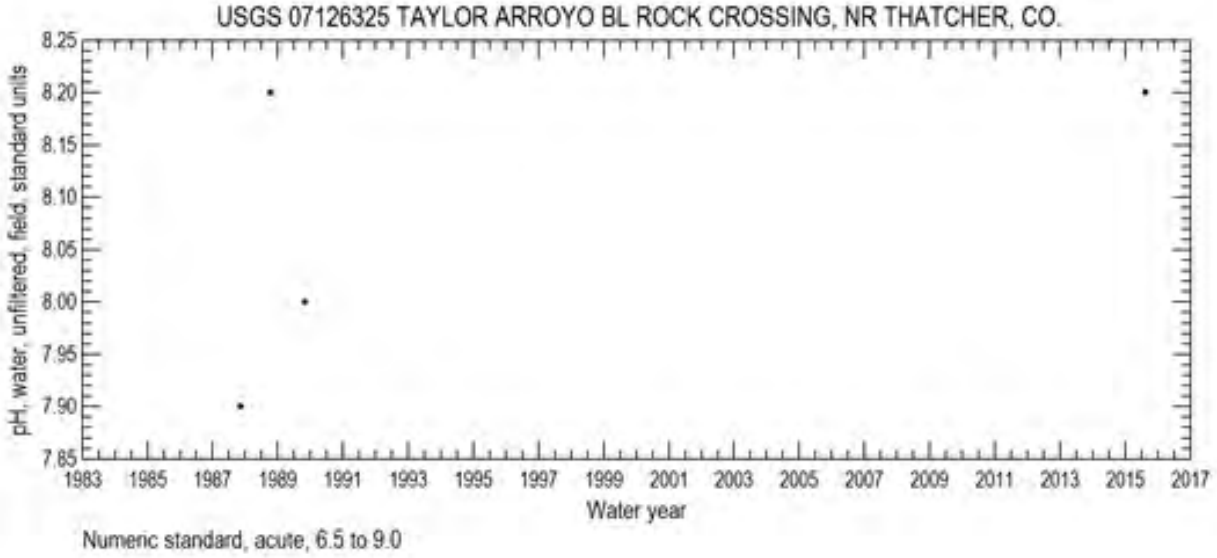

USGS 07126320 BURKE ARROYO TRIBUTARY NEAR THATCHER, CO
Chloride, water, filtered, milligrams per liter
10
8
6
4
2
0
1984
1985
1986
1987
Water year
Numeric standard, chronic, 250

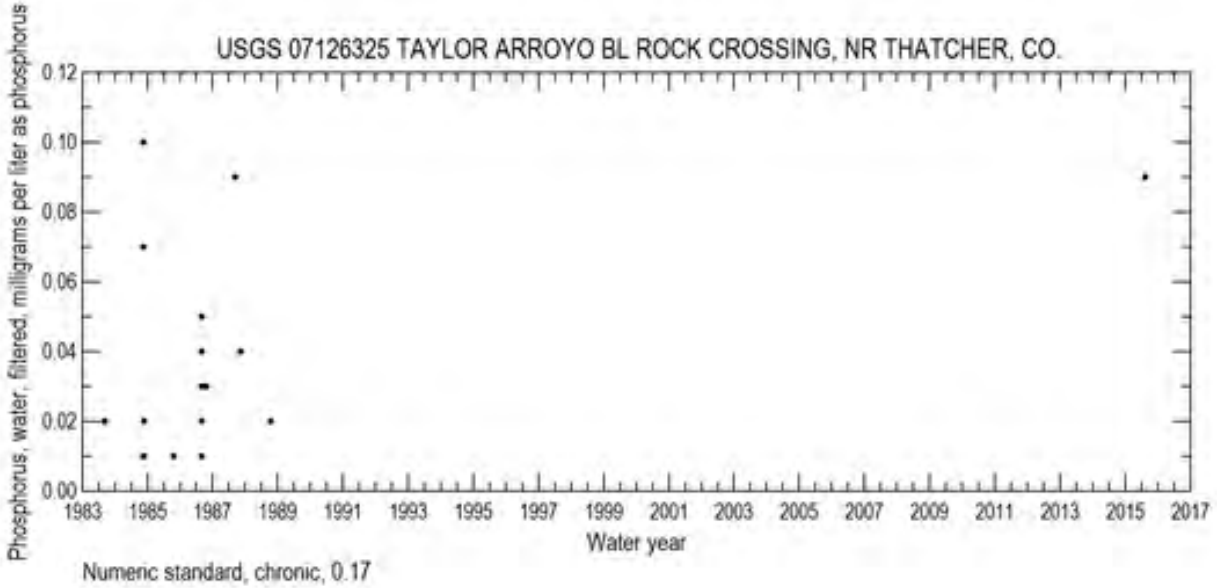

USGS 07126320 BURKE ARROYO TRIBUTARY NEAR THATCHER, CO
Sulfate, water, filtered, milligrams per liter
0
10
20
30
40
50
60
70
80
90
1984
1985
1986
1987
Water year
Domestic water-supply standard, chronic, 250

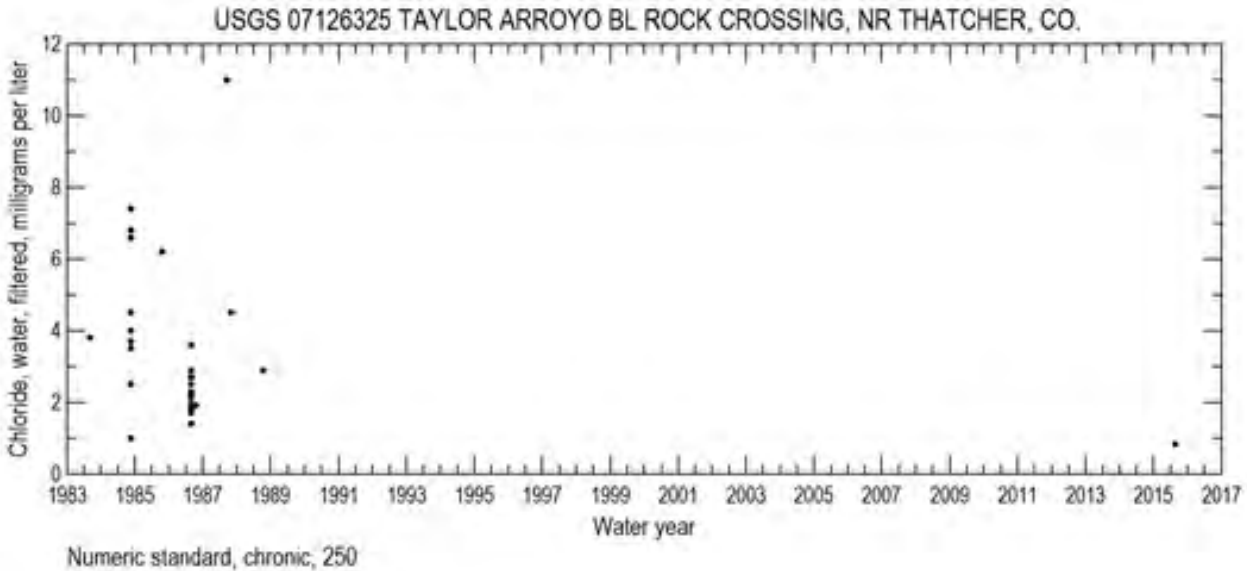

USGS 07126320 BURKE ARROYO TRIBUTARY NEAR THATCHER, CO
Iron, water, filtered, micrograms per liter
0
20
40
60
80
100
120
140
1984
1985
1986
1987
Water year
Domestic water-supply standard, chronic, 300

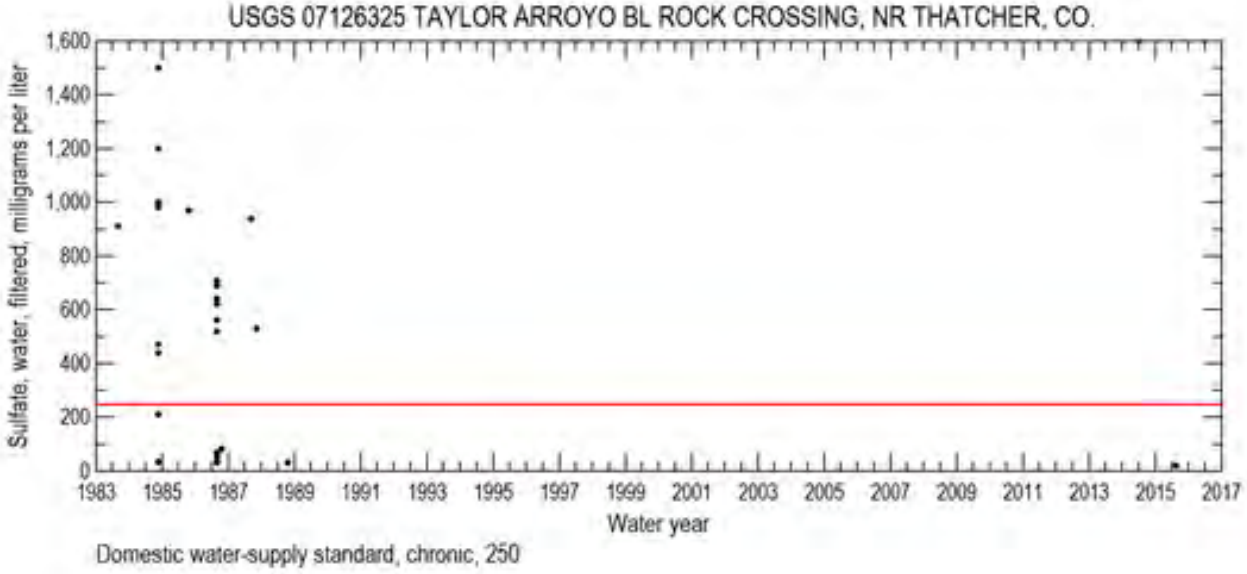

USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
Temperature, water, degrees Celsius
5
10
15
20
25
30
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Numeric standard, daily maximum, 15.9 (December–February) and 31.8 (March–November)

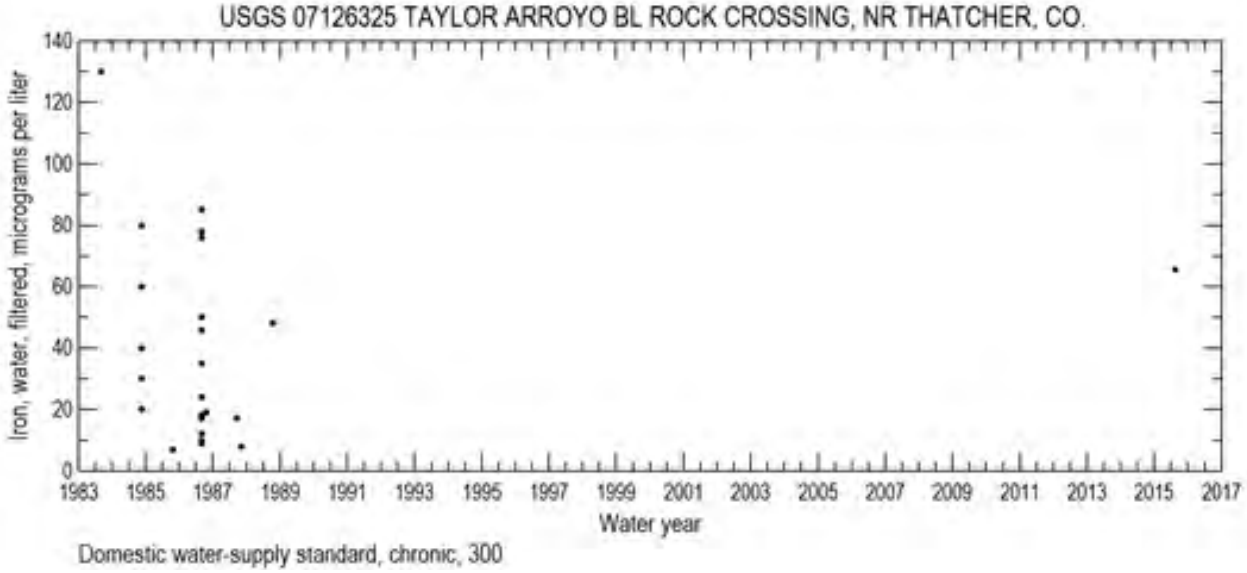

USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
Dissolved oxygen, water, unfiltered, milligrams per liter
9.0
8.5
8.0
7.5
7.0
6.5
6.0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Numeric standard, chronic, 5.0

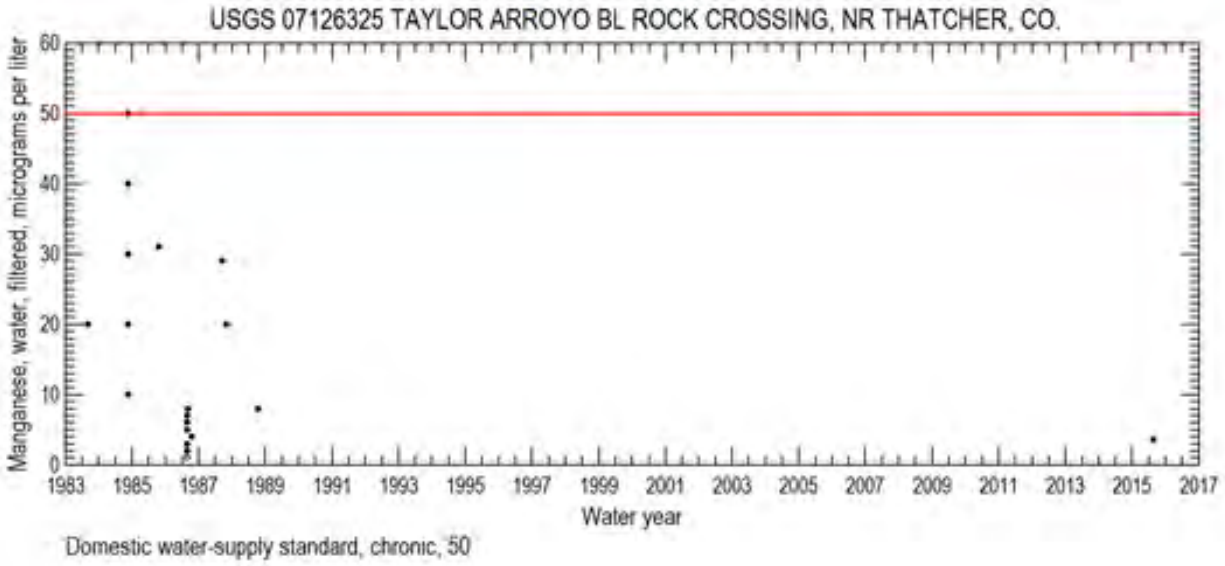

USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
pH, water, unfiltered, field, standard units
8.25
8.20
8.15
8.10
8.05
8.00
7.95
7.90
7.85
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Numeric standard, acute, 6.5 to 9.0


USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
Phosphorus, water, filtered, milligrams per liter as phosphorus
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Numeric standard, chronic, 0.17

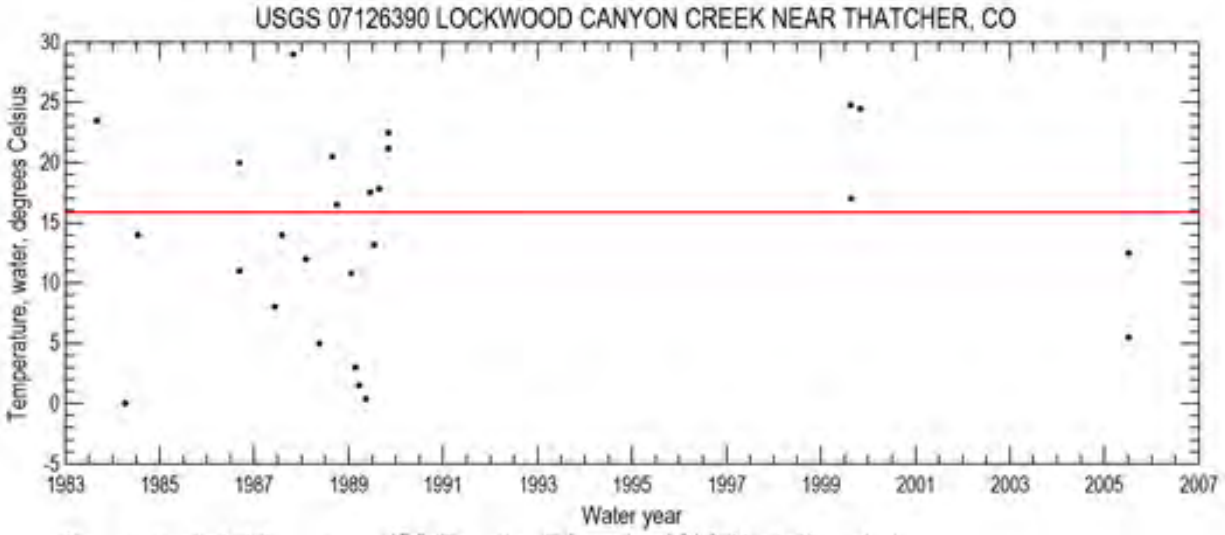

USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
Chloride, water, filtered, milligrams per liter
0
2
4
6
8
10
12
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Numeric standard, chronic, 250


USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
Sulfate, water, filtered, milligrams per liter
0
200
400
600
800
1,000
1,200
1,400
1,600
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Domestic water-supply standard, chronic, 250

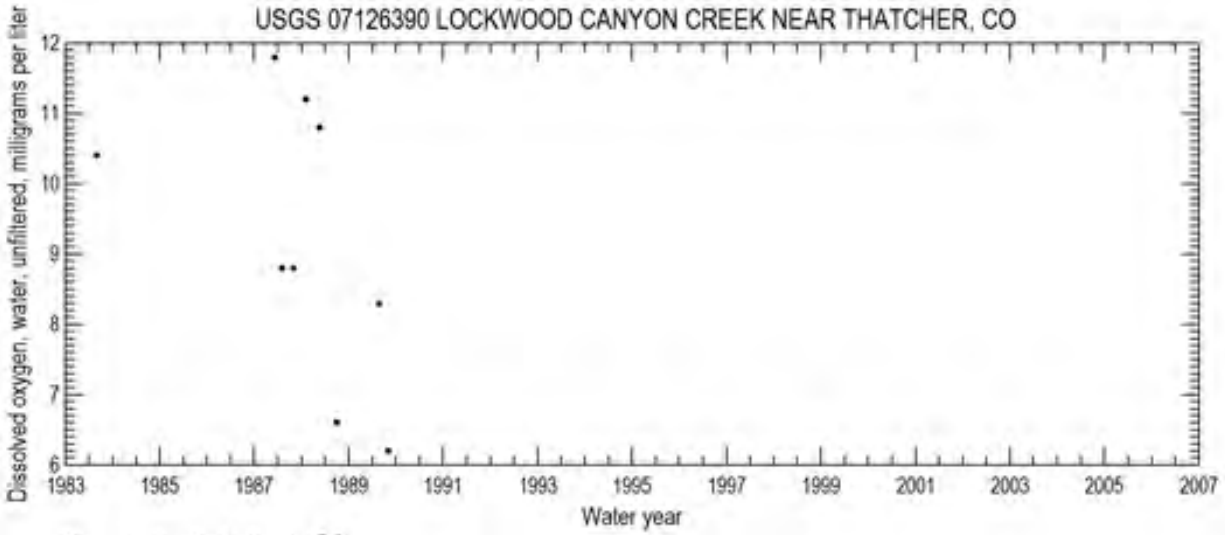

USGS 07126325 TAYLOR ARROYO BL ROCK CROSSING, NR THATCHER, CO.
Iron, water, filtered, micrograms per liter
0
20
40
60
80
100
120
140
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Domestic water-supply standard, chronic, 300



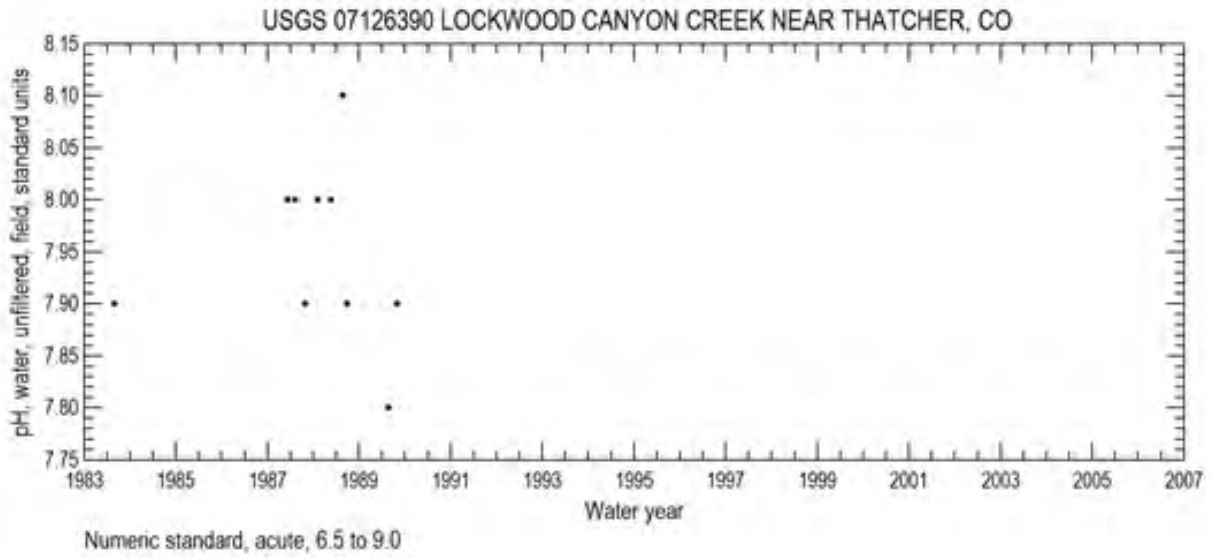
Domestic water-supply standard, chronic, 50



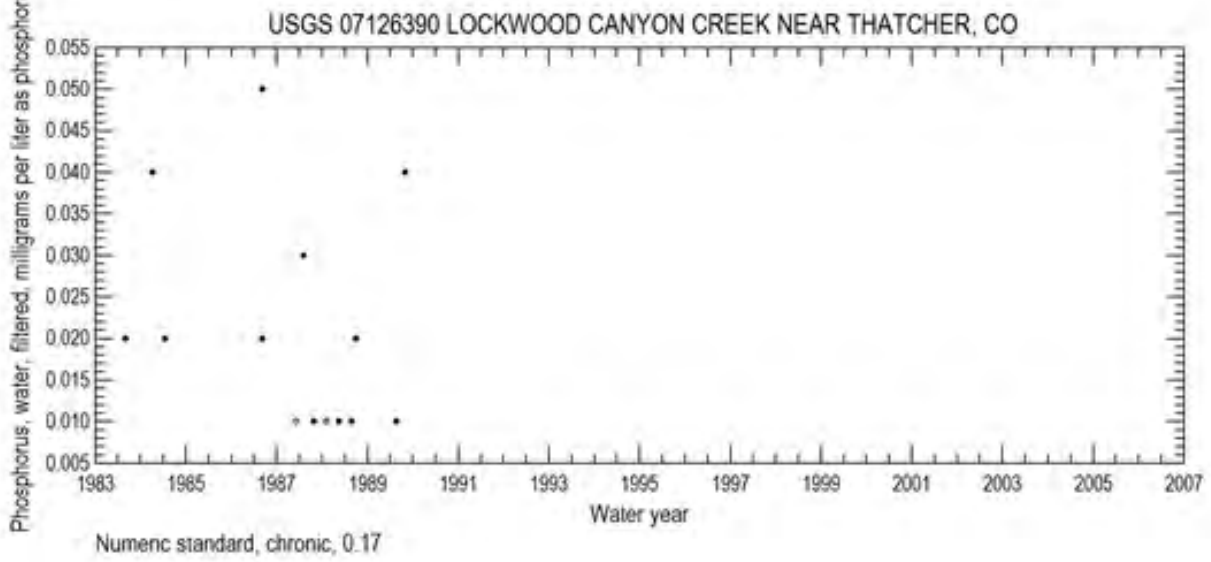
Numeric standard, daily maximum, 15.9 (December–February) and 31.8 (March–November)



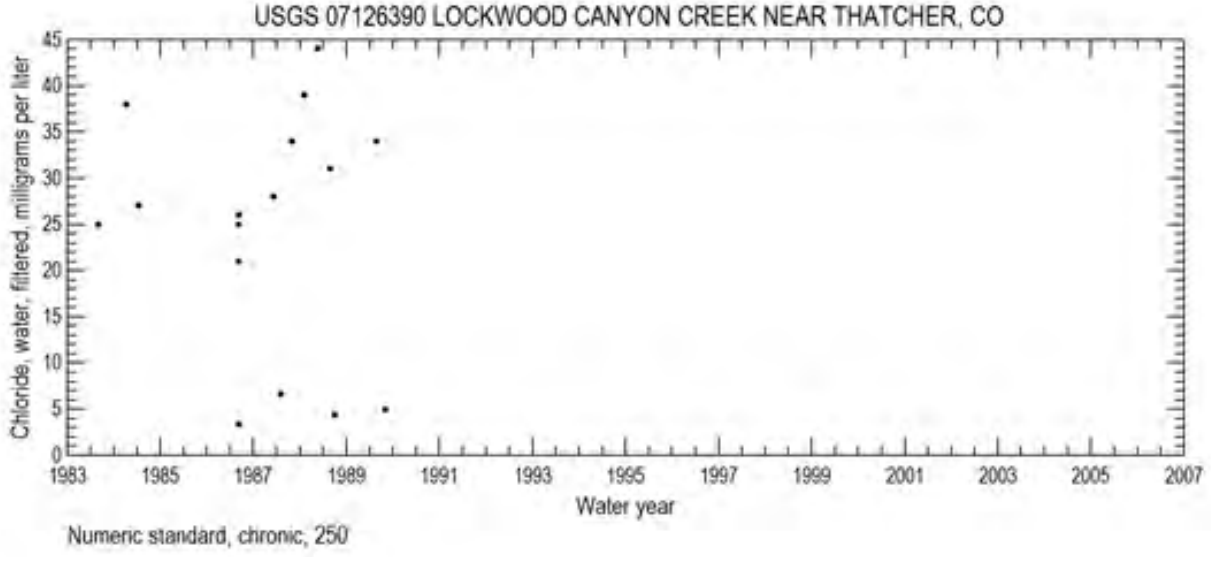
Numeric standard, chronic, 5.0



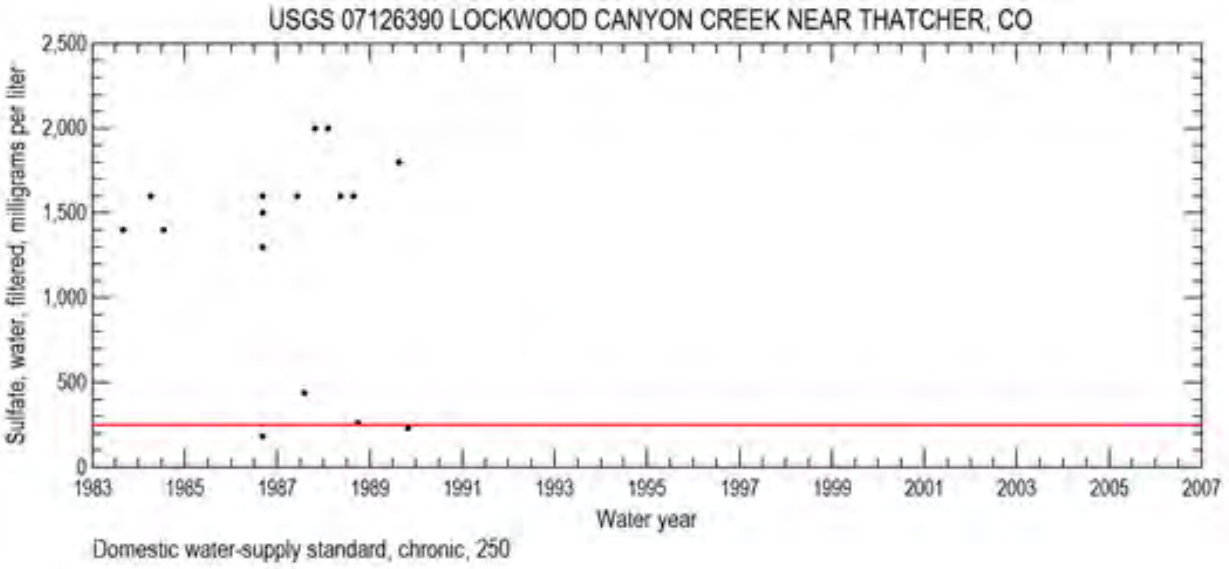
Numeric standard, acute, 6.5 to 9.0

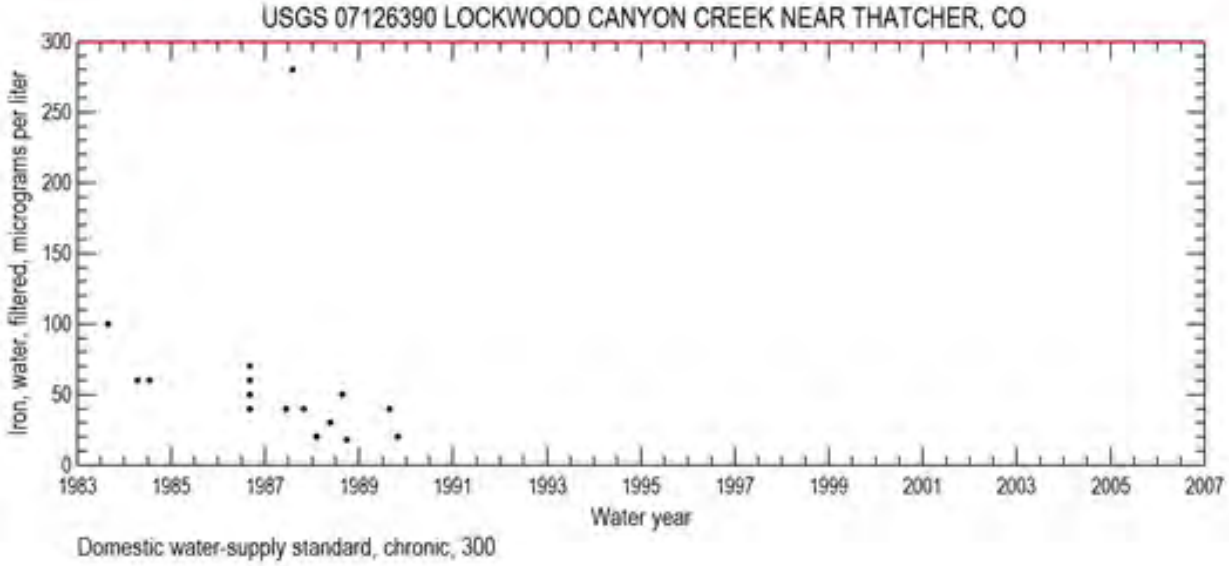


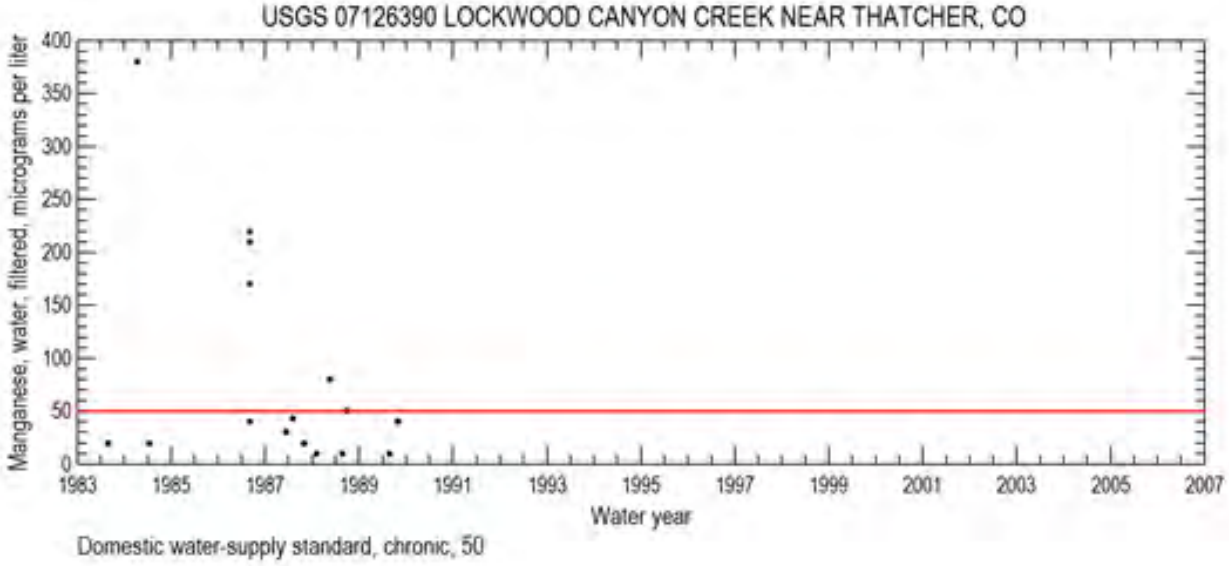
Numenc standard, chronic, 0.17

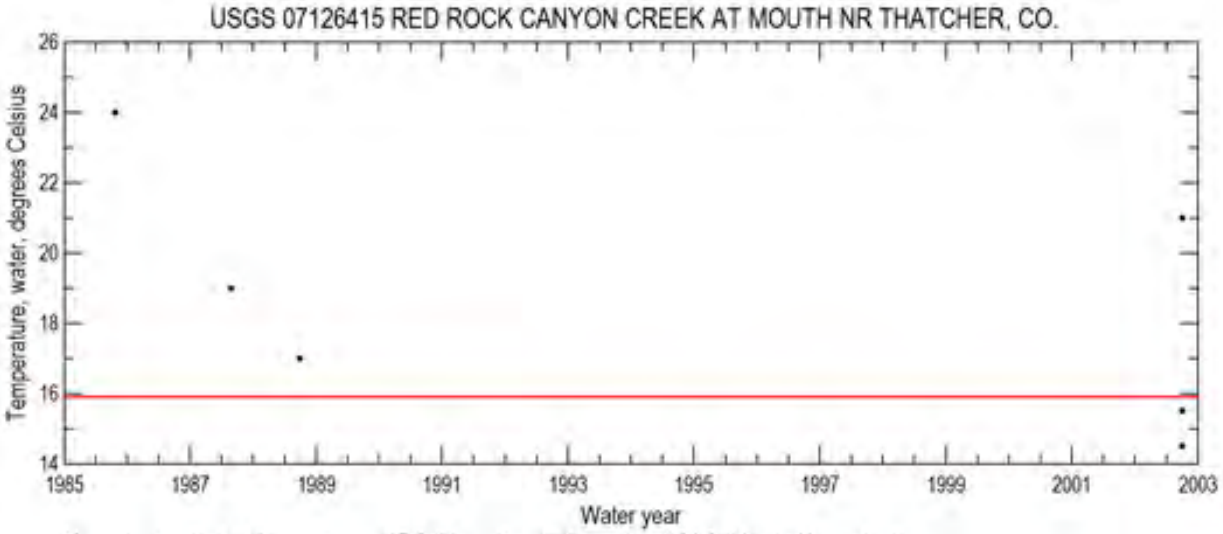


Numeric standard, chronic, 250

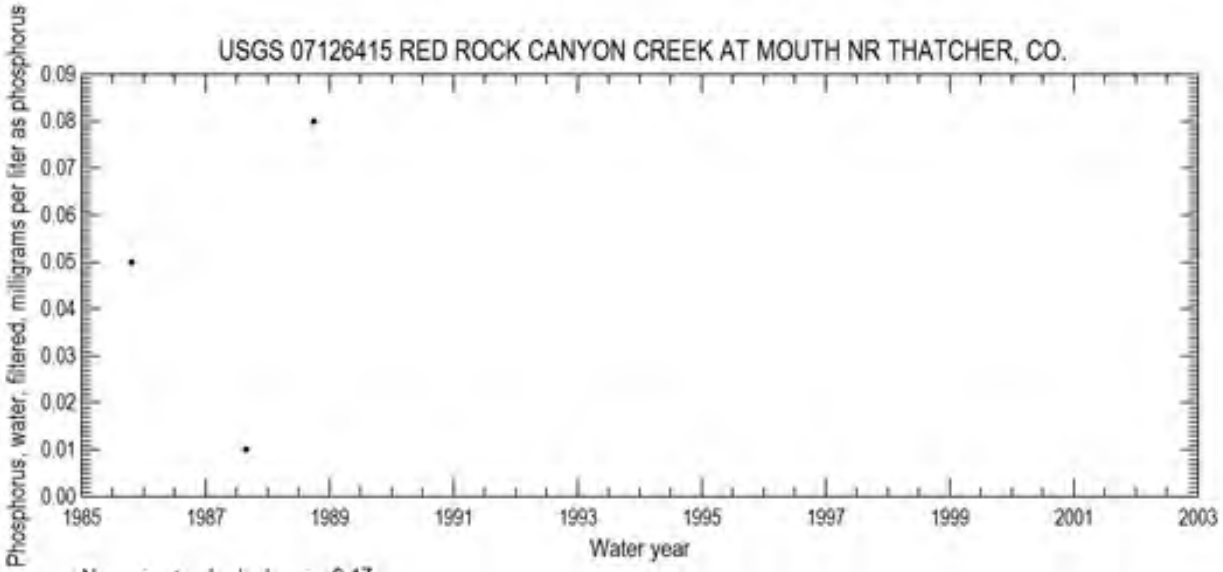

USGS 07126390 LOCKWOOD CANYON CREEK NEAR THATCHER, CO
Sulfate, water, filtered, milligrams per liter
2,500
2,000
1,500
1,000
500
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
Water year
Domestic water-supply standard, chronic, 250


USGS 07126390 LOCKWOOD CANYON CREEK NEAR THATCHER, CO
Iron, water, filtered, micrograms per liter
300
250
200
150
100
50
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
Water year
Domestic water-supply standard, chronic, 300

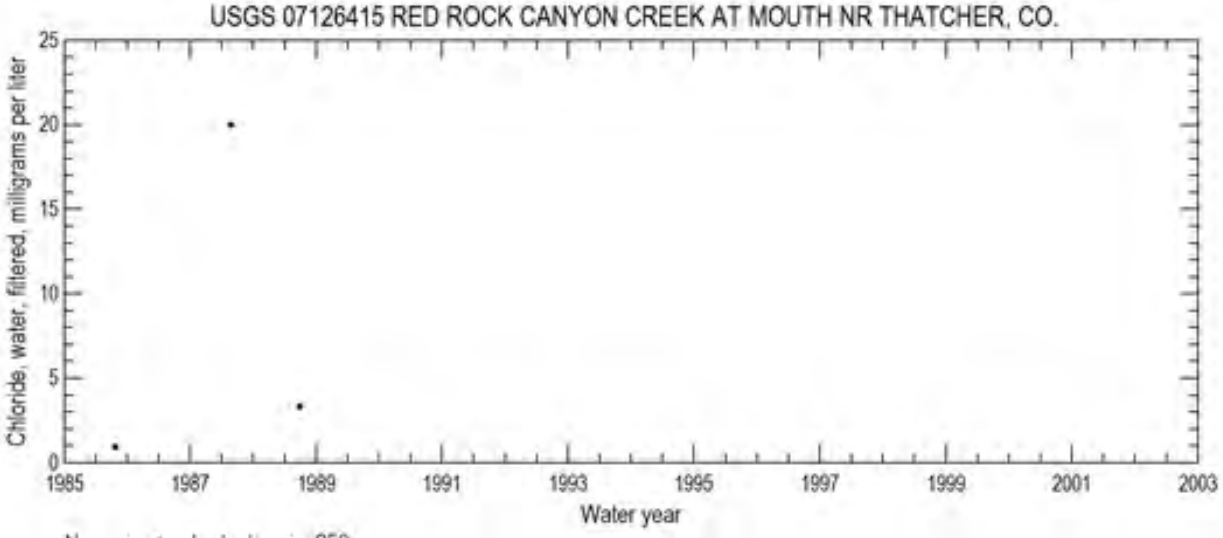

USGS 07126390 LOCKWOOD CANYON CREEK NEAR THATCHER, CO
Manganese, water, filtered, micrograms per liter
400
350
300
250
200
150
100
50
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
Water year
Domestic water-supply standard, chronic, 50



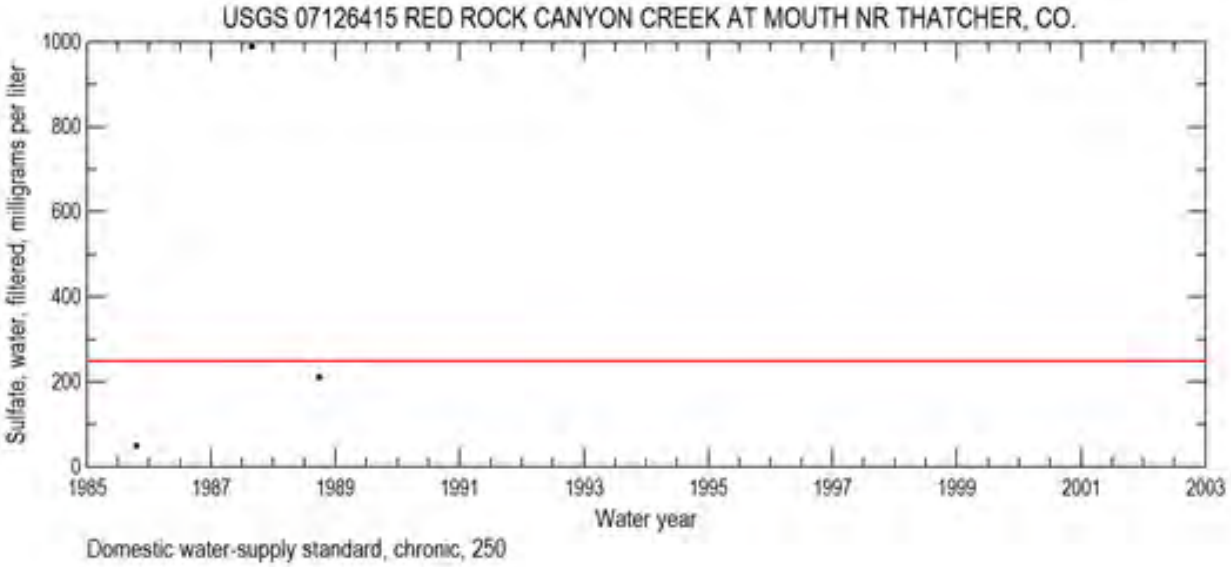
Numeric standard, daily maximum, 15.9 (December–February) and 31.8 (March–November)

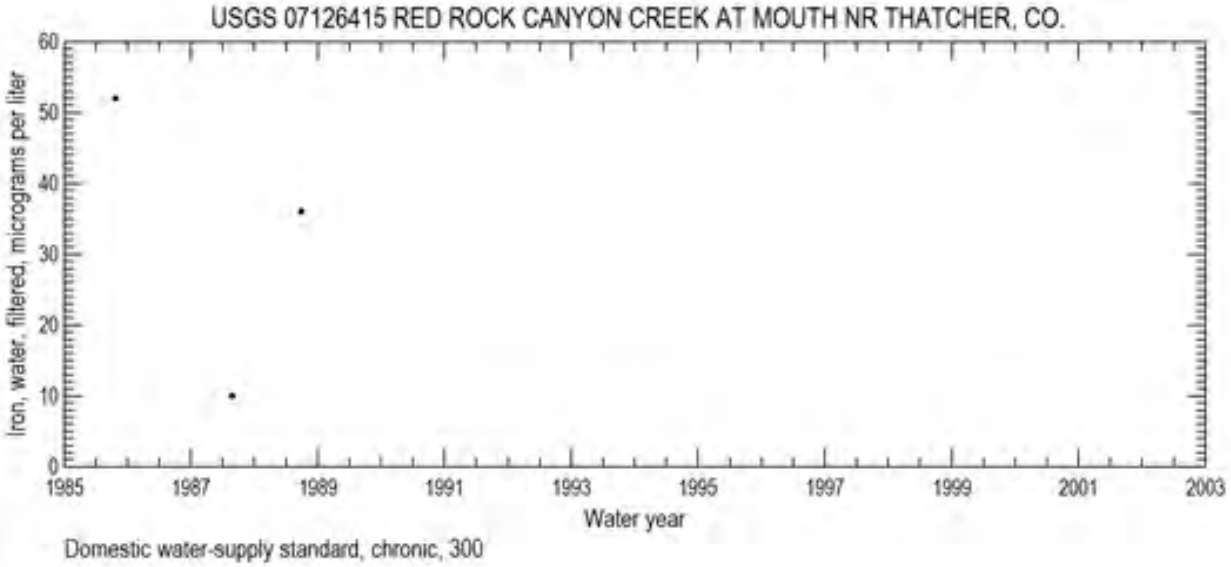


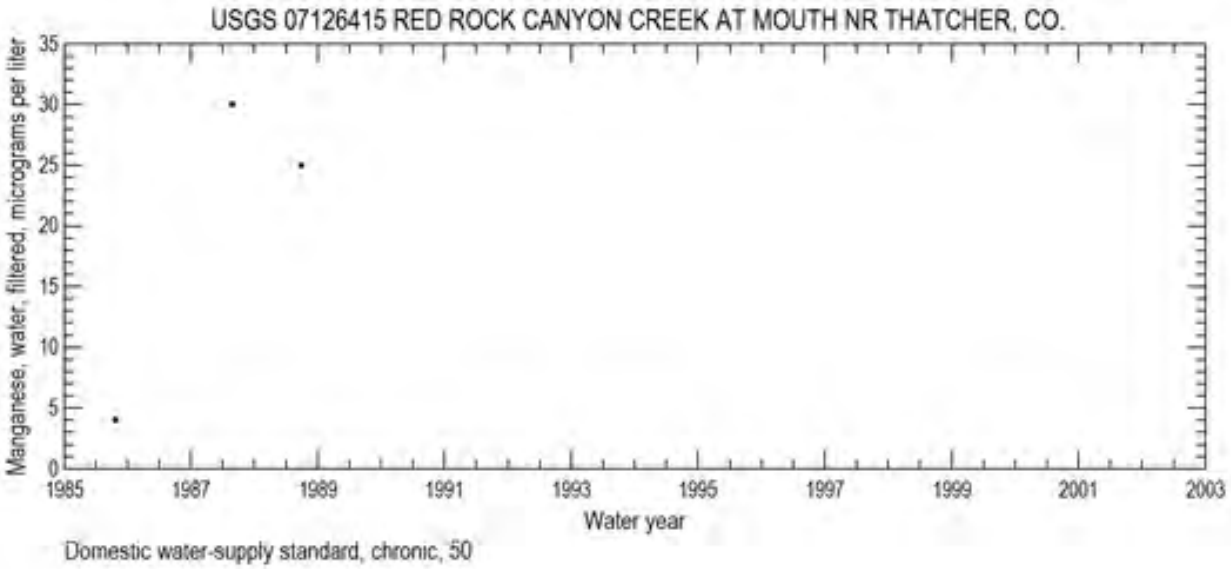
Numeric standard, chronic, 0.17

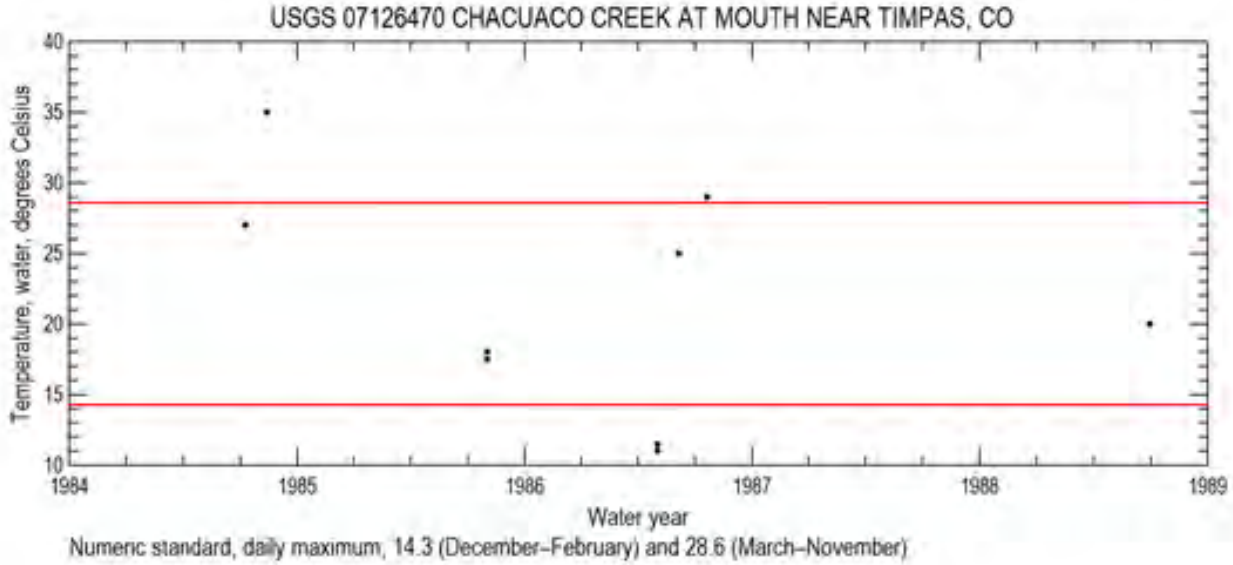


Numeric standard, chronic, 250

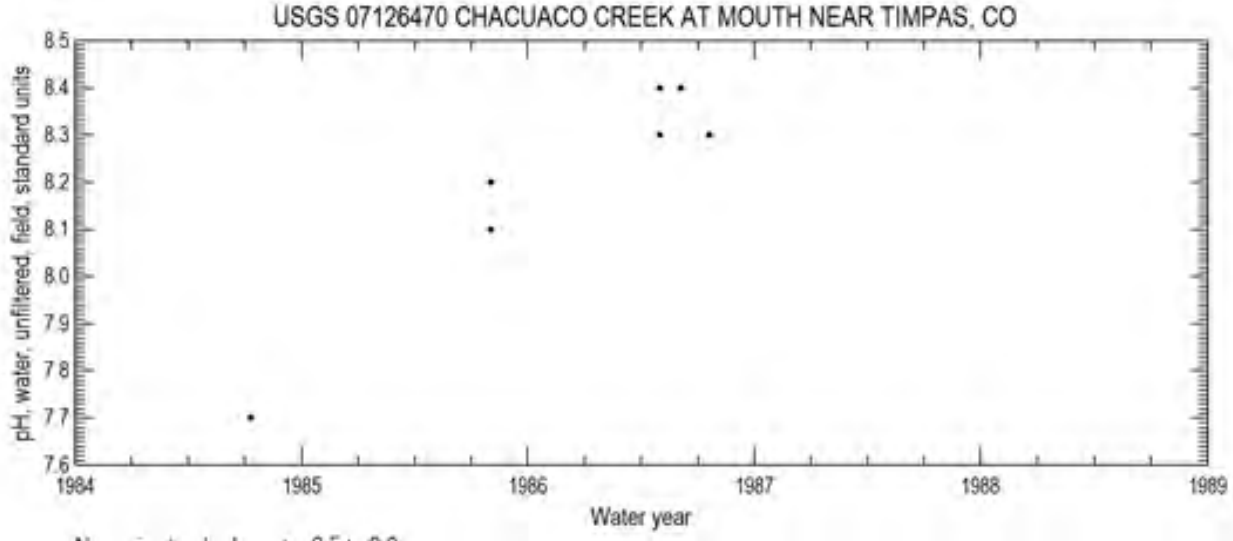

USGS 07126415 RED ROCK CANYON CREEK AT MOUTH NR THATCHER, CO.
Sulfate, water, filtered, milligrams per liter
1000
800
600
400
200
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Domestic water-supply standard, chronic, 250


USGS 07126415 RED ROCK CANYON CREEK AT MOUTH NR THATCHER, CO.
Iron, water, filtered, micrograms per liter
60
50
40
30
20
10
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Domestic water-supply standard, chronic, 300

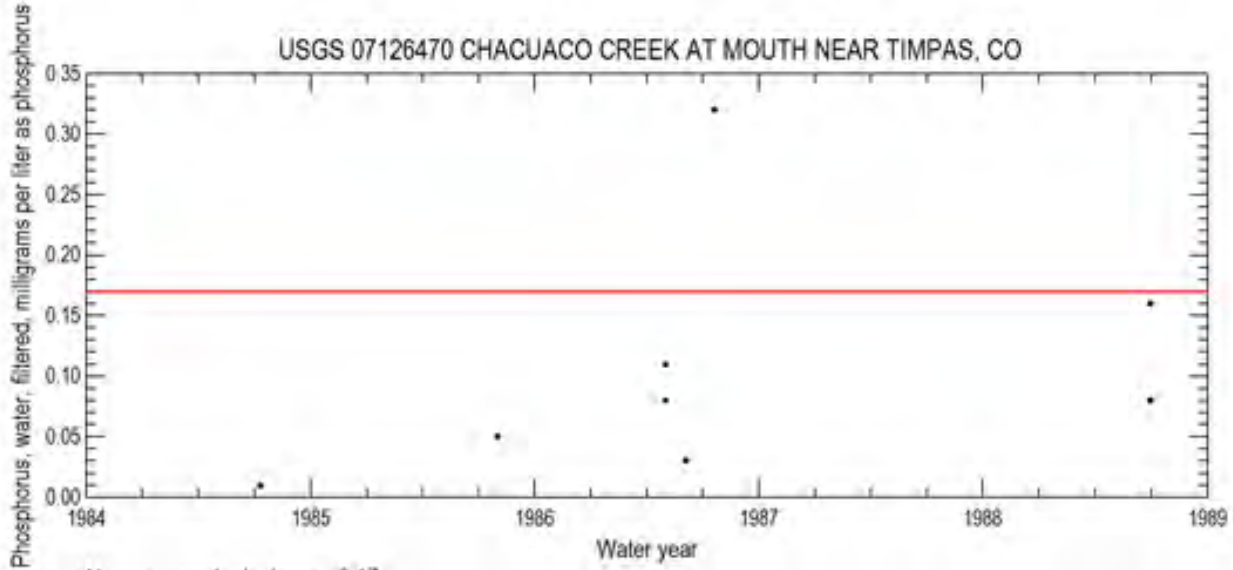

USGS 07126415 RED ROCK CANYON CREEK AT MOUTH NR THATCHER, CO.
Manganese, water, filtered, micrograms per liter
35
30
25
20
15
10
5
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Water year
Domestic water-supply standard, chronic, 50



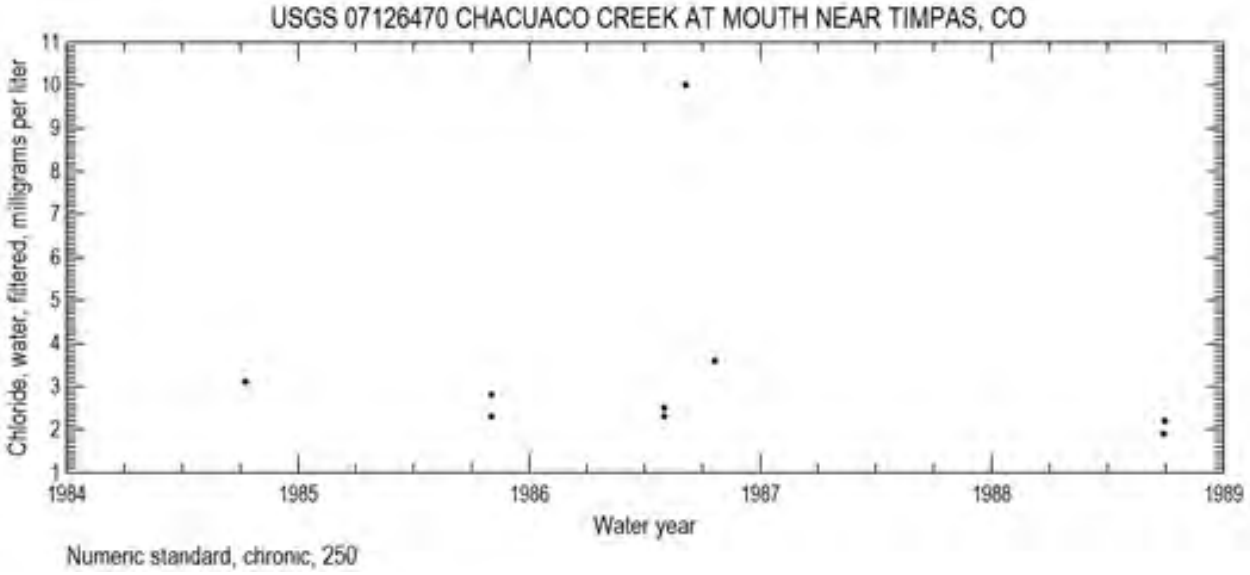
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)

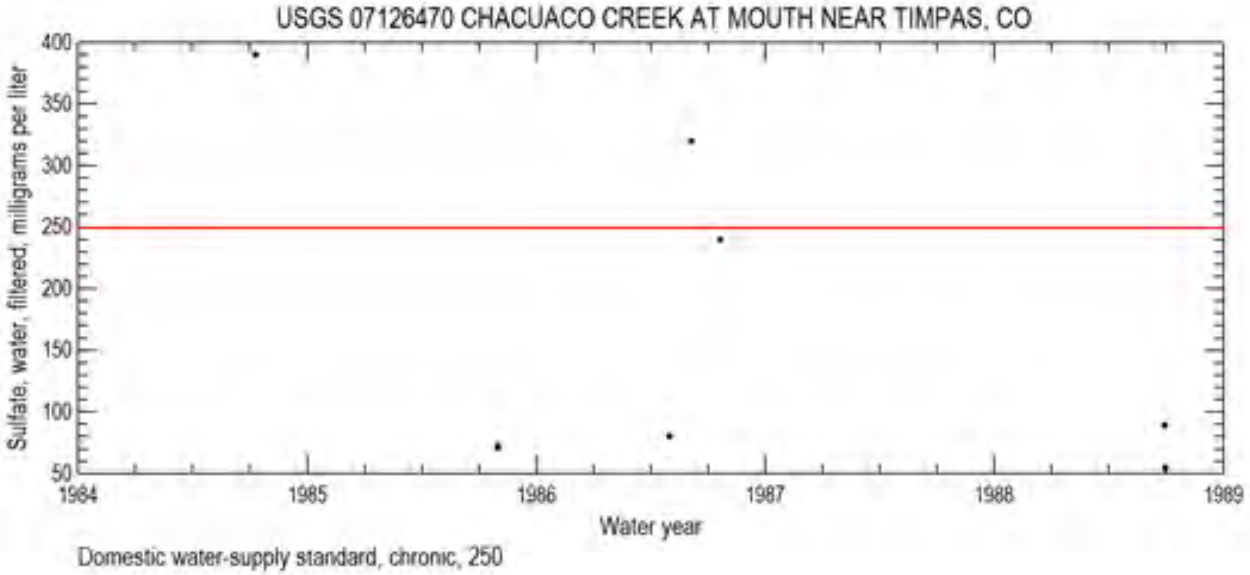


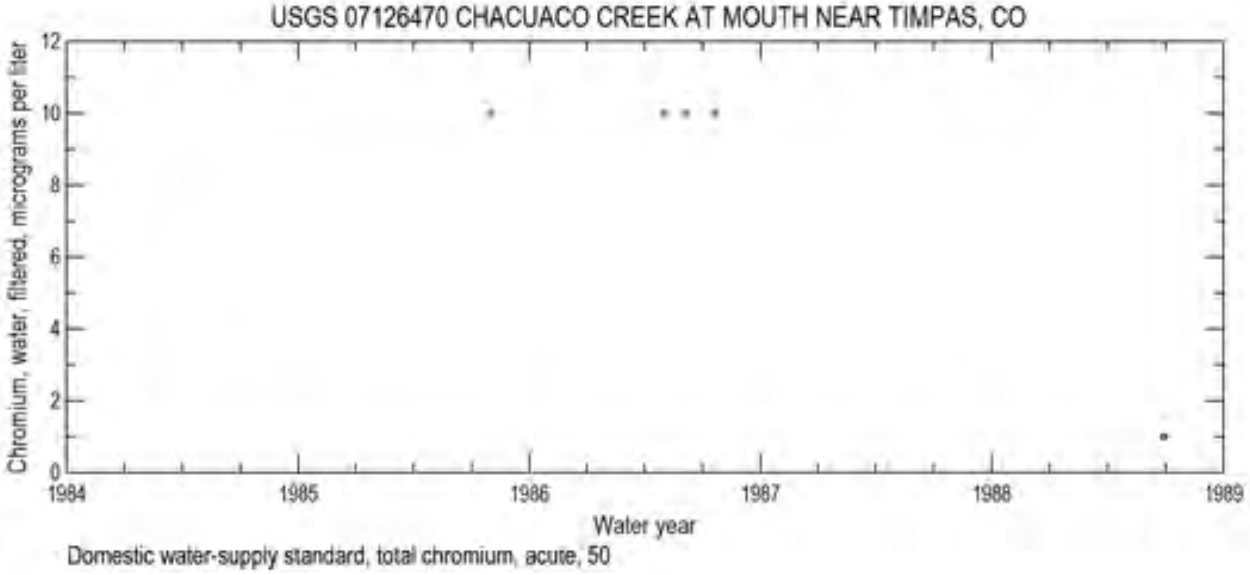
Numeric standard, acute, 6.5 to 9.0

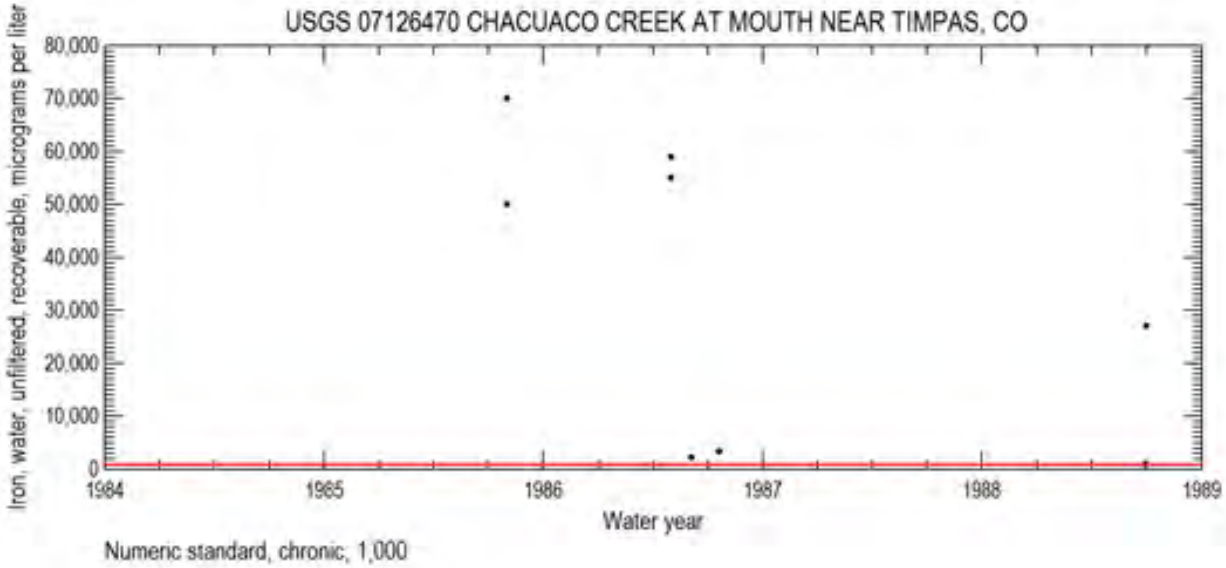


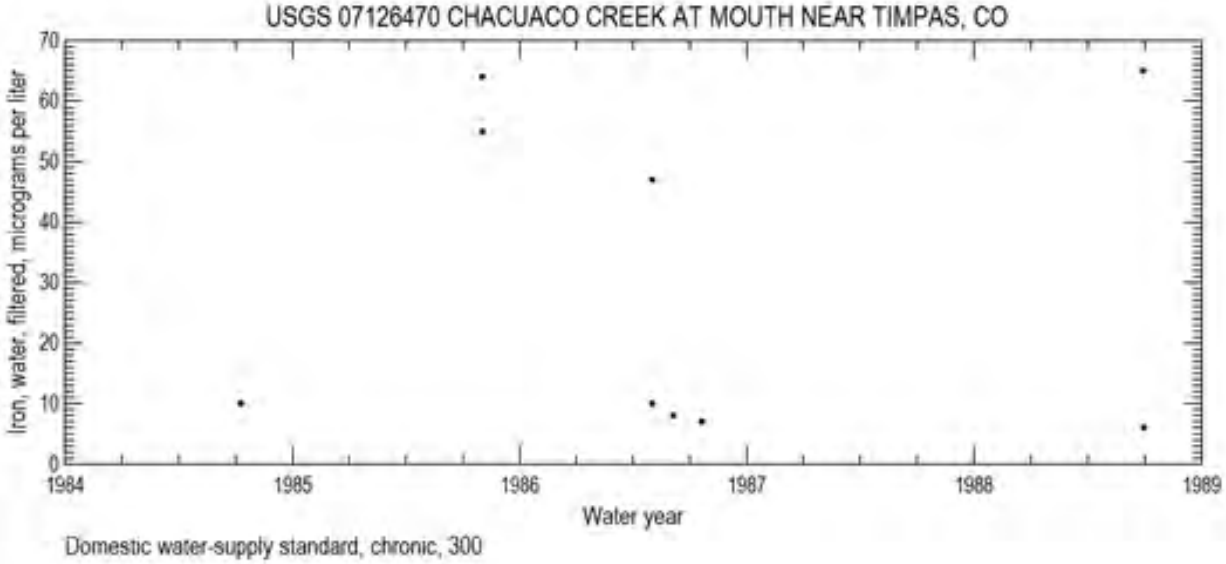
Numeric standard, chronic, 0.17

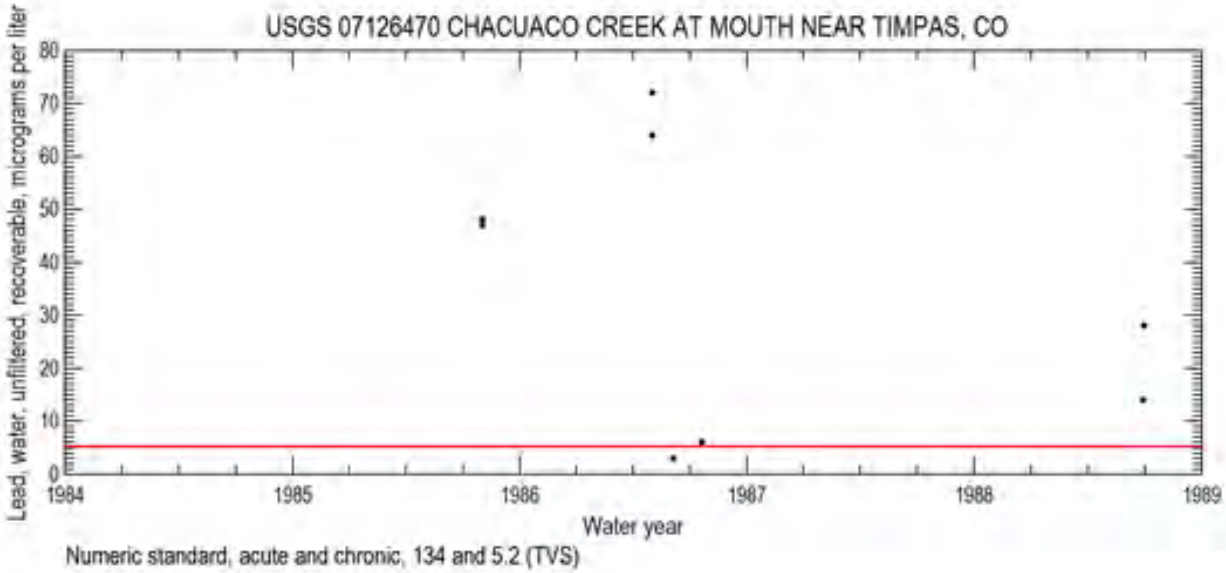

USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO
Chloride, water, filtered, milligrams per liter
11
10
9
8
7
6
5
4
3
2
1
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, chronic, 250

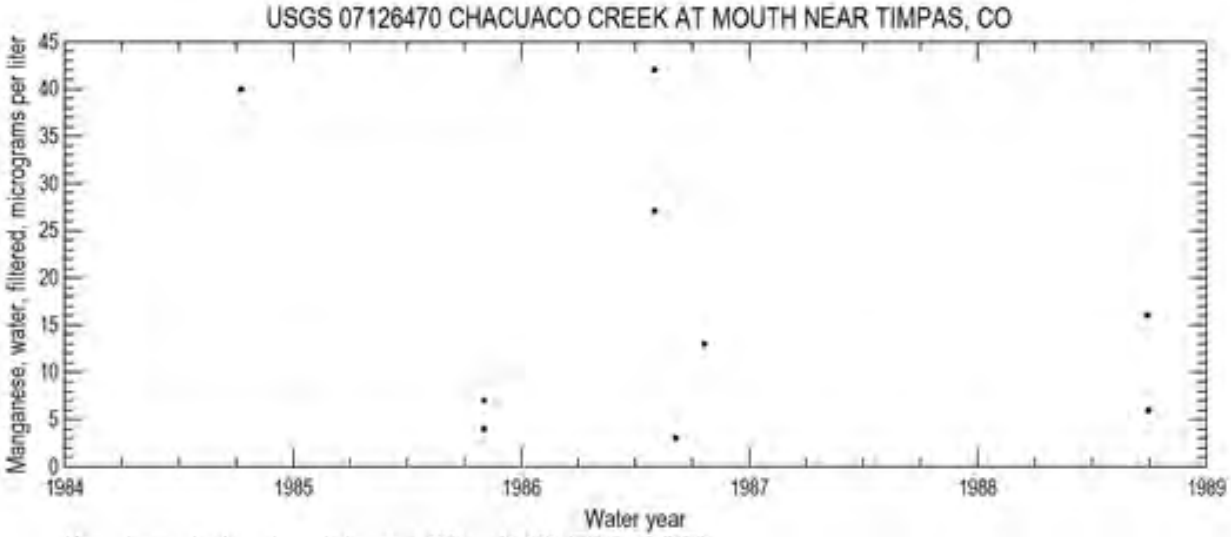

USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO
Sulfate, water, filtered, milligrams per liter
400
350
300
250
200
150
100
50
1984
1985
1986
1987
1988
1989
Water year
Domestic water-supply standard, chronic, 250


USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO
Chromium, water, filtered, micrograms per liter
12
10
8
6
4
2
0
1984
1985
1986
1987
1988
1989
Water year
Domestic water-supply standard, total chromium, acute, 50

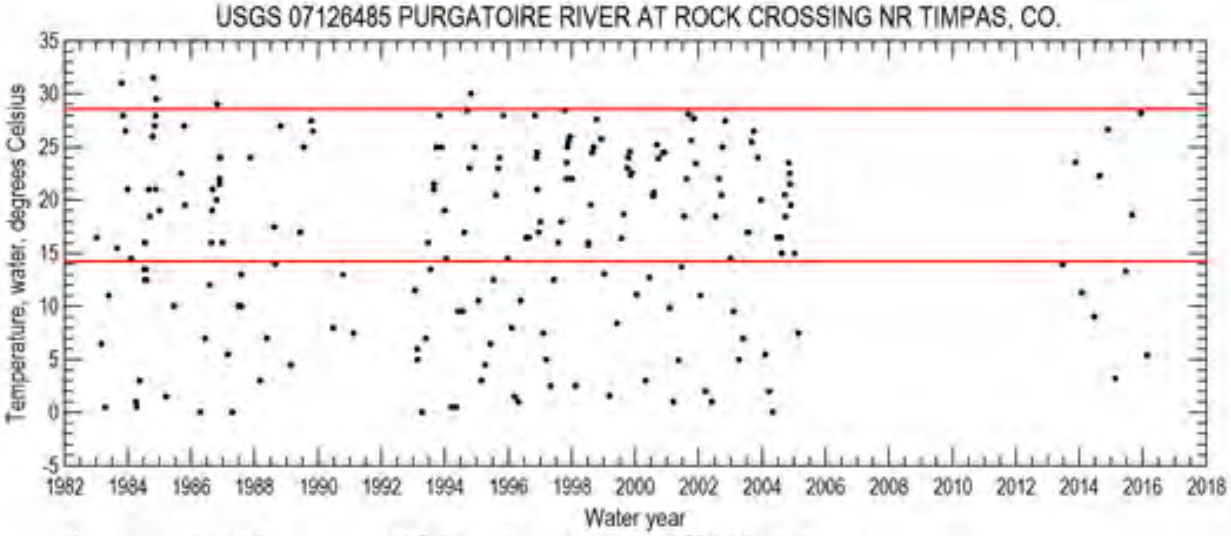

USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO
Iron, water, unfiltered, recoverable, micrograms per liter
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1984
1965
1986
1987
1988
1989
Water year
Numeric standard, chronic, 1,000


USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO
Iron, water, filtered, micrograms per liter
70
60
50
40
30
20
10
0
1984
1985
1986
1987
1988
1989
Water year
Domestic water-supply standard, chronic, 300

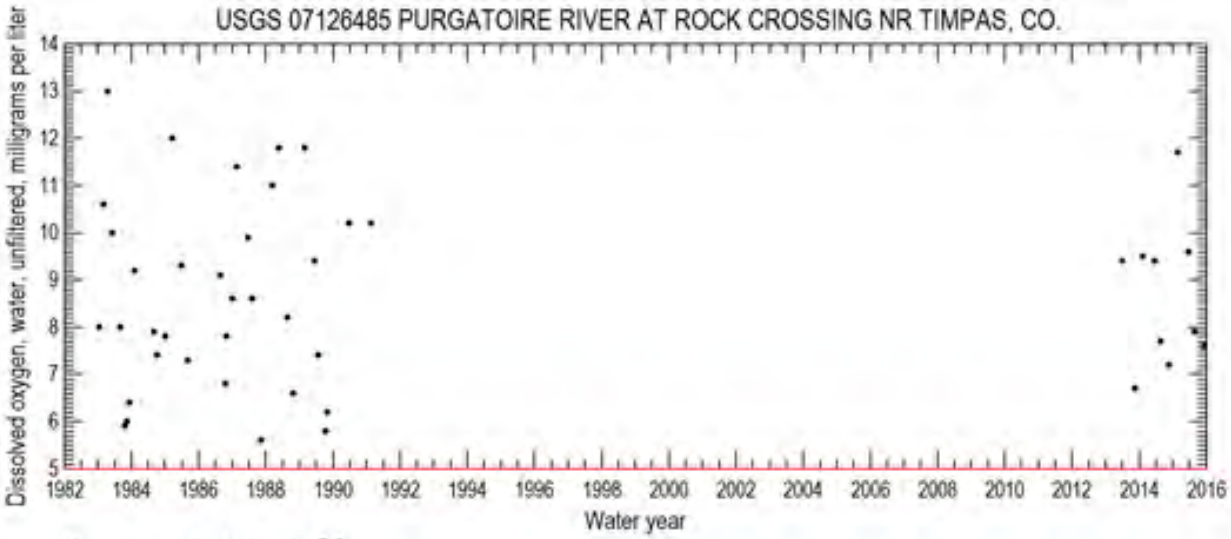

USGS 07126470 CHACUACO CREEK AT MOUTH NEAR TIMPAS, CO
Lead, water, unfiltered, recoverable, micrograms per liter
80
70
60
50
40
30
20
10
0
1984
1985
1986
1987
1988
1989
Water year
Numeric standard, acute and chronic, 134 and 5.2 (TVS)



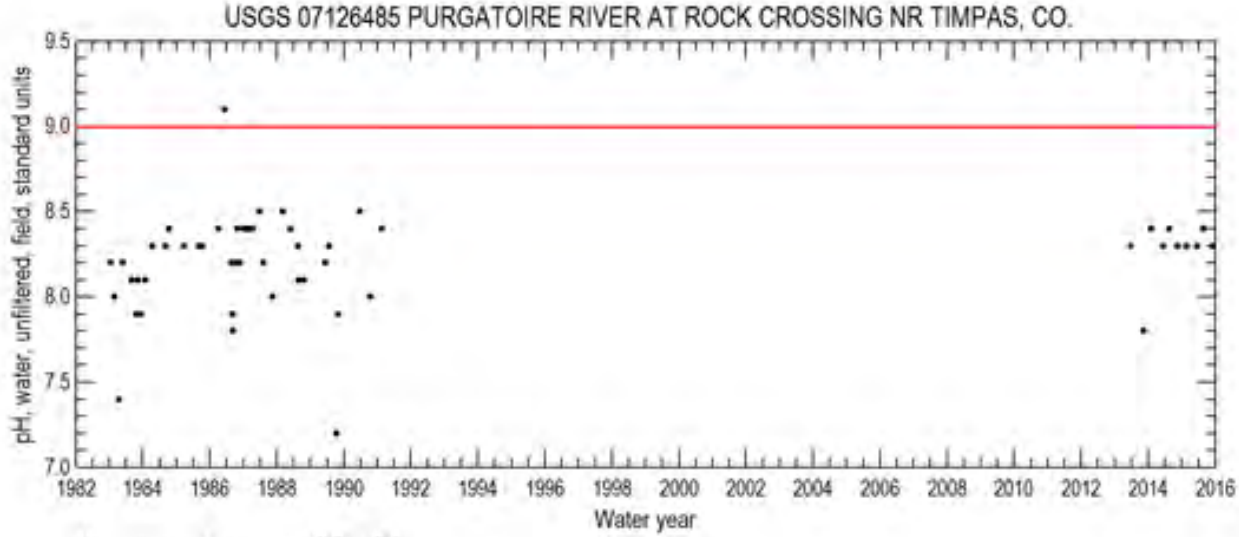
Numeric standard, acute and chronic, 3,750 and 2,070 (TVS); 50 (WS)



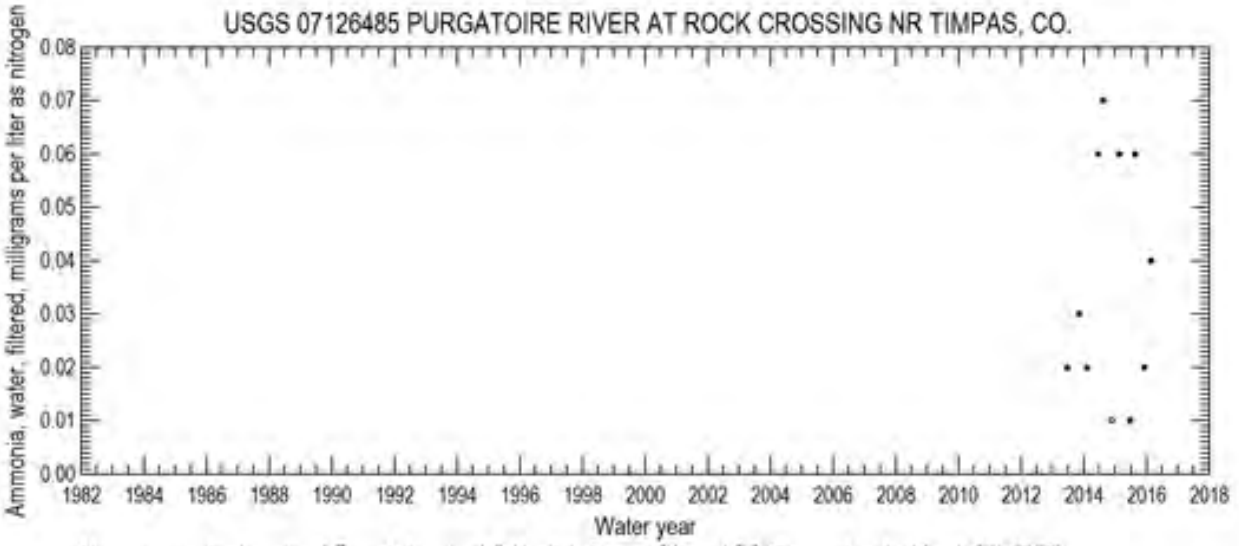
Numeric standard, daily maximum, 14.3 (December–February) and 28.6 (March–November)



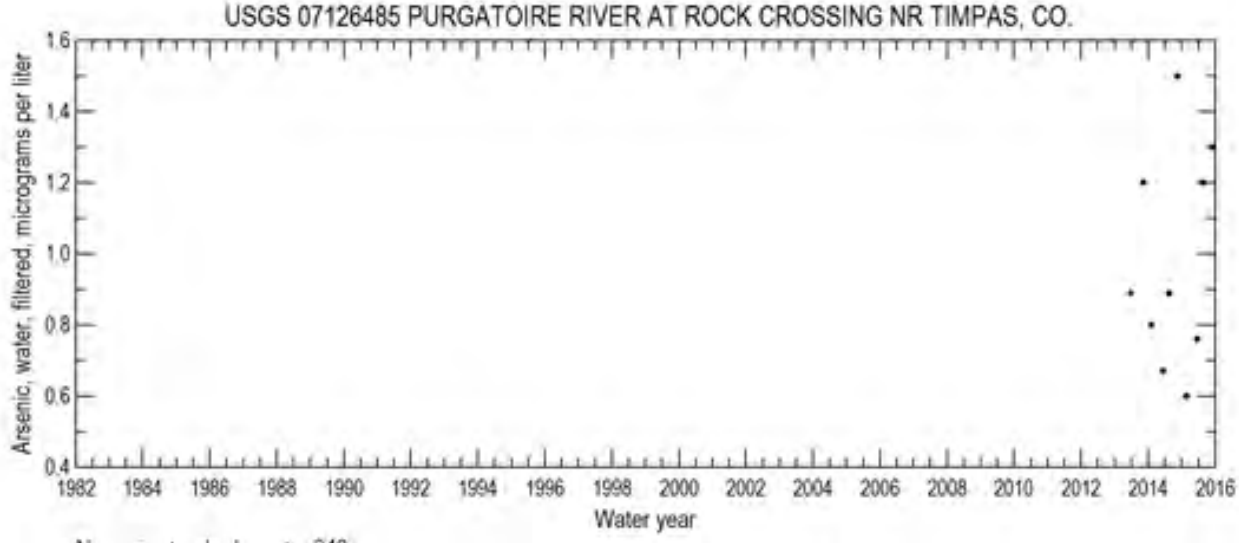
Numeric standard, chronic, 5.0



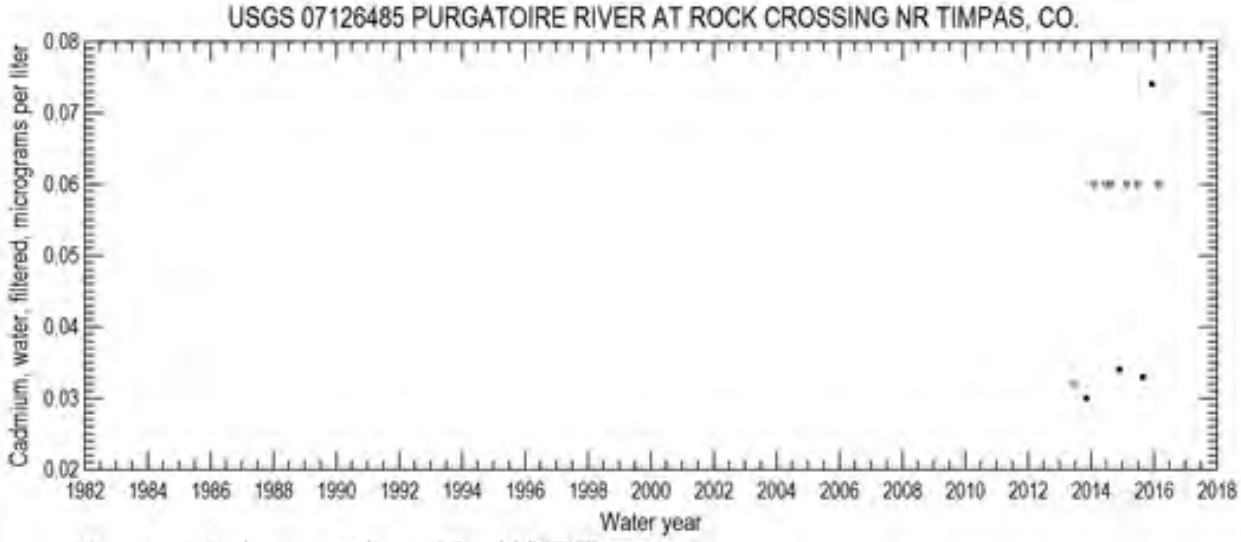
Numeric standard, acute, 6.5 to 9.0



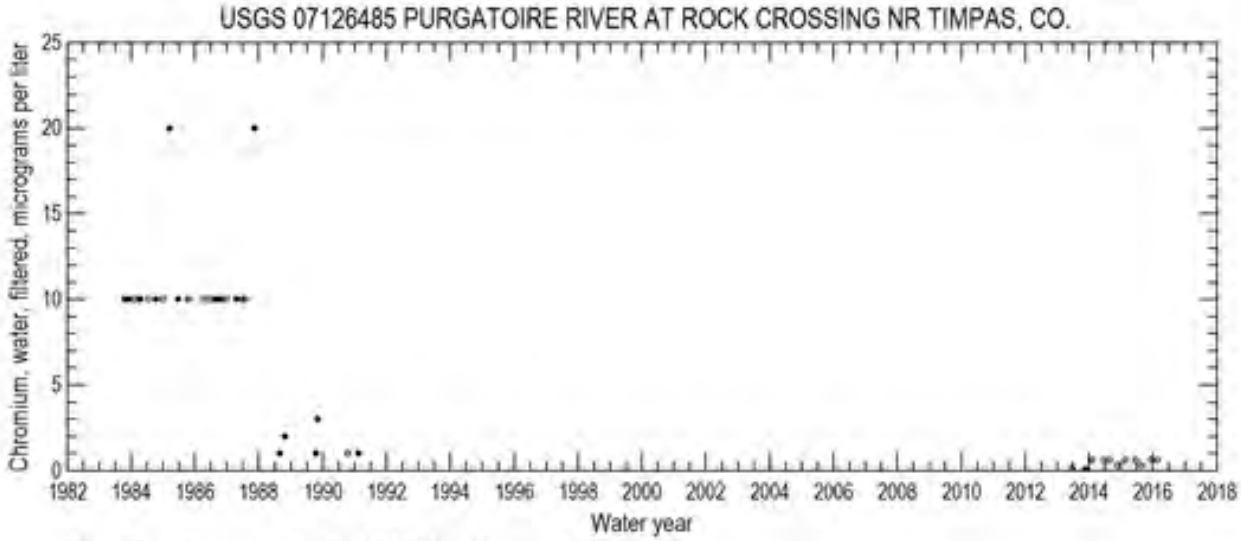
Numeric standard, acute, 4 7, and chronic, 1.3 (April 1- August 31) and 6.2 (September 1 - March 31) (TVS)



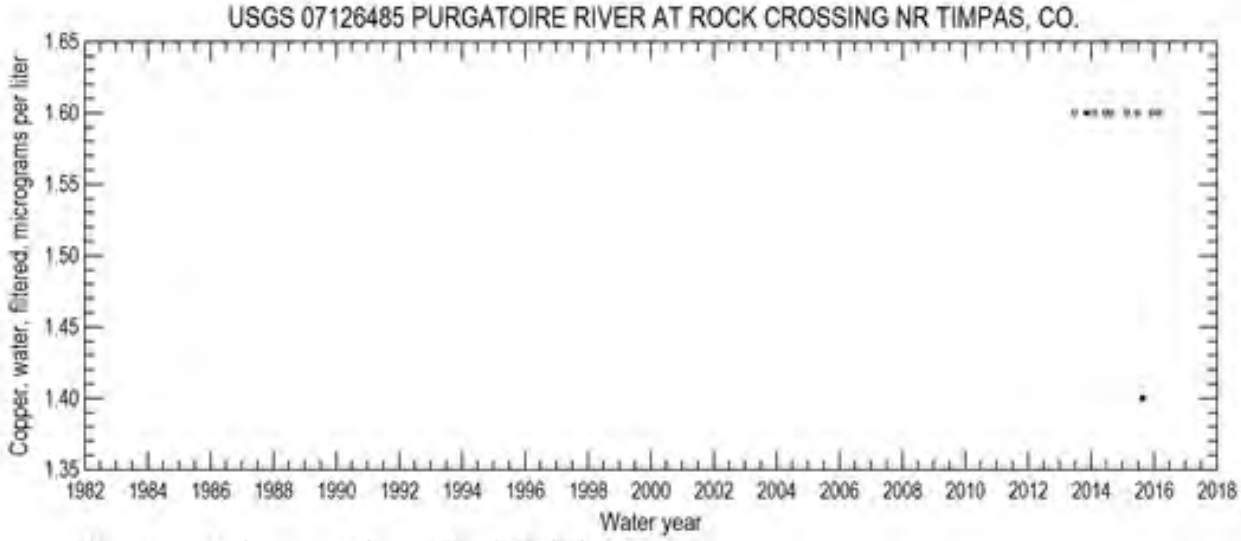
Numeric standard, acute, 340



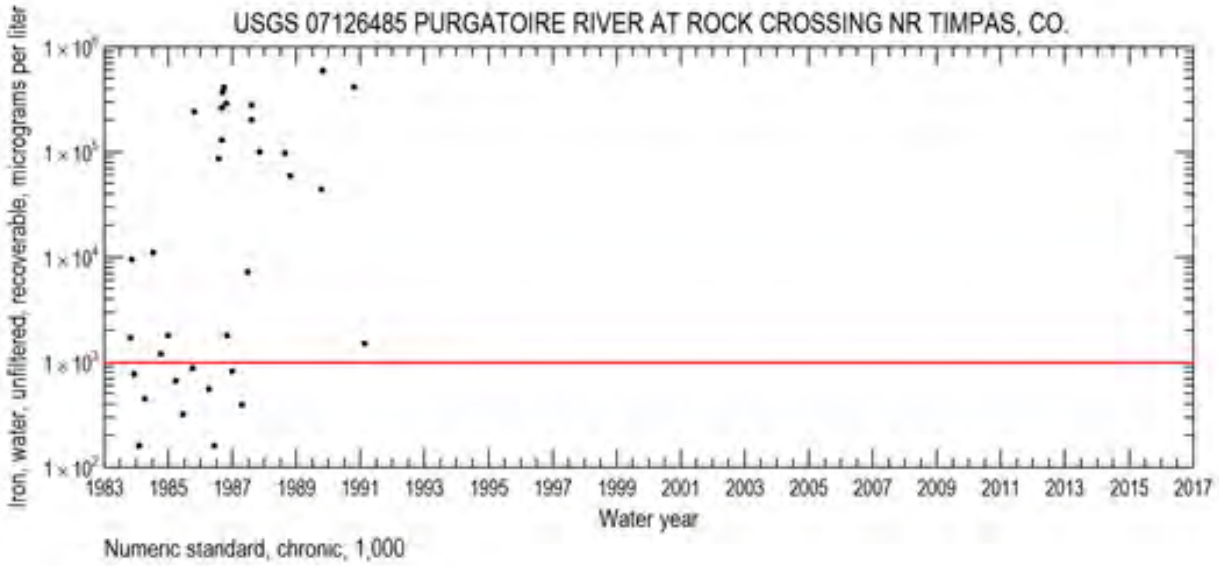
Numeric standard, acute and chronic, 9.2 and 1.2 (TVS)

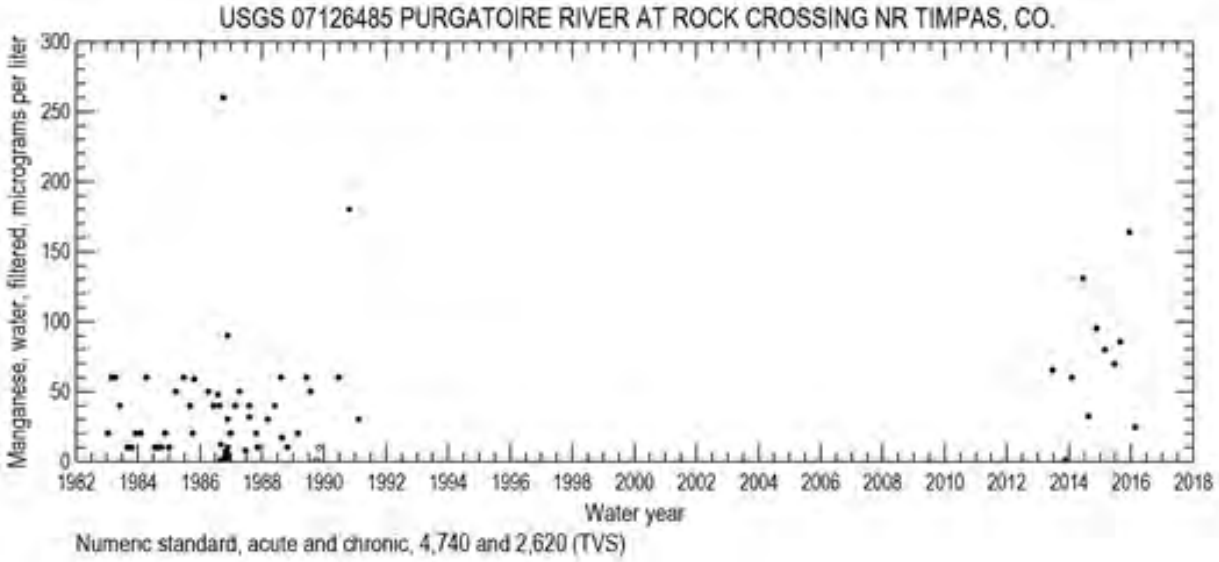


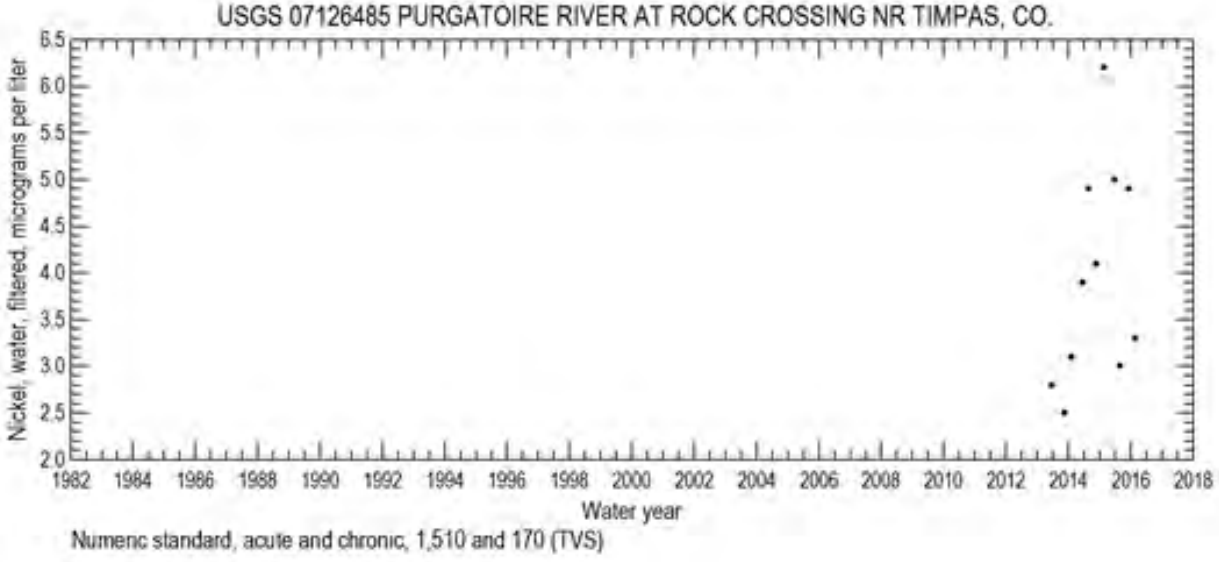
Domestic water-supply standard, total chromium, acute, 50

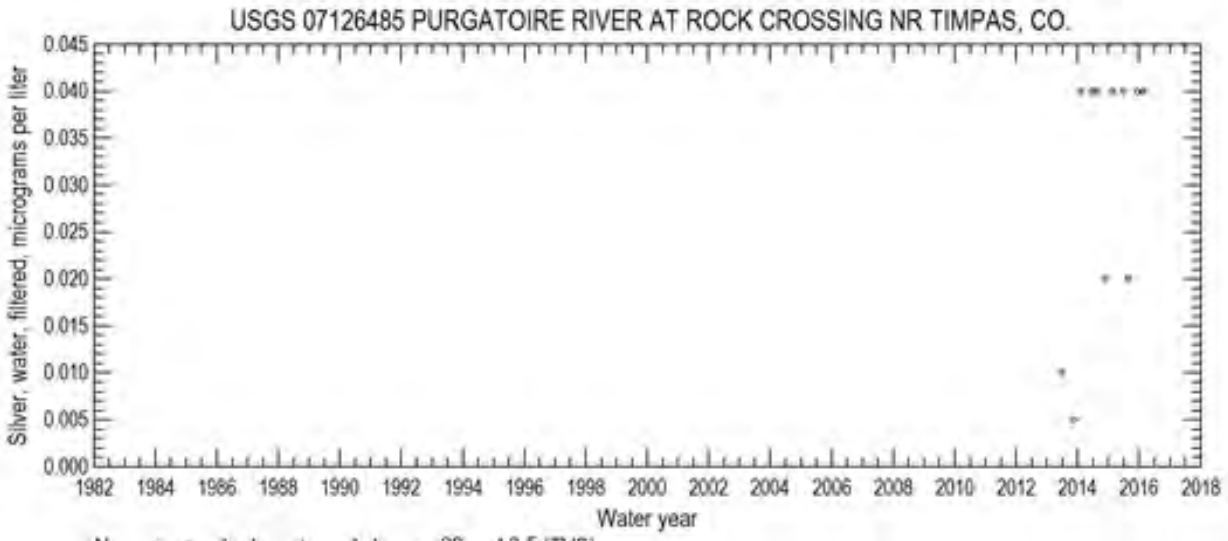


Numeric standard, acute and chronic, 50 and 29 (TVS)

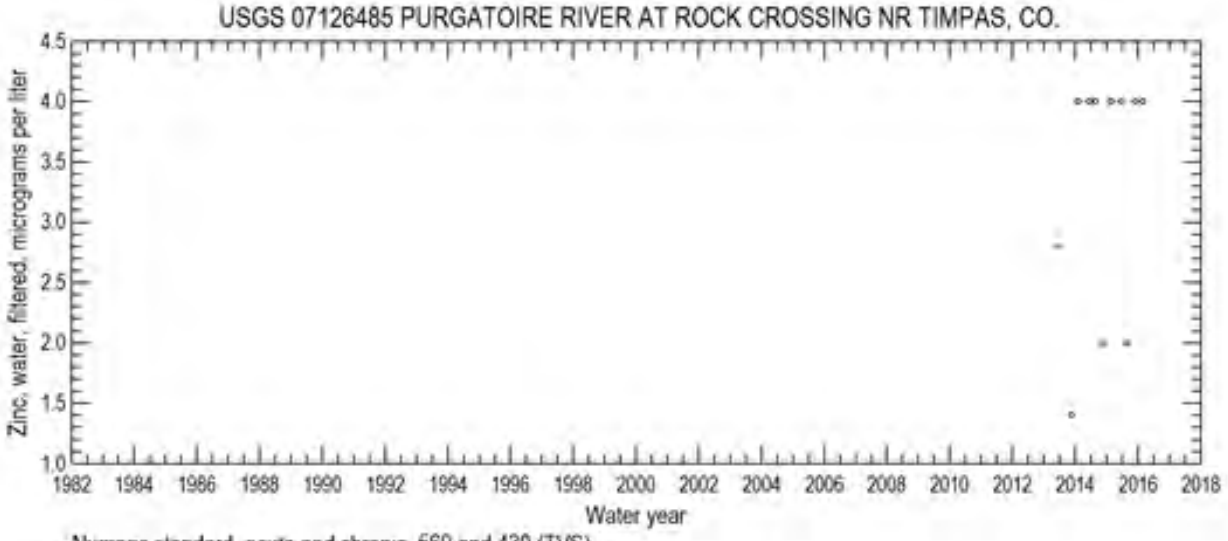

USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CO.
Iron, water, unfiltered, recoverable, micrograms per liter
1 × 10^5
1 × 10^4
1 × 10^3
1 × 10^2
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Water year
Numeric standard, chronic, 1,000


USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CO.
Manganese, water, filtered, micrograms per liter
300
250
200
150
100
50
0
1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, acute and chronic, 4,740 and 2,620 (TVS)

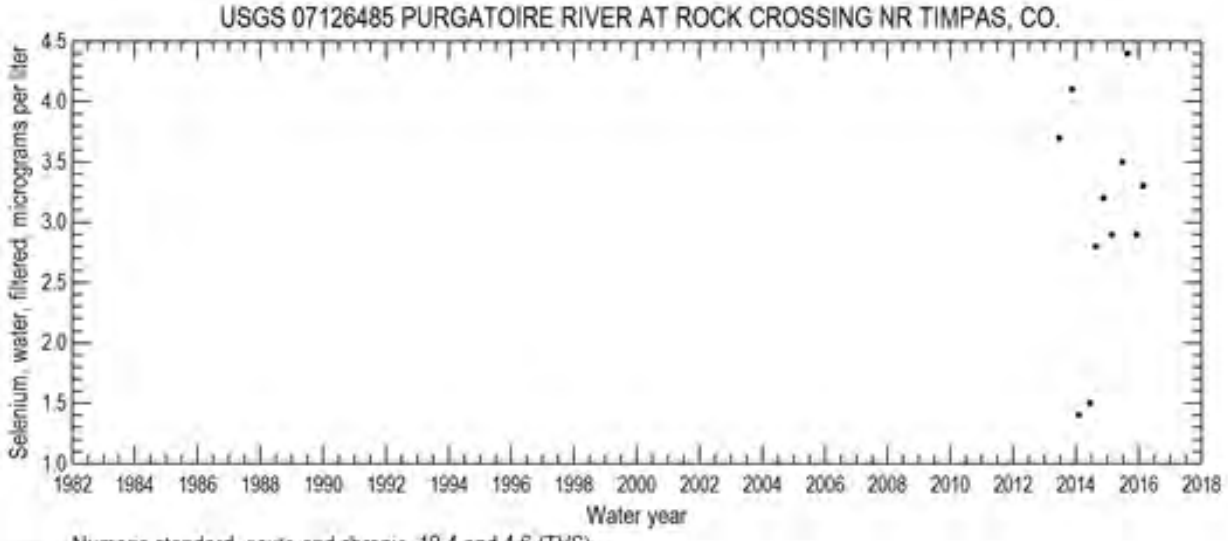

USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CO.
Nickel, water, filtered, micrograms per liter
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Water year
Numeric standard, acute and chronic, 1,510 and 170 (TVS)



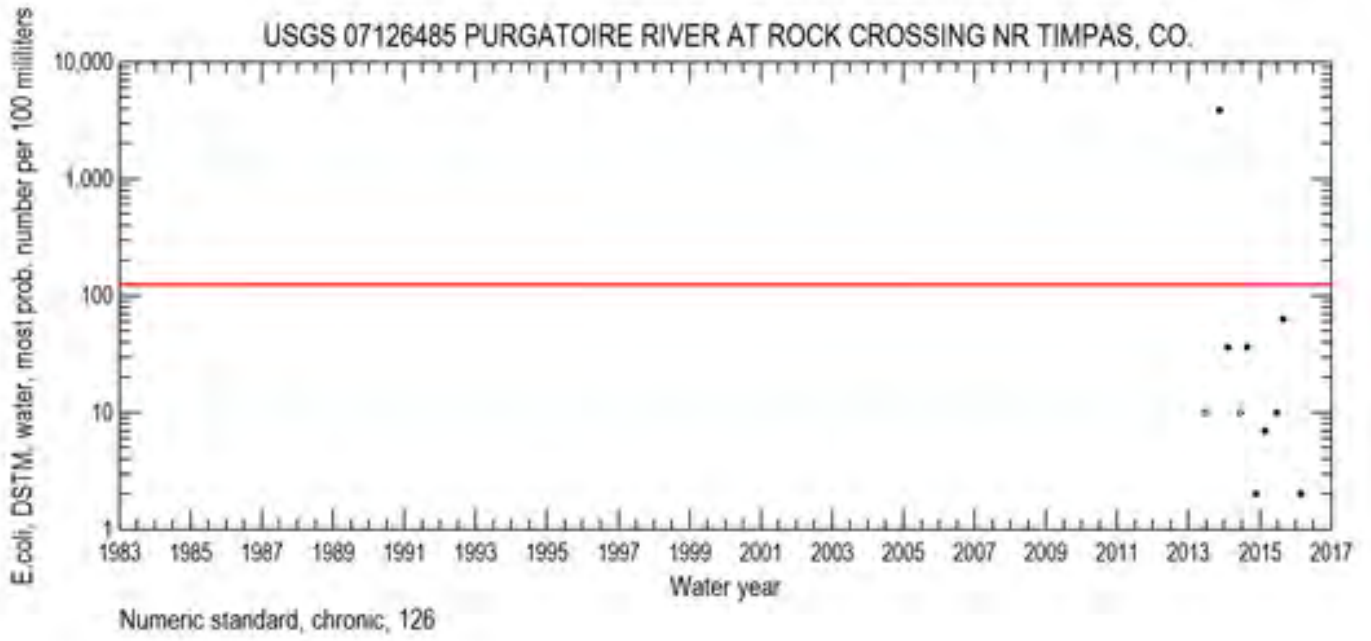
Numeric standard, acute and chronic, 22 and 3.5 (TVS)



Numeric standard, acute and chronic, 560 and 430 (TVS)



Numeric standard, acute and chronic, 18.4 and 4.6 (TVS)


USGS 07126485 PURGATOIRE RIVER AT ROCK CROSSING NR TIMPAS, CO.
E.coli, DSTM, water, most prob. number per 100 milliliters
10,000
1,000
100
10
1
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
Water year
Numeric standard, chronic, 126

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