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Water-Quality, Bed-Sediment, and Biological Data (October 2012 through September 2013) and Statistical Summaries of Data for Streams in the Clark Fork Basin, Montana

Open-File Report 2014–1244

U.S. Department of the Interior
U.S. Geological Survey

Cover photographs. Center: Collecting aquatic insects for tissue analysis, Silver Bow Creek at Opportunity (12323600). Photograph by Michelle Hornberger, U.S. Geological Survey, taken August 2013.
Lower left: Identifying and collecting target taxa from rocks, Clark Fork near Drummond (12331800). Photograph by Michelle Hornberger, U.S. Geological Survey, taken August 2013.
Lower right: The net spinning caddisfly, *Arctopsyche grandis*. The retreat and net can be seen in the background. Photograph by Amy Kleckner, U.S. Geological Survey, taken August 2013.

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By Kent A. Dodge, Michelle I. Hornberger, and Jessica L. Dyke

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U.S. Department of the Interior
U.S. Geological Survey

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
inch (in.)	25,400	micrometer (µm)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
gallon (gal)	3.785	liter (L)
gallon (gal)	3,785	milliliter (mL)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
	Mass	
ounce (oz)	28.35	gram (g)
parts per million	1	microgram per gram (µg/g)
ton	907.2	kilogram (kg)
ton per day (ton/d)	907.2	kilogram per day

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

$°F=(1.8\times°C)+32$

Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Water year is the 12-month period from October 1 through September 30 of the following calendar year. The water year is designated by the calendar year in which it ends. For example, water year 2013 is the period from October 1, 2012, through September 30, 2013.

Abbreviations

FNU	formazin nephelometric units
ICP–AES	inductively coupled plasma-atomic emission spectrometry
ICP–MS	inductively coupled plasma-mass spectrometry
ICP–OES	inductively coupled plasma-optical emission spectrometry
LRL	laboratory reporting level
LT–MDL	long-term method detection level
MRL	minimum reporting level
NIST	National Institute of Standards and Technology
NRP	National Research Program
NTRU	nephelometric turbidity ratio unit
NWQL	National Water Quality Laboratory
PTFE	polytetrafluoroethylene
RSD	relative standard deviation
spp.	species
SRM	standard reference material
USGS	U.S. Geological Survey
YSI	Yellow Springs Instruments Company

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Abstract

Water, bed sediment, and biota were sampled in streams from Butte to near Missoula, Montana, as part of a monitoring program in the upper Clark Fork Basin of western Montana. The sampling program was led by the U.S. Geological Survey in cooperation with the U.S. Environmental Protection Agency to characterize aquatic resources in the Clark Fork Basin, with emphasis on trace elements associated with historic mining and smelting activities. Sampling sites were located on the Clark Fork and selected tributaries. Water samples were collected periodically at 20 sites from October 2012 through September 2013. Bed-sediment and biota samples were collected once at 13 sites during August 2013.

This report presents the analytical results and quality-assurance data for water-quality, bed-sediment, and biota samples collected at sites from October 2012 through September 2013. Water-quality data include concentrations of selected major ions, trace elements, and suspended sediment. Turbidity and dissolved organic carbon were analyzed for water samples collected at the four sites where seasonal daily values of turbidity were being determined. Daily values of mean suspended-sediment concentration and suspended-sediment discharge were determined for four sites. Bed-sediment data include trace-element concentrations in the fine-grained fraction. Biological data include trace-element concentrations in whole-body tissue of aquatic benthic insects. Statistical summaries of water-quality, bed-sediment, and biological data for sites in the upper Clark Fork Basin are provided for the period of record.

Introduction

The Clark Fork originates near the town of Warm Springs in western Montana at the confluence of Silver Bow and Warm Springs Creeks (fig. 1). Along the 148-mile (mi) reach of stream from Silver Bow Creek in Butte to the Clark Fork near Missoula, six major tributaries enter: Blacktail Creek, Warm Springs Creek, Little Blackfoot River, Flint Creek, Rock Creek, and Blackfoot River. Principal surface-water uses in the 6,000–square-mile (mi^2) upper Clark Fork Basin above Missoula include irrigation, stock watering, small-scale industry (Cannon and Johnson, 2004), and habitat for trout fisheries. Primary current land uses are cattle production, logging, mining, residential development, and recreation. Large-scale mining and smelting were prevalent land uses in the upper basin for more than 100 years, but are now (2014) either discontinued or substantially reduced in scale.

Deposits of copper, gold, silver, and lead ores were extensively mined, milled, and smelted in the drainages of Silver Bow and Warm Springs Creeks from about the 1860s to the 1980s (U.S. Environmental Protection Agency, 2004). Moderate- and small-scale mining also took place in the basins of most of the major tributaries to the upper Clark Fork. Tailings produced during past mineral processing commonly contain large quantities of trace elements such as arsenic, cadmium, copper, lead, and zinc. Eroded tailings mix with stream sediment and get deposited farther downstream in stream channels, on flood plains, in the Warm Springs Ponds, and at the location of the former Milltown Reservoir. Milltown Dam was breached on March 28, 2008 (Andrews, 1987). The occurrence of elevated trace-element concentrations in water and bed sediment can pose a potential risk to aquatic biota and human health (U.S. Environmental Protection Agency, 2004).

Concern about the potential toxicity of trace elements to aquatic biota and human health has resulted in a comprehensive effort by State, Federal, Tribal, and private entities to characterize the aquatic resources in the upper Clark Fork Basin to guide and monitor remedial cleanup activities. A long-term database was considered necessary to detect trends over time in order to evaluate the effectiveness of remediation. Water-quality data have been collected by the U.S. Geological Survey (USGS) at selected sites in the upper Clark Fork Basin since 1985 (Lambing, 1987 through 1991; Lambing and others, 1994, 1995; Dodge and others, 1996 through 2010, 2012 through 2014). Trace-element data for bed sediment and

biota (aquatic benthic insects) have been collected intermittently at selected sites since 1986 as part of studies on the contamination of bed-sediment quality and bioaccumulation of metals lead by the USGS National Research Program (NRP) (Axtmann and Luoma, 1991; Cain and others, 1992, 1995; Axtmann and others, 1997; Hornberger and others, 1997). In March 1993, an expanded monitoring program for water, bed sediment, and biota in the upper basin was implemented by the USGS in cooperation with the U.S. Environmental Protection Agency to systematically quantify the seasonal and annual variability in selected constituents.

The purpose of this report is to present water-quality data from samples collected at 20 sites and bed-sediment and biological data from samples collected at 13 sites in the Clark Fork Basin from October 2012 through September 2013 (fig. 1). Quality-assurance data are presented for water-quality, bed-sediment, and biota samples collected during the same time period. Statistical summaries also are provided for water-quality, bed-sediment, and biological data collected at the sites for the period of record.

Sampling Locations and Types of Data

Sampling sites for the monitoring program in the upper Clark Fork Basin from Butte to near Missoula (fig. 1) are located on the Clark Fork main stem (including Silver Bow Creek), three major tributaries (Blacktail Creek, Warm Springs Creek, and Blackfoot River), and three smaller tributaries (Mill Creek, Willow Creek, and Lost Creek). The sites, types of data collected, and period of record for each type of data are listed in table 1. Main-stem sampling sites were selected to divide the upper Clark Fork into reaches of approximate uniform length, with each reach encompassing either a major tributary or depositional environment (Warm Springs Ponds and the former Milltown Reservoir). Major tributaries were sampled to describe water-quality, bed-sediment, and biological characteristics of important hydrologic sources in the upper Clark Fork Basin and to provide reference comparisons to the main stem. The three smaller tributaries were sampled to gain better spatial resolution on sources of metals entering the Clark Fork in an area of historical metal-processing activities near Anaconda, Montana. Water-quality samples were collected periodically at 20 sites. Daily suspended-sediment samples were collected at four sites, and daily turbidity data were measured by continuous turbidity monitors recording every 15 minutes at four sites. Bed-sediment and biological samples were collected once annually at 13 sites. Continuous streamflow data were collected at 19 sites.

Properties measured onsite and constituents for which water, bed-sediment, and biota samples were analyzed are listed in table 2. Data-quality objectives for analyses of water samples are listed in table 3. Results of onsite measurements of stream properties; laboratory analyses of water-quality, bed-sediment, and biota samples; and quality-assurance data for water year 2013 are listed in tables 4 through 24 at the back of the report. Statistical summaries of long-term water-quality, bed-sediment, and biological data collected between March 1985 and September 2013 are listed in tables 25 through 27 at the back of the report.

Quality assurance of data was maintained through the use of documented procedures described in the following sections, which were designed to provide environmentally representative data. Acceptable results of the procedures were verified with quality-control samples that were collected systematically to provide a measure of the accuracy, precision, and bias of the environmental data, and to identify problems associated with sampling, processing, or analysis.

Water-Quality Data

Water-quality data consist of onsite measurements of selected stream properties and laboratory determination of concentrations of chemical and physical constituents in periodically collected stream samples. Water samples were collected at 20 sites in the upper Clark Fork Basin 6–8 times per year on a schedule designed to describe seasonal and hydrologic variability. At the four daily suspended-sediment sites, suspended-sediment samples were collected by an observer 2–8 times per week, depending on season and flow conditions. Continuous turbidity monitors were operated seasonally (March/April to September 2013) at four sites near Warm Springs and Anaconda; turbidity data (recorded every 15 minutes) were used to compute daily mean turbidity values (table 1).

Methods

Water samples were collected and composited from vertical transits throughout the entire stream depth at multiple locations across the stream by using depth- and width-integration methods described by Ward and Harr (1990), Edwards and Glysson (1999), and the U.S. Geological Survey (variously dated). These methods provide a vertically and laterally discharge-weighted composite sample that is intended to be representative of the entire flow passing through the cross section of a stream. Samplers consisted of isokinetic depth-integrating water-quality samplers (Davis, 2005) that were constructed of plastic or coated with a nonmetallic rubber-coating paint and equipped with nylon or polytetrafluoroethylene (PTFE) nozzles.

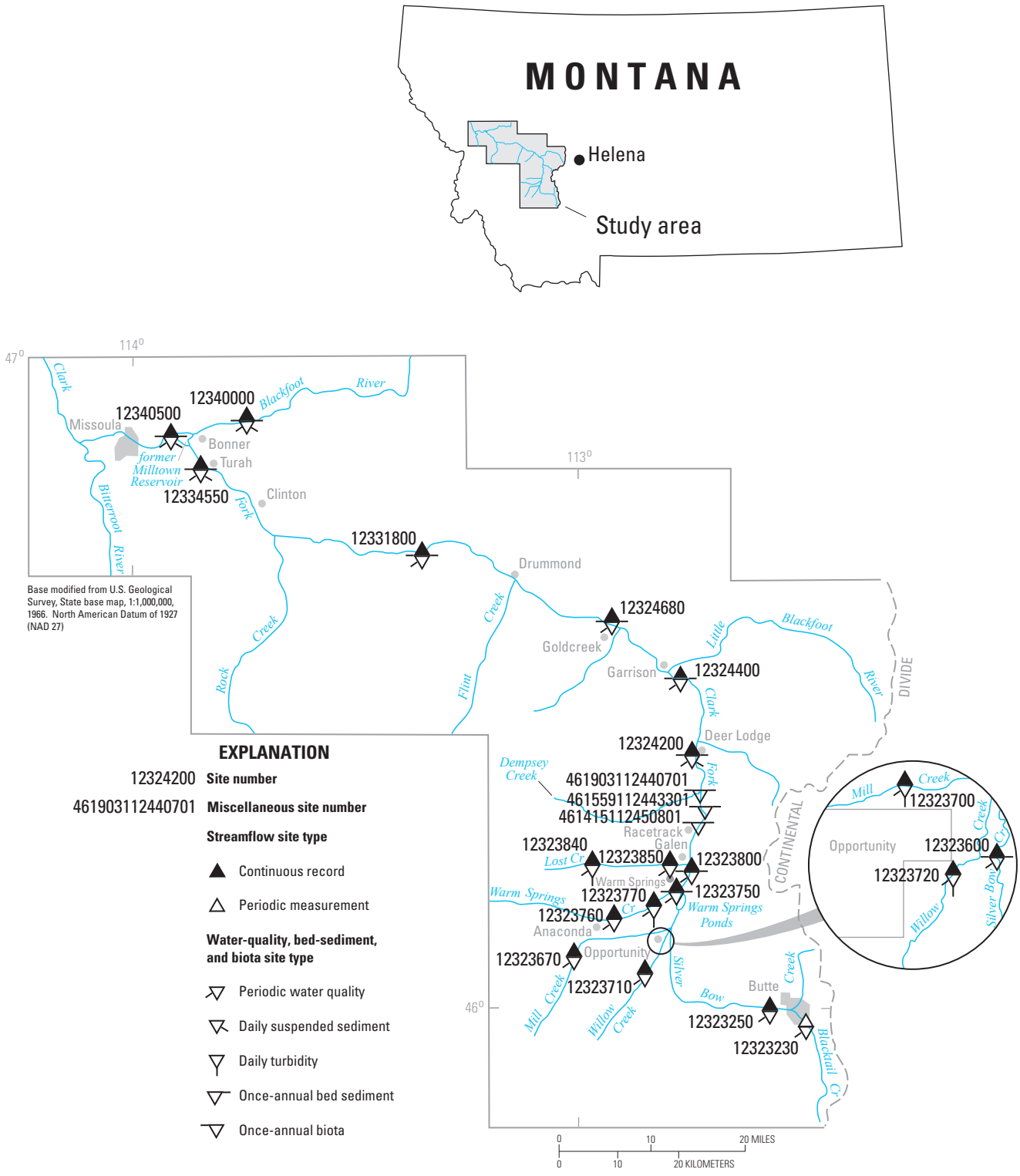

Figure 1. Location of study area in the Clark Fork Basin, Montana.

Table 1. Type and period of data collection at sampling sites in the Clark Fork Basin, Montana.

[--, no data; P, present; D, discontinued]

Station number (fig. 1)	Station name	Continuous-record streamflow	Periodic water quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Biota[2]
12323230	Blacktail Creek at Harrison Avenue, at Butte	--	03/93–08/95, 12/96–08/03, 12/04–P	--	--	--	--
12323250	Silver Bow Creek below Blacktail Creek, at Butte	10/83–P	03/93–08/95, 12/96–P	--	--	--	--
12323600	Silver Bow Creek at Opportunity	07/88–P	03/93–08/95, 12/96–P	03/93–09/95, D	--	07/92–P	07/92, 08/94–08/95, 08/97–P
12323670	Mill Creek near Anaconda	10/04–P	12/04–P	--	06/06–09/12, D	--	--
12323700	Mill Creek at Opportunity	04/03–P	03/03–P	--	04/13–P	--	--
12323710	Willow Creek near Anaconda	03/05–P	12/04–P	--	06/06–09/12, D	--	--
12323720	Willow Creek at Opportunity	04/03–P	03/03–P	--	04/13–P	--	--
12323750	Silver Bow Creek at Warm Springs	03/72–09/79, 04/93–P	03/93–P	04/93–09/95, D	--	07/92–P	07/92–P
12323760	Warm Springs Creek near Anaconda	10/97–P	10/05–P	--	05/06–09/12, D	--	--
12323770	Warm Springs Creek at Warm Springs	10/83–P	03/93–P	--	04/13–P	08/95, 08/97, 08/99, 08/02, 08/05, 08/08, 08/11	08/95, 08/97, 08/99, 08/02, 08/05, 08/08, 08/11
12323800	Clark Fork near Galen	07/88–P	07/88–P	--	--	08/87, 08/91–P	08/87, 08/91–P
12323840	Lost Creek near Anaconda	10/04–P	12/04–P	--	05/06–P	--	--
12323850	Lost Creek near Galen	04/03–P	03/03–P	--	--	--	--
461415112450801	Clark Fork below Lost Creek, near Galen	--	--	--	--	08/96–P	08/96–P
461559112443301	Clark Fork at county bridge, near Racetrack	--	--	--	--	08/96–P	08/96–P
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	--	--	--	--	08/96–P	08/96–P
12324200	Clark Fork at Deer Lodge	10/78–P	03/85–P	03/85–08/86, 04/87–03/03, 08/03–P	--	08/86–08/87, 08/90–P	08/86–08/87, 08/90–P
12324400	Clark Fork above Little Blackfoot River, near Garrison	02/09–P	03/09–P	--	--	08/09–P	08/09–P
12324680	Clark Fork at Goldcreek	10/77–P	03/93–P	--	--	07/92–P	07/92–P

Table 1. Type and period of data collection at sampling sites in the Clark Fork Basin, Montana.—Continued

[--, no data; P, present; D, discontinued]

Station number (fig. 1)	Station name	Continuous-record streamflow	Periodic water quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Biota[2]
12331800	Clark Fork near Drummond	04/93–P	03/93–P	--	--	08/86, 08/87, 08/91–P	08/86, 08/91–P
12334550	Clark Fork at Turah Bridge, near Bonner	03/85–P	03/85–P	03/85–03/03, 08/03–P	--	08/86, 08/91–P	08/86, 08/91–P
12340000	Blackfoot River near Bonner	10/39–P	03/85–P	07/86–04/87, 06/88–09/95, 10/05–P	--	08/86–08/87, 08/91, 08/93–08/96, 08/98–08/01, 09/03, 08/06–P	08/86–08/87, 08/91, 08/93, 08/96, 08/98, 09/00, 09/03, 08/06–P
12340500	Clark Fork above Missoula	03/29–P	07/86–P[3]	07/86–04/87, 06/88–01/96, 03/96–03/03, 08/03–P	04/07–09/07	08/97–P	08/97–P

[1]Onsite measurements of physical properties and laboratory analyses for selected major ions, trace elements, and suspended sediment. Before March 1993, laboratory analyses included only trace elements and suspended sediment.

[2]Laboratory analyses for trace elements.

[3]Before October 1989, water-quality data for Clark Fork above Missoula included only suspended-sediment data.

Table 2. Properties and constituents measured onsite or analyzed in water, bed-sediment, and biota samples from the Clark Fork Basin, Montana.

Water		Bed sediment	Biota
Property	**Constituent**	**Constituent**	**Constituent**
Streamflow	Hardness (calculated)	Arsenic	Arsenic
pH	Calcium	Cadmium	Cadmium
Specific conductance	Magnesium	Chromium	Chromium
Temperature	Potassium	Copper	Copper
Turbidity	Sodium	Iron	Iron
	Alkalinity	Lead	Lead
	Chloride	Manganese	Manganese
	Fluoride	Nickel	Nickel
	Silica	Zinc	Zinc
	Sulfate		
	Cadmium		
	Copper		
	Iron		
	Lead		
	Manganese		
	Zinc		
	Arsenic		
	Dissolved organic carbon		
	Suspended sediment		

Instantaneous streamflow was determined at the time of water sampling either by direct measurement or from stage-discharge rating tables (Rantz and others, 1982). Daily mean streamflow values during ice periods were estimated because backwater affected the stage-discharge relation. Onsite measurements of pH, specific conductance, and water temperature were made during collection of periodic water samples. Onsite sample processing, including filtration and preservation, was completed according to procedures described by Ward and Harr (1990), Horowitz and others (1994), and the U.S. Geological Survey (variously dated).

Composite water samples were analyzed for the constituents listed in table 2. Filtered (0.45-micrometer [µm] pore size) and unfiltered recoverable concentrations of trace elements (arsenic, cadmium, copper, iron, lead, manganese, and zinc) and filtered concentrations of calcium, magnesium, potassium, sodium, chloride, fluoride, silica, and sulfate were measured by the USGS National Water Quality Laboratory (NWQL) in Denver, Colorado. Concentrations of calcium and magnesium were used for the calculation of water hardness.

Filtered concentrations of arsenic, cadmium, copper, lead, manganese, and zinc were measured using inductively coupled plasma-mass spectrometry (ICP–MS) (Faires, 1993; Garbarino and others, 2006). At select sites in the upper basin, filtered concentrations of potassium, sodium, alkalinity, chloride, fluoride, silica, sulfate, and dissolved organic carbon were measured by ICP–MS (Fishman, 1993; Fishman and Friedman, 1989; American Public Health Association, 1998). Filtered concentrations of calcium, magnesium, and iron were measured using inductively coupled plasma-atomic emission spectrometry (ICP–AES) (Fishman, 1993). Unfiltered recoverable concentrations of trace elements were measured in unfiltered samples that were first digested with dilute hydrochloric acid (Hoffman and others, 1996). For cadmium, iron, lead, and manganese, the digested samples were analyzed by ICP–MS as described by Garbarino and Struzeski (1998). For arsenic, copper, and zinc, the digested samples were analyzed by ICP–MS as described by Garbarino and others (2006).

Water samples for analysis of suspended sediment also were collected from multiple vertical transits when periodic water samples were collected. These samples were analyzed for suspended-sediment concentration and the percentage of suspended-sediment mass finer than 0.062-millimeter (mm) diameter (silt size and smaller) by the USGS Wyoming-Montana Water Science Center Sediment Laboratory (hereinafter referred to as the "Wyoming-Montana Sediment Laboratory") in Helena, Mont., according to methods described by Guy (1969) and Dodge and Lambing (2006).

Table 3. Data-quality objectives for analyses of water samples collected in the Clark Fork Basin, Montana.

[mg/L, milligrams per liter; --, not determined; µg/L, micrograms per liter; mm, millimeter]

Constituent	Data-quality objectives		
	Detectability	Precision	Bias
	Laboratory reporting level	Maximum relative standard deviation of replicate analyses (percent)	Maximum deviation of spike recovery (percent)
Calcium, filtered	0.022 mg/L	20	--
Magnesium, filtered	0.011 mg/L	20	--
Cadmium, filtered	0.016 µg/L	20	25
Cadmium, unfiltered recoverable	0.016 µg/L	20	25
Copper, filtered	0.80 µg/L	20	25
Copper, unfiltered recoverable	0.70 µg/L	20	25
Iron, filtered	4.0 µg/L	20	25
Iron, unfiltered recoverable	4.6 µg/L	20	25
Lead, filtered	0.025 µg/L	20	25
Lead, unfiltered recoverable	0.04 µg/L	20	25
Manganese, filtered	0.15 µg/L	20	25
Manganese, unfiltered recoverable	0.4 µg/L	20	25
Zinc, filtered	1.4 µg/L	20	25
Zinc, unfiltered recoverable	3.0 µg/L	20	25
Arsenic, filtered	0.04 µg/L	20	25
Arsenic, unfiltered recoverable	0.28 µg/L	20	25
Sediment, suspended, percent finer than 0.062 mm	1 percent	20	--
Sediment, suspended	1 mg/L	20	--

Suspended-sediment samples for the four daily suspended-sediment sites (table 1) were collected by local contract observers using the depth-integration method at a single vertical transit near midstream. The samples were analyzed for suspended-sediment concentration and used to calculate daily mean suspended-sediment concentrations according to methods described by Porterfield (1972).

Suspended-sediment discharge is determined according to the following equation (Porterfield, 1972):

$$Q_s = Q_w \times C_s \times k, \quad (1)$$

where

Q_s is suspended-sediment discharge, in tons per day;
Q_w is streamflow, in cubic feet per second;
C_s is suspended-sediment concentration, in milligrams per liter; and
k is a units-conversion constant (0.0027) to convert instantaneous suspended-sediment discharge to an equivalent daily suspended-sediment discharge.

Turbidity data were measured using continuous turbidity monitors (Yellow Springs Instruments Company [YSI] 6136 turbidity sensor) at four tributary sites in the upper Clark Fork Basin near Anaconda (table 1). The turbidity sites are operated seasonally, generally from early spring (after ice breakup) to early fall (before stream freeze-up). Turbidity values are recorded at 15-minute intervals and can be viewed in real-time at *http://waterdata.usgs.gov/mt/nwis/current?type=quality*. Continuous recordings enable determination of the minimum and maximum value for each day as well as a daily mean turbidity, which is based on the average of all values in a 24-hour period. Procedures for the operation of continuous turbidity monitors and for daily record computations are described by Wagner and others (2006).

Results

Water-quality data from samples collected periodically during water year 2013 are listed in table 4. Daily mean streamflow, daily mean suspended-sediment concentration, and daily suspended-sediment discharge for water year 2013 at the four daily suspended-sediment sites are listed in tables 5 through 8 along with monthly summary statistics and annual totals for streamflow and suspended-sediment discharge. Daily maximum, minimum, and mean turbidity at four sites are listed in tables 9 through 12 along with monthly summary statistics.

Quality Assurance

Quality-assurance procedures used for the collection and field processing of water samples are described by Ward and Harr (1990), Horowitz and others (1994), Edwards and Glysson (1999), Lambing (2006), and the U.S. Geological Survey (variously dated). Standard procedures used by the NWQL for internal sample handling and quality assurance are described by Friedman and Erdmann (1982), Jones (1987), and Pritt and Raese (1995). Quality-assurance procedures used by the Wyoming-Montana Sediment Laboratory are described by Dodge and Lambing (2006). Standard procedures used for the calibration, measurement, and quality assurance of turbidity monitors are described by Anderson (2005).

The quality of analytical results reported for water samples was evaluated using quality-control samples that were submitted from the field and analyzed concurrently in the laboratory with routine samples. These quality-control samples consisted of replicates, spikes, and blanks that provided quantitative information on the precision and bias of the overall field and laboratory process. Each type of quality-control sample was submitted at a proportion equivalent to about 5 percent of the total number of water samples; therefore, the total number of quality-control samples represented about 15 percent of the total number of water samples.

In addition to the use of quality-control samples submitted from the field, internal quality-assurance practices are performed systematically by the NWQL to provide quality control of analytical procedures (D.L. Stevenson, U.S. Geological Survey, written commun., 2012). These internal practices include analyses of quality-control samples such as calibration standard samples, standard reference water samples, replicate samples, deionized-water blank samples, or spiked samples at a proportion equivalent to at least 10 percent of the sample load. The NWQL participates in a blind-sample program in which standard reference water samples prepared by the USGS Branch of Quality Systems are routinely inserted into the sample line for each analytical method at a frequency proportional to the sample load (*http://bqs.usgs.gov*). The laboratory also participates in external evaluation studies and audits with the National Environmental Laboratory Accreditation Program, the U.S. Environmental Protection Agency, Environment Canada, and the USGS Branch of Quality Systems, to assess analytical performance.

Replicate data can be collected in different ways to provide an assessment of precision (reproducibility) of analytical results. Replicate samples are two or more samples considered to be essentially identical in composition. Replicate samples can be collected in the field (field replicate) either by repeating the collection process to obtain two or more independent composite samples or by splitting a single composite sample into two or more subsamples. The individual replicate samples are then analyzed separately. Likewise, a single sample can be analyzed two or more times in the laboratory to obtain a measure of analytical precision (laboratory replicate).

Precision of analytical results for field replicates can be affected by numerous sources of variability within the field and laboratory environments, including sample collection, processing, and analysis. To provide data on overall precision for samples exposed to field and laboratory sources of variability, replicate stream samples for chemical analysis were obtained in the field by splitting a composite stream sample. Replicate stream samples for suspended-sediment analysis were obtained in the field by collecting two independent cross-sectional samples. Analyses of field replicate samples indicate the reproducibility of environmental data that are affected by the combined potential variability introduced by field and laboratory processes.

Precision of analytical results for laboratory replicates, which exclude field sources of variability, was determined using two independent chemical analyses of aliquots from a single sample selected from the group of samples constituting each analytical run. A separate analysis of the sample was made at the beginning and end of each analytical run to provide information on the reproducibility of laboratory analytical results independent of possible variability caused by field sample collection and processing. Laboratory replicates are not obtainable for suspended-sediment samples because the samples are consumed during the analysis.

Spiked samples are used to evaluate bias, which measures the ability of an analytical method to accurately quantify a known amount of analyte added to a sample. Because some constituents in stream water potentially can interfere with the analysis of a sample for a targeted analyte, it is important to determine whether such effects are causing biased (consistently high or low) results. Deionized-water blank samples and aliquots of stream samples were spiked in the laboratory with known amounts of the same trace elements for which water samples were being analyzed. Analyses of spiked blanks indicate if the spiking procedure and analytical method are within control for a water matrix that is presumably free of chemical interference. Analyses of spiked aliquots of stream samples indicate if the chemical matrix of the stream water interferes with the analytical measurement and whether these interferences could contribute substantial bias to reported trace-element concentrations for stream samples.

Deionized-water blank samples were submitted for every field trip and analyzed to identify the presence and magnitude

of contamination that could potentially bias analytical results. The type of blank sample routinely tested was a field blank. Field blanks are aliquots of deionized water that are certified as constituent-free and are processed in the field through the sampling equipment used to collect stream samples. These blanks then are subjected to the same processing (sample splitting, filtration, preservation, transportation, and laboratory handling) as stream samples. Blank samples are analyzed for the same constituents as stream samples to identify whether any detectable concentrations exist.

All water samples were handled in accordance with chain-of-custody procedures that provide documentation of sample identity, shipment, receipt, and laboratory handling (Driscoll and Hatcher, 2010). All environmental and quality-control samples submitted from a sampling episode were stored in a secure area of the NWQL and analyzed as a discrete sample group, independent of other samples submitted to the NWQL; therefore, the quality-control data apply solely to the analytical results for stream samples reported herein and provide a direct measure of data quality for this monitoring program.

Data-quality objectives (table 3) were established for water-quality data as part of the study plan for the expanded long-term monitoring program initiated in 1993. The objectives identify the analytical requirements of detectability and serve as a guide for identifying questionable data by establishing acceptable limits for precision and bias of laboratory results. Comparisons of quality-control data to data-quality objectives were used to evaluate whether sampling and analytical procedures produced environmentally representative data in a consistent manner. Data that did not meet the objectives were evaluated for acceptability; if necessary, additional quality-control samples were submitted and corrective action was taken.

The NWQL uses a statistically based convention for establishing minimum laboratory reporting levels (LRLs) for analytical results and for reporting low-concentration data (Childress and others, 1999). Quality-control data are collected by the NWQL on a continuing basis to determine long-term method detection levels (LT–MDLs) and LRLs. These values are reevaluated each year and, consequently, can change from year to year. The methods used to determine the LRLs are designed to limit the likelihood of a possible occurrence of a false positive or false negative error to 1 percent or less. Accordingly, concentrations are reported as less than the LRL for samples in which the analyte was not detected. The LRL for organics is twice the LT-MDL. A thorough description of these laboratory definitions can be found at the USGS Branch of Quality Systems Website (*https://bqs.usgs.gov/ltmdl/definition.shtml*). Estimated values are noted with a remark code of "E" for describing streamflow (for ice affected periods) and turbidity (for periods that exceed the manufacturers' threshold for the sonde).

The precision of analytical results for a constituent can be determined by estimating a standard deviation of the differences in concentrations between replicate analyses for several sets of samples. These replicate analyses may consist either of individual analyses of a pair of samples considered to be essentially identical (field replicates) or of multiple analyses of an individual sample (laboratory replicates). The differences in concentration between replicate analyses can be used to estimate a standard deviation according to the following equation (Taylor, 1987):

$$S = \sqrt{\frac{\sum d^2}{2k}}, \tag{2}$$

where

S is the standard deviation of the difference in concentration between replicate analyses,
d is the difference in concentration between each pair of replicate analyses, and
k is the number of pairs of replicate analyses.

Precision also can be expressed as a relative standard deviation (RSD), in percent, which is computed from the standard deviation and the mean concentration for all the replicate analyses. Expressing precision relative to a mean concentration standardizes the comparison of precision among individual constituents. The RSD is calculated according to the following equation (Taylor, 1987):

$$RSD = \frac{S}{\bar{x}} \times 100, \tag{3}$$

where

RSD is the relative standard deviation;
S is the standard deviation; and
$\bar{x}$ is the mean concentration for all replicate analyses.

Paired analyses of field replicates are listed in table 13. The overall precision for each constituent estimated from analyses of field replicates, which include field and laboratory sources of variability, is listed in table 14. Standard deviation and RSD were not calculated for potassium, sodium, alkalinity, chloride, fluoride, silica, sulfate, and organic carbon because of the small sample set (only two replicate samples were collected for these constituents in water year 2013). The data-quality objective used to indicate acceptable precision of results for field replicates was a maximum RSD of 20 percent (table 3). Precision estimates for the analytical results of field replicates were within the 20-percent RSD limit for all constituents (table 14).

The precision for each constituent estimated from laboratory replicate analyses, which include only laboratory sources of variability, is listed in table 15. Statistics for the precision of analytical results for laboratory replicates are calculated by using unrounded values stored in laboratory data files. The data-quality objective used to indicate acceptable precision of results for laboratory replicates was a maximum RSD of 20 percent (table 3). Precision estimates for the laboratory

replicates were within the 20-percent RSD limit for all constituents (table 15). No adjustments were made to analytical data on the basis of replicate analyses precision.

Recovery efficiency for analyses of constituents is determined by comparison of a sample and a spiked aliquot of the same sample. The data-quality objective for acceptable spike recovery of trace elements in water samples determined by NWQL was a maximum deviation of 25 percent from a theoretical 100-percent recovery of added constituent (table 3). At the laboratory, a spiked deionized-water blank sample and a spiked aliquot of a stream sample were prepared and analyzed along with the original unspiked sample. The differences between the spiked and unspiked sample concentrations were determined and used to compute recovery, in percent, according to equation 4:

$$R = \frac{D}{C} \times 100, \quad (4)$$

where

R is the spike recovery, in percent;
D is the difference between the spiked and unspiked sample concentrations; and
C is the concentration of material used to spike the sample.

If the spike recovery of a trace element was outside a range of 75 to 125 percent, the instrument was recalibrated and the entire sample set and all spiked samples were reanalyzed for that particular trace element until recoveries were improved to the extent possible. Recovery efficiency for individual trace elements in laboratory-spiked deionized-water blank samples and in laboratory-spiked stream samples is listed in tables 16 and 17, respectively. The mean spike recovery for deionized-water blank samples spiked with trace elements (table 16) ranged from 92.4 to 105 percent with the smallest individual constituent recovery being copper, filtered, at 87.0 percent and the largest being iron, unfiltered recoverable, at 112 percent. The 95-percent confidence intervals (Taylor, 1987) for the mean spike recovery for each constituent for which deionized-water blank samples were analyzed (table 16) did not exceed a 25-percent deviation from an expected 100-percent recovery. The mean spike recovery for spiked stream samples (table 17) ranged from 84.1 to 102 percent with the smallest individual constituent recovery being zinc, unfiltered recoverable, at 79.5 percent and the largest being iron, filtered and unfiltered recoverable, at 110 percent. The 95-percent confidence intervals for the mean spike recovery for each constituent for which stream water samples were analyzed (table 17) did not exceed a 25-percent deviation from an expected 100-percent recovery. No adjustments were made to analytical data on the basis of the mean spike recovery.

High or low bias is indicated if the 95-percent confidence interval does not include 100-percent recovery, thereby indicating a consistent deviation or bias, either high or low. Confidence intervals for percent recovery include 100 percent for all laboratory-spiked deionized-water blank samples (table 16) except for filtered copper (87.0–97.9 percent) and unfiltered zinc (91.7–98.7 percent). Confidence intervals for percent recovery include 100 percent for all laboratory-spiked stream samples (table 17) except for unfiltered arsenic (91.0–98.8 percent), filtered cadmium (90.4–99.3 percent), unfiltered cadmium (87.0–95.7 percent), filtered copper (86.0–95.8 percent), unfiltered copper (87.5–92.4 percent), filtered manganese (95.4–99.0 percent), and unfiltered zinc (79.5–88.7). Because the mean spike recoveries for all constituents of laboratory-spiked stream samples met data-quality objectives (less than a 25-percent deviation from 100-percent recovery), no adjustments were made to analytical results for stream samples on the basis of spike recoveries.

Analytical results for field blanks are listed in table 18. A field blank with constituent concentrations equal to or less than the LRL for the analytical method indicates that the entire process of sample collection, field processing, and laboratory analysis is presumably free of contamination. If detectable concentrations of trace elements in field blanks were equal to or greater than twice the LRL, the concentrations were noted during data review. Analytical results from the field blank collected as part of the subsequent sample set were evaluated for evidence of a consistent trend that could indicate systematic contamination. Sporadic, infrequent, nonconsecutive exceedances of twice the LRL most likely represented random contamination or instrument calibration error that was not persistent in the process and was not likely to cause positive bias in a long-term record of analytical results. However, if concentrations for a particular constituent exceeded twice the LRL in field blanks from two consecutive field trips, additional blank samples were collected from individual components of the processing sequence and were submitted for analysis to identify the source of contamination.

Constituent concentrations in field blanks (table 18) were almost always less than the LRL. One sample concentration of filtered copper (1.0 micrograms/liter [µg/L]) exceeded the LRL of 0.80 µg/L. Three sample concentrations of filtered iron (4.4, 5.2, and 5.9 µg/L) exceeded the LRL of 4.0 µg/L. Seven sample concentrations of filtered manganese (ranging from 0.15 to 0.62 µg/L) exceeded the LRL of 0.15 µg/L. The systematic presence of filtered manganese has been documented and is currently (2014) being reviewed by the USGS Office of Water Quality. No adjustments were made to water-quality sample data pending the results of this review.

Bed-Sediment Data

Bed-sediment data for the long-term monitoring program in the Clark Fork Basin consist of trace-element concentrations in the fine-grained (less than 0.063 mm) fraction of bed-sediment samples. Bed-sediment samples are collected once annually at 13 sites (fig. 1 and table 1) during low, stable flow conditions at about the same time of year as previous samples

(typically August), to facilitate data comparisons among years. Warm Springs Creek at Warm Springs is sampled once every 3 years rather than once annually and was not sampled during water year 2013.

Methods

Fine-grained bed-sediment samples were collected in August 2013 using protocols described by Axtmann and Luoma (1991). Samples were collected from the surfaces of streambed deposits in areas near the edge of the stream using an acid-washed polypropylene scoop. Whenever possible, samples were collected from both sides of the stream.

Individual samples of bed sediment were collected by scooping material from the surfaces of three to five randomly selected deposits along pools or low-velocity areas. The three to five individual samples were combined to form a single composite sample. This collection process was repeated three times to obtain three composite samples. Each composite sample was wet-sieved onsite through a 0.063-mm polyester-mesh sieve using ambient stream water. The fraction of bed sediment in each composite sample that was finer than 0.063 mm was collected in an acid-washed 500-milliliter (mL) polyethylene bottle and transported to the laboratory on ice.

Bed-sediment samples were processed and analyzed at the USGS National Research Program Ecology and Contaminants Project Laboratory in Menlo Park, California. Bed-sediment samples were oven-dried at 60 degrees Celsius (°C) and ground into smaller particle sizes using an acid-washed, ceramic mortar and pestle. Single aliquots of approximately 0.5–0.6 grams (g) of sediment from each of the three composite bed-sediment samples were digested using a hot, concentrated, nitric acid reflux according to methods described by Luoma and Bryan (1981). Laboratory replicates were analyzed by taking an aliquot from one of the three sieved replicate samples at each station. After a 2-week digestion period, the aliquots were evaporated to dryness on a hot plate. The dry residue was reconstituted in 10 mL of 0.6N (normal) hydrochloric acid. The reconstituted aliquots were then filtered through a 0.45-µm pore-size filter by using a syringe and an in-line disposable filter cartridge. The filtrate was diluted to a 1:10 ratio with 0.6N hydrochloric acid. These final solutions were analyzed for arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc by using inductively coupled plasma-optical emission spectrometry (ICP–OES). The smallest concentration of a constituent that can be reliably reported for analyses of bed sediment is termed the minimum reporting level (MRL).

Results

Concentrations of trace elements measured in samples of fine-grained bed sediment collected during August 2013 are listed in table 19. Liquid-phase concentrations, measured in microgram per milliliter (µg/mL), were analyzed in the reconstituted aliquots of digested bed sediment. Solid-phase concentrations, measured in microgram per gram (µg/g), were calculated using the following equation:

$$\mu g/g = \frac{(\mu g/mL)(\text{volume of digested sample, in mL})}{(\text{dry weight of sample, in grams})(\text{dilution ratio})} \quad (5)$$

The reported solid-phase concentrations (table 19) are the means of all analyses for replicate aliquots from each composite bed-sediment sample collected at the site. Because the conversion from liquid-phase to solid-phase concentration is dependent on both the dilution ratio and the dry weight of the sample, MRLs for some trace elements might differ among stations and among years.

Quality Assurance

The USGS protocols for field collection and processing of bed-sediment samples are designed to prevent contamination from metal sources. Nonmetallic sampling and processing equipment (white plastic scoop, funnel-frame apparatus, and 500-mL sample bottles) were acid-washed and rinsed with deionized water before the collection of the first sample. Polyester-mesh sieves were washed in laboratory-grade detergent and rinsed with deionized water. All equipment received a final rinse onsite with stream water. Sampling equipment used at more than one site was rinsed thoroughly between sites with stream water. Separate sieves were used at each site and, therefore, did not require between-site cleaning. Bed-sediment samples were collected sequentially at sites along an increasing concentration gradient (downstream to upstream sites) to minimize effects from potential site-to-site carryover contamination.

Quality assurance of analytical results for bed-sediment samples included laboratory instrument calibration with standard solutions and analysis of quality-control samples designed to identify the presence and magnitude of bias (Ellen V. Axtmann, U.S. Geological Survey, written commun., 1994). Quality-control samples consisted of standard reference materials (SRMs), issued by the National Institute of Standards and Technology (NIST), and procedural blanks. Thirteen procedural blanks, 10 low-concentration SRMs, and 10 high-concentration SRMs were analyzed.

Standard reference materials are commercially prepared materials that have certified concentrations of trace elements. Analyses of SRMs are used to indicate the ability of the method to accurately measure a known quantity of a constituent. Multiple analyses of SRMs are made to derive a mean and 95-percent confidence interval for recovery. Recovery efficiency for trace-element analyses of SRMs for bed sediment is listed in table 20. Two SRMs consisting of agricultural soils representing low and high concentrations of trace elements were analyzed to test recovery efficiency for a range of

concentrations similar to those occurring in the bed sediment in streams in the upper Clark Fork Basin.

The digestion process used to analyze bed-sediment samples is not a "total" digestion (does not liberate elements associated with crystalline lattices); therefore, 100-percent recovery may not be achieved for elements strongly bound to the sediment. The percent recovery of trace elements for SRM analyses that use less than a total digestion is useful to indicate which trace elements display strong sediment-binding characteristics in the SRM and whether analytical recovery is consistent between multiple sets of analyses.

Although data-quality objectives have not been established for bed sediment, percent recoveries for individual trace elements (table 20) illustrate analytical performance. Metal recoveries of sediment digests were evaluated with NIST 2709a San Joaquin soils and NIST 2711a Montana Soil II. In SRM 2709a, mean recoveries ranged from 51.6–86.6 percent of the certified concentrations and in SRM 2711a, mean recoveries ranged from 47.8–98.4 percent. The highest mean recoveries in SRM 2709a were iron (85.4 percent) and manganese (86.6 percent). Arsenic, cadmium, copper, and lead recoveries were low in SRM 2709a (51.6–70.8 percent), but these same elements performed up to 47 percent better in SRM 2711a (80.6–98.4 percent recoveries). Nickel and zinc recoveries were similar in both SRMs: nickel at 80.4 percent (SRM 2709a) and 79.3 percent (SRM 2711a), and zinc at 80.2 percent (SRM 2709a) and 86.9 percent (SRM 2711a). Chromium recovery was poor for both SRM 2709a (58.1 percent) and SRM 2711a (47.8 percent). The small range of variation (3 percent) in the 95-percent confidence interval indicates good reproducibility of multiple analyses of SRM 2709a and SRM 2711a samples. No adjustments were made to trace-element concentrations in bed-sediment samples on the basis of recovery efficiencies.

Procedural blanks for bed-sediment samples consisted of the same reagents used for sample digestion and reconstitution. Concentrated nitric acid used for sample digestion was heated and evaporated to dryness. After evaporation, 0.6N hydrochloric acid was added to reconstitute the dry residue. Procedural blanks, therefore, represent the same chemical matrix and exposure to analytical materials and handling as the reagents used to digest and reconstitute bed-sediment samples. Analytical results of procedural blanks for bed sediment (table 21) are reported as a liquid-phase concentration, in micrograms per milliliter. A procedural blank was prepared and analyzed concurrently with bed-sediment samples for each site. Concentrations of trace elements in all procedural blanks were less than the MRL for all elements except iron indicating no contamination bias for these elements. Iron blanks were only slightly higher than the iron MRL (<0.021), thus no adjustments to the trace-element concentrations in bed sediment samples were made.

Biological Data

Biological data for the long-term monitoring program in the Clark Fork Basin consist of analyses of trace-element concentrations in the whole-body tissue of aquatic benthic insects. Insect samples are collected once annually at the same 13 sites and on the same dates as bed-sediment samples (fig. 1 and table 1), allowing for a direct comparison of biological data with bed-sediment data through the years. Warm Springs Creek at Warm Springs is sampled once every 3 years, rather than once annually, and was not sampled during water year 2013.

Methods

Insect samples were collected using protocols described in Hornberger and others (1997). Benthic insects at immature stages were collected with a large nylon-mesh kick net. A single riffle at each site was sampled repeatedly until an adequate number of individual insects were collected to provide sufficient mass for analysis. Targeted taxa for collection were the order Trichoptera (caddisflies) and the order Plecoptera (stoneflies).

Two caddisfly species of the genus *Hydropsyche* (*Hydropsyche cockerelli* and *Hydropsyche occidentalis)* were targeted for collection in this study because of their occurrence at most sites. *Hydropsyche* species (spp.) that could not be positively identified were categorized as *Hydropsyche* spp. or *Hydropsyche morosa* group. On the few occasions when *Hydropsyche* were not present, other caddisflies, including *Brachycentrus* spp. and *Rhyacophila* spp., were collected. The caddisfly *Arctopsyche grandis* and the stoneflies *Claassenia sabulosa* and *Hesperoperla* spp. were collected where available to represent additional insect taxa that are commonly distributed in the Clark Fork Basin.

Samples of each taxon were sorted by genus in the field and placed in acid-washed plastic containers. Samples were frozen in a small amount of ambient stream water on dry ice within 30 minutes of collection. Between 1986 and 1998, macroinvertebrate containers were kept on ice to allow the insects to evacuate their gut contents (depurate) for 6 to 8 hours. Excess water was drained and insects were frozen for transport to the laboratory. Since 1999, samples were immediately frozen on dry ice in the field to reduce the possibility of metal loss through intracellular breakdown during depuration. A comparison of immediately frozen to depurated samples indicated that although no substantial difference occurred for most metals, concentrations of copper were about 20 percent lower in the depurated samples than in the samples that were immediately frozen. The data were not adjusted for this difference.

Insect samples were processed and analyzed at the USGS National Research Program Ecology and Contaminants Project Laboratory in Menlo Park, Calif. Insects were thawed and rinsed with ultrapure deionized water to remove particulate

matter and then sorted to their lowest possible taxonomic level. If large numbers of specimens were collected at a site, similar-sized individuals were composited into replicate subsamples. Subsamples were placed in tared scintillation vials and oven-dried at 70 °C. Subsamples were weighed to obtain a final dry weight and digested by reflux using concentrated nitric acid (Cain and others, 1992). After digestion, insect samples were evaporated to dryness on a hot plate. The dry residue was reconstituted in 0.6N hydrochloric acid, filtered through a 0.45-µm pore-size filter, and analyzed undiluted by inductively coupled plasma-optical emission spectrometry (ICP–OES) for arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc. The smallest concentration of a constituent that can be reliably reported for analyses of biota is termed the MRL.

Results

Concentrations of trace elements in whole-body tissue of aquatic insects collected during August 2013 are listed in table 22. The variability in the number of composite samples among species and among sites reflects differences in insect abundance, with the number of composite samples increasing with the relative abundance of insects. Liquid-phase concentrations, in micrograms per milliliter, analyzed in the reconstituted samples were converted to solid-phase concentrations, in microgram per gram, by using equation 5 (used earlier in this report to calculate solid-phase concentrations of trace elements in bed sediment). All tissue samples were analyzed undiluted (dilution ratio 1:1). As with MRLs for trace elements in bed sediment, MRLs for trace elements in insects may differ among sites as a result of varied sample weights. In general, the smaller the biological-sample weight (primarily a function of insect abundance), the higher the MRL; therefore, higher MRLs do not necessarily imply a higher trace-element concentration in tissue.

Quality Assurance

The protocols for field collection and processing of biota samples are designed to prevent contamination from metal sources. Nonmetallic nets, sampling equipment, and processing equipment were used in all sample collection. Equipment was acid-washed and rinsed in ultrapure deionized water before the first sample collection. Nets and equipment were thoroughly rinsed in stream water at each main-stem site. New nets were used at each tributary site. Biota samples were collected sequentially at sites along an increasing concentration gradient, which was from downstream sites to upstream sites to minimize effects from potential site-to-site carryover contamination (Hornberger and others, 1997).

Quality assurance of analytical results for biota samples included laboratory-instrument calibration with standard solutions and analyses of quality-control samples designed to quantify precision and to identify the presence and magnitude of bias. Quality-control samples consisted of 12 replicates of the tissue SRM sample TORT-2 lobster hepatopancreas, issued by the NIST and 13 procedural blanks (1 at each site). Quality-control samples were analyzed in a proportion equivalent to about 20 percent of the total number of biota samples.

Recovery efficiency for trace-element analyses of the SRM sample TORT-2 for biota is listed in table 23. Data-quality objectives have not been established for analytical recovery in biota, but percent recoveries indicate analytical performance. Mean SRM recoveries for arsenic, cadmium, copper, iron, manganese, nickel and zinc ranged from 91.7 to 112 percent and were within 12 percent of the 95-percent confidence intervals for each metal. Higher mean recoveries were measured for chromium (167 percent) and lead (220 percent), due in part to the relatively low certified concentrations in the SRM (0.77 µg/g and 0.35 µg/g, respectively). No adjustments were made to trace-element concentrations in biota samples on the basis of recovery efficiencies.

Procedural blanks for biota consisted of undiluted aliquots of the same reagents used to digest and reconstitute tissue of aquatic insects. Analytical results of procedural blanks for biota (table 24) are reported as a liquid-phase concentration, in microgram per milliliter. A procedural blank was prepared and analyzed concurrently with biota samples for each site. Concentrations of trace elements in all procedural blanks were less than the MRL; therefore, no adjustments to the data were necessary.

Statistical Summaries of Data

Statistical summaries of long-term water-quality, bed-sediment, and biological data for the Clark Fork Basin are listed in tables 25 through 27 for the period of record at each site. The summaries include the period of record; number of samples; and maximum, minimum, mean, and median concentrations.

Statistical summaries of water-quality data (table 25) are based on results of cross-section samples collected periodically by the USGS for the long-term monitoring program in the Clark Fork Basin during the period of record for each site. The summaries do not include data for supplemental samples collected at selected sites that targeted high-flow conditions or maintenance drawdowns of Milltown Reservoir, which might disproportionately skew the long-term statistics relative to the other sites in the network. Statistical summaries of bed-sediment (table 26) and biological data (table 27) are based on results of samples collected once during the indicated years. Because not all sites were sampled for bed sediment and biota every year, the data for some sites do not represent a consecutive annual record. Statistical summaries are not presented for discontinued sites.

Statistics for bed-sediment data (table 26) are based on the mean trace-element concentrations determined for each year from the mean of the analyses of composite samples;

therefore, the number of samples for bed sediment represents the number of years that the constituent was analyzed. The number of samples for arsenic for bed sediment is smaller than the number for other trace elements because sampling for arsenic began in September 2003. In addition, the number of samples analyzed for silver in bed sediment is smaller because analysis for this constituent was discontinued in 2004.

In contrast, statistics for biological data (table 27) are based on individual analyses for each composite sample collected rather than on a single mean concentration for each year. Differences in the number of composited biota samples among species reflect differences in species abundance, both within and between sites and among years. As a result, the statistics for biota describe a wider range of variation in trace-element concentrations than would be evident if results from individual composite samples were averaged. Also, the number of samples for arsenic in biota samples is smaller than the number for other trace elements because sampling for arsenic began in September 2003. The abundance of aquatic insects at a particular site in a given year limits the biomass of the sample, which in turn may result in varied MRLs. When MRLs vary among years, differences in concentration with time are difficult to determine, especially when a large percentage of the samples have concentrations less than MRLs.

The presence or absence of insect species at a given site can vary among years and may result in different taxa being analyzed in the long-term period of record. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics for the *Hydropsyche morosa* group are based on the combined results for two or more species because these samples could not be clearly identified to the species level, but the individual insects had *morosa* characteristics.

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Data

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323230—Blacktail Creek at Harrison Avenue, at Butte								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2012	0955	6.5	7.5	315	4.0	131	38.1	8.75
03/12/2013	1220	6.7	7.8	310	4.0	120	34.5	8.12
04/08/2013	0930	13	7.6	246	2.0	93.5	26.8	6.43
05/20/2013	0920	9.2	7.6	278	7.0	107	30.0	7.67
06/03/2013	0900	15	7.6	250	8.0	95.1	26.6	6.97
06/17/2013	0945	10	7.6	267	10.5	104	29.5	7.42
07/15/2013	0830	2.3	7.6	365	9.0	149	42.0	10.7
08/12/2013	0840	2.7	7.6	369	9.0	153	42.9	11.1

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/13/2012	--	--	--	--	--	--	--	0.025	0.022
03/12/2013	--	--	--	--	--	--	--	0.026	0.017
04/08/2013	--	--	--	--	--	--	--	0.019	0.025
05/20/2013	2.50	11.7	81.8	13.3	0.26	25.4	32.3	0.032	0.030
06/03/2013	2.43	10.1	74.8	10.7	0.24	23.9	28.9	0.025	0.036
06/17/2013	2.47	10.2	87.2	10.4	0.21	24.1	26.5	0.019	0.019
07/15/2013	3.05	14.1	122	14.7	0.30	25.4	34.1	0.019	<0.016
08/12/2013	3.01	14.2	124	15.7	0.29	25.4	35.4	0.022	0.018

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323230—Blacktail Creek at Harrison Avenue, at Butte								
Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/13/2012	1.2	1.9	53.0	256	0.030	0.25	54.8	63.3
03/12/2013	1.6	2.2	90.9	248	0.049	0.19	48.6	54.2
04/08/2013	2.0	4.2	266	678	0.143	0.77	47.6	73.7
05/20/2013	2.0	3.6	166	500	0.083	0.48	53.5	82.2
06/03/2013	3.0	4.4	174	513	0.118	2.04	49.1	66.2
06/17/2013	2.0	2.6	218	523	0.087	0.36	49.2	57.2
07/15/2013	0.87	0.91	39.5	123	<0.025	0.08	50.5	52.6
08/12/2013	1.1	3.1	51.0	140	<0.025	0.15	56.8	58.2

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2012	2.9	3.2	1.7	2.1	--	87	3	0.05
03/12/2013	2.3	<3.0	1.7	2.1	--	81	3	0.05
04/08/2013	3.1	5.5	2.7	3.8	--	79	7	0.25
05/20/2013	2.1	<3.0	3.0	3.9	4.96	92	7	0.17
06/03/2013	2.7	4.1	3.4	4.3	4.62	86	5	0.20
06/17/2013	1.8	<3.0	4.2	5.4	3.85	97	3	0.08
07/15/2013	1.7	<3.0	1.7	2.1	1.40	94	1	0.01
08/12/2013	2.4	3.2	1.8	2.1	1.52	94	1	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323250—Silver Bow Creek below Blacktail Creek, at Butte								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2012	1125	19	7.5	571	5.0	191	49.7	16.1
03/12/2013	1345	19	7.6	539	6.0	166	45.7	12.6
04/08/2013	1045	26	7.6	444	3.0	144	40.1	10.6
05/20/2013	1055	24	7.6	476	9.0	149	41.5	11.1
06/03/2013	1035	33	7.7	444	10.0	144	39.8	10.8
06/17/2013	1125	20	7.6	470	14.0	146	40.6	10.9
07/15/2013	1000	13	7.6	550	15.0	159	44.9	11.3
08/12/2013	1015	16	7.6	544	15.0	158	45.4	10.8

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/13/2012	--	--	--	--	--	--	--	0.069	0.081
03/12/2013	--	--	--	--	--	--	--	0.063	0.136
04/08/2013	--	--	--	--	--	--	--	0.050	0.088
05/20/2013	5.40	24.7	66.9	26.5	0.37	20.5	77.8	0.067	0.087
06/03/2013	4.96	22.2	102	24.2	0.41	21.8	69.5	0.057	0.122
06/17/2013	5.55	24.4	72.4	26.4	0.32	20.3	71.0	0.074	0.092
07/15/2013	6.96	30.5	72.4	32.3	0.43	17.6	83.7	0.064	0.078
08/12/2013	7.07	31.7	95.1	33.3	0.36	17.7	84.8	0.045	0.061

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323250—Silver Bow Creek below Blacktail Creek, at Butte								
Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/13/2012	3.8	8.8	32.0	127	0.219	0.79	59.6	73.4
03/12/2013	4.2	13.2	57.0	331	0.303	2.28	108	124
04/08/2013	3.8	11.3	135	398	0.265	1.70	89.0	98.5
05/20/2013	3.5	10.0	72.5	278	0.264	1.11	70.7	89.1
06/03/2013	4.1	11.4	112	393	0.247	1.71	86.6	109
06/17/2013	3.9	8.4	85.5	268	0.252	0.80	62.9	73.4
07/15/2013	3.6	11.0	39.6	108	0.313	0.80	36.5	44.5
08/12/2013	3.6	9.6	28.4	94.6	0.269	0.81	20.7	28.8

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2012	31.4	35.0	2.8	3.0	--	79	3	0.15
03/12/2013	33.3	41.7	2.9	3.4	--	82	11	0.56
04/08/2013	20.8	30.6	3.2	4.2	--	67	8	0.56
05/20/2013	21.3	28.1	3.7	4.6	7.12	86	5	0.32
06/03/2013	23.2	35.6	4.4	5.5	5.73	80	7	0.62
06/17/2013	27.6	31.4	4.5	5.0	5.94	92	4	0.22
07/15/2013	37.4	38.8	4.3	4.4	7.55	74	3	0.11
08/12/2013	31.4	32.4	4.2	4.1	5.76	79	3	0.13

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323600—Silver Bow Creek at Opportunity								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	0835	E34	7.9	526	4.5	196	58.3	12.2
03/13/2013	0955	44	8.0	514	2.0	178	51.4	12.0
04/09/2013	0840	49	8.0	469	-1.0	166	47.9	11.3
05/21/2013	0845	64	8.1	393	8.0	146	43.6	9.06
06/03/2013	1210	93	8.1	318	9.0	113	33.8	7.06
06/17/2013	1600	34	9.0	412	20.0	155	45.1	10.3
07/15/2013	1625	17	9.2	527	24.0	187	54.9	12.2
08/12/2013	1650	13	9.1	537	19.0	177	51.3	11.9

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.403	0.417	12.2	21.3	16.6	366	0.165	2.48
03/13/2013	0.363	0.590	13.1	36.0	35.2	568	0.330	5.79
04/09/2013	0.225	0.325	8.7	17.0	44.0	285	0.194	1.65
05/21/2013	0.123	0.354	6.5	20.3	26.2	405	0.167	3.82
06/03/2013	0.095	0.402	8.5	30.1	44.9	793	0.325	6.39
06/17/2013	0.118	0.257	9.5	17.9	31.2	288	0.266	2.38
07/15/2013	0.229	0.364	15.2	24.1	25.5	249	0.340	2.78
08/12/2013	0.242	0.382	14.1	24.8	25.3	234	0.214	2.14

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	114	141	112	124	6.2	6.7	55	10	0.92
03/13/2013	281	332	103	138	6.4	7.3	84	21	2.5
04/09/2013	240	247	79.9	99.0	5.6	6.5	85	9	1.2
05/21/2013	120	214	33.4	74.1	5.1	6.6	88	16	2.8
06/03/2013	80.5	166	32.4	83.3	5.3	6.8	65	36	9.0
06/17/2013	72.4	125	12.2	40.1	8.3	8.3	83	16	1.5
07/15/2013	48.6	120	17.2	50.3	10.7	11.7	89	11	0.50
08/12/2013	41.5	110	18.3	52.8	12.9	12.0	90	10	0.35

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323670—Mill Creek near Anaconda									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2012	1310	12	7.9	187	1.0	E2.2	90.7	25.1	6.81
03/12/2013	1610	9.7	8.1	213	5.0	<2.0	95.0	25.8	7.42
04/08/2013	1340	19	7.9	150	2.0	--	65.2	17.8	5.01
05/20/2013	1340	68	7.6	84	7.5	--	37.3	10.6	2.66
06/03/2013	1415	96	7.6	82	7.0	--	34.3	9.87	2.35
06/17/2013	1405	75	7.8	79	12.0	--	33.6	9.74	2.26
07/15/2013	1235	30	8.0	115	13.0	--	50.4	14.3	3.54
08/12/2013	1255	17	8.1	154	13.5	--	69.6	19.0	5.38

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/13/2012	0.083	0.082	1.2	1.7	39.3	79.4	0.076	0.20
03/12/2013	0.071	0.087	1.1	1.8	25.5	79.4	0.075	0.35
04/08/2013	0.043	0.067	2.0	3.0	35.5	116	0.079	0.52
05/20/2013	0.043	0.067	2.1	3.1	32.5	155	0.078	0.57
06/03/2013	0.039	0.051	2.5	3.6	43.7	124	0.122	0.50
06/17/2013	0.031	0.039	1.9	2.5	29.5	110	0.084	0.34
07/15/2013	0.038	0.044	1.5	2.1	48.6	110	0.116	0.37
08/12/2013	0.045	0.067	2.7	2.4	61.3	103	0.135	0.36

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2012	5.63	7.2	2.9	<3.0	14.8	13.7	86	1	0.03
03/12/2013	4.79	7.1	1.7	<3.0	16.1	15.7	71	1	0.03
04/08/2013	4.22	8.4	2.7	4.3	12.8	14.0	56	3	0.15
05/20/2013	3.73	12.3	1.8	3.0	8.4	9.7	43	5	0.92
06/03/2013	4.14	7.1	4.3	4.5	10.3	11.2	57	4	1.0
06/17/2013	4.00	7.5	2.3	3.0	9.1	9.7	71	4	0.81
07/15/2013	6.50	11.5	<1.4	<3.0	12.2	12.6	73	2	0.16
08/12/2013	6.48	10.1	1.9	<3.0	25.3	24.4	83	1	0.05

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323700—Mill Creek at Opportunity									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2012	1545	E5.0	7.8	220	1.0	--	101	28.4	7.28
03/13/2013	0830	8.5	8.0	242	2.0	--	106	29.5	7.83
04/08/2013	1655	12	8.0	176	3.0	<2.0	78.0	21.7	5.77
05/21/2013	0725	27	7.7	97	6.0	<2.0	39.4	11.0	2.89
06/04/2013	0745	38	7.7	93	6.5	E2.6	37.6	10.6	2.72
06/18/2013	0735	38	7.7	86	9.5	E2.3	36.8	10.6	2.49
07/15/2013	1510	8.0	8.0	132	17.0	<2.0	58.3	16.7	4.04
08/12/2013	1530	2.3	8.1	183	15.0	<2.0	79.2	21.9	5.97

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/13/2012	--	--	--	--	--	--	--	0.088	0.080
03/13/2013	--	--	--	--	--	--	--	0.067	0.061
04/08/2013	0.83	6.00	72.0	0.57	0.36	13.5	17.8	0.048	0.053
05/21/2013	0.55	3.25	41.4	0.30	0.37	11.6	7.30	0.053	0.079
06/04/2013	0.55	3.22	40.0	0.30	0.37	12.0	6.50	0.044	0.079
06/18/2013	0.48	2.29	38.2	0.22	0.31	9.47	5.01	0.048	0.087
07/15/2013	0.65	3.40	57.9	0.31	0.40	10.2	9.12	0.050	0.072
08/12/2013	0.82	4.98	79.5	0.48	0.37	11.4	15.2	0.035	0.039

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323700—Mill Creek at Opportunity								
Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/13/2012	1.6	1.7	32.4	60.4	0.052	0.10	10.2	9.8
03/13/2013	1.2	2.0	20.9	49.8	0.045	0.11	2.56	2.9
04/08/2013	2.2	2.8	27.2	91.9	0.073	0.29	2.87	5.2
05/21/2013	2.4	4.1	31.1	164	0.084	0.73	3.60	10.4
06/04/2013	2.7	4.8	41.6	213	0.106	0.86	4.14	10.3
06/18/2013	2.4	4.3	29.0	197	0.092	0.90	3.92	12.0
07/15/2013	2.1	3.1	43.8	140	0.129	0.52	6.22	11.6
08/12/2013	1.7	2.3	40.8	62.3	0.086	0.18	4.73	5.2

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2012	4.1	4.2	13.5	14.0	--	63	1	0.01
03/13/2013	2.6	<3.0	13.1	12.6	--	90	1	0.02
04/08/2013	1.8	<3.0	14.1	14.2	2.06	76	2	0.06
05/21/2013	2.5	4.1	11.5	13.0	2.66	66	5	0.36
06/04/2013	2.8	4.7	12.4	13.3	2.44	69	6	0.62
06/18/2013	2.1	3.9	12.0	13.2	2.04	53	5	0.51
07/15/2013	<1.4	<3.0	17.5	19.2	1.61	79	7	0.15
08/12/2013	<1.4	<3.0	23.6	23.1	1.33	88	1	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323710—Willow Creek near Anaconda									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
03/12/2013	1510	E1.3	7.7	124	1.0	<2.0	44.9	14.9	1.86
04/08/2013	1240	4.1	7.6	109	0.5	--	40.0	13.3	1.63
05/20/2013	1240	9.5	7.6	83	8.0	--	28.3	9.49	1.13
06/03/2013	1320	16	7.7	81	7.0	--	28.8	9.65	1.13
06/17/2013	1310	6.9	7.6	96	10.5	--	35.7	12.0	1.40
07/15/2013	1140	2.6	7.8	108	12.0	--	38.7	13.1	1.48
08/12/2013	1200	1.7	7.7	110	12.0	--	39.8	13.3	1.62

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
03/12/2013	0.016	0.023	0.82	1.0	55.3	112	0.048	0.12
04/08/2013	<0.016	0.028	2.1	2.5	73.6	235	0.111	0.38
05/20/2013	0.019	0.038	1.8	2.7	67.1	251	0.141	0.61
06/03/2013	0.027	0.048	2.4	3.4	128	368	0.255	0.80
06/17/2013	0.028	0.041	1.9	2.1	65.7	209	0.166	0.42
07/15/2013	0.035	0.047	1.9	2.3	83.7	187	0.194	0.44
08/12/2013	0.034	0.060	2.3	2.9	107	207	0.260	0.53

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
03/12/2013	18.2	20.6	<1.4	<3.0	10.4	10.0	87	2	0.01
04/08/2013	13.0	19.9	1.9	3.1	12.1	13.0	88	2	0.02
05/20/2013	10.8	23.3	<1.4	<3.0	12.4	13.9	91	6	0.15
06/03/2013	11.2	21.0	2.7	4.2	13.3	14.0	90	7	0.30
06/17/2013	12.6	16.5	2.2	<3.0	14.6	14.6	97	4	0.07
07/15/2013	9.74	17.6	1.7	<3.0	19.5	20.6	92	3	0.02
08/12/2013	11.5	17.9	<1.4	<3.0	24.2	24.2	90	2	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323720—Willow Creek at Opportunity									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	0800	5.1	7.7	299	2.5	--	137	40.6	8.63
03/13/2013	0910	5.4	7.7	268	2.0	--	110	32.3	7.24
04/09/2013	0800	6.5	7.7	273	0.0	E5.5	115	34.0	7.36
05/21/2013	0820	6.8	7.7	232	7.0	E4.0	98.1	28.2	6.70
06/04/2013	0845	14	7.6	199	8.0	E5.2	79.9	23.3	5.27
06/18/2013	0835	8.0	7.8	279	10.0	E3.4	123	35.7	8.14
07/15/2013	1600	6.5	8.7	282	24.0	<2.0	124	36.0	8.19
08/12/2013	1630	8.7	8.3	286	14.5	<2.0	128	36.6	9.01

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/14/2012	--	--	--	--	--	--	--	0.030	0.060
03/13/2013	--	--	--	--	--	--	--	0.043	0.056
04/09/2013	1.39	12.2	110	2.24	0.34	23.1	29.1	0.025	0.114
05/21/2013	1.40	9.28	94.5	1.56	0.35	22.5	22.3	0.041	0.066
06/04/2013	1.38	8.60	82.6	1.53	0.29	23.3	16.2	0.036	0.099
06/18/2013	1.45	8.92	120	2.00	0.43	22.2	21.0	0.032	0.055
07/15/2013	1.43	9.64	127	2.06	0.56	19.4	21.8	0.024	0.029
08/12/2013	1.29	9.39	125	2.15	0.49	18.4	24.0	0.018	0.024

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323720—Willow Creek at Opportunity								
Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/14/2012	1.7	4.2	23.1	161	0.139	1.17	65.2	76.3
03/13/2013	1.8	4.0	34.2	167	0.120	1.00	86.4	93.3
04/09/2013	2.1	11.5	38.6	421	0.198	4.14	68.8	104
05/21/2013	4.6	8.8	53.7	256	0.243	1.49	55.4	70.3
06/04/2013	6.2	11.3	83.7	335	0.323	1.91	37.0	51.3
06/18/2013	3.5	6.4	48.7	241	0.209	1.27	45.3	53.8
07/15/2013	2.7	3.7	20.5	111	0.125	0.71	12.8	18.8
08/12/2013	1.7	2.6	9.7	67.2	0.064	0.39	4.95	7.6

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	5.0	7.9	11.2	11.4	--	97	5	0.07
03/13/2013	6.0	7.8	11.2	12.3	--	94	4	0.06
04/09/2013	4.8	17.5	12.2	15.1	2.63	95	11	0.19
05/21/2013	4.8	9.5	20.7	23.4	4.21	97	6	0.11
06/04/2013	7.8	14.1	30.9	32.6	5.59	95	10	0.38
06/18/2013	3.3	6.9	38.2	38.3	4.19	94	3	0.06
07/15/2013	<1.4	<3.0	24.1	24.9	2.28	97	3	0.05
08/12/2013	<1.4	3.7	14.0	13.7	1.60	93	1	0.02

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323750—Silver Bow Creek at Warm Springs								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	1010	46	8.5	577	1.0	253	73.3	16.9
03/13/2013	1050	60	8.7	541	3.0	223	62.0	16.7
04/09/2013	1010	65	8.1	516	2.0	203	56.8	14.9
05/21/2013	1020	77	8.3	391	11.0	156	43.4	11.5
06/04/2013	1030	153	9.0	398	9.5	154	42.1	11.9
06/18/2013	1015	89	9.1	348	14.0	135	36.2	10.8
07/16/2013	0720	35	9.0	466	15.0	198	55.5	14.5
08/13/2013	0820	20	9.0	533	12.5	222	62.0	16.3

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.032	0.066	2.7	4.0	9.9	131	0.128	0.89
03/13/2013	0.064	0.079	3.1	4.9	10.0	121	0.044	0.56
04/09/2013	0.025	0.286	1.6	15.3	15.4	481	0.104	4.57
05/21/2013	0.031	0.060	2.5	5.0	36.4	226	0.156	1.13
06/04/2013	0.055	0.083	4.2	6.7	36.7	189	0.161	0.86
06/18/2013	0.033	0.051	3.5	5.2	54.8	174	0.166	0.68
07/16/2013	0.026	0.037	3.0	3.2	24.3	120	0.107	0.50
08/13/2013	0.023	0.027	2.3	2.9	18.4	84.3	0.074	0.38

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	53.0	88.5	2.7	5.5	23.2	22.9	81	3	0.37
03/13/2013	51.4	87.2	3.0	7.3	9.2	10.4	91	2	0.32
04/09/2013	208	259	3.3	30.6	8.4	13.0	90	8	1.4
05/21/2013	86.3	124	3.2	8.1	15.5	17.5	85	4	0.83
06/04/2013	38.7	62.2	2.8	9.1	18.2	19.7	94	2	0.83
06/18/2013	61.7	102	1.7	5.1	23.7	24.0	92	2	0.48
07/16/2013	84.2	149	<1.4	3.1	27.8	28.3	92	2	0.19
08/13/2013	60.6	88.0	<1.4	<3.0	30.9	30.1	77	1	0.05

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323760—Warm Springs Creek near Anaconda									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2012	1455	67	8.3	272	4.5	<2.0	141	42.2	8.74
04/08/2013	1535	62	8.5	271	3.5	--	136	40.3	8.66
05/20/2013	1630	102	8.3	201	9.0	--	97.1	28.8	6.14
06/03/2013	1545	125	8.4	188	9.0	--	89.7	26.7	5.59
07/15/2013	1400	95	8.5	214	13.0	--	101	30.2	6.25
08/12/2013	1425	66	8.6	247	12.0	--	120	35.2	7.68

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/13/2012	0.021	0.016	<0.80	0.78	<4.0	26.5	0.038	0.09
04/08/2013	<0.016	0.016	<0.80	1.2	4.7	56.6	<0.025	0.17
05/20/2013	0.024	0.020	<0.80	3.3	7.8	76.3	<0.025	0.20
06/03/2013	<0.016	0.021	1.2	2.1	11.3	88.9	0.026	0.24
07/15/2013	0.021	0.024	0.96	1.6	6.7	63.2	<0.025	0.29
08/12/2013	0.021	0.025	1.0	1.7	6.1	41.9	<0.025	0.17

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2012	1.27	1.3	<1.4	<3.0	1.9	1.7	71	1	0.18
04/08/2013	1.05	2.3	<1.4	<3.0	1.9	2.1	66	4	0.67
05/20/2013	1.16	3.7	<1.4	<3.0	1.8	2.0	75	4	1.1
06/03/2013	1.74	4.1	<1.4	<3.0	2.3	2.5	72	4	1.4
07/15/2013	1.08	3.7	<1.4	<3.0	2.0	2.3	74	4	1.0
08/12/2013	1.26	2.4	<1.4	<3.0	2.4	2.6	70	2	0.36

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323770—Warm Springs Creek at Warm Springs									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	0940	48	8.2	348	2.0	--	182	55.0	10.9
04/09/2013	1040	45	8.1	358	0.0	E2.5	185	54.8	11.7
05/21/2013	0955	65	8.1	280	8.0	E2.3	135	40.8	8.01
06/04/2013	0945	78	8.0	274	7.0	<2.0	130	39.4	7.72
06/18/2013	0925	90	8.0	226	10.0	E2.5	106	32.4	6.07
07/15/2013	1720	36	8.3	293	18.0	<2.0	138	42.6	7.64
08/13/2013	0740	10	8.1	382	11.0	<2.0	190	57.3	11.5

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/14/2012	--	--	--	--	--	--	--	0.052	0.065
04/09/2013	1.54	4.34	141	1.56	0.43	11.5	47.6	0.033	0.072
05/21/2013	1.19	3.03	108	1.02	0.44	9.85	34.4	0.055	0.074
06/04/2013	1.09	2.90	105	1.03	0.43	10.0	33.5	0.038	0.062
06/18/2013	1.05	2.35	88.0	0.80	0.40	10.1	25.8	--	--
07/15/2013	1.37	3.31	113	1.15	0.52	9.90	36.1	0.037	0.040
08/13/2013	1.66	4.37	140	1.72	0.51	11.2	60.1	0.041	0.056

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323770—Warm Springs Creek at Warm Springs								
Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/14/2012	2.1	8.8	13.8	138	0.075	1.04	85.4	136
04/09/2013	1.6	11.2	6.6	213	<0.025	1.14	69.4	151
05/21/2013	2.3	10.9	8.0	181	0.029	0.98	86.8	144
06/04/2013	2.5	8.9	15.9	126	0.041	0.66	83.5	108
06/18/2013	--	--	9.8	17.2	--	--	--	--
07/15/2013	2.8	4.9	11.6	54.9	0.044	3.42	58.5	78.9
08/13/2013	2.5	5.3	18.3	55.2	0.048	0.22	63.5	78.9

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	3.0	4.3	3.9	4.2	--	64	5	0.65
04/09/2013	<1.4	5.8	3.7	4.9	1.00	77	10	1.2
05/21/2013	<1.4	4.8	4.2	5.6	1.66	69	9	1.6
06/04/2013	3.5	3.6	4.3	4.8	1.84	77	5	1.1
06/18/2013	4.3	<3.0	--	--	1.67	70	7	1.7
07/15/2013	<1.4	<3.0	6.2	6.6	1.24	85	2	0.19
08/13/2013	<1.4	<3.0	7.1	7.1	0.97	90	1	0.03

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323800—Clark Fork near Galen								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	1130	95	8.3	473	2.0	221	64.5	14.5
03/13/2013	1200	105	8.4	480	4.0	210	59.6	14.8
04/09/2013	1210	E105	8.2	464	3.5	199	57.2	13.6
05/21/2013	1155	133	8.4	350	11.0	154	44.6	10.3
06/04/2013	1140	242	8.8	356	10.0	145	40.7	10.5
06/18/2013	1140	184	8.7	296	14.0	123	36.0	8.18
07/16/2013	0850	57	8.2	386	14.5	174	50.5	11.5
08/13/2013	0935	38	8.4	498	14.0	225	65.1	15.1

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.041	0.082	2.8	9.3	9.4	184	0.069	1.17
03/13/2013	0.064	0.083	3.3	7.8	9.8	141	0.045	1.25
04/09/2013	0.042	0.228	3.0	20.6	12.1	471	0.130	3.91
05/21/2013	0.043	0.079	3.1	11.2	18.9	248	0.089	1.42
06/04/2013	0.042	0.101	4.1	11.9	26.9	245	0.125	1.46
06/18/2013	0.027	0.074	3.7	9.9	35.6	192	0.124	1.00
07/16/2013	0.020	0.065	1.4	6.9	15.5	96.2	0.042	0.63
08/13/2013	0.041	0.044	3.5	5.7	12.4	67.5	0.063	0.40

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	56.5	107	3.2	7.8	13.3	13.7	80	6	1.5
03/13/2013	65.2	106	3.5	7.8	7.5	8.9	76	5	1.4
04/09/2013	130	216	6.4	28.5	7.0	10.9	87	13	3.7
05/21/2013	63.4	121	1.9	9.0	10.8	12.8	84	7	2.5
06/04/2013	41.6	81.6	3.6	12.6	14.0	15.4	72	8	5.2
06/18/2013	46.6	88.0	1.6	6.7	15.4	16.1	80	6	3.0
07/16/2013	13.1	77.3	1.5	4.9	12.5	15.8	89	2	0.31
08/13/2013	40.9	57.2	2.4	3.8	22.0	21.5	96	2	0.21

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323840—Lost Creek near Anaconda									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2012	1400	10	8.0	213	0.0	<2.0	109	33.2	6.40
03/12/2013	1700	6.2	8.2	222	3.0	<2.0	104	31.0	6.50
04/08/2013	1420	7.2	8.1	217	2.0	<2.0	107	32.0	6.62
05/20/2013	1500	2.6	8.0	183	11.0	<2.0	87.5	26.1	5.44
06/03/2013	1450	9.2	8.0	175	9.5	E2.3	81.9	24.8	4.89
06/17/2013	1450	9.9	8.1	192	12.0	<2.0	88.9	27.2	5.10
07/15/2013	1320	2.4	8.2	225	13.0	<2.0	106	32.6	5.92
08/12/2013	1335	9.6	8.2	224	11.5	<2.0	107	32.3	6.47

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/13/2012	--	--	--	--	--	--	--	0.026	0.027
03/12/2013	--	--	--	--	--	--	--	0.019	0.023
04/08/2013	1.30	2.92	103	0.73	0.47	11.3	10.8	<0.016	0.017
05/20/2013	1.18	2.66	86.1	0.69	0.43	11.3	8.34	0.028	0.029
06/03/2013	1.14	2.62	82.5	0.60	0.40	11.1	7.58	0.020	0.028
06/17/2013	1.14	2.63	91.8	0.57	0.37	10.9	7.33	0.020	0.022
07/15/2013	1.39	3.18	109	0.68	0.47	11.2	8.17	0.025	0.018
08/12/2013	1.26	2.67	109	0.64	0.42	11.3	8.80	0.020	0.023

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323840—Lost Creek near Anaconda								
Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/13/2012	1.1	3.4	6.0	116	0.031	0.47	2.23	4.5
03/12/2013	0.98	4.4	5.1	115	<0.025	0.52	1.19	4.2
04/08/2013	1.2	3.1	4.6	70.5	0.045	0.29	1.68	3.2
05/20/2013	2.4	4.1	9.1	53.6	<0.025	0.22	1.48	3.1
06/03/2013	1.9	5.0	9.7	128	<0.025	0.51	1.32	4.9
06/17/2013	1.9	3.3	8.5	71.5	0.026	0.24	1.46	3.2
07/15/2013	1.6	2.1	8.7	27.3	<0.025	0.09	1.91	3.2
08/12/2013	1.2	3.2	5.7	98.3	0.027	0.36	1.64	5.3

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2012	2.7	<3.0	2.1	2.1	--	61	7	0.19
03/12/2013	<1.4	<3.0	2.1	2.4	--	43	5	0.08
04/08/2013	<1.4	<3.0	2.0	2.1	1.09	51	3	0.06
05/20/2013	<1.4	<3.0	3.9	4.0	2.30	72	2	0.01
06/03/2013	1.5	<3.0	3.9	4.1	2.31	63	8	0.20
06/17/2013	<1.4	<3.0	5.1	5.1	1.95	47	3	0.08
07/15/2013	<1.4	<3.0	5.2	5.7	1.36	56	1	0.01
08/12/2013	<1.4	<3.0	3.4	3.5	0.91	52	5	0.13

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12323850—Lost Creek near Galen								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	1055	60	8.2	589	2.0	296	87.6	18.8
03/13/2013	1125	49	8.1	588	4.0	292	84.8	19.5
04/09/2013	1135	E45	8.2	635	1.0	319	92.5	21.4
05/21/2013	1125	13	8.4	699	11.0	352	101	24.2
06/04/2013	1115	23	8.3	755	10.0	379	106	27.6
06/18/2013	1105	14	8.3	638	14.0	329	94.5	22.6
07/16/2013	0820	14	7.9	639	13.0	330	96.3	21.9
08/13/2013	0910	21	8.0	614	11.0	302	87.7	20.2

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.025	0.039	1.2	3.4	6.8	89.4	0.046	0.35
03/13/2013	0.025	0.062	1.5	6.4	15.9	180	0.057	0.78
04/09/2013	0.018	0.073	0.99	8.3	13.0	280	0.053	1.19
05/21/2013	0.032	0.021	1.6	2.7	14.9	59.6	0.029	0.20
06/04/2013	0.020	0.030	1.8	3.1	17.7	49.1	0.030	0.34
06/18/2013	0.020	0.024	1.8	3.0	13.4	45.0	0.037	0.16
07/16/2013	0.026	0.020	2.3	2.3	14.2	49.6	0.106	0.18
08/13/2013	<0.016	<0.016	1.3	2.3	11.4	34.7	<0.025	0.15

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	10.4	12.1	2.3	3.3	11.2	11.4	87	5	0.81
03/13/2013	20.0	28.6	3.0	5.2	11.5	12.1	86	8	1.1
04/09/2013	21.5	35.9	1.8	6.4	9.6	11.6	85	15	1.8
05/21/2013	19.2	21.9	3.1	3.4	11.3	12.0	46	25	0.88
06/04/2013	15.9	16.6	<1.4	<3.0	22.0	22.4	65	23	1.4
06/18/2013	13.2	21.8	<1.4	<3.0	16.4	15.9	73	9	0.34
07/16/2013	12.3	15.2	1.5	<3.0	13.5	12.3	76	25	0.95
08/13/2013	6.87	7.6	1.7	<3.0	11.8	11.4	86	10	0.57

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12324200—Clark Fork at Deer Lodge								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	1300	258	8.2	491	2.0	227	66.5	14.8
03/13/2013	1335	228	8.3	491	5.0	222	63.9	15.1
04/09/2013	1330	220	8.3	500	4.0	226	65.7	15.0
05/21/2013	1325	121	8.9	434	14.0	200	58.5	13.2
06/04/2013	1240	272	8.3	449	12.0	190	53.5	13.7
06/18/2013	1320	186	8.8	393	18.0	173	49.7	11.8
07/16/2013	1015	90	8.3	480	16.0	219	64.6	14.1
08/13/2013	1035	61	8.3	525	14.0	231	68.8	14.5

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.036	0.125	4.0	24.2	5.5	405	0.061	2.80
03/13/2013	0.070	0.107	5.6	22.8	6.5	305	0.061	2.10
04/09/2013	0.054	0.147	4.8	25.1	12.3	405	0.065	3.28
05/21/2013	0.035	0.065	5.7	13.2	18.7	156	0.111	1.10
06/04/2013	0.060	0.191	7.3	37.2	24.3	575	0.183	4.46
06/18/2013	0.047	0.082	6.2	16.0	22.8	174	0.152	1.43
07/16/2013	0.049	0.077	3.4	12.5	14.5	116	0.083	0.96
08/13/2013	0.035	0.046	5.5	9.4	8.3	76.3	0.060	0.60

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	29.7	87.3	6.4	22.0	10.2	12.0	87	18	13
03/13/2013	46.0	74.2	6.3	19.0	8.5	9.7	77	14	8.6
04/09/2013	61.2	114	5.1	22.4	9.2	12.2	87	15	8.9
05/21/2013	53.1	81.9	1.6	8.5	13.4	14.2	92	5	1.6
06/04/2013	28.1	102	6.6	32.6	15.9	20.2	80	23	17
06/18/2013	35.0	55.5	1.6	10.1	17.4	17.7	89	8	4.0
07/16/2013	50.2	59.2	2.5	8.8	14.7	17.4	96	3	0.73
08/13/2013	17.0	29.3	3.0	5.6	13.2	13.3	78	4	0.66

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12324400—Clark Fork above Little Blackfoot River, near Garrison								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	1420	249	8.4	484	2.0	227	66.5	14.7
03/13/2013	1440	255	8.6	488	6.0	219	63.0	15.1
04/09/2013	1450	226	8.6	494	5.0	218	63.1	14.7
06/04/2013	1435	303	8.4	468	14.0	200	55.9	14.6
06/18/2013	1440	208	8.6	434	19.0	195	55.2	13.8
07/16/2013	1140	110	8.6	481	17.0	215	61.5	14.9
08/13/2013	1215	71	8.5	499	17.0	217	61.8	15.2

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.035	0.143	4.2	26.9	23.0	460	0.113	3.26
03/13/2013	0.066	0.136	5.7	24.5	8.2	363	0.094	2.54
04/09/2013	0.058	0.139	6.0	25.5	9.2	383	0.068	3.02
06/04/2013	0.051	0.261	7.9	51.8	22.4	815	0.247	6.43
06/18/2013	0.045	0.118	7.3	20.9	13.5	215	0.135	2.02
07/16/2013	0.030	0.027	7.1	10.2	10.0	46.1	0.135	0.39
08/13/2013	0.024	0.034	6.2	10.0	9.2	66.9	0.113	0.57

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	27.2	104	5.5	25.6	10.8	12.5	75	23	15
03/13/2013	46.8	84.5	3.8	21.4	9.3	10.9	75	18	12
04/09/2013	50.9	104	3.1	21.9	9.6	12.1	84	17	10
06/04/2013	30.6	138	4.8	44.5	17.1	21.5	81	37	30
06/18/2013	41.4	76.3	2.1	14.8	18.4	19.4	90	9	5.1
07/16/2013	12.3	19.7	4.9	<3.0	16.2	17.4	90	17	5.0
08/13/2013	19.9	36.6	2.3	4.6	16.1	15.2	81	4	0.77

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12324680—Clark Fork at Goldcreek								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2012	1525	370	8.4	441	2.5	211	62.1	13.6
03/13/2013	1545	366	8.8	437	6.5	196	56.8	13.2
04/09/2013	1535	383	8.5	419	6.0	190	55.0	12.8
05/21/2013	1515	396	8.6	297	15.0	131	38.1	8.72
06/04/2013	1600	892	8.2	321	13.5	142	40.3	10.0
06/19/2013	0810	431	8.1	360	13.0	161	46.6	10.8
07/16/2013	1240	276	8.8	369	18.0	174	50.1	11.9
08/13/2013	1310	137	8.7	415	18.0	194	56.5	12.7

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/14/2012	0.023	0.106	3.1	18.5	5.2	335	0.058	2.29
03/13/2013	0.043	0.090	4.9	15.2	8.9	240	0.079	1.53
04/09/2013	0.026	0.089	3.7	16.5	6.3	308	0.051	2.02
05/21/2013	0.022	0.078	3.4	11.0	19.7	353	0.083	1.50
06/04/2013	0.035	0.240	4.7	37.2	34.5	1,410	0.186	6.27
06/19/2013	0.030	0.062	4.3	11.2	19.8	171	0.085	1.11
07/16/2013	<0.016	0.021	4.2	5.6	8.6	31.8	0.038	0.14
08/13/2013	0.020	0.049	3.4	7.7	7.7	126	0.054	0.72

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2012	13.9	79.5	2.8	17.6	8.5	9.1	88	16	16
03/13/2013	30.1	90.2	2.1	13.6	7.9	8.1	75	12	12
04/09/2013	26.4	69.4	1.8	15.5	7.5	9.1	83	14	14
05/21/2013	17.2	68.4	2.4	13.8	7.1	8.3	89	16	17
06/04/2013	18.9	176	3.4	44.5	9.1	14.1	73	74	178
06/19/2013	18.7	47.2	3.1	10.7	10.9	11.3	90	8	9.3
07/16/2013	5.48	9.3	<1.4	<3.0	10.6	10.8	91	5	3.7
08/13/2013	16.4	61.1	1.8	6.5	9.9	9.6	92	7	2.6

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12331800—Clark Fork near Drummond								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/15/2012	0820	582	8.2	472	3.0	227	65.1	15.6
03/14/2013	1105	586	8.2	457	6.0	211	59.6	15.1
04/10/2013	0805	565	8.1	447	7.0	207	58.6	14.8
05/22/2013	0745	398	8.0	403	13.5	184	51.8	13.3
06/05/2013	0815	1,020	8.1	367	12.0	160	44.8	11.8
06/19/2013	0920	557	8.1	437	14.5	199	56.3	14.2
07/16/2013	1345	315	8.5	453	20.0	212	58.0	16.3
08/13/2013	1415	248	8.4	538	20.0	247	68.9	18.3

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/15/2012	0.029	0.102	2.5	14.7	<4.0	346	0.052	2.55
03/14/2013	0.039	0.113	4.1	18.7	12.2	393	0.089	2.82
04/10/2013	0.029	0.130	3.7	19.9	9.6	464	0.071	3.58
05/22/2013	0.038	0.087	4.2	12.0	12.4	233	0.090	1.56
06/05/2013	0.023	0.311	4.7	48.4	26.8	1,390	0.204	8.47
06/19/2013	0.024	0.064	4.5	11.5	11.6	168	0.091	1.16
07/16/2013	0.021	0.026	4.5	5.4	8.6	24.8	0.046	0.17
08/13/2013	0.024	0.037	2.8	5.4	28.4	103	0.129	0.61

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/15/2012	11.3	86.0	5.2	20.0	8.0	8.6	83	19	30
03/14/2013	25.3	81.9	3.5	22.5	7.9	8.9	79	27	43
04/10/2013	19.9	97.0	3.4	26.2	7.5	9.8	87	25	38
05/22/2013	19.5	70.2	4.6	15.7	8.7	9.1	93	11	12
06/05/2013	15.2	175	4.4	62.0	10.0	14.3	78	78	215
06/19/2013	18.3	42.9	3.4	11.1	11.2	11.8	87	8	12
07/16/2013	4.24	9.9	<1.4	<3.0	10.9	11.0	85	4	3.4
08/13/2013	11.5	37.1	2.2	5.8	11.2	10.8	86	6	4.0

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12334550—Clark Fork at Turah Bridge, near Bonner								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/15/2012	0955	886	8.2	385	3.0	186	52.8	13.1
03/14/2013	0940	837	8.1	379	5.0	174	48.0	13.1
04/10/2013	1000	1,230	8.1	294	5.0	132	36.3	10.0
05/22/2013	0940	1,740	8.0	178	10.0	184	52.0	13.1
06/05/2013	0955	2,130	8.0	250	11.0	110	30.7	7.99
06/19/2013	1130	1,310	8.2	281	13.0	123	34.7	8.87
07/17/2013	0730	804	7.9	307	17.0	137	36.6	11.2
08/14/2013	1040	490	8.3	339	15.5	149	39.8	12.0

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/15/2012	0.018	0.071	1.8	9.2	<4.0	217	0.038	1.57
03/14/2013	0.022	0.078	2.7	11.2	6.4	248	0.059	1.70
04/10/2013	<0.016	0.073	2.1	11.4	22.2	336	0.070	1.99
05/22/2013	0.018	0.032	1.6	3.8	15.3	148	0.042	0.50
06/05/2013	0.017	0.200	2.8	27.8	23.9	757	0.169	5.18
06/19/2013	<0.016	0.059	2.2	6.6	43.1	145	0.148	0.85
07/17/2013	0.019	0.025	2.7	4.7	6.0	79.4	0.032	0.39
08/14/2013	<0.016	0.038	1.6	4.4	20.4	120	0.034	0.59

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/15/2012	5.26	54.3	3.7	14.2	5.7	6.2	91	11	26
03/14/2013	11.2	57.3	3.1	16.3	5.5	5.9	82	17	38
04/10/2013	6.87	50.8	2.3	16.6	4.4	5.3	81	18	60
05/22/2013	4.56	16.6	4.2	8.4	2.7	3.0	67	9	42
06/05/2013	6.89	110	4.0	37.6	5.9	8.4	88	38	219
06/19/2013	6.88	27.1	2.1	10.4	5.8	5.6	87	7	25
07/17/2013	4.93	16.0	2.5	5.2	4.6	4.8	86	6	13
08/14/2013	5.53	23.5	1.7	6.9	5.6	5.6	84	9	12

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12340000—Blackfoot River near Bonner								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/15/2012	1220	711	8.3	255	3.5	135	34.3	11.9
04/10/2013	1215	2,350	8.1	156	5.0	75.8	19.8	6.39
05/22/2013	1150	5,220	8.1	149	10.0	74.7	19.3	6.47
06/05/2013	1155	4,230	8.2	173	11.0	84.6	21.6	7.44
07/17/2013	0845	965	8.3	234	17.0	124	31.2	11.2
08/14/2013	0915	634	8.4	251	15.5	122	29.5	11.8

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/15/2012	<0.016	<0.016	<0.80	<0.70	<4.0	45.0	<0.025	0.04
04/10/2013	<0.016	<0.016	<0.80	<0.70	32.1	158	<0.025	0.13
05/22/2013	<0.016	<0.016	<0.80	1.1	15.0	270	<0.025	0.31
06/05/2013	<0.016	<0.016	<0.80	0.83	36.2	191	0.068	0.22
07/17/2013	<0.016	<0.016	<0.80	<0.70	7.4	29.0	<0.025	--
08/14/2013	<0.016	<0.016	<0.80	<0.70	20.9	24.6	0.031	<0.04

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/15/2012	2.36	4.8	<1.4	<3.0	0.95	1.0	83	3	5.8
04/10/2013	3.44	15.4	<1.4	<3.0	0.70	0.68	79	9	57
05/22/2013	1.85	19.5	1.7	<3.0	0.67	0.88	82	23	324
06/05/2013	3.05	13.1	<1.4	<3.0	0.77	0.92	87	14	160
07/17/2013	1.62	4.6	<1.4	<3.0	1.0	1.1	83	2	5.2
08/14/2013	5.17	5.1	<1.4	<3.0	1.2	1.1	87	2	3.4

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2012 through September 2013.—Continued

[hh, hours; mm, minutes; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; --, no data; <, less than laboratory reporting level; mm, millimeters; ton/d, tons per day; E, estimated; NTRU, nephelometric turbidity ratio unit]

12340500—Clark Fork above Missoula								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperture, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/15/2012	1405	1,640	8.4	326	3.5	160	43.9	12.3
03/14/2013	0815	1,540	8.1	316	4.5	144	38.5	11.7
04/10/2013	1405	3,660	8.1	204	5.5	93.3	25.4	7.25
05/22/2013	1405	7,200	8.1	157	10.5	73.7	19.3	6.22
06/05/2013	1340	6,520	8.3	198	12.5	92.4	24.5	7.58
06/19/2013	1345	4,060	8.2	216	13.5	101	27.1	8.08
07/17/2013	1020	1,720	8.4	263	18.0	128	33.0	11.0
08/14/2013	0755	1,090	8.2	286	16.0	128	32.5	11.3

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/15/2012	0.018	0.036	1.3	4.6	<4.0	124	0.089	0.74
03/14/2013	0.019	0.044	2.1	6.6	12.6	210	0.041	1.04
04/10/2013	<0.016	0.026	1.0	3.9	27.3	219	0.037	0.71
05/22/2013	<0.016	<0.016	1.1	2.3	17.1	250	<0.025	0.43
06/05/2013	<0.016	0.065	2.1	8.4	17.4	329	0.087	1.56
06/19/2013	<0.016	0.020	1.4	2.5	14.6	118	0.036	0.34
07/17/2013	<0.016	<0.016	1.5	1.9	5.4	48.6	<0.025	0.14
08/14/2013	<0.016	0.029	1.0	3.3	6.2	100	<0.025	0.45

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/15/2012	6.42	31.1	2.4	6.9	3.7	3.8	91	6	27
03/14/2013	15.1	43.2	2.5	11.0	3.4	3.6	88	13	54
04/10/2013	5.59	28.2	<1.4	6.3	1.8	2.3	80	13	128
05/22/2013	4.53	19.8	3.4	6.6	1.2	1.4	83	20	389
06/05/2013	5.34	41.6	2.4	11.9	2.5	3.5	88	19	334
06/19/2013	4.49	14.8	<1.4	<9.0	2.4	2.2	85	7	77
07/17/2013	5.15	10.1	1.5	<3.0	2.6	2.7	87	3	14
08/14/2013	6.11	26.9	<1.4	5.7	3.3	3.3	81	7	21

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2012 through September 2013.

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	111	11	3.3	236	17	11	255	12	8.3
2	115	10	3.1	242	19	12	263	11	7.8
3	131	10	3.5	234	21	13	274	12	8.9
4	148	10	4.0	239	23	15	270	13	9.5
5	154	10	4.2	232	21	13	264	14	10
6	155	10	4.2	237	20	13	261	16	11
7	157	10	4.2	232	18	11	251	15	10
8	162	10	4.4	e220	17	10	237	14	9.0
9	180	10	4.9	e200	18	9.7	e190	13	6.7
10	186	10	5.0	e210	19	11	e200	12	6.5
11	183	10	4.9	e220	19	11	e220	14	8.3
12	182	10	4.9	e230	20	12	243	18	12
13	182	10	4.9	250	19	13	240	22	14
14	183	12	5.9	260	18	13	e200	24	13
15	185	10	5.0	258	18	13	e210	22	12
16	193	11	5.7	265	18	13	e220	19	11
17	214	13	7.5	286	16	12	e210	17	9.6
18	206	12	6.7	286	15	12	e190	15	7.7
19	218	13	7.7	280	13	9.8	e170	15	6.9
20	221	14	8.4	279	12	9.0	e160	17	7.3
21	216	14	8.2	287	12	9.3	e160	18	7.8
22	219	14	8.3	285	12	9.2	e180	20	9.7
23	233	14	8.8	257	13	9.0	e190	23	12
24	235	13	8.2	253	13	8.9	211	26	15
25	233	12	7.5	248	14	9.4	212	28	16
26	233	12	7.5	232	14	8.8	210	31	18
27	236	12	7.6	e200	15	8.1	217	31	18
28	237	12	7.7	e210	15	8.5	218	30	18
29	233	13	8.2	241	15	9.8	e210	29	16
30	230	14	8.7	247	14	9.3	e200	28	15
31	231	15	9.4	--	--	--	e190	28	14
Total[1]	**6,002**	**--**	**192.5**	**7,356**	**--**	**326.8**	**6,726**	**--**	**349**
Mean	**194**	**12**	**6.2**	**245**	**17**	**11**	**217**	**20**	**11**
Max	**237**	**15**	**9.4**	**287**	**23**	**15**	**274**	**31**	**18**
Min	**111**	**10**	**3.1**	**200**	**12**	**8.1**	**160**	**11**	**6.5**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2012 through September 2013.—Continued

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		January			February			March	
1	e180	29	14	230	35	22	220	19	11
2	e170	29	13	229	34	21	235	19	12
3	e160	30	13	226	32	20	240	18	12
4	e160	32	14	230	31	19	227	17	10
5	e180	34	17	227	29	18	209	17	9.6
6	e190	37	19	224	25	15	224	17	10
7	e200	39	21	217	21	12	234	16	10
8	215	37	21	219	19	11	237	16	10
9	221	33	20	219	19	11	231	16	10
10	224	30	18	221	21	13	232	15	9.4
11	e180	28	14	207	22	12	236	15	9.6
12	e150	27	11	e200	23	12	224	14	8.5
13	e160	28	12	e210	23	13	229	14	8.7
14	e170	28	13	217	22	13	237	14	9.0
15	e170	29	13	216	21	12	240	16	10
16	e180	31	15	219	20	12	238	18	12
17	e200	33	18	226	19	12	239	19	12
18	e220	36	21	220	18	11	231	19	12
19	e210	38	22	215	17	9.9	229	20	12
20	e200	37	20	e210	16	9.1	233	20	13
21	e190	33	17	211	16	9.1	231	20	12
22	e180	30	15	e210	18	10	215	20	12
23	e190	28	14	219	19	11	207	19	11
24	222	29	17	210	20	11	e190	20	10
25	226	33	20	215	20	12	210	23	13
26	232	37	23	215	20	12	221	22	13
27	232	41	26	211	20	11	219	19	11
28	e210	41	23	214	20	12	216	15	8.7
29	e210	39	22	--	--	--	218	17	10
30	224	38	23	--	--	--	224	20	12
31	226	36	22	--	--	--	221	15	9.0
Total[1]	**6,082**	**--**	**551**	**6,087**	**--**	**366.1**	**6,997**	**--**	**332.5**
Mean	**196**	**33**	**18**	**217**	**22**	**13**	**226**	**18**	**11**
Max	**232**	**41**	**26**	**230**	**35**	**22**	**240**	**23**	**13**
Min	**150**	**27**	**11**	**200**	**16**	**9.1**	**190**	**14**	**8.5**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2012 through September 2013.—Continued

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	April			May			June		
1	221	16	9.5	177	9	4.3	303	32	26
2	221	16	9.5	167	9	4.1	275	20	15
3	219	14	8.3	158	8	3.4	290	21	16
4	221	17	10	156	9	3.8	278	23	17
5	226	16	9.8	155	10	4.2	256	16	11
6	225	15	9.1	153	8	3.3	225	13	7.9
7	e220	16	9.5	144	9	3.5	228	11	6.8
8	e220	19	11	137	11	4.1	228	13	8.0
9	222	17	10	133	8	2.9	231	12	7.5
10	223	14	8.4	132	6	2.1	212	11	6.3
11	220	14	8.3	136	7	2.6	188	10	5.1
12	213	12	6.9	136	7	2.6	210	13	7.4
13	213	15	8.6	142	13	5.0	221	19	11
14	207	13	7.3	167	25	11	271	26	19
15	205	14	7.7	183	15	7.4	258	19	13
16	198	14	7.5	149	7	2.8	228	16	9.8
17	196	15	7.9	132	9	3.2	199	18	9.7
18	197	13	6.9	142	9	3.5	190	9	4.6
19	202	12	6.5	144	9	3.5	186	6	3.0
20	203	12	6.6	138	10	3.7	190	8	4.1
21	201	9	4.9	123	10	3.3	185	8	4.0
22	198	11	5.9	116	116	36	182	8	3.9
23	197	12	6.4	202	138	75	187	6	3.0
24	193	10	5.2	310	50	42	181	6	2.9
25	192	11	5.7	250	17	11	193	9	4.7
26	183	11	5.4	203	28	15	187	11	5.6
27	179	12	5.8	224	41	25	187	13	6.6
28	179	12	5.8	278	60	45	185	7	3.5
29	171	11	5.1	336	63	57	176	10	4.8
30	176	10	4.8	349	47	44	173	8	3.7
31	--	--	--	344	35	33	--	--	--
Total[1]	**6,141**	**--**	**224.3**	**5,716**	**--**	**467.3**	**6,503**	**--**	**250.9**
Mean	**205**	**13**	**7.5**	**184**	**26**	**15**	**217**	**13**	**8.4**
Max	**226**	**19**	**11**	**349**	**138**	**75**	**303**	**32**	**26**
Min	**171**	**9**	**4.8**	**116**	**6**	**2.1**	**173**	**6**	**2.9**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2012 through September 2013.—Continued

[ft³/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	July			August			September		
1	168	5	2.3	63	17	2.9	72	21	4.1
2	158	4	1.7	86	19	4.4	75	20	4.0
3	150	4	1.6	97	18	4.7	77	20	4.2
4	155	5	2.1	85	16	3.7	79	19	4.1
5	148	6	2.4	76	14	2.9	87	18	4.2
6	144	5	1.9	65	13	2.3	100	17	4.6
7	142	5	1.9	58	13	2.0	107	19	5.5
8	133	6	2.2	55	12	1.8	100	16	4.3
9	131	6	2.1	57	12	1.8	102	15	4.1
10	121	7	2.3	64	11	1.9	102	16	4.4
11	119	7	2.2	66	9	1.6	96	13	3.4
12	120	7	2.3	65	6	1.1	97	13	3.4
13	113	14	4.3	65	3	0.53	97	13	3.4
14	108	12	3.5	71	6	1.2	99	12	3.2
15	103	4	1.1	71	4	0.77	102	12	3.3
16	91	4	0.98	66	5	0.89	100	12	3.2
17	92	7	1.7	63	5	0.85	100	13	3.5
18	110	17	5.0	66	5	0.89	112	14	4.2
19	97	14	3.7	63	5	0.85	117	16	5.1
20	88	12	2.9	57	6	0.92	116	14	4.4
21	83	10	2.2	56	6	0.91	111	11	3.3
22	80	9	1.9	61	13	2.1	108	9	2.6
23	73	9	1.8	59	9	1.4	123	10	3.3
24	67	8	1.4	62	11	1.8	131	9	3.2
25	66	7	1.2	57	8	1.2	148	9	3.6
26	64	8	1.4	58	10	1.6	160	10	4.3
27	60	11	1.8	61	8	1.3	160	10	4.3
28	56	14	2.1	57	6	0.92	162	10	4.4
29	58	16	2.5	70	16	3.0	160	10	4.3
30	56	16	2.4	73	22	4.3	172	10	4.6
31	60	17	2.8	72	21	4.1	--	--	--
Total[1]	**3,214**	**--**	**69.68**	**2,045**	**--**	**60.63**	**3,372**	**--**	**118.5**
Mean	**104**	**9**	**2.2**	**66**	**11**	**2.0**	**112**	**14**	**4.0**
Max	**168**	**17**	**5.0**	**97**	**22**	**4.7**	**172**	**21**	**5.5**
Min	**56**	**4**	**0.98**	**55**	**3**	**0.53**	**72**	**9**	**2.6**

[1]Total for water year 2013 (unrounded sum of daily values): streamflow=66,241 ft³/s (annual runoff=131,400 acre-feet); suspended-sediment discharge=3,309.21 tons.

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2012 through September 2013.

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	584	6	9.5	945	14	36	921	10	25
2	590	6	9.6	948	14	36	998	13	35
3	614	6	9.9	939	15	38	1,130	21	64
4	634	6	10	919	16	40	1,080	16	47
5	679	7	13	898	16	39	1,040	12	34
6	712	9	17	884	14	33	1,070	14	40
7	738	12	24	882	12	29	1,040	11	31
8	753	12	24	887	11	26	992	7	19
9	759	13	27	897	10	24	847	6	14
10	776	13	27	886	9	22	817	6	13
11	789	13	28	794	9	19	860	7	16
12	793	14	30	e750	9	18	926	11	28
13	801	15	32	858	10	23	925	10	25
14	808	17	37	891	12	29	833	8	18
15	814	19	42	894	12	29	793	6	13
16	900	23	56	884	12	29	819	6	13
17	980	25	66	878	13	31	841	6	14
18	964	20	52	904	13	32	834	5	11
19	922	15	37	915	13	32	751	4	8.1
20	913	13	32	906	14	34	704	4	7.6
21	916	13	32	1,020	22	61	e730	4	7.9
22	910	12	29	1,110	32	96	775	4	8.4
23	919	12	30	1,010	20	55	795	4	8.6
24	927	12	30	944	13	33	805	5	11
25	921	12	30	954	13	33	780	5	11
26	917	12	30	922	10	25	782	5	11
27	915	12	30	792	9	19	796	5	11
28	943	12	31	e750	8	16	828	5	11
29	955	12	31	878	8	19	763	5	10
30	961	14	36	913	9	22	699	5	9.4
31	966	14	37	--	--	--	750	5	10
Total[1]	**25,773**	**--**	**929**	**27,052**	**--**	**978**	**26,724**	**--**	**585**
Mean	**831**	**13**	**30**	**902**	**13**	**33**	**862**	**8**	**19**
Max	**980**	**25**	**66**	**1,110**	**32**	**96**	**1,130**	**21**	**64**
Min	**584**	**6**	**9.5**	**750**	**8**	**16**	**699**	**4**	**7.6**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2012 through September 2013.—Continued

[ft³/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	January			February			March		
1	e700	5	9.5	807	6	13	745	8	16
2	e650	4	7.0	820	8	18	783	10	21
3	e600	4	6.5	789	8	17	832	17	38
4	e550	3	4.5	790	7	15	873	19	45
5	e600	3	4.9	822	8	18	797	12	26
6	e650	3	5.3	816	9	20	770	10	21
7	735	4	7.9	795	9	19	804	11	24
8	799	6	13	768	10	21	798	11	24
9	827	6	13	790	11	23	790	10	21
10	850	5	11	778	10	21	783	9	19
11	e750	3	6.1	729	9	18	790	9	19
12	e650	2	3.5	742	8	16	805	11	24
13	e550	2	3.0	760	8	16	807	15	33
14	e550	2	3.0	790	9	19	861	18	42
15	e600	2	3.2	769	10	21	929	23	58
16	e650	2	3.5	771	11	23	991	29	78
17	e700	2	3.8	792	12	26	1,010	23	63
18	e700	3	5.7	788	11	23	960	17	44
19	e750	4	8.1	766	9	19	916	15	37
20	e770	4	8.3	770	7	15	896	14	34
21	e770	4	8.3	756	6	12	922	16	40
22	e750	4	8.1	737	6	12	920	15	37
23	755	4	8.2	761	5	10	865	11	26
24	792	4	8.6	754	5	10	828	10	22
25	804	6	13	734	5	9.9	819	11	24
26	808	4	8.7	731	6	12	823	13	29
27	813	3	6.6	726	7	14	848	16	37
28	779	2	4.2	726	7	14	861	18	42
29	769	2	4.2	--	--	--	889	19	46
30	780	3	6.3	--	--	--	928	20	50
31	782	4	8.4	--	--	--	970	22	58
Total[1]	**22,233**	**--**	**215.4**	**21,577**	**--**	**474.9**	**26,613**	**--**	**1,098**
Mean	**717**	**4**	**6.9**	**771**	**8**	**17**	**858**	**15**	**35**
Max	**850**	**6**	**13**	**822**	**12**	**26**	**1,010**	**29**	**78**
Min	**550**	**2**	**3.0**	**726**	**5**	**9.9**	**745**	**8**	**16**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2012 through September 2013.—Continued

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	1,020	24	66	1,210	14	46	2,100	34	193
2	1,080	27	79	1,150	12	37	1,930	24	125
3	1,150	33	102	1,100	12	36	2,070	32	179
4	1,220	35	115	1,100	12	36	2,150	31	180
5	1,310	36	127	1,110	12	36	2,080	37	208
6	1,410	41	156	1,150	12	37	1,870	30	151
7	1,430	34	131	1,290	18	63	1,760	25	119
8	1,400	28	106	1,510	31	126	1,690	23	105
9	1,310	19	67	1,710	36	166	1,640	25	111
10	1,230	19	63	1,840	35	174	1,560	22	93
11	1,210	19	62	2,000	36	194	1,470	19	75
12	1,180	18	57	2,190	38	225	1,400	16	60
13	1,150	19	59	2,470	48	320	1,470	17	67
14	1,140	15	46	2,770	56	419	1,710	23	106
15	1,100	14	42	2,700	40	292	1,670	20	90
16	1,050	12	34	2,420	25	163	1,500	15	61
17	1,000	9	24	2,240	19	115	1,390	12	45
18	991	11	29	2,130	16	92	1,300	9	32
19	982	12	32	2,050	15	83	1,310	8	28
20	988	13	35	1,900	13	67	1,440	11	43
21	987	12	32	1,780	12	58	1,490	13	52
22	989	11	29	1,810	13	64	1,440	10	39
23	959	9	23	1,900	14	72	1,390	6	23
24	942	12	31	1,970	19	101	1,390	6	23
25	934	10	25	1,960	26	138	1,420	7	27
26	935	8	20	1,850	22	110	1,440	6	23
27	963	12	31	1,840	20	99	1,390	4	15
28	1,050	12	34	2,000	26	140	1,310	4	14
29	1,200	17	55	2,250	41	249	1,220	3	9.9
30	1,260	18	61	2,280	45	277	1,160	4	13
31	--	--	--	2,240	42	254	--	--	--
Total[1]	**33,570**	**--**	**1,773**	**57,920**	**--**	**4,289**	**47,160**	**--**	**2,309.9**
Mean	**1,119**	**19**	**59**	**1,868**	**25**	**138**	**1,572**	**17**	**77**
Max	**1,430**	**41**	**156**	**2,770**	**56**	**419**	**2,150**	**37**	**208**
Min	**934**	**8**	**20**	**1,100**	**12**	**36**	**1,160**	**3**	**9.9**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2012 through September 2013.—Continued

[ft³/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	July			August			September		
1	1,120	6	18	507	10	14	387	4	4.2
2	1,080	5	15	545	12	18	383	4	4.1
3	1,020	3	8.3	566	15	23	388	4	4.2
4	983	2	5.3	539	14	20	401	4	4.3
5	964	2	5.2	514	13	18	421	5	5.7
6	956	2	5.2	497	13	17	484	8	10
7	921	2	5.0	480	13	17	523	8	11
8	897	2	4.8	460	13	16	511	7	9.7
9	872	2	4.7	458	13	16	504	6	8.2
10	843	2	4.6	517	14	20	494	6	8.0
11	825	2	4.5	530	14	20	484	6	7.8
12	820	2	4.4	500	14	19	469	6	7.6
13	832	3	6.7	492	14	19	452	6	7.3
14	813	4	8.8	480	11	14	451	6	7.3
15	781	5	11	456	9	11	459	6	7.4
16	781	6	13	443	8	9.6	457	6	7.4
17	793	7	15	433	8	9.4	462	8	10
18	805	7	15	421	7	8.0	485	10	13
19	789	8	17	417	7	7.9	501	11	15
20	744	8	16	410	6	6.6	506	10	14
21	707	9	17	398	6	6.4	506	10	14
22	684	10	18	385	6	6.2	514	10	14
23	666	9	16	381	6	6.2	528	11	16
24	637	9	15	379	6	6.1	554	13	19
25	612	10	17	381	6	6.2	622	19	32
26	587	11	17	383	6	6.2	676	25	46
27	558	10	15	384	6	6.2	717	25	48
28	527	9	13	388	6	6.3	708	24	46
29	516	8	11	398	6	6.4	716	23	44
30	503	8	11	403	6	6.5	801	25	54
31	494	9	12	392	5	5.3	--	--	--
Total[1]	**24,130**	**--**	**349.5**	**13,937**	**--**	**371.5**	**15,564**	**--**	**499.2**
Mean	**778**	**6**	**11**	**450**	**9**	**12**	**519**	**11**	**17**
Max	**1,120**	**11**	**18**	**566**	**15**	**23**	**801**	**25**	**54**
Min	**494**	**2**	**4.4**	**379**	**5**	**5.3**	**383**	**4**	**4.1**

[1]Total for water year 2013 (unrounded sum of daily values): streamflow=342,253 ft³/s (annual runoff=678,900 acre-feet); suspended-sediment discharge=13,872.4 tons.

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2012 through September 2013.

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	531	4	5.7	668	4	7.2	754	4	8.1
2	528	4	5.7	670	5	9.0	823	5	11
3	542	4	5.9	698	6	11	905	7	17
4	540	4	5.8	719	6	12	902	7	17
5	547	3	4.4	728	7	14	902	7	17
6	550	3	4.5	726	7	14	914	7	17
7	552	2	3.0	727	6	12	899	6	15
8	552	2	3.0	730	6	12	874	5	12
9	550	2	3.0	744	6	12	771	4	8.3
10	545	2	2.9	713	5	9.6	813	4	8.8
11	546	2	2.9	680	5	9.2	817	4	8.8
12	544	2	2.9	689	4	7.4	811	4	8.8
13	544	3	4.4	704	4	7.6	795	4	8.6
14	549	3	4.4	706	3	5.7	738	4	8.0
15	557	4	6.0	710	3	5.8	712	3	5.8
16	613	4	6.6	700	4	7.6	738	3	6.0
17	627	6	10	687	4	7.4	752	3	6.1
18	625	7	12	689	4	7.4	757	3	6.1
19	602	7	11	680	6	11	e700	3	5.7
20	600	6	9.7	676	7	13	e550	4	5.9
21	597	5	8.1	779	9	19	e580	4	6.3
22	597	4	6.4	871	12	28	e650	4	7.0
23	606	2	3.3	822	12	27	741	3	6.0
24	603	1	1.6	783	9	19	709	3	5.7
25	605	1	1.6	775	6	13	659	2	3.6
26	597	2	3.2	741	5	10	655	2	3.5
27	607	2	3.3	681	4	7.4	703	2	3.8
28	633	2	3.4	721	4	7.8	e750	2	4.0
29	671	3	5.4	709	4	7.7	e700	2	3.8
30	695	3	5.6	717	4	7.7	e650	2	3.5
31	682	4	7.4	--	--	--	e600	2	3.2
Total[1]	**18,137**	**--**	**163.1**	**21,643**	**--**	**341.5**	**23,324**	**--**	**251.4**
Mean	**585**	**3**	**5.3**	**721**	**6**	**11**	**752**	**4**	**8.1**
Max	**695**	**7**	**12**	**871**	**12**	**28**	**914**	**7**	**17**
Min	**528**	**1**	**1.6**	**668**	**3**	**5.7**	**550**	**2**	**3.2**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2012 through September 2013.—Continued

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		January			February			March	
1	e600	2	3.2	660	6	11	560	3	4.5
2	e550	2	3.0	646	6	10	603	5	8.1
3	e450	2	2.4	659	7	12	649	6	11
4	e400	2	2.2	633	7	12	673	6	11
5	e450	3	3.6	629	8	14	627	7	12
6	e600	4	6.5	617	7	12	627	7	12
7	e650	5	8.8	605	6	9.8	623	6	10
8	e700	5	9.5	595	4	6.4	613	5	8.3
9	699	6	11	592	3	4.8	610	5	8.2
10	685	5	9.2	579	3	4.7	612	5	8.3
11	648	5	8.7	558	3	4.5	620	5	8.4
12	e500	4	5.4	580	4	6.3	628	6	10
13	e400	4	4.3	581	4	6.3	646	7	12
14	e350	3	2.8	586	4	6.3	701	10	19
15	e380	3	3.1	582	4	6.3	770	14	29
16	e400	3	3.2	582	4	6.3	859	18	42
17	e400	2	2.2	590	4	6.4	887	17	41
18	e450	2	2.4	587	3	4.8	868	11	26
19	e520	2	2.8	582	3	4.7	856	10	23
20	e550	2	3.0	579	3	4.7	863	10	23
21	e500	2	2.7	569	2	3.1	899	10	24
22	e480	3	3.9	568	2	3.1	891	9	22
23	e470	4	5.1	570	3	4.6	871	8	19
24	e550	5	7.4	561	3	4.5	840	7	16
25	e700	6	11	555	4	6.0	827	8	18
26	e680	5	9.2	553	4	6.0	824	8	18
27	e660	5	8.9	545	3	4.4	824	8	18
28	e650	4	7.0	546	3	4.4	833	8	18
29	650	3	5.3	--	--	--	867	9	21
30	650	4	7.0	--	--	--	919	10	25
31	654	5	8.8	--	--	--	996	11	30
Total[1]	**17,026**	**--**	**173.6**	**16,489**	**--**	**189.4**	**23,486**	**--**	**555.8**
Mean	**549**	**4**	**5.6**	**589**	**4**	**6.8**	**758**	**8**	**18**
Max	**700**	**6**	**11**	**660**	**8**	**14**	**996**	**18**	**42**
Min	**350**	**2**	**2.2**	**545**	**2**	**3.1**	**560**	**3**	**4.5**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2012 through September 2013.—Continued

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	1,110	15	45	2,650	13	93	4,590	14	174
2	1,280	21	73	2,530	11	75	4,310	14	163
3	1,480	23	92	2,420	10	65	4,260	13	150
4	1,710	25	115	2,360	9	57	4,350	15	176
5	1,950	26	137	2,350	10	63	4,210	14	159
6	2,280	28	172	2,530	11	75	4,080	13	143
7	2,540	33	226	3,020	18	147	4,220	14	160
8	2,590	22	154	3,830	33	341	4,480	16	194
9	2,460	13	86	4,740	45	576	4,540	17	208
10	2,320	10	63	5,760	55	855	4,420	15	179
11	2,190	9	53	6,490	62	1,090	4,150	14	157
12	2,060	8	44	7,000	64	1,210	3,940	13	138
13	1,960	8	42	8,050	85	1,850	3,860	13	135
14	1,890	7	36	9,680	180	4,700	3,880	14	147
15	1,780	7	34	9,290	126	3,160	3,560	14	135
16	1,670	5	23	7,950	79	1,700	3,140	11	93
17	1,580	4	17	6,770	51	932	2,870	9	70
18	1,500	6	24	5,960	36	579	2,730	9	66
19	1,450	4	16	5,500	30	446	2,690	8	58
20	1,430	4	15	5,180	26	364	2,830	9	69
21	1,450	4	16	5,030	25	340	2,970	13	104
22	1,500	4	16	5,210	24	338	2,730	9	66
23	1,490	3	12	5,810	29	455	2,550	7	48
24	1,490	4	16	e5700	28	431	2,410	6	39
25	1,480	4	16	5,210	22	309	2,380	7	45
26	1,480	4	16	4,700	18	228	2,380	8	51
27	1,590	6	26	4,490	19	230	2,290	8	49
28	1,940	9	47	4,580	16	198	2,110	7	40
29	2,410	17	111	4,860	19	249	2,000	6	32
30	2,630	20	142	4,900	17	225	1,930	6	31
31	--	--	--	4,930	17	226	--	--	--
Total[1]	**54,690**	**--**	**1,885**	**159,480**	**--**	**21,607**	**100,860**	**--**	**3,279**
Mean	**1,823**	**12**	**63**	**5,145**	**38**	**697**	**3,362**	**11**	**109**
Max	**2,630**	**33**	**226**	**9,680**	**180**	**4,700**	**4,590**	**17**	**208**
Min	**1,110**	**3**	**12**	**2,350**	**9**	**57**	**1,930**	**6**	**31**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2012 through September 2013.—Continued

[ft³/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	July			August			September		
1	1,820	6	29	689	2	3.7	478	2	2.6
2	1,720	5	23	736	2	4.0	475	2	2.6
3	1,620	5	22	755	2	4.1	479	2	2.6
4	1,530	5	21	741	2	4.0	493	2	2.7
5	1,460	4	16	704	2	3.8	499	2	2.7
6	1,410	4	15	669	2	3.6	517	2	2.8
7	1,360	3	11	652	2	3.5	515	2	2.8
8	1,300	3	11	641	2	3.5	519	2	2.8
9	1,290	3	10	639	2	3.5	540	2	2.9
10	1,240	3	10	643	2	3.5	530	2	2.9
11	1,200	3	9.7	640	2	3.5	512	2	2.8
12	1,160	2	6.3	644	2	3.5	494	2	2.7
13	1,140	2	6.2	648	2	3.5	483	2	2.6
14	1,090	2	5.9	629	2	3.4	476	2	2.6
15	1,060	2	5.7	604	2	3.3	484	2	2.6
16	1,010	2	5.5	586	1	1.6	486	2	2.6
17	967	2	5.2	575	1	1.6	491	2	2.7
18	952	1	2.6	567	1	1.5	499	2	2.7
19	924	2	5.0	550	2	3.0	513	2	2.8
20	900	3	7.3	538	2	2.9	511	3	4.1
21	868	3	7.0	527	2	2.8	515	3	4.2
22	841	3	6.8	524	2	2.8	516	3	4.2
23	827	3	6.7	522	2	2.8	521	3	4.2
24	802	2	4.3	514	2	2.8	526	3	4.3
25	780	2	4.2	524	2	2.8	552	3	4.5
26	762	2	4.1	517	2	2.8	560	3	4.5
27	744	3	6.0	506	2	2.7	550	3	4.5
28	730	4	7.9	507	2	2.7	550	3	4.5
29	713	2	3.9	503	2	2.7	559	3	4.5
30	703	2	3.8	502	2	2.7	584	3	4.7
31	693	2	3.7	488	2	2.6	--	--	--
Total[1]	**33,616**	**--**	**285.8**	**18,484**	**--**	**95.2**	**15,427**	**--**	**99.7**
Mean	**1,084**	**3**	**9.2**	**596**	**2**	**3.1**	**514**	**2**	**3.3**
Max	**1,820**	**6**	**29**	**755**	**2**	**4.1**	**584**	**3**	**4.7**
Min	**693**	**1**	**2.6**	**488**	**1**	**1.5**	**475**	**2**	**2.6**

[1]Total for water year 2013 (unrounded sum of daily values): streamflow=502,662 ft³/s (annual runoff=997,000 acre-feet); suspended-sediment discharge=28,926.5 tons.

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2012 through September 2013.

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	1,150	4	12	1,620	8	35	1,730	6	28
2	1,150	3	9.3	1,620	8	35	1,860	7	35
3	1,190	3	9.6	1,630	8	35	2,080	8	45
4	1,200	2	6.5	1,640	9	40	2,050	8	44
5	1,240	3	10	1,640	9	40	2,020	8	44
6	1,280	4	14	1,630	8	35	2,050	9	50
7	1,300	5	18	1,630	7	31	2,020	7	38
8	1,320	6	21	1,630	7	31	1,960	5	26
9	1,320	6	21	1,660	6	27	1,730	4	19
10	1,330	7	25	1,630	6	26	1,680	4	18
11	1,340	7	25	1,520	5	21	1,760	5	24
12	1,340	7	25	1,510	5	20	1,810	6	29
13	1,350	7	26	1,570	6	25	1,790	5	24
14	1,360	8	29	1,630	7	31	1,660	5	22
15	1,370	10	37	1,630	7	31	1,580	4	17
16	1,490	11	44	1,620	6	26	1,620	3	13
17	1,580	10	43	1,600	6	26	1,650	4	18
18	1,570	9	38	1,620	6	26	1,640	3	13
19	1,510	8	33	1,620	6	26	1,510	3	12
20	1,500	7	28	1,610	6	26	e1,300	2	7.0
21	1,500	7	28	1,810	11	54	e1,350	2	7.3
22	1,500	7	28	2,010	11	60	e1,500	3	12
23	1,510	6	24	1,890	7	36	1,590	7	30
24	1,520	6	25	1,770	7	33	1,570	8	34
25	1,520	6	25	1,770	7	33	1,480	6	24
26	1,510	6	24	1,720	5	23	e1,400	3	11
27	1,520	6	25	1,550	4	17	e1,500	4	16
28	1,580	6	26	1,520	4	16	1,590	6	26
29	1,630	7	31	1,620	4	17	1,500	2	8.1
30	1,660	9	40	1,680	5	23	1,400	2	7.6
31	1,650	8	36	--	--	--	e1,400	3	11
Total[1]	**43,990**	**--**	**786.4**	**49,600**	**--**	**905**	**51,780**	**--**	**713**
Mean	**1,419**	**6**	**25**	**1,653**	**7**	**30**	**1,670**	**5**	**23**
Max	**1,660**	**11**	**44**	**2,010**	**11**	**60**	**2,080**	**9**	**50**
Min	**1,150**	**2**	**6.5**	**1,510**	**4**	**16**	**1,300**	**2**	**7.0**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2012 through September 2013.—Continued

[ft³/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	January			February			March		
1	e1,350	1	3.6	1,490	4	16	1,320	6	21
2	e1,300	1	3.5	1,490	4	16	1,390	7	26
3	e1,100	2	5.9	1,450	5	20	1,480	8	32
4	e1,000	3	8.1	1,450	5	20	1,560	12	51
5	e1,100	4	12	1,490	5	20	1,460	9	35
6	e1,300	4	14	1,470	6	24	1,420	8	31
7	e1,450	4	16	1,450	6	23	1,450	8	31
8	1,540	5	21	1,410	6	23	1,440	8	31
9	1,540	5	21	1,420	6	23	1,420	8	31
10	1,570	5	21	1,400	6	23	1,420	8	31
11	1,470	5	20	1,340	6	22	1,440	8	31
12	e1,250	4	14	1,350	6	22	1,460	8	32
13	e1,000	4	11	1,370	6	22	1,470	9	36
14	e950	4	10	1,410	6	23	1,560	12	51
15	e1,100	5	15	1,390	6	23	1,690	16	73
16	e1,150	5	16	1,390	6	23	1,870	22	111
17	e1,150	6	19	1,410	6	23	1,940	18	94
18	e1,200	6	19	1,410	6	23	1,880	14	71
19	e1,350	5	18	1,380	6	22	1,820	12	59
20	e1,400	5	19	1,390	6	23	1,800	11	53
21	e1,350	5	18	1,360	6	22	1,850	13	65
22	e1,300	5	18	1,350	6	22	1,850	10	50
23	e1,300	5	18	1,370	5	18	1,780	9	43
24	e1,450	6	23	1,360	4	15	1,700	9	41
25	1,510	6	24	1,330	4	14	1,680	8	36
26	1,490	5	20	1,320	4	14	1,680	8	36
27	1,470	4	16	1,300	5	18	1,700	9	41
28	1,420	4	15	1,300	5	18	1,710	11	51
29	1,410	3	11	--	--	--	1,770	11	53
30	1,420	3	12	--	--	--	1,860	12	60
31	1,440	4	16	--	--	--	1,980	15	80
Total[1]	**40,830**	**--**	**478.1**	**39,050**	**--**	**575**	**50,850**	**--**	**1,487**
Mean	**1,317**	**4**	**15**	**1,395**	**5**	**21**	**1,640**	**11**	**48**
Max	**1,570**	**6**	**24**	**1,490**	**6**	**24**	**1,980**	**22**	**111**
Min	**950**	**1**	**3.5**	**1,300**	**4**	**14**	**1,320**	**6**	**21**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2012 through September 2013.—Continued

[ft^3/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	2,130	19	109	3,960	14	150	6,910	20	373
2	2,370	23	147	3,770	12	122	6,430	16	278
3	2,630	26	185	3,600	10	97	6,480	16	280
4	2,960	30	240	3,540	10	96	6,680	18	325
5	3,280	29	257	3,530	10	95	6,500	19	333
6	3,740	32	323	3,730	12	121	6,150	18	299
7	4,080	34	375	4,370	18	212	6,140	16	265
8	4,120	22	245	5,460	34	501	6,330	16	273
9	3,890	14	147	6,660	47	845	6,360	16	275
10	3,640	14	138	7,760	53	1,110	6,160	17	283
11	3,490	14	132	8,630	60	1,400	5,810	15	235
12	3,320	12	108	9,240	63	1,570	5,520	12	179
13	3,180	12	103	10,400	84	2,360	5,470	15	222
14	3,090	10	83	12,300	155	5,150	5,730	15	232
15	2,950	9	72	12,000	142	4,600	5,420	14	205
16	2,790	8	60	10,500	70	1,980	4,820	12	156
17	2,630	6	43	9,140	46	1,140	4,410	11	131
18	2,540	6	41	8,170	33	728	4,160	10	112
19	2,480	8	54	7,630	24	494	4,090	9	99
20	2,450	8	53	7,200	21	408	4,340	9	105
21	2,470	6	40	6,910	20	373	4,540	10	123
22	2,530	5	34	7,110	20	384	4,270	8	92
23	2,500	6	40	7,800	23	484	4,020	6	65
24	2,470	7	47	7,890	24	511	3,840	6	62
25	2,450	8	53	7,400	22	440	3,820	7	72
26	2,450	8	53	6,780	19	348	3,830	7	72
27	2,560	11	76	6,500	16	281	3,690	7	70
28	2,960	14	112	6,730	17	309	3,420	5	46
29	3,620	18	176	7,260	24	470	3,210	5	43
30	3,970	20	214	7,350	26	516	3,060	5	41
31	--	--	--	7,380	24	478	--	--	--
Total[1]	**89,740**	**--**	**3,760**	**220,700**	**--**	**27,773**	**151,610**	**--**	**5,346**
Mean	**2,991**	**15**	**125**	**7,119**	**37**	**896**	**5,054**	**12**	**178**
Max	**4,120**	**34**	**375**	**12,300**	**155**	**5,150**	**6,910**	**20**	**373**
Min	**2,130**	**5**	**34**	**3,530**	**10**	**95**	**3,060**	**5**	**41**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2012 through September 2013.—Continued

[ft³/s, cubic feet per second; mg/L, milligrams per liter; ton/d, tons per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	July			August			September		
1	2,910	6	47	1,150	9	28	828	6	13
2	2,770	7	52	1,230	7	23	817	6	13
3	2,610	5	35	1,280	10	35	829	6	13
4	2,460	4	27	1,250	8	27	854	6	14
5	2,370	4	26	1,180	7	22	871	6	14
6	2,290	4	25	1,130	7	21	938	7	18
7	2,230	3	18	1,100	6	18	989	9	24
8	2,140	3	17	1,060	6	17	981	7	19
9	2,110	3	17	1,050	5	14	998	9	24
10	2,030	3	16	1,120	8	24	981	6	16
11	1,970	5	27	1,130	7	21	953	5	13
12	1,920	6	31	1,100	7	21	921	5	12
13	1,920	4	21	1,100	7	21	895	4	9.7
14	1,870	4	20	1,070	7	20	878	4	9.5
15	1,800	4	19	1,030	7	19	894	4	9.7
16	1,750	4	19	993	8	21	896	5	12
17	1,720	4	19	970	8	21	903	5	12
18	1,700	3	14	947	7	18	933	6	15
19	1,670	3	14	925	7	17	961	6	16
20	1,610	4	17	907	7	17	967	5	13
21	1,540	6	25	885	7	17	969	5	13
22	1,490	8	32	871	6	14	976	5	13
23	1,450	8	31	865	6	14	997	6	16
24	1,390	8	30	857	6	14	1,030	7	19
25	1,340	7	25	864	6	14	1,120	10	30
26	1,300	6	21	869	6	14	1,190	12	39
27	1,250	5	17	854	6	14	1,220	13	43
28	1,210	5	16	853	6	14	1,220	12	40
29	1,180	6	19	865	6	14	1,230	11	37
30	1,160	7	22	870	6	14	1,330	12	43
31	1,140	8	25	843	6	14	--	--	--
Total[1]	**56,300**	**--**	**744**	**31,218**	**--**	**582**	**29,569**	**--**	**582.9**
Mean	**1,816**	**5**	**24**	**1,007**	**7**	**19**	**986**	**7**	**19**
Max	**2,910**	**8**	**52**	**1,280**	**10**	**35**	**1,330**	**13**	**43**
Min	**1,140**	**3**	**14**	**843**	**5**	**14**	**817**	**4**	**9.5**

[1]Total for water year 2013 (unrounded sum of daily values): streamflow=855,237 ft³/s (annual runoff=1,696,000 acre-feet); suspended-sediment discharge=43,732.4 tons.

Table 9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana (12323700), April through September 2013.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data; <, less than]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	2.5	1.0	1.5	6.0	3.5	4.5
2	--	--	--	3.5	1.5	2.0	6.0	3.0	4.0
3	--	--	--	2.5	1.5	2.0	5.0	3.0	3.5
4	--	--	--	3.5	1.5	2.0	5.0	3.0	4.0
5	--	--	--	3.5	0.5	2.0	5.0	2.5	3.5
6	--	--	--	3.0	1.5	2.0	5.5	2.5	3.5
7	--	--	--	5.5	2.5	4.0	7.0	3.5	5.0
8	--	--	--	14	5.0	9.5	18	6.0	10
9	--	--	--	14	9.5	12	9.0	4.0	6.0
10	--	--	--	16	7.0	11	7.0	3.5	4.5
11	--	--	--	20	8.5	13	8.0	4.0	5.0
12	--	--	--	24	12	17	8.5	4.0	6.0
13	--	--	--	--	--	--	8.0	4.5	6.5
14	--	--	--	--	--	--	8.0	3.5	6.0
15	--	--	--	--	--	--	7.5	4.0	6.0
16	--	--	--	--	--	--	8.5	3.5	6.0
17	--	--	--	--	--	--	8.5	4.0	6.5
18	3.0	2.0	2.5	--	--	--	10	4.5	7.5
19	2.5	1.5	2.0	--	--	--	13	5.0	8.0
20	2.5	1.5	2.0	--	--	--	12	5.0	8.0
21	--	--	--	4.5	3.0	3.5	10	4.5	6.5
22	--	--	--	7.0	2.0	3.5	8.0	4.0	5.5
23	--	--	--	14	4.5	7.5	8.0	4.5	5.5
24	--	--	--	7.0	3.0	4.5	7.5	3.0	5.5
25	--	--	--	5.5	2.5	3.5	8.0	1.5	4.0
26	2.0	1.0	1.5	9.5	2.0	3.5	2.5	1.0	1.5
27	2.0	0.5	1.0	9.5	3.0	4.5	3.0	1.0	2.0
28	2.0	0.5	1.0	14	3.5	9.5	--	--	--
29	2.5	1.0	1.5	13	6.5	8.5	--	--	--
30	2.5	1.0	1.5	9.0	5.0	6.0	--	--	--
31	--	--	--	6.5	4.5	5.5	--	--	--
Month[1]	**3.0**	**0.5**	**1.6**	**24**	**0.5**	**6.0**	**18**	**1.0**	**5.4**

Table 9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana (12323700), April through September 2013.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data; <, less than]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	July			August			September		
1	--	--	--	2.0	0.5	1.5	1.0	0.5	1.0
2	--	--	--	2.0	0.5	1.5	1.5	<0.5	1.0
3	--	--	--	2.5	1.0	1.0	2.0	0.5	1.5
4	--	--	--	2.0	0.5	1.0	1.5	1.0	1.0
5	--	--	--	1.5	0.5	1.0	--	--	--
6	--	--	--	1.5	<0.5	1.0	--	--	--
7	--	--	--	1.5	0.5	1.0	--	--	--
8	--	--	--	2.0	0.5	1.0	--	--	--
9	--	--	--	2.0	0.5	1.0	--	--	--
10	--	--	--	1.5	0.5	1.0	--	--	--
11	--	--	--	1.5	0.5	1.0	--	--	--
12	2.0	1.5	2.0	2.0	0.5	1.0	--	--	--
13	2.5	1.0	1.5	2.0	0.5	1.0	--	--	--
14	2.5	0.5	1.0	2.0	0.5	1.0	1.0	0.5	0.5
15	2.5	1.0	1.5	1.5	0.5	1.0	1.5	0.5	1.0
16	2.0	0.5	1.0	2.0	0.5	1.0	1.5	0.5	1.0
17	2.0	0.5	1.0	2.0	0.5	1.0	1.5	0.5	1.0
18	2.0	0.5	1.0	2.0	1.0	1.0	2.0	0.5	1.0
19	1.5	0.5	0.5	2.0	0.5	1.0	1.0	<0.5	0.5
20	1.5	<0.5	0.5	2.0	1.0	1.5	1.0	<0.5	0.5
21	1.0	<0.5	0.5	1.5	0.5	1.0	1.0	<0.5	0.5
22	1.5	<0.5	0.5	1.5	1.0	1.0	1.0	<0.5	0.5
23	1.0	<0.5	0.5	1.5	1.0	1.0	0.5	0.5	0.5
24	1.0	<0.5	0.5	1.5	1.0	1.0	2.5	<0.5	0.5
25	1.0	<0.5	0.5	1.5	1.0	1.0	4.0	0.5	1.0
26	1.0	<0.5	0.5	1.5	1.0	1.0	16	3.5	6.5
27	1.0	0.5	0.5	2.0	1.5	1.5	6.5	4.0	5.0
28	1.5	<0.5	0.5	1.5	1.0	1.5	7.5	5.0	5.5
29	1.0	0.5	0.5	2.0	1.5	1.5	8.5	4.0	5.0
30	1.5	<0.5	0.5	2.0	1.0	1.5	--	--	--
31	2.0	0.5	1.0	2.0	0.5	1.5	--	--	--
Month[1]	**2.5**	**0.5**	**0.8**	**2.5**	**0.5**	**1.1**	**16**	**0.5**	**1.8**

[1]For months with missing daily values, the means are calculated using available values.

Table 10. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana (12323720), April through September 2013.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	9.0	5.0	6.0	18	10	13
2	--	--	--	11	4.5	6.5	19	10	13
3	--	--	--	7.0	5.0	6.0	56	16	30
4	--	--	--	7.0	5.0	6.0	110	20	47
5	--	--	--	7.5	4.5	6.0	22	10	16
6	--	--	--	8.0	4.5	6.0	24	11	17
7	--	--	--	8.0	4.0	5.5	22	12	16
8	--	--	--	7.0	5.0	6.0	65	16	40
9	--	--	--	8.0	5.0	6.5	--	--	--
10	--	--	--	9.0	5.5	7.0	15	6.5	9.0
11	--	--	--	9.0	4.0	6.0	14	5.0	9.0
12	--	--	--	7.5	4.5	5.5	16	6.5	11
13	--	--	--	6.5	4.5	5.0	14	6.5	9.0
14	--	--	--	7.5	3.5	5.5	--	--	--
15	--	--	--	5.5	4.0	5.0	7.0	2.5	4.5
16	--	--	--	9.0	4.5	6.0	6.5	2.5	4.5
17	--	--	--	10	4.5	6.0	7.0	2.5	5.0
18	16	4.5	7.0	6.5	4.5	5.5	7.0	3.0	4.0
19	8.5	5.0	6.5	6.5	4.5	5.5	6.5	3.0	4.5
20	8.0	5.0	6.0	--	--	--	5.0	3.0	4.0
21	9.0	5.0	6.5	8.5	4.5	6.5	6.0	2.5	4.0
22	16	4.5	8.0	11	4.5	6.5	5.0	2.5	3.5
23	19	4.5	7.0	39	10	23	5.0	2.0	3.5
24	13	5.0	6.5	34	11	17	6.5	2.5	3.5
25	--	--	--	22	12	16	6.5	2.5	4.0
26	8.0	5.0	7.0	31	19	24	4.0	2.0	2.5
27	9.5	5.5	7.0	190	23	87	4.0	2.0	2.5
28	8.5	5.5	6.5	--	--	--	4.5	2.0	3.0
29	9.0	6.5	8.0	--	--	--	--	--	--
30	10	6.5	7.5	20	12	15	--	--	--
31	--	--	--	15	9.0	11	--	--	--
Month[1]	**19**	**4.5**	**7.0**	**190**	**3.5**	**11**	**110**	**2.0**	**11**

Table 10. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana (12323720), April through September 2013.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	July			August			September		
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	2.5	1.5	2.0	--	--	--	--	--	--
13	2.5	1.5	2.0	--	--	--	--	--	--
14	2.5	1.5	2.0	--	--	--	--	--	--
15	3.0	1.5	2.0	--	--	--	--	--	--
16	3.0	1.5	2.0	--	--	--	--	--	--
17	3.0	2.0	2.0	--	--	--	3.5	2.0	2.5
18	3.5	2.0	2.5	--	--	--	8.0	2.0	3.5
19	3.5	1.5	2.5	--	--	--	6.5	1.5	3.0
20	3.0	1.5	2.0	2.0	1.0	1.5	5.0	2.0	2.5
21	3.0	1.5	2.0	2.0	1.0	1.5	7.0	2.0	3.0
22	2.5	1.5	2.0	3.0	1.5	2.0	4.5	2.0	3.0
23	2.5	2.0	2.0	2.5	1.0	2.0	4.5	2.5	3.0
24	3.0	2.0	2.0	3.0	1.5	2.0	5.0	2.5	3.0
25	3.0	2.0	2.0	3.5	1.5	2.5	4.0	2.5	3.0
26	3.0	2.0	2.5	3.5	1.5	2.5	6.0	3.5	4.0
27	3.0	2.0	2.5	4.0	2.0	2.5	8.0	3.5	5.5
28	3.0	2.0	2.5	4.0	2.5	3.0	8.0	3.0	4.5
29	3.5	2.0	2.5	--	--	--	11	3.0	5.0
30	3.0	2.5	2.5	--	--	--	7.5	4.0	5.5
31	--	--	--	--	--	--	--	--	--
Month[1]	**3.5**	**1.5**	**2.2**	**4.0**	**1.0**	**2.2**	**11**	**1.5**	**3.6**

[1]For months with missing daily values, the means are calculated using available values.

Table 11. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Warm Springs Creek at Warm Springs, Montana (12323770), April through September 2013.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	6.5	2.0	3.5	4.5	3.0	3.5
2	--	--	--	4.5	2.0	3.0	5.0	3.0	4.0
3	--	--	--	3.0	1.5	2.0	6.5	3.5	4.5
4	--	--	--	3.0	1.5	2.0	5.0	3.0	4.0
5	--	--	--	3.0	1.0	2.0	5.0	3.0	3.5
6	--	--	--	3.0	1.5	2.0	5.0	3.0	4.0
7	--	--	--	4.5	1.5	2.5	8.0	4.0	5.5
8	--	--	--	3.0	1.0	2.0	16	4.0	10
9	--	--	--	3.0	1.5	2.0	8.0	4.0	5.5
10	--	--	--	4.5	2.0	2.5	7.5	3.5	5.0
11	4.5	2.5	3.5	5.0	2.0	3.0	6.5	3.5	4.5
12	3.5	2.5	3.0	4.0	2.0	3.0	7.5	3.5	5.0
13	3.5	2.5	3.0	32	3.5	16	14	4.0	7.5
14	4.0	2.5	3.0	47	9.0	32	11	4.5	7.5
15	4.0	3.0	3.5	--	--	--	11	5.5	7.0
16	5.0	3.5	4.0	--	--	--	7.5	4.5	6.0
17	6.5	3.5	4.5	--	--	--	--	--	--
18	5.0	3.5	4.0	--	--	--	7.0	4.0	5.5
19	4.5	3.0	3.5	--	--	--	7.0	4.0	5.5
20	4.5	3.0	3.5	--	--	--	6.5	3.0	4.5
21	4.5	3.0	3.5	4.5	3.5	4.0	5.5	3.0	4.0
22	5.0	3.0	3.5	6.0	4.0	5.0	5.0	3.0	4.0
23	4.5	2.5	3.5	20	6.0	11	5.0	2.5	3.5
24	4.0	2.5	3.0	10	4.0	6.0	4.5	2.0	3.0
25	3.5	2.5	3.0	5.5	3.5	4.5	4.0	3.0	3.5
26	3.5	2.0	2.5	5.5	3.0	4.0	4.0	2.5	3.0
27	3.0	1.5	2.0	9.0	3.5	5.0	4.5	2.0	3.0
28	3.0	2.0	2.5	16	4.5	9.5	5.0	2.5	3.5
29	4.0	2.0	2.5	11	5.5	8.0	4.5	2.5	3.5
30	6.0	2.0	3.5	8.0	5.0	6.5	5.5	2.5	4.0
31	--	--	--	6.0	3.5	4.5	--	--	--
Month[1]	**6.5**	**1.5**	**3.2**	**47**	**1.0**	**5.8**	**16**	**2.0**	**4.7**

Table 11. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Warm Springs Creek at Warm Springs, Montana (12323770), April through September 2013.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
		July			August			September	
1	4.5	1.5	3.0	1.0	0.5	0.5	3.5	2.0	2.5
2	4.0	2.0	3.0	2.0	0.5	1.0	3.0	2.0	2.5
3	4.0	2.0	3.0	--	--	--	6.5	2.0	2.5
4	3.5	2.0	2.5	--	--	--	6.0	1.5	2.5
5	3.5	2.0	3.0	--	--	--	3.5	1.5	2.0
6	4.0	2.0	3.0	--	--	--	5.5	1.5	2.5
7	4.0	2.0	2.5	--	--	--	3.0	1.0	2.0
8	3.5	2.0	2.5	--	--	--	2.5	1.0	1.5
9	3.5	1.5	2.5	--	--	--	2.5	1.0	1.5
10	3.0	1.5	2.0	--	--	--	2.5	1.0	1.5
11	3.0	1.5	2.0	--	--	--	2.0	1.0	1.5
12	3.5	1.5	2.0	--	--	--	2.5	1.0	1.5
13	3.0	1.5	2.0	--	--	--	2.0	0.5	1.0
14	3.0	1.5	2.0	--	--	--	2.0	0.5	1.5
15	3.5	1.5	2.0	--	--	--	2.0	0.5	1.0
16	3.0	1.5	2.0	--	--	--	1.5	0.5	1.0
17	6.0	1.5	2.5	--	--	--	2.5	0.5	1.5
18	7.0	1.5	3.0	--	--	--	3.0	1.5	2.0
19	2.5	1.0	1.5	--	--	--	2.5	1.0	1.5
20	2.5	1.0	1.5	3.5	2.0	2.5	2.0	1.0	1.5
21	2.5	1.0	1.5	3.5	2.0	2.5	2.0	1.0	1.0
22	2.0	0.5	1.0	3.0	2.5	2.5	2.0	1.0	1.0
23	1.5	0.5	1.0	3.5	2.5	3.0	2.0	1.0	1.5
24	1.0	0.5	1.0	3.5	2.0	3.0	3.5	1.0	1.5
25	1.0	0.5	0.5	3.5	2.5	2.5	3.5	1.0	2.0
26	1.0	0.5	1.0	3.0	2.0	2.5	5.0	1.5	2.5
27	1.0	0.5	0.5	3.0	2.0	2.5	3.0	1.0	2.0
28	1.0	0.5	0.5	4.0	2.0	3.0	2.5	1.0	1.5
29	1.0	0.5	0.5	4.0	2.5	3.0	3.0	1.5	2.0
30	1.0	0.5	0.5	3.5	2.5	2.5	4.5	1.5	2.5
31	0.5	0.5	0.5	3.5	2.5	2.5	--	--	--
Month[1]	**7.0**	**0.5**	**1.8**	**4.0**	**0.5**	**2.4**	**6.5**	**0.5**	**1.8**

[1]For months with missing daily values, the means are calculated using available values.

Table 12. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Lost Creek near Anaconda, Montana (12323840), March through September 2013.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data; <, less than]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	March			April			May		
1	--	--	--	3.5	2.0	2.5	3.5	1.5	2.0
2	--	--	--	4.0	2.0	2.5	3.0	1.5	2.0
3	--	--	--	3.0	2.0	2.5	3.0	1.5	2.0
4	--	--	--	3.5	2.0	2.5	4.0	1.5	2.5
5	--	--	--	5.5	2.0	3.0	5.5	1.5	3.0
6	--	--	--	3.5	2.0	2.5	11	2.0	4.0
7	--	--	--	3.0	2.0	2.5	17	2.0	3.5
8	--	--	--	--	--	--	6.0	1.5	3.0
9	--	--	--	20	2.0	5.5	4.5	1.5	2.5
10	--	--	--	4.0	2.0	2.5	5.5	1.5	2.5
11	--	--	--	3.5	2.0	2.5	8.0	2.0	4.0
12	--	--	--	2.5	1.5	2.0	12	1.5	3.5
13	--	--	--	3.5	2.0	2.5	8.5	2.0	4.0
14	--	--	--	3.0	1.5	2.0	15	2.5	6.0
15	--	--	--	4.5	1.5	2.5	5.0	2.0	3.0
16	--	--	--	7.5	1.5	3.0	4.0	1.5	2.5
17	--	--	--	10	1.5	4.0	8.0	1.5	3.0
18	--	--	--	10	2.0	4.0	6.0	1.5	2.5
19	--	--	--	3.0	1.5	2.0	4.5	1.5	2.0
20	--	--	--	3.0	1.5	2.0	4.5	1.5	2.5
21	--	--	--	2.5	1.5	2.0	2.5	1.0	1.5
22	--	--	--	6.0	1.5	2.5	16	1.5	2.5
23	--	--	--	5.5	1.5	2.5	35	7.0	11
24	--	--	--	3.0	1.5	2.0	8.0	3.5	5.5
25	--	--	--	3.0	1.5	2.0	5.0	2.0	3.0
26	--	--	--	3.5	1.5	2.5	47	2.0	5.0
27	--	--	--	9.0	2.5	3.5	14	4.5	7.5
28	--	--	--	4.5	2.0	3.0	91	9.5	25
29	3.5	2.0	2.5	4.5	2.0	3.0	15	7.5	11
30	3.5	1.5	2.5	15	1.5	3.0	12	4.5	6.5
31	3.5	2.0	2.5	--	--	--	6.5	3.5	4.5
Month[1]	**3.5**	**1.5**	**2.5**	**20**	**1.5**	**2.7**	**91**	**1.0**	**4.6**

Table 12. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Lost Creek near Anaconda, Montana (12323840), March through September 2013.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data; <, less than]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
		June			July			August	
1	8.0	3.0	4.0	1.5	0.5	1.0	9.5	0.5	1.5
2	7.0	3.0	4.0	1.5	0.5	1.0	3.5	0.5	1.0
3	9.0	3.0	4.0	1.5	0.5	1.0	1.5	0.5	0.5
4	6.5	2.5	3.5	2.0	0.5	1.0	1.5	0.5	0.5
5	5.5	2.0	3.5	1.5	0.5	1.0	1.0	<0.5	0.5
6	5.0	2.5	3.5	1.5	0.5	1.0	68	<0.5	4.0
7	7.5	2.5	4.0	2.0	0.5	1.0	24	3.5	6.5
8	5.5	2.5	4.0	17	0.5	1.5	27	2.5	4.5
9	11	3.5	4.5	1.5	0.5	1.0	5.0	2.5	3.0
10	7.5	2.0	4.0	1.0	0.5	0.5	4.5	2.0	2.5
11	27	2.5	6.0	1.0	0.5	0.5	4.5	2.0	2.5
12	5.5	2.5	3.5	1.5	0.5	1.0	3.0	1.5	2.0
13	9.0	3.5	5.0	2.0	0.5	1.0	4.0	1.5	2.5
14	6.0	2.0	3.0	2.0	0.5	1.0	2.5	1.5	2.0
15	3.0	1.5	2.0	2.5	0.5	1.0	2.5	1.5	2.0
16	2.5	1.5	1.5	3.5	0.5	1.0	3.0	1.5	2.0
17	3.0	1.5	2.0	40	0.5	2.5	2.5	1.5	2.0
18	4.5	1.0	1.5	40	2.5	6.0	3.0	1.5	2.0
19	3.0	1.0	1.5	3.0	1.0	2.0	3.0	1.5	2.0
20	2.5	1.0	1.5	2.0	1.0	1.5	2.5	1.5	2.0
21	1.5	1.0	1.0	5.5	1.0	2.0	4.0	1.5	2.0
22	2.0	1.0	1.5	2.5	1.5	1.5	6.5	1.5	2.0
23	2.0	1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.5
24	7.5	1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.0
25	4.0	1.0	1.5	2.0	1.0	1.0	210	1.0	14
26	1.5	1.0	1.0	1.5	1.0	1.0	52	1.5	4.0
27	2.5	1.0	1.0	2.0	0.5	1.0	3.0	1.0	1.5
28	2.0	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0
29	1.5	0.5	1.0	1.5	0.5	1.0	2.5	1.0	1.0
30	1.5	0.5	1.0	1.5	0.5	1.0	2.0	1.0	1.0
31	--	--	--	1.5	0.5	1.0	2.0	0.5	1.0
Month[1]	**27**	**0.5**	**2.6**	**40**	**0.5**	**1.3**	**210**	**<0.5**	**2.4**

Table 12. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Lost Creek near Anaconda, Montana (12323840), March through September 2013.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU); --, no data; <, less than]

Day	Maximum	Minimum	Mean
		September	
1	1.5	0.5	1.0
2	2.0	0.5	1.0
3	1.5	0.5	1.0
4	1.5	0.5	0.5
5	15	0.5	1.0
6	160	8.5	29
7	10	4.5	7.0
8	6.5	3.5	4.5
9	5.0	3.0	3.5
10	3.5	2.5	3.0
11	4.0	2.5	3.0
12	3.0	2.5	2.5
13	4.5	2.5	2.5
14	3.0	2.5	2.5
15	7.0	2.5	3.0
16	3.5	2.5	3.0
17	3.0	2.0	2.5
18	2.5	1.0	1.5
19	1.0	1.0	1.0
20	3.5	1.0	1.5
21	2.0	1.0	1.5
22	1.5	1.0	1.5
23	1.5	1.0	1.0
24	4.5	1.0	1.5
25	5.0	1.0	1.5
26	10	1.5	3.5
27	2.0	1.5	1.5
28	4.5	1.5	2.0
29	31	2.0	5.5
30	9.5	2.0	3.0
31	--	--	--
Month[1]	**160**	**0.5**	**3.2**

[1]For months with missing daily values, the means are calculated using available values.

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; µg/L, micrograms per liter; mm, millimeter; <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time, hhmm	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium filtered (mg/L)	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)
12323700	Mill Creek at Opportunity	08/12/2013	1530	<2.0	79.2	21.9	5.97	0.82	4.98	79.5
		08/12/2013	1535	<2.0	80.7	22.4	6.05	0.81	4.80	79.4
12323750	Silver Bow Creek at Warm Springs	07/16/2013	0720	--	198	55.5	14.5	--	--	--
		07/16/2013	0725	--	204	57.3	14.7	--	--	--
12323840	Lost Creek near Anaconda	04/08/2013	1420	<2.0	107	32.0	6.62	1.30	2.92	103
		04/08/2013	1425	<2.0	108	32.4	6.67	1.28	2.85	103
12324200	Clark Fork at Deer Lodge	05/21/2013	1325	--	200	58.5	13.2	--	--	--
		05/21/2013	1330	--	199	58.1	13.2	--	--	--
12324400	Clark Fork above Little Blackfoot, near Garrison	03/13/2013	1440	--	219	63.0	15.1	--	--	--
		03/13/2013	1445	--	222	63.9	15.1	--	--	--
12324680	Clark Fork at Goldcreek	11/14/2012	1525	--	211	62.1	13.6	--	--	--
		11/14/2012	1530	--	216	64.3	13.6	--	--	--
12334550	Clark Fork at Turah Bridge, near Bonner	06/05/2013	0955	--	110	30.7	7.99	--	--	--
		06/05/2013	1000	--	107	29.8	7.85	--	--	--
12340500	Clark Fork above Missoula	06/19/2013	1345	--	101	27.1	8.08	--	--	--
		06/19/2013	1350	--	101	27.0	8.10	--	--	--

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; µg/L, micrograms per liter; mm, millimeter; <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time, hhmm	Chloride, filtered (mg/L)	Flouride, filtered (mg/L)	Silica, filtered (mg/l)	Sulfate, filtered (mg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)
12323700	Mill Creek at Opportunity	08/12/2013	1530	0.48	0.37	11.4	15.2	0.035	0.039	1.7	2.3
		08/12/2013	1535	0.48	0.37	11.2	15.3	0.032	0.035	1.6	2.2
12323750	Silver Bow Creek at Warm Springs	07/16/2013	0720	--	--	--	--	0.026	0.037	3.0	3.2
		07/16/2013	0725	--	--	--	--	0.029	0.036	2.4	3.1
12323840	Lost Creek near Anaconda	04/08/2013	1420	0.73	0.47	11.3	10.8	<0.016	0.017	1.2	3.1
		04/08/2013	1425	0.73	0.47	11.3	10.8	<0.016	0.019	<0.80	2.8
12324200	Clark Fork at Deer Lodge	05/21/2013	1325	--	--	--	--	0.035	0.065	5.7	13.2
		05/21/2013	1330	--	--	--	--	0.035	0.073	5.7	13.0
12324400	Clark Fork above Little Blackfoot, near Garrison	03/13/2013	1440	--	--	--	--	0.066	0.136	5.7	24.5
		03/13/2013	1445	--	--	--	--	0.057	0.156	5.5	28.8
12324680	Clark Fork at Goldcreek	11/14/2012	1525	--	--	--	--	0.023	0.106	3.1	18.5
		11/14/2012	1530	--	--	--	--	0.026	0.097	3.1	18.7
12334550	Clark Fork at Turah Bridge, near Bonner	06/05/2013	0955	--	--	--	--	0.017	0.200	2.8	27.8
		06/05/2013	1000	--	--	--	--	0.018	0.195	3.0	29.7
12340500	Clark Fork above Missoula	06/19/2013	1345	--	--	--	--	<0.016	0.020	1.4	2.5
		06/19/2013	1350	--	--	--	--	<0.016	0.022	1.1	2.6

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; µg/L, micrograms per liter; mm, millimeter; <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time, hhmm	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
12323700	Mill Creek at Opportunity	08/12/2013	1530	40.8	62.3	0.086	0.18	4.73	5.2
		08/12/2013	1535	39.4	61.3	0.085	0.18	5.04	5.2
12323750	Silver Bow Creek at Warm Springs	07/16/2013	0720	24.3	120	0.107	0.50	84.2	149
		07/16/2013	0725	34.1	118	0.124	0.50	87.7	151
12323840	Lost Creek near Anaconda	04/08/2013	1420	4.6	70.5	0.045	0.29	1.68	3.2
		04/08/2013	1425	5.3	88.4	<0.025	0.34	1.78	4.0
12324200	Clark Fork at Deer Lodge	05/21/2013	1325	18.7	156	0.111	1.10	53.1	81.9
		05/21/2013	1330	17.9	157	0.110	1.11	53.6	81.0
12324400	Clark Fork above Little Blackfoot, near Garrison	03/13/2013	1440	8.2	363	0.094	2.54	46.8	84.5
		03/13/2013	1445	12.7	379	0.098	2.60	46.9	85.5
12324680	Clark Fork at Goldcreek	11/14/2012	1525	5.2	335	0.058	2.29	13.9	79.5
		11/14/2012	1530	<4.0	329	0.046	2.27	15.2	78.5
12334550	Clark Fork at Turah Bridge, near Bonner	06/05/2013	0955	23.9	757	0.169	5.18	6.89	110
		06/05/2013	1000	22.9	747	0.165	4.96	7.33	110
12340500	Clark Fork above Missoula	06/19/2013	1345	14.6	118	0.036	0.34	4.49	14.8
		06/19/2013	1350	14.6	130	0.049	0.34	4.42	18.7

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; µg/L, micrograms per liter; mm, millimeter; <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time, hhmm	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)
12323700	Mill Creek at Opportunity	08/12/2013	1530	<1.4	<3.0	23.6	23.1	1.33	88	1
		08/12/2013	1535	<1.4	<3.0	22.9	22.7	1.31	83	1
12323750	Silver Bow Creek at Warm Springs	07/16/2013	0720	<1.4	3.1	27.8	28.3	--	92	2
		07/16/2013	0725	1.6	3.1	26.8	28.2	--	95	2
12323840	Lost Creek near Anaconda	04/08/2013	1420	<1.4	<3.0	2.0	2.1	1.09	51	3
		04/08/2013	1425	<1.4	<3.0	1.9	2.2	1.15	58	3
12324200	Clark Fork at Deer Lodge	05/21/2013	1325	1.6	8.5	13.4	14.2	--	92	5
		05/21/2013	1330	<1.4	8.5	13.2	14.2	--	90	7
12324400	Clark Fork above Little Blackfoot, near Garrison	03/13/2013	1440	3.8	21.4	9.3	10.9	--	75	18
		03/13/2013	1445	3.6	22.3	9.2	12.3	--	69	20
12324680	Clark Fork at Goldcreek	11/14/2012	1525	2.8	17.6	8.5	9.1	--	88	16
		11/14/2012	1530	2.8	18.1	8.7	9.5	--	86	16
12334550	Clark Fork at Turah Bridge, near Bonner	06/05/2013	0955	4.0	37.6	5.9	8.4	--	88	38
		06/05/2013	1000	4.6	38.1	5.9	8.9	--	87	37
12340500	Clark Fork above Missoula	06/19/2013	1345	<1.4	<9.0	2.4	2.2	--	85	7
		06/19/2013	1350	<1.4	3.6	2.4	2.4	--	85	7

Table 14. Precision of analyses of field replicates for water samples, Clark Fork Basin, Montana.

[mg/L, milligrams per liter; µg/L, micrograms per liter; mm, millimeter]

Constituent and reporting unit	Number of replicate pairs	Standard deviation[1] (listed units)	Relative standard deviation (percent)	Within limits[2] of data-quality objective
Calcium, filtered, mg/L	8	0.80	1.8	Yes
Magnesium, filtered, mg/L	8	0.07	0.62	Yes
Arsenic, filtered, µg/L	8	0.32	2.7	Yes
Arsenic, unfiltered recoverable, µg/L	8	0.40	3.2	Yes
Cadmium, filtered, µg/L	8	0.00	9.7	Yes
Cadmium, unfiltered recoverable, µg/L	8	0.01	7.8	Yes
Copper, filtered, µg/L	8	0.27	9.2	Yes
Copper, unfiltered recoverable, µg/L	8	1.2	9.6	Yes
Iron, filtered, µg/L	8	2.9	16	Yes
Iron, unfiltered recoverable, µg/L	8	7.3	2.9	Yes
Lead, filtered, µg/L	8	0.01	12	Yes
Lead, unfiltered recoverable, µg/L	8	0.06	3.8	Yes
Manganese, filtered, µg/L	8	0.95	3.5	Yes
Manganese, unfiltered recoverable, µg/L	8	1.2	1.8	Yes
Zinc, filtered, µg/L	8	0.36	19	Yes
Zinc, unfiltered recoverable, µg/L	8	0.36	3.0	Yes
Sediment, suspended, percent finer than 0.062 mm	8	2.8	3.4	Yes
Sediment, suspended, mg/L	8	0.75	6.6	Yes

[1]Standard deviation is calculated using one-half of the laboratory reporting level for censored values (less than the laboratory reporting level).

[2]The data-quality objective for an acceptable level of precision is a maximum relative standard deviation of 20 percent for field replicate analyses (table 3).

Table 15. Precision of analyses of laboratory replicates for water samples, Clark Fork Basin, Montana.

[mg/L, milligrams per liter; µg/L, micrograms per liter]

Constituent and reporting unit	Number of replicate pairs	Standard deviation (listed units)	Relative standard deviation (percent)	Within limits[1] of data-quality objective
Calcium, filtered, mg/L	8	0.32	0.72	Yes
Magnesium, filtered, mg/L	8	0.17	1.6	Yes
Arsenic, filtered, µg/L	8	0.05	0.42	Yes
Arsenic, unfiltered recoverable, µg/L	8	0.43	3.5	Yes
Cadmium, filtered, µg/L	8	0.00	7.4	Yes
Cadmium, unfiltered recoverable, µg/L	8	0.02	19	Yes
Copper, filtered, µg/L	8	0.08	2.7	Yes
Copper, unfiltered recoverable, µg/L	8	0.68	5.5	Yes
Iron, filtered, µg/L	8	1.5	8.6	Yes
Iron, unfiltered recoverable, µg/L	8	2.2	0.88	Yes
Lead, filtered, µg/L	8	0.00	2.7	Yes
Lead, unfiltered recoverable, µg/L	8	0.03	2.0	Yes
Manganese, filtered, µg/L	8	0.34	1.2	Yes
Manganese, unfiltered recoverable, µg/L	8	0.68	1.0	Yes
Zinc, filtered, µg/L	8	0.11	5.3	Yes
Zinc, unfiltered recoverable, µg/L	8	0.32	2.6	Yes

[1]The data-quality objective for an acceptable level of precision is a maximum relative standard deviation of 20 percent for laboratory replicate analyses (table 3).

Table 16. Recovery efficiency for analyses of laboratory-spiked deionized-water blank samples.

[µg/L, micrograms per liter]

Constituent and reporting unit	Number of samples	95-percent confidence interval for spike recovery, in percent	Mean spike recovery, in percent	Within limits[1] of data-quality objective
Arsenic, filtered, µg/L	5	93.1–103	98.0	Yes
Arsenic, unfiltered recoverable, µg/L	5	96.0–103	99.3	Yes
Cadmium, filtered, µg/L	5	92.4–100	96.3	Yes
Cadmium, unfiltered recoverable, µg/L	5	92.9–100	96.6	Yes
Copper, filtered, µg/L	5	87.0–97.9	92.4	Yes
Copper, unfiltered recoverable, µg/L	5	92.6–100	96.3	Yes
Iron, filtered, µg/L	5	95.5–111	103	Yes
Iron, unfiltered recoverable, µg/L	5	98.2–112	105	Yes
Lead, filtered, µg/L	5	92.3–103	97.5	Yes
Lead, unfiltered recoverable, µg/L	5	97.1–103	99.9	Yes
Manganese, filtered, µg/L	5	92.3–104	98.1	Yes
Manganese, unfiltered recoverable, µg/L	5	94.8–102	98.5	Yes
Zinc, filtered, µg/L	5	90.9–106	98.6	Yes
Zinc, unfiltered recoverable, µg/L	5	91.7–98.7	95.2	Yes

[1]The data-quality objective for acceptable bias is a maximum deviation of 25 percent from a theoretical 100-percent recovery (table 3).

Table 17. Recovery efficiency for analyses of laboratory-spiked stream samples, Clark Fork Basin, Montana.

[µg/L, micrograms per liter]

Constituent and reporting unit	Number of samples	95-percent confidence interval for spike recovery, in percent	Mean spike recovery, in percent	Within limits[1] of data-quality objective
Arsenic, filtered, µg/L	5	91.2–108	99.5	Yes
Arsenic, unfiltered recoverable, µg/L	5	91.0–98.8	94.9	Yes
Cadmium, filtered, µg/L	5	90.4–99.3	94.8	Yes
Cadmium, unfiltered recoverable, µg/L	5	87.0–95.7	91.3	Yes
Copper, filtered, µg/L	5	86.0–95.8	90.9	Yes
Copper, unfiltered recoverable, µg/L	5	87.5–92.4	90.0	Yes
Iron, filtered, µg/L	5	94.8–110	102	Yes
Iron, unfiltered recoverable, µg/L	5	92.6–110	101	Yes
Lead, filtered, µg/L	5	92.8–108	101	Yes
Lead, unfiltered recoverable, µg/L	5	92.3–101	96.7	Yes
Manganese, filtered, µg/L	5	95.4–99.0	97.2	Yes
Manganese, unfiltered recoverable, µg/L	5	84.9–101	93.0	Yes
Zinc, filtered, µg/L	5	92.0–107	99.5	Yes
Zinc, unfiltered recoverable, µg/L	5	79.5–88.7	84.1	Yes

[1]The data-quality objective for acceptable bias is a maximum deviation of 25 percent from a theoretical 100-percent recovery (table 3).

Table 18. Analyses of field blanks for water samples.

[hh, hours; mm, minutes; µS/cm, microsiemens per centimeter at 25 degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligrams per liter; <, less than laboratory reporting level; --, no data; µg/L, micrograms per liter]

Date	Time, hhmm	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Turbidity, unfiltered, lab (NTRU)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Chloride, filtered (mg/L)
11/13/2012	1305	5.4	2	<2.0	<0.022	<0.011	--	--	--
[1]03/11/2013	0800	5.6	2	--	<0.022	<0.011	--	--	--
04/10/2013	1400	5.6	2	--	<0.022	<0.011	--	--	--
05/20/2013	1455	5.3	2	<2.0	<0.022	<0.011	<0.03	<0.06	<0.06
06/04/2013	1235	5.4	2	--	<0.022	<0.011	--	--	--
06/19/2013	0915	5.6	2	--	<0.022	<0.011	--	--	--
07/16/2013	0845	5.5	2	--	<0.022	<0.011	--	--	--
08/13/2013	0815	5.5	2	--	<0.022	<0.011	--	--	--

Date	Time, hhmm	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (mg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2012	1305	--	--	--	<0.016	<0.016	<0.80	<0.70	<4.0	<4.6
[1]03/11/2013	0800	--	--	--	<0.016	<0.016	<0.80	<0.70	<4.0	<4.6
04/10/2013	1400	--	--	--	<0.016	<0.016	<0.80	<0.70	<4.0	<4.6
05/20/2013	1455	<0.01	<0.018	<0.09	<0.016	<0.016	<0.80	<0.70	5.2	<4.6
06/04/2013	1235	--	--	--	<0.016	<0.016	<0.80	<0.70	5.9	<4.6
06/19/2013	0915	--	--	--	<0.016	<0.016	<0.80	<0.70	4.4	<4.6
07/16/2013	0845	--	--	--	<0.016	<0.016	1.0	<0.70	<4.0	<4.6
08/13/2013	0815	--	--	--	<0.016	<0.016	<0.80	<0.70	<4.0	<4.6

Table 18. Analyses of field blanks for water samples.—Continued

[hh, hours; mm, minutes; µS/cm, microsiemens per centimeter at 25 degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligrams per liter; <, less than laboratory reporting level; --, no data; µg/L, micrograms per liter]

Date	Time, hhmm	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)
11/13/2012	1305	<0.025	<0.04	0.33	<0.4	<1.4	<3.0	<0.04	<0.28	--
[1]03/11/2013	0800	<0.025	<0.04	<0.15	<0.4	<1.4	<3.0	<0.04	<0.28	--
04/10/2013	1400	<0.025	<0.04	0.24	<0.4	<1.4	<3.0	<0.04	<0.28	--
05/20/2013	1455	<0.025	<0.04	0.28	<0.4	<1.4	<3.0	<0.04	<0.28	<0.23
06/04/2013	1235	<0.025	<0.04	0.62	<0.4	<1.4	<3.0	<0.04	<0.28	--
06/19/2013	0915	<0.025	<0.04	0.34	<0.4	<1.4	<3.0	<0.04	<0.28	--
07/16/2013	0845	<0.025	<0.04	0.54	<0.4	<1.4	<3.0	<0.04	<0.28	--
08/13/2013	0815	<0.025	<0.04	0.15	<0.4	<1.4	<3.0	<0.04	<0.28	--

[1]Annual office equipment blank collected before any equipment was used in the field.

Table 19. Bed-sediment data for the Clark Fork Basin, Montana, August 2013.

[Trace-element concentrations in bed sediment were determined for the fine-grained fraction (material less than 0.063 millimeter in diameter). Reported concentrations are the mean of all replicate aliquot analyses from each composite sample. µg/g, micrograms per gram of dry sample weight; <, less than laboratory reporting level]

Site number (fig. 1)	Site name	Number of composite samples	Concentration (µg/g)								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	3	51	14.8	25.9	882	30,200	137	3,910	14.8	2,270
12323750	Silver Bow Creek at Warm Springs	3	136	5.0	15.3	255	26,300	59	6,470	12.8	676
12323800	Clark Fork near Galen	3	156	5.5	22.8	1,250	32,300	106	4,280	15.5	939
461415112450801	Clark Fork below Lost Creek, near Galen	3	108	5.2	22.0	1,540	29,600	145	2,910	12.1	1,050
461559112443301	Clark Fork at county bridge, near Racetrack	3	69	4.6	22.8	978	26,300	109	2,250	12.3	911
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	3	103	7.2	18.9	1,350	25,400	106	3,520	11.8	1,090
12324200	Clark Fork at Deer Lodge	3	76	3.7	27.7	981	28,500	105	1,920	14.8	869
12324400	Clark Fork above Little Blackfoot River, near Garrison	3	57	4.1	19.9	773	20,400	92	2,660	10.6	850
12324680	Clark Fork at Goldcreek	3	25	3.4	20.2	480	17,500	54	1,580	9.3	566
12331800	Clark Fork near Drummond	3	17	2.0	9.2	183	14,800	27	912	4.8	380
12334550	Clark Fork at Turah Bridge, near Bonner	3	17	1.5	20.8	213	15,500	37	591	9.5	448
12340000	Blackfoot River near Bonner	3	4	<0.15	14.5	18	15,900	10	634	10.4	55
12340500	Clark Fork above Missoula	3	13	1.3	13.2	141	14,700	28	1,420	9.8	376

Table 20. Recovery efficiency for analyses of standard reference materials for bed-sediment samples.

[Dilution ratio is the proportion of initial volume of concentrated nitric acid used as a digesting reagent to final volume of solution after addition of 0.6N (normal) hydrochloric acid used for reconstituting dried residue; µg/g, micrograms per gram of dry sample weight; SRM, standard reference material (agricultural soils)]

Constituent	Number of analyses	Dilution ratio	Certified concentration (µg/g)	Mean SRM recovery (percent)	95-percent confidence interval for SRM recovery (percent)
SRM sample 2709a					
Arsenic	10	1:10	10.5	60.0	58.5–61.6
Cadmium	10	1:10	0.371	51.6	49.6–53.6
Chromium	10	1:10	130	58.1	56.7–59.5
Copper	10	1:10	33.9	70.8	68.5–73.1
Iron	10	1:10	33,600	85.4	84.1–86.8
Lead	10	1:10	17.3	56.5	55.7–57.3
Manganese	10	1:10	529	86.6	85.3–88.0
Nickel	10	1:10	85	80.4	79.6–81.3
Zinc	10	1:10	103	80.2	79.3–81.0
SRM sample 2711a					
Arsenic	10	1:10	107	80.6	79.3–81.9
Cadmium	10	1:10	54.1	98.4	96.6–100
Chromium	10	1:10	52.3	47.8	46.5–49.1
Copper	10	1:10	140	95.7	93.0–98.4
Iron	10	1:10	28,200	80.7	78.9–82.5
Lead	10	1:10	1,400	94.3	92.5–96.0
Manganese	10	1:10	675	79.4	77.4–81.4
Nickel	10	1:10	21.7	79.3	78.1–80.5
Zinc	10	1:10	414	86.9	85.3–88.4

Table 21. Analyses of procedural blanks for bed-sediment samples.

[Dilution ratio is the proportion of initial volume of concentrated nitric acid used as a digesting reagent to final volume of solution after addition of 0.6N (normal) hydrochloric acid used for reconstituting dried residue. µg/mL, micrograms per milliliter; <, less than minimum reporting level for liquid-phase concentration, in µg/mL]

Site number (fig. 1)	Site name	Dilution ratio	Trace element concentration (µg/mL)								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12323750	Silver Bow Creek at Warm Springs	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12323800	Clark Fork near Galen	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
461415112450801	Clark Fork below Lost Creek, near Galen	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
461559112443301	Clark Fork at county bridge, near Racetrack	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12324200	Clark Fork at Deer Lodge	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12324400	Clark Fork above Little Blackfoot River, near Garrison	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12324680	Clark Fork at Goldcreek	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12331800	Clark Fork near Drummond	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12334550	Clark Fork at Turah Bridge, near Bonner	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12340000	Blackfoot River near Bonner	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01
12340500	Clark Fork above Missoula	1:10	<0.002	<0.001	<0.003	<0.002	<0.117	<0.004	<0.003	<0.001	<0.01

Table 22. Biological data for the Clark Fork Basin, Montana, August 2013.

[Analyses are for the whole-body tissue of aquatic insects. Composite samples were made by combining similar-sized insects of the same species into a sample of sufficient mass for analysis. Concentrations for biota samples composed of two or more composite samples are the means of all analyses. All tissues were analyzed undiluted (dilution ratio 1:1). µg/g, micrograms per gram of dry sample weight; spp., species]

Taxon	Number of composite samples	Concentration (µg/g)								
		Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600—Silver Bow Creek at Opportunity										
Hydropsyche cockerelli	3	7.1	3.5	4.0	129	3,410	22.9	1,370	3.9	657
Hydropsyche spp.	1	6.3	4.0	4.1	151	3,630	26.3	1,790	4.1	805
12323750—Silver Bow Creek at Warm Springs										
Claassenia sabulosa	1	5.0	0.5	0.6	66.4	300	1.5	922	0.6	340
Hydropsyche cockerelli	1	15.3	0.4	1.9	33.7	1,470	5.5	1,080	1.8	178
Hydropsyche occidentalis	1	14.8	0.4	2.0	29.6	1,490	6.0	1,260	1.8	197
12323800—Clark Fork near Galen										
Hydropsyche cockerelli	2	19.8	1.9	2.7	142	2,270	14.7	2,400	3.0	277
Hydropsyche occidentalis	2	17.4	1.3	2.4	125	2,040	12.9	2,590	2.6	261
461415112450801—Clark Fork below Lost Creek, near Galen										
Hydropsyche cockerelli	2	24.8	1.7	2.7	180	2,520	20.1	2,160	2.4	289
461559112443301—Clark Fork at county bridge, near Racetrack										
Hydropsyche cockerelli	2	12.9	2.0	2.1	84.9	1,700	10.2	2,070	1.6	237
Hydropsyche occidentalis	1	12.8	1.4	2.2	89.3	1,470	11.1	2,540	1.9	281
461903112440701–Clark Fork at Dempsey Creek diversion, near Racetrack										
Arctopsyche grandis	1	8.1	2.5	1.4	72.4	840	5.9	1,360	1.2	256
Claassenia sabulosa	1	3.8	1.5	1.2	87.2	485	3.4	1,260	1.0	394
Hydropsyche cockerelli	2	14.4	1.7	2.0	119	1,640	10.9	1,960	1.6	265
Hydropsyche occidentalis	1	11.3	1.5	1.6	106	1,290	8.2	1,800	1.4	250
12324200—Clark Fork at Deer Lodge										
Arctopsyche grandis	1	7.3	2.6	1.9	88.6	1,000	8.9	1,440	1.7	257
Hydropsyche cockerelli	3	12.3	2.0	2.8	147	2,000	15.7	1,440	2.3	249
Hydropsyche occidentalis	2	11.1	1.3	2.8	131	1,930	14.1	1,500	2.3	259
12324400—Clark Fork above Little Blackfoot River, near Garrison										
Arctopsyche grandis	2	3.6	1.3	1.0	44.2	431	4.5	720	0.7	233
Hydropsyche cockerelli	1	7.8	0.9	2.0	81.5	1,050	10.1	1,270	1.4	216
Hydropsyche occidentalis	1	6.4	1.3	2.3	85.7	1,220	8.8	1,220	1.9	290

Table 22. Biological data for the Clark Fork Basin, Montana, August 2013.—Continued

[Analyses are for the whole-body tissue of aquatic insects. Composite samples were made by combining similar-sized insects of the same species into a sample of sufficient mass for analysis. Concentrations for biota samples composed of two or more composite samples are the means of all analyses. All tissues were analyzed undiluted (dilution ratio 1:1). µg/g, micrograms per gram of dry sample weight; spp., species]

Taxon	Number of composite samples	Concentration (µg/g)								
		Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12324680—Clark Fork at Goldcreek										
Arctopsyche grandis	3	2.4	1.7	0.8	30.0	481	2.1	729	0.6	235
Claassenia sabulosa	1	1.0	0.5	0.6	60.0	170	0.9	192	0.6	327
Hydropsyche occidentalis	1	8.2	1.3	2.3	68.3	1,530	8.9	2,900	2.4	328
12331800—Clark Fork near Drummond										
Arctopsyche grandis	2	2.0	1.4	0.9	25.7	305	3.1	690	0.6	268
Claassenia sabulosa	2	1.2	0.6	0.7	70.6	222	1.4	201	0.5	371
Hydropsyche cockerelli	1	4.8	0.6	1.7	41.9	899	7.4	1,320	1.2	221
Hydropsyche occidentalis	1	6.1	0.9	2.6	58.2	1,280	9.1	1,520	1.7	272
12334550—Clark Fork at Turah Bridge, near Bonner										
Arctopsyche grandis	2	3.5	0.9	1.5	26.0	546	3.8	790	1.1	228
Hydropsyche cockerelli	2	4.4	0.5	1.6	30.3	891	5.4	764	1.3	200
Hydropsyche occidentalis	1	7.3	1.0	3.4	65.5	1,930	10.3	1,260	2.9	371
12340000—Blackfoot River near Bonner										
Arctopsyche grandis	2	2.2	0.3	1.5	17.9	823	1.2	343	1.4	169
Hydropsyche cockerelli	1	2.7	0.2	2.0	17.0	1,380	1.6	417	1.5	163
Hydropsyche occidentalis	2	2.0	0.2	1.9	19.0	1,320	1.7	481	1.6	185
12340500—Clark Fork above Missoula										
Arctopsyche grandis	3	3.4	1.0	1.2	23.7	618	2.6	1,070	1.1	209
Claassenia sabulosa	2	1.2	0.6	0.7	52.9	293	0.9	189	0.5	339
Hydropsyche cockerelli	3	4.0	0.7	2.1	28.1	1,300	5.1	1,140	1.9	222
Hydropsyche occidentalis	1	4.2	0.7	2.4	30.8	1,460	5.8	1,360	2.0	250

Table 23. Recovery efficiency for analyses of standard reference material for biota samples.

[SRM, standard reference material (lobster hepatopancreas); µg/g, micrograms per gram of dry sample weight]

Constituent	Number of analyses	Certified concentration (µg/g)	Mean SRM recovery (percent)	95-percent confidence interval for SRM recovery (percent)
		SRM sample TORT-2		
Arsenic	12	21.6	110	108–112
Cadmium	12	26.7	98.9	95.1–103
Chromium	12	0.77	167	157–176
Copper	12	106	92.9	90.9–94.9
Iron	12	105	112	108–117
Lead	12	0.35	220	202–238
Manganese	12	13.6	96.8	94.0–99.6
Nickel	12	2.5	91.7	88.1–95.4
Zinc	12	180	104	99.2–108

Table 24. Analyses of procedural blanks for biota samples.

[Procedural blanks were not diluted prior to analyses. µg/mL, micrograms per milliliter; <, less than minimum reporting level for liquid-phase concentration, in µg/mL]

Site number (fig. 1)	Site name	Dilution ratio	Trace element concentration (µg/mL)								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12323750	Silver Bow Creek at Warm Springs	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12323800	Clark Fork near Galen	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
461415112450801	Clark Fork below Lost Creek, near Galen	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
461559112443301	Clark Fork at county bridge, near Racetrack	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12324200	Clark Fork at Deer Lodge	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12324400	Clark Fork above Little Blackfoot River, near Garrison	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12324680	Clark Fork at Goldcreek	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12331800	Clark Fork near Drummond	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12334550	Clark Fork at Turah Bridge, near Bonner	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12340000	Blackfoot River near Bonner	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005
12340500	Clark Fork above Missoula	1:10	<0.003	<0.0004	<0.005	<0.002	<0.4	<0.005	<0.006	<0.002	<0.005

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323230—Blacktail Creek at Harrison Avenue, at Butte Period of record for water-quality data: March 1993–August 1995, December 1996–August 2003, December 2004–September 2013					
Streamflow, instantaneous (ft^3/s)	155	156	1.9	16	9.2
pH, onsite (standard units)	155	8.4	7.3	7.7	7.7
Specific conductance, onsite (µS/cm)	155	412	116	263	264
Temperature, water (ºC)	155	17.5	1.0	8.0	8.0
Hardness, filtered (mg/L as $CaCO_3$)	155	153	37.7	104	106
Calcium, filtered (mg/L)	155	42.9	10.6	29.7	30.0
Magnesium, filtered (mg/L)	155	11.1	2.71	7.24	7.29
Potassium, filtered (mg/L)	33	6.40	2.00	2.80	2.50
Sodium, filtered (mg/L)	33	18.0	6.40	10.6	10.7
Alkalinity, filtered, lab (mg/L)	5	124	74.8	98.0	87.2
Chloride, filtered (mg/L)	33	18.0	2.80	7.47	6.50
Fluoride, filtered (mg/L)	33	0.60	0.20	0.32	0.30
Silica, filtered (mg/L)	33	32.0	14.0	24.5	25.0
Sulfate, filtered (mg/L)	33	36.0	15.0	26.9	28.0
Cadmium, filtered (µg/L)	153	0.50	<0.04	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	155	0.11	<0.01	[2]0.04	<1
Copper, filtered (µg/L)	154	10.0	<1.0	[2]3.5	3.0
Copper, unfiltered recoverable (µg/L)	155	52.0	0.91	6.4	5.0
Iron, filtered (µg/L)	155	640	15	190	174
Iron, unfiltered recoverable (µg/L)	155	4,220	123	664	590
Lead, filtered (µg/L)	155	2.80	<0.02	[2]0.18	0.04
Lead, unfiltered recoverable (µg/L)	155	47.0	<1.00	[2]1.66	0.66
Manganese, filtered (µg/L)	155	144	14.2	44.4	38.8
Manganese, unfiltered recoverable (µg/L)	155	240	23.5	61.8	52.7
Zinc, filtered (µg/L)	153	11	<1.0	[2]3.4	2.6
Zinc, unfiltered recoverable (µg/L)	155	130	<3.0	[2]7.9	4.0
Arsenic, filtered (µg/L)	154	13.0	1.0	4.1	3.4
Arsenic, unfiltered recoverable (µg/L)	155	18.0	1.0	[2]5.4	4.5
Organic carbon, filtered (mg/L)	5	4.96	1.40	3.27	3.85
Sediment, suspended (percent finer than 0.062 mm)	155	97	50	82	83
Sediment, suspended concentration (mg/L)	155	139	1	12	7
Sediment, suspended discharge (ton/d)	155	59	0.01	0.99	0.17

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323250—Silver Bow Creek below Blacktail Creek, at Butte Period of record for water-quality data: March 1993–August 1995, December 1996–September 2013					
Streamflow, instantaneous (ft^3/s)	163	202	13	31	25
pH, onsite (standard units)	163	8.2	7.2	7.6	7.6
Specific conductance, onsite (µS/cm)	163	691	209	460	468
Temperature, water (ºC)	163	20.0	1.0	10.2	10.0
Hardness, filtered (mg/L as $CaCO_3$)	163	217	66.0	147	150
Calcium, filtered (mg/L)	163	62.7	19.0	41.9	42.4
Magnesium, filtered (mg/L)	163	16.1	4.51	10.4	10.7
Potassium, filtered (mg/L)	33	35.0	4.00	8.58	5.90
Sodium, filtered (mg/L)	33	66.0	12.0	25.6	25.0
Alkalinity, filtered, lab (mg/L)	5	102	66.9	81.8	72.4
Chloride, filtered (mg/L)	32	88.0	6.70	22.7	20.5
Fluoride, filtered (mg/L)	32	0.80	0.30	0.46	0.40
Silica, filtered (mg/L)	32	28.0	17.0	22.6	23.0
Sulfate, filtered (mg/L)	32	96.0	35.0	73.1	75.5
Cadmium, filtered (µg/L)	163	6.2	0.04	0.87	0.22
Cadmium, unfiltered recoverable (µg/L)	163	6.0	0.06	1.17	0.40
Copper, filtered (µg/L)	163	303	2.9	29.5	12.2
Copper, unfiltered recoverable (µg/L)	163	550	8.4	68.2	23.6
Iron, filtered (µg/L)	163	292	9.6	95.4	77.6
Iron, unfiltered recoverable (µg/L)	163	7,400	85	795	546
Lead, filtered (µg/L)	163	2.4	<0.5	[2]0.43	0.24
Lead, unfiltered recoverable (µg/L)	163	250	0.61	10.5	2.69
Manganese, filtered (µg/L)	163	1,700	20.7	293	153
Manganese, unfiltered recoverable (µg/L)	163	1,600	25.9	333	188
Zinc, filtered (µg/L)	163	2,200	5.3	283	89.7
Zinc, unfiltered recoverable (µg/L)	163	2,200	20.5	343	128
Arsenic, filtered (µg/L)	163	13.4	2.3	6.0	6.0
Arsenic, unfiltered recoverable (µg/L)	163	45.0	3.0	9.8	8.3
Organic carbon, filtered (mg/L)	5	7.55	5.73	6.42	5.94
Sediment, suspended (percent finer than 0.062 mm)	162	98	42	83	85
Sediment, suspended concentration (mg/L)	162	405	2	20	9
Sediment, suspended discharge (ton/d)	162	70	0.08	2.3	0.62

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323600—Silver Bow Creek at Opportunity Period of record for water-quality data: March 1993–August 1995, December 1996–September 2013					
Streamflow, instantaneous (ft^3/s)	163	648	13	79	52
pH, onsite (standard units)	165	9.5	7.2	8.4	8.3
Specific conductance, onsite (µS/cm)	165	633	202	415	407
Temperature, water (ºC)	165	24.0	-1.0	9.4	9.5
Hardness, filtered (mg/L as $CaCO_3$)	165	240	60.2	149	148
Calcium, filtered (mg/L)	165	71.6	18.5	44.0	44.0
Magnesium, filtered (mg/L)	165	15.0	3.42	9.44	9.34
Potassium, filtered (mg/L)	37	16.0	2.85	4.95	4.20
Sodium, filtered (mg/L)	37	33.5	8.10	17.7	17.0
Alkalinity, filtered, lab (mg/L)	8	110	76.2	94.9	94.1
Chloride, filtered (mg/L)	36	36.0	3.20	12.7	11.5
Fluoride, filtered (mg/L)	36	0.80	0.20	0.42	0.40
Silica, filtered (mg/L)	36	28.0	9.56	20.7	21.0
Sulfate, filtered (mg/L)	36	190	32.0	66.2	62.2
Cadmium, filtered (µg/L)	164	41.0	<0.1	[2]0.97	0.51
Cadmium, unfiltered recoverable (µg/L)	165	49.0	0.26	[2]1.77	1.00
Copper, filtered (µg/L)	163	450	6.5	40.0	30.4
Copper, unfiltered recoverable (µg/L)	165	3,900	17	174	94.7
Iron, filtered (µg/L)	165	307	<3	[2]48.5	27.5
Iron, unfiltered recoverable (µg/L)	164	24,100	196	1,470	764
Lead, filtered (µg/L)	165	5.1	<0.5	[2]0.66	0.32
Lead, unfiltered recoverable (µg/L)	165	650	1.65	32.7	14.5
Manganese, filtered (µg/L)	165	9,300	30.3	367	279
Manganese, unfiltered recoverable (µg/L)	165	10,000	69.8	482	359
Zinc, filtered (µg/L)	164	13,000	11.2	250	124
Zinc, unfiltered recoverable (µg/L)	165	15,000	40.1	443	251
Arsenic, filtered (µg/L)	165	34.0	1.0	10.6	10.0
Arsenic, unfiltered recoverable (µg/L)	165	235	6.5	23.2	16.0
Organic carbon, filtered (mg/L)	5	6.05	3.70	4.99	5.19
Sediment, suspended (percent finer than 0.062 mm)	166	95	37	78	83
Sediment, suspended concentration (mg/L)	166	801	5	49	20
Sediment, suspended discharge (ton/d)	163	781	0.18	21	2.7

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323670—Mill Creek near Anaconda Period of record for water-quality data: December 2004–September 2013					
Streamflow, instantaneous (ft^3/s)	71	309	7.4	62	30
pH, onsite (standard units)	72	8.6	7.5	8.0	8.0
Specific conductance, onsite (µS/cm)	72	213	56	132	132
Temperature, water (ºC)	72	17.0	0.0	8.2	8.0
Turbidity, unfiltered, lab, (NTRU)	66	21	<2.0	[2]2.5	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	72	98.0	23.7	57.6	57.1
Calcium, filtered (mg/L)	72	26.7	7.00	16.0	16.0
Magnesium, filtered (mg/L)	72	8.01	1.45	4.32	4.18
Cadmium, filtered (µg/L)	71	0.11	0.02	[2]0.05	0.04
Cadmium, unfiltered recoverable (µg/L)	72	0.19	0.03	0.08	0.07
Copper, filtered (µg/L)	72	5.1	0.72	2.2	2.0
Copper, unfiltered recoverable (µg/L)	72	10.6	1.3	3.7	3.1
Iron, filtered (µg/L)	72	125	21.2	45.6	40.2
Iron, unfiltered recoverable (µg/L)	72	619	77.8	188	148
Lead, filtered (µg/L)	72	0.24	0.02	[2]0.12	0.11
Lead, unfiltered recoverable (µg/L)	72	3.12	0.15	0.72	0.55
Manganese, filtered (µg/L)	72	12.0	3.1	5.8	5.6
Manganese, unfiltered recoverable (µg/L)	72	36.6	7.1	13.2	11.4
Zinc, filtered (µg/L)	72	4.3	<1.4	[2]1.7	1.5
Zinc, unfiltered recoverable (µg/L)	72	9.2	1.0	[2]3.0	2.4
Arsenic, filtered (µg/L)	72	32.9	7.3	16.2	14.9
Arsenic, unfiltered recoverable (µg/L)	72	34.8	7.8	17.4	15.6
Sediment, suspended (percent finer than 0.062 mm)	72	86	28	63	67
Sediment, suspended concentration (mg/L)	72	29	1	6	3
Sediment, suspended discharge (ton/d)	71	13	0.02	1.9	0.19

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323700—Mill Creek at Opportunity Period of record for water-quality data: March 2003–September 2013					
Streamflow, instantaneous (ft^3/s)	86	261	0.43	37	12
pH, onsite (standard units)	88	8.3	7.5	8.0	8.0
Specific conductance, onsite (µS/cm)	88	242	59	148	152
Temperature, water (ºC)	88	20.0	-0.1	9.1	9.0
Turbidity, unfiltered, lab (NTRU)	6	2.6	<2.0	[2]1.5	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	88	112	24.0	63.5	65.0
Calcium, filtered (mg/L)	88	31.0	7.01	17.8	18.2
Magnesium, filtered (mg/L)	88	8.44	1.56	4.63	4.67
Potassium, filtered (mg/L)	6	0.83	0.48	0.65	0.60
Sodium, filtered (mg/L)	6	6.00	2.29	3.86	3.32
Alkalinity, filtered, lab (mg/L)	6	79.5	38.2	54.8	49.6
Chloride, filtered (mg/L)	6	0.57	0.22	0.36	0.30
Fluoride, filtered (mg/L)	6	0.40	0.31	0.36	0.37
Silica, filtered (mg/L)	6	13.5	9.47	11.4	11.5
Sulfate, filtered (mg/L)	6	17.8	5.01	10.2	8.21
Cadmium, filtered (µg/L)	88	0.13	0.02	0.06	0.06
Cadmium, unfiltered recoverable (µg/L)	88	0.86	0.03	0.13	0.09
Copper, filtered (µg/L)	88	6.1	1.0	2.8	2.4
Copper, unfiltered recoverable (µg/L)	88	38.8	1.5	6.2	3.9
Iron, filtered (µg/L)	88	93.8	15.9	45.5	41.2
Iron, unfiltered recoverable (µg/L)	88	1,960	44.3	285	140
Lead, filtered (µg/L)	88	0.35	<0.08	[2]0.13	0.12
Lead, unfiltered recoverable (µg/L)	88	12.7	0.07	1.37	0.45
Manganese, filtered (µg/L)	88	32.8	2.1	6.9	5.1
Manganese, unfiltered recoverable (µg/L)	88	113	2.9	17.6	12.0
Zinc, filtered (µg/L)	87	7.7	<1.4	[2]2.8	2.7
Zinc, unfiltered recoverable (µg/L)	88	41	<2.4	[2]6.1	4.1
Arsenic, filtered (µg/L)	88	55.1	9.0	21.1	19.2
Arsenic, unfiltered recoverable (µg/L)	88	53.5	10.0	23.9	22.0
Organic carbon, filtered (mg/L)	6	2.66	1.33	2.02	2.05
Sediment, suspended (percent finer than 0.062 mm)	88	91	26	69	72
Sediment, suspended concentration (mg/L)	88	107	1	12	2
Sediment, suspended discharge (ton/d)	86	55	<0.01	[2]3.4	0.09

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323710—Willow Creek near Anaconda Period of record for water-quality data: December 2004–September 2013					
Streamflow, instantaneous (ft^3/s)	63	114	1.0	15	7.6
pH, onsite (standard units)	65	8.2	7.5	7.7	7.7
Specific conductance, onsite (µS/cm)	65	151	66	103	108
Temperature, water (ºC)	65	15.5	0.0	7.1	7.0
Turbidity, unfiltered, lab (NTRU)	59	39	<2.0	[2]5.4	2.8
Hardness, filtered (mg/L as $CaCO_3$)	65	56.3	22.1	37.6	38.7
Calcium, filtered (mg/L)	65	18.3	7.56	12.6	13.0
Magnesium, filtered (mg/L)	65	2.60	0.78	1.51	1.47
Cadmium, filtered (µg/L)	63	0.05	<0.02	[2]0.03	0.03
Cadmium, unfiltered recoverable (µg/L)	65	0.33	<0.04	[2]0.06	0.05
Copper, filtered (µg/L)	65	4.2	0.82	2.1	2.0
Copper, unfiltered recoverable (µg/L)	65	16.8	1.0	3.7	3.0
Iron, filtered (µg/L)	65	277	28	84.7	68.6
Iron, unfiltered recoverable (µg/L)	65	2,380	85.7	358	226
Lead, filtered (µg/L)	65	0.37	0.03	[2]0.15	0.15
Lead, unfiltered recoverable (µg/L)	65	7.96	0.10	0.89	0.49
Manganese, filtered (µg/L)	65	34.5	6.0	14.5	13.1
Manganese, unfiltered recoverable (µg/L)	65	99.9	12.8	26.5	23.3
Zinc, filtered (µg/L)	65	3.3	0.65	[2]1.7	1.6
Zinc, unfiltered recoverable (µg/L)	65	17.8	<2.0	[2]3.2	2.0
Arsenic, filtered (µg/L)	65	25.7	9.9	15.9	14.9
Arsenic, unfiltered recoverable (µg/L)	65	27.0	9.8	16.9	15.4
Sediment, suspended (percent finer than 0.062 mm)	65	97	25	75	80
Sediment, suspended concentration (mg/L)	65	195	1	16	5
Sediment, suspended discharge (ton/d)	63	50	<0.01	[2]2.3	0.09

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323720—Willow Creek at Opportunity Period of record for water-quality data: March 2003–September 2013					
Streamflow, instantaneous (ft^3/s)	88	116	4.5	17	8.7
pH, onsite (standard units)	88	9.0	7.6	8.1	8.1
Specific conductance, onsite (µS/cm)	88	371	116	269	289
Temperature, water (ºC)	88	24.0	0.0	11.1	11.0
Turbidity, unfiltered, lab (NTRU)	6	5.5	<2.0	[2]3.4	3.7
Hardness, filtered (mg/L as $CaCO_3$)	88	169	58.5	117	124
Calcium, filtered (mg/L)	88	47.4	18.1	34.0	36.4
Magnesium, filtered (mg/L)	88	12.3	3.24	7.73	8.16
Potassium, filtered (mg/L)	6	1.45	1.29	1.39	1.40
Sodium, filtered (mg/L)	6	12.2	8.60	9.67	9.34
Alkalinity, filtered, lab (mg/L)	6	127	82.6	110	115
Chloride, filtered (mg/L)	6	2.24	1.53	1.92	2.03
Fluoride, filtered (mg/L)	6	0.56	0.29	0.41	0.39
Silica, filtered (mg/L)	6	23.3	18.4	21.5	22.4
Sulfate, filtered (mg/L)	6	29.1	16.2	22.4	22.0
Cadmium, filtered (µg/L)	88	0.12	<0.04	[2]0.04	0.04
Cadmium, unfiltered recoverable (µg/L)	88	0.52	0.02	0.10	0.07
Copper, filtered (µg/L)	88	21.4	1.1	5.2	3.5
Copper, unfiltered recoverable (µg/L)	88	48.8	2.6	11.0	7.7
Iron, filtered (µg/L)	88	274	6.1	50.2	42.3
Iron, unfiltered recoverable (µg/L)	88	1,670	27	289	220
Lead, filtered (µg/L)	88	0.89	0.04	[2]0.22	0.19
Lead, unfiltered recoverable (µg/L)	88	14.4	0.27	2.26	1.46
Manganese, filtered (µg/L)	88	200	3.3	33.8	25.7
Manganese, unfiltered recoverable (µg/L)	88	228	4.7	47.2	37.2
Zinc, filtered (µg/L)	88	19.8	<1.4	[2]5.0	4.0
Zinc, unfiltered recoverable (µg/L)	88	68	1.1	12.2	9.0
Arsenic, filtered (µg/L)	88	164	10.9	38.1	28.1
Arsenic, unfiltered recoverable (µg/L)	88	164	11.4	40.5	28.0
Organic carbon, filtered (mg/L)	6	5.59	1.60	3.42	3.41
Sediment, suspended (percent finer than 0.062 mm)	88	97	54	86	89
Sediment, suspended concentration (mg/L)	88	87	1	11	5
Sediment, suspended discharge (ton/d)	88	11	0.02	0.94	0.16

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323750—Silver Bow Creek at Warm Springs Period of record for water-quality data: March 1993–September 2013					
Streamflow, instantaneous (ft^3/s)	172	1,030	16	140	88
pH, onsite (standard units)	170	9.6	8.0	8.8	8.8
Specific conductance, onsite (µS/cm)	170	783	182	462	474
Temperature, water (ºC)	171	25.0	0.0	10.4	10.5
Hardness, filtered (mg/L as $CaCO_3$)	170	314	74.9	192	196
Calcium, filtered (mg/L)	170	90.4	22.5	55.7	57.2
Magnesium, filtered (mg/L)	170	21.4	4.52	12.7	13.0
Potassium, filtered (mg/L)	31	8.30	2.60	4.44	4.30
Sodium, filtered (mg/L)	31	23.0	8.20	16.0	17.0
Alkalinity, filtered, lab (mg/L)	3	99.7	77.4	85.0	77.9
Chloride, filtered (mg/L)	31	15.0	1.30	8.13	7.60
Fluoride, filtered (mg/L)	31	1.20	0.50	0.72	0.70
Silica, filtered (mg/L)	31	20.0	6.3	12.5	12.0
Sulfate, filtered (mg/L)	31	210	44.0	117	120
Cadmium, filtered (µg/L)	170	0.31	<0.04	[2]0.06	0.03
Cadmium, unfiltered recoverable (µg/L)	170	0.56	<0.1	[2]0.12	0.06
Copper, filtered (µg/L)	170	40.0	1.6	7.4	5.2
Copper, unfiltered recoverable (µg/L)	170	96.8	2.4	15.1	10.7
Iron, filtered (µg/L)	170	93	<5	[2]19.3	15.4
Iron, unfiltered recoverable (µg/L)	170	3,000	35.8	315	236
Lead, filtered (µg/L)	170	1.0	<0.08	[2]0.13	<1.0
Lead, unfiltered recoverable (µg/L)	170	41.8	<1.00	[2]2.26	1.24
Manganese, filtered (µg/L)	170	875	11.8	114	76.8
Manganese, unfiltered recoverable (µg/L)	170	899	24.0	173	135
Zinc, filtered (µg/L)	170	73	<1.0	[2]6.9	3.6
Zinc, unfiltered recoverable (µg/L)	170	180	2.0	[2]28.5	16.4
Arsenic, filtered (µg/L)	170	60.0	6.8	22.9	23.0
Arsenic, unfiltered recoverable (µg/L)	170	94.0	10.0	26.5	25.4
Sediment, suspended (percent finer than 0.062 mm)	171	98	43	83	85
Sediment, suspended concentration (mg/L)	172	229	1	9	5
Sediment, suspended discharge (ton/d)	172	279	0.05	6.0	1.3

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323760—Warm Springs Creek near Anaconda Period of record for water-quality data: October 2005–September 2013					
Streamflow, instantaneous (ft^3/s)	48	573	41	140	94
pH, onsite (standard units)	48	8.8	7.8	8.5	8.5
Specific conductance, onsite (µS/cm)	48	278	125	220	230
Temperature, water (ºC)	48	16.0	3.0	8.9	9.0
Turbidity, unfiltered, lab (NTRU)	43	18	<2.0	[2]2.1	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	48	145	58.5	107	110
Calcium, filtered (mg/L)	48	42.8	18.5	32.2	33.2
Magnesium, filtered (mg/L)	48	9.34	2.96	6.57	6.72
Cadmium, filtered (µg/L)	48	0.05	<0.02	[2]0.02	0.02
Cadmium, unfiltered recoverable (µg/L)	48	0.14	<0.02	[2]0.04	0.03
Copper, filtered (µg/L)	47	6.4	<0.80	[2]1.1	0.88
Copper, unfiltered recoverable (µg/L)	48	28.0	1.1	[2]3.4	2.1
Iron, filtered (µg/L)	48	22.4	<4	[2]7.4	5.8
Iron, unfiltered recoverable (µg/L)	48	1,000	26.5	124	75.0
Lead, filtered (µg/L)	48	0.11	<0.01	[2]0.03	<0.08
Lead, unfiltered recoverable (µg/L)	48	3.51	0.07	0.43	0.24
Manganese, filtered (µg/L)	48	2.9	<0.1	[2]1.3	1.1
Manganese, unfiltered recoverable (µg/L)	48	45.2	1.2	6.0	4.1
Zinc, filtered (µg/L)	48	5.6	<1.4	[2]1.0	<2.0
Zinc, unfiltered recoverable (µg/L)	48	20.1	<2.0	[2]3.1	1.2
Arsenic, filtered (µg/L)	48	3.9	1.6	2.3	2.2
Arsenic, unfiltered recoverable (µg/L)	48	5.6	1.7	2.7	2.5
Sediment, suspended (percent finer than 0.062 mm)	48	83	32	65	66
Sediment, suspended concentration (mg/L)	48	65	1	8	4
Sediment, suspended discharge (ton/d)	48	68	0.13	4.5	1.0

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323770—Warm Springs Creek at Warm Springs Period of record for water-quality data: March 1993–September 2013					
Streamflow, instantaneous (ft^3/s)	128	420	2.8	97	57
pH, onsite (standard units)	127	8.7	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	127	795	139	291	295
Temperature, water (ºC)	128	20.0	0.0	8.5	8.0
Turbidity, unfiltered, lab (NTRU)	6	2.5	<2.0	[2] 1.7	1.6
Hardness, filtered (mg/L as $CaCO_3$)	127	415	39.8	141	142
Calcium, filtered (mg/L)	127	130	10.5	43.1	43.6
Magnesium, filtered (mg/L)	127	22.0	3.29	8.18	8.02
Potassium, filtered (mg/L)	25	4.70	0.90	1.51	1.30
Sodium, filtered (mg/L)	25	7.40	1.80	3.52	3.03
Alkalinity, filtered, lab (mg/L)	8	141	88.0	116	110
Chloride, filtered (mg/L)	25	3.60	0.50	1.24	1.00
Fluoride, filtered (mg/L)	25	0.60	0.30	0.42	0.40
Silica, filtered (mg/L)	25	13.0	8.40	10.4	10.0
Sulfate, filtered (mg/L)	25	270	20.0	57.1	36.1
Cadmium, filtered (µg/L)	126	0.10	<0.04	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	126	0.41	<0.05	[2]0.08	0.04
Copper, filtered (µg/L)	126	16.0	1.0	3.2	2.6
Copper, unfiltered recoverable (µg/L)	126	147	2.3	19.1	8.9
Iron, filtered (µg/L)	127	30	<5.0	[2]11.5	10.1
Iron, unfiltered recoverable (µg/L)	127	2,110	17.2	304	122
Lead, filtered (µg/L)	126	1.8	<0.025	[2]0.07	<0.60
Lead, unfiltered recoverable (µg/L)	126	14.0	<1.00	[2]1.89	0.67
Manganese, filtered (µg/L)	126	570	18.8	111	82.9
Manganese, unfiltered recoverable (µg/L)	126	1,400	37.0	194	150
Zinc, filtered (µg/L)	126	10	<1.0	[2]2.0	1.4
Zinc, unfiltered recoverable (µg/L)	127	60	<2.4	[2]8.8	3.0
Arsenic, filtered (µg/L)	126	14.0	2.0	5.0	4.3
Arsenic, unfiltered recoverable (µg/L)	126	27.0	3.0	7.2	5.8
Organic carbon, filtered (mg/L)	6	1.84	0.97	1.40	1.45
Sediment, suspended (percent finer than 0.062 mm)	128	90	43	71	71
Sediment, suspended concentration (mg/L)	128	127	1	18	8
Sediment, suspended discharge (ton/d)	128	87	0.03	8.3	1.1

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen Period of record for water-quality data: July 1988–September 2013					
Streamflow, instantaneous (ft^3/s)	212	1,380	14	223	137
pH, onsite (standard units)	200	9.2	7.5	8.5	8.6
Specific conductance, onsite (µS/cm)	201	720	182	410	417
Temperature, water (ºC)	212	23.5	0.0	9.7	10.0
Hardness, filtered (mg/L as $CaCO_3$)	199	365	76.4	179	186
Calcium, filtered (mg/L)	199	110	23.2	53.0	55.0
Magnesium, filtered (mg/L)	199	22.0	4.44	11.4	11.7
Potassium, filtered (mg/L)	32	5.90	2.00	3.51	3.30
Sodium, filtered (mg/L)	32	19.0	3.60	12.0	12.5
Alkalinity, filtered, lab (mg/L)	3	117	84.4	96.3	87.4
Chloride, filtered (mg/L)	32	11.0	2.00	6.50	6.20
Fluoride, filtered (mg/L)	32	1.10	0.40	0.60	0.60
Silica, filtered (mg/L)	32	17.0	8.10	11.7	11.8
Sulfate, filtered (mg/L)	32	220	34.0	97.2	98.5
Cadmium, filtered (µg/L)	199	1.0	<0.04	[2]0.06	0.02
Cadmium, unfiltered recoverable (µg/L)	199	3.0	<0.1	[2]0.18	0.06
Copper, filtered (µg/L)	199	50.0	1.4	7.5	5.6
Copper, unfiltered recoverable (µg/L)	198	240	4.1	26.3	14.9
Iron, filtered (µg/L)	199	110	<3.0	[2]15.9	12.0
Iron, unfiltered recoverable (µg/L)	199	9,200	56	461	260
Lead, filtered (µg/L)	199	3.00	<0.08	[2]0.14	<1.00
Lead, unfiltered recoverable (µg/L)	199	31.0	<1.00	[2]3.30	1.80
Manganese, filtered (µg/L)	199	460	13.1	101	74.0
Manganese, unfiltered recoverable (µg/L)	199	1,400	47.3	212	163
Zinc, filtered (µg/L)	199	110	<1.0	[2]8.4	4.0
Zinc, unfiltered recoverable (µg/L)	199	360	<10.0	[2]34.4	20.0
Arsenic, filtered (µg/L)	199	53.0	4.0	15.0	14.0
Arsenic, unfiltered recoverable (µg/L)	199	78.0	3.0	19.0	17.0
Sediment, suspended (percent finer than 0.062 mm)	212	97	32	76	77
Sediment, suspended concentration (mg/L)	213	338	1	17	8
Sediment, suspended discharge (ton/d)	212	459	0.12	20	2.8

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323840—Lost Creek near Anaconda Period of record for water-quality data: December 2004–September 2013					
Streamflow, instantaneous (ft^3/s)	71	73	0.37	12	8.7
pH, onsite (standard units)	71	8.6	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	71	253	121	198	211
Temperature, water (ºC)	71	17.0	0.0	8.0	8.5
Turbidity, unfiltered, lab (NTRU)	71	24,200	<2.0	[2]343	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	71	122	50.4	94.6	101
Calcium, filtered (mg/L)	71	37.1	15.7	28.7	30.2
Magnesium, filtered (mg/L)	71	7.40	2.71	5.58	5.91
Potassium, filtered (mg/L)	6	1.39	1.14	1.24	1.22
Sodium, filtered (mg/L)	6	3.18	2.62	2.78	2.66
Alkalinity, filtered, lab (mg/L)	6	109	82.5	96.9	97.4
Chloride, filtered (mg/L)	6	0.73	0.57	0.65	0.66
Fluoride, filtered (mg/L)	6	0.47	0.37	0.43	0.42
Silica, filtered (mg/L)	6	11.3	10.9	11.2	11.2
Sulfate, filtered (mg/L)	6	10.8	7.33	8.50	8.26
Cadmium, filtered (µg/L)	70	0.90	<0.02	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	71	147	0.01	[2]2.1	0.03
Copper, filtered (µg/L)	71	90.5	0.80	3.1	1.6
Copper, unfiltered recoverable (µg/L)	71	29,100	1.3	416	4.4
Iron, filtered (µg/L)	71	26.5	<6.0	[2]9.6	8.7
Iron, unfiltered recoverable (µg/L)	71	99,700	22	1,590	102
Lead, filtered (µg/L)	71	0.18	<0.02	[2]0.04	0.02
Lead, unfiltered recoverable (µg/L)	71	1,290	0.08	19.0	0.42
Manganese, filtered (µg/L)	71	42.4	<0.2	[2]1.9	1.3
Manganese, unfiltered recoverable (µg/L)	71	8,830	1.2	131	4.5
Zinc, filtered (µg/L)	70	30.0	<1.4	[2]1.7	0.8
Zinc, unfiltered recoverable (µg/L)	70	7,780	<2	[2]114	2.0
Arsenic, filtered (µg/L)	71	156	1.8	6.3	3.4
Arsenic, unfiltered recoverable (µg/L)	71	3,860	2.0	59.0	3.8
Organic carbon, filtered (mg/L)	6	2.31	0.91	1.65	1.66
Sediment, suspended (percent finer than 0.062 mm)	71	97	22	57	58
Sediment, suspended concentration (mg/L)	71	58,900	1	841	5
Sediment, suspended discharge (ton/d)	71	1,320	<0.01	[2]19	0.11

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323850—Lost Creek near Galen Period of record for water-quality data: March 2003–September 2013					
Streamflow, instantaneous (ft^3/s)	87	71	1.3	24	18
pH, onsite (standard units)	88	8.7	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	88	934	540	643	629
Temperature, water (ºC)	88	26.5	0.0	10.1	10.0
Hardness, filtered (mg/L as $CaCO_3$)	88	451	203	303	302
Calcium, filtered (mg/L)	88	122	48.5	86.0	87.4
Magnesium, filtered (mg/L)	88	35.7	17.3	21.6	20.9
Cadmium, filtered (µg/L)	87	0.05	<0.02	[2]0.03	0.02
Cadmium, unfiltered recoverable (µg/L)	88	0.12	<0.02	[2]0.04	0.04
Copper, filtered (µg/L)	88	6.7	0.99	2.2	1.9
Copper, unfiltered recoverable (µg/L)	88	22.5	1.6	5.3	4.3
Iron, filtered (µg/L)	88	61.1	<6	[2]13.2	11.0
Iron, unfiltered recoverable (µg/L)	88	392	14	104	79.0
Lead, filtered (µg/L)	87	0.33	<0.025	[2]0.05	0.02
Lead, unfiltered recoverable (µg/L)	88	1.90	0.04	0.38	0.27
Manganese, filtered (µg/L)	88	54.0	1.9	15.4	13.9
Manganese, unfiltered recoverable (µg/L)	88	56.5	2.2	20.5	19.0
Zinc, filtered (µg/L)	87	3.8	<1.0	[2]1.6	1.3
Zinc, unfiltered recoverable (µg/L)	88	10.3	<2.0	[2]3.0	2.0
Arsenic, filtered (µg/L)	88	41.8	6.0	14.2	12.6
Arsenic, unfiltered recoverable (µg/L)	88	43.0	6.0	15.0	13.4
Sediment, suspended (percent finer than 0.062 mm)	88	88	18	60	62
Sediment, suspended concentration (mg/L)	88	79	2	16	15
Sediment, suspended discharge (ton/d)	87	4.2	0.01	1.0	0.68

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12324200—Clark Fork at Deer Lodge Period of record for water-quality data: March 1985–September 2013					
Streamflow, instantaneous (ft^3/s)	265	2,000	23	307	228
pH, onsite (standard units)	213	8.9	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	248	642	228	469	494
Temperature, water (ºC)	264	23.0	0.0	9.9	10.0
Hardness, filtered (mg/L as $CaCO_3$)	205	282	94.9	198	208
Calcium, filtered (mg/L)	205	82.0	28.2	58.6	61.0
Magnesium, filtered (mg/L)	205	18.7	5.53	12.6	13.3
Potassium, filtered (mg/L)	31	6.30	2.40	3.62	3.60
Sodium, filtered (mg/L)	31	25.0	8.60	14.9	14.0
Alkalinity, filtered, lab (mg/L)	3	142	105	119	109
Chloride, filtered (mg/L)	31	12.0	1.20	7.00	7.10
Fluoride, filtered (mg/L)	31	0.70	0.10	0.61	0.60
Silica, filtered (mg/L)	31	34.0	11.0	16.6	16.0
Sulfate, filtered (mg/L)	31	140	44.0	96.2	98.0
Cadmium, filtered (µg/L)	214	2.0	<0.10	[2]0.08	<1.0
Cadmium, unfiltered recoverable (µg/L)	214	5.0	<0.10	[2]0.38	0.10
Copper, filtered (µg/L)	215	120	3.2	10.6	8.0
Copper, unfiltered recoverable (µg/L)	213	1,500	8.2	77.0	35.0
Iron, filtered (µg/L)	215	190	<3	[2]15.1	9.4
Iron, unfiltered recoverable (µg/L)	215	29,000	27	1,390	499
Lead, filtered (µg/L)	215	6.00	<0.08	[2]0.30	<5.00
Lead, unfiltered recoverable (µg/L)	215	200	0.33	[2]10.2	4.36
Manganese, filtered (µg/L)	215	400	1.0	41.1	33.4
Manganese, unfiltered recoverable (µg/L)	215	4,600	11.9	221	130
Zinc, filtered (µg/L)	215	230	<10.0	[2]11.2	7.5
Zinc, unfiltered recoverable (µg/L)	213	1,700	4.0	80.0	38.2
Arsenic, filtered (µg/L)	215	39.0	6.0	14.4	13.4
Arsenic, unfiltered recoverable (µg/L)	214	215	4.8	23.4	17.2
Sediment, suspended (percent finer than 0.062 mm)	256	99	31	72	73
Sediment, suspended concentration (mg/L)	265	2,250	1	66	22
Sediment, suspended discharge (ton/d)	265	8,690	0.18	139	12

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for water-quality data: March 2009–September 2013					
Streamflow, instantaneous (ft^3/s)	38	2,310	71	498	326
pH, onsite (standard units)	38	8.8	7.9	8.3	8.4
Specific conductance, onsite (µS/cm)	38	499	249	410	447
Temperature, water (ºC)	38	21.0	1.0	11.0	12.0
Hardness, filtered (mg/L as $CaCO_3$)	38	227	104	180	196
Calcium, filtered (mg/L)	38	66.5	31.8	52.7	56.8
Magnesium, filtered (mg/L)	38	15.2	5.93	11.8	12.9
Cadmium, filtered (µg/L)	38	.23	0.02	0.07	0.07
Cadmium, unfiltered recoverable (µg/L)	38	.84	0.03	0.28	0.22
Copper, filtered (µg/L)	38	40.6	4.0	9.9	7.9
Copper, unfiltered recoverable (µg/L)	38	222	10.0	61.9	32.6
Iron, filtered (µg/L)	38	43.2	4.5	16.5	13.8
Iron, unfiltered recoverable (µg/L)	38	3,860	46.1	928	516
Lead, filtered (µg/L)	38	.42	0.04	0.15	0.12
Lead, unfiltered recoverable (µg/L)	38	32.3	0.39	8.1	3.95
Manganese, filtered (µg/L)	38	64.6	12.3	29.7	27.6
Manganese, unfiltered recoverable (µg/L)	38	344	19.7	125	104
Zinc, filtered (µg/L)	38	37.1	1.9	6.5	5.4
Zinc, unfiltered recoverable (µg/L)	38	181	3.0	50.7	28.8
Arsenic, filtered (µg/L)	38	36.7	9.2	15.5	16.1
Arsenic, unfiltered recoverable (µg/L)	38	46.0	10.9	21.9	18.6
Sediment, suspended (percent finer than 0.062 mm)	38	90	42	71	74
Sediment, suspended concentration (mg/L)	38	205	4	47	26
Sediment, suspended discharge (ton/d)	38	550	0.77	99	26

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek Period of record for water-quality data: March 1993–September 2013					
Streamflow, instantaneous (ft^3/s)	171	4,450	87	776	513
pH, onsite (standard units)	170	8.9	7.9	8.4	8.3
Specific conductance, onsite (µS/cm)	170	510	206	367	380
Temperature, water (ºC)	171	23.0	0.0	10.2	10.5
Hardness, filtered (mg/L as $CaCO_3$)	170	232	85.8	162	169
Calcium, filtered (mg/L)	170	68.0	25.9	47.7	50.0
Magnesium, filtered (mg/L)	170	15.0	5.15	10.4	10.8
Potassium, filtered (mg/L)	28	6.90	2.00	3.11	3.00
Sodium, filtered (mg/L)	28	19.0	6.90	11.5	12.0
Chloride, filtered (mg/L)	28	7.20	2.50	4.73	4.40
Fluoride, filtered (mg/L)	28	0.60	0.10	0.43	0.40
Silica, filtered (mg/L)	28	25.0	14.0	18.3	18.0
Sulfate, filtered (mg/L)	28	88.0	31.0	59.5	55.5
Cadmium, filtered (µg/L)	170	0.2	<0.02	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	170	2	<0.10	[2]0.17	0.07
Copper, filtered (µg/L)	169	36.0	2.1	6.6	5.3
Copper, unfiltered recoverable (µg/L)	169	440	5.2	38.8	22.9
Iron, filtered (µg/L)	170	100	<3	[2]19.0	12.0
Iron, unfiltered recoverable (µg/L)	170	12,000	27	835	416
Lead, filtered (µg/L)	168	0.6	<0.08	[2]0.11	<1.00
Lead, unfiltered recoverable (µg/L)	169	73.0	0.14	[2]5.40	2.79
Manganese, filtered (µg/L)	170	57.3	4.0	18.9	17.0
Manganese, unfiltered recoverable (µg/L)	170	1,100	9.3	116	82.9
Zinc, filtered (µg/L)	170	26	<1.0	[2]5.3	3.5
Zinc, unfiltered recoverable (µg/L)	170	510	2	41.6	28.6
Arsenic, filtered (µg/L)	170	22.5	5.8	10.1	10.0
Arsenic, unfiltered recoverable (µg/L)	170	75.0	7.0	14.6	12.0
Sediment, suspended (percent finer than 0.062 mm)	171	94	43	75	78
Sediment, suspended concentration (mg/L)	171	752	1	47	20
Sediment, suspended discharge (ton/d)	171	7,960	0.55	202	27

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12331800—Clark Fork near Drummond Period of record for water-quality data: March 1993–September 2013					
Streamflow, instantaneous (ft^3/s)	171	5,540	149	1,070	771
pH, onsite (standard units)	170	8.7	7.8	8.3	8.3
Specific conductance, onsite (µS/cm)	170	630	189	407	419
Temperature, water (ºC)	171	22.5	0.5	11.0	11.0
Hardness, filtered (mg/L as $CaCO_3$)	170	298	73.9	183	190
Calcium, filtered (mg/L)	170	83.0	21.0	52.6	54.6
Magnesium, filtered (mg/L)	170	22.0	5.2	12.6	13.0
Potassium, filtered (mg/L)	28	10.0	2.10	3.67	3.40
Sodium, filtered (mg/L)	28	20.0	5.60	11.5	12.0
Chloride, filtered (mg/L)	28	7.80	2.70	4.83	4.65
Fluoride, filtered (mg/L)	28	0.50	0.20	0.39	0.40
Silica, filtered (mg/L)	28	24.0	10.0	18.7	18.5
Sulfate, filtered (mg/L)	28	130	25.0	64.8	64.5
Cadmium, filtered (µg/L)	169	0.30	<0.04	[2]0.05	0.02
Cadmium, unfiltered recoverable (µg/L)	170	2.0	<0.10	[2]0.22	0.08
Copper, filtered (µg/L)	167	21.0	1.0	6.3	4.9
Copper, unfiltered recoverable (µg/L)	168	360	4.6	41.3	21.8
Iron, filtered (µg/L)	170	150	<3	[2]18.8	9.6
Iron, unfiltered recoverable (µg/L)	169	8,800	19.7	966	457
Lead, filtered (µg/L)	166	1.2	<0.08	[2]0.16	0.04
Lead, unfiltered recoverable (µg/L)	166	56.0	<1.00	[2]7.36	3.45
Manganese, filtered (µg/L)	169	60.7	3.3	16.6	15.0
Manganese, unfiltered recoverable (µg/L)	170	880	8.0	140	90.6
Zinc, filtered (µg/L)	170	21.0	1.4	[2]5.7	4.3
Zinc, unfiltered recoverable (µg/L)	170	490	2.9	56.7	30.0
Arsenic, filtered (µg/L)	170	23.9	3.2	10.5	10.0
Arsenic, unfiltered recoverable (µg/L)	170	62	8	15.9	13.0
Sediment, suspended (percent finer than 0.062 mm)	171	93	38	74	75
Sediment, suspended concentration (mg/L)	171	530	2	61	25
Sediment, suspended discharge (ton/d)	171	4,720	1.7	310	48

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for water-quality data: March 1985–September 2013					
Streamflow, instantaneous (ft^3/s)	268	10,600	296	1,960	1,160
pH, onsite (standard units)	214	8.8	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	243	483	139	299	312
Temperature, water (ºC)	267	22.0	0.0	9.5	10.0
Hardness, filtered (mg/L as $CaCO_3$)	204	205	53.6	131	134
Calcium, filtered (mg/L)	204	59.0	14.9	36.9	37.2
Magnesium, filtered (mg/L)	204	14.0	3.94	9.43	9.58
Potassium, filtered (mg/L)	32	5.70	1.51	2.45	2.45
Sodium, filtered (mg/L)	32	12.0	3.34	7.95	8.45
Alkalinity, filtered, lab (mg/L)	5	155	52.5	110	120
Chloride, filtered (mg/L)	32	5.60	1.50	3.13	2.95
Fluoride, filtered (mg/L)	32	0.40	0.17	0.29	0.30
Silica, filtered (mg/L)	32	19.0	12.0	14.9	15.0
Sulfate, filtered (mg/L)	32	68.0	12.6	41.8	41.0
Cadmium, filtered (µg/L)	212	0.10	<0.02	[2]0.03	<1
Cadmium, unfiltered recoverable (µg/L)	213	4.00	<0.01	[2]0.24	0.03
Copper, filtered (µg/L)	212	25.0	1.1	4.7	3.7
Copper, unfiltered recoverable (µg/L)	211	500	2.7	32.1	14.6
Iron, filtered (µg/L)	213	190	<3	[2]23.5	14.0
Iron, unfiltered recoverable (µg/L)	213	19,000	32.6	953	360
Lead, filtered (µg/L)	209	7.00	<.02	[2]0.27	<1.00
Lead, unfiltered recoverable (µg/L)	209	100	<1.00	[2]6.49	2.56
Manganese, filtered (µg/L)	213	37.4	<1.0	[2]8.4	7.0
Manganese, unfiltered recoverable (µg/L)	213	2,000	8.9	115	58.7
Zinc, filtered (µg/L)	211	39	<3.0	[2]5.7	4.0
Zinc, unfiltered recoverable (µg/L)	213	1,100	2.9	[2]54.6	27.0
Arsenic, filtered (µg/L)	213	17.0	2.7	6.1	5.6
Arsenic, unfiltered recoverable (µg/L)	213	110	3.0	9.5	7.0
Sediment, suspended (percent finer than 0.062 mm)	257	98	27	74	76
Sediment, suspended concentration (mg/L)	268	1,370	2	54	18
Sediment, suspended discharge (ton/d)	268	34,700	3.0	610	60

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner Period of record for water-quality data: March 1985–September 2013					
Streamflow, instantaneous (ft^3/s)	196	13,400	344	2,790	1,360
pH, onsite (standard units)	156	8.7	7.5	8.3	8.3
Specific conductance, onsite (µS/cm)	173	294	131	208	204
Temperature, water (ºC)	196	22.5	0.0	9.6	9.5
Turbidity, unfiltered, lab (NTRU)	7	30	<2.0	[2]7.2	2.0
Hardness, filtered (mg/L as $CaCO_3$)	148	146	55.1	104	98.6
Calcium, filtered (mg/L)	148	37.7	14.0	26.5	25.4
Magnesium, filtered (mg/L)	148	13.2	4.90	9.15	8.66
Potassium, filtered (mg/L)	26	2.80	0.48	0.87	0.80
Sodium, filtered (mg/L)	26	3.41	1.17	2.46	2.50
Alkalinity, filtered, lab (mg/L)	9	148	71.5	117	131
Chloride, filtered (mg/L)	26	1.60	0.23	0.64	0.58
Fluoride, filtered (mg/L)	26	0.10	<0.10	[2]0.10	<0.10
Silica, filtered (mg/L)	26	12.0	6.80	8.64	8.10
Sulfate, filtered (mg/L)	26	6.60	1.10	4.58	4.80
Cadmium, filtered (µg/L)	154	1.00	<0.02	[2]0.02	<0.10
Cadmium, unfiltered recoverable (µg/L)	156	2.00	<0.01	[2]0.09	<1.00
Copper, filtered (µg/L)	152	7.0	<0.80	[2]1.3	0.71
Copper, unfiltered recoverable (µg/L)	153	34.0	<0.70	[2]4.3	1.9
Iron, filtered (µg/L)	155	100	<3	[2]17.5	10.2
Iron, unfiltered recoverable (µg/L)	156	3,600	13.9	404	185
Lead, filtered (µg/L)	150	8.00	<0.01	[2]0.29	<0.60
Lead, unfiltered recoverable (µg/L)	151	25.0	<0.04	[2]2.06	0.08
Manganese, filtered (µg/L)	155	11.0	<1.0	[2]2.4	2.0
Manganese, unfiltered recoverable (µg/L)	156	180	<10.0	[2]27.8	16.0
Zinc, filtered (µg/L)	154	15.0	<0.60	[2]1.9	<3.0
Zinc, unfiltered recoverable (µg/L)	156	60.0	<1.0	[2]5.0	<10.0
Arsenic, filtered (µg/L)	155	2.0	<1.0	[2]0.96	0.96
Arsenic, unfiltered recoverable (µg/L)	156	4.0	<1.0	[2]1.3	1.0
Sediment, suspended (percent finer than 0.062 mm)	194	98	42	80	82
Sediment, suspended concentration (mg/L)	196	271	1	28	8
Sediment, suspended discharge (ton/d)	196	7,670	1.1	515	31

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2013.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 ºC; ºC, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; lab, laboratory; µg/L, micrograms per liter; <, less than laboratory reporting level[1]; mm, millimeter; ton/d, tons per day; NTRU, nephelometric turbidity ratio unit]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12340500—Clark Fork above Missoula Period of record for water-quality data: July 1986–September 2013					
Streamflow, instantaneous (ft^3/s)	233	22,900	720	4,620	2,470
pH, onsite (standard units)	191	8.8	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	211	399	142	252	261
Temperature, water (ºC)	231	22.0	0.0	9.6	9.5
Turbidity, unfiltered, lab (NTRU)	40	100	<2.0	[2]13	4.9
Hardness, filtered (mg/L as $CaCO_3$)	191	168	60.5	116	118
Calcium, filtered (mg/L)	191	46.0	14.0	31.4	31.6
Magnesium, filtered (mg/L)	191	13.4	5.28	9.20	9.20
Potassium, filtered (mg/L)	28	4.50	0.90	1.72	1.50
Sodium, filtered (mg/L)	28	7.80	2.40	5.29	5.35
Chloride, filtered (mg/L)	28	4.20	0.90	1.92	1.80
Fluoride, filtered (mg/L)	28	0.30	<0.10	[2]0.19	0.20
Silica, filtered (mg/L)	28	16.0	9.40	11.8	11.0
Sulfate, filtered (mg/L)	28	43.0	9.30	23.3	23.0
Cadmium, filtered (µg/L)	190	.20	<0.02	[2]0.03	<0.10
Cadmium, unfiltered recoverable (µg/L)	191	5.0	<0.01	[2]0.15	<1.0
Copper, filtered (µg/L)	190	12.6	0.7	2.8	2.1
Copper, unfiltered recoverable (µg/L)	189	400	1.9	18.8	8.1
Iron, filtered (µg/L)	191	200	<3	[2]21.6	15.0
Iron, unfiltered recoverable (µg/L)	191	13,000	42.1	614	247
Lead, filtered (µg/L)	184	1.20	<0.02	[2]0.13	<1.00
Lead, unfiltered recoverable (µg/L)	186	78.0	<1.00	[2]3.33	1.50
Manganese, filtered (µg/L)	191	230	4.5	15.5	13.2
Manganese, unfiltered recoverable (µg/L)	191	1,100	10.0	63.8	40.0
Zinc, filtered (µg/L)	190	16.0	<1.0	[2]3.4	2.3
Zinc, unfiltered recoverable (µg/L)	191	1,100	<3.0	[2]32.1	13.8
Arsenic, filtered (µg/L)	191	9.0	1.0	3.4	3.2
Arsenic, unfiltered recoverable (µg/L)	191	69.0	1.0	5.3	4.0
Sediment, suspended (percent finer than 0.062 mm)	229	99	14	83	88
Sediment, suspended concentration (mg/L)	234	950	2	43	12
Sediment, suspended discharge (ton/d)	233	21,900	5.8	1,090	85

[1]Differing less-than (<) values for an individual constituent are the result of changes in the laboratory reporting level during the period of record.

[2]Value for the mean is estimated by using a log-probability regression to predict the values of data less than the laboratory reporting level (Helsel and Cohn, 1988). Minimum values that are not censored when the mean indicates that a censored value was used in the mean calculation, are a result of changes in the laboratory reporting level during the period of record.

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2013.

[Reported concentrations are in micrograms per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. Values are reported using U.S. Geological Survey rounding standards. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12323600—Silver Bow Creek at Opportunity Period of record for bed-sediment data: 1992–2013					
Arsenic	11	186	34	106	119
Cadmium	22	43.9	5.9	26.9	26.8
Chromium	20	50.7	16.8	30.2	26.8
Copper	22	9,020	522	3,720	3,960
Iron	22	45,300	28,200	35,100	34,200
Lead	22	1,030	121	572	551
Manganese	22	9,220	1,160	3,220	2,680
Nickel	21	21.4	12.0	14.9	14.8
Silver	12	20.0	8.3	15.5	15.8
Zinc	22	13,400	1,490	6,520	6,870
12323750—Silver Bow Creek at Warm Springs Period of record for bed-sediment data: 1992–2013					
Arsenic	11	177	67	112	103
Cadmium	22	12.2	4.2	7.0	6.5
Chromium	20	46.8	<15.7	[1]24.3	[1]23.2
Copper	22	769	169	343	295
Iron	22	32,500	15,400	23,700	23,000
Lead	22	100	49	70	69
Manganese	22	17,700	1,470	7,460	7,210
Nickel	21	20.0	9.2	14.8	14.6
Silver	12	4.4	0.3	[1]1.9	[1]1.8
Zinc	22	2,220	554	904	707
12323770—Warm Springs Creek at Warm Springs Period of record for bed-sediment data: 1995, 1997, 1999, 2002, 2005, 2008, 2011					
Arsenic	3	66	34	51	52
Cadmium	7	5.8	1.2	3.2	3.3
Chromium	7	39.3	27.5	32.1	31.5
Copper	7	1,060	496	849	881
Iron	7	26,600	16,800	21,400	21,900
Lead	7	86	42	75	82
Manganese	7	12,100	555	6,890	7,780
Nickel	7	25.5	14.5	19.4	19.2
Silver	4	5.1	3.1	3.8	3.5
Zinc	7	453	237	381	396

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Reported concentrations are in micrograms per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. Values are reported using U.S. Geological Survey rounding standards. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen Period of record for bed-sediment data: 1987, 1991–2013					
Arsenic	11	156	73	104	99
Cadmium	24	20.1	3.8	8.0	6.8
Chromium	20	44.6	19.1	29.8	28.3
Copper	24	2,300	838	1,190	1,120
Iron	24	39,800	22,600	27,900	27,200
Lead	24	235	92	129	122
Manganese	24	17,300	1,530	8,720	8,510
Nickel	21	23.2	13.9	18.6	18.3
Silver	14	7.3	<3.2	[1]4.4	[1]4.5
Zinc	24	3,560	721	1,370	1,120
461415112450801—Clark Fork below Lost Creek, near Galen Period of record for bed-sediment data: 1996–2013					
Arsenic	11	204	90	115	108
Cadmium	18	10.5	4.8	6.8	6.4
Chromium	18	42.4	20.5	30.4	31.8
Copper	18	2,050	1,150	1,490	1,440
Iron	18	32,800	24,400	29,100	29,600
Lead	18	218	123	162	160
Manganese	18	9,820	1,430	5,250	5,280
Nickel	18	19.9	11.7	15.9	16.3
Silver	8	7.8	4.2	6.5	6.7
Zinc	18	1,680	930	1,260	1,250
461559112443301—Clark Fork at county bridge, near Racetrack Period of record for bed-sediment data: 1996–2013					
Arsenic	11	132	56	89	90
Cadmium	18	8.7	4.6	6.4	6.1
Chromium	18	45.2	19.0	30.1	29.2
Copper	18	1,810	933	1,270	1,290
Iron	18	31,700	21,200	27,400	28,100
Lead	18	186	103	142	143
Manganese	18	6,310	1,600	3,210	2,990
Nickel	18	18.4	10.3	14.4	14.7
Silver	8	6.1	<3.3	[1]5.0	[1]5.4
Zinc	18	1,550	911	1,170	1,150

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Reported concentrations are in micrograms per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. Values are reported using U.S. Geological Survey rounding standards. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack Period of record for bed-sediment data: 1996–2013					
Arsenic	11	103	58	80	80
Cadmium	18	10.3	4.1	6.2	5.8
Chromium	18	39.2	16.0	28.5	27.6
Copper	18	1,580	721	1,120	1,100
Iron	18	33,700	20,600	26,900	26,600
Lead	18	155	92	128	131
Manganese	18	8,370	1,200	3,790	3,210
Nickel	18	16.9	8.7	12.9	12.5
Silver	8	6.2	2.7	4.9	5.0
Zinc	18	1,570	900	1,120	1,080
12324200—Clark Fork at Deer Lodge Period of record for bed-sediment data: 1986–87, 1990–2013					
Arsenic	11	102	49	73	70
Cadmium	26	10.0	3.5	5.9	5.1
Chromium	20	50.7	19.5	32.5	30.4
Copper	26	4,180	683	1,240	1,070
Iron	26	35,300	21,100	27,400	26,300
Lead	26	242	103	143	140
Manganese	26	6,020	1,070	2,590	2,420
Nickel	21	21.1	11.5	14.8	14.3
Silver	16	7.9	2.4	4.7	4.5
Zinc	26	1,730	844	1,170	1,090
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for bed-sediment data: 2009-2013					
Arsenic	5	91	50	72	81
Cadmium	5	5.5	4.1	4.6	4.5
Chromium	5	52.8	19.9	40.7	45.5
Copper	5	1,290	773	1,090	1,260
Iron	5	32,400	20,400	26,500	27,300
Lead	5	145	92	125	140
Manganese	5	3,560	1,150	2,370	2,660
Nickel	5	17.2	10.6	13.8	13.9
Silver	0	--	--	--	--
Zinc	5	1,240	850	1,050	1,100

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Reported concentrations are in micrograms per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. Values are reported using U.S. Geological Survey rounding standards. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek Period of record for bed-sediment data: 1992–2013					
Arsenic	11	62	23	40	36
Cadmium	22	8.1	2.5	4.4	4.0
Chromium	20	55.3	20.2	33.1	31.8
Copper	22	1,080	338	674	702
Iron	22	32,100	15,500	23,400	24,000
Lead	22	152	52	93	93
Manganese	22	2,610	977	1,800	1,810
Nickel	21	18.6	9.0	13.8	14.1
Silver	12	4.8	2.3	3.2	3.2
Zinc	22	1,320	531	895	892
12331800—Clark Fork near Drummond Period of record for bed-sediment data: 1986–87, 1991–2013					
Arsenic	11	66	17	37	33
Cadmium	25	7.7	1.7	4.1	4.2
Chromium	20	41.9	9.2	28.1	30.7
Copper	25	747	183	458	460
Iron	25	43,700	14,800	24,100	23,200
Lead	25	135	27	84	83
Manganese	25	4,820	832	2,010	1,880
Nickel	21	16.8	4.8	12.7	13.4
Silver	15	4.7	<3.2	[1]3.0	[1]2.9
Zinc	25	1,230	380	905	947
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for bed-sediment data: 1986, 1991–2013					
Arsenic	11	43	17	27	25
Cadmium	24	7.3	1.2	3.4	3.4
Chromium	20	42.5	15.3	27.0	28.4
Copper	24	635	211	345	322
Iron	24	25,900	12,600	19,200	17,300
Lead	24	115	37	66	64
Manganese	24	2,340	591	1,260	1,240
Nickel	21	19.1	6.9	12.3	11.5
Silver	14	3.9	<1.9	[1]2.1	[1]1.9
Zinc	24	1,160	448	779	781

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Reported concentrations are in micrograms per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. Values are reported using U.S. Geological Survey rounding standards. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner Period of record for bed-sediment data: 1986–87, 1991, 1993–96, 1998–2001, 2003, 2006–13					
Arsenic	9	6	<0.2	[1]3	[1]4
Cadmium	20	2.0	0.04	[1]0.5	[1]0.3
Chromium	16	35.2	14.5	22.6	23.7
Copper	20	27	11	20	21
Iron	20	23,000	12,400	17,500	17,900
Lead	20	20	<13	[1]13	[1]11
Manganese	20	746	298	544	544
Nickel	17	14.3	6.0	11.2	11.7
Silver	12	<1.9	<0.3	[1]0.5	[1]<0.6
Zinc	20	82	35	60	61
12340500—Clark Fork above Missoula Period of record for bed-sediment data: 1997–2013					
Arsenic	11	54	12	30	29
Cadmium	17	5.8	1.0	2.9	2.8
Chromium	16	40.7	13.2	27.0	29.0
Copper	17	551	129	342	326
Iron	17	27,000	14,700	20,600	20,400
Lead	17	78	25	53	54
Manganese	17	2,250	477	1,090	1,020
Nickel	17	15.8	7.6	12.5	12.7
Silver	7	2.9	0.8	[1]2.0	[1]2.1
Zinc	17	1,090	346	696	696

[1]Value determined by substituting one-half of the minimum reporting level for censored (<) values when both uncensored and censored values were used to determine the mean and median.

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323600—Silver Bow Creek at Opportunity Period of record for biological data: 1992, 1994–95, 1997–2013					
Brachycentrus spp.					
Arsenic	0	--	--	--	--
Cadmium	5	12.5	5.8	10.1	11.6
Chromium	5	5.9	0.7	2.1	0.9
Copper	5	846	235	587	592
Iron	5	1,190	335	617	469
Lead	5	21.5	7.4	13.7	13.8
Manganese	5	817	231	515	503
Nickel	5	2.1	<0.1	11.3	11.6
Zinc	5	995	629	803	815
Hydropsyche cockerelli					
Arsenic	20	33.3	5.4	12.9	11.1
Cadmium	26	9.7	3.0	5.3	4.8
Chromium	26	25.5	1.0	4.3	3.7
Copper	26	1,090	115	356	351
Iron	26	6,150	689	2,750	2,430
Lead	26	74.3	16.6	35.7	31.1
Manganese	26	3,030	180	1,040	1,120
Nickel	26	4.3	0.7	2.6	2.6
Zinc	26	1,590	540	848	780
Hydropsyche spp.					
Arsenic	14	23.1	6.1	12.1	10.7
Cadmium	19	11.0	2.0	5.4	5.0
Chromium	19	4.7	0.6	2.6	3.0
Copper	19	930	80.7	428	352
Iron	19	3,630	1,050	2,260	2,210
Lead	19	237	19.3	45.5	36.5
Manganese	19	1,790	612	1,040	1,040
Nickel	19	4.1	0.7	2.2	2.3
Zinc	19	1,290	388	875	876
Hydropsyche tana					
Arsenic	0	--	--	--	--
Cadmium	6	9.2	4.8	6.8	6.9
Chromium	6	11.5	0.9	4.5	1.8
Copper	6	456	10.5	236	298
Iron	6	1,520	875	1,100	1,050
Lead	6	21.0	15.6	18.6	18.3
Manganese	6	969	307	634	675
Nickel	6	1.8	0.7	1.4	1.6
Zinc	6	1,070	760	961	1,020

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323750—Silver Bow Creek at Warm Springs Period of record for biological data: 1992–2013					
Claassenia sabulosa					
Arsenic	2	5.0	1.8	3.4	--
Cadmium	2	1.1	0.5	0.8	--
Chromium	2	2.8	0.6	1.7	--
Copper	2	66.4	47.6	57.0	--
Iron	2	300	151	226	--
Lead	2	1.5	0.6	1.0	--
Manganese	2	922	98	510	--
Nickel	2	0.6	0.5	0.6	--
Zinc	2	400	340	370	--
Hydropsyche cockerelli					
Arsenic	18	23.6	7.9	12.9	11.5
Cadmium	44	2.1	0.2	0.6	0.5
Chromium	44	4.3	0.4	1.1	0.9
Copper	44	97.0	16.7	36.9	32.0
Iron	44	1,650	351	837	773
Lead	44	6.0	0.3	3.2	3.0
Manganese	44	3,890	491	1,250	992
Nickel	44	1.8	0.3	0.9	0.8
Zinc	44	276	115	176	169
Hydropsyche occidentalis					
Arsenic	9	31.0	10.5	18.6	15.6
Cadmium	24	1.6	0.2	0.6	0.4
Chromium	24	6.8	0.3	1.7	1.0
Copper	24	48.9	11.0	33.2	32.0
Iron	24	2,960	372	1,240	1,000
Lead	24	8.2	<1.7	[1]4.2	[1]3.8
Manganese	24	6,940	996	2,380	1,890
Nickel	24	2.7	0.7	1.5	1.5
Zinc	24	220	140	181	182
Hydropsyche spp.					
Arsenic	1	--	--	14.0	--
Cadmium	5	2.3	0.4	1.0	0.6
Chromium	5	2.5	0.5	1.4	1.3
Copper	5	47.6	34.9	39.9	40.4
Iron	5	1,100	561	763	767
Lead	5	5.1	1.9	4.0	4.5
Manganese	5	1,190	443	817	804
Nickel	5	1.9	<0.4	[1]1.0	[1]0.8
Zinc	5	284	141	188	162

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323770—Warm Springs Creek at Warm Springs Period of record for biological data: 1995, 1997, 1999, 2002, 2005, 2008, 2011					
Arctopsyche grandis					
Arsenic	4	9.8	7.9	9.2	9.5
Cadmium	8	3.6	0.4	2.5	2.7
Chromium	8	4.2	0.8	2.3	2.4
Copper	8	133	53.2	102	100
Iron	8	1,350	684	970	969
Lead	8	7.2	3.0	[1]5.2	[1]5.2
Manganese	8	3,560	738	2,320	2,380
Nickel	8	3.5	1.1	[1]2.3	[1]2.3
Zinc	8	267	181	205	196
Hesperoperla spp.					
Arsenic	1	--	--	1.2	--
Cadmium	1	--	--	1.0	--
Chromium	1	--	--	2.0	--
Copper	1	--	--	64.9	--
Iron	1	--	--	456	--
Lead	1	--	--	1.9	--
Manganese	1	--	--	202	--
Nickel	1	--	--	0.6	--
Zinc	1	--	--	573	--
Hydropsyche occidentalis					
Arsenic	3	13.6	12.7	13.2	13.3
Cadmium	5	1.3	0.7	1.0	1.2
Chromium	5	8.6	0.3	3.8	3.2
Copper	5	183	125	158	165
Iron	5	2,360	1,590	1,940	1,950
Lead	5	12.6	6.7	8.5	7.7
Manganese	5	3,190	2,400	2,800	2,880
Nickel	5	4.5	2.0	3.0	3.0
Zinc	5	204	148	169	166
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	2	1.1	0.6	0.8	--
Chromium	2	1.6	1.4	1.5	--
Copper	2	95.9	94.8	95.4	--
Iron	2	1,220	1,150	1,180	--
Lead	2	5.9	5.2	5.6	--
Manganese	2	3,390	956	2,170	--
Nickel	2	2.0	1.8	1.9	--
Zinc	2	129	125	127	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen Period of record for biological data: 1987, 1991–2013					
Claassenia sabulosa					
Arsenic	1	--	--	2.0	--
Cadmium	1	--	--	0.2	--
Chromium	1	--	--	1.5	--
Copper	1	--	--	54.7	--
Iron	1	--	--	242	--
Lead	1	--	--	1.0	--
Manganese	1	--	--	323	--
Nickel	1	--	--	0.5	--
Zinc	1	--	--	237	--
Hydropsyche cockerelli					
Arsenic	11	20.5	13.2	15.4	14.2
Cadmium	36	2.7	0.7	1.5	1.5
Chromium	36	9.6	0.8	2.2	1.8
Copper	36	181	48.7	107	111
Iron	36	2,660	816	1,520	1,480
Lead	36	17.1	1.2	8.7	8.4
Manganese	36	3,620	1,070	2,290	2,320
Nickel	36	6.5	0.9	1.9	1.6
Zinc	36	363	136	218	212
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	5	3.2	2.4	2.5	2.4
Chromium	5	4.6	1.8	2.6	2.2
Copper	5	185	156	173	175
Iron	5	1,890	1,360	1,510	1,430
Lead	5	12.4	7.1	8.5	7.9
Manganese	5	3,960	2,360	3,500	3,860
Nickel	5	3.6	1.9	2.3	2.1
Zinc	5	349	292	309	303
Hydropsyche occidentalis					
Arsenic	20	17.7	9.1	14.3	14.6
Cadmium	52	1.6	0.6	1.1	1.2
Chromium	52	6.6	0.4	2.1	1.9
Copper	52	151	49.2	94.6	91.6
Iron	52	2,590	642	1,510	1,420
Lead	52	13.5	1.6	8.2	8.1
Manganese	52	6,170	653	2,480	2,080
Nickel	52	3.5	0.8	1.8	1.7
Zinc	52	286	168	206	200

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen—Continued Period of record for biological data: 1987, 1991–2013					
Hydropsyche tana					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	1.5	--
Chromium	1	--	--	1.4	--
Copper	1	--	--	92.9	--
Iron	1	--	--	1,340	--
Lead	1	--	--	9.0	--
Manganese	1	--	--	2,160	--
Nickel	1	--	--	2.1	--
Zinc	1	--	--	206	--
Hydropsyche spp.					
Arsenic	5	15.7	5.5	11.1	14.2
Cadmium	9	3.5	0.7	1.8	1.3
Chromium	5	2.4	1.1	1.8	1.9
Copper	9	154	55.3	110	126
Iron	9	2,110	914	1,350	1,300
Lead	9	13.5	3.8	9.0	10.5
Manganese	5	4,760	668	2,410	1,520
Nickel	5	2.7	0.9	1.6	1.5
Zinc	9	329	132	239	228

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461415112450801—Clark Fork below Lost Creek, near Galen Period of record for biological data: 1996–2013					
Claassenia sabulosa					
Arsenic	1	--	--	1.5	--
Cadmium	2	0.4	0.3	0.4	--
Chromium	2	1.9	0.4	1.2	--
Copper	2	70.1	67.1	68.6	--
Iron	2	209	189	199	--
Lead	2	1.2	.7	1.0	--
Manganese	2	238	90.4	164	--
Nickel	2	0.2	<0.2	10.2	--
Zinc	2	245	208	226	--
Hydropsyche cockerelli					
Arsenic	16	27.8	8.8	16.4	14.6
Cadmium	27	2.8	1.1	1.8	1.7
Chromium	27	4.0	0.8	2.2	2.5
Copper	27	338	48.8	147	121
Iron	27	4,080	691	1,760	1,290
Lead	27	28.6	4.5	13.4	11.3
Manganese	27	3,160	1,230	1,860	1,750
Nickel	27	2.8	0.9	1.6	1.4
Zinc	27	339	151	238	234
Hydropsyche occidentalis					
Arsenic	9	20.9	12.7	15.8	15.0
Cadmium	23	1.9	0.9	1.4	1.4
Chromium	23	3.6	1.2	2.1	2.0
Copper	23	219	52.1	117	119
Iron	23	2,830	963	1,650	1,510
Lead	23	19.4	6.6	11.0	10.7
Manganese	23	4,150	1,220	2,540	2,190
Nickel	23	3.0	0.9	1.6	1.5
Zinc	23	308	174	243	245
Hydropsyche spp.					
Arsenic	4	14.5	7.0	10.2	9.7
Cadmium	8	1.8	1.0	1.3	1.3
Chromium	8	2.4	0.9	1.4	1.2
Copper	8	153	45.1	96.4	93.0
Iron	8	1,810	533	1,160	1,130
Lead	8	20.5	4.1	9.5	8.0
Manganese	8	1,980	775	1,270	1,230
Nickel	8	2.8	0.9	1.6	1.4
Zinc	8	228	143	182	173

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461415112450801—Clark Fork below Lost Creek, near Galen—Continued Period of record for biological data: 1996–2013					
			Rhyacophila spp.		
Arsenic	2	5.2	3.5	4.4	--
Cadmium	2	4.3	3.9	4.1	--
Chromium	2	1.1	1.0	1.0	--
Copper	2	93.1	73.7	83.4	--
Iron	2	346	324	335	--
Lead	2	5.9	4.8	5.4	--
Manganese	2	320	192	256	--
Nickel	2	0.3	0.3	0.3	--
Zinc	2	411	301	356	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461559112443301—Clark Fork at county bridge, near Racetrack Period of record for biological data: 1996–2013					
Arctopsyche grandis					
Arsenic	1	--	--	13.0	--
Cadmium	1	--	--	1.2	--
Chromium	1	--	--	1.9	--
Copper	1	--	--	101	--
Iron	1	--	--	1,410	--
Lead	1	--	--	13.2	--
Manganese	1	--	--	2,480	--
Nickel	1	--	--	1.4	--
Zinc	1	--	--	260	--
Claassenia sabulosa					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	0.4	--
Chromium	1	--	--	0.3	--
Copper	1	--	--	40.3	--
Iron	1	--	--	113	--
Lead	1	--	--	0.8	--
Manganese	1	--	--	172	--
Nickel	1	--	--	0.2	--
Zinc	1	--	--	213	--
Hydropsyche cockerelli					
Arsenic	14	20.2	11.1	14.5	13.7
Cadmium	25	2.2	0.8	1.6	1.5
Chromium	25	3.0	0.6	1.8	2.0
Copper	25	198	50.0	106	98.2
Iron	25	3,330	657	1,400	1,080
Lead	25	18.7	3.7	9.6	8.2
Manganese	25	2,360	646	1,670	1,900
Nickel	25	2.0	0.7	1.3	1.1
Zinc	25	302	139	203	188
Hydropsyche occidentalis					
Arsenic	15	16.8	9.2	13.1	12.8
Cadmium	28	2.3	0.7	1.4	1.4
Chromium	28	3.7	1.1	2.2	2.0
Copper	28	164	59.5	116	122
Iron	28	3,690	1,030	1,670	1,580
Lead	28	15.7	4.3	10.9	10.9
Manganese	28	3,770	660	1,990	1,910
Nickel	28	2.3	1.1	1.5	1.3
Zinc	28	361	181	234	227

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461559112443301—Clark Fork at county bridge, near Racetrack—Continued Period of record for biological data: 1996–2013					
			Hydropsyche spp.		
Arsenic	6	12.8	5.7	9.6	9.8
Cadmium	8	2.4	1.0	1.6	1.5
Chromium	8	3.9	0.7	1.6	1.0
Copper	8	144	68.1	97	84.0
Iron	8	1,880	787	1,220	1,170
Lead	8	15.0	5.7	8.8	7.1
Manganese	8	2,370	886	1,320	1,150
Nickel	8	2.0	0.7	1.3	1.2
Zinc	8	229	151	193	194

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack Period of record for biological data: 1996–2013					
Arctopsyche grandis					
Arsenic	3	17.5	8.1	12.5	11.8
Cadmium	4	7.1	1.7	3.7	3.1
Chromium	4	12.9	1.4	[1]5.9	[1]3.4
Copper	4	196	30.8	113	112
Iron	4	2,800	340	1,370	1,170
Lead	4	17.6	5.9	[1]12.0	[1]12.4
Manganese	4	2,060	510	1,280	1,270
Nickel	4	2.5	1.0	1.7	1.7
Zinc	4	489	87	303	318
Claassenia sabulosa					
Arsenic	3	3.8	1.6	2.8	3.1
Cadmium	3	2.4	0.9	1.6	1.5
Chromium	3	1.7	0.2	1.0	1.2
Copper	3	87.2	58.6	73.1	73.4
Iron	3	485	173	318	297
Lead	3	3.4	0.9	2.1	1.9
Manganese	3	1,260	115	582	372
Nickel	3	1.0	0.2	0.5	0.4
Zinc	3	394	168	297	330
Hydropsyche cockerelli					
Arsenic	12	18.8	8.0	13.2	13.4
Cadmium	21	2.0	0.7	1.4	1.4
Chromium	21	4.0	0.5	1.7	1.5
Copper	21	247	60.7	115	95.1
Iron	21	3,010	552	1,270	979
Lead	21	21.9	3.5	9.2	8.4
Manganese	21	2,650	487	1,430	1,350
Nickel	21	2.5	0.5	1.2	1.0
Zinc	21	285	162	217	214
Hydropsyche occidentalis					
Arsenic	18	24.0	9.8	14.8	15.3
Cadmium	35	2.4	0.7	1.3	1.3
Chromium	35	6.2	0.8	2.1	1.9
Copper	35	345	74.9	128	110
Iron	35	3,390	940	1,750	1,550
Lead	35	21.8	6.1	12.5	11.5
Manganese	35	4,460	826	2,320	2,170
Nickel	35	2.4	1.0	1.6	1.5
Zinc	35	386	197	262	241

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack—Continued Period of record for biological data: 1996–2013					
			Hydropsyche spp.		
Arsenic	2	6.5	6.4	6.4	--
Cadmium	4	1.7	0.9	1.3	1.3
Chromium	4	2.1	0.8	1.4	1.2
Copper	4	140	65.5	94.1	85.4
Iron	4	1,610	875	1,120	987
Lead	4	13.2	7.3	9.7	9.1
Manganese	4	1,150	638	824	756
Nickel	4	1.6	0.6	1.1	1.1
Zinc	4	212	162	184	180

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324200—Clark Fork at Deer Lodge Period of record for biological data: 1986–87, 1990–2013					
Arctopsyche grandis					
Arsenic	6	13.3	5.8	9.3	9.2
Cadmium	8	4.7	2.6	[1]3.5	[1]3.4
Chromium	8	4.7	1.0	[1]2.4	[1]1.9
Copper	8	183	34.9	99.1	89.6
Iron	8	2,320	537	1,170	1,050
Lead	8	17.4	3.8	[1]10.5	[1]11.2
Manganese	8	1,620	380	1,100	1,170
Nickel	8	1.9	<1.3	[1]1.4	[1]1.2
Zinc	8	370	140	268	274
Hydropsyche cockerelli					
Arsenic	10	17.1	5.8	10.3	10.7
Cadmium	33	3.5	0.6	1.5	1.5
Chromium	33	4.3	0.4	1.8	1.8
Copper	33	241	54.7	107	104
Iron	33	3,340	490	1,260	1,060
Lead	33	24.9	3.8	10.6	9.9
Manganese	33	1,570	396	953	994
Nickel	33	2.4	0.3	1.3	1.1
Zinc	33	391	132	200	192
Hydropsyche occidentalis					
Arsenic	21	21.1	6.6	11.4	10.6
Cadmium	58	3.4	0.6	1.4	1.3
Chromium	58	3.7	0.6	2.0	1.9
Copper	58	222	49.4	124	121
Iron	58	3,240	558	1,530	1,490
Lead	58	20.1	3.5	12.0	11.8
Manganese	58	2,850	649	1,610	1,660
Nickel	58	12.9	1.0	1.7	1.4
Zinc	58	346	166	246	237
Hydropsyche spp.					
Arsenic	1	--	--	6.0	--
Cadmium	4	2.6	1.6	2.2	2.3
Chromium	1	--	--	0.8	--
Copper	4	222	91	166	176
Iron	4	2,220	1,070	1,770	1,900
Lead	4	16.7	9.0	14.4	15.9
Manganese	1	--	--	837	--
Nickel	1	--	--	0.9	--
Zinc	4	298	196	242	237

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for biological data: 2009–12					
Arctopsyche grandis					
Arsenic	8	16.6	3.2	7.3	6.6
Cadmium	8	4.9	1.2	3.2	3.5
Chromium	8	4.6	0.9	[1]1.9	[1]1.7
Copper	8	209	42.0	106	103
Iron	8	2,580	410	1,090	974
Lead	8	18.0	4.2	9.2	8.5
Manganese	8	1,940	659	1,240	981
Nickel	8	2.2	0.7	1.3	1.2
Zinc	8	378	228	283	285
Hydropsyche cockerelli					
Arsenic	2	11.1	7.8	9.5	--
Cadmium	2	4.0	0.9	2.5	--
Chromium	2	3.4	2.0	2.7	--
Copper	2	158	81.5	120	--
Iron	2	2,150	1,050	1,600	--
Lead	2	18.8	10.1	14.4	--
Manganese	2	1,500	1,270	1,380	--
Nickel	2	1.7	1.4	1.5	--
Zinc	2	284	216	250	--
Hydropsyche occidentalis					
Arsenic	9	14.7	6.4	10.1	8.8
Cadmium	9	2.5	1.3	2.0	2.0
Chromium	9	3.6	0.7	2.1	2.0
Copper	9	182	85.7	132	142
Iron	9	2,390	1,190	1,650	1,300
Lead	9	17.9	8.8	13.4	11.5
Manganese	9	2,100	975	1,460	1,260
Nickel	9	1.9	1.0	1.5	1.5
Zinc	9	299	223	260	254
Hydropsyche spp.					
Arsenic	1	--	--	13.6	--
Cadmium	1	--	--	1.7	--
Chromium	1	--	--	4.3	--
Copper	1	--	--	187	--
Iron	1	--	--	2,570	--
Lead	1	--	--	18.5	--
Manganese	1	--	--	919	--
Nickel	1	--	--	1.8	--
Zinc	1	--	--	296	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek Period of record for biological data: 1992–2013					
Arctopsyche grandis					
Arsenic	37	17.0	1.8	5.1	4.7
Cadmium	66	6.6	0.6	2.0	1.8
Chromium	66	5.3	0.1	1.4	1.1
Copper	66	232	19.9	51.7	39.3
Iron	66	3,070	195	774	586
Lead	66	16.9	1.0	4.1	3.4
Manganese	66	1,580	436	876	870
Nickel	66	3.1	0.2	0.8	0.7
Zinc	66	326	146	207	192
Claassenia sabulosa					
Arsenic	26	2.5	0.4	1.4	1.4
Cadmium	46	3.5	0.1	1.0	0.7
Chromium	46	1.6	0.2	0.6	0.5
Copper	46	84.9	33.0	59.4	58.8
Iron	46	640	63.0	199	170
Lead	46	2.8	0.4	1.0	0.8
Manganese	46	320	50.6	153	143
Nickel	46	0.7	0.1	0.3	0.3
Zinc	46	364	166	265	260
Hydropsyche cockerelli					
Arsenic	17	9.8	4.1	6.0	5.7
Cadmium	36	4.2	0.5	1.5	1.3
Chromium	36	4.7	0.5	2.0	1.9
Copper	36	188	17.1	73.6	58.5
Iron	36	3,250	522	1,160	942
Lead	36	17.6	2.4	6.7	5.3
Manganese	36	1,710	538	1,000	981
Nickel	36	3.5	0.3	1.2	1.1
Zinc	36	359	106	192	185
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	4	1.7	1.1	1.4	1.4
Chromium	4	1.4	1.3	1.4	1.4
Copper	4	72.9	43.8	60.5	62.7
Iron	4	1,320	612	1,050	1,130
Lead	4	6.9	2.4	4.6	4.6
Manganese	4	1,030	538	804	822
Nickel	4	1.4	0.9	1.2	1.2
Zinc	4	190	137	167	170

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek—Continued Period of record for biological data: 1992–2013					
Hydropsyche occidentalis					
Arsenic	15	11.5	4.4	6.8	6.0
Cadmium	30	2.3	0.4	1.3	1.3
Chromium	30	3.9	0.4	1.8	1.7
Copper	30	170	26.4	72.6	62.5
Iron	30	2,720	466	1,240	1,140
Lead	30	15.7	2.9	7.4	6.0
Manganese	30	2,900	530	1,250	1,140
Nickel	30	2.5	0.8	1.3	1.1
Zinc	30	328	97.0	205	203
Hydropsyche spp.					
Arsenic	2	5.9	5.7	5.8	--
Cadmium	2	1.8	1.7	1.8	--
Chromium	2	1.6	1.6	1.6	--
Copper	2	83.5	73.6	78.6	--
Iron	2	1,150	1,110	1,130	--
Lead	2	9.2	8.0	8.6	--
Manganese	2	1,180	1,130	1,160	--
Nickel	2	0.8	0.8	0.8	--
Zinc	2	210	196	203	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12331800—Clark Fork near Drummond Period of record for biological data: 1986, 1991–2013					
Arctopsyche grandis					
Arsenic	28	8.2	1.8	4.1	4.0
Cadmium	60	3.8	0.4	1.5	1.3
Chromium	60	4.2	0.2	1.1	1.0
Copper	60	103	16.9	35.2	29.6
Iron	60	1,720	193	620	516
Lead	60	11.8	1.6	4.7	3.9
Manganese	60	2,010	456	833	737
Nickel	60	1.9	0.2	0.7	0.6
Zinc	60	314	140	203	192
Claassenia sabulosa					
Arsenic	23	1.9	0.6	1.2	1.2
Cadmium	59	2.8	0.1	1.0	1.0
Chromium	59	3.3	0.2	0.7	0.6
Copper	59	165	18.0	65.1	61.3
Iron	59	449	45.4	176	148
Lead	59	2.9	0.2	1.0	0.9
Manganese	59	748	33.1	184	147
Nickel	59	1.1	0.1	[1]0.3	[1]0.2
Zinc	59	567	103	280	268
Hydropsyche cockerelli					
Arsenic	16	7.2	3.9	5.6	5.5
Cadmium	45	4.5	0.3	1.2	0.9
Chromium	45	3.5	0.4	1.6	1.5
Copper	45	156	30.0	58.6	51.1
Iron	45	2,500	506	1,160	969
Lead	45	15.0	4.7	8.4	7.4
Manganese	45	1,680	549	1,000	929
Nickel	45	2.0	0.5	1.1	1.1
Zinc	45	322	134	196	187
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	6	1.3	1.1	1.2	1.2
Chromium	6	2.8	1.9	2.3	2.2
Copper	6	57.4	50.2	55.2	55.8
Iron	6	1,730	1,370	1,570	1,600
Lead	6	10.8	7.0	8.9	9.0
Manganese	6	1,940	1,260	1,610	1,610
Nickel	6	1.7	1.3	1.5	1.5
Zinc	6	250	227	239	240

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12331800—Clark Fork near Drummond—Continued Period of record for biological data: 1986, 1991–2013					
Hydropsyche occidentalis					
Arsenic	17	7.7	4.3	5.6	5.4
Cadmium	33	2.0	0.4	1.0	1.0
Chromium	33	8.1	0.4	2.2	2.1
Copper	33	118	13.3	58.0	55.8
Iron	33	2,060	424	1,230	1,190
Lead	33	14.0	3.0	8.6	8.9
Manganese	33	2,920	477	1,400	1,220
Nickel	33	2.4	0.5	1.3	1.2
Zinc	33	293	153	221	222
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	2.6	--
Chromium	0	--	--	--	--
Copper	1	--	--	85.0	--
Iron	1	--	--	913	--
Lead	1	--	--	9.1	--
Manganese	0	--	--	--	--
Nickel	0	--	--	--	--
Zinc	1	--	--	260	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for biological data: 1986, 1991–2013					
Arctopsyche grandis					
Arsenic	31	7.2	3.1	4.5	4.4
Cadmium	73	2.7	0.4	1.2	1.0
Chromium	73	4.1	0.5	1.6	1.5
Copper	73	125	17.6	37.6	31.7
Iron	73	2,870	372	919	790
Lead	73	13.2	1.6	4.4	3.7
Manganese	73	902	324	652	662
Nickel	73	2.6	0.4	1.1	0.9
Zinc	73	282	111	203	201
Claassenia sabulosa					
Arsenic	21	1.9	0.2	1.1	1.0
Cadmium	47	2.5	0.1	1.0	0.8
Chromium	47	2.0	0.2	0.7	0.6
Copper	47	95.1	37.5	59.6	56.8
Iron	47	378	58.6	134	114
Lead	47	1.6	0.2	0.7	0.6
Manganese	47	229	37.2	103	90.2
Nickel	47	0.6	0.04	0.2	0.2
Zinc	47	342	144	230	235
Hydropsyche cockerelli					
Arsenic	23	9.8	3.7	4.9	4.7
Cadmium	51	2.2	0.3	0.9	0.7
Chromium	51	14.2	0.2	2.2	1.6
Copper	51	126	26.4	49.0	44.0
Iron	51	3,180	566	1,230	1,110
Lead	51	19.7	2.2	5.6	5.2
Manganese	51	848	426	648	661
Nickel	51	2.7	0.6	1.3	1.2
Zinc	51	332	119	190	194
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	2	1.3	1.1	1.2	--
Chromium	2	4.6	2.4	3.5	--
Copper	2	84.1	26.8	55.4	--
Iron	2	1,800	986	1,390	--
Lead	2	6.6	<7.8	[1]5.2	--
Manganese	2	1,320	537	928	--
Nickel	2	1.7	1.3	1.5	--
Zinc	2	231	171	201	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12334550—Clark Fork at Turah Bridge, near Bonner—Continued Period of record for biological data: 1986, 1991–2013					
Hydropsyche occidentalis					
Arsenic	19	7.3	2.9	4.7	4.2
Cadmium	39	1.8	0.3	1.0	0.9
Chromium	39	5.0	0.6	2.0	1.7
Copper	39	102	27.4	49.9	45.3
Iron	39	2,590	472	1,280	1,160
Lead	39	14.2	2.8	6.5	5.7
Manganese	39	1,600	454	857	813
Nickel	39	3.2	0.6	1.3	1.2
Zinc	39	416	145	216	221
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	1.3	--
Chromium	1	--	--	2.4	--
Copper	1	--	--	84.1	--
Iron	1	--	--	1,800	--
Lead	1	--	--	<7.8	--
Manganese	1	--	--	537	--
Nickel	1	--	--	1.3	--
Zinc	1	--	--	171	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner					
Period of record for biological data: 1986–87, 1991, 1993, 1996, 1998, 2000, 2003, 2006–13					
Arctopsyche grandis					
Arsenic	10	4.6	1.6	2.6	2.2
Cadmium	20	0.5	0.1	0.3	0.2
Chromium	15	6.9	0.5	2.1	1.3
Copper	20	19.3	9.9	13.5	12.7
Iron	20	1,880	108	731	761
Lead	20	2.3	0.5	1.1	0.9
Manganese	15	633	286	454	422
Nickel	15	3.7	0.7	1.4	1.2
Zinc	20	170	106	142	141
Claassenia sabulosa					
Arsenic	11	3.0	0.1	1.0	0.7
Cadmium	22	0.2	0.1	0.1	0.2
Chromium	17	5.2	0.3	1.0	0.7
Copper	22	88.5	19.0	43.8	44.0
Iron	22	317	46.2	147	140
Lead	22	0.8	0.1	0.3	0.2
Manganese	17	133	26.3	80.3	73.4
Nickel	17	1.1	0.1	0.3	0.3
Zinc	22	399	117	230	207
Hydropsyche cockerelli					
Arsenic	7	4.2	2.1	3.0	3.0
Cadmium	7	0.6	<0.1	[1]0.3	[1]0.3
Chromium	7	3.8	1.6	2.8	2.4
Copper	7	17.0	5.6	14.2	15.5
Iron	7	2,390	1,120	1,720	1,640
Lead	7	2.3	1.5	2.0	2.0
Manganese	7	814	417	585	615
Nickel	7	4.6	1.4	2.3	1.9
Zinc	7	165	140	151	148
Hydropsyche occidentalis					
Arsenic	14	3.8	1.2	2.2	2.0
Cadmium	26	0.5	0.1	0.2	0.2
Chromium	26	5.8	0.8	2.1	1.9
Copper	26	20.9	12.0	15.9	15.8
Iron	26	2,090	927	1,470	1,480
Lead	26	2.0	0.8	1.5	1.5
Manganese	26	798	412	518	460
Nickel	26	4.9	0.9	1.6	1.4
Zinc	26	202	116	143	144

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner—Continued					
Period of record for biological data: 1986–87, 1991, 1993, 1996, 1998, 2000, 2003, 2006–13					
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	0.6	--
Chromium	1	--	--	1.6	--
Copper	1	--	--	13.9	--
Iron	1	--	--	1,140	--
Lead	1	--	--	2.9	--
Manganese	1	--	--	525	--
Nickel	1	--	--	2.8	--
Zinc	1	--	--	132	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2013.—Continued

[Concentrations are in micrograms per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. Values are reported using U.S. Geological Survey rounding standards. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340500—Clark Fork above Missoula Period of record for biological data: 1997–2013					
Arctopsyche grandis					
Arsenic	29	7.2	1.2	3.8	3.6
Cadmium	48	2.3	0.1	1.0	0.8
Chromium	48	4.2	0.4	1.6	1.5
Copper	48	81.2	13.7	38.7	35.0
Iron	48	2,340	302	1,020	894
Lead	48	8.8	1.1	4.1	3.9
Manganese	48	1,410	476	909	890
Nickel	48	2.1	0.3	1.2	1.1
Zinc	48	272	133	200	200
Claassenia sabulosa					
Arsenic	20	1.9	0.1	1.2	1.2
Cadmium	29	2.0	0.2	0.7	0.6
Chromium	29	1.4	0.1	0.7	0.8
Copper	29	81.1	25.8	52.5	51.0
Iron	29	424	82.0	225	227
Lead	29	3.1	0.2	1.0	0.8
Manganese	29	683	57.8	195	146
Nickel	29	0.6	0.2	[1]0.3	[1]0.3
Zinc	29	379	191	273	271
Hydropsyche cockerelli					
Arsenic	20	8.9	2.4	6.0	6.4
Cadmium	29	2.0	0.4	0.9	1.0
Chromium	29	6.0	1.0	2.9	3.1
Copper	29	99.7	24.4	62.8	59.7
Iron	29	3,590	830	2,030	2,060
Lead	29	12.1	2.5	7.5	7.2
Manganese	29	1,910	764	1,220	1,180
Nickel	29	2.4	0.9	1.8	1.8
Zinc	29	266	156	221	222
Hydropsyche occidentalis					
Arsenic	12	7.4	2.2	5.1	5.6
Cadmium	18	1.5	0.4	0.8	0.7
Chromium	18	5.5	0.7	2.9	3.0
Copper	18	80.7	25.3	53.9	58.9
Iron	18	2,540	690	1,900	2,060
Lead	18	11.4	2.1	6.8	6.6
Manganese	18	2,470	717	1,510	1,560
Nickel	18	2.4	0.7	1.8	1.8
Zinc	18	278	183	229	230

[1]Values determined by substituting one-half of the minimum reporting level for censored (<) values when both uncensored and censored values were used in determining the mean and median.

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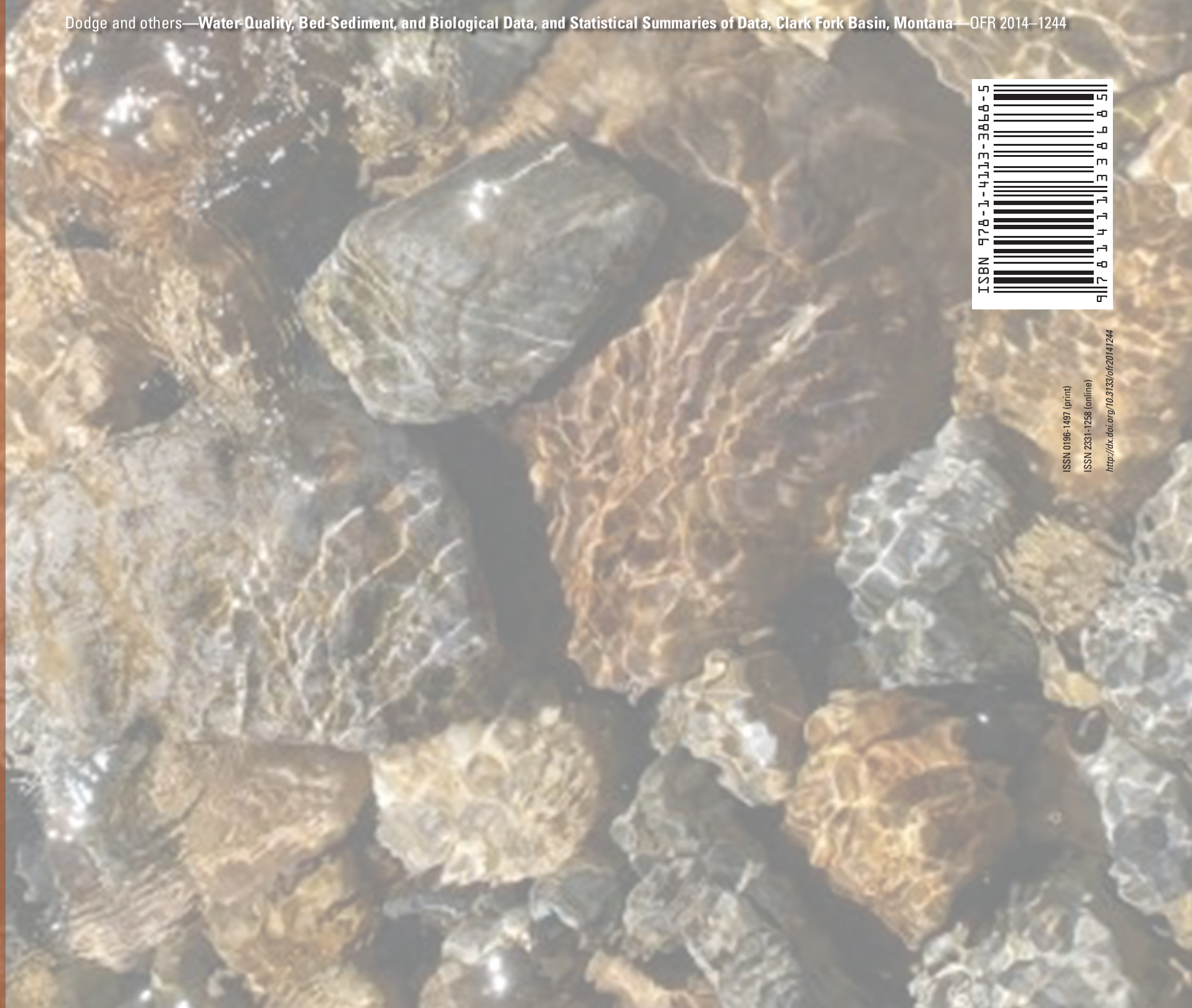

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