PHYSICAL, CHEMICAL, AND BIOLOGICAL DATA FOR DETAILED STUDY OF THE SUN RIVER IRRIGATION PROJECT, FREEZOUT LAKE WILDLIFE MANAGEMENT AREA, AND BENTON LAKE NATIONAL WILDLIFE REFUGE, WEST-CENTRAL MONTANA, 1990-92, WITH SELECTED DATA FOR 1987-89

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATED UNITS OF MEASURE

Multiply	By	To obtain
acre (ac)	4,047	square meter (m^2)
cubic foot per second (ft^3/s)	0.028317	cubic meter per second (m^3/s)
foot (ft)	0.3048	meter (m)
gallon (gal)	3.785	liter (L)
inch (in.)	25.4	millimeter (mm)
	25,400	micrometer (µm)
mile (mi)	1.609	kilometer (km)
ounce (oz)	28.35	gram (g)
ton, short (t)	0.9072	megagram (Mg)

Temperature can be converted to degrees Celsius (°C) or degrees Fahrenheit (°F) by the following equations:

$$°C = 5/9\ (°F - 32)$$

$$°F = 9/5\ (°C) + 32$$

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Chemical concentration in water is reported in milligrams per liter (mg/L) or micrograms per liter (µg/L). Milligrams per liter is a unit expressing the solute mass (milligram) per unit volume (liter) of water and is about the same as parts per million unless concentrations are more than 7,000 milligrams per liter (Hem, 1989, p. 55). One thousand micrograms per liter is equivalent to 1 milligram per liter. Tritium concentration is expresed in tritium units (TU). A tritium unit is equal to 3.2 picocuries per liter (pCi/L), which is equal to 2.2 radioactive disintegrations per minute in a unit volume (liter) of water. Chemical concentration in sediment and biological tissues is reported in milligrams per kilogram (mg/kg) or micrograms per gram (µg/g), which are both equal to parts per million, or in percent, which is equal to parts per hundred.

Specific conductance of water is a measure of the ability of water and dissolved constituents to conduct an electrical current and is an indication of the ionic strength of the solution. Specific conductance is expressed in microsiemens per centimeter at 25 °C (µS/cm) and increases with the concentration of dissolved constituents.

Water-year: A water year is the 12-month period October 1 through September 30. It is designated by the calendar year in which it ends.

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By John H. Lambing, David A. Nimick, *and* J. Roger Knapton, U.S. Geological Survey, *and* Donald U. Palawski, U.S. Fish and Wildlife Service

Abstract

Physical, chemical, and biological data were collected in the lower Sun River area of west-central Montana during 1990-92 as part of a detailed study of the extent, magnitude, sources, and potential biological impacts of contaminants associated with irrigation drainage. Physical and chemical data were collected from areas within and near the Sun River Irrigation Project and from wetland areas receiving irrigation drainage. Biological data were collected from areas in and near Freezout Lake Wildlife Management Area and Benton Lake National Wildlife Refuge.

This report presents data for selenium and other potentially toxic constituents in solid-phase, water, and biological media. Physical and chemical data are reported for soils, ground water, drill cores, surface water, and bottom sediment. Biological data include trace-element residues measured in aquatic plants, invertebrates, fish, amphibians, bird eggs and bird livers, and results of bioassay testing.

INTRODUCTION

Concerns about irrigation-induced water-quality problems have been expressed in recent years as a result of documented adverse biological impacts in areas of the western United States that receive drainage water from irrigated farmland. The U.S. Department of the Interior (DOI) was directed by the U.S. Congress to identify the nature and extent of potential problems in irrigation projects administered by the DOI or in wildlife areas that receive irrigation drainage from these projects. The Sun River Irrigation Project and surrounding areas in west-central Montana were selected by the DOI in 1985 for a reconnaissance investigation of potential impacts associated with irrigation drainage because available data on selenium concentrations in water and bottom sediment indicated a potential for toxicity. The reconnaissance investigation was conducted in 1986-87 (Knapton and others, 1988) by an interagency study team representing the U.S. Geological Survey, U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, and the U.S. Bureau of Indian Affairs. Results of that study indicated that most sampling sites within the Sun River Irrigation Project had constituent concentrations less than established criteria and standards for the protection of humans, fish, and wildlife. However, several sites in Freezout Lake Wildlife Management Area and Benton Lake National Wildlife Refuge, which receive irrigation drainage from the project, had constituent concentrations in water, bottom sediment, and biota that were moderately to considerably higher than established criteria and standards. Selenium was considered to have the greatest potential for toxicity, but other constituents also were present in concentrations higher than criteria for known biological impacts.

Because several sites that receive irrigation drainage from the Greenfields Division of the Sun River Irrigation Project (herein referred to as the Greenfields Irrigation Division) had elevated concentrations of some constituents, a detailed study was initiated by the DOI in 1990. The primary objectives of this process-oriented study were to determine the extent, magnitude, sources, contamination pathways,

and potential biological impacts of contaminants associated with irrigation drainage. Secondary objectives were to identify contaminant source areas in adjacent non-irrigated lands that contribute flow to wildlife areas and to quantify contaminant inputs to the extent possible.

Purpose and Scope

The purpose of this report is to present the physical, chemical, and biological data collected during 1990-92 in the detailed study of solid-phase media, water, and biota within and near the Sun River Irrigation Project (Greenfields Irrigation Division), Freezout Lake Wildlife Management Area, and Benton Lake National Wildlife Refuge (fig. 1). Also included are biological data collected during 1987-89 as part of a U.S. Fish and Wildlife Service program. The data in this report were collected from 40 soil sites, 69 ground-water sites, 8 drill-core sites, 49 surface-water sites, 9 bottom-sediment sites, and 30 biological sites. Some of the sites were sampled previously during the reconnaissance study, whereas others were initially sampled in this study to supplement previous data.

Data were collected at frequencies ranging from one-time site visits to continuous monitoring. Data-collection schedules were principally determined by hydrologic conditions related to irrigation and natural runoff, seasonal variations in biological productivity, and life-cycle stages of resident or migratory biota in the area. The data collection represents a collective effort by scientists from the U.S. Geological Survey and the U.S. Fish and Wildlife Service.

System for Specifying Geographic Locations

Soil, ground-water, and drill-core sampling sites are assigned local numbers according to their geographic position within the rectangular grid system used in Montana by the U.S. Bureau of Land Management (fig. 2). The local number consists of as many as 14 characters. The first three characters specify the township and its position north (N) of the Montana Base Line. The next three characters specify the range and its position east (E) or west (W) of the Montana Principal Meridian. The next two characters are the section number. The next one to four alpha characters designate the quarter section (160-acre tract), quarter-quarter section (40-acre tract), quarter-quarter-quarter section (10-acre tract), and quarter-quarter-quarter-quarter section (2.5-acre tract), respectively, in which the well or sampling site is located. These four subdivisions of the section are designated A, B, C, and D in a counterclockwise direction, beginning in the northeastern quadrant. The last two numeric characters specify a sequence number to distinguish between multiple wells or multiple depths at a single location. For example, as shown in figure 2, well 22N03W09ADAA01 is a single well inventoried in the NE1/4(A) of the NE1/4(A) of the SE1/4(D) of the NE1/4(A) of section 9, Township 22 N., Range 3 W.

Fifteen-digit site-identification numbers also are used for soil, ground-water, drill-core, and miscellaneous surface-water sites. These numbers represent the approximate latitude and longitude of the site (first 13 digits), plus the sequence number (last 2 digits). Eight-digit station-identification numbers for routine surface-water sites represent the standard U.S. Geological Survey numbering system for streamflow-gaging stations wherein numbers increase in a downstream direction according to geographic location within the drainage basin.

Biological samples, particularly composite samples, commonly were collected from extensive areas of a wetland. Consequently, the general geographic areas for biological sampling sites are indicated in this report by the illustrations of sampling site locations. The location numbers for spatially extensive biological sampling areas represent the latitude and longitude of the approximate central location of a broad area, unless the biological sites are located near sites at which other media were sampled.

Description of Study Area

The Sun River study area (fig. 1) is located within Cascade, Chouteau, and Teton Counties of west-central Montana. Headwaters of the Sun River form along the eastern slopes of the Rocky Mountains from which the river flows eastward to its confluence with the Missouri River at the city of Great Falls. Irrigation water is diverted from the Sun River below Gibson Reservoir, which lies at the foot of the mountains. The irrigation water is conveyed by canals to several elevated prairie plateaus termed "benches." The largest of these benches served by the Sun River Irrigation Project is the Greenfields Bench.

The study area encompasses a broad and diverse geographic area that includes several administrative units and hydrologic basins. To clarify data presentation, the study area is subdivided into three local areas: the Greenfields Irrigation Division, Freezout Lake Wildlife Management Area, and Benton Lake National Wildlife Refuge.

Greenfields Irrigation Division

The Greenfields Irrigation Division consists of about 83,000 acres of irrigated land, mostly on the Greenfields Bench, and contains about 600 farms (fig. 1). The predominant irrigated crops are barley and alfalfa. Some of the irrigated land is used as pasture. Water for the irrigation project is diverted from the Sun River and passes through a series of reservoirs and canals before distribution to fields. Most of the irrigation return flow from the Division drains into the Sun River, either directly from the south flanks of the irrigated benches or indirectly through the tributary Muddy Creek along the north and east flanks of the Greenfields Bench. A small part of the Division near the western edge of the Greenfields Bench drains to Freezout Lake Wildlife Management Area.

Freezout Lake Wildlife Management Area

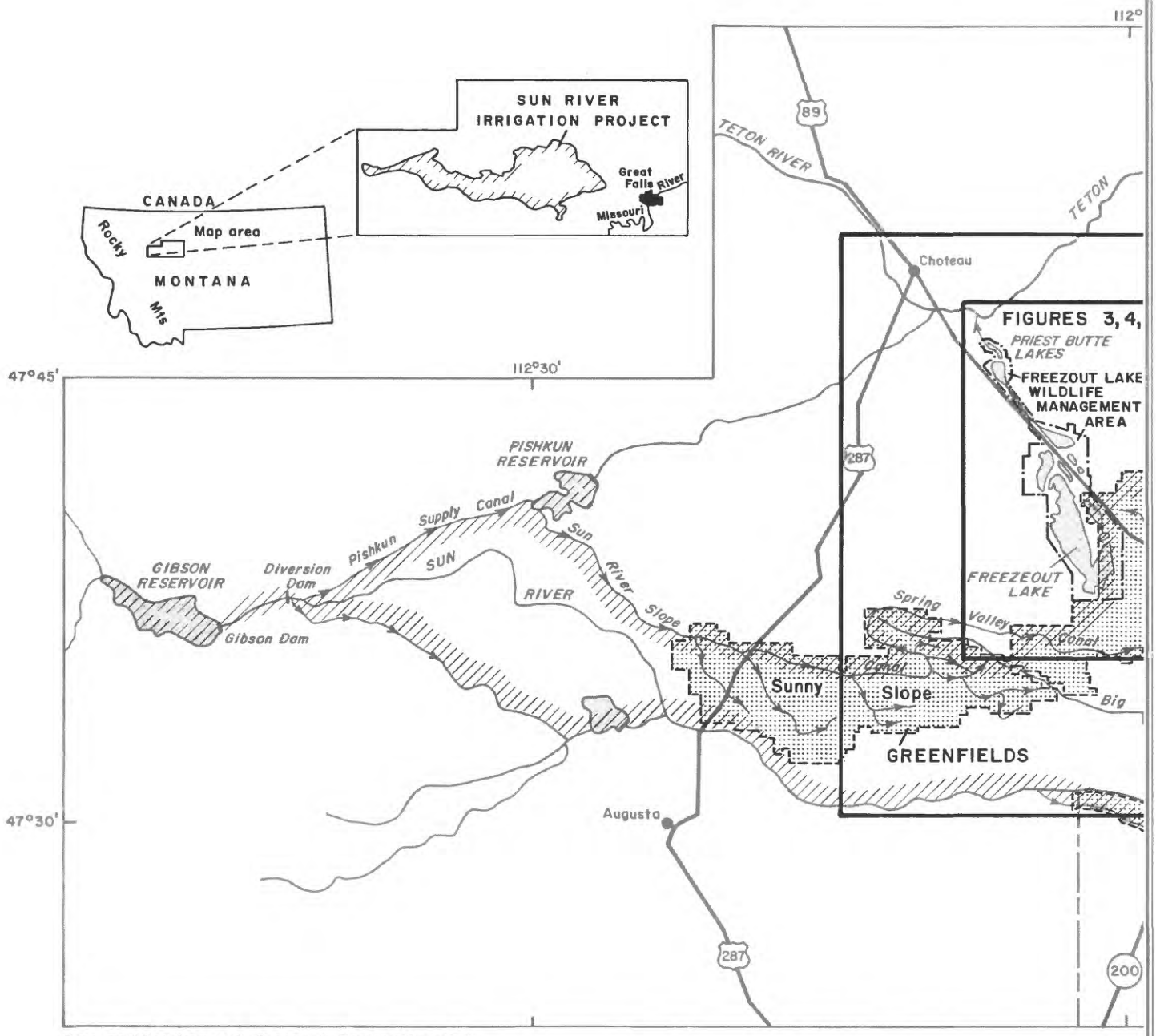
Freezout Lake Wildlife Management Area (WMA) is managed by the Montana Department of Fish, Wildlife and Parks and contains 12,000 acres that are about evenly divided between wetlands and uplands (fig. 1). The wetlands contain six marsh units, Priest Butte Lakes, and a main lake (Freezeout Lake). The WMA is adjacent to the northwest part of the Greenfields Irrigation Division near the foot of the Greenfields Bench and extends northward nearly to the Teton River. Irrigation delivery losses (canal seepage, unused excess supply) and irrigation drainage from farmlands are major sources of water for the WMA and are an important supplement to natural flows. Most delivery losses and irrigation drainage enters the WMA through drain canals that terminate either at one of the ponds or at Freezeout Lake. Variable amounts of natural runoff are contributed to the WMA from semiarid non-irrigated lands to the west and north of Freezeout Lake and to the east of Priest Butte Lakes. Water is distributed by a canal system among the interconnected ponds of the WMA to manipulate water levels for waterfowl management. Water from Freezeout Lake can be transferred by canal to Priest Butte Lakes. Water can be discharged from Priest Butte Lakes to the Teton River through an outlet structure and canal. These discharges are regulated by the Montana Department of Health and Environmental Sciences in accordance with State criteria for discharge of saline water.

Benton Lake National Wildlife Refuge

Benton Lake National Wildlife Refuge (NWR) consists of 12,400 acres--6,800 acres in uplands and 5,600 acres of wetlands (fig. 1). Benton Lake is a closed water system with no surface outlet. The lake is divided into six marsh units which are interconnected by canals. Water levels in the individual pools are manipulated for waterfowl management by transfer of water through the canals. A principal source of water for the refuge is Muddy Creek, which contains a large proportion of irrigation drainage from the Greenfields Irrigation Division. Water is pumped from Muddy Creek approximately 5 miles through a pipeline over a low drainage divide. The pumped water is discharged into the Lake Creek channel where it flows for about 12 miles to its mouth at Benton Lake. Natural sources of water to the refuge are runoff from non-irrigated farmland and rangeland in the Lake Creek Basin and precipitation that falls directly on the lake. In many years, natural flow volumes are small relative to pumped quantities.

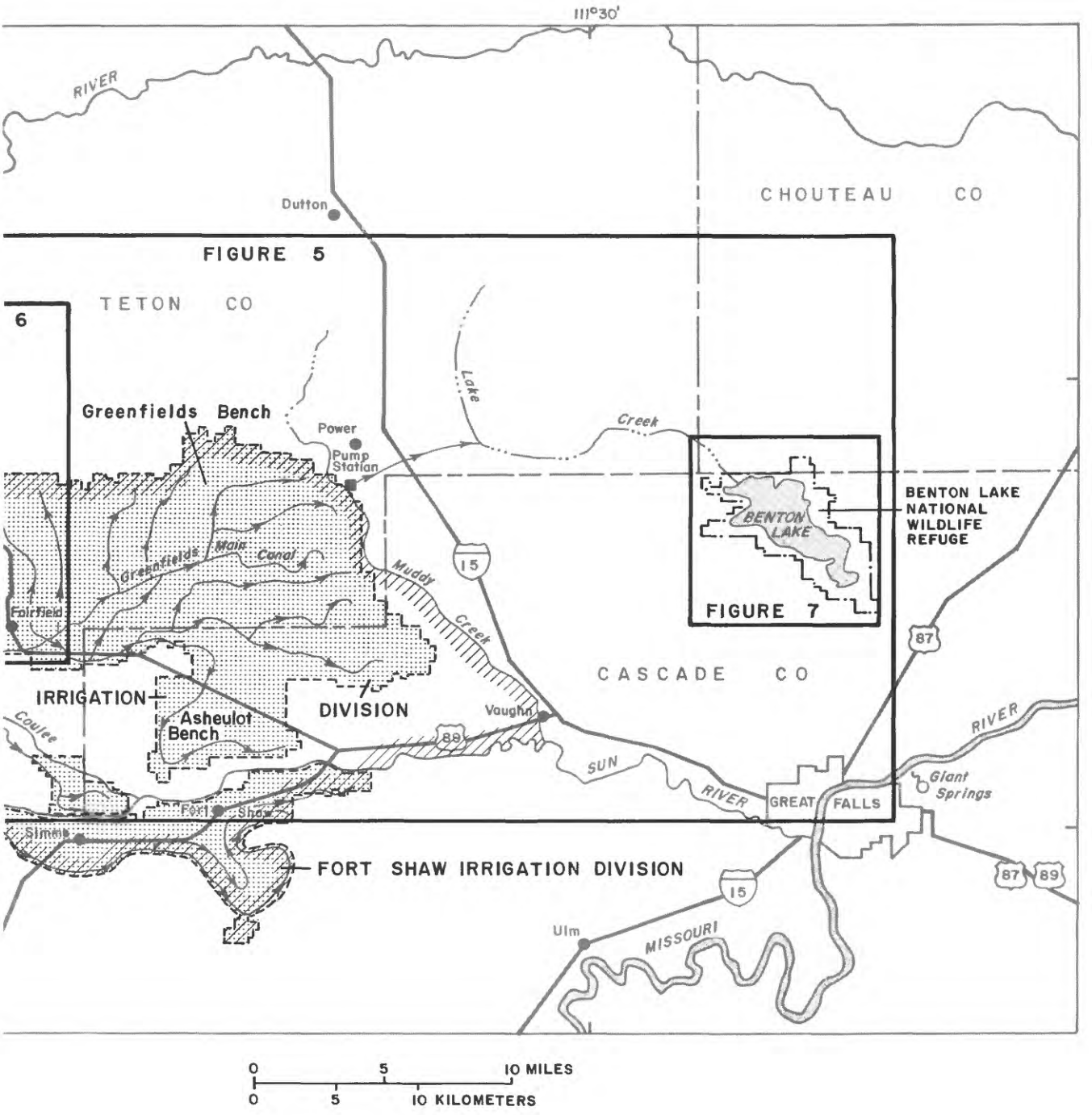
Acknowledgments

The authors acknowledge with appreciation the many individuals who assisted in the study. Particular thanks for assistance are given to Donald G. Hultman, James E. McCollum, Stephen J. Martin and the staff at Benton Lake National Wildlife Refuge; Jerry Nypen, Manager of the Greenfields Irrigation District; and Frank G. Fiest, Mark E. Schlepp and the staff at Freezout Lake Wildlife Management Area. Assisting in the collection of water-quality and hydrologic data were Fred A. Bailey, C. Lee Chambers, David W. Clark, James A. Hull, Philip L. Karper, Timothy J. Morgan, and Joanna N. Thamke of the U.S. Geological Survey. Much of the biological data were collected by Kristi L. DuBois, Robert A. Grove, and John C. Malloy of the U.S. Fish and Wildlife Service, and Victoria L. Kurnat, Alison E.H. Perkins and Rachel E. White of the University of Montana. Peter Schendel of the U.S. Bureau of Reclamation provided technical assistance throughout the study. Appreciation is extended to the many landowners in the study area for allowing access to their property.



Base modified from U.S. Bureau of Reclamation, 1973

Figure 1. Location of study area (with insets



showing location of areas for figures 3-7).

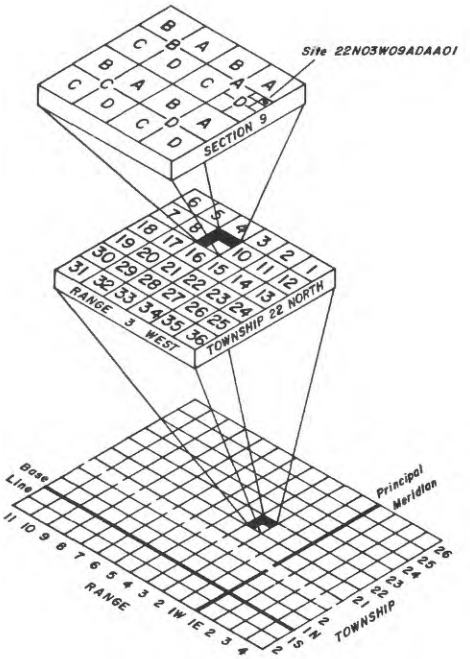


Figure 2. Numbering system for specifying geographic location of soil, ground-water, and drill-core sampling sites.

DATA-COLLECTION SITES

Surface water was sampled throughout the study area, including areas managed for irrigation and wildlife, and adjacent non-irrigated land that contributes natural flow. Sampling of soil, ground water, and biota was concentrated in and near irrigated farmland and wetlands receiving irrigation drainage. The data-collection sites for the detailed study are grouped into the following categories: soil, ground water and drill cores, surface water and bottom sediment, and biota. Data groupings, site details, and types of monitoring are discussed in the following sections.

Soil

Soil was sampled in two general contiguous areas--irrigated land in the northwest part of the Greenfields Irrigation Division and non-irrigated land within or near Freezout Lake WMA (fig. 3). Soil sampling sites are listed in table 1. Twenty-three soil sampling sites were within the Greenfields Irrigation Division and 17 sites were within or near Freezout Lake WMA. Depth-composite soil samples were collected at all sites and additional soil samples from specific depths were collected at three sites.

Ground Water and Drill Cores

Ground water was monitored at 69 wells located in or near Freezout Lake WMA (fig. 4) and Benton Lake NWR (fig. 5). Monitoring activities included installation of 20 test wells, measurement of water-levels, and collection of ground-water and drill-core samples for chemical analysis. Ground-water and drill-core sampling sites and the type of monitoring done at each site are listed in table 2. Ground water was sampled from 11 domestic wells and 16 test wells near Freezeout Lake and analyzed for selected chemical constituents. Seven of the domestic wells are on the Greenfields Bench and are completed in gravel recharged by irrigation. The other four domestic wells are completed in other aquifers. Four domestic wells and the four test wells installed near Benton Lake were sampled. The principal aquifer in which each domestic well was completed was determined from driller's logs and geologic reports (Lemke, 1977; Mudge and others, 1982).

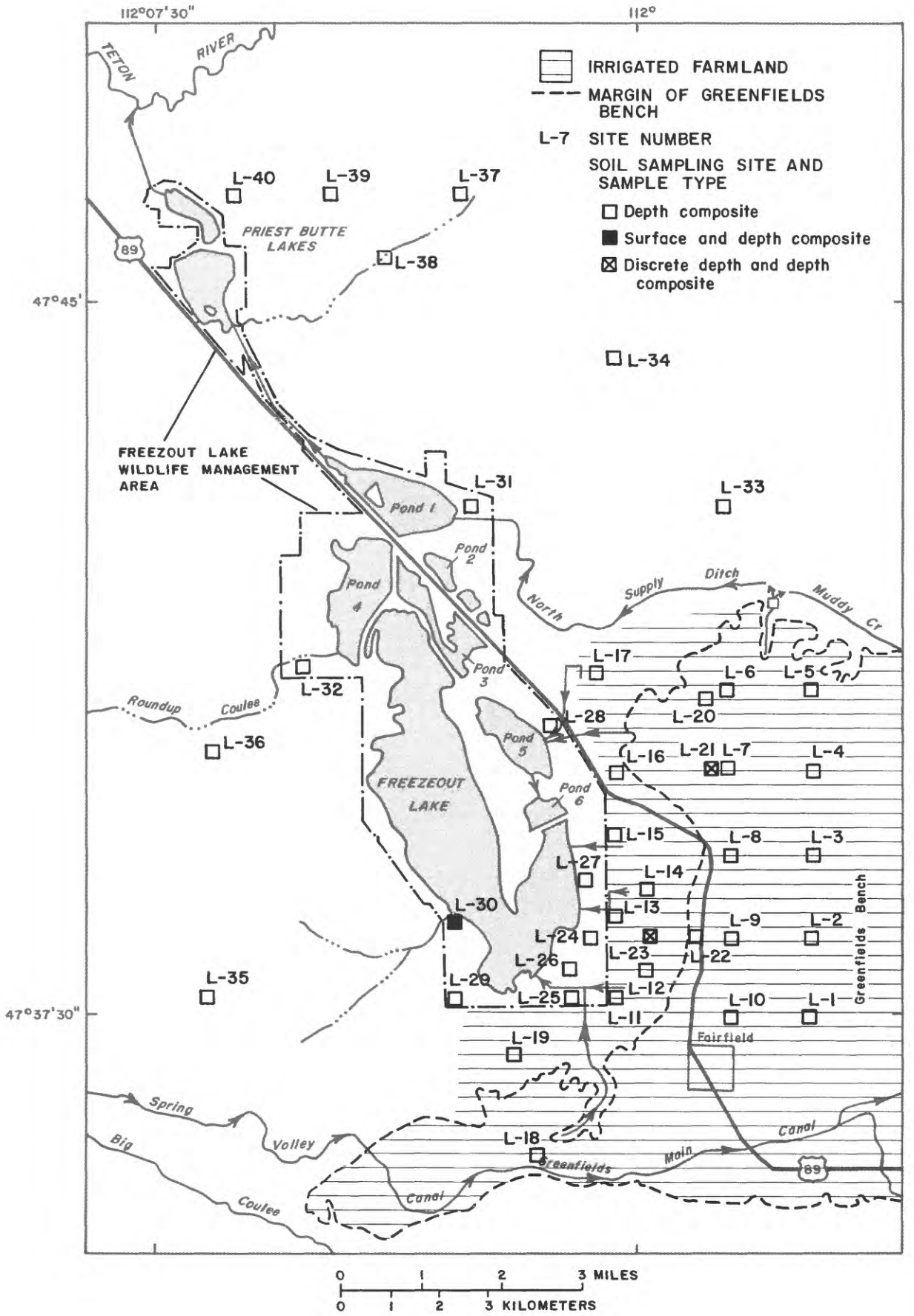


Figure 3. Location of soil sampling sites within or near Greenfields Irrigation Division and Freezout Lake Wildlife Management Area, Montana.

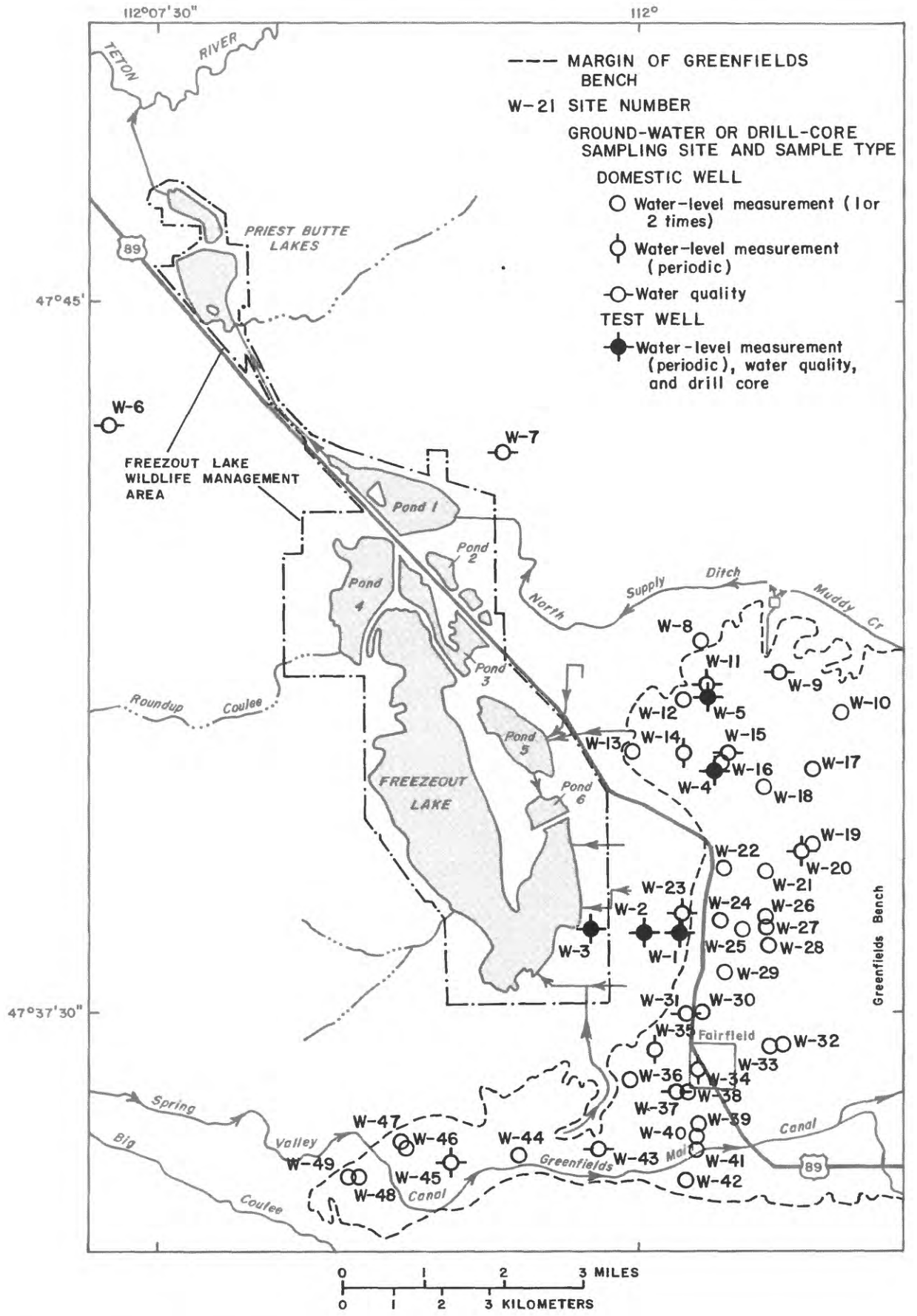


Figure 4. Location of ground-water and drill-core sampling sites within or near Greenfields Irrigation Division and Freezout Lake Wildlife Management Area, Montana.

Surface Water and Bottom Sediment

Surface water was sampled in and near Greenfields Irrigation Division, Freezout Lake WMA, and Benton Lake NWR (fig. 5). Sampling locations included 9 irrigation drains, 9 lake sites, 21 sites on streams that seasonally receive irrigation drainage, 6 sites on streams or canals that are either in non-irrigated areas or upgradient from irrigation returns, 3 irrigation-induced seeps, and 1 seep in a non-irrigated area. Bottom sediment was sampled at 9 of the surface-water sites, primarily in lakes. Surface-water and bottom-sediment sampling sites and types of samples collected at each site are listed in table 3.

Sites that do not receive irrigation drainage are considered to be reference sites that are representative of areas not impacted by irrigation practices. Reference sites are not necessarily considered to be representative of natural flow conditions, however, because their water-quality characteristics may be impacted by other land uses such as non-irrigated farming.

Biota

Samples of biota were collected primarily in or near Freezout Lake WMA and Benton Lake NWR. Samples of aquatic plants, aquatic invertebrates, fish, amphibians, bird eggs, and bird livers were collected from 30 locations (figs. 5-7). Biological sampling sites commonly encompassed a broad area centered around the locations shown in figs. 5-7. Biological sampling sites and type of samples collected at each location are listed in table 4.

METHODS OF SAMPLE COLLECTION, PROCESSING, AND ANALYSIS

Data for the detailed study were collected from July 1990 through September 1992. Some additional data collected from other programs established prior to the detailed study are presented in this report, including biological data for the wildlife areas and streamflow data for long-term streamflow-gaging stations. Field and laboratory methods for sample collection, processing, and analysis are discussed in the following sections for each of the sampled media. A list of the constituents analyzed for each media and the minimum reporting levels are given in table 5.

Physical and Chemical Data

Samples of soil, ground water, drill cores, surface water, and bottom sediment were collected from July 1990 to September 1992 as part of the detailed study and analyzed for various physical and chemical properties. All samples were analyzed for selenium. Selected samples were analyzed for physical characteristics, major and trace elements, nutrients, or isotopes.

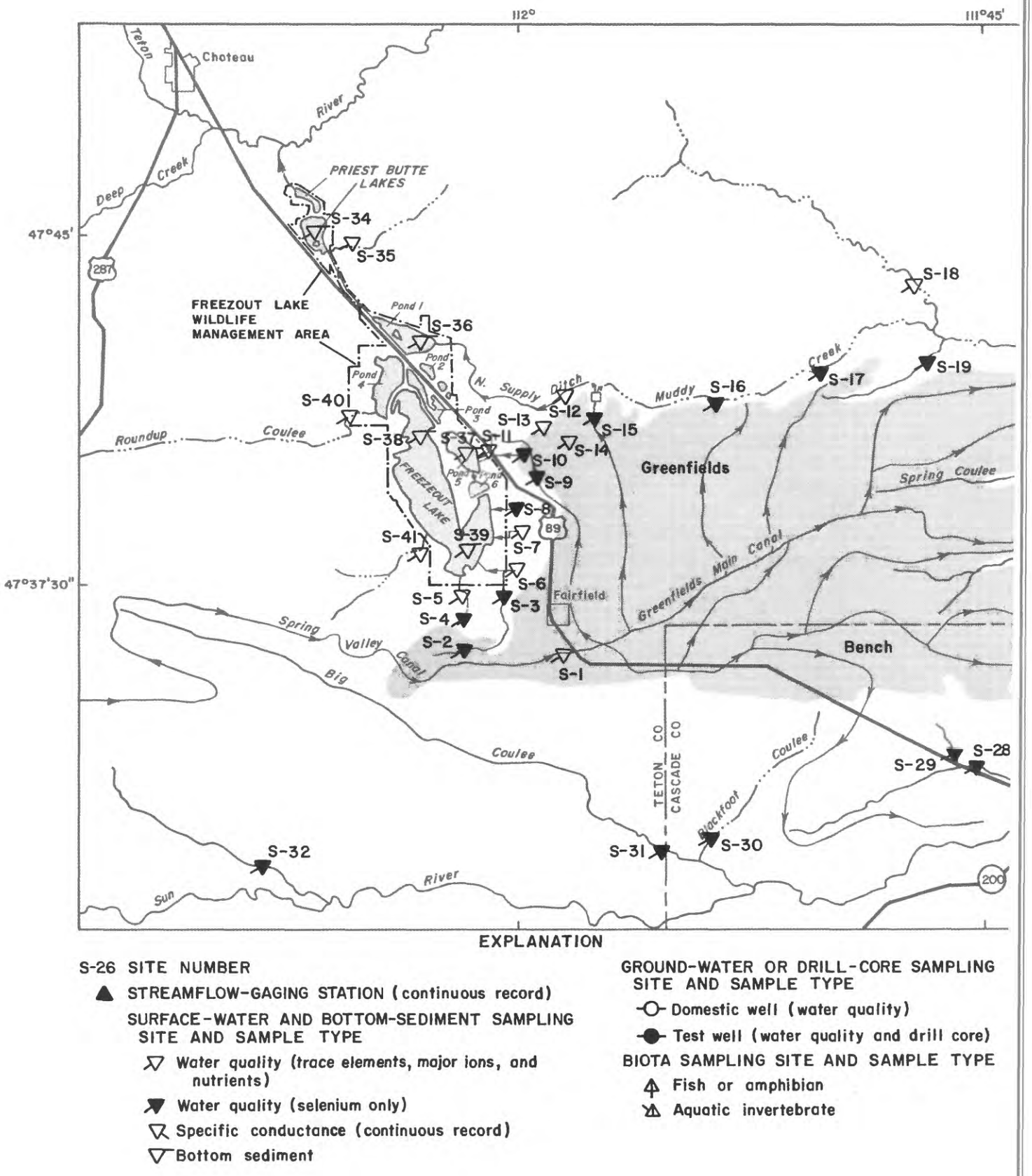
Soil

Soil samples were collected during late summer and fall of 1991. At each of the 40 sites, a sample was obtained from the interval between near-surface and a maximum depth of 3 ft. A sampling depth of 3 ft generally was possible to attain except on the Greenfields Bench where subsurface gravel commonly limited sampling depths to less than 3 ft. Soil collected from the entire depth of the sampling hole was composited by collecting subsets of material from the several auger or core extracts required to complete each hole. The subsets were placed in a polyethylene bucket and vigorously mixed with a plastic spoon. A sample of approximately 0.5 kilogram was withdrawn from the depth-composite mixture and placed in a polyethylene container for subsequent analysis.

At two soil sites, L-21 and L-23, additional samples were collected at depths of 0.5, 2.0, and 4.0 ft to determine chemical variation with depth. An additional surface sample was collected at site L-30 from the upper 1/4-in layer of salt crust.

All soil samples were collected with either a stainless steel 3 1/4-in soil auger or a stainless steel 1-in core sampler, except for the sample of salt crust at site L-30 that was skimmed from the surface. The auger was used for all sites except those in alkali flats or in saline seeps containing water-saturated soils. The core sampler was used to sample saturated soils.

All soil samples were analyzed by the U.S. Geological Survey's Branch of Geochemistry Laboratory, Geologic Division, in Lakewood, Colo. The bulk unsieved samples were air-dried at ambient temperature, disaggregated, and sieved through a minus-10-mesh (2 mm) screen (Arbogast, 1990, p. 29). Material passing through the sieve was retained for analysis. Each sample was analyzed for selected major and trace elements by inductively coupled plasma (ICP) atomic emission spectrometry following digestion with a mixture of strong acids at low temperature. Total selenium and arsenic were analyzed by hydride generation atomic absorption spectrometry following a high-temperature digestion with a mixture of strong acids. Water-extractable selenium was analyzed by hydride



EXPLANATION

S-26 SITE NUMBER

▲ STREAMFLOW-GAGING STATION (continuous record)

SURFACE-WATER AND BOTTOM-SEDIMENT SAMPLING SITE AND SAMPLE TYPE

- Water quality (trace elements, major ions, and nutrients)
- Water quality (selenium only)
- Specific conductance (continuous record)
- Bottom sediment

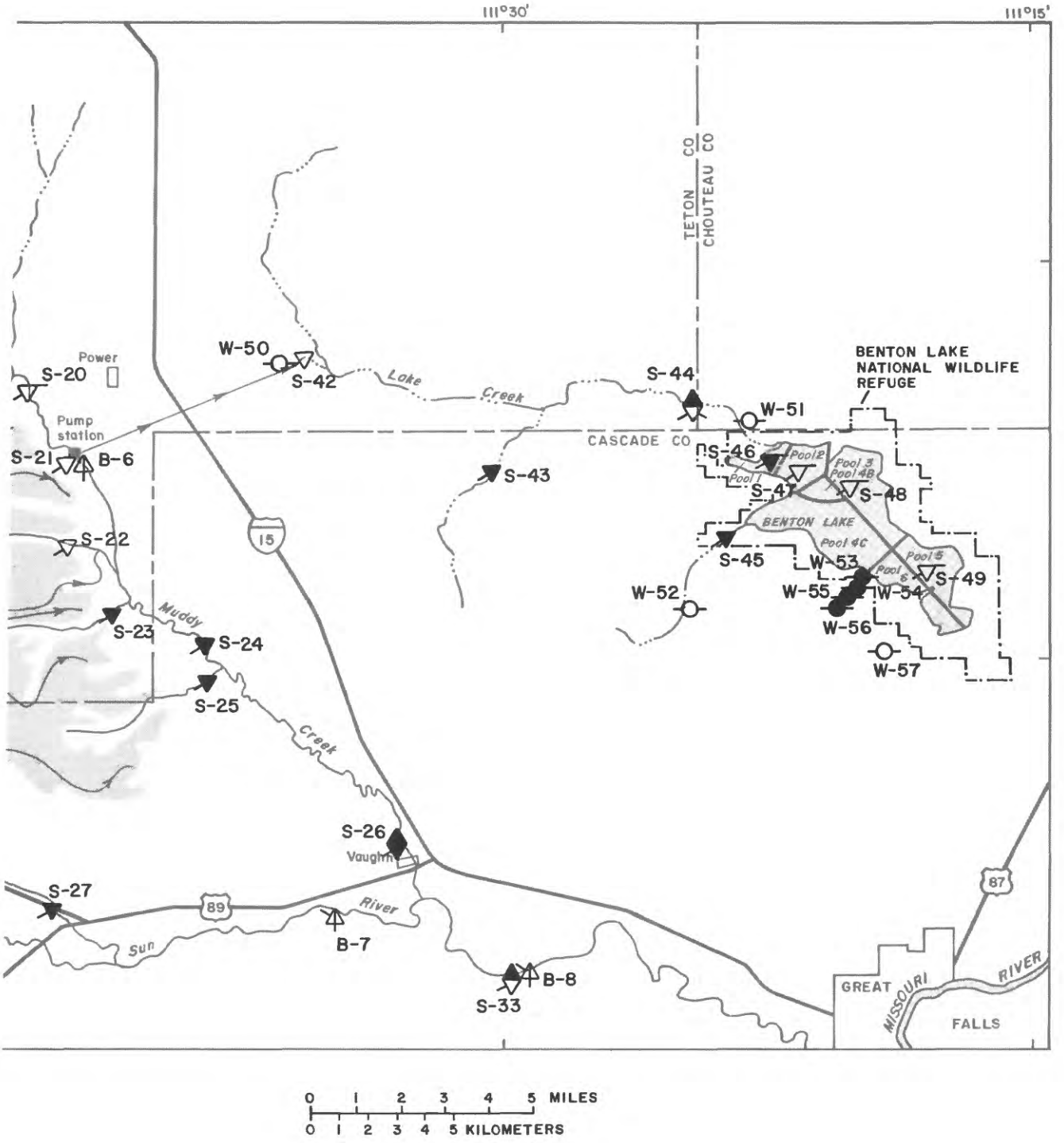
GROUND-WATER OR DRILL-CORE SAMPLING SITE AND SAMPLE TYPE

- Domestic well (water quality)
- Test well (water quality and drill core)

BIOTA SAMPLING SITE AND SAMPLE TYPE

- Fish or amphibian
- Aquatic invertebrate

Figure 5. Location of surface-water and bottom-sediment sampling sites in the Sun River area, Montana. Locations of



selected ground-water, drill-core, and biological sampling sites not shown in figures 4, 6, and 7 are included.

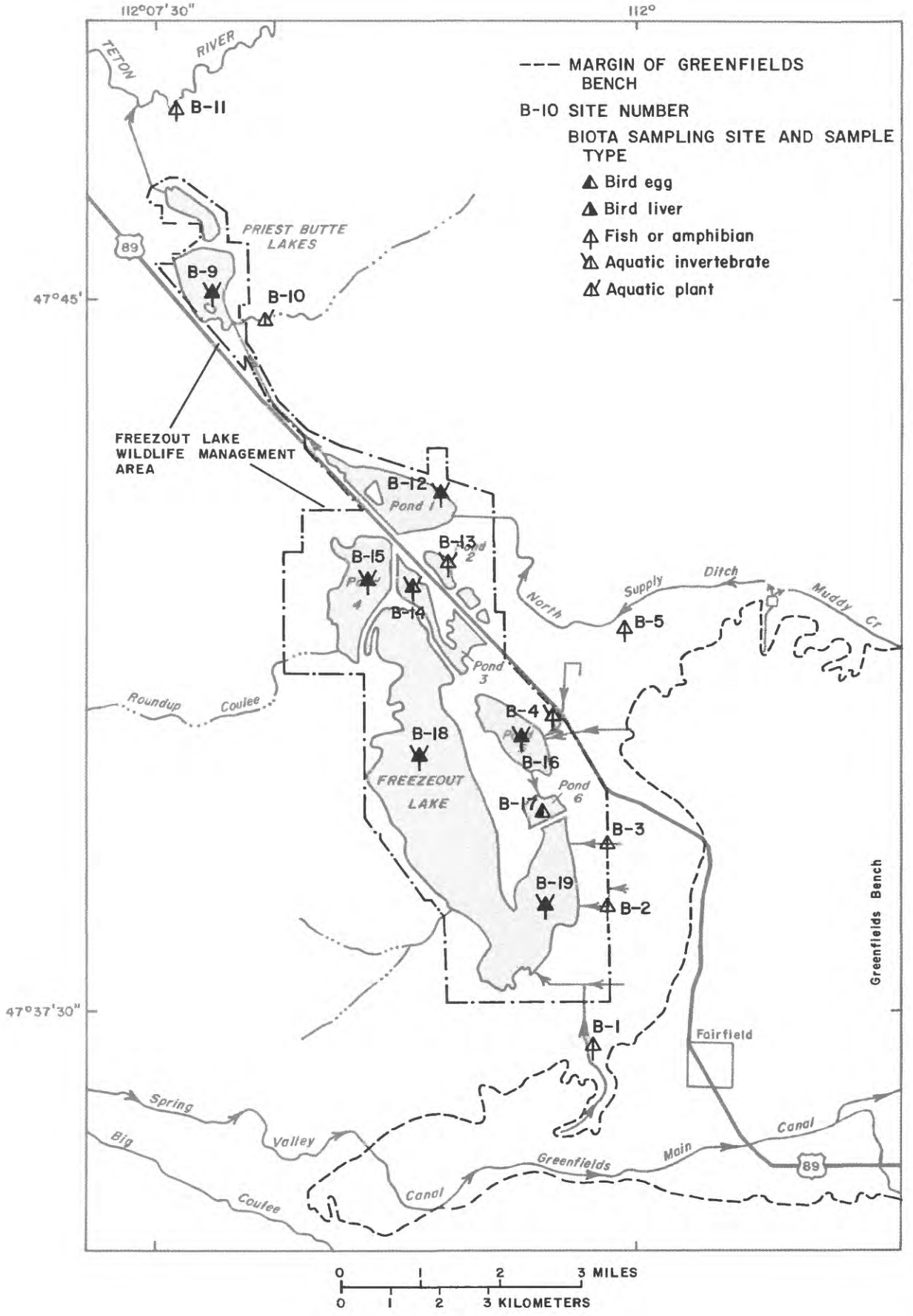


Figure 6. Location of biological sampling sites within and near Freezout Lake Wildlife Management Area, Montana.

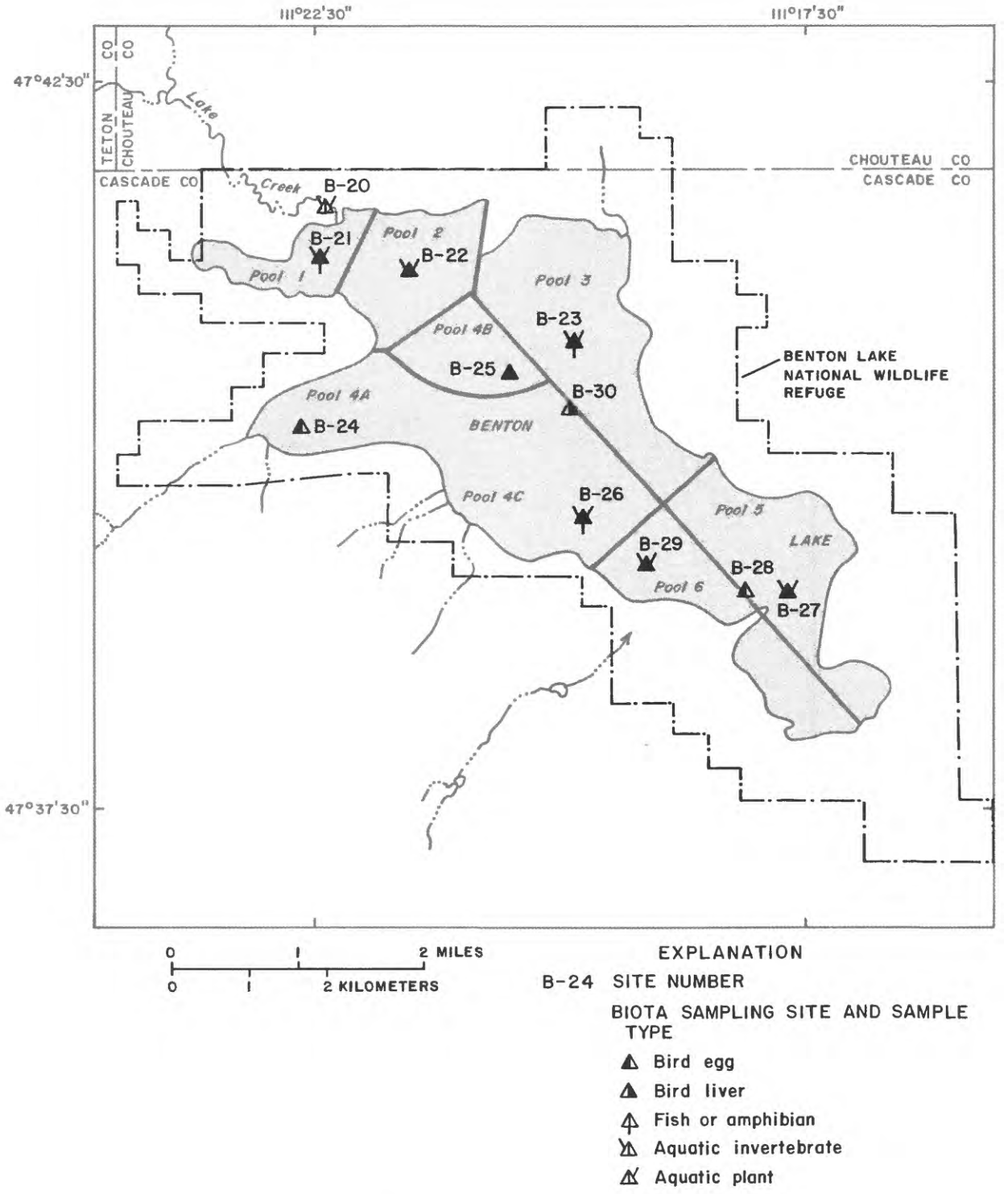


Figure 7. Location of biological sampling sites within Benton Lake National Wildlife Refuge, Montana.

generation atomic absorption spectrometry from the filtrate of a 1:5 mixture (by dry weight) of solid-phase sample and deionized water after agitation in a reciprocating shaker for four hours (Crock and others, 1991). Specific conductance was measured on an aliquot of the filtrate obtained for the water-extractable selenium analysis. Results of chemical analyses of soil samples are presented in table 6.

Ground Water

Four test wells were drilled and installed upgradient of a saline seep near Benton Lake in August 1990. An additional 16 test wells were installed near Freezeout Lake in October 1991. Six of these wells (W-4A through W-5C) were completed in gravel or underlying shale at two irrigated sites on the Greenfields Bench. The other 10 test wells (W-1A through W-3D) were installed at three sites on an irrigated hill slope underlain by glacial-lake deposits and shale east of Freezeout Lake. Construction records of the test wells are in table 7. Lithologic logs of the boreholes are in table 8.

Test wells were installed in boreholes made with a rotary drill rig. Depending on site conditions and the capabilities of the particular drill rig used at each site, either air, water, or drilling mud was used during drilling. Casing material was either 2- or 4-in diameter polyvinyl chloride (PVC). The annulus, or space in the borehole between the well casing and the formation, was filled to complete each well. First, silica sand was added to fill the portion of the annulus adjacent to the well screen for all wells except the four wells completed in the gravel underlying the Greenfields Bench. Next, bentonite pellets or chips were emplaced on top of the sand pack to form a seal one to two feet thick. Grout or, in some cases, shale drill cuttings were used to fill the rest of the annulus. No filter pack was used in completing the four wells completed in gravel (W-4A, W-4B, W-5A, and W-5B); instead, the gravel was allowed to collapse around the well casing after the drilling mud was blown out of the borehole. A concrete surface seal and protective steel surface casing was installed around each of the test wells near Freezeout Lake. Wells W-1B and W-1C were installed in one borehole and bentonite pellets were emplaced in the annulus from the top of the sand pack of well W-1C to the bottom of the sand pack of well W-1B. Test wells were developed using a surge block, bailer, or pump until clear water could be obtained from each well. Wells W-1A, W-2C, W-3A, and W-3B recovered relatively slowly, and development efforts in these wells were discontinued before clear water was produced.

Water levels were measured twice in domestic wells on or near the Greenfields Bench to determine the potentiometric surface of shallow ground water. Measurements were made once in 35 wells in January and February 1991 during the non-irrigation season and once in 40 wells in August 1991 during irrigation. These and other water-level measurements plus physical data and aquifer information for all wells are in table 9. At selected wells, additional water-level measurements were made with a steel tape periodically between January 1991 and October 1992 to determine seasonal changes in water levels (table 10). Water level in well W-4B was monitored continuously with an electronic recorder from November 1991 through October 1992.

Ground-water samples were collected with a variety of samplers. Samples from domestic wells were obtained using the existing pump and collected from a discharge point as close to the well as possible. Most domestic wells near Freezeout Lake had jet pumps, which cause aeration and, possibly, chemical changes in the pumped water. All other domestic wells had submersible pumps. Test wells that yielded sufficient water were sampled with a portable 2-in diameter stainless-steel submersible pump. Test wells with low yields were sampled with a polytetrafluoroethylene bailer. All wells were purged until at least three well volumes of water were removed. Purging of pumped wells continued until field parameters (pH, water temperature, dissolved oxygen, and specific conductance), as measured in a flow-through chamber, stabilized. Water from bailed wells was collected in a clean sample container after three well volumes of water were removed. When purging bailed wells, the water level in the well was not lowered below the top of the well screen to minimize the possibility of introducing oxygen into the formation. Purging of these wells sometimes took as long as 2.5 days due to the slow recovery of the wells. Field parameters for bailed wells were measured in subsamples taken from the sample container.

Water samples for chemical analysis were collected from a flow-through chamber or sample container using a peristaltic pump. Sample processing, filtration, and preservation were performed in the field as described by Knapton (1985). Samples for selenium speciation were filtered and preserved with hydrochloric acid. Dissolved constituents were determined in samples filtered through a 0.45-µm cellulose-nitrate filter using a plastic filtration unit. Water samples analyzed for oxygen-18/oxygen-16 (O-18/O-16) and deuterium/hydrogen (D/H) isotopic ratios and for tritium were not filtered or preserved.

Ground-water samples were analyzed for major ions, nutrients and trace elements by the U.S. Geological Survey's National Water Quality Laboratory (NWQL) in Arvada, Colo., using methods described by Fishman and Friedman (1989) and Fishman (1993). Ground-water samples were analyzed for O-18/O-16 and D/H isotopic ratios and for tritium by U.S. Geological Survey laboratories in Reston, Va. The O-18/O-16 isotopic ratio was determined using a modification of the carbon-dioxide equilibration method developed by Epstein and Mayeda (1953). The D/H isotopic ratio of water samples was determined by analyzing hydrogen quantitatively extracted from the water (Kendall and Coplen, 1985). The O-18/O-16 and D/H results are reported relative to Vienna Standard Mean Ocean Water (V-SMOW) in the per mil notation. Tritium was determined by liquid scintillation with enrichment. Results of chemical analyses of ground-water samples are in table 11.

Selenium-speciation analyses were performed by the Montana Bureau of Mines and Geology (MBMG) in Butte, Mont., using hydride generation atomic absorption spectrometry. In performing the speciation analyses, selenite was determined on subsamples which were not reduced with hydrochloric acid prior to injection into the hydride generator (Presser and Barnes, 1984). The concentration of selenite plus selenate was determined on subsamples that were digested with hydrochloric acid. Selenate was determined as the difference between the concentration of selenite plus selenate and the concentration of selenite. The values for selenite plus selenate reported by MBMG are lower in some samples than values for selenium reported for the same samples by NWQL (Fishman and Friedman, 1989, p. 403). The difference probably can be attributed to the more complete digestion performed by NWQL. The digestion used by NWQL included reagents that can oxidize organic selenium compounds. The digestion used by MBMG did not include oxidizing reagents. Selenium-speciation data for ground-water samples are in table 12.

Drill Cores

Samples of drill cores and cuttings from glacial-lake deposits and shale were collected during the drilling of four test wells near Freezeout Lake. No samples were collected from gravel at sites W-4 and W-5 because bentonite mud that was used during drilling contaminated the drill cuttings. Samples of drill cuttings also were collected during drilling of the four test wells near Benton Lake.

Drill cores were analyzed by the U.S. Geological Survey's Branch of Geochemistry Laboratory. Samples were dried at ambient air temperature and crushed according to procedures described in Arbogast (1990). Specific conductance, selected major and trace elements, total arsenic, total selenium, and water-extractable selenium were analyzed by methods described for soils. pH was measured in an aliquot of the filtrate obtained for measurement of specific conductance. Total sulfur and sulfide and sulfate fractions of total sulfur were analyzed using extraction procedures described by Jackson and others (1987) and a combustion method using an automated sulfur analyzer (Arbogast, 1990). Results of chemical analyses of drill-core samples are in table 13.

Surface Water

Surface water was sampled periodically for chemical quality from July 1990 through September 1992. Selenium was analyzed in samples from all 49 surface-water sites. Twenty-six sites were sampled for trace elements, major ions, and nutrients. Twelve of these sites were sampled for stable isotopes. Water temperature, pH, and specific conductance were measured in the field during all samplings, and dissolved oxygen was measured in the field when samples were collected for complete chemical analysis. Field measurements of water-quality properties and field sample processing were performed as described by the U.S. Geological Survey (1977) and Knapton (1985).

Samples from streams and irrigation drains were collected either by depth integration at multiple stream verticals according to methods described by Knapton (1985), or by grab sampling at weirs, culverts, and sites where streamflow was very small. Instantaneous streamflow was determined at the time of sampling by direct measurement, stage-discharge rating, or estimation. Samples from lakes generally were collected near a central location; however, Freezeout and Benton Lakes were sampled at more than one location. Multiple sampling locations were separated either by substantial distance or physical barriers such as dikes. At each sampling point, samples were collected near mid-depth.

Sampling equipment was either nonmetal or coated with an epoxy paint to prevent trace-element contamination of the sample. Depth-integrated samples of flowing water with sufficient depth were collected with an epoxy-painted U.S. DH-48 hand-held sampler. Grab samples of point discharges and small flows were collected directly in either a glass or polyethylene sampling bottle, or a polyethylene churn splitter. Water samples from lakes were collected in a nonmetal Van Dorn point sampler that was lowered by

rope to mid-depth and triggered to seal a 10-L sample volume.

Surface-water samples were analyzed by the NWQL. Analytical methods are described by Fishman and Friedman (1989) and Fishman (1993). Results of field measurements and trace-element analyses of surface-water samples are presented in table 14. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples are in table 15.

Continuous-record streamflow-gaging stations were operated at three of the 49 surface-water sampling sites. Two of the gaging stations, Muddy Creek (site S-26) and Sun River (site S-33), were established previously for other data-collection programs. One station, Lake Creek near Power (site S-44), was established during this study to seasonally measure inflow to Benton Lake NWR. In addition, a water-quality monitor was installed in March 1992 at the Lake Creek gaging station to record specific conductance hourly during periods of flow. Daily mean values of streamflow are presented in tables 16 through 18. Daily mean values of specific conductance for Lake Creek are presented in table 19. Daily mean values of streamflow are based on an average of recorded unit values of stage and computational methods described by Kennedy (1983) and Rantz and others (1982). Daily mean specific conductance is based on an average of recorded unit values or by interpolation and statistical correlation with streamflow during periods of missing record.

Bottom Sediment

Samples of bottom sediment were collected at eight locations in lakes of Freezout Lake WMA and Benton Lake NWR and at one location on Muddy Creek in July 1991. One wetland site (site S-37) was sampled a second time in June 1992 to verify the selenium concentration reported for the earlier sample. All bottom-sediment sampling locations correspond to surface-water sampling sites.

Bottom-sediment samples were collected from the upper 4-6 in of the bed surface using a U.S. BMH-53 handheld, stainless-steel coring device. The brass end-plate of the internal piston was coated with an epoxy paint to prevent trace-element contamination. Five to ten replicate cores of sediment were collected at each site and composited into a porcelain-coated steel mixing pan. The sediment was thoroughly mixed with a wooden spoon, and about 0.5 liter of material was withdrawn and placed into a plastic carton. The bulk, unsieved samples were submitted for analysis in a wet condition.

Bottom-sediment samples were analyzed for a suite of major and trace elements by the Branch of Geochemistry Laboratory. Samples were air dried at ambient temperature. The bulk sample was disaggregated and sieved through a 230-mesh (0.063 mm) nonmetal screen. The fraction of bulk sediment finer than 0.063 mm diameter was analyzed for selected major and trace elements by ICP as described for soils. Analyses for total selenium and arsenic were performed by hydride generation atomic absorption spectrometry. Mercury was determined by cold vapor atomic absorption spectrometry in samples digested with nitric acid and sodium dichromate. Water-extractable boron was determined by ICP following a hot-water extraction. Uranium and thorium were measured by "delayed neutron counting," a nuclear activation method used for analysis of complex geologic sample matrices without chemical processing. Detailed analytical procedures for solid-phase samples are described by Arbogast (1990). Results of chemical analyses of bottom-sediment samples are presented in table 20.

Biological Data

Biological samples of aquatic plants, invertebrates, bird eggs, and bird livers were collected during 1987-89 as part of a previously initiated program of the U.S. Fish and Wildlife Service. Biological samples also were collected during 1990-92 as part of the DOI detailed study, and included aquatic plants, invertebrates, fish and amphibians, bird eggs, and bird livers. Most samples submitted for trace-element analysis were collected in 1988, 1990, and 1991. All samples of biota were analyzed for selenium by hydride generation atomic absorption spectrometry. Most samples also were analyzed for arsenic by hydride generation atomic absorption spectrometry, for mercury by cold vapor-atomic absorption spectrometry, and for other elements by ICP. Trace-element analyses were conducted by The Environmental Trace Substances Research Center, Columbia, Mo.; Hazelton Laboratories, Inc., Madison, Wisc.; Research Triangle Institute, Research Triangle Park, N.C.; and the U.S. Fish and Wildlife Service's Patuxent Analytical Control Facility (PACF), Laurel, Md.

Aquatic Plants

Samples of aquatic plants included algae, water milfoil (*Myrophyllum exalbescens*), and sago pondweed (*Potamogeton pectinatus*). Vascular plants were prepared either as whole samples or separated into leaf, stem, and root or tuber samples. Plant samples were stored in plastic bags and frozen prior to analysis.

Results of trace-element analyses of aquatic plants are presented in table 21.

Aquatic Invertebrates

Composite samples of aquatic invertebrates included amphipods (Class Crustacea, *Gammarus* sp.), daphnia (Class Crustacea, *Daphnia* sp.), waterboatmen (Class Insecta, Family Corixidae), damselfly nymphs (Class Insecta, Order Odonata), backswimmers (Class Insecta, Family Notonectidae), and chironomid larvae (Class Insecta, Family Chironomidae). Invertebrate samples were collected with either light traps using methods described by Espinosa and Clark (1972) or with a sweep net. Invertebrate samples were sorted by taxa with forceps and placed in acid-cleansed jars. A minimum of 8.0 g of biomass was obtained for composite samples of invertebrates. Results of trace-element analyses of aquatic invertebrates are presented in table 22.

Fish and Amphibians

Fish samples consisted of small forage fish and large fish. Forage fish included northern redbelly dace, *(Phoxinus eos)*, longnose dace (*Rhinichthys cataractae*), fathead minnows *(Pimephales promelas)*, brassy minnows (*Hybognathus hankinsoni*), mottled sculpin (*Cottus bairdi*) and brook sticklebacks (*Culaea inconstans*). Large fish included brown trout (*Salmo trutta*), mountain whitefish (*Prosopium williamsoni*), carp (*Cyprinus carpio*), white sucker (*Catostomus commersoni*), black crappie *(Pomoxis nigromaculatus)*, and yellow perch *(Perca flavescens)*. Amphibian samples consisted of tiger salamanders (*Ambystoma tirgrinum*). Fish and amphibians were collected with light traps, sweep nets, seines, gill nets, or electrofishing equipment. Forage fish and amphibians were analyzed as whole-body composites. Large fish were analyzed as either whole individuals or fillets. Results of trace-element analyses of fish and amphibians are presented in table 23.

Water-Bird Eggs

Eggs of water birds were collected from the nests of eared grebe (*Podiceps nigricollis*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), gadwall (*Anas strepera*), blue-winged teal (*Anas discors),* northern shoveler (*Anas clypeata*), redhead (*Aythya americana*), lesser scaup (*Aythya affinis*), ruddy duck (*Oxyura jamaicensis*), American coot (*Fulica americana*), and American avocet (*Recurvirosta americana*) at Freezout Lake WMA and Benton Lake NWR. Nests of eared grebe and American coot were located by searching emergent vegetation from an airboat or canoe. Upland nesting waterfowl were located by systematic cable-chain dragging (Klett and others, 1986). American avocet nests were located by searching shoreline and mudflat areas on foot. Marked nests were visited at approximately 10-day intervals and again soon after the end of the anticipated incubation period to determine nest fate. Nest success was determined by both the apparent and Mayfield methods (Johnson, 1979).

In most instances, one egg was collected randomly from each active nest, although two clutches of five American coot eggs were collected. Additional eggs were collected from abandoned or depredated nests, or where unhatched eggs remained in successful nests.

The incubation stage of duck eggs was estimated by candling (Klett and others, 1986). The flotation method was used to estimate the incubation stage of eared grebe and American avocet eggs (Westerskov, 1950). Eggs were opened with scalpel blades and their contents weighed in plastic boats. Fertility, viability, stage of development, and observable gross abnormalities were noted and the egg contents then placed in acid-cleansed glass jars. Embryos believed to be abnormal were submitted for detailed examination to the U.S. Fish and Wildlife Service's pathology laboratory at the Patuxent Wildlife Research Center in Laurel, Md. Results of trace-element analyses of water-bird eggs are presented in tables 24-27.

Water-Bird Livers

Livers of adult and young-of-the-year water birds were collected from eared grebe, Canada goose (*Branta canadensis*), mallard, northern pintail, gadwall, American wigeon (*Anas americana*), northern shoveler, lesser scaup, American coot, American avocet, and Franklin's gull (*Larus pipixcans*). Birds were collected either by shooting with steel shot or recovering carcasses during botulism outbreaks. Their livers were excised and stored in acid-cleansed glass jars. All samples were kept frozen until submitted for chemical analysis. Results of trace-element analyses of water-bird livers are presented in tables 28-31.

Bioassay Testing

Bioassay testing was conducted to measure the toxic response of selected biota to various water types under controlled conditions. Responses were tested by subjecting biota to either ambient exposure or direct ingestion of surface water collected from various parts

of the study area. All surface-water samples used in bioassay testing were analyzed for chemical composition.

Aquatic Bioassays

Static acute bioassay tests were conducted in 1992 using daphnia (*Daphnia magna*), amphipods (*Hyalella azteca*), and fathead minnows exposed to 33 surface-water samples and a saltwater reference toxicant (Instant Ocean^{R}). The methods used were slight variations of established procedures described by Peltier and Weber (1985) and the American Society for Testing and Materials (1989). The methods differed from standardized procedures in that daphnia were 1 to 96 hours old upon test initiation, one replicate per concentration was used, and pH, dissolved oxygen, and specific conductance were measured only at the beginning and end of the test. Daphnia and amphipod stocks were obtained from the National Fisheries Contaminant Research Center, Columbia, Mo. Aquatic invertebrates were cultured at Benton Lake NWR in accordance with standard methods described by Ingersoll and Nelson (1990) and Ingersoll and others (1990). Spring water obtained from inflow to the Giant Springs Fish Hatchery near Great Falls, Mont., was used for culture, dilution, and control-treatment water.

Glass beakers (250 mL) containing 200 mL of test water were used for the aquatic invertebrate bioassays. One-day old fathead minnows were purchased from Aquatic Biosystems Inc., Fort Collins, Colo., and immediately stocked in 1,000-mL glass beakers containing 600 mL of test water. Analytical results of the undiluted surface-water sample splits that were used for bioassay testing are reported in tables 14-15. Dead animals in each test chamber were removed every 24 hours during the exposure period and the cumulative mortality was recorded (tables 32-34).

Duckling Bioassay

One hundred 1-day-old mallard ducklings were obtained from a commercial game farm (Whistling Wings, Inc., Hanover, Ill.) and randomly assigned to 16 groups of six ducklings each. The ducklings in two groups were sacrificed immediately. From each of these two pre-exposure groups, a composite liver sample was analyzed for trace elements and a composite brain sample was analyzed for sodium by the Environmental Trace Substances Research Center (ETSRC), Columbia, Mo. (table 35). Each of the 14 remaining groups was housed in a wire-and-particle-board cage (0.9 x 0.9 x 0.6 m) equipped with a brood lamp. The groups were provided with commercial (minimum of 22 percent protein) duckling food in unrestricted quantities (*ad libitum*). Samples of two brands of duckling food were analyzed for trace elements by ETSRC (table 36).

Twelve of the duckling groups were subjected to experimental exposures and two groups were controls. Control groups drank water from Giant Springs. The twelve experimental groups drank surface water collected as grab samples from six sites in the study area, with two replicates for each site. Water was obtained for the experimental groups from the seep east of Priest Butte Lakes, Freezeout Lake (south end), Freezout Lake WMA (Pond 5), tributary to Benton Lake (Pool 4), Benton Lake (Pool 2), and Benton Lake (Pool 6). Grab samples from lake sites were near shore and do not directly correspond to surface-water sites listed in table 3. Specific conductance was measured each time water was collected. Water samples collected for bioassay drinking-water treatments on June 30, 1992 and July 13, 1992 were analyzed for selected major ions (magnesium, sodium, sulfate, and chloride), and trace elements by ETSRC (table 37).

The exposure period to commercial diet and drinking-water treatments was 28 days. Duckling survival was monitored every day. All ducklings found dead during the exposure period were retrieved and their brains and livers removed. Individual brain samples from these ducklings were analyzed for sodium. Liver samples from ducklings that had died during exposure were composited, by group, for trace-element analysis by ETSRC (table 35). All ducklings remaining alive at the end of the exposure period (day 28) were sacrificed by asphyxiation with carbon dioxide and their brains and livers removed for individual analysis of trace elements in liver tissue and sodium in brain tissue (table 35). Procedures used by ETSRC to analyze trace elements and major ions in drinking water, feed, and biological tissues collected as part of the duckling bioassay experiment are described by the U.S. Fish and Wildlife Service (1985).

Quality-Assurance Data

Data-collection and analytical procedures used in this study incorporated practices designed to control, verify, and assess the quality of sample data. Methods and associated quality control for collection and processing of water samples are described by Ward and Harr (1990), Guy and Norman (1970), Knapton (1985), and Knapton and Nimick (1991).

The Branch of Geochemistry Laboratory and the NWQL provided quality control of analyses performed within their facilities and within contract labo-

ratories performing selected analyses. Quality assurance for procedures of the Branch of Geochemistry Laboratory are described by Arbogast (1990). Standard quality-assurance procedures used by the NWQL are described by Friedman and Erdmann (1982) and Jones (1987).

All sample bottles, standard solutions, and preservatives for water samples were provided by the NWQL and are systematically tested by internal quality control for conformance with criteria described in Bench-Level Protocols on file in the Quality Control Office of the laboratory. In addition, selected analytical schedules, requirements for sample treatments, and required sample bottles are described in the laboratory's analytical services catalog (Pritt and Jones, 1989).

Quality-control data to document sample contamination and reproducibility of analytical results were provided by test samples that consisted of either a blank sample of deionized water or a replicate environmental sample incorporated in the sampling train. Quality-control samples comprised about ten percent of the total number of samples submitted for analysis. A field-blank sample is a volume of deionized water that is treated as an environmental sample in all aspects, including exposure to sampling equipment, sample containers, filtration apparatus, and chemical preservatives in the field, and to holding times and laboratory processing. A replicate environmental sample is a volume of sampled media split into subsamples in such a manner that the physical and chemical characteristics of each subsample are considered to be essentially identical in composition.

Results of chemical analyses of deionized-water field blanks processed through ground-water and surface-water sampling and processing equipment are listed in table 38. Results of chemical analyses of replicate solid-phase (soil, drill core, and bottom sediment) samples are listed in table 39. Results of chemical analyses of replicate ground-water and surface-water samples are listed in tables 40 to 42.

Laboratory quality control of biological samples was assured through the PACF. The precision and accuracy of laboratory analyses were confirmed with procedural blanks, duplicate analyses, test recoveries of spiked material, and reference-material analyses. Round-robin tests among U.S. Fish and Wildlife Service and contract analytical laboratories also were part of the PACF quality-assurance review. All U.S. Fish and Wildlife Service contaminant analyses received a quality-assurance review by the PACF.

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DATA

Table 1. Soil sampling sites in the Sun River area, Montana

[Site number: letter preceding number indicates media type (L, soil; W, ground water). Sample type: C, composite soil sample from near surface to maximum of 3 ft; D, soil sample collected at specific depth; number in parentheses indicates the number of depth horizons sampled at each site. Parent material: Qg, Quaternary glacial drift; Ql, Quaternary glacial-lake deposits; QTg, Quaternary and Tertiary gravel; Km, Upper Cretaceous Montana Group. Symbol: --, no data]

Site number (fig. 3)	Corresponding site number for other sampled media	U.S. Geological Survey site identification number[1]	Local number[2]	Sample type	Parent material	Soil name[3]	Land use or land type[4]
			GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND				
L-1	--	473730111572001	22N03W35BAA01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-2	--	473825111572001	22N03W26BAA01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-3	--	473915111572001	22N03W23BAA01	C	QTg	Varney clay loam	Irrigated pasture (flood)
L-4	--	474010111572001	22N03W14ABB01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-5	--	474100111572001	22N03W11BAA01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-6	--	474100111583001	22N03W10ABB01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-7	--	474010111583001	22N03W15ABB01	C	QTg	Varney clay loam	Irrigated crops (flood)
L-8	--	473915111583001	22N03W22ABB01	C	QTg	Rothiemay clay loam	Irrigated crops (sprinkler)
L-9	--	473825111583001	22N03W27BAA01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-10	--	473730111583001	22N03W34ABB01	C	QTg	Rothiemay clay loam	Irrigated crops (flood)
L-11	--	473735112002501	22N03W28CCC01	C	Ql	Kremlin clay loam, calcareous	Irrigated crops (sprinkler)
L-12	--	473805111595001	22N03W28BDD01	C	Ql	Ethridge clay loam	Irrigated crops (sprinkler)
L-13	--	473830112002501	22N03W21CCC01	C	Ql	Ethridge clay loam	Irrigated crops (flood)
L-14	--	473850111594501	22N03W21DBB01	C	Ql	Richey silty clay loam	Irrigated crops (flood)
L-15	--	473920112002501	22N03W16CCC01	C	Ql	Richey silty clay loam	Irrigated crops (flood)
L-16	--	474010112002501	22N03W16BBB01	C	Ql	Kobar silty clay loam	Irrigated crops (flood)
L-17	--	474105112003501	22N03W05DDD01	C	Ql	Marcott silty clay loam	Irrigated crops (flood)
L-18	--	473610112014001	21N03W05CBC01	C	QTg	Rothiemay gravelly clay loam, calcareous	Irrigated crops (flood)
L-19	--	473705112015001	22N03W31DAA01	C	Ql	Kremlin clay loam, calcareous	Irrigated crops (flood)
L-20	W-5A	474055111585501	22N03W10BAC01	C	QTg	Crago gravelly loam	Non-irrigated pasture
L-21	W-4A	474005111584001	22N03W15BAA01	C,D(3)	QTg	Varney clay loam	Irrigated crops (flood)
L-22	W-1A	473825111591001	22N03W28AAA01	C	Ql	Rothiemay clay loam	Irrigated crops (flood)
L-23	W-2A	473825111595001	22N03W28ABB01	C,D(3)	Ql	Rothiemay clay loam	Irrigated crops (sprinkler)
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND				
L-24	W-3A	473825112004501	22N03W29AAB01	C	Ql	Ethridge clay loam	Non-irrigated crops
L-25	--	473735112010001	22N03W29DCC01	C	Ql	Rothiemay clay loam	Non-cropped[5]
L-26	--	473805112010001	22N03W29ACC01	C	Ql	Kremlin clay loam	Non-cropped[5]
L-27	--	473850112004501	22N03W20DAB01	C	Ql	Marcott silty clay loam	Non-cropped, undisturbed
L-28	--	474050112013501	22N03W08BCA01	C	Ql	Marvan silty clay, wet	Alkali flat

Table 1. Soil sampling sites in the Sun River area, Montana (Continued)

Site number (fig. 3)	Corresponding site number for other sampled media	U.S. Geological Survey site identification number[1]	Local number[2]	Sample type	Parent material	Soil name[3]	Land use or land type[4]
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND--Continued				
L-29	--	473735112025501	22N03W30CCC01	C	Ql	Kremlin clay loam	Non-cropped, undisturbed
L-30	--	473835112030001	22N03W19CCB01	C,D(1)	Km	Marvan silty clay, wet	Alkali flat
L-31	--	474250112022501	23N03W30CDD01	C	Ql	Marvan silty clay, wet	Alkali flat
L-32	--	474110112050001	22N04W02CDA01	C	Km	Marvan silty clay, wet	Alkali flat
L-33	--	474250111584501	23N03W27CDD01	C	Qg	Ethridge clay loam	Non-cropped[5]
L-34	--	474430112002501	23N03W21BBB01	C	Qg	Kremlin clay loam, calcareous	Non-irrigated crops
L-35	--	473735112064501	22N04W27CCC01	C	Km	Delpoint loam, calcareous	Rangeland
L-36	--	474015112064501	22N04W10CCC01	C	Km	Delpoint loam, calcareous	Non-cropped[5]
L-37	--	474610112025001	23N03W07BBB01	C	Qg	Kobar clay loam	Non-cropped[5]
L-38	--	474525112034501	23N04W12CDD01	C	Qg	Haploborolls clay, wet and saline	Saline seep
L-39	--	474615112043501	23N04W11ABA01	C	Qg	Kremlin clay loam, calcareous	Non-irrigated crops
L-40	--	474610112060001	23N04W10ABA01	C	Qg	Haploborolls clay, wet and saline	Alkali flat

[1]Fifteen-digit site-identification number is a unique identifier that represents the approximate latitude and longitude location of the site (first 13 digits), plus the sequence number (last two digits). Identification numbers for corresponding sites that do not have identical latitude and longitude indicate that samples were collected in close proximity.

[2]Local number represents the township, range, section, and quadrants of section, plus the sequence number. Local numbers for corresponding sites that do not have identical section quadrants indicate that samples were collected in areas of close proximity.

[3]Information from unpublished soil survey of Teton County conducted by U.S. Soil Conservation Service.

[4]Based on field observation.

[5]Land showed evidence of past cropping.

Table 2. Ground-water and drill-core sampling sites in the Sun River area, Montana

[Site number: letter preceding number indicates media type (W, ground water or drill core or both; L, soil); letter following number indicates an individual well at a site with multiple wells. Site type: D, domestic well; T, test well. Data type: C, continuous water-level measurements; DC, drill-core sample analyzed for chemical constituents; QW, ground-water sample analyzed for major-ion, nutrient, and trace-element chemistry plus field parameters; S, seasonal water-level measurements; WL, one or two water-level measurements. Symbol: --, no data]

Site number (fig. 4 and 5)	Corresponding site number for other sampled media	U.S. Geological Survey site-identification number[1]	Local number[2]	Site type	Data type
		GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND			
W-1A	L-22	473823111591203	22N03W28AAAA03	T	QW,S
W-1B	--	473823111591202	22N03W28AAAA02	T	QW,S
W-1C	--	473823111591201	22N03W28AAAA01	T	DC,QW,S
W-2A	L-23	473824111595003	22N03W28ABBB03	T	QW,S
W-2B	--	473824111595002	22N03W28ABBB02	T	QW,S
W-2C	--	473824111595001	22N03W28ABBB01	T	QW,S
W-3A	L-24	473826112004504	22N03W29AABA04	T	QW,S
W-3B	--	473826112004503	22N03W29AABA03	T	QW,S
W-3C	--	473826112004502	22N03W29AABA02	T	QW,S
W-3D	--	473826112004501	22N03W29AABA01	T	DC,QW,S
W-4A	L-21	474005111583804	22N03W15BAAD04	T	QW,S
W-4B	--	474005111583803	22N03W15BAAD03	T	C,QW,S
W-4C	--	474005111583801	22N03W15BAAD01	T	DC,QW,S
W-5A	L-20	474055111585704	22N03W10BBAD04	T	QW,S
W-5B	--	474055111585703	22N03W10BBAD03	T	QW,S
W-5C	--	474055111585701	22N03W10BBAD01	T	DC,QW,S
W-6	--	474338112080901	23N04W20DDDD01	D	QW,WL
W-7	--	474325112020801	23N03W30ABDC01	D	QW,WL
W-8	--	474128111590001	22N03W03BCDC01	D	WL
W-9	--	474103111575201	22N03W02CCCC01	D	QW,WL
W-10	--	474036111564401	22N03W11ADDC01	D	WL
W-11	--	474100111585701	22N03W10BBAA01	D	QW,S
W-12	--	474048111591401	22N03W09ADAA01	D	WL
W-13	--	474012112000401	22N03W09CDCD01	D	WL
W-14	--	474012111591301	22N03W09DDDD01	D	S
W-15	--	474011111583501	22N03W10CDDD01	D	QW,WL
W-16	--	474007111583701	22N03W15BAAA01	D	WL
W-17	--	474008111571201	22N03W14ABBB01	D	WL
W-18	--	473949111575701	22N03W15ADAD01	D	WL
W-19	--	473916111571301	22N03W23ABBB01	D	WL
W-20	--	473913111572201	22N03W23BACA01	D	QW,S
W-21	--	473902111580001	22N03W22ADAC01	D	WL
W-22	--	473902111583501	22N03W22BDAD01	D	WL
W-23	--	473831111591401	22N03W21DDDA01	D	S,QW,WL
W-24	--	473827111583401	22N03W22CDDD01	D	WL
W-25	--	473825111581601	22N03W27ABAA01	D	WL
W-26	--	473828111575701	22N03W22DDDD01	D	WL
W-27	--	473825111575501	22N03W27AAAA01	D	WL
W-28	--	473816111575601	22N03W27AADA01	D	WL
W-29	--	473756111583001	22N03W27DBBC01	D	WL

Table 2. Ground-water and drill-core sampling sites in the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Corresponding site number for other sampled media	U.S. Geological Survey site-identification number[1]	Local number[2]	Site type	Data type
		GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued			
W-30A	--	473733111591001	22N03W34BBBB01	D	WL
W-30B	--	473733111591002	22N03W34BBBB02	D	WL
W-31	--	473731111591601	22N03W33AAAB01	D	QW,WL
W-32	--	473708111575201	22N03W35BCCC01	D	WL
W-33	--	473707111575601	22N03W34ADDD01	D	WL
W-34	--	473654111590901	22N03W34CCBB01	D	S
W-35	--	473706111594701	22N03W33DBBB01	D	S
W-36	--	473644112001001	22N03W33CCDD01	D	WL
W-37	--	473641111591701	21N03W04AAAB01	D	QW,WL
W-38	--	473639111591301	21N03W04AAAA01	D	WL
W-39	--	473614111590501	21N03W03CBBA01	D	WL
W-40	--	473607111590601	21N03W03CBCB01	D	WL
W-41	--	473603111590901	21N03W03CBCC01	D	WL
W-42	--	473548111591301	21N03W09AAAA01	D	WL
W-43	--	473604112003601	21N03W05DADC01	D	QW,WL
W-44	--	473602112014501	21N03W06DDAA01	D	WL
W-45	--	473553112025601	21N03W06CCCA01	D	QW,S
W-46	--	473604112035401	21N04W01CACC02	D	WL
W-47	--	473605112035501	21N04W01CACC01	D	WL
W-48	--	473549112041801	21N04W11AAAA01	D	WL
W-49	--	473548112042701	21N04W11AABA01	D	WL
		BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND			
W-50	--	474301111360501	23N01E28DADD01	D	QW,WL
W-51	--	474203111230001	23N03E32CCAD01	D	QW,WL
W-52	--	473828111243701	22N02E24DDDA01	D	QW
W-53	--	473909111194502	22N03E22AACB02	T	DC,QW,WL
W-54	--	473902111194611	22N03E22ADBB11	T	DC,QW,WL
W-55	--	473855111195814	22N03E22ACCD14	T	DC,QW,WL
W-56	--	473842111201817	22N03E22CACD17	T	DC,QW,WL
W-57	--	473738111190501	22N03E26CDCB01	D	QW

[1]Fifteen-digit site-identification number is a unique identifier that represents the approximate latitude and longitude location of the site (first 13 digits), plus the sequence number (last two digits).

[2]Local number represents the township, range, section, and quadrants of section, plus the sequence number.

Table 3. Surface-water and bottom-sediment sampling sites in the Sun River area, Montana

[Site number: letter preceding number indicates media type (S, surface water or surface water and bottom sediment; B, biota). Site type: DR, irrigation drain; LK, lake; SP1, irrigation-induced seep or spring; SP2, dryland seep; ST1, stream that seasonally receives irrigation drainage; ST2, stream that receives no irrigation drainage (reference site). Data type: BA, surface water used for aquatic bioassay; BC, bottom sediment analyzed for trace-element chemistry; G, continuous-record streamflow-gaging station; M, multiparameter water-quality monitor; WC, water analyzed for major-ion, nutrient, and trace-element chemistry plus field parameters; WS, water analyzed for selenium and field parameters. Abbreviations: NASQAN, National Stream Quality Accounting Network station operated to monitor long-term water-quality characteristics. Symbol: --, no data]

Site number (fig. 5)	Corresponding site number for other sampled media	U.S. Geological Survey site-identification number[1]	Site name	Site type	Data type
			GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND		
S-1	--	473601111582201	Greenfields Main Canal near Fairfield[2]	ST2	BA,WC
S-2	--	473605112014401	Upper Wilke Coulee at Highway 408 near Fairfield	ST1	WS
S-3	B-1	473708112005001	Lower Wilke Coulee near Fairfield	ST1	WS
S-4	--	473636112015001	Seep south of Freezeout Lake near Fairfield	SP1	WS
S-5	--	473708112014501	Drain south of Freezeout Lake near Fairfield	DR	BA,WC
S-6	--	473800112002701	Drain at old Highway 89 (south) near Fairfield[2]	DR	BA,WC
S-7	B-2	473833112002701	Drain at old Highway 89 (middle) near Fairfield	DR	BA,WC
S-8	B-3	473918112002801	Drain at old Highway 89 (north) near Fairfield	DR	WS
S-9	--	474010112001901	Drain on west side of bench near Fairfield	DR	WS
S-10	--	474025112002801	Developed spring above Pond 5 near Fairfield	SP1	WC
S-11	B-4	474045112012101	Drain to Pond 5 at Highway 89 near Fairfield	DR	BA,WC
S-12	--	474158111591201	North Supply Ditch at Base Line Road near Fairfield[2]	DR	BA,WC
S-13	--	474134112002101	Drain to North Supply Ditch near Fairfield	DR	WC
S-14	--	474101111590301	Upper drain to North Supply Ditch near Fairfield	DR	WC
S-15	--	474112111574901	Seep above North Supply Ditch near Fairfield	SP1	WS
S-16	--	474132111534701	Muddy Creek at 4th Lane near Fairfield	ST1	WS
S-17	--	474213111500901	Muddy Creek at 7th Lane near Power	ST1	WS
S-18	--	474338111470001	Northwest tributary to Muddy Creek near Power	ST2	WS
S-19	--	474245111463001	Unnamed coulee at 7th Road North near Power	ST1	WS
S-20	--	06088000	Muddy Creek near Power[2]	ST1	BC,WC
S-21	B-6	474136111420501	Muddy Creek at pump station near Power	ST1	BA,WC
S-22	--	06088100	Spring Coulee near Power[2]	ST1	WC
S-23	--	06088200	Tank Coulee near Power	ST1	WS
S-24	--	06088300	Muddy Creek near Vaughn	ST1	WS
S-25	--	473720111375901	Coulee 0.2 mi south of Gordon near Vaughn	ST1	WS
S-26	--	06088500	Muddy Creek at Vaughn[2]	ST1	G,WS
S-27	--	473241111422401	Mill Coulee at Highway 89, near mouth near Sun River	ST1	WS
S-28	--	473322111450401	Mill Coulee at Highway 89, near Sun River	ST1	WS
S-29	--	473330111453101	Mill Coulee tributary near Sun River	ST1	WS
S-30	--	473154111540701	Blackfoot Coulee near Simms	ST1	BA,WC
S-31	--	473148111551701	Big Coulee at Simms-Fairfield Road, near Simms	ST1	WS
S-32	--	473123112085201	School Section Coulee near Simms	ST1	WS
S-33	B-8	06089000	Sun River near Vaughn (NASQAN)[2]	ST1	G,WC
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND		
S-34	B-9	474510112063501	Priest Butte Lakes (south end) near Choteau[2]	LK	BA,BC,WC
S-35	B-10	474452112053301	Seep east of Priest Butte Lakes near Choteau	SP2	BA,WC
S-36	B-12	474250112033001	Freezout Lake WMA (Pond 1) near Fairfield	LK	BC,WC
S-37	B-16	474020112014001	Freezout Lake WMA (Pond 5) near Fairfield	LK	BA,BC,WC
S-38	B-18	474030112032001	Freezeout Lake (north end) near Fairfield	LK	BA,BC,WC

Table 3. Surface-water and bottom-sediment sampling sites in the Sun River area, Montana (Continued)

Site number (fig. 5)	Corresponding site number for other sampled media	U.S. Geological Survey site-identification number[1]	Site name	Site type	Data type
		FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND--Continued			
S-39	B-19	473825112013001	Freezeout Lake (south end) near Fairfield[2]	LK	BA,BC,WC
S-40	--	474112112053401	Roundup Coulee near Fairfield[2]	ST2	WC
S-41	--	473837112030501	Coulee southwest of Freezeout Lake near Fairfield	ST2	WC
		BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND			
S-42	--	474304111360201	Muddy Creek diversion near Power	ST1	WC
S-43	--	474101111303201	Tributary to Lake Creek near Power[2]	ST2	BA,WC
S-44	--	06090650	Lake Creek near Power[2]	ST1	BA,G,M,WC
S-45	--	474002111232001	Tributary to Benton Lake (Pool 4) near Power	ST2	WS
S-46	B-22	474130111221501	Benton Lake (Pool 1) near Black Eagle[2]	LK	BC,WS
S-47	B-23	474110111212001	Benton Lake (Pool 2) near Black Eagle[2]	LK	BA,BC,WC
S-48	B-24	474015111193501	Benton Lake (Pool 3) near Black Eagle	LK	BA,WC
S-49	B-28	473910111180001	Benton Lake (Pool 5) near Black Eagle[2]	LK	BA,BC,WC

[1]Fifteen-digit site-identification number is a unique identifier that represents the approximate latitude and longitude location of the site (first 13 digits), plus the sequence number (last two digits). Eight-digit station identification number represents the standard USGS streamflow-gaging station numbering system wherein numbers increase in a downstream direction according to geographic location within the drainage basin.

[2]Site (or nearby location) previously sampled during 1986-87 reconnaissance study (Knapton and others, 1988).

Table 4. Biological sampling sites in the Sun River area, Montana

[Site number: Letter preceding number indicates media type (B, biota; S, surface water). Data type: BE, bird egg; BL, bird liver; F, fish or amphibian; I aquatic invertebrate; P, aquatic plant. Symbol: --, no data]

Site number (fig. 4)	Corresponding site number for other sampled media	Location number[1]	Site name	Data type
		GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND		
B-1	S-3	4737081120050	Lower Wilke Coulee near Fairfield	F
B-2	S-7	4738331120027	Drain at old Highway 89 (middle) near Fairfield	F
B-3	S-8	4739181120028	Drain at old Highway 89 (north) near Fairfield	F
B-4	S-11	4740451120121	Drain to Pond 5 at Highway 89 near Fairfield	F,I
B-5	--	4741351120030	North supply ditch near Fairfield	F
B-6	S-21	4741361114205	Muddy Creek at pump station near Power[2]	F
B-7	--	4732081114300	Sun River above Muddy Creek[2]	F,I
B-8	S-33	4732001112900	Sun River near Vaughn[2]	F,I
		FREEZOUT LAKE WILDLIFE MANAGMENT AREA AND ADJACENT LAND		
B-9	S-34	4745001120600	Priest Butte Lakes near Choteau[2]	BE,BL.F,I,P
B-10	S-35	4744521120533	Seep east of Priest Butte Lakes near Choteau	P
B-11	--	4747001120700	Teton River near Choteau	F
B-12	S-36	4743001120300	Freezout Lake WMA (Pond 1) near Fairfield	BE,BL,F,I,P
B-13	--	4742001120300	Freezout Lake WMA (Pond 2) near Fairfield	F,I,P
B-14	--	4741001120300	Freezout Lake WMA (Pond 3) near Fairfield	BE,F,I,P
B-15	--	4742001120400	Freezout Lake WMA (Pond 4) near Fairfield	BE,BL,F,I,P
B-16	S-37	4740001120200	Freezout Lake WMA (Pond 5) near Fairfield	BE,BL,F,I,P
B-17	--	4739001120100	Freezout Lake WMA (Pond 6) near Fairfield	BE
B-18	S-38	4740001120300	Freezeout Lake (north end) near Fairfield	BE,BL,F,I,P
B-19	S-39	4738001120100	Freezeout Lake (south end) near Fairfield[2]	BE,BL,F,I,P
		BENTON LAKE NATIONAL WILDLIFE REFUGE		
B-20	--	4742001112200	Lake Creek at mouth near Black Eagle[2]	I,P
B-21	S-46	4741001112200	Benton Lake (Pool 1) near Black Eagle[2]	BE,BL,F,I,P
B-22	S-47	4741001112100	Benton Lake (Pool 2) near Black Eagle[2]	BE,BL,I,P
B-23	S-48	4741001112000	Benton Lake (Pool 3) near Black Eagle[2]	BE,BL,F,I,P
B-24	--	4740001112300	Benton Lake (Pool 4A) near Black Eagle[2]	BE
B-25	--	4741001112100	Benton Lake (Pool 4B) near Black Eagle	BE,BL
B-26	--	4739001112000	Benton Lake (Pool 4C) near Black Eagle[2]	BE,BL,F,I,P
B-27	S-49	4739001111800	Benton Lake (Pool 5) near Black Eagle[2]	BE,BL,I,P
B-28	--	4738001111800	Benton Lake (Pool 5/6 dike) near Black Eagle	BE
B-29	--	4738001111900	Benton Lake (Pool 6) near Black Eagle[2]	BE,BL,I,P
B-30	--	4740301112000	Benton Lake (main canal) near Black Eagle	BL

[1]Location number represents approximate latitude and longitude. Where sampling was done over broad area (for example pool or pond) location is given only to minutes, seconds are listed as 00.

[2]Site (or nearby location) previously sampled during 1986-87 reconnaissance study (Knapton and others, 1988).

Table 5. Minimum reporting levels for constituents analyzed in water, soil, drill core, bottom sediment, and biota

[Abbreviations: µg/L, micrograms per liter; µg/g, micrograms per gram (dry weight); mg/L, milligrams per liter; percent, parts per hundred; SMOW, Standard Mean Ocean Water; TU, tritium unit; ND, not determined. Symbol: --, constituent not analyzed in the indicated medium]

Constituent	Minimum reporting level[1]		
	Water	Soil, drill core, and bottom sediment	Biota
TRACE ELEMENTS			
Aluminum	--	--	2.7-50 µg/g
Arsenic	1 µg/L	0.1-10 µg/g	.1-5 µg/g
Barium	100 µg/L	10 µg/g	.1-19.1 µg/g
Beryllium	--	1 µg/g	.03-1.9 µg/g
Boron	10 µg/L	10 µg/g	.4-19.1 µg/g
Cadmium	1-2 µg/L	2 µg/g	.1-1.9 µg/g
Chromium	1-2 µg/L	1 µg/g	.3-12.6 µg/g
Cobalt	--	1 µg/g	--
Copper	1 µg/L	1 µg/g	.5-12.5 µg/g
Iron	3-10 µg/L	--	29-238 µg/g
Lead	--	10 µg/g	.5-38.2 µg/g
Lithium	--	10 µg/g	--
Manganese	1 µg/L	10 µg/g	.7-9.8 µg/g
Mercury	--	.01 µg/g	.1-1 µg/g
Molybdenum	--	2 µg/g	.4-19.1 µg/g
Nickel	1 µg/L	1 µg/g	.5-15.3 µg/g
Selenium	1 µg/L	.1 µg/g	.2-1.2 µg/g
Selenium, water extractable	--	.005 µg/g	--
Silver	--	2 µg/g	--
Strontium	--	10 µg/g	.2-3.8 µg/g
Uranium	--	1-100 µg/g	--
Vanadium	--	10 µg/g	.3-19.1 µg/g
Zinc	3-10 µg/L	1 µg/g	4 µg/g
MAJOR ELEMENTS			
Alkalinity	1 mg/L	--	--
Aluminum	--	0.1 percent	2.7-50 µg/g
Bicarbonate	1 mg/L	--	--
Calcium	.1 mg/L	.01 percent	--
Carbon, carbonate	--	.1 percent	--
Carbon, organic	--	.1 percent	--
Chloride	.1 mg/L	--	--
Fluoride	.1 mg/L	--	--
Iron	--	.1 percent	--
Magnesium	.01 mg/L	.01 percent	30-43 µg/g
Phosphorus	--	.01 percent	--
Potassium	.1 mg/L	.1 percent	--
Silica	.1 mg/L	--	--
Sodium	.1 mg/L	.01 percent	--
Solids, dissolved	1 mg/L	--	--
Sulfate	1 mg/L	--	--
Sulfur, total	--	.05 percent	--
Sulfur, sulfide	--	.05 percent	--
Sulfur, sulfate	--	.001 percent	--
NUTRIENTS			
Nitrogen, ammonia	.01 mg/L	--	--
Nitrogen, nitrite	.01 mg/L	--	--
Nitrogen, nitrite plus nitrate	.05-.1 mg/L	--	--
Phosphorus, orthophosphate	.02 mg/L	--	--
ISOTOPES			
Deuterium/Hydrogen relative to SMOW	ND	--	--
Oxygen-18/Oxygen-16 relative to SMOW	ND	--	--
Tritium	.3 TU	--	--

[1]Minimum reporting levels for several elements vary as a result of method detection capabilities and matrix interferences.

Table 6. Results of chemical analyses of soil samples from the Sun River area, Montana

[Analyses by U.S. Geological Survey. Specific conductance measured on filtrate of 1:5 mixture (by dry weight) of soil and deionized water. Abbreviations: ft, feet below land surface; water extr., water extractable from soil; µS/cm, microsiemens per centimeter at 25 degrees Celsius; percent, percent of dry sample weight; µg/g, micrograms per gram of dry sample weight. Symbols: <, less than; --, no data]

Site number (fig. 3)	Date	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Specific conductance of water extract (µS/cm)	Aluminum, total (percent)	Calcium, total (percent)	Iron, total (percent)	Magnesium, total (percent)	Phosphorus, total (percent)	Potassium, total (percent)	Sodium, total (percent)
L-01	10-01-91	0	2.5	220	5.1	7.9	2.0	1.6	0.06	1.4	0.8
L-02	10-01-91	0	2.5	230	5.6	6.2	2.1	1.3	.06	1.6	.8
L-03	10-01-91	0	2.0	230	6.0	5.3	2.3	1.4	.07	1.7	.9
L-04	10-01-91	0	2.2	210	6.6	4.1	2.6	1.4	.08	1.9	.8
L-05	10-01-91	0	2.5	220	6.2	4.3	2.5	1.2	.07	1.7	.8
L-06	10-01-91	0	2.5	310	6.2	4.0	2.5	1.3	.08	1.8	.8
L-07	10-01-91	0	2.5	320	6.8	3.9	2.6	1.5	.08	1.9	.8
L-08	10-01-91	0	2.0	260	5.9	5.1	2.2	1.3	.08	1.6	.9
L-09	10-01-91	0	2.5	220	5.3	7.2	2.0	1.4	.07	1.4	.9
L-10	10-01-91	0	2.0	220	6.4	5.2	2.4	1.5	.08	1.7	.8
L-11	10-01-91	0	1.5	3,800	5.5	5.1	2.0	1.2	.07	1.6	1.1
L-12	10-01-91	0	3.0	720	5.1	8.5	1.9	1.7	.07	1.4	.9
L-13	10-01-91	0	3.0	300	5.2	7.8	2.0	1.3	.06	1.3	.8
L-14	10-01-91	0	3.0	310	5.8	5.9	2.1	1.5	.07	1.6	.9
L-15	10-01-91	0	3.0	340	7.0	4.2	2.6	1.7	.08	1.9	.7
L-16	10-02-91	0	3.0	3,000	7.2	3.9	2.9	2.0	.08	2.0	.9
L-17	10-18-91	0	3.0	310	6.6	5.3	2.5	1.8	.07	1.8	.8
L-18	10-02-91	0	3.0	280	5.6	5.3	2.1	1.2	.07	1.5	.9
L-19	10-02-91	0	3.0	440	6.3	3.2	2.1	1.3	.09	1.9	1.2
L-20	10-03-91	0	2.1	240	5.2	8.7	2.0	1.2	.06	1.4	.7
L-21	10-03-91	0	3.0	300	6.7	2.7	2.6	1.3	.14	1.9	.8
L-21	11-14-91	.4	.6	230	--	--	--	--	--	--	--
L-21	11-14-91	1.9	2.1	230	--	--	--	--	--	--	--
L-21	11-14-91	3.9	4.1	240	--	--	--	--	--	--	--
L-22	10-03-91	0	3.0	800	5.7	3.6	2.0	1.2	.07	1.7	1.2
L-23	10-03-91	0	3.0	1,400	5.0	9.2	1.8	2.0	.06	1.3	1.0
L-23	11-14-91	.4	.6	1,200	--	--	--	--	--	--	--
L-23	11-14-91	1.9	2.1	1,900	--	--	--	--	--	--	--
L-23	11-14-91	3.9	4.1	1,400	--	--	--	--	--	--	--
L-24	10-02-91	0	3.0	350	6.3	5.6	2.4	1.8	.07	1.7	.8

Table 6. Results of chemical analyses of soil samples from the Sun River area, Montana (Continued)

Site number (fig. 3)	Arsenic, total (µg/g)	Barium, total (µg/g)	Beryllium, total (µg/g)	Cadmium, total (µg/g)	Chromium, total (µg/g)	Cobalt, total (µg/g)	Copper, total (µg/g)	Lead, total (µg/g)	Lithium, total (µg/g)	Manganese, total (µg/g)
L-01	<10	620	1	<2	42	8	16	12	26	330
L-02	10	630	1	<2	30	8	15	11	28	350
L-03	10	630	1	<2	46	9	19	14	29	390
L-04	10	650	1	<2	53	10	19	13	34	420
L-05	10	660	1	<2	48	10	18	15	32	380
L-06	10	620	1	<2	54	10	19	12	34	390
L-07	10	590	2	<2	54	10	17	12	36	410
L-08	10	610	1	<2	45	9	17	12	30	370
L-09	<10	700	1	<2	42	9	15	11	28	320
L-10	10	580	1	<2	48	9	18	13	34	360
L-11	<10	650	1	<2	40	7	15	13	31	380
L-12	<10	550	1	<2	40	8	15	10	28	310
L-13	<10	640	1	<2	40	8	15	13	29	310
L-14	<10	580	1	<2	44	8	16	9	30	350
L-15	<10	610	2	<2	52	10	19	15	39	400
L-16	10	570	2	<2	56	10	21	16	43	410
L-17	<10	630	2	<2	54	9	18	14	41	330
L-18	<10	670	1	<2	40	9	16	11	27	380
L-19	10	660	1	<2	36	7	14	12	32	440
L-20	10	650	1	<2	42	8	16	9	34	270
L-21	10	570	2	<2	49	10	20	20	33	430
L-21	--	--	--	--	--	--	--	--	--	--
L-21	--	--	--	--	--	--	--	--	--	--
L-21	--	--	--	--	--	--	--	--	--	--
L-22	10	610	1	<2	42	7	16	13	29	350
L-23	10	740	1	<2	30	8	14	9	29	300
L-23	--	--	--	--	--	--	--	--	--	--
L-23	--	--	--	--	--	--	--	--	--	--
L-23	--	--	--	--	--	--	--	--	--	--
L-24	<10	620	1	<2	49	9	18	14	35	350

Table 6. Results of chemical analyses of soil samples from the Sun River area, Montana (Continued)

Site number (fig. 3)	Molybdenum, total (µg/g)	Nickel, total (µg/g)	Selenium, total (µg/g)	Selenium, water extr. (µg/g)	Silver, total (µg/g)	Strontium, total (µg/g)	Vanadium, total (µg/g)	Zinc, total (µg/g)
L-01	<2.0	13	0.2	0.007	<2	230	72	58
L-02	<2.0	14	.3	.007	<2	210	74	63
L-03	<2.0	19	.2	<.005	<2	180	83	71
L-04	<2.0	17	.2	<.005	<2	160	95	79
L-05	<2.0	16	.3	.018	<2	160	89	77
L-06	<2.0	18	.3	.010	<2	150	95	79
L-07	<2.0	17	.1	.007	<2	160	96	81
L-08	<2.0	14	.2	.007	<2	170	81	69
L-09	<2.0	13	.4	.007	<2	200	78	58
L-10	<2.0	15	.3	.008	<2	180	90	73
L-11	<2.0	12	.5	.029	<2	210	73	62
L-12	<2.0	12	.6	.030	<2	220	73	55
L-13	<2.0	13	.4	.013	<2	230	78	57
L-14	<2.0	14	.3	.011	<2	200	79	63
L-15	<2.0	20	.2	.014	<2	190	97	85
L-16	<2.0	18	.8	.450	<2	180	110	93
L-17	<2.0	17	.2	.011	<2	200	110	78
L-18	<2.0	13	.2	.007	<2	170	72	61
L-19	<2.0	10	.4	.019	<2	240	66	73
L-20	<2.0	13	.3	.008	<2	230	84	57
L-21	<2.0	16	.2	.010	<2	150	94	96
L-21	--	--	.2	<.005	--	--	--	--
L-21	--	--	.2	<.005	--	--	--	--
L-21	--	--	.1	<.005	--	--	--	--
L-22	<2.0	15	1.6	.550	<2	200	78	66
L-23	<2.0	12	.9	.100	<2	280	70	50
L-23	--	--	.8	.035	--	--	--	--
L-23	--	--	5.5	.160	--	--	--	--
L-23	--	--	3.7	.170	--	--	--	--
L-24	<2.0	15	.9	.030	<2	200	89	70

Table 6. Results of chemical analyses of soil samples from the Sun River area, Montana (Continued)

Site number (fig. 3)	Date	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Specific conductance of water extract (µS/cm)	Aluminum, total (percent)	Calcium, total (percent)	Iron, total (percent)	Magnesium, total (percent)	Phosphorus, total (percent)	Potassium, total (percent)	Sodium, total (percent)
L-25	10-02-91	0	3.0	290	5.6	7.1	2.1	2.3	.07	1.6	.9
L-26	10-02-91	0	3.0	3,200	6.1	7.6	2.3	2.2	.06	1.7	.8
L-27	10-02-91	0	3.0	1,600	5.5	8.2	2.1	2.0	.06	1.4	1.0
L-28	10-03-91	0	3.0	9,900	7.1	3.8	2.7	2.2	.07	2.0	1.4
L-29	10-02-91	0	3.0	1,900	6.1	3.6	2.0	1.4	.07	1.7	1.3
L-30	10-02-91	0	3.0	9,600	6.2	3.7	2.1	1.6	.06	1.5	2.2
L-30	10-02-91	0	.02	--	3.9	1.3	1.0	.8	.07	1.2	7.2
L-31	10-18-91	0	3.0	14,000	6.7	3.6	2.6	2.4	.06	1.7	2.2
L-32	10-02-91	0	3.0	7,700	6.4	4.9	2.3	1.7	.06	1.6	2.1
L-33	10-03-91	0	3.0	300	6.5	3.4	2.7	1.2	.08	1.9	.8
L-34	10-18-91	0	3.0	250	6.5	3.4	2.6	1.3	.09	2.0	.6
L-35	10-02-91	0	3.0	390	6.0	4.8	1.9	1.3	.07	1.6	.7
L-36	10-02-91	0	2.1	160	4.2	13	1.6	1.6	.04	1.1	.7
L-37	10-02-91	0	3.0	240	6.9	4.2	2.7	1.6	.08	2.0	.8
L-38	10-02-91	0	3.0	8,700	5.6	3.4	1.9	2.2	.07	1.6	1.3
L-39	10-02-91	0	3.0	240	6.1	5.7	2.3	1.5	.07	1.7	1.0
L-40	10-03-91	0	3.0	870	6.7	5.5	2.7	2.4	.07	1.8	1.2

Table 6. Results of chemical analyses of soil samples from the Sun River area, Montana (Continued)

Site number (fig. 3)	Arsenic, total (µg/g)	Barium, total (µg/g)	Beryllium, total (µg/g)	Cadmium, total (µg/g)	Chromium, total (µg/g)	Cobalt, total (µg/g)	Copper, total (µg/g)	Lead, total (µg/g)	Lithium, total (µg/g)	Manganese, total (µg/g)
L-25	10	650	1	<2	42	9	15	9	37	360
L-26	<10	110	1	<2	47	9	17	9	38	340
L-27	<10	660	1	<2	43	8	17	9	31	320
L-28	10	220	2	<2	58	10	19	9	57	300
L-29	10	590	1	<2	33	7	13	11	32	390
L-30	<10	410	1	<2	24	7	14	12	34	370
L-30	<10	170	<1	<2	12	3	6	8	20	230
L-31	<10	68	2	<2	50	9	19	8	39	340
L-32	10	270	1	<2	41	9	17	13	35	450
L-33	10	720	2	<2	59	10	18	14	42	350
L-34	20	960	1	<2	68	10	20	13	43	270
L-35	<10	740	1	<2	34	7	15	15	28	330
L-36	<10	700	1	<2	27	8	13	7	25	270
L-37	<10	630	2	<2	64	10	20	16	41	370
L-38	<10	230	1	<2	36	7	14	10	39	380
L-39	10	600	1	<2	48	8	16	12	31	350
L-40	10	140	1	<2	60	10	23	8	48	340

Table 6. Results of chemical analyses of soil samples from the Sun River area, Montana (Continued)

Site number (fig. 3)	Molybdenum, total (µg/g)	Nickel, total (µg/g)	Selenium, total (µg/g)	Selenium, water extr. (µg/g)	Silver, total (µg/g)	Strontium, total (µg/g)	Vanadium, total (µg/g)	Zinc, total (µg/g)
L-25	<2.0	13	.4	.018	<2	340	72	64
L-26	<2.0	19	.4	<.005	<2	320	87	69
L-27	<2.0	13	.1	.007	<2	280	76	58
L-28	<2.0	25	1.1	.090	<2	230	150	90
L-29	<2.0	9	1.1	.310	<2	210	61	62
L-30	<2.0	10	.2	.023	<2	320	60	59
L-30	<2.0	2	.3	.470	<2	180	32	33
L-31	2.0	16	1.0	.110	<2	210	95	81
L-32	<2.0	17	.2	.044	<2	350	75	71
L-33	<2.0	20	.5	.008	<2	160	120	88
L-34	<2.0	23	1.1	.011	<2	160	140	92
L-35	<2.0	8	.3	.010	<2	230	59	65
L-36	<2.0	10	.2	<.005	<2	440	55	39
L-37	<2.0	20	.4	.007	<2	160	120	90
L-38	<2.0	16	8.5	.210	<2	230	81	62
L-39	<2.0	14	.3	.008	<2	200	85	69
L-40	<2.0	23	1.1	.120	<2	190	110	84

Table 7. Construction records of test wells in the Sun River area, Montana

[Top or bottom of sandpack: N, well was completed with a natural filter pack instead of an artificial sand pack. Abbreviations: ft, feet; in., inches. Drilling fluid: A, air; M, mud; W, water]

Site number (fig. 4 and 5)	Local number	Date well constructed	Depth of hole (ft)	Top of open interval (feet below land surface)	Bottom of open interval (feet below land surface)	Top of sand pack (feet below land surface)	Bottom of sand pack (feet below land surface)	Width of openings (in.)	Diameter of casing (in.)	Drilling fluid used
				GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND						
W-1A	22N03W28AAAA03	10-19-91	17	7	17	5	17	0.014	2	W
W-1B[1]	22N03W28AAAA02	10-19-91	38	27	37	23	37.5	.014	2	W
W-1C[1]	22N03W28AAAA01	10-19-91	81	66	81	59	81	.014	2	W
W-2A	22N03W28ABBB03	10-20-91	16	9	16	7	16	.014	2	W
W-2B	22N03W28ABBB02	10-20-91	37	27	37	24	37	.014	2	W
W-2C	22N03W28ABBB01	10-20-91	80	67	80	63	80	.014	2	W
W-3A	22N03W29AABA04	10-01-91	14	9	14	6.5	14	.014	2	W
W-3B	22N03W29AABA03	10-01-91	23	18	23	16.5	23	.014	2	W
W-3C	22N03W29AABA02	10-01-91	45	40	45	37.5	45	.014	2	W
W-3D	22N03W29AABA01	09-30-91	75	60	75	57.5	75	.014	2	W
W-4A	22N03W15BAAD04	10-18-91	31	23	30	N	N	.125	4	M
W-4B	22N03W15BAAD03	10-17-91	49	42	47	N	N	.125	4	M
W-4C	22N03W15BAAD01	10-21-91	92	81	91	76	92	.014	2	W
W-5A	22N03W10BBAD04	10-04-91	12.5	5.5	10.5	N	N	.125	4	M
W-5B	22N03W10BBAD03	10-04-91	24.5	15.5	20.5	N	N	.125	4	M
W-5C	22N03W10BBAD01	10-03-91	52	42	50	39.5	52	.014	2	W
				BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND						
W-53	22N03E22AACB02	08-06-90	13	3	13	3	13	.125	4	A
W-54	22N03E22ADBB11	08-23-90	50	23	38	22	38	.020	4	A
W-55	22N03E22ACCD14	08-23-90	60	20	40	18	42	.020	4	A
W-56	22N03E22CACD17	08-23-90	80	15	20	13	20	.125	4	A
				20	60	20	60	.020	4	
				60	80	60	80	.125	4	

[1] Wells W-1B and W-1C were installed in one borehole.

Table 8. Lithologic logs of test-well boreholes in the Sun River area, Montana

[At sites with multiple wells, lithology is given for deepest well only. Abbreviations: ft, feet; in., inches]

Site number (fig. 4 and 5)	Lithology	Top of interval (feet below land surface)	Bottom of interval (feet below land surface)
W-1	Silt; contains sand and gravel	0	1.5
	Gravel, sand, and silt, dry	1.5	3
	Gravel, sand, and silt, wet	3	7.5
	Sand, coarse to very coarse; contains silt, clay, and gravel	7.5	12
	Sand, medium to coarse; contains silt, clay, and gravel	12	19
	Shale, brown chips with gray centers, weathered	19	23
	Shale, gray, soft; has many fractures, all with thin, brown, weathered zones	23	28
	Shale, gray, hard; fractures with oxidized surfaces; calcite(?) or gypsum(?) veins up to 1/4-in thick occur about every 6 in.	28	32
	Shale, dark gray, fractured	32	35
	Shale, black, massive; shale contains thin, interbedded varves of black mudstone and light gray, very fine sandstone; sandstone varves occasionally up to 1-in thick; vertical fracture at 72 ft; 2 calcite(?) veins with brown staining near 77 ft.	35	81
W-2	Sand, fine, clayey, silty	0	3
	Gravel	3	5
	Silt; contains fine sand and clay	5	16
	Shale, grayish brown, weathered	16	30
	Shale, gray, soft	30	35
	Shale, dark gray, massive; shale contains thin, interbedded varves of black mudstone and light gray, very fine sandstone	35	80
W-3	Sand, fine, silty, clayey	0	6
	Silt, brown, clayey, sandy	6	12
	Clay, brown, silty	12	14
	Shale, brown, very weathered, moist	14	18
	Shale, grayish brown, weathered	18	24
	Shale, gray with brown streaks, partly weathered	24	30
	Shale, gray, slightly weathered	30	41
	Shale, black, massive	41	75
W-4	Silt, clayey, sandy	0	5
	Sand and gravel, silty	5	7.5
	Gravel	7.5	9
	Gravel and cobbles	9	49
	Shale, brown, very weathered, sticky	49	52
	Shale, brown, weathered	52	54
	Shale, gray, soft	54	57
	Shale, gray, hard	57	63
	Shale, dark gray, massive, few fractures	63	92
W-5	Silt, fine sandy	0	5
	Sand, coarse; silt, clay, gravel	5	6
	Gravel and cobbles	6	21
	Shale, brown, very weathered, sticky	21	23
	Shale, mottled gray and brown, weathered	23	26

Table 8. Lithologic logs of test-well boreholes in the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Lithology	Top of interval (feet below land surface)	Bottom of interval (feet below land surface)
W-5--Continued			
	Shale, brownish gray, partly weathered	26	33
	Shale, dark gray, massive; few sandstone lenses up to 1/4-in thick; few calcite(?) or gypsum(?) veins	33	52
W-53	Clay, silty	0	4
	Shale, weathered	4	13
W-54	Silt, sandy, gravelly	0	6
	Sandstone, brown with orange and gray mottling,weathered	6	23
	Shale, weathered	23	30
	Shale, dark gray	30	43.5
	Bentonite, gray	43.5	44.5
	Shale, dark gray	44.5	50
W-55	Silt, sandy, clayey, cemented	0	10
	Sandstone, brown, weathered	10	25
	Shale, brown, weathered	25	33
	Shale, gray, soft	33	40
	Shale, dark gray, hard	40	60
W-56	Silt, brown, clayey, sandy	0	12
	Shale, brown, weathered	12	20
	Shale, gray, weathered	20	25
	Shale and sandstone, interbedded	25	47
	Shale, dark gray	47	80

Table 9. Physical data and selected seasonal water levels for domestic and test wells in the Sun River area, Montana

[Principal aquifer: Qg, Quaternary glacial drift; Ql, Quaternary glacial-lake deposits; QTg, Quaternary and Tertiary gravel; Kv, Upper Cretaceous Virgelle Sandstone; Kc, Upper Cretaceous Colorado Group.; Symbol: --, no data]

Site number (fig. 4 and 5)	Local number	Principal aquifer	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Non-irrigation season			Irrigation season		
					Date of water level measurement	Water level (feet below land surface)	Altitude of water level (feet above sea level)	Date of water level measurement	Water level (feet below land surface)	Altitude of water level (feet above sea level)
			GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND							
W-1A	22N03W28AAAA03	Ql	3,881.58	17	02-19-92	6.97	3,874.61	08-11-92	3.27	3,878.31
W-1B	22N03W28AAAA02	Kc	3,881.43	37	02-19-92	6.06	3,875.37	08-11-92	6.22	3,875.21
W-1C	22N03W28AAAA01	Kc	3,881.44	81	02-19-92	15.44	3,866.00	08-11-92	15.59	3,865.85
W-2A	22N03W28ABBB03	Ql	3,813.19	16	02-19-92	5.83	3,807.36	08-11-92	2.69	3,810.50
W-2B	22N03W28ABBB02	Kc	3,813.03	37	02-19-92	3.40	3,809.63	08-11-92	3.27	3,809.76
W-2C	22N03W28ABBB01	Kc	3,813.14	80	02-19-92	4.95	3,808.19	08-11-92	5.21	3,807.93
W-3A	22N03W29AABA04	Ql	3,778.57	14	02-19-92	12.33	3,766.24	08-11-92	12.55	3,766.02
W-3B	22N03W29AABA03	Kc	3,778.46	23	02-19-92	11.59	3,766.87	08-11-92	11.97	3,766.49
W-3C	22N03W29AABA02	Kc	3,778.50	45	02-19-92	8.32	3,770.18	08-11-92	8.88	3,769.62
W-3D	22N03W29AABA01	Kc	3,778.60	75	02-19-92	6.17	3,772.43	08-11-92	6.29	3,772.31
W-4A	22N03W15BAAD04	QTg	3,938.08	30	02-19-92	25.85	3,912.23	08-11-92	8.92	3,929.16
W-4B	22N03W15BAAD03	QTg	3,937.97	47	02-19-92	24.69	3,913.28	08-11-92	8.74	3,929.23
W-4C	22N03W15BAAD01	Kc	3,937.70	92	02-19-92	20.70	3,917.00	08-11-92	19.05	3,918.65
W-5A	22N03W10BBAD04	QTg	3,919.34	11	02-19-92	6.85	3,912.49	08-11-92	1.38	3,917.96
W-5B	22N03W10BBAD03	QTg	3,919.07	21	02-19-92	6.59	3,912.48	08-11-92	1.16	3,917.91
W-5C	22N03W10BBAD01	Kc	3,918.99	50	02-19-92	8.14	3,910.85	08-11-92	6.87	3,912.12
W-6	23N04W20DDDD01	Kv	3,860	43	02-27-91	14.11	3,846	--	--	--
W-7	23N03W30ABDC01	Qg	3,845	65	--	--	--	08-06-91	41.43	3,804
W-8	22N03W03BCDC01	Qg	3,855	8	02-21-91	2.99	3,852	08-06-91	2.13	3,853
W-9	22N03W02CCCC01	QTg	3,918	15	02-22-91	12.29	3,906	08-05-91	7.08	3,911
W-10	22N03W11ADDC01	QTg	3,915	34	--	--	--	08-06-91	6.24	3,909
W-11	22N03W10BBAA01	QTg	3,923.95	28	02-21-91	12.49	3,911.46	08-06-91	8.42	3,915.53
W-12	22N03W09ADAA01	QTg	3,923	25	01-31-91	14.69	3,908	08-06-91	9.70	3,913
W-13	22N03W09CDCD01	QTg	3,931	--	01-31-91	26.44	3,905	08-06-91	18.50	3,912
W-14	22N03W09DDDD01	QTg	3,935.91	27	01-31-91	21.69	3,914.22	08-06-91	10.34	3,925.57
W-15	22N03W10CDDD01	QTg	3,936.33	48	02-25-91	23.26	3,913.07	08-06-91	9.91	3,926.42
W-16	22N03W15BAAA01	QTg	3,937.50	38	02-25-91	24.24	3,913.26	08-06-91	11.58	3,925.92
W-17	22N03W14ABBB01	QTg	3,931	30	02-01-91	20.60	3,910	--	--	--
W-18	22N03W15ADAD01	QTg	3,942	38	--	--	--	08-07-91	15.63	3,926
W-19	22N03W23ABBB01	QTg	3,948	--	01-31-91	36.42	3,912	--	--	--

Table 9. Physical data and selected seasonal water levels for domestic and test wells in the Sun River area, Montana

(Continued)

Site number (fig. 4 and 5)	Local number	Principal aquifer	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Non-irrigation season			Irrigation season		
					Date of water level measurement	Water level (feet below land surface)	Altitude of water level (feet above sea level)	Date of water level measurement	Water level (feet below land surface)	Altitude of water level (feet above sea level)
GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued										
W-20	22N03W23BACA01	QTg	3,950	63	02-27-91	39.08	3,911	08-05-91	22.42	3,928
W-21	22N03W22ADAC01	QTg	3,961	--	--	--	--	08-06-91	25.16	3,936
W-22	22N03W22BDAD01	Kc	3,960	75	--	--	--	08-07-91	49.43	3,911
W-23	22N03W21DDDA01	Ql	3,880	39	02-21-91	12.51	3,867	08-06-91	9.21	3,871
W-24	22N03W22CDDD01	QTg	3,975	80	--	--	--	08-07-91	14.27	3,961
W-25	22N03W27ABAA01	QTg	3,970	50	01-17-91	46.79	3,923	08-06-91	25.45	3,945
W-26	22N03W22DDDD01	QTg	3,966	--	01-31-91	37.55	3,928	08-05-91	33.40	3,933
W-27	22N03W27AAAA01	QTg	3,965	73	--	--	--	08-06-91	26.54	3,938
W-28	22N03W27AADA01	QTg	3,965	65	01-31-91	44.68	3,920	08-05-91	30.40	3,935
W-29	22N03W27DBBC01	QTg	3,973	--	01-17-91	31.39	3,942	08-05-91	16.60	3,956
W-30A	22N03W34BBBB01	QTg	3,987	27	01-31-91	20.63	3,966	08-05-91	9.98	3,977
W-30B	22N03W34BBBB02	Kc	3,987	190	--	--	--	07-24-77	[1]86	3,901
W-31	22N03W33AAAB01	Kc	3,987	200	01-31-91	66.28	3,921	08-05-91	58.24	3,929
W-32	22N03W35BCCC01	QTg	3,968	21	01-17-91	12.43	3,956	08-07-91	7.48	3,961
W-33	22N03W34ADDD01	QTg	3,970	--	01-17-91	10.35	3,960	08-06-91	8.84	3,961
W-34	22N03W34CCBB01	QTg	3,988	19	02-01-91	9.36	3,979	08-05-91	6.44	3,982
W-35	22N03W33DBBB01	QTg	4,000	50	02-01-91	26.88	3,973	08-05-91	10.14	3,990
W-36	22N03W33CCDD01	QTg	4,005	55	01-16-91	14.65	3,990	08-06-91	5.72	3,999
W-37	21N03W04AAAB01	QTg	3,993	27	02-22-91	12.07	3,981	08-06-91	7.19	3,986
W-38	21N03W04AAAA01	QTg	3,992	20	01-17-91	14.77	3,977	08-05-91	11.36	3,981
W-39	21N03W03CBBA01	QTg	4,000	--	01-17-91	14.33	3,986	08-05-91	7.10	3,993
W-40	21N03W03CBCB01	QTg	4,010	--	01-17-91	28.64	3,981	08-06-91	13.07	3,997
W-41	21N03W03CBCC01	QTg	4,020	37	01-17-91	27.65	3,992	08-06-91	17.08	4,003
W-42	21N03W09AAAA01	QTg	4,060	80	01-17-91	55.59	4,004	08-05-91	29.30	4,031
W-43	21N03W05DADC01	QTg	4,000	11	01-16-91	8.05	3,992	--	--	--
W-44	21N03W06DDAA01	QTg	4,030	--	01-16-91	19.53	4,010	08-05-91	12.70	4,017
W-45	21N03W06CCCA01	QTg	4,055	30	01-16-91	6.97	4,048	08-06-91	2.26	4,053
W-46	21N04W01CACC02	QTg	4,100	--	--	--	--	08-06-91	29.15	4,071
W-47	21N04W01CACC01	QTg	4,110	--	--	--	--	08-06-91	35.82	4,074
W-48	21N04W11AAAA01	QTg	4,100	30	01-16-91	29.91	4,070	08-06-91	18.36	4,082
W-49	21N04W11AABA01	QTg	4,110	--	01-16-91	25.24	4,085	08-06-91	29.21	4,081

Table 9. Physical data and selected seasonal water levels for domestic and test wells in the Sun River area, Montana

(Continued)

Site number (fig. 4 and 5)	Local number	Principal aquifer	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Non-irrigation season			Irrigation season		
					Date of water level measurement	Water level (feet below land surface)	Altitude of water level (feet above sea level)	Date of water level measurement	Water level (feet below land surface)	Altitude of water level (feet above sea level)
				BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND						
W-50	23N01E28DADD01	Kc	3,710	111	11-16-90	15.04	3,695	--	--	--
W-51	23N03E32CCAD01	Kc	3,640	27	11-15-90	16.00	3,624	--	--	--
W-52	22N02E24DDDA01	Kc	3,760	160	--	--	--	--	--	--
W-53	22N03E22AACB02	Kc	3,620	12	05-16-91	4.08	3,616	--	--	--
W-54	22N03E22ADBB11	Kc	3,668	49	05-16-91	29.86	3,638	--	--	--
W-55	22N03E22ACCD14	Kc	3,678	59	05-16-91	29.15	3,649	--	--	--
W-56	22N03E22CACD17	Kc	3,714	78	05-16-91	49.62	3,664	--	--	--
W-57	22N03E26CDCB01	Kc	3,695	177	--	--	--	--	--	--

[1]Water level reported by driller.

Table 10. Seasonal water levels in domestic and test wells in the Greenfields Irrigation Division and adjacent land, Montana

[Water level--in feet below land surface]

SITE: W-1A
LOCAL NUMBER: 22N03W28AAAA03

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	5.40	MAR 04, 1992	7.16	MAY 2, 1992	4.90	OCT 08, 1992	4.63
DEC 17	6.01	MAR 31	7.51	JUL 09	5.08		
JAN 08, 1992	6.39	APR 14	7.71	JUL 27	2.29		
FEB 19	6.97	MAY 07	1.58	AUG 11	3.27		

SITE: W-1B
LOCAL NUMBER: 22N03W28AAAA02

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 26, 1991	1.05	MAR 06, 1992	6.75	MAY 28, 1992	8.40	OCT 08, 1992	3.04
DEC 17	3.46	31	7.47	JUL 09	7.93		
JAN 08, 1992	3.91	APR 14	7.79	27	7.23		
FEB 19	6.06	MAY 07	8.50	AUG 11	6.22		

SITE: W-1C
LOCAL NUMBER: 22N03W28AAAA01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	14.49	FEB 19, 1992	15.44	MAY 07, 1992	15.91	OCT 08, 1992	15.30
NOV 26	14.57	MAR 04	15.67	28	16.11		
DEC 17	14.70	31	15.41	JUL 27	15.99		
JAN 08, 1992	14.87	APR 14	16.03	AUG 11	15.59		

SITE: W-2A
LOCAL NUMBER: 22N03W28ABBB03

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	5.21	FEB 19, 1992	5.83	MAY 07, 1992	6.35	AUG 11, 1992	2.69
NOV 26	4.75	MAR 05	6.00	28	3.14	OCT 08	4.92
DEC 17	5.42	31	6.23	JUL 09	4.33		
JAN 08, 1992	5.67	APR 14	6.34	27	4.48		

SITE: W-2B
LOCAL NUMBER: 22N03W28ABBB02

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	2.54	FEB 19, 1992	3.40	MAY 07, 1992	3.45	AUG 11, 1992	3.27
NOV 26	2.19	MAR 05	3.72	28	3.48	OCT 08	3.04
DEC 17	2.77	31	4.11	JUL 09	3.57		
JAN 08, 1992	2.96	APR 14	4.23	27	3.53		

SITE: W-2C
LOCAL NUMBER: 22N03W28ABBB01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	4.84	FEB 19, 1992	4.95	MAY 07, 1992	5.86	AUG 11, 1992	5.21
NOV 26	4.70	MAR 05	5.05	28	5.59	OCT 08	5.20
DEC 17	4.76	31	5.25	JUL 09	5.38		
JAN 08, 1992	4.78	APR 14	5.87	27	5.38		

Table 10. Seasonal water levels in domestic and test wells in the Greenfields Irrigation Division and adjacent land, Montana (Continued)

SITE: W-3A
LOCAL NUMBER: 22N03W29AABA04

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17, 1991	11.95	FEB 19, 1992	12.33	MAY 07, 1992	12.55	AUG 11, 1992	12.55
NOV 26	12.19	MAR 05	12.45	28	12.36	OCT 08	12.47
DEC 17	12.38	31	12.64	JUL 09	11.98		
JAN 08, 1992	12.41	APR 14	12.57	28	12.48		

SITE: W-3B
LOCAL NUMBER: 22N03W29AABA03

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 17, 1991	11.69	MAR 05, 1992	11.70	MAY 07, 1992	12.20	JUL 28, 1992	11.84
JAN 08, 1992	11.58	31	12.35	28	11.96	AUG 11	11.97
FEB 19	11.59	APR 14	12.53	JUL 09	11.90	OCT 08	11.71

SITE: W-3C
LOCAL NUMBER: 22N03W29AABA02

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16, 1991	8.38	FEB 19, 1992	8.32	MAY 28, 1992	8.35	OCT 08, 1992	8.74
NOV 26	8.32	MAR 05	8.40	JUL 09	8.32		
DEC 17	8.32	31	8.25	28	8.36		
JAN 08, 1992	8.21	MAY 07	8.60	AUG 11	8.88		

SITE: W-3D
LOCAL NUMBER: 22N03W29AABA01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	6.21	FEB 19, 1992	6.17	MAY 07, 1992	6.30	AUG 11, 1992	6.29
NOV 26	6.19	MAR 05	6.19	28	6.29	OCT 08	6.21
DEC 17	6.20	31	6.25	JUL 09	6.25		
JAN 08, 1992	6.20	APR 14	6.32	28	6.25		

SITE: W-4A
LOCAL NUMBER: 22N03W15BAAD04

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	17.58	FEB 19, 1992	25.85	APR 14, 1992	27.16	JUL 28, 1992	9.12
NOV 26	20.05	MAR 06	25.49	MAY 07	26.09	AUG 11	8.92
DEC 17	21.18	10	25.67	28	21.01	OCT 08	14.11
JAN 08, 1992	22.49	31	26.60	JUL 09	12.48		

SITE: W-4B
LOCAL NUMBER: 22N03W15BAAD03

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	17.67	FEB 19, 1992	24.69	MAY 07, 1992	26.00	AUG 11, 1992	8.74
NOV 26	19.59	MAR 06	25.37	28	20.91	OCT 09	13.97
DEC 17	21.03	31	26.47	JUL 09	12.33		
JAN 08, 1992	22.34	APR 15	27.10	28	8.96		

Table 10. Seasonal water levels in domestic and test wells in the Greenfields Irrigation Division and adjacent land, Montana (Continued)

SITE: W-4C
LOCAL NUMBER: 22N03W15BAAD01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31 1991	18.33	FEB 19, 1992	20.70	MAY 07, 1992	22.73	AUG 11, 1992	19.05
NOV 26	19.12	MAR 06	20.96	28	21.96	OCT 08	17.74
DEC 17	19.76	31	21.96	JUL 09	20.64		
JAN 08, 1992	20.03	APR 14	22.38	28	19.56		

SITE: W-5A
LOCAL NUMBER: 22N03W10BBAD04

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	3.84	FEB 19, 1992	6.85	APR 14, 1992	8.10	JUL 28, 1992	1.61
NOV 26	4.56	MAR 06	7.24	MAY 07	6.75	AUG 11	1.38
DEC 17	5.10	10	7.33	28	3.30	OCT 08	2.20
JAN 08, 1992	5.73	31	7.80	JUL 09	1.96		

SITE: W-5B
LOCAL NUMBER: 22N03W10BBAD03

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	3.42	FEB 19, 1992	6.59	APR 15, 1992	7.86	JUL 28, 1992	1.39
NOV 26	4.30	MAR 06	6.99	MAY 07	6.51	AUG 11	1.16
DEC 17	4.86	10	7.08	28	3.07	OCT 08	1.95
JAN 08, 1992	5.47	31	7.54	JUL 09	1.76		

SITE: W-5C
LOCAL NUMBER: 22N03W10BBAD01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31, 1991	7.88	FEB 19, 1992	8.14	APR 14, 1992	8.92	AUG 11, 1992	6.87
NOV 26	7.77	MAR 06	8.34	MAY 07	9.11	OCT 08	7.17
DEC 17	7.78	10	8.47	28	8.79		
JAN 08, 1992	7.83	31	8.71	JUL 09	8.27		

SITE: W-11
LOCAL NUMBER: 22N03W10BBAA01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 21, 1991	12.49	AUG 06, 1991	8.42	JAN 08, 1992	10.72	JUL 09, 1992	8.82
25	12.65	26	8.90	FEB 19	12.49	28	8.60
MAY 03	13.33	SEP 27	9.42	APR 01	13.17	AUG 11	8.67
23	13.20	OCT 15	9.82	14	13.36	OCT 08	9.08
JUN 20	11.14	NOV 26	10.83	MAY 07	12.10		
JUL 10	9.92	DEC 17	11.29	28	9.90		

SITE: W-14
LOCAL NUMBER: 22N03W09DDDD01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 31, 1991	21.69	AUG 26, 1991	11.83	FEB 19, 1992	22.52	JUL 28, 1992	10.57
MAY 03	24.92	SEP 27	13.95	MAR 31	24.07	AUG 11	7.11
23	25.29	OCT 21	14.92	APR 14	24.51	OCT 08	13.76
JUN 20	19.27	NOV 26	18.58	MAY 07	19.64		
JUL 10	17.70	DEC 17	20.50	28	15.20		
AUG 06	10.34	JAN 08, 1992	20.93	JUL 09	11.96		

Table 10. Seasonal water levels in domestic and test wells in the Greenfields Irrigation Division and adjacent land, Montana (Continued)

SITE: W-20
LOCAL NUMBER: 22N03W23BACA01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 27, 1991	39.08	AUG 05, 1991	22.42	DEC 17, 1991	34.50	MAY 28, 1992	35.62
MAY 03	42.20	26	24.79	JAN 08, 1992	36.76	JUL 08	28.92
23	42.74	SEP 27	27.31	FEB 19	38.98	AUG 11	20.79
JUN 20	37.66	OCT 16	28.87	MAR 31	40.95	OCT 08	25.88
JUL 10	27.55	NOV 29	39.61	APR 14	41.55		

SITE: W-23
LOCAL NUMBER: 22N03W21DDDA01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 21, 1991	12.51	AUG 06, 1991	9.21	DEC 17, 1991	10.45	JUL 27, 1992	9.70
26	12.35	26	8.75	FEB 19, 1992	10.07	AUG 11	7.44
MAY 23	11.73	SEP 27	9.83	MAR 31	11.57	OCT 08	8.51
JUN 20	10.45	OCT 21	9.76	MAY 28	9.70		
JUL 10	8.84	NOV 26	11.32	JUL 09	9.94		

SITE: W-34
LOCAL NUMBER: 22N03W34CCBB01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 01, 1991	9.36	AUG 05, 1991	6.44	JAN 08, 1992	8.73	JUL 09, 1992	6.05
22	9.17	26	7.08	FEB 19	9.14	AUG 12	6.88
MAY 03	8.90	SEP 27	7.15	MAR 31	9.63	OCT 08	7.29
23	9.08	OCT 21	7.54	APR 14	9.58		
JUN 20	6.63	NOV 26	8.23	MAY 07	9.34		
JUL 10	6.05	DEC 17	8.69	28	8.04		

SITE: W-35
LOCAL NUMBER: 22N03W33DBBB01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 01, 1991	26.88	JUL 10, 1991	9.23	NOV 26, 1991	23.91	MAY 28, 1992	8.08
22	22.41	AUG 05	9.24	FEB 19, 1992	23.14	JUL 09	8.73
MAY 03	25.62	26	9.28	MAR 31	23.93	AUG 11	8.16
23	11.07	SEP 27	10.64	APR 14	24.82	OCT 08	10.06
JUN 20	9.77	OCT 21	14.01	MAY 07	26.66		

SITE: W-45
LOCAL NUMBER: 21N03W06CCCA01

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 16, 1991	6.97	JUL 10, 1991	3.17	NOV 26, 1991	5.68	JUL 09, 1992	2.68
FEB 26	7.74	AUG 06	2.26	DEC 17	6.09	AUG 11	2.93
MAY 03	8.27	26	4.09	FEB 19, 1992	7.71	OCT 08	3.81
23	6.60	SEP 27	2.59	MAR 31	8.45		
JUN 20	3.01	OCT 21	4.53	MAY 07	5.53		

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana

[Constituents are dissolved, except as indicated. Principal aquifer: Qg, Quaternary glacial drift; Ql, Quaternary glacial-lake deposits; QTg, Quaternary and Tertiary gravel; Kv, Upper Cretaceous Virgelle sandstone; Kc, Upper Cretaceous Colorado Group. Sampler type: B, bailer; J, jet pump; S, submersible pump installed in domestic well; SS, portable 2-in. diameter stainless steel submersible pump. Abbreviations: °C, degrees Celsius; IT, incremental titration; µg/L micrograms per liter; µS/cm, microsiemens per centimeter at 25 °C; mg/L milligrams per liter; per mil, parts per thousand; TU, tritium units. Symbols: --, no data; <, less than]

Site number (fig. 4 and 5)	Principal aquifer	Date	Sampler type	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Hardness (mg/L as $CaCO_3$)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium (mg/L as Na)
W-1A	Ql	04-16-92	B	615	8.0	--	--	330	36	57	15
	Ql	08-13-92	B	655	7.9	--	--	320	35	57	17
W-1B	Kc	04-16-92	SS	2,890	6.8	9.5	0.4	2,100	530	190	62
	Kc	07-27-92	SS	3,330	6.8	10.5	.4	2,200	560	200	67
W-1C	Kc	04-16-92	SS	1,990	7.8	--	--	79	17	8.7	520
	Kc	07-27-92	SS	2,270	7.8	11.0	.4	84	18	9.2	530
W-2A	Ql	04-16-92	SS	5,090	7.5	8.5	5.3	2,100	260	360	500
	Ql	07-27-92	SS	5,190	7.4	10.0	3.9	2,300	290	390	550
W-2B	Kc	04-16-92	SS	4,430	6.8	9.5	.5	1,800	420	170	500
	Kc	07-27-92	SS	4,570	6.7	9.5	.4	1,900	460	180	510
W-2C	Kc	04-16-92	SS	2,540	8.2	9.0	2.7	34	6.6	4.2	640
	Kc	08-13-92	SS	2,500	8.2	10.0	1.2	28	5.5	3.4	600
W-3A	Ql	04-17-92	B	30,500	--	--	--	--	--	--	--
	Ql	08-13-92	B	31,400	--	--	--	--	--	--	--
W-3B	Kc	04-17-92	B	14,500	7.5	--	--	5,000	470	930	2,000
	Kc	08-13-92	B	14,800	7.4	--	--	5,100	490	940	2,300
W-3C	Kc	04-15-92	SS	8,370	6.6	--	--	2,400	500	270	1,200
	Kc	07-28-92	SS	8,520	6.6	10.0	.8	2,800	560	300	1,200
W-3D	Kc	04-15-92	SS	4,630	7.8	9.5	--	88	9.4	15	1,200
	Kc	07-28-92	SS	4,610	7.9	10.0	--	82	9.2	14	1,000
W-4A	QTg	03-10-92	SS	867	7.9	10.0	8.8	450	25	93	15
	QTg	08-12-92	SS	920	7.8	10.0	10.0	510	24	110	11
W-4B	QTg	04-15-92	SS	754	7.8	8.5	10.1	420	29	84	13
	QTg	07-28-92	SS	763	7.8	9.0	10.6	410	27	83	13
W-4C	Kc	04-16-92	SS	3,710	7.7	9.0	3.3	780	130	110	600
	Kc	08-12-92	SS	3,770	7.7	9.0	1.2	780	130	110	630
W-5A	QTg	03-10-92	SS	540	8.1	6.5	6.5	270	21	52	12
	QTg	08-12-92	SS	498	8.1	11.0	6.8	250	20	48	13
W-5B	QTg	04-15-92	SS	518	8.1	7.0	8.0	270	22	52	13
	QTg	07-28-92	SS	523	8.1	9.5	8.3	260	21	51	13

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Potassium (mg/L as K)	Bicarbonate, field (IT), (mg/L as HCO_3)	Carbonate, field (IT), (mg/L as CO_3)	Alkalinity, field (IT), (mg/L as $CaCO_3$)	Alkalinity, lab (mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride (mg/L as Cl)	Fluoride (mg/L as F)	Silica (mg/L as SiO_2)	Dissolved solids, calculated (mg/L)
W-1A	3.6	379	0	311	305	61	0.60	0.50	9.4	375
	4.6	405	0	332	332	42	2.2	.60	13	374
W-1B	8.3	431	0	353	356	1,900	25	.60	11	2,940
	8.7	437	0	358	360	1,700	22	<.1	11	2,790
W-1C	2.7	1,070	0	878	877	310	39	1.4		1,440
	2.9	1,070	0	880	885	330	34	1.6	7.5	1,460
W-2A	4.1	492	0	403	403	2,700	97	2.6	10	4,230
	4.8	503	0	413	416	2,700	91	2.1	11	4,340
W-2B	7.3	580	0	476	467	2,200	32	.30	11	3,630
	8.4	571	0	468	474	2,200	47	<.1	11	3,700
W-2C	2.3	1,530	0	1,250	1,240	230	30	2.3	6.2	1,680
	2.2	1,560	0	1,280	1,280	140	28	2.1	5.5	1,550
W-3A	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
W-3B	15	1,160	0	951	924	5,700	1,800	.70	9.5	11,500
	15	1,140	0	930	920	6,000	1,900	2.7	9.0	12,200
W-3C	14	1,000	0	820	798	2,800	1,100	.80	8.4	6,400
	14	997	0	817	826	2,600	1,100	.50	8.4	6,390
W-3D	4.1	1,580	0	1,300	1,270	29	830	1.5	6.0	2,880
	3.8	1,610	0	1,320	1,290	25	750	1.4	6.3	2,600
W-4A	1.2	529	0	434	435	28	9.7	1.4	9.9	486
	.80	559	0	458	457	28	11	.80	9.1	530
W-4B	1.2	491	0	402	401	33	6.6	1.7	9.8	442
	1.2	503	0	412	400	26	3.0	1.3	9.5	432
W-4C	5.4	296	0	242	242	1,800	42	.60	9.2	2,850
	5.1	302	0	248	243	1,700	39	1.3	8.2	2,780
W-5A	.60	327	0	268	265	27	5.8	1.0	7.7	297
	.60	314	0	256	248	24	2.0	1.3	7.3	277
W-5B	.60	320	0	262	262	28	2.1	1.2	8.0	293
	.70	318	0	260	260	26	2.2	1.2	8.2	287

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Nitrite (mg/L as N)	Nitrite plus nitrate (mg/L as N)	Ammonia (mg/L as N)	Phospho-rus, ortho (mg/L as P)	Arsenic (µg/L as As)	Barium (µg/L as Ba)	Boron (µg/L as B)	Cadmium (µg/L as Cd)	Chromium (µg/L as Cr)
W-1A	<0.01	0.99	0.04	<0.01	--	110	100	--	--
	<.01	.58	.03	<.01	--	--	--	--	--
W-1B	<.01	<.05	.06	<.01	--	<100	520	--	--
	<.01	<.05	.10	<.01	--	--	--	--	--
W-1C	<.01	<.05	.46	.02	--	<100	1,200	--	--
	<.01	<.05	.60	.02	--	--	--	--	--
W-2A	<.01	11	.04	<.01	--	<100	780	--	--
	<.01	11	<.01	<.01	--	--	--	--	--
W-2B	<.01	<.05	.45	<.01	--	<100	1,100	--	--
	<.01	<.05	.44	<.01	--	--	--	--	--
W-2C	<.01	<.05	.31	.01	--	<100	1,100	--	--
	<.01	<.05	.07	.02	--	--	--	--	--
W-3A	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
W-3B	<.01	<.05	.10	.02	--	<100	1,300	--	--
	<.01	<.05	.16	.02	--	--	--	--	--
W-3C	<.01	<.05	.85	<.01	--	<100	1,800	--	--
	<.01	<.05	.94	<.01	--	--	--	--	--
W-3D	<.01	<.05	1.0	.03	--	1,400	1,100	--	--
	<.01	<.05	.99	.03	--	--	--	--	--
W-4A	<.01	9.4	<.01	.01	--	58	250	--	--
	<.01	12	<.01	.01	--	--	--	--	--
W-4B	<.01	4.7	.04	<.01	--	77	220	--	--
	<.01	4.4	<.01	<.01	--	--	--	--	--
W-4C	<.01	<.05	0.70	<.01	--	<100	1,300	--	--
	<.01	.09	.71	<.01	--	--	--	--	--
W-5A	<.01	1.9	<.01	<.01	--	66	110	--	--
	<.01	1.3	<.01	<.01	--	--	--	--	--
W-5B	<.01	1.8	.03	.01	--	78	130	--	--
	<.01	1.6	<.01	<.01	--	--	--	--	--

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Copper (µg/L as Cu)	Iron (µg/L as Fe)	Manganese (µg/L as Mn)	Selenium (µg/L as Se)	Strontium (µg/L as Sr)	Zinc (µg/L as Zn)	Tritium (TU)	Deuterium/hydrogen stable-isotope ratio (per mil)	Oxygen-18/oxygen-16 stable-isotope ratio (per mil)
W-1A	--	3	8	2	600	--	19	-133.0	-17.60
	--	<3	2	1	660	--	--	--	--
W-1B	--	180	720	<1	3,700	--	1.3	-135.0	-16.85
	--	130	750	<1	3,800	--	--	--	--
W-1C	--	30	50	<1	870	--	<.3	-140.0	-17.50
	--	70	40	<1	900	--	--	--	--
W-2A	--	10	10	190	4,600	--	69	-133.0	-16.95
	--	10	10	190	4,600	--	--	--	--
W-2B	--	680	650	<1	5,000	--	<.3	-140.0	-17.80
	--	490	780	<1	4,600	--	--	--	--
W-2C	--	20	20	<1	520	--	.3	-137.0	-17.30
	--	30	20	<1	480	--	--	--	--
W-3A	--	--	--	70	--	--	--	--	--
	--	--	--	18	--	--	--	--	--
W-3B	--	10	1,200	4	6,400	--	--	-119.0	-13.60
	--	130	990	3	6,600	--	--	--	--
W-3C	--	980	750	<1	11,000	--	<.3	-118.0	-13.75
	--	580	790	<1	11,000	--	--	--	--
W-3D	--	440	150	<1	1,500	--	<.3	-111.0	-13.45
	--	300	90	<1	1,400	--	--	--	--
W-4A	--	6	<1	10	940	--	22	-132.0	-17.30
	--	<3	<1	18	930	--	--	--	--
W-4B	--	<3	<1	9	930	--	--	-132.0	-17.15
	--	3	<1	10	910	--	--	--	--
W-4C	--	<10	30	<1	3,500	--	<.3	-133.0	-16.25
	--	50	90	<1	3,600	--	--	--	--
W-5A	--	3	<1	5	480	--	23	-133.0	-17.50
	--	<3	<1	4	520	--	--	--	--
W-5B	--	<3	<1	4	540	--	22	-133.0	-17.40
	--	<3	<1	6	530	--	--	--	--

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Principal aquifer	Date	Sampler type	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Hardness (mg/L as $CaCO_3$)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium (mg/L as Na)
W-5C	Kc	04-17-92	SS	3,920	7.3	8.0	--	2,000	360	270	300
	Kc	08-12-92	SS	3,990	7.3	9.0	2.5	2,000	390	250	320
W-6	Kv	02-27-91	J	1,060	7.4	9.0	--	270	66	26	140
W-7	Qg	03-05-91	S	1,470	7.6	9.0	3.8	480	62	79	130
	Qg	08-06-91	S	1,660	7.6	7.0	4.5	600	74	100	140
W-9	QTg	02-27-91	J	685	7.8	11.0	--	330	56	46	27
	QTg	08-05-91	J	502	7.8	12.0	--	240	40	33	18
W-11	QTg	02-25-91	J	400	7.5	8.0	--	210	23	38	7.9
	QTg	08-05-91	J	406	8.1	9.0	--	200	21	37	7.0
W-15	QTg	08-06-91	J	451	7.8	9.5	--	230	39	33	6.1
W-20	QTg	02-27-91	S	590	7.8	9.0	8.4	320	29	61	7.7
W-23	Ql	02-26-91	J	1,420	7.5	8.0	--	510	44	98	130
	Ql	08-07-91	J	2,020	7.9	9.0	--	790	85	140	180
W-31	Kc	02-25-91	S	1,600	7.1	10.0	5.0	510	120	51	170
	Kc	08-05-91	S	1,440	7.2	11.0	5.2	520	120	53	120
W-37	QTg	03-05-91	S	580	8.0	7.0	6.8	300	37	51	8.8
	QTg	08-06-91	S	582	7.8	11.5	--	310	44	48	6.3
W-43	QTg	02-26-91	S	350	8.1	5.5	8.1	160	28	23	11
W-45	QTg	02-26-91	J	550	8.1	7.5	--	270	20	53	21
	QTg	08-06-91	J	511	8.0	7.0	--	270	19	54	18
W-50	Kc	11-16-90	SS	6,700	9.1	8.5	--	29	2.4	5.5	1,500
W-51	Kc	11-15-90	S	5,010	6.3	7.5	3.4	2,500	460	330	400
W-52	Kc	11-15-90	S	3,280	7.7	10.0	2.4	100	18	14	780
W-53	Kc	06-18-91	B	14,700	5.0	11.0	--	7,500	360	1,600	2,000
W-54	Kc	06-19-91	B	14,000	6.7	10.0	--	10,000	360	2,300	1,200
W-55	Kc	06-19-91	B	9,800	7.2	9.5	--	4,000	380	730	1,600
W-56	Kc	06-20-91	B	10,100	7.2	10.0	--	2,600	200	500	2,100
W-57	Kc	11-16-90	S	10,100	5.6	8.5	1.4	3,100	400	510	1,700

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Potassium (mg/L as K)	Bicarbonate, field (IT), (mg/L as HCO_3)	Carbonate, field (IT), (mg/L as CO_3)	Alkalinity, field (IT), (mg/L as $CaCO_3$)	Alkalinity, lab (mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride (mg/L as Cl)	Fluoride (mg/L as F)	Silica (mg/L as SiO_2)	Dissolved solids, calculated (mg/L)
W-5C	7.0	271	0	222	220	2,300	28	.40	11	3,420
	6.5	274	0	225	216	2,300	25	1.1	10	3,450
W-6	2.8	506	0	415	411	170	15	.30	8.1	677
W-7	2.2	--	--	--	324	390	26	2.5	9.3	940
	2.5	393	0	322	324	600	31	2.0	10	1,190
W-9	1.2	406	0	333	327	41	6.8	.60	7.4	409
	1.0	293	0	240	242	20	5.9	.70	8.4	285
W-11	.50	251	0	203	204	22	3.5	.70	7.8	233
	.60	243	0	200	203	18	6.5	.70	8.7	224
W-15	1.0	272	0	223	221	18	5.2	.50	8.4	251
W-20	1.2	361	0	296	296	25	5.4	.50	9.7	342
W-23	1.6	443	0	360	363	410	12	2.2	9.2	958
	2.5	394	0	323	311	810	21	1.9	10	1,470
W-31	4.1	442	0	362	353	510	21	.60	10	1,130
	4.6	434	0	356	362	360	20	.50	13	948
W-37	1.2	--	--	--	286	17	3.5	.40	9.1	319
	1.8	350	0	287	291	21	7.7	.50	11	332
W-43	.60	--	--	--	161	23	2.2	.30	6.7	194
W-45	.90	344	0	282	284	25	4.8	.80	9.7	314
	.90	346	0	284	294	21	6.5	.80	11	313
W-50	7.0	1,860	132	--	1,720	1,600	39	1.4	2.9	4,210
W-51	13	147	0	121	122	2,900	180	1.8	19	4,560
W-52	4.5	--	--	--	870	990	14	.80	7.2	2,350
W-53	41	95	0	78	3.8	12,000	210	17	29	16,300
W-54	42	741	0	608	607	13,000	210	.40	9.9	17,600
W-55	21	723	0	591	594	7,000	220	1.0	11	10,400
W-56	16	1,040	0	852	847	6,000	300	1.6	6.8	9,660
W-57	30	125	0	102	94	5,600	330	2.9	29	9,250

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Nitrite (mg/L as N)	Nitrite plus nitrate (mg/L as N)	Ammonia (mg/L as N)	Phospho-rus, ortho (mg/L as P)	Arsenic (µg/L as As)	Barium (µg/L as Ba)	Boron (µg/L as B)	Cadmium (µg/L as Cd)	Chromium (µg/L as Cr)
W-5C	<.01	<.05	.94	<.01	--	<100	1,100	--	--
	<.01	<.05	.96	<.01	--	--	--	--	--
W-6	<.01	<.05	.03	<.01	<1	--	210	<1	<1
W-7	<.01	9.9	<.01	<.01	<1	--	390	<1	<1
	<.01	8.1	<.01	<.01	<1	--	360	<1	<1
W-9	<.01	5.2	<.01	<.01	<1	--	160	1	<1
	<.01	3.0	.01	<.01	<1	--	130	<1	<1
W-11	<.01	1.3	<.01	<.01	<1	--	80	<1	<1
	<.01	1.1	.01	<.01	<1	--	90	<1	<1
W-15	<.01	1.4	<.01	<.01	<1	--	80	<1	<1
W-20	<.01	5.6	<.01	<.01	<1	--	70	1	<1
W-23	<.01	7.5	<.01	<.01	<1	--	280	<1	<1
	<.01	6.0	<.01	<.01	<1	--	360	<1	<1
W-31	<.01	6.4	.10	<.01	<1	--	440	<1	<1
	<.01	9.6	.13	<.01	<1	--	400	<1	<1
W-37	<.01	4.5	<.01	<.01	1	--	50	<1	<1
	<.01	4.3	.01	<.01	2	--	50	<1	<1
W-43	<.01	.54	<.01	<.01	<1	--	30	<1	<1
W-45	<.01	2.1	<.01	<.01	<1	--	90	<1	<1
	<.01	2.5	.01	<.01	2	--	90	<1	<1
W-50	.01	<.1	1.7	.07	8	--	590	<1	<1
W-51	<.01	41	.06	.35	1	--	740	3	<1
W-52	<.01	.5	.40	<.01	<1	--	1,400	<1	<1
W-53	.04	1.7	.28	.01	<1	--	1,200	100	<1
W-54	.05	20	.08	<.01	<1	--	350	<2	6
W-55	.03	13	.05	<.01	<1	--	480	<2	<2
W-56	.15	3.9	1.4	.02	1	--	1,600	<2	2
W-57	.06	130	3.8	<.01	<1	--	1,200	20	<1

Table 11. Results of field measurements and chemical analyses of ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Copper (µg/L as Cu)	Iron (µg/L as Fe)	Manganese (µg/L as Mn)	Selenium (µg/L as Se)	Strontium (µg/L as Sr)	Zinc (µg/L as Zn)	Tritium (TU)	Deuterium/ hydrogen stable-isotope ratio (per mil)	Oxygen-18/ oxygen-16 stable-isotope ratio (per mil)
W-5C	--	750	240	<1	7,200	--	<.3	-128.0	-15.35
	--	920	320	<1	7,000	--	--	--	--
W-6	<1	60	35	<1	--	<3	--	--	--
W-7	2	10	<1	9	--	5	--	--	--
	1	4	<1	19	--	7	--	-133.0	-17.00
W-9	35	<3	<1	12	--	<3	--	--	--
	35	<3	<1	3	--	6	18	-133.0	-17.30
W-11	6	4	<1	3	--	4	--	--	--
	12	<3	<1	3	--	<3	20	-134.0	-17.55
W-15	1	<3	<1	2	--	7	18	-132.0	-17.40
W-20	1	<3	<1	1	--	12	--	--	--
W-23	2	7	<1	28	--	19	--	--	--
	2	<3	<1	50	--	22	--	-136.0	-17.70
W-31	1	7	12	1	--	4	--	--	--
	2	10	11	2	--	5	41	-127.0	-15.80
W-37	2	6	2	<1	--	23	--	--	--
	3	--	<1	1	--	5	--	--	--
W-43	<1	4	<1	<1	--	6	--	--	--
W-45	1	<3	<1	1	--	10	--	--	--
	<1	3	<1	<1	--	11	--	--	--
W-50	<1	--	--	1	--	<10	--	--	--
W-51	7	--	--	87	--	160	--	--	--
W-52	52	--	--	<1	--	80	--	--	--
W-53	8	130	21,000	300	--	4,900	12	-148.0	-18.25
W-54	2	10	220	270	--	30	13	-129.0	-15.10
W-55	2	10	320	200	--	<10	2.5	-133.0	-16.00
W-56	2	30	1,400	19	--	<10	<.3	-132.0	-15.90
W-57	4	--	--	530	--	2,100	--	--	--

Table 12. Results of selenium-speciation analyses of ground-water samples from the Sun River area, Montana

[Constituents are dissolved. Selenium analyzed by U.S. Geological Survey; Selenite (Se^{+4}) and Selenite plus Selenate (Se^{+6}) analyzed by the Montana Bureau of Mines and Geology. Abbreviation: µg/L, microgram per liter. Symbol: <, less than]

Site number (fig. 4 and 5)	Date	Selenium (µg/L as Se)	Selenite (µg/L as Se)	Selenite plus selenate (µg/L as Se)
W-1A	04-16-92	2	<1	3
W-1B	04-16-92	<1	<1	<1
W-1C	04-16-92	<1	<1	<1
W-2A	04-16-92	190	<1	161
W-2B	04-16-92	<1	<1	<1
W-2C	04-16-92	<1	<1	<1
W-3B	04-17-92	4	2.6	3.7
W-3C	04-15-92	<1	<1	<1
W-3D	04-15-92	<1	1.0	<1
W-4B	04-15-92	9	<1	9.3
W-4C	04-16-92	<1	<1	<1
W-5B	04-15-92	4	<1	5.1
W-5C	04-17-92	<1	<1	<1
W-53	06-18-91	300	1.2	258
W-54	06-19-91	270	1.1	236
W-55	06-19-91	200	1.1	147
W-56	06-20-91	19	7.2	21

Table 13. Results of chemical analyses of drill-core samples from the Sun River area, Montana

[Analyses by U.S. Geological Survey. Depth at top or bottom of sample inverval in feet below land surface. Abbreviations: ft, feet; µg/g, micrograms per gram of dry sample weight; µS/cm, microsiemens per centimeter at 25 degrees Celsius; percent, percent of dry sample weight; water extr., water extractable. Symbols: <, less than; --, no data]

Site number (fig. 4 and 5)	Date	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Specific conductance, water extr. (µS/cm)	pH, water extr. (standard units)	Aluminum, total (percent)	Calcium, total (percent)	Iron, total (percent)	Magnesium, total (percent)	Phosphorus, total (percent)	Potassium, total (percent)	Sodium, total (percent)
W-1	10-18-91	4	6	--	--	3.4	14	1.5	2.0	0.03	1.2	0.77
	10-18-91	8	10	--	--	4.6	8.3	1.8	1.3	.05	1.4	.87
	10-18-91	14	16	--	--	7.0	3.7	2.5	1.3	.08	2.2	.52
	10-18-91	16	18	--	--	7.3	2.7	3.0	1.3	.09	2.3	.53
	10-18-91	23.5	24.5	--	--	8.0	1.3	3.4	1.5	.11	2.4	.32
	10-18-91	29.5	30.5	--	--	7.5	3.8	2.9	1.7	.09	2.5	.29
	10-18-91	39.5	40.5	--	--	7.2	1.6	2.8	1.3	.08	2.2	.36
	10-18-91	59.5	60.5	--	--	7.4	2.7	2.9	1.6	.11	2.1	.43
	10-18-91	79.5	80.5	--	--	6.5	2.0	2.6	1.5	.09	2.2	.49
W-3	09-30-91	4	6	--	--	6.7	4.8	2.6	2.0	.07	1.8	1.0
	09-30-91	10	12	--	--	6.2	6.3	2.3	2.0	.07	1.8	.91
	09-30-91	14	16	--	--	8.0	2.2	2.9	1.7	.09	2.5	.52
	09-30-91	22	24	--	--	8.1	.96	3.7	1.2	.10	2.6	.42
	09-30-91	26	28	--	--	7.6	2.5	3.1	1.4	.10	2.4	.38
	09-30-91	35	40	--	--	7.4	2.4	3.0	1.6	.09	2.4	.39
	09-30-91	45	50	--	--	7.2	3.7	2.7	1.4	.09	1.9	.44
	09-30-91	59.5	60.5	--	--	6.3	3.8	2.8	1.7	.09	1.9	.50
	09-30-91	72.5	73.5	--	--	7.1	2.8	2.9	1.8	.17	2.2	.60
W-4	10-21-91	52.5	53.5	--	--	7.6	.71	2.9	1.2	.09	2.4	.33
	10-21-91	56.5	57.5	--	--	7.0	.84	2.6	1.3	.09	2.3	.33
	10-21-91	61.5	62.5	--	--	8.0	.57	3.1	1.3	.09	2.6	.31
	10-21-91	74.5	75.5	--	--	6.3	3.1	2.8	1.6	.10	2.1	.39
	10-21-91	87.5	88.5	--	--	7.8	3.0	3.0	1.6	.11	2.3	.56
W-5	10-03-91	27.5	28.5	--	--	6.9	.78	2.7	1.1	.09	2.2	.32
	10-03-91	30.5	31.5	--	--	7.2	.84	3.0	1.1	.09	2.4	.33
	10-03-91	36.5	37.5	--	--	7.1	1.4	2.8	1.4	.10	2.3	.35
	10-03-91	43.5	44.5	--	--	7.0	2.2	2.9	1.5	.09	2.3	.33
	10-03-91	50.5	51.5	--	--	7.3	2.0	2.9	1.4	.10	2.1	.52
W-53	08-06-90	.8	1.2	6,100	7.6	6.2	1.9	2.6	1.1	.09	1.9	1.1
	08-06-90	8.5	9.5	3,600	5.8	5.9	.56	2.4	.68	.10	2.4	.56
	08-06-90	10.5	11.5	3,600	4.1	6.9	1.0	2.7	.79	.09	2.9	.39

Table 13. Results of chemical analyses of drill-core samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Sulfur, total (percent)	Sulfur, sulfide, total (percent as S)	Sulfur, sulfate, total (percent as S)	Arsenic, total (µg/g)	Barium, total (µg/g)	Beryllium, total (µg/g)	Cadmium, total (µg/g)	Chromium, total (µg/g)	Cobalt, total (µg/g)	Copper, total (µg/g)	Lead, total (µg/g)
W-1	4	6	<0.05	--	--	5.1	1,200	<1	<2	22	7	18	8
	8	10	<.05	--	--	7.1	890	1	<2	31	7	15	10
	14	16	<.05	--	--	8.8	1,100	2	<2	87	10	23	17
	16	18	<.05	--	--	15	900	2	<2	94	10	25	17
	23.5	24.5	<.05	--	--	13	1,000	2	<2	110	11	34	22
	29.5	30.5	1.18	0.52	--	7.8	440	2	2	97	12	32	20
	39.5	40.5	1.44	1.43	--	4.4	270	2	<2	91	10	23	16
	59.5	60.5	1.71	1.59	--	13	250	2	<2	72	9	24	14
	79.5	80.5	1.35	1.25	--	4.9	230	2	<2	83	9	25	18
W-3	4	6	.09	<.05	--	7.2	650	1	<2	53	11	21	12
	10	12	.36	.07	--	7.0	950	1	<2	58	9	22	13
	14	16	.54	.07	--	11	680	2	<2	110	10	33	20
	22	24	.41	<.05	--	20	720	2	<2	120	12	32	22
	26	28	1.06	<.05	--	11	490	2	<2	100	10	30	18
	35	40	.80	.14	--	10	670	2	<2	100	11	29	17
	45	50	1.35	1.10	--	5.0	380	2	<2	75	9	23	15
	59.5	60.5	1.77	1.62	--	9.0	270	1	<2	72	10	27	15
	72.5	73.5	1.75	1.65	--	11	300	2	<2	69	9	20	14
W-4	52.5	53.5	<.05	--	--	12	980	2	<2	97	9	27	21
	56.5	57.5	<.05	--	--	9.5	850	2	<2	94	9	24	18
	61.5	62.5	<.05	--	--	9.7	720	2	<2	94	10	23	19
	74.5	75.5	1.66	--	--	8.9	410	1	<2	72	9	23	14
	87.5	88.5	1.50	--	--	5.7	200	2	<2	69	9	20	18
W-5	27.5	28.5	<.05	--	--	12	1,100	2	<2	94	10	23	18
	30.5	31.5	<.05	--	--	14	750	2	<2	100	10	26	21
	36.5	37.5	.47	.39	--	7.2	750	2	<2	88	11	26	22
	43.5	44.5	1.59	1.51	--	4.7	330	2	<2	97	10	28	18
	50.5	51.5	1.82	1.76	--	8.6	170	2	<2	72	10	28	21
W-53	.8	1.2	1.23	--	0.63	8.2	290	2	<2	66	9	18	14
	8.5	9.5	.49	--	.37	9.4	460	2	<2	81	10	20	18
	10.5	11.5	.86	--	.40	10	460	2	<2	94	10	26	19

Table 13. Results of chemical analyses of drill-core samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Lithium, total (µg/g)	Manganese, total (µg/g)	Molybdenum, total (µg/g)	Nickel, total (µg/g)	Selenium, total (µg/g)	Selenium, water extr. total (µg/g)	Silver, total (µg/g)	Strontium, total (µg/g)	Uranium, total (µg/g)	Vanadium, total (µg/g)	Zinc, total (µg/g)
W-1	4	6	24	340	<2	12	0.2	--	<2	310	<100	54	35
	8	10	30	320	<2	14	.4	--	<2	270	<100	71	52
	14	16	72	220	<2	32	.8	--	<2	200	<100	190	110
	16	18	81	210	2	36	1.1	--	<2	180	<100	200	110
	23.5	24.5	83	180	4	44	4.8	--	<2	140	<100	250	130
	29.5	30.5	65	190	5	43	9.3	--	<2	140	<100	250	150
	39.5	40.5	61	130	2	32	1.8	--	<2	120	<100	210	120
	59.5	60.5	57	180	7	28	1.8	--	<2	180	<100	170	110
	79.5	80.5	55	130	2	33	2.4	--	<2	180	<100	180	110
W-3	4	6	39	460	<2	23	.5	--	<2	240	<100	100	84
	10	12	48	290	3	24	1.0	--	<2	220	<100	130	80
	14	16	80	130	3	40	5.4	--	<2	140	<100	240	130
	22	24	96	130	4	44	6.3	--	<2	140	<100	250	140
	26	28	84	160	4	41	2.4	--	<2	150	<100	230	130
	35	40	65	190	3	41	2.4	--	<2	190	<100	240	130
	45	50	52	220	<2	30	1.8	--	<2	220	<100	180	110
	59.5	60.5	54	180	5	32	3.0	--	<2	190	<100	170	120
	72.5	73.5	57	170	<2	27	1.8	--	<2	200	<100	150	100
W-4	52.5	53.5	61	84	2	35	1.2	--	<2	140	<100	210	120
	56.5	57.5	58	72	<2	36	1.2	--	<2	130	<100	190	110
	61.5	62.5	63	130	2	35	1.8	--	<2	130	<100	200	110
	74.5	75.5	47	160	6	31	2.1	--	<2	160	<100	160	86
	87.5	88.5	55	230	8	27	1.5	--	<2	230	<100	150	94
W-5	27.5	28.5	59	120	<2	34	1.2	--	<2	120	<100	190	110
	30.5	31.5	65	89	<2	36	4.8	--	<2	130	<100	200	120
	36.5	37.5	55	120	4	35	3.0	--	<2	120	<100	190	100
	43.5	44.5	61	150	3	37	2.7	--	<2	150	<100	200	120
	50.5	51.5	52	140	4	29	1.8	--	<2	210	<100	170	93
W-53	.8	1.2	40	150	<2	22	.8	0.042	<2	180	<100	110	83
	8.5	9.5	30	130	<2	22	.6	.019	<2	250	<100	110	82
	10.5	11.5	29	81	<2	23	1.0	.032	<2	190	<100	130	120

Table 13. Results of chemical analyses of drill-core samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Date	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Specific conductance, water extr. (µS/cm)	pH, water extr. (standard units)	Aluminum, total (percent)	Calcium, total (percent)	Iron, total (percent)	Magnesium, total (percent)	Phosphorus, total (percent)	Potassium, total (percent)	Sodium, total (percent)
W-54	08-23-90	3.5	4.5	280	8.7	4.4	2.8	1.9	.56	.14	1.7	.33
	08-23-90	9.5	10.5	2,600	7.9	3.7	1.2	1.6	.48	.16	1.8	.35
	08-23-90	17.5	18.5	2,700	7.7	4.6	1.3	1.9	.67	.11	2.1	.36
	08-23-90	22.5	23.5	3,100	7.7	4.7	1.2	1.9	.63	.08	1.9	.44
	08-23-90	29.5	30.5	2,800	7.6	5.7	1.2	2.1	.97	.09	2.4	.40
	08-23-90	42.5	43.5	1,100	8.5	4.7	2.6	1.7	.80	.08	1.5	.46
	08-23-90	43.5	44.5	1,500	8.5	6.9	1.1	2.3	1.1	.06	1.5	.51
	08-23-90	49.5	50	980	8.3	4.9	.56	1.9	.67	.10	2.0	.42
W-55	08-23-90	0	5	2,600	7.8	4.3	4.9	2.1	.59	.17	2.1	.31
	08-23-90	5	10	2,600	7.7	3.7	1.1	1.7	.35	.17	2.0	.30
	08-23-90	10	15	2,600	7.7	4.2	1.2	1.8	.63	.14	2.3	.31
	08-23-90	20	25	2,800	7.8	4.4	2.1	2.1	.76	.12	2.1	.32
	08-23-90	25	30	3,500	7.5	7.3	1.1	2.2	.90	.08	2.0	.57
	08-23-90	35	40	2,700	7.5	5.2	1.2	1.9	.92	.09	2.2	.46
	08-23-90	50	55	1,200	9.1	8.4	1.7	2.4	1.2	.05	1.5	.77
W-56	08-23-90	5	10	260	8.6	6.7	1.9	2.6	1.2	.08	1.6	.62
	08-23-90	10	15	270	8.9	5.7	1.4	1.8	.88	.07	1.2	.48
	08-23-90	15	20	170	8.3	6.7	.85	1.6	1.2	.02	.46	.74
	08-23-90	20	25	1,400	4.6	6.5	.53	2.1	.80	.09	2.0	.33
	08-23-90	25	30	2,800	7.4	4.4	3.1	2.2	.56	.24	1.9	.38
	08-23-90	40	45	3,000	7.5	4.2	2.1	1.9	.78	.15	2.3	.30
	08-23-90	50	55	2,700	7.6	5.0	1.5	2.2	.94	.13	2.3	.38

Table 13. Results of chemical analyses of drill-core samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Sulfur, total (percent)	Sulfur, sulfide, total (percent as S)	Sulfur, sulfate, total (percent as S)	Arsenic, total (µg/g)	Barium, total (µg/g)	Beryllium, total (µg/g)	Cadmium, total (µg/g)	Chromium, total (µg/g)	Cobalt, total (µg/g)	Copper, total (µg/g)	Lead, total (µg/g)
W-54	3.5	4.5	<.05	--	.002	5.0	560	1	<2	44	7	13	9
	9.5	10.5	.38	--	.30	4.2	620	1	<2	43	6	6	11
	17.5	18.5	.46	--	.31	6.8	820	1	<2	52	8	11	12
	22.5	23.5	.53	--	.37	5.8	490	1	<2	40	8	8	13
	29.5	30.5	.36	--	.32	5.5	620	2	<2	62	10	14	16
	42.5	43.5	.50	--	.17	4.1	530	2	<2	42	6	11	13
	43.5	44.5	.53	--	.11	3.4	360	2	<2	32	4	7	24
	49.5	50	.54	--	.063	5.3	450	2	<2	63	7	24	25
W-55	0	5	.57	--	.30	7.1	510	1	<2	46	11	11	10
	5	10	.47	--	.29	6.6	460	1	<2	43	8	7	10
	10	15	.34	--	.30	4.5	480	1	<2	49	9	8	11
	20	25	.68	--	.32	6.8	490	1	<2	58	10	13	10
	25	30	.50	--	.33	5.0	660	1	<2	36	6	9	24
	35	40	.49	--	.28	4.9	850	2	<2	52	8	11	14
	50	55	.60	--	.063	6.9	420	2	<2	25	5	8	28
W-56	5	10	<.05	--	.005	9.8	1,000	2	<2	61	11	25	20
	10	15	<.05	--	.006	11	1,400	3	<2	35	8	16	23
	15	20	<.05	--	.005	4.2	830	3	<2	5	4	8	29
	20	25	.28	--	.14	7.1	1,300	3	<2	63	5	5	20
	25	30	1.38	--	.31	18	230	2	<2	45	21	21	12
	40	45	.75	--	.37	6.8	450	1	<2	50	9	9	10
	50	55	.91	--	.30	6.2	500	1	<2	58	10	10	14

Table 13. Results of chemical analyses of drill-core samples from the Sun River area, Montana (Continued)

Site number (fig. 4 and 5)	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Lithium, total (µg/g)	Manganese, total (µg/g)	Molybdenum, total (µg/g)	Nickel, total (µg/g)	Selenium, total (µg/g)	Selenium, water extr. total (µg/g)	Silver, total (µg/g)	Strontium, total (µg/g)	Uranium, total (µg/g)	Vanadium, total (µg/g)	Zinc, total (µg/g)
W-54	3.5	4.5	24	170	<2	16	.2	.007	<2	140	<100	74	51
	9.5	10.5	22	180	<2	13	.1	<.005	<2	130	<100	68	47
	17.5	18.5	25	370	<2	20	.6	.005	<2	120	<100	82	73
	22.5	23.5	23	270	<2	16	.6	.042	<2	150	<100	67	66
	29.5	30.5	24	190	<2	23	.5	.014	<2	150	<100	95	86
	42.5	43.5	24	350	<2	14	.4	.039	<2	170	<100	65	72
	43.5	44.5	28	220	<2	11	.3	.037	<2	160	<100	50	79
	49.5	50	29	110	<2	19	.5	.11	<2	120	<100	93	80
W-55	0	5	21	900	5	21	.3	<.005	<2	150	<100	75	69
	5	10	17	86	<2	14	.4	<.005	<2	120	<100	67	53
	10	15	20	240	<2	16	.4	<.005	<2	98	<100	75	64
	20	25	23	290	<2	21	.5	.026	<2	100	<100	88	75
	25	30	22	230	<2	14	.5	.040	<2	180	<100	57	71
	35	40	24	170	<2	17	.4	.044	<2	140	<100	82	74
	50	55	25	240	<2	10	.3	.039	<2	240	<100	41	81
W-56	5	10	36	340	3	28	.2	<.005	<2	230	<100	110	84
	10	15	27	290	7	24	.2	.005	<2	410	<100	58	88
	15	20	28	110	<2	9	.3	.007	<2	220	<100	10	56
	20	25	30	68	3	10	1.0	.058	<2	250	<100	100	58
	25	30	28	470	5	40	1.1	.035	<2	220	<100	79	140
	40	45	21	270	<2	19	.5	.011	<2	120	<100	78	73
	50	55	25	280	<2	21	.7	.025	<2	120	<100	89	82

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Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana

[Abbreviations: °C, degrees Celsius; inst., instantaneous; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25 °C; mg/L, milligrams per liter. Symbols: <, less than; --, no data]

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
				GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND							
S-1	07-23-91	616	216	8.5	14.5	9.8	110	<1	<1	80	<10
	05-27-92	839	236	8.4	11.0	10.8	114	<1	<1	10	<10
S-2	11-14-90	1.0	560	8.1	4.0	--	--	--	--	--	--
S-3	11-14-90	2.5	480	8.3	5.0	--	--	--	--	--	--
	04-01-91	.42	504	8.8	17.5	--	--	--	--	--	--
	03-31-92	2.0	510	8.7	5.0	--	--	--	--	--	--
	05-27-92	8.0	345	8.9	17.5	--	--	--	--	--	--
S-4	11-14-90	.01	633	8.0	7.0	--	--	--	--	--	--
	04-01-91	.01	675	8.1	8.5	--	--	--	--	--	--
S-5	11-14-90	.71	665	8.6	7.0	--	--	--	--	--	--
	04-01-91	.44	685	8.6	12.0	9.7	104	<1	<1	200	120
	07-23-91	2.0	605	8.4	13.5	--	--	--	--	--	--
	11-25-91	1.0	650	8.6	4.5	--	--	--	--	--	--
	04-02-92	2.0	640	8.6	9.5	--	--	--	--	--	--
	05-27-92	5.0	345	9.1	16.5	8.9	105	1	<1	40	30
S-6	11-14-90	.25	2,060	8.2	4.5	--	--	--	--	--	--
	04-01-91	.09	3,400	8.6	12.5	--	--	--	--	--	--
	07-23-91	1.0	1,500	8.3	19.5	10.9	135	2	2	290	260
	04-02-92	.30	3,170	8.5	11.0	14.2	150	1	<1	520	550
	05-27-92	4.0	844	8.4	20.5	--	--	--	--	--	--
S-7	11-14-90	.02	4,500	8.3	5.0	--	--	--	--	--	--
	04-01-91	.05	3,800	8.6	15.0	13.0	151	2	1	690	610
	07-23-91	1.2	900	8.4	20.5	--	--	--	--	--	--
	11-25-91	.30	4,120	8.0	.5	--	--	--	--	--	--
	04-02-92	.10	4,770	8.4	16.0	--	--	--	--	--	--
	06-02-92	.60	3,570	8.2	20.5	8.8	114	3	2	590	620
S-8	11-14-90	.06	4,780	8.3	5.0	--	--	--	--	--	--
	04-01-91	.10	4,100	8.5	15.0	--	--	--	--	--	--
	03-31-92	.20	4,710	8.4	6.0	--	--	--	--	--	--
	05-27-92	.20	5,310	8.3	18.5	--	--	--	--	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND							
S-1	<1	<1	2	<1	4	<1	2	<1	<1	<1	<10	<3
	<1	<1	3	<1	<1	<1	<1	<1	<1	<1	<10	<3
S-2	--	--	--	--	--	--	--	--	--	1	--	--
S-3	--	--	--	--	--	--	--	--	--	<1	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	<1	--	--	--
S-4	--	--	--	--	--	--	--	--	--	3	--	--
	--	--	--	--	--	--	--	--	<1	--	--	--
S-5	--	--	--	--	--	--	--	--	--	3	--	--
	<1	<1	<1	<1	<1	<1	1	1	1	3	<10	4
	--	--	--	--	--	--	--	--	1	--	--	--
	--	--	--	--	--	--	--	--	5	--	--	--
	--	--	--	--	--	--	--	--	1	--	--	--
	<1	<1	<1	<1	3	<1	1	<1	<1	<1	<10	<3
S-6	--	--	--	--	--	--	--	--	--	40	--	--
	--	--	--	--	--	--	--	--	55	--	--	--
	<1	<1	2	<1	3	<1	2	2	12	11	<10	9
	<1	<1	<1	<1	6	1	<1	1	78	68	20	<10
	--	--	--	--	--	--	--	--	3	--	--	--
S-7	--	--	--	--	--	--	--	--	--	110	--	--
	<1	<1	<1	<1	3	1	6	2	130	100	20	<10
	--	--	--	--	--	--	--	--	21	--	--	--
	--	--	--	--	--	--	--	--	180	--	--	--
	--	--	--	--	--	--	--	--	120	--	--	--
	<1	<1	<1	<1	2	2	3	2	95	83	10	<10
S-8	--	--	--	--	--	--	--	--	--	180	--	--
	--	--	--	--	--	--	--	--	120	--	--	--
	--	--	--	--	--	--	--	--	140	--	--	--
	--	--	--	--	--	--	--	--	120	--	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
				GREENFIELDS IRRIGATION DIVISION AND AJACENT LAND--Continued							
S-9	11-14-90	.02	1,740	7.9	7.0	--	--	--	--	--	--
	04-01-91	.01	2,260	8.1	11.0	--	--	--	--	--	--
	03-31-92	.05	2,410	8.2	6.0	--	--	--	--	--	--
	05-27-92	.30	744	8.2	18.0	--	--	--	--	--	--
S-10	11-14-90	.64	710	8.4	7.0	--	--	--	--	--	--
	04-02-91	.14	590	8.6	10.0	--	--	--	--	--	--
	04-02-92	.50	544	7.7	15.5	9.4	109	2	1	150	160
	05-27-92	.30	462	8.8	17.0	--	--	--	--	--	--
S-11	11-14-90	.13	6,100	8.4	7.0	--	--	--	--	--	--
	04-01-91	.13	6,000	8.5	14.0	13.1	150	2	2	930	890
	07-23-91	5.0	1,270	8.3	22.0	--	--	--	--	--	--
	11-25-91	.30	5,560	8.2	.5	--	--	--	--	--	--
	04-02-92	.20	6,450	8.4	17.0	--	--	--	--	--	--
	05-28-92	5.0	800	7.9	9.5	7.2	73	3	2	80	70
	06-02-92	.50	3,690	8.6	23.0	--	--	--	--	--	--
S-12	11-15-90	.35	885	8.4	.0	--	--	--	--	--	--
	04-02-91	.27	3,600	8.6	11.5	14.0	149	2	2	300	290
	07-24-91	6.0	303	8.8	22.0	--	--	--	--	--	--
	11-25-91	.40	930	8.7	.5	--	--	--	--	--	--
	04-03-92	.50	1,820	8.4	6.0	--	--	--	--	--	--
	05-28-92	7.0	820	8.8	13.5	11.6	128	1	<1	40	40
S-13	11-15-90	1.1	738	8.4	3.0	--	--	--	--	--	--
	04-02-91	.50	980	8.6	9.0	--	--	--	--	--	--
	07-23-91	6.0	560	8.4	24.0	8.0	108	2	2	250	130
	04-02-92	1.5	950	8.7	13.5	10.4	116	1	1	200	210
	05-28-92	3.0	920	8.4	10.0	--	--	--	--	--	--
S-14	07-23-91	2.0	687	8.0	24.5	6.3	86	3	3	260	210
	04-03-92	.20	490	8.2	7.0	--	--	--	1	--	110
	05-28-92	.30	565	8.1	10.5	--	--	--	--	--	130

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-9	--	--	--	--	--	--	--	--	--	9	--	--
	--	--	--	--	--	--	--	--	11	--	--	--
	--	--	--	--	--	--	--	--	15	--	--	--
	--	--	--	--	--	--	--	--	5	--	--	--
S-10	--	--	--	--	--	--	--	--	--	6	--	--
	--	--	--	--	--	--	--	--	5	--	--	--
	<1	<1	5	<1	2	<1	3	<1	3	4	20	<3
	--	--	--	--	--	--	--	--	4	--	--	--
S-11	--	--	--	--	--	--	--	--	--	65	--	--
	<1	<1	<1	<1	2	1	8	9	75	50	<10	<10
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	47	--	--	--
	--	--	--	--	--	--	--	--	45	--	--	--
	<1	<1	--	<1	4	<1	--	<1	4	4	<10	<3
	--	--	--	--	--	--	--	--	23	--	--	--
S-12	--	--	--	--	--	--	--	--	--	7	--	--
	<1	<1	2	<1	4	1	5	2	20	17	10	<10
	--	--	--	--	--	--	--	--	1	--	--	--
	--	--	--	--	--	--	--	--	7	--	--	--
	--	--	--	--	--	--	--	--	10	--	--	--
	<1	<1	<1	<1	3	<1	2	<1	1	1	10	9
S-13	--	--	--	--	--	--	--	--	--	6	--	--
	--	--	--	--	--	--	--	--	8	--	--	--
	<1	<1	3	<1	5	1	3	1	3	2	<10	6
	<1	<1	2	<1	3	<1	<1	<1	6	6	<10	3
	--	--	--	--	--	--	--	--	8	--	--	--
S-14	<1	<1	3	<1	4	<1	13	2	2	2	10	6
	--	<1	--	<1	--	<1	--	<1	--	4	--	<3
	--	--	--	--	--	--	--	--	--	3	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
				GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-15	11-15-90	.05	712	8.1	6.0	--	--	--	--	--	--
	04-02-91	.10	762	8.4	17.0	--	--	--	--	--	--
	05-28-92	.05	740	8.0	8.5	--	--	--	--	--	--
S-16	11-25-91	5.0	675	8.7	5.5	--	--	--	--	--	--
	03-31-92	3.0	755	8.7	9.0	--	--	--	--	--	--
	05-28-92	15	443	9.0	18.0	--	--	--	--	--	--
S-17	11-15-90	15	750	8.5	.0	--	--	--	--	--	--
	04-30-91	10	720	8.9	11.5	--	--	--	--	--	--
	07-24-91	25	573	8.9	19.5	--	--	--	--	--	--
	11-25-91	25	640	8.8	4.5	--	--	--	--	--	--
S-18	05-01-91	.40	15,000	9.0	8.0	--	--	--	--	--	--
	07-24-91	.10	2,490	8.5	22.0	--	--	--	--	--	--
S-19	11-25-91	10	875	8.9	4.5	--	--	--	--	--	--
	03-31-92	4.0	1,280	8.4	8.0	--	--	--	--	--	--
	05-28-92	25	643	9.1	17.0	--	--	--	--	--	--
S-20	06-14-91	25	970	8.6	14.5	8.6	97	1	<1	110	140
	09-10-91	81	600	8.7	14.5	10.0	113	1	1	120	100
	04-03-92	20	980	8.9	11.5	12.5	133	1	2	160	170
S-21	04-30-91	10	1,710	8.8	8.5	12.2	--	1	<1	160	140
	05-28-92	100	635	8.5	16.5	--	--	--	--	--	--
S-22	11-15-90	6.0	818	8.5	2.5	--	--	--	--	--	--
	04-02-91	4.8	905	8.6	13.5	10.7	118	1	1	480	250
	07-24-91	60	449	8.6	17.5	--	--	--	--	--	--
	11-25-91	20	790	8.5	4.5	--	--	--	--	--	--
	03-31-92	10	850	8.7	10.0	--	--	--	--	--	--
	05-28-92	50	386	9.3	18.5	10.5	128	2	1	80	60
S-23	11-15-90	8.0	1,200	8.4	3.0	--	--	--	--	--	--
	05-28-92	40	651	8.9	19.0	--	--	--	--	--	--
S-24	04-30-91	29	1,510	8.7	9.0	--	--	--	--	--	--
	03-31-92	25	1,130	8.6	9.5	--	--	--	--	--	--
	05-29-92	200	638	8.4	13.0	--	--	--	--	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-15	--	--	--	--	--	--	--	--	--	13	--	--
	--	--	--	--	--	--	--	--	16	--	--	--
	--	--	--	--	--	--	--	--	14	--	--	--
S-16	--	--	--	--	--	--	--	--	3	--	--	--
	--	--	--	--	--	--	--	--	4	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
S-17	--	--	--	--	--	--	--	--	--	2	--	--
	--	--	--	--	--	--	--	--	4	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
S-18	--	--	--	--	--	--	--	--	180	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
S-19	--	--	--	--	--	--	--	--	3	--	--	--
	--	--	--	--	--	--	--	--	7	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
S-20	<1	<1	1	<1	6	1	10	3	3	2	<10	4
	<1	<1	1	<1	3	1	4	1	2	2	<10	4
	<1	<1	1	<1	6	<1	4	3	5	5	20	6
S-21	<1	<1	4	<1	4	1	14	4	8	7	20	14
	--	--	--	--	--	--	--	--	2	--	--	--
S-22	--	--	--	--	--	--	--	--	--	2	--	--
	<1	<1	3	<1	3	1	9	2	4	3	10	7
	--	--	--	--	--	--	--	--	<1	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
	<1	<1	3	<1	3	<1	3	<1	<1	<1	<10	<3
S-23	--	--	--	--	--	--	--	--	--	2	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
S-24	--	--	--	--	--	--	--	--	9	--	--	--
	--	--	--	--	--	--	--	--	5	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
				GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-25	11-15-90	3.0	1,030	8.5	2.5	--	--	--	--	--	--
	04-02-91	1.7	1,160	8.6	12.0	--	--	--	--	--	--
	03-31-92	3.0	1,070	8.5	11.0	--	--	--	--	--	--
	05-29-92	15	483	8.5	13.5	--	--	--	--	--	--
S-26	11-15-90	48	1,110	8.6	3.0	--	--	--	--	--	--
	04-02-91	29	1,610	8.8	14.0	--	--	--	--	--	--
	04-30-91	36	1,580	8.6	11.5	--	--	--	--	--	--
	07-24-91	354	618	8.5	18.5	--	--	--	--	--	--
	11-25-91	58	930	8.6	4.0	--	--	--	--	--	--
	03-31-92	23	1,200	8.6	11.5	--	--	--	--	--	--
	05-29-92	290	684	8.5	16.0	--	--	--	--	--	--
S-27	11-15-90	8.0	1,240	8.5	5.0	--	--	--	--	--	--
	05-01-91	5.0	1,590	--	8.5	--	--	--	--	--	--
	03-31-92	6.0	1,340	8.4	4.0	--	--	--	--	--	--
	05-27-92	15	843	8.3	12.0	--	--	--	--	--	--
S-28	11-15-90	5.0	1,020	8.4	5.0	--	--	--	--	--	--
S-29	11-15-90	.10	1,250	8.2	5.0	--	--	--	--	--	--
S-30	11-16-90	.05	7,250	8.2	.0	--	--	--	--	--	--
	11-25-91	.20	7,350	8.3	.5	--	--	--	--	--	--
	04-02-92	.50	8,420	8.3	6.0	--	--	--	--	--	--
	06-02-92	3.0	1,490	8.3	15.5	--	--	--	--	--	--
S-31	11-16-90	8.0	1,220	8.4	.0	--	--	--	--	--	--
	11-25-91	15	1,100	8.5	1.0	--	--	--	--	--	--
	03-31-92	10	1,380	8.3	2.5	--	--	--	--	--	--
	06-02-92	20	885	8.5	16.0	--	--	--	--	--	--
S-32	11-16-90	5.0	662	8.5	.0	--	--	--	--	--	--
S-33	09-10-90	369	637	8.6	18.0	11.1	132	--	<1	--	--
	10-15-90	306	752	8.2	9.0	11.8	116	--	<1	--	--
	03-05-91	418	643	8.3	.0	12.6	99	--	<1	--	--
	06-11-91	4,910	284	8.4	13.0	8.9	96	--	<1	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-25	--	--	--	--	--	--	--	--	--	4	--	--
	--	--	--	--	--	--	--	--	<2	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
	--	--	--	--	--	--	--	--	1	--	--	--
S-26	--	--	--	--	--	--	--	--	--	2	--	--
	--	--	--	--	--	--	--	--	8	--	--	--
	--	--	--	--	--	--	--	--	10	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
	--	--	--	--	--	--	--	--	6	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
S-27	--	--	--	--	--	--	--	--	--	<2	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	1	--	--	--
S-28	--	--	--	--	--	--	--	--	--	2	--	--
S-29	--	--	--	--	--	--	--	--	--	3	--	--
S-30	--	--	--	--	--	--	--	--	--	20	--	--
	--	--	--	--	--	--	--	--	17	--	--	--
	--	--	--	--	--	--	--	--	27	--	--	--
	--	--	--	--	--	--	--	--	2	--	--	--
S-31	--	--	--	--	--	--	--	--	--	2	--	--
	--	--	--	--	--	--	--	--	1	--	--	--
	--	--	--	--	--	--	--	--	3	--	--	--
	--	--	--	--	--	--	--	--	<1	--	--	--
S-32	--	--	--	--	--	--	--	--	--	<1	--	--
S-33	--	<1	--	<1	--	4	--	2	--	<1	--	6
	--	<1	--	4	--	3	--	1	--	<1	--	7
	--	<1	--	<1	--	2	--	1	--	2	--	<3
	--	<1	--	<1	--	2	--	1	--	<1	--	9

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
				GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-33	09-10-91	700	592	8.6	13.0	9.9	106	--	<1	--	--
	10-24-91	404	645	8.4	3.0	--	--	--	--	--	--
	12-11-91	320	653	8.3	.0	--	--	--	--	--	--
	03-10-92	165	782	8.4	4.0	12.2	105	--	--	--	--
	07-09-92	494	642	8.6	12.5	10.2	109	--	--	--	--
	09-17-92	486	623	8.5	9.5	10.1	100	--	--	--	--
				FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND							
S-34	04-17-91	--	8,000	9.0	2.5	10.9	94	9	9	980	960
	07-01-91	--	7,200	8.9	19.0	9.6	121	8	9	880	910
	04-06-92	--	8,890	9.0	8.0	10.2	102	11	12	910	980
	06-24-92	--	9,350	8.9	22.5	10.3	141	12	13	1,000	1,000
S-35	04-02-91	.06	30,000	8.5	16.5	18.1	239	2	2	1,000	860
	05-01-91	.20	30,000	--	11.0	--	--	--	--	--	--
	11-25-91	.10	34,500	8.3	5.0	--	--	--	--	--	--
	04-03-92	.10	34,400	8.6	11.5	--	--	--	--	--	--
	05-28-92	.20	32,700	8.4	25.5	11.4	180	2	2	1,000	1,100
S-36	07-02-91	--	1,550	9.0	23.0	9.8	131	5	5	250	250
	04-06-92	--	1,910	9.0	5.5	14.7	135	4	5	150	180
S-37	07-01-91	--	730	9.1	17.5	6.7	80	2	3	160	120
	04-06-92	--	1,850	9.3	4.5	12.0	107	2	2	170	170
	06-24-92	--	477	9.4	24.5	13.3	184	1	2	90	90
S-38	04-17-91	--	4,950	9.2	2.5	11.6	99	11	10	710	720
	07-02-91	--	4,600	9.7	19.0	8.6	107	16	18	750	780
	04-07-92	--	5,360	9.2	5.5	8.0	74	12	13	760	810
	06-24-92	--	6,010	9.5	21.5	12.4	165	21	22	840	870
S-39	04-17-91	--	4,700	9.0	2.5	11.8	100	8	8	710	690
	07-02-91	--	3,400	9.7	17.0	11.7	140	16	14	540	570
	04-07-92	--	5,160	9.4	4.5	9.2	83	12	12	680	740
	06-24-92	--	4,510	9.9	22.0	12.9	172	14	16	750	650
S-40	11-25-91	.05	1,530	8.3	.5	--	--	--	--	--	--
	04-03-92	.10	1,850	8.1	8.5	7.0	70	3	2	360	390

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued												
S-33	--	<1	--	<1	--	2	--	<1	--	<1	--	<3
	--	--	--	--	--	--	--	1	--	<1	--	--
	--	--	--	--	--	--	--	<1	--	1	--	--
	--	--	--	--	--	--	--	<1	--	2	--	--
	--	--	--	--	--	--	--	3	--	2	--	--
	--	--	--	--	--	--	--	2	--	<1	--	--
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND												
S-34	<1	<1	<1	<1	3	<1	3	3	11	8	<10	<10
	<1	<1	1	<1	2	<1	5	1	15	13	<10	<10
	<1	<1	<1	<1	<1	<1	1	2	9	9	<10	<10
	<1	<1	<1	<1	<1	1	3	2	9	11	<10	<10
S-35	<3	<3	<10	<5	15	<3	39	<3	960	1,000	10	10
	--	--	--	--	--	--	--	--	820	--	--	--
	--	--	--	--	--	--	--	--	1,000	--	--	--
	--	--	--	--	--	--	--	--	880	--	--	--
	<1	<1	<1	<1	22	10	32	17	720	720	20	<10
S-36	<1	<1	<1	<1	5	<1	1	1	1	<1	<10	<10
	<1	<1	<1	<1	2	<1	<1	<1	1	1	10	8
S-37	<1	<1	<1	<1	1	<1	2	<1	2	2	<10	<3
	<1	<1	<1	<1	<1	<1	<1	<1	2	1	10	8
	<1	<1	<1	<1	<1	<1	1	<1	<1	1	<10	<3
S-38	<1	<1	2	<1	3	<1	2	2	1	1	<10	<10
	<1	<1	<1	<1	2	<1	<1	2	1	<1	<10	<10
	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10
	<1	<1	<1	<1	2	2	3	1	<1	1	<10	<10
S-39	<1	<1	1	<1	4	<1	3	1	2	2	<10	<10
	<1	<1	<1	<1	10	<1	4	1	2	1	10	12
	<1	<1	<1	<1	<1	<1	<1	<1	2	2	<10	<10
	<1	<1	<1	<1	1	<1	1	<1	2	2	20	<10
S-40	--	--	--	--	--	--	--	--	<1	--	--	--
	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	20	8

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
				FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND--Continued							
S-41	04-02-91	.20	2,410	9.0	16.5	15.8	188	2	2	540	530
	04-19-91	.38	3,050	8.4	4.5	14.5	129	3	3	600	620
	07-23-91	.20	1,990	8.7	27.5	--	--	--	--	--	--
				BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND							
S-42	07-24-90	18	680	8.7	19.0	--	--	2	2	160	150
S-43	11-16-90	.02	15,000	4.6	.5	--	--	--	--	--	--
	06-14-91	.30	13,000	4.5	15.0	--	--	--	--	--	--
	04-03-92	.10	12,300	4.6	9.5	--	--	--	--	--	--
	06-02-92	.10	14,000	4.4	20.0	--	--	--	--	--	--
S-44	07-25-90	5.0	17,300	4.5	17.0	--	--	1	<1	1,400	1,400
	07-25-90	11	8,980	6.7	17.0	6.6	81	1	<1	700	630
	07-25-90	15	4,000	7.2	17.0	6.7	81	2	<1	350	330
	07-25-90	15	2,530	7.4	20.5	7.1	91	1	<1	270	240
	07-25-90	16	1,710	7.9	19.5	6.8	85	1	1	250	210
	07-26-90	16	1,260	8.1	16.0	--	--	2	1	210	170
	08-02-90	34	776	8.3	19.0	8.1	100	2	2	160	130
	11-16-90	.07	9,600	6.5	1.0	--	--	--	--	--	--
	04-03-91	.18	6,950	5.9	5.0	9.7	89	<1	<1	550	530
	04-18-91	35	1,360	6.3	4.5	11.0	97	4	<1	160	130
	04-19-91	7.6	2,280	6.4	7.0	--	--	--	--	--	--
	04-30-91	.30	9,600	5.2	6.5	9.8	94	<1	<1	540	480
	06-14-91	34	905	8.5	15.0	8.8	100	2	<1	70	130
	06-21-91	90	1,070	7.1	--	--	--	--	--	--	--
	06-22-91	30	2,000	6.8	--	--	--	--	--	--	--
	09-10-91	37	665	8.6	12.0	9.2	98	2	1	160	120
	11-26-91	.05	9,250	6.2	.0	--	--	--	--	--	--
	03-05-92	.20	8,160	--	2.0	--	--	--	--	--	--
	03-19-92	.20	11,000	5.1	5.0	--	--	--	--	--	--
	04-04-92	.10	11,600	6.6	7.5	9.1	91	<1	<1	680	660

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND--Continued							
S-41	<1	<1	4	<1	3	1	3	1	<1	2	<10	<10
	<1	<1	15	<1	4	<1	9	2	1	1	<10	<10
	--	--	--	--	--	--	--	--	<1	--	--	--
					BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND							
S-42	<1	<1	3	<1	3	2	13	7	3	3	10	3
S-43	--	--	--	--	--	--	--	--	--	680	--	--
	--	--	--	--	--	--	--	--	660	--	--	--
	--	--	--	--	--	--	--	--	570	--	--	--
	--	--	--	--	--	--	--	--	730	--	--	--
S-44	7	4	15	<3	24	15	2,200	2,000	190	190	3,400	3,500
	<1	<1	5	<1	8	7	300	220	110	110	400	260
	<1	<1	3	<1	8	4	89	84	39	42	110	50
	<1	<1	2	<1	4	5	48	44	19	21	60	30
	<1	<1	2	<1	4	2	37	22	10	10	40	16
	<1	<1	3	<1	4	2	20	14	5	6	40	10
	<1	<1	4	<1	4	2	11	4	3	3	30	19
	--	--	--	--	--	--	--	--	--	160	--	--
	3	4	<1	<1	5	3	400	300	120	140	690	670
	1	<1	12	<1	14	2	120	59	12	11	190	100
	--	--	--	--	--	--	--	--	13	--	--	--
	6	6	7	<1	7	5	550	550	62	61	1,100	1,100
	<1	<1	5	<1	11	2	20	6	3	2	30	3
	--	--	--	--	--	--	--	--	14	--	--	--
	--	--	--	--	--	--	--	--	11	--	--	--
	<1	<1	5	<1	7	2	11	3	2	2	30	4
	--	--	--	--	--	--	--	--	90	--	--	--
	--	--	--	--	--	--	--	--	84	--	--	--
	--	--	--	--	--	--	--	--	110	--	--	--
	5	5	<2	2	1	3	480	500	120	120	1,100	670

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Discharge, inst., (cubic feet per second)	Specific conductance, field (µS/cm)	pH, field (standard units)	Temperature, water (°C)	Oxygen, dissolved, field (mg/L)	Oxygen, dissolved (percent saturation)	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND--Continued											
S-44	04-22-92	.55	13,700	5.3	14.0	--	--	--	--	--	--
	05-22-92	34	704	8.3	12.5	--	--	--	--	--	--
	05-29-92	35	679	8.4	14.5	--	--	4	1	140	100
	09-03-92	35	735	8.9	20.0	--	--	--	--	--	--
S-45	04-22-92	.30	12,500	8.5	15.0	--	--	--	--	--	--
S-46	04-08-92	--	1,740	9.1	.5	--	--	--	--	--	--
	06-23-92	--	815	9.4	27.0	--	--	--	--	--	--
S-47	04-18-91	--	1,840	8.9	4.0	11.5	100	3	2	180	150
	07-03-91	--	1,380	10.2	21.5	8.9	116	6	7	150	160
	04-08-92	--	1,370	9.5	.5	13.8	110	3	3	180	200
	06-23-92	--	758	9.7	27.0	12.6	182	11	12	160	170
S-48	04-22-92	--	6,120	8.6	--	--	--	--	--	--	--
	06-23-92	--	1,730	9.3	29.0	18.0	271	33	37	350	340
	09-03-92	--	4,690	9.3	24.0	--	--	--	92	--	--
	09-24-92	--	7,360	9.2	13.0	--	--	--	60	--	--
S-49	04-18-91	--	4,600	9.0	4.0	11.6	102	10	7	290	250
	07-03-91	--	3,400	9.6	24.0	5.4	75	70	68	500	530
	04-08-92	--	9,150	9.3	.5	13.9	114	52	36	370	370
	09-24-92	--	1,260	8.8	13.0	--	--	--	12	--	--

Table 14. Results of field measurements and trace-element analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND--Continued							
S-44	--	15	--	--	--	--	--	950	--	110	--	1,600
	--	--	--	--	--	--	--	--	--	<1	--	--
	<1	<1	11	<1	15	<1	24	1	2	3	70	<3
	--	--	--	--	--	--	--	--	3	3	--	--
S-45	--	--	--	--	--	--	--	--	--	18	--	--
S-46	--	--	--	--	--	--	--	--	2	--	--	--
	--	--	--	--	--	--	--	--	1	--	--	--
S-47	<1	<1	2	<1	2	1	5	2	<1	<1	<10	5
	<1	<1	1	<1	6	1	5	5	4	4	20	6
	<1	<1	<1	<1	<1	<1	2	2	<1	<1	<10	<3
	<1	<1	1	<1	<1	<1	3	2	<1	<1	<10	8
S-48	--	--	--	--	--	--	--	--	--	<1	--	--
	<1	<1	<1	<1	2	2	4	4	<1	<1	<10	<3
	--	--	--	--	--	--	--	--	--	<1	--	--
	--	--	--	--	--	--	--	--	--	<1	--	--
S-49	<1	<1	4	<1	5	<1	28	6	<1	<1	20	<10
	<1	<1	1	<1	6	3	7	3	1	1	<10	<10
	<1	<1	<1	<1	<1	<1	10	9	<1	<1	20	<10
	--	--	--	--	--	--	--	--	--	2	--	--

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana

[Abbreviations: mg/L, milligrams per liter; per mil, parts per thousand. Symbols: <, less than; --, no data]

Site number (fig. 5)	Date	Hardness (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium (percent)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)
		GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND							
S-1	07-23-91	110	32	7.7	1.4	3	0.1	0.60	107
	05-27-92	120	35	8.4	1.6	3	.1	.60	110
S-5	04-01-91	300	52	42	38	21	1	2.1	263
	04-02-92	280	43	42	34	21	.9	1.8	272
	05-27-92	170	36	20	9.5	11	.3	1.3	150
S-6	07-23-91	700	120	96	76	19	1	4.3	336
	04-02-92	1,800	300	250	180	18	2	7.3	259
S-7	04-01-91	1,600	190	280	370	33	4	2.8	263
	04-02-92	2,200	290	350	440	31	4	3.1	323
	06-02-92	1,600	210	250	330	32	4	3.1	340
S-10	04-02-92	280	30	49	14	10	.4	1.2	282
S-11	04-01-91	4,000	310	780	370	17	3	14	346
	04-02-92	4,200	330	810	350	15	2	15	368
	05-28-92	380	60	55	28	14	.6	5.3	154
	06-02-92	2,100	200	380	220	19	2	16	371
S-12	04-02-91	1,900	93	410	250	22	2	4.0	364
	04-03-92	920	90	170	94	18	1	2.0	326
	05-28-92	380	44	65	40	19	.9	1.2	128
S-13	07-23-91	270	43	39	15	11	.4	5.3	241
	04-02-92	510	60	87	25	10	.5	1.9	318
S-14	07-23-91	330	45	53	21	12	.5	7.5	352
	04-03-92	270	26	49	11	8	.3	.60	249
	05-28-92	290	33	51	11	8	.3	1.9	283
S-20	06-14-91	400	51	65	74	29	2	2.0	243
	09-10-91	290	41	45	23	15	.6	1.8	252
	04-03-92	440	42	81	57	22	1	1.7	295
S-21	04-30-91	640	57	120	140	32	2	2.5	317
	05-28-92	280	43	43	27	17	.7	1.9	224
S-22	04-02-91	380	59	56	59	25	1	2.1	304
	05-28-92	190	42	20	13	13	.4	1.9	153
S-30	04-02-92	4,900	400	940	790	26	5	12	444
	06-02-92	670	88	110	81	21	1	4.7	232
S-33	08-03-90	280	54	36	32	20	.8	2.0	214
	09-10-90	290	58	36	33	20	.8	1.9	216
	09-12-90	290	55	38	34	20	.9	1.9	215

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Dissolved solids, calculated (mg/L)	Nitrite, dissolved (mg/L as N)	Nitrite plus nitrate, dissolved (mg/L as N)	Ammonia, dissolved (mg/L as N)	Phosphorus, ortho, dissolved (mg/L as P)	Deuterium/hydrogen stable-isotope ratio (per mil)	Oxygen-18/oxygen-16 stable-isotope ratio (per mil)
					GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND						
S-1	8.6	<0.10	0.10	4.0	119	<0.01	<0.05	<0.01	<0.01	-130.0	-17.40
	17	<.10	.20	4.4	133	<.01	<.05	.01	<.01	-130.0	-17.25
S-5	80	5.2	.80	8.1	413	<.01	3.4	<.01	<.01	--	--
	73	6.3	.80	9.3	373	--	--	--	--	--	--
	23	.10	.40	5.2	190	<.01	.96	.02	<.01	--	--
S-6	530	24	.50	20	1,090	.44	4.00	.68	1.0	--	--
	1,800	32	.50	2.4	2,740	.02	2.80	.06	.04	--	--
S-7	2,100	49	1.0	3.1	3,170	.01	.09	.02	<.01	--	--
	2,700	79	1.0	1.8	4,060	--	--	--	--	--	--
	1,800	62	.80	4.8	2,870	<.01	.22	.04	.01	-130.0	-16.50
S-10	25	6.2	1.0	7.5	307	.02	.75	.03	<.01	--	--
S-11	5,200	30	.60	1.1	6,920	.01	<.05	.04	.02	--	--
	4,600	43	.20	.50	6,370	--	--	--	--	--	--
	250	5.2	.20	7.1	506	.03	.43	.16	.26	--	--
	2,000	88	.50	4.6	3,130	--	--	--	--	--	--
S-12	2,200	38	.90	3.5	3,230	.06	2.5	.07	.01	--	--
	800	13	.70	5.5	1,370	--	--	--	--	--	--
	300	7.5	.30	4.3	539	<.01	<.05	.02	<.01	--	--
S-13	72	4.7	.50	10	337	<.01	.60	<.01	.07	--	--
	220	8.3	.90	7.3	610	.02	1.9	.04	<.01	--	--
S-14	45	3.9	.80	13	402	<.01	.25	<.01	.07	--	--
	25	6.2	1.0	8.3	283	<.01	1.2	.03	.01	--	--
	38	6.2	1.0	9.2	322	--	--	--	--	-131.0	-17.15
S-20	280	8.9	.60	6.1	642	.02	2.0	.04	.01	--	--
	83	6.7	.60	6.7	368	.01	2.0	<.01	<.01	--	--
	240	11	1.0	3.9	630	.04	3.5	.02	<.01	--	--
S-21	660	19	.90	2.2	1,210	<.01	4.9	.02	<.01	--	--
	120	7.0	.60	5.8	462	--	--	--	--	--	--
S-22	180	7.9	.80	5.0	580	.02	1.8	.02	<.01	--	--
	45	2.8	.40	3.3	223	.02	.69	.01	.01	--	--
S-30	6,200	98	.90	.70	8,710	--	--	--	--	--	--
	580	8.5	.40	1.3	1,010	--	--	--	--	--	--
S-33	140	5.5	.50	4.7	406	--	.70	--	--	--	--
	120	4.7	.60	4.5	393	<.01	.40	.01	<.01	--	--
	130	5.0	.60	4.1	400	--	.50	--	--	--	--

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Hardness (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium (percent)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)
		GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued							
S-33	10-15-90	350	66	44	41	20	1	2.0	250
	12-11-90	250	56	27	23	17	.6	1.3	198
	03-05-91	270	58	31	32	20	.8	1.3	187
	04-05-91	260	58	27	24	17	.7	1.3	151
	05-07-91	180	47	15	8.6	9	.3	1.1	154
	06-11-91	140	36	11	6.1	9	.2	.90	124
	07-12-91	220	52	22	20	16	.6	1.7	185
	07-24-91	260	53	30	23	16	.6	1.8	210
	09-10-91	280	59	31	26	17	.7	1.9	222
	10-24-91	300	62	36	30	18	.7	1.7	232
	12-11-91	310	66	34	30	18	.7	1.5	235
	03-10-92	330	67	39	40	21	1	1.7	200
	05-08-92	280	58	33	31	19	.8	2.2	200
	05-12-92	280	58	32	28	18	.7	2.2	206
	06-22-92	290	55	38	38	22	1	1.9	214
	07-09-92	290	54	37	33	20	.8	1.9	219
	09-02-92	290	57	37	33	19	.8	1.9	216
	09-17-92	280	59	33	27	17	.7	1.9	222
		FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND							
S-34	04-17-91	3,000	65	700	1,300	48	10	12	598
	07-01-91	3,100	76	700	1,200	46	9	13	551
	04-06-92	3,100	64	710	1,300	48	10	13	585
	06-24-92	3,300	24	780	1,400	48	11	13	571
S-35	04-02-91	35,000	250	8,400	2,700	14	6	39	1,190
	04-03-92	33,000	500	7,700	2,300	13	6	45	1,250
	05-28-92	35,000	480	8,100	2,400	13	6	44	1,020
S-36	07-02-91	660	50	130	600	66	10	3.8	247
	04-06-92	640	41	130	220	43	4	4.7	410
S-37	07-01-91	330	47	52	47	23	1	3.0	154
	04-06-92	810	60	160	120	24	2	5.0	216
	06-24-92	220	33	34	18	15	.5	1.1	126

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Dissolved solids, calculated (mg/L)	Nitrite, dissolved (mg/L as N)	Nitrite plus nitrate, dissolved (mg/L as N)	Ammonia, dissolved (mg/L as N)	Phosphorus, ortho, dissolved (mg/L as P)	Deuterium/hydrogen stable-isotope ratio (per mil)	Oxygen-18/oxygen-16 stable-isotope ratio (per mil)
					GREENFIELDS IRRIGATION DIVISION AND ADJACENT LAND--Continued						
S-33	160	7.6	.40	6.3	385	<.01	1.0	.01	.01	--	--
	110	4.3	.20	5.7	348	<.01	.70	.03	<.01	--	--
	160	4.5	.30	5.1	411	<.01	.76	.02	<.01	--	--
	130	3.5	.30	3.9	339	--	--	--	--	--	--
	48	2.6	.20	5.1	218	<.01	.13	.01	<.01	--	--
	25	.30	.20	4.9	155	.02	.09	.01	<.01	--	--
	79	4.5	.20	4.8	295	--	--	--	--	--	--
	98	5.3	.40	4.8	342	--	--	--	--	--	--
	110	5.3	.40	6.4	374	<.01	.52	.01	<.01	--	--
	130	3.9	.40	6.0	411	.01	.82	<.01	<.01	--	--
	140	4.9	.40	6.0	424	<.01	.83	<.01	<.01	--	--
	210	6.4	.40	3.8	513	<.01	.79	.02	<.01	--	--
	130	4.5	.40	3.8	383	--	--	--	--	--	--
	120	4.6	.40	4.8	374	.01	.62	.01	<.01	--	--
	140	4.3	.50	2.5	409	--	--	--	--	--	--
	130	4.3	.50	1.9	392	<.01	.94	.02	<.01	--	--
	140	5.2	.40	3.8	408	--	--	--	--	--	--
	120	3.6	.40	5.4	389	<.01	.57	.02	<.01	--	--
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND						
S-34	5,200	230	.50	.60	7,870	.02	.31	.20	<.01	--	--
	5,000	100	.90	.70	7,420	.03	.28	<.01	<.01	-70.0	-5.85
	5,200	210	.50	.10	7,850	.01	.19	.04	<.01	-66.0	-4.90
	5,500	230	.40	.10	8,290	.02	.05	.05	<.01	-63.5	-4.00
S-35	43,000	170	4.6	.60	55,700	2.10	84	.18	.03	--	--
	41,000	260	1.2	.50	52,600	--	--	--	--	--	--
	38,000	220	<.10	3.2	50,100	1.00	43	.35	<.01	--	--
S-36	1,700	28	.70	1.3	2,660	<.01	<.05	<.01	<.01	--	--
	660	41	.70	3.5	1,350	<.01	<.05	.01	<.01	--	--
S-37	250	8.7	.20	3.2	504	<.01	<.05	<.01	.03	-121.0	-15.70
	860	19	.30	1.9	1,360	<.01	<.05	.01	<.01	--	--
	130	2.5	.40	4.5	299	.01	<.05	.02	.01	-120.0	-15.65

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Hardness (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium (percent)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)
		FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND--Continued							
S-38	04-17-91	1,300	45	300	860	58	10	7.1	706
	07-02-91	500	43	96	910	80	18	5.1	560
	04-07-92	1,400	35	310	970	61	11	8.3	645
	06-24-92	1,500	26	350	1,100	61	12	6.2	660
S-39	04-17-91	1,300	26	290	830	59	10	7.3	598
	07-02-91	930	28	210	600	58	9	3.7	258
	04-07-92	1,200	32	280	910	61	11	7.6	592
	06-24-92	1,100	27	240	760	61	10	4.9	501
S-40	04-03-92	370	61	53	290	63	7	4.8	531
S-41	04-02-91	560	74	92	420	62	8	4.9	482
	04-19-91	690	77	120	500	61	8	9.2	722
		BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND							
S-42	07-24-90	340	46	54	38	20	.9	2.3	274
S-43	04-03-92	5,500	390	1,100	1,300	34	8	11	<1.0
	06-02-92	5,900	380	1,200	1,600	37	9	16	<1.0
S-44	07-25-90	4,600	300	940	2,500	54	16	27	<1.0
	07-25-90	3,500	290	670	1,300	45	10	18	143
	07-25-90	1,600	180	270	460	39	5	11	205
	07-25-90	1,000	120	170	260	36	4	6.6	232
	07-25-90	630	71	110	140	32	2	4.9	252
	07-26-90	520	62	88	97	29	2	3.7	268
	08-02-90	330	46	52	44	22	1	2.6	257
	04-03-91	3,100	230	610	850	37	7	8.8	7.0
	04-18-91	500	40	96	100	30	2	6.6	18
	04-30-91	4,700	290	960	1,300	38	8	15	3.0
	06-14-91	360	48	58	62	27	1	2.1	221
	09-10-91	310	43	48	31	18	.8	2.2	253
	04-04-92	5,100	390	1,000	1,600	41	10	10	27
	04-22-92	6,900	440	1,400	1,800	36	9	14	6.5
	05-22-92	310	45	48	36	20	.9	2.7	231
	05-29-92	300	45	45	33	19	.8	2.0	223
	09-03-92	330	40	56	36	19	.9	2.0	253

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Dissolved solids, calculated (mg/L)	Nitrite, dissolved (mg/L as N)	Nitrite plus nitrate, dissolved (mg/L as N)	Ammonia, dissolved (mg/L as N)	Phosphorus, ortho, dissolved (mg/L as P)	Deuterium/hydrogen stable-isotope ratio (per mil)	Oxygen-18/oxygen-16 stable-isotope ratio (per mil)
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND--Continued						
S-38	2,500	130	.60	.20	4,270	.04	<.05	.04	.04	--	--
	2,200	130	.90	.50	3,720	<.01	<.05	<.01	.01	-70.5	-6.10
	2,400	170	.80	.40	4,280	<.01	<.05	.10	.02	-69.5	-5.90
	2,700	190	1.0	.60	4,770	.01	<.05	.02	.02	-62.5	-4.60
S-39	2,200	140	.80	.20	3,850	<.01	<.05	.04	<.01	--	--
	1,600	100	.70	.30	2,700	<.01	<.05	.05	.02	-84.5	-9.00
	2,400	170	1.3	.30	4,160	<.01	<.05	.02	<.01	-71.5	-6.30
	2,000	140	.60	3.8	3,480	<.01	<.05	.01	<.01	-77.5	-7.50
S-40	430	49	.50	3.1	1,210	<.01	<.05	.03	.04	--	--
S-41	970	61	.60	2.7	1,910	<.01	<.05	.02	<.01	--	--
	1,100	74	.60	11	2,330	.01	.09	.02	.02	--	--
					BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND						
S-42	110	5.2	.50	6.9	440	--	2.8	--	--	--	--
S-43	7,600	370	12	20	10,800	--	--	--	--	--	--
	8,400	400	16	21	12,000	--	--	--	--	--	--
S-44	13,000	550	2.3	8.3	17,400	--	110	--	--	--	--
	5,500	270	3.5	4.0	8,470	--	75	--	--	--	--
	2,000	97	1.0	4.7	3,270	--	28	--	--	--	--
	1,100	54	1.0	5.2	1,910	--	13	--	--	--	--
	590	33	1.0	5.4	1,140	--	6.6	--	--	--	--
	410	19	.90	6.1	865	--	3.9	--	--	--	--
	170	8.2	.50	5.6	494	--	2.5	--	--	--	--
	4,300	280	2.5	5.1	6,630	.16	75	.68	<.01	--	--
	710	24	.70	6.5	1,020	.02	6.7	.08	.01	--	--
	7,000	310	4.3	6.1	9,920	.17	5.9	.44	<.01	--	--
	250	8.3	.70	5.3	577	.01	2.3	.03	.02	--	--
	120	8.4	.60	6.6	420	.01	1.9	.01	<.01	--	--
	7,600	380	1.0	6.5	11,300	.14	66	.28	<.01	-116.0	-12.90
	9,200	480	5.7	7.1	13,400	--	--	--	--	--	--
	130	8.3	.70	4.7	414	--	--	--	--	--	--
	120	6.7	.60	4.9	402	.02	2.4	.03	.02	-128	-16.95
	140	10	.70	1.9	438	--	--	--	--	--	--

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Date	Hardness (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium (percent)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND--Continued									
S-45	04-22-92	6,100	450	1,200	1,800	39	10	19	494
S-46	06-23-92	--	--	--	--	--	--	--	--
S-47	04-18-91	670	71	120	170	35	3	9.7	389
	07-03-91	510	43	97	140	37	3	3.9	161
	04-08-92	560	42	110	120	32	2	6.9	312
	06-23-92	340	37	60	55	26	1	2.7	288
S-48	04-22-92	2,200	86	480	950	48	9	10	902
	06-23-92	650	79	110	170	36	3	9.9	459
	09-03-92	1,400	66	310	760	54	9	4	684
	09-24-92	2,400	51	540	1,200	53	11	23	1,190
S-49	04-18-91	1,600	61	340	660	48	7	24	411
	07-03-91	1,200	42	270	520	48	6	17	527
	04-08-92	3,000	95	670	1,400	50	11	36	778
	09-24-92	490	53	86	86	27	2	15	396

Table 15. Results of major-ion, nutrient, and stable-isotope analyses of surface-water samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Dissolved solids, calculated (mg/L)	Nitrite, dissolved (mg/L as N)	Nitrite plus nitrate, dissolved (mg/L as N)	Ammonia, dissolved (mg/L as N)	Phosphorus, ortho, dissolved (mg/L as P)	Deuterium/hydrogen stable-isotope ratio (per mil)	Oxygen-18/oxygen-16 stable-isotope ratio (per mil)
					BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND--Continued						
S-45	7,900	580	1.4	2.4	12,200	--	--	--	--	--	--
S-46	--	--	--	--	--	--	--	--	--	-110.0	-13.35
S-47	640	40	.90	<.10	1,290	<.01	<.05	.01	<.01	--	--
	640	20	.70	.50	1,040	<.01	<.05	<.01	.05	-99.5	-12.30
	420	21	1.0	1.5	910	<.01	<.05	.01	.02	-100.0	-11.05
	170	10	1.0	5.8	516	.01	<.05	.02	.58	-107.0	-12.60
S-48	2,600	250	1.0	2.0	4,920	--	--	--	--	--	--
	540	35	1.2	4.5	1,230	.01	<.05	.03	.90	-83.0	-8.05
	2,000	130	2.8	1.5	3,680	--	--	--	--	-46.0	0
	3,100	270	2.7	.3	5,900	--	--	--	--	-30.0	2.55
S-49	2,400	180	1.2	<.10	3,910	<.01	<.05	.04	.08	--	--
	1,600	120	1.5	.90	2,890	<.01	<.05	.02	.34	-61.0	-5.20
	4,700	370	1.1	1.2	7,740	<.01	<.05	.04	.48	-53.0	-2.10
	290	33	1.0	.60	802	--	--	--	--	-105.0	-11.75

Table 16. Daily mean streamflow for Muddy Creek at Vaughn (site S-26), water years 1990-92

[Abbreviations: ac-ft, acre-feet; max, maximum; min, minimum. Symbol: ---, no data]

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1990 (OCTOBER 1989 TO SEPTEMBER 1990)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	112	e68	e62	e34	e27	e30	e40	30	e160	252	225	130
2	99	e68	e65	e32	e30	e30	e40	28	e160	284	202	134
3	94	e68	e70	e33	e32	e30	e40	32	e160	361	221	137
4	95	e70	e60	e33	e32	e30	e38	35	e160	340	250	133
5	91	e71	e50	e33	e31	e30	32	33	160	368	235	128
6	92	e72	e50	e34	e29	e30	31	32	160	426	231	131
7	92	73	e50	e35	e28	e30	30	29	173	420	206	141
8	89	70	e50	e35	e30	e30	33	32	162	414	231	142
9	88	69	e45	e35	e31	e31	33	61	185	424	236	122
10	85	68	e30	e35	e31	e30	32	72	176	357	254	127
11	81	63	e28	e32	e30	e27	41	61	187	300	256	132
12	80	e64	e30	e33	e29	e28	37	97	203	287	258	139
13	81	e62	e35	e34	e27	e28	39	100	180	277	238	147
14	80	e60	e35	e34	e25	e28	38	112	170	291	235	149
15	80	60	e35	e34	e20	e28	34	97	191	345	244	147
16	79	90	e35	e32	e22	e28	34	91	210	438	237	157
17	79	75	e34	e30	e25	e29	35	81	217	347	230	175
18	80	65	e32	e30	e25	e30	32	89	216	306	249	186
19	78	62	e31	e30	e30	e33	28	81	205	270	257	158
20	78	61	e30	e30	e30	e35	27	73	222	249	295	150
21	77	61	e28	e31	e30	e40	26	131	238	247	302	161
22	75	e60	e25	e32	e29	e38	34	191	292	248	288	166
23	75	e55	e28	e33	e28	e36	33	199	322	289	271	155
24	76	e58	e30	e33	e27	e40	31	189	322	262	235	153
25	74	e62	e35	e33	e27	e40	31	448	329	284	230	182
26	73	e60	e35	e33	e27	e40	27	348	286	306	216	187
27	71	e55	e35	e32	e26	e42	30	200	291	320	195	125
28	71	e55	e35	e31	e28	e42	32	155	291	305	181	108
29	69	e60	e35	e30	---	e40	32	159	280	277	167	131
30	70	e60	e35	e28	---	e40	32	149	263	281	154	122
31	e70	---	e34	e25	---	e40	---	162	---	249	145	---
TOTAL	2,534	1,945	1,212	999	786	1,033	1,002	3,597	6,571	9,824	7,174	4,355
MEAN	81.7	64.8	39.1	32.2	28.1	33.3	33.4	116	219	317	231	145
MAX	112	90	70	35	32	42	41	448	329	438	302	187
MIN	69	55	25	25	20	27	26	28	160	247	145	108
AC-FT	5,030	3,860	2,400	1,980	1,560	2,050	1,990	7,130	13,030	19,490	14,230	8,640

e Estimated

Table 16. Daily mean streamflow for Muddy Creek at Vaughn (site S-26), water years 1990-92 (Continued)

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1991 (OCTOBER 1990 TO SEPTEMBER 1991)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	59	e40	e30	e35	e35	31	33	178	336	341	156
2	114	60	e40	e28	e40	e40	29	33	134	325	356	159
3	106	60	e42	e27	e50	e40	29	27	161	309	306	141
4	106	61	e45	e26	e60	e35	27	30	284	260	287	166
5	99	e60	e43	e26	e55	e32	26	26	353	320	265	154
6	81	e55	e42	e25	e55	e32	25	24	537	331	270	134
7	79	e60	e50	e25	e60	e32	24	22	320	289	295	186
8	77	e62	e55	e25	e60	e33	25	31	256	288	275	225
9	75	62	e55	e26	e55	e34	24	145	396	209	268	233
10	71	59	e52	e27	e55	e35	24	130	311	267	267	247
11	68	57	e50	e28	e55	e33	37	159	188	235	230	232
12	68	55	e50	e29	e60	32	42	222	181	219	226	219
13	66	53	e49	e30	e55	33	58	118	162	245	263	211
14	66	49	e48	e31	e55	33	48	52	128	275	266	224
15	65	48	e47	e32	e55	31	43	36	152	302	244	225
16	67	47	e46	e32	e55	31	44	62	122	254	250	218
17	67	51	e45	e31	e50	31	58	99	125	261	280	195
18	66	49	e40	e30	e45	30	82	97	110	324	296	187
19	65	47	e30	e29	e50	34	69	148	114	404	282	190
20	64	e47	e20	e28	e50	35	58	236	363	356	250	190
21	63	e45	e15	e27	e50	34	51	208	861	288	215	183
22	64	e48	e18	e26	e48	39	47	150	637	324	185	171
23	61	e45	e20	e26	e45	37	44	94	581	332	194	164
24	61	e40	e25	e25	e45	33	41	138	571	343	189	177
25	61	e37	e30	e25	e48	e32	40	191	390	292	154	189
26	61	e35	e35	e26	e48	e30	38	176	390	271	152	186
27	59	e40	e40	e26	e45	e30	38	126	397	308	194	164
28	57	e45	e30	e24	e30	e32	40	115	338	274	215	162
29	54	e42	e20	e22	---	e34	38	227	315	255	210	151
30	57	e40	e30	e25	---	35	37	195	300	224	192	160
31	59	---	e40	e30	---	33	---	194	---	261	161	---
TOTAL	2,247	1,518	1,192	847	1,414	1,040	1,217	3,544	9,355	8,981	7,578	5,599
MEAN	72.5	50.6	38.5	27.3	50.5	33.5	40.6	114	312	290	244	187
MAX	120	62	55	32	60	40	82	236	861	404	356	247
MIN	54	35	15	22	30	30	24	22	110	209	152	134
AC-FT	4,460	3,010	2,360	1,680	2,800	2,060	2,410	7,030	18,560	17,810	15,030	11,110

e Estimated

Table 16. Daily mean streamflow for Muddy Creek at Vaughn (site S-26), water years 1990-92 (Continued)

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1992 (OCTOBER 1991 TO SEPTEMBER 1992)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	e45	e42	e33	e50	33	22	219	244	288	279	219
2	186	e40	e40	e33	e45	32	21	189	237	385	285	195
3	185	e45	e40	e32	e40	32	21	159	207	363	336	168
4	163	e55	e45	e31	e43	32	21	159	193	352	328	156
5	134	e50	e48	e30	e40	31	21	136	204	412	337	166
6	124	e47	e50	e29	e38	30	20	180	221	412	291	167
7	112	e45	e45	e28	e35	30	20	125	192	347	273	184
8	107	e55	e42	e25	e33	30	21	104	167	348	257	222
9	101	e60	e40	e27	e30	e26	23	195	127	351	274	229
10	55	e55	e40	e30	e28	e28	25	177	151	413	278	241
11	46	e55	e40	e33	e27	30	25	189	178	496	240	212
12	44	e60	e38	e30	e30	29	40	226	205	556	216	152
13	41	e70	e35	e27	e35	29	71	264	381	438	220	150
14	40	64	e38	e24	e38	28	76	178	440	386	239	184
15	40	e60	e40	e25	e40	27	86	151	358	349	247	175
16	37	e58	e40	e27	e42	26	140	174	511	302	224	202
17	34	e60	e35	e29	e40	27	107	153	431	243	206	218
18	34	61	e37	e31	e40	29	94	146	322	232	180	195
19	65	e55	e40	e33	e38	27	71	180	297	220	199	166
20	67	56	e38	e35	e30	27	109	206	274	254	210	147
21	69	54	e35	e33	e25	28	164	222	239	225	297	166
22	67	e52	e38	e30	e28	28	230	228	199	316	338	161
23	65	e50	e38	e32	e30	26	212	163	163	372	403	191
24	67	e55	e37	e33	e32	25	247	141	150	326	387	179
25	69	e58	e36	e34	e32	25	197	190	120	248	262	181
26	69	e55	e35	e35	e33	24	172	209	148	245	199	163
27	e55	e52	e34	e38	e33	24	145	303	111	328	177	114
28	e50	e50	e34	e40	e32	24	127	379	150	260	180	101
29	e47	e45	e34	e42	33	23	174	312	210	245	191	85
30	e45	e40	e33	e45	---	24	198	315	354	257	210	76
31	e50	---	e32	e48	---	22	---	269	---	253	211	---
TOTAL	2,457	1,607	1,199	1,002	1,020	856	2,900	6,241	7,184	10,222	7,974	5,165
MEAN	79.3	53.6	38.7	32.3	35.2	27.6	96.7	201	239	330	257	172
MAX	189	70	50	48	50	33	247	379	511	556	403	241
MIN	34	40	32	24	25	22	20	104	111	220	177	76
AC-FT	4,870	3,190	2,380	1,990	2,020	1,700	5,750	12,380	14,250	20,280	15,820	10,240

e Estimated

Table 17. Daily mean streamflow for Sun River near Vaughn (site S-33), water years 1990-92

[Abbreviations: ac-ft, acre-feet; max, maximum; min, minimum. Symbol: ---, no data]

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1990 (OCTOBER 1989 TO SEPTEMBER 1990)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	708	422	e680	e450	e300	e600	388	1,890	4,730	891	507	432
2	727	432	e640	e400	e400	e700	390	1,580	4,270	938	460	425
3	718	419	617	e400	e500	e600	412	1,590	3,420	1,280	475	427
4	709	e380	618	e450	e550	e500	593	1,570	2,890	1,240	490	419
5	707	e360	622	e500	e550	e400	765	1,550	2,230	981	465	407
6	700	e350	614	e550	e550	e420	1,020	1,510	2,010	949	459	406
7	695	e340	613	e600	e500	e450	1,280	1,470	1,990	890	410	414
8	690	e320	601	e600	e450	e450	1,300	1,200	1,780	720	419	410
9	682	307	608	e600	e400	e450	1,320	833	1,540	676	408	373
10	660	e310	e300	e500	e500	e470	1,350	794	1,470	565	424	372
11	605	e350	e350	e400	e600	e450	1,360	563	1,370	495	440	344
12	578	e500	e450	e450	e400	e430	1,360	496	1,250	436	447	328
13	570	e1,000	e550	e500	e300	e420	1,360	479	1,500	465	443	315
14	575	1,570	e600	e550	e250	e410	1,360	495	1,670	437	435	310
15	578	1,580	e650	e500	e200	e400	1,360	454	1,380	430	446	285
16	582	1,610	e600	e450	e250	e400	1,390	366	1,420	485	441	296
17	578	1,620	e500	e400	e220	e420	1,400	307	1,350	437	431	315
18	562	1,590	e450	e350	e300	e430	1,390	287	e1,400	381	502	341
19	561	1,580	e400	e400	e400	e450	1,580	273	e1,400	352	552	340
20	552	1,590	e350	e450	e500	e500	1,750	265	e1,400	355	724	345
21	560	1,480	e300	e500	e550	e500	1,780	340	1,450	402	813	374
22	552	1,280	e250	e600	e650	e450	1,820	481	2,190	436	731	429
23	558	1,150	e350	e550	e700	e410	1,830	535	2,150	471	641	403
24	561	1,160	e400	e500	e650	e370	2,120	571	2,210	469	587	385
25	556	1,140	e450	e550	e600	e350	2,290	1,090	2,550	491	614	384
26	552	1,130	e500	e500	e550	e380	2,310	1,520	2,450	518	622	410
27	534	e950	e600	e450	e500	397	2,270	2,540	2,150	529	580	341
28	485	e850	e550	e450	e550	390	2,240	2,650	2,100	529	532	304
29	433	e760	e500	e400	---	390	2,230	2,640	1,530	518	488	346
30	431	e720	e450	e300	---	388	2,220	2,810	1,040	538	459	369
31	432	---	e400	e250	---	387	---	3,910	---	521	445	---
TOTAL	18,391	27,250	15,563	14,550	12,870	13,762	44,238	37,059	60,290	18,825	15,890	11,049
MEAN	593	908	502	469	460	444	1,475	1,195	2,010	607	513	368
MAX	727	1,620	680	600	700	700	2,310	3,910	4,730	1,280	813	432
MIN	431	307	250	250	200	350	388	265	1,040	352	408	285
AC-FT	36,480	54,050	30,870	28,860	25,530	27,300	87,750	73,510	119,600	37,340	31,520	21,920

e Estimated

Table 17. Daily mean streamflow for Sun River near Vaughn (site S-33), water years 1990-92 (Continued)

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1991 (OCTOBER 1990 TO SEPTEMBER 1991)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	345	277	e550	e400	e600	e250	424	840	3,350	3,920	752	570
2	317	279	e520	e350	e800	e280	418	749	3,600	4,120	949	596
3	308	276	e500	e330	e700	e350	411	917	4160	3,920	815	615
4	313	275	e550	e320	e650	e450	409	973	4,790	3,200	817	651
5	300	288	e600	e310	e600	e420	404	1,200	5,290	2,920	808	573
6	309	e270	e580	e300	e550	e400	407	1,340	5,720	2,920	800	555
7	321	e250	e550	e300	e500	e390	426	1,550	5,880	2,760	868	605
8	318	278	e600	e300	e450	e380	433	1,710	5,740	2,010	850	589
9	316	300	e650	e320	e420	365	428	1,810	5,670	1,580	813	638
10	306	346	e580	e360	e400	355	426	1,840	5,220	1490	845	694
11	309	433	e520	e450	e380	350	462	1,900	4,930	1,150	809	658
12	308	457	e500	e550	e370	336	507	2,180	4,850	919	845	589
13	307	462	e480	e500	e360	336	497	2,300	4,600	732	951	558
14	305	460	e470	e450	e360	338	492	2,410	3,870	704	977	578
15	305	459	e470	e400	e350	336	489	2,560	3,210	780	982	613
16	309	457	e460	e390	e350	347	497	2,490	2,760	677	989	589
17	307	477	e450	e400	e350	358	535	2,500	2,510	637	1,010	522
18	301	532	e350	e430	e340	344	583	2,560	2,200	662	996	481
19	296	536	e300	e400	e350	340	564	3,100	1,730	791	991	479
20	291	547	e250	e380	352	386	539	4,430	1,760	792	917	487
21	284	530	e220	e360	353	418	529	6,200	3,140	668	809	470
22	283	547	e200	e350	354	439	522	6,990	3,300	709	634	471
23	282	542	e250	e350	348	436	543	6,230	4,850	728	610	481
24	282	537	e350	e340	342	426	654	6,140	4,960	742	700	454
25	282	e510	e400	e330	347	431	711	5,960	4,720	673	695	453
26	279	e450	e430	e320	342	379	782	5,990	4,470	708	677	515
27	275	e400	e450	e320	348	421	790	5,370	4,030	776	706	459
28	270	e450	e400	e300	e300	489	938	4,440	4,170	710	755	437
29	267	e500	e300	e310	---	454	941	3,830	4,020	648	765	420
30	270	e600	e250	e350	---	433	930	3,370	3,750	584	681	444
31	272	---	e300	e400	---	427	---	3,260	---	624	619	---
TOTAL	9,237	12,725	13,480	11,370	11,966	11,864	16,691	97,139	123,250	44,254	25,435	16,244
MEAN	298	424	435	367	427	383	556	3,134	4,108	1,428	820	541
MAX	345	600	650	550	800	489	941	6,990	5,880	4,120	1,010	694
MIN	267	250	200	300	300	250	404	749	1,730	584	610	420
AC-FT	18,320	25,240	26,740	22,550	23,730	23,530	33,110	192,700	244,500	87,780	50,450	32,220

e Estimated

Table 17. Daily mean streamflow for Sun River near Vaughn (site S-33), water years 1990-92 (Continued)

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1992 (OCTOBER 1991 TO SEPTEMBER 1992)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	454	e250	e300	e260	e240	191	144	284	436	581	403	424
2	454	e200	e320	e260	e220	191	142	268	409	634	415	379
3	478	e250	e330	e250	e210	191	138	238	353	619	468	347
4	513	e300	e340	e240	e210	190	137	245	308	565	472	315
5	541	e350	e360	e230	e200	190	135	231	305	626	471	322
6	486	e320	e370	e220	e200	187	133	247	323	642	434	332
7	443	e300	e360	e210	e190	177	134	207	311	527	411	366
8	425	e320	e340	e200	e180	171	136	168	264	510	400	385
9	412	e350	e330	e210	e180	162	149	205	206	519	400	399
10	419	e380	e330	e220	e170	164	158	259	205	614	405	426
11	396	e400	e320	e230	e150	164	166	242	239	690	369	400
12	384	402	e310	e220	e160	160	173	285	249	830	364	384
13	380	401	e300	e200	e180	157	197	334	403	671	374	399
14	382	402	e300	e180	e190	157	182	274	858	535	395	411
15	373	375	e300	e160	e190	153	228	229	750	486	390	425
16	348	e370	e290	e170	e200	152	272	220	1,010	418	373	458
17	348	382	e270	e190	e200	155	250	236	1,330	343	359	495
18	358	382	e270	e200	e200	161	232	224	1,060	330	329	449
19	393	360	e280	e200	e200	163	220	254	789	324	315	414
20	403	364	e290	e210	e190	159	231	264	644	383	318	384
21	395	368	e300	e200	e180	158	242	270	515	431	414	392
22	404	360	e300	e190	e190	155	235	303	420	516	501	367
23	403	e340	e300	e180	e200	152	239	281	346	542	663	343
24	406	e350	e300	e200	e200	149	238	254	280	492	847	326
25	408	e380	e290	e210	198	150	212	274	234	427	712	348
26	413	373	e290	e220	199	148	188	301	247	396	587	306
27	406	358	e290	e220	200	147	166	388	262	448	501	259
28	e350	e350	e280	e230	196	146	148	472	311	389	449	249
29	e270	e320	e280	e240	191	146	204	390	386	341	436	238
30	e250	e300	e270	e250	---	149	254	461	662	365	433	222
31	e300	---	e270	e250	---	148	---	517	---	388	434	---
TOTAL	12,395	10,357	9,480	6,650	5,614	5,043	5,683	8,825	14,115	15,582	13,842	10,964
MEAN	400	345	306	215	194	163	189	285	470	503	447	365
MAX	541	402	370	260	240	191	272	517	1,330	830	847	495
MIN	250	200	270	160	150	146	133	168	205	324	315	222
AC-FT	24,590	20,540	18,800	13,190	11,140	10,000	11,270	17,500	28,000	30,910	27,460	21,750

e Estimated

Table 18. Daily mean streamflow for Lake Creek near Power (site S-44), water years 1990-92

[Abbreviations: ac-ft, acre-feet; max, maximum; min, minimum. Symbol: ---, no data]

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND WATER YEAR 1990 (OCTOBER 1989 TO SEPTEMBER 1990)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	0.00	17	45
2	---	---	---	---	---	---	---	---	---	.00	40	45
3	---	---	---	---	---	---	---	---	---	.00	43	44
4	---	---	---	---	---	---	---	---	---	.00	41	44
5	---	---	---	---	---	---	---	---	---	.00	40	44
6	---	---	---	---	---	---	---	---	---	.23	39	43
7	---	---	---	---	---	---	---	---	---	.23	38	42
8	---	---	---	---	---	---	---	---	---	.11	37	42
9	---	---	---	---	---	---	---	---	---	.01	35	42
10	---	---	---	---	---	---	---	---	---	.00	34	42
11	---	---	---	---	---	---	---	---	---	.00	33	41
12	---	---	---	---	---	---	---	---	---	.00	33	41
13	---	---	---	---	---	---	---	---	---	.00	32	40
14	---	---	---	---	---	---	---	---	---	.00	32	40
15	---	---	---	---	---	---	---	---	---	.00	32	40
16	---	---	---	---	---	---	---	---	---	.00	34	40
17	---	---	---	---	---	---	---	---	---	.00	34	31
18	---	---	---	---	---	---	---	---	---	.00	34	40
19	---	---	---	---	---	---	---	---	---	.00	37	40
20	---	---	---	---	---	---	---	---	---	.00	53	34
21	---	---	---	---	---	---	---	---	---	.00	1.0	42
22	---	---	---	---	---	---	---	---	---	.00	.38	42
23	---	---	---	---	---	---	---	---	---	.00	3.1	42
24	---	---	---	---	---	---	---	---	---	.00	48	42
25	---	---	---	---	---	---	---	---	---	8.5	49	41
26	---	---	---	---	---	---	---	---	---	16	49	41
27	---	---	---	---	---	---	---	---	---	16	48	41
28	---	---	---	---	---	---	---	---	---	15	47	32
29	---	---	---	---	---	---	---	---	---	16	47	.68
30	---	---	---	---	---	---	---	---	---	16	46	.32
31	---	---	---	---	---	---	---	---	---	16	45	---
TOTAL	---	---	---	---	---	---	---	---	---	104.08	1,101.48	1,144.00
MEAN	---	---	---	---	---	---	---	---	---	3.36	35.5	38.1
MAX	---	---	---	---	---	---	---	---	---	16	53	45
MIN	---	---	---	---	---	---	---	---	---	.00	.38	.32
AC-FT	---	---	---	---	---	---	---	---	---	206	2,180	2,270

Table 18. Daily mean streamflow for Lake Creek near Power (site S-44), water years 1990-92 (Continued)

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND

WATER YEAR 1991 (OCTOBER 1990 TO SEPTEMBER 1991)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.35	---	---	---	---	e.30	.39	.20	39	.92	.00	35
2	.29	---	---	---	---	e.40	.30	.18	37	.80	.00	35
3	.22	---	---	---	---	e.50	.18	9.0	37	.70	.00	35
4	.25	---	---	---	---	e.80	.12	10	37	.61	.00	34
5	.42	---	---	---	---	e.70	.10	10	48	.45	.00	37
6	.38	---	---	---	---	e.50	.09	9.9	100	.36	.00	37
7	.50	---	---	---	---	e.40	.07	9.7	65	.25	.00	37
8	.41	---	---	---	---	e.30	.09	9.6	42	.20	.00	37
9	.39	---	---	---	--	e.40	.10	9.2	35	.16	.00	37
10	.39	---	---	---	---	e.50	.11	12	34	.17	.00	37
11	.37	---	---	---	---	e.50	.24	24	37	.15	.00	36
12	.48	---	---	---	---	e.40	.70	26	35	.12	.00	36
13	.67	---	---	---	---	e.30	15	28	34	.10	.00	36
14	.63	---	---	---	---	e.30	8.3	38	33	.08	.00	36
15	.61	---	---	---	---	e.30	3.0	32	33	.07	.00	36
16	.55	---	---	---	---	e.30	1.2	37	29	.06	.00	36
17	.48	---	---	---	---	e.40	11	36	33	.06	.00	36
18	.50	---	---	---	---	e.40	31	35	28	.04	.00	36
19	.49	---	---	---	---	.42	11	36	18	.03	.00	35
20	.46	---	---	---	---	.42	6.1	35	8.3	.02	.32	35
21	.52	---	---	---	---	.42	2.6	34	77	.00	36	35
22	.57	---	---	---	---	.44	1.2	34	29	.00	39	35
23	.49	---	---	---	---	.48	.69	28	13	.00	38	35
24	.48	---	---	---	---	.42	.46	27	4.1	.00	37	35
25	.51	---	---	---	---	.38	.25	37	2.7	.00	37	35
26	.51	---	---	---	---	.31	.20	37	2.1	.00	37	35
27	.42	---	---	---	---	.31	.19	36	1.6	.00	37	35
28	.47	---	---	---	---	.34	.27	37	1.3	.00	37	35
29	.48	---	---	---	---	.50	.30	37	1.1	.00	36	35
30	.53	---	---	---	---	.62	.27	37	1.0	.00	36	35
31	.57	---	---	---	---	.53	---	39	---	.00	36	---
TOTAL	14.39	---	---	---	---	13.29	95.52	789.78	895.2	5.35	406.32	1,069
MEAN	.46	---	---	---	---	.43	3.18	25.5	29.8	.17	13.1	35.6
MAX	.67	---	---	---	---	.80	31	39	100	.92	39	37
MIN	.22	---	---	---	---	.30	.07	.18	1.0	.00	.00	34
AC-FT	29	---	---	---	---	26	189	1,570	1,780	11	806	2,120

e Estimated

Table 18. Daily mean streamflow for Lake Creek near Power (site S-44), water years 1990-92 (Continued)

DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND

WATER YEAR 1992 (OCTOBER 1991 TO SEPTEMBER 1992)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	e.40	---	---	---	e.50	.11	26	32	.00	.00	30
2	36	e.40	---	---	---	e.45	.13	25	31	.00	.00	30
3	36	e.50	---	---	---	e.40	.14	25	33	.00	.00	29
4	36	e.60	---	---	---	e.35	.12	26	33	.00	.00	27
5	36	e.50	---	---	---	.30	.11	25	34	.00	.00	16
6	36	e.50	---	---	---	.26	.13	26	33	.00	.00	16
7	36	e.60	---	---	---	.26	.13	27	33	.00	.00	16
8	36	e.70	---	---	---	.24	.13	27	32	.00	.00	16
9	35	.81	---	---	---	.22	.12	28	32	.00	.00	16
10	35	.78	---	---	---	.20	.22	28	23	.00	.00	20
11	33	.71	---	---	---	.18	.15	28	.82	.00	.00	38
12	34	.53	---	---	---	.18	.14	29	.53	.00	.00	38
13	34	.51	---	---	---	.18	.19	31	.36	.00	.00	38
14	34	e.40	---	---	---	.15	.18	30	.25	.00	.00	39
15	33	e.35	---	---	---	.15	.14	27	.21	.00	.00	38
16	31	e.35	---	---	---	.15	.16	36	.26	.00	.00	39
17	36	.33	---	---	---	.15	.35	36	.26	.00	.00	39
18	28	.25	---	---	---	.15	.52	35	.80	.00	14	36
19	3.0	.24	---	---	---	.13	.45	34	.39	.00	25	38
20	2.5	.22	---	---	---	.13	.35	34	.22	.00	27	40
21	2.2	e.20	---	---	---	.12	.34	34	.10	.00	28	42
22	2.0	e.15	---	---	---	.10	2.3	34	.03	.00	28	36
23	1.7	e.10	---	---	---	.12	21	33	.00	.00	29	41
24	1.3	e.08	---	---	---	.11	22	33	.00	.00	25	39
25	e1.0	e.06	---	---	---	.10	27	33	.00	.00	30	40
26	e.90	e.05	---	---	---	.11	27	33	.00	.00	30	40
27	e.80	e.04	---	---	---	.13	26	35	.00	.00	30	40
28	e.70	e.03	---	---	---	.16	25	36	.00	.00	30	38
29	e.60	e.02	---	---	---	.13	26	36	.00	.00	30	38
30	e.50	e.00	---	---	---	.12	26	34	.00	.00	30	37
31	e.50	---	---	---	---	.12	---	34	---	.00	30	---
TOTAL	637.70	10.41	---	---	---	6.05	206.61	958	320.23	.00	386.00	990
MEAN	20.6	.35	---	---	---	.20	6.89	30.9	10.7	.00	12.5	33.0
MAX	36	.81	---	---	---	.50	27	36	34	.00	30	42
MIN	.50	.00	---	---	---	.10	.11	25	.00	.00	.00	16
AC-FT	1,260	21	---	---	---	12	410	1,900	635	.00	766	1,960

e Estimated

Table 19. Daily mean specific conductance for Lake Creek near Power (site S-44), water year 1992

[Abbreviations: µS/cm, microsiemens per centimeter at 25 degrees Celsius; max, maximum; min, minimum. Symbol: ---, no data]

DAILY MEAN CONDUCTANCE, IN µS/CM WATER YEAR 1992 (OCTOBER 1991 TO SEPTEMBER 1992)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
1	---	---	---	---	---	e7,680	e11,500	746	686	---	---	729
2	---	---	---	---	---	e7,950	e11,500	757	655	---	---	761
3	---	---	---	---	---	e8,250	e11,600	763	678	---	---	749
4	---	---	---	---	---	e8,610	e11,600	761	720	---	---	769
5	---	---	---	---	---	e9,050	e11,700	754	734	---	---	801
6	---	---	---	---	---	e9470	e11,800	730	726	---	---	788
7	---	---	---	---	---	e9,590	e11,900	692	739	---	---	772
8	---	---	---	---	---	e9720	e12,000	707	696	---	---	754
9	---	---	---	---	---	e9,990	e12,000	683	684	---	---	770
10	---	---	---	---	---	e10,200	e12,100	630	e850	---	---	774
11	---	---	---	---	---	e10,500	e12,100	628	e1,010	---	---	760
12	---	---	---	---	---	e10,500	e12,200	597	e1,170	---	---	766
13	---	---	---	---	---	e10,500	e12,400	577	e1,330	---	---	762
14	---	---	---	---	---	e10,800	e12,500	599	e1,490	---	---	744
15	---	---	---	---	---	e10,800	e12,600	705	e1,650	---	---	726
16	---	---	---	---	---	e10,800	e12,800	705	e1,810	---	---	716
17	---	---	---	---	---	e10,800	e13,000	695	e1,970	---	---	710
18	---	---	---	---	---	e10,800	e13,100	723	e1,200	---	e1,440	691
19	---	---	---	---	---	e11,000	e13,400	755	e2,380	---	1,020	707
20	---	---	---	---	---	e11,000	e13,400	734	e3,550	---	948	709
21	---	---	---	---	---	e11,100	e13,600	703	e4,720	---	875	747
22	---	---	---	---	---	e11,100	e13,200	e700	e5,900	---	802	733
23	---	---	---	---	---	e11,100	1,370	e700	---	---	812	747
24	---	---	---	---	---	e11,200	904	e700	---	---	833	759
25	---	---	---	---	---	e11,200	855	e700	---	---	852	763
26	---	---	---	---	---	e11,300	857	e700	---	---	869	750
27	---	---	---	---	---	e11,300	847	e700	---	---	804	761
28	---	---	---	---	---	e11,300	853	e700	---	---	812	784
29	---	---	---	---	---	e11,400	821	e700	---	---	796	798
30	---	---	---	---	---	e11,400	761	727	---	---	781	840
31	---	---	---	---	---	e11,400	---	659	---	---	760	---
MEAN	---	---	---	---	---	10,400	9,310	698	1,610	---	886	755
MAX	---	---	---	---	---	11,400	13,600	763	5,900	---	1,440	840
MIN	---	---	---	---	---	7,680	761	577	655	---	760	691

e Estimated

Table 20. Results of chemical analyses of bottom-sediment samples from the Sun River area, Montana

[Analyses by U.S. Geological Survey. Analyses conducted on sediment fraction finer than 0.063 millimeter diameter. Abbreviations: µg/g, microgram per gram of dry sample weight; percent, percent of dry sample weight. Symbols: <, less than; --, no data]

Site number (fig. 5)	Date	Aluminum, total (percent)	Calcium, total (percent)	Carbon, carbonate, total (percent)	Carbon, organic, total (percent)	Iron, total (percent)	Magnesium, total (percent)	Phosphorus, total (percent)	Potassium, total (percent)	Sodium, total (percent)
GREENFIELDS IRRIGATION DIVISION										
S-20	07-02-91	6.2	1.8	0.5	0.9	2.5	1.2	0.10	1.9	0.54
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA										
S-34	07-01-91	6.4	8.4	3.4	.5	2.8	3.4	.07	1.8	.87
S-36	07-02-91	7.3	4.2	1.3	1.5	3.0	1.9	.08	2.0	.73
S-37	07-01-91	7.5	5.5	1.6	2.3	3.1	1.9	.09	2.2	.49
	06-24-92	--	--	1.6	2.0	--	--	--	--	--
S-38	07-02-91	5.8	5.9	2.1	1.1	2.2	2.2	.08	1.7	1.1
S-39	07-02-91	5.6	6.1	2.2	.9	2.1	2.3	.09	1.6	1.2
BENTON LAKE NATIONAL WILDLIFE REFUGE										
S-46	07-03-91	6.7	1.2	.2	1.4	2.5	.98	.09	2.0	.57
S-47	07-03-91	7.7	.79	.1	1.4	2.9	.89	.08	2.3	.40
S-49	07-03-91	8.3	2.0	.4	2.8	3.1	1.4	.10	2.4	.48

Site number (fig. 5)	Arsenic, total (µg/g)	Barium, total (µg/g)	Beryllium, total (µg/g)	Boron, water extractable (µg/g)	Cadmium, total (µg/g)	Chromium, total (µg/g)	Cobalt, total (µg/g)	Copper, total (µg/g)	Lead, total (µg/g)	Lithium, total (µg/g)
GREENFIELDS IRRIGATION DIVISION										
S-20	9.3	880	2	3	<2	80	10	20	16	51
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA										
S-34	8.9	750	2	6	<2	56	10	21	13	49
S-36	4.4	680	2	4	<2	56	11	23	16	43
S-37	2.8	630	2	5	<2	73	11	26	19	51
	--	--	--	--	--	--	--	--	--	--
S-38	5.5	720	1	7	<2	38	9	16	13	35
S-39	4.5	720	1	6	<2	47	8	19	10	33
BENTON LAKE NATIONAL WILDLIFE REFUGE										
S-46	6.8	680	2	4	<2	87	14	24	17	58
S-47	7.1	820	2	3	<2	110	9	29	20	58
S-49	10	700	2	6	<2	110	11	33	20	62

Table 20. Results of chemical analyses of bottom-sediment samples from the Sun River area, Montana (Continued)

Site number (fig. 5)	Manganese, total (µg/g)	Mercury, total (µg/g)	Molybdenum, total (µg/g)	Nickel, total (µg/g)	Selenium, total (µg/g)	Silver, total (µg/g)	Strontium, total (µg/g)	Uranium, total (µg/g)	Vanadium, total (µg/g)	Zinc total (µg/g)
				GREENFIELDS IRRIGATION DIVISION						
S-20	230	0.05	<2	29	1.0	<2	190	4	160	110
				FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
S-34	370	.04	<2	24	1.1	<2	810	4	100	80
S-36	430	.02	<2	22	1.9	<2	270	4	110	98
S-37	430	.05	<2	27	11	<2	350	6	130	110
	--	--	--	--	8	--	--	--	--	--
S-38	470	.04	<2	15	.7	<2	360	4	73	60
S-39	370	.01	<2	18	2.5	<2	320	4	77	60
				BENTON LAKE NATIONAL WILDLIFE REFUGE						
S-46	290	.02	<2	49	2.9	<2	200	5	160	140
S-47	180	.03	3	28	.9	<2	190	5	200	97
S-49	360	.06	<2	32	.6	<2	200	4	200	120

Table 21. Results of trace-element analyses of aquatic plants from the Sun River area, Montana

[Concentrations in micrograms per gram of sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6, 7)	Sample identification	Date	Taxon	Matrix	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-09	FL-PB-P	08/06/92	SAGO PONDWEED	WHOLE	2,880	5.5	54	<0.2	669	<0.2
B-10	FL-SP-P	08/06/92	ALGAE-NONFILAMENTOUS	WHOLE	14,070	7.3	21	.5	31	<.2
B-12	FL-1-P	08/06/92	SAGO PONDWEED	WHOLE	990	<1.2	66	.7	515	.7
B-13	FL-2-P	08/06/92	SAGO PONDWEED	WHOLE	1,190	8.7	52	<.2	438	<.2
B-14	FL-3-P	08/06/92	SAGO PONDWEED	WHOLE	901	1.9	75	<.2	610	.6
B-15	FL-4-P	08/06/92	SAGO PONDWEED	WHOLE	882	4.5	72	<.2	424	<.2
B-16	FL-5-P	08/04/92	SAGO PONDWEED	WHOLE	1,630	<1.2	233	<.2	232	<.2
B-18	FL-NL-P	08/06/92	SAGO PONDWEED	WHOLE	641	1.7	18	<.2	632	.3
B-19	FL-SL-P	08/04/92	SAGO PONDWEED	WHOLE	331	1.4	30	<.2	434	<.2
			BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-20	BL-ALG-1LC	08/03/89	ALGAE-FILAMENTOUS	WHOLE	3,260	13	129	<.3	107	.7
B-21	BL-ALG-1SW	08/03/89	ALGAE-FILAMENTOUS	WHOLE	1,280	8	30	<.3	413	.7
B-21	JUN-MYR-I	06/28/88	WATER MILFOIL	WHOLE	2,610	<5.0	309	.1	23	<.2
B-21	JUL-MYR-I	07/28/88	WATER MILFOIL	WHOLE	1,570	<5.0	128	<.1	32	<.2
B-21	MAY-POT-L-I	05/12/88	SAGO PONDWEED	LEAVES	10,400	<6.0	152	.4	203	.4
B-21	MAY-POT-S-I	05/12/88	SAGO PONDWEED	STEMS	12,100	10	156	.4	88	.2
B-21	MAY-POT-T-I	05/12/88	SAGO PONDWEED	TUBERS	6,800	10	93	.3	37	<.2
B-21	JUN-POT-L-I	06/15/88	SAGO PONDWEED	LEAVES	1,200	<5.0	85	.1	819	<.2
B-21	JUN-POT-S-I	06/15/88	SAGO PONDWEED	STEMS	829	<5.0	39	<.1	140	<.2
B-21	JUN-POT-W-IA	06/15/88	SAGO PONDWEED	WHOLE	2,980	6.0	112	.2	482	.4
B-21	JUN-POT-W-I	06/28/88	SAGO PONDWEED	WHOLE	1,410	<5.0	73	.1	810	<.2
B-21	JUL-POT-W-I	07/28/88	SAGO PONDWEED	WHOLE	3,240	<5.0	79	.2	608	<.2
B-22	BL-ALG-2	08/03/89	ALGAE-FILAMENTOUS	WHOLE	2,660	5.2	95	<.3	82	<.5
B-22	JUN-MYR-II	06/29/88	WATER MILFOIL	WHOLE	859	<5.0	70	<.1	19	<.2
B-22	JUN-POT-W-II	06/29/88	SAGO PONDWEED	WHOLE	1,680	<5.0	103	.1	832	<.2
B-23	BL-ALG-3	08/03/89	ALGAE-FILAMENTOUS	WHOLE	744	9.1	50	<.3	310	<.5
B-26	BL-ALG-4	08/03/89	ALGAE-FILAMENTOUS	WHOLE	13,900	37	112	4.4	149	23
B-26	JUN-MYR-IV	06/29/88	WATER MILFOIL	WHOLE	1,520	7.0	37	<.1	31	<.2
B-26	JUL-MYR-IV	07/28/88	WATER MILFOIL	WHOLE	5,740	<5.0	104	.2	33	<.2
B-26	MAY-POT-S-IV	05/12/88	SAGO PONDWEED	STEMS	4,800	5.0	47	.2	43	.3
B-26	MAY-POT-L-IV	05/12/88	SAGO PONDWEED	LEAVES	6,510	6.0	65	.3	120	.4
B-26	MAY-POT-T-IV	05/12/88	SAGO PONDWEED	TUBERS	2,650	7.0	30	.2	21	.2
B-26	JUN-POT-L-IV	06/28/88	SAGO PONDWEED	LEAVES	3,110	10	167	.2	734	<.2
B-26	JUN-POT-S-IV	06/28/88	SAGO PONDWEED	STEMS	6,850	6.0	136	.3	170	<.2
B-26	JUN-POT-W-IV	06/29/88	SAGO PONDWEED	WHOLE	6,470	10	181	.2	516	<.2
B-26	JUL-POT-W-IV	07/27/88	SAGO PONDWEED	WHOLE	4,550	<5.0	80	.2	583	<.2
B-27	BL-ALG-5	08/03/89	ALGAE-FILAMENTOUS	WHOLE	3,430	10	61	.3	306	.6
B-29	BL-ALG-6	08/03/89	ALGAE-FILAMENTOUS	WHOLE	1,540	13	38	<.3	268	.5

Table 21. Results of trace-element analyses of aquatic plants from the Sun River area, Montana (Continued)

Site number (fig. 6, 7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA								
B-09	4.2	4.4	1,970	11,600	579	<0.2	1.8	4.7	5.4	5.5	437	8.7	49
B-10	15	13	14,130	58,000	445	<.2	<1.0	18	13	10	489	32	67
B-12	10	10	1,220	11,200	91	<.2	2.9	9.2	6.7	<1.2	96	4.6	46
B-13	1.8	5.0	1,380	8,720	1,980	<.2	<1.2	1.7	6.2	1.3	265	6.4	18
B-14	3.9	13	833	8,610	1,370	<.2	1.6	3.3	2.0	1.8	175	3.4	36
B-15	4.3	8.0	1,080	9,210	2,020	<.2	1.5	3.5	2.4	<1.2	79	4.2	50
B-16	3.4	8.5	1,240	4,900	363	<.2	2.0	2.2	3.6	2.9	154	5.3	45
B-18	1.9	3.5	458	12,600	71	<.2	2.0	1.6	2.5	<1.2	237	1.8	21
B-19	<1.2	4.1	259	8,160	139	<.2	<1.2	<1.2	<1.2	4.3	209	<1.2	55
					BENTON LAKE NATIONAL WILDLIFE REFUGE								
B-20	4.7	<3.0	2,710	7,250	4,730	<.02	<5.0	13	<7.0	2.1	1,970	9.9	26
B-21	<3.0	6.9	1,300	9,370	689	<.02	<5.0	7.4	<7.0	2.4	99	5.2	71
B-21	3.0	4.1	1,350	6,550	1,380	--	<1.0	7.7	<4.0	2.2	1,850	7.8	8.0
B-21	3.0	5.8	874	11,500	127	--	1.0	3.0	<4.0	1.3	413	6.5	8.3
B-21	18	14	8,080	8,080	288	--	<2.0	16	5.0	1.3	165	33	59
B-21	16	13	8,440	6,370	167	--	<2.0	14	5.0	1.1	127	37	60
B-21	9.7	7.5	9,160	4,320	118	--	<2.0	11	<4.0	.6	76	23	46
B-21	2.0	8.8	926	11,900	988	--	2.0	9.3	<5.0	1.6	320	5.4	20
B-21	4.4	7.5	713	5,070	870	--	<1.0	6.6	<4.0	.6	118	3.3	14
B-21	6.0	13	3,350	10,800	869	--	2.0	13	<4.0	1.9	368	14	32
B-21	3.0	6.9	1,000	15,000	264	--	2.0	4.9	<4.0	1.3	332	5.1	21
B-21	5.8	5.4	1,850	14,300	99	--	2.0	4.9	<4.0	1.4	190	11	15
B-22	3.5	4.9	3,350	4,370	385	<.02	<5.0	4.7	<7.0	5.6	4,130	8.2	18
B-22	2.0	8.2	651	8,330	233	--	2.0	2.0	<5.0	1.2	173	3.0	18
B-22	3.0	4.3	914	16,800	245	--	2.0	3.0	<4.0	.8	443	7.1	16
B-23	<3.0	<3.0	880	6,310	1,730	.03	<5.0	3.7	<7.0	1.8	130	3.4	12
B-26	9.4	7.8	8,680	14,600	12,400	.02	<5.0	437	18	8.9	104	15	800
B-26	3.0	5.3	1,060	10,600	2,250	--	<1.0	9.3	<4.0	.7	146	5.5	11
B-26	7.6	5.9	2,890	12,900	181	--	<1.0	4.2	<4.0	1.1	233	17	25
B-26	9.0	18	3,300	5,950	88	--	<1.0	9.4	<4.0	.2	57	15	54
B-26	13	22	3,950	7,530	146	--	2.0	13	<5.0	.3	81	21	63
B-26	4.9	12	6,780	4,030	53	--	2.0	6.6	<5.0	.3	42	15	40
B-26	4.8	4.6	1,920	17,100	14,000	--	2.0	40	<4.0	1.9	145	11	29
B-26	9.0	5.9	3,780	8,060	7,580	--	<1.0	25	<4.0	1.1	85	21	29
B-26	6.9	5.2	3,060	13,500	13,100	--	2.0	43	<4.0	1.5	122	19	31
B-26	7.5	23	2,120	14,300	296	--	1.0	4.8	<4.0	1.1	188	13	21
B-27	5.0	6.1	3,000	9,700	381	.02	<5.0	9.4	<7.0	1.8	141	9.6	18
B-29	<3.0	3.9	2,130	12,600	1,100	<.02	<5.0	5.4	<7.0	1.2	128	4.2	16

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 5-7)	Sample identification	Date	Taxon	Alumi-num	Arse-nic	Bari-um	Beryi-lium	Bo-ron	Cad-mium	Chro-mium
			GREENFIELDS IRRIGATION DIVISION							
B-04	FL-AMP01	04/25/91	AMPHIPOD	3,610	3.9	39	<0.3	15	<0.5	3.2
B-04	FL-AMP02	04/25/91	AMPHIPOD	270	<.5	11	<.3	5.7	<.5	<2.4
B-07	1CRA1	07/14/92	CRAYFISH	444	2.5	118	<.1	4.2	<.1	4.9
B-08	2CRA1	07/13/92	CRAYFISH	1,010	2.9	110	<.1	3.1	<.1	3.0
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-09	FLAM006	09/03/91	AMPHIPOD	927	6.3	16	<.2	16	<.2	1.3
B-09	FLBS005	09/03/91	BACKSWIMMER	44	<1.1	<1.1	<.2	4.9	<.2	<1.1
B-09	FL-PB-C	08/05/92	CHIRONOMID	4,350	6.5	51	.5	9.1	.4	4.8
B-09	FLOD006	09/03/91	DAMSELFLY	399	5.2	<12	<1.2	26	<1.2	<12
B-09	FLWB008	09/03/91	WATERBOATMEN	104	1.6	2.4	<.2	5.0	<.2	<1.2
B-09	FL-PB-W	08/06/92	WATERBOATMEN	206	<1.2	8.6	<.2	4.6	<.2	<1.2
B-12	FLAM003	08/08/91	AMPHIPOD	544	3.9	58	<.2	14	<.2	<.9
B-12	FLCH006	08/14/91	CHIRONOMID	3,350	1.9	25	.3	19	.3	2.3
B-12	FLWB004	08/08/91	WATERBOATMEN	197	2.3	5.8	<.2	8.7	<.2	<1.2
B-13	FLAM005	08/15/91	AMPHIPOD	1,340	4.2	86	<.2	8.0	<.2	1.5
B-13	FLBS003	08/15/91	BACKSWIMMER	68	<1.1	1.9	<.2	3.3	<.2	<1.1
B-13	FLCH004	08/15/91	CHIRONOMID	2,970	1.7	23	.1	17	<.1	2.1
B-13	FLOD003	08/15/91	DAMSELFLY	288	1.6	<12	<1.2	13	<1.2	<12
B-13	FLWB007	08/15/91	WATERBOATMEN	693	<1.2	14	<.2	6.3	<.2	<1.2
B-14	FLAM004	08/15/91	AMPHIPOD	1,030	3.4	51	<.2	9.4	<.2	<1.2
B-14	FLCH007	08/21/91	CHIRONOMID	2,240	1.3	74	.1	8.0	<.1	2.1
B-14	FLDA004	09/04/91	DAPHNIA	4,440	7.9	62	<.2	25	<.2	3.3
B-14	FLWB006	08/15/91	WATERBOATMEN	70	.5	27	--	12	--	.6
B-15	FLAM002	07/26/91	AMPHIPOD	1,920	4.3	68	<.2	13	<.2	1.2
B-15	FLBS002	08/08/91	BACKSWIMMER	50	<1.0	2.1	<.2	4.8	.7	<1.0
B-15	FLCH003	08/07/91	CHIRONOMID	1,720	3.0	21	<1.2	<12	<.2	<12
B-15	FLOD001	08/07/91	DAMSELFLY	466	8.2	<12	<1.2	<12	<1.2	<12
B-15	FLWB003	08/07/91	WATERBOATMEN	267	<1.2	7.0	<.2	14	.7	<1.2
B-16	FLAM001	08/07/91	AMPHIPOD	738	2.6	51	<1.2	12	<1.2	<12
B-16	FLBS001	07/25/91	BACKSWIMMER	193	<.5	14	<.1	7.0	<.1	1.1
B-16	FLCH002	08/08/91	CHIRONOMID	2,330	.8	86	.3	13	<.1	2.3
B-16	FL-5-C	08/04/92	CHIRONOMID	923	<1.2	46	<.2	5.4	<.2	1.2
B-16	FLDA001	08/07/91	DAPHNIA	928	6.0	27	<.2	6.1	<.2	<1.0
B-16	FLWB002	07/25/91	WATERBOATMEN	274	1.3	83	<.2	2.0	<.2	<1.1
B-16	FL-5-W	08/04/92	WATERBOATMEN	39	<1.1	27	<.2	1.6	<.2	<1.2
B-18	FLCH005	08/13/91	CHIRONOMID	5,430	3.1	42	.2	31	<.1	3.7
B-18	FLCH008	09/11/91	CHIRONOMID	1,710	3.2	23	<1.2	33	<1.2	<12
B-18	FLDA007	09/24/91	DAPHNIA	2,720	6.8	55	<1.2	15	<1.2	<12
B-18	FLWB005	08/13/91	WATERBOATMEN	3,020	2.5	34	<.2	30	<.2	2.8
B-18	FLWB009	09/12/91	WATERBOATMEN	252	2.9	20	<1.2	<12	<1.2	<12

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					GREENFIELDS IRRIGATION DIVISION							
B-04	52	2,390	5,710	65	<0.1	<4.9	2.7	<2.5	20	1,170	6.8	71
B-04	3.5	178	1,360	13	.2	<4.9	<2.5	<2.5	9.0	576	<3.9	138
B-07	46	261	2,500	55	.1	<.5	1.4	<.5	1.5	801	<.5	68
B-08	61	870	2,700	59	<.1	<.5	1.9	2.3	2.4	650	2.3	86
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-09	53	318	12,400	14	<.2	<1.2	<1.2	<1.2	11	923	<1.2	55
B-09	26	92	3,200	25	<.2	<1.1	<1.1	<1.1	18	69	<1.1	250
B-09	18	4,320	6,610	102	<.2	<1.1	7.0	6.2	36	158	8.2	80
B-09	<12	360	10,200	<9.8	<.2	<12	<12	<12	13	48	<9.8	69
B-09	51	173	3,820	12	<.2	1.4	<1.2	<1.2	15	23	<1.2	240
B-09	25	260	2,750	19	<.2	<1.2	<.2	<1.2	15	32	<1.2	199
B-12	72	116	5,200	51	<.2	<.9	1.2	4.3	6.3	599	<.9	66
B-12	22	2,380	4,360	141	<.1	<.4	3.7	<.5	12	82	5.5	77
B-12	32	212	2,450	37	<.2	<1.2	<1.2	1.6	5.4	26	<1.2	191
B-13	78	502	5,270	109	<.2	<1.1	<1.1	1.2	7.4	659	1.5	68
B-13	42	130	2,320	50	<.2	<.5	<1.1	<1.1	7.9	29	<.1	199
B-13	24	2,370	4,080	113	<.1	<.4	2.3	2.3	12	84	4.0	90
B-13	23	360	1,380	25	<.2	<12	<12	<12	4.6	9	<9.5	74
B-13	24	501	1,750	44	<.2	<1.2	<1.2	<1.2	5.1	24	<1.2	182
B-14	56	357	3,690	121	<.2	<1.2	<1.2	1.4	3.4	1,050	1.8	64
B-14	9.4	2,310	3,390	54	<.1	<.4	2.0	<.5	4.7	36	5.1	58
B-14	10	2,270	8,510	78	<.2	<1.0	4.2	1.8	2.8	543	1.3	55
B-14	17	140	1,270	52	.1	1.0	.6	.6	4.6	19	.1	174
B-15	79	750	6,810	60	<.2	<1.1	<1.1	<1.1	5.9	570	2.1	67
B-15	50	117	2,800	29	<.2	<1.0	1.5	<1.0	7.0	27	<1.0	229
B-15	15	1,790	2,510	32	<.2	<12	<12	<12	15	28	<9.5	130
B-15	23	294	1,390	9.8	<.2	<2.1	<12	<12	5.3	20	<9.7	79
B-15	37	244	2,360	27	<.2	<1.2	1.5	2.4	5.3	22	<1.2	185
B-16	30	<238	3,380	137	<.2	<12	<12	<12	4.0	1,120	<9.5	58
B-16	6.8	203	1,660	30	<.1	<.5	.8	1.3	5.7	214	<.5	137
B-16	11	2,150	3,430	57	<.1	.7	4.2	2.7	3.3	50	4.3	50
B-16	11	1,410	2,570	19	<.2	<1.2	1.6	<1.2	26	30	2.3	58
B-16	6.9	499	3,560	124	<.2	<1.0	<1.0	<1.0	5.3	678	1.3	50
B-16	11	268	1,320	47	<.2	<1.1	<1.1	<1.1	4.8	21	<1.1	170
B-16	12	94	1,450	14	<.2	<.2	<1.2	<1.2	8.4	28	<1.2	170
B-18	18	3,700	12,100	80	<.1	<.4	3.8	7.2	3.4	176	6.8	77
B-18	14	1,910	7,370	38	<.2	<12	<12	<12	8.6	106	<9.7	65
B-18	<12	1,780	4,660	47	<.2	<12	<12	<12	13	796	<9.8	54
B-18	22	1,480	9,840	37	<.2	<1.2	2.0	6.8	2.8	158	3.5	141
B-18	<12	319	3,690	17	<.2	<12	<12	<12	4.7	125	<9.7	119

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Sample identification	Date	Taxon	Alumi-num	Arse-nic	Bari-um	Beryl-lium	Bo-ron	Cad-mium	Chro-mium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued							
B-19	FLCH001	08/06/91	CHIRONOMID	4,360	3.4	50	.1	27	<.1	3.8
B-19	FLCH009	09/23/91	CHIRONOMID	1,920	2.5	36	<1.2	20	<1.2	<2.6
B-19	FL-SL-C	08/05/92	CHIRONOMID	307	<1.2	7.9	.4	10	<.3	<1.5
B-19	FLDA006	09/24/91	DAPHNIA	1,190	6.3	56	<1.0	12	<1.0	<10
B-19	FL-SL-D	08/05/92	DAMSELFLY	<24	1.2	< 1.2	.3	3.4	.3	<1.2
B-19	FLWB001	08/06/91	WATERBOATMEN	184	<1.1	29	<.2	5.1	<.2	<1.1
B-19	FL-SL-W	08/05/92	WATERBOATMEN	75	<1.2	10	<.2	2.6	1.1	<1.2
			BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-20	AMP1LSEP	09/06/89	AMPHIPOD	3,390	3.3	3.3	.2	4.7	<.1	4.4
B-20	DAP1LSEP	09/07/89	DAPHNIA	3,410	5.0	6.6	<.1	3.8	<.1	4.6
B-20	COR1LSEP	09/07/89	WATERBOATMEN	184	.8	5.2	<.1	1.6	.2	.5
B-21	MAY-A-I	05/12/88	AMPHIPOD	1,740	<5.0	86	<.1	4.0	<.2	2.0
B-21	JUN-A-I	06/15/88	AMPHIPOD	930	<5.0	95	<.1	3.0	<.2	<1.0
B-21	JUL-A-I	07/28/88	AMPHIPOD	1,310	<5.0	143	<.1	8.7	<.2	2.0
B-21	AMP-I-MAY	05/10/89	AMPHIPOD	981	--	94	<.4	6.7	<.4	1.7
B-21	AMP1SEP	09/12/89	AMPHIPOD	717	3.2	60	<.1	3.7	<.1	1.0
B-21	B91-A-1	08/01/91	AMPHIPOD	1,580	5.7	63	<.2	6.0	<.2	1.4
B-21	BL9101AM	08/07/92	AMPHIPOD	1,610	5.3	111	<.2	7.1	<.2	<1.2
B-21	MAY-C-I	05/10/88	CHIRONOMID	5,190	<5.0	47	.2	9.3	.2	6.1
B-21	JUN-C-I	06/14/88	CHIRONOMID	2,440	<5.0	22	<.1	4.0	<.2	3.0
B-21	CHIR-I-MAY	05/10/89	CHIRONOMID	683	--	16	<.6	<5.7	<.6	<1.4
B-21	CHI1SEP	09/12/89	CHIRONOMID	109	.7	1.9	<.1	.6	<.1	<.5
B-21	B91-C-1	08/01/91	CHIRONOMID	1,370	1.5	21	.1	8.2	.1	2.0
B-21	BL9201CH	08/07/92	CHIRONOMID	5,920	4.3	84	.4	8.4	<.2	7.3
B-21	DAP-I-MAY	05/10/89	DAPHNIA	563	--	15	<.8	10	<.8	<1.7
B-21	DAP1SEP	09/12/89	DAPHNIA	1,030	4.8	27	<.1	3.8	.2	1.8
B-21	B91-X-1	08/01/91	DAPHNIA	3,190	8.3	59	<.2	20	<.2	3.5
B-21	BL9201DA	08/07/92	DAPHNIA	1,480	6.9	71	<.2	2.4	<.2	2.1
B-21	ODO1SEP	09/12/89	DAMSELFLY	445	1.5	7.4	<.1	3.2	<.1	.7
B-21	MAY-B-I	05/11/88	WATERBOATMEN	1,540	<5.0	19	<.1	2.0	.3	3.0
B-21	JUN-B-I	06/15/88	WATERBOATMEN	564	<5.0	17	<.1	< 2.0	<.2	1.0
B-21	JUL-B-I	07/28/88	WATERBOATMEN	120	<5.0	4.7	<.1	< 2.0	<.3	<1.0
B-21	COR-I-MAY	05/17/89	WATERBOATMEN	93	--	3.6	<.2	< 2.4	.5	<.5
B-21	COR1SEP	09/06/89	WATERBOATMEN	76	<.3	3.0	<.1	1.8	.2	.6
B-21	B91-W-1	08/01/91	WATERBOATMEN	161	< 1.2	4.7	<.2	7.9	<.2	<1.2
B-21	BL9201WB	08/07/92	WATERBOATMEN	84	1.2	4.1	<.2	< 1.1	<.2	<1.1
B-22	AMP-II-MAY	05/11/89	AMPHIPOD	1,110	--	123	<.4	13	<.4	1.7
B-22	AMP2SEP	09/08/89	AMPHIPOD	332	2.9	40	<.1	3.6	<.1	.6

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued							
B-19	17	3,720	6,460	62	<.1	<.4	6.0	3.8	6.1	69	7.1	80
B-19	13	2,200	6,660	41	<.2	<12	<12	<12	13.8	72	9.9	53
B-19	7.6	712	2,640	10	<.2	<1.5	3.0	2.8	11.4	33	1.5	33
B-19	<10	749	4,470	27	<.2	<10	<10	<10	5.1	1,930	8.2	54
B-19	20	49	1,090	2.7	<.2	<1.2	1.7	2.1	7.1	11	1.2	67
B-19	12	206	1,770	18	<.2	<.1	<1.1	<1.1	5.6	55	1.1	153
B-19	26	140	1,530	11	<.2	<1.2	4.4	3.3	16	43	1.2	166
					BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-20	6.7	1,100	3,230	54	<.1	<.5	4.8	<1.5	5.4	76	8.3	68
B-20	9.8	815	3,440	61	<.1	<.5	5.3	1.8	6.7	126	8.4	70
B-20	16	265	1,140	18	.2	.7	.9	<1.5	5.9	10	.6	150
B-21	50	882	3,340	100	--	<1.0	3.0	<4.0	3.2	626	5.4	66
B-21	74	484	3,090	193	--	<1.0	1.0	<4.0	3.5	711	2.9	67
B-21	78	628	4,720	32	--	<1.0	2.0	<4.0	3.2	902	3.7	62
B-21	66	674	3,600	143	--	<3.6	3.6	<2.2	3.2	225	3.6	74
B-21	59	374	2,600	72	<.1	.8	2.2	<1.5	3.8	376	2.1	55
B-21	81	699	5,110	80	<.2	<1.1	2.0	<1.1	9.0	551	3.1	67
B-21	46	1,250	4,230	44	<.2	<1.2	<1.2	<1.2	4.8	694	3.8	54
B-21	15	3,150	2,650	81	--	<1.0	4.5	<4.0	11	46	14	90
B-21	14	1,950	1,530	46	--	<1.0	2.0	<4.0	13	23	6.8	118
B-21	21	1,820	2,580	46	--	<5.7	4.5	4.2	9.7	21	5.7	138
B-21	<.5	345	389	6.4	<.1	<.5	.5	1.5	9.8	3	.5	21
B-21	16	1,700	4,100	85	<.1	<.4	5.6	1.5	23	37	3.4	97
B-21	15	6,200	5,480	178	<.2	<1.2	10	6.1	13	106	13	67
B-21	34	775	4,330	34	--	<8.3	6.7	5.0	5.0	84	8.3	112
B-21	7.1	761	2,560	28	.2	.9	1.2	1.7	3.7	205	2.5	70
B-21	11	2,300	6,600	184	<.2	<1.1	8.0	1.1	8.8	399	6.3	68
B-21	11	1,740	3,270	69	<.2	<1.2	3.0	2.3	6.2	495	3.0	85
B-21	5.0	688	1,270	28	<.1	<.6	1.5	1.7	5.5	12	1.4	24
B-21	36	891	1,510	29	--	<1.0	2.0	4.0	2.8	19	4.8	249
B-21	41	422	1,660	72	--	1.0	1.0	4.0	4.6	18	2.1	192
B-21	32	171	1,760	34	--	1.0	1.0	5.0	4.6	25	.6	190
B-21	42	181	1,580	32	--	<2.4	1.9	1.4	3.4	15	2.4	182
B-21	20	153	763	14	.2	.6	.5	1.5	3.6	8	.5	144
B-21	34	232	1,990	25	<.2	<1.2	2.6	1.2	8.4	23	1.2	166
B-21	17	183	1,160	15	<.2	<1.1	1.1	1.1	5.7	21	1.1	154
B-22	95	658	3,330	101	--	<3.5	2.8	2.1	1.4	1	3.8	84
B-22	34	178	2,190	49	<.1	<.5	.8	1.5	3.3	393	1.5	46

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Sample identification	Date	Taxon	Alumi-num	Arse-nic	Bari-um	Beryl-lium	Bo-ron	Cad-mium	Chro-mium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued							
B-22	BL9202AM	08/11/92	AMPHIPOD	344	4.7	45	<.2	1.3	<.2	<1.2
B-22	CHIR-II-MAY	05/17/89	CHIRONOMID	473	--	9.5	<.6	7.1	<.6	<1.2
B-22	CHI2SEP	09/07/89	CHIRONOMID	911	1.0	9.7	<.1	2.3	<.1	1.2
B-22	BL9202CH	08/11/92	CHIRONOMID	673	< 1.2	13	<.2	2.5	<.2	1.2
B-22	DAP-II-MAY	05/17/89	DAPHNIA	157	--	22	<.6	<6.2	<.6	<1.2
B-22	DAP2SEP	09/07/89	DAPHNIA	861	3.5	28	<.2	3.9	<.2	1.7
B-22	COR-II-MAY	05/17/89	WATERBOATMEN	137	--	8.1	<.3	<2.6	<.3	<.5
B-22	COR2SEP	09/07/89	WATERBOATMEN	36	<.3	2.1	<.1	.6	.2	<.5
B-22	BL9202WB	08/11/92	WATERBOATMEN	76	< 1.2	3.1	.3	2.6	.3	<1.2
B-23	AMP-III-MAY	05/11/89	AMPHIPOD	1,100	--	105	<.3	16	<.3	1.6
B-23	AMP3SEP	09/07/89	AMPHIPOD	437	4.2	79	<.1	4.9	<.1	.8
B-23	BL9203AM	08/11/92	AMPHIPOD	1,440	5.6	118	.3	6.9	.3	2.2
B-23	CHI3SEP	09/07/89	CHIRONOMID	298	.9	2.4	<.1	1.7	<.1	.5
B-23	BL9203CH	08/12/92	CHIRONOMID	3,700	3.6	57	<.2	5.1	<.2	4.7
B-23	DAP-III-MAY	05/10/89	DAPHNIA	107	--	17	<.7	6.8	<.7	1.6
B-23	DAP3SEP	09/07/89	DAPHNIA	1,430	5.1	33	<.1	7.5	<.1	2.1
B-23	BL9203DL	08/12/92	DAMSELFLY	704	2.1	< 1.1	<.2	2.8	<.2	1.3
B-23	COR-III-MAY	05/17/89	WATERBOATMEN	77	--	6.1	<.4	<3.6	.5	<.7
B-23	COR3SEP	09/07/89	WATERBOATMEN	62	.5	2.6	<.2	1.2	<.2	<1.0
B-23	BL9203WB	08/12/92	WATERBOATMEN	249	<1.1	5.6	<.2	1.7	<.2	<1.2
B-26	MAY-A-IV	05/12/88	AMPHIPOD	3,030	<5.0	104	.1	5.0	<.2	3.0
B-26	JUN-A-IV	06/15/88	AMPHIPOD	1,210	<5.0	88	<.1	4.0	<.2	2.0
B-26	JUL-A-IV	07/27/88	AMPHIPOD	1,030	<5.0	99	<.1	4.0	<.2	<1.0
B-26	AMP-IVC-MAY	05/10/89	AMPHIPOD	1,120	--	153	<.3	5.8	.6	1.5
B-26	AMP4CSEP	09/07/89	AMPHIPOD	614	3.1	68	.2	3.7	.2	1.2
B-26	B91-A-4C	07/31/91	AMPHIPOD	1,590	4.7	60	<.2	1.4	<.2	1.4
B-26	BL9204AM	08/13/92	AMPHIPOD	1,090	5.3	129	<.2	5.4	<.2	1.4
B-26	MAY-C-IV	05/24/88	CHIRONOMID	6,990	<5.0	58	.2	9.4	<.2	8.5
B-26	JUN-C-IV	06/15/88	CHIRONOMID	10,500	<6.0	83	.4	14	.7	13
B-26	JUL-C-IV	07/27/88	CHIRONOMID	15,400	<6.0	136	.5	22	.3	18
B-26	CHIR-IVC-MAY	05/08/89	CHIRONOMID	2,850	--	35	<.2	13	2.4	<2.4
B-26	CHI4SEP	09/07/89	CHIRONOMID	1,160	2.5	11	<.1	2.7	<.1	1.8
B-26	BL9204CH	08/12/92	CHIRONOMID	3,410	4.8	37	.6	8.3	3.1	3.0
B-26	BEE-IVC-MAY	05/09/89	COLEOPTERA	128	--	4.4	<.2	5.7	.6	.5
B-26	B91-T-4C	07/31/91	COLEOPTERA	79	<1.1	1.3	<.2	1.5	<.2	<1.1
B-26	DAP-IVC-MAY	05/09/89	DAPHNIA	1,280	--	24	<.9	<9.4	2.5	<1.9
B-26	DAP4CSEP	09/06/89	DAPHNIA	1,370	4.4	13	.3	5.4	1.6	2.5
B-26	MAY-B-IV	05/11/88	WATERBOATMEN	100	<4.0	3.0	<.1	<2.0	1.4	<1.0
B-26	JUN-B-IV	06/16/88	WATERBOATMEN	462	<5.0	5.5	<.1	2.0	.5	<1.0
B-26	JUL-B-IV	07/27/88	WATERBOATMEN	61	<5.0	3.9	<.1	<2.0	<.2	<1.0

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued							
B-22	43	164	4,140	18	<.2	<1.2	1.2	1.2	3.7	851	1.2	62
B-22	13	1,290	5,030	29	--	<5.9	4.7	3.5	12	73	5.9	142
B-22	.9	947	906	20	<.1	<.5	.8	1.5	23	21	2.4	23
B-22	8.7	1,480	1,620	36	<.2	<1.0	1.0	1.0	17	13	2.2	72
B-22	7.7	351	2,690	69	--	<6.2	<4.9	<3.7	4.9	160	<6.2	96
B-22	8.2	777	2,673	30	<.1	<1.0	1.2	<2.9	5.1	225	2.1	68
B-22	43	227	1,610	30	--	<2.6	<2.1	<1.5	1.0	18	<2.6	165
B-22	18	104	599	9.1	.1	.6	<.5	<1.5	3.0	8	<.5	124
B-22	14	129	1,350	16	<.2	1.4	1.3	2.1	6.8	23	<1.2	123
B-23	82	683	2,900	104	--	<3.3	<2.6	<2.0	5.2	<1	3.6	80
B-23	39	238	2,406	54	.1	1.0	.6	<1.5	2.1	585	1.6	52
B-23	58	774	4,880	45	<.2	<1.2	2.9	3.2	2.8	1,260	4.2	60
B-23	<.5	306	714	25	<.1	<.5	<.5	<1.5	12	5	1.1	12
B-23	16	4,210	5,070	84	<.2	<1.1	5.8	4.9	8.3	35	8.6	80
B-23	13	230	2,550	53	--	<6.8	<5.4	<4.1	6.8	87	<6.8	100
B-23	8.6	1,137	2,538	93	.2	<.5	1.7	<1.5	2.7	276	3.2	62
B-23	19	332	1,680	10	<.2	<1.1	<1.1	<1.1	2.5	13	1.9	78
B-23	48	208	1,400	50	--	<3.6	<2.9	<2.2	2.9	17	<3.6	233
B-23	12	144	861	24	.3	<1.0	<.5	<3.0	2.0	7	<1.0	143
B-23	17	265	1,530	14	<.2	<1.2	<1.2	<1.2	3.3	13	<1.2	160
B-26	49	1,370	3,910	197	--	<1.0	3.0	<4.0	1.8	536	8.3	71
B-26	63	542	3,790	185	--	<1.0	3.4	<4.0	2.4	809	3.3	66
B-26	54	445	4,750	46	--	<1.0	1.0	<4.0	2.5	820	2.9	60
B-26	74	621	3,290	194	--	<2.8	2.7	<1.7	3.4	<1	3.3	84
B-26	48	345	2,161	96	<.1	<.5	1.5	<1.5	2.1	464	1.7	51
B-26	48	583	4,080	49	<.2	<1.1	<1.1	<1.1	3.9	667	3.0	63
B-26	58	593	3,850	33	<.2	<1.1	1.7	1.4	2.7	932	2.6	66
B-26	16	3,490	2,280	91	--	<1.0	6.1	<4.0	8.3	20	18	89
B-26	20	5,340	3,790	180	--	<1.0	20	<4.0	11	28	27	129
B-26	19	7,540	4,740	199	--	<2.0	13	4.0	12	42	39	102
B-26	41	3,350	3,520	319	--	<12	26	<7.3	12	27	<12	235
B-26	<.5	1,363	1,082	42	<.1	<.5	.7	<1.5	5.5	8	3.3	25
B-26	13	3,410	6,700	136	<.2	<1.1	53	1.9	14	20	6.2	199
B-26	44	133	1,530	107	--	<2.3	<1.9	<1.4	4.2	11	<2.3	155
B-26	28	66	1,060	30	1.4	<1.1	<1.1	<1.1	6.7	10	<1.1	78
B-26	12	1,360	3,060	128	--	<9.4	12	<5.7	7.5	155	<9.4	144
B-26	5.9	751	2,210	87	<.1	<.5	16	<1.5	3.9	159	1.9	107
B-26	29	174	2,720	45	--	1.0	1.0	<4.0	3.0	22	.5	229
B-26	7.0	365	3,430	58	--	<1.0	8.1	<4.0	3.5	21	1.1	244
B-26	39	113	2,040	43	--	<1.0	1.0	<4.0	3.2	34	.4	186

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Sample identification	Date	Taxon	Alumi-num	Arse-nic	Bari-um	Beryl-lium	Bo-ron	Cad-mium	Chro-mium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued							
B-26	COR-IVC-MAY	05/09/89	WATERBOATMEN	179	--	3.5	<.3	<2.5	.6	.5
B-26	COR4SEP	09/06/89	WATERBOATMEN	224	.5	4.0	<.1	2.6	.4	.5
B-26	B91-W-4C	07/31/91	WATERBOATMEN	52	<1.2	2.9	<.2	<1.2	<.2	<1.2
B-26	BL9204WB	08/13/92	WATERBOATMEN	216	<1.2	2.8	<.2	3.7	<.2	<1.1
B-27	AMP5SEP	09/05/89	AMPHIPOD	270	4.3	42	<.1	3.0	<.1	.8
B-27	B91-A-5	07/30/91	AMPHIPOD	1,110	5.8	59	<.2	10	<.2	1.1
B-27	CHIR-V-MAY	05/11/89	CHIRONOMID	2,060	--	33	<.9	12	<.9	<1.8
B-27	CHI5SEP	09/05/89	CHIRONOMID	692	1.2	11	<.1	4.5	.3	1.4
B-27	B91-C-5	07/30/91	CHIRONOMID	5,500	3.9	52	.2	15	<.1	6.1
B-27	BL9205CH	08/18/92	CHIRONOMID	4,460	2.8	50	<.2	5.3	<.2	5.5
B-27	DAP-V-MAY	05/10/89	DAPHNIA	1,220	--	34	<1.1	12	<1.1	<2.2
B-27	DAP5SEP	09/07/89	DAPHNIA	859	3.2	18	<.1	4.8	.1	1.2
B-27	COR-V-MAY	05/18/89	WATERBOATMEN	84	--	< 4.3	<.4	<4.3	<.4	<.9
B-27	COR5SEP	09/05/89	WATERBOATMEN	286	.7	12	<.1	2.0	.2	1.0
B-27	B91-W-5	07/30/91	WATERBOATMEN	180	<1.1	2.3	<.2	1.5	<.2	<1.1
B-27	BL9205WB	08/18/92	WATERBOATMEN	249	2.1	19	<.2	2.2	<.2	<1.0
B-29	AMP-VI-MAY	05/16/89	AMPHIPOD	991	--	103	<.5	7.1	<.5	1.8
B-29	AMP6SEP	09/06/89	AMPHIPOD	252	4.1	30	<.1	3.2	<.1	<.5
B-29	B91-A-6	07/31/91	AMPHIPOD	2,070	5.4	60	<.2	2.9	<.2	1.2
B-29	BL9206AM	08/14/92	AMPHIPOD	365	5.1	144	<.2	4.0	<.2	<1.1
B-29	CHIR-VI-MAY	05/16/89	CHIRONOMID	2,240	--	43	<.9	11	<.9	3.6
B-29	CHI6SEP	09/06/89	CHIRONOMID	44	1.4	1.0	<.1	1.1	<.1	<.5
B-29	B91-C-6	09/05/91	CHIRONOMID	1,730	3.2	17	<1.1	<11	<1.1	<11
B-29	BL9206CH	08/14/92	CHIRONOMID	2,980	3.6	43	.5	10	.5	3.9
B-29	DAP-VI-MAY	05/09/89	DAPHNIA	480	--	12	<.5	<5.4	.5	1.3
B-29	DAP6SEP	09/06/89	DAPHNIA	1,210	4.7	27	<.1	6.5	<.1	2.1
B-29	COR-VI-MAY	05/10/89	WATERBOATMEN	81	--	< 6.9	<.7	<6.9	.7	<1.4
B-29	COR6SEP	09/06/89	WATERBOATMEN	125	.7	5.4	<.1	1.8	<.1	.5
B-29	B91-W-6	07/31/91	WATERBOATMEN	300	2.0	<11	<1.1	<11	<1.1	<11
B-29	BL9206WB	08/14/92	WATERBOATMEN	106	< 1.2	2.7	.3	1.9	.4	<1.2

Table 22. Results of trace-element analyses of aquatic invertebrates from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued							
B-26	33	189	1,100	36	--	<2.5	2.0	1.5	1.5	13	2.5	146
B-26	11	186	1,121	25	.2	.9	.5	1.5	2.6	12	.5	292
B-26	18	124	1,540	19	<.2	<1.2	1.2	1.2	5.5	12	1.2	177
B-26	15	250	2,210	23	<.2	<1.1	2.0	1.1	2.2	6	1.1	133
B-27	48	192	2,980	23	<.1	<.9	1.0	<1.5	2.6	1,560	.9	48
B-27	68	464	3,960	115	<.2	<.9	1.4	<.9	3.4	922	1.8	63
B-27	28	3,060	2,790	124	--	<8.8	<7.0	<5.3	14	39	<8.8	126
B-27	12	1,080	1,977	27	<.1	.7	2.3	1.9	6.5	17	2.0	81
B-27	17	5,320	7,080	109	<.1	1.0	9.1	3.0	7.7	46	13	88
B-27	18	4,490	5,140	103	<.2	<1.2	7.1	4.3	8.8	27	12	95
B-27	17	1,740	5,270	102	--	<11	<8.9	<6.7	4.4	385	<11	98
B-27	8.7	621	2,923	26	<.1	<.5	12	<1.5	1.0	553	1.9	--
B-27	37	181	1,390	23	--	<4.3	<3.4	<2.6	2.2	14	<4.3	59
B-27	23	340	996	20	.1	.6	1.0	1.9	1.6	25	.8	161
B-27	20	192	1,770	20	<.2	<1.1	<1.1	<1.1	4.3	15	<1.1	214
B-27	16	329	1,630	14	<.2	<1.0	<1.0	<1.0	2.8	11	<1.0	142
B-29	71	674	3,430	134	--	<5.0	<4.0	<3.0	2.0	620	<5.0	78
B-29	21	182	2,579	86	.1	<.5	1.0	<1.5	1.6	523	.7	49
B-29	64	998	3,850	74	<.2	<1.0	<4.0	1.7	3.1	728	4.0	59
B-29	65	233	3,600	30	<.2	<1.1	<1.1	<1.1	2.2	1,710	<1.1	57
B-29	27	3,560	2,920	65	--	<9.4	9.6	<5.7	15	33	<9.4	115
B-29	<.5	54	657	11	<1.0	<.5	<.5	<1.5	2.8	4	<.5	16
B-29	12	1,800	6,430	31	<.2	<11	<11	<11	6.7	39	<8.4	74
B-29	15	3,290	5,710	58	<.2	<1.2	6.6	3.9	9.1	28	7.1	76
B-29	11	683	2,390	97	--	<5.4	<4.4	<3.3	4.3	100	<5.4	99
B-29	9.4	1,270	4,953	54	1.1	<.5	1.4	<1.5	1.7	496	2.5	86
B-29	43	196	1,350	36	--	<6.9	<5.6	<4.2	2.4	18	<6.9	176
B-29	11	230	1,210	22	.4	<.5	<.5	<1.5	1.3	19	<.5	156
B-29	21	273	1,450	25	<.2	<11	<11	<11	4.2	13	<9.0	168
B-29	19	137	1,330	11	<.2	<1.2	1.4	<1.2	1.9	5	<1.2	174

Table 23. Results of trace-element analyses of fish and amphibians from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbol: <, less than]

Site number (fig. 5-7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			GREENFIELDS IRRIGATION DIVISION						
B-01	FL-SB-2	04/15/91	BROOK STICKLEBACK	171	0.5	21	<0.3	4.9	<0.5
B-02	FL-SB-1	04/15/91	BROOK STICKLEBACK	244	.9	19	<.3	12	<.5
B-03	FL-SB-3	04/15/91	BROOK STICKLEBACK	214	.6	23	<.3	4.0	<.5
B-04	FL-SB-4	04/25/91	BROOK STICKLEBACK	351	<.5	14	<.3	8.1	<.5
B-04	FL-SB-5	04/25/91	BROOK STICKLEBACK	235	<.5	10	<.3	<2.4	<.5
B-04	FL-FHM-3	04/25/91	FATHEAD MINNOW	1,340	.9	25	<.3	8.0	<.5
B-04	FL-FHM-4	04/25/91	FATHEAD MINNOW	405	.5	26	<.3	5.9	<.5
B-04	FL-NRD-1	04/25/91	NORTHERN REDBELLY DACE	793	.7	15	<.3	14	<.5
B-05	FL-FHM-5	04/26/91	FATHEAD MINNOW	517	.8	31	<.3	4.6	<.5
B-06	3LND1	07/14/92	LONGNOSE DACE	269	.6	18	<.1	<.5	<.1
B-06	3SCL1	07/14/92	MOTTLED SCULPIN	800	.7	27	<.1	2.0	.2
B-07	1BRT1	07/14/92	BROWN TROUT	33	<.5	1.6	<.1	<.5	<.1
B-07	1LND1	07/14/92	LONGNOSE DACE	70	21	10	<.1	1.6	<.1
B-07	1SCL1	07/14/92	MOTTLED SCULPIN	95	<.9	8.7	<.3	<1.7	<.3
B-07	1WHI2	07/14/92	MOUNTAIN WHITEFISH	128	<.5	3.1	<.1	<.5	<.1
B-07	1WS1	07/14/92	WHITE SUCKER	261	.6	11	<.1	<.5	.2
B-08	2LND1	07/13/92	LONGNOSE DACE	113	.5	13	.2	<.5	<.1
B-08	2SCL1	07/13/92	MOTTLED SCULPIN	164	<.5	16	<.1	.7	<.1
B-08	2WS1	07/13/92	WHITE SUCKER	773	.9	30	<.1	.8	<.1
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
B-09	PL-30	05/24/91	BLACK CRAPPIE	25	<.5	<2.4	<.3	2.9	<.5
B-09	PL-31	05/24/91	BLACK CRAPPIE	56	<.5	<2.4	<.3	<2.4	<.5
B-09	PL-34	05/24/91	BLACK CRAPPIE	195	<.5	<2.4	<.3	<2.4	<.5
B-09	PL-32	05/24/91	BLACK CRAPPIE	127	<.5	<2.3	<.3	3.7	<.5
B-09	PL-33	05/24/91	BLACK CRAPPIE	230	<.5	2.9	<.3	2.6	<.5
B-09	PL-35	05/24/91	BLACK CRAPPIE	196	<.5	<2.4	<.3	<2.4	<.5
B-09	FL-BM-1	05/24/91	BRASSY MINNOW	194	1.7	6.6	<.3	4.8	<.5
B-09	FL-SB-7	05/24/91	BROOK STICKLEBACK	201	.9	12	<.3	<2.4	<.5
B-09	PL-23	05/24/91	CARP	174	<.5	<2.3	<.3	<2.3	<.5
B-09	PL-25	05/24/91	CARP	77	<.5	<2.4	<.3	<2.4	<.5
B-09	PL-24	05/24/91	CARP	112	<.5	<2.4	<.3	<2.4	<.5
B-09	FL-FHM-7	05/24/91	FATHEAD MINNOW	288	.9	4.2	<.3	3.4	<.5
B-09	FL-FHM-6	05/24/91	FATHEAD MINNOW	177	.9	3.6	<.3	3.4	<.5
B-09	PL-36	05/24/91	TIGER SALAMANDER	231	.6	1.5	<.1	7.6	<.1
B-09	PL-38	05/24/91	TIGER SALAMANDER	248	.7	2.0	<.1	3.4	<.1
B-09	PL-40	05/24/91	TIGER SALAMANDER	496	.8	5.3	<.1	4.6	<.1
B-09	PL-37	05/24/91	TIGER SALAMANDER	284	.8	2.1	<.1	5.9	<.1
B-09	PL-39	05/24/91	TIGER SALAMANDER	254	.7	2.0	<.1	4.4	<.1
B-09	PL-12-WS	05/24/91	WHITE SUCKER	153	<.5	<2.4	<.3	3.7	<.5
B-09	Pl-7-WS	05/24/91	WHITE SUCKER	121	<.5	<2.4	<.3	<2.4	<.5
B-09	PL-2-WS	05/24/91	WHITE SUCKER	199	<.5	<2.3	<.3	<2.3	<.5
B-09	PL-1	05/24/91	YELLOW PERCH	317	<.5	<2.4	<.3	<2.4	<.5
B-11	4STK1	07/14/92	BROOK STICKLEBACK	177	<.5	9.0	<.1	1.3	<.1
B-11	5STK1	07/14/92	BROOK STICKLEBACK	162	1.9	13	<.1	2.0	.2
B-11	4BRT1	07/14/92	BROWN TROUT	32	<.5	2.0	<.1	<.5	<.1

Table 23. Results of trace-element analyses of fish and amphibians from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					GREENFIELDS IRRIGATION DIVISION								
B-01	<2.4	7.3	108	1,350	25	<0.1	<5.0	<2.5	<2.5	7.8	1,170	<4.0	180
B-02	<2.4	7.2	179	1,760	21	.1	<4.9	3.2	<2.5	32	1,030	<3.9	143
B-03	<2.4	6.4	122	1,390	27	<.1	<5.0	<2.5	<2.5	7.6	1,200	<4.0	154
B-04	<2.3	8.3	171	1,820	52	<.1	<4.9	<2.4	<2.4	22	254	<3.9	170
B-04	4.9	8.5	153	1,880	45	<.1	<4.9	<2.5	<2.5	26	165	<3.9	208
B-04	<2.4	4.6	881	2,370	21	<.1	<5.0	<2.5	<2.5	33	313	<4.0	154
B-04	<2.4	9.9	597	2,320	18	.7	<4.9	<2.5	<2.5	11	234	<3.9	202
B-04	<2.4	10	520	2,170	19	<.1	<5.0	<2.5	<2.5	16	246	<4.0	233
B-05	2.7	5.0	411	1,880	21	<.1	<5.0	<2.5	3.1	9.1	158	<4.0	175
B-06	1.3	4.0	494	1,120	11	<.1	<.5	.7	.7	6.6	126	1.1	162
B-06	6.8	5.4	932	1,560	39	<.1	<.5	1.7	1.2	5.9	230	5.0	116
B-07	5.3	5.7	91	1,160	4.5	.4	<.5	<.5	<.5	3.9	43	<.5	131
B-07	3.0	5.2	100	1,240	7.8	.2	<.5	.6	<.5	5.5	95	<.5	112
B-07	9.8	7.6	255	1,400	19	<.2	<1.7	6.8	<1.7	8.3	96	<1.7	98
B-07	1.2	88	143	1,160	13	.2	<.5	<.5	.6	7.7	37	<.5	130
B-07	7.2	1.3	309	1,450	19	.2	<.5	1.0	<.5	2.5	70	1.3	89
B-08	7.4	2.9	166	1,310	10	.3	<.5	1.4	<.5	5.3	104	<.5	110
B-08	2.2	1.3	197	1,650	20	.3	<.5	<.5	<.5	3.7	165	1.4	101
B-08	2.0	6.8	968	2,010	25	.1	<.5	1.4	1.4	3.5	99	2.1	128
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA								
B-09	<2.4	<2.4	30	1,380	<3.0	.3	<5.0	<2.5	<2.5	57	37	<4.0	35
B-09	<2.4	<2.4	<29	1,370	<2.9	.2	<4.9	<2.5	<2.5	63	108	<3.9	44
B-09	<2.4	<2.4	<30	1,780	14	.2	<5.0	<2.5	<2.5	40	813	<4.0	51
B-09	<2.3	<2.3	54	1,380	6.0	.2	<4.9	<2.4	<2.4	47	326	<3.9	76
B-09	<2.4	<2.4	44	1,780	11	.1	<4.9	<2.5	3.6	39	902	<3.9	73
B-09	<2.4	<2.4	48	1,620	9.3	.1	<5.0	<2.5	<2.5	41	689	<4.0	68
B-09	5.0	3.6	132	1,620	8.6	<.1	<4.9	<2.4	<2.4	29	391	<3.9	208
B-09	<2.4	4.7	107	1,930	18	<.1	<5.0	<2.5	<2.5	35	771	<4.0	153
B-09	<2.3	7.7	94	1,560	3.6	<.1	<4.9	<2.4	<2.4	32	325	<3.9	141
B-09	<2.4	5.1	79	772	<3.0	<.1	<5.0	<2.5	<2.5	19	161	<4.0	133
B-09	<2.4	<2.4	69	1,070	<2.9	<.1	<4.9	<2.5	<2.5	32	277	<3.9	131
B-09	<2.4	4.9	143	2,190	5.9	<.1	<5.0	<2.5	<2.5	25	242	<4.0	115
B-09	<2.4	4.5	102	1,740	4.8	.1	<5.0	<2.5	<2.5	25	198	<4.0	103
B-09	2.2	4.2	119	1,940	10	<.1	<.5	<.5	1.1	49	271	<.5	179
B-09	.7	8.8	173	1,560	4.8	<.1	<.5	<.5	<.5	33	134	<.5	96
B-09	.9	10	261	2,310	14	<.1	<.5	<.5	.7	51	348	.5	175
B-09	14	11	191	1,780	5.3	<.1	<.5	<.5	<.5	30	170	<.5	115
B-09	.9	7.8	195	1,660	7.2	<.1	<.5	<.5	<.5	52	170	<.5	116
B-09	<2.4	6.1	52	1,390	3.4	.1	<4.9	<2.5	<2.5	29	227	<3.9	51
B-09	<2.4	3.9	59	1,480	<3.0	<.1	<5.0	<2.5	<2.5	28	163	<4.0	55
B-09	<2.3	2.9	38	1,640	4.2	<.1	<4.9	<2.4	<2.4	25.3	392	<3.9	52
B-09	3.2	6.1	100	2,860	10	.1	<4.9	<2.5	<2.5	67	642	<4.0	110
B-11	1.1	3.8	174	1,250	27	.3	<.5	<.5	.5	2.9	53	<.5	91
B-11	1.4	21	230	1,680	36	.9	<.5	1.9	.6	15	86	<.5	281
B-11	1.0	2.6	42	1,220	31	.3	<.5	<.5	<.5	3.7	43	<.5	126

Table 23. Results of trace-element analyses of fish and amphibians from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued						
B-11	4BRT4	07/14/92	BROWN TROUT	16	<.5	.5	<.1	<.5	<.1
B-11	4BRT5	07/14/92	BROWN TROUT	27	<.5	1.8	<.1	<.5	<.1
B-11	5BRT1	07/14/92	BROWN TROUT	41	<.5	1.2	<.1	1.3	<.1
B-11	5BRT2	07/14/92	BROWN TROUT	63	<.5	2.5	<.1	<.5	<.1
B-11	5BRT4	07/14/92	BROWN TROUT	59	<.5	4.2	<.1	<.5	<.1
B-11	4LND1	07/14/92	LONGNOSE DACE	49	<.5	14	<.1	<.5	<.1
B-11	5LND1	07/14/92	LONGNOSE DACE	95	<.5	13	<.1	<.5	.1
B-11	5WHI1	07/14/92	MOUNTAIN WHITEFISH	73	<.5	1.8	<.1	<.5	<.1
B-11	4WS2	07/14/92	WHITE SUCKER	300	.6	16	<.2	1.4	<.2
B-11	5WS1	07/14/92	WHITE SUCKER	218	<.5	17	<.2	<1.0	<.2
B-12	FLSB003	08/14/91	BROOK STICKLEBACK	175	<.5	17	<.1	6.2	<.1
B-13	FLBM001	08/19/91	BRASSY MINNOW	460	.9	18	<.1	2.6	<.1
B-13	FLFM001	08/16/91	FATHEAD MINNOW	588	1.5	85	<.2	15	<.2
B-14	FLSB005	08/15/91	BROOK STICKLEBACK	224	<.5	14	<.1	2.4	<.1
B-15	FLSB002	08/08/91	BROOK STICKLEBACK	182	<.5	13	<.1	2.2	<.1
B-15	FL-TS-1	08/14/91	TIGER SALAMANDER	424	1.8	12	.2	6.9	.5
B-16	FLSB001	08/08/91	BROOK STICKLEBACK	183	<1.1	13	<.2	<1.1	<.2
B-18	FL-SB-6	04/26/91	BROOK STICKLEBACK	258	<.5	20	<.3	<2.4	<.5
B-19	FL-FHM-1	04/15/91	FATHEAD MINNOW	318	.8	33	<.3	<2.4	<.5
B-19	FL-FHM-2	04/15/91	FATHEAD MINNOW	1,500	4.5	38	<.3	10	<.5
			BENTON LAKE NATIONAL WILDLIFE REFUGE						
B-21	BL9201FM	08/07/92	FATHEAD MINNOW	247	1.2	15	<.5	<2.3	<.5
B-23	BL9203FM	08/12/92	FATHEAD MINNOW	840	1.8	16	<.2	3.3	.3
B-26	BL9204FM	08/13/92	FATHEAD MINNOW	309	1.1	13	<.2	2.0	<.2

Table 23. Results of trace-element analyses of fish and amphibians from the Sun River area, Montana (Continued)

Site number (fig. 5-7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued													
B-11	.7	4.2	36	985	1.8	.3	<.5	<.5	<.5	8.9	20	<.5	82
B-11	.9	37	55	1,260	2.9	.5	<.5	<.5	1.5	12	41	<.5	110
B-11	.8	4.2	118	1,050	4.6	.3	<.5	<.5	<.5	4.2	44	<.5	151
B-11	1.3	5.1	73	1,730	10	.3	<.5	<.5	<.5	4.2	74	<.5	196
B-11	1.1	4.0	66	1,480	17	.3	<.5	<.5	<.5	4.0	77	<.5	193
B-11	1.4	4.2	90	1,300	11	.5	<.5	<.5	<.5	7.7	95	<.5	156
B-11	1.1	10	137	1,610	12	.4	<.5	<.5	.8	7.1	103	<.5	164
B-11	1.1	2.5	88	1,140	8.0	.3	<.5	<.5	<.5	5.4	26	<.5	86
B-11	1.6	5.4	393	1,600	22	.2	<1.2	<1.2	1.4	4.0	70	<1.2	99
B-11	<1.0	5.1	300	1,790	18	.2	<1.0	<1.0	<1.0	4.5	78	<1.0	122
B-12	.6	7.0	64	1,530	32	<.1	<.5	1.5	<.5	5.3	138	<.5	121
B-13	.9	11	237	2,070	18	.1	<.5	<.5	3.0	4.2	197	.8	184
B-13	7.6	9.6	353	2,550	32	<.2	<.9	1.3	2.6	4.8	168	<.9	173
B-14	.6	8.8	116	1,570	32	<.1	<.5	.5	<.5	3.3	185	<.5	137
B-15	.8	11	82	1,480	29	<.1	<.5	<.5	<.5	7.0	148	<.5	132
B-15	1.0	16	215	2,470	11	<.1	<.5	.5	<.5	4.9	119	.8	134
B-16	<1.1	32	203	2,310	35	<.2	1.3	<1.1	<1.1	6.1	34	<1.1	153
B-18	<2.4	7.2	144	1,570	19	<.1	<4.9	<2.5	<2.5	17	1,090	<4.0	168
B-19	3.9	5.1	210	1,560	10	.2	<4.9	<2.5	<2.5	7.9	774	<3.9	161
B-19	<2.4	65	825	7,060	46	<.1	<5.0	2.9	<2.5	21	941	<4.0	70
BENTON LAKE NATIONAL WILDLIFE REFUGE													
B-21	23	26	302	1,910	11	<.2	<2.3	<2.3	<2.3	5.1	196	<2.3	187
B-23	7.4	5.9	758	2,420	24	<.2	<1.1	2.0	1.3	2.5	201	2.4	168
B-26	3.3	4.8	341	2,340	16	<.2	<1.1	<1.1	<1.1	2.8	152	<1.1	148

Table 24. Results of trace-element analyses of eared grebe eggs from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
B-16	EG2-19	07/03/91	67	<0.5	<2.3	<0.3	<2.3	<0.5	<2.3
B-16	EG2-21	07/03/91	37	<.5	<2.4	<.3	5.6	<.5	<2.4
B-16	EG2-08	07/03/91	43	<.5	<2.4	<.3	2.9	<.5	<2.4
B-16	EG2-09	07/03/91	42	<.5	<2.3	<.3	2.4	<.5	<2.3
B-16	EG2-06	07/03/91	32	<.5	<2.4	.5	4.1	<.5	<2.4
B-19	EG1-01	06/12/91	63	<.5	<2.4	<.3	3.4	<.5	<2.4
B-19	EG1-02	06/12/91	45	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-19	EG1-08	06/12/91	58	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-22	06/12/91	33	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-32	06/12/91	53	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-12	06/21/91	62	<.5	<2.4	.6	4.9	<.5	<2.4
B-19	EG1-24	06/21/91	25	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-19	EG1-25	06/21/91	<20	<.5	<2.4	<.3	5.5	<.5	<2.4
B-19	EG1-26	06/21/91	58	<.5	<2.4	<.3	3.4	<.5	<2.4
B-19	EG1-30	06/21/91	54	<.5	<2.4	<.3	2.6	<.5	<2.4
B-19	EG1-31	06/21/91	42	.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-11	06/21/91	32	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-19	EG1-15	06/26/91	29	<.5	<2.4	<.3	2.6	<.5	<2.4
B-19	EG1-27	06/26/91	40	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-R01	06/26/91	65	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-19	06/26/91	39	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-R02	06/26/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-19	EG1-28	06/26/91	55	<.5	<2.3	<.3	2.6	<.5	<2.3
B-19	EG1-33	07/03/91	22	<.5	<2.4	<.3	5.5	<.5	<2.4
B-19	EG1-35	07/03/91	50	<.5	<2.4	<.3	<2.4	<.5	3.3
B-19	EG1-34	07/03/91	43	<.5	<2.4	<.3	3.2	<.5	<2.4
			BENTON LAKE NATIONAL WILDLIFE REFUGE						
B-21	EG-I-1	05/26/88	<3.0	<5.0	1.8	<.1	<2.0	<.3	<1.0
B-21	EG-I-2	05/26/88	<3.0	<5.0	1.2	<.1	<2.0	<.3	<1.0
B-21	EG-I-3	05/26/88	<3.0	<5.0	.9	<.1	<2.0	<.3	<1.0
B-21	EG-I-4	05/26/88	<3.0	<5.0	1.5	<.1	<2.0	<.3	<1.0
B-21	EG-I-5	05/26/88	<3.0	<5.0	2.6	<.1	<2.0	<.3	<1.0
B-21	EG-I-6	05/26/88	<3.0	<5.0	1.1	<.1	<2.0	<.3	<1.0
B-21	EG-I-7	05/26/88	<3.0	<5.0	1.5	<.1	<2.0	<.3	<1.0
B-21	EG-I-8	05/26/88	<3.0	<5.0	.9	<.1	<2.0	<.3	<1.0
B-21	EG-I-9	05/26/88	<3.0	<4.0	1.0	<.1	<2.0	<.3	<1.0
B-21	EG-I-10	05/26/88	4.0	<5.0	1.0	<.1	<2.0	<.3	<1.0
B-21	EG-I-11	05/26/88	<3.0	<5.0	1.2	<.1	<2.0	<.3	<1.0
B-21	EG-I-12	05/26/88	<3.0	<5.0	.8	<.1	<2.0	<.3	<1.0
B-21	EG-I-13	05/26/88	<3.0	<5.0	1.3	<.1	<2.0	<.3	<1.0
B-21	BL-EG13-1	06/30/88	<6.3	--	3.6	<.03	<.8	<.4	.6
B-21	B1G-15	06/18/91	28	<.5	<2.4	<.3	<2.4	<.5	<2.4

Table 24. Results of trace element analyses of eared grebe eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-16	4.1	172	758	<2.9	0.2	<4.9	<2.4	5.8	13	31	<3.9	57
B-16	3.6	147	515	<3.0	<.1	<4.9	3.2	<2.5	18	19	<3.9	48
B-16	3.5	152	518	<3.0	.2	<4.9	<2.5	3.1	16	21	<3.9	52
B-16	4.1	106	429	<2.9	<.1	<4.9	<2.4	5.1	11	16	<3.9	47
B-16	13	107	465	<3.0	.2	<4.9	2.5	7.9	10	11	<3.9	45
B-19	3.7	213	660	4.3	.3	<4.9	<2.5	<2.5	17	85	<3.9	63
B-19	2.9	160	657	<2.9	.4	<4.8	<2.4	<2.4	12	79	<3.9	52
B-19	3.7	114	672	<3.0	.2	<4.9	<2.5	<2.5	14	73	<3.9	61
B-19	3.5	124	445	<2.9	.2	<4.9	<2.5	<2.5	12	44	<3.9	37
B-19	4.0	168	714	<3.0	.2	<4.9	<2.5	<2.5	14	108	<4.0	61
B-19	4.5	145	640	<3.0	.2	<5.0	3.4	<2.5	15	100	<4.0	63
B-19	3.1	145	421	<2.9	.2	<4.9	<2.5	<2.4	10	48	<3.9	50
B-19	3.9	206	339	<3.0	.3	<4.9	<2.5	<2.5	11	34	<4.0	56
B-19	3.4	171	697	<3.0	.3	<4.9	<2.5	<2.5	12	109	<3.9	63
B-19	3.3	187	728	<3.0	.2	<5.0	<2.5	<2.5	13	69	<4.0	69
B-19	3.3	117	628	4.8	.6	<4.9	<2.5	<2.5	16	72	<3.9	46
B-19	3.4	150	640	<2.9	.1	<4.9	<2.4	<2.4	17	53	<3.9	53
B-19	3.4	113	449	<3.0	.3	<5.0	<2.5	<2.5	15	70	<4.0	50
B-19	4.3	194	680	<3.0	.2	<5.0	<2.5	<2.5	18	43	<4.0	58
B-19	5.2	172	747	<3.0	.2	<5.0	<2.5	<2.5	17	151	<4.0	72
B-19	3.4	135	627	<3.0	.3	<5.0	<2.5	<2.5	14	52	<4.0	51
B-19	3.2	119	415	4.9	.1	<5.0	<2.5	<2.5	17	39	<4.0	42
B-19	3.7	147	708	3.9	.4	<4.9	<2.4	<2.4	12	118	<3.9	62
B-19	3.3	118	358	<3.0	.4	<5.0	<2.5	<2.5	11	39	<4.0	39
B-19	4.6	178	641	<3.0	.2	<5.0	<2.5	<2.5	16	87	<4.0	62
B-19	3.9	168	592	<3.0	.2	<5.0	<2.5	<2.5	11	87	<4.0	51
					BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-21	3.2	146	483	2.1	--	<1.0	<2.0	<4.0	9.4	16	<.3	60
B-21	1.6	78	283	1.8	--	<1.0	<2.0	<4.0	5.9	11	<.3	34
B-21	2.0	110	413	3.2	--	<1.0	<2.0	<4.0	11	10	<.3	54
B-21	2.7	185	479	3.0	--	<1.0	<2.0	<4.0	10.	14	<.3	58
B-21	2.5	166	487	2.5	--	<1.0	<2.0	<4.0	7.9	19	<.3	57
B-21	3.5	150	405	4.7	--	<1.0	<2.0	<4.0	10	15	<.3	58
B-21	2.6	112	404	2.3	--	<1.0	<2.0	<4.0	7.8	15	<.3	50
B-21	2.3	133	431	4.0	--	<1.0	<2.0	<4.0	11	14	<.3	47
B-21	2.9	104	643	3.0	--	<1.0	<2.0	<4.0	9.6	13	<.3	49
B-21	3.1	163	387	5.5	--	<1.0	<2.0	<4.0	10	11	<.3	60
B-21	2.4	150	419	5.6	--	<1.0	<2.0	<4.0	9.4	14	<.3	44
B-21	2.2	175	373	3.8	--	<1.0	<2.0	<4.0	9.8	12	<.3	50
B-21	2.9	62	431	3.1	--	<1.0	<2.0	<4.0	7.0	13	<.3	49
B-21	3.6	153	897	3.5	--	<7.0	<4.5	<9.0	12	39	<.6	59
B-21	3.5	182	495	<3.0	.3	<5.0	<2.5	<2.5	13	20	<4.0	53

Table 24. Results of trace-element analyses of eared grebe eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-21	B1G-01	06/18/91	<20	<.5	<2.4	<.3	2.7	<.5	<2.4
B-21	B1G-04	06/18/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-07	06/18/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-09	06/18/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-11	06/18/91	31	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-14	06/18/91	55	<.5	<2.4	<.3	5.7	<.5	<2.4
B-21	B1G-03	06/18/91	60	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-05	06/18/91	<19	<.5	<2.3	<.3	5.0	<.5	<2.3
B-21	B1G-08	06/18/91	<44	<.5	<2.3	<.3	4.0	<.5	<2.3
B-21	B1G-10	06/18/91	68	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-13	06/18/91	51	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B1G-18	07/16/91	41	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-23	EG3	07/20/89	<4.3	--	<2.2	<.2	<2.2	<.2	.6
B-23	EG4	07/20/89	<4.0	--	<2.0	<.2	<2.0	<.2	.8
B-23	EG5	07/20/89	<3.7	--	<1.9	<.2	<1.9	<.2	.8
B-23	EG6	07/20/89	<3.8	--	<1.9	<.2	<1.9	<.2	.6
B-23	EG7	07/20/89	<3.7	--	<1.8	<.2	<1.8	<.2	.6
B-23	EG8	07/20/89	<3.4	--	3.0	<.2	<1.7	<.2	<.3
B-23	EG9	07/20/89	<3.8	--	2.1	<.2	<1.9	<.2	.4
B-23	EG10	07/20/89	<4.3	--	2.6	<.2	<2.1	<.2	.5
B-23	EG2	07/20/89	<3.8	--	<1.9	<.2	<1.9	<.2	<.4
B-23	EG1	07/20/89	<3.5	--	<1.8	<.2	<1.8	<.2	.4
B-25	EG-IVB-4	06/30/88	<3.0	--	.8	<.1	<2.0	<.3	<1.0
B-25	EG-IVB-5	06/30/88	<3.0	--	.8	<.1	<2.0	<.3	<1.0
B-25	EG-IVB-1	06/30/88	5.0	--	.8	<.1	<2.0	<.3	3.7
B-25	EG-IVB-3	06/30/88	5.0	--	.5	<.1	<2.0	<.3	<1.0
B-25	EG-IVB-2	06/30/88	<3.0	--	.4	<.1	<2.0	<.3	<1.0
B-26	B2G-02	06/25/91	20	<.5	<2.4	<.3	3.9	<.5	<2.4
B-26	B2G-04	06/25/91	51	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-26	B2G-06	06/25/91	30	<.5	<2.4	<.3	4.8	<.5	<2.4
B-26	B2G-08	06/25/91	27	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-26	B2G-07	06/25/91	50	<.5	<2.4	<.3	2.6	<.5	<2.4
B-26	B2G-09	06/25/91	63	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-26	B2G-01	06/25/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-26	B2G-03	06/25/91	743	<.5	3.6	<.3	26	<.5	<2.3
B-26	B2G-05	06/25/91	91	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-26	B2G-03B	07/02/91	104	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-26	B2G-07B	07/02/91	66	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-26	B2G-12	07/02/91	50	<.5	<2.4	<.3	5.7	<.5	<2.4

Table 24. Results of trace element analyses of eared grebe eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued												
B-21	2.4	64	339	3.3	.1	<4.9	<2.5	<2.5	10	7.8	<3.9	40
B-21	2.7	107	326	<3.0	.1	<5.0	<2.5	<2.5	8.6	6.3	<4.0	41
B-21	2.5	151	393	3.6	.3	<4.9	<2.5	<2.5	14	10	<3.9	48
B-21	2.7	135	476	3.1	.1	<5.0	<2.5	<2.5	8.3	9.2	<4.0	41
B-21	<2.4	122	441	<3.0	.3	<5.0	<2.5	<2.5	11	19	<4.0	51
B-21	3.7	120	689	3.1	.5	<5.0	<2.5	<2.5	18	17	<4.0	60
B-21	3.4	130	613	<3.0	.6	<5.0	<2.5	<2.5	20	25	<4.0	56
B-21	2.6	118	335	3.1	.2	<4.8	<2.4	<2.4	12	8.9	<3.9	39
B-21	3.3	156	563	4.8	.1	<4.9	<2.4	<2.4	12	26	<3.9	49
B-21	3.3	150	658	<3.0	.3	<4.9	<2.5	<2.5	14	43	<3.9	58
B-21	2.6	161	577	3.1	.3	<5.0	<2.5	<2.5	15	17	<4.0	51
B-21	2.6	150	587	<3.0	.3	<5.0	<2.5	<2.5	13	11	<4.0	51
B-23	6.2	194	558	4.2	--	<2.2	<1.7	<1.3	8.2	12	<2.2	59
B-23	5.1	139	698	4.2	--	<2.0	<1.6	<1.2	7.7	10	<2.0	55
B-23	4.8	156	637	4.3	--	<1.9	<1.5	<1.1	4.8	15	<1.9	66
B-23	4.7	105	438	6.0	--	<1.9	<1.5	<1.1	4.2	7.1	<1.9	57
B-23	4.2	156	533	3.5	--	<1.8	<1.5	<1.1	4.4	8.8	<1.8	58
B-23	4.1	153	530	7.0	--	<1.7	<1.3	<1.1	5.0	10	<1.7	57
B-23	4.6	156	569	3.5	--	<1.9	<1.5	<1.1	4.5	8.2	<1.9	58
B-23	6.5	160	<43	6.9	--	<2.1	<1.7	<1.3	6.0	11	<2.1	62
B-23	5.2	134	300	3.8	--	<1.9	<1.5	<1.1	7.9	6.4	<1.9	62
B-23	5.2	150	626	4.1	--	<1.8	<1.4	<1.1	5.6	9.0	<1.8	48
B-25	3.1	164	768	3.8	--	<1.0	<2.0	<4.0	8.3	11	<.3	54
B-25	3.4	163	1,290	5.2	--	<1.0	<2.0	<4.0	7.8	11	<.3	58
B-25	4.5	175	1,090	6.2	--	<1.0	3.0	<4.0	5.8	24	<.3	67
B-25	3.5	123	795	4.6	--	<1.0	<2.0	<4.0	7.9	8.5	<.3	56
B-25	3.7	147	607	3.9	--	<1.0	<2.0	<4.0	7.7	10	<.3	53
B-26	3.7	133	400	3.0	.3	<5.0	<2.5	<2.5	6.3	7.7	<4.0	41
B-26	5.0	186	820	3.6	.2	<5.0	<2.5	<2.5	7.1	19	<4.0	63
B-26	3.8	119	480	<3.0	.2	<5.0	<2.5	<2.5	6.5	11	<4.0	47
B-26	3.8	159	787	<2.9	.3	<4.8	<2.4	<2.4	8.7	16	<3.9	48
B-26	4.1	123	662	<3.0	.3	<4.9	<2.5	<2.5	6.4	25	<3.9	54
B-26	3.8	144	834	2.9	.2	<4.9	<2.4	<2.4	6.9	24	<3.9	63
B-26	3.1	119	405	<2.9	.3	<4.9	<2.5	<2.5	8.4	8.0	<3.9	42
B-26	46	2,020	7,750	47	.1	<4.9	18	<2.4	9.1	225	<3.9	627
B-26	4.2	218	729	6.6	.3	<5.0	<2.5	<2.5	5.7	31	<4.0	61
B-26	3.6	293	732	5.0	.2	<5.0	<2.5	<2.5	11	23	<4.0	61
B-26	3.7	149	977	5.7	.4	<4.8	<2.4	<2.4	7.5	27	<3.9	57
B-26	3.4	175	742	<3.0	.5	<5.0	<2.5	<2.5	5.5	17	<4.0	50

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana

[Concentrations in microgram per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
B-09	PBGA-01	06/17/91	GADWALL	20	<0.5	8.0	<0.3	<2.3	<0.5
B-09	PB-SH01	05/29/91	NORTHERN SHOVELER	21	<.3	9.1	<.1	<.4	<.1
B-09	PB-SHO2	06/13/91	NORTHERN SHOVELER	<20	<.5	4.3	<.3	3.7	<.5
B-12	FL-SC36	06/14/89	LESSER SCAUP	<2.9	--	5.0	<.2	<1.4	<.1
B-12	FL-SC37	06/14/89	LESSER SCAUP	3.2	--	3.8	<.2	<1.5	<.2
B-12	21E#1A	06/27/91	NORTHERN SHOVELER	69	<.5	2.8	<.3	4.5	<.5
B-12	21E#14	07/17/91	NORTHERN SHOVELER	47	<.5	<2.4	<.3	5.1	<.5
B-14	FL-G67	06/14/89	AMERICAN WIGEON	<3.1	--	16	<.2	2.8	<.2
B-14	FL-G68	06/14/89	GADWALL	--	--	--	--	--	--
B-14	FL-G70	06/14/89	GADWALL	--	--	--	--	--	--
B-14	FL-G66	06/14/89	GADWALL	--	--	--	--	--	--
B-14	FL-G141	07/14/89	GADWALL	--	--	--	--	--	--
B-14	FL-G69	07/14/89	GADWALL	--	--	--	--	--	--
B-14	FL-SC9	06/03/89	LESSER SCAUP	<2.8	--	3.6	<.1	1.5	<.1
B-14	FL-SC38	06/14/89	LESSER SCAUP	<3.0	--	4.6	<.2	<1.5	<.2
B-14	FL-SC39	06/14/89	LESSER SCAUP	<3.0	--	4.4	<.2	<1.5	<.2
B-14	FL-SC40	06/14/89	LESSER SCAUP	<2.9	--	1.9	<.2	<1.5	<.1
B-14	31N#39	06/26/91	LESSER SCAUP	21	<.5	3.1	<.3	<2.4	<.5
B-14	L3#15	06/29/91	LESSER SCAUP	28	<.5	<2.3	<.3	4.1	<.5
B-14	31N#38	07/01/91	LESSER SCAUP	<20	<.5	12	<.3	<2.4	<.5
B-14	FL-M30	05/20/89	MALLARD	7.0	--	8.9	<.2	3.8	.4
B-14	FL-M31	05/20/89	MALLARD	<2.9	--	6.6	<.2	<1.5	<.2
B-14	FL-PT28	05/20/89	MALLARD	<3.3	--	11	<.2	3.1	.3
B-14	FL-SH26	06/03/89	NORTHERN SHOVELER	<2.9	--	<1.5	<.2	<1.5	<.2
B-14	31S#6	06/17/91	NORTHERN SHOVELER	50	<.5	<2.4	<.3	<2.4	<.5
B-14	31S#9	06/17/91	NORTHERN SHOVELER	27	<.5	<2.4	<.3	<2.4	<.5
B-14	31N#37	06/26/91	NORTHERN SHOVELER	55	<.5	<2.4	<.3	<2.4	<.5
B-14	31S#17	06/26/91	NORTHERN SHOVELER	49	<.5	<2.4	<.3	3.4	<.5
B-14	31N#35	07/01/91	NORTHERN SHOVELER	<49	<.5	<4.9	<.5	< 4.9	<.5
B-14	31S#49	07/11/91	NORTHERN SHOVELER	75	<.5	<2.4	<.3	2.4	<.5
B-14	FL-T24	06/03/89	TEAL	<2.9	--	2.7	<.2	<1.5	<.2
B-14	FL-T46	06/14/89	TEAL	<3.2	--	2.8	<.2	<1.6	<.2
B-14	FL-T51	06/14/89	TEAL	<2.9	--	2.4	<.2	1.8	<.2
B-14	FL-T48	06/26/89	TEAL	<2.9	--	2.0	<.2	<1.5	<.2
B-16	INC#987	07/02/91	LESSER SCAUP	22	<.5	5.4	<.3	<2.4	<.5
B-16	1W#14	07/10/91	LESSER SCAUP	52	<.5	5.1	<.3	<2.4	<.5
B-16	FLM-K02	05/18/90	MALLARD	<5.0	.4	3.7	<.1	.8	<.1
B-16	FLM-V04	05/18/90	MALLARD	<5.0	.3	7.7	<.1	1.2	<.1
B-16	1W#26	07/10/91	NORTHERN SHOVELER	102	<.5	<2.4	<.3	<2.4	<.5
B-16	FLRE-01D	06/26/91	REDHEAD	<49	<.5	16	<.5	< 4.9	<.5

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA								
B-09	<2.3	3.2	96	290	<2.9	0.1	<4.9	<2.4	<2.4	4.0	5.5	<3.9	55
B-09	<.4	1.9	122	291	1.3	1.0	<.4	<.5	<.5	7.3	12	<.4	52
B-09	<2.4	3.2	129	293	<3.0	.7	<4.9	<2.5	<2.5	5.6	11	<3.9	62
B-12	.7	4.0	64	410	.6	--	<1.4	<1.2	<.9	2.4	16	<1.4	55
B-12	<.3	3.9	146	425	1.3	--	<1.5	<1.2	1.1	1.8	17	<1.5	64
B-12	<2.4	3.3	136	655	3.1	.4	<5.0	<2.5	<2.5	8.9	26	<4.0	60
B-12	<2.4	5.4	117	473	<3.0	5.4	<5.0	<2.5	<2.5	7.2	13	<4.0	55
B-14	<.3	4.6	134	527	2.2	--	<1.6	<1.3	.9	1.4	14	<1.6	60
B-14	--	--	--	--	--	--	--	--	--	4.6	--	--	--
B-14	--	--	--	--	--	--	--	--	--	3.5	--	--	--
B-14	--	--	--	--	--	--	--	--	--	4.5	--	--	--
B-14	--	--	--	--	--	--	--	--	--	2.9	--	--	--
B-14	--	--	--	--	--	--	--	--	--	3.7	--	--	--
B-14	.6	4.0	39	361	2.8	--	2.5	<1.1	<.8	1.4	66	<1.4	66
B-14	<.3	4.5	141	353	2.5	--	<1.5	<1.2	<.9	1.3	41	<1.5	63
B-14	1.2	3.8	128	378	1.6	--	<1.5	<1.2	<.9	1.9	53	<1.5	56
B-14	<.3	4.7	95	359	1.9	--	<1.5	<1.2	<.9	2.0	54	<1.5	60
B-14	<2.4	3.1	114	312	<3.0	.1	<5.0	<2.5	<2.5	4.5	66	<4.0	51
B-14	<2.3	4.1	130	448	<2.9	.2	<4.9	<2.4	<2.4	3.6	35	<3.9	53
B-14	<2.4	3.1	136	392	<3.0	<.1	<5.0	<2.5	<2.5	5.1	16	<4.0	46
B-14	.8	3.3	98	352	1.3	--	<1.5	1.2	<.9	1.9	31	<1.5	55
B-14	.7	4.8	104	464	1.3	--	<1.5	<1.2	<.9	.9	22	<1.5	55
B-14	.7	3.3	122	474	1.2	--	1.9	<1.3	<1.0	2.8	32	<1.6	61
B-14	.4	3.5	37	371	.6	--	2.0	<1.2	<.9	1.5	43	2.5	51
B-14	<2.4	3.0	113	417	<2.9	.2	<4.9	<2.5	<2.5	3.1	24	<3.9	62
B-14	<2.4	3.6	93	426	<3.0	.3	<5.0	<2.5	<2.5	2.3	17	<4.0	60
B-14	<2.4	3.3	102	535	<3.0	.3	<5.0	<2.5	<2.5	5.5	42	<4.0	66
B-14	<2.4	4.6	101	404	<3.0	1.7	<5.0	<2.5	<2.5	5.0	74	<4.0	57
B-14	<5.0	<5.0	117	344	<3.9	.3	<4.9	<4.9	<4.9	2.8	15	<3.9	59
B-14	<2.4	2.8	72	548	<3.0	.3	<4.9	<2.5	<2.5	3.0	46	<3.9	61
B-14	.8	5.0	135	302	2.3	--	2.1	<1.2	<.9	2.4	14	<1.5	61
B-14	.6	4.4	71	366	1.9	--	1.8	<1.3	<1.0	2.1	43	2.5	65
B-14	.5	4.5	108	291	.5	--	1.5	<1.2	<.9	1.5	19	2.2	64
B-14	<.3	4.3	72	318	1.3	--	3.2	<1.2	<.9	1.6	13	2.3	62
B-16	<2.4	4.0	127	318	<3.0	.5	<5.0	<2.5	<2.5	8.4	17	<4.0	48
B-16	<2.4	3.2	123	432	<3.0	.3	<4.9	<2.5	<2.5	7.2	23	4.0	58
B-16	<.5	3.0	95	378	2.8	.1	<.8	<.8	<1.5	7.1	11	<.5	64
B-16	<.5	5.3	117	532	2.4	.1	<.8	<.8	<1.5	7.4	40	<.5	75
B-16	<2.4	3.7	88	629	<3.0	1.4	<5.0	<2.5	<2.5	2.6	67	<4.0	74
B-16	<5.0	<5.0	114	377	<3.9	<.1	<4.9	<4.9	<4.9	12	16	<3.9	50

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued						
B-16	FLRE-02D	06/26/91	REDHEAD	<50	<.5	7.8	<.5	<5.0	<.5
B-16	FLRD-01D	06/26/91	RUDDY DUCK	<20	<.5	5.2	<.3	3.7	<.5
B-16	FRD-01	07/03/91	RUDDY DUCK	<20	<.5	7.0	<.3	<2.4	<.5
B-16	P5-9A#2	07/24/91	RUDDY DUCK	33	<.5	4.6	<.3	<2.4	<.5
B-16	FRD-1-6	07/24/91	RUDDY DUCK	<49	<.5	11	<.5	<4.9	<.5
B-16	FRD-1-3	07/24/91	RUDDY DUCK	18	<.5	7.9	<.1	1.2	<.1
B-16	FRD-1-5	07/24/91	RUDDY DUCK	<49	<.5	9.0	<.5	<4.9	<.5
B-16	FRD-1-2	07/24/91	RUDDY DUCK	74	<.5	2.7	<.1	4.8	<.1
B-16	FRD-1-4	07/24/91	RUDDY DUCK	17	<.5	4.7	<.1	.8	<.1
B-17	FL-PT27	06/03/89	NORTHERN PINTAIL	<3.2	--	11	<.2	<1.6	<.2
B-18	FL-SC54	06/26/89	LESSER SCAUP	<2.7	--	1.7	<.2	<1.4	<.1
B-18	FL-SC55	06/26/89	LESSER SCAUP	<3.0	--	7.3	<.2	<1.5	<.2
B-18	FL-SC56	06/27/89	LESSER SCAUP	<2.8	--	5.0	<.2	<1.4	<.1
B-18	FL-SC57	06/27/89	LESSER SCAUP	<2.9	--	3.8	<.2	<1.4	<.1
B-18	DUN#12	06/25/91	LESSER SCAUP	77	<.5	4.3	<.3	5.0	<.5
B-18	DUN#26	07/04/91	LESSER SCAUP	36	<.5	12	<.3	<2.3	<.5
B-18	DUN#18	07/16/91	LESSER SCAUP	84	<.5	44	1.3	41	1.1
B-18	FOD26	05/27/90	MALLARD	<5.0	.3	22	<.1	3.8	<.1
B-18	FLM-125	06/06/90	MALLARD	<5.0	.4	4.5	<.1	.9	<.1
B-18	FOD31	06/23/90	MALLARD	<5.0	.7	2.5	<.1	1.0	<.1
B-19	7#4	07/02/91	LESSER SCAUP	28	<.5	5.8	<.3	5.6	<.5
B-19	P2W#18	07/13/91	LESSER SCAUP	65	<.5	3.9	<.3	<2.4	<.5
B-19	DUS#24	07/16/91	LESSER SCAUP	65	<.5	9.9	<.3	<2.4	<.5
B-19	FOG55	06/24/90	MALLARD	<5.0	.5	6.4	<.1	1.5	<.1
B-19	FOG63	06/24/90	MALLARD	<5.0	.3	4.0	.2	1.4	.3
B-19	FL-PT62	06/27/89	NORTHERN PINTAIL	<3.4	--	13	<.2	<1.7	<.2
B-19	FOG2	05/27/90	NORTHERN SHOVELER	<5.0	.3	4.2	<.1	1.4	<.1
B-19	FOG4	05/27/90	NORTHERN SHOVELER	<5.0	<.3	4.0	<.1	1.3	<.1
B-19	FOG5	05/27/90	NORTHERN SHOVELER	<5.0	<.3	6.4	<.1	1.3	<.1
B-19	FOG6	05/27/90	NORTHERN SHOVELER	<5.0	<.3	2.7	<.1	1.6	<.1
B-19	FOG8	05/27/90	NORTHERN SHOVELER	<5.0	.3	3.6	<.1	.8	<.1
B-19	FOG9	05/27/90	NORTHERN SHOVELER	<5.0	.3	5.1	<.1	.7	<.1
B-19	FOG10	05/27/90	NORTHERN SHOVELER	<5.0	<.3	2.5	<.1	<.5	<.1
B-19	FOG17	05/27/90	NORTHERN SHOVELER	<5.0	<.3	4.1	<.1	1.1	<.1
B-19	FOG25	06/24/90	NORTHERN SHOVELER	<5.0	<.3	2.9	<.1	.8	<.1
B-19	5F#10S	06/11/91	NORTHERN SHOVELER	31	<.5	<2.4	<.3	2.9	<.5
B-19	5F#4	06/21/91	NORTHERN SHOVELER	54	<.5	<2.4	<.3	<2.4	<.5
B-19	5F#6	06/21/91	NORTHERN SHOVELER	22	<.5	<2.4	<.3	<2.4	<.5
B-19	FLRD-02	07/22/91	RUDDY DUCK	<20	<.5	2.9	<.3	<2.3	<.5
B-19	DUS#36	07/25/91	RUDDY DUCK	<20	<.5	15	<.3	4.9	<.5
B-19	FL-T61	06/27/89	TEAL	<2.8	--	8.2	<.1	<1.4	<.1

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued								
B-16	<5.1	<5.1	117	338	<4.0	<.1	<5.0	<5.0	<5.0	9.4	12	<4.0	49
B-16	<2.3	2.6	144	294	<2.9	<.1	<4.9	<2.4	<2.4	8.5	7.7	<3.9	46
B-16	<2.4	3.8	78	326	<3.0	<.1	<5.0	<2.5	<2.5	8.1	5.9	<4.0	34
B-16	<2.4	4.7	120	393	<3.0	<.1	<5.0	<2.5	<2.5	7.9	12	<4.0	43
B-16	<5.0	<5.0	110	315	<3.9	<.1	<4.9	<4.9	<4.9	9.2	9.1	<3.9	45
B-16	<.5	3.7	118	345	1.1	<.1	<.5	<.5	<.5	8.9	7.2	<.5	46
B-16	<5.0	<5.0	< 98	339	<3.9	<.1	<4.9	<4.9	<4.9	8.7	11	<3.9	38
B-16	<.5	4.5	130	427	1.2	<.1	<.5	<.5	<.5	7.3	8.2	<.5	40
B-16	<.5	4.1	129	337	1.0	.3	<.5	<.5	<.5	13	5.6	<.5	43
B-17	.9	4.2	115	465	1.3	--	1.7	<1.3	<1.0	1.3	13	<1.6	55
B-18	.6	4.1	169	363	2.2	--	<1.4	<1.1	<.8	1.5	34	<1.4	62
B-18	<.3	5.0	134	420	1.8	--	<1.5	<1.2	<.9	2.3	52	<1.5	63
B-18	.7	4.4	138	412	1.3	--	<1.4	<1.1	<.8	2.6	79	<1.4	61
B-18	.5	4.5	127	445	2.0	--	<1.4	<1.2	<.9	1.8	51	<1.4	66
B-18	<2.4	4.5	118	559	<3.0	.2	<5.0	<2.5	<2.5	7.1	157	<4.0	69
B-18	<2.3	2.3	119	416	<2.9	<.1	<4.9	<2.4	<2.4	9.2	21	<3.9	48
B-18	<2.4	4.3	192	674	3.3	<.1	<5.0	7.1	3.0	8.0	67	<4.0	62
B-18	.6	2.9	106	456	1.6	<.2	<.8	<.8	<1.5	2.3	23	<.5	57
B-18	<.5	3.6	71	458	1.3	.1	<.8	<.8	<1.5	7.7	56	<.5	41
B-18	<.5	4.7	103	472	4.0	.2	<.8	<.8	<1.5	2.8	9.8	<.5	69
B-19	<2.4	2.6	126	366	<3.0	<.1	<5.0	<2.5	<2.5	9.3	29	<4.0	53
B-19	<2.3	4.7	134	547	<3.0	<.1	<5.0	<2.5	<2.5	8.6	261	<4.0	58
B-19	<2.4	<2.4	151	419	<3.0	<.1	<5.0	<2.5	<2.5	10	22	<4.0	58
B-19	<.5	3.9	106	441	.8	.3	<.8	<.8	<1.5	5.5	63	<.5	61
B-19	<.5	4.8	116	506	1.6	.6	<.8	1.1	<1.5	8.8	125	<.5	77
B-19	.9	4.2	121	469	1.7	--	<1.7	<1.4	<1.0	.9	34	<1.7	54
B-19	<.5	3.5	160	588	2.1	.4	<.8	<.8	<1.5	5.6	71	<.5	66
B-19	<.5	3.0	115	424	1.9	.5	<.8	<.8	<1.5	5.2	51	<.5	67
B-19	<.5	2.8	132	507	3.5	1.6	<.8	<.8	<1.5	5.4	53	<.5	64
B-19	<.5	3.7	150	455	1.9	.5	<.8	<.8	<1.5	5.5	47	<.5	62
B-19	<.5	3.0	147	445	3.2	.6	<.8	<.8	<1.5	5.8	51	<.5	57
B-19	<.5	3.3	93	384	2.6	1.2	<.8	<.8	<1.5	6.0	44	<.5	64
B-19	1.1	3.1	95	436	2.4	.4	<.8	<.8	<1.5	6.5	33	<.5	51
B-19	.5	4.5	156	517	3.2	.4	<.8	<.8	<1.5	5.1	109	<.5	80
B-19	<.5	4.9	90	464	1.2	5.1	<.8	<.8	<1.5	6.4	72	<.5	55
B-19	<2.4	2.8	116	386	<3.0	.6	<4.9	<2.5	<2.5	6.5	32	<3.9	58
B-19	<2.4	3.6	124	466	<3.0	.2	<5.0	<2.5	<2.5	7.8	65	<4.0	71
B-19	<2.4	3.9	99	374	<3.0	1.3	<5.0	<2.5	<2.5	7.0	35	<4.0	57
B-19	<2.3	<2.3	113	296	<2.9	<.1	<4.9	<2.4	<2.4	7.5	9.2	<3.9	42
B-19	<2.4	4.7	120	349	<3.0	.2	<4.9	<2.5	<2.5	2.5	15	<4.0	35
B-19	.4	5.1	80	343	1.2	--	2.2	<1.1	<.9	1.8	55	2.0	62

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			BENTON LAKE NATIONAL WILDLIFE REFUGE						
B-21	BL1-G14	06/05/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G12	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G13	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G23	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G72	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G74	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G71	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G73	06/19/89	GADWALL	--	--	--	--	--	--
B-21	BL1-G138	07/07/89	GADWALL	--	--	--	--	--	--
B-21	BL1-SC10	06/05/89	LESSER SCAUP	--	--	--	--	--	--
B-21	1-SC18A	06/19/89	LESSER SCAUP	--	--	--	--	--	--
B-21	BL-046-1M	05/11/88	MALLARD	<6.3	--	5.0	<.03	1.4	.6
B-21	BL-046-2M	06/08/88	MALLARD	<3.0	--	2.6	<.1	<2.0	<.3
B-21	BL-046-3M	06/08/88	MALLARD	<3.0	--	4.4	<.1	<2.0	<.3
B-21	BL1-SH1	06/05/89	NORTHERN SHOVELER	<2.7	--	16	<.1	<1.4	<.1
B-21	BL1-SH28	06/05/89	NORTHERN SHOVELER	<2.9	--	5.5	<.1	<1.5	<.1
B-21	BL1-SH27	06/05/89	NORTHERN SHOVELER	3.8	--	3.5	<.1	<1.5	<.1
B-21	BL1-T54	06/19/89	TEAL	<3.2	--	9.2	<.2	<1.6	<.2
B-22	BL2-G17	06/06/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G75	06/19/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G18	06/19/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G16	06/19/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G76	06/19/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G78	07/06/89	GADWALL	--	--	--	--	--	--
B-22	2-G136A	07/06/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G135	07/06/89	GADWALL	--	--	--	--	--	--
B-22	BL2-G137	07/06/89	GADWALL	--	--	--	--	--	--
B-22	BL2-SC7	05/31/89	LESSER SCAUP	<2.9	--	10	<.1	<1.4	<.1
B-22	BL2-SC6	06/07/89	LESSER SCAUP	<3.0	--	5.5	<.2	<1.5	<.2
B-22	BL2-SC13	06/19/89	LESSER SCAUP	<2.9	--	8.1	<.2	<1.5	<.2
B-22	BL2-SC41	06/19/89	LESSER SCAUP	<3.0	--	7.9	<.2	<1.5	<.2
B-22	BL-047-1M	05/11/88	MALLARD	<6.3	--	13	<.03	.9	.4
B-22	BL-138-1M	06/06/88	MALLARD	<6.3	--	9.7	<.03	<.8	<.4
B-22	BL-047-3M	06/17/88	MALLARD	<3.0	--	10	<.1	<2.0	<.3
B-22	BL-047-4M	06/17/88	MALLARD	3.0	--	15	<.1	<2.0	<.3
B-22	BL-047-2M	06/17/88	MALLARD	<3.0	--	14	<.1	<2.0	<.3
B-22	BL2-M3	05/09/89	MALLARD	<2.7	--	6.3	<.1	1.7	<.1
B-22	BL2-M14	05/15/89	MALLARD	4.4	--	10	<.1	<1.4	<.1
B-22	BL2-M12	05/16/89	MALLARD	<3.3	--	4.3	<.2	<1.6	<.2
B-22	BL2-M13	05/23/89	MALLARD	<3.0	--	7.9	<.2	<1.5	<.2

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE								
B-21	--	--	--	--	--	--	--	--	--	4.1	--	--	--
B-21	--	--	--	--	--	--	--	--	--	5.0	--	--	--
B-21	--	--	--	--	--	--	--	--	--	6.6	--	--	--
B-21	--	--	--	--	--	--	--	--	--	4.4	--	--	--
B-21	--	--	--	--	--	--	--	--	--	6.2	--	--	--
B-21	--	--	--	--	--	--	--	--	--	7.4	--	--	--
B-21	--	--	--	--	--	--	--	--	--	4.6	--	--	--
B-21	--	--	--	--	--	--	--	--	--	5.7	--	--	--
B-21	--	--	--	--	--	--	--	--	--	2.8	--	--	--
B-21	--	--	--	--	--	--	--	--	--	1.6	--	--	--
B-21	--	--	--	--	--	--	--	--	--	8.3	--	--	--
B-21	1.0	3.7	105	311	1.3	--	<7.0	<4.5	<9.0	6.9	10	<.6	57
B-21	<1.0	3.3	86	370	1.0	--	<1.0	<2.0	<4.0	5.6	7.2	<.3	49
B-21	<1.0	3.3	109	324	1.3	--	<1.0	<2.0	<4.0	7.2	8.3	<.3	53
B-21	.9	5.6	90	523	3.3	--	2.2	<1.1	<.8	3.8	39	2.1	67
B-21	.4	3.5	53	370	2.0	--	1.9	<1.2	<.9	2.1	18	2.3	58
B-21	.4	3.0	97	441	1.3	--	<1.5	<1.2	<.9	1.7	15	2.4	64
B-21	.5	3.2	113	350	1.7	--	3.8	<1.3	<1.0	2.5	11	2.3	56
B-21	--	--	--	--	--	--	--	--	--	2.1	--	--	--
B-22	--	--	--	--	--	--	--	--	--	8.9	--	--	--
B-22	--	--	--	--	--	--	--	--	--	10	--	--	--
B-22	--	--	--	--	--	--	--	--	--	2.2	--	--	--
B-22	--	--	--	--	--	--	--	--	--	14	--	--	--
B-22	--	--	--	--	--	--	--	--	--	2.7	--	--	--
B-22	--	--	--	--	--	--	--	--	--	2.6	--	--	--
B-22	--	--	--	--	--	--	--	--	--	4.2	--	--	--
B-22	--	--	--	--	--	--	--	--	--	3.3	--	--	--
B-22	.4	3.4	63	368	2.0	--	<1.4	<1.2	<.9	1.3	17	<1.4	63
B-22	<.3	4.3	57	358	2.7	--	<1.5	<1.2	<.9	2.0	9.8	3.4	61
B-22	<.3	5.8	139	421	1.1	--	<1.5	<1.2	<.9	2.6	16	<1.5	54
B-22	.9	4.3	117	454	1.5	--	<1.5	<1.2	<.9	2.1	13	<1.5	68
B-22	<.5	2.4	107	410	1.0	--	<7.0	<4.5	<9.0	4.0	12	<.6	53
B-22	<.5	4.3	122	476	1.1	--	<7.0	7.4	<9.0	4.6	8.4	<.6	60
B-22	<1.0	2.3	111	389	1.4	--	<1.0	<2.0	<4.0	5.1	11	<.3	52
B-22	<1.0	2.7	127	421	1.4	--	<1.0	<2.0	<4.0	4.1	15	<.3	59
B-22	<1.0	2.2	123	386	1.3	--	<1.0	<2.0	<4.0	4.5	14	<.3	56
B-22	.5	3.6	72	392	1.7	--	2.1	<1.1	<.8	1.6	10	<1.4	43
B-22	.8	3.9	58	357	1.4	--	2.3	<1.1	<.8	1.9	6.1	<1.4	55
B-22	.7	3.5	101	218	1.6	--	2.6	<1.3	<1.0	2.0	6.0	<1.6	43
B-22	.4	2.5	67	< 30	4.5	--	<1.5	<1.2	<.9	1.7	10	<1.5	48

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--*Continued*						
B-22	BL2-PT2	05/09/89	NORTHERN PINTAIL	<3.0	--	13	<.2	<1.5	<.2
B-22	BL2-PT13	05/11/89	NORTHERN PINTAIL	<3.0	--	15	<.2	<1.5	<.2
B-22	BL2-PT37	05/30/89	NORTHERN PINTAIL	<3.2	--	16	<.2	<1.6	.5
B-22	BL2-PT51	06/19/89	NORTHERN PINTAIL	<3.2	--	11	<.2	<1.6	.2
B-22	BL-073-1S	05/19/88	NORTHERN SHOVELER	<3.0	--	5.5	<.1	<2.0	<.3
B-22	BL2-T13	05/30/89	TEAL	<2.9	--	4.6	<.2	<1.5	<.2
B-22	BL2-T25	06/06/89	TEAL	<3.0	--	9.0	<.2	<1.5	<.2
B-22	BL2-T26	06/19/89	TEAL	<3.0	--	7.5	<.2	<1.5	<.2
B-23	BL-357-1T	07/13/88	BLUE-WINGED TEAL	<15	--	8.3	<.1	.5	<.4
B-23	BL-120-1T	07/13/88	BLUE-WINGED TEAL	<15	--	6.1	<.1	<.5	<.4
B-23	BL-131-7G	07/12/88	GADWALL	<15	--	2.6	<.1	<.5	<.4
B-23	BL3-G15A	06/05/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G6	06/21/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G104	06/21/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G105	06/21/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G5	06/22/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G106	07/05/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G130	07/05/89	GADWALL	--	--	--	--	--	--
B-23	BL3-G133	07/05/89	GADWALL	--	--	--	--	--	--
B-23	BL3-SC44	06/21/89	LESSER SCAUP	<3.0	--	12	<.2	<1.5	<.2
B-23	BL3-SC61	07/05/89	LESSER SCAUP	<3.0	--	5.3	<.2	<1.5	<.2
B-23	BL-222-1M	06/27/88	MALLARD	<6.3	--	5.7	<.03	<.8	<.4
B-23	BL-222-2M	06/27/88	MALLARD	<6.3	--	4.1	<.03	<.8	<.4
B-23	BL-222-3M	06/27/88	MALLARD	<15	--	4.6	.1	<.5	<.4
B-23	BL-222-4M	06/27/88	MALLARD	<15	--	3.2	<.1	<.5	<.4
B-23	BL3-M16	05/16/89	MALLARD	9.9	--	7.9	<.2	<1.5	<.2
B-23	BL3-M85	06/21/89	MALLARD	3.0	--	14	<.2	<1.5	<.2
B-23	BL-029-1P	05/18/88	NORTHERN PINTAIL	<3.0	--	1.8	<.1	<2.0	<.3
B-23	BL-030-1P	06/08/88	NORTHERN PINTAIL	3.0	--	1.4	<.1	<2.0	<.3
B-23	BL-030-2P	06/08/88	NORTHERN PINTAIL	<3.0	--	2.4	<.1	<2.0	<.3
B-23	BL-030-3P	06/08/88	NORTHERN PINTAIL	<3.0	--	2.1	<.1	<2.0	<.3
B-23	BL3-PT11	05/16/89	NORTHERN PINTAIL	<3.0	--	5.6	<.2	<1.5	<.2
B-23	BL3-PT12	05/16/89	NORTHERN PINTAIL	<2.9	--	2.5	<.2	<1.5	<.2
B-23	BL3-PT21	05/16/89	NORTHERN PINTAIL	<3.1	--	3.6	<.2	<1.6	<.2
B-23	BL3-PT20	05/22/89	NORTHERN PINTAIL	<3.1	--	12	<.2	<1.5	<.2
B-23	BL3-PT54	06/21/89	NORTHERN PINTAIL	<3.3	--	20	<.2	<1.6	1.1
B-23	BL3-PT57	06/21/89	NORTHERN PINTAIL	<3.2	--	12	<.2	<1.6	<.2
B-23	BL3-PT56	06/21/89	NORTHERN PINTAIL	<3.2	--	10	<.2	<1.6	.7
B-23	BL-123-1S	06/02/88	NORTHERN SHOVELER	<3.0	--	3.0	<.1	<2.0	<.3
B-23	BL-132-1S	06/06/88	NORTHERN SHOVELER	<3.0	--	3.5	<.1	<2.0	<.3

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued								
B-22	1.0	4.1	157	528	2.3	--	<1.5	<1.2	<.9	2.1	9.9	<1.5	79
B-22	.9	3.2	149	350	2.4	--	2.0	<1.2	<.9	2.8	14	<1.5	54
B-22	1.0	4.1	84	427	2.0	--	2.3	<1.3	<1.0	1.3	9.3	<1.6	56
B-22	1.0	4.4	167	531	1.9	--	2.4	<1.3	1.5	9.7	14	<1.6	69
B-22	<1.0	2.6	110	421	2.0	--	<1.0	<2.0	<4.0	4.2	14	<.3	58
B-22	.9	4.7	119	327	4.8	--	2.1	<1.2	<.9	2.8	8.5	<1.5	61
B-22	1.0	5.0	57	319	4.2	--	2.1	<1.2	<.9	2.1	14	<1.5	54
B-22	.4	3.1	116	362	3.8	--	2.8	<1.2	<.9	2.4	7.7	2.5	62
B-22	<.6	4.8	137	433	4.0	--	< 12	<4.5	<9.0	2.3	14	<.5	49
B-23	<.6	5.6	140	637	2.5	--	< 12	<4.5	<9.0	3.9	104	<.5	67
B-23	<.6	5.3	111	467	3.4	--	< 12	<4.5	<9.0	1.9	10	<.5	63
B-23	--	--	--	--	--	--	--	--	--	3.3	--	--	--
B-23	--	--	--	--	--	--	--	--	--	13	--	--	--
B-23	--	--	--	--	--	--	--	--	--	8.1	--	--	--
B-23	--	--	--	--	--	--	--	--	--	3.5	--	--	--
B-23	--	--	--	--	--	--	--	--	--	3.7	--	--	--
B-23	--	--	--	--	--	--	--	--	--	6.6	--	--	--
B-23	--	--	--	--	--	--	--	--	--	9.4	--	--	--
B-23	--	--	--	--	--	--	--	--	--	7.5	--	--	--
B-23	<.3	4.3	175	405	4.0	--	<1.5	<1.2	.9	2.3	13	<1.5	66
B-23	<.3	4.0	165	445	1.8	--	<1.5	<1.2	<.9	3.4	18	<1.5	67
B-23	<.5	4.0	105	446	1.4	--	<7.0	<4.5	<9.0	4.0	8.6	<.6	65
B-23	<.5	5.1	82	478	<1.0	--	<7.0	<4.5	<9.0	3.5	7.5	<.6	60
B-23	<.6	5.6	111	435	1.8	--	<12	<4.5	<9.0	4.4	11	<.5	63
B-23	<.6	6.2	102	457	1.5	--	<12	<4.5	<9.0	4.1	9.2	<.5	57
B-23	.9	3.7	69	198	1.6	--	<1.5	<1.2	<.9	1.2	9.9	<1.5	60
B-23	.9	3.8	111	405	3.3	--	2.0	<1.2	<.9	1.9	8.4	<1.5	49
B-23	<1.0	3.8	100	340	1.1	--	<1.0	<2.0	<4.0	6.0	2.6	<.3	48
B-23	<1.0	2.9	92	321	2.1	--	<1.0	<2.0	<4.0	6.0	2.7	<.3	57
B-23	<1.0	3.2	101	386	1.1	--	<1.0	<2.0	<4.0	4.5	5.3	<.3	62
B-23	<1.0	2.9	112	346	1.4	--	<1.0	<2.0	<4.0	4.4	4.2	<.3	67
B-23	.9	6.3	118	407	1.5	--	<1.5	<1.2	.9	1.8	11	3.1	62
B-23	.9	4.8	112	415	1.5	--	<1.5	<1.2	<.9	1.2	6.9	<1.5	62
B-23	.8	5.3	136	400	1.2	--	<1.6	<1.3	<.9	1.8	6.6	<1.6	55
B-23	.9	3.7	112	425	3.1	--	<1.5	<1.2	1.3	2.2	16	<1.5	58
B-23	<.3	5.1	81	464	2.4	--	2.4	<1.3	<1.0	3.3	17	<1.6	61
B-23	1.1	4.1	151	390	2.8	--	1.8	<1.3	1.5	2.0	13	<1.6	53
B-23	.6	4.0	58	410	1.4	--	<1.6	<1.3	<1.0	2.6	13	<1.6	51
B-23	<1.0	2.3	89	352	2.5	--	<1.0	<2.0	<4.0	2.7	14	<.3	67
B-23	<1.0	1.9	122	357	1.6	--	<1.0	<2.0	<4.0	1.9	25	<.3	65

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-23	BL-133-1S	06/06/88	NORTHERN SHOVELER	<3.0	--	2.1	<.1	<2.0	<.3
B-23	BL-135-4S	07/12/88	NORTHERN SHOVELER	<6.3	--	6.5	<.03	<.8	<.4
B-23	BL3-M16A	05/16/89	REDHEAD	3.5	--	12	<.2	2.5	<.2
B-23	BL3-T22	06/21/89	TEAL	<2.9	--	17	<.1	<1.4	<.1
B-23	BL3-T18	06/21/89	TEAL	<3.1	--	14	<.2	<1.6	<.2
B-24	BL4A-G1	06/01/89	GADWALL	--	--	--	--	--	--
B-24	BL4A-G4	06/07/89	GADWALL	--	--	--	--	--	--
B-24	4A-G103	06/22/89	GADWALL	--	--	--	--	--	--
B-24	4A-G114	06/22/89	GADWALL	--	--	--	--	--	--
B-24	4A-G115	06/22/89	GADWALL	--	--	--	--	--	--
B-24	4A-G134	07/05/89	GADWALL	--	--	--	--	--	--
B-24	4A-SC50	06/22/89	LESSER SCAUP	<3.0	--	3.8	<.2	<1.5	<.2
B-24	4A-SC51	06/22/89	LESSER SCAUP	<2.9	--	7.1	<.2	<1.5	<.2
B-24	4A-SC52	06/22/89	LESSER SCAUP	<3.0	--	2.5	<.2	<1.5	<.2
B-24	4A-SC52A	06/22/89	LESSER SCAUP	<5.8	--	<2.9	<.3	<2.9	<.3
B-24	4A-SC62	07/05/89	LESSER SCAUP	3.1	--	2.3	<.2	<1.4	<.1
B-24	BL4A-M2	05/09/89	MALLARD	4.6	--	6.2	<.2	1.9	.2
B-24	BL4A-M25	05/17/89	MALLARD	--	--	--	--	--	--
B-24	BL4A-M27	05/17/89	MALLARD	--	--	--	--	--	--
B-24	BL4A-M26	05/17/89	MALLARD	--	--	--	--	--	--
B-24	BL4A-M35	05/22/89	MALLARD	<2.9	--	12	<.2	<1.5	<.2
B-24	BL4A-M58	06/07/89	MALLARD	--	--	--	--	--	--
B-24	BL4A-M84	06/20/89	MALLARD	<3.1	--	14	<.2	<1.6	<.2
B-24	BL4A-PT1	05/09/89	NORTHERN PINTAIL	--	--	--	--	--	--
B-24	4A-PT60	06/22/89	NORTHERN PINTAIL	<3.2	--	9.4	<.2	<1.6	<.2
B-24	4A-PT61	06/22/89	NORTHERN PINTAIL	<2.8	--	17	<.1	<1.4	<.1
B-25	BL-87-EM-2	07/16/87	BLUE-WINGED TEAL	5.0	<.2	1.3	.1	2.0	<.3
B-25	BL-316-5G	07/20/88	GADWALL	<6.3	--	20	.03	3.4	<.4
B-25	BL-314-2G	07/20/88	GADWALL	<6.3	--	9.7	<.03	1.4	<.4
B-25	BL-322-2G	07/20/88	GADWALL	<6.3	--	2.8	<.03	1.5	<.4
B-25	L-401-21	07/03/91	LESSER SCAUP	31	<.5	<2.4	<.3	<2.4	<.5
B-25	L-703-49	07/09/91	LESSER SCAUP	43	<.5	3.5	<.3	<2.4	<.5
B-25	L-401-11	07/09/91	LESSER SCAUP	22	<.5	<2.4	<.3	<2.4	<.5
B-25	L-401-03	07/09/91	LESSER SCAUP	53	<.5	2.5	<.3	4.2	<.5
B-25	BL-099-1M	05/20/88	MALLARD	<6.3	--	3.5	<.03	<.8	.5
B-25	BL-311-1M	07/20/88	MALLARD	<6.3	--	10	.04	1.3	<.4
B-25	BL-090-1P	05/20/88	NORTHERN PINTAIL	<3.0	--	2.1	<.1	<2.0	<.3
B-25	BL-100-1P	05/20/88	NORTHERN PINTAIL	<6.3	--	3.6	<.03	<.8	<.4
B-25	BL-095-1P	06/21/88	NORTHERN PINTAIL	<3.0	--	6.2	<.1	<2.0	<.3
B-25	BL-095-2P	06/21/88	NORTHERN PINTAIL	<15	--	4.6	<.1	<.5	<.4

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued													
B-23	2.0	1.9	127	383	1.6	--	<1.0	<2.0	<4.0	2.9	11	<.3	65
B-23	.8	5.1	166	541	1.9	--	<7.0	<4.5	<9.0	7.9	29	<.6	73
B-23	1.0	3.6	61	370	4.8	--	2.1	<1.3	<1.0	1.9	12	<1.6	69
B-23	1.3	5.5	194	434	3.6	--	1.5	<1.1	2.0	1.7	13	3.3	54
B-23	1.3	5.6	162	495	5.6	--	2.0	<1.2	1.1	2.9	18	<1.6	59
B-24	--	--	--	--	--	--	--	--	--	3.5	--	--	--
B-24	--	--	--	--	--	--	--	--	--	3.9	--	--	--
B-24	--	--	--	--	--	--	--	--	--	3.9	--	--	--
B-24	--	--	--	--	--	--	--	--	--	7.1	--	--	--
B-24	--	--	--	--	--	--	--	--	--	2.9	--	--	--
B-24	--	--	--	--	--	--	--	--	--	2.7	--	--	--
B-24	<.3	2.6	100	386	3.6	--	<1.5	<1.2	<.9	2.0	14	<1.5	55
B-24	<.3	3.4	159	429	1.8	--	<1.5	<1.2	<.9	2.2	17	<1.5	60
B-24	<.3	4.0	146	390	2.1	--	<1.5	<1.2	<.9	2.5	16	<1.5	58
B-24	2.6	14	345	1,092	7.6	--	<2.9	<2.3	<1.7	5.6	60	<2.9	110
B-24	<.3	5.2	157	369	3.0	--	<1.4	<1.1	<.9	2.7	14	<1.4	70
B-24	.7	3.3	69	326	2.0	--	1.6	<1.2	<.9	1.2	9.2	<1.5	54
B-24	--	--	--	--	--	--	--	--	--	4.2	--	--	--
B-24	--	--	--	--	--	--	--	--	--	10	--	--	--
B-24	--	--	--	--	--	--	--	--	--	3.4	--	--	--
B-24	.9	5.3	137	354	2.7	--	<1.5	<1.2	<.9	1.8	11	<1.5	60
B-24	--	--	--	--	--	--	--	--	--	5.5	--	--	--
B-24	1.0	2.8	156	448	2.8	--	<1.6	<1.3	<.9	2.6	16	<1.6	59
B-24	--	--	--	--	--	--	--	--	--	6.1	--	--	--
B-24	.9	4.7	148	486	2.1	--	2.3	<1.3	<1.0	2.0	17	<1.6	54
B-24	.9	5.0	168	521	1.3	--	1.7	<1.1	1.0	1.9	21	<1.4	55
B-25	1.0	5.2	127	499	2.4	1.1	<1.0	<1.0	<4.0	9.0	29	<.4	75
B-25	<.5	5.0	133	725	15	--	<7.0	<4.5	<9.0	3.3	32	<.6	76
B-25	<.5	5.8	127	688	8.3	--	<7.0	<4.5	<9.0	1.9	32	<.6	75
B-25	<.5	5.2	123	633	3.7	--	<7.0	<4.5	<9.0	3.9	23	<.6	73
B-25	<2.4	3.2	101	397	<3.0	.2	<5.0	<2.5	<2.5	8.1	17	<4.0	60
B-25	<2.4	<2.4	142	468	<3.0	.1	<5.0	<2.5	<2.5	8.4	15	<4.0	56
B-25	<2.4	4.8	114	360	<3.0	.2	<4.9	<2.5	<2.5	7.2	10	<3.9	46
B-25	<2.3	3.7	164	498	<2.9	.2	<4.9	<2.4	<2.4	5.4	27	<3.9	54
B-25	<.5	5.2	117	375	3.4	--	<7.0	<4.5	<9.0	10	7.2	<.6	62
B-25	<.5	3.1	82	499	1.6	--	<7.0	<4.5	<9.0	2.8	18	<.6	52
B-25	<1.0	2.8	115	469	2.1	--	<1.0	<2.0	<4.0	3.4	7.3	<.3	48
B-25	<.5	3.7	115	412	1.2	--	<7.0	<4.5	<9.0	6.0	7.6	<.6	61
B-25	<1.0	3.3	135	418	1.1	--	<1.0	<2.0	<4.0	6.3	8.0	<.3	61
B-25	<.6	5.3	166	666	1.8	--	<12	<4.5	<9.0	3.8	20	<.5	74

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-25	BL-048-1S	05/11/88	NORTHERN SHOVELER	<6.3	--	2.5	.1	1.1	.7
B-25	BL-097-1S	05/20/88	NORTHERN SHOVELER	<3.0	--	3.0	<.1	<2.0	<.3
B-25	BL-101-1S	05/20/88	NORTHERN SHOVELER	<3.0	--	2.9	<.1	<2.0	<.3
B-25	BL-363-3S	07/13/88	NORTHERN SHOVELER	<6.3	--	3.6	<.03	<.8	<.4
B-25	BL-319-2S	07/20/88	NORTHERN SHOVELER	<6.3	--	3.8	<.03	<.8	<.4
B-25	703-33	06/24/91	NORTHERN SHOVELER	32	<.5	<2.3	<.3	<2.3	<.5
B-25	S-703-25	06/24/91	NORTHERN SHOVELER	22	1.5	<2.4	<.3	<2.4	<.5
B-25	S-703-17	06/24/91	NORTHERN SHOVELER	<20	<.5	<2.4	<.3	<2.4	<.5
B-25	S-FWE-01	06/24/91	NORTHERN SHOVELER	26	<.5	<2.4	<.3	<2.4	<.5
B-25	S-703-37	06/24/91	NORTHERN SHOVELER	29	<.5	<2.4	<.3	4.5	<.5
B-25	S-703-26	06/24/91	NORTHERN SHOVELER	<20	.7	<2.4	<.3	<2.4	<.5
B-25	BL-296-8R	07/13/88	REDHEAD	<15	--	4.3	<.1	<.5	<.4
B-25	BL-296-5R	07/13/88	REDHEAD	<6.3	--	4.9	.1	1.6	<.4
B-26	BL-87-EM-3	07/16/87	BLUE-WINGED TEAL	4.0	<.2	2.2	<.1	<2.0	<.3
B-26	BL-103-1T	05/24/88	BLUE-WINGED TEAL	<6.3	--	6.0	<.03	<.8	<.4
B-26	BL-338-1T	07/20/88	BLUE-WINGED TEAL	<6.3	--	1.7	.03	1.1	<.4
B-26	BL-87-EM-4	07/16/87	GADWALL	3.0	<.2	3.2	<.1	3.0	<.3
B-26	BL-303-1G	06/21/88	GADWALL	<6.3	--	4.3	<.03	1.6	<.4
B-26	BL-337-1G	07/20/88	GADWALL	<6.3	--	9.1	<.03	2.2	<.4
B-26	BL4C-G59	06/13/89	GADWALL	--	--	--	--	--	--
B-26	BL4C-G62	06/13/89	GADWALL	--	--	--	--	--	--
B-26	BL4C-G52	06/13/89	GADWALL	--	--	--	--	--	--
B-26	BL4C-G64	06/13/89	GADWALL	--	--	--	--	--	--
B-26	BL4C-G61	06/13/89	GADWALL	--	--	--	--	--	--
B-26	4C-G108	06/21/89	GADWALL	--	--	--	--	--	--
B-26	BL4C-G21	06/22/89	GADWALL	--	--	--	--	--	--
B-26	4C-G129	07/03/89	GADWALL	--	--	--	--	--	--
B-26	4C-G126	07/03/89	GADWALL	--	--	--	--	--	--
B-26	BL4-G97	07/06/89	GADWALL	--	--	--	--	--	--
B-26	4C-G140	07/10/89	GADWALL	--	--	--	--	--	--
B-26	G-SAL-1	07/13/89	GADWALL	--	--	--	--	--	--
B-26	BL-299-1LS	06/21/88	LESSER SCAUP	<6.3	--	12	<.03	<.8	<.4
B-26	4C-SC28	06/13/89	LESSER SCAUP	<2.9	--	5.7	.2	<1.4	<.1
B-26	4C-SC47	06/21/89	LESSER SCAUP	--	--	--	--	--	--
B-26	4C-SC16	06/21/89	LESSER SCAUP	--	--	--	--	--	--
B-26	L-402-19	06/26/91	LESSER SCAUP	35	<.5	<2.4	<.3	<2.4	<.5
B-26	L-402-03	07/03/91	LESSER SCAUP	44	<.5	5.6	<.3	<2.4	<.5
B-26	BL-051-1M	05/16/88	MALLARD	<3.0	--	2.5	<.1	<2.0	<.3
B-26	BL-053-1M	05/16/88	MALLARD	5.0	--	5.5	<.1	<2.0	<.3
B-26	BL-054-1M	05/16/88	MALLARD	<3.0	--	2.6	<.1	<2.0	<.3

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued								
B-25	.5	4.4	108	311	4.8	--	<7.0	<4.5	<9.0	5.5	5.4	<.6	48
B-25	<1.0	1.9	95	241	2.1	--	<1.0	<2.0	<4.0	2.1	9.1	<.3	33
B-25	<2.0	2.6	106	340	2.7	--	<1.0	<2.0	<4.0	3.2	7.6	<.3	52
B-25	<.5	3.6	138	628	2.8	--	<7.0	<4.5	<9.0	1.7	61	<.6	65
B-25	<.5	4.0	94	426	1.8	--	<7.0	<4.5	<9.0	3.3	23	<.6	61
B-25	<2.3	3.6	75	412	<2.9	.3	<4.9	<2.4	<2.4	2.5	14	<3.9	49
B-25	<2.4	4.0	102	415	<3.0	.6	<4.9	<2.5	<2.5	3.0	14	<3.9	56
B-25	<2.4	3.8	75	257	<3.0	.6	<5.0	<2.5	<2.5	3.4	4.6	<4.0	39
B-25	<2.4	3.5	96	398	<3.0	<.1	<5.0	<2.5	<2.5	6.5	15	<4.0	65
B-25	<2.4	3.3	102	402	<3.0	.4	<5.0	<2.5	<2.5	3.6	16	<4.0	56
B-25	<2.4	5.2	86	280	<3.0	.5	<5.0	<2.5	<2.5	2.8	12	<4.0	45
B-25	<.6	4.2	132	426	2.7	--	<12.0	<4.5	<9.0	4.4	18	<.5	52
B-25	<.5	4.5	121	430	1.9	--	<7.0	<4.5	<9.0	2.4	10	<.6	62
B-26	3.0	2.6	136	548	2.8	.7	<1.0	<1.0	<4.0	1.8	45	<.4	75
B-26	<.5	5.4	125	421	2.6	--	<7.0	<4.5	<9.0	2.7	12	<.6	48
B-26	<.5	5.9	166	442	3.4	--	<7.0	<4.5	<9.0	2.5	12	<.6	72
B-26	3.1	5.2	146	346	1.9	.2	<1.0	2.0	<4.0	2.4	12	<.4	72
B-26	<.5	3.9	81	482	1.5	--	<7.0	<4.5	<9.0	3.7	18	<.6	61
B-26	<.5	2.4	77	430	19	--	<7.0	<4.5	<9.0	1.7	21	<.6	56
B-26	--	--	--	--	--	--	--	--	--	4.3	--	--	--
B-26	--	--	--	--	--	--	--	--	--	4.1	--	--	--
B-26	--	--	--	--	--	--	--	--	--	5.0	--	--	--
B-26	--	--	--	--	--	--	--	--	--	3.1	--	--	--
B-26	--	--	--	--	--	--	--	--	--	3.2	--	--	--
B-26	--	--	--	--	--	--	--	--	--	4.4	--	--	--
B-26	--	--	--	--	--	--	--	--	--	9.4	--	--	--
B-26	--	--	--	--	--	--	--	--	--	3.2	--	--	--
B-26	--	--	--	--	--	--	--	--	--	4.6	--	--	--
B-26	--	--	--	--	--	--	--	--	--	7.7	--	--	--
B-26	--	--	--	--	--	--	--	--	--	1.6	--	--	--
B-26	--	--	--	--	--	--	--	--	--	1.9	--	--	--
B-26	<.5	3.5	137	444	2.0	--	<7.0	<4.5	<9.0	4.9	11	<.6	59
B-26	.3	4.9	129	388	2.6	--	<1.4	<1.2	<.9	1.7	9.9	<1.4	53
B-26	--	--	--	--	--	--	--	--	----	4.8	--	--	--
B-26	--	--	--	--	--	--	--	--	----	4.3	--	--	--
B-26	<2.4	4.2	136	432	<3.0	.6	<4.9	<2.5	<2.5	5.9	19	<3.9	53
B-26	<2.4	<2.4	145	450	<3.0	.3	<4.9	<2.5	<2.5	5.7	17	<4.0	66
B-26	<1.0	3.3	130	438	1.4	--	<1.0	<2.0	<4.0	9.4	17	<.3	62
B-26	<1.0	2.9	116	398	2.7	--	<1.0	<2.0	<4.0	12	18	<.3	67
B-26	<1.0	3.0	105	412	3.7	--	<1.0	<2.0	<4.0	14	16	<.3	65

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-26	BL-104-1M	05/24/88	MALLARD	<6.3	--	4.8	<.03	<.8	<.4
B-26	BL4-M1	05/09/89	MALLARD	--	--	--	--	--	--
B-26	BL4C-M41	05/30/89	MALLARD	<2.8	--	9.9	<.1	1.4	<.1
B-26	BL4C-M43	05/30/89	MALLARD	<3.3	--	6.8	<.2	<1.7	<.2
B-26	BL4C-M44	05/30/89	MALLARD	<3.1	--	9.8	<.2	<1.6	<.2
B-26	BL4C-M46	05/30/89	MALLARD	<2.8	--	8.3	<.1	1.6	<.1
B-26	BL4C-M56	05/30/89	MALLARD	<3.2	--	9.4	<.2	<1.6	<.2
B-26	BL4C-M32	06/09/89	MALLARD	--	--	--	--	--	--
B-26	BL4C-M64	06/22/89	MALLARD	--	--	--	--	--	--
B-26	BL4C-M88	06/22/89	MALLARD	--	--	--	--	--	--
B-26	BL-036-1P	05/16/88	NORTHERN PINTAIL	<3.0	--	1.0	<.1	<2.0	<.3
B-26	BL-037-1P	05/16/88	NORTHERN PINTAIL	<3.0	--	1.6	<.1	<2.0	<.3
B-26	BL-093-2P	06/21/88	NORTHERN PINTAIL	3.0	--	9.9	<.1	<2.0	<.3
B-26	BL-300-1P	06/21/88	NORTHERN PINTAIL	<6.3	--	2.1	<.03	<.8	<.4
B-26	BL4C-PT4	05/22/89	NORTHERN PINTAIL	--	--	--	--	--	--
B-26	4C-PT33	05/30/89	NORTHERN PINTAIL	<3.0	--	5.8	<.2	<1.5	.4
B-26	4C-PT35	05/30/89	NORTHERN PINTAIL	<2.8	--	6.6	<.1	<1.4	.3
B-26	BL-075-1S	05/20/88	NORTHERN SHOVELER	<3.0	--	1.9	<.1	<2.0	<.3
B-26	BL-111-1S	06/01/88	NORTHERN SHOVELER	<3.0	--	1.7	<.1	<2.0	<.3
B-26	4C-PT33A	05/30/89	NORTHERN SHOVELER	<3.3	--	6.6	<.2	<1.7	<.2
B-26	S-402-41	06/25/91	NORTHERN SHOVELER	23	<.5	<2.4	<.3	2.8	<.5
B-26	S-402-35	06/25/91	NORTHERN SHOVELER	20	<.5	<2.4	<.3	5.6	<.5
B-26	BL4C-T8	05/30/89	TEAL	<3.1	--	8.0	<.2	<1.5	<.2
B-26	BL4C-T12	05/30/89	TEAL	<2.9	--	8.4	<.1	<1.4	<.1
B-26	BL4C-T27	06/06/89	TEAL	--	--	--	--	--	--
B-26	BL4C-T9	06/13/89	TEAL	<3.0	--	12	<.2	<1.5	<.2
B-26	BL4C-T37	06/13/89	TEAL	<3.0	--	13	<.2	<1.5	<.2
B-26	BL4C-T41	06/13/89	TEAL	<3.1	--	11	<.2	<1.6	<.2
B-26	BL4C-T32	06/22/89	TEAL	--	--	--	--	--	--
B-27	BL-419-3G	07/07/88	GADWALL	<15	--	7.3	<.1	3.6	<.4
B-27	BL-375-3G	07/19/88	GADWALL	<6.3	--	7.3	<.03	1.1	<.4
B-27	BL-381-4G	07/19/88	GADWALL	<6.3	--	7.4	<.03	6.4	<.4
B-27	BL-405-1G	07/25/88	GADWALL	<6.3	--	5.7	.03	1.3	<.4
B-27	BL-270-1G	07/27/88	GADWALL	<6.3	--	3.8	<.03	4.0	<.4
B-27	BL-168-1LS	07/07/88	LESSER SCAUP	<6.3	--	3.1	<.03	<.8	<.4
B-27	BL-385-2LS	07/27/88	LESSER SCAUP	<15	--	1.9	.2	2.0	.9
B-27	L-V-1	07/16/91	LESSER SCAUP	39	<.5	2.9	<.3	3.3	<.5
B-27	BL-049-1M	05/16/88	MALLARD	4.0	--	5.0	<.1	<2.0	<.3
B-27	BL-050-1M	05/16/88	MALLARD	<3.0	--	1.8	<.1	<2.0	<.3
B-27	BL-049-2M	06/30/88	MALLARD	<6.3	--	3.3	<.03	<.8	<.4

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued								
B-26	<.5	4.4	110	404	2.5	--	<7.0	<4.5	<9.0	6.8	8.0	<.6	74
B-26	--	--	--	--	--	--	--	--	--	3.8	--	--	--
B-26	.3	3.4	127	339	2.1	--	1.4	<1.1	<.8	1.5	8.4	<1.4	52
B-26	.5	4.2	120	373	2.2	--	2.3	<1.3	<1.0	1.9	13	<1.7	52
B-26	.8	4.3	129	500	2.3	--	<1.6	<1.2	<.9	1.5	16	<1.6	66
B-26	.7	4.2	152	276	2.3	--	1.4	<1.1	<.9	2.4	7.6	3.2	59
B-26	1.0	4.7	1,860	341	1.2	--	2.2	<1.3	<1.0	4.4	10	<1.6	64
B-26	--	--	--	--	--	--	--	--	--	3.9	--	--	--
B-26	--	--	--	--	--		--	--	--	5.5	--	--	--
B-26	--	--	--	--	--	--	--	--	--	6.1	--	--	--
B-26	<1.0	3.2	122	366	1.6	--	<1.0	<2.0	<4.0	8.4	9.9	<.3	56
B-26	<1.0	2.6	126	420	1.2	--	<1.0	<2.0	<4.0	11	24	<.3	64
B-26	<1.0	2.8	142	444	1.2	--	<1.0	<2.0	<4.0	4.6	19	<.3	57
B-26	<.5	2.8	114	457	1.6	--	<7.0	<4.5	<9.0	6.8	7.8	<.6	53
B-26	--	--	--	--	--	--	--	--	--	2.1	--	--	--
B-26	.7	4.2	93	335	2.3	--	<1.5	<1.2	<.9	2.6	12	<1.5	58
B-26	.7	5.2	93	366	1.9	--	1.8	<1.1	1.1	2.2	11	<1.4	56
B-26	<1.0	2.1	118	370	1.3	--	<1.0	<2.0	<4.0	2.6	14	<.3	52
B-26	1.0	2.5	111	328	1.9	--	<1.0	<2.0	<4.0	2.0	12	<.3	56
B-26	2.2	5.9	211	802	3.8	--	<1.7	<1.3	<1.0	4.3	64	<1.7	93
B-26	<2.4	3.5	108	397	<3.0	1.2	<5.0	<2.5	<2.5	5.5	18	<4.0	70
B-26	<2.4	3.8	118	361	<3.0	.9	<5.0	<2.5	<2.5	3.8	13	<4.0	55
B-26	1.0	5.4	119	346	2.0	--	<1.5	<1.2	1.0	2.5	15	<1.5	58
B-26	.9	6.0	140	328	4.9	--	2.4	<1.2	.9	1.9	11	<1.4	57
B-26	--	--	--	--	--	--	--	--	--	1.2	--	--	--
B-26	.9	5.2	135	317	7.4	--	2.2	<1.2	<.9	1.4	9.3	<1.5	65
B-26	.6	4.9	127	363	3.6	--	3.2	1.3	<.9	1.7	7.4	<1.5	61
B-26	.6	5.1	96	412	3.8	--	2.3	1.8	<.9	1.3	7.9	2.5	45
B-26	--	--	--	--	--	--	--	--	--	3.0	--	--	--
B-27	<.6	3.8	132	442	6.9	--	< 12	<4.5	<9.0	2.5	18	<.5	61
B-27	<.5	5.9	194	666	2.5	--	<7.0	<4.5	<9.0	2.3	28	<.6	82
B-27	.7	5.5	131	642	9.3	--	<7.0	<4.5	<9.0	2.2	33	<.6	73
B-27	<.5	3.4	126	404	8.3	--	<7.0	<4.5	<9.0	2.7	21	<.6	60
B-27	.9	4.3	128	422	1.9	--	<7.0	<4.5	<9.0	1.8	17	<.6	67
B-27	.8	5.3	125	574	1.8	--	<7.0	<4.5	<9.0	4.2	28	<.6	55
B-27	<.6	5.4	147	399	2.2	--	< 12	<4.5	<9.0	3.3	17	<.5	53
B-27	<2.4	3.8	122	436	<3.0	.3	<4.9	<2.5	<2.5	6.7	22	<3.9	47
B-27	<1.0	2.8	110	460	1.7	--	<1.0	<2.0	<4.0	5.7	8.8	<.3	60
B-27	<1.0	3.3	98	358	1.8	--	<1.0	<2.0	<4.0	6.7	6.3	<.3	49
B-27	<.5	4.2	120	425	1.3	--	<7.0	<4.5	<9.0	5.2	15	<.6	54

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-27	BL-023-1P	05/17/88	NORTHERN PINTAIL	<3.0	--	.9	<.1	<2.0	<.3
B-27	BL-057-1S	05/17/88	NORTHERN SHOVELER	<3.0	--	3.9	<.1	<2.0	<.3
B-27	BL-153-2S	07/07/88	NORTHERN SHOVELER	<6.3	--	2.3	<.03	<.8	<.4
B-27	BL-152-1S	07/07/88	NORTHERN SHOVELER	<15	--	4.2	<.1	<.5	<.4
B-28	5/6-G11	06/12/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G24	06/12/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G32	06/12/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G44	06/12/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G35	06/12/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G25	06/29/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G38	06/29/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G116	06/29/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G120	06/29/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G29	06/29/89	GADWALL	--	--	--	--	--	--
B-28	5/6-G117	06/29/89	GADWALL	--	--	--	--	--	--
B-28	5/6-SC26	06/12/89	LESSER SCAUP	<2.9	--	7.9	<.2	<1.5	<.2
B-28	BL5/6-M8	05/10/89	MALLARD	<3.3	--	2.8	<.2	<1.6	<.2
B-28	BL5/6-M9	05/10/89	MALLARD	4.2	--	11	<.2	<1.5	<.2
B-28	5/6-M20	05/16/89	MALLARD	<2.9	--	12	<.1	<1.5	<.1
B-28	BL5/6-M7	05/16/89	MALLARD	4.1	--	9.7	<.2	1.8	.2
B-28	5/6-M68	06/12/89	MALLARD	<3.0	--	7.5	<.2	<1.5	<.2
B-28	5/6-M69	06/12/89	MALLARD	<3.2	--	6.9	<.2	<1.6	<.2
B-28	5/6-PT5	05/10/89	NORTHERN PINTAIL	2.9	--	7.7	<.2	<1.5	<.2
B-28	5/6-PT9	05/16/89	NORTHERN PINTAIL	3.5	--	8.1	<.1	<1.5	<.1
B-28	BL5/6-T5	06/02/89	TEAL	<3.0	--	3.4	<.2	<1.5	<.2
B-28	5/6-T65	06/29/89	TEAL	<2.8	--	2.7	<.1	<1.4	<.1
B-29	BL-87-EM-1	07/14/87	GADWALL	12	<.2	4.4	<.1	5.0	<.3
B-29	BL-233-1LS	07/19/88	LESSER SCAUP	<15	--	6.5	<.1	<.5	<.4
B-29	BL6-M86	06/21/89	MALLARD	--	--	--	--	--	--
B-29	BL-068-1P	05/18/88	NORTHERN PINTAIL	<3.0	--	3.8	<.1	<2.0	<.3
B-29	BL-069-1P	05/18/88	NORTHERN PINTAIL	3.0	--	5.2	<.1	<2.0	<.3
B-29	BL-074-2P	06/09/88	NORTHERN PINTAIL	3.0	--	6.3	<.1	<2.0	<.3
B-29	BL-065-1S	05/18/88	NORTHERN SHOVELER	<3.0	--	1.7	<.1	<2.0	<.3
B-29	BL-186-1S	07/26/88	NORTHERN SHOVELER	<6.3	--	2.5	<.03	<.8	<.4
B-29	BL6-T57	06/21/89	TEAL	--	--	--	--	--	--
B-29	BL6-T59	06/21/89	TEAL	--	--	--	--	--	--
B-29	BL6-T58	06/21/89	TEAL	--	--	--	--	--	--

Table 25. Results of trace-element analyses of duck eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Chromium	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued								
B-27	<1.0	4.5	135	497	1.7	--	<1.0	<2.0	<4.0	1.9	16	<.3	48
B-27	3.3	3.3	126	385	5.4	--	<1.0	2.0	<4.0	2.3	20	<.3	52
B-27	.6	5.3	99	730	1.1	--	<7.0	<4.5	<9.0	4.0	101	<.6	78
B-27	<.6	2.1	116	462	2.9	--	< 12	<4.5	<9.0	1.9	36	<.5	64
B-28	--	--	--	--	--	--	--	--	--	3.7	--	--	--
B-28	--	--	--	--	--	--	--	--	--	4.3	--	--	--
B-28	--	--	--	--	--	--	--	--	--	3.3	--	--	--
B-28	--	--	--	--	--	--	--	--	--	3.8	--	--	--
B-28	--	--	--	--	--	--	--	--	--	2.9	--	--	--
B-28	--	--	--	--	--	--	--	--	--	3.7	--	--	--
B-28	--	--	--	--	--	--	--	--	--	4.1	--	--	--
B-28	--	--	--	--	--	--	--	--	--	3.6	--	--	--
B-28	--	--	--	--	--	--	--	--	--	3.0	--	--	--
B-28	--	--	--	--	--	--	--	--	--	4.1	--	--	--
B-28	--	--	--	--	--	--	--	--	--	4.0	--	--	--
B-28	<.3	3.6	116	500	2.0	--	<1.5	<1.2	<.9	1.7	15	<1.5	58
B-28	1.0	4.2	49	361	2.9	--	2.3	<1.3	<1.0	.7	9.0	<1.6	51
B-28	.8	4.5	51	339	1.3	--	1.9	<1.2	<.9	1.6	7.0	<1.5	52
B-28	.8	4.4	72	316	1.5	--	<1.5	1.2	.9	1.1	12	<1.5	51
B-28	.9	3.7	50	371	1.5	--	<1.6	<1.3	1.1	1.2	10	<1.6	52
B-28	.8	3.7	167	409	2.9	--	<1.5	<1.2	<.9	2.6	13	3.3	64
B-28	.9	4.3	115	434	2.1	--	<1.6	<1.3	<1.0	2.1	11	<1.6	55
B-28	1.0	4.7	145	378	1.9	--	<1.5	<1.2	.9	1.8	10	<1.5	70
B-28	1.0	4.2	151	399	3.1	--	1.7	<1.2	.9	1.6	10	<1.5	58
B-28	1.0	4.0	101	366	2.5	--	1.6	<1.2	<.9	1.4	13	3.4	49
B-28	.4	5.1	58	402	3.0	--	2.5	<1.1	<.8	1.5	10	2.2	62
B-29	3.0	4.0	143	621	7.5	.2	<1.0	2.0	<4.0	2.4	42	<.4	82
B-29	<.6	3.4	148	395	1.6	--	< 12	<4.5	<9.0	2.5	31	<.5	49
B-29	--	--	--	--	--	--	--	--	--	4.0	--	--	--
B-29	<1.0	2.3	108	408	1.3	--	<1.0	<2.0	<4.0	2.6	7.6	<.3	54
B-29	<1.0	2.6	111	408	1.0	--	<1.0	<2.0	<4.0	3.6	7.0	<.3	65
B-29	<1.0	3.1	102	358	1.1	--	<1.0	<2.0	<4.0	5.3	6.3	<.3	56
B-29	2.0	3.1	100	412	2.4	--	<1.0	<2.0	<4.0	2.6	17	<.3	66
B-29	.7	2.7	128	290	1.7	--	<7.0	<4.5	<9.0	2.8	26	<.6	61
B-29	--	--	--	--	--	--	--	--	--	4.1	--	--	--
B-29	--	--	--	--	--	--	--	--	--	1.5	--	--	--
B-29	--	--	--	--	--	--	--	--	--	2.3	--	--	--

Table 26. Results of trace-elements analyses of American coot and other bird eggs from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-16	C91-01	06/18/91	AMERICAN COOT	53	<0.5	2.9	<0.3	6.6	<0.5	<2.3
B-16	C91-06	06/18/91	AMERICAN COOT	92	<.5	4.8	<.3	<2.4	<.5	<2.4
B-16	C91-10	06/18/91	AMERICAN COOT	34	<.5	<2.4	<.3	7.0	<.5	<2.4
B-16	C91-11	06/18/91	AMERICAN COOT	37	<.5	6.0	<.3	4.9	<.5	<2.3
B-16	C91-14	06/18/91	AMERICAN COOT	47	<.5	30	<.3	3.8	<.5	<2.4
B-19	C91-04	06/12/91	AMERICAN COOT	23	<.5	4.6	<.3	4.8	<.5	<2.4
B-19	C91-05	06/12/91	AMERICAN COOT	40	<.5	<2.4	<.3	3.3	<.5	<2.4
B-19	C91-15	07/22/91	AMERICAN COOT	74	.8	6.7	<.1	4.8	<.1	<.5
B-19	SE01	06/27/89	SHORT-EARED OWL	54	--	<18	<.2	<18	<.2	<3.6
			BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-21	C-I-2	05/26/88	AMERICAN COOT	<3.0	<5.0	6.0	<.1	<2.0	<.3	<1.0
B-21	C-I-3	05/26/88	AMERICAN COOT	<3.0	<4.0	1.0	<.1	<2.0	<.3	<1.0
B-21	C-I-4	05/26/88	AMERICAN COOT	<3.0	<5.0	1.1	<.1	<2.0	<.3	<1.0
B-21	C-I-5	05/26/88	AMERICAN COOT	<3.0	<4.0	4.2	<.1	<2.0	<.3	<1.0
B-21	C-I-6	05/26/88	AMERICAN COOT	<3.0	<5.0	2.5	<.1	<2.0	<.3	<1.0
B-21	C-I-7	05/26/88	AMERICAN COOT	<3.0	<5.0	.7	<.1	<2.0	<.3	<1.0
B-21	C-I-1	05/26/88	AMERICAN COOT	<3.0	<4.0	1.8	<.1	<2.0	<.3	<1.0
B-21	C-I-8-2	06/17/88	AMERICAN COOT	6.0	<5.0	8.0	<.1	<2.0	<.3	<1.0
B-21	C-I-8-4	06/17/88	AMERICAN COOT	<3.0	<5.0	8.4	<.1	<2.0	<.3	<1.0
B-21	C-I-9	06/17/88	AMERICAN COOT	<3.0	<4.0	10	<.1	<2.0	<.3	<1.0
B-21	C-I-11	06/17/88	AMERICAN COOT	<3.0	<5.0	3.5	<.1	<2.0	<.3	1.0
B-21	C-I-8-1	06/17/88	AMERICAN COOT	9.0	<5.0	8.9	<.1	<2.0	<.3	<1.0
B-21	C-I-8-5	06/17/88	AMERICAN COOT	<3.0	<4.0	7.9	<.1	<2.0	<.3	<1.0
B-21	C-I-8-3	06/17/88	AMERICAN COOT	6.0	<5.0	8.6	<.1	<2.0	<.3	<1.0
B-21	C-I-10	06/17/88	AMERICAN COOT	<3.0	<5.0	7.9	<.1	<2.0	<.3	<1.0
B-22	C-II-1	05/26/88	AMERICAN COOT	<3.0	<5.0	3.1	<.1	<2.0	<.3	<1.0
B-22	C-II-3	05/26/88	AMERICAN COOT	<3.0	<5.0	8.4	<.1	<2.0	<.3	<1.0
B-22	C-II-5	05/26/88	AMERICAN COOT	<3.0	<5.0	5.4	<.1	<2.0	<.3	<1.0
B-22	C-II-4	05/26/88	AMERICAN COOT	4.0	<4.0	2.9	<.1	<2.0	<.3	<1.0
B-22	C-II-2	05/26/88	AMERICAN COOT	<3.0	<5.0	8.5	<.1	<2.0	<.3	<1.0
B-22	MH1	07/20/89	NORTHERN HARRIER	<5.5	--	<2.8	<.3	<2.8	<.3	<.6
B-26	C-IV-2	06/16/88	AMERICAN COOT	<3.0	<4.0	1.0	<.1	<2.0	<.3	<1.0
B-26	C-IV-3	06/16/88	AMERICAN COOT	<3.0	<4.0	3.2	<.1	3.0	<.3	<1.0
B-26	C-IV-4	06/16/88	AMERICAN COOT	3.0	<5.0	2.6	<.1	<2.0	<.3	<1.0
B-26	C-IV-6	06/16/88	AMERICAN COOT	<3.0	<5.0	14	<.1	<2.0	<.3	<1.0
B-26	C-IV-7	06/16/88	AMERICAN COOT	<3.0	<4.0	6.7	<.1	2.0	<.3	<1.0
B-26	C-IV-8	06/16/88	AMERICAN COOT	<3.0	<5.0	2.5	<.1	2.0	<.3	<1.0
B-26	C-IV-9	06/16/88	AMERICAN COOT	<3.0	<5.0	1.1	<.1	2.0	<.3	<1.0
B-26	C-IV-5-1	06/16/88	AMERICAN COOT	<3.0	<5.0	6.8	<.1	<2.0	<.3	<1.0
B-26	C-IV-5-2	06/16/88	AMERICAN COOT	<3.0	<5.0	6.3	<.1	2.0	<.3	<1.0
B-26	C-IV-5-3	06/16/88	AMERICAN COOT	<3.0	<5.0	6.7	<.1	4.0	<.3	<1.0
B-26	C-IV-5-4	06/16/88	AMERICAN COOT	<3.0	<4.0	6.8	<.1	3.0	<.3	<1.0
B-26	C-IV-5-5	06/16/88	AMERICAN COOT	<3.0	<5.0	6.6	<.1	3.0	<.3	<1.0
B-26	C-IV-10	06/16/88	AMERICAN COOT	<3.0	<5.0	2.1	<.1	<2.0	<.3	<1.0
B-26	C-IV-11	06/16/88	AMERICAN COOT	<3.0	<4.0	4.1	<.1	<2.0	<.3	<1.0
B-26	C-IV-12	06/16/88	AMERICAN COOT	<3.0	<5.0	4.1	<.1	<2.0	<.3	<1.0
B-26	C-IV-1	06/16/88	AMERICAN COOT	<3.0	<4.0	6.3	<.1	<2.0	<.3	<1.0
B-26	MH2	05/30/89	NORTHERN HARRIER	<4.3	--	<2.2	<.2	<2.2	<.2	.5

Table 26. Results of trace-element analyses of American coot and other bird eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-16	4.5	117	690	<2.9	<0.1	<4.9	<2.4	<2.4	6.8	35	<3.9	68
B-16	3.3	83	922	<3.0	<.1	<4.9	<2.5	<2.5	4.7	66	<3.9	67
B-16	3.7	108	568	<3.0	.1	<5.0	<2.5	<2.5	7.0	15	<4.0	53
B-16	3.9	102	742	<2.9	<.1	<4.9	<2.4	<2.4	7.8	25	<3.9	54
B-16	4.1	117	721	<3.0	<.1	<5.0	<2.5	38	7.0	33	<4.0	58
B-19	2.8	103	591	<3.0	<.1	<4.9	<2.5	<2.5	7.9	38	<3.9	48
B-19	3.5	86	665	<2.9	.1	<4.9	<2.5	<2.5	9.3	25	<3.9	45
B-19	4.0	138	880	1.9	<.1	.6	<0.5	2.4	5.1	69	<.5	89
B-19	14	146	748	<4.4	--	<18	<14	<11	3.4	<3.6	<18	105
					BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-21	3.3	103	541	2.3	--	<1.0	<2.0	<4.0	5.9	14	<.3	55
B-21	3.6	87	516	1.0	--	<1.0	<2.0	<4.0	2.6	5.7	<.3	71
B-21	2.7	81	554	2.3	--	<1.0	<2.0	<4.0	5.0	7.4	<.3	52
B-21	3.1	98	534	2.1	--	<1.0	<2.0	<4.0	3.8	15	<.3	55
B-21	3.2	90	519	1.5	--	<1.0	<2.0	<4.0	5.2	16	<.3	59
B-21	2.6	67	419	2.3	--	<1.0	<2.0	<4.0	3.6	9.6	<.3	52
B-21	3.6	101	496	1.4	--	<1.0	<2.0	<4.0	3.9	5.9	<.3	57
B-21	2.8	129	481	1.4	--	<1.0	<2.0	<4.0	3.8	19	<.3	59
B-21	2.7	125	463	1.2	--	<1.0	<2.0	<4.0	3.7	20	<.3	62
B-21	3.5	93	617	1.3	--	<1.0	<2.0	<4.0	4.4	20	<.3	65
B-21	5.5	138	628	1.8	--	<1.0	<2.0	<4.0	3.7	23	<.3	61
B-21	2.9	135	472	1.4	--	<1.0	<2.0	<4.0	3.8	20	<.3	63
B-21	2.7	119	501	.9	--	<1.0	<2.0	<4.0	3.8	20	<.3	57
B-21	2.5	135	480	1.3	--	<1.0	<2.0	<4.0	4.0	22	<.3	67
B-21	3.1	79	687	2.8	--	<1.0	<2.0	<4.0	4.5	27	<.3	63
B-22	2.9	100	476	3.5	--	<1.0	<2.0	<4.0	3.5	10	<.3	51
B-22	3.4	120	528	3.4	--	<1.0	<2.0	<4.0	3.3	15	<.3	55
B-22	4.0	130	550	1.4	--	<1.0	<2.0	<4.0	2.7	12	<.3	69
B-22	3.2	88	513	3.0	--	1.0	<2.0	<4.0	4.7	8.6	<.3	63
B-22	3.1	127	447	3.0	--	<1.0	<2.0	<4.0	3.2	17	<.3	57
B-22	4.9	81	646	<.7	--	<2.8	<2.2	1.8	2.4	3.9	<2.8	32
B-26	2.9	92	531	2.2	--	<1.0	<2.0	<4.0	1.5	6.9	<.3	50
B-26	3.2	92	529	3.4	--	<1.0	<2.0	<4.0	1.6	12	<.3	58
B-26	3.9	85	527	4.1	--	<1.0	<2.0	<4.0	2.0	9.2	<.3	63
B-26	4.1	125	470	2.7	--	<1.0	<2.0	<4.0	2.6	10	<.3	69
B-26	2.3	134	582	2.7	--	<1.0	2.0	<4.0	3.0	7.8	<.3	52
B-26	2.6	121	439	3.7	--	<1.0	<2.0	<4.0	2.8	6.5	<.3	59
B-26	2.5	137	474	3.6	--	<1.0	<2.0	<4.0	2.2	5.5	<.3	55
B-26	3.5	94	508	3.6	--	<1.0	<2.0	<4.0	2.6	11	<.3	57
B-26	3.4	99	497	3.8	--	<1.0	<2.0	<4.0	2.6	9.8	<.3	59
B-26	4.2	91	499	4.5	--	<1.0	<2.0	<4.0	2.8	12	<.3	66
B-26	4.2	88	508	3.7	--	<1.0	<2.0	<4.0	2.6	11	<.3	65
B-26	3.8	89	504	3.7	--	<1.0	<2.0	<4.0	2.6	9.8	<.3	62
B-26	3.2	115	581	1.6	--	<1.0	<2.0	<4.0	2.1	7.6	<.3	62
B-26	3.5	93	599	3.7	--	<1.0	<2.0	<4.0	3.0	11	<.3	65
B-26	3.3	129	525	4.9	--	<1.0	<2.0	<4.0	1.8	11	<.3	82
B-26	2.9	103	463	3.8	--	<1.0	<2.0	<4.0	1.8	12	<.3	56
B-26	3.8	58	580	1.3	--	<2.2	<1.7	<1.3	3.9	2.6	<2.2	38

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbol: <, less than]

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
B-09	FLA-177	06/12/90	<3.0	<0.1	0.7	<0.1	<2.0	<0.3	<1.0
B-09	FLA-178	06/12/90	<3.0	<.1	1.1	<.1	<2.0	<.3	<1.0
B-09	FLA-179	06/12/90	<3.0	<.1	2.2	<.1	2.0	<.3	<1.0
B-09	FLA-180	06/13/90	<3.0	<.1	.3	<.1	<2.0	<.3	<1.0
B-09	FLA-181	06/13/90	<3.0	<.1	.6	<.1	<2.0	<.3	<1.0
B-09	FLA-183	06/13/90	<3.0	<.1	.7	<.1	<2.0	<.3	<1.0
B-09	FLA-184	06/13/90	<3.0	<.1	1.0	<.1	<2.0	<.3	<1.0
B-09	FLA-186	06/13/90	<3.0	<.1	1.0	<.1	<2.0	<.3	<1.0
B-09	FLA-187	06/13/90	<3.0	<.1	.5	<.1	<2.0	<.3	<1.0
B-09	PBA-13	06/13/91	64	<.5	<2.4	<.3	5.5	<.5	<2.4
B-09	PBA-15	06/13/91	<20	<.5	<2.4	<.3	3.4	<.5	<2.4
B-09	PBA-18	06/13/91	39	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-09	PBA-31	06/13/91	24	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PBA-03	06/13/91	22	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PBA-08	06/13/91	38	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PBA-07	06/13/91	30	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PBA-27	06/17/91	134	<.5	<2.4	<.3	2.5	<.5	<2.4
B-09	PBA-35	06/17/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PBA-25	06/17/91	35	<.5	<2.3	<.3	2.9	<.5	<2.3
B-09	PBA-24	06/17/91	34	<.5	<2.4	<.3	4.7	<.5	<2.4
B-09	PBA-28	06/17/91	31	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PBA-19	06/17/91	37	<.5	2.6	<.3	2.4	<.5	<2.4
B-09	PBA-20	06/17/91	25	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-09	PB-DROP1	06/19/91	<20	<.5	<2.3	<.3	<2.3	<.5	<2.3
B-12	FLA-155	06/12/90	<3.0	<.1	2.2	<.1	2.0	<.3	<1.0
B-12	FLA-156	06/12/90	<3.0	<.1	2.0	<.1	2.0	<.3	<1.0
B-12	FLA-157	06/12/90	<3.0	<.1	.8	<.1	<2.0	<.3	<1.0
B-12	FLA-167	06/12/90	<3.0	<.1	1.1	<.1	2.0	<.3	<1.0
B-12	FLA-159	06/12/90	<3.0	<.1	1.3	<.1	<2.0	<.3	<1.0
B-12	FLA-171	06/12/90	<3.0	<.1	2.6	<.1	4.0	<.3	<1.0
B-12	FLA-161	06/12/90	<3.0	<.1	1.8	<.1	2.0	<.3	<1.0
B-12	FLA-165	06/12/90	<3.0	<.1	2.0	<.1	<2.0	<.3	<1.0
B-12	FLA-166	06/12/90	<3.0	<.1	.7	<.1	3.0	<.3	<1.0
B-12	FLA-160	06/12/90	<3.0	<.1	1.5	<.1	<2.0	<.3	<1.0
B-12	FLA-163	06/12/90	<3.0	<.1	3.6	<.1	2.0	<.3	<1.0

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Mag-nesium	Man-ga-nese	Mer-cury	Molyb-denum	Nickel	Lead	Sele-nium	Stron-tium	Vana-dium	Zinc
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA												
B-09	3.3	162	484	2.0	0.3	<1.0	<2.0	<4.0	21	40	<0.4	56
B-09	3.0	98	464	2.0	.9	<1.0	<2.0	<4.0	26	29	<.4	52
B-09	2.4	110	435	1.5	.2	<1.0	<2.0	<4.0	16	27	<.4	45
B-09	3.7	130	443	1.5	.4	<1.0	<2.0	<4.0	33	34	<.4	54
B-09	3.6	110	630	1.5	.3	<1.0	<2.0	<4.0	28	44	<.4	55
B-09	3.0	120	478	1.9	.6	<1.0	<2.0	<4.0	33	25	<.4	49
B-09	3.5	130	685	1.2	.4	<1.0	<2.0	<4.0	23	52	<.4	53
B-09	2.8	156	460	1.4	.5	<1.0	<2.0	<4.0	26	33	<.4	59
B-09	3.5	110	611	1.0	.5	<1.0	<2.0	<4.0	26	50	<.4	54
B-09	3.7	98	671	<3.0	.1	<5.0	2.7	2.7	19	51	<4.0	51
B-09	3.3	110	390	<3.0	.2	<5.0	<2.5	<2.5	17	24	<4.0	43
B-09	3.8	107	574	<2.9	.1	<4.9	<2.4	<2.4	23	35	<3.9	44
B-09	4.2	75	411	<3.0	.3	<5.0	<2.5	<2.5	16	16	<4.0	43
B-09	3.6	131	432	<3.0	.3	<5.0	<2.5	<2.5	21	29	<4.0	44
B-09	4.2	127	547	<3.0	.2	<5.0	<2.5	<2.5	25	34	<4.0	49
B-09	3.7	135	468	<3.0	<.1	<5.0	<2.5	<2.5	20	32	<4.0	45
B-09	4.3	117	999	<2.9	.1	<4.9	<2.5	<2.5	35	108	<3.9	58
B-09	3.4	94	388	<3.0	.2	<5.0	<2.5	<2.5	26	19	<4.0	40
B-09	3.5	104	552	<2.9	.3	<4.9	<2.4	<2.4	34	37	<3.9	40
B-09	3.7	125	532	<3.0	.3	<4.9	<2.5	<2.5	39	37	<3.9	44
B-09	3.7	136	506	<3.0	.1	<5.0	<2.5	<2.5	27	33	<4.0	47
B-09	3.7	93	531	<3.0	.1	<5.0	<2.5	2.9	20	29	<4.0	48
B-09	3.8	114	471	<3.0	.4	<5.0	<2.5	3.5	30	29	<4.0	54
B-09	3.4	84	387	<2.9	.1	<4.9	<2.4	<2.4	16	23	<3.9	51
B-12	3.4	100	627	2.0	.4	<1.0	<2.0	<4.0	7.8	24	<.4	50
B-12	3.1	110	532	1.4	.1	<1.0	<2.0	<4.0	5.7	21	<.4	48
B-12	2.8	110	439	2.1	.7	<1.0	<2.0	<4.0	4.8	16	<.4	37
B-12	4.0	110	544	1.2	.2	<1.0	<2.0	<4.0	5.1	23	<.4	46
B-12	3.1	100	503	1.9	.1	<1.0	<2.0	<4.0	5.2	19	<.4	50
B-12	2.9	149	559	1.8	.2	<1.0	<2.0	<4.0	7.0	25	<.4	43
B-12	2.9	96	545	2.0	.6	<1.0	<2.0	<4.0	4.8	22	<.4	43
B-12	2.9	110	458	1.8	.5	<1.0	<2.0	<4.0	5.0	17	<.4	49
B-12	2.5	110	397	1.7	.4	<1.0	<2.0	<4.0	7.4	13	<.4	47
B-12	3.8	110	597	1.0	.5	<1.0	<2.0	<4.0	5.6	20	<.4	45
B-12	3.1	130	490	2.8	.3	<1.0	<2.0	<4.0	5.8	19	<.4	62

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued						
B-14	F91-02	06/19/91	23	<.5	2.7	<.3	3.7	<.5	<2.4
B-14	F91-03	06/19/91	21	<.5	<2.4	<.3	3.8	<.5	<2.4
B-14	F91-01	06/19/91	<20	<.5	<2.4	<.3	4.9	<.5	<2.4
B-15	FLA-102	06/06/90	<3.0	<.2	3.1	<.1	4.0	<.4	1.0
B-15	FLA-100	06/06/90	<3.0	<.2	1.9	<.1	<2.0	<.3	<1.0
B-15	FLA-101	06/06/90	<3.0	<.2	2.6	<.1	2.0	<.4	<1.0
B-15	FLA-142	06/07/90	<3.0	<.1	2.2	<.1	6.0	<.3	<1.0
B-15	FLA-143	06/07/90	<3.0	<.1	4.0	<.1	6.0	<.3	<1.0
B-15	FLA-138	06/07/90	<3.0	<.2	1.5	<.1	3.0	<.3	2.0
B-15	FLA-134	06/07/90	<3.0	<.2	2.0	<.1	5.0	<.3	<1.0
B-15	FLA-139	06/07/90	<3.0	<.2	2.2	<.1	4.0	<.3	<1.0
B-18	FLA-066	05/23/90	<3.0	<.1	1.6	<.1	<2.0	<.3	<1.0
B-18	FLA-061	05/23/90	<3.0	<.1	.4	<.1	<2.0	<.3	<1.0
B-18	FLA-050	05/23/90	<3.0	<.1	1.8	<.1	2.0	<.3	<1.0
B-18	FLA-065	06/06/90	<3.0	<.2	1.1	<.1	<2.0	<.3	<1.0
B-18	FLA-105	06/06/90	<3.0	<.2	2.2	<.1	3.0	<.4	1.0
B-18	FLA-106	06/06/90	<3.0	<.2	1.9	<.1	<2.0	<.4	1.0
B-18	FLA-097	06/06/90	<3.0	<.2	1.9	<.1	2.0	<.3	1.0
B-18	FLA-107	06/06/90	<3.0	<.3	3.5	<.1	1.6	<.1	.8
B-18	FLA-099	06/06/90	<3.0	<.2	2.4	<.1	<2.0	<.3	<1.0
B-18	FLA-108	06/06/90	<3.0	<.3	1.9	<.1	.7	<.1	.8
B-18	FLA-109	06/06/90	<3.0	<.3	1.0	<.1	1.3	<.1	.6
B-18	FLA-111	06/06/90	<3.0	<.3	1.3	.2	1.0	.2	.8
B-18	FLA-113	06/06/90	<3.0	<.3	2.8	<.1	2.1	<.1	.8
B-18	FLA-098	06/06/90	<3.0	<.2	1.2	<.1	3.0	<.4	2.0
B-18	FLA-114	06/06/90	<3.0	<.3	.7	<.1	1.9	<.1	<.5
B-18	FLA-117	06/06/90	<3.0	<.2	1.4	<.1	<2.0	<.3	<.9
B-18	FLA-119	06/06/90	<3.0	<.2	1.3	<.1	<2.0	<.3	<.9
B-18	FLA-123	06/06/90	<3.0	<.2	.7	<.1	<2.0	<.3	3.0
B-18	FLA-095	06/06/90	<3.0	<.2	2.9	<.1	4.0	<.4	1.0
B-18	FLA-145	06/07/90	<3.0	<.1	4.9	<.1	<2.0	<.3	<1.0
B-18	FLA-147	06/07/90	<3.0	<.1	1.9	<.1	<2.0	<.3	<1.0
B-18	FLA-150	06/07/90	5.0	<.1	1.6	<.1	<2.0	<.3	<1.0
B-18	FLA-152	06/07/90	<3.0	<.3	1.1	<.1	1.5	<.1	.6
B-18	FLA-148	06/07/90	<3.0	<.1	1.1	<.1	<2.0	<.3	<1.0
B-18	FLA-151	06/07/90	<3.0	<.3	2.5	<.1	1.0	<.1	.5
B-18	FLA-154	06/07/90	<3.0	<.3	1.6	<.1	.9	<.1	1.2
B-19	FLA-001	05/23/90	<3.0	<.1	1.5	<.1	<2.0	<.3	<1.0
B-19	FLA-002	05/23/90	<3.0	<.1	.9	<.1	<2.0	<.3	<1.0
B-19	FLA-089	06/05/90	<3.0	<.2	1.6	<.1	3.0	<.3	<.9

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Mag-nesium	Man-ga-nese	Mer-cury	Molyb-denum	Nickel	Lead	Sele-nium	Stron-tium	Vana-dium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued							
B-14	3.3	119	484	<2.9	<.1	<4.9	<2.5	<2.5	3.0	24	<3.9	40
B-14	3.9	99	389	<3.0	<.1	<5.0	<2.5	<2.5	4.1	19	<4.0	42
B-14	2.6	343	428	3.0	<.1	<4.9	<2.5	<2.5	2.6	12	<4.0	55
B-15	4.2	160	695	1.9	.2	<1.0	<2.0	<4.0	3.3	64	<.3	54
B-15	3.8	120	478	2.2	.2	<1.0	<2.0	<4.0	3.4	45	<.3	47
B-15	4.1	173	709	2.4	.4	<1.0	<2.0	<4.0	5.1	100	<.3	58
B-15	3.2	130	533	2.5	.7	<1.0	<2.0	<4.0	3.5	28	<.4	47
B-15	4.1	120	635	1.9	.2	<1.0	<2.0	<4.0	3.5	46	<.4	47
B-15	6.9	96	378	2.1	.8	<1.0	<2.0	<4.0	3.8	23	<.3	43
B-15	3.8	122	511	1.5	.2	<1.0	<2.0	<4.0	3.5	30	<.3	38
B-15	4.9	125	548	2.6	.1	<1.0	<3.0	<4.0	3.9	33	<.3	47
B-18	2.6	110	436	1.2	.2	<1.0	<2.0	<4.0	3.8	55	<.4	56
B-18	3.1	120	467	1.6	.3	<1.0	<2.0	<4.0	4.7	27	<.4	47
B-18	3.0	171	439	1.1	.2	<1.0	<2.0	<4.0	4.1	44	<.4	51
B-18	2.7	120	378	1.7	.3	<1.0	<3.0	<4.0	5.1	29	<.3	37
B-18	3.3	113	618	3.2	.3	<1.0	<2.0	<4.0	5.6	45	<.3	56
B-18	3.8	164	702	2.2	.3	<1.0	<2.0	<4.0	4.1	149	<.3	58
B-18	3.5	116	443	2.0	.3	<1.0	<2.0	<4.0	4.3	23	<.3	43
B-18	3.8	164	552	2.3	.2	<.5	<.5	<1.8	9.1	39	<.5	66
B-18	3.0	123	452	.8	.2	<1.0	<2.0	<4.0	2.9	32	<.3	44
B-18	4.8	141	795	2.5	.3	<.5	<.5	<1.8	5.4	77	<.5	67
B-18	4.9	173	567	3.2	1.8	.8	<.5	<1.8	4.2	65	<.5	67
B-18	3.9	109	577	2.5	.1	<.5	1.0	<1.8	4.4	38	<.5	47
B-18	4.0	124	695	1.4	.2	<.5	.6	<1.8	5.7	66	<.5	62
B-18	4.2	177	736	3.3	.3	2.0	3.0	<5.0	4.0	157	<.5	65
B-18	4.1	103	468	2.2	.1	<.5	<.5	<1.8	5.6	26	<.5	46
B-18	2.5	124	417	1.4	2.4	<.9	<2.0	<4.0	5.7	33	<.3	45
B-18	2.9	119	447	1.4	.1	<.9	<2.0	<4.0	4.5	31	<.3	45
B-18	6.4	114	441	1.6	.3	<.9	<2.0	<4.0	6.1	33	<.3	47
B-18	3.8	131	690	3.1	.3	<1.0	<2.0	<4.0	4.6	103	<.3	58
B-18	2.5	150	407	1.5	.2	<1.0	<2.0	<4.0	4.2	22	<.4	50
B-18	2.7	100	463	2.4	.8	<1.0	<2.0	<4.0	3.2	9.1	<.4	45
B-18	2.7	144	457	1.9	.2	<1.0	<2.0	<4.0	4.8	25	<.4	51
B-18	4.3	149	639	2.1	.3	<.5	<.5	<1.8	3.5	48	<.5	50
B-18	2.9	144	394	4.0	.6	<1.0	<2.0	<4.0	4.7	23	<.4	44
B-18	3.3	139	444	1.7	.2	<.5	<.5	<1.8	4.1	30	<.5	47
B-18	4.0	124	688	2.9	.2	<.5	<.5	<1.8	4.9	80	<.5	51
B-19	3.9	100	469	1.9	.5	<1.0	<2.0	<4.0	5.1	23	<.4	46
B-19	3.0	110	382	2.0	.3	<1.0	<2.0	<4.0	5.7	25	<.4	39
B-19	6.2	106	711	1.8	1.5	<.9	<2.0	<4.0	3.8	60	<.3	47

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued						
B-19	FLA-067	06/05/90	<3.0	<.2	2.1	<.1	<2.0	<.3	<1.0
B-19	FLA-073	06/05/90	<3.0	<.2	2.9	<.1	<2.0	<.3	<1.0
B-19	FLA-000	06/05/90	<3.0	<.3	2.2	<.1	.9	<.1	.5
B-19	FLA-083A	06/05/90	<3.0	<.2	1.4	<.1	3.0	<.3	<1.0
B-19	FLA-072	06/05/90	<3.0	<.2	2.9	<.1	<2.0	<.3	<1.0
B-19	FLA-130	06/06/90	<3.0	<.2	3.2	<.1	<2.0	<.3	<1.0
B-19	FLA-088	06/13/90	<3.0	<.2	1.8	<.1	3.0	<.3	<1.0
B-19	FLA-090	06/13/90	<3.0	<.2	1.6	<.1	3.0	<.4	<1.0
B-19	FLA-045B	06/13/90	<3.0	<.3	1.7	<.1	.7	<.1	.6
B-19	FLA-083B	06/13/90	<3.0	.3	1.5	<.1	2.4	<.1	.6
B-19	FLA-188	06/13/90	<3.0	<.1	6.7	<.1	<2.0	<.3	2.0
B-19	FLA-091	06/13/90	<3.0	<.2	3.1	<.1	3.0	<.3	<1.0
B-19	FLA-076	06/13/90	<3.0	<.2	3.3	<.1	<2.0	<.3	<1.0
B-19	FLA-080	06/13/90	<3.0	<.2	2.6	<.1	3.0	<.3	<1.0
B-19	FLA-077	06/13/90	<3.0	<.3	3.5	<.1	2.1	.2	.6
B-19	FLA-082	06/13/90	<3.0	<.2	1.9	<.1	<2.0	<.3	<1.0
B-19	FLA-074	06/13/90	<3.0	<.2	5.1	<.1	2.0	<.3	<.9
B-19	FLA-081	06/13/90	<3.0	<.2	2.0	<.1	3.0	<.3	<1.0
B-19	FLA-092	06/13/90	<3.0	<.2	7.1	<.1	2.0	<.3	<.9
B-19	FLA-078	06/13/90	<3.0	<.2	2.7	<.1	3.0	<.3	<1.0
			BENTON LAKE NATIONAL WILDLIFE REFUGE						
B-23	BLA-007	06/01/90	<3.0	<.1	1.7	<.1	<2.0	<.2	<1.0
B-23	BLA-026	06/01/90	6.0	<.1	2.5	<.1	<2.0	<.2	<1.0
B-23	BLA-028	06/01/90	<3.0	<.1	2.1	<.1	<2.0	<.2	<1.0
B-23	BLA-008	06/01/90	<3.0	<.1	2.4	<.1	<2.0	<.2	<1.0
B-23	BLA-010	06/01/90	<3.0	<.3	2.5	<.1	1.1	<.1	<.5
B-23	BLA-012	06/01/90	<3.0	<.3	3.8	<.1	1.7	<.1	<.5
B-23	BLA-014	06/01/90	<3.0	<.3	2.0	<.1	1.4	<.1	<.5
B-23	BLA-015	06/01/90	<3.0	<.3	3.1	<.1	5.6	<.1	.5
B-23	BLA-016	06/01/90	<3.0	<.3	1.3	<.1	.7	<.1	19.1
B-23	BLA-017	06/01/90	<3.0	<.3	3.2	<.1	1.0	<.1	.5
B-23	BLA-018	06/01/90	<3.0	<.3	1.4	<.1	1.3	<.1	.6
B-23	BLA-019	06/01/90	<3.0	<.3	3.8	<.1	2.2	<.1	.7
B-23	BLA-029	06/01/90	<3.0	<.3	2.1	<.1	1.7	<.1	.6
B-23	BLA-047	06/08/90	<3.0	<.3	4.2	1.0	3.0	.9	1.4
B-24	BLA-036	06/04/90	<3.0	<.1	1.1	<.1	<2.0	<.2	<1.0

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Mag-nesium	Man-ga-nese	Mer-cury	Molyb-denum	Nickel	Lead	Sele-nium	Stron-tium	Vana-dium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA--Continued							
B-19	3.2	127	464	2.0	.2	<1.0	<2.0	<4.0	4.9	22	<.3	45
B-19	3.1	106	504	1.5	.7	<1.0	<2.0	<4.0	4.1	33	<.3	31
B-19	3.8	138	594	1.6	<.1	<.5	<.5	<1.8	6.5	35	<.5	53
B-19	3.3	136	399	1.7	.2	<1.0	<2.0	<4.0	5.2	35	<.3	51
B-19	3.1	142	469	3.0	.3	<1.0	<2.0	<4.0	4.2	40	<.3	50
B-19	6.0	120	632	2.2	.4	<1.0	<2.0	<4.0	7.6	58	<.3	49
B-19	4.4	125	654	1.7	.5	<1.0	<3.0	<4.0	5.8	59	<.3	50
B-19	3.8	132	604	2.5	.5	<1.0	<3.0	<4.0	5.7	63	<.3	56
B-19	4.2	153	544	3.0	.1	<.5	<.5	<1.8	5.3	39	<.5	89
B-19	4.3	143	633	2.0	.2	<.5	<.5	<1.8	6.5	79	<.5	62
B-19	5.2	140	421	1.5	.3	<1.0	<2.0	<4.0	5.2	26	<.4	42
B-19	3.5	108	472	1.7	.5	<1.0	<2.0	<4.0	7.5	31	.4	44
B-19	3.6	140	471	2.2	.4	<1.0	<3.0	<4.0	10	35	<.3	48
B-19	3.3	137	603	2.4	.5	<1.0	<2.0	<4.0	4.8	51	<.3	35
B-19	4.3	177	420	3.8	.4	<.5	<.5	<1.8	2.9	20	<.5	52
B-19	3.6	159	577	2.6	.5	<1.0	<3.0	<4.0	5.0	64	<.3	51
B-19	3.2	157	603	3.3	.1	<.9	<2.0	<4.0	5.9	51	<.3	56
B-19	2.6	119	430	1.6	.2	<1.0	<2.0	<4.0	3.7	22	<.3	39
B-19	3.7	123	515	1.9	.1	<.9	<2.0	<4.0	4.3	27	<.3	43
B-19	3.5	140	576	2.8	.2	<1.0	<2.0	<4.0	10	42	<.3	48
					BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-23	3.6	123	723	2.4	.7	<1.0	<1.0	<4.0	4.2	27	<.3	42
B-23	3.6	113	555	2.1	.4	<1.0	<1.0	<4.0	4.0	20	<.3	46
B-23	3.3	113	614	1.3	.2	<1.0	<1.0	<4.0	3.5	25	<.3	53
B-23	3.3	121	657	2.1	.2	<1.0	<1.0	<4.0	4.2	34	<.3	52
B-23	3.4	131	505	1.6	.2	<.5	<.5	<1.8	3.2	16	<.5	44
B-23	4.0	135	521	2.5	.1	<.5	<.5	<1.8	3.5	17	<.5	51
B-23	3.7	126	418	2.3	.1	<.5	<.5	<1.8	3.8	8.9	<.5	44
B-23	4.4	144	600	2.6	.2	<.5	<.5	<1.8	3.5	13	<.5	44
B-23	4.1	152	615	3.1	.5	<.5	<.5	<1.8	3.5	27	<.5	51
B-23	3.9	118	754	2.4	.1	<.5	2.5	<1.8	4.0	24	<.5	57
B-23	3.8	131	482	2.4	.2	<.5	<.5	<1.8	3.4	20	<.5	49
B-23	3.7	126	547	2.6	.2	<.5	<.5	<1.8	4.3	29	<.5	49
B-23	4.0	152	586	3.0	.7	<.5	<.5	<1.8	4.9	20	<.5	47
B-23	4.7	154	584	3.4	.4	1.0	4.9	5.2	3.4	14	1.1	56
B-24	3.2	134	466	2.5	.3	<1.0	<1.0	<4.0	4.7	22	<.3	45

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-24	BLA-037	06/04/90	3.0	<.1	2.1	<.1	<2.0	<.2	<1.0
B-24	BLA-091	06/04/90	<3.0	<.1	.7	<.1	<2.0	<.2	<1.0
B-24	BLA-093	06/04/90	<3.0	<.1	.8	<.1	<2.0	<.2	<1.0
B-25	BLA-103	06/21/90	<3.0	<.1	3.2	<.1	<2.0	<.2	<1.0
B-25	BLA-104	06/21/90	<3.0	<.1	2.6	<.1	<2.0	<.2	<1.0
									<1.0
B-25	BLA-101	06/21/90	<3.0	<.1	2.2	<.1	<2.0	<.2	<1.0
B-25	BLA-102	06/21/90	<3.0	<.1	1.6	<.1	<2.0	<.2	<1.0
B-26	BLA-031	05/14/90	<3.0	<.1	1.9	<.1	<2.0	<.2	<1.0
B-26	BLA-001	05/21/90	<3.0	<.1	2.4	<.1	<2.0	<.2	1.0
B-26	BLA-006	05/21/90	<3.0	<.1	2.7	<.1	<2.0	<.2	<1.0
B-26	BLA-041	05/21/90	<3.0	<.1	1.5	<.1	2.0	<.2	1.0
B-26	BLA-040	05/21/90	<3.0	<.1	1.3	<.1	<2.0	<.2	1.0
B-26	BLA-002	05/21/90	<3.0	<.1	.8	<.1	<2.0	<.2	<1.0
B-26	BLA-042	05/21/90	<3.0	<.1	.8	<.1	<2.0	<.2	.8
B-26	BLA-0001	05/22/90	<3.0	<.3	2.0	.2	2.4	.2	
									<.5
B-26	BLA-090	06/01/90	<3.0	<.3	1.8	<.1	1.7	<.1	<1.0
B-26	BLA-070	06/01/90	<3.0	<.1	2.4	<.1	<2.0	<.2	<1.0
B-26	BLA-078	06/01/90	<3.0	<.1	3.3	<.1	<2.0	<.2	.6
B-26	BLA-083	06/01/90	<3.0	<.3	1.9	<.1	1.3	<.1	<.5
B-26	BLA-099	06/20/90	<3.0	<.3	.7	<.1	1.2	<.1	
									<.5
B-26	BLA-100	06/20/90	<3.0	<.3	1.6	<.1	1.3	<.1	.6
B-27	BLA-055	05/22/90	<3.0	<.3	1.6	<.1	.8	<.1	.5
B-27	BLA-048	05/22/90	<3.0	<.3	.9	<.1	.5	<.1	<.5
B-27	BLA-051	05/22/90	<3.0	<.3	1.3	<.1	.8	<.1	<2.4
B-27	B91A-16	06/11/91	78	<.5	2.7	<.3	<2.4	<.5	
									<.4
B-27	B91A-03	06/11/91	42	<.3	3.0	<.1	<.4	<.1	<.5
B-27	B91A-02	06/11/91	18	<.5	1.9	<.1	<.5	<.1	<.5
B-27	B91A-21	06/11/91	34	<.5	1.7	<.1	2.6	<.1	<.5
B-27	B91A-20	06/11/91	46	<.5	1.8	<.1	2.3	<.1	<.4
B-27	B91A-05	06/11/91	42	<.3	2.0	.1	1.4	<.1	
									<.5
B-27	B91A-15	06/11/91	48	<.5	2.7	<.1	9.4	<.1	<.5
B-27	B91A-17	06/11/91	40	<.5	3.2	<.1	4.0	<.1	<.5
B-27	B91A-19	06/11/91	32	<.5	1.1	<.1	5.6	<.1	.4
B-27	B91A-06	06/25/91	38	<.3	2.8	<.1	2.0	<.1	<2.3
B-27	B91A-10	06/25/91	81	<.5	3.1	<.3	7.5	<.5	<1.0

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Mag-nesium	Man-ga-nese	Mer-cury	Molyb-denum	Nickel	Lead	Sele-nium	Stron-tium	Vana-dium	Zinc
BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued												
B-24	3.6	123	547	2.3	.4	<1.0	<1.0	<4.0	4.5	24	<.3	47
B-24	2.7	87	421	2.1	.7	<1.0	<1.0	<4.0	5.1	13	<.3	42
B-24	3.3	109	463	2.6	.2	<1.0	<1.0	<4.0	8.6	9.9	<.3	44
B-25	3.5	96	716	1.9	.9	<1.0	<1.0	<4.0	3.3	20	<.3	55
B-25	3.7	145	502	2.3	.5	<1.0	<1.0	<4.0	3.1	9.6	<.3	50
B-25	2.7	112	437	1.4	.2	<1.0	<1.0	<4.0	2.9	11	<.3	46
B-25	3.1	128	535	2.4	.2	<1.0	<1.0	<4.0	4.0	11	<.3	52
B-26	3.5	106	588	2.7	.2	<1.0	<1.0	<4.0	3.1	13	<.3	49
B-26	3.3	121	657	2.1	.1	<1.0	<1.0	<4.0	2.8	34	<.3	52
B-26	2.8	126	374	2.0	.1	<1.0	<1.0	<4.0	3.9	15	<.3	47
B-26	3.4	119	324	2.1	.1	<1.0	<2.0	<4.0	3.8	7.4	<.3	43
B-26	3.5	120	437	.7	.3	<1.0	<1.0	<4.0	3.1	8.8	<.3	47
B-26	3.6	121	494	1.2	.3	<1.0	<1.0	<4.0	3.6	15	<.3	41
B-26	3.9	116	419	1.0	.1	<1.0	<1.0	<4.0	11	13	<.3	59
B-26	4.3	136	484	2.8	.1	<.5	1.0	<1.8	2.8	12	<.5	49
B-26	4.3	168	538	3.0	<.1	<.5	<.5	<1.8	3.5	18	<.5	57
B-26	3.7	124	586	1.8	.4	<1.0	<1.0	<4.0	3.6	16	<.3	51
B-26	3.8	121	543	2.2	.8	<1.0	<1.0	<4.0	4.2	20	<.3	54
B-26	3.9	116	665	2.5	.1	<.5	<.5	<1.8	4.2	27	<.5	44
B-26	3.5	127	424	2.1	.1	<.5	<.5	<1.8	2.8	12	<.5	40
B-26	3.7	114	464	1.5	.1	<.5	<.5	<1.8	2.9	20	<.5	45
B-27	4.7	116	431	1.8	.7	<.5	<.5	<1.8	2.7	12	<.5	40
B-27	4.0	121	417	3.2	.1	<.5	<.5	<1.8	2.7	13	<.5	46
B-27	3.5	123	483	4.0	.2	<.5	<.5	<1.8	2.6	15	<.5	43
B-27	3.3	124	712	<3.0	.2	<5.0	<2.5	<2.5	2.7	29	<4.0	58
B-27	4.3	124	617	2.3	.1	<.4	<.5	<.5	5.0	18	<.4	47
B-27	2.9	96	442	2.2	<.1	<.5	<.5	<.5	3.8	10	<.5	35
B-27	2.9	109	573	2.2	<.1	<.5	<.5	<.5	3.2	15	<.5	50
B-27	4.1	131	738	2.0	.2	<.5	<.5	<.5	2.8	18	<.5	59
B-27	2.8	99	576	1.8	.3	<.4	1.1	<.5	2.9	15	<.4	51
B-27	4.2	104	788	2.5	.1	<.5	<.5	<.5	3.6	23	<.5	58
B-27	4.2	101	559	1.3	.2	<.5	<.5	<.5	3.3	12	<.5	39
B-27	3.7	113	544	1.8	.1	<.5	<.5	<.5	3.0	14	<.5	46
B-27	4.3	118	537	2.2	<.1	<.4	<.5	<.5	4.0	13	<.4	42
B-27	4.2	151	784	<2.9	.8	<4.9	<2.4	<2.4	4.1	26	<3.9	60

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued						
B-29	BLA-094	06/14/90	<3.0	<.1	3.0	<.1	<2.0	<.2	<1.0
B-29	BLA-095	06/14/90	<3.0	<.1	1.9	<.1	<2.0	<.2	<1.0
B-29	BLA-096	06/14/90	<3.0	<.1	1.9	<.1	<2.0	<.2	<1.0
B-29	BLA-097	06/14/90	<3.0	<.1	1.7	<.1	<2.0	<.2	<.5
B-29	BLA-D01	06/14/90	<3.0	<.3	.8	<.1	.7	<.1	<.5
B-29	BLA-D03	06/14/90	<3.0	<.3	2.5	<.1	1.3	<.1	<.5
B-29	BLA-D02	06/14/90	<3.0	<.3	.9	<.1	1.2	<.1	<.5
B-29	BLA-D04	06/14/90	<3.0	<.3	1.4	<.1	1.1	<.1	.6
B-29	B91A-12	06/11/91	5.0	<.3	<.4	<.1	9.0	<.1	.4
B-29	B91A-08	06/11/91	51	<.3	2.1	.2	4.7	<.1	<1.0

Table 27. Results of trace-element analyses of American avocet eggs from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Mag-nesium	Man-ga-nese	Mer-cury	Molyb-denum	Nickel	Lead	Sele-nium	Stron-tium	Vana-dium	Zinc
BENTON LAKE NATIONAL WILDLIFE REFUGE--Continued												
B-29	3.1	105	622	1.9	.7	<1.0	<1.0	<4.0	3.1	36	<.3	49
B-29	3.2	151	438	1.2	.1	<1.0	<1.0	<4.0	2.8	17	<.3	51
B-29	3.2	123	564	2.6	.3	<1.0	<1.0	<4.0	2.2	27	<.3	52
B-29	3.9	126	410	1.7	.2	<1.0	<1.0	<4.0	2.7	19	<.3	44
B-29	2.8	99	394	2.6	.2	<.5	<.5	<1.8	2.7	12	<.5	41
B-29	3.7	135	448	2.9	.3	<.5	<.5	<1.8	4.1	12	<.5	52
B-29	2.4	110	394	2.0	<.1	<.5	<.5	<1.8	1.6	14	<.5	37
B-29	3.1	87	409	3.9	.9	<.5	<.5	<1.8	3.9	6.6	<.5	39
B-29	11	450	890	15	.2	1.1	<.5	<.5	3.4	1.1	<.4	91
B-29	3.6	111	551	2.2	.2	<.4	.8	<.5	3.2	21	<.4	47

Table 28. Results of trace-element analyses of eared grebe livers from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6,7)	Sample identification	Date	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Copper
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-16	F91G-08L	08/09/91	4.6	<0.3	<0.4	<0.1	0.8	<0.1	<0.4	18
B-16	F91G-10L	08/09/91	<4.0	<.3	<.4	.2	4.3	<.1	.6	23
B-16	F91G-09L	08/09/91	4.5	<2.9	<.4	<.1	.5	<.1	.5	23
B-16	F91G-11L	08/09/91	<3.9	<.3	<.4	<.1	2.0	<.1	.4	15
B-16	F91G-12L	08/13/91	<4.9	<.5	<.5	<.1	3.7	<.1	<.5	14
B-19	F91G-01L	07/25/91	<20	<.5	<2.4	<.3	5.9	<.5	<2.4	16
B-19	F91G-02L	07/25/91	<20	<.5	<2.4	<.3	2.9	<.5	<2.4	21
B-19	F91G-45L	07/25/91	<20	<.5	<2.4	<.3	5.1	<.5	<2.4	48
B-19	F91G-03L	07/25/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4	18
B-19	F91G-67L	07/25/91	<20	<.5	<2.4	<.3	3.7	<.5	<2.4	49
			BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-21	BL-87-EG-6	08/02/87	<3.0	<.2	<.1	<.1	<2.0	<.3	<1.0	24
B-21	BL-87-EG-7	08/02/87	3.0	.2	.1	.1	<2.0	<.3	1.0	22
B-21	BL-87-EG-8	08/02/87	<3.0	<.2	.3	<.1	<2.0	<.3	1.0	42
B-21	BL-87-EG-9	08/02/87	<3.0	<.2	<.1	<.1	<2.0	<.3	<1.0	10
B-21	CARC-I-1EG	06/29/88	3.0	<5.0	<.1	<.1	<2.0	3.2	<1.0	12
B-21	EG-LIV-I-06	07/26/88	4.0	<5.0	<.1	<.1	<2.0	<.2	<1.0	21
B-21	EG-LIV-I-04	07/26/88	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0	20
B-21	EG-LIV-I-02	07/26/88	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0	30
B-21	EG-LIV-I-05	07/26/88	5.0	<5.0	.3	<.1	<2.0	<.2	<1.0	25
B-21	EG-LIV-I-03	07/26/88	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0	24
B-21	EG-LIV-I-01	07/26/88	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0	14
B-21	B91G-04L	07/23/91	<20	<.5	<2.4	<.3	4.4	<.5	<2.4	27
B-21	B91G-06L	07/23/91	<20	<.5	<2.3	<.3	<2.3	<.5	<2.3	19
B-21	B91G-03L	07/23/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4	68
B-21	B91G-05L	07/23/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4	22
B-21	B91G-07L	07/23/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4	36
B-22	BL-87-EG-2	08/02/87	<3.0	<.2	<.1	.1	<2.0	<.3	<1.0	16
B-22	BL-87-EG-4	08/02/87	<3.0	<.2	<.1	<.1	<2.0	<.3	<1.0	10
B-22	BL-87-EG-5	08/02/87	<3.0	<.2	<.1	.1	<2.0	<.3	<1.0	29
B-22	BL-87-EG-3	08/02/87	<3.0	<.2	<.1	<.1	<2.0	<.3	<1.0	21
B-26	BL-87-EG-10	08/02/87	3.0	<.2	<.1	<.1	<2.0	<.3	1.0	19
B-26	BL-87-EG-12	08/02/87	3.0	<.2	<.1	.1	<2.0	<.3	1.0	19
B-26	BL-87-EG-11	08/02/87	<3.0	<.2	<.1	<.1	<2.0	<.3	<1.0	6.4
B-26	EG-LIV-IV-01	07/26/88	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0	23
B-26	B91G-08L	07/23/91	<20	<.5	<2.3	<.3	<2.3	<.5	<2.3	59
B-29	BL-87-EG-1	07/29/87	<3.0	<.2	<.1	<.1	<2.0	<.3	<1.0	28
B-29	B91G-02L	07/16/91	<20	<.5	<2.4	<.3	13	<.5	<2.4	28
B-29	B91G-01L	07/16/91	<19	<.5	<2.3	<.3	11	<.5	<2.3	28
B-29	B91G-09L	08/07/91	<4.9	<.5	<.5	<.1	2.0	<.1	<.5	25
B-29	B91G-10L	08/07/91	19	<.5	<.5	<.1	1.2	<.1	<.5	24
B-29	B91G-11L	08/07/91	<4.9	<.5	<.5	<.1	3.7	<.1	<.5	28

Table 28. Results of trace-element analyses of eared grebe livers from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
B-16	1,010	744	16	1.1	0.8	<0.5	<0.5	21	0.4	<0.4	104
B-16	185	808	14	.3	1.1	<.5	<.5	13	.8	<.4	101
B-16	318	735	18	.7	1.2	<.5	<.5	18	<.4	<.4	96
B-16	470	831	16	.4	<.4	<.5	<.5	13	1.0	<.4	97
B-16	213	1,060	18	.2	<.5	<.5	<.5	8.3	1.2	<.5	118
B-19	875	653	12	.1	<5.0	<2.5	<2.5	27	2.3	<4.0	88
B-19	527	750	17	.2	<4.9	<2.5	<2.5	12	<2.0	<3.9	104
B-19	435	730	13	.2	<4.9	<2.5	<2.5	9.6	<2.0	<3.9	99
B-19	375	741	14	.2	<4.9	<2.5	<2.5	20	2.1	<4.0	93
B-19	783	713	13	.3	<4.9	<2.5	<2.5	8.9	2.0	<3.9	117
					BENTON LAKE NATIONAL WILDLIFE REFUGE						
B-21	893	802	17	1.0	1.0	<1.0	<4.0	11	.3	<.4	115
B-21	504	807	17	.4	1.0	<1.0	<4.0	74	.5	<.4	128
B-21	639	836	18	.6	1.0	<1.0	<4.0	54	1.4	<.4	107
B-21	202	300	6.5	.7	<1.0	<1.0	<4.0	33	.2	<.4	45
B-21	3,210	769	15	--	1.0	<1.0	<4.0	26	.6	.7	131
B-21	555	841	19	--	1.0	<1.0	<4.0	39	1.2	<.3	105
B-21	664	863	18	--	2.0	<1.0	<4.0	25	.8	<.3	111
B-21	482	937	20	--	2.0	<1.0	<4.0	28	1.3	<.3	144
B-21	682	856	19	--	1.0	<1.0	<4.0	24	1.0	<.3	105
B-21	828	829	17	--	1.0	<1.0	<4.0	39	.5	<.3	112
B-21	879	803	16	--	1.0	<1.0	<4.0	38	.5	<.3	103
B-21	782	734	16	.2	<5.0	<2.5	<2.5	62	<2.0	<4.0	95
B-21	541	755	19	.2	<4.9	<2.4	<2.4	58	<2.0	<3.9	133
B-21	722	789	22	.3	<5.0	<2.5	<2.5	55	<2.0	<4.0	101
B-21	744	750	19	.2	<5.0	<2.5	<2.5	54	<2.0	<4.0	97
B-21	825	759	21	.3	<5.0	<2.5	<2.5	47	<2.0	<4.0	102
B-22	1,030	887	14	5.5	1.0	<1.0	<4.0	15	.7	<.4	98
B-22	179	169	3.8	1.5	<1.0	<1.0	<4.0	6.0	.1	<.4	30
B-22	572	686	16	1.4	1.0	<1.0	<4.0	16	.2	<.4	95
B-22	627	475	7.8	1.7	<1.0	<1.0	<4.0	5.2	.2	<.4	93
B-26	482	750	14	1.2	1.0	<1.0	<4.0	12	.7	<.4	86
B-26	386	718	16	1.0	1.0	<1.0	<4.0	13	.4	<.4	107
B-26	123	269	6.0	1.0	<1.0	<1.0	<4.0	3.6	.3	<.4	35
B-26	705	834	16	--	1.0	<1.0	<4.0	14	.5	<.3	92
B-26	1,000	728	15	3.3	<4.9	<2.4	<2.4	32	<2.0	<3.9	116
B-29	262	535	10	.7	<1.0	<1.0	<4.0	12	1.1	<.4	62
B-29	716	762	13	.7	<4.9	<2.5	<2.5	34	<2.0	<3.9	75
B-29	355	721	19	1.1	<4.8	<2.4	<2.4	5.5	<1.9	<3.9	96
B-29	585	842	20	1.1	1.1	<.5	<.5	15	.6	<.5	107
B-29	715	810	22	1.6	1.0	<.5	<.5	20	.6	<.5	105
B-29	538	787	21	.7	1.9	<.5	<.5	22	.7	<.5	87

Table 29. Results of trace-element analyses of duck livers from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-16	F91L-01L	08/20/91	LESSER SCAUP	<3.9	<0.3	<0.4	<0.1	1.1	<0.1	0.4
B-16	F91L-02L	08/20/91	LESSER SCAUP	<4.0	<.3	<.4	<.1	1.3	<.1	<.4
B-16	F91B-07L	08/20/91	MALLARD	<49	<.5	<4.9	<.5	<4.9	2.1	<5.0
B-19	F91B-04L	08/08/91	MALLARD	53	<.3	<.4	<.1	1.7	<.1	<.4
B-19	F91B-03L	08/08/91	MALLARD	10	<.3	.8	.6	3.8	.7	.9
B-19	F91B-06L	08/08/91	NORTHERN SHOVELER	5.4	<.3	<.4	<.1	3.1	<.1	<.4
B-19	F91B-02L	08/08/91	NORTHERN SHOVELER	<49	<.5	<4.9	<.5	<4.9	1.9	<5.0
B-19	F91B-05L	08/08/91	NORTHERN SHOVELER	6.8	<.3	<.4	.2	4.4	.7	<.4
B-19	F91B-01L	08/08/91	NORTHERN SHOVELER	71	<.5	<4.9	<.5	<4.9	1.7	<5.0
			BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-22	B91B-09L	08/30/91	LESSER SCAUP	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-23	B91B-03L	08/12/91	AMERICAN WIGEON	28	<.5	<.5	<.1	5.0	.5	<.5
B-23	B91B-02L	08/12/91	GADWALL	<4.8	<.5	<.5	<.1	.6	.2	<.5
B-23	B91B-01L	08/12/91	GADWALL	<4.8	<.5	1.3	<.1	5.2	.1	<.5
B-23	B91B-14L	08/13/91	GADWALL	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-23	B91B-13L	08/13/91	GADWALL	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-23	B91B-17L	08/28/91	GADWALL	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-23	B91S-12L	08/12/91	LESSER SCAUP	5.2	<.3	<.4	.1	4.0	<.1	.8
B-23	B91B-19L	08/28/91	LESSER SCAUP	<50	<.5	<5.0	<.5	<5.0	<.5	<5.1
B-23	B91B-20L	08/28/91	LESSER SCAUP	<49	<.5	<4.9	.5	<4.9	<.5	<5.0
B-23	B91B-18L	08/28/91	MALLARD	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-23	B91B-16L	08/28/91	MALLARD	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-23	B91B-04L	08/12/91	NORTHERN PINTAIL	<4.9	<.5	<.5	<.1	4.5	<.1	<.5
B-23	B91B-15L	08/13/91	NORTHERN SHOVELER	<50	<.5	<5.0	<.5	<5.0	<.5	<5.1
B-25	B91S-04L	08/12/91	LESSER SCAUP	4.0	<.3	<.4	<.1	2.5	<.1	.5
B-25	B91S-05L	08/12/91	LESSER SCAUP	5.2	<.3	<.4	<.1	1.0	<.1	<.4
B-25	B91S-06L	08/12/91	LESSER SCAUP	4.5	<.3	<.4	<.1	.6	<.1	<.4
B-25	B91B-12L	08/29/91	LESSER SCAUP	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-25	B91B-11L	08/29/91	RUDDY DUCK	<50	<.5	<.0	<.5	<5.0	<.5	<5.1
B-26	B91L-01L	07/23/91	LESSER SCAUP	16	<.5	<.5	<.1	3.8	5.6	<.5
B-26	SH-LIV-IV-01	07/26/88	NORTHERN SHOVELER	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0
B-29	B91S-01L	08/07/91	LESSER SCAUP	<4.0	<.3	<.4	<.1	.4	<.1	.5
B-29	B91S-02L	08/12/91	LESSER SCAUP	4.7	<.3	<.4	.1	4.0	.1	.5
B-29	B91S-03L	08/12/91	LESSER SCAUP	<4.0	<.3	<.4	<.1	1.9	<.1	.5
B-29	BLD-02L	07/18/90	NORTHERN PINTAIL	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-29	CARC-6-3S	07/29/88	NORTHERN SHOVELER	10	<5.0	.7	<.1	<2.0	<.2	<1.0
B-29	BLD-01L	07/18/90	NORTHERN SHOVELER	<49	<.5	<4.9	<.5	<4.9	<.5	<5.0
B-29	B91B-08L	08/15/91	NORTHERN SHOVELER	<50	<.5	<5.0	<.5	<5.0	<.5	<5.1
B-29	B91R-01L	07/16/91	RUDDY DUCK	266	<.5	<4.8	<.5	<4.8	5.2	<.9
B-30	B91S-07L	08/12/91	LESSER SCAUP	4.1	<.3	<.4	<.1	1.4	<.1	<.4
B-30	B91S-08L	08/12/91	LESSER SCAUP	5.0	<.3	<.4	<.1	.6	<.1	<.4
B-30	B91S-09L	08/12/91	LESSER SCAUP	<5.0	<.5	<.5	<.1	<.5	.2	<.5
B-30	B91S-10L	08/12/91	LESSER SCAUP	<4.9	<.5	<.5	<.1	<.5	<.1	<.5
B-30	B91S-11L	08/12/91	LESSER SCAUP	<4.9	<.5	<.5	<.1	<.5	.2	.5

Table 29. Results of trace-element analyses of duck livers from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA												
B-16	46	903	841	19	0.3	1.8	<0.5	<0.5	14	0.6	<0.4	137
B-16	81	890	731	16	.2	2.4	<.5	<.5	11	.4	<.4	126
B-16	48	1,870	666	14	1.0	<4.9	<4.9	<4.9	12	<2.0	<3.9	154
B-19	19	2,100	665	8.5	<.1	3.0	<.5	<.5	24	2.4	<.4	106
B-19	43	4,200	711	11	.2	4.2	3.3	4.8	23	2.2	.8	175
B-19	31	5,570	871	16	.8	3.1	<.5	.7	17	2.7	<.4	108
B-19	66	3,720	747	15	2.6	<4.9	<4.9	<4.9	14	<2.0	<3.9	137
B-19	18	1,060	603	11	1.6	2.0	1.9	<.5	4.6	1.1	.5	90
B-19	19	2,030	694	15	9.9	<4.9	<4.9	<4.9	16	<2.0	<3.9	125
BENTON LAKE NATIONAL WILDLIFE REFUGE												
B-22	174	592	891	13	1.4	<4.9	<4.9	<4.9	31	<2.0	<3.9	145
B-23	490	2,940	1,000	32	.7	9.5	.5	<.5	21	1.0	<.5	322
B-23	227	1,270	783	18	.3	5.2	<.5	1.6	8.5	<.2	<.5	271
B-23	87	1,680	647	10	.2	2.6	<.5	1.7	15	.2	<.5	141
B-23	215	3,910	769	16	.4	9.1	<4.9	<4.9	16	<2.0	<3.9	232
B-23	207	2,270	763	17	.9	5.9	<4.9	<4.9	11	<2.0	<4.0	222
B-23	245	1,640	730	11	.3	<4.9	<4.9	<4.9	16	<2.0	<3.9	193
B-23	1,780	3,930	830	12	1.7	3.6	<.5	<.5	11	<.4	<.4	473
B-23	78	868	784	17	.7	<5.0	<5.0	<5.0	11	<2.0	<4.0	108
B-23	98	759	883	12	1.0	<4.9	<4.9	<4.9	19	<2.0	<4.0	121
B-23	101	1,380	645	8.7	.9	<4.9	<4.9	<4.9	9.6	<2.0	<3.9	125
B-23	147	3,370	629	13	.9	<4.9	<4.9	<4.9	16	<2.0	<3.9	189
B-23	70	1,310	849	16	.3	3.1	<.5	<.5	17	.8	.5	139
B-23	26	949	710	13	1.1	<5.0	<4.9	<5.0	4.0	<2.0	<4.0	96
B-25	43	515	859	18	1.8	2.3	<.5	<.5	11	.7	<.4	147
B-25	71	684	888	16	2.5	2.6	<.5	<.5	16	.9	<.4	155
B-25	104	1,010	804	20	2.8	2.4	<.5	<.5	13	.6	<.4	131
B-25	20	1,350	743	17	.3	<4.9	<4.9	<4.9	11	<2.0	<4.0	140
B-25	13	909	809	20	<.1	<5.0	<5.0	<5.0	19	<2.0	<4.0	126
B-26	248	10,500	827	14	3.9	9.1	.7	3.3	16	.4	.6	408
B-26	12	1,430	872	11	--	3.0	<1.0	<4.0	9.4	.7	<.3	106
B-29	20	2,040	773	16	.2	1.9	<.5	<.5	12	.7	<.4	108
B-29	74	755	806	18	.5	2.6	.9	.5	11	1.0	<.4	110
B-29	25	1,130	857	19	.3	2.7	<.5	<.5	14	.8	<.4	122
B-29	9.5	498	855	12	.5	<4.9	<4.9	<4.9	15	<2.0	<3.9	95
B-29	8.0	599	1,010	12	--	2.0	<1.0	<4.0	9.5	2.5	<.3	79
B-29	10	506	934	15	.9	<4.9	<4.9	<4.9	21	2.6	<3.9	109
B-29	14	2,890	790	11	2.8	<5.0	<5.0	<5.0	12	<2.0	<4.0	113
B-29	205	3,600	799	37	2.3	<4.8	<4.8	<4.8	20	<1.9	<3.9	162
B-30	118	912	824	20	1.0	2.0	<.5	<.5	16	.8	<.4	120
B-30	100	1,780	818	20	.9	2.1	<.5	<.5	19	1.0	<.4	136
B-30	73	1,420	896	18	.4	3.3	<.5	3.3	17	1.0	<.5	156
B-30	215	749	889	21	1.2	2.8	<.5	1.2	17	.7	<.5	162
B-30	134	643	871	21	.9	2.6	<.5	2.0	12	.8	<.5	155

Table 30. Results of trace-element analyses of American coot and other bird livers from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data. Abbreviation: SP, species unknown.]

Site number (fig. 6,7)	Sample identification	Date	Taxon	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-09	FLCG-1L	06/06/91	CANADA GOOSE	<49	<0.5	<4.9	<0.5	<4.9	<0.5	<5.0
			BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-21	C-LIV-I-04	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	<2.0	<.2	<1.0
B-21	C-LIV-I-01	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	3.0	<.2	<1.0
B-21	C-LIV-I-03	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	3.0	<.2	<1.0
B-21	BLG-01L	07/18/90	FRANKLIN'S GULL	<50	<.5	<5.0	<.5	6.6	.8	<5.1
B-22	BL-87-C-5	08/02/87	AMERICAN COOT	<3.0	<.2	.1	<.1	3.0	<.3	<1.0
B-22	BL-87-C-6	08/02/87	AMERICAN COOT	3.0	.2	<.1	<.1	4.0	<.3	<1.0
B-25	B91B-10L	08/29/91	AMERICAN COOT	<50	<.5	<5.0	<.5	<5.0	<.5	<5.1
B-26	BL-87-C-1	07/29/87	AMERICAN COOT	<3.0	.2	<.1	<.1	4.0	<.3	<1.0
B-26	BL-87-C-3	07/29/87	AMERICAN COOT	<3.0	.2	<.1	<.1	5.0	<.3	<1.0
B-26	BL-87-C-4	07/29/87	AMERICAN COOT	<3.0	<.2	<.1	<.1	5.0	<.3	<1.0
B-26	BL-87-C-2	07/29/87	AMERICAN COOT	<3.0	.2	<.1	<.1	5.0	<.3	<1.0
B-26	C-LIV-IV-04	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	3.0	<.2	<1.0
B-26	C-LIV-IV-03	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	4.0	<.2	<1.0
B-26	C-LIV-IV-02	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	2.0	<.2	<1.0
B-26	C-LIV-IV-01	07/26/88	AMERICAN COOT	<3.0	<5.0	<.1	<.1	3.0	<.2	9.2
B-29	BL-87-C-7	08/02/87	AMERICAN COOT	<3.0	<.2	<.1	<.1	3.0	<.3	<1.0
B-29	CARC-6-4C	07/29/88	AMERICAN COOT	<3.0	<5.0	.9	<.1	5.0	<.2	<1.0
B-29	CARC-6-5C	07/29/88	AMERICAN COOT	<3.0	<5.0	.5	<.1	4.0	<.2	<1.0
B-29	CARC-6-1AN	07/29/88	ANAS SP.	4.0	<5.0	.7	<.1	4.0	.2	<1.0
B-29	CARC-6-2AN	07/29/88	ANAS SP.	8.0	<5.0	.5	<.1	7.2	<.2	<1.0

Table 30. Results of trace-element analyses of American coot and other bird livers from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
					FREEZOUT LAKE WILDLIFE MANAGEMENT AREA							
B-09	127	1,370	844	12	<0.1	<4.9	<4.9	<4.9	14	<2.0	<3.9	151
					BENTON LAKE NATIONAL WILDLIFE REFUGE							
B-21	20	847	940	19	--	3.0	<1.0	<4.0	13	1.0	<.3	189
B-21	90	1,250	782	16	--	3.0	<1.0	<4.0	11	1.1	<.3	172
B-21	117	694	915	17	--	3.3	<1.0	<4.0	18	.7	<.3	202
B-21	15	4,100	1,050	17	1.6	5.7	<5.0	<5.0	16	<2.0	<4.0	160
B-22	153	1,160	889	14	.5	3.6	<1.0	<4.0	6.8	1.0	<.4	214
B-22	46	1,970	751	12	.8	3.0	<1.0	<4.0	23	1.3	<.4	146
B-25	13	989	816	13	.3	<5.0	<5.0	<5.0	6.3	<2.0	<4.0	172
B-26	55	1,200	890	18	1.9	2.0	<1.0	<4.0	3.7	.9	<.4	149
B-26	79	599	822	12	1.0	2.0	<1.0	<4.0	3.6	.9	<.4	202
B-26	30	2,720	755	15	.3	3.5	<1.0	<4.0	6.8	.4	<.4	171
B-26	35	631	589	15	1.6	2.0	<1.0	<4.0	5.3	.5	<.4	98
B-26	83	214	897	12	--	1.0	<1.0	<4.0	3.6	.8	<.3	168
B-26	94	1,390	785	95	--	<1.0	<1.0	<4.0	3.6	.6	<.3	156
B-26	48	1,810	866	12	--	2.0	<1.0	<4.0	5.7	.6	<.3	180
B-26	36	1,290	771	13	--	2.0	4.9	<4.0	7.7	.5	<.3	177
B-29	11	1,890	677	12	.2	2.0	<1.0	<4.0	3.4	.3	<.4	140
B-29	40	558	798	23	--	2.0	<1.0	<4.0	8.2	<2.0	<.3	197
B-29	13	711	648	16	--	2.0	<1.0	<4.0	9.5	.7	<.3	118
B-29	59	1,110	969	15	--	3.9	<1.0	<4.0	22	.5	<.3	239
B-29	40	785	1,000	14	--	3.0	<1.0	<4.0	11	1.5	<.3	160

Table 31. Results of trace-element analyses of American avocet livers from the Sun River area, Montana

[Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Site number (fig. 6,7)	Sample identification	Date	Alumi-num	Arsenic	Bari-um	Beryl-lium	Boron	Cad-mium	Chro-mium
			FREEZOUT LAKE WILDLIFE MANAGEMENT AREA						
B-09	FLA-08L	07/11/90	<3.0	<0.3	<0.5	<0.1	1.7	<0.1	<0.5
B-12	FLA-10L	07/11/90	<3.0	<.3	<.5	<.1	2.0	<.1	<.5
B-15	FLA-09L	07/11/90	<3.0	<.3	<.5	<.1	3.7	<.1	<.5
B-18	FLA-05L	07/10/90	<3.0	<.3	<.5	<.1	1.0	<.1	<.5
B-18	FLA-03L	07/10/90	<3.0	<.3	<.5	<.1	1.5	<.1	<.5
B-18	FLA-07L	07/11/90	<3.0	<.3	<.5	<.1	1.7	<.1	<.5
B-18	FLA-11L	07/30/90	103	<.5	<5.0	1.1	6.0	2.1	<5.1
B-18	FLA-12L	08/11/90	<50	<.5	<5.0	<.5	<5.0	<.5	<5.1
B-18	F91A-02L	08/09/91	6.3	.4	<.4	<.1	2.0	<.1	.4
B-18	F91A-01L	08/09/91	<4.0	<.3	<4.0	<.1	3.6	<.1	.5
B-18	F91A-03L	08/09/91	<4.0	<.3	<.4	<.1	1.2	.2	<.4
B-18	F91A-04L	08/13/91	4.5	<.3	<.4	<.1	4.8	<.1	<.4
B-19	FLA-01L	07/06/90	<3.0	<.3	<.5	<.1	2.0	<.1	<.5
B-19	FLA-02L	07/10/90	4.9	<.3	<.5	<.1	1.2	.1	.5
B-19	FLA-06L	07/10/90	<3.0	<.3	<.5	<.1	2.0	<.1	<.5
B-19	FLA-04L	07/10/90	<3.0	<.3	<.5	<.1	1.2	<.1	.6
			BENTON LAKE NATIONAL WILDLIFE REFUGE						
B-21	BLU1-87-AV2	08/18/87	<38	.2	<19	<1.9	<19	<1.9	<3.8
B-21	BLU1-87-AV1	08/18/87	<38	.1	<19	<1.9	<19	<1.9	<3.8
B-21	BLU1-87-AV3	08/18/87	<36	.1	<18	<1.8	<18	<1.8	<3.6
B-21	B91A-02L	07/16/91	<20	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-21	B91A-01L	07/16/91	<20	<.5	<2.4	<.3	3.8	<.5	<2.4
B-21	B91A-03L	07/23/91	28	<.5	<2.4	<.3	<2.4	<.5	<2.4
B-23	BLA-08L	07/09/90	<3.0	<.3	<.5	<.1	2.2	.2	.6
B-23	BLA-09L	07/09/90	<3.0	<.3	<.5	<.1	2.0	.1	<.5
B-25	BLA-04L	07/09/90	<3.0	<.3	<.5	<.1	1.7	<.1	<.5
B-25	BLA-05L	07/09/90	<3.0	<.3	<.5	<.1	.6	<.1	<.5
B-25	B91A-09L	07/23/91	<20	<.5	<2.4	<.3	7.9	<.5	<2.4
B-25	B91A-10L	07/23/91	<20	<.5	<2.4	<.3	6.3	<.5	<2.4
B-25	B91A-11L	07/23/91	<20	<.5	<2.4	<.3	3.3	<.5	<2.4
B-27	CARC-V-1AV	06/27/88	<3.0	<5.0	.9	<.1	<2.0	<.2	<1.0
B-27	BLA-06L	07/09/90	6.4	<.3	<.5	<.1	4.0	<.1	.5
B-27	BLA-10L	07/09/90	<3.0	<.3	<.5	<.1	1.7	<.1	<.5
B-27	BLA-07L	07/09/90	<3.0	<.3	<.5	<.1	3.7	.1	<.5
B-27	B91A-04L	07/23/91	<20	<.5	<2.3	<.3	4.6	<.5	<2.3
B-27	B91A-06L	07/23/91	<20	<.5	<2.3	<.3	3.7	<.5	<2.3
B-27	B91A-05L	07/23/91	<20	<.5	<2.4	<.3	6.3	<.5	<2.4
B-27	B91A-07L	07/23/91	<20	<.5	<2.4	<.3	8.1	<.5	<2.4
B-27	B91A-12L	08/07/91	20	<.3	1.4	<.1	1.1	<.1	.5
B-27	B91A-13L	08/07/91	7.0	<.3	<.4	<.1	.6	<.1	<.4
B-29	BLA-02L	07/09/90	<3.0	<.3	<.5	<.1	3.1	<.1	<.5
B-29	BLA-01L	07/09/90	6.6	<.3	<.5	<.1	1.6	<.1	<.5
B-29	B91B-07L	08/15/91	<48	<.5	<4.8	<.5	<4.8	<.5	<4.9
B-29	B91B-06L	09/06/91	<49	<.5	<4.9	<.5	<4.9	.6	<5.0
B-30	BLA-03L	07/09/90	<3.0	<.3	<.5	<.1	1.1	.1	<.5

Table 31. Results of trace-element analyses of American avocet livers from the Sun River area, Montana (Continued)

Site number (fig. 6,7)	Copper	Iron	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA												
B-09	19	1,140	635	11	0.2	1.3	<0.5	<1.8	43	0.9	<0.5	68
B-12	9.8	834	615	12	.1	1.2	<.5	<1.8	20	.9	<.5	77
B-15	29	773	645	15	.1	1.5	<.5	<1.8	31	<.5	<.5	90
B-18	13	836	520	10	.1	2.1	<.5	<1.8	24	1.2	<.5	72
B-18	12	598	729	12	<.1	1.8	<.5	<1.8	19	1.2	<.5	75
B-18	20	936	677	15	.7	1.8	<.5	<1.8	24	1.0	<.5	94
B-18	40	1,400	834	15	.7	<5.0	5.5	5.5	13	4.9	<4.0	102
B-18	11	1,380	744	9.7	.2	<5.0	<5.0	<5.0	17	<2.0	<4.0	116
B-18	13	1,180	807	15	.8	1.9	<.5	<.5	14	1.9	<.4	101
B-18	23	1,240	793	15	1.1	2.1	<.5	<.5	16	.6	<.4	112
B-18	15	4,200	711	11	.9	4.2	3.3	4.8	33	.8	<.4	175
B-18	13	1,520	665	11	.5	2.6	<.5	<.5	27	1.3	<.4	84
B-19	7.4	626	588	9.4	.1	1.5	<.5	<1.8	29	.8	<.5	62
B-19	14	798	603	13	.3	1.8	<.5	<1.8	18	1.4	<.5	77
B-19	13	1,080	630	13	<.1	1.7	<.5	<1.8	21	.9	<.5	74
B-19	17	810	694	13	.1	2.6	<.5	<1.8	21	.6	<.5	68
BENTON LAKE NATIONAL WILDLIFE REFUGE												
B-21	16	1,310	754	14	1.9	<19	<15	<38	45	<3.8	<19	99
B-21	49	660	748	13	2.0	<19	<15	<38	11	<3.8	<19	140
B-21	18	3,090	810	19	.8	<18	<14	<36	19	<3.6	<18	99
B-21	14	545	782	15	.2	<4.9	<2.5	<2.5	34	<2.0	<3.9	97
B-21	15	510	793	16	.3	<4.9	<2.5	<2.5	31	<2.0	<4.0	84
B-21	13	622	848	16	.5	<4.9	<2.5	2.6	40	<2.0	<3.9	114
B-23	41	1,820	717	18	.9	2.2	<.5	<1.8	30	1.6	<.5	127
B-23	14	1,430	681	12	.7	2.1	<.5	<1.8	26	1.5	<.5	106
B-25	44	1,170	754	15	.9	2.6	<.5	<1.8	29	.9	<.5	135
B-25	32	282	693	14	.8	1.7	<.5	<1.8	25	<.5	<.5	103
B-25	19	636	857	17	.5	<5.0	<2.5	<2.5	15	<2.0	<4.0	136
B-25	38	423	848	18	.3	<4.9	<2.5	<2.5	12	<2.0	<3.9	119
B-25	24	670	867	15	.6	<5.0	<2.5	<2.5	11	<2.0	<4.0	98
B-27	15	887	760	9.7	--	2.0	<1.0	<4.0	13	.5	<.3	93
B-27	15	1,470	699	12	.7	1.5	<.5	<1.8	18	1.0	<.5	100
B-27	28	1,350	773	14	.1	2.1	<.5	<1.8	31	1.4	<.5	102
B-27	11	3,080	767	12	.1	2.5	<.5	<1.8	32	1.0	<.5	164
B-27	16	754	747	12	.3	<4.9	<2.4	<2.4	21	<2.0	<3.9	101
B-27	11	552	781	13	.1	<4.9	<2.4	<2.4	19	<2.0	<3.9	92
B-27	11	831	776	13	.2	<5.0	<2.5	<2.5	16	<2.0	<4.0	77
B-27	9.2	636	817	12	.2	<5.0	<2.5	<2.5	15	<2.0	<4.0	85
B-27	4.0	124	388	1.6	<.1	<.4	<.5	<.5	14	13	<.4	37
B-27	17	454	824	17	.5	1.7	<.5	<.5	13	.9	<.4	119
B-29	19	3,100	919	14	.8	3.9	<.5	<1.8	24	1.1	<.5	244
B-29	23	1,120	699	15	.3	2.5	<.5	<1.8	19	1.0	<.5	97
B-29	8.0	1,000	708	13	.5	<4.8	<4.8	<4.8	9.3	<1.9	<3.8	114
B-29	22	1,220	693	8.2	1.0	<4.9	<4.9	<4.9	13	<2.0	<3.9	86
B-30	22	781	661	14	.5	1.9	<.5	<1.8	27	.9	<.5	82

Table 32. Results of 48-hour bioassay testing of surface-water samples using *Daphnia magna*

[Mortality is given as the number of individuals dead after 48 hours (top number) per number of individuals exposed (bottom number). Abbreviations: µS/cm, microsiemens per centimeter at 25 degrees Celsius. Symbol: ---, artificial source prepared in laboratory]

Reference solution or site number for source of surface water (fig. 5)	Collection date	Bioassay date	0-hour specific conductance (µS/cm)	Cumulative mortality at 48 hours					
				Percentage of surface water in sample					
				[1]100	50	25	12	6	0
Reconstituted saltwater[2]	---	05-27-92	29,700	10/10	10/10	0/11	0/9	0/11	0/11
Reconstituted saltwater[3]	---	06-17-92	30,900	10/10	10/10	7/10	1/10	3/10	4/10
S-1	05-27-92	06-15-92	238	1/10	0/10	0/10	1/10	0/10	0/10
S-5	04-02-92	05-26-92	[4]621	0/10	0/10	0/10	0/10	0/11	0/10
S-5	05-27-92	06-15-92	345	1/10	0/10	1/10	2/10	2/10	0/10
S-6	04-02-92	05-27-92	3,240	0/11	0/10	0/10	0/10	0/10	0/9
S-7	04-02-92	05-26-92	[4]4,570	0/10	0/10	0/10	0/10	0/10	0/10
S-7	06-02-92	06-03-92	3,580	0/10	0/10	0/10	0/10	0/10	0/10
S-11	04-02-92	05-27-92	6,450	0/10	0/11	0/10	0/10	0/11	0/10
S-11	05-28-92	06-17-92	824	2/10	3/10	1/10	1/10	2/10	0/10
S-11	06-02-92	06-03-92	3,710	0/10	0/10	0/10	0/10	0/10	0/10
S-12	04-03-92	05-27-92	1,866	0/10	0/10	0/10	0/10	0/10	0/10
S-12	05-28-92	06-16-92	845	0/10	0/10	4/10	1/10	0/10	0/10
S-21	05-28-92	06-15-92	635	2/9	0/10	0/10	0/10	0/10	0/10
S-30	04-02-92	05-18-92	8,680	4/10	0/10	0/10	0/10	0/10	0/10
S-30	06-02-92	06-03-92	1,491	0/10	0/10	0/10	0/10	0/10	0/10
S-34	04-06-92	05-18-92	8,810	0/10	0/10	0/10	0/10	0/9	0/10
S-34	06-24-92	07-08-92	9,060	0/11	0/10	0/10	0/10	0/10	0/10
S-35	04-03-92	05-18-92	33,900	10/10	10/10	10/10	0/10	0/10	0/10
S-35	05-28-92	07-09-92	33,500	10/10	10/10	10/10	1/10	0/10	0/10
S-37	06-24-92	07-08-92	454	0/10	0/10	0/10	0/10	0/10	0/10
S-38	04-07-92	05-19-92	5,660	1/11	0/11	0/10	0/9	0/10	0/10
S-38	06-24-92	06-30-92	5,990	0/9	0/10	0/9	0/10	0/10	0/10
S-39	04-07-92	05-26-92	[4]5,290	0/11	0/10	0/10	0/10	0/10	0/10
S-39	06-24-92	07-08-92	4,420	0/10	0/10	0/10	0/10	0/10	0/10
S-43	04-03-92	05-13-92	12,550	10/10	10/10	0/10	0/10	0/10	0/10
S-43	06-02-92	06-03-92	14,120	10/10	10/10	0/10	0/10	0/10	0/10
S-44	04-04-92	05-19-92	12,100	0/10	0/10	0/10	0/10	0/10	0/10
S-44	05-29-92	06-16-92	679	1/10	0/10	1/10	1/10	1/10	0/10
S-47	04-08-92	05-19-92	1,446	0/10	0/9	0/10	0/10	0/10	0/10
S-47	06-23-92	06-30-92	753	0/11	0/10	0/10	0/9	0/10	0/10
S-48	06-23-92	06-30-92	1,850	0/10	0/0	0/10	0/10	0/11	0/10
S-49	04-08-92	05-18-92	9,430	0/11	0/10	0/10	0/10	0/10	0/10

[1]Analytical results for undiluted surface-water samples are reported in tables 14-15.

[2]Reconstituted saltwater formulated by adding 20.8 grams of Instant Ocean[R] to 1 liter of Giant Springs water.

[3]Reconstituted saltwater formulated by adding 21.7 grams of Instant Ocean[R] to 1 liter of Giant Springs water.

[4]Specific conductance at 24 hours.

Table 33. Results of 48-hour bioassay testing of surface-water samples using *Hyalella azteca*

[Mortality is given as the number of individuals dead after 48 hours (top number) per number of individuals exposed (bottom number). Abbreviations: µS/cm, microsiemens per centimeter at 25 degrees Celsius. Symbols: ---, artificial source prepared in laboratory; --, no data]

Reference solution or site number for source of surface water (fig. 5)	Collection date	Bioassay date	0-hour specific conductance (µS/cm)	Cumulative mortality at 48 hours					
				Percentage of surface water in sample					
				[1]100	50	25	12	6	0
Reconstituted saltwater[2]	---	05-13-92	31,000	7/9	2/9	0/10	0/10	0/10	0/10
Reconstituted saltwater[3]	---	06-24-92	29,600	10/10	1/10	0/8	0/10	0/10	0/10
S-1	05-27-92	06-22-92	235	6/8	0/7	0/10	0/9	0/10	0/10
S-5	04-02-92	05-12-92	660	3/10	0/9	1/10	0/9	3/10	2/9
S-5	05-27-92	06-23-92	343	1/9	0/10	0/11	0/10	0/10	0/10
S-6	04-02-92	05-11-92	3,310	1/11	0/10	0/10	2/11	2/10	3/12
S-7	04-02-92	05-11-92	4,840	0/10	0/11	1/11	0/9	1/10	1/10
S-7	06-02-92	06-18-92	3,550	1/12	0/10	0/11	1/10	1/9	0/10
S-11	04-02-92	04-29-92	6,320	0/11	0/9	0/9	2/10	1/9	1/10
S-11	05-28-92	06-24-92	814	0/10	0/10	1/11	0/10	0/10	1/10
S-11	06-02-92	06-22-92	3,650	3/10	0/10	0/8	1/10	0/10	1/10
S-12	04-03-92	05-06-92	1,880	0/10	1/10	0/10	1/10	2/10	2/10
S-12	05-28-92	06-23-92	830	0/10	0/10	0/10	1/11	0/10	0/10
S-21	05-28-92	06-22-92	631	0/9	0/9	0/10	0/8	0/9	0/10
S-30	04-02-92	04-29-92	8,150	0/10	2/11	0/10	0/9	1/10	1/10
S-30	06-02-92	06-18-92	1,479	1/10	0/10	0/11	0/10	0/8	0/10
S-34	04-06-92	04-22-92	8,610	5/10	1/11	0/10	0/10	0/10	0/10
S-34	06-24-92	10-13-92	9,610	0/8	0/9	0/10	0/9	--	0/10
S-35	04-03-92	04-29-92	35,200	10/10	11/11	8/10	2/11	1/11	2/10
S-35	05-28-92	06-23-92	33,100	10/10	10/10	8/10	1/10	1/10	0/10
S-37	06-24-92	10-13-92	478	0/8	1/8	0/9	0/9	--	0/10
S-38	04-07-92	05-12-92	5,610	0/12	0/10	0/10	0/11	0/9	2/9
S-38	06-24-92	10-13-92	6,140	8/10	0/10	0/10	1/9	--	0/10
S-39	04-07-92	05-06-92	5,300	1/10	0/11	0/10	2/12	0/10	1/9
S-39	06-24-92	10-13-92	4,470	5/10	1/11	0/10	0/10	--	0/10
S-43	04-03-92	04-29-92	12,610	6/12	7/12	3/10	0/10	1/10	2/9
S-43	06-02-92	06-18-92	13,970	10/10	8/10	3/10	1/10	0/10	2/10
S-44	04-04-92	05-11-92	12,020	1/10	0/10	0/10	1/10	1/10	1/10
S-44	05-29-92	06-24-92	674	5/10	0/11	1/9	0/9	0/9	1/9
S-47	04-08-92	05-13-92	1,400	0/10	0/10	1/10	0/10	3/10	3/10
S-47	06-23-92	10-13-92	807	1/9	0/10	0/9	0/9	--	0/10
S-48	06-23-92	06-30-92	1,880	0/10	0/10	0/11	0/11	--	2/8
S-49	04-08-92	05-29-92	9,430	2/11	1/11	3/12	0/11	1/11	1/10

[1]Analytical results for undiluted surface-water samples are reported in tables 14-15.

[2]Reconstituted saltwater formulated by adding 21.7 grams of Instant Ocean^{R} to 1 liter of Giant Springs water.

[3]Reconstituted saltwater formulated by adding 20.8 grams of Instant Ocean^{R} to 1 liter of Giant Springs water.

Table 34. Results of 96-hour bioassay testing of surface-water samples using fathead minnows

[Mortality is given as the number of individuals dead after 48 hours (top number) per number of individuals exposed (bottom number). Abbreviations: µS/cm, microsiemens per centimeter at 25 degrees Celsius. Symbols: ---, artificial source prepared in laboratory; --, no data]

Reference solution or site number for source of surface water (fig. 5)	Collection date	Bioassay date	0-hour specific conductance (µS/cm)	Cumulative mortality at 96 hours					
				Percentage of surface water in sample					
				[1]100	50	25	12	6	0
Reconstituted saltwater[2]	---	04-17-92	30,700	10/10	10/10	9/10	5/10	2/10	2/10
Reconstituted saltwater[3]	---	09-22-92	29,700	10/10	2/10	0/10	0/10	0/10	0/10
S-1	05-27-92	09-09-92	254	0/10	0/10	0/10	0/10	0/10	0/10
S-5	04-02-92	04-17-92	680	5/10	1/10	1/10	1/10	--	3/10
S-5	04-02-92	10-06-92	613	2/10	0/11	1/11	0/10	1/10	0/10
S-5	05-27-92	09-09-92	357	0/10	0/10	0/10	0/10	0/10	0/10
S-6	04-02-92	04-17-92	3,350	4/10	0/10	3/10	1/10	--	1/10
S-6	04-02-92	10-06-92	3,330	0/10	1/10	0/10	0/10	0/10	0/10
S-7	04-02-92	04-17-92	4,930	2/10	0/10	0/10	1/10	--	1/10
S-7	04-02-92	10-06-92	4,900	1/10	0/9	0/10	0/10	0/10	0/10
S-7	06-02-92	09-09-92	3,720	0/10	0/10	0/10	0/10	0/10	0/10
S-11	04-02-92	04-17-92	6,710	8/10	9/10	4/10	2/10	--	1/10
S-11	04-02-92	10-06-92	6,650	4/10	0/10	0/10	1/10	1/10	0/10
S-11	05-28-92	09-22-92	838	0/10	0/10	0/10	0/10	0/10	0/10
S-11	06-02-92	09-09-92	3,890	0/10	0/10	0/10	0/10	0/10	0/10
S-12	04-03-92	04-17-92	1,960	0/10	1/10	1/10	2/10	--	1/10
S-12	05-28-92	09-09-92	856	0/10	0/10	0/10	0/10	0/10	0/10
S-21	05-28-92	09-09-92	662	1/10	0/10	0/10	1/10	0/10	0/10
S-30	04-02-92	04-17-92	8,890	10/10	6/10	4/10	4/10	--	1/10
S-30	06-02-92	09-09-92	1,556	0/10	0/10	0/10	0/10	1/10	0/10
S-34	04-06-92	04-17-92	9,020	9/10	5/11	6/10	8/10	--	1/10
S-34	04-06-92	10-06-92	9,100	2/10	3/10	0/10	0/10	0/10	0/10
S-34	06-24-92	09-22-92	8,440	0/10	0/10	0/10	1/10	1/10	0/10
S-35	04-03-92	04-17-92	35,800	9/9	8/8	10/10	10/10	3/10	1/10
S-35	05-28-92	09-22-92	34,200	10/10	10/10	7/10	0/10	0/10	0/10
S-37	06-24-92	09-22-92	481	0/10	0/10	0/10	1/10	1/10	0/10
S-38	04-07-92	04-17-92	5,740	0/10	3/10	1/10	2/10	--	1/10
S-38	04-07-92	10-06-92	5,670	1/10	0/10	0/10	0/10	2/10	0/10
S-38	06-24-92	09-22-92	6,190	2/10	0/10	0/10	1/10	0/10	1/10
S-39	04-07-92	04-17-92	5,500	4/10	2/10	0/10	2/10	--	1/10
S-39	04-07-92	10-06-92	5,520	0/10	0/10	0/10	0/10	0/10	0/10
S-39	06-24-92	09-22-92	4,360	1/10	0/10	0/10	0/10	0/10	1/10
S-43	04-03-92	04-17-92	12,820	10/10	10/10	6/10	5/10	3/10	2/10
S-43	06-02-92	09-09-92	14,570	10/10	10/10	1/10	0/10	0/10	0/10
S-44	04-04-92	04-17-92	12,270	5/10	2/10	1/10	5/10	2/10	1/10
S-44	04-04-92	10-06-92	12,300	8/10	1/10	0/10	0/10	0/10	0/10
S-44	05-29-92	09-22-92	689	0/11	0/10	0/10	0/10	0/10	0/10

Table 34. Results of 96-hour bioassay testing of surface-water samples using fathead minnows (Continued)

Reference solution or site number for source of surface water (fig. 5)	Collection date	Bioassay date	0-hour specific conductance (µS/cm)	Cumulative mortality at 96 hours					
				Percentage of surface water in sample					
				[1]100	50	25	12	6	0
S-47	04-08-92	04-17-92	1,450	3/10	4/10	1/10	2/10	--	1/10
S-47	04-08-92	10-06-92	1,469	0/10	1/10	0/10	0/10	1/10	1/10
S-47	06-23-92	09-22-92	809	1/10	1/10	0/10	0/10	0/10	0/10
S-48	06-23-92	09-22-92	1,918	0/10	0/10	0/10	0/10	0/10	0/10
S-49	04-08-92	04-17-92	9,660	7/10	4/10	3/10	1/10	3/10	1/10
S-49	04-08-92	10-06-92	9,890	6/10	4/10	2/10	1/10	0/10	0/10

[1]Analytical results for undiluted surface-water samples are reported in tables 14-15.

[2]Reconstituted saltwater formulated by adding 21.7 grams of Instant Ocean[R] to 1 liter of Giant Springs water.

[3]Reconstituted saltwater formulated by adding 20.8 grams of Instant Ocean[R] to 1 liter of Giant Springs water.

Table 35. Results of trace-element analyses of liver tissue and sodium analyses of brain tissue from mallard ducklings used in 28-day bioassay testing

[Concentrations are for individual ducklings, except where noted. Concentrations in micrograms per gram of dry sample weight. All concentrations are total. Symbols: <, less than; --, no data]

Sample identification	Number of days exposed[2]	Liver									
		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Copper	Iron	Magnesium
PRE-EXPOSURE GROUP[1]											
DAY1-1L	0	<3	<0.2	<0.1	<0.01	<2	<0.02	<0.2	31	195	470
DAY1-2L	0	<3	<.2	<.1	<.01	<2	<.02	<.1	24	179	465
GIANT SPRINGS CONTROL GROUP											
CONA-1L	28	<3	<.2	<.1	<.01	<2	.5	<.1	265	1,590	617
CONA-2L	28	<3	<.2	<.1	<.01	<2	.4	<.1	224	591	580
CONA-3L	28	<3	<.2	<.1	<.01	<2	.4	.2	230	677	603
CONA-4L	28	<3	<.2	<.1	<.01	<2	.5	<.2	206	949	627
CONA-5L	28	<3	<.2	<.1	<.01	<2	.4	<.1	251	1,140	575
CONA-6L	28	<3	<.2	<.1	<.01	<2	.5	<.2	194	976	581
CONB-1L	6	--	--	--	--	--	--	--	--	--	--
CONB-2L	28	<3	<.2	<.1	<.01	<2	.6	<.2	355	885	675
CONB-3L	28	3	<.2	<.1	<.01	<2	.5	<.2	458	1,150	663
CONB-4L	28	<3	<.2	<.1	<.01	<2	.3	<.1	200	893	626
CONB-5L	28	<3	<.2	<.1	<.01	<2	.6	<.2	313	691	670
CONB-6L	28	<3	<.2	<.1	<.01	<2	.4	<.2	377	980	696
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND											
SEEP EAST OF PRIEST BUTTE LAKES GROUP											
FLPBA-1L[1]	1-3	<3	<.2	<.1	<.01	<2	<.02	<.2	23	439	469
FLPBB-1L[1]	1-3	6	<.2	.1	<.01	2	<.02	<.2	24	400	543
FLPBA-1B	1	--	--	--	--	--	--	--	--	--	--
FLPBA-2B	1	--	--	--	--	--	--	--	--	--	--
FLPBA-3B	2	--	--	--	--	--	--	--	--	--	--
FLPBA-4B	2	--	--	--	--	--	--	--	--	--	--
FLPBA-5B	2	--	--	--	--	--	--	--	--	--	--
FLPBA-6B	3	--	--	--	--	--	--	--	--	--	--
FLPBB-1B	1	--	--	--	--	--	--	--	--	--	--
FLPBB-2B	1	--	--	--	--	--	--	--	--	--	--
FLPBB-3B	1	--	--	--	--	--	--	--	--	--	--
FLPBB-4B	1	--	--	--	--	--	--	--	--	--	--
FLPBB-5B	2	--	--	--	--	--	--	--	--	--	--
FLPBB-6B	2	--	--	--	--	--	--	--	--	--	--
FREEZOUT LAKE WMA (POND 5) GROUP											
FL5A-1L	28	<3	<.2	<.1	<.01	<2	.7	<.2	343	1,110	707
FL5A-2L	28	<3	<.2	<.1	<.02	<2	1.1	<.3	403	1,070	745
FL5A-3L	28	<3	<.2	<.1	<.01	<2	.4	<.2	298	1,130	720
FL5A-4L	28	4	<.2	<.1	<.01	<2	.6	<.2	305	1,470	720
FL5A-5L	28	<3	<.2	<.1	<.01	<2	.6	<.2	395	1,210	698
FL5A-6L	28	<3	<.2	<.1	<.01	<2	.2	.2	219	963	673
FL5B-1L	28	<3	<.2	<.1	<.01	<2	.8	<.2	531	768	717

Table 35. Results of trace-element analyses of liver tissue and sodium analyses of brain tissue from mallard ducklings used in 28-day bioassay testing (Continued)

Sample identification	Number of days exposed[2]	Liver									Brain
		Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc	Sodium
PRE-EXPOSURE GROUP[1]											
DAY1-1L	0	7.9	0.05	1.0	0.8	<0.4	2.4	<0.1	<0.3	62	6,570
DAY1-2L	0	8.1	.04	1.0	.7	<.4	2.4	.1	<.3	55	6,720
GIANT SPRINGS CONTROL GROUP											
CONA-1L	28	13	.05	3.0	.3	<.4	3.6	.1	.4	94	6,210
CONA-2L	28	12	.06	3.0	.1	<.4	3.2	.2	<.3	97	6,970
CONA-3L	28	13	.07	3.0	.3	<.4	3.3	<.1	<.3	88	6,720
CONA-4L	28	12	.03	3.0	.1	<.4	3.1	.1	<.3	115	6,880
CONA-5L	28	11	.03	2.0	<.1	.5	3.1	.1	<.3	82	6,750
CONA-6L	28	14	.04	2.0	.2	.6	3.2	.1	.3	97	6,780
CONB-1L	6	--	--	--	--	--	--	--	--	--	6,990
CONB-2L	28	11	<.03	3.0	.2	<.4	5.0	.3	<.3	125	6,100
CONB-3L	28	13	.03	2.0	.1	<.4	5.4	.4	<.3	109	6,570
CONB-4L	28	11	.04	2.0	.5	.5	3.3	.1	<.3	93	6,540
CONB-5L	28	15	.06	3.0	<.1	.4	4.3	.2	<.3	132	6,610
CONB-6L	28	13	.05	3.0	.4	<.4	4.1	.2	<.3	135	6,160
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND											
SEEP EAST OF PRIEST BUTTE LAKES GROUP											
FLPBA-1L[1]	1-3	7.0	.04	1.0	.1	<.4	2.4	.3	<.3	65	--
FLPBB-1L[1]	1-3	6.1	.03	1.0	<.1	<.4	2.6	.3	<.3	81	--
FLPBA-1B	1	--	--	--	--	--	--	--	--	--	9,700
FLPBA-2B	1	--	--	--	--	--	--	--	--	--	9,300
FLPBA-3B	2	--	--	--	--	--	---	--	--	--	10,100
FLPBA-4B	2	--	--	--	--	--	--	--	--	--	9,130
FLPBA-5B	2	--	--	--	--	--	--	--	--	--	10,300
FLPBA-6B	3	--	--	--	--	--	--	--	--	--	10,600
FLPBB-1B	1	--	--	--	--	--	--	--	--	--	9,840
FLPBB-2B	1	--	--	--	--	--	--	--	--	--	8,970
FLPBB-3B	1	--	--	--	--	--	--	--	--	--	8,980
FLPBB-4B	1	--	--	--	--	--	--	--	--	--	9,460
FLPBB-5B	2	--	--	--	--	--	--	--	--	--	10,300
FLPBB-6B	2	--	--	--	--	--	--	--	--	--	10,100
FREEZOUT LAKE WMA (POND 5) GROUP											
FL5A-1L	28	15	.06	3.0	.1	.5	4.2	.1	.3	116	5,820
FL5A-2L	28	17	.05	3.7	.3	<.8	4.9	.1	.3	119	6,500
FL5A-3L	28	14	.05	2.0	.1	1.0	3.0	.1	.3	109	6,200
FL5A-4L	28	14	.04	3.3	<.1	.5	3.8	.1	.3	139	6,020
FL5A-5L	28	13	.04	3.0	.2	2.2	5.8	.1	<.3	116	6,090
FL5A-6L	28	16	.05	2.0	.1	<.4	3.5	.1	<.3	105	6,640
FL5B-1L	28	12	.05	4.2	.1	<.4	6.2	.4	<.3	156	6,030

Table 35. Results of trace-element analyses of liver tissue and sodium analyses of brain tissue from mallard ducklings used in 28-day bioassay testing (Continued)

Sample identification	Number of days exposed[2]	Liver									
		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Copper	Iron	Magnesium
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND											
FREEZOUT LAKE WMA (POND 5) GROUP--Continued											
FL5B-2L	28	<3	<.2	<.1	<.01	<2	.8	<.2	414	1,170	700
FL5B-3L	28	<3	<.2	<.1	<.01	<2	1.0	<.2	327	1,090	721
FL5B-4L	28	<3	<.2	<.1	<.01	<2	.4	<.2	310	1,140	705
FL5B-5L	28	<3	<.2	<.1	<.01	<2	.8	<.1	208	1,110	686
FL5B-6L	28	4	<.2	<.1	<.01	<2	.8	<.2	398	1,820	694
FREEZEOUT LAKE (SOUTH END) GROUP											
FLSLA-1L	28	<3	<.2	<.1	<.01	<2	.9	<.2	319	884	714
FLSLA-2L	28	<3	<.2	<.1	<.01	<2	.7	<.1	583	1,110	653
FLSLA-3L	28	<3	<.2	<.1	<.01	<2	.6	<.2	293	1,240	668
FLSLA-4L	28	<3	<.2	<.1	<.01	<2	.4	<.2	316	1,030	664
FLSLA-5L	28	<3	<.2	<.1	<.01	<2	.6	<.2	363	1,300	640
FLSLA-6L	28	<3	<.2	<.1	<.01	<2	.5	<.2	293	939	662
FLSLB-1L	1	--	--	--	--	--	--	--	--	--	--
FLSLB-2L	28	<3	<.2	<.1	<.01	<2	.5	<.2	342	670	654
FLSLB-3L	28	<3	<.2	<.1	<.01	<2	.8	<.2	393	1,080	699
FLSLB-4L	28	5	<.2	<.1	<.01	<2	.5	<.1	299	896	688
FLSLB-5L	28	5	.2	.2	<.01	<2	.5	<.2	425	980	678
FLSLB-6L	28	<3	<.2	<.1	<.01	<2	.4	<.2	326	1,050	639
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND											
BENTON LAKE (POOL 2) GROUP											
BL2A-1L	28	<3	<.2	<.1	<.01	2	.7	<.2	316	1,960	680
BL2A-2L	28	<3	<.2	<.1	<.01	2	.6	<.2	251	941	686
BL2A-3L	28	<3	<.2	<.1	<.01	2	.5	.2	304	900	731
BL2A-4L	28	<3	<.2	<.1	<.01	2	.8	<.2	275	2,470	677
BL2A-5L	28	<3	<.2	<.1	<.01	<2	.7	.2	236	959	708
BL2A-6L	28	<3	<.2	<.1	<.01	<2	.6	<.2	244	1,420	671
BL2B-1L	28	<3	<.2	<.1	<.01	<2	.5	.2	339	573	672
BL2B-2L	28	<3	<.2	<.1	<.01	<2	.5	<.2	239	962	716
BL2B-3L	28	<3	<.2	<.1	<.01	<2	.7	<.2	356	1,250	653
BL2B-4L	28	<3	<.2	<.1	<.01	<2	.6	.2	326	1,400	701
BL2B-5L	28	<3	<.2	<.1	<.01	<2	.6	<.2	130	1,450	628
BL2B-6L	28	<3	<.2	<.1	<.01	<2	.4	.2	157	740	741
TRIBUTARY TO BENTON LAKE (POOL 4) GROUP											
BL4AA-1L	28	<3	<.2	<.1	<.01	<2	.2	.3	380	844	665
BL4AA-2L	28	<3	<.2	<.1	<.01	<2	.7	<.2	381	1,290	693
BL4AA-3L	28	<3	<.2	<.1	<.01	<2	.6	<.2	161	1,110	724
BL4AA-4L[3]	28	--	--	--	--	--	--	--	--	--	--
BL4AA-5L	28	<3	<.2	<.1	<.01	<2	.6	<.2	327	1,470	675
BL4AA-6L	28	<3	<.2	<.1	<.01	<2	.8	.2	223	1,110	674

Table 35. Results of trace-element analyses of liver tissue and sodium analyses of brain tissue from mallard ducklings used in 28-day bioassay testing (Continued)

Sample identification	Number of days exposed[2]	Liver									Brain
		Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc	Sodium
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND											
FREEZOUT LAKE WMA (POND 5) GROUP--Continued											
FL5B-2L	28	13	.05	2.0	<.1	.5	4.2	.1	<.3	144	6,420
FL5B-3L	28	12	.04	2.0	.1	.5	3.9	.1	<.3	133	6,540
FL5B-4L	28	14	.04	2.0	<.1	<.4	3.9	.1	.3	123	5,300
FL5B-5L	28	13	.04	2.0	<.1	<.4	4.0	.1	<.3	128	6,300
FL5B-6L	28	13	.04	2.0	<.1	<.4	4.5	.1	.4	119	6,230
FREEZEOUT LAKE (SOUTH END) GROUP											
FLSLA-1L	28	15	.05	3.0	<.1	.7	5.3	.1	<.3	127	6,770
FLSLA-2L	28	12	.05	3.0	<.1	<.4	6.0	.1	<.3	127	5,860
FLSLA-3L	28	14	.04	2.0	<.1	<.4	3.9	.1	<.3	117	6,280
FLSLA-4L	28	16	.05	3.2	<.1	<.4	4.2	.1	<.3	103	6,480
FLSLA-5L	28	13	.04	2.9	<.1	<.4	3.9	.1	.3	135	6,340
FLSLA-6L	28	13	.04	3.0	<.1	<.4	4.0	.1	.3	118	6,390
FLSLB-1L	1	--	--	--	--	--	--	--	--	--	10,300
FLSLB-2L	28	14	<.03	2.0	<.1	<.4	4.9	.1	<.3	119	6,200
FLSLB-3L	28	15	.04	2.0	<.1	<.4	4.0	.2	<.3	138	6,560
FLSLB-4L	28	16	.04	2.9	.2	<.4	4.1	.1	<.3	158	6,230
FLSLB-5L	28	14	.05	2.0	.8	<.4	5.2	.2	<.3	136	6,680
FLSLB-6L	28	14	.03	3.0	<.1	<.4	4.0	.1	.4	123	6,340
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND											
BENTON LAKE (POOL 2) GROUP											
BL2A-1L	28	14	<.05	3.0	<.1	.5	4.5	.5	<.3	130	6,570
BL2A-2L	28	14	<.05	3.0	.3	<.4	3.9	.1	<.3	113	6,160
BL2A-3L	28	16	<.05	3.0	<.1	<.4	4.3	.3	<.3	117	6,170
BL2A-4L	28	16	<.05	3.5	<.1	.7	4.1	.2	<.3	122	6,640
BL2A-5L	28	13	<.05	3.0	<.1	.4	3.4	.2	<.3	128	6,620
BL2A-6L	28	14	<.05	3.1	<.1	<.4	4.9	.3	<.3	108	6,420
BL2B-1L	28	13	<.05	3.7	<.1	.5	4.1	.3	<.3	138	6,260
BL2B-2L	28	17	<.05	3.5	<.1	.7	4.2	.1	<.3	130	6,530
BL2B-3L	28	14	<.05	2.0	<.1	.5	4.0	.5	<.3	90	6,150
BL2B-4L	28	16	<.05	3.0	.2	1.7	3.7	.2	<.3	150	6,660
BL2B-5L	28	13	<.05	3.0	<.1	.6	3.4	.1	.4	111	6,620
BL2B-6L	28	19	<.05	3.1	<.1	<.4	3.5	.2	<.3	133	6,640
TRIBUTARY TO BENTON LAKE (POOL 4) GROUP											
BL4AA-1L	28	14	<.05	4.4	<.1	<.4	4.9	.1	<.3	90	5,760
BL4AA-2L	28	13	<.05	3.0	<.1	<.4	4.4	.4	.4	118	5,940
BL4AA-3L	28	18	<.05	3.1	<.1	.5	4.1	.3	.3	81	6,030
BL4AA-4L[3]	28	--	--	--	--	--	--	--	--	--	6,610
BL4AA-5L	28	12	<.05	3.3	<.1	.5	3.9	.3	<.3	95	6,100
BL4AA-6L	28	15	<.05	2.0	<.1	.4	3.6	.2	<.3	103	6,270

Table 35. Results of trace-element analyses of liver tissue and sodium analyses of brain tissue from mallard ducklings used in 28-day bioassay testing (Continued)

Sample identification	Number of days exposed[2]	Liver									
		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Copper	Iron	Magnesium
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND											
TRIBUTARY TO BENTON LAKE (POOL 4) GROUP--Continued											
BL4AB-1L	28	<3	<.2	<.1	<.01	<2	.6	<.2	338	1,120	658
BL4AB-2L	28	<3	<.2	<.1	<.01	<2	.5	<.1	284	1,480	640
BL4AB-3L	28	<3	<.2	<.1	<.01	2	.4	<.2	327	1,490	623
BL4AB-4L	28	<3	<.2	<.1	<.01	<2	.1	<.1	221	460	334
BL4AB-5L	28	<3	<.2	<.1	<.01	<2	.6	<.2	479	1,130	642
BL4AB-6L	28	<3	<.2	<.1	<.01	<2	.4	<.2	335	1,340	612
BENTON LAKE (POOL 6) GROUP											
BL6A-1L	28	<3	<.2	<.1	<.01	<2	.6	<.1	301	626	554
BL6A-2L	28	<3	<.2	<.1	<.01	<2	.6	<.1	298	1,190	640
BL6A-3L	28	<3	<.2	<.1	<.01	<2	.6	<.2	260	1,090	690
BL6A-4L	28	<3	<.2	<.1	<.01	<2	.6	<.2	215	1,350	640
BL6A-5L	28	<3	<.2	<.1	<.01	<2	.6	<.1	433	967	688
BL6A-6L	28	<3	<.2	<.1	<.01	<2	.2	<.2	138	525	276
BL6B-1L	28	<3	<.2	<.1	<.01	<2	.6	<.1	165	937	617
BL6B-2L	28	<3	<.2	<.1	<.01	<2	.6	.3	220	981	604
BL6B-3L	28	<3	<.2	<.1	<.01	2	.5	.3	187	1,010	603
BL6B-4L	28	<3	<.2	<.1	<.01	<2	.3	<.2	252	790	601
BL6B-5L	28	<3	<.2	<.1	<.01	2	.6	<.2	342	691	622
BL6B-6L	28	<3	<.2	<.1	<.01	<2	.4	<.2	148	717	614

[1]Each sample represents a composite of six individuals.
[2]Number of days less than 28 indicates that death occurred prior to completion of the test period. Day 28 indicates survival through the entire test period.
[3]Sample was accidently ruined.

Table 35. Results of trace-element analyses of liver tissue and sodium analyses of brain tissue from mallard ducklings used in 28-day bioassay testing (Continued)

Sample identification	Number of days exposed[2]	Liver									Brain
		Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Strontium	Vanadium	Zinc	Sodium
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND											
TRIBUTARY TO BENTON LAKE (POOL 4) GROUP--Continued											
BL4AB-1L	28	12	<.05	2.0	1.4	.6	5.1	.2	<.3	87	6,690
BL4AB-2L	28	11	<.05	3.0	<.1	.7	3.7	.3	<.3	98	6,540
BL4AB-3L	28	8.5	.04	2.0	<.1	.6	3.6	.4	<.3	106	6,600
BL4AB-4L	28	4.6	.05	1.0	<.1	<.4	2.0	<.1	<.3	46	6,510
BL4AB-5L	28	9.5	.04	2.0	.2	<.4	5.4	.2	<.3	82	6,500
BL4AB-6L	28	9.1	.05	2.0	.8	.6	4.3	.1	<.3	70	6,470
BENTON LAKE (POOL 6) GROUP											
BL6A-1L	28	13	.04	2.0	.2	<.4	4.7	<.1	<.3	97	6,090
BL6A-2L	28	14	.04	2.0	<.1	<.4	4.2	.1	<.3	111	6,090
BL6A-3L	28	17	.04	3.0	<.1	.8	3.8	.1	.3	109	6,410
BL6A-4L	28	15	.04	3.1	.2	<.4	3.4	.1	<.3	130	6,810
BL6A-5L	28	13	.04	3.0	.2	<.4	5.7	.1	<.3	110	6,320
BL6A-6L	28	5.1	.06	1.0	.1	.5	1.8	<.1	<.3	54	6,310
BL6B-1L	28	11	.06	2.0	<.1	.8	3.5	.1	<.3	108	6,460
BL6B-2L	28	11	.06	2.0	.1	<.4	3.6	.1	<.3	104	4,820
BL6B-3L	28	12	.05	2.0	.4	.7	3.2	.1	<.3	91	7,430
BL6B-4L	28	12	.04	2.0	.6	<.4	3.5	.1	<.3	88	6,510
BL6B-5L	28	11	.07	2.0	<.1	<.4	4.7	.4	.3	85	6,620
BL6B-6L	28	11	.07	2.0	.2	.6	3.0	.2	<.3	93	6,540

Table 36. Results of trace-element and nutritional analyses of commercial diets used in mallard duckling bioassay testing

[Analyses by Environmental Trace Substances Research Center, Columbia, Mo. Concentrations in micrograms per gram of dry sample weight, except where noted. All concentrations are total. Symbol: <, less than]

Constituent	Concentration	
	Purina Game Bird Starter	AgriBasics Duck Starter
TRACE ELEMENTS		
Aluminum	160	91
Arsenic	<.2	<.2
Barium	14	11
Beryllium	.02	.01
Boron	18	11
Cadmium	.3	.1
Chromium	5.2	.3
Copper	21	21
Iron	306	210
Lead	.6	.5
Magnesium	2,990	1,810
Manganese	128	141
Mercury	<.01	<.01
Molybdenum	3.0	2.0
Nickel	3.2	2.4
Selenium	.9	.6
Strontium	18	11
Vanadium	1.1	.6
Zinc	131	131
NUTRITIONAL CONTENT		
Crude protein	30 percent	22 percent
Crude fat	2.5 percent	3.5 percent
Crude fiber	6.5 percent	4.2 percent

Table 37. Results of chemical analyses of drinking-water treatments used in mallard duckling bioassay testing

[Analyses by Environmental Trace Substance Research Center, Columbia, Mo. Concentrations are total recoverable.
Symbols: µS/cm, microsiemens per centimeter at 25 degrees Celsius; <, less than]

Sample identification	Date	Specific conductance (µS/cm)	Concentration of major ions, in milligrams per liter				Concentration of trace elements, in micrograms per liter					
			Magnesium	Sodium	Sulfate	Chloride	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium
GIANT SPRINGS[1] CONTROL TREATMENT												
GSW6-30	06-30-92	620	28	9.6	152	6.2	<30	<0.5	30	<0.1	40	<0.2
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND												
SEEP EAST OF PRIEST BUTTE LAKES TREATMENT												
FLPB6-30	06-30-92	33,500	12,300	2,020	56,200	282	<300	4	20	<.1	1,200	<.2
FREEZOUT LAKE WMA (POND 5)[2] TREATMENT												
FL5W6-30	06-30-92	294	18	6.6	36	3.3	230	<.5	49	<.1	40	<.2
FL5W7-13	07-13-92	327	20	6.5	44	2.5	4,150	.7	119	.2	40	<.2
FREEZEOUT LAKE (SOUTH END)[2] TREATMENT												
FLSW6-30	06-30-92	2,760	141	290	1,300	70	270	9	42	<.1	450	<.2
FLSW7-13	07-13-92	2,610	154	275	1,300	60	520	3	34	<.1	490	<.2
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND												
BENTON LAKE (POOL 2)[2] TREATMENT												
BL2W6-30	06-30-92	770	54	59	191	9.9	810	17	23	<0.1	130	<.2
BL2W7-13	07-13-92	695	41	57	181	8.8	800	10	15	<.1	79	<.2
TRIBUTARY TO BENTON LAKE (POOL 4) TREATMENT												
BL4W6-30	06-30-92	16,370	1,470	2,080	11,500	734	950	16	23	<.1	900	<.2
BL4W7-13	07-13-92	13,100	1,140	1,550	8,900	826	1,400	8	19	<.1	930	<.2
BENTON LAKE (POOL 6)[2] TREATMENT												
BL6W6-30	06-30-92	7,260	477	865	3,720	141	4,700	37	79	.3	640	<.2
BL6W7-13	07-13-92	6,290	412	791	3,180	161	3,220	32	61	.2	690	<.2

Table 37. Results of chemical analyses of drinking-water treatments used in mallard duckling bioassay testing (Continued)

Sample identification	Date	Concentrations of trace elements, in micrograms per liter											
		Chromium	Copper	Iron	Lead	Manganese	Molybdenum	Mercury	Nickel	Selenium	Strontium	Vanadium	Zinc
GIANT SPRINGS[1] CONTROL TREATMENT													
GSW6-30	06-30-92	<2	23	30	<4	<2	<10	<4	<1	0.8	1,100	<3	7
FREEZOUT LAKE WILDLIFE MANAGEMENT AREA AND ADJACENT LAND													
SEEP EAST OF PRIEST BUTTE LAKES TREATMENT													
FLPB6-30	06-30-92	<2	<30	310	<4	170	<100	<4	49	530	11,000	<50	40
FREEZOUT LAKE WMA (POND 5)[2] TREATMENT													
FL5W6-30	06-30-92	<2	14	130	<4	10	<10	<4	1	.7	200	3	<2
FL5W7-13	07-13-92	4	16	1,970	<4	32	<10	<4	2	1	300	11	7
FREEZEOUT LAKE (SOUTH END)[2] TREATMENT													
FLSW6-30	06-30-92	2	110	280	<4	27	<10	<4	1	6	1,300	7	16
FLSW7-13	07-13-92	3	120	90	<4	7	<10	<4	2	21	1,400	10	<2
BENTON LAKE NATIONAL WILDLIFE REFUGE AND ADJACENT LAND													
BENTON LAKE (POOL 2)[2] TREATMENT													
BL2W6-30	06-30-92	3	44	330	<4	17	<10	<4	2	.8	300	15	5
BL2W7-13	07-13-92	2	33	220	<4	7	<10	<4	2	.7	300	16	<2
TRIBUTARY TO BENTON LAKE (POOL 4) TREATMENT													
BL4W6-30	06-30-92	2	1,170	510	<4	400	<10	<4	9	11	5,800	8	12
BL4W7-13	07-13-92	2	910	160	<4	130	<10	<4	8	2	5,000	<3	5
BENTON LAKE (POOL 6)[2] TREATMENT													
BL6W6-30	06-30-92	7	380	2,260	4	730	<10	<4	26	.9	1,800	18	70
BL6W7-13	07-13-92	6	330	1,500	10	480	<10	<4	22	1	1,600	15	9

[1]Spring discharging from limestone aquifer near Great Falls, Mont. (fig. 1).

[2]All lake samples were collected near shore and do not directly correspond to surface-water sampling sites reported in tables 14 and 15.

Table 38. Results of chemical analyses of deionized-water field blanks

[Abbreviations: mg/L, milligrams per liter; µg/L, micrograms per liter. Symbols: <, less than; --, no data]

Date	Hardness, (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)
					GROUND-WATER EQUIPMENT					
02-27-91	--	--	--	--	--	--	--	--	--	--
04-17-92	--	--	--	--	--	--	--	--	--	--
					SURFACE-WATER EQUIPMENT					
07-24-91	1	0.02	0.16	<0.2	<0.1	2.0	<0.1	<0.1	<0.1	<0.1
04-02-92	1	.10	.05	<.2	<.1	1.8	<.1	<.1	<.1	<.1
06-02-92	--	--	--	--	--	--	--	--	--	--

Date	Nitrite, dissolved (mg/L as N)	Nitrite plus nitrate, dissolved (mg/L as N)	Ammonia, dissolved (mg/L as N)	Phosphorus, ortho, dissolved (mg/L as P)	Arsenic, total (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)
					GROUND-WATER EQUIPMENT					
02-27-91	--	--	--	--	--	<1	--	<10	--	<1
04-17-92	--	--	--	--	--	<1	--	<10	--	<1
					SURFACE-WATER EQUIPMENT					
07-24-91	<.01	<.05	<.01	<.01	<1	<1	--	<10	<1	<1
04-02-92	<.01	<.05	.01	<.01	<1	<1	<10	<10	<1	<1
06-02-92	--	--	--	--	--	<1	--	10	--	<1

Date	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
					GROUND-WATER EQUIPMENT					
02-27-91	--	<1	--	1	--	<1	--	<1	--	10
04-17-92	--	<1	--	<1	--	<1	--	<1	--	7
					SURFACE-WATER EQUIPMENT					
07-24-91	1	<1	2	<1	2	<1	<1	<1	<10	<3
04-02-92	<1	<1	<1	<1	<1	<1	<1	<1	<10	<3
06-02-92	--	<1	--	<1	--	<1	--	<1	--	<10

Table 39. Results of chemical analyses of replicate soil, drill-core, and bottom-sediment samples from the Sun River area, Montana

[Analyses by U.S. Geological Survey. Depth at top or bottom of sample interval in feet below land surface. Abbreviations: ft, feet (below land surface); µg/g, micrograms per gram of dry sample weight; µS/cm, microsiemens per centimeter at 25 degrees Celsius; percent, percent of dry sample weight; water extr., water extractable. Symbols: <, less than; --, no data]

Site number (fig. 3-5)	Date	Depth at top of sample interval (ft)	Depth at bottom of sample interval (ft)	Specific conductance, water extr. (µS/cm)	pH, water extr. (standard units)	Aluminum, total (percent)	Calcium, total (percent)	Carbon, organic (percent)	Carbon, organic (percent)	Iron, total (percent)	Magnesium, total (percent)	Phosphorus, total (percent)
					SOIL							
L-10	10-01-91	0	2.0	220	--	6.4	5.2	--	--	2.4	1.5	0.08
	10-01-91	0	2.0	220	--	5.3	7.5	--	--	2.0	1.3	.06
L-25	10-02-91	0	3.0	290	--	5.6	7.1	--	--	2.1	2.3	.07
	10-02-91	0	3.0	200	--	5.6	7.2	--	--	2.1	2.3	.07
L-34	10-18-91	0	3.0	250	--	6.5	3.4	--	--	2.6	1.3	.09
	10-18-91	0	3.0	230	--	6.6	3.5	--	--	2.7	1.3	.09
L-36	10-02-91	0	2.1	160	--	4.2	13	--	--	1.6	1.6	.04
	10-02-91	0	2.1	170	--	4.2	13	--	--	1.6	1.5	.04
					DRILL CORE							
W-3D	09-30-91	26	28	--	--	7.6	2.2	--	--	3.1	1.4	.10
	09-30-91	26	28	--	--	7.6	2.5	--	--	3.1	1.4	.10
W-3D	09-30-91	72.5	73.5	--	--	6.5	3.1	--	--	2.7	1.8	.12
	09-30-91	72.5	73.5	--	--	7.1	2.8	--	--	2.9	1.8	.17
W-4C	10-21-91	61.5	62.5	--	--	7.6	.86	--	--	3.2	1.4	.09
	10-21-91	61.5	62.5	--	--	8.0	.57	--	--	3.1	1.3	.09
W-54	08-23-90	49.5	50.5	1,200	8.1	4.9	.67	--	--	1.9	.67	.10
	08-23-90	49.5	50.5	980	8.3	4.9	.56	--	--	1.9	.67	.10
W-55	08-23-90	0	5	2,700	7.1	4.4	5.9	--	--	2.2	.61	.16
	08-23-90	0	5	2,600	7.8	4.3	4.9	--	--	2.1	.59	.17
W-56	08-23-90	10	15	300	8.5	5.7	1.3	--	--	1.7	.88	.07
	08-23-90	10	15	270	8.9	5.7	1.4	--	--	1.8	.88	.07
					BOTTOM SEDIMENT							
S-46	07-03-91	--	--	--	--	6.7	1.2	0.2	1.4	2.5	.98	.09
	07-03-91	--	--	--	--	6.7	1.2	.2	1.4	2.5	.99	.09

Table 39. Results of chemical analyses of replicate soil, drill-core, and bottom-sediment samples from the Sun River area, Montana (Continued)

Site number	Potassium, total (percent)	Sodium, total (percent	Sulfur, total (percent)	Sulfur, sulfide, total (percent as S)	Sulfur, sulfate, total (percent as S)	Arsenic, total (µg/g)	Barium, total (µg/g)	Beryllium, total (µg/g)	Boron, water extr., total (µg/g)	Cadmium, total (µg/g)	Chromium, total (µg/g)	Cobalt, total (µg/g)	Copper, total (µg/g)
						SOIL							
L-10	1.7	0.8	--	--	--	10	580	1	--	<2	48	9	18
	1.4	.8	--	--	--	<10	640	1	--	<2	41	8	15
L-25	1.6	.9	--	--	--	10	650	1	--	<2	42	9	15
	1.6	.9	--	--	--	<10	660	1	--	<2	44	8	15
L-34	2.0	.6	--	--	--	20	960	1	--	<2	68	10	20
	2.0	.6	--	--	--	10	970	2	--	<2	72	10	21
L-36	1.1	.7	--	--	--	<10	700	1	--	<2	27	8	13
	1.1	.7	--	--	--	<10	700	<1	--	<2	28	7	14
						DRILL CORE							
W-3D	2.4	.39	0.91	<0.05	--	12	560	2	--	<2	100	11	28
	2.4	.38	1.06	<.05	--	11	490	2	--	<2	100	10	30
W-3D	2.2	.54	1.51	1.44	--	7.1	290	1	--	<2	69	9	22
	2.2	.60	1.75	1.65	--	11	300	2	--	<2	69	9	20
W-4C	2.4	.32	.98	--	--	11	490	2	--	<2	94	11	25
	2.6	.31	<.05	<.05	--	9.7	720	2	--	<2	94	10	23
W-54	1.9	.41	.53	--	0.093	5.6	450	2	--	<2	60	7	21
	2.0	.42	.54	--	.063	5.3	450	2	--	<2	63	11	24
W-55	2.1	.32	.87	--	.31	7.4	490	1	--	<2	45	12	10
	2.1	.31	.57	--	.30	7.1	510	1	--	<2	46	8	11
W-56	1.2	.53	<.05	--	.006	11	1,200	3	--	<2	31	7	14
	1.2	.48	<.05	--	.006	11	1,400	3	--	<2	35	4	16
						BOTTOM SEDIMENT							
S-46	2.0	.57	--	--	--	6.8	680	2	4	<2	87	14	24
	2.0	.57	--	--	--	6.8	660	2	3	<2	89	14	25

Table 39. Results of chemical analyses of replicate soil, drill-core, and bottom-sediment samples from the Sun River area, Montana (Continued)

Site number	Lead, total (µg/g)	Lithium, total (µg/g)	Manganese, total (µg/g)	Mercury, total (µg/g)	Molybdenum, total (µg/g)	Nickel, total (µg/g)	Selenium, total (µg/g)	Selenium, water extr., total (µg/g)	Silver, total (µg/g)	Strontium, total (µg/g)	Uranium, total (µg/g)	Vanadium, total (µg/g)	Zinc, total (µg/g)
						SOIL							
L-10	13	34	360	--	<2	15	0.3	0.008	<2	180	<100	90	73
	12	29	330	--	<2	13	.3	<.005	<2	230	<100	79	60
L-25	9	37	360	--	<2	13	.4	.018	<2	340	<100	72	64
	10	37	360	--	<2	13	.4	.011	<2	340	<100	73	64
L-34	13	43	270	--	<2	23	1.1	.011	<2	160	<100	140	92
	16	44	270	--	3	23	1.1	.011	<2	160	<100	140	96
L-36	7	25	270	--	<2	10	.2	<.005	<2	440	<100	55	39
	7	25	270	--	<2	9	.1	.007	<2	440	<100	54	39
						DRILL CORE							
W-3D	19	85	170	--	4	42	1.8	--	<2	150	<100	240	130
	18	84	160	--	4	41	2.4	--	<2	150	<100	230	130
W-3D	14	53	170	--	6	28	2.1	--	<2	180	<100	150	100
	14	57	170	--	<2	27	1.8	--	<2	200	<100	150	100
W-4C	21	63	120	--	5	37	6	--	<2	130	<100	200	110
	19	63	130	--	2	35	1.8	--	<2	130	<100	200	110
W-54	36	29	130	--	<2	18	.5	.082	<2	130	<100	91	76
	25	29	110	--	<2	19	.5	.11	<2	120	<100	93	80
W-55	10	22	950	--	3	21	.4	<.005	<2	150	<100	74	69
	10	21	900	--	5	21	.3	<.005	<2	150	<100	75	69
W-56	23	28	280	--	8	22	.3	.005	<2	350	<100	51	85
	23	27	290	--	7	24	.2	.005	<2	410	<100	58	88
						BOTTOM SEDIMENT							
S-46	17	58	290	0.02	2	49	2.9	--	<2	200	5	160	140
	16	58	300	.06	<2	49	2.9	--	<2	200	5	170	140

Table 40. Results of chemical analyses of replicate ground-water samples from the Sun River area, Montana

[Constituents are dissolved, except as indicated. Abbreviations: µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter. Symbols: <, less than; --, no data]

Site number (fig. 4,5)	Date	Specific conductance, lab (µS/cm)	pH, lab (standard units)	Hardness (mg/L as $CaCO_3$)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium (mg/L as Na)	Potassium (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)
W-2A	07-27-92	5,090	7.5	2,300	290	390	550	4.8	--	2,700
	07-27-92	5,080	7.5	2,300	280	390	540	4.3	416	2,600
W-3D	04-15-92	4,640	7.8	88	9.4	15	1,200	4.1	1,270	29
	04-15-92	4,660	7.8	93	10	16	1,000	4.3	1,270	20
W-4C	08-12-92	3,710	7.8	780	130	110	630	5.1	243	1,700
	08-12-92	3,710	7.8	780	130	110	610	5.1	243	1,700
W-23	08-07-91	1,960	7.9	790	85	140	180	2.5	311	810
	08-07-91	1,960	7.9	790	86	140	180	2.6	330	820
W-45	02-26-91	549	8.1	270	20	53	21	.90	284	25
	02-26-91	550	8.0	270	20	53	21	.90	284	24
W-56	06-20-91	10,500	7.3	2,600	200	500	2,100	16	847	6,000
	06-20-91	10,500	7.3	2,700	210	520	2,000	15	833	6,300

Site number (fig. 4,5)	Chloride, (mg/L as Cl)	Fluoride (mg/L as F)	Silica (mg/L SiO_2)	Dissolved solids, calculated (mg/L)	Nitrite (mg/L as N)	Nitrite plus nitrate (mg/L as N)	Ammonia (mg/L as N)	Phosphorus, ortho (mg/L as P)	Arsenic (µg/L as As)	Barium (µg/L as Ba)
W-2A	91	2.1	11	4,340	<0.01	11	<0.01	<0.01	--	--
	96	2.5	11	4,220	<.01	11	<.01	<.01	--	--
W-3D	830	1.5	6.0	2,880	<.01	<.05	1.0	.03	--	1,400
	830	1.5	5.9	2,700	--	--	--	--	--	1,400
W-4C	39	1.3	8.2	2,780	<.01	.09	.71	<.01	--	--
	38	1.3	8.2	2,760	<.01	.09	.72	<.01	--	--
W-23	21	1.9	10	1,470	<.01	6.0	<.01	<.01	<1	--
	23	1.8	10	1,490	<.01	6.0	.01	<.01	<1	--
W-45	4.8	.80	9.7	314	<.01	2.1	<.01	<.01	<1	--
	4.8	.80	9.7	314	<.01	2.1	<.01	<.01	<1	--
W-56	300	1.6	6.8	9,660	.15	3.9	1.4	.02	1	--
	290	2.0	6.9	9,870	.15	3.9	1.5	.02	1	--

Table 40. Results of chemical analyses of replicate ground-water samples from the Sun River area, Montana (Continued)

Site number (fig. 4,5)	Boron (µg/L as B)	Cadmium (µg/L as Cd)	Chromium (µg/L as Cr)	Copper (µg/L as Cu)	Iron (µg/L as Fe)	Manganese (µg/L as Mn)	Selenium (µg/L as Se	Strontium (µg/L as Sr)	Zinc (µg/L as Zn)
W-2A	--	--	--	--	10	10	190	4,600	--
	--	--	--	--	<10	10	170	4,700	--
W-3D	1,100	--	--	--	440	150	<1	1,500	--
	1,100	--	--	--	180	120	<1	1,400	--
W-4C	--	--	--	--	50	90	<1	3,600	--
	--	--	--	--	50	90	<1	3,600	--
W-23	360	<1.0	<1	2	<3	<1	50	--	22
	360	<1.0	<1	2	5	<1	47	--	23
W-45	90	<1.0	<1	1	<3	<1	1	--	10
	90	1.0	<1	1	<3	<1	<1	--	3
W-56	1,600	<2.0	2	2	30	1,400	19	--	<10
	1,600	<2.0	<2	2	10	1,400	18	--	<10

Table 41. Results of trace-element analyses of replicate surface-water samples from the Sun River area, Montana

[Abbreviations: µg/L, micrograms per liter. Symbols: <, less than; --, no data]

Site number (fig. 5)	Date	Arsenic, total recoverable (µg/L as As)	Arsenic, dissolved (µg/L as As)	Boron, total recoverable (µg/L as B)	Boron, dissolved (µg/L as B)	Cadmium, total recoverable (µg/L as Cd)	Cadmium, dissolved (µg/L as Cd)	Chromium, total recoverable (µg/L as Cr)	Chromium, dissolved (µg/L as Cr)
S-8	03-31-92	--	--	--	--	--	--	--	--
	03-31-92	--	--	--	--	--	--	--	--
S-11	04-02-92	--	--	--	--	--	--	--	--
	04-02-92	--	--	--	--	--	--	--	--
S-12	04-02-91	2	2	300	290	<1	<1	2	<1
	04-02-91	2	2	320	280	<1	<1	1	<1
S-13	04-02-92	1	1	200	210	<1	<1	2	<1
	04-02-92	2	<1	190	210	<1	<1	<1	<1
S-30	06-02-92	--	--	--	--	--	--	--	--
	06-02-92	--	--	--	--	--	--	--	--
S-34	04-06-92	11	12	910	980	<1	<1	<1	<1
	04-06-92	12	11	920	980	<1	<1	<1	<1
S-37	06-24-92	1	2	90	90	<1	<1	<1	<1
	06-24-92	2	1	90	90	<1	<1	<1	<1
S-39	04-17-91	8	8	710	690	<1	<1	1	<1
	04-17-91	9	7	670	680	<1	<1	1	<1
S-44	11-26-91	--	--	--	--	--	--	--	--
	11-26-91	--	--	--	--	--	--	--	--
S-46	04-08-92	--	--	--	--	--	--	--	--
	04-08-92	--	--	--	--	--	--	--	--
S-48	09-24-92	--	60	--	--	--	--	--	--
	09-24-92	--	64	--	--	--	--	--	--
S-49	07-03-91	70	68	500	530	<1	<1	1	<1
	07-03-91	76	69	530	530	<1	<1	<1	<1
	04-08-92	--	--	370	--	<1	--	<1	--
	04-08-92	--	--	390	--	<1	--	<1	--

Table 41. Results of trace-element analyses of replicate surface-water samples from the Sun River area, Montana (Continued)

Site number	Date	Copper, total recoverable (µg/L as Cu)	Copper, dissolved (µg/L as Cu)	Nickel, total recoverable (µg/L as Ni)	Nickel, dissolved (µg/L as Ni)	Selenium, total recoverable (µg/L as Se)	Selenium, dissolved (µg/L as Se)	Zinc, total recoverable (µg/L as Zn)	Zinc, dissolved (µg/L as Zn)
S-8	03-31-92	--	--	--	--	140	--	--	--
	03-31-92	--	--	--	--	140	--	--	--
S-11	04-02-92	--	--	--	--	45	--	--	--
	04-02-92	--	--	--	--	48	--	--	--
S-12	04-02-91	4	1	5	2	20	17	10	<10
	04-02-91	4	1	5	5	20	15	10	<10
S-13	04-02-92	3	<1	<1	<1	6	6	<10	3
	04-02-92	<1	<1	<1	<1	9	7	<10	<3
S-30	06-02-92	--	--	--	--	2	--	--	--
	06-02-92	--	--	--	--	2	--	--	--
S-34	04-06-92	<1	<1	1	2	9	9	<10	<10
	04-06-92	<1	<1	1	2	11	11	10	<10
S-37	06-24-92	<1	<1	1	<1	<1	1	<10	<3
	06-24-92	<1	<1	1	<1	<1	<1	<10	<10
S-39	04-17-91	4	<1	3	1	2	2	<10	<10
	04-17-91	1	<1	2	1	2	2	<10	<10
S-44	11-26-91	--	--	--	--	90	--	--	--
	11-26-91	--	--	--	--	95	--	--	--
S-46	04-08-92	--	--	--	--	2	--	--	--
	04-08-92	--	--	--	--	1	--	--	--
S-48	09-24-92	--	--	--	--	--	<1	--	--
	09-24-92	--	--	--	--	--	<1	--	--
S-49	07-03-91	6	3	7	3	1	1	<10	<10
	07-03-91	10	6	6	6	1	<1	<10	<10
	04-08-92	<1	--	10	--	<1	--	20	--
	04-08-92	<1	--	10	--	<1	--	20	--

Table 42. Results of major-ion and nutrient analyses of replicate surface-water samples from the Sun River area, Montana

[Abbreviations: mg/L, milligrams per liter. Symbols: <, less than; --, no data]

Site number (fig. 5)	Date	Hardness (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium (percent)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)
S-11	04-02-92	4,200	330	810	350	15	2	15	368	4,600
	04-02-92	4,100	330	790	350	16	2	15	398	4,100
S-12	04-02-91	1,900	93	410	250	22	2	4.0	364	2,200
	04-02-91	1,900	94	410	250	22	2	4.1	364	2,200
S-13	04-02-92	510	60	87	25	10	.5	1.9	318	220
	04-02-92	510	60	87	25	10	.5	2.0	318	220
S-34	04-06-92	3,100	64	710	1,300	48	10	13	585	5,200
	04-06-92	3,000	62	700	1,300	48	10	13	585	4,600
S-39	04-17-91	1,300	26	290	830	59	10	7.3	598	2,200
	04-17-91	1,300	26	290	800	58	10	6.7	597	2,100
S-48	09-24-92	2,400	51	540	1,200	53	11	23	1,190	3,100
	09-24-92	2,300	51	530	1,200	53	11	24	1,190	3,200
S-49	07-03-91	1,200	42	270	520	48	6	17	527	1,600
	07-03-91	1,200	42	270	520	48	6	17	509	1,600

Site number (fig. 5)	Date	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, sum of constituents, dissolved (mg/L)	Nitrite, dissolved (mg/L as N)	Nitrite plus nitrate, dissolved (mg/L as N)	Ammonia, dissolved (mg/L as N)	Phosphorus, ortho, dissolved (mg/L as P)
S-11	04-02-92	43	0.2	0.5	6,370	--	--	--	--
	04-02-92	31	.1	.4	5,860	--	--	--	--
S-12	04-02-91	38	.9	3.5	3,230	0.06	2.5	0.07	0.01
	04-02-91	60	.8	3.4	3,250	.06	2.3	.06	<.01
S-13	04-02-92	8.3	.9	7.3	610	.02	1.9	.04	<.01
	04-02-92	8.3	.9	7.2	610	.02	1.9	.04	<.01
S-34	04-06-92	210	.5	.1	7,850	.01	.19	.04	<.01
	04-06-92	230	1.0	.1	7,260	<.01	.19	.04	<.01
S-39	04-17-91	140	.8	.2	3,850	<.01	<.05	.04	<.01
	04-17-91	150	.7	.2	3,730	<.01	<.05	.03	<.01
S-48	09-24-92	270	1.3	.3	5,900	--	--	--	--
	09-24-92	270	1.4	.2	5,990	--	--	--	--
S-49	07-03-91	120	1.5	.9	2,890	<.01	<.05	.02	.34
	07-03-91	120	1.5	1.1	2,800	<.01	<.05	.02	.35

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