WATER QUALITY STATUS REPORT NO. 100

CEDAR DRAW
Twin Falls County, Idaho
1982 – 1988

Idaho Department of Health and Welfare

Division of Environmental Quality

1991

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1982 - 1988

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ABSTRACT

An intensive water quality study was conducted on Cedar Draw, Twin Falls County, Idaho, between 1982 and 1988 to measure the effectiveness of best management practices applied to irrigated farmland. This study was done in conjunction with the Rock Creek Rural Clean Water Program. Cost-share funds were provided to participating landowners by the State Agricultural Water Quality Program.

An "above and below" monitoring strategy was used for this project. Cedar Draw at the confluence of Low Line Canal served as the monitoring site above the agricultural activity. Cedar Draw essentially begins at this confluence. The mouth of Cedar Draw just above its confluence with the Snake River served as the monitoring site below the agricultural activity. Some monitoring was done between these sites to assess the status of the aquatic biological community.

Water quality in Cedar Draw was degraded as the water traveled downstream from the Low Line Canal and through the network of irrigation canals, laterals, ditches, and drains towards the Snake River. Water quality improved from poor to fair during the study period based upon the U.S. Environmental Protection Agency's Water Quality Index.

Nutrient levels (nitrate nitrogen and total phosphorus) in Cedar Draw exceeded criteria established to prevent eutrophication. Nitrate nitrogen levels increased with downstream progression reflecting agricultural activities in the drainage and ground water accrual. Bacteriological data indicate that the primary contact recreation use remains impaired in the creek. A nonparametric trend analysis of pollutant concentrations revealed substantial reductions in total suspended sediment, total Kjeldahl nitrogen, total phosphorus, and fecal coliform bacteria at the mouth of Cedar Draw.

Pesticides identified from the water column of Cedar Draw included lindane, phthalate, and 2,4-D. Fish tissues contained traces of a number of pesticides including analogs of DDT, DCPA, hexachlorocyclohexane, dieldrin, nonachlor, oxychlordane, heptachlor, endosulfan I, and lindane at concentrations below U.S. Food and Drug Administration action levels.

Trace levels of a number of metals were detected in muscle tissue of rainbow trout and carp. Metals detected included arsenic, cadmium, chromium, copper, lead, manganese, mercury, and zinc.

The Hilsenhoff Biotic Index (HBI), a measure of macroinvertebrate community health, indicated improvement in Cedar Draw during the project for most seasons. Fisheries data generally indicated an

improvement in trout populations during the study period. Density, biomass, and wild trout numbers increased.

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INTRODUCTION

Cedar Draw is a natural drainage way in Twin Falls County, Idaho (Figure 1). The stream and its watershed have been altered by irrigated agriculture over the past century. The stream is located to the west and northwest of Filer. The portion of Cedar Draw addressed by this study flows approximately ten miles from its source with the Low Line Canal in a northerly direction to its confluence with the Snake River.

The Cedar Draw watershed consists of 198 square miles, or 126,720 acres. In the area of the current study, 15,665 acres are involved (LaPlant 1983). This study was conducted on the lower ten miles of the stream where there is year-round flow. Cedar Draw discharges to the Snake River at River Mile 599.6 (Schaefer 1975). It is located within the Snake River Plains Ecoregion (Omernik and Gallant 1986).

The Cedar Draw watershed is mostly private irrigated farmland with some grazing on steeper slopes. The soil is silt loam over basalt. The major crops grown are sugar beets, beans, corn, small grains, and hay. During the non-irrigation season, water from springs and seepage tunnels makes up most of the flow in Cedar Draw.

Soils in the Cedar Draw watershed can be generally described as thin, light colored, medium textured surface soils and very strongly calcareous silty subsoils over fractured basalt (Barker et al. 1983; Lewis and Fosberg 1982; and Pierce et al. 1982). Much of the area was covered with loess soils before irrigation began.

A mile or so above its confluence with the Snake River, Cedar Draw drops about 400 feet in elevation as it spills over the basalt rim of the Snake River Canyon. The lower end of Cedar Draw cuts through sand and gravel bars and terraces of the Snake River that are erosional and depositional features of the Lake Bonneville floods during the late Pleistocene (Ross and Savage 1967). Ross and Savage (1967) also note that the area at the mouth of Cedar Draw is a good example of a slipoff slope. A slipoff slope is a streamward sloping erosional surface developed along the inner bends of rivers. The surface is the result of the interaction of lateral and downward erosion by the river.

Two hydroelectric power plants have been built on lower Cedar Draw during this study which complicates interpretation of water quality data. The Cedar Draw hydro began operation in May 1984 and the Crystal Springs hydro started in January 1986. A period of disturbance of water quality (including flow regulation, loss of riparian vegetation, disruption of the stream banks and the streambed and the resultant temporary increases in suspended sediment) preceded each project.
In addition, flow peaking has been observed at the mouth station

which will affect water quality, instream habitat, and resident biological communities.

PAST WATER QUALITY STUDIES

Water quality research has been conducted on the Twin Falls irrigation tract, including Cedar Draw, since 1970 by the Agricultural Research Service (Brown et al. 1974; Carter 1972, 1976; Carter and Robbins 1978; and Carter et al. 1970, 1971, 1973, and 1974). This work related to pollutants resulting from the intense irrigated agriculture in the tract and on the development of best management practices (BMPs).

The first study done by the Idaho Department of Health and Welfare, Division of Environmental Quality (IDHW-DEQ) was conducted from 1970 through 1975 (Schaefer 1975). The study was conducted to examine point source discharges (City of Filer and a commercial fish hatchery). Nonpoint sources identified by the study were irrigation return flows, small livestock holding areas and other runoff from the watershed. Clark and Wroten (1980) examined the study area from the Low Line Canal to the mouth for stream channel stability conditions. The stream received a good to fair stability rating, with individual segments ranging from good to poor. The lower portion of the stream had the best stability because of the basalt lava base (with the exception of the approximately one mile reach above its confluence with the Snake River). Most of the upper stream was found to be unstable primarily because of a lack of rock and a lack of riparian vegetation from livestock use. The report recommended that corrective measures be taken on the upper portion of the stream.

The U.S. Geological Survey (USGS) conducted water quality studies in the area (Edwards et al. 1982; and Frenzel and Jones 1985). The USGS has conducted flow (discharge) measurements on Cedar Draw for many years (Harenberg et al. 1986, 1988a, 1988b, 1989, 1990; and USGS 1962-1983). The U.S. Environmental Protection Agency (U.S. EPA) surveyed agricultural return flows and documented sediment problems (U.S. EPA 1975).

Ground water quality was not addressed in the present study. The ground water in the area has previously been studied in tunnel drains (Carter 1972; Carter et al. 1970, 1971, 1973, and 1974). Maret (1990) found elevated nitrate concentrations and trace levels of pesticides in tunnel drains along Rock Creek in the Twin Falls irrigation tract. High water tables appeared in some areas in the Twin Falls irrigation tract after irrigation was initiated between 1905-1910. To alleviate this problem the Twin Falls Canal Company excavated tunnels 4 feet by 7 feet in size into the basalt underlying the high water table areas. The tunnels were hand cut into the basalt for a distance of 0.25 to 1.5 miles and drained the water seeping through the fractured basalt (Clark 1988a). These tunnels provide a good means to monitor ground water in this area.

LaPlant (1983) is the baseline report for the current study. The report covered the 1982 water year. The objective of the study was to establish a baseline by which future monitoring could be compared after BMPs had been installed by landowners. Clark (1986b) gave a brief update of water quality data for the first part of the project.

Cedar Draw monitoring was done in conjunction with the Rock Creek Rural Clean Water Program (RCWP), and numerous publications relating to Rock Creek monitoring can be consulted for insights to the Cedar Draw data (Clark 1985b, 1986b, 1987, 1988a, 1988b, 1989a, 1989b, and 1991).

Water quality conditions at the mouth of Cedar Draw were monitored from June 1990 through July 1991 as part of a comprehensive monitoring program on the Middle Snake River (Brockway and Robison 1992). An objective of this research was to determine loadings of pollutants from tributaries including Cedar Draw to the Snake River. During the study, Cedar Draw was determined to contribute 18,576 tons of sediment, 202.7 tons of nitrate nitrogen, 78.1 tons of organic nitrogen, and 26.3 tons to total phosphorus to the Snake River (Brockway and Robison 1992).

OBJECTIVES

The objectives of the State Agricultural Water Quality project on Cedar Draw were to "reduce water pollution from agricultural activities", "to meet State water quality standards," and "to achieve these water quality objectives in the most cost-effective manner possible in keeping with the provisions of adequate supplies of food and fiber and a quality environment" (Balanced Rock Soil Conservation District 1980).

The objectives of the this report are to present the water quality information collected on Cedar Draw and to relate it to BMPs installed in the watershed. Water quality conditions in Cedar Draw should have improved throughout the life of the project as BMPs were implemented in the watershed. An improvement in water quality should also be reflected in an improvement in health of the biological community (fish and macroinvertebrates) present in the creek.

MATERIALS AND METHODS

The water quality survey was designed and modified, in part, using the following: (Canter 1985; Champlin 1974; Cross 1975; Environment Canada 1983; Kittrell 1969; Mills et al. 1986; Schilperoort and Groot 1983; Shirley et al. 1976; and U.S. EPA 1977, 1982b). IDHW-DEQ survey design and sample procedures were followed during the survey. Recently a nonpoint source monitoring and evaluation guide has been published which will be helpful for future data collection and analysis (U.S. EPA 1987a).

SAMPLE STATIONS

The ambient stations on Cedar Draw were designed to measure the long-term impact of the project on water quality of the stream, and to assess the pollutant input of this watershed to the Snake River.

There were three water quality monitoring stations on Cedar Draw (Table 1). These stations were established by the USGS under the Rock Creek § 208 project and were continued in this project. The rationale for placement of these stations is as follows:

CD-5: Cedar Draw just below the Low Line Canal (Figure 2). This sample station serves as the upstream or control station for this study. Chemical and bacteriological samples were taken here. Discharge measurements were made at a staff gauge located on a Cipolletti weir. Water quality at this site reflects conditions in the Low Line Canal and water entering the Cedar Draw watershed. Macroinvertebrates and fish were not sampled here because there is water here only during the irrigation season.

CD-3: Cedar Draw just below Pole Line Road (Figure 3). This study site is located just below Pole Line Road. This station was used to monitor discharge and chemical, physical, and biological (bacteria, macroinvertebrates, and fish) parameters of Cedar Draw. This station was used to show water quality changes between the CD-5 and this location.

CD-1: Cedar Draw near mouth (Figure 4). This station lies one mile above the confluence of Cedar Draw with the Snake River. The station was used to monitor the status of the watershed and to show changes between CD-3 and this location. The site was monitored for chemical, physical and biological (bacteria, macroinvertebrate, and fish) parameters. The U.S. Geological Survey operated a flow gauging station near here most of the study (USGS stream gage #13093550)(Harenberg et al. 1989).

WATER CHEMISTRY

All samples were grabs taken at mid-channel using a churn splitter. The sample stations were sampled approximately monthly from April to October (the irrigation season), and once in December and February, 1982-1988. Parameters measured included nutrients (phosphorus and nitrogen), bacteria, suspended sediment, dissolved oxygen, pH, temperature, specific conductance, common ions, flow and pesticides. Beginning in 1986, our protocol for dissolved ortho-phosphate was modified to include analysis of field-filtered water samples. Laboratory-filtered samples were also analyzed to allow for comparison with past data. Water chemistry and

bacteriological samples were analyzed by the IDHW-Bureau of Laboratories, Boise.

Most organic (mainly pesticide) samples were analyzed by the IDHW-Bureau of Laboratories, Boise. Fish were analyzed separately unless size of the species required a composite such as with sculpins, redside shiners and dace. During 1987, split fish tissue samples (fillets) for pesticide analyses were also evaluated by the U.S. EPA Region 10 Laboratory in Manchester, Washington.

Since the intensive monitoring project focused on total phosphorus, dissolved ortho-phosphate, and suspended sediment, the methods for their specific chemical analyses are outlined below:

Total phosphorus (mg/L) - All of the phosphorus present in the sample, regardless of form, as measured by the persulfate digestion procedure (EPA STORET #09665). The digested sample is then analyzed by direct colorimetry: Ammonia molybdate and antimony potassium tartrate react in an acid medium with dilute solutions of phosphorus to form an antimony-phosphomolybdate complex. This complex is reduced to a blue colored complex by ascorbic acid. The color is proportional to the phosphorus concentration. Only ortho-phosphate forms a blue color in this test.

Dissolved Ortho-phosphate (mg/L) - All of the phosphorus present in the filtrate of a sample filtered through phosphorus-free Schleicher and Schuell 0.45 micron membrane filters (EPA STORET #00671). Some phosphorus contamination was discovered by the State Laboratory on random new filters. Beginning in 1986 Micron Sep™ Magna Nylon 66 membrane filters (available from Fisher Scientific as Cat. No. NO4SP02500) were used. These filters are routinely checked for contamination and have been found to be phosphorus free. The field sampling of this parameter was changed in June 1985 to allow for field filtration (described in more detail later). Beginning in 1986 both lab-filtered and field-filtered samples were analyzed so that continuity would not be lost with previous year's samples. The filtered sample is then analyzed by direct colorimetry as in total phosphorus above.

Suspended Sediment (mg/L) - The suspended sediment is measured as nonfilterable residue (EPA STORET #80154). A well mixed sample is filtered through a glass fiber filter, and the residue retained on the filter is dried to constant weight at 103-105°C.

All chemical analyses were performed in accordance with approved methods: U.S. EPA (1979) and American Public Health Association (1980, 1985, and 1988). Both field and laboratory quality assurance procedures were followed and are described later in this

section.

FIELD PARAMETERS

Field parameters were determined with the use of portable meters. Dissolved oxygen, temperature and specific conductance were measured with Yellow Springs Instrument Company Model 54A and Model 33 SCT meters, respectively. The pH was determined with a Sargent-Welch Model BPL pH meter. The meters were calibrated at the beginning of each survey and checked for accuracy several times during each survey.

Water collection techniques follow Bellinger (1980); Canter (1985); Champlin (1974); Cross (1975); Curtis et al. (1986); Environment Canada (1983); Rainwater and Thatcher (1960); Ralston and Browne (1976); Shirley et al. (1976); U. S. Department of the Interior (1977); and U. S. EPA (1977, 1982b). In addition to the above, the Federal Working Group on Pest Management (1974) was followed in conducting pesticide sampling. All water samples for chemical analysis were collected as grab samples or with DH-48 or DH-59 suspended sediment samplers (U. S. Interagency Committee on Water Resources (1963); Guy and Norman (1970); and Thomas (1985)). Composite and grab samples were collected in a churn splitter (Pickering 1978). Analysis of samples collected using both techniques showed no statistically significant difference when samples were collected at well-mixed locations in Cedar Draw (Martin, unpub. data). Sub-samples were dispensed into new one liter cubitainers. One liter was preserved with two ml of concentrated H_2SO_4 for analysis of nutrients (except for dissolved ortho-phosphate). Water for dissolved ortho-phosphate analysis was field-filtered (after June 1985) with the use of polypropylene syringes, Gelman® Delrin™ syringe-type membrane filter holders and 0.45 micron membrane filters as mentioned above. The sample was then filtered into Corning™ 16 x 125 mm polystyrene disposable culture tubes. On sample runs where metals were examined, a liter cubitainer was preserved with 10 ml (later in the survey 2 ml) of 1:1 redistilled HNO_3. All samples were stored and transported to the laboratory on ice to reduce the sample temperature to 4°C.

FLOW

Flow was measured using standard techniques (Leupold and Stevens 1978; Rantz 1982a, 1982b; U. S. Bureau of Reclamation 1967; and Van Haveren 1986). Water velocity was measured with a Marsh-McBirney Model 201 portable current meter and used to calculate flow (discharge in cubic feet per second). A bridge board and winch were used with the meter during high flows at the mouth station. Flow has historically been monitored by the USGS near the mouth of Cedar Draw and at other miscellaneous stations over the past few decades (see discussion in Introduction). The station is serviced and calibrated by the USGS to their standards and specifications.

The station supplies daily flow data. Discharge measurements at the Low Line Canal station were made by comparing staff gauge levels at a Cipolletti weir with a rating table (Table 2).

BACTERIA

Bacterial grab samples were collected according to Greeson et al. (1977) into sterile 250 ml Nalgene™ polyethylene bottles. All samples were placed on ice to cool to 4°C and shipped to the State Laboratory on the same day as sampled. Analyses were conducted by the IDHW-Bureau of Laboratories following standard methods and procedures (American Public Health Association 1980, 1985 and 1988).

BENTHIC MACROINVERTEBRATES

Benthic macroinvertebrates were collected at CD-3 and CD-1, and the data were used to assess community structure and function (Cairns and Dickson 1973; Greeson et al. 1977; Hilsenhoff 1977; Pascoe and Edwards 1984; Plafkin et al. 1989; Weber 1973; and Winget and Mangum 1979). Benthic macroinvertebrates were sampled on Cedar Draw in March, June, August, and November with a Hess sampler ($0.10m^2$ area;mesh size of 0.5 mm). The March samples measured the benthic community response to approximately five months of "background" water. June and August samples were collected during the irrigation season, a time of high sediment concentrations. November samples measured community recovery after the irrigation season. Three replicate samples were collected in riffle habitats on each sampling date. Samples were preserved in 70 percent isopropyl alcohol. Identifications were made by the IDHW-Bureau of Laboratories. Voucher specimens have been deposited in the Orma J. Smith Museum of Natural History, Albertson College of Idaho, Caldwell.

FISHERIES

Fish (both game and nongame) community analysis of Cedar Draw followed Bagenal (1978); Everhart and Youngs (1981); Reynolds (1983); Ricker (1975); and Zippin (1958) at two locations (CD-3 and CD-1) during March or early April of 1982, 1985, 1986, 1987, and 1988. Electrofishing was the capture method utilized (Reynolds 1983) at the same two locations used for benthic organism collection. Electrofishing was used because it is nonconsumptive and provides the necessary data for determining relative fish population abundance and length-weight data to determine age, growth and size class distributions. The four-step removal depletion method described by Zippin (1958) was used on 100 meter reaches. Voucher specimens have been deposited in the O.J. Smith Museum of Natural History, Albertson College of Idaho, Caldwell, in compliance with Idaho Department of Fish and Game Scientific Collecting Permits #F-106-86 and #F-18-87. Habitat Evaluation

Procedures (HEP) analyses were also conducted at both stations in 1982 and 1984.

Fish tissue was collected following Federal Working Group on Pest Management (1974) and Hopkins et al. (1985) and analyzed by the IDHW-Bureau of Laboratories for organo-phosphorus insecticides and triazine herbicides from two locations sampled at both Cedar Draw stations during March 1985, at the mouth in March 1987, and at both stations during March 1988.

DATA ANALYSIS TECHNIQUES

Statistics

Statistical and data analysis methods follow Dixon (1953); Federal Working Group on Pest Management (1974); NCASI (1985); Ponce (1980); SAS Institute (1982); Sokal and Rohlf (1969); U.S. Environmental Protection Agency (1982a); and Youden and Steiner (1975). Trend analysis using Spearman's Rho and Sen nonparametric statistics were performed using WQHYDRO programs (Aroner 1990).

Water Quality Index

Using the STORET data base for Cedar Draw, a water quality index (WQI) was calculated for the monitoring stations from 1982 through 1988. This tool was developed by U.S. EPA Region X, Seattle and resides on STORET as a canned program called PGM=WQI. The WQI compares measured water quality with recommended "fishable/swimmable" federal criteria. These criteria are a synthesis of state standards, technical literature and professional judgement. There are nine pollutant categories in this index including temperature, oxygen, pH, bacteria, trophic status, aesthetics, solids, organic toxicity and inorganic toxicity. Values are determined for each category by using a severity curve for that particular parameter. Curves were developed against criteria values for threshold and acute levels for each category. These two levels correspond to 20 and 60 points on the curve. Values range from 0-100. In general, the lower the WQI, the better the water quality. Three major categories of scores are recognized and include: 0-20 = GOOD - beneficial uses are fully supported; 21-60 = FAIR - partial support of beneficial uses; 61-100 = POOR - beneficial uses not supported.

Biological Assessments

The Hilsenhoff Biotic Index was used to evaluate macroinvertebrate communities in Cedar Draw (Hilsenhoff 1977; Clark and Maret 1991). Other measures used to summarize the macroinvertebrate data included taxa richness, the EPT index (total number of taxa represented by the following insect orders: Ephemeroptera, Plecoptera, and Trichoptera) and densities. Data were stored on BIOS and summarized using the program PGM=TAXATABLE.

Quality Assurance

Quality assurance (quality control) is standard operating procedure for both the laboratory and the field portions of the research. Quality assurance for the field work is outlined below and follows Bauer (1986); Bauer et al. (1986); and U. S. EPA (1985) guidelines. Laboratory quality assurance follows IDHW (1984) and U. S. EPA (1983) guidelines.

Two specific quality assurance methods are outlined below. Because Cedar Draw and Rock Creek (RCWP monitoring) were sampled concurrently from 1982-1988, a single QA/QC program as outlined below was conducted. QA/QC samples for this program were collected at various Rock Creek stations. Conclusions regarding data quality are applicable to both surveys.

Precision

Duplicate (split) samples were taken at Rock Creek subbasin Station 7-4 on each survey date for each parameter. Chemical samples were divided with the churn splitter. Duplicate bacteriological grab samples were taken as close together (in time and space) in the stream as possible. These data were then treated following guidelines to determine the relative range of the precision of the duplicate samples (U. S. EPA 1983).

Accuracy

Field spiked samples were collected for the first time during 1985. Three sets of spiked samples were collected for all Rock Creek stations and for most (20) of the subbasin stations during the same time period that the Cedar Draw samples were taken. Chemical spikes for ortho-phosphate, total phosphorus, nitrate, total Kjeldahl nitrogen, calcium, fluoride, chloride, potassium, sodium and magnesium were prepared in the laboratory and sealed in Kimble™ 10 ml borosilicate glass ampules. Celite was used for suspended solids spiking and was contained in polypropylene vials. The spike containers were placed into 1L cubitainers containing 900 ml of sample water. The glass ampules were rinsed in sample water before opening. Percent recovery was calculated according to the known amount of the material in the spike by subtracting the "background" values determined by the analysis of split unspiked samples. Accuracy is expressed in mean percent recovery and was interpreted following Provost and Elder (1983).

MISCELLANEOUS

Color slides were taken of each sample station on each sampling date for comparison with other sample dates. The photographs make a permanent record of visual water quality, riparian conditions, sediment deposits, and other important features. These photographs

are on file at the IDHW-DEQ South Central Idaho Regional Office, 629 Washington Street North, Twin Falls, ID 83301.

Complete water quality data for this survey are on file with the U.S. EPA (STORET, IDHW-DEQ Agency ID# 21IDSURV) IDHW-DEQ, 1410 N. Hilton Street, Boise, ID 83706, and the IDHW-DEQ South Central Idaho Regional Office.

RESULTS AND DISCUSSION

Water Quality Index

The Water Quality Index (WQI) for the three Cedar Draw stations (1982-1988) is summarized in Table 3. As would be expected, the WQI at the Low Line Canal did not change substantially during the course of the study. The 1988 value of 43 was very near the mean of 45 for the duration of the study. The 1988 value did not differ much from the 1983 value of 43 (Table 3). The WQI at Pole Line Road was erratic and reflects the incomplete data set for that site. Both of these sites fell into the "fair" category as defined by EPA and thus partially support beneficial uses.

The site near the mouth of Cedar Draw always experienced lower water quality as shown by the high WQI values (Table 3). The WQI values decreased over the life of the project from 78 in 1982 to 54 in 1988. The improvement was from a "poor" rating in 1982 to just into the "fair" category by 1988. This was a marked improvement above the mean value of 66 for the life of the study. The worst water quality is in the middle to late summer (Table 3) corresponding with maximum irrigation return flow discharge to Cedar Draw. These data indicate that beneficial uses have changed from "not supported" to "partially supported" between 1982 and 1988 (see Yankey et al. 1991).

WATER QUALITY STANDARDS VIOLATIONS

One means of summarizing and evaluating water quality information is by making comparisons to established water quality criteria and standards. These comparisons are shown in Tables 4-6. The criteria used by EPA (STORET) for evaluation of the water quality data are shown in Table 7. The lower limit for dissolved oxygen is 6.0 mg/L for protection of cold-water biota in Cedar Draw (IDHW 1990); there is no upper limit. The criteria (upper limits) for nitrate + nitrite as N is 0.3 mg/L, for total phosphorus 0.05 mg/L, and for fecal coliform bacteria 50 colonies/100 ml (geometric mean). These nutrient criteria have been recommended by the U.S. EPA to prevent eutrophication (U.S. EPA 1986), while the referenced bacteriological standard is to protect primary contact recreation (or swimming) in Cedar Draw (IDHW 1990).

Dissolved oxygen (DO) was below the recommended minimum of 6 mg/L 18% of the time at the Low Line Canal. The lowest DO recorded during the study was 5.5 mg/L. The mean DO was 7.3 mg/L at Low Line Canal and 9.2 mg/L at the mouth station. The mean value at Pole Line Road was 8.6 mg/L. The DO increased as the water traveled downstream in Cedar Draw probably as a result of aeration and aquatic plant growth in the stream and stream margin. There does not appear to be a DO problem in Cedar Draw. Although not assessed in this study, nighttime DO levels in agriculturally impacted streams can sometimes fall below the state standard

because of respiration of aquatic plants and algae (Litke 1986; and Litke unpub. data). Future studies on Cedar Draw should evaluate DO levels over 24 hour periods during low flow summer conditions when plant biomass is at a peak instream.

Nitrate + nitrite as N values exceeded the 0.3 mg/L criterion 11 times (16% of 67 samples) at the Low Line Canal and 71 times (88% of 81 samples) at the mouth site (Tables 4-5, Figures 5-6). The minimum, mean, and maximum sizes of the variation above the criterion were greatest at the lower site (Table 5). The increase in inorganic nitrogen is probably partially a result of agricultural practices in the area. Much of this increase in nitrate nitrogen is likely from ground water inflows including the tunnel drains.

Total phosphorus concentrations exceeded the criterion for most samples (Tables 4-6, Figures 7-8). At the Low Line Canal, 98% (81 of 83) total phosphorus values exceeded 0.05 mg/L (mean value 0.19 mg/L). At the mouth of Cedar Draw 96% (96 of 100) samples exceeded the criterion. The mean concentration at the mouth increased to 0.24 mg/L as compared with the Low Line Canal site (0.18 mg/L). Nutrient levels are discussed in greater detail below.

Fecal coliform bacteria densities exceeded the 50/100 ml standard to protect primary contact recreation (swimming) 43% of the time (35 of 82 samples) at the Low Line Canal and 76% of the time (76 of 100 samples) at the mouth site. The overall mean of the samples exceeding the standard was 267 colonies/100 ml at Low Line Canal compared with 522 colonies/100 ml at the mouth station for the period of the study (Tables 4-5, Figures 9-10). This increase over the background level shown at the Low Line Canal is attributed to the intense agriculture in the watershed.

SUSPENDED SEDIMENT

Sediment is the most common nonpoint source pollutant in Idaho affecting the beneficial uses of salmonid spawning and cold water biota (IDHW 1989). In southern Idaho suspended sediment is the dominant portion of the total sediment load of streams (Clark 1988a). Sediment impacts these uses through smothering fish spawning and rearing habitats, through smothering fish-food organisms (benthic macroinvertebrates), and by increasing turbidity which can affect light penetration and impair fish feeding behavior. Suspended sediment also serves as a good "indicator parameter" since other pollutants such as phosphorus, organic nitrogen, bacteria, metals and pesticides are often attached to the sediment (Clark 1985a, 1988a).

Table 8 summarizes estimated suspended sediment loadings for the Low Line Canal (above project) and the mouth of Cedar Draw (below project) for the period 1982 to 1988. The analysis of the data and subsequent interpretation is hampered by small sample size,

especially for the years 1985, 1986, and 1988. For example, the 1988 loads are calculated from only four samples. The results are erratic (Table 8, Figures 11-12) and care must be taken in extrapolating these data to evaluate BMP effectiveness. The highest suspended sediment loading, based upon a relatively complete data set, was in 1984 which corresponds to the 100 year storm event in that area (Clark 1989a). The net suspended sediment loadings (mouth load minus the load entering the creek from the Low Line Canal) at the beginning and end of the project were essentially the same at 1,254 tons in 1982 and 1,223 tons in 1988 (Table 8). We cannot show a significant decline in suspended sediment load over the life of the project but one must again take into account the annual variability in these data and the relatively small sample size, particularly in 1988.

Our last water quality monitoring on Cedar Draw was conducted in April and May of 1988. The total suspended sediment load for that period was 3164.3 tons (Table 8). For comparison, Brockway and Robison (1992) sampled Cedar Draw at the mouth four times in April and May, 1991. They calculated a sediment load to the Snake River of 3059.2 tons. Brockway and Robison (1992) calculated an annual loading for the mouth of Cedar Draw from June 1990 through July 1991 of 18,577 tons.

For a regional comparison we have used the 50 mg/L criteria for suspended sediment (Yankey et al. 1991) which provides a high level of protection for cold water biota. Most of the suspended sediment levels measured during the study exceeded this criterion (Figures 11 and 12).

Trends in Suspended Sediment Levels

To assess trends in suspended sediment levels at the mouth of Cedar Draw (Station CD-1) and at the Low Line Canal (Station CD-5) between 1982 and 1988, sediment data were first assessed for seasonality with the Kruskal-Wallis test (Aroner 1990). Seasonality was not observed during the May to August period which coincides with the peak irrigation period. BMP effects on instream suspended sediment levels should be observed during the irrigation seasons from 1982-1988 as implementation occurred. To evaluate trends in sediment levels, data were analyzed with the nonparametric Spearman Rho test (Aroner 1990).

Suspended sediment levels in Cedar Draw at the Low Line Canal (Station CD-5), which essentially is Low Line Canal water, appear to have declined during the course of the project (Figure 13). This reduction of sediment levels in Low Line Canal possibly reflects benefits of BMP implementation in the adjacent Rock Creek watershed as part of the Rock Creek RCWP. This would result in less sediment transfer from the Rock Creek watershed into Cedar Draw.

At the mouth of Cedar Draw (Station CD-1) sediment levels also appear to have declined throughout the project period (Figure 14). However, although the downward trend is greater at CD-1 than CD-5, the trend is statistically weaker than that calculated for Station CD-5. It would appear that BMP implementation in the Cedar Draw watershed, as well as the reductions in sediment levels in the Low Line Canal, combined through time to reduce sediment levels at the mouth. Additional sampling during the project at Station CD-1 would have helped to define this trend as well as post-BMP implementation suspended sediment loads transported to the Snake River. Also, the effects of operation of upstream hydroelectric impoundments may have changed the apparent effectiveness of BMPs applied in the watershed as assessed at the mouth of Cedar Draw.

To determine that decreasing total suspended sediment levels at CD-1 were not an artifact of changing flows, trends in flows at CD-1 and CD-5 were also assessed. At CD-1, flows apparently decreased during the study, possibly a result of the drought years in the late 1980s (see Figure 15). At the same time, flows in the canal system at CD-5 appear to remain constant (Figure 16). However, once again this assessment is based upon a limited data set.

NUTRIENTS

Nutrients are a major concern when examining the water quality of a stream. An excess supply of nutrients may cause an over-abundance of plant and animal biomass, especially of undesirable species or communities. The nutrients examined during this survey were phosphorus and nitrogen.

Nitrogen

Nitrogen is present in surface waters in a number of different forms. It may be present in organic and inorganic forms, as a particulate form, or in solution. Excess inorganic nitrogen (nitrate) is considered a pollutant. A major source of nitrate is from the production (and eventual plowout) of alfalfa (*Medicago sativa* L.) in this area (Robbins and Carter 1980). About 50 percent of nitrate present in ground water has been determined to be the result of plowout of alfalfa (Robbins and Carter 1980). Indeed, Carter (pers. comm. 1985) believes that as much as 70 percent of the nitrate in the ground water of the area may be attributable to alfalfa and other leguminous crop plowout. Carter and Bondurant (1976) have shown that the mean concentration of nitrate nitrogen in the subsurface water Twin Falls irrigation tract is 3.24 mg/L. Maret (1990) also found elevated nitrate nitrogen levels above background in Rock Creek tunnel drains with values ranging from 3.3-5.4 mg/L. In contrast, organic nitrogen (total Kjeldahl nitrogen) is mostly associated with the sediment. Sediment reduction will, therefore, reduce the organic nitrogen. Significant reductions of organic nitrogen have been measured in nearby Rock Creek but inorganic nitrogen has not been significantly

reduced by implementation of best management practices (BMPs) (Clark 1985b, 1986a).

Total Inorganic Nitrogen

A concentration of total inorganic nitrogen (nitrate and nitrite) of 0.3 mg/L is considered the limit for preventing the development of biological nuisances and the acceleration of cultural eutrophication (IDHW 1980). Nitrate usually comprises the major portion of total inorganic nitrogen and is often the only form of nitrogen considered when evaluating the 0.3 mg/L limit. A summary of nitrate and nitrite data are shown in the form of variations from maximum criteria (Tables 4-6 and Figures 5-6). Generally, irrigation flows on the Twin Falls' Tract have low nitrate nitrogen levels. Most of the samples collected from Cedar Draw at the Low Line Canal (primarily Snake River water) had less than 0.3 mg/L nitrate nitrogen (Figure 5). Higher nitrate nitrogen levels were observed at the mouth station reflecting agricultural inputs and ground water accrual (Figure 6). Indeed, highest nitrate nitrogen levels were observed at CD-1 during nonirrigation months when the creek is supported primarily by spring flows (Figure 6). Agricultural return flows often exceed the 0.3 mg/L criterion. Reduced plant production and nitrate nitrogen uptake in the creek during this period of time would also result in more nitrate nitrogen in transport.

Phosphorus

To prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphorus as phosphorus (P) should not exceed 0.05 mg/L in a stream where it enters a lake or reservoir (U.S. EPA 1977). A desired goal for the prevention of plant nuisances in flowing waters not discharging directly to lakes or impoundments is 0.1 mg/L total phosphorus (MacKenthun 1973). This literature therefore indicates that a reasonable criteria for total phosphorus is in the range of 0.05-0.10 mg/L. Since Cedar Draw water will enter the Snake River and eventually several reservoirs, the 0.05 mg/L criterion was used to evaluate the Cedar Draw data.

Phosphorus data can be found in Appendix 1 as well as in the discussion of the Water Quality Index.

The total phosphorus data has the same general limitations as does the suspended sediment data discussed above. Total phosphorus appears to have been reduced during the project. The 1982 estimated agricultural loading of nearly 15 tons was reduced to 5.5 tons during 1988 (Table 8).

Trends in nutrient levels

Trends in nutrient levels during the irrigation season from 1982-

1988 were assessed with the nonparametric Spearman Rho test (Aroner 1990). At the mouth and Low Line canal stations, there was no detectable trend in nitrate nitrogen levels during the course of the project (Figures 17-18). However, a significant reduction in total Kjeldahl nitrogen was observed at the mouth station (Figure 19) and not at the Low Line station (Figure 20). Significant reductions in total phosphorus were observed at both locations (Figures 21-22).

Since nitrate nitrogen is soluble, BMP implementation is not expected to reduce instream levels (Clark 1985b, 1986a). However, sediment levels are usually correlated with total Kjeldahl nitrogen and total phosphorus levels (Clark 1985b, 1986a). Implementation of agricultural BMPs to control erosion would be expected to reduce instream levels of these nutrients.

Correlations between total suspended sediment and nutrient levels were evaluated for the irrigation season on Cedar Draw from 1982-1988 using Spearman's rank correlation (Zar 1974). Significant correlations were found for both sites between total suspended sediment and total Kjeldahl nitrogen and total phosphorus at the 99% significance level. It is not surprising then that the trend analysis indicates a reduction in nutrient levels during the course of the project as BMPs were installed. The lack of a discernable trend in total Kjeldahl nitrogen at the Low Line Canal may be due to the limited data available.

BACTERIA

Fecal coliform bacteria are found in the intestinal tracts of warm-blood animals and are, therefore, used as indicators of contamination and the possible presence of other disease-causing organisms. Fecal coliform bacteria have been reported associated with livestock grazing in Idaho (Lappin and Clark 1986; Smith and Douglas 1973; Stephenson and Street 1978) and can be used as an indicator of livestock contamination of surface waters (Clark 1985b, 1986a). The segment of the Snake River between Milner Dam and Buhl (USB-70) is protected for primary contact recreation by the Idaho Water Quality Standards (IDHW 1990). The bacteriological standards for primary contact recreation state that the geometric mean for fecal coliforms shall not exceed 50/100 ml or 500/100 ml at any one time (IDHW 1990).

Fecal coliform bacteria were usually lower in the samples of Low Line Canal water as would be expected (Table 9). Some variation was found at this site which can probably be explained by the nature of agricultural return flows that enter the canal as it passes through the irrigation tract. The annual geometric mean values were always higher for Cedar Draw at the mouth, reflecting the influence of agriculture on water quality. The lowest geometric mean annual contribution was 70.3 colonies/100 ml in 1982 and the highest mean annual contribution was 476.5 colonies/100 ml

for the partial year of 1988 (Table 9). The next highest annual geometric mean value was 356.8 colonies/100 ml for 1987. Monthly geometric means usually exceeded the 50/100 ml standard throughout the study, indicating that the primary contact recreation use is generally not supported in Cedar Draw. During this study (1982-1988), this standard was not exceeded only in September 1982, and in September and October 1986 (Table 9).

A nonparametric trend analysis of fecal coliform data indicates that bacteria densities at the mouth decreased during the course of the project (Figure 23). There was no discernable trend in fecal coliform densities at the Low Line Canal (Figure 24). However, this may be a result of the limited data set at that location.

MACROINVERTEBRATES

Macroinvertebrates, by definition, are animals that are visible to the unaided eye and retained by a U.S. Standards No. 30 sieve (American Public Health Association 1980, 1985). These organisms inhabit the vegetation and substrate of streams and lakes. Macroinvertebrates are an important component of aquatic ecosystems, and serve as a food source for fish. Although stream communities are composed primarily of insects (Hynes 1970; Minshall 1969), other groups such as annelids, flatworms, crustaceans, and molluscs are often present depending upon water quality and habitat conditions.

Macroinvertebrates are well-suited for assessing water quality conditions because a) they live in the stream and their presence reflects an integration through time of the effects of complex chemical/physical conditions, b) most species are not very mobile and therefore reflect localized conditions, and c) they are sensitive to a wide range of environmental impacts and therefore can be used to assess the overall health of an aquatic community (Plafkin et al. 1989; Platts et al. 1983; and Rosenberg et al. 1986).

Macroinvertebrate data will reflect environmental degradation (water quality or habitat degradation) through changes in community structure, community balance, and trophic structure or community function. A healthy community would be composed of many species including those generally classified as "pollution sensitive", and possess a balanced trophic structure. Degraded stream systems in southcentral Idaho typically have macroinvertebrate communities composed of few taxa that are generally "pollution tolerant" and generally a simplistic trophic structure (Litke 1988, 1989).

The EPT index (for Ephemeroptera, Plecoptera, and Trichoptera) is a measure often used to assess community structure. It is the sum of the taxa richness for these three insect groups which are generally considered sensitive to pollution and therefore composed of "clean water" species. The EPT value has been found to be

consistently related to water quality; a higher value indicates good conditions while a lower value indicates degraded conditions (degraded water quality or habitat) exist.

Another index that incorporates species tolerance to pollution is the Hilsenhoff Biotic Index (HBI) (Clark and Maret 1991; Hilsenhoff 1977). Individual taxa are assigned tolerance values of 0-10 with higher values indicative of increased tolerance to sedimentation or organic pollution. Tolerance values for individual taxa found in Idaho are outlined in Clark and Maret (1991) and subject to refinement as more information is collected on each group. An average value is determined for a community using these values and abundances of individuals within each taxa. This index has been demonstrated effective in detecting impairment due to point and nonpoint source pollution.

Taxa richness, or the number of distinct taxa present in a community, is another measure of community health. A healthy biological community is generally composed of a diversity of taxa including many EPT taxa and other non-insect groups.

Community trophic structure may also be assessed to gain insight into the food resource base supporting a community and feeding relationships between the various taxa. Invertebrates collected on each date were placed into functional feeding groups following Clark and Maret (1991); Merritt and Cummins (1988); and Pennak (1978, 1989).

Table 10 summarizes the taxa collected at Cedar Draw stations CD-1 and CD-3 between 1984 and 1988 (see also Appendix 2). A total of 31 different taxa were collected during the study. The highest number of taxa (31) were collected from CD-1 near the mouth of Cedar Draw. Generally, more pollution tolerant organisms were collected at the upstream station (Station CD-3 at Pole Line Road). The average Hilsenhoff tolerance values for the taxa collected at the mouth and Pole Line Road stations were 5.19 and 5.35, respectively. Slightly better conditions at the mouth were also reflected in the number of EPT taxa collected. Total EPT taxa collected during the study were 8 and 12 taxa at CD-3 and CD-1, respectively.

Slightly better biological conditions at the mouth (CD-1) may be the result of better habitat conditions at that sight. Habitat at CD-1 may be characterized as boulder, cobble, and some gravel. There are few deposits of sediment. At the upstream station (CD-3), habitat visually appears more degraded with generally finer substrate and areas with deposited sediment. Also, Station CD-3 is within a pasture, so riparian and stream bank condition at that site is degraded in comparison to CD-1.

The difference in taxa richness between the two sites may be attributed primarily to invertebrates that scrape periphyton (or

algae) from rocks in the stream. These taxa include the lepidopteran Petrophila sp., the trichopteran Helicopsyche borealis, and a few gastropods including Fossaria sp. and Lymnaea sp. which were found at CD-1 and not CD-3. This increase in scrapers at CD-1 may indicate better water quality conditions existed at this site (lower sediment levels, reduced turbidity) that were conducive for periphyton growth. Reduced sediment loads at CD-1 might be expected given the potential settling effect of dams and diversions upstream of this site at two small hydropower facilities. Unfortunately, inadequate water quality data are available for CD-3 to permit upstream-downstream comparisons and assessment of this hypothesis.

Trends in water quality improvement through this project may be assessed by examining community structure and function at CD-1 and CD-3 through time. Seasonal summaries for each site are outlined in Tables 11 through 17. Generally these data are somewhat difficult to interpret due to variability in sampling frequency between seasons and years at each site. Also, changes that occurred in monitoring personnel and taxonomists during the course of the study might have affected the integrity of the data set. Keeping these concerns in mind, the following generalizations may be made. At both sites, for most seasons, there was a downward trend in the HBI. This would tend to indicate a shift in community composition from pollution tolerant to more pollution sensitive species through time as a result of water quality or habitat condition improvement. This trend is not apparent at CD-3 in the March or August samples during the study (Table 15 and 17).

The trend towards community health improvement indicated by the HBI is not generally supported by species richness data or the EPT index. It would be expected that an improvement in the HBI would be correlated with an increase in both taxa richness and EPT index. At both sites, and for the various seasons, these two measures fluctuated erratically with no clear trends or apparent correlation with the HBI. It is possible that there has been a shift in pollution tolerance of the communities present at each site, but due to the potential problems outlined above with the data set, measures such as taxa richness and the EPT index appear unreliable.

The trophic structure at both sites may be characterized as predominately collector-gatherers, collector-filterers, and scrapers (Tables 15 through 17). However, the data do indicate a shift in trophic composition through time at both sites towards an increase in scrapers. A comparison of August samples at CD-3 between 1984 and 1987 indicate an increase in scrapers from 26.2% to 64.3% (Figures 25-26). Similarly, scrapers increase from 6.4% in August 1984 at CD-1 to 43.2% in August 1987 (Figures 27-28). This change in trophic composition may reflect improved water quality conditions permitting better light penetration and periphyton production. However, adequate water quality data are not available to substantiate this conclusion. It should also be

noted that during May 1984 a 100-year flood event took place in the adjacent Rock Creek drainage (Clark 1989). Although not documented a similar flood event may have occurred in Cedar Draw and may have influenced August 1984 invertebrate communities.

FISH COMMUNITY

Salmonid spawning and cold water biota are designated beneficial uses of Cedar Draw (IDHW 1990). These uses are important in the project area, and it is therefore important that these be directly assessed and the information collected be used to evaluate BMP effectiveness. Fish populations were assessed in Cedar Draw in March or early April of 1982, 1985, 1986, 1987, and 1988 at stations CD-1 and CD-3. Fish names and identification follow (Simpson and Wallace 1978).

A total of five species, representing 3 families, were collected from Cedar Draw (Table 18). Rainbow trout (*Oncorhynchus mykiss*) were collected at both sites and were the only salmonid collected. Only four species of nongame fish were found in Cedar Draw (Table 18). This is in contrast to nearby Rock Creek, where nine species of nongame fish have been collected (Yankey et al. 1991). The greatest numbers of nongame fish were collected at the Pole Line Road station (CD-3). The most common nongame fish were speckled dace (*Rhinichthys osculus*) and redside shiners (*Richardsonius balteatus*), both of which are important forage fish for rainbow trout. Mottled sculpin (*Cottus bairdi*), typically found in cold-water riffle habitats, were found at both stations.

At Pole Line Road (Station CD-3), the number of rainbow trout collected increased from 6 in 1982 to 44 in 1988 (Table 19). During this period of time, although the average weight of rainbow trout decreased, the density and biomass of rainbow trout increased substantially. Biomass and density estimates were similar to values reported for sites impacted by irrigation return flows on nearby Rock Creek (Yankey et al. 1991). Most of the rainbow trout captured in 1988 (about 98%) were wild trout (Table 19). Population data for the nongame species collected at CD-3 are summarized in Table 20.

The data at CD-3 do not indicate good recruitment into the rainbow trout population of young-of-the-year (YOY) fish. Because of rainbow trout fish hatcheries on Cedar Draw and its tributaries, spawning occurs in both spring and fall. YOY from the fall spawning may be out of streambed gravels by March and available to be captured by electrofishing. These fish would be 3-4 cm in length, remain in shallow water, and may be difficult to capture using electrofishing gear (Fred Partridge 1991, personal communication). Otherwise, the smallest fish available to be sampled would be 1+ age class fish from the previous spring's spawning. These fish would likely be in the 10 cm size range. The data indicate few rainbow trout were collected throughout the study

less than 10 cm in length at CD-3, except for the 1987 monitoring. Spawning may therefore remain impaired in Cedar Draw.

According to Idaho Department of Fish and Game records, Cedar Draw was stocked with rainbow trout during the study period only in May of 1987 with 975 catchables (about 25 cm long) (Fred Partridge pers. communication 1991). These fish were likely released in the Pole Line Road area, but did not appear in the 1988 sampling.

Fish community data from the mouth of Cedar Draw (station CD-1) reflect a community similar in composition to CD-3 but with fewer salmonids and nongame fish (Table 21). This reduction in density and biomass is likely the result of upstream hydroelectric facilities and their impacts on flow and habitat. The number of rainbow trout captured at CD-1 decreased from 161 in 1982 to 19 in 1985. The hydroelectric plants above CD-1 came on line in May 1984 and January 1986. Since 1985, trout numbers, densities, and biomass appear to be on an upward trend. As at station CD-3, most of the trout captured at CD-1 were wild fish. Also, with the exception of the 1987 sampling, there is little evidence of natural recruitment into the population. This may again reflect poor habitat conditions and impairment of this use.

Data from both stations therefore generally indicate an improvement in rainbow trout populations with density and biomass of trout increasing through the project. However, the substantial reduction in trout densities at CD-1 after 1982 (essentially prior to the project) indicates an impact possibly related to hydroelectric plant development and operation. The percentage of wild rainbow trout also increased, as did representation of this species in the community. However, the lack of smaller trout in most of the collections may indicate salmonid spawning remains impaired.

PESTICIDES

Pesticides refer to a variety of organic chemicals including insecticides, herbicides, fungicides and algicides (Hampel and Hawley 1976). Pesticides are commonly used in agricultural practices and are, thus, logical to investigate in environmental samples. PCBs (used as a coolant in electrical equipment) are also tested for in environmental samples. Fish tissue is an excellent indicator of pesticide usage and PCB contamination since the organisms bioaccumulate pesticides and thus show presence during the year rather than just following a chemical application. The edible portion of fish tissue was used since the results are then comparable to U.S. Food and Drug Administration standards (Food and Drug Administration 1979) and have public health implications. The names of pesticides have been standardized using Berg (1987), Beste (1983), and Meister (1988). Pesticides used in Twin Falls County are listed in Table 22 and those detected during this survey are listed in Table 23. Pesticides were examined less frequently in water column samples because the chances of detection are low. The

Precision is a measure of agreement among individual measurements of the same property, under prescribed similar conditions (US EPA 1983). Precision is expressed in terms of concentration units (range of duplicates or standard deviation) or as it is related to the mean concentration (relative range or average coefficient of variation) (Bauer 1986; Bauer et al. 1986; and U.S. Environmental Protection Agency 1983). Precision has been studied since 1984 with duplicate samples being taken at Rock Creek subbasin 7-4 for each sample run during 1984-1986 and for Rock Creek Station S-2 during 1986, so that an estimate of precision was obtained. Precision was good for suspended sediment, total Kjeldahl nitrogen, total phosphorus and nitrate-nitrite with mean relative ranges of 9.7, 9.9, 11.8 and 17.4 percent, respectively, for 1984-85 data. During 1986 the average relative ranges for Stations S-2 and 7-4 (combined) were 8, 14.6, 11.8, and 25.5 percent for the same parameters, respectively. For 1986, the values for suspended sediment, total Kjeldahl nitrogen, nitrate-nitrite nitrogen, total phosphorus, and dissolved ortho-phosphate are considered good (Clark 1985b). Precision was poor in 1984-85 for dissolved ortho-phosphate and fecal coliform bacteria (mean relative ranges 23.2 and 44.8 percent, respectively) but was good in 1986 with relative ranges of 17.8 and 18.8 percent, respectively (Clark 1985b). The precision data are summarized in Tables 38-39. Precision for pesticides is shown in Table 40.

Additional parameters examined on Rock Creek Station S-2 show excellent precision for minerals: hardness, total alkalinity, bicarbonate alkalinity, potassium, sodium, and magnesium (2 percent relative range or less) and good to poor precision for trace metals (Table 41). The poor precision for metals in Rock Creek may be partly because of the low number of samples [less than the 10 recommended by Bauer (1986)] and by the fact that metal levels are so near their detection limits that small differences in value become large differences in average relative range. Precision for metals in fish tissue was good (Table 42), but was not calculated because of the small sample size.

The precision data (duplicates) for trace metals in fish tissue for 1988 are presented in Table 42. This table depicts the raw data, pooled coefficients of variation and 95% probability intervals. The 95% probability interval estimates random error associated with individual measurements. For example, if two measurements for copper differ by more than 45.6% (2x22.8%), there is a 95% probability that the difference is real because it exceeds the range of random error.

Accuracy

Accuracy is a measure of the closeness of an individual measurement or an average of a number of measurements to the true value. Accuracy includes both precision and recovery (or bias) and can be expressed as a percent recovery (or percent bias) interval (U.S.

Environmental Protection Agency 1983). Accuracy is expressed in mean percent recovery and was interpreted following Provost and Elder (1983).

During 1985 the mean percent recovery for suspended sediment was excellent at 98.2 percent (95 percent confidence interval between 96.1 and 100.3 percent) (Table 43). Excellent recovery was also found for total Kjeldahl nitrogen (96.2 percent, ±1.7 percent), calcium (93.1 percent, ±2.6 percent), magnesium (100.7 percent, ±3.5 percent), sodium (99.1 percent, ±0.8 percent), total phosphorus (101.9 percent, ±2.1 percent) and potassium (110.7 percent, ±3 percent). Recovery was good for chloride (91.2 percent ±3.2 percent) and fair for nitrate (99.1 percent, ±4.4 percent). Recovery was poor for fluoride (20.7 percent) on all samples (Table 43). Evidently there was interference in surface water resulting to the poor recovery. Results for ortho-phosphate were erratic (Table 43). Some random contamination evidently occurred in June (±51 percent confidence interval) but was apparently corrected in August (±6.5 confidence interval) and September (±7.3 confidence interval) (Table 43).

Accuracy sampling was reduced during 1986, but the minimum number of samples suggested by Bauer (1986) was maintained (Table 44). Only the key parameters (suspended sediment and nutrients) were sampled. The accuracy for some other parameters was established during 1985. Excellent recovery was found for all parameters (suspended sediment, 94 percent, ±5.3 percent; total phosphorus, 105.7 percent, ±4.1 percent; ortho-phosphate, 107.3 percent, ±8.6 percent; nitrate-nitrite, 106 percent, ±3.9 percent; and total Kjeldahl nitrogen, 102.5 percent, ±6.9 percent). The random contamination problems reported for dissolved ortho-phosphate during 1985 (Clark 1985b) were corrected. Random phosphorus contamination was found by the IDHW-Bureau of Laboratories, in the Schleicher and Schuell filters used. In 1986 the laboratory began using Micron Sep filters with excellent results as seen in the above data. Continued testing of the filters has found no phosphorus contamination.

The results of the quality assurance work on Rock Creek and Cedar Draw show that the data are precise and accurate. The problems with fecal coliform bacteria are to be expected, since they represent a dynamic biological community. The problem with dissolved ortho-phosphate has been corrected. The problem with fluoride encountered during the 1985 survey has been attributed to natural interference in the water in Rock Creek and Cedar Draw by the IDHW-Bureau of Laboratories. The results of the fluoride analyses are not critical to the present study.

Quality assurance was increased during 1987 for organic chemicals (pesticides). Table 36 shows the results of pesticide and PCB unknown sample analysis by the IDHW-Bureau of Laboratories. The QA analysis was conducted by the U.S. EPA laboratory in Cincinnati,

Ohio. Table 36 shows analysis of all substances were in an acceptable range. In addition, we had six fish specimens prepared and split for both the IDHW-Bureau of Laboratories and U.S. EPA laboratory in Manchester, Washington. The results of these samples for precision are shown in Table 40. The results are within expected limits for pesticides in a biological medium. Standard QA procedures for water samples tested for pesticides included blank samples, duplicate samples (10 percent or more of each sample run), and samples spiked with mirex (10 percent or more of each sample run). The spikes were recovered at 81.3 percent.

During 1988 accuracy estimations were made of the metals data from fish tissue collected from Rock Creek and Cedar Draw. The bias of the measurements shown in Table 45 depicts the percent recovery of a spike of known concentration added to the dried fish tissue prior to digestion and analysis. The average percent recovery has been calculated and the standard error of the mean is reported. The standard error of the mean expresses the interval about the average recovery which has a 95% chance of containing the true mean recovery. The percent recovery interval for copper, for example, is 103 to 105%. Since 100% recovery is not included in this range, there is a 95% chance that the determinations for copper have a slight 3%-6% high bias. The recovery interval for mercury is 76% to 96%. Again, 100% recovery is not included in this range. There is a 95% chance that mercury determinations are biased low by about 17%. The recovery interval for zinc is 97.7% to 103.7%.

Table 37 depicts the results from testing the EPA quality control sample "Trace Metals in Fish." The reference value, experimental values and the EPA 95% confidence intervals are shown. According to the literature accompanying the quality control material from EPA, individual determinations should fall within the 95% confidence intervals. All of our determinations fell within these intervals.

CONCLUSIONS

The Water Quality Index (WQI) decreased during the project from 78 in 1982 to 54 in 1988 at the mouth of Cedar Draw. This reduction represents an improvement from a "poor" rating in 1982 to "fair" in 1988. This also indicates that beneficial uses have improved from "not supported" to "partially supported" at the mouth site during the course of the project (see Yankey et al. 1991).

Dissolved oxygen levels in Cedar Draw, which were only monitored during daylight hours, generally exceeded state standards during the study. Mean concentrations at Pole Line Road and at the mouth of Cedar Draw were 8.6 mg/L and 9.2 mg/L, respectively.

Nutrient levels in Cedar Draw generally exceeded criteria established to prevent eutrophication or nuisance growths of aquatic plants and algae. Nitrate nitrogen levels increased with downstream progression reflecting agricultural activities in the watershed and ground water accrual. Total phosphorus levels exceeded eutrophication criteria (0.1 mg/L total phosphorus as phosphorus) 96% of the time at the mouth station (mean on 0.24 mg/L). Water entering the Cedar Draw watershed via the Low Line Canal generally exhibited total phosphorus levels in excess of 0.1 mg/L. The mean level calculated for the Low Line Canal was 0.19 mg/L.

The bacteriological data indicate that the primary contact recreation use remains impaired in Cedar Draw. Highest fecal coliform bacteria densities were found at the mouth of Cedar Draw. A mean density of 522 colonies/100 ml was calculated for the mouth station for the study period; 76% of the samples collected at this site exceeded the primary contact recreation standard of 50 colonies/100 ml.

Suspended sediment levels in Cedar Draw generally exceeded the 50 mg/L criteria used by Yankey et al. (1991). Suspended sediment loadings at the mouth station at the beginning and end of the project were essentially the same at 1,254 tons in 1982 and 1,223 tons in 1988. Significant reductions in total suspended sediment loads were difficult to assess given the relatively small sample size and variability of the data set.

A nonparametric trend analysis revealed reductions in total suspended sediment, total Kjeldahl nitrogen, total phosphorus, and fecal coliform levels at the mouth station. These reductions are likely due, in part, to the implementation of agricultural BMPs in the Cedar Draw watershed. However, care must be taken in evaluating the significance of these reductions given the variability of the data, the limited data set, and the potential complexities due to the effects of the construction and operation of upstream hydroelectric plants.

Pesticides identified in the water column included lindane, phthalate, and 2,4-D. Fish tissue contained traces of analogs of DDT, DCPA, hexachlorocyclohexane, dieldrin, nonachlor, oxychlordane, heptachlor, endosulfan I, and lindane. The concentrations found were below U.S. Food and Drug Administration action levels.

Metal concentrations found in fish tissues increased slightly at the lower sampling station on Cedar Draw. Trace amounts of arsenic, cadmium, chromium, copper, lead, manganese, mercury, and zinc were found in rainbow trout and carp muscle tissue.

Biological data indicate an improvement in water quality at the mouth station through the study period. A downward trend in the Hilsenhoff Biotic Index (HBI) for most seasons indicates a shift in community composition from pollution tolerant to more pollution sensitive species. This improvement in HBI was not supported by similar improvements in the EPT index or taxa richness. Trophic data indicate a shift in trophic composition to include more scrapers. This may also indicate an improvement in water quality at the lower site.

Fisheries data from Pole Line Road and at the mouth of Cedar Draw generally indicates an improvement in trout populations. The density and biomass of trout increased throughout the project, as did the number of wild trout. The lack of smaller trout in the collections indicates that salmonid spawning likely remains impaired. A substantial reduction in trout densities at the mouth station in 1983 likely reflects impacts associated with construction and operation of upstream hydroelectric plants.

Overall, nonparmetric trend analyses of water quality data collected during this study indicate reductions in pollutant levels in Cedar Draw from agricultural sources from 1982 through 1988. This type of an analysis is a good means to determine if pollutant levels have statistically declined during the project life. Traditional loading calculations based on the small sample size for many of the pollutant parameters in different years proved unreliable and misleading.

RECOMMENDATIONS

1. Any future agricultural water quality survey on Cedar Draw should include monitoring of the major irrigation drains entering the stream.

2. Any future monitoring on Cedar Draw should be done at a minimum of weekly intervals during the agricultural season.

3. The same physical and chemical parameters should be examined at all sample sites, where appropriate.

4. Adequate baseline water quality monitoring data, including biological assessments, should be obtained prior to BMP implementation.

5. Any future monitoring should include stream bank and riparian vegetation analysis.

6. Any future monitoring should include an assessment of the impacts of confined animal feeding operations, grazing, aquaculture, and hydroelectric impoundments be evaluated.

7. Any future monitoring program should have a habitat focus so that changes in the biological community can be attributed either to habitat characteristics or changes in water quality.

8. BMPs should be implemented on schedule and maintained for the life of any future project. We recommend that BMP implementation audits be conducted by interdisciplinary teams on an annual basis.

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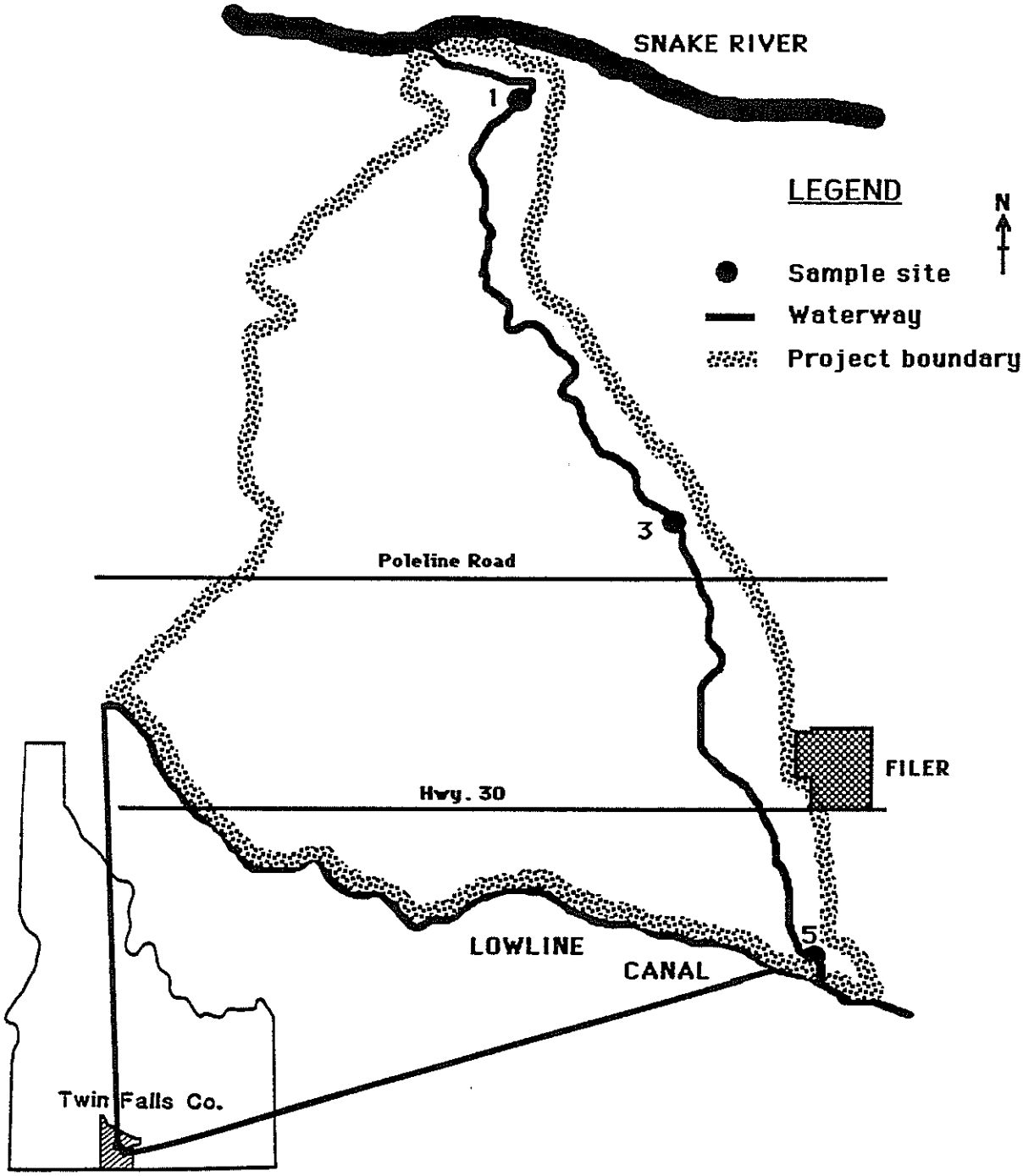

Figure 1. Map of Cedar Draw Study Area. The watershed is outlined in relation to the Low Line Canal and the Snake River. Water quality monitoring stations are shown.

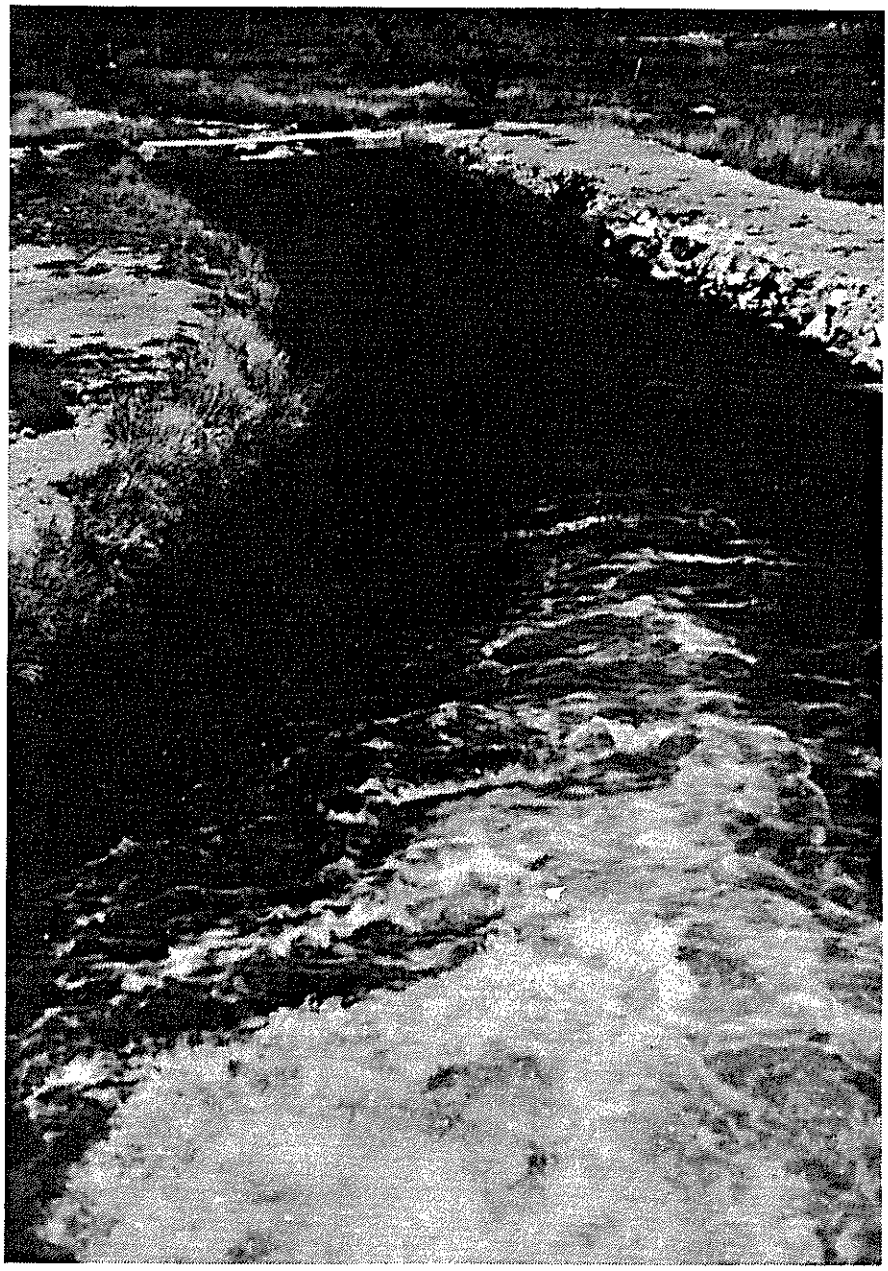

Figure 2. Cedar Draw just below its source at the Low Line Canal, facing north. Cipolletti weir (allowing discharge measurements) is in the upper portion of the photo.

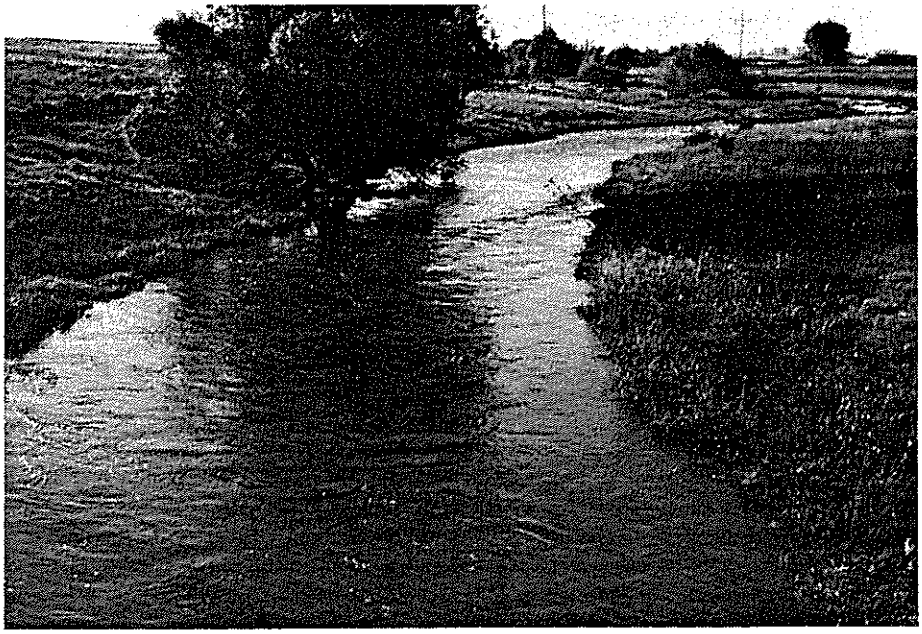

Figure 3. Cedar Draw just below Pole Line Road, facing south. (a) Winter condition, note lack of riparian vegetation. (b) Summer condition.

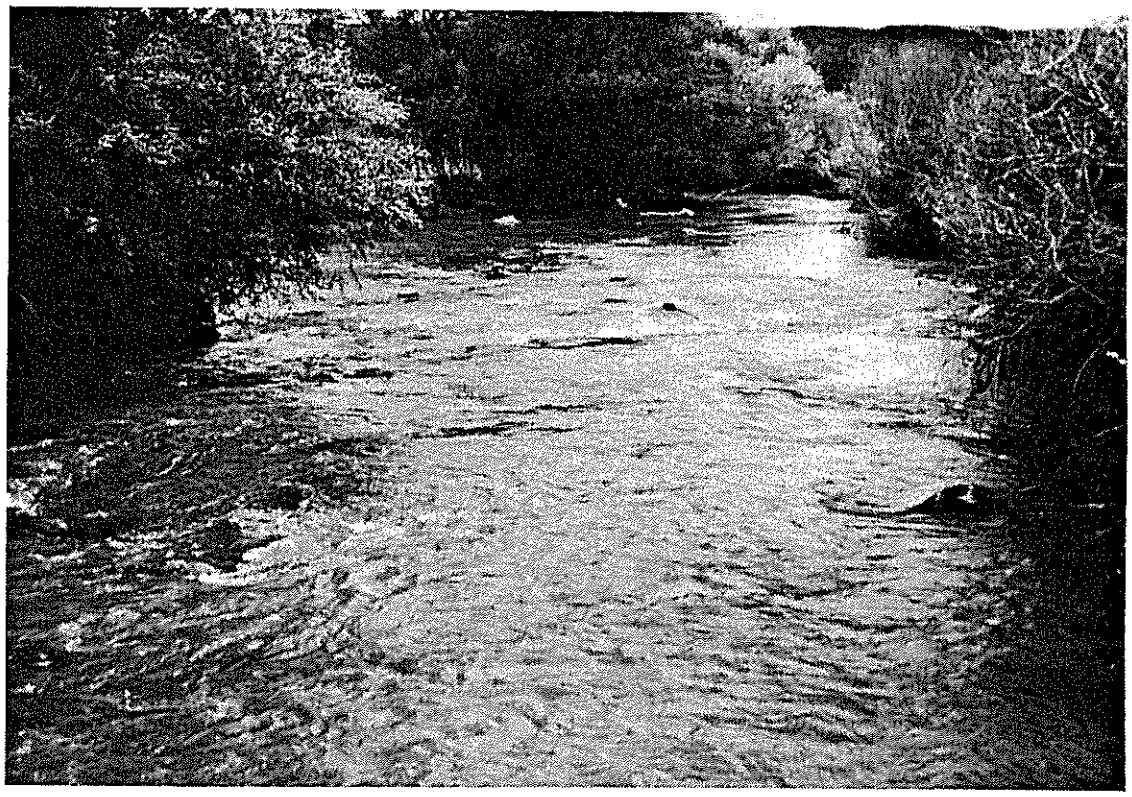

Figure 4. Cedar Draw near the mouth, facing north (downstream). A well developed riparian vegetation zone occurs here.

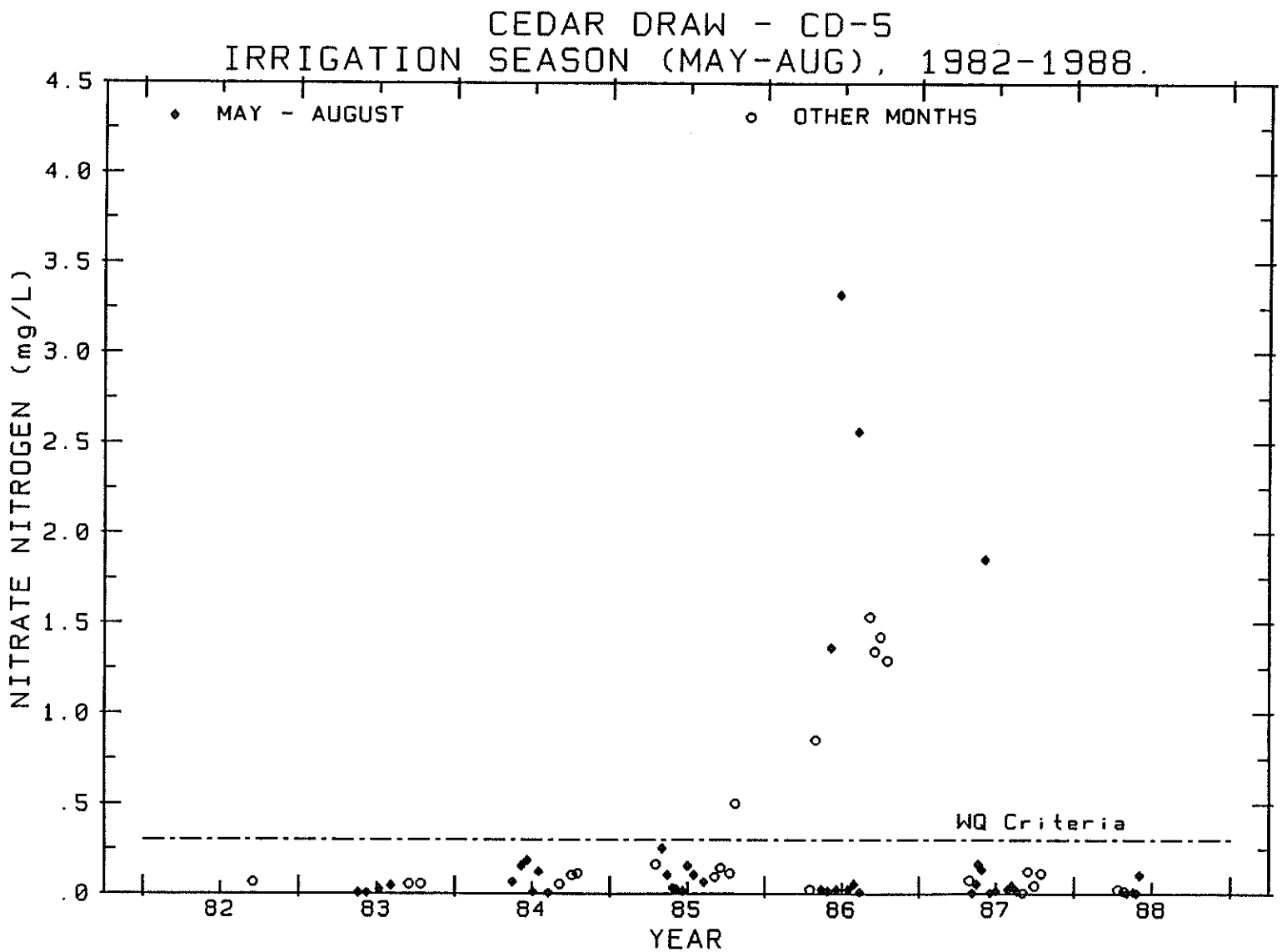

Figure 5. Scatter plot of nitrate nitrogen levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

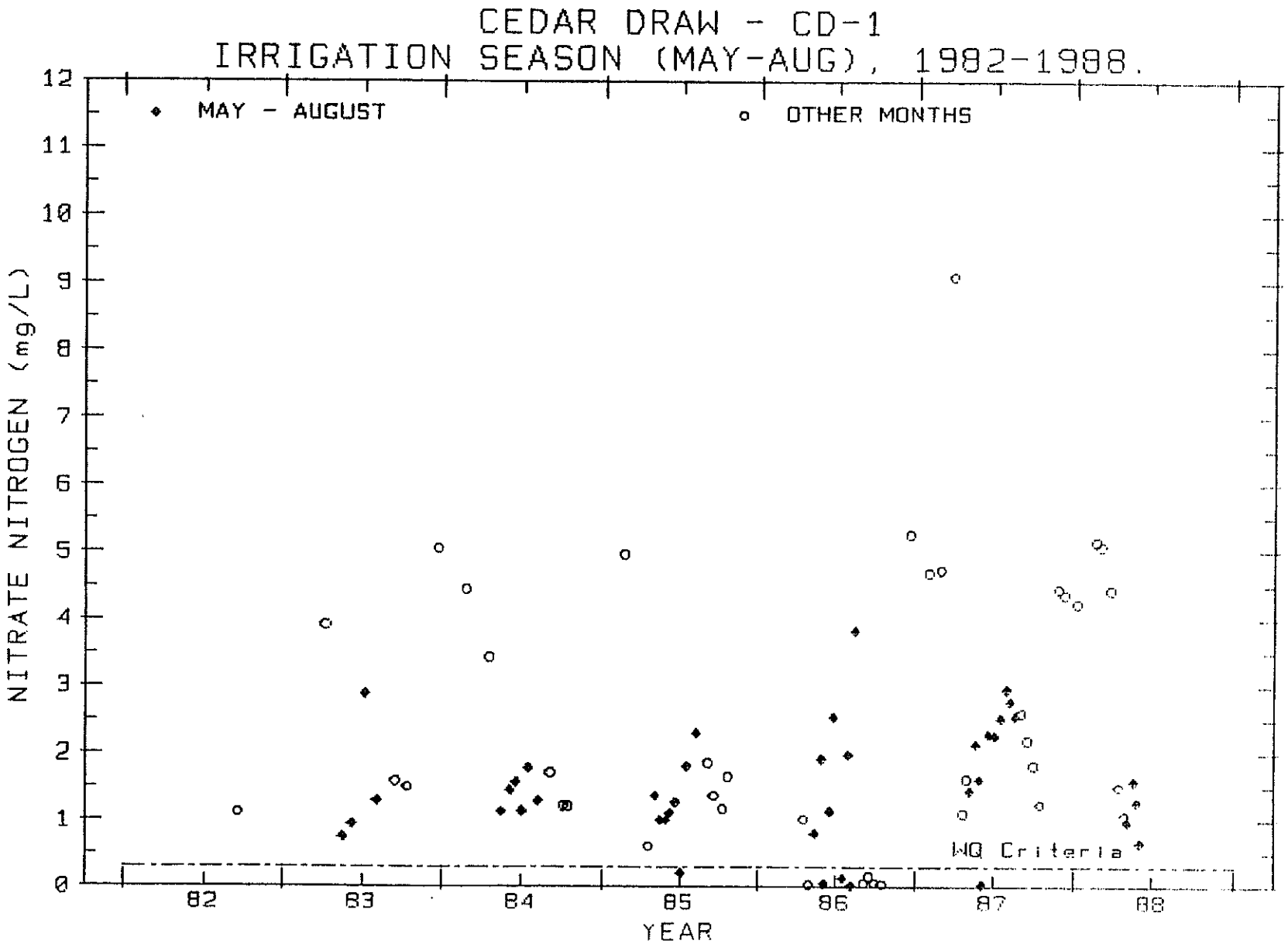

Figure 6. Scatter plot of nitrate nitrogen levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

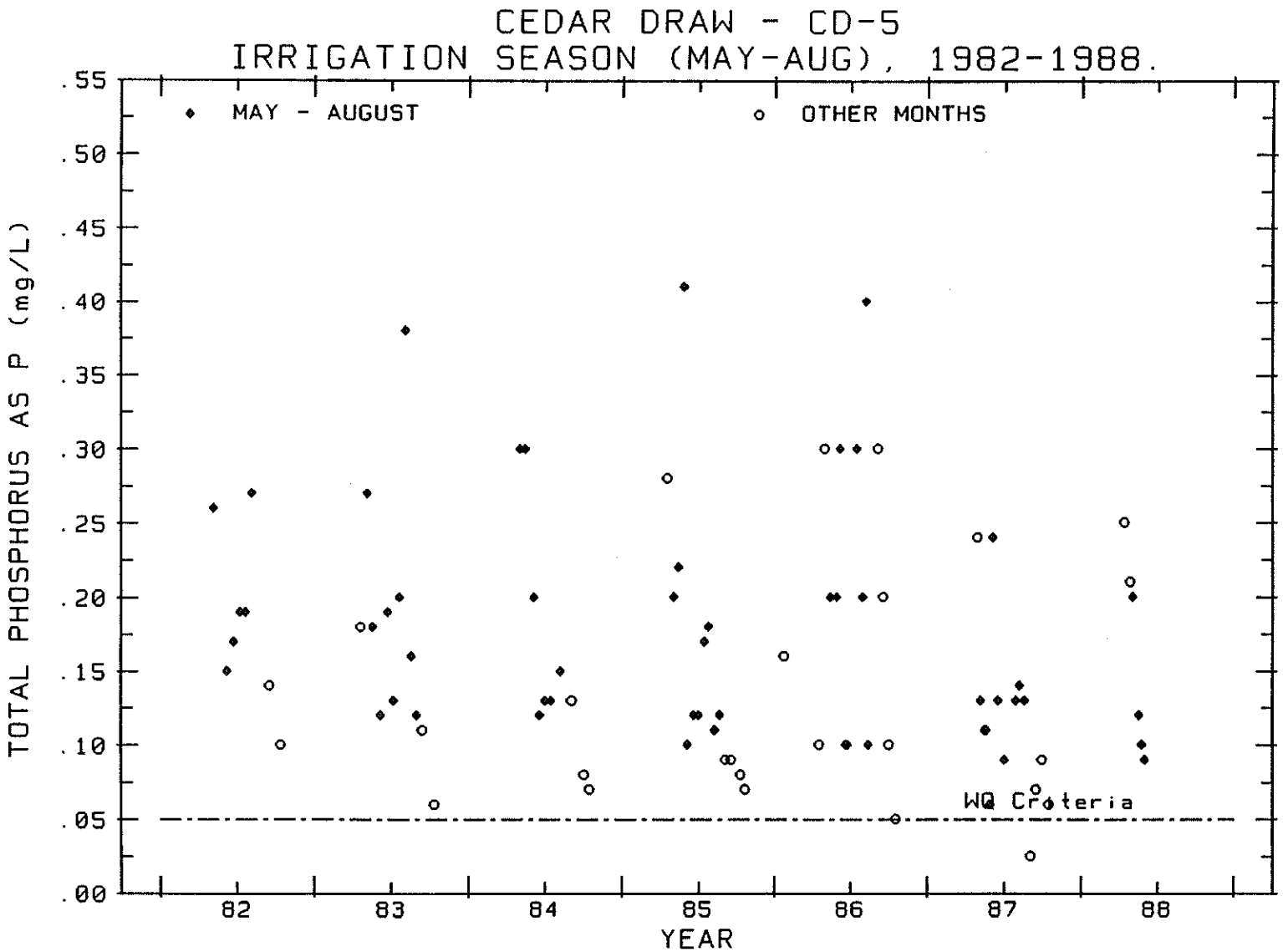

Figure 7. Scatter plot of total phosphorus levels in Cedar Draw at the Low Line Canal during the irrigation season (may-Aug), 1982-1988.

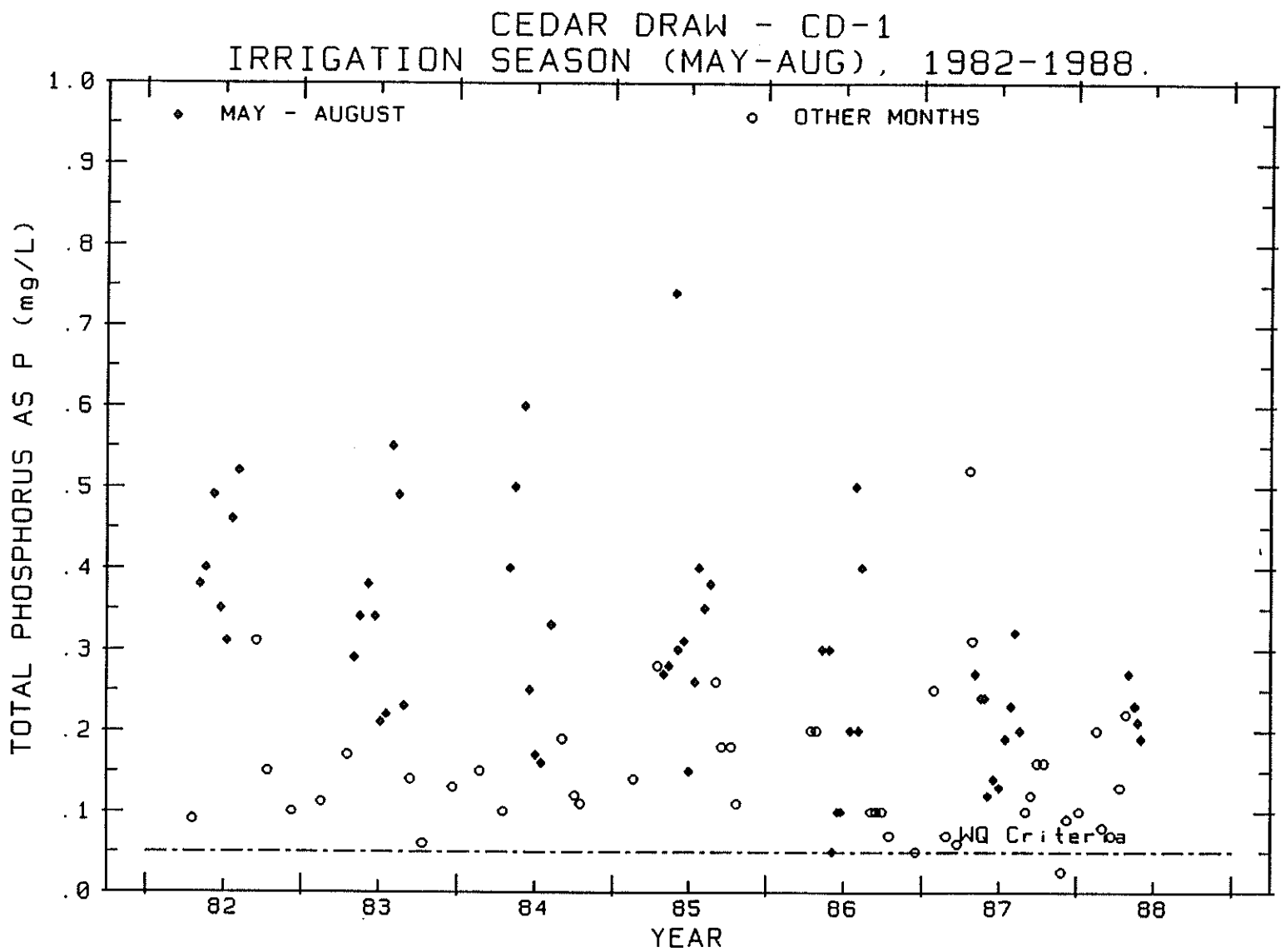

Figure 8. Scatter plot of total phosphorus levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

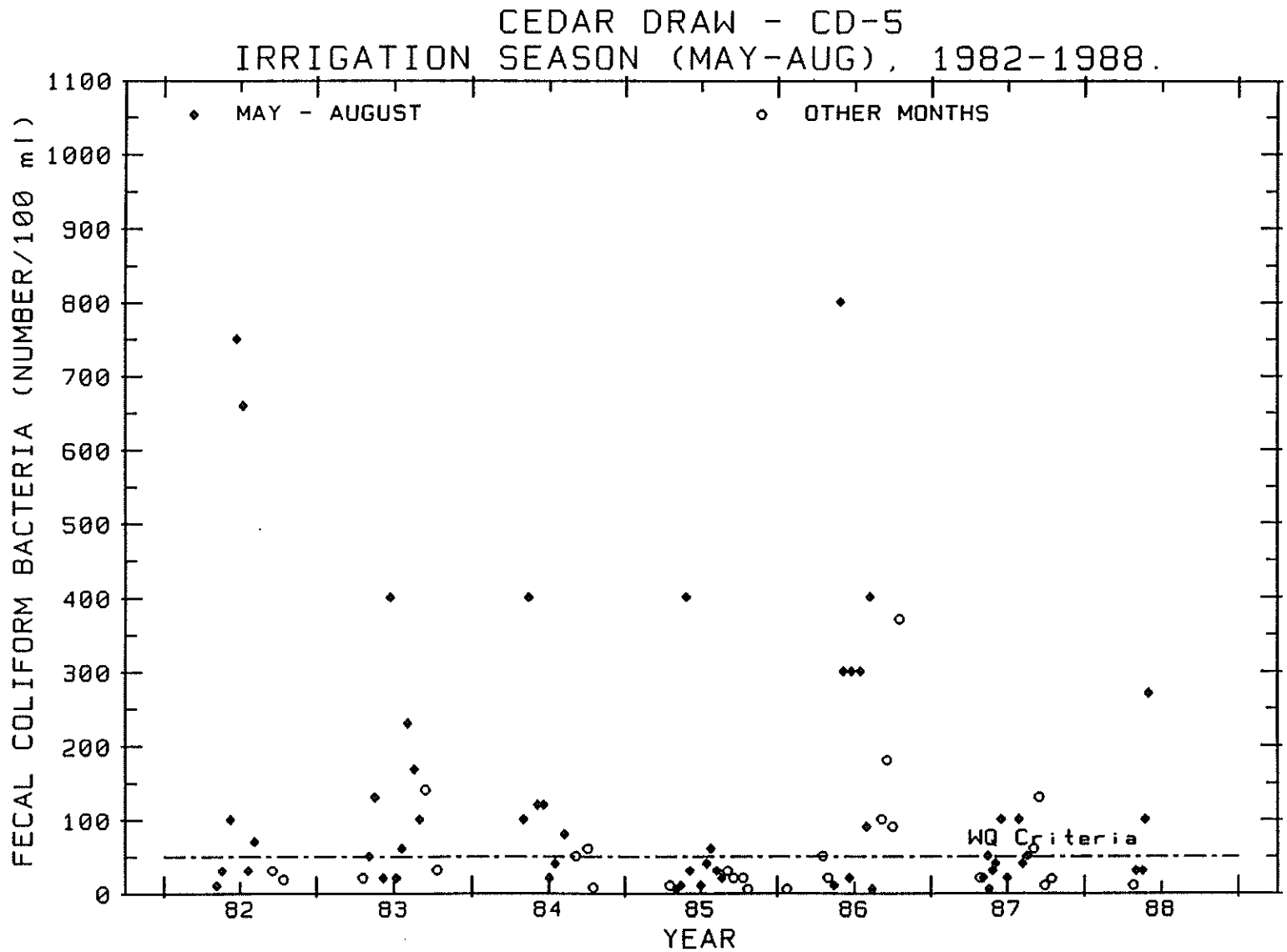

Figure 9. Scatter plot of fecal coliform bacteria levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

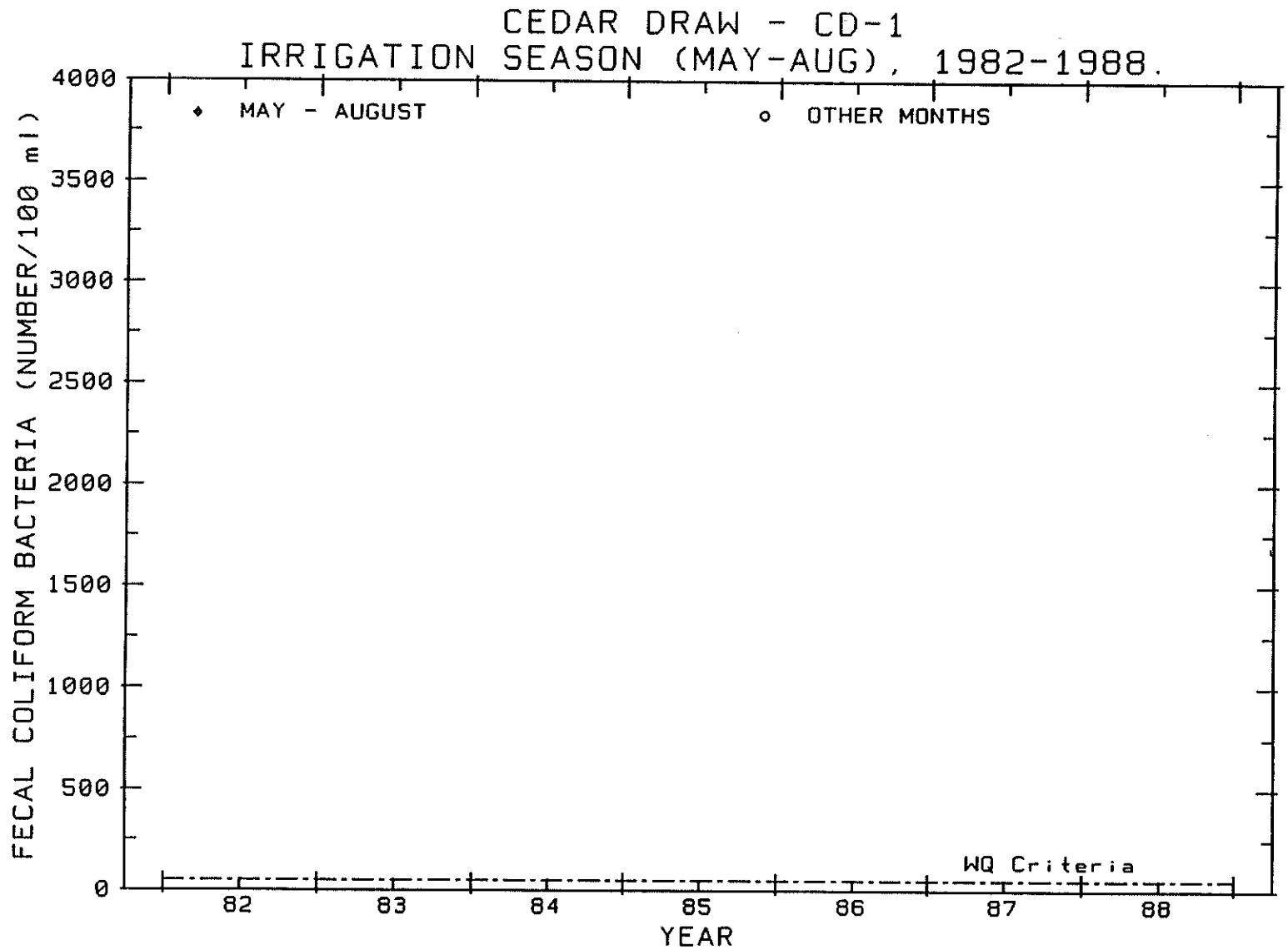

Figure 10. Scatter plot of fecal coliform bacteria levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

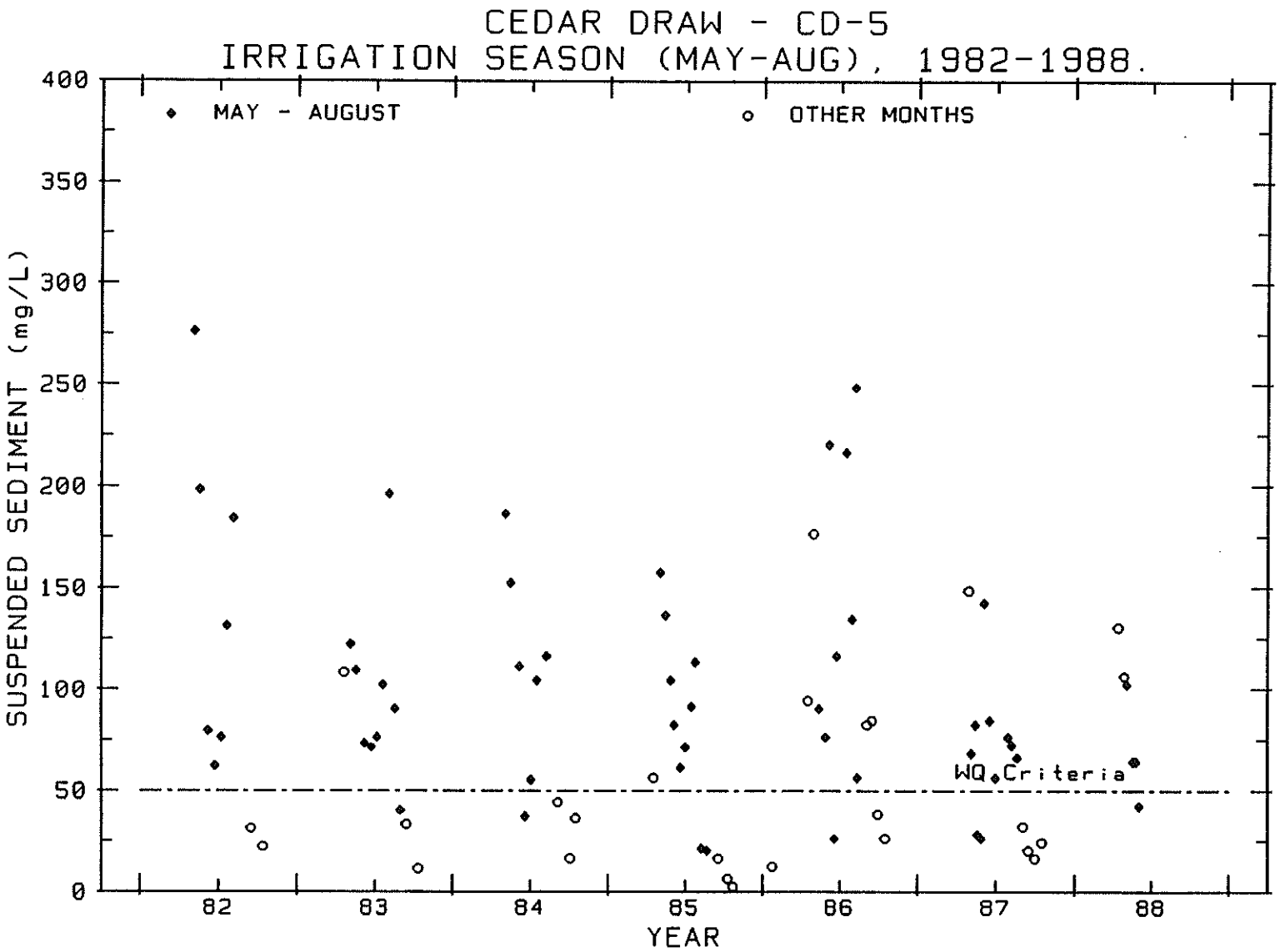

Figure 11. Scatter plot of suspended sediment levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

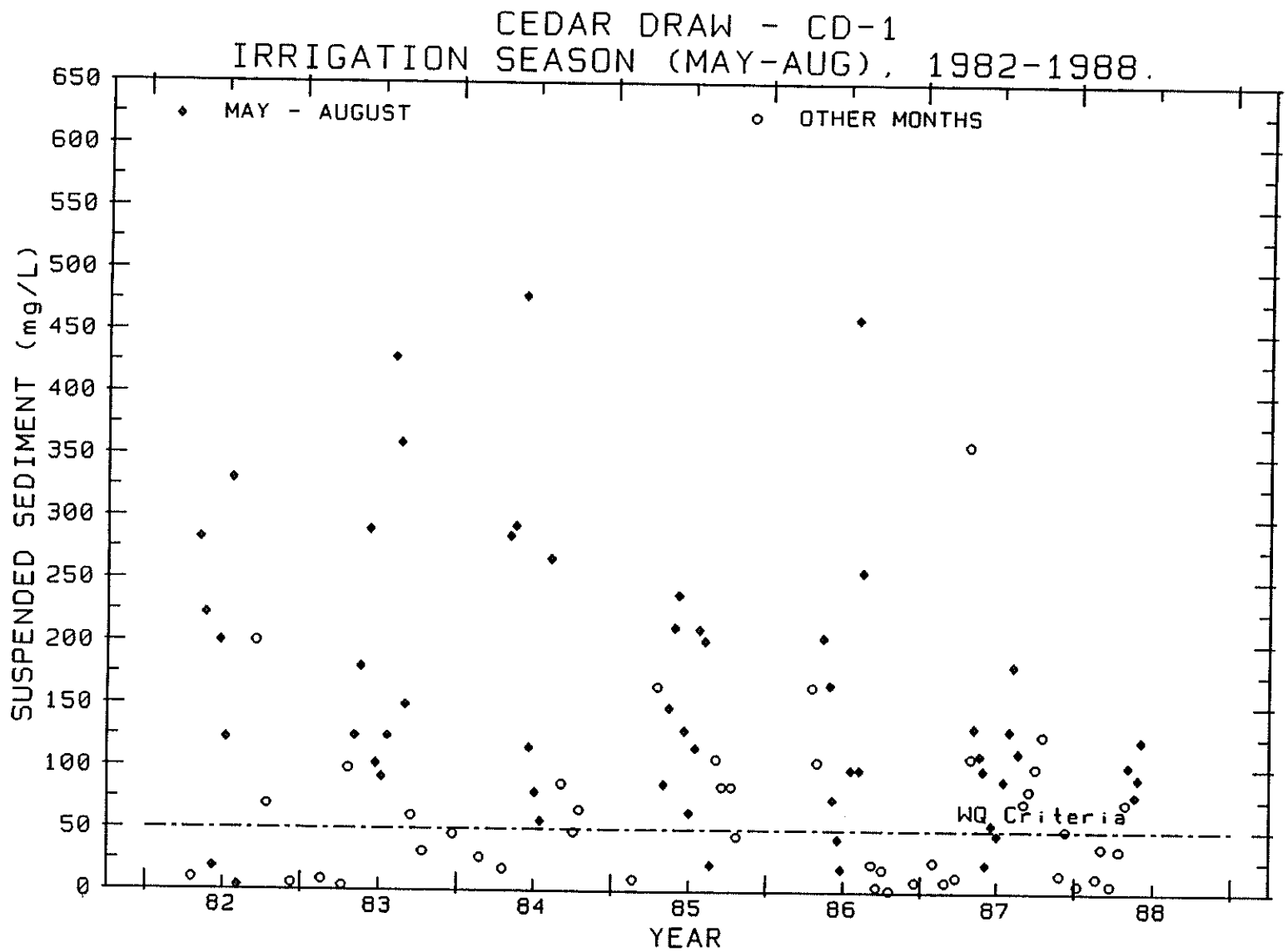

Figure 12. Scatter plot of suspended sediment levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

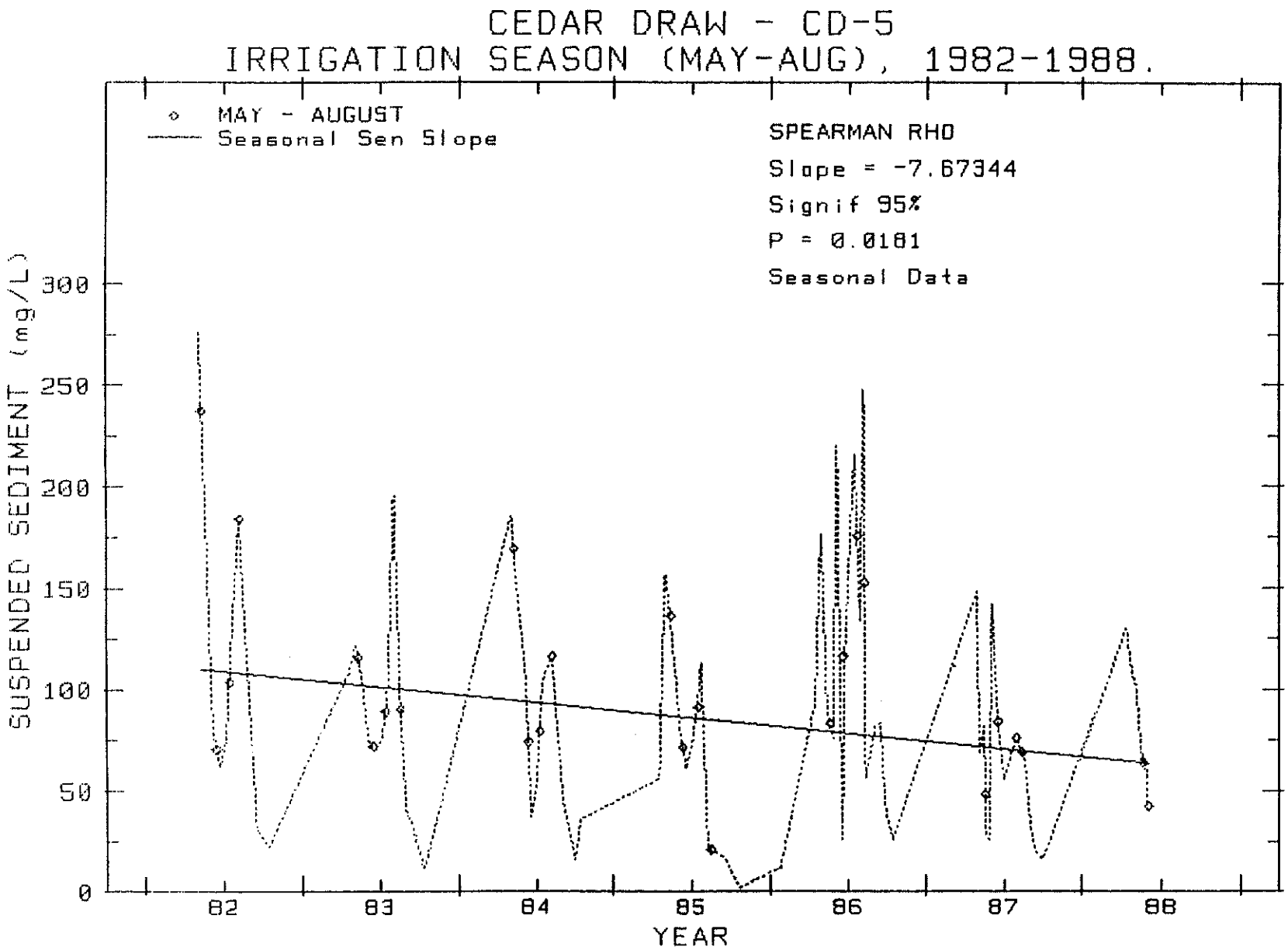

Figure 13. Nonparametric trend of monthly median suspended sediment levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

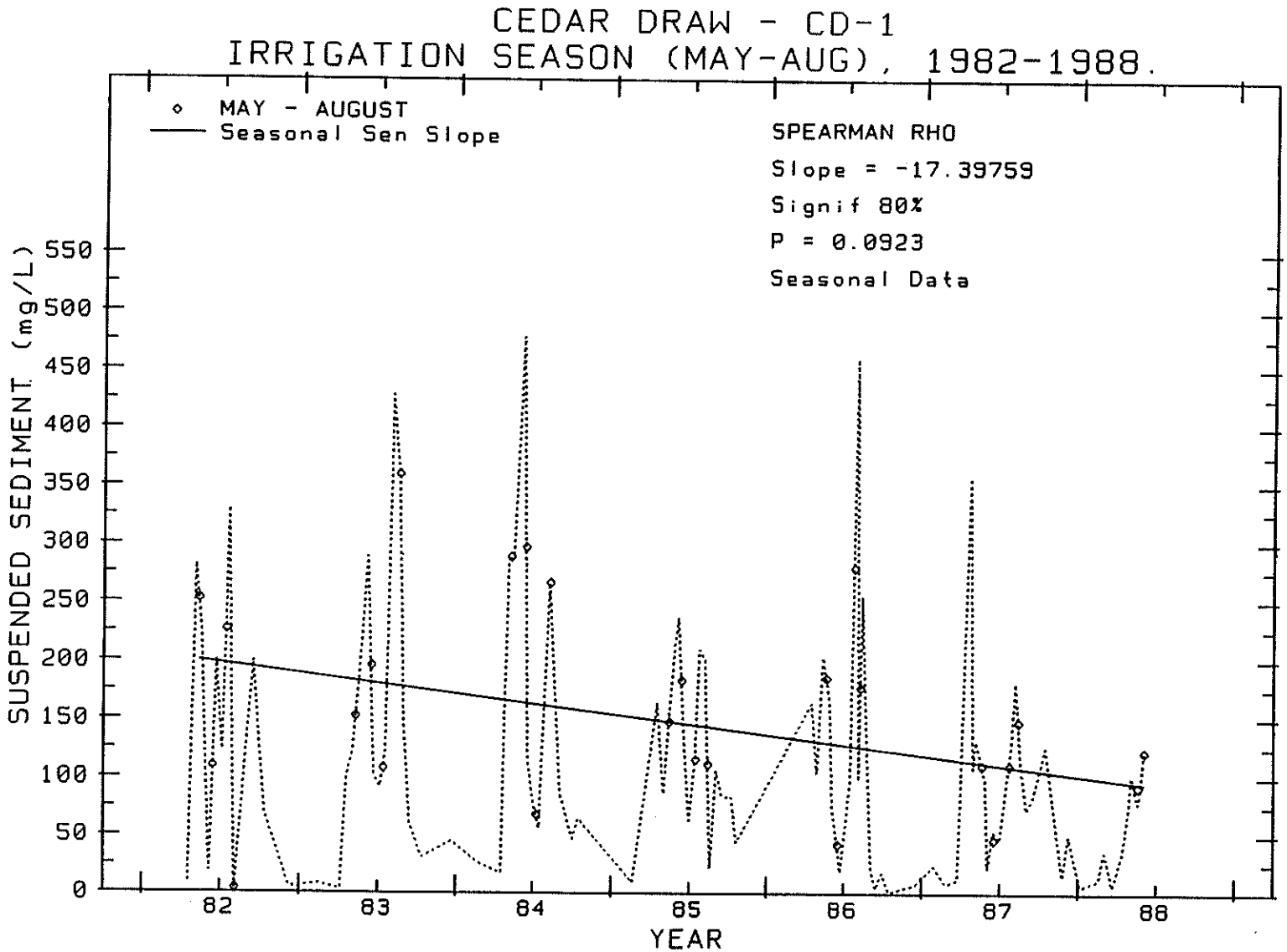

Figure 14. Nonparametric trend of monthly median suspended sediment levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

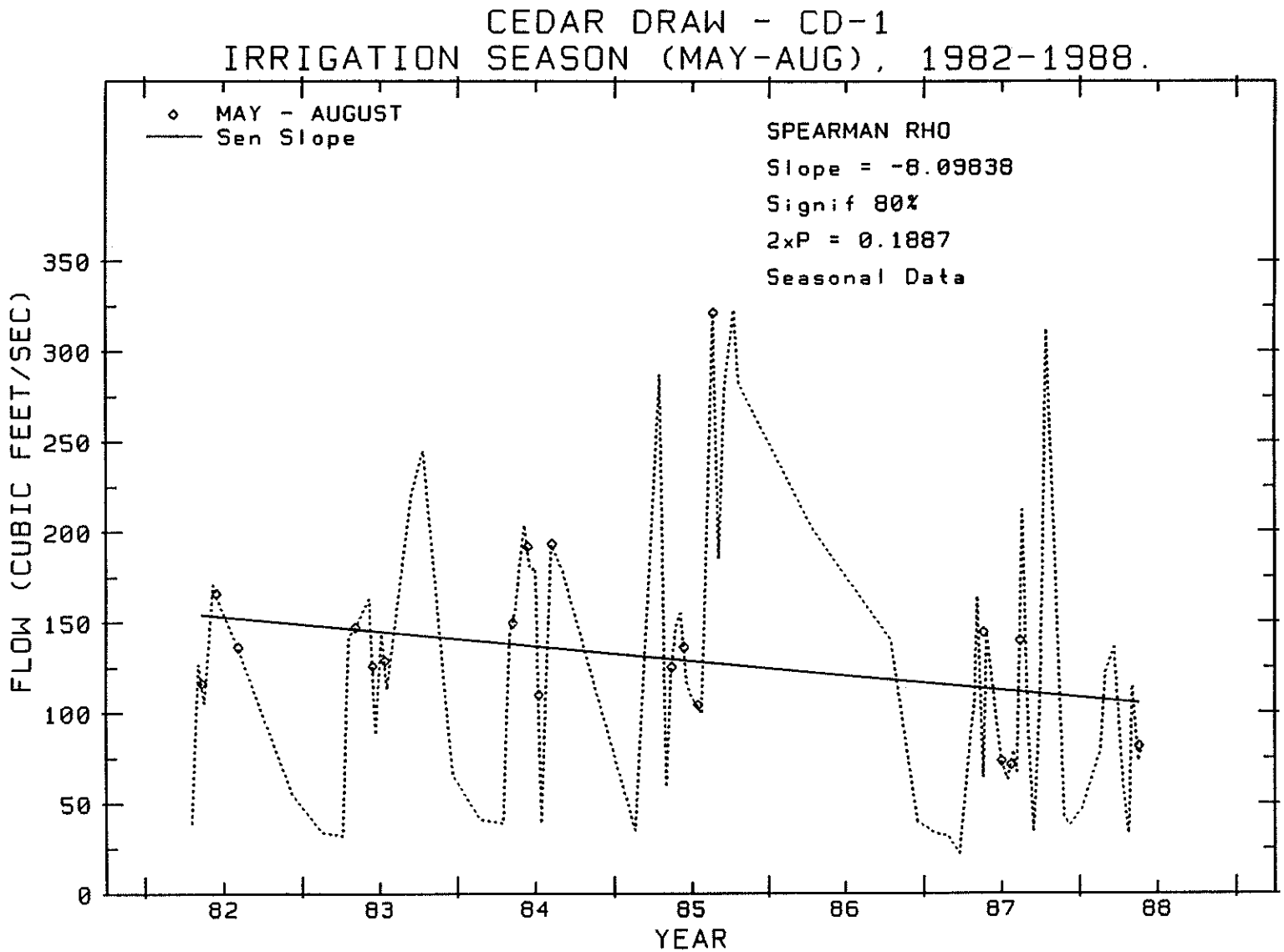

Figure 15. Nonparametric trend of monthly median flows in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

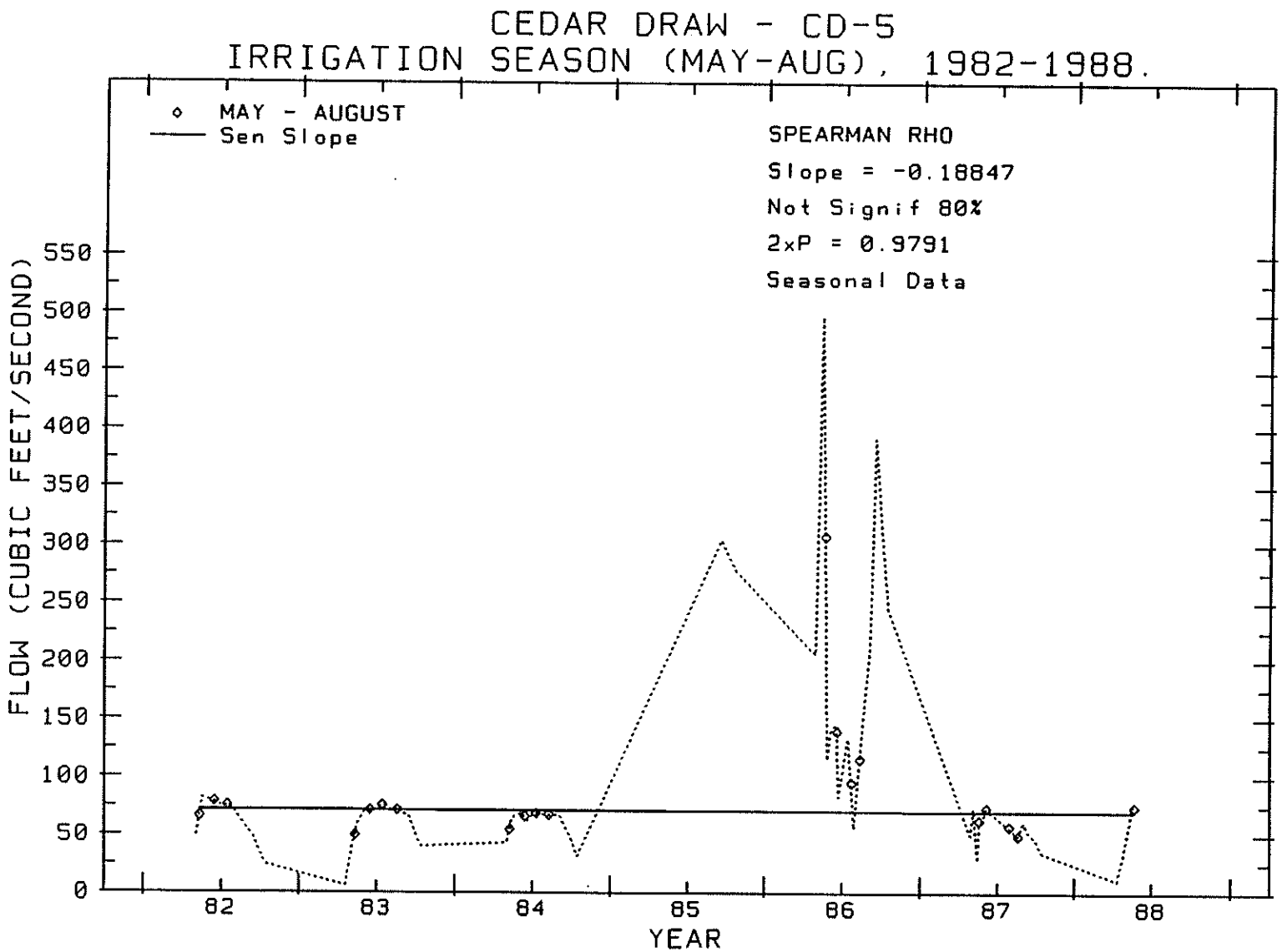

Figure 16. Nonparametric trend of monthly median flows in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

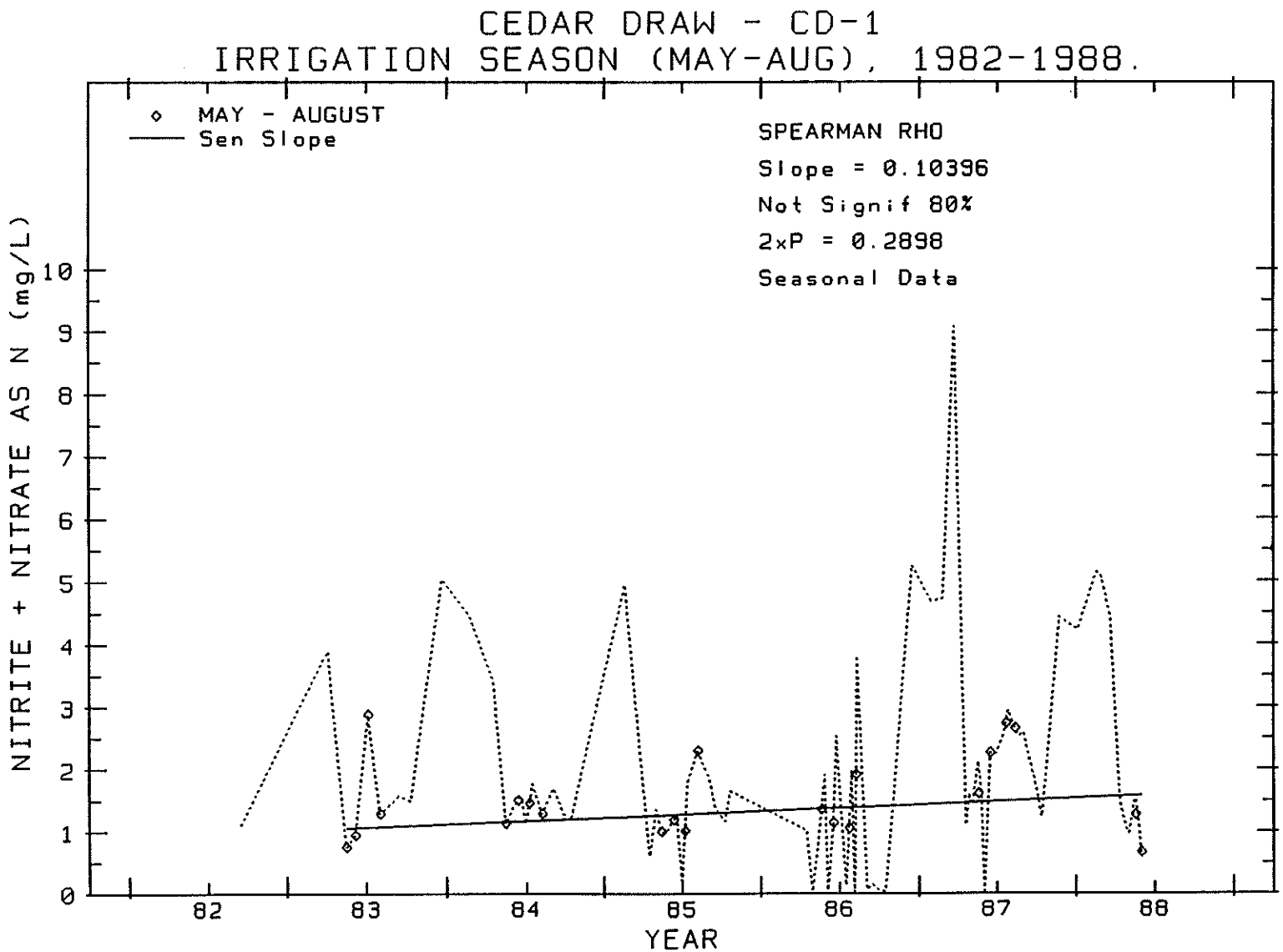

Figure 17. Nonparametric trend of monthly median nitrite + nitrate nitrogen levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

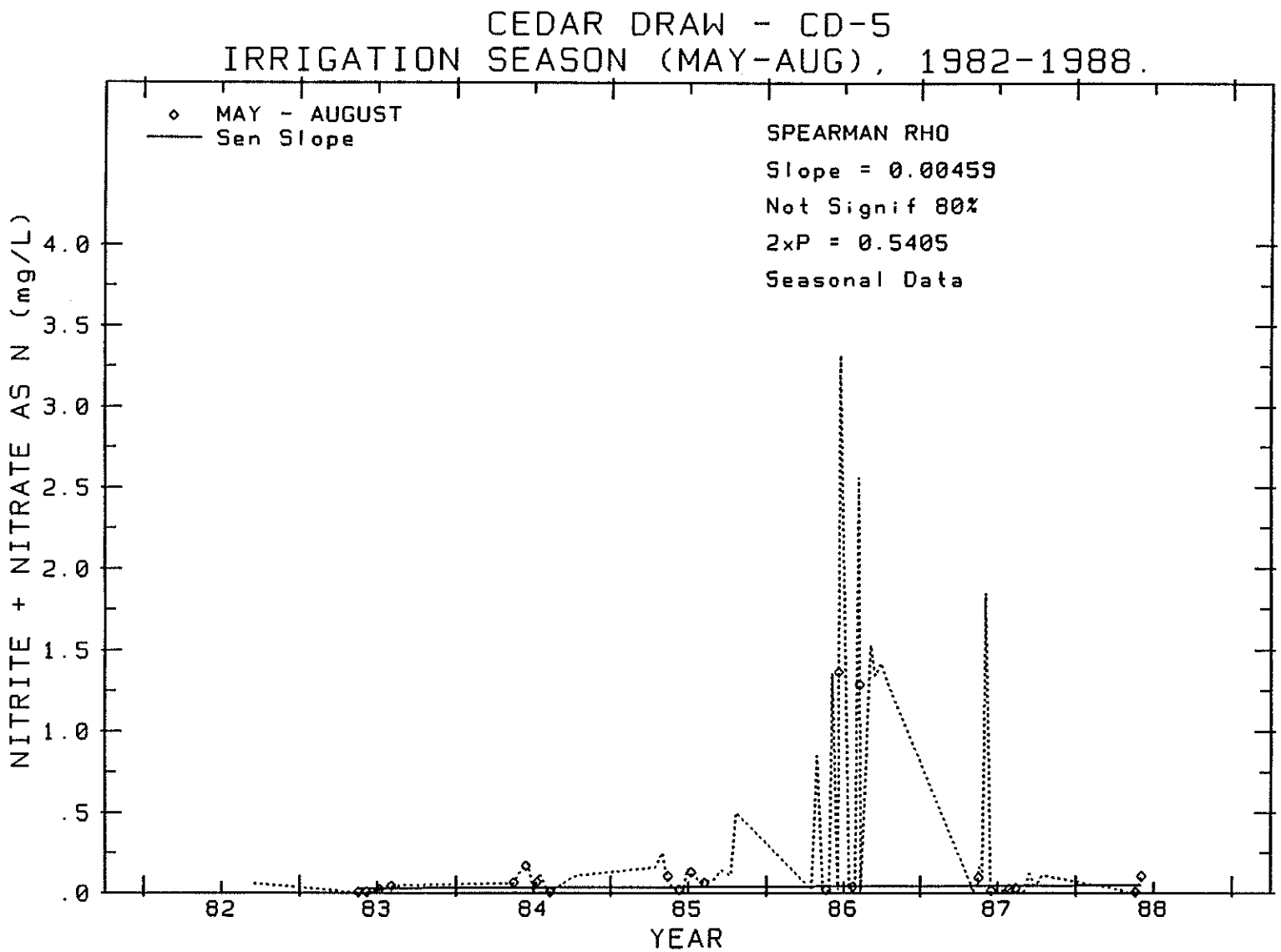

Figure 18. Nonparametric trend of monthly median nitrite + nitrate nitrogen levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

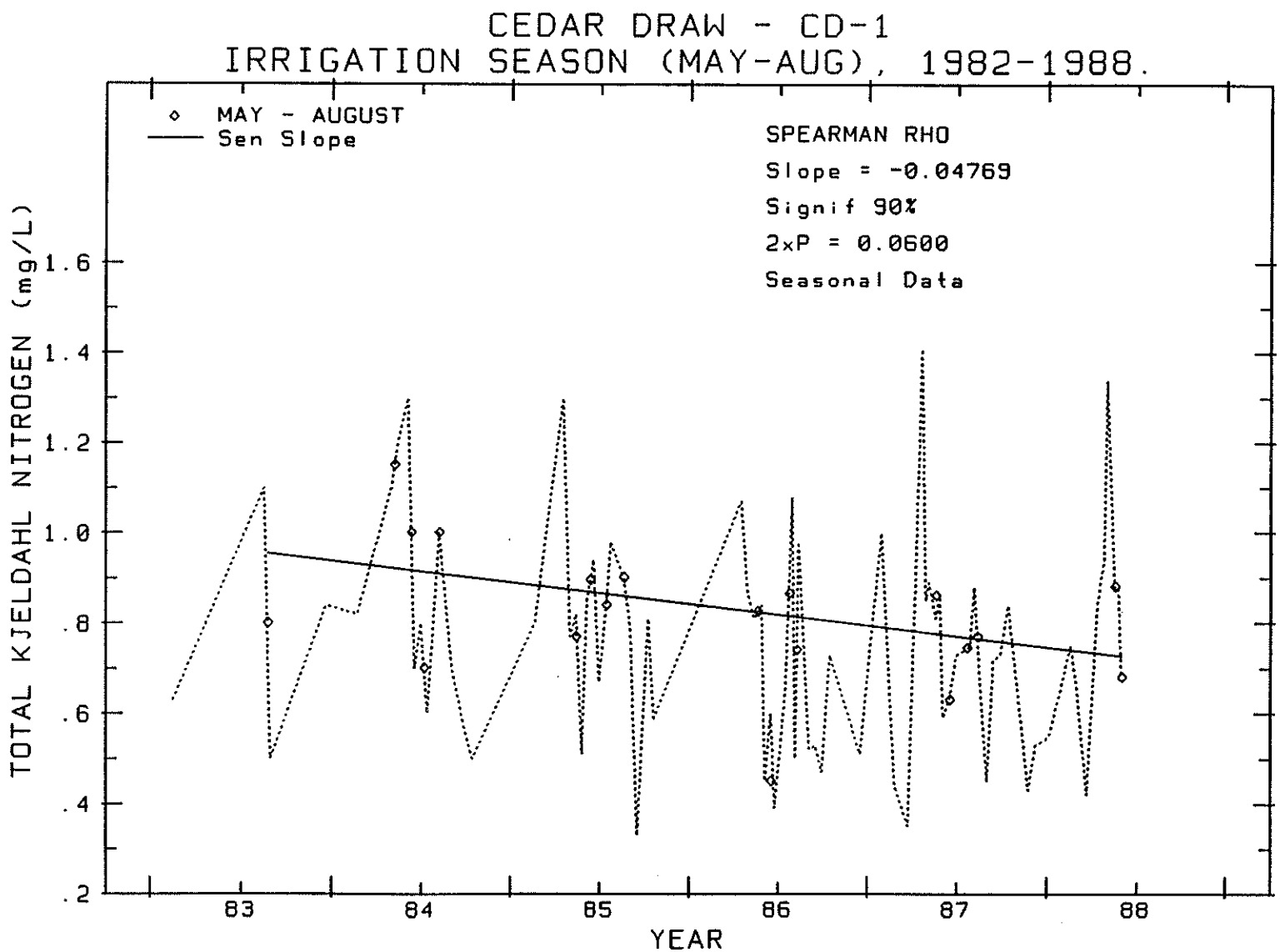

Figure 19. Nonparametric trend of monthly median total Kjeldahl nitrogen levels in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

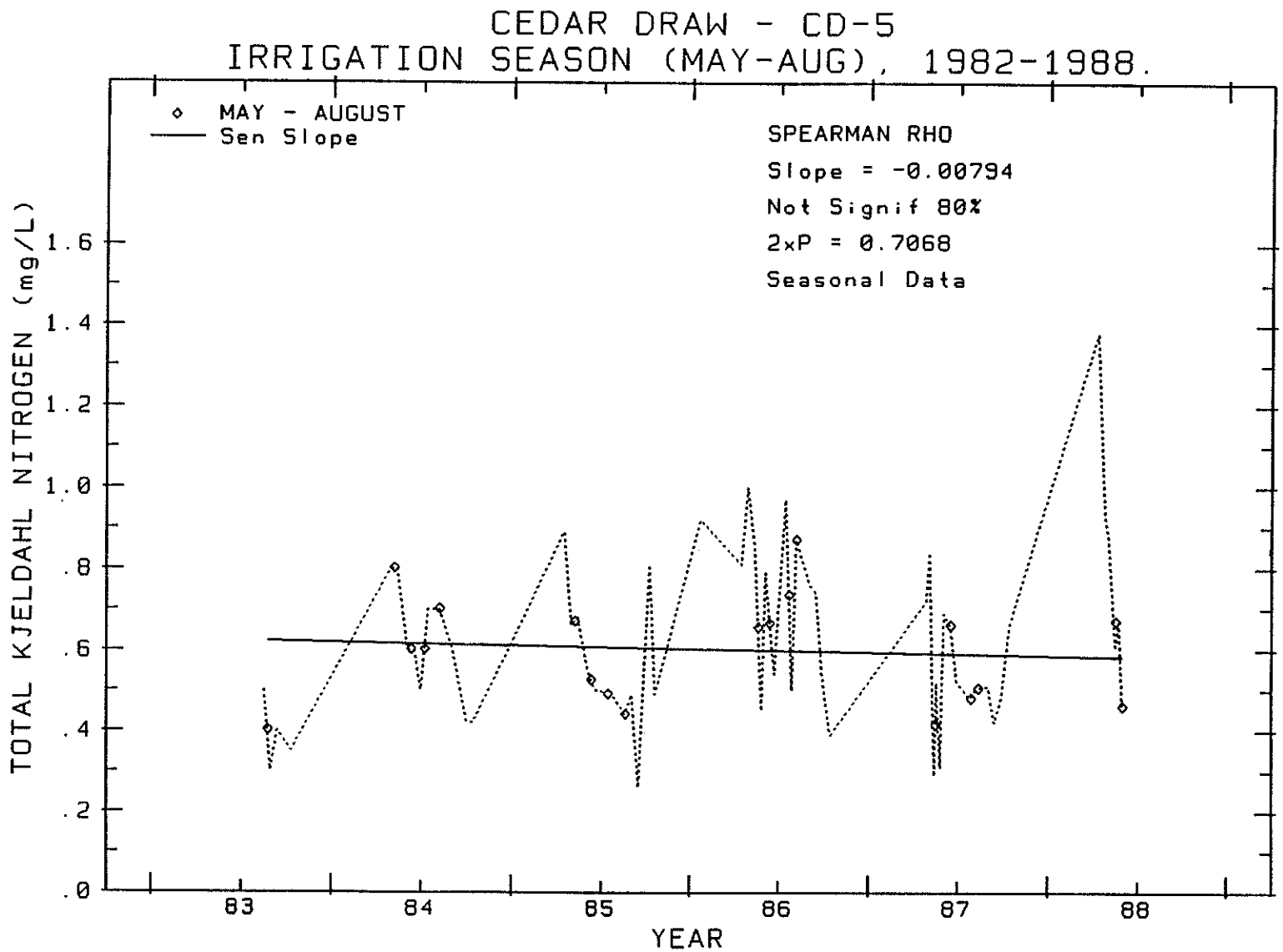

Figure 20. Nonparametric trend of monthly median total Kjeldahl nitrogen levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

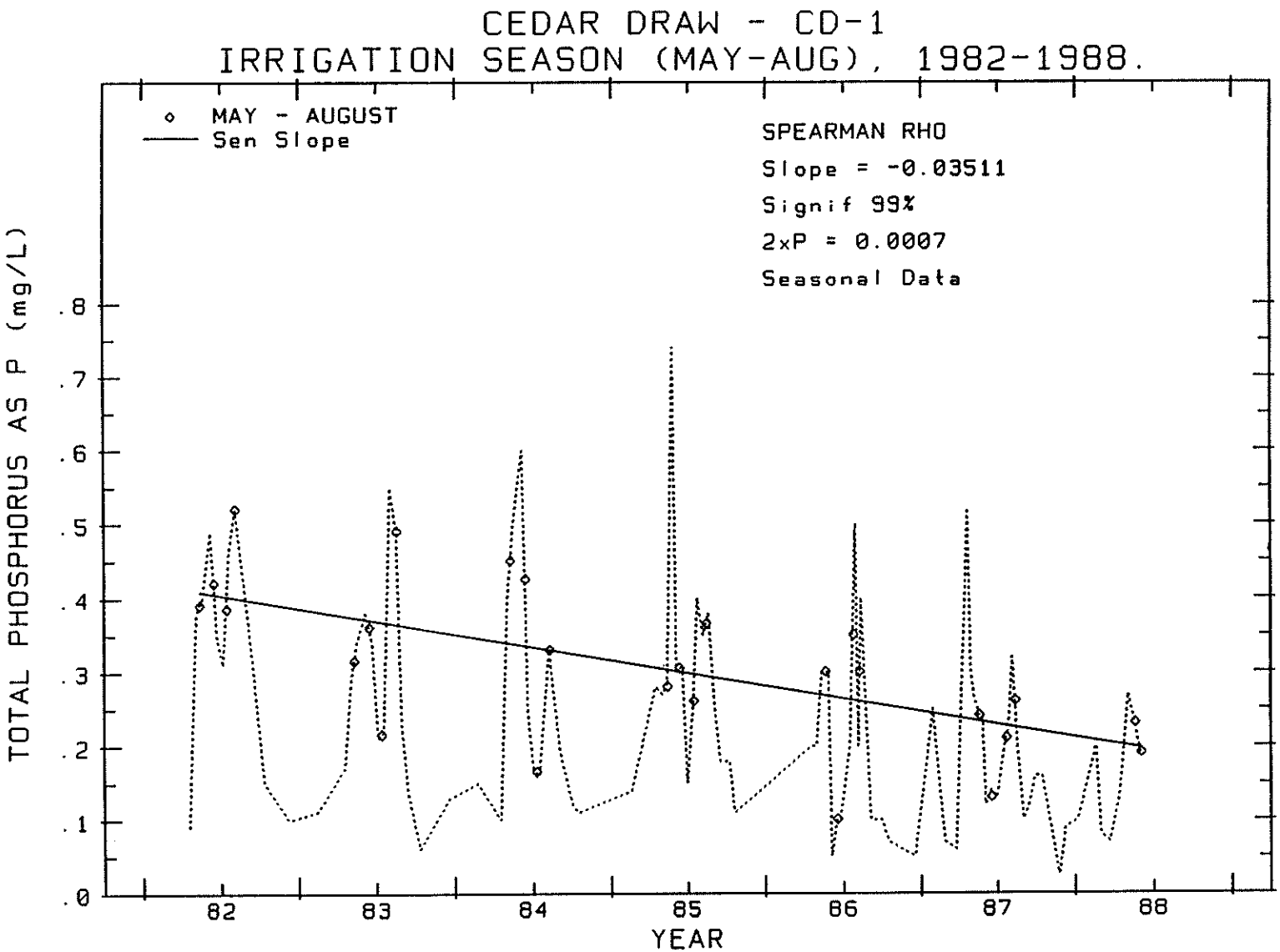

Figure 21. Nonparametric trend of monthly median total phosphorus levels in Cedar Draw at the mouth during the irrigaiton season (May-Aug), 1982-1988.

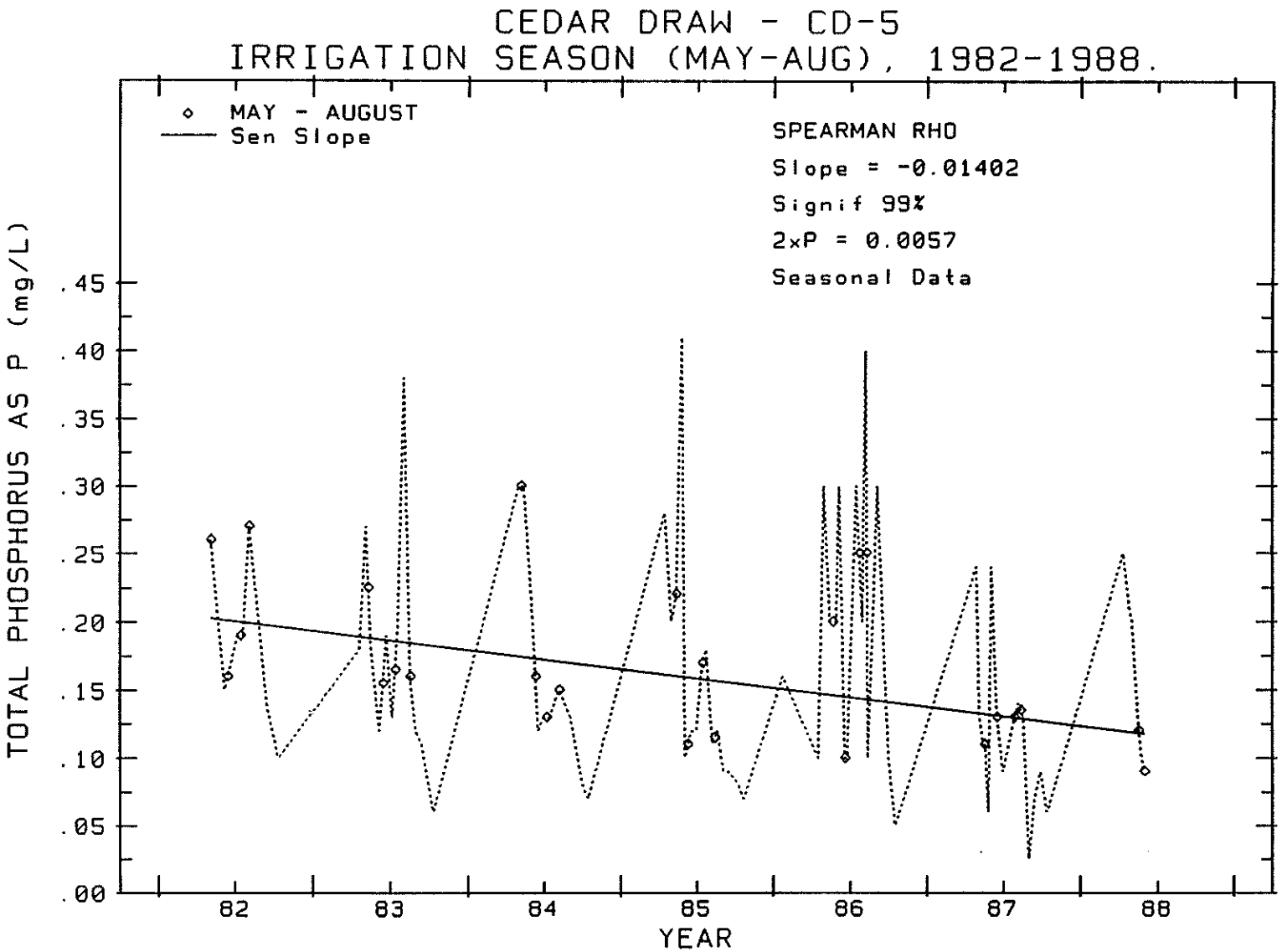

Figure 22. Nonparametric trend of monthly median total phosphorus levels in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

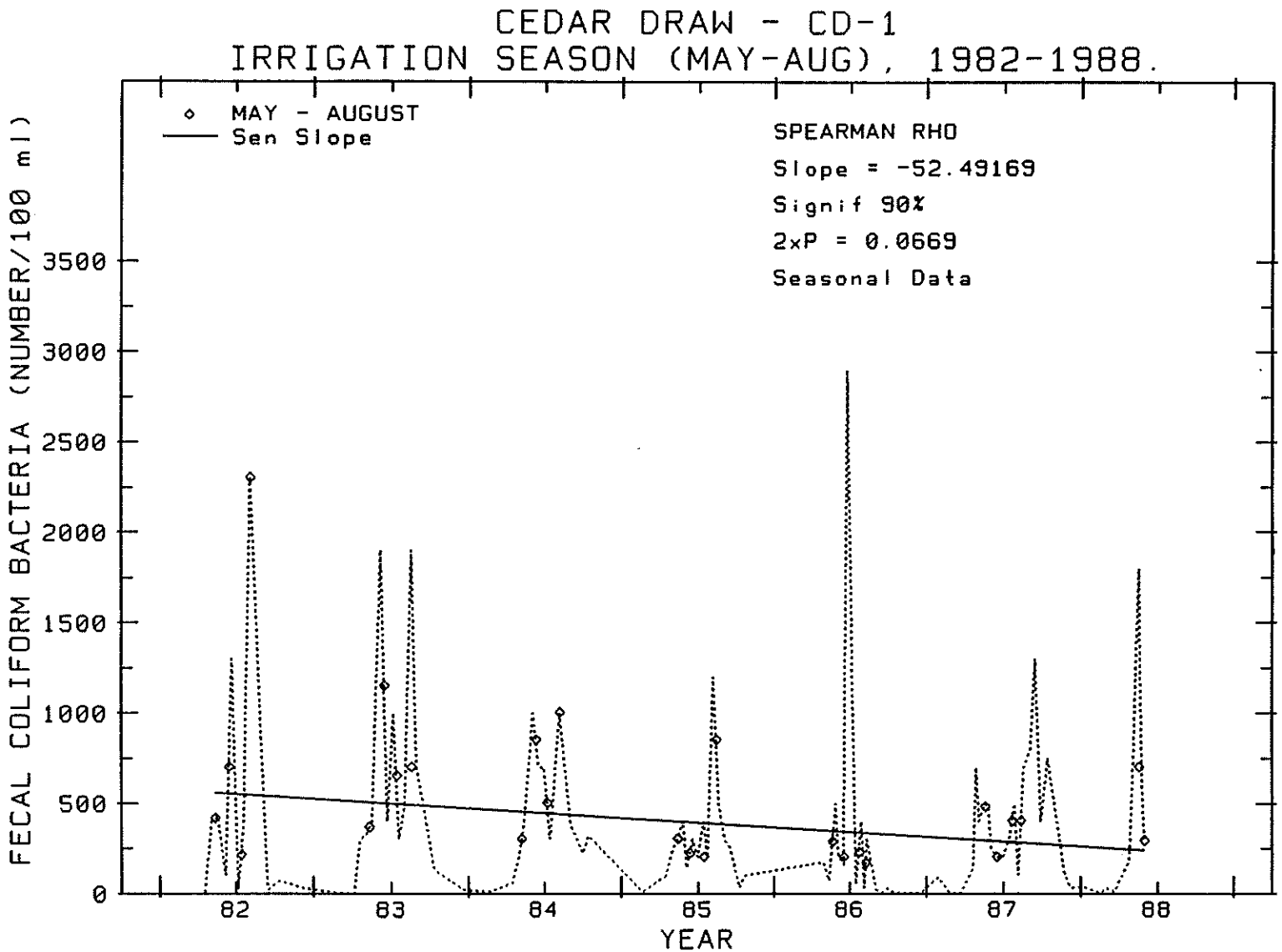

Figure 23. Nonparametric trend of monthly median fecal coliform bacteria densities in Cedar Draw at the mouth during the irrigation season (May-Aug), 1982-1988.

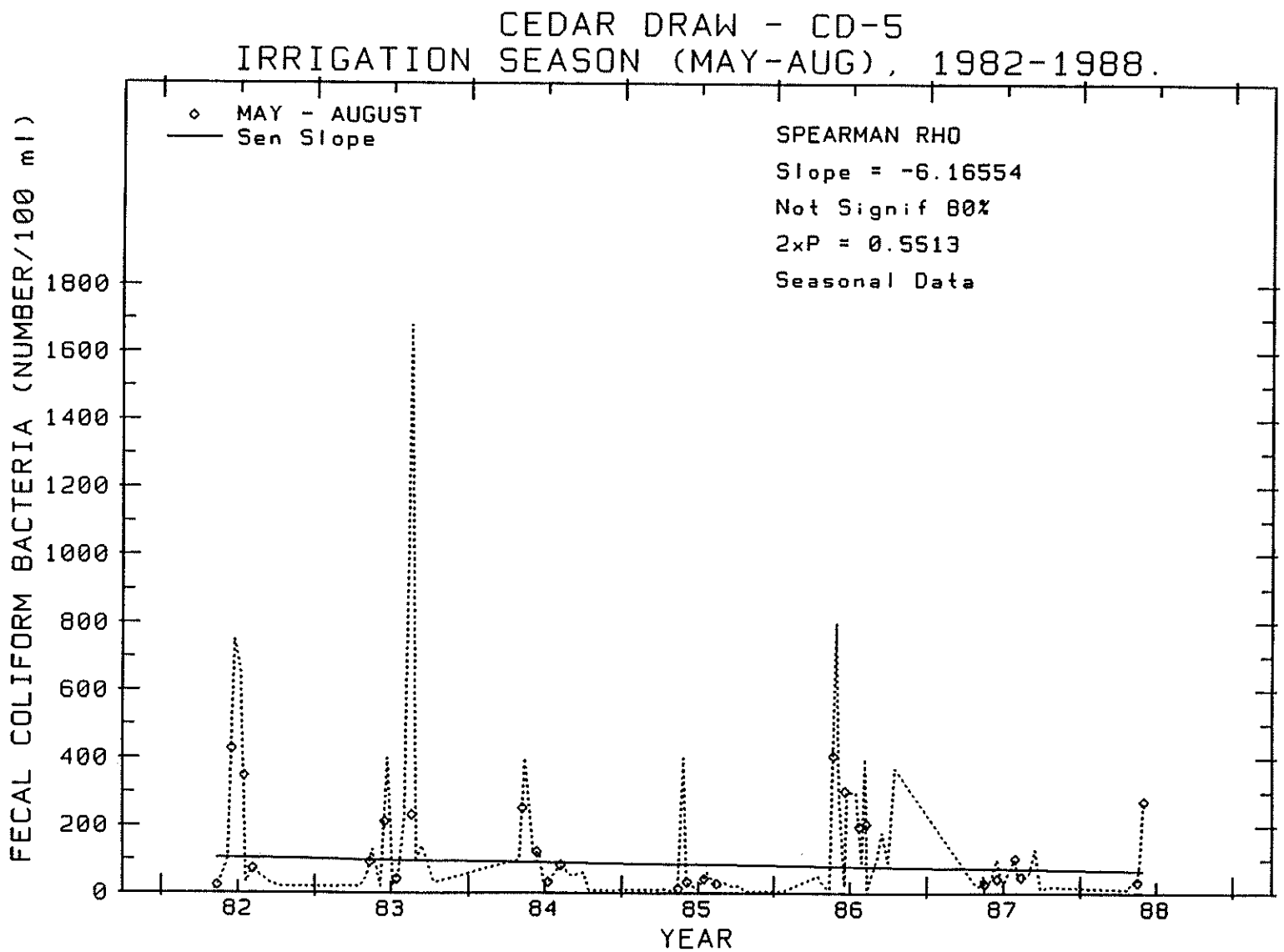

Figure 24. Nonparametric trend of monthly median fecal coliform bacteria densities in Cedar Draw at the Low Line Canal during the irrigation season (May-Aug), 1982-1988.

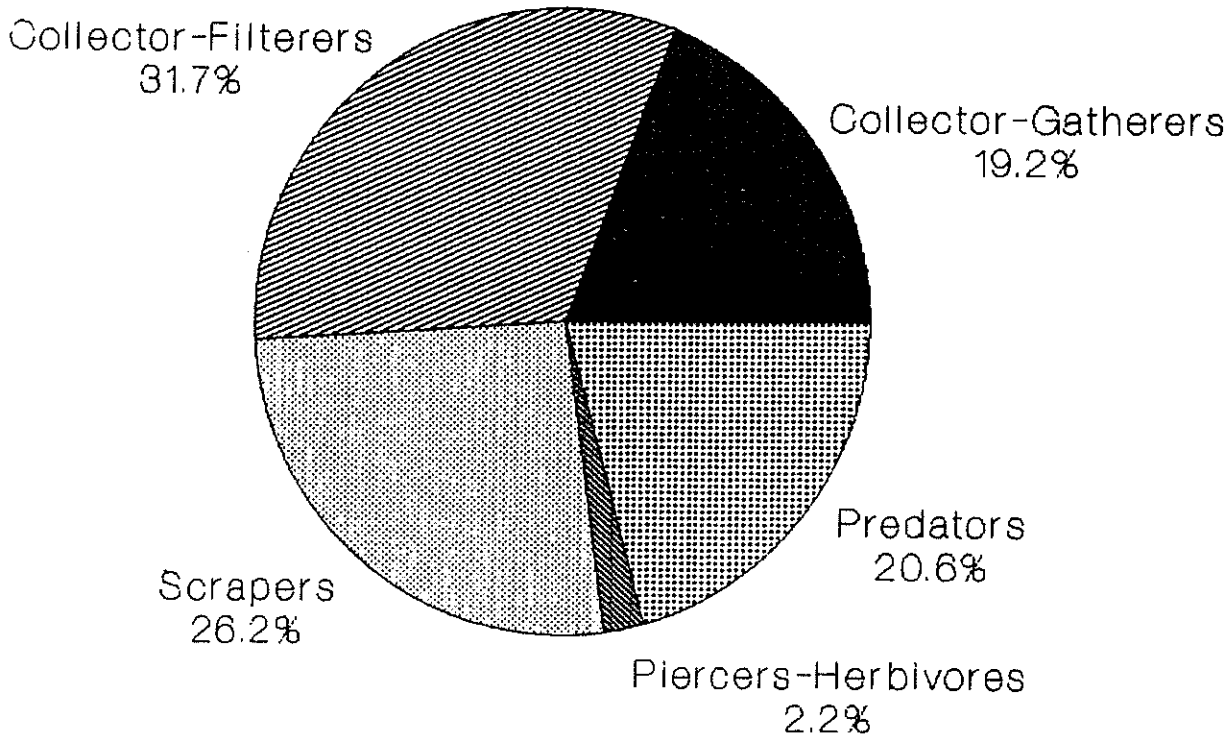

Figure 25. Functional feeding groups from Cedar Draw at Pole Line Road (Station CD-3), August 1984.

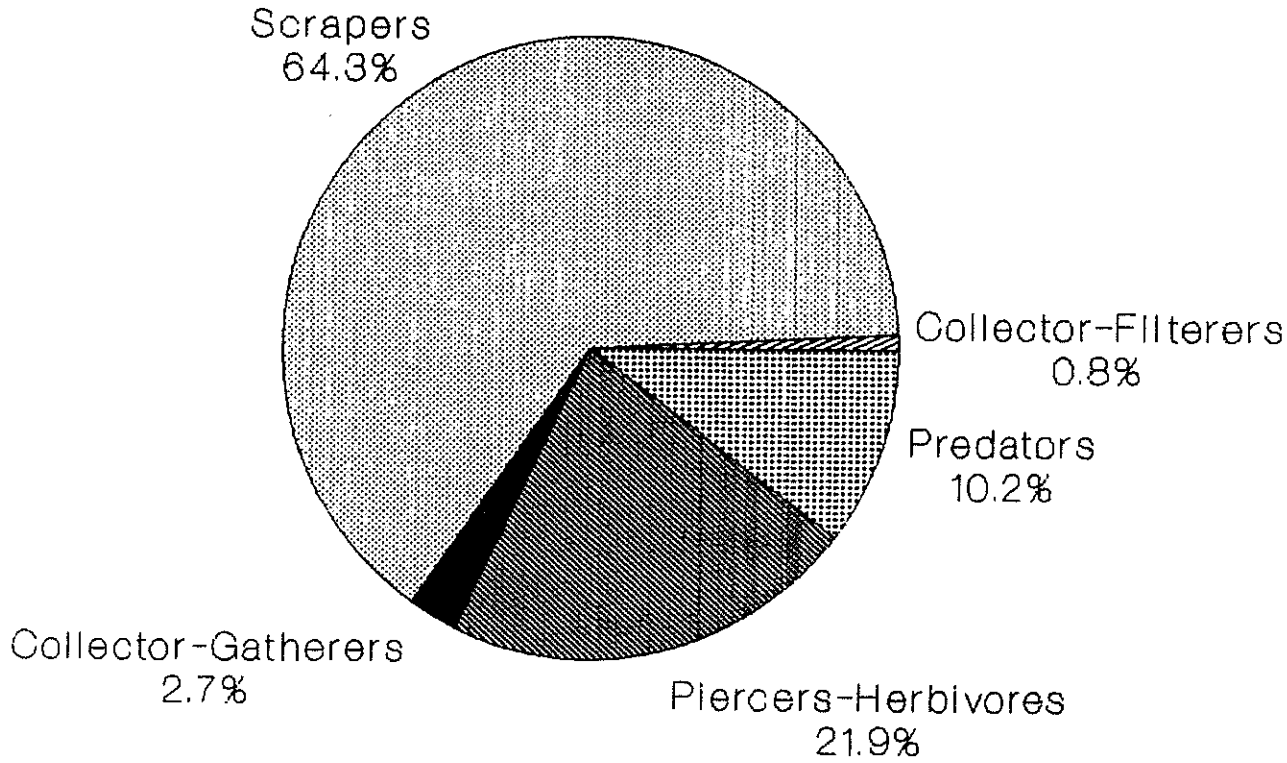

Figure 26. Functional feeding groups from Cedar Draw at Pole Line Road (Station CD-3), August 1987.

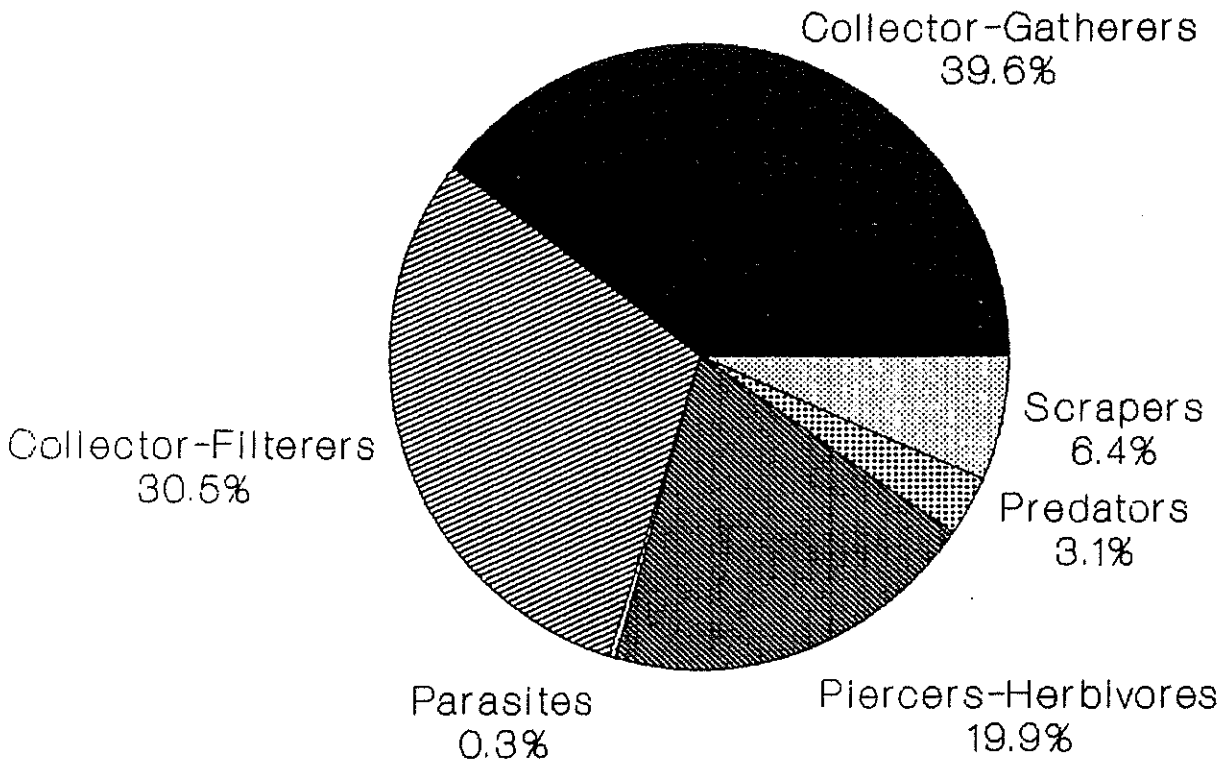

Figure 27. Functional feeding groups from Cedar Draw at mouth (Station CD-1), August 1984.

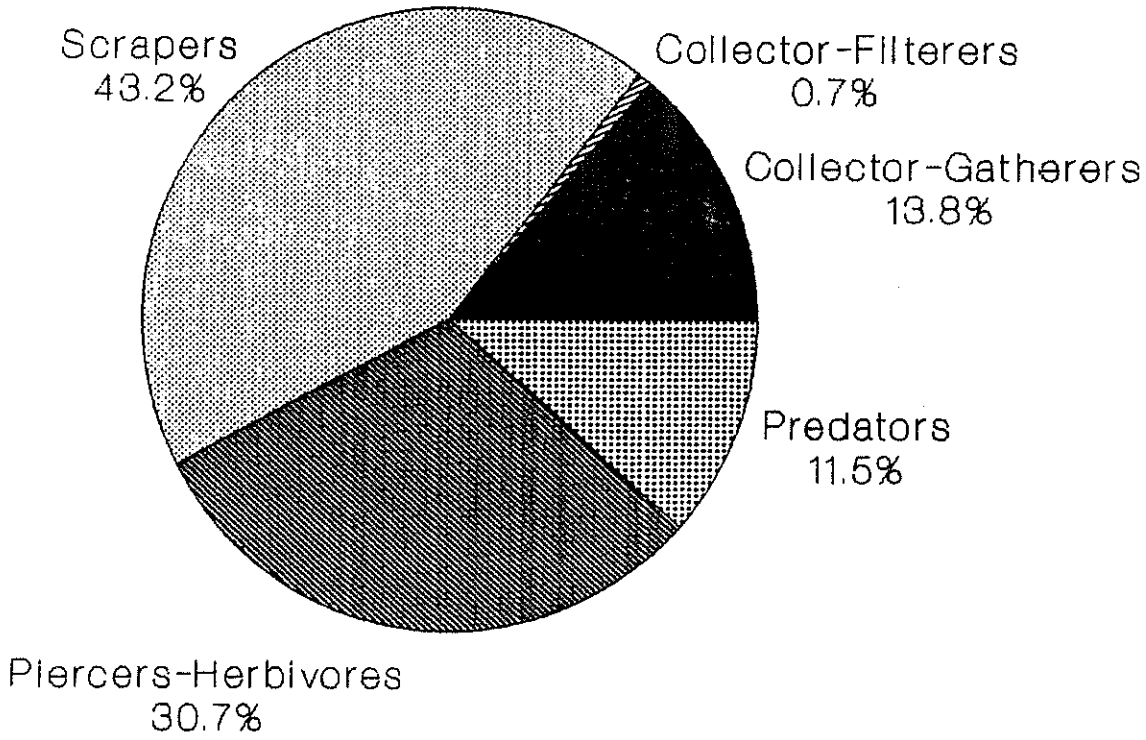

Figure 28. Functional feeding groups from Cedar Draw at mouth (Station CD-1), August 1987.

TABLE 1. Stream Sample Stations for Cedar Draw.

Station #	STORET #	Description	Latitude/Longitude	Elevation
CD-1	2060153	Cedar Draw near mouth near Crystal Springs	42 39'05"/114 39'32"	3100'
CD-3	2060155	Cedar Draw bl Poleline Rd. NW of Filer	42 35'52"/114 38'00"	3610'
CD-5	2060157	Low Line Canal W. of Filer	42 32'50"/114 40'30"	3922'
ADDITIONAL SAMPLE STATIONS OF PREVIOUS MONITORING STUDIES:				
____	2060021	Cedar Draw @ USGS, NW of Filer near Buhl	42 37'25"/114 39'10"	3540'
____	2060154	Cedar Draw @ Rest Area W of Filer	42 34'00"/114 37'25"	3770'

TABLE 2. Rating Table for Cedar Draw at Low Line Canal.
STORET (2060157)
Discharge of Standard Cipolletti Weir
Computed from the Formula ($Q = 3.367\ LH^{3/2}$)
Process Date August 8, 1987

	00	01	02	03	04	05	06	07	08	09
0.10	1.28	1.48	1.68	1.90	2.12	2.34	2.58	2.84	3.08	3.24
0.20	3.62	3.88	4.16	4.46	4.76	5.06	5.36	5.66	5.98	6.30
0.30	6.64	6.98	7.32	7.66	8.00	8.36	8.72	9.10	9.46	9.84
0.40	10.22	10.60	11.00	11.40	11.80	12.20	12.60	13.12	13.44	13.86
0.50	14.28	14.72	15.12	15.58	16.04	16.48	16.94	17.38	17.84	18.30
0.60	18.78	19.24	19.72	20.20	20.68	21.18	21.66	22.16	22.66	23.16
0.70	23.66	24.16	24.68	25.20	25.72	26.24	26.76	27.30	27.84	28.36
0.80	28.90	29.46	30.00	31.54	31.10	31.66	32.22	32.78	33.36	33.92
0.90	34.50	35.08	35.66	36.24	36.82	37.40	38.00	38.60	39.20	39.80
1.00	42.20	41.00	41.62	42.24	42.84	43.46	44.10	44.72	45.32	45.98
1.10	46.60	47.24	47.88	48.52	49.18	49.82	50.48	51.12	51.78	52.66
1.20	53.32	53.78	54.44	55.12	55.98	56.46	57.14	57.82	58.50	59.20
1.30	59.88	60.58	61.26	61.96	62.66	63.36	64.08	64.78	65.50	66.20
1.40	66.92	67.64	68.36	69.08	69.82	70.54	71.28	72.00	72.64	73.48
1.50	74.22	74.96	75.70	76.46	77.20	77.87	78.72	79.48	80.24	81.00

TABLE 3. Water Quality Index (WQI)[a] Summary for Cedar Draw 1982-88. Values Represent Annual WQI Scores with the Worst Three Month Period in Parentheses.

Station	Year						
	1982	1983	1984	1985	1986	1987	1988
Low Line Canal	--[b]	44 (Jul-Sept)	45 (Mar-May)	39 (May-Jul)	57 (Jul-Sept)	41.0 (Feb-Apr)	43 (Jul-Aug)
Pole Line Road	22 (Jul-Sept)	--	30 (Aug-Oct)	62 (Jan-Mar)	35 (Jul-Sept)	41 (May-Jul)	--
Mouth	78 (Jul-Sept)	72 (Jun-Aug)	70 (Jun-Aug)	60 (Jul-Sept)	65 (Jun-Aug)	63 (Aug-Oct)	54 (May-Jul)

[a]Water Quality Index	Rating	Definition
0-20	Good	Water quality is high Beneficial uses supported
21-60	Fair	Water quality partially supporting uses
61-100	Poor	Water quality poor Uses not supported

[b]--Insufficient Data

TABLE 4. Summary of Variations from water Quality Criteria for Cedar draw below Low Line Canal from May 1982 to June 1988.

Variation From Criteria	Parameter				
	Dissolved Oxygen mg/L	Unionized Ammonia mg/L	Nitrate + Nitrate mg/L	Total Phosphorus mg/L	Fecal Coliform Bacteria colonies/100ml
No. of Values	11	0	67	83	82
Mean	7.282	0.0000	0.359	0.1839	127.99
Median	6.700	------	0.059	0.1300	40.00
No Variations	2	0	11	81	35.00
Percent Variation	18	0	16	98	43.00
Minimum Variation	5.500	0.0000	0.496	0.0600	60.00
Mean Variation	5.650	0.0000	1.877	0.1872	267.14
Maximum Variation	5.800	0.0000	4.660	2.0000	1680.0
Minimum Criteria	6.000	------	------	-------	------
Maximum Criteria	-----	0.200	0.300	0.050	50.0

TABLE 5. Summary of Variations from Water Quality Criteria for Cedar Draw at the Mouth from May 1982 to June 1988.

Variation From Criteria	Parameter			
	Dissolved Oxygen mg/L	Nitrate + Nitrate mg/L	Total Phosphorus mg/L	Fecal Coliform Bacteria colonies/100ml
No. of values	41	81	100	100
Mean	9.1	2.02	0.236	400
Median	8.7	1.56	0.200	270
No variations	1	71	96	76
Percent Variation	28	88	96	76
Minimum Variation	5.7	0.56	0.060	60
Mean Variation	5.7	2.30	0.242	521
Maximum Variation	5.7	9.08	.740	2900
Minimum Criteria	6.0	--	--	--
Maximum Criteria	--	0.30	0.050	50

TABLE 6. Summary of Variations from Water Quality Criteria for Cedar Draw at the Mouth from May 1982 to June 1988.

Variation From Criteria	Parameter			
	Dissolved Oxygen mg/L	Nitrate + Nitrate mg/L	Total Phosphorus mg/L	Fecal Coliform Bacteria colonies/100ml
No. of values	42	2*	3*	4*
Mean	8.5	0.84	0.496	45
Median	8.4	0.84	0.390	35
No variations	2	2	3	1
Percent Variation	5	100	100	25
Minimum Variation	5.5	0.66	0.100	90
Mean Variation	5.6	0.84	0.497	90
Maximum Variation	5.7	1.02	1.000	90
Minimum Criteria	6.0	--	--	--
Maximum Criteria	--	0.30	0.050	50

*Insufficient sample size to allow comparison with the other two sample sites.

TABLE 7. Water Quality Criterial used to Evaluate Water Quality Data Collected on Cedar Draw 1982-1988

Storet Code	Parameter		Criteria	
	Name	Unit	Lower Limit	Upper Limit
00300	Dissolved Oxygen	mg/L	6.0	---
00612	Unionized Ammonia as N	mg/L	---	0.02
00630	Nitrate + Nitrite a N	mg/L	---	0.30
00665	Total Phosphorus as P	mg/L	---	0.05
31616	Fecal Coliform Bacteria	Colonies/100 ml	---	50

TABLE 8. Loadings for Suspended Sediment and Total Phosphorus, Mean Discharge and Estimated Agricultural Contribution for Cedar Draw at the Mouth (Station CD-1) for the Irrigation Season (April - October) 1982-1988. Low Line Canal Loadings were used as background values to calculate agricultural contributions.

	Low Line Canal				Mouth				Estimated Agricultural Contribution	
	MD[a] (cfs)	TPL (tons)	SSL (tons)	N	MD (cfs)	TPL (tons)	SSL (tons)	N	Total Phosphorus	Suspended Sediment
1982	63.6	5.8	3942	8	91.5	20.5	5196.4	7	14.7	1254.4
1983	60	11.8	2759.2	12	158.8	16.7	7877.9	9	4.9	5118.7
1984	58.5	5.2	2761.6	10	161.6	18.9	15965.2	9	13.7	13203.6
1985*	291	12.6	1461.7	2	220.9	32.3	11758.8	14	19.7	10297.1
1986**	204.1	20.6	10164.5	13	127	17.1	11013.1	3	0	848.6
1987	54.1	3	1479.1	11	130.9	14.7	8764	13	11.7	7284.9
1988***	48	3.5	1941.8	4	73	9	3164.3	4	5.5	1222.5

*Sept-Oct only
**April, Oct., and Dec. only
***April-May only

[a]MD = Mean Discharge
TPL = Total Phosphorus Loading
SSL = Suspended Sediment Loading
N = Number of Measurements

TABLE 9. Fecal Coliform Bacteria Densities (Colonies/100 ml) for Cedar Draw at the Low Line Canal and Mouth (Monthly and Annual Geometric means) and the estimated agricultural contributions, 1982-1988.

Month	Sample Station/Year: Low Line Canal	Mouth	Estimated Agricultural Contribution
	1982		
May	17.3	414.7	
June	131	360.5	
July	140.7	89.4	
August	70	2300	
September	30	20	
October	18	70	
1982 MEAN	58.9	129.2	70.3
	1983		
April	20	17.3	
May	80.6	363.3	
June	89.4	871.8	
July	34.6	547.7	
August	338	872.8	
September	140	520	
October	87.8	130	
1983 MEAN	87.7	322.4	234.7

TABLE 9 CONTINUED.

Month	Low Line Canal	Mouth	Estimated Agricultural Contribution
	Sample Station/Year		
	1984		
May	199.9	282.8	
June	120	836.7	
July	28.3	458.3	
August	80	1000	
September	50	380	
October	20.5	265.3	
1984 MEAN	61.5	372	310.5
	1985		
April	10	100	
May	34.2	306.5	
June	30	204.9	
July	28.8	252	
August	24.5	774.6	
September	24.5	273.9	
October	14.1	54.8	
1985 MEAN	24	229.7	205.7

TABLE 9 CONTINUED.

Month	Sample Station/Year: Low Line Canal	Sample Station/Year: Mouth	Estimated Agricultural Contributions
		1986	
April	31.6	170	
May	89.4	187.1	
June	121.6	452.7	
July	164.3	141.4	
August	63.2	94.9	
September	117.4	18.2	
October	370	10	
1986 MEAN	86.2	100	13.8
		1987	
April	20	313	
May	18.2	457.9	
June	43.1	215.4	
July	70.7	387.3	
August	44.7	264.6	
September	42.7	746.5	
October	19	750	
1987 MEAN	35	391.8	356.8
		1988	
April	10	180	
May	44.8	911	
June	270	290	
1988 MEAN	47.5	524	476.5

TABLE 10. Checklist of benthic macroinvertebrates collected from Cedar Draw, 1984-1988. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, and functional feeding groups (FFG), are from Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	At Pole Line Rd. (CD-3)	At Mouth (CD-1)	TV[a]	FFG[b]
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.	X	X	1	CG
Brachycentrus sp.	X	X	1	CG/OM
Oligoplectrum sp.		X	1	CG
Helicopsychidae				
Helicopsyche borealis (Hagen)		X	3	SC
Hydroptilidae				
Hydroptila sp.	X	X	6	PH
Leucotrichia sp.	X	X	5	SC
Hydropsychidae				
Hydropsyche sp.	X	X	4	CF
Leptoceridae				
Nectopsyche sp.		X	4	SH
EPHEMEROPTERA				
Baetidae				
Baetis sp.		X	5	CG/OM
Baitis tricaudatus Dodds	X	X	5	CG/OM
Ephemerellidae				
Ephimerella inermis Eaton	X	X	1	CG
Tricorythidae				
Tricorythodes minutus Traver	X	X	4	CG
DIPTERA				
Chironomidae	X	X	6	CG/OM
Simulidae				
Simulium sp.	X	X	6	CF

TABLE 10 CONTINUED.

Taxon	At Pole Line Rd. (CD-3)	At Mouth (CD-1)	TV[a]	FFG[b]
COLEOPTERA				
Elmidae				
Optioservus sp.	X	X	4	SC
LEPIDOPTERA				
Pyralidae				
Petrophila sp.		X	5	SC
ODONATA				
Coenagrionidae				
Ischnura sp.	X	X	7	PR
HIRUDINEA	X	X	10	PR
NEMATODA	X	X	5	PA
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	X	X	5	CG
TURBELLARIA				
Tricladida				
Planariidae	X	X	4	PR
GASTROPODA				
Hydrobiidae				
Fontelicella sp.	X	X	8	SC
Fluminicola virens (Lea)	X	X	5	SC
Lymnaeidae				
Fossaria sp.		X	6	SC
Lymnaea sp		X	6	SC
Physidae				
Physa sp.	X	X	8	SC

TABLE 10 CONTINUED.

Taxon	At Pole Line Rd. (CD-3)	At Mouth (CD-1)	TV[a]	FFG[b]
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	X	X	8	CF
Piscidium sp.	X	X	8	CF
CRUSTACEA				
Gammaridae				
Gammarus sp.	X	X	4	CF
Talitridae				
Hyalella azteca (Saussure)	X	X	8	CG
ACARI		X	8	PR
Total Numbers of taxa	23	31		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
SC = Scraper
PH = Piercer Herbivore
PR = Predator
SH = Shredder
PA = Parasite

TABLE 11. Macroinvertebrates collected from near the mouth of Cedar Draw (Station CD-1) in March of 1984, 1985, 1986 and 1988. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, and functional feeding groups (FFG), are from Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1984	1985	1986	1988	TV[a]	FFG[b]
TRICHOPTERA						
Brachycentridae						
Brachycentrus sp.	20.0		76.7	340.0	1	CG/OM
Oligoplectrum sp.			13.3		1	CG
Helicopsychidae						
Helicopsyche borealis (Hagen)			6.7		3	SC
Hydroptilidae						
Hydroptila sp.		6.7			6	PH
Leucotrichia sp.	13.3	23.3			5	SC
Hydropsychidae						
Hydropsyche sp.	1033.3	333.3	946.7	9300.0	4	CF
Leptoceridae						
Nectopsyche sp.			16.7		4	SH
EPHEMEROPTERA						
Baetidae						
Baetis sp.	10.0				5	CG/OM
Baetis tricaudatus Dodds	3640.0	526.7	680.0	486.7	5	CG/OM
Ephemerellidae						
Ephemerella inermis Eaton	10.0	23.3	13.3		1	CG
Tricorythidae						
Tricorythodes minutus Traver	10.0				4	CG
DIPTERA						
Chironomidae	200.0	303.3	40.0	10.0	6	CG/OM
Simulidae						
Simulium sp.	36.7	10.0		6.7	6	CF

TABLE 11 CONTINUED.

Taxon	1984	1985	1986	1988	TV[a]	FFG[b]
COLEOPTERA						
Elmidae						
optioservus sp.	150.0	40.0	16.7	86.7	4	SC
HIRUDINEA	3.3	70.0			10	PR
NEMATODA	10.0				5	PA
OLIGOCHAETA						
Tubificidae						
Tubifex sp.	60.0	76.7			5	CG
TURBELLARIA						
Tricladida						
Planariidae	60.0		3.3		4	PR
GASTROPODA						
Hydrobiidae						
Fontelicella sp.		3.3		3.3	8	SC
Fluminicola virens (Lea)		103.3		6.7	5	SC
Lymnaeidae						
Fossaria sp.	3.3				6	SC
Physidae						
Physa sp.		13.3			8	SC
PELECYPODA						
Sphaeriidae						
Sphaerium sp.	13.3	20.0			8	CF
Piscidium sp.	6.7	26.7			8	CF
CRUSTACEA						
Gammaridae						
Gammarus sp.						

TABLE 11 CONTINUED.

Taxon	1984	1985	1986	1988	TV[a]	FFG[b]
Talitridae						
Hyalella azteca (Saussure)	13.3	13.3			8	CG
ACARI	3.3				8	PR
Total number/m^2	5296.5	1593.2	1813.4	10240.1		
Species richness	19	16	10	8		
# of EPT taxa	7	5	7	3		
% of taxa that are EPT	36.8	31.2	70.0	37.5		
Mod. Hilsenhoff BI	4.8	5.3	4.2	3.95		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
SC = Scraper
PH = Piercer Herbivore
PR = Predator
SH = Shredder
PA = Parasite

TABLE 12. Macroinvertebrates collected from near the mouth of Cedar Draw (Station CD-1) in June of 1984, 1985, 1986 and 1987. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, and functional feeding groups (FFG), are from Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1984	1985	1986	1987	TV[a]	FFG[b]
TRICHOPTERA						
Brachycentridae						
Amiocentrus sp.		3.3		1050.0	1	CG
Brachycentrus sp.	10.0	253.3	390.0	2986.7	1	CG/OM
Hydroptilidae						
Hydroptila sp.	6.7	70.0	15.0	866.7	6	PH
Leucotrichia sp.	133.3		15.0		5	SC
Hydropsychidae						
Hydropsyche sp.	330.0	1533.3	385.0	350.0	4	CF
EPHEMEROPTERA						
Baetidae						
Baetis tricaudatus Dodds	190.0	2990.0	255.0	810.0	5	CG/OM
Ephemerellidae						
Ephemerella inermis Eaton	63.3	13.3			1	CG
DIPTERA						
Chironomidae	20.0	536.7	260.0	1083.3	6	CG/OM
Simulidae						
Simulium sp.	3.3		90.0	100.0	6	CF
COLEOPTERA						
Elmidae						
Optioservus sp.	26.7	306.7	30.0	53.3	4	SC
LEPIDOPTERA						
Pyralidae						
Petrophila sp.		13.3			5	SC

TABLE 12 CONTINUED.

Taxon	1984	1985	1986	1987	TV[a]	FFG[b]
ODONATA						
Coenagrioniidae						
Ischnura sp.		3.3			7	PR
HIRUDINEA	3.3		10.0		10	PR
NEMATODA			5.0		5	PA
GASTROPODA						
Hydrobiidae						
Fluminicola virens (Lea)				13.3	5	SC
Lymnaeidae						
Lymnaea sp.	3.3				6	SC
PELECYPODA						
Sphaeriidae						
Sphaerium sp.	3.3	13.3			8	CF
Piscidium sp.	10.0	13.3	10.0		8	CF
CRUSTACEA						
Talitridae						
Hyalella azteca (Saussure)	23.3			506.7	8	CG
Total number/m^2	826.5	5749.8	1465.0	7820.0		
Species richness	14	12	11	10		
# of EPT taxa	6	6	5	5		
% of taxa that are EPT	42.8	50	45.4	50		
Mod. Hilsenhoff BI	4.41	4.71	3.95	3.34		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
PR = Predator
PA = Parasite
PH = Piercer Herbivore
SC = Scraper

TABLE 13. Macroinvertebrates collected from near the mouth of Cedar Draw (Station CD-1) in August of 1984 and 1987. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1984	1987	TV[a]	FFG[b]
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.	196.7		1	CG
Brachycentrus sp.	106.7	463.3	1	CG/OM
Hydroptilidae				
Hydroptila sp.	1306.7	1080.0	6	PH
Leucotrichia sp.	216.7	76.7	5	SC
Hydropsychidae				
Hydropsyche sp.	1980.0	16.7	4	CF
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus Dodds	653.3		5	CG/OM
Tricorythidae				
Tricorythodes minutus Traver	476.7		4	CG
DIPTERA				
Chironomidae	236.7	20.0	6	CG/OM
Simulidae				
Simulium sp.	13.3		6	CF
COLEOPTERA				
Elmidae				
Optioservus sp.	173.3	336.7	4	SC
ODONATA				
Coenagrioniidae				
Ischnura sp.	6.7		7	PR
HIRUDINEA	66.7	13.3	10	PR
NEMATODA	20.0		5	PA
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	26.7		5	CG
TURBELLARIA				
Tricladida				
Planariidae	133.3	393.3	4	PR

TABLE 13 CONTINUED.

Taxon	1984	1987	TV[a]	FFG[b]
GASTROPODA				
Hydrobiidae				
Fontelicella sp.		733.3	5	SC
Fluminicola virens (Lea)		373.3	5	SC
Lymnaeidae				
Lymnaea sp.	13.3		6	SC
Physidae				
Physa sp.	16.7		8	SC
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	3.3		8	CF
Piscidium sp.		10.0	8	CF
CRUSTACEA				
Gammaridae				
Gammarus sp.		3.3	4	CG
Talitridae				
Hyallella azteca (Saussure)	896.7		8	CG
Total number/m^2	6543.5	3519.9		
Species richness	19	12		
# of EPT taxa	7	4		
% of taxa that are EPT	36.8	33.3		
Mod. Hilsenhoff BI	5.10	4.60		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
SC = Scraper
PH = Piercer Herbivore
PR = Predator
PA = Parasite

TABLE 14. Macroinvertebrates collected from near the mouth of Cedar Draw (Station CD-1) in November of 1986 and 1987. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index are found in Clark and Maret (1991). Functional feeding groups were determined based upon Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1986	1987	TV[a]	FFG[b]
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	413.3	12580.0	1	CG/OM
Hydropsychidae				
Hydropsyche sp.	2813.3	20826.7	4	CF
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus Dodds	1026.7	70.0	5	CG/OM
Ephemerillidae				
Ephemerella inermis Eaton	13.3		1	CG
DIPTERA				
Chironomidae	6.7	23.3	6	CG/OM
COLEOPTERA				
Elmidae				
Optioservus sp.	33.3		4	SC
LEPIDOPTERA				
Pyralidae				
Petrophila sp.		13.3	5	SC
TURBELLARIA				
Tricladida				
Planariidae	13.3		4	PR
GASTROPODA				
Physidae				
Physa sp.	3.3		8	SC
Total number/m^2	4323.2	33513.3		
Species richness	8	5		
# of EPT taxa	4	3		
% of taxa that are EPT	50	60		
Mod. Hilsenhoff BI	3.95	2.88		

[a]Tolerance values range from 1 - 10.
[b]Functional Feeding Group Designations
CF = Collector-Filterer
CG = Collector-Gatherer
SC = Scraper
PR = Predator
OM = Omnivore

TABLE 15. Macroinvertebrates collected from Cedar Draw at Pole Line Road (Station CD-3) in March 1985, 1986, 1987 and 1988. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, and functional feeding groups (FFG), are from Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1985	1986	1987	1988	TV[a]	FFG[b]
TRICHOPTERA						
Brachycentridae						
Amiocentrus sp.			1090.0		1	CG
Brachycentrus sp.		86.7	100.0	270.0	1	CG/OM
Hydroptilidae						
Hydroptila sp.	10.0			140.0	6	PH
Leucotrichia sp.				10.0	5	SC
Hydropsychidae						
Hydropsyche sp.	555.0	346.7	280.0	20.0	4	CF
EPHEMEROPTERA						
Baetidae						
Baetis tricaudatus Dodds	260.0	370.0	786.7	523.3	5	CG/OM
Ephemerellidae						
Ephemerella inermis Eaton	25.0	16.7	20.0	6.7	1	CG
Tricorythidae						
Tricorythodes minutus Traver				3.3	4	CG
DIPTERA						
Chironomidae	260.0	263.3	930.0	546.7	6	CG/OM
Simulidae						
Simulium sp.				13.3	6	CF
COLEOPTERA						
Elmidae						
Optioservus sp.	15.0		6.7	90.0	4	SC

TABLE 15 CONTINUED.

Taxon	1985	1986	1987	1988	TV[a]	FFG[b]
HIRUDINEA	85.0	50.0		6.7	10	PR
NEMATODA		13.3			5	PA
OLIGOCHAETA						
Tubificidae						
Tubifex sp.	35.0	26.7		6.7	5	CG
TURBELLARIA						
Tricladida						
Planariidae	5.0				4	PR
GASTROPODA						
Hydrobiidae						
Fontelicella sp.				1070.0	8	SC
Fluminicola virens (Lea)	165.0	40.0		73.3	5	SC
Physidae						
Physa sp.	5.0		3.3		8	SC
PELECYPODA						
Sphaeriidae						
Sphaerium sp.	20.0			50.0	8	CF
Piscidium sp.	15.0	16.7		6.7	8	CF
CRUSTACEA						
Talitridae						
Hyalella azteca (Saussure)	10.0				8	CG

TABLE 15 CONTINUED.

	1985	1986	1987	1988	TV[a]	FFG[b]
Total number/m^2	1465.0	1230.1	3216.7	2836.7		
Species richness	14	10	8	16		
# of EPT taxa	4	4	5	7		
% of taxa that are EPT	28.6	40.0	62.5	43.7		
Mod. Hilsenhoff BI	5.12	4.83	3.69	6.02		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
SC = Scraper
PH = Piercer Herbivore
PR = Predator
PA = Parasite

TABLE 16. Macroinvertebrates collected from Cedar Draw at Pole Line Road (Station CD-3) in June 1984, 1986 and 1987. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, and functional feeding groups (FFG), are from Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1984	1986	1987	TV[a]	FFG[b]
TRICHOPTERA					
Brachycentridae					
Amiocentrus sp.			200.0	1	CG
Brachycentrus sp.		73.3	1220.0	1	CG/OM
Hydroptilidae					
Hydroptila sp.	26.7	3.3	110.0	6	PH
Leucotrichia sp.	346.7	3.3		5	
Hydropsychidae					
Hydropsyche sp.	2180.0	126.7	90.0	4	CF
EPHEMEROPTERA					
Baetidae					
Baetis tricaudatus Dodds	893.3	276.7	366.7	5	CG/OM
Tricorythidae					
Tricorythodes minutus Traver	26.7		13.3	4	CG
DIPTERA					
Chironomidae	53.3	410.0	733.3	6	CG/OM
Simulidae					
Simulium sp.	26.7	230.0	26.7	6	CF
COLEOPTERA					
Elmidae					
Optioservus sp.	80.0	16.7	10.0	4	SC
HIRUDINEA	280.0			4	PR

TABLE 16 CONTINUED.

Taxon	1984	1986	1987	TV[a]	FFG[b]
TURBELLARIA					
Tricladida					
Planariidae	10.0			4	PR
GASTROPODA					
Physidae					
Physa sp.	13.3			8	SC
PELECYPODA					
Sphaeriidae					
Sphaerium sp.	53.3			8	CF
Piscidium sp.	26.7	3.3	13.3	8	CF
CRUSTACEA					
Gammaridae					
Gammarus sp.	240.0			4	CG
Talitridae					
Hyalella azteca (Saussure)	80.0	3.3	93.3	8	CG
Total number/m^2	4326.7	1156.6	2876.6		
Species richness	14	11	11		
# of EPT taxa	5	5	6		
% of taxa that are EPT	35.7	45.4	54.5		
Mod. Hilsenhoff BI	4.88	5.19	3.39		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
SC = Scraper
PH = Piercer Herbivore
PR = Predator
PA = Parasite

TABLE 17. Macroinvertebrates collected from Cedar Draw at Pole Line Road (Station CD-3) in August 1984, 1985 and 1987. Station values are mean densities per square meter as determined from three replicate Hess samples. Tolerance values (TV) used to calculate the Modified Hilsenhoff Biotic Index, and functional feeding groups (FFG), are from Clark and Maret (1991), Merritt and Cummins (1988), and Pennak (1989).

Taxon	1984	1985	1987	TV[a]	FFG[b]
TRICHOPTERA					
Brachycentridae					
Brachycentrus sp.	26.7	190.0	203.3	1	CG/OM
Hydroptilidae					
Hydroptila sp.	63.3	90.0	2040.0	6	PH
Leucotrichia sp.	670.0	310.0	1070.0	5	SC
Hydropsychidae					
Hydropsyche sp.	780.0	1170.0	36.7	4	CF
EPHEMEROPTERA					
Baetidae					
Baetis tricaudatus Dodds	93.3	60.0		5	CG/OM
Tricorythidae					
Tricorythodes minutus Traver	90.0	145.0		4	CG
DIPTERA					
Chironomidae	116.7	145.0	43.3	6	CG/OM
Simulidae					
Simulium sp.		10.0	33.3	6	CF
COLEOPTERA					
Elmidae					
Optioservus sp.	63.3	245.0	403.3	4	SC

TABLE 17 CONTINUED.

Taxon	1984	1985	1987	TV[a]	FFG[b]
ODONATA					
Coenagrionidae					
Ishnura sp.		10.0	3.3	7	PR
HIRUDINEA	563.3	65.0	330.0	10	PR
OLIGOCHAETA					
Tubificidae					
Tubifex sp.	23.3	5.0		5	CG
TURBELLARIA					
Tricladida					
Planariidae	30.0		620.0	4	PR
GASTROPODA					
Hydrobiidae					
Fontelicella sp.		10.0	3546.7	8	SC
Fluminicola virens (Lea)		60.0	980.0	5	SC
Physidae					
Physa sp.	20.0	5.0	3.3	8	SC
PELECYPODA					
Sphaeriidae					
Sphaerium sp.	96.7	30.0	3.3	8	CF
Piscidium sp.	33.3		3.3	8	CF
CRUSTACEA					
Gammaridae					
Gammarus sp.	160.0		6.7	4	CG
Talitridae					
Hyalella azteca (Saussure)	43.3	5.0		8	CG

TABLE 17 CONTINUED.

Taxon	1984	1985	1987	TV[a]	FFG[b]
Total number/m^2	2873.2	2555.0	9326.5		
Species richness	16	17	16		
# of EPT taxa	6	6	4		
% of taxa that are EPT	37.5	35.3	25.0		
Mod. Hilsenhoff BI	5.82	4.38	6.35		

[a]Tolerance values range from 1 - 10.

[b]Functional Feeding Group Designations

CF = Collector-Filterer
CG = Collector-Gatherer
OM = Omnivore
SC = Scraper
PH = Piercer Herbivore
PR = Predator
PA = Parasite

Table 18. Fish species collected from the two Cedar Draw stations, 1982-1988.

	Poleline Road	Near Mouth
Salmonidae	X	X
Rainbow Trout		
Oncorhynchus mykiss (Walbaum)		
Cyprinidae	X	
Speckled Dace		
Rhinichthys osculus (Girard)		
Redside Shiner	X	X
Richardsonius balteatus (Richardson)		
Carp		X
Cyprinus carpio Linneaus		
Cottidae	X	X
Mottled Sculpin		
Cottus bairdi Girard		

Table 19. Fish community analysis for samples collected from Cedar Draw near Pole Line Road, 1982-1988.

	1982	1985	1986	1987	1988
	Rainbow trout				
Actual number collected	6	6	2	9	44
Average length (cm)	33	30	39	20.6	26.5
Range in lengths (cm)	24-45	22-38	37-41	5.4-44	15.5-31
Average weight (gm)	523	343	684	252.6	238.3
Range in weights	195-1300	150-590	542-825	6.1-988	105-408
% composition in sample	0.9	0.4	0.5	0.5	7.3
% wild	50	100	100	66.7	97.7
Standing crop (Fish/ha)	40	40	40	90	400
Biomass (Kg/ha)	19.6	12.0	32.0	22.0	101.7
	Non-game species*				
Actual number collected	1584	915	393	1863	552
Average length (cm)	--	--	--	--	--
Range in lengths (cm)	--	--	--	--	--
Average weight (gm)	1.2	8	8.7	11.86	12.6
Range in weights	0.5-60	2.550	1.5-67.5	--	--
% composition in sample	99.1	99.6	99.5	99.6	92.7
Standing crop (Fish/ha)	9900	6000	800	18,100	5300
Biomass (Kg/ha)	79	46	8	214	68

Table 20. Nongame fish species collected from Cedar Draw near Pole Line Road, 1987-1988.

	1987	1988
SPECKLED DACE		
Number collected	1150	71
Average length (cm)	--	--
Range of lengths (cm)	--	--
Average weight (gm)	11.1	14.8
Range of weights (gm)	--	--
% composition in sample	61.4	11.9
Standing Crop (fish/ha)	11,000	700
Biomass (kg/ha)	123	10.2
MOTTLED SCULPIN		
Number collected	32	142
Average length (cm)	14.4	9.8
Range of lengths (cm)	10-18	6.5-17.5
Average weight (gm)	59.1	16.6
Range of weights (gm)	22-107.5	3.8-83.5
% composition in sample	1.7	23.8
Standing Crop (fish/ha)	310	1400
Biomass (kg/ha)	18	22.8
REDSIDE SHINER		
Number collected	681	339
Average length (cm)	--	--
Range of lengths (cm)	--	--
Average weight (gm)	10.9	10.5
Range of weights (gm)	--	--
% composition in sample	36.5	56.9
Standing Crop (fish/ha)	6600	3300
Biomass (kg/ha)	72.4	34.6

Table 21. Fish community analysis for samples collected at the mouth of Cedar Draw, 1982-1988.

	1982	1985	1986	1987	1988
	Rainbow trout				
Actual number collected	161	19	28	17	21
Average length (cm)	26	29.7	29	18.7	25.8
Range in lengths (cm)	15-40	18-41	28-30	4.3-48	19-29
Average weight (gm)	162	316	271.5	238.9	201.3
Range in weights	36-560	80-600	206-338	6-1159	93-262
% composition in sample	92	13	41	7.9	30.4
% wild	50	74	93	94	100
Standing crop (fish/ha)	900	90	90	200	250
Biomass (kg/ha)	153	27	25	34.6	50.4
	Non-game species*				
Actual number collected	16	99	396	196	48
Average length (cm)	--	--	--	--	9.8
Range in lengths (cm)	--	--	--	--	7-14
Average weight (gm)	1.2	8	55.3	20.8	13.8
Range in weights	8-100	6-700	15-825	--	4.8-45.7
% composition in sample	8	87	59	92.1	69.6
Standing crop (fish/ha)	90	600	200	2300	600
Biomass (kg/ha)	1.8	13	15.3	48.6	138

*In 1987 and 1988 only mottled sculpins were collected at this site.

TABLE 22. Pesticides commonly used in the Twin Falls County, area. See (Clark 1988a) for a list of the pesticides including other names commonly used, chemical names, and use information.

	Trade Name	Common Name
Insecticide:	Temik	aldicarb
	Cygon	dimethoate
	Diazinon	diazinon
	Di-syston	disulfoton
	Furadan*	carbofuran
	Guthion	azinphosmethyl
	Malathion	malathion
	Sevin*	carbaryl
	Thimet	phorate
	Pounce*	permethrin
Herbicide:	Atrazine	atrazine
	Avenge*	difenzoquat methyl sulfate
	Banvel	dicamba
	Dacthal	DCPA
	Eptom*	EPTC
	Kerb*	pronamide
	Lasso	alachlor
	Ro-neet*	cycloate
	Roundup*	glyphosate
	Simizine	simizine
	Sonalan	ethalfluralin
	Surflan*	oryzalin
	Tillam*	pebulate
	Treflan	trifluralin
	Velpar	hexazinone
	2, 4-D	2, 4-D
Fungicide:	Bayleton*	triadimefon
	Benomyl	benomyl
	Captan	captan
	Polygram*	metiram
Algicide:	Magnacide H*	acrolein
	copper sulfate	copper sulfate
	xylene	xylene

*State laboratory did not have capability to analyze these compounds (8/26/86).

TABLE 23. The following organic compounds (mainly pesticides) have been detected by the State of Idaho Bureau of Laboratories from fish samples collected in Cedar Draw.

	Trade Name	Common Name
Insecticide:	DDT	DDT
	o.p. DDT	DDT
	p.p' DDT	DDT
	o.p' DDD	analog of DDT
	p.p' DDD	analog of DDT
	p.p' DDE	analog of DDT
	Dieldrin	dieldrin
	Endosulfan	benzoepin
	Endrin	endrin
	Heptachlor	heptachlor
	Heptachlor epoxide	--
	Hexachlor	alpha BHC
	Hexachlor	beta BHC
	Lindane	gamma BHC
	Methoxychlor	methoxychlor
	Nonachlor	nonachlor
	Oxychlordane	chlordane
	Toxaphene	toxaphene
	Phthalate	dimethyl
Herbicide:	Banvel	dicamba
	Dacthal	DCPA
	2, 4-D	2, 4-D
Fungicide:	Pentachlorophenol	penta

TABLE 24. Results of pesticide analysis of water samples collected at Cedar Draw stations CD-1 and CD-5, June 8, 1987. Values are in ppm.

	CD-1	CD-5
Lindane	trace	--
Phthalate	trace	--
2,4-D	0.814	0.241
Dicamba	--	--
Silvex	--	--
Dinoseb	--	--
Tordon	--	--

-- = Below detectable limits.

TABLE 25. Pesticide Residues in Rainbow Trout and Mottled Sculpin from Cedar Draw (CD-3), March 19, 1987. Pesticide values are in ppm.

	Rainbow Trout					Mottled Sculpin (composite)*
	#1	#2	#3	#4	#5	
Length (cm)	44	37	27.5	23	31	17.9
Weight (g)	988	514	239	135	355	101.7
PESTICIDES:						
Total PCBs (1254)	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--
Endrin	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--
Total DDT & Analogs	0.084	0.006	0.012	0.004	0.007	0.014
o.p.DDE	--	--	--	--	--	--
p.p'DDE	0.084	0.006	0.012	0.004	0.007	0.014
o.p.DDD	--	--	--	--	--	--
p.p'DDD	--	--	--	--	--	--
o.p.DDT	--	--	--	--	--	--
p.p'DDT	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--
Total Chlordane	--	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--	--
trans is. of nonachlor	--	--	--	--	--	--
Lindane	--	--	--	--	--	--
Hexachlorocyclohexane						
alpha BHC isomer	--	0.017	--	0.041	--	--
Oxychlondane	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--

TABLE 25 CONTINUED. Pesticide Residues in Rainbow Trout and Mottled Sculpin from Cedar Draw (CD-3), March 19, 1987. Pesticide values are in ppm.

	Rainbow Trout					Mottled Sculpin (composite)*
	#1	#2	#3	#4	#5	
Dacthal	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--
Hexachlorocyclohexane gamma isomer	--	--	--	--	--	--
DCPA	--	0.006	--	0.005	--	--

*Results are from a composite sample of 5 fish. Listed length & weight are means for these 5 fish.

-- = Below Detectable Limits.

TABLE 26. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-3), March 17, 1988. Results in ppm.

	Rainbow Trout				
	#1	#2	#3	#4	#5
Length (cm)	29	27.5	27	28	27.5
Weight (g)	320	268	256.5	259	262
PESTICIDES:					
Total PCBs (1254)	--	--	--	--	--
Aldrin	--	--	--	--	--
Endrin	--	--	--	--	--
Dieldrin	--	--	0.003	0.002	--
Methoxychlor	--	--	--	--	--
Total DDT & Analogs	0.043	0.038	0.013	0.019	0.036
o.p. DDE	--	--	--	--	--
p.p' DDE	0.032	0.035	0.007	0.019	0.036
o.p. DDD	--	--	--	--	--
p.p' DDD	--	--	0.003	--	--
o.p. DDT	--	--	--	--	--
p.p' DDT	0.011	0.003	0.003	--	--
Pentachlorophenol	--	--	--	--	--
Total Chlordane	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--
trans is. of nonachlor	--	--	--	--	--
Lindane	--	--	--	--	--
Hexachlorocyclohexane					
alpha BHC isomer	--	--	--	--	--
Oxychlondane	--	--	0.019	0.002	--
Heptachlor	--	--	0.010	0.007	0.007
Toxaphene	--	--	--	--	--
Endosulfan I	--	--	0.002	--	--

TABLE 26 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-3), March 17, 1988. Results in ppm.

	Rainbow Trout				
	#1	#2	#3	#4	#5
Dacthal	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--

-- = Below Detectable Limits.

TABLE 26 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-3), March 17, 1988. Results in ppm.

	Rainbow Trout				
	#6	#7	#8	#9	#10
Length (cm)	26.5	27	28	24	25
Weight (g)	232	263	205	197	216
PESTICIDES:					
Total PCBs (1254)	--	--	--	--	--
Aldrin	--	--	--	--	--
Endrin	--	--	--	--	--
Dieldrin	0.005	--	--	--	--
Methoxychlor	--	--	--	--	--
Total DDT & Analogs	0.039	0.049	0.007	0.066	0.032
o.p. DDE	--	--	--	--	--
p.p' DDE	0.033	0.047	0.005	0.057	0.029
o.p. DDD	--	--	--	--	--
p.p' DDD	0.003	0.001	--	0.005	--
o.p. DDT	--	--	--	--	--
p.p' DDT	0.003	0.001	0.002	0.004	0.003
Pentachlorophenol	--	--	--	--	--
Total Chlordane	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--
trans is. of nonachlor	--	--	--	--	0.002
Lindane	--	--	--	--	--
Hexachlorocyclohexane alpha BHC isomer	--	--	--	--	--
Oxychlondane	--	0.002	0.003	--	--
Heptachlor	0.019	--	--	--	--
Toxaphene	--	--	--	--	--
Endosulfan I	--	--	--	--	--

TABLE 26 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-3), March 17, 1988. Results in ppm.

	Rainbow Trout				
	#6	#7	#8	#9	#10
Dacthal	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--

-- = Below Detectable Limits.

TABLE 26 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-3), March 17, 1988. Results in ppm.

	Rainbow Trout				
	#11	#12	#13	#14	#15
Length (cm)	31	31	30	26.5	27.5
Weight (g)	399	408	329.5	235	262
PESTICIDES:					
Total PCBs (1254)	--	--	--	--	--
Aldrin	--	--	--	--	--
Endrin	--	--	--	--	--
Dieldrin	0.002	0.001	0.001	--	0.004
Methoxychlor	--	--	--	--	--
Total DDT & Analogs	0.056	0.013	0.024	0.113	0.086
o.p. DDE	--	--	--	--	--
p.p' DDE	0.052	0.013	0.021	0.113	0.078
o.p. DDD	--	--	--	--	--
p.p' DDD	--	--	--	--	0.005
o.p. DDT	--	--	--	--	--
p.p' DDT	0.004	--	0.003	--	0.003
Pentachlorophenol	--	--	--	--	--
Total Chlordane	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--
cis is of nonachlor	--	--	--	--	--
trans is. of nonachlor	0.003	0.001	--	--	0.005
Lindane	--	--	0.001	--	--
Hexachlorocyclohexane					
alpha BHC isomer	--	--	--	--	0.002
Oxychlondane	--	--	--	--	--
Heptachlor	0.001	--	0.003	--	--
Toxaphene	--	--	--	--	--
Endosulfan I	--	--	--	--	--

TABLE 26 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-3, March 17, 1988. Results in ppm.

	Rainbow Trout				
	#11	#12	#13	#14	#15
Dacthal	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--

-- = Below Detectable Limits.

TABLE 27. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), March 17, 1985. Pesticide values are in ppm.

	Rainbow Trout				
	#1	#2	#3	#4	#5
Length (cm)	36.0	31.0	33.0	29.0	30.5
Weight (g)	466	369.6	352.8	260.5	333.4
PESTICIDES:					
Total PCBs (1254)	--	--	--	--	--
Aldrin	--	--	--	--	--
Endrin	--	--	--	--	--
Dieldrin	--	--	--	--	--
Methoxychlor	--	--	--	--	--
Total DDT & Analogs	0.001	--	0.006	0.003	0.002
o.p. DDE	--	--	--	--	--
p.p' DDE	0.001	--	0.006	0.003	0.002
o.p. DDD	--	--	--	--	--
p.p' DDD	--	--	--	--	--
o.p. DDT	--	--	--	--	--
p.p' DDT	--	--	--	--	--
Pentachlorophenol	0.004	--	0.005	0.005	0.008
Total Chlordane	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--
trans is. of nonachlor	--	--	--	--	--
Lindane	--	--	--	--	--
Hexachlorocyclohexane					
alpha BHC isomer	0.006	--	--	--	--
Oxychlondane	--	--	--	--	--
Heptachlor epoxide	0.008	--	--	--	--
Toxaphene	--	--	--	--	--
Endosulfan I	--	--	--	--	--

TABLE 27 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), March 17, 1985. Pesticide values are in ppm.

	Rainbow Trout				
	#1	#2	#3	#4	#5
Dacthal	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--

-- = Below Detectable Limits.

TABLE 28. Pesticide Residues in Carp from Cedar Draw (CD-1), March 17, 1985. Pesticide values are in ppm.

	Carp	
	#1	#2
Weight (g)	1046	906
PESTICIDES:		
Total PCBs (1254)	--	--
Aldrin	--	--
Endrin	--	0.003
Dieldrin	0.007	0.006
Methoxychlor	--	--
Total DDT & Analogs	0.085	0.120
o.p. DDE	--	--
p.p' DDE	0.078	0.102
o.p. DDD	--	--
p.p' DDD	0.007	0.011
o.p. DDT	--	--
p.p' DDT	--	0.007
Pentachlorophenol	0.014	0.004
Total Chlordane	--	--
cis is. of chlordane	--	--
trans is. of chlordane	--	--
cis is. of nonachlor	--	--
trans is. of nonachlor	0.004	0.004
Lindane	--	--
Hexachlorocyclohexane		
alpha BHC isomer	--	--
Oxychlondane	--	--
Heptachlor epoxide	--	0.003
Toxaphene	--	--
Endosulfan I	--	--
Dacthal	--	--
Hexachlorobenzene	--	--

-- = Below Detectable Limits.

TABLE 29. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), April 1, 1986. Pesticide values are in ppm.

	Rainbow Trout				
	#1	#2	#3	#4	#5
Length (cm)	--	--	--	--	--
Weight (g)	--	--	--	--	--
PESTICIDES:					
Total PCB's (1254)	--	--	--	--	--
Aldrin	--	--	--	--	--
Endrin	--	--	--	--	--
Dieldrin	0.003	0.005	0.004	--	0.003
Methoxychlor	--	--	--	--	--
Total DDT & Analogs	0.008	0.098	0.036	0.004	0.013
o.p. DDE	--	--	--	--	--
p.p' DDE	0.008	0.046	0.031	0.004	0.010
o.p. DDD	--	--	--	--	--
p.p' DDD	--	0.005	0.003	--	0.003
o.p. DDT	--	0.006	--	--	--
p.p' DDT	--	0.041	0.002	--	--
Pentachlorophenol	--	--	--	--	--
Total Chlordane	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--
trans is. of nonachlor	--	--	--	--	--
Lindane	--	--	--	--	--
Hexachlorocyclohexane					
alpha BHC isomer	--	--	--	--	--
Oxychlondane	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--
Toxaphene	--	--	--	--	--
Endosulfan I	--	--	--	--	--

TABLE 29 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), April 1, 1986. Pesticide values are in ppm.

	Rainbow Trout				
	#1	#2	#3	#4	#5
Dacthal	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--

-- = Below Detectable Limits.

TABLE 29 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), April 1, 1986. Pesticide values are in ppm.

	Rainbow Trout			
	#6	#7	#8	#9
Length (cm)	--	--	--	--
Weight (g)	--	--	--	--
PESTICIDES:				
Total PCB's (1254)	--	--	--	--
Aldrin	--	--	--	--
Endrin	--	--	--	--
Dieldrin	0.003	0.002	--	0.01
Methoxychlor	--	--	--	--
Total DDT & Analogs	0.021	0.019	0.020	0.009
o.p. DDE	--	--	--	--
p.p' DDE	0.021	0.019	0.020	0.009
o.p. DDD	--	--	--	--
p.p' DDD	--	--	--	--
o.p. DDT	--	--	--	--
p.p' DDT	--	--	--	--
Pentachlorophenol	--	--	--	--
Total Chlordane	--	--	--	--
cis is. of chlordane	--	--	--	--
trans is. of chlordane	--	--	--	--
cis is. of nonachlor	--	--	--	--
trans is. of nonachlor	--	--	--	--
Lindane	--	--	--	--
Hexachlorocyclohexane				
alpha BHC isomer	--	--	--	--
Oxychlondane	--	--	--	--
Heptachlor epoxide	--	--	--	--
Toxaphene	--	--	--	--
Endosulfan I	--	--	--	--

TABLE 29 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), April 1, 1986. Pesticide values are in ppm.

	Rainbow Trout			
	#6	#7	#8	#9
Dacthal	--	--	--	--
Hexachlorobenzene	--	--	--	--

-- = Below Detectable Limits.

Table 30. Pesticide Residues in Rainbow Trout and Mottled Sculpin from Cedar Draw (CD-1), March 19, 1987. Pesticide values are in ppm.

	Rainbow Trout					
	#1	#2	#3	#4	#5	#6
Length (cm)	34.5	28	48	24	27	47
Weight (g)	463	41	1145	189	247	1159
PESTICIDES:						
Total PCBs (1254)	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--
Endrin	--	--	--	--	--	--
Dieldrin	--	--	0.002	--	--	--
Methoxychlor	--	--	--	--	--	--
Total DDT & Analogs	0.032	0.017	0.031	--	--	--
o.p. DDE	--	--	--	--	--	--
p.p' DDE	0.032	0.017	0.012	--	--	--
o.p. DDD	--	--	--	--	--	--
p.p' DDD	--	--	0.007	--	0.023	0.019
o.p. DDT	--	--	0.010	--	--	--
p.p' DDT	--	--	0.002	--	--	--
Pentachlorophenol	--	--	--	--	--	--
Total Chlordane	--	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--	--
trans is. of nonachlor	--	--	0.002	--	--	--
Lindane	--	--	--	--	--	--
Hexachlorocyclohexane alpha BHC isomer	--	--	--	--	--	--
Hexachlorocyclohexane gamma isomer	--	--	--	--	--	--

-- = Below Detectable Limits

TABLE 30 CONTINUED. Pesticide Residues in Rainbow Trout and Mottled Sculpin from Cedar Draw (CD-1), March 19, 1987. Pesticide values are in ppm.

	Rainbow Trout				Mottled Sculpin (composite)*
	#7	#8	#9	#10	
Length (cm)	31.5	29.4	29	26.8	14.0
Weight (g)	361	252.5	319	232.5	46.1
PESTICIDES:					
Total PCBs (1254)	--	--	--	--	--
Aldrin	--	--	--	--	--
Endrin	--	--	--	--	--
Dieldrin	--	--	0.002	--	0.271
Methoxychlor	--	--	--	--	--
Total DDT & Analogs	0.077	0.045	0.065	0.018	0.125
o.p. DDE	--	--	--	--	--
p.p' DDE	0.064	0.040	0.059	--	0.086
o.p. DDD	--	--	--	--	--
p.p' DDD	0.005	0.002	0.004	--	--
o.p. DDT	0.004	0.002	0.002	--	0.039
p.p' DDT	0.004	0.001	--	--	--
Pentachlorophenol	--	--	--	--	--
Total Chlordane	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--
trans is. of nonachlor	--	--	--	--	--
Lindane	--	--	--	--	--
Hexachlorocyclohexane alpha BHC isomer	--	--	--	--	--
Hexachlorocyclohexane gamma isomer	--	--	--	--	--

TABLE 30 CONTINUED. Pesticide Residues in Rainbow Trout and Mottled Sculpin from Cedar Draw (CD-1), March 19, 1987. Pesticide values are in ppm.

-- = Below Detectable Limits.

*Results are from a composite sample of 5 fish. Listed length and weight are means for these 5 fish.

TABLE 31. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), March 17, 1988. Pesticide Values are in ppm.

	Rainbow Trout					
	#1	#2	#3	#4	#5	#6
Length (cm)	29	25	26.5	27.5	28.5	27.5
Weight (g)	256	199	218	229.5	262	235
PESTICIDES:						
Total PCBs (1254)	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--
Endrin	--	--	--	--	--	--
Dieldrin	0.026	0.008	--	--	--	--
Methoxychlor	--	--	--	--	--	--
Total DDT & Analogs	0.258	0.147	0.272	0.164	0.350	0.041
o.p. DDE	--	--	--	--	--	--
p.p' DDE	0.242	0.147	0.261	0.151	0.297	0.041
o.p. DDD	--	--	--	--	--	--
p.p' DDD	--	--	--	--	0.031	--
o.p. DDT	--	--	--	--	--	--
p.p' DDT	0.016	--	0.011	0.013	0.022	--
Pentachlorophenol	--	--	--	--	--	--
Total Chlordane	--	--	--	--	--	--
cis is. of chlordane	--	--	--	--	--	--
trans is. of chlordane	--	--	--	--	--	--
cis is. of nonachlor	--	--	--	--	--	--
trans is. of nonachlor	--	--	0.002	--	0.004	--
Lindane	--	--	--	--	--	--
Hexachlorocyclohexane						
alpha BHC isomer	--	--	--	--	--	--

TABLE 31 CONTINUED. Pesticide Residues in Rainbow Trout from Cedar Draw (CD-1), March 17, 1988. Pesticide Values are in ppm.

	Rainbow Trout					
	#1	#2	#3	#4	#5	#6
Oxychlondane	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--
Dacthal	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--

-- = Below Detectable Limits.

TABLE 32. Mean Values of Pesticide Residues in Rainbow Trout from Cedar Draw, March 17, 1988. Results in ppm.

Pesticide	Station and Number of Trout	
	CD-1 (n=6)	CD-3 (n=15)
Total PCBs (1254)	--	--
Aldrin	--	--
Endrin	--	--
Dieldrin	0.017	0.002
Methoxychlor	--	--
Total DDT & Analogs	0.205	0.042
o.p. DDE	--	--
p.p′ DDE	0.190	0.038
p.p. DDD	--	--
p.p′ DDD	0.031	0.003
o.p. DDT	--	--
p.p′ DDT	0.020	0.004
Pentachlorophenol	--	--
Total Chlordane	--	--
cis is. of chlordane	--	--
trans is. of chlordane	--	--
cis is. of nonachlor	--	--
trans is. of nonachlor	--	0.003
Lindane	0.003	0.001
Hexachlorocyclohexane alpha BHC isomer	--	0.002
Oxychlondane	--	--
Heptachlor	--	0.008
Toxaphene	--	--
Endosulfan I	--	0.002
Dacthal	--	--
Hexachlorobenzene	--	--

-- = Below Detectable Limits (not used in mean calculations).

TABLE 33. Metals in Fish Muscle Tissue for Cedar Draw (Mouth), March 12, 1985.

	Concentration Micrograms per Gram Wet Tissue (ppm)					
	Rainbow Trout					
	#1	#2	#3	#4	#5	Mean (n=5)
%Moisture	78.4	77.0	75.7	77.1	77.1	77.1
Weight (g)	466.0	369.6	352.8	260.5	333.4	356.5
Arsenic	<0.1	0.26	<0.1	<0.1	<0.1	0.052
Cadmium	0.001	<0.001	0.002	0.008	0.011	0.004
Chromium	0.36	0.10	0.06	0.08	0.08	0.136
Lead	0.02	<0.01	0.02	0.04	0.05	0.026
Copper	0.34	0.18	0.39	0.41	0.41	0.282
Manganese	0.35	0.23	0.30	0.11	0.17	0.232
Zinc	5.23	4.53	6.96	6.04	5.86	5.724
Mercury	0.04	0.02	0.01	0.01	0.03	0.022

TABLE 33 CONTINUED. Metals in Fish Muscle Tissue for Cedar Draw (Mouth), March 12, 1985.

	Carp		
	#1	#2	Mean (n=2)
%Moisture	75.3	71.5	73.4
Weight (g)	1046.0	906.0	976.0
Arsenic	<0.1	<0.1	<0.1
Cadmium	0.011	0.011	0.011
Chromium	<0.01	<0.01	<0.01
Lead	0.12	0.11	0.115
Copper	1.28	1.36	1.32
Manganese	0.45	0.26	0.355
Zinc	16.34	31.86	24.1
Mercury	0.12	0.06	0.09

TABLE 34. Trace Metal Concentrations (mg/kg or ppm) for Cedar Draw (Mouth) Rainbow Trout Tissue, March 17, 1988.

	Rainbow Trout						
	#1	#2	#3	#4	#5	#6	Mean (n=6)
Weight (g)	256.0	199.0	218.0	229.5	262.0	235.0	
Copper	0.63	0.70	0.64	0.73	1.10	0.59	0.73
Mercury	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Zinc	7.32	9.15	7.22	12.50	8.41	7.11	8.68

TABLE 35. Trace Metal Concentrations (mg/kg or ppm) for Cedar Draw (Pole Line Road) Rainbow Trout Tissue, March 17, 1988.

	Rainbow Trout							
	#1	#2	#3	#4	#5	#6	#7	#8
Weight (g)	320.0	268.0	256.5	259.0	262.0	232.0	263.0	205.0
Copper	0.70	0.50	0.64	0.71	0.73	0.73	0.65	0.43
Mercury	0.06	0.05	0.07	0.07	0.07	0.09	0.07	0.02
Zinc	7.09	5.60	7.65	7.69	6.94	9.05	7.82	8.72

	Rainbow Trout							
	#9	#10	#11	#12	#13	#14	#15	Mean (n=15)
Weight (g)	197.0	216.0	399.0	408.0	329.5	235.0	262.0	
Copper	0.85	0.50	0.68	0.53	0.61	0.98	0.91	0.68
Mercury	0.08	0.06	0.06	0.09	0.07	0.07	0.05	0.06
Zinc	8.33	6.22	6.66	8.34	6.72	7.28	9.21	7.55

TABLE 36. Quality Assurance Data for Pesticides and PCBs, Idaho Department of Health and Welfare, Bureau of Laboratories, Fall 1987. Analysis conducted by U.S. Environmental Protection Agency Laboratory, Cincinnati, Ohio (EPA Water Pollution Study #019).

PARAMETER	Sample Number	Report Value	True Value*	Acceptance Limits	Warning Limits	Performance Evaluation
Pesticides in Micrograms per Liter:						
Dieldrin	1	0.341	0.829	0.453-1.120	0.538-1.030	Acceptable
	2	0.350	0.290	0.134-0.405	0.168-0.370	Acceptable
DDD	1	0.438	0.390	0.135-0.565	0.189-0.511	Acceptable
	2	0.968	0.975	0.419-1.310	0.533-1.200	Acceptable
DDE	1	0.630	0.676	0.285-0.920	0.365-0.840	Acceptable
	2	0.186	0.169	0.093-0.255	0.113-0.234	Acceptable
DDT	1	0.336	0.297	0.088-0.477	0.137-0.428	Acceptable
	2	0.826	0.742	0.330-1.070	0.424-0.973	Acceptable
Heptachlor	1	0.415	0.540	0.203-0.745	0.272-0.676	Acceptable
	2	0.146	0.166	0.060-0.239	0.084-0.216	Acceptable
Heptachlor Epoxide	1	0.107	0.105	0.055-0.144	0.066-0.132	Acceptable
	2	0.390	0.456	0.262-0.603	0.305-0.560	Acceptable
Chlordane	3	6.348	7.730	3.560-9.390	4.310-8.650	Acceptable
	4	0.631	0.620	0.240-0.919	0.327-0.833	Acceptable
PCB's in Micrograms per Liter:						
PCB-Aroclor 1016/1242	1	3.924	4.570	2.010-6.610	2.600-6.020	Acceptable
PCB-Aroclor 1260	2	1.825	1.860	0.733-2.540	0.996-2.280	Acceptable

*Based upon Theoretical Calculations, or a Reference Value when necessary.

TABLE 37. Analysis of EPA QC Sample, Trace Metals in Fish, Rock Creek and Cedar Draw, 1988.

	Copper		Zinc		Mercury	
Reference Value, ug/g	2.21		43.6		2.52	
95% Confidence Interval	0.93	3.49	35.5	51.7	1.24	3.80
Experimental Values, ug/g	2.50	2.70	41.1	41.4	2.23	1.99
	2.35	2.45	41.9	44.6	1.93	2.26
Percent Recoveries, %*	113.1	122.2	94.2	95.0	88.6	78.9
	106.3	110.9	96.1	102.4	76.6	90.5
MEAN PERCENT RECOVERY, %	113.1		96.9		83.6	

*Calculation based on the Reference Value.

TABLE 38. Precision of split samples for Rock Creek* subbasin station 7-4, 1984-1986 irrigation seasons.

PARAMETER	PRECISION					
	1984		1985		1986	
	N	Average Relative Range(%)	N	Average Relative Range(%)	N	Average Relative Range(%)
Suspended Sediment	13	11.2	14	8.2	21	4.3
Total Kjeldahl Nitrogen	15	9.9	---	---	21	17.2
Nitrate-Nitrite	15	14.1	6	20.7	20	29.8
Total Phosphorus	15	12.6	14	10.9	21	7.8
Dissolved Ortho-phosphate	14	19.5	14	26.9	21	20.4
Fecal Coliform Bacteria	17	37.4	14	52.1	20	23.1
Volatile Suspended Solids	n/a	n/a	n/a	n/a	16	16.3

*Cedar Draw monitoring was done in conjuction with the Rock Creek RCWP monitoring. The quality assurance data applies to both studies.

--- = inadequate sample size

n/a = not sampled during 1984/85

TABLE 39. Precision of split samples for Rock Creek* station S-2 and 7-4 (combined), 1986.

PARAMETER	N	PRECISION Average Relative Range (%)
Suspendend Sediment	33	8.0
Volatile Suspended Solids	27	25.0
Total Kjeldahl Nitrogen	34	14.6
Nitrate-Nitrite	33	19.4
Total Phosphorus	32	11.8
Dissolved Ortho-phosphate	34	17.8
Fecal Coliform Bacteria	27	18.8

*Cedar Draw monitoring was done in conjunction with the Rock Creek RCWP monitoring. The quality assurance data applies to both studies.

TABLE 40. Quality Assurance (Precision) for Pesticides. Fish Samples were split between the State Bureau of Laboratories in Boise and U.S. Environmental Protection Agency Laboratory in Manchester, Washington. Results in mg/kg.

	SAMPLE STATION*					
Parameter Laboratory	S-1 BT	S-2 RBT	S-3 RBT	S-4 BT	S-5 MS	S-6 RBT
p.p'DDT						
State	0.097	0.011	0.061	---	0.005	---
EPA	0.055	0.140	0.120	0.020	0.015	---
p.p'DDD						
State	0.038	0.004	0.028	0.004	0.005	---
EPA	0.067	---	0.079	0.053	0.017	---
p.p'DDE						
State	0.629	0.078	0.066	0.079	0.014	0.006
EPA	0.900	1.200	0.690	2.500	0.041	0.020

*Cedar Draw monitoring was done in conjunction with the Rock Creek RCWP monitoring. The resulting quality assurance data applies to both studies.

--- = Below Detection Limits (0.001 mg/kg)
BT = Brown Trout
RBT = Rainbow Trout
MS = Mountain Sucker

TABLE 41. Precision of split samples for Rock Creek* station S-2, 1986.

PARAMETER	N	PRECISION Average Relative Range (%)
Suspended Sediment	12	11.7
Volatile Suspended Solids	7	26.9
Turbidity	7	13.8
Total Kjeldahl Nitrogen	13	12.1
Nitrate-Nitrite	13	9.0
Total Phosphorus	11	15.8
Dissolved Ortho-phosphate	13	15.2
Hardness, as Ca CO_3	7	2.0
Total Alkalinity, as CA CO_3	7	1.1
Bicarbonate Alkalinity	7	0.9
Calcium	7	5.7
Potassium	7	0.0
Sodium	7	0.1
Magnesium	7	0.7
Sulphate, as SO^4	7	4.0
Arsenic, Total	6	13.0
Boron, Total	7	20.0
Iron, Total	7	9.6
Manganese, Total	7	14.0
Zinc, Total	7	64.5
Fecal Coliform Bacteria	11	21.3

*Cedar Draw monitoring was done in conjunction with the Rock Creek RCWP monitoring. The resulting quality assurance data applies to both studies.

TABLE 42. Precision (analysis of split samples) for Fish Tissue, Rock Creek and Cedar Draw, 1988.

Sample Number	Sample Description	Concentration Copper		Micrograms Per Zinc		Gram Mercury	
204	RC S-3 Rainbow					0.07	0.07
205	RC S-3 Rainbow	1.05	0.83	8.26	7.69		
224	RC S-5 Sucker					0.35	0.39
225	RC S-5 Sucker	0.73	0.69	8.54	8.55		
244	RC S-8 Rainbow					0.08	0.08
245	RC S-6 Brown	0.58	0.64	7.00	7.56		
265	CD CD-3 Rainbow					0.08	0.09
266	CD CD-3 Rainbow	0.65	0.65	7.82	8.03		
285	RC S-1 Sculpin	0.51	0.51	12.29	11.81	0.16	0.12

Pooled Coefficents of Variation: Copper ±8.22, Zinc ±3.65%, Mercury ±10.35%

Probability Interval (95%): Copper ±22.8%, Zinc ±10.2%, Mercury ±28.8%

RC - Rock Creek
CD - Cedar Draw

TABLE 43. Accuracy (% recovery) for Rock Creek* and subbasin stations. June, July and August 1985.

PARAMETER	ACCURACY		
	N	Average % Recovery	95% CI
Suspended Sediment	52	98.2	± 2.1
Total Phosphorus	79	101.9	± 2.1
Ortho-phosphate**			
June	25	93.9	± 51
August	24	93.2	± 6.5
September	27	87.8	+ 7.3
Aug/Sept pooled	51	90.3	± 4.1
Nitrate	54	99.1	± 4.4
Total Kjeldahl Nitrogen	39	96.2	± 1.7
Calcium***	15	93.1	± 2.6
Magnesium***	15	100.7	± 3.5
Sodium***	15	99.1	± 0.8
Potassium***	15	110.7	± 3
Chloride***	15	91.2	± 3.2
Fluoride***	15	20.7	± 5.8

* Cedar Draw monitoring was done in conjunction with the Rock Creek RCWP monitoring. The resulting Quality assurance data applies to both studies.

** June ortho-phosphate precision samples appeared to be randomly contaminated and are therefore excluded from the pooled estimate.

***Analyzed on Rock Creek Stations Only.

TABLE 44. Accuracy (% recovery) for Rock Creek* and subbasin stations. May, July and August 1986.

PARAMETER	ACCURACY		
	N	Average %Recovery	95% CI
Suspended Sediment	29	94.0	± 5.3
Total Phosphorus	10	105.7	± 4.1
Ortho-phosphate	29	107.3	± 8.6
Nitrate-Nitrite	29	106.0	± 3.9
Total Kjeldahl Nitrogen	29	102.5	± 6.9

*Cedar Draw monitoring was done in conjunction with the Rock Creek RCWP monitoring. The resulting quality assurance data applies to both studies.

TABLE 45. Accuracy (Percent recovery of spike) for Fish Tissue, Rock Creek and Cedar Draw, 1988.

Sample Number	Sample Description		Percent Recovery of Spike Copper	Zinc	Mercury
214	RC S-3	Sucker			96.0
215	RC S-3	Sucker	103.3	97.7	
234	RC S-3	Rainbow			82.0
235	RC S-8	Rainbow	105.0	100.2	
255	CD CD-1	Rainbow			78.0
256	CD CD-1	Rainbow	104.0	103.7	
275	RC S-1	Rainbow			76.0
276	RC S-1	Rainbow	104.5	103.9	
PERCENT RECOVERY MEAN			104.2	101.4	83.0

Standard Error of the Mean: Copper ±1.2%, Zinc ±4.7%, Mercury ±14.3%

RC - Rock Creek
CD - Cedar Draw

Appendix 1

Water Quality Data

STORET RETRIEVAL DATE 91/08/27 PGM=ALLPARM PAGE: 1

2060153 13093500
42 39 05.0 114 39 32.0 2
CEDAR DRAW NEAR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HG 17040212020 0006.870 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INITIAL DATE				01/01/01	82/04/19	82/05/05	82/05/19	82/06/07	82/06/22	82/07/07	82/07/20	82/08/04
INITIAL TIME					1230	1430	1500	1400	1600	1015	0900	1200
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT		9.0	11.0						
00011	WATER	TEMP	FAHN		48.2$	51.8$				18.0		19.0
00042	ALTITUDE	FEET	AB MSL	3100						64.4$		66.2$
00061	STREAM	FLOW,	INST-CFS		39	127	105	171	160		1	136
00094	CNDUCTVY	FIELD	MICROMHO			450						
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L		12.0	9.7				8.6		10.4
00301	DO	SATUR	PERCENT		115.8$	97.8$				101.3$		123.9$
00400	PH		SU		8.70	8.00				8.40		8.60
00665	PHOS-TOT		MG/L P		.090	.380	.400	.490	.350	.310	.460	.520
00671	PHOS-DIS	ORTHO	MG/L P		.049	.055	.083	.039	.081	.095	.076	.078
31616	FEC COLI	MFM-FCBR	/100ML		10K	400	430	100	1300	20	400	2300
80154	SUSP SED	CONC	MG/L		9	282	222	18	200	122	330	3

INITIAL DATE				82/09/15	82/10/12	82/12/08	83/02/15	83/04/05	83/04/19	83/05/04	83/05/17	83/06/06
INITIAL TIME				1100	1015	1100	1330	1400	1000	1600	0915	1530
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	12.0		3.0						
00011	WATER	TEMP	FAHN	53.6$		37.4$						
00061	STREAM	FLOW,	INST-CFS			55	34	32	142	147		163
00094	CNDUCTVY	FIELD	MICROMHO	468								
00095	CNDUCTVY	AT 25C	MICROMHO				813					
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	9.0		11.3						
00301	DO	SATUR	PERCENT	93.3$		93.7$						
00400	PH		SU	8.00								
00403	PH	LAB	SU				8.7					
00410	T ALK	CACO3	MG/L				321					
00425	HCO3 ALK	CACO3	MG/L				290					
00610	NH3+NH4-	N TOTAL	MG/L				.030					
00615	NO2-N	TOTAL	MG/L				.029					
00620	NO3-N	TOTAL	MG/L				3.850	.017				
00625	TOT KJEL	N	MG/L				.630	3.920				
00630	NO2&NO3	N-TOTAL	MG/L	1.10				3.90			.74	.93
00665	PHOS-TOT		MG/L P	.310	.150	.100	.112		.170	.290	.340	.380

(SAMPLE CONTINUED ON NEXT PAGE)

2060153 13093500
42 39 05.0 114 39 32.0 2
CEDAR DRAW NEAR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212020 0006.870 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			82/09/15	82/10/12	82/12/08	83/02/15	83/04/05	83/04/19	83/05/04	83/05/17	83/06/06
	INITIAL TIME			1100	1015	1100	1330	1400	1000	1600	0915	1530
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00669	PHOS-TOT	HYDRO	MG/L P					.050				
00671	PHOS-DIS	ORTHO	MG/L P	.056	.015	.056	.045	.025	.009	.033	.043	.045
00900	TOT HARD	CACO3	MG/L				312					
00916	CALCIUM	CA-TOT	MG/L				64.0					
00940	CHLORIDE	TOTAL	MG/L				52					
00945	SULFATE	SO4-TOT	MG/L				182					
00951	FLUORIDE	F,TOTAL	MG/L				.79					
00956	SILICA	TOTAL	MG/L				51.0					
01022	BORON	B,TOT	UG/L				350					
31501	TOT COLI	MFIMENDO	/100ML			280						
31616	FEC COLI	MFM-FCBR	/100ML	20	70	29	7	1	300	330	400	1900
31679	FECSTREP	MF M-ENT	/100ML			75						
80154	SUSP SED	CONC	MG/L	200	69	5	8	3	98	124	180	289
82028	RATIO	FEC COL	FEC STRP			.4$						
82078	TURBIDIT	Y FIELD	NTU	52.0		3.0						

	INITIAL DATE			83/06/22	83/07/06	83/07/19	83/08/02	83/08/17	83/08/30	83/09/13	83/10/11	83/12/20
	INITIAL TIME			1610	0920	1010	0950	1320	0925	1105	1125	1445
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00061	STREAM	FLOW,	INST-CFS	88	144	113				220	245	66
00095	CNDUCTVY	AT 25C	MICROMHO									954
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00403	PH	LAB	SU									8.5
00610	NH3+NH4-	N TOTAL	MG/L									.047
00625	TOT KJEL	N	MG/L					1.100	.500	.500	.390	.840
00630	NO2&NO3	N-TOTAL	MG/L		2.87		1.28			1.58	1.49	5.04
00665	PHOS-TOT		MG/L P	.340	.210	.220	.550	.490	.230	.140	.060	.130
00671	PHOS-DIS	ORTHO	MG/L P	.093	.061	.038	.046	.053	.048	.044	.027	.037
31616	FEC COLI	MFM-FCBR	/100ML	400	1000	300	500	1900	700	520	130	20
74041	WQF	SAMPLE	UPDATED					860620				
80154	SUSP SED	CONC	MG/L	102	91	124	428	359	149	60	31	45

	INITIAL DATE			84/02/22	84/04/17	84/05/02	84/05/15	84/06/05	84/06/19	84/07/02	84/07/16	84/08/08
	INITIAL TIME			1115	0900	1015	1045	0850	1130	1050	1545	0910
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT					9.1				17.0
00011	WATER	TEMP	FAHN					48.4$				62.6$
00061	STREAM	FLOW,	INST-CFS	41	39	143	156	204	179	180	39	193

(SAMPLE CONTINUED ON NEXT PAGE)

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16083 IDAHO TWIN FALLS
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21IDSURV 820710 HQ 17040212020 0006.870 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				84/02/22	84/04/17	84/05/02	84/05/15	84/06/05	84/06/19	84/07/02	84/07/16	84/08/08
INITIAL TIME				1115	0900	1015	1045	0850	1130	1050	1545	0910
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00094	CNDUCTVY	FIELD	MICROMHO					452				
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L					9.9				8.0
00301	DO	SATUR	PERCENT					95.5$				92.3$
00400	PH		SU					7.70				8.30
00625	TOT KJEL	N	MG/L	.820		1.100	1.200	1.300	.700	.800	.600	1.000
00630	NO2&NO3	N-TOTAL	MG/L	4.44	3.42		1.12	1.44	1.56	1.13	1.77	1.28
00665	PHOS-TOT		MG/L P	.150	.100	.400	.500	.600	.250	.170	.160	.330
00671	PHOS-DIS	ORTHO	MG/L P	.086	.058	.047	.052	.054	.042	.039	.050	.035
31616	FEC COLI	MFM-FCBR	/100ML	10	60	200	400	1000	700	700	300	1000
80154	SUSP SED	CONC	MG/L	26	17	284	292	478	115	79	56	266

INITIAL DATE				84/09/04	84/10/03	84/10/16	85/02/19	85/04/17	85/05/02	85/05/14	85/05/27	85/06/05
INITIAL TIME				1400	0845	1355	1600	0935	1305	1047	1650	1515
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	17.2	11.1		7.0		12.0	11.0	16.0	
00011	WATER	TEMP	FAHN	63.0$	52.0$		44.6$		53.6$	51.8$	60.8$	
00061	STREAM	FLOW,	INST-CFS	178			35	287	59	125	150	155
00076	TURB	TRBIDMTR	HACH FTU				5.6	22.0				
00094	CNDUCTVY	FIELD	MICROMHO	515	393		690		512	365	509	
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	8.4	8.8		10.7		8.0	10.2	8.1	
00301	DO	SATUR	PERCENT	96.9$	88.8$		98.2$		82.9$	102.9$	90.7$	
00400	PH		SU	8.10	8.40		8.40		7.20	8.10	8.30	
00403	PH	LAB	SU		8.4		8.2	8.1				
00610	NH3+NH4-	N TOTAL	MG/L				.139	.053				
00612	UN-IONZD	NH3-N	MG/L				.005$					
00619	UN-IONZD	NH3-NH3	MG/L				.006$					
00625	TOT KJEL	N	MG/L	.700	.550	.500	.800	1.300	.770	.820	.510	.850
00630	NO2&NO3	N-TOTAL	MG/L	1.70	1.21	1.20	4.95	.60	1.36	.99	.99	1.10
00665	PHOS-TOT		MG/L P	.190	.120	.110	.140	.280	.270	.280	.740	.300
00671	PHOS-DIS	ORTHO	MG/L P	.041	.030	.028	.091	.017	.117	.047	.105	.022
31501	TOT COLI	MFIMENDO	/100ML				60					
31616	FEC COLI	MFM-FCBR	/100ML	380	220	320	10	100	240	300	400	140
31679	FECSTREP	MF M-ENT	/100ML				460					
74041	WQF	SAMPLE	UPDATED							860516	860516	860516
80154	SUSP SED	CONC	MG/L	86	47	65	9	164	86	147	211	237
82028	RATIO	FEC COL	FEC STRP				.02$					

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21IDSURV 820710 HQ 17040212020 0006.870 OFF
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/TYPA/AMBNT/STREAM

	INITIAL DATE			85/06/19	85/07/01	85/07/15	85/07/24	85/08/07	85/08/20	85/09/03	85/09/10	85/09/17
	INITIAL TIME			1230	1600	1515	1510	1545	1030	1630	1601	1440
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT					22.0		19.5	9.8	
00011	WATER	TEMP	FAHN					71.6$		67.1$	49.6$	
00061	STREAM	FLOW,	INST-CFS	117	108	104	99		321	185	389	280
00076	TURB	TRBIDMTR	HACH FTU		22.0					28.0		
00094	CNDUCTVY	FIELD	MICROMHO					819		735	410	
00095	CNDUCTVY	AT 25C	MICROMHO		667							
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L					8.5		9.8	12.4	
00301	DO	SATUR	PERCENT					108.1$		116.7$	122.8$	
00400	PH		SU					8.60		8.60	8.20	
00403	PH	LAB	SU		8.8					8.5		
00410	T ALK	CACO3	MG/L		228					234		
00425	HCO3 ALK	CACO3	MG/L							222		
00610	NH3+NH4-	N TOTAL	MG/L		.149					.077		
00612	UN-IONZD	NH3-N	MG/L							.010$		
00619	UN-IONZD	NH3-NH3	MG/L							.012$		
00625	TOT KJEL	N	MG/L	.940	.670	.840	.980		.900	.790		.330
00630	NO2&NO3	N-TOTAL	MG/L	1.26	.20	1.80		2.29		1.85		1.36
00665	PHOS-TOT		MG/L P	.310	.150	.260	.400	.350	.380	.260		.180
00671	PHOS-DIS	ORTHO	MG/L P	.010	.037	.014	.047	.060	.056	.051		.122
00900	TOT HARD	CACO3	MG/L		256					267		
00916	CALCIUM	CA-TOT	MG/L		59.2					62.0		
00927	MGNSIUM	MG,TOT	MG/L		24.0					27.0		
00929	SODIUM	NA,TOT	MG/L		41.50					45.00		
00937	PTSSIUM	K,TOT	MG/L		4.40					4.70		
00940	CHLORIDE	TOTAL	MG/L		31					32		
00945	SULFATE	SO4-TOT	MG/L		117					90		
00951	FLUORIDE	F,TOTAL	MG/L		.84					.72		
00956	SILICA	TOTAL	MG/L		29.2							
31616	FEC COLI	MFM-FCBR	/100ML	300	200	400	200	1200	500	300		250
46570	CAL HARD	CA MG	MG/L		247$					266$		
74041	WQF	SAMPLE	UPDATED	860516	860516	860516	860516		860516	860516	860516	860516
80154	SUSP SED	CONC	MG/L	129	63	115	210	201	21	106		84

/TYPA/AMBNT/STREAM

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	INITIAL DATE			85/10/09	85/10/21	86/04/16	86/04/29	86/05/12	86/05/28	86/06/02	86/06/04	86/06/16
	INITIAL TIME			1648	1742	0907	0914	1700	1601	1320	1320	1144
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT			8.8	8.0	14.0		20.0		
00011	WATER	TEMP	FAHN			47.8$	46.4$	57.2$		68.0$		
00061	STREAM	FLOW,	INST-CFS	323	282	201						
00076	TURB	TRBIDMTR	HACH FTU	14.0	6.0	31.0		30.0				12.0
00094	CNDUCTVY	FIELD	MICROMHO			350	396	441		650		
00095	CNDUCTVY	AT 25C	MICROMHO	461	711							
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L			9.4	9.0	8.7		8.0		
00301	DO	SATUR	PERCENT			90.7$	84.7$	93.6$		97.3$		
00400	PH		SU			8.70	8.50	8.80		8.10		
00403	PH	LAB	SU	8.4	8.3							
00410	T ALK	CACO3	MG/L	210	218							
00425	HCO3 ALK	CACO3	MG/L		218							
00535	RESIDUE	VOL NFLT	MG/L									
00610	NH3+NH4-	N TOTAL	MG/L	.043							3B	8
00625	TOT KJEL	N	MG/L	.810	.590	1.070	.870	.810	.840		.450	.600
00630	NO2&NO3	N-TOTAL	MG/L	1.16	1.65	1.01	.02	.79	1.91		.04	1.13
00665	PHOS-TOT		MG/L P	.180	.110	.200	.200	.300	.300		.100K	.100
00671	PHOS-DIS	ORTHO	MG/L P	.015	.019	.008	.004	.011	.005		.001	.032
00900	TOT HARD	CACO3	MG/L	234	248							
00916	CALCIUM	CA-TOT	MG/L	54.0	60.0							
00927	MGNSIUM	MG,TOT	MG/L	22.5	23.5							
00929	SODIUM	NA,TOT	MG/L	37.40	41.00							
00937	PTSSIUM	K,TOT	MG/L	5.00	5.10							
00940	CHLORIDE	TOTAL	MG/L	30	32							
00945	SULFATE	SO4-TOT	MG/L	76	80							
00951	FLUORIDE	F,TOTAL	MG/L	.70	.73							
00956	SILICA	TOTAL	MG/L	29.0								
31616	FEC COLI	MFM-FCBR	/100ML	30	100	170	170	70	500		200	160
46570	CAL HARD	CA MG	MG/L	227$	247$							
74041	WQF	SAMPLE	UPDATED	860516	860516	860801	860710	860620	860627	870731	870731	860801
80154	SUSP SED	CONC	MG/L	84	44	164	104	204	166		74	42

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INITIAL DATE				86/06/24	86/07/16	86/07/29	86/08/05	86/08/11	86/09/03	86/09/15	86/09/29	86/10/15
INITIAL TIME				1619	1212	1738	1645	1629	1227	1024	1152	1603
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT									10.0
00011	WATER	TEMP	FAHN									50.0$
00061	STREAM	FLOW,	INST-CFS									140
00076	TURB	TRBIDMTR	HACH FTU		26.0	68.0		12.0	8.0	9.0	3.0	3.0
00094	CNDUCTVY	FIELD	MICROMHO									486
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L									7.8
00301	DO	SATUR	PERCENT									77.3$
00400	PH		SU									8.10
00535	RESIDUE	VOL NFLT	MG/L	2	2K	34	2K	8	6	2K	2K	2K
00625	TOT KJEL	N	MG/L	.390	.650	1.080	.500	.940	.520	.530	.470	.730
00630	NO2&NO3	N-TOTAL	MG/L	2.53	.12	1.97	.006	3.81	.05	.15	.10	.03
00665	PHOS-TOT		MG/L P	.100	.200	.500	.200	.400	.100	.100	.100K	.070
00671	PHOS-DIS	ORTHO	MG/L P	.013	.025	.025	.001	.025	.003K	.018	.014	.003
01147	SELENIUM	SE,TOT	UG/L		5K							
31616	FEC COLI	MFM-FCBR	/100ML	2900	50	400	30	300	20	10K	30	10K
74041	WQF	SAMPLE	UPDATED	860801	870611	860904	860919	860919	861030	861031	861031	870319
80154	SUSP SED	CONC	MG/L	18	98	460	98	256	22	4	18	2K

INITIAL DATE				86/12/16	87/01/28	87/02/25	87/03/24	87/04/21	87/04/28	87/05/05	87/05/19	87/05/27
INITIAL TIME				1545	0854	1750	1721	2033	0838	1427	1644	1301
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	7.0	5.0	6.0	12.0				14.2	
00011	WATER	TEMP	FAHN	44.6$	41.0$	42.8$	53.6$				57.6$	
00061	STREAM	FLOW,	INST-CFS	40	33	32	22	91	106	164	64	144
00076	TURB	TRBIDMTR	HACH FTU	1.0	3.3	1.9			22.0			17.5
00094	CNDUCTVY	FIELD	MICROMHO	520	390	397	802				496	
00095	CNDUCTVY	AT 25C	MICROMHO	1124	1046	1040			688		706	664
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	8.4	8.4	8.2	5.7				6.8	
00301	DO	SATUR	PERCENT	77.1$	73.5$	73.5$	59.1$				73.2$	
00400	PH		SU	8.20	8.10	8.10	8.40				8.40	
00410	T ALK	CACO3	MG/L	312	299	294			228		224	204
00425	HCO3 ALK	CACO3	MG/L	312	299	286			228		224	204
00535	RESIDUE	VOL NFLT	MG/L	4	6	6	6	24	6	16	18	6

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INITIAL DATE			86/12/16	87/01/28	87/02/25	87/03/24	87/04/21	87/04/28	87/05/05	87/05/19	87/05/27
INITIAL TIME			1545	0854	1750	1721	2033	0838	1427	1644	1301
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00625 TOT KJEL	N	MG/L	.510	1.000	.440	.350	1.410	.850	.890	.810	.860
00630 NO2&NO3	N-TOTAL	MG/L	5.25	4.68	4.72	9.08	1.09	1.61	1.43	2.12	1.60
00665 PHOS-TOT		MG/L P	.050	.250	.070	.060	.520	.310	.270	.240	.240
00671 PHOS-DIS	ORTHO	MG/L P	.043	.141	.039	.034	.111	.015	.064	.041	.058
00900 TOT HARD	CACO3	MG/L	354	342	332					212	224
00916 CALCIUM	CA-TOT	MG/L	61.0	74.5	62.5			60.0		47.0	61.0
00927 MGNSIUM	MG,TOT	MG/L	39.0	39.0	39.5			24.0		25.0	23.0
00929 SODIUM	NA,TOT	MG/L	83.50	82.00	86.00			43.00		40.50	38.00
00937 PTSSIUM	K,TOT	MG/L	4.90	6.00	4.30			5.10		5.10	5.00
00940 CHLORIDE	TOTAL	MG/L	54	58	53			34		36	34
00945 SULFATE	SO4-TOT	MG/L	203	174	120			87		98	87
00951 FLUORIDE	F,TOTAL	MG/L	.79	.74	.76			.79		.80	.81
00956 SILICA	TOTAL	MG/L	52.0	50.5	51.2					1.0	
01002 ARSENIC	AS,TOT	UG/L	18	13							
01022 BORON	B,TOT	UG/L	340	401						268	
01034 CHROMIUM	CR,TOT	UG/L	50K								
01042 COPPER	CU,TOT	UG/L	10K								
01045 IRON	FE,TOT	UG/L	20	280							
01051 LEAD	PB,TOT	UG/L	10K								
01055 MANGNESE	MN	UG/L	10.0K	20.0							
01092 ZINC	ZN,TOT	UG/L	1K	6							
31616 FEC COLI	MFM-FCBR	/100ML	10K	90	1K	10K	140	700	400	500	480
46570 CAL-HARD	CA MG	MG/L	313$	347$	319$			249$		220$	247$
71900 MERCURY	HG,TOTAL	UG/L	.5K								
74041 WQF	SAMPLE	UPDATED	870326	870326	870424	870424	870611	870619	870612	871023	870820
80154 SUSP SED	CONC	MG/L	8	24	8	12	358	108	132	110	96

INITIAL DATE			87/06/01	87/06/03	87/06/16	87/06/30	87/07/15	87/07/15	87/07/28	87/08/05	87/08/06
INITIAL TIME			1339	1042	1529	1430	1159	1659	1315	0931	0931
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER	TEMP	CENT						22.0	22.0		18.1
00011 WATER	TEMP	FAHN						71.6$	71.6$		64.6$
00061 STREAM	FLOW,	INST-CFS	164			73		63	79	67	67
00076 TURB	TRBIDMTR	HACH FTU			15.0		34.0		41.0		48.0
00094 CNDUCTVY	FIELD	MICROMHO						771	859		751
00095 CNDUCTVY	AT 25C	MICROMHO			763		858		869		869
00116 INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300 DO		MG/L						6.0	6.2		8.0

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(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			87/06/01	87/06/03	87/06/16	87/06/30	87/07/15	87/07/15	87/07/28	87/08/05	87/08/06
	INITIAL TIME			1339	1042	1529	1430	1159	1659	1315	0931	0931
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00301	DO	SATUR	PERCENT						76.3$	78.9$		94.3$
00400	PH		SU						8.40	8.30		8.10
00410	T ALK	CACO3	MG/L			245		272		282		284
00425	HCO3 ALK	CACO3	MG/L					272		276		284
00535	RESIDUE	VOL NFLT	MG/L		6	10	16	20		22		12
00625	TOT KJEL	N	MG/L		.590	.630	.730	.740		.750		.880
00630	NO2&NO3	N-TOTAL	MG/L		.02	2.27	2.25	2.51		2.94		2.76
00665	PHOS-TOT		MG/L P		.120	.140	.130	.190		.230		.320
00671	PHOS-DIS	ORTHO	MG/L P		.060	.020	.035			.078		.062
00900	TOT HARD	CACO3	MG/L			228		300		310		280
00916	CALCIUM	CA-TOT	MG/L			60.0		68.0		75.0		80.0
00927	MGNSIUM	MG,TOT	MG/L			27.5		30.0		31.0		32.0
00929	SODIUM	NA,TOT	MG/L			54.00		57.50		60.00		60.00
00937	PTSSIUM	K,TOT	MG/L			5.00		5.30		5.30		5.60
00940	CHLORIDE	TOTAL	MG/L			35		39		41		40
00945	SULFATE	SO4-TOT	MG/L			120		133		142		136
00951	FLUORIDE	F,TOTAL	MG/L			.83		.84		.86		.78
00956	SILICA	TOTAL	MG/L					40.0				12.5
01002	ARSENIC	AS,TOT	UG/L									13
01022	BORON	B,TOT	UG/L									12
01045	IRON	FE,TOT	UG/L									4340
01055	MANGNESE	MN	UG/L									130.0
01092	ZINC	ZN,TOT	UG/L									15
31616	FEC COLI	MFM-FCBR	/100ML	250		200	200		300	500		100
46570	CAL HARD	CA MG	MG/L			263$		293$		315$		332$
74041	WQF	SAMPLE	UPDATED	870731	870827	870919	870919	870919	871016	871023	871002	871008
80154	SUSP SED	CONC	MG/L		22	54	46	90		130		182

	INITIAL DATE			87/08/18	87/09/01	87/09/03	87/09/12	87/09/14	87/09/28	87/10/14	87/11/24	87/12/08
	INITIAL TIME			0515	0952	1006	0710	0710	0810	1442	0730	0900
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT		15.0				10.0	13.0	9.0	6.0
00011	WATER	TEMP	FAHN		59.0$				50.0$	55.4$	48.2$	42.8$
00061	STREAM	FLOW,	INST-CFS	212	91			34	106	312	42	38
00076	TURB	TRBIDMTR	HACH FTU	37.0					17.0	22.0	1.0	1.5
00094	CNDUCTVY	FIELD	MICROMHO		724				629	553	678	678
00095	CNDUCTVY	AT 25C	MICROMHO	748	763				592	475	993	848
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	877605	811605	811605	811605	811605	811605

(SAMPLE CONTINUED ON NEXT PAGE)

2060153 13093500
42 39 05.0 114 39 32.0 2
CEDAR DRAW NEAR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HG 17040212020 0006.870 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				87/08/18	87/09/01	87/09/03	87/09/12	87/09/14	87/09/28	87/10/14	87/11/24	87/12/08
INITIAL TIME				0515	0952	1006	0710	0710	0810	1442	0730	0900
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00300	DO		MG/L		8.7				8.6	9.6	8.4	8.4
00301	DO	SATUR	PERCENT		95.5$				85.2$	101.4$	81.1$	75.3$
00400	PH		SU		8.30				8.20	8.10	8.00	7.30
00410	T ALK	CACO3	MG/L	272	271				226	210	290	
00425	HCO3 ALK	CACO3	MG/L	272	271				226	210		305
00535	RESIDUE	VOL NFLT	MG/L	24	12			8	2	6	8	4
00625	TOT KJEL	N	MG/L	.660	.450			.720	.730	.840	.430	.530
00630	NO2&NO3	N-TOTAL	MG/L	2.53	2.59			2.18	1.81	1.23	4.43	4.35
00665	PHOS-TOT		MG/L P	.200	.100			.120	.160	.160	.050K	.090
00671	PHOS-DIS	ORTHO	MG/L P	.058	.031			.047	.300	.021	.022	.040
00900	TOT HARD	CACO3	MG/L	278	294				252	236	328	344
00916	CALCIUM	CA-TOT	MG/L	69.0	75.0				61.0	58.0	73.0	77.0
00927	MGNSIUM	MG,TOT	MG/L	32.0	31.5				25.0	23.5	39.0	40.0
00929	SODIUM	NA,TOT	MG/L	52.20	61.00				43.00	39.00	80.00	80.00
00937	PTSSIUM	K,TOT	MG/L	5.10	5.20				4.60	4.60	4.80	4.70
00940	CHLORIDE	TOTAL	MG/L	38	41				32	32	51	50
00945	SULFATE	SO4-TOT	MG/L	137	121				94	85	170	177
00951	FLUORIDE	F,TOTAL	MG/L	.79	.80				.73	.71	.84	.94
00956	SILICA	TOTAL	MG/L								49.0	48.0
01002	ARSENIC	AS,TOT	UG/L								16	16
01022	BORON	B,TOT	UG/L								254	281
01045	IRON	FE,TOT	UG/L								160	260
01055	MANGNESE	MN	UG/L								10.0	10.0
01092	ZINC	ZN,TOT	UG/L								4	8
31616	FEC COLI	MFM-FCBR	/100ML	700		800	1300		400	750	110	30
46570	CAL HARD	CA MG	MG/L	304$	317$				255$	242$	343$	357$
74041	WQF	SAMPLE	UPDATED	871023	871008	870919	870919	871016	880323	880323	880323	880422
80154	SUSP SED	CONC	MG/L	112	72			82	100	126	14	50

INITIAL DATE				88/01/05	88/02/17	88/03/01	88/03/01	88/03/22	88/04/12	88/04/26	88/04/26	88/05/03
INITIAL TIME				0947	1651	0854	0859	0837	0943	1010	1105	1007
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	6.0	9.0	10.0		10.0	10.0			
00011	WATER	TEMP	FAHN	42.8$	48.2$	50.0$		50.0$	50.0$			
00061	STREAM	FLOW,	INST-CFS	47	79	122		136	60	33	115	
00076	TURB	TRBIDMTR	HACH FTU	1.6			1.2					
00094	CNDUCTVY	FIELD	MICROMHO	677	601	768		565	576			
00095	CNDUCTVY	AT 25C	MICROMHO	861			911					

(SAMPLE CONTINUED ON NEXT PAGE)

2060153 13093500
42 39 05.0 114 39 32.0 2
CEDAR DRAW NEAR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212020 0006.870 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				88/01/05	88/02/17	88/03/01	88/03/01	88/03/22	88/04/12	88/04/26	88/04/26	88/05/03
INITIAL TIME				0947	1651	0854	0859	0837	0943	1010	1105	1007
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	8.8	12.8	12.4		12.4	10.9			
00301	DO	SATUR	PERCENT	78.9$	123.5$	122.8$		122.8$	108.0$			
00400	PH		SU	7.90	8.20	8.30		8.40	7.80			
00410	T ALK	CACO3	MG/L	305			299					
00425	HCO3 ALK	CACO3	MG/L	305			299					
00535	RESIDUE	VOL NFLT	MG/L	4	2K		4	6	2K		12	6
00625	TOT KJEL	N	MG/L	.550	.750		.660	.470	.840		.940	1.340
00630	NO2&NO3	N-TOTAL	MG/L	4.22	5.14		5.06	4.42	1.49		1.06	.96
00665	PHOS-TOT		MG/L P	.100	.200		.080	.070	.130		.220	.270
00671	PHOS-DIS	ORTHO	MG/L P	.058	.142		.027	.039	.028		.045	.030
00900	TOT HARD	CACO3	MG/L	348			362					
00916	CALCIUM	CA-TOT	MG/L	79.0			82.0					
00927	MGNSIUM	MG,TOT	MG/L	39.0			39.5					
00929	SODIUM	NA,TOT	MG/L				81.00					
00937	PTSSIUM	K,TOT	MG/L	5.00			4.30					
00939	POTASIUM	TOT.REC.	MG/L	86								
00940	CHLORIDE	TOTAL	MG/L	47			54					
00945	SULFATE	SO4-TOT	MG/L	178			133					
00951	FLUORIDE	F,TOTAL	MG/L	.85			.93					
00956	SILICA	TOTAL	MG/L	48.0			43.8					
01002	ARSENIC	AS,TOT	UG/L	17			15					
01022	BORON	B,TOT	UG/L	273			315					
01045	IRON	FE,TOT	UG/L	460			270					
01055	MANGNESE	MN	UG/L	10.0			10.0					
01092	ZINC	ZN,TOT	UG/L	8			7					
31616	FEC COLI	MFM-FCBR	/100ML	39	1K	31		9			180	600
46570	CAL HARD	CA MG	MG/L	358$			367$					
74041	WQF	SAMPLE	UPDATED	880609	880422	880422	880505	880609	880610	880830	880802	880616
80154	SUSP SED	CONC	MG/L	6	12		36	6	34		72	102

INITIAL DATE				88/05/18	88/05/25	88/06/01
INITIAL TIME				0935	1232	0845
MEDIUM				WATER	WATER	WATER
00010	WATER	TEMP	CENT			17.0
00011	WATER	TEMP	FAHN			62.6$
00061	STREAM	FLOW,	INST-CFS	73	81	
00094	CNDUCTVY	FIELD	MICROMHO			478

(SAMPLE CONTINUED ON NEXT PAGE)

2060153 13093500
42 39 05.0 114 39 32.0 2
CEDAR DRAW NEAR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212020 0006.870 OFF
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			88/05/18	88/05/25	88/06/01
	INITIAL TIME			0935	1232	0845
	MEDIUM			WATER	WATER	WATER
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605
00300	DO		MG/L			10.0
00301	DO	SATUR	PERCENT			115.4*
.00400	PH		SU			8.10
00535	RESIDUE	VOL NFLT	MG/L	4	12	12
00625	TOT KJEL	N	MG/L	.870	.880	.680
00630	NO2&NO3	N-TOTAL	MG/L	1.58	1.26	.65
00665	PHOS-TOT		MG/L P	.230	.210	.190
00671	PHOS-DIS	ORTHO	MG/L P	.051	.054	.012
31616	FEC COLI	MFM-FCBR	/100ML	1800	700	290
74041	WQF	SAMPLE	UPDATED	880802	880802	880707
80154	SUSP SED	CONC	MG/L	78	92	122

2060154
42 34 00.0 114 37 25.0 2
CEDAR DRAW @ REST AREA W OF FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INITIAL DATE				01/01/01	82/04/19	82/05/05	82/05/25	82/06/07	82/06/22	82/07/07	82/08/04	82/09/15
INITIAL TIME					1000	1600				0900	0930	0945
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT		8.0	13.0				19.0	21.0	12.0
00011	WATER	TEMP	FAHN		46.4$	55.4$				66.2$	69.8$	53.6$
00042	ALTITUDE	FEET	AB MSL	3770								
00061	STREAM	FLOW,	INST-CFS		.4	53	21	69	44		37	
00094	CNDUCTVY	FIELD	MICROMHO									324
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L		15.0	9.4				7.6	8.1	9.2
00301	DO	SATUR	PERCENT		144.6$	101.8$				92.8$	103.3$	97.8$
00400	PH		SU		8.70	7.80				8.50	8.60	7.40
00665	PHOS-TOT		MG/L P		.040							
00671	PHOS-DIS	ORTHO	MG/L P		.005							
31616	FEC COLI	MFM-FCBR	/100ML		320							
80154	SUSP SED	CONC	MG/L		7							
82078	TURBIDIT	Y FIELD	NTU									35.0

INITIAL DATE				82/12/08	87/10/14
INITIAL TIME				0900	1527
MEDIUM				WATER	WATER
00010	WATER	TEMP	CENT	2.0	
00011	WATER	TEMP	FAHN	35.6$	
00061	STREAM	FLOW,	INST-CFS	.8	
00076	TURB	TRBIDMTR	HACH FTU		8.3
00095	CNDUCTVY	AT 25C	MICROMHO		381
00116	INTNSVE	SURVEY	IDENT	811605	811605
00300	DO		MG/L	12.1	
00301	DO	SATUR	PERCENT	100.6$	
00410	T ALK	CACO3	MG/L		173
00425	HCO3 ALK	CACO3	MG/L		173
00535	RESIDUE	VOL NFLT	MG/L		2
00625	TOT KJEL	N	MG/L		.660
00630	NO2&NO3	N-TOTAL	MG/L		.11
00665	PHOS-TOT		MG/L P		.060
00671	PHOS-DIS	ORTHO	MG/L P		.007
00900	TOT HARD	CACO3	MG/L		180
00916	CALCIUM	CA-TOT	MG/L		47.0

(SAMPLE CONTINUED ON NEXT PAGE)

/TYPA/AMBNT/STREAM

2060154
42 34 00.0 114 37 23.0 2
CEDAR DRAW @ REST AREA W OF FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			82/12/08	87/10/14
	INITIAL TIME			0900	1527
	MEDIUM			WATER	WATER
00927	MGNSIUM	MG,TOT	MG/L		18.5
00929	SODIUM	NA,TOT	MG/L		26.00
00937	PTSSIUM	K,TOT	MG/L		4.60
00940	CHLORIDE	TOTAL	MG/L		36
00945	SULFATE	SO4-TOT	MG/L		58
00951	FLUORIDE	F,TOTAL	MG/L		.71
46570	CAL HARD	CA MG	MG/L		194$
74041	WQF	SAMPLE	UPDATED		880323
80154	SUSP SED	CONC	MG/L		24
82078	TURBIDIT	Y FIELD	NTU	2.0	

2060155
42 35 52.0 114 38 00.0 2
CEDAR DRAW BL POLE LINE RD NW OF FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INITIAL DATE				01/01/01	82/04/19	82/05/05	82/05/25	82/06/07	82/06/22	82/07/07	82/08/04	82/09/15
INITIAL TIME					1050	1530				0930	1015	1015
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT		10.0	13.0				18.0	19.0	14.0
00011	WATER	TEMP	FAHN		50.0$	55.4$				64.4$	66.2$	57.2$
00042	ALTITUDE	FEET	AB MSL	3610								
00061	STREAM	FLOW,	INST-CFS		12	79	22	98	58	168	72	
00094	CNDUCTVY	FIELD	MICROMHO									402
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L		13.0	9.3				7.7	7.5	8.3
00301	DO	SATUR	PERCENT		131.2$	100.1$				92.5$	91.0$	91.0$
00400	PH		SU		8.90	8.20				8.40	8.40	8.00
00665	PHOS-TOT		MG/L P		.390							
00671	PHOS-DIS	ORTHO	MG/L P		.195							
31616	FEC COLI	MFM-FCBR	/100ML		20							
80154	SUSP SED	CONC	MG/L		11							
82078	TURBIDIT	Y FIELD	NTU									55.0

INITIAL DATE				82/12/08	84/07/05	84/07/16	84/08/08	84/10/03	85/04/17	85/05/14	85/05/27	85/06/19
INITIAL TIME				0930	1200	1635	1030	0930	1030	0930	1751	1345
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	6.5			20.0	11.4		10.0	17.0	
00011	WATER	TEMP	FAHN	43.7$			68.0$	52.5$		50.0$	62.6$	
00061	STREAM	FLOW,	INST-CFS	15	22	20		97	79			
00094	CNDUCTVY	FIELD	MICROMHO					376		306	486	
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	10.0			7.8	9.7		11.0	7.7	
00301	DO	SATUR	PERCENT	91.3$			96.7$	99.7$		111.0$	90.6$	
00400	PH		SU				7.70	8.30		8.00	8.70	
00625	TOT KJEL	N	MG/L					.500			.660	
00630	NO2&NO3	N-TOTAL	MG/L					.66			1.02	
00665	PHOS-TOT		MG/L P					.100			1.000	
00671	PHOS-DIS	ORTHO	MG/L P					.020			.088	
31616	FEC COLI	MFM-FCBR	/100ML					90			30	40
80154	SUSP SED	CONC	MG/L					48			238	
82078	TURBIDIT	Y FIELD	NTU	2.0								

2060155
42 35 52.0 114 38 00.0 2
CEDAR DRAW BL POLE LINE RD NW OF FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INITIAL DATE				85/07/01	85/07/15	85/07/24	85/08/07	85/09/03	85/09/10	85/10/21	86/04/16	86/04/29
INITIAL TIME				1545	1600	1400	1620	1600	0810	1711	0939	1000
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT				21.0		9.0	10.0	9.8	9.0
00011	WATER	TEMP	FAHN				69.8$		48.2$	50.0$	49.6$	48.2$
00061	STREAM	FLOW,	INST-CFS	45	20	22		63			149	126
00094	CNDUCTVY	FIELD	MICROMHO				673		410	479	424	350
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L				10.0		11.3	10.5	9.5	8.7
00301	DO	SATUR	PERCENT				126.7$		111.1$	106.0$	95.9$	85.6$
00400	PH		SU				8.40		8.10	8.40	8.30	8.30
74041	WQF	SAMPLE	UPDATED								870731	870731

INITIAL DATE				86/05/12	86/05/14	86/06/02	86/07/18	86/07/29	86/08/11	86/09/03	86/09/30	86/12/16
INITIAL TIME				0958	0958	1400	0820	0700	1549	1115	1000	1220
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT		10.0	18.0	17.0	19.0	20.0		10.0	6.0
00011	WATER	TEMP	FAHN		50.0$	64.4$	62.6$	66.2$	68.0$		50.0$	42.8$
00061	STREAM	FLOW,	INST-CFS	145	86	138	139	180	120	156	154	31
00094	CNDUCTVY	FIELD	MICROMHO		378	568	512	565	789	580	396	475
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L		8.5	7.5	6.9	6.1	6.1	6.2	7.8	8.4
00301	DO	SATUR	PERCENT		85.8$	90.1$	81.1$	74.0$	75.6$		78.7$	76.7$
00400	PH		SU		8.00	8.20	8.30	8.10	8.20	8.20	7.80	8.10
74041	WQF	SAMPLE	UPDATED	860801	870731	860807	870731	860904	861030	861110	861031	870731

INITIAL DATE				87/01/28	87/02/25	87/03/24	87/05/27	87/06/01	87/06/19	87/07/08	87/07/15	87/07/28
INITIAL TIME				0942	1832	1630	1405	1430	1730	0730	0721	0730
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	5.0	6.0	14.5		14.7	13.0		20.0	19.0
00011	WATER	TEMP	FAHN	41.0$	42.8$	58.1$		58.5$	55.4$		68.0$	66.2$
00061	STREAM	FLOW,	INST-CFS	20	21	16		59	63	36	54	36
00094	CNDUCTVY	FIELD	MICROMHO	365	360	881		549	497		759	812
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605		811605		811605	811605
00300	DO		MG/L	8.0	8.4	6.3		6.0	6.1		5.5	5.7
00301	DO	SATUR	PERCENT	71.3$	76.7$	69.1$		67.1$	65.6$		68.2$	69.2$
00400	PH		SU	7.90	8.30	8.90		8.40	8.30		8.40	8.30
74041	WQF	SAMPLE	UPDATED	870318	870318	870424	870731	870919	870919	871023	871016	871030

/TYPA/AMBNT/STREAM

2060155
42 35 52.0 114 38 00.0 2
CEDAR DRAW BL POLE LINE RD NW OF FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

INITIAL DATE				87/08/05	87/09/01	87/09/28	87/10/14	87/11/24	87/12/08	88/01/05	88/02/18	88/03/01
INITIAL TIME				0824	0824	0930	1759	1210	0957	1030	0851	0730
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	17.8	14.0	10.0	13.0	10.0	7.5	7.0	6.0	9.0
00011	WATER	TEMP	FAHN	64.0$	57.2$	50.0$	55.4$	50.0$	45.5$	44.6$	42.8$	48.2$
00061	STREAM	FLOW,	INST-CFS	48	56	49	98	60	26	28	18	18
00094	CNDUCTVY	FIELD	MICROMHO	718	678	607	557	691	689	689	587	695
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	7.8	8.4	8.3	8.7	7.0	8.4	8.6	10.9	12.2
00301	DO	SATUR	PERCENT	93.7$	92.1$	83.8$	93.6$	70.7$	78.5$	80.4$	99.5$	120.0$
00400	PH		SU	8.30	8.20	8.10	8.20	8.00	8.00	8.00	8.20	8.20
74041	WQF	SAMPLE	UPDATED	871023	871008	871009	871106	880323	880323	880422	880422	880422

INITIAL DATE				88/03/22	88/04/14	88/06/01
INITIAL TIME				0731	1004	1553
MEDIUM				WATER	WATER	WATER
00010	WATER	TEMP	CENT	10.0	10.0	15.0
00011	WATER	TEMP	FAHN	50.0$	50.0$	59.0$
00061	STREAM	FLOW,	INST-CFS	21	33	
00094	CNDUCTVY	FIELD	MICROMHO	557	562	452
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605
00300	DO		MG/L	12.5	10.3	10.4
00301	DO	SATUR	PERCENT	126.2$	104.0$	116.3$
00400	PH		SU	8.30	8.20	8.30
74041	WQF	SAMPLE	UPDATED	880422	880609	880630

/TYPA/AMBNT/STREAM

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

INITIAL DATE				01/01/01	82/05/05	82/05/18	82/06/07	82/06/18	82/06/22	82/07/07	82/07/20	82/08/04
INITIAL TIME					1300	1530	1140	1530	1330	0830	1020	0930
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT							74.1		
00011	WATER	TEMP	FAHN							165.4*		
00042	ALTITUDE	FEET	AB MSL	3922								
00061	STREAM	FLOW,	INST-CFS		49	82	79		77	74	76	
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00665	PHOS-TOT		MG/L P		.260		.150		.170	.190	.190	.270
00671	PHOS-DIS	ORTHO	MG/L P		.008	.008	.005		.036	.018	.018	.030
31616	FEC COLI	MFM-FCBR	/100ML		10	30	100	30	750	660	30	70
80154	SUSP SED	CONC	MG/L		276	198	79		62	76	131	184

INITIAL DATE				82/09/15	82/10/12	83/04/19	83/05/04	83/05/17	83/06/06	83/06/22	83/07/06	83/07/19
INITIAL TIME				0900	0945	0900	1630	0845	1615	1545	0845	0945
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00061	STREAM	FLOW,	INST-CFS	47	24	6	39	59	72	70	74	76
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00630	NO2&NO3	N-TOTAL	MG/L	.06				.002	.001		.02	
00665	PHOS-TOT		MG/L P	.140	.100	.180	.270	.180	.120	.190	.130	2.000
00671	PHOS-DIS	ORTHO	MG/L P	.033	.001	.005	.001	.001K	.003	.002	.005	.003
31616	FEC COLI	MFM-FCBR	/100ML	30	18	20	50	130	20	400	20	60
80154	SUSP SED	CONC	MG/L	31	22	108	122	109	73	71	76	102

INITIAL DATE				83/08/02	83/08/17	83/08/17	83/08/30	83/09/13	83/10/11	84/05/02	84/05/15	84/06/05
INITIAL TIME				0910	1320	1330	0900	1215	1100	0930	1125	0820
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00061	STREAM	FLOW,	INST-CFS	71		74	68	67	40	43	65	69
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00625	TOT KJEL	N	MG/L			.500	.300	.400	.350	.800	.800	.600
00630	NO2&NO3	N-TOTAL	MG/L	.04				.05	.05		.06	.15
00665	PHOS-TOT		MG/L P	.380		.160	.120	.110	.060	.300	.300	.200
00671	PHOS-DIS	ORTHO	MG/L P	.010		.007	.025	.029	.019	.004	.005	.011
31616	FEC COLI	MFM-FCBR	/100ML	230	1680		100	140	31	100	400	120
80154	SUSP SED	CONC	MG/L	196		90	40	33	11	186	152	111

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INITIAL DATE				84/06/19	84/07/02	84/07/16	84/08/08	84/09/04	84/10/03	84/10/16	85/04/17	85/05/02
INITIAL TIME				1430	1010	1515	0825	1440	0800	1400	0905	1400
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT									10.0
00011	WATER	TEMP	FAHN									50.0$
00061	STREAM	FLOW,	INST-CFS	62	68	68	67	67	45	31		
00076	TURB	TRBIDMTR	HACH FTU								13.0	
00094	CNDUCTVY	FIELD	MICROMHO									452
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L									8.4
00301	DO	SATUR	PERCENT									85.8$
00400	PH		SU									7.70
00403	PH	LAB	SU								7.7	
00610	NH3+NH4-	N TOTAL	MG/L								.055	
00625	TOT KJEL	N	MG/L	.600	.500	.700	.700	.600	.420	.420	.890	.660
00630	NO2&NO3	N-TOTAL	MG/L	.18	.006	.12	.001	.05	.10	.11	.16	.25
00665	PHOS-TOT		MG/L P	.120	.130	.130	.150	.130	.080	.070	.280	.200
00671	PHOS-DIS	ORTHO	MG/L P	.021	.003	.005	.007	.016	.014	.024	.017	.018
31616	FEC COLI	MFM-FCBR	/100ML	120	20	40	80	50	60	7	10	10K
80154	SUSP SED	CONC	MG/L	37	55	104	116	44	16	36	56	157

INITIAL DATE				85/05/14	85/05/27	85/06/04	85/06/19	85/07/01	85/07/15	85/07/24	85/08/08	85/08/20
INITIAL TIME				1030	1530	1600	1345	1520	1620	1312	1700	1120
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00076	TURB	TRBIDMTR	HACH FTU					21.0				
00095	CNDUCTVY	AT 25C	MICROMHO					370				
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00403	PH	LAB	SU					8.6				
00410	T ALK	CACO3	MG/L					142				
00610	NH3+NH4-	N TOTAL	MG/L					.171				
00625	TOT KJEL	N	MG/L	.680		.550	.500	.500	.480	.490		.440
00630	NO2&NO3	N-TOTAL	MG/L	.12	.03	.02	.01	.15	.10		.06	
00665	PHOS-TOT		MG/L P	.220	.410	.100	.120	.120	.170	.180	.110	.120
00671	PHOS-DIS	ORTHO	MG/L P	.001K	.063	.006	.006	.001K	.005	.014	.028	.029
00900	TOT HARD	CACO3	MG/L					160				
00916	CALCIUM	CA-TOT	MG/L					43.2				
00927	MGNSIUM	MG,TOT	MG/L					13.2				
00929	SODIUM	NA,TOT	MG/L					17.50				

(SAMPLE CONTINUED ON NEXT PAGE)

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HO 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				85/05/14	85/05/27	85/06/04	85/06/19	85/07/01	85/07/15	85/07/24	85/08/08	85/08/20
INITIAL TIME				1030	1530	1600	1345	1520	1620	1312	1700	1120
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00937	PTSSIUM	K,TOT	MG/L					3.00				
00940	CHLORIDE	TOTAL	MG/L					16				
00945	SULFATE	SO4-TOT	MG/L					37				
00951	FLUORIDE	F,TOTAL	MG/L					.73				
00956	SILICA	TOTAL	MG/L					9.3				
31616	FEC COLI	MFM-FCBR	/100ML	10	400	30		10	40	60	30	20
46570	CAL HARD	CA MG	MG/L					162$				
80154	SUSP SED	CONC	MG/L	136	104	82	61	71	91	113	21	20

INITIAL DATE				85/09/03	85/09/17	85/10/09	85/10/21	86/01/22	86/04/16	86/04/29	86/05/13	86/05/28
INITIAL TIME				1720	1522	1601	1609	1414	0800	0837	1335	1536
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT				11.0			8.0		
00011	WATER	TEMP	FAHN				51.8$			46.4$		
00061	STREAM	FLOW,	INST-CFS		304		278			206	498	115
00076	TURB	TRBIDMTR	HACH FTU	9.0		6.2	3.3		20.0		20.0	
00094	CNDUCTVY	FIELD	MICROMHO				499			396		
00095	CNDUCTVY	AT 25C	MICROMHO			366	520					
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L				11.0			9.0		
00301	DO	SATUR	PERCENT				114.4$			87.3$		
00400	PH		SU				8.60			8.50		
00403	PH	LAB	SU	8.6		8.9	8.5					
00410	T ALK	CACO3	MG/L	155		173	181					
00425	HCO3 ALK	CACO3	MG/L	143		173	173					
00610	NH3+NH4-	N TOTAL	MG/L			.039						
00625	TOT KJEL	N	MG/L	.490	.260	.810	.490	.920	.810	1.000	.860	.450
00630	NO2&NO3	N-TOTAL	MG/L	.09	.14	.11	.50	4.66	.02	.85	.02	.01
00665	PHOS-TOT		MG/L P	.090	.090	.080	.070	.160	.100	.300	.200	.200
00671	PHOS-DIS	ORTHO	MG/L P	.021	.036	.006	.014		.008	.023	.003	.026
00900	TOT HARD	CACO3	MG/L	176		190	204					
00916	CALCIUM	CA-TOT	MG/L	44.0		44.0	50.0					
00927	MGNSIUM	MG,TOT	MG/L	16.0		17.0	19.0					
00929	SODIUM	NA,TOT	MG/L	20.50		24.70	25.80					
00937	PTSSIUM	K,TOT	MG/L	3.90		4.90	5.10					
00940	CHLORIDE	TOTAL	MG/L	19		26	27					
00945	SULFATE	SO4-TOT	MG/L	40		50	49					
00951	FLUORIDE	F,TOTAL	MG/L	.65		.67	.63					

(SAMPLE CONTINUED ON NEXT PAGE)

/TYPA/AMBNT/STREAM

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE			85/09/03	85/09/17	85/10/09	85/10/21	86/01/22	86/04/16	86/04/29	86/05/13	86/05/28
INITIAL TIME			1720	1522	1601	1609	1414	0800	0837	1335	1536
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00956 SILICA	TOTAL	MG/L			18.0						
31616 FEC COLI	MFM-FCBR	/100ML	30	20	20	10K	10K	50	20	10	800
46570 CAL HARD	CA MG	MG/L	176$		180$	203$					
70507 PHOS-T	ORTHO	MG/L P					.119				
74041 WQF	SAMPLE	UPDATED					860620	860620	870319	870319	870319
80154 SUSP SED	CONC	MG/L		16	6	2	12	94	176	90	76

INITIAL DATE			86/06/04	86/06/18	86/06/23	86/07/15	86/07/29	86/08/06	86/08/11	86/09/03	86/09/15
INITIAL TIME			1236	1501	0837	1652	1657	0901	1457	1000	0956
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00005 VSAMPLOC	DEPTH	% OF TOT					8				
00010 WATER	TEMP	CENT				19.0	19.0		21.0		
00011 WATER	TEMP	FAHN				66.2$	66.2$		69.8$		
00061 STREAM	FLOW,	INST-CFS	139	146	83	134	56		115	209	392
00076 TURB	TRBIDMTR	HACH FTU			12.0	44.0	30.0		28.0	23.0	
00094 CNDUCTVY	FIELD	MICROMHO				655	622		802	611	
00116 INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300 DO		MG/L				6.7	5.5		5.8	6.0	
00301 DO	SATUR	PERCENT				82.3$	67.5$		74.4$		
00400 PH		SU				8.20	8.30		8.40	8.20	
00535 RESIDUE	VOL NFLT	MG/L	58	4	8	4	18	12	2K	6	22
00625 TOT KJEL	N	MG/L	.790	31.000	.540	.970	.500	.870		.760	.740
00630 NO2&NO3	N-TOTAL	MG/L	1.36	.02	3.32	.02	.05	2.53	.006	1.53	1.34
00665 PHOS-TOT		MG/L P	.300	.100	.100	.300	.200	.400	.100	.300	.200
00671 PHOS-DIS	ORTHO	MG/L P	.021	.001	.017	.035	.001K		.001	.008	.033
01147 SELENIUM	SE,TOT	UG/L				5K					
31616 FEC COLI	MFM-FCBR	/100ML	300	20	300	300	90	400	10K	100	180
74041 WQF	SAMPLE	UPDATED	870319	870319	870319	870319	870319	860919	870319	870319	870319
80154 SUSP SED	CONC	MG/L	220	26	116	216	134	248	56	82	84

INITIAL DATE			86/09/29	86/10/15	87/04/28	87/05/05	87/05/19	87/05/27	87/06/01	87/06/03	87/06/16
INITIAL TIME			1223	1505	0802	1510	1622	1405	1401	1005	1552
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER	TEMP	CENT	11.0	12.0			13.7		15.2		
00011 WATER	TEMP	FAHN	51.8$	53.6$			56.7$		59.4$		
00061 STREAM	FLOW,	INST-CFS	316	245	50	73	62	63	73		
00076 TURB	TRBIDMTR	HACH FTU	6.0	7.0	29.0			7.5			22.0
00094 CNDUCTVY	FIELD	MICROMHO	437	474			509		565		

(SAMPLE CONTINUED ON NEXT PAGE)

/TYPA/AMBNT/STREAM

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE			86/09/29	86/10/15	87/04/28	87/05/05	87/05/19	87/05/27	87/06/01	87/06/03	87/06/16
INITIAL TIME			1223	1505	0802	1510	1622	1405	1401	1005	1552
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00095	CNDUCTVY	AT 25C			452		455	471			440
00116	INTNSVE	SURVEY	811605	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		7.9	7.4			6.2		6.2		
00301	DO	SATUR	82.1$	79.1$			68.8$		70.1$		
00400	PH		7.90	8.20			8.40		8.50		
00410	T ALK	CACO3			165		160	162			
00425	HCO3 ALK	CACO3			165		160	162			153
00535	RESIDUE	VOL NFLT	14	6	4	10	10	2K		12	16
00625	TOT KJEL	N	.530	.390	.720	.840	.520	.310		.690	.660
00630	NO2&NO3	N-TOTAL	1.42	1.29	.07	.001K	.16	.13		1.85	.001K
00665	PHOS-TOT		.100	.050	.240	.130	.110	.060		.240	.130
00671	PHOS-DIS	ORTHO	.023	.017	.001K	.004	.003	.005		.004	.001
00900	TOT HARD	CACO3					180	194			164
00916	CALCIUM	CA-TOT			47.0		41.0	46.0			43.0
00927	MGNSIUM	MG,TOT			16.0		16.5	16.0			16.5
00929	SODIUM	NA,TOT			21.90		21.00	21.80			21.30
00937	PTSSIUM	K,TOT			3.80		4.20	4.20			4.30
00940	CHLORIDE	TOTAL			25		23	24			42
00945	SULFATE	SO4-TOT			38		46	42			51
00951	FLUORIDE	F,TOTAL			.78		.85	.80			.71
00956	SILICA	TOTAL					.5				
01022	BORON	B,TOT					98				
31616	FEC COLI	MFM-FCBR	90	370	20	20	10K	30	40		100
46570	CAL HARD	CA MG			183$		170$	181$			175$
74041	WQF	SAMPLE	870319	870319	870619	871002	870820	871002	871002	870827	870919
80154	SUSP SED	CONC	38	26	148	68	28	26		142	84

INITIAL DATE			87/06/30	87/07/15	87/07/28	87/08/06	87/08/18	87/09/01	87/09/03	87/09/14	87/09/28
INITIAL TIME			1345	1624	1657	1004	0525	0806	0944	0749	0730
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00061	STREAM	FLOW,		28	57		49	61		51	47
00076	TURB	TRBIDMTR		23.0	23.0	19.0	18.0	10.0			6.0
00095	CNDUCTVY	AT 25C		463	469	479	437	440			471
00116	INTNSVE	SURVEY	811605	811605	811605	811605	811605	811605	811605	811605	811605
00410	T ALK	CACO3		163	167	167	171	166			172
00425	HCO3 ALK	CACO3		163	163	167	171	166			172
00535	RESIDUE	VOL NFLT	18	24	18	4	18	8		6	2K
00625	TOT KJEL	N	.520	.290	.480	.500	.510	.510		.420	.480

(SAMPLE CONTINUED ON NEXT PAGE)

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE			87/06/30	87/07/15	87/07/28	87/08/06	87/08/18	87/09/01	87/09/03	87/09/14	87/09/28
INITIAL TIME			1345	1624	1657	1004	0525	0806	0944	0749	0730
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00630 NO2&NO3	N-TOTAL	MG/L	.01	.05	.02	.04	.01	.001K		.12	.04
00665 PHOS-TOT		MG/L P	.090	.110	.130	.140	.130	.050K		.070	.090
00671 PHOS-DIS	ORTHO	MG/L P	.001K		.050	.019	.018	.053		.019	.027
00900 TOT HARD	CACO3	MG/L		184	188	184	188	186			197
00916 CALCIUM	CA-TOT	MG/L		44.0	47.0	50.0	39.0	49.0			49.0
00927 MGNSIUM	MG,TOT	MG/L		16.5	17.0	18.0	18.0	17.5			18.0
00929 SODIUM	NA,TOT	MG/L		21.30	21.90	21.80	21.60	23.40			24.20
00937 PTSSIUM	K,TOT	MG/L		4.20	4.30	4.50	4.40	4.60			4.60
00940 CHLORIDE	TOTAL	MG/L		22	24	23	23	25			26
00945 SULFATE	SO4-TOT	MG/L		52	101	59	57	51			55
00951 FLUORIDE	F,TOTAL	MG/L		.74	.75	.73	.74	.72			.73
00956 SILICA	TOTAL	MG/L		13.0		5.7					
01002 ARSENIC	AS,TOT	UG/L				10K					
01022 BORON	B,TOT	UG/L				181					
01045 IRON	FE,TOT	UG/L				1140					
01055 MANGNESE	MN	UG/L				50.0					
01092 ZINC	ZN,TOT	UG/L				3					
31616 FEC COLI	MFM-FCBR	/100ML	20	50	100	40	50		60	130	10
46570 CAL HARD	CA MG	MG/L		178$	187$	199$	172$	194$			196$
74041 WQF	SAMPLE	UPDATED	870731	871016	871008	871002	871023	871008	870919	871016	880422
80154 SUSP SED	CONC	MG/L	56	82	76	72	66	32		20	16

INITIAL DATE			87/10/14	87/10/14	88/04/12	88/04/26	88/05/03	88/05/18	88/05/25	88/06/01
INITIAL TIME			1521	1527	0817	1010	1151	0857	1339	0959
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00061 STREAM	FLOW,	INST-CFS		35	11	33		76	72	
00076 TURB	TRBIDMTR	HACH FTU	8.3	8.3						
00095 CNDUCTVY	AT 25C	MICROMHO	381	381						
00116 INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605
00410 T ALK	CACO3	MG/L	173	173						
00425 HCO3 ALK	CACO3	MG/L	173	173						
00535 RESIDUE	VOL NFLT	MG/L	2	2	12	20	2	2	10	8
00625 TOT KJEL	N	MG/L	.660	.660	1.380	.930	.880	.610	.670	.460
00630 NO2&NO3	N-TOTAL	MG/L	.11	.11	.02	.01	.001	.06	.001	.10
00665 PHOS-TOT		MG/L P	.060	.060	.250	.210	.200	.120	.100	.090
00671 PHOS-DIS	ORTHO	MG/L P	.007	.007	.006	.001	.061	.006	.001K	.003
00900 TOT HARD	CACO3	MG/L	180	180						
00916 CALCIUM	CA-TOT	MG/L	47.0	47.0						

(SAMPLE CONTINUED ON NEXT PAGE)

2060157 13093475
42 32 50.0 114 40 30.0 2
CEDAR DRAW BL LOW LINE CANAL NR FILER
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 820710 HQ 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				87/10/14	87/10/14	88/04/12	88/04/26	88/05/03	88/05/18	88/05/25	88/06/01
INITIAL TIME				1521	1527	0817	1010	1151	0857	1339	0959
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00927	MGNSIUM	MG,TOT	MG/L	18.5	18.5						
00929	SODIUM	NA,TOT	MG/L	26.00	26.00						
00937	PTSSIUM	K,TOT	MG/L	4.60	4.60						
00940	CHLORIDE	TOTAL	MG/L	36	36						
00945	SULFATE	SO4-TOT	MG/L	58	58						
00951	FLUORIDE	F,TOTAL	MG/L	.71	.71						
31616	FEC COLI	MFM-FCBR	/100ML		19		10	30	30	100	270
46570	CAL HARD	CA MG	MG/L	194$	194$						
74041	WQF	SAMPLE	UPDATED	880422	880610	880505	880802	880616	880802	880802	880707
80154	SUSP SED	CONC	MG/L	24	24	130	106	102	64	64	42

/TYPA/AMBNT/STREAM

2060021 151054
42 37 25.0 114 39 10.0 4
CEDAR DRAW @ USGS NW OF FILER NR BUHL
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 760302 17040212
0000 FEET DEPTH

	INITIAL DATE			01/01/01	70/04/15	70/07/30	71/03/22	71/09/08	72/06/14	72/08/17	72/12/19	73/03/14
	INITIAL TIME						1430					
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT			17.2	12.0	17.8	19.4	17.8	7.2	10.0
00011	WATER	TEMP	FAHN			63.0$	53.6$	64.0$	67.0$	64.0$	45.0$	50.0$
00042	ALTITUDE	FEET	AB MSL	3540								
00076	TURB	TRBIDMTR	HACH FTU		25.0K		1.0	70.0	68.0	68.0	22.0	54.0
00095	CNDUCTVY	AT 25C	MICROMHO						360	540	604	840
00300	DO		MG/L			7.6	12.8					12.0
00301	DO	SATUR	PERCENT			89.2$	134.9$					120.8$
00310	BOD	5 DAY	MG/L		10.0	1.6	1.9	1.2	3.2	1.7	6.0	2.4
00335	COD	LOWLEVEL	MG/L		66.0	86.0	47.0	4.0K	20.3	23.7	43.0	36.0
00400	PH		SU		8.30	8.10						
00403	PH	LAB	SU				8.3	8.0	7.9	7.8	7.8	7.9
00410	T ALK	CACO3	MG/L		232	266	276	248	136	192	296	256
00500	RESIDUE	TOTAL	MG/L		696	644	740	600	592	920	696	1076
00610	NH3+NH4-	N TOTAL	MG/L		.683	.777	.078	.233	.233		.543	.388
00612	UN-IONZD	NH3-N	MG/L			.030$	.003$	.008$	.007$		.005$	.006$
00615	NO2-N	TOTAL	MG/L								.064	.029
00619	UN-IONZD	NH3-NH3	MG/L			.037$	.004$	.009$	.008$		.006$	.007$
00620	NO3-N	TOTAL	MG/L		.384	1.400	4.176	1.670	.293	1.603	3.679	2.302
00900	TOT HARD	CACO3	MG/L			300	300	264	156	212		
00916	CALCIUM	CA-TOT	MG/L		34.0	50.0	42.0	50.0	35.0	42.0		
00927	MGNSIUM	MG,TOT	MG/L			42.0	47.0	34.0	16.0	26.0		
00929	SODIUM	NA,TOT	MG/L		94.00	52.00	67.00	69.00	40.00	75.00	78.00	42.00
00937	PTSSIUM	K,TOT	MG/L			6.00	5.60	5.90	3.00	2.20	6.90	2.90
00940	CHLORIDE	TOTAL	MG/L		46	36	57	32	18	32		6
00945	SULFATE	SO4-TOT	MG/L			110M	205	100	38	99		
00951	FLUORIDE	F,TOTAL	MG/L			.79	.65	.42	.67	.76		
00956	SILICA	TOTAL	MG/L				44.0	38.0	39.2	90.5		
01022	BORON	B,TOT	UG/L				100K	100K	100K	100K		
01045	IRON	FE,TOT	UG/L		580	1310	10K	30	120	150	40	70
01055	MANGNESE	MN	UG/L		50.0	290.0	10.0K	10.0	60.0	20.0	60.0	10.0K
31501	TOT COLI	MFIMENDO	/100ML			2300	292	4600	6600	8400	19000	220
46570	CAL HARD	CA MG	MG/L			298$	298$	265$	153$	212$		
70300	RESIDUE	DISS-180 C	MG/L		365	538	672	492				
70507	PHOS-T	ORTHO	MG/L P		.010	.179	.055	.072	.016	.046	.235	.046

/TYPA/AMBNT/STREAM

Z060021 151054
42 37 25.0 114 39 18.0 4
CEDAR DRAW @ USGS NW OF FILER NR BUHL
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 760302 17040212
0000 FEET DEPTH

INITIAL DATE				73/05/22	73/07/23	73/11/19	74/03/14	74/09/11	74/10/17	74/11/13	74/12/11	75/01/30
INITIAL TIME								0825	1105	1108		1010
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
DEPTH-FT(SMK)												1
00010	WATER	TEMP	CENT	20.0	22.0	10.0	9.0	17.0	12.0	12.0		
00011	WATER	TEMP	FAHN	68.0$	71.6$	50.0$	48.2$	62.6$	53.6$	53.6$		
00070	TURB	JKSN	JTU							70.0		
00076	TURB	TRBIDMTR	HACH FTU	90.0	75.0	70.0	27.0	60.0	7.0		52.0	6.4
00095	CNDUCTVY	AT 25C	MICROMHO	529	530	800	879	620	660	680	720	
00300	DO		MG/L	9.2	7.2	10.3	13.0	10.2	10.1	13.0		
00301	DO	SATUR	PERCENT	113.8$	93.1$	103.7$	127.5$	119.6$	106.4$	137.0$		
00310	BOD	5 DAY	MG/L	2.9	3.1	2.5	3.0	.4	1.9	1.2	2.1	
00335	COD	LOWLEVEL	MG/L	63.0	50.0	85.0	13.0		41.0	49.1	17.1	
00400	PH		SU		8.00	8.40		8.30	8.00	8.30		
00403	PH	LAB	SU	7.7	7.3	7.8	7.8	7.7	7.0	7.3	8.1	
00410	T ALK	CACO3	MG/L	172	232	180	252	200	210	208	190	
00500	RESIDUE	TOTAL	MG/L	744	696	796	956	576	543	598	604	
00530	RESIDUE	TOT NFLT	MG/L							95		
00610	NH3+NH4-	N TOTAL	MG/L	.233	.078	.699	.078	.140	.062	.101	.031	
00612	UN-IONZD	NH3-N	MG/L	.005$	.003$	.031$	.0008$	.008$	.001$	.004$		
00615	NO2-N	TOTAL	MG/L	.009	.005	.016	.017	.003	.006	.019	.022	
00619	UN-IONZD	NH3-NH3	MG/L	.006$	.004$	.038$	.001$	.010$	.002$	.005$		
00620	NO3-N	TOTAL	MG/L	1.354	1.129	4.176	5.530	.923	2.038	2.348	3.928	
00929	SODIUM	NA,TOT	MG/L	45.00	72.00	72.00	88.00	57.50	60.00	67.50	85.00	
00937	PTSSIUM	K,TOT	MG/L	4.20	5.10	5.50	6.30	5.10	4.90	4.20	4.40	
00940	CHLORIDE	TOTAL	MG/L								11	
01045	IRON	FE,TOT	UG/L	1690	40	430	30	230	140	40	70	110
01055	MANGNESE	MN	UG/L	160.0	10.0	20.0	10.0K	50.0	20.0	20.0	10.0K	
31501	TOT COLI	MFIMENDO	/100ML	1200	16000	5300	524	4800	6200	4600	3700	4800
31616	FEC COLI	MFM-FCBR	/100ML						270			630
70507	PHOS-T	ORTHO	MG/L P	.085	.111	.016	.104	.049	.007	.046	.130	

INITIAL DATE				75/02/12	75/03/04	75/04/16	75/05/06	75/06/09	75/07/07	75/07/08	75/11/12	82/04/19
INITIAL TIME				1130	1230	1330	1130	1040				1130
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
DEPTH-FT(SMK)				1	1	1	1	1				
00010	WATER	TEMP	CENT								8.0	10.0
00011	WATER	TEMP	FAHN								46.4$	50.0$

(SAMPLE CONTINUED ON NEXT PAGE)

2060021 151054
42 37 25.0 114 39 10.0 4
CEDAR DRAW @ USGS NW OF FILER NR BUHL
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 760302 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE			75/02/12	75/03/04	75/04/16	75/05/06	75/06/09	75/07/07	75/07/08	75/11/12	82/04/19
INITIAL TIME			1130	1230	1330	1130	1040				1130
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
DEPTH-FT(SMK)			1	1	1	1	1				
00061 STREAM	FLOW,	INST-CFS									
00070 TURB	JKSN	JTU								75	29
00076 TURB	TRBIDMTR	HACH FTU	22.0	27.0	25.0	28.0	35.0	75.0			
00095 CNDUCTVY	AT 25C	MICROMHO						75.0	68.0	10.0	
00116 INTNSVE	SURVEY	IDENT								660	
00300 DO		MG/L									811605
00301 DO	SATUR	PERCENT								13.0	12.8
00310 BOD	5 DAY	MG/L								124.3$	128.9$
00335 COD	LOWLEVEL	MG/L								4.5	
00400 PH		SU								16.8	
00403 PH	LAB	SU								8.00	8.60
00410 T ALK	CACO3	MG/L								8.2	
00500 RESIDUE	TOTAL	MG/L								240	
00505 RESIDUE	TOT VOL	MG/L								490	
00530 RESIDUE	TOT NFLT	MG/L								104	
00610 NH3+NH4-	N TOTAL	MG/L								65	
00612 UN-IONZD	NH3-N	MG/L								.210	
00615 NO2-N	TOTAL	MG/L								.003$	
00619 UN-IONZD	NH3-NH3	MG/L								.007	
00620 NO3-N	TOTAL	MG/L								.004$	
00650 T PO4	PO4	MG/L								1.871	
00665 PHOS-TOT		MG/L P								.41	
00671 PHOS-DIS	ORTHO	MG/L P								.150	.120
01045 IRON	FE,TOT	UG/L									.046
31501 TOT COLI	MFIMENDO	/100ML	170	80	20	80	240				
31616 FEC COLI	MFM-FCBR	/100ML	6800	3200	5900	4800	8000			3700	
31679 FECSTREP	MF M-ENT	/100ML	140	370	140	62	1000			780	10K
70507 PHOS-T	ORTHO	MG/L P								620	
80154 SUSP SED	CONC	MG/L								.003K	
82028 RATIO	FEC COL	FEC STRP								1$	7

INITIAL DATE			82/05/05	82/05/25	82/06/07	82/06/22	82/07/07	82/08/04	82/09/15	82/12/08
INITIAL TIME			1500				0945	1100	1045	1030
MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER	TEMP	CENT	10.0				19.0	11.0	12.0	4.0
00011 WATER	TEMP	FAHN	50.0$				66.2$	51.8$	53.6$	39.2$
00061 STREAM	FLOW,	INST-CFS	82	63	121	105	181	99		34

(SAMPLE CONTINUED ON NEXT PAGE)

2060021 151054
42 37 25.0 114 39 10.0 4
CEDAR DRAW @ USGS NW OF FILER NR BUHL
16083 IDAHO TWIN FALLS
PACIFIC NORTHWEST 130600
UPPER SNAKE RIVER
21IDSURV 760302 17040212
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			82/05/05	82/05/25	82/06/07	82/06/22	82/07/07	82/08/04	82/09/15	82/12/08
	INITIAL TIME			1500				0945	1100	1045	1030
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00094	CNDUCTVY	FIELD	MICROMHO							432	
00116	INTNSVE	SURVEY	IDENT	811605	811605	811605	811605	811605	811605	811605	811605
00300	DO		MG/L	8.2				8.4	7.0	8.9	11.8
00301	DO	SATUR	PERCENT	82.6$				101.7$	71.8$	93.8$	102.5$
00400	PH		SU	7.90				8.40	8.30	8.00	
82078	TURBIDIT	Y FIELD	NTU							48.0	3.0

13093500
42 37 25.0 114 39 05.0 2
CEDAR DRAW NR FILER (OLD STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

INITIAL DATE				67/08/17	68/03/28	68/11/06	69/04/14	69/09/11	70/03/07	70/09/15	71/02/22	71/09/24
INITIAL TIME					0825	1710	1555	0905	1635	1815	1545	1015
MEDIUM-USGS REMARK				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT		9.0	12.0	13.0	14.5	10.0	15.0	10.0	11.0
00011	WATER	TEMP	FAHN		48.2$	53.6$	55.4$	58.1$	50.0$	59.0$	50.0$	51.8$
00060	STREAM	FLOW	CFS	45	22	59	29	77	26	89	24	113
00080	COLOR	PT-CO	UNITS	15	5	5	5	5				
00095	CNDUCTVY	AT 25C	MICROMHO	824	980	898	798	820	950	778	962	707
00400	PH		SU	8.20	8.10	8.20	7.60	7.70	8.30	8.00	8.30	7.70
00410	T ALK	CACO3	MG/L		300	292	249	277	266	265	276	234
00440	HCO3 ION	HCO3	MG/L	326	366	356	304	338	322	323	337	285
00445	CO3 ION	CO3	MG/L	0	0	0	0	0	1	0	0	0
00631	NO2&NO3	N-DISS	MG/L								.9	2.1
00650	T PO4	PO4	MG/L		.09	.17	.22	.39	.09	.00		
00660	ORTHOPO4	PO4	MG/L								.10	.28
00665	PHOS-TOT		MG/L P								.100	.270
00671	PHOS-DIS	ORTHO	MG/L P									.090
00900	TOT HARD	CACO3	MG/L	312	344	334	292	318	309	286	320	260
00902	NC HARD	CACO3	MG/L	45	44	42	42	41	44	22	44	28
00915	CALCIUM	CA,DISS	MG/L	74.0	77.0	73.0	69.0	73.0	58.0	67.0	61.0	62.0
00925	MGNSIUM	MG,DISS	MG/L	31.0	37.0	37.0	29.0	33.0	40.0	29.0	42.0	26.0
00930	SODIUM	NA,DISS	MG/L	63.00	84.00	78.00	60.00	63.00	92.00	60.00	89.00	48.00
00931	SODIUM	ADSBTION	RATIO	1.6	2.0	1.9	1.5	1.5	2.3	1.5	2.1	1.3
00932	PERCENT	SODIUM	%		34	33	30	30	39	31	37	28
00935	PTSSIUM	K,DISS	MG/L	5.50	4.70	5.00	5.20	4.80	4.90	5.50	5.60	4.10
00940	CHLORIDE	TOTAL	MG/L	42	52	45	42	38	54	35	55	25
00945	SULFATE	SO4-TOT	MG/L	117	140	137	112	121	159	96	140	91
00950	FLUORIDE	F,DISS	MG/L	1.10	.90	.90	.20	.80	.90	.90	.90	.80
00955	SILICA	DISOLVED	MG/L	38.0	42.0	43.0	38.0	36.0	49.0	20.0	55.0	26.0
01020	BORON	B,DISS	UG/L	190	200							
46570	CAL HARD	CA MG	MG/L	312$	345$	335$	292$	318$	310$	287$	325$	262$
70300	RESIDUE	DISS-180	C MG/L	555	618	594	488	535	630	483		
70301	DISS SOL	SUM	MG/L		634	605	518	547	635	484	610	433
70302	DISS SOL	TONS/DAY			36.70	94.00	38.30	111.00	44.20	116.00	39.20	132.00
70303	DISS SOL	TONS PER	ACRE-FT	.75	.84	.81	.66	.73	.86	.66	.83	.59
71851	NITRATE	DISS-NO3	MG/L	9.4	16.0	11.0	12.0	11.0	18.0	12.0		

13093500
42 37 25.0 114 39 05.0 2
CEDAR DRAW NR FILER (OLD STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

	INITIAL DATE			79/11/08	79/12/20	80/02/12	80/04/22	80/05/12	80/05/12	80/05/13	80/06/27	80/07/07
	INITIAL TIME			1525	1015	0945	1430	0835	1520	0915	1045	1315
	MEDIUM-USGS REMARK			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	11.5	9.5	7.0	15.5	10.5	15.0	11.5	13.0	21.0
00011	WATER	TEMP	FAHN	52.7$	49.1$	44.6$	59.9$	50.9$	59.0$	52.7$	55.4$	69.8$
00020	AIR	TEMP	CENT	12.0	7.0	-1.5	22.0	10.0	22.0	12.5	17.0	32.0
00028	ANALYZE	AGENCY	CODE	80020	80020	80020	80020	80020	80020	80020	80020	80020
00041	WEATHER	WMO CODE	4501	.000005	2							
00061	STREAM	FLOW,	INST-CFS	50	39	30	73	192	185	226	65	63
00076	TURB	TRBIDMTR	HACH FTU		2.5	4.3	44.0	46.0	40.0	37.0	19.0	40.0
00095	CNDUCTVY	AT 25C	MICROMHO	974	840	993	576	516	535	506	665	733
00300	DO		MG/L	10.0	12.2	10.9	9.2	9.2	8.8	9.2	11.0	9.1
00301	DO	SATUR	PERCENT	105.0	124.0	105.0	106.0	94.0	100.0	96.0	118.0	115.0
00400	PH		,SU	8.60	8.50	8.30	8.40	8.50	8.40	8.40	8.50	8.35
00405	CO2		MG/L	1.5	1.5	3.0	1.5	1.2	1.7	1.6	1.5	2.3
00410	T ALK	CACO3	MG/L	310	250	310	187	200	222	200	238	260
00440	HCO3 ION	HCO3	MG/L	330	270	380	200	220	250	210	270	310
00445	CO3 ION	CO3	MG/L	24	17	.000005	14	12	10	17	10	2
00600	TOTAL N	N	MG/L	5.00	4.70	4.90	2.00	1.80	1.50	1.90	2.60	2.40
00605	ORG N	N	MG/L	.780	1.400	.720	1.500	1.200	.950	1.600	.920	.910
00610	NH3+NH4-	N TOTAL	MG/L	.020	.060	.140	.000	.130	.150	.020	.030	.000
00612	UN-IONZD	NH3-N	MG/L	.002$	.003$	.004$	.000$	.007$	.010$	.0010$	.002$	.000$
00615	NO2-N	TOTAL	MG/L	.080	.080	.070	.000	.010	.020	.010	.030	.010
00619	UN-IONZD	NH3-NH3	MG/L	.002$	.004$	.005$	.000$	.009$	.012$	.001$	.003$	.000$
00620	NO3-N	TOTAL	MG/L	4.100	3.100	3.900	.520	.510	.410	.330	1.600	1.500
00623	KJELDL N	DISS	MG/L	.140	1.300	.860K	.660	.620	.530	.700	.940	.770
00624	KJELDL N	SUSP	MG/L	.660	.200	.000	.840	.680	.570	.900	.010	.000
00625	TOT KJEL	N	MG/L	.800	1.500	.860	1.500	1.300	1.100	1.600	.950	.910
00630	NO2&NO3	N-TOTAL	MG/L	4.20	3.20	4.00	.52	.52	.43	.34	1.60	1.50
00650	T PO4	PO4	MG/L	.15	.09	.25	.25	.12	.15	.03	.40	.03
00660	ORTHOPO4	PO4	MG/L	.15	.15	.25	.21	.25	.34	.15	.40	.34
00665	PHOS-TOT		MG/L P	.050	.080	.140	.270	.340	.090	.320	.190	.290
00671	PHOS-DIS	ORTHO	MG/L P	.050	.030K	.080	.070	.040K	.050K	.010K	.130	.010K
00900	TOT HARD	CACO3	MG/L	340		390		210				
00902	NC HARD	CACO3	MG/L	31		76		12				
00915	CALCIUM	CA,DISS	MG/L	76.0		86.0		52.0				
00925	MGNSIUM	MG,DISS	MG/L	37.0		42.0		20.0				
00930	SODIUM	NA,DISS	MG/L	75.00		87.00		31.00				

(SAMPLE CONTINUED ON NEXT PAGE)

13093500
42 37 25.0 114 39 05.0 2
CEDAR DRAW NR FILER (OLD STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			79/11/08	79/12/20	80/02/12	80/04/22	80/05/12	80/05/12	80/05/13	80/06/27	80/07/07
	INITIAL TIME			1525	1015	0945	1430	0835	1520	0915	1045	1315
	MEDIUM-USGS REMARK			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00931	SODIUM	ADSBTION	RATIO	1.8		1.9		.9				
00932	PERCENT	SODIUM	%	32		32		24				
00933	NA+K		MG/L	80.00		100.00						
00935	PTSSIUM	K,DISS	MG/L	5.10		13.00		4.70				
00940	CHLORIDE	TOTAL	MG/L	47		53		26				
00945	SULFATE	SO4-TOT	MG/L	140		150		54				
00950	FLUORIDE	F,DISS	MG/L	.90		.80		.60				
00955	SILICA	DISOLVED	MG/L	52.0		50.0		15.0				
01002	ARSENIC	AS,TOT	UG/L					6				
01022	BORON	B,TOT	UG/L					140				
01034	CHROMIUM	CR,TOT	UG/L					0				
01042	COPPER	CU,TOT	UG/L					6				
01045	IRON	FE,TOT	UG/L					3800				
01051	LEAD	PB,TOT	UG/L					6				
01055	MANGNESE	MN	UG/L					150.0				
01092	ZINC	ZN,TOT	UG/L					50				
31625	FEC COLI	M-FCAGAD	/100 ML	70	68	200	520	780	590	6000L	1350	1280B
46570	CAL HARD	CA MG	MG/L	342$		388$		212$				
70300	RESIDUE	DISS-180 C	MG/L	576	509	566	626	497		490	581	713
70301	DISS SOL	SUM	MG/L	620		669		324				
70302	DISS SOL	TONS/DAY		78.10	53.60	45.80	123.00	258.00		299.00	102.00	121.00
70303	DISS SOL	TONS PER	ACRE-FT	.78	.69	.77	.85	.68		.67	.79	.97
70331	SUSP SED	PARTSIZE	%<.062MM	90	91	81	97	89	93	86	99	91
70507	PHOS-T	ORTHO	MG/L P	.050	.030	.080	.080	.040	.050	.010	.130	.010
71845	AMMONIA	TOT-NH4	MG/L	.02	.07	.2	.0	.2	.2	.02	.04	.0
71886	TOTAL P	AS PO4	MG/L	.15	.25	.43	.83	1.00	.28	.98	.58	.89
71887	TOTAL N	AS NO3	MG/L	22.0	21.0	22.0	8.9	8.1	6.8	8.6	11.0	11.0
71900	MERCURY	HG,TOTAL	UG/L					.0				
80154	SUSP SED	CONC	MG/L	12	8	23	96	236	205	280	43	89
80155	SUSP SED	DISCHARG	TONS/DAY	1.63	.84	1.90	19.00	122.00	102.00	171.00	7.50	15.00

	INITIAL DATE			80/07/08	80/08/15	80/09/15	80/10/24	80/12/08	81/02/02	81/04/08	81/05/11	81/05/12
	INITIAL TIME			0800	0930	1415	1130	1400	1430	0850	1115	1720
	MEDIUM-USGS REMARK			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	15.0	15.0	17.0	7.0	8.0	9.0	5.5	9.5	15.5
00011	WATER	TEMP	FAHN	59.0$	59.0$	62.6$	44.6$	46.4$	48.2$	41.9$	49.1$	59.9$
00020	AIR	TEMP	CENT	19.5	19.0	25.0	11.0	-2.0	2.5	6.5	12.5	15.0
00028	ANALYZE	AGENCY	CODE	80020	80020	80020	80020	80020	80020	80020	80020	80020

(SAMPLE CONTINUED ON NEXT PAGE)

13093500
42 37 25.0 114 37 05.0 2
DEBAR BRAW NR FILER (BLM STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			80/07/08	80/08/15	80/09/15	80/10/24	80/12/08	81/02/02	81/04/08	81/05/11	81/05/12
	INITIAL TIME			0800	0930	1415	1130	1400	1430	0850	1115	1720
	MEDIUM-USGS REMARK			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00061	STREAM	FLOW,	INST-CFS	64	69	234	182	41	30	24	53	45
00076	TURB	TRBIDMTR	HACH FTU	13.0	60.0	37.0	.2	1.4	6.1	1.5	23.0	32.0
00094	CNDUCTVY	FIELD	MICROMHO				592					
00095	CNDUCTVY	AT 25C	MICROMHO	716	787	560	592	1239	950	960	579	623
00300	DO		MG/L	9.2	8.4	8.4	11.2	12.2	12.0	15.9	11.1	10.0
00301	DO	SATUR	PERCENT	103.0	95.0	99.0	107.0	116.0	117.0	143.0	111.0	114.0
00400	PH		SU	8.20	8.20	8.50	8.20	8.50	8.80	8.30	8.60	8.90
00403	PH	LAB	SU				8.2	8.4	8.2		8.2	8.5
00405	CO2		MG/L	3.1	3.5	1.3	2.6	2.3	.9	2.8	1.0	.5
00410	T ALK	CACO3	MG/L	250	287	212	213	376	298	287	209	221
00440	HCO3 ION	HCO3	MG/L	310	350	220	260	400	300	350	230	210
00445	CO3 ION	CO3	MG/L	.000005	.000005	19	.000005	29	31	0	12	29
00600	TOTAL N	N	MG/L	3.30	3.70	1.70	2.50	6.00	4.70	4.90	1.60	2.10
00605	ORG N	N	MG/L	1.100	.740	.580	1.200	1.600	.890	.940	.810	1.100
00610	NH3+NH4-	N TOTAL	MG/L	.030	.050	.020	.050	.140	.110	.050	.080	.140
00612	UN-IONZD	NH3-N	MG/L	.001$	.002$	.002$	.001$	.007$	.011$	.001$	.005$	.026$
00615	NO2-N	TOTAL	MG/L	.080	.030	.010	.010	.050	.050	.080	.000	.030
00619	UN-IONZD	NH3-NH3	MG/L	.002$	.003$	.002$	.001$	.008$	.013$	.002$	.006$	.031$
00620	NO3-N	TOTAL	MG/L	2.100	2.900	1.100	1.300	4.300	3.700	3.800	.660	.870
00623	KJELDL N	DISS	MG/L	.880	.740	.550	.990	.810	1.000K	.990K	.690	.730
00624	KJELDL N	SUSP	MG/L	.220	.050	.050	.210	.890	.000	.000	.200	.470
00625	TOT KJEL	N	MG/L	1.100	.790	.600	1.200	1.700	1.000	.990	.890	1.200
00630	NO2&NO3	N-TOTAL	MG/L	2.20	2.90	1.10	1.30	4.30	3.70	3.90	.66	.90
00650	T PO4	PO4	MG/L	.25	.55	.00	.09	.06				
00660	ORTHOPO4	PO4	MG/L	.25	.52	.00	.09	.28	.34	.15	.21	.43
00665	PHOS-TOT		MG/L P	.310	.350	.100	.110	.030	.130	.110	.150	.260
00671	PHOS-DIS	ORTHO	MG/L P	.080	.170	.000	.030	.020K	.110	.050	.050K	.140
00900	TOT HARD	CACO3	MG/L	280			230		370		230	
00902	NC HARD	CACO3	MG/L	28			12		72		21	
00915	CALCIUM	CA,DISS	MG/L	67.0			54.0		81.0		55.0	
00925	MGNSIUM	MG,DISS	MG/L	28.0			22.0		40.0		22.0	
00930	SODIUM	NA,DISS	MG/L	50.00			40.00		89.00		36.00	
00931	SODIUM	ADSBTION	RATIO	1.3			1.2		2.0		1.0	
00932	PERCENT	SODIUM	%	27			27		34		25	
00935	PTSSIUM	K,DISS	MG/L	4.80			5.10		4.60		4.60	
00940	CHLORIDE	TOTAL	MG/L	35			30		54		32	
00945	SULFATE	SO4-TOT	MG/L	93			76		160		70	
00950	FLUORIDE	F,DISS	MG/L	.90			.70		.80		.80	

(SAMPLE CONTINUED ON NEXT PAGE)

13093500
42 37 25.0 114 39 05.0 2
CEDAR DRAW NR FILER (OLD STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				80/07/08	80/08/15	80/09/15	80/10/24	80/12/08	81/02/02	81/04/08	81/05/11	81/05/12
INITIAL TIME				0800	0930	1415	1130	1400	1430	0850	1115	1720
MEDIUM-USGS REMARK				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00955	SILICA	DISOLVED	MG/L	33.0			19.0		54.0		18.0	
01002	ARSENIC	AS,TOT	UG/L	12							8	
01022	BORON	B,TOT	UG/L	150							250	
01034	CHROMIUM	CR,TOT	UG/L	8							9	
01042	COPPER	CU,TOT	UG/L	11							6	
01045	IRON	FE,TOT	UG/L	2900							1600	
01051	LEAD	PB,TOT	UG/L	8							10	
01055	MANGNESE	MN	UG/L	130.0							70.0	
01092	ZINC	ZN,TOT	UG/L	50							0	
31625	FEC COLI	M-FCAGAD	/100 ML	1400	1200	440	70B	61		56	260	390
46570	CAL HARD	CA MG	MG/L	283$			225$		367$		228$	
70300	RESIDUE	DISS-180 C	MG/L	704								
70301	DISS SOL	SUM	MG/L	465			377		663		364	
70302	DISS SOL	TONS/DAY		122.00			185.00		53.70		52.10	
70303	DISS SOL	TONS PER	ACRE-FT	.96			.51		.90		.50	
70331	SUSP SED	PARTSIZE	%<.062MM	96	98	97	86	67	97		97	96
70507	PHOS-T	ORTHO	MG/L P	.080	.180	.000	.030	.020	.130	.070	.050	.120
71845	AMMONIA	TOT-NH4	MG/L	.04	.06	.02	.06	.2				
71886	TOTAL P	AS PO4	MG/L	.95	1.10	.31	.34	.09	.40	.34	.46	.80
71887	TOTAL N	AS NO3	MG/L	15.0	16.0	7.5	11.0	27.0	21.0	22.0	6.9	9.3
71900	MERCURY	HG,TOTAL	UG/L	.1							.1	
80154	SUSP SED	CONC	MG/L	93	120	165	27	17	20	3	57	44
80155	SUSP SED	DISCHARG	TONS/DAY	16.00	22.00	104.00	13.00	1.90	1.60	.19	8.20	5.30
82068	POTAS-40	K-40,DIS	PC/LITER						3.40		3.40	

INITIAL DATE				81/06/16	81/07/06	81/07/07	81/08/20	81/10/01
INITIAL TIME				0915	1530	1020	1330	1145
MEDIUM-USGS REMARK				WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	13.0	25.0	14.0	20.0	11.5
00011	WATER	TEMP	FAHN	55.4$	77.0$	57.2$	68.0$	52.7$
00020	AIR	TEMP	CENT	20.0	27.5	14.0	27.0	18.5
00027	COLLECT	AGENCY	CODE					80020
00028	ANALYZE	AGENCY	CODE	80020	80020	80020	80020	80020
00061	STREAM	FLOW,	INST-CFS	257	32	38	53	183
00076	TURB	TRBIDMTR	HACH FTU	52.0	10.0	1.1	64.0	18.0
00095	CNDUCTVY	AT 25C	MICROMHO	514	716	778	810	646
00300	DO		MG/L	9.0	12.6	10.0	8.1	10.0
00301	DO	SATUR	PERCENT	98.0	173.0	110.0	102.0	104.0

(SAMPLE CONTINUED ON NEXT PAGE)

13093500
42 37 25.0 114 37 05.0 2
CEDAR DRAW NR FILER (OLD STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			81/06/16	81/07/06	81/07/07	81/08/20	81/10/01
	INITIAL TIME			0915	1530	1020	1330	1145
	MEDIUM-USGS REMARK			WATER	WATER	WATER	WATER	WATER
00400	PH		SU	8.40	8.90	8.40	8.40	8.40
00403	PH	LAB	SU		8.2	8.0		7.7
00405	CO2		MG/L	1.5	.6	2.0	2.2	1.6
00410	T ALK	CACO3	MG/L	192	240	254	287	208
00440	HCO3 ION	HCO3	MG/L	230	240	300	340	250
00445	CO3 ION	CO3	MG/L	2	26	5	5	2
00600	TOTAL N	N	MG/L	1.80	2.90	3.10	3.70	2.10
00605	ORG N	N	MG/L	1.200	1.100	.880	1.500	.780
00610	NH3+NH4-	N TOTAL	MG/L	.130	.110	.120	.160	.170
00612	UN-IONZD	NH3-N	MG/L	.007$	.034$	.007$	.014$	.008$
00615	NO2-N	TOTAL	MG/L	.020	.050	.060	.040	.030
00619	UN-IONZD	NH3-NH3	MG/L	.009$	.042$	.009$	.018$	.010$
00620	NO3-N	TOTAL	MG/L	.480	1.700	2.000	2.000	1.100
00623	KJELDL N	DISS	MG/L	.880	1.100	.960	.930	.490
00624	KJELDL N	SUSP	MG/L	.420	.100	.040	.770	.460
00625	TOT KJEL	N	MG/L	1.300	1.200	1.000	1.700	.950
00630	NO2&NO3	N-TOTAL	MG/L	.50	1.70	2.10	2.00	1.10
00660	ORTHOPO4	PO4	MG/L	.06	.40	.43	.15	.25
00665	PHOS-TOT		MG/L P	.300	.150	.180	.310	.140
00671	PHOS-DIS	ORTHO	MG/L P	.020	.130	.140	.050	.070K
00900	TOT HARD	CACO3	MG/L		280			250
00902	NC HARD	CACO3	MG/L		40			42
00915	CALCIUM	CA,DISS	MG/L		67.0			59.0
00925	MGNSIUM	MG,DISS	MG/L		27.0			24.0
00930	SODIUM	NA,DISS	MG/L		51.00			40.00
00931	SODIUM	ADSBTION	RATIO		1.3			1.2
00932	PERCENT	SODIUM	%		28			26
00935	PTSSIUM	K,DISS	MG/L		5.40			4.30
00940	CHLORIDE	TOTAL	MG/L		39			30
00945	SULFATE	SO4-TOT	MG/L		110			74
00950	FLUORIDE	F,DISS	MG/L		.70			.80
00955	SILICA	DISOLVED	MG/L		35.0			30.0
01002	ARSENIC	AS,TOT	UG/L		15			
01022	BORON	B,TOT	UG/L		270			
01034	CHROMIUM	CR,TOT	UG/L		7			
01042	COPPER	CU,TOT	UG/L		7			
01045	IRON	FE,TOT	UG/L		410			
01051	LEAD	PB,TOT	UG/L		6			

(SAMPLE CONTINUED ON NEXT PAGE)

13093500
42 37 25.0 114 39 05.0 2
CEDAR DRAW NR FILER (OLD STATION)
16083 IDAHO TWIN FALLS
130691

/TYPA/AMBNT/STREAM

112WRD 17040212
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			81/06/16	81/07/06	81/07/07	81/08/20	81/10/01
	INITIAL TIME			0915	1530	1020	1330	1145
	MEDIUM-USGS REMARK			WATER	WATER	WATER	WATER	WATER
01055	MANGNESE	MN	UG/L		20.0			
01092	ZINC	ZN,TOT	UG/L		20			
31625	FEC COLI	M-FCAGAD	/100 ML	790	540	960	1200	280
46570	CAL HARD	CA MG	MG/L		278*			246*
70301	DISS SOL	SUM	MG/L		480			387
70302	DISS SOL	TONS/DAY			41.50			191.00
70303	DISS SOL	TONS PER	ACRE-FT		.65			.53
70331	SUSP SED	PARTSIZE	%<.062MM	87	85	86	96	88
70507	PHOS-T	ORTHO	MG/L P	.060	.150	.180	.100	.070
71886	TOTAL P	AS PO4	MG/L	.92	.46	.55	.95	.43
71887	TOTAL N	AS NO3	MG/L	8.0	13.0	14.0	16.0	9.1
71900	MERCURY	HG,TOTAL	UG/L		.1			
80154	SUSP SED	CONC	MG/L	245	11	15	210	78
80155	SUSP SED	DISCHARG	TONS/DAY	170.00	.95	1.50	30.00	39.00
82068	POTAS-40	K-40,DIS	PC/LITER		4.00			

THAT'S ALL FOLKS

Appendix 2

Macroinvertebrate Community Data

Appendix 2. Macroinvertebrate community data. Macroinvertebrates collected on March 13, 1984 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.		4.0	2.0	20.0
Hydroptilidae				
Leucotrichia sp.			4.0	13.3
Hydropsychidae				
Hydropsyche sp.	183.0	107.0	20.0	1033.3
EPHEMEROPTERA				
Baetidae				
Baetis alexanderi	3.0			
Baetis tricaudatus	418.0	447.0	227.0	3640.0
Ephemerellidae				
Ephemerella inermis	3.0			10.0
Tricorythidae				
Tricorythodes minutus	3.0			10.0
DIPTERA				
Chironomidae	51.0	7.0	2.0	200.0
Empididae	1.0			
Simulidae				
Simulium sp.	7.0	1.0	3.0	36.7
COLEOPTERA				
Elmidae				
Optioservus sp.	39.0	4.0	2.0	150.0
HIRUDINEA	1.0		3.3	
NEMATODA	3.0			10.0
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	5.0	13.0	60.0	
TURBELLARIA				
Tricladida				
Planariidae	9.0	7.0	2.0	60.0
GASTROPODA				
Lymnaeidae				
Fossaria sp.		1.0	3.3	
PELECYPODA				
Sphaeriidae				
Sphaerium sp.		3.0	1.0	13.3
Piscidium sp.	1.0	1.0		6.7

Appendix 2 Continued. Macroinvertebrates collected on March 13, 1984 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
CRUSTACEA				
Talitridae				
Hyalella azteca	2.0	2.0		13.3
ACARI	1.0			3.3
TOTALS	724.0	589.0	277.0	5286.7

Appendix 2 Continued. Macroinvertebrates collected on June 19, 1984 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.		3.0	10.0	
Hydroptilidae				
Hydroptila sp.	2.0			6.7
Leucotrichia sp.	10.0	1.0	29.0	133.3
Hydropsychidae				
Hydropsyche sp.	62.0	2.0	35.0	330.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	23.0	28.0	6.0	190.0
Ephemerellidae				
Ephemerella inermis	8.0	6.0	5.0	63.3
DIPTERA				
Chironomidae	3.0	2.0	1.0	20.0
Simulidae				
Simulium sp.	1.0			3.3
COLEOPTERA				
Elmidae				
Optioservus sp.	1.0	6.0	1.0	26.7
HIRUDINEA			1.0	3.3
GASTROPODA				
Lymnaeidae				
Lymnaea sp.	1.0		3.3	
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	1.0			3.3
Piscidium sp	1.0	1.0	1.0	10.0
CRUSTACEA				
Talitridae				
Hyalella azteca	3.0	1.0	3.0	23.3
TOTALS	115.0	48.0	85.0	826.7

Appendix 2 Continued. Macroinvertebrates collected on August 8, 1984 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.	15.0	24.0	20.0	196.7
Brachycentrus sp.	28.0	4.0	106.7	
Hydroptilidae				
Hydroptila sp.	64.0	216.0	112.0	1306.7
Leucotrichia sp.	1.0	56.0	8.0	216.7
Hydropsychidae				
Hydropsyche sp.	54.0	240.0	300.0	1980.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	24.0	172.0	653.3	
Tricorythidae				
Tricorythodes minutus	83.0	20.0	40.0	476.7
DIPTERA				
Chironomidae	3.0	28.0	40.0	236.7
Simulidae				
Simulium sp.	4.0		13.3	
COLEOPTERA				
Elmidae				
Optioservus sp.	8.0	20.0	24.0	173.3
ODONATA				
Coenagrioniidae				
Ischnura sp.	2.0			6.7
HIRUDINEA		16.0	4.0	66.7
NEMATODA	2.0		4.0	20.0
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	4.0	4.0	26.7	
TURBELLARIA				
Tricladida				
Planariidae	40.0		133.3	
GASTROPODA				
Lymnaeidae				
Lymnaea sp.	4.0		13.3	
Physidae				
Physa sp.	1.0	4.0		16.7

Appendix 2 Continued. Macroinvertebrates collected on August 8, 1984 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	1.0			3.3
CRUSTACEA				
Talitridae				
Hyalella azteca	73.0	60.0	136.0	896.7
TOTAL	307.0	788.0	868.0	6543.3

Appendix 2 Continued. Macroinvertebrates collected on December 28, 1984 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	32.0	4.0	28.0	213.3
Hydroptilidae				
Leucotrichia sp.	4.0	4.0		26.7
Hydropsychidae				
Hydropsyche sp.	496.0	420.0	412.0	4426.7
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	756.0	600.0	420.0	5920.0
DIPTERA				
Chironomidae	116.0	80.0	60.0	853.3
Simulidae				
Simulium sp.	28.0	28.0	40.0	320.0
COLEOPTERA				
Elmidae				
Optioservus sp.	52.0	20.0	20.0	306.7
HIRUDINEA	4.0			13.3
GASTROPODA				
Lymnaeidae				
Lymnaea sp.		1.0	3.3	
PELECYPODA				
Sphaeriidae				
Piscidium sp.	4.0			13.3
CRUSTACEA				
Talitridae				
Hyalella azteca			4.0	13.3
TOTALS	1492.0	1156.0	985.0	12110.0

Appendix 2 Continued. Macroinvertebrates collected on March 19, 1985 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Hydroptilidae				
Hydroptila sp.	1.0	1.0	6.7	
Leucotrichia sp.	3.0	4.0	23.3	
Hydropsychidae				
Hydropsyche sp.	19.0	69.0	12.0	333.3
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	59.0	57.0	42.0	526.7
Ephemerellidae				
Ephemerella inermis	4.0	2.0	1.0	23.3
DIPTERA				
Chironomidae	57.0	17.0	17.0	303.3
Simulidae				
Simulium sp.	3.0			10.0
COLEOPTERA				
Elmidae				
Optioservus sp.	6.0	4.0	2.0	40.0
HIRUDINEA	3.0	12.0	6.0	70.0
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	7.0	12.0	4.0	76.7
GASTROPODA				
Hydrobiidae				
Fontelicella sp.	1.0			3.3
Fluminicola virens	8.0	9.0	14.0	103.3
Physidae				
Physa sp.	2.0	1.0	1.0	13.3
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	3.0	2.0	1.0	20.0
Piscidium sp.	3.0	3.0	2.0	26.7
CRUSTACEA				
Talitridae				
Hyalella azteca	3.0	1.0		13.3
TOTALS	178.0	193.0	107.0	1593.3

Appendix 2 Continued. Macroinvertebrates collected on June 19, 1985 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.		1.0		3.3
Brachycentrus sp.	12.0	24.0	40.0	253.3
Hydroptilidae				
Hydroptila sp.		13.0	8.0	70.0
Hydropsychidae				
Hydropsyche sp.	100.0	200.0	160.0	1533.3
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	480.0	325.0	92.0	2990.0
Ephemerellidae				
Ephemerella inermis		4.0		13.3
DIPTERA				
Chironomidae	36.0	93.0	32.0	536.7
COLEOPTERA				
Elmidae				
Optioservus sp.	12.0	48.0	32.0	306.7
LEPIDOPTERA				
Pyralidae				
Paragyractis sp.		4.0		13.3
ODONATA				
Coenagrionidae				
Ischnura sp.			1.0	3.3
PELECYPODA				
Sphaeriidae				
Sphaerium sp.		4.0		13.3
Piscidium sp.		4.0		13.3
TOTALS	640.0	720.0	365.0	5750.0

Appendix 2 Continued. Macroinvertebrates collected on March 13, 1986 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	3.0	8.0	12.0	76.7
Oligoplectrum sp.	4.0			13.3
Helicopsychidae				
Helicopsyche borealis	2.0			6.7
Hydropsychidae				
Hydropsyche sp.	70.0	152.0	62.0	946.7
Leptoceridae				
Nectopsyche sp.			5.0	16.7
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	75.0	112.0	17.0	680.0
Ephemerellidae				
Ephemerella inermis	3.0		1.0	13.3
DIPTERA				
Chironomidae	10.0		2.0	40.0
COLEOPTERA				
Elmidae				
Optioservus sp.		4.0	1.0	16.7
TURBELLARIA				
Tricladida				
Planariidae		1.0		3.3
TOTALS	167.0	277.0	100.0	1813.3

Appendix 2 Continued. Macroinvertebrates collected on June 23, 1986 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	#/m2
TRICHOPTERA			
Brachycentridae			
Brachycentrus sp.	41.0	37.0	390.0
Hydroptilidae			
Hydroptila sp.	2.0	1.0	15.0
Leucotrichia sp.	2.0	1.0	15.0
Hydropsychidae			
Hydropsyche sp.	40.0	37.0	385.0
EPHEMEROPTERA			
Baetidae			
Baetis tricaudatus	30.0	21.0	255.0
DIPTERA			
Chironomidae	31.0	21.0	260.0
Simulidae			
Simulium sp.	10.0	8.0	90.0
COLEOPTERA			
Elmidae			
Optioservus sp.	4.0	2.0	30.0
HIRUDINEA	1.0	1.0	10.0
NEMATODA		1.0	5.0
PELECYPODA			
Sphaeriidae			
Piscidium sp.	1.0	1.0	10.0
TOTALS	162.0	131.0	1465.0

Appendix 2 Continued. Macroinvertebrates collected on November 7, 1986 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	76.0	12.0	36.0	413.3
Hydropsychidae				
Hydropsyche sp.	530.0	213.0	101.0	2813.3
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	121.0	156.0	31.0	1026.7
Ephemerellidae				
Ephemerella inermis			4.0	13.3
DIPTERA				
Chironomidae			2.0	6.7
COLEOPTERA				
Elmidae				
Optioservus sp.	6.0	4.0		33.3
TURBELLARIA				
Tricladida				
Planariidae		4.0		13.3
GASTROPODA				
Physidae				
Physa sp.			1.0	3.3
TOTALS	733.0	389.0	175.0	4323.3

Appendix 2 Continued. Macroinvertebrates collected on June 4, 1987 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.	60.0	115.0	140.0	1050.0
Brachycentrus sp.	320.0	288.0	288.0	2986.7
Hydroptilidae				
Hydroptila sp.	88.0	116.0	56.0	866.7
Hydropsychidae				
Hydropsyche sp.	56.0	21.0	28.0	350.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	84.0	67.0	92.0	810.0
DIPTERA				
Chironomidae	120.0	117.0	88.0	1083.3
Simulidae				
Simulium sp.	8.0	6.0	16.0	100.0
COLEOPTERA				
Elmidae				
Optioservus sp.	4.0	4.0	8.0	53.3
GASTROPODA				
Hydrobiidae				
Fluminicola virens			4.0	13.3
CRUSTACEA				
Talitridae				
Hyalella azteca	40.0	40.0	72.0	506.7
TOTALS	780.0	774.0	792.0	7820.0

Appendix 2 Continued. Macroinvertebrates collected on August 11, 1987 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	3.0	2.0	134.0	463.3
Hydroptilidae				
Hydroptila sp.	122.0	101.0	101.0	1080.0
Leucotrichia sp.		1.0	22.0	76.7
Hydropsychidae				
Hydropsyche sp.	2.0	3.0		16.7
DIPTERA				
Chironomidae	1.0	1.0	4.0	20.0
COLEOPTERA				
Elmidae				
Optioservus sp.	39.0	33.0	29.0	336.7
HIRUDINEA			4.0	13.3
TURBELLARIA				
Tricladida				
Planariidae	48.0	58.0	12.0	393.3
GASTROPODA				
Hydrobiidae				
Fontelicella sp.	10.0	48.0	162.0	733.3
Fluminicola virens	56.0	8.0	48.0	373.3
PELECYPODA				
Sphaeriidae				
Piscidium sp.			3.0	10.0
CRUSTACEA				
Gammaridae				
Gammarus sp.			1.0	3.3
TOTALS	281.0	255.0	520.0	3520.0

Appendix 2 Continued. Macroinvertebrates collected on November 5, 1987 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	1840.0	892.0	1042.0	12580.0
Hydropsychidae				
Hydropsyche sp.	2632.0	1515.0	2101.0	20826.7
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	11.0	6.0	4.0	70.0
DIPTERA				
Chironomidae	4.0	3.0		23.3
LEPIDOPTERA				
Pyralidae				
Paragyractis sp.	2.0	1.0	1.0	13.3
TOTALS	4489.0	2417.0	3148.0	33513.3

Appendix 2 Continued. Macroinvertebrates collected on March 9, 1988 at the mouth of Cedar Draw.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.		71.0	31.0	340.0
Hydropsychidae				
Hydropsyche sp.	622.0	320.0	1848.0	9300.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	44.0		102.0	486.7
DIPTERA				
Chironomidae	2.0	1.0		10.0
Simulidae				
Simulium sp.		2.0		6.7
COLEOPTERA				
Elmidae				
Optioservus sp.	8.0	8.0	10.0	86.7
GASTROPODA				
Hydrobiidae				
Fontelicella sp.		1.0		3.3
Fluminicola virens	1.0	1.0		6.7
TOTALS	677.0	404.0	1991.0	10240.0

Appendix 2 Continued. Macroinvertebrates collected on June 19, 1984 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Hydroptilidae				
Hydroptila sp.		4.0	4.0	26.7
Leucotrichia sp.	40.0	24.0	40.0	346.7
Hydropsychidae				
Hydropsyche sp.	78.0	192.0	384.0	2180.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	28.0	132.0	108.0	893.3
Tricorythidae				
Tricorythodes minutus		4.0	4.0	26.7
DIPTERA				
Chironomidae	4.0	12.0		53.3
Simulidae				
Simulium sp.	4.0		4.0	26.7
COLEOPTERA				
Elmidae				
Optioservus sp.	16.0	8.0		80.0
HIRUDINEA	68.0	8.0	8.0	280.0
GASTROPODA				
Lymnaeidae				
Lymnaea sp.	4.0	8.0	4.0	
Physidae				
Physa sp.		4.0		13.3
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	8.0	4.0	4.0	53.3
Piscidium sp.		8.0		26.7
CRUSTACEA				
Gammaridae				
Gammarus sp.	64.0		8.0	240.0
Talitridae				
Hyalella azteca	4.0	4.0	16.0	80.0
ISOPODA				
Ascellidae				
Asellus sp.		4.0		
TOTALS	318.0	416.0	584.0	4326.7

Appendix 2 Continued. Macroinvertebrates collected on August 8, 1984 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	4.0	4.0		26.7
Hydroptilidae				
Hydroptila sp.	2.0	5.0	12.0	63.3
Leucotrichia sp.	61.0	127.0	13.0	670.0
Hydropsychidae				
Hydropsyche sp.	64.0	62.0	108.0	780.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	5.0	15.0	8.0	93.3
Tricorythidae				
Tricorythodes minutus	12.0	7.0	8.0	90.0
DIPTERA				
Chironomidae	6.0	13.0	16.0	116.7
COLEOPTERA				
Elmidae				
Optioservus sp.	6.0	3.0	10.0	63.3
HIRUDINEA	98.0	62.0	9.0	563.3
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	4.0	3.0		23.3
TURBELLARIA				
Tricladida				
Planariidae		2.0	7.0	30.0
GASTROPODA				
Lymnaeidae				
Lymnaea sp.	24.0	10.0	2.0	
Physidae				
Physa sp.	2.0	4.0		20.0
Planorbiidae				
Gyraulus sp.			3.0	
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	17.0	10.0	2.0	96.7
Piscidium sp.	2.0	8.0		33.3

Appendix 2 Continued. Macroinvertebrates collected on August 8, 1984 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
CRUSTACEA				
Gammaridae				
Gammarus sp.	44.0	4.0		160.0
Talitridae				
Hyalella azteca		7.0	6.0	43.3
TOTALS	351.0	349.0	201.0	2873.3

Appendix 2 Continued. Macroinvertebrates collected on December 28, 1984 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	1.0	4.0	4.0	30.0
Hydroptilidae				
Hydroptila sp.			4.0	13.3
Leucotrichia sp.	38.0	40.0	48.0	420.0
Hydropsychidae				
Hydropsyche sp.	5.0	40.0	60.0	350.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	53.0	284.0	120.0	1523.3
DIPTERA				
Chironomidae	26.0	136.0	68.0	766.7
Simulidae				
Simulium sp.	51.0	320.0	192.0	1876.7
COLEOPTERA				
Elmidae				
Optioservus sp.	2.0	8.0	4.0	46.7
HIRUDINEA	7.0	4.0	36.0	156.7
OLIGOCHAETA				
Tubificidae				
Tubifex sp.			8.0	26.7
TURBELLARIA				
Tricladida				
Planariidae	3.0		8.0	36.7
GASTROPODA				
Hydrobiidae				
Fluminicola virens	7.0	8.0	8.0	76.7
Planorbiidae				
Gyraulus sp.			4.0	
PELECYPODA				
Sphaeriidae				
Sphaerium sp.			4.0	13.3
Piscidium sp.	2.0			6.7
CRUSTACEA				
Gammaridae				
Gammarus sp.	1.0			3.3
TOTALS	196.0	844.0	568.0	5346.7

Appendix 2 Continued. Macroinvertebrates collected on March 19, 1985 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	#/m2
TRICHOPTERA			
Hydroptilidae			
Hydroptila sp.		2.0	10.0
Hydropsychidae			
Hydropsyche sp.	32.0	79.0	555.0
EPHEMEROPTERA			
Baetidae			
Baetis tricaudatus	31.0	21.0	260.0
Ephemerellidae			
Ephemerella inermis	2.0	3.0	25.0
DIPTERA			
Chironomidae	19.0	33.0	260.0
COLEOPTERA			
Elmidae			
Optioservus sp.	1.0	2.0	15.0
HIRUDINEA	5.0	12.0	85.0
OLIGOCHAETA			
Tubificidae			
Tubifex sp.	5.0	2.0	35.0
TURBELLARIA			
Tricladida			
Planariidae	1.0		5.0
GASTROPODA			
Hydrobiidae			
Fluminicola virens	28.0	5.0	165.0
Physidae			
Physa sp.		1.0	5.0
PELECYPODA			
Sphaeriidae			
Sphaerium sp.	2.0	2.0	20.0
Piscidium sp.	2.0	1.0	15.0
CRUSTACEA			
Talitridae			
Hyalella azteca	2.0		10.0
TOTALS	130.0	163.0	1465.0

Appendix 2 Continued. Macroinvertebrates collected on August 7, 1985 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	#/m2
TRICHOPTERA			
Brachycentridae			
Brachycentrus sp.	8.0	30.0	190.0
Hydroptilidae			
Hydroptila sp.		18.0	90.0
Leucotrichia sp.	10.0	52.0	310.0
Hydropsychidae			
Hydropsyche sp.	112.0	122.0	1170.0
EPHEMEROPTERA			
Baetidae			
Baetis tricaudatus	6.0	6.0	60.0
Tricorythidae			
Tricorythodes minutus	6.0	23.0	145.0
DIPTERA			
Chironomidae	5.0	24.0	145.0
Simulidae			
Simulium sp.	1.0	1.0	10.0
COLEOPTERA			
Elmidae			
Optioservus sp.	11.0	38.0	245.0
ODONATA			
Coenagrionidae			
Ishnura sp.		2.0	10.0
HIRUDINEA	6.0	7.0	65.0
OLIGOCHAETA			
Tubificidae			
Tubifex sp.	1.0		5.0
GASTROPODA			
Hydrobiidae			
Fontelicella sp.		2.0	10.0
Fluminicola virens	7.0	5.0	60.0
Physidae			
Physa sp.	1.0		5.0
PELECYPODA			
Sphaeriidae			
Sphaerium sp.	5.0	1.0	30.0

Appendix 2 Continued. Macroinvertebrates collected on August 7, 1985 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	#/m2
CRUSTACEA			
Talitridae			
Hyalella azteca	1.0		5.0
TOTALS	180.0	331.0	2555.0

Appendix 2 Continued. Macroinvertebrates collected on March 13, 1986 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	9.0	9.0	8.0	86.7
Hydropsychidae				
Hydropsyche sp.	38.0	31.0	35.0	346.7
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	41.0	39.0	31.0	370.0
Ephemerellidae				
Ephemerella inermis	3.0	1.0	1.0	16.7
DIPTERA				
Chironomidae	28.0	30.0	21.0	263.3
HIRUDINEA	5.0	4.0	6.0	50.0
NEMATODA	1.0	2.0	1.0	13.3
OLIGOCHAETA				
Tubificidae				
Tubifex sp.	4.0	3.0	1.0	26.7
GASTROPODA				
Hydrobiidae				
Fluminicola virens	3.0	7.0	2.0	40.0
PELECYPODA				
Sphaeriidae				
Piscidium sp.	2.0	2.0	1.0	16.7
TOTALS	134.0	128.0	107.0	1230.0

Appendix 2 Continued. Macroinvertebrates collected on June 23, 1986 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	8.0	11.0	3.0	73.3
Hydroptilidae				
Hydroptila sp.	1.0			3.3
Leucotrichia sp.	1.0			3.3
Hydropsychidae				
Hydropsyche sp.	12.0	8.0	18.0	126.7
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	30.0	12.0	41.0	276.7
DIPTERA				
Chironomidae	16.0	43.0	64.0	410.0
Simulidae				
Simulium sp.	29.0	15.0	25.0	230.0
COLEOPTERA				
Elmidae				
Optioservus sp.	1.0		4.0	16.7
TURBELLARIA				
Planariidae		2.0	1.0	10.0
PELECYPODA				
Sphaeriidae				
Piscidium sp.	1.0			3.3
CRUSTACEA				
Talitridae				
Hyalella azteca		1.0		3.3
TOTALS	99.0	92.0	156.0	1156.7

Appendix 2 Continued. Macroinvertebrates collected on November 11, 1986 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	36.0	18.0		180.0
Hydropsychidae				
Hydropsyche sp.	331.0	208.0	317.0	2853.3
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	35.0		27.0	206.7
COLEOPTERA				
Elmidae				
Optioservus sp.	4.0			13.3
TOTALS	406.0	226.0	344.0	3253.3

Appendix 2 Continued. Macroinvertebrates collected on March 9, 1987 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.	103.0	88.0	136.0	1090.0
Brachycentrus sp.	8.0	7.0	15.0	100.0
Hydropsychidae				
Hydropsyche sp.	28.0	24.0	32.0	280.0
Rhyacophilidae				
Rhyacophila sp.	1.0		1.0	
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	72.0	106.0	58.0	786.7
Ephemerellidae				
Ephemerella inermis			6.0	20.0
DIPTERA				
Chironomidae	66.0	103.0	110.0	930.0
COLEOPTERA				
Elmidae				
Optioservus sp.	1.0		1.0	6.7
Physidae				
Physa sp.	1.0			3.3
TOTALS	280.0	328.0	359.0	3216.7

Appendix 2 Continued. Macroinvertebrates collected on June 4, 1987 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Amiocentrus sp.	7.0	1.0	52.0	200.0
Brachycentrus sp.	101.0	65.0	200.0	1220.0
Hydroptilidae				
Hydroptila sp.	14.0	3.0	16.0	110.0
Hydropsychidae				
Hydropsyche sp.	7.0	4.0	16.0	90.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	43.0	7.0	60.0	366.7
Tricorythidae				
Tricorythodes minutus			4.0	13.3
DIPTERA				
Chironomidae	62.0	52.0	106.0	733.3
Simulidae				
Simulium sp.			8.0	26.7
COLEOPTERA				
Elmidae				
Optioservus sp.	1.0	2.0		10.0
PELECYPODA				
Sphaeriidae				
Piscidium sp.	1.0	3.0		13.3
CRUSTACEA				
Talitridae				
Hyalella azteca	3.0	1.0	24.0	93.3
TOTALS	229.0	136.0	410.0	2583.3

Appendix 2 Continued. Macroinvertebrates collected on August 11, 1987 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	2.0	28.0	31.0	203.3
Hydroptilidae				
Hydroptila sp.	5.0	287.0	320.0	2040.0
Leucotrichia sp.		184.0	137.0	1070.0
Hydropsychidae				
Hydropsyche sp.	1.0	3.0	7.0	36.7
DIPTERA				
Chironomidae		5.0	8.0	43.3
Simulidae				
Simulium sp.	1.0	2.0	7.0	33.3
COLEOPTERA				
Elmidae				
Optioservus sp.	1.0	48.0	72.0	403.3
ODONATA				
Coenagrionidae				
Ishnura sp.			1.0	3.3
HIRUDINEA		53.0	46.0	330.0
TURBELLARIA				
Tricladida				
Planariidae	6.0	82.0	98.0	620.0
GASTROPODA				
Hydrobiidae				
Fontelicella sp.	346.0	360.0	358.0	3546.7
Fluminicola virens	46.0	144.0	104.0	980.0
Physidae				
Physa sp.	1.0			3.3
PELECYPODA				
Sphaeriidae				
Sphaerium sp.		1.0		3.3
Piscidium sp.			1.0	3.3
CRUSTACEA				
Gammaridae				
Gammarus sp.	1.0		1.0	6.7
TOTALS	409.0	1197.0	1190.0	9320.0

Appendix 2 Continued. Macroinvertebrates collected on November 5, 1987 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	11.0	13.0	151.0	583.3
Hydroptilidae				
Leucotrichia sp.	2.0			6.7
DIPTERA				
Chironomidae	6.0	4.0	20.0	100.0
Simulidae				
Simulium sp.	29.0	21.0	18.0	226.7
COLEOPTERA				
Elmidae				
Optioservus sp.	8.0	6.0	13.0	90.0
HIRUDINEA	4.0	3.0	1.0	26.7
TURBELLARIA				
Tricladida				
Planariidae	5.0	4.0	4.0	43.3
GASTROPODA				
Hydrobiidae				
Fontelicella sp.	215.0	281.0	140.0	2120.0
Fluminicola virens	7.0	6.0	12.0	83.3
PELECYPODA				
Sphaeriidae				
Sphaerium sp.				0.0
Piscidium sp.	2.0		1.0	10.0
TOTALS	289.0	338.0	360.0	3290.0

Appendix 2 Continued. Macroinvertebrates collected on March 9, 1988 from Cedar Draw at Pole Line Road.

Taxon	Rep. #1	Rep. #2	Rep. #3	#/m2
TRICHOPTERA				
Brachycentridae				
Brachycentrus sp.	41.0	22.0	18.0	270.0
Hydroptilidae				
Hydroptila sp.	22.0	6.0	14.0	140.0
Leucotrichia sp.		1.0	2.0	10.0
Hydropsychidae				
Hydropsyche sp.		3.0	3.0	20.0
EPHEMEROPTERA				
Baetidae				
Baetis tricaudatus	33.0	63.0	61.0	523.3
Ephemerellidae				
Ephemerella inermis			2.0	6.7
Tricorythidae				
Tricorythodes minutus	1.0			3.3
DIPTERA				
Chironomidae	36.0	72.0	56.0	546.7
Simulidae				
Simulium sp.		3.0	1.0	13.3
COLEOPTERA				
Elmidae				
Optioservus sp.		12.0	15.0	90.0
HIRUDINEA	1.0		1.0	6.7
OLIGOCHAETA				
Tubificidae				
Tubifex sp.		2.0		6.7
GASTROPODA				
Hydrobiidae				
Fontelicella sp.	101.0	104.0	116.0	1070.0
Fluminicola virens	6.0	10.0	6.0	73.3
PELECYPODA				
Sphaeriidae				
Sphaerium sp.	5.0	6.0	4.0	50.0
Piscidium sp.	1.0		1.0	6.7
TOTALS	247.0	304.0	300.0	2836.7

Appendix 3

Fish Community Data

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 17, 1988

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	29	256	W
1	25	199	W
1	26.5	218	W
1	21.5	99.2	W
1	27.5	227	W
1	27.5	229.5	W
1	28.5	262	W
1	27	236	W
1	27.5	234.5	W
1	24	159	W
1	27	204	W
1	27.5	233	W
1	26.75	212	W
1	24	172	W
1	25.5	197	W
1	19	93	W
2	28	258.5	W
2	26	228	W
3	27.5	235	W
3	26	188.5	W
3	20	87	W

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	10	21	---	---
1	12	23.6	---	---
1	9	13.8	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	9	12.5	---	---
1	7.5	7.1	---	---
1	12	22.7	---	---
1	11.5	25.7	---	---
1	12	25.8	---	---
1	9	11.6	---	---
1	10.75	11.7	---	---
1	9.25	12.8	---	---
1	12.75	35.5	---	---
1	8.25	10.1	---	---
1	9.5	14.1	---	---
1	9.5	13.3	---	---
1	9	12.2	---	---
1	10	15.5	---	---
1	8.5	8.6	---	---
1	9.5	13.4	---	---
1	7	5.2	---	---
1	9.5	13.6	---	---
1	14	34.1	---	---
1	8.5	10.2	---	---
1	7.5	5.9	---	---
1	8.5	10.7	---	---
1	7	4.8	---	---
1	10	15.3	---	---
1	14.5	45.7	---	---
1	8.5	10.2	---	---
1	9	13	---	---
1	11.5	23.7	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	10	14.7	---	---
1	8	6.8	---	---
1	8	7.9	---	---
2	10.5	19.7	---	---
2	10	16.8	---	---
2	10	17.9	---	---
2	11	23.8	---	---
3	9	11.4	---	---
3	13	25.1	---	---
3	10	15.3	---	---
3	9	10.7	---	---
3	9	10.9	---	---
3	8	12.5	---	---
3	10	14.7	---	---
3	9	12.2	---	---
3	10.75	20.1	---	---
3	10.5	19.4	---	---
4	14	44.4	---	---
4	12	27.4	---	---
4	14	34.5	---	---
4	13	39.3	---	---
4	8.5	10.9	---	---
4	13.75	35.6	---	---
4	14	51	---	---

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 19, 1987

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	34.5	463	W
1	28	41	W
1	48	1145	W
1	24	189	W
1	27	247	W
1	47	1159	H
1	31.5	361	W
1	5.5	10.05	W
2	5.5	11	W
2	5.5	8	W
2	4.4	7.5	W
2	4.5	8	W
2	4.3	7.5	W
3	6.4	7.5	W
3	5.0	6.2	W
4	31.5	384	W
4	5.5	6	W

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8.2	26	---	---
1	11	36	---	---
1	11	36	---	---
1	13.5	54	---	---
1	12	43	---	---
1	--	50.5	---	---
1	8	24	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 19, 1987

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	31.5	---	---
1	10.5	37	---	---
1	10.1	37	---	---
1	11.3	37.5	---	---
1	11.6	47.5	---	---
1	12.8	46.5	---	---
1	12	44.5	---	---
1	9.2	28.5	---	---
1	8.9	26.5	---	---
1	9.6	25	---	---
1	8.4	21.5	---	---
1	12.4	42	---	---
1	9	25.5	---	---
1	9	23	---	---
1	7.7	19	---	---
1	9.1	23.7	---	---
1	9.9	30	---	---
1	8.3	22.5	---	---
1	9.9	29.5	---	---
1	8.3	20	---	---
1	8.7	20	---	---
1	9.4	25.5	---	---
1	8.9	23.5	---	---
1	8.8	23.5	---	---
1	8	21	---	---
1	8.3	20	---	---
1	8.3	25.5	---	---
1	7	17	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 19, 1987

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8.2	20.5	---	---
1	7.5	17.5	---	---
1	9.0	23	---	---
1	8.2	20	---	---
1	9.2	24	---	---
1	8	20	---	---
1	8.7	23	---	---
1	8.5	21.5	---	---
1	8.3	18	---	---
1	8.1	19	---	---
1	7.9	15.6	---	---
1	7.5	15	---	---
1	8.5	18	---	---
2	--	--	930	55
2	--	--	277	17
3	--	--	86	3
3	--	--	133	4
3	--	--	177	8
3	--	--	276	16
3	--	--	383	17
4	--	--	209	9
4	--	--	144	11
4	--	--	147	8

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

April 1, 1986

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	27	212.5	W
1	24	170	W
1	26	180	W
1	30	320	W
1	30	230	W
1	25	207.5	W
1	26	200.5	W
1	25	206.9	W
1	27	257.5	W
1	31	380	W
1	25	210	W
1	28	247	W
1	27	237	W
1	28.5	291	W
1	27	270.2	W
1	24.5	221.5	W
1	25.5	218.5	W
1	26.5	247.5	W
2	27	220	W
2	23	176	W
2	31	367	W
2	25.5	212	W
2	28.5	287.5	W
2	25	232	W
3	29.7	295	H
3	25.5	190	W
3	29.2	301.6	W
3	27.1	240.3	H

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

April 1, 1986

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	14.5	82.5	---	---
1	13.5	72.5	---	---
1	13	71.5	---	---
1	12.5	70	---	---
1	10	49.5	---	---
2	12.5	40	---	---
2	13	50	---	---
2	12.5	48.5	---	---
2	10	29	---	---
2	9.5	28.5	---	---
2	8.5	23.3	---	---
2	10	32.7	---	---
2	9.1	28.5	---	---
3	9.4	23.9	---	---
3	9.1	25	---	---
3	13.2	52.3	---	---
3	12.3	44.2	---	---
3	12	45	---	---
3	9.5	27.7	---	---
3	9.1	27.3	---	---
3	8.5	26.1	---	---
3	9.3	29.4	---	---
3	9.3	31.2	---	---
3	10.2	35.3	---	---
3	11.5	41.7	---	---
3	12.4	41.5	---	---
3	14.8	65	---	---
3	9.6	31.2	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

April 1, 1986

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
3	12	41.3	---	---
3	12	44	---	---
3	9.1	28	---	---
3	8.3	27.3	---	---
3	8.5	26.8	---	---

Redside Shiner

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	14.5	---	---
2	8.3	19.5	---	---
2	10	20.65	---	---
2	8.7	19.9	---	---
2	8.5	19.7	---	---
2	7.7	18	---	---
2	7.7	17.5	---	---

Appendix 3. Cedar Draw Fish Community data, 1982-1988.

Cedar Draw near the Mouth (CD-1)

March 10, 1982

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	22	100	H
1	23	110	H
1	24	120	H
1	22	110	H
1	29	260	W
1	20	90	H
1	37	560	W
1	19	100	W
1	24.5	160	H
1	23	140	H
1	24	160	H
1	21	130	H
1	20	80	H
1	23.5	130	H
1	24.5	140	H
1	25	180	H
1	22.5	140	H
1	23.5	130	H
1	18	100	W
1	21	110	W
1	22.5	130	H
1	19.5	100	H
1	19	90	H
1	27.5	200	W
1	26.5	230	W

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 3, 1982

Rainbow Trout (Con't.)

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	34	440	H
1	25	200	H
1	30	290	H
1	25.5	190	H
1	27	240	W
1	26	190	H
1	27	250	H
1	28.5	300	H
1	28	260	H
1	22.5	230	H
1	22	130	H
1	29	260	H
1	21.5	120	H
1	25	160	H
1	25.5	190	H
1	25	240	W
1	21.5	110	W
1	24	190	H
1	28.5	250	H
1	21	100	W
1	24	180	H
1	20	110	W
1	17.5	70	H
1	21	100	H
1	24	160	H

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 10, 1982

Rainbow Trout (Con't.)

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	28	180	H
1	26	178	W
1	27	178	W
1	26	150	H
1	26	220	W
1	29	270	W
1	21	90	W
1	21	100	W
1	26	170	H
1	26	170	H
1	26	170	H
1	27	230	H
1	21	90	W
1	22	100	H
1	19	76	W
1	28	180	H
1	26	180	H
1	26	150	H
1	22	80	H
1	20	90	H
1	24	110	H
1	19	80	W
1	17	60	W
1	31	280	H
1	32	100	H

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 10, 1982

Rainbow Trout (Con't.)

Renewal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	25	149	H
1	19	90	H
1	22	90	H
1	24	120	H
1	20	90	W
1	28	210	H
1	21	80	W
1	24	160	H
1	27	160	H
1	28	180	H
1	28	250	H
1	24	110	H
1	23	100	H
1	15	36	H
1	27	160	W
1	19.5	75	H
1	22.5	110	H
1	25.5	170	W
1	26	150	H
1	27	185	H
1	26	180	W
1	20	85	W
1	28	220	H
1	25	120	H
1	24	125	H

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 10, 1982

Rainbow Trout (Con't.)

Renewal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	22	90	H
1	23	110	H
1	26	190	H
1	34	330	W
1	26	125	H
1	22	110	H
1	23	85	H
1	26	165	H
1	16.5	50	W
1	22	100	H
1	21	90	H
1	19	75	W
1	22	95	W
1	21	70	W
2	40	560	W
2	22	110	W
2	27	190	H
2	28	240	H
2	19	80	W
2	18	70	W
2	27	200	H
2	21	80	H
2	27	180	H
2	25	170	H
2	21	90	H

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 10, 1982

Rainbow Trout (Con't.)

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
2	18	60	H
2	19	80	W
2	28	280	H
2	22	90	H
2	26	180	H
2	26	190	H
2	31	250	W
2	23	130	W
2	21	90	H
2	29	260	W
2	22	110	W
2	28	230	W
2	26	160	W
2	21	100	W
2	20	80	W
2	23	100	W
2	19	70	H
2	24	170	W
2	21	85	W
2	24	140	W
2	21	90	H
2	21	110	W
3	22	110	H
3	22	100	H
3	20	100	H

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 10, 1982

Rainbow Trout (Con't.)

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
3	19.5	75	W
3	18	70	H
3	22	100	W
3	28	260	W
3	24	150	H
3	31	290	H
3	22	90	W
3	19	50	H
3	25	150	H
4	26	180	H
4	19	80	H
4	19	100	H
4	22	110	H
4	29.5	260	H
4	31	310	W
4	23	110	H
4	22	130	H
4	26	210	H
4	28	230	W
4	27	190	W
4	26	200	W
4	19	70	W

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw Near the Mouth (CD-1)

March 10, 1982

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	47	2
1	--	--	15	1
2	--	--	100	3
2	--	--	10	2
3	--	--	8	2
3	--	--	10	3
4	--	--	40	1
4	--	--	15	2
4	--	--	50	2

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	29	320	W
1	27.5	268	W
1	30.5	322.5	H
1	27	256.5	W
1	28	259	W
1	27.5	262	W
1	24.5	194	W
1	26.5	232	W
1	24.5	150	W
1	27	263	W
1	28	205	W
1	24.5	180	W
1	24	197	W
1	25	216	W
1	27.5	227	W
1	31	399	W
1	31	408	W
1	26	210	W
1	25	179	W
1	26	213.3	W
1	24	186	W
1	30	329.5	W
1	28	253	W
1	25	228	W
1	27	237.5	W
1	26.5	232	W
1	26.5	256	W
1	26.5	232	W

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Rainbow Trout (Con't.)

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	25	199	W
1	26	224	W
1	25	199.5	W
1	29.5	317	W
1	27	272	W
1	27.5	213	W
1	28	284	W
1	24	195	W
2	26.5	235	W
2	26.5	254	W
2	27.5	262	W
2	26.5	206	W
2	25.5	203	W
2	26.5	224.5	W
3	15.5	32.7	W
4	26	251.5	W

Redside Shiner

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8	4.4	---	---
1	12	18.2	---	---
1	11	14	---	---
1	11	12	---	---
1	8	5	---	---
1	10.5	14	---	---
1	11	15.6	---	---
1	11	13.7	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Redside Shiner (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	11	15.6	---	---
1	11.5	16.9	---	---
1	10	11.8	---	---
1	9.5	10.5	---	---
1	10	11.9	---	---
1	12	16.8	---	---
1	10.5	10.8	---	---
1	11	13.6	---	---
1	12	22.4	---	---
1	11	16	---	---
1	8	4.1	---	---
1	11	15	---	---
1	11.5	17.2	---	---
1	10	10.8	---	---
1	10	10.5	---	---
1	11	14.5	---	---
1	11.5	17.4	---	---
1	10.5	12	---	---
1	10.5	10.8	---	---
1	7	2.4	---	---
1	10	8.4	---	---
1	11	16	---	---
1	10	10.3	---	---
1	8.5	5.1	---	---
1	12	16	---	---
1	9.5	10	---	---
1	10.5	12	---	---
1	6.5	2.8	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Redside Shiner (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8.5	5.8	---	---
1	8	4.8	---	---
1	8	3.7	---	---
1	8	4.2	---	---
1	11.5	16.3	---	---
1	9	6.2	---	---
1	7.5	3.5	---	---
1	9	6.8	---	---
1	9	6.8	---	---
1	10	9.9	---	---
1	11	14.4	---	---
1	12	19.3	---	---
1	11.5	13.4	---	---
1	10	9.9	---	---
1	7.5	4	---	---
1	8.5	5.2	---	---
1	8	4.5	---	---
1	10	10.1	---	---
1	12	17.1	---	---
1	10	11.2	---	---
1	8.5	5	---	---
1	7	2.8	---	---
1	8	4.6	---	---
1	7.5	3.8	---	---
1	10	10.8	---	---
1	8.5	5.5	---	---
1	7	2.5	---	---
1	11.5	16.6	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Redside Shiner (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	7	3.4	---	---
1	10.5	10	---	---
1	7.5	3.8	---	---
1	7.5	3.8	---	---
1	9.5	8	---	---
1	11	15.2	---	---
1	10	10.8	---	---
1	10	9.2	---	---
1	11	14.3	---	---
1	11	13.3	---	---
1	10	8.7	---	---
1	9.5	8.8	---	---
1	10	12.1	---	---
1	10.5	13	---	---
1	9	6.1	---	---
1	10	10.6	---	---
1	7.5	3.9	---	---
1	7.5	3.9	---	---
1	7.5	4	---	---
1	8.5	5.2	---	---
1	10.5	12.1	---	---
1	13	20.3	---	---
1	6.5	2.7	---	---
1	9.5	9.2	---	---
1	9.5	8.2	---	---
1	10.5	12.3	---	---
1	7	2.9	---	---
1	10.5	12.3	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Redside Shiner (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8.5	5.1	---	---
1	7	2.5	---	---
1	10	10.8	---	---
1	7	3.2	---	---
1	7	2.5	---	---
1	8.5	5.7	---	---
1	7	3	---	---
1	7.5	3.8	---	---
1	8	3.9	---	---
1	7	2.9	---	---
1	10.5	15.4	---	---
1	11	14.3	---	---
1	12	16.3	---	---
1	7	3	---	---
1	7.5	3.5	---	---
1	8	6	---	---
1	6.5	2.1	---	---
1	7.5	4.2	---	---
1	6	1.8	---	---
1	8.5	5.3	---	---
1	10	9.6	---	---
1	10	9.1	---	---
1	6.5	2.2	---	---
1	11	14.9	---	---
1	10.5	10.1	---	---
1	10.5	12.3	---	---
1	10.5	12	---	---
1	10.5	10.5	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (CD-3)

March 17, 1988

Redside Shiner (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8	4.5	---	---
1	10.5	10.7	---	---
1	10	10.5	---	---
1	9	6.6	---	---
1	7.5	2.6	---	---
1	9.5	10.5	---	---
1	12.5	18.2	---	---
1	10	11.1	---	---
1	11	15.3	---	---
1	9.5	7.9	---	---
1	7.5	3.1	---	---
1	13	17.7	---	---
1	11	16.1	---	---
1	7.5	3.8	---	---
1	10	12.1	---	---
1	10	8.6	---	---
1	10.5	14.7	---	---
1	13	22.2	---	---
1	10	10.7	---	---
1	--	--	543	50
1	10.5	19.9	---	---
1	9.5	11.9	---	---
1	9	6.9	---	---
1	9.5	8.6	---	---
1	9.5	8.5	---	---
1	--	--	156	19
2	--	--	130	14
2	--	--	531	50
3	--	--	304.5	30
4	--	--	535	32

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt (gm)	#Fish
1	14	42.4	---	---
1	14	40.6	---	---
1	8.5	8.1	---	---
1	10	18.8	---	---
1	9.5	12.3	---	---
1	9	10.1	---	---
1	9	11.7	---	---
1	11	15.6	---	---
1	10	15	---	---
1	9	9	---	---
1	8	5.8	---	---
1	9	12.7	---	---
1	9	12.9	---	---
1	8	6.5	---	---
1	9	9.3	---	---
1	8.5	8.3	---	---
1	9.5	10.4	---	---
1	8	7.3	---	---
1	9	12.1	---	---
1	7.5	5.8	---	---
1	8.5	8	---	---
1	8.5	7.7	---	---
1	8.5	8.9	---	---
1	8.5	8.2	---	---
1	9.5	12.4	---	---
1	10.5	15.5	---	---
1	8.5	8.9	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	9.5	13.7	---	---
1	7	5	---	---
1	7.5	8.7	---	---
1	8	6.7	---	---
1	7.5	4.8	---	---
1	13.5	36.7	---	---
1	13	31.8	---	---
1	15.5	55.7	---	---
1	9.5	15.8	---	---
1	9.5	15.7	---	---
1	9	12.2	---	---
1	8.5	8.8	---	---
1	19	94	---	---
1	9	10.2	---	---
1	11	21.2	---	---
1	9	10.6	---	---
1	9.5	12.1	---	---
1	8.5	8.4	---	---
2	10.5	18.9	---	---
2	16.5	76.1	---	---
2	10	14.5	---	---
2	10	12.7	---	---
2	8.5	9.1	---	---
2	14	44.8	---	---
2	8.5	10.2	---	---
2	9.5	14.3	---	---
2	10	16.8	---	---
2	9.5	13.1	---	---

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
2	9.5	13.3	---	---
2	16	72.5	---	---
2	9	6	---	---
2	6.5	3.8	---	---
2	9	11.3	---	---
2	10	15.2	---	---
2	9	9.1	---	---
2	10.5	15	---	---
2	9.5	12.7	---	---
2	8.5	6.1	---	---
2	8	9	---	---
2	8	6.6	---	---
2	10	17.4	---	---
2	8	8.4	---	---
2	9	12	---	---
2	12	23.2	---	---
2	10	16.7	---	---
2	10	15.9	---	---
2	9.5	12.4	---	---
2	9	10.5	---	---
2	8	6.5	---	---
2	9	10.5	---	---
2	8	8.9	---	---
2	8.5	8.5	---	---
2	9.5	17	---	---
2	9.5	10.3	---	---
2	9.5	14.7	---	---

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
2	9	11.6	---	---
2	9	9.8	---	---
3	17.5	78.3	---	---
3	17	83.5	---	---
3	11	20.4	---	---
3	10.5	18.2	---	---
3	10	12.6	---	---
3	11	15.5	---	---
3	11	19.6	---	---
3	10.5	18.4	---	---
3	10	15.6	---	---
3	11.5	25.1	---	---
3	10.5	18.7	---	---
3	11	20.7	---	---
3	10	15.4	---	---
3	9.5	13.0	---	---
3	11.5	25.7	---	---
3	11.5	17.8	---	---
3	10.5	20.9	---	---
3	11	18	---	---
3	11	24	---	---
3	9	15.7	---	---
3	9.5	12.9	---	---
3	10	14.1	---	---
3	9.5	12.6	---	---
3	11	19.7	---	---
3	9.5	14.6	---	---
3	8	7.4	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
3	9	10.3	---	---
3	10	12.7	---	---
3	9	10.2	---	---
3	9	11.1	---	---
3	9	10.2	---	---
3	9	13.6	---	---
3	8	8.1	---	---
3	9	10.1	---	---
3	9.5	13.8	---	---
3	8	6.3	---	---
3	9.5	13.2	---	---
3	9	10.3	---	---
3	9.5	12.6	---	---
3	8.5	8.3	---	---
4	15	56.2	---	---
4	10	22.5	---	---
4	11.5	29.5	---	---
4	9	11.8	---	---
4	9.5	14.4	---	---
4	9.5	11.7	---	---
4	7.5	5.5	---	---
4	8.5	9.3	---	---
4	9.5	11.3	---	---
4	10.5	18.7	---	---
4	10	17.8	---	---
4	11	21	---	---
4	8	6.8	---	---
4	9.5	10	---	---

Cedar Draw at Pole Line Road (Station CD-3)

March 17, 1988

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
4	9	12.3	---	---
4	9	9.1	---	---
4	9	9	---	---
4	8.5	8.5	---	---

Speckled Dace

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	7.5	3.9	---	---
1	14.5	36.2	---	---
1	8.5	5.8	---	---
1	9	7.4	---	---
1	10.5	10.9	---	---
1	12	15.1	---	---
1	9	6.3	---	---
1	6	1.8	---	---
1	9	6.7	---	---
2	7.5	3.6	---	---
2	8	3.9	---	---
2	--	--	174.5	11
3	--	--	418	29
4	--	--	344	19

Appendix 3. Cedar Draw Fish Community Data, 1982-1988

Cedar Draw at Pole Line Road (Station CD-3)

March 19, 1987

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	44	988	W
1	37	514	H
1	27.5	239	W
1	23	135	H
2	31	355	H
2	5.4	13	W
3	6	6.1	W
4	5.5	9	W
4	5.8	14.5	W

Speckled Dace

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	14	25.5	----	---
1	14	24	----	---
1	--	--	599	55
1	--	--	1300	100
1	--	--	468	58
2	--	--	1132	100
2	--	--	1212	100
2	--	--	1094.5	114
3	--	--	493	51
3	--	--	1005	63
3	--	--	969	72
3	--	--	274	50
3	--	--	28	2
4	--	--	1098	100
4	--	--	1303	100
4	--	--	520	50
4	--	--	1195	133

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 19, 1987

Redside Shiner

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	8	9.5	---	---
1	10	14	---	---
1	9	12	---	---
1	10.5	18	---	---
1	9	14	---	---
1	9	14	---	---
1	10.3	18	---	---
1	9.5	16.5	---	---
1	10	17.5	---	---
1	10.3	18	---	---
1	11.8	27	---	---
1	10	17	---	---
1	10.5	18.5	---	---
1	10	18	---	---
1	9.3	14.5	---	---
1	10	18	---	---
1	11.8	26.5	---	---
1	11	23	---	---
1	9.3	18	---	---
1	9.5	18	---	---
1	10	19	---	---
1	10.5	20.5	---	---
1	10	18	---	---
1	9.5	18	---	---
1	7.5	12	---	---
1	10.5	20.5	---	---
1	11	22	---	---
1	11	25	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 19, 1987

Redside Shiner (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	11	26.5	---	---
1	11.1	28	---	---
1	10.1	22	---	---
1	11.8	26.5	---	---
1	11.4	31	---	---
1	--	--	549	50
1	--	--	525	50
1	--	--	570	93
1	--	--	339	30
1	--	--	46	3
2	--	--	1077	100
2	--	--	1260	123
3	--	--	154	12
3	--	--	538	42
3	--	--	360	29
3	--	--	189	15
3	--	--	24	---
4	--	--	336	29
4	--	--	316.5	27
4	--	--	38	2
4	--	--	351	27
4	--	--	158.5	15

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	17.5	76.5	---	---
1	10.5	24	---	---
1	16.5	72.5	---	---

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 19, 1987

Mottled Sculpin (Con't.)

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	17.1	86	---	---
1	11.6	37	---	---
1	15.5	92.5	---	---
1	16	78.4	---	---
1	18	107.5	---	---
1	14.5	63.2	---	---
1	11.5	31	---	---
1	28	27	---	---
2	--	125.5	---	---
2	17.4	103	---	---
2	10.4	33.5	---	---
2	17.2	95	---	---
2	15.4	76.5	---	---
2	11.5	32	---	---
2	14.6	63.5	---	---
2	10.4	25.5	---	---
3	16.5	89	---	---
3	12.5	40	---	---
3	18	89.5	---	---
3	18	96.5	---	---
3	18	103	---	---
3	16.5	93	---	---
4	11.5	32	---	---
4	10.5	26.5	---	---
4	10	27	---	---
4	14	53	---	---
4	10	25	---	---
4	11	31.5	---	---
4	10	22	---	---
4	11	37.5	---	---

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 12, 1985

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	38	590	W
1	36	475	W
1	34	470	W
1	26	220	W
1	22	150	W
2	22	150	W

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	1728	45
2	--	--	89	2
2	--	--	349	9
2	--	--	305	9
2	--	--	212	4
2	--	--	164	4
3	--	--	305	9
4	--	--	211	6

Redside Shiner

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	637	115
2	--	--	138	35
2	--	--	157	12
3	--	--	150	18
3	--	--	8.5	1
4	--	--	49	12

Appendix 3 Continued. Cedar Draw Fish Community data, 1982-1988

Cedar Draw at Pole Line Road (Station CD-3)

March 12, 1985

Speckled Dace

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	587	86
1	--	--	594	---
1	--	--	544	---
1	--	--	561	---
1	--	--	579	135
1	--	--	335	---
1	--	--	55	83
2	--	--	593	---
2	--	--	483	---
2	--	--	598	---
2	--	--	598	---
2	--	--	390	65
3	--	--	526	---
3	--	--	580	---
3	--	--	458	---
4	--	--	472	---

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

April 1, 1986

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	37	542	W
3	41	824.6	W

Mountain Sucker

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	3	---

Speckled Dace

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	212	139
2	--	--	670	71
3	--	--	774.8	86
4	--	--	321	26

Redside Shiner

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	660.2	49
2	--	--	76.7	6
3	--	--	136.2	10
4	--	--	32	1

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
3	--	--	67.5	1
4	--	--	77.1	1

Appendix 3. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 10, 1982

Rainbow Trout

Removal #	Length (cm)	Weight (gm)	Wild/Hatchery
1	46	1300	W
1	35	460	H
1	30	310	H
1	31	370	W
1	24	195	H
2	34	500	W

Speckled Dace

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	136	29
1	--	--	176	260
1	--	--	50	29
2	--	--	110	39
2	--	--	33	14
2	--	--	81	39
2	--	--	30	1
3	--	--	97	26
3	--	--	80	23
4	--	--	109	18

Mottled Sculpin

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	90	2
2	--	--	60	1
2	--	--	33	1

Appendix 3 Continued. Cedar Draw Fish Community Data, 1982-1988.

Cedar Draw at Pole Line Road (Station CD-3)

March 10, 1982

Redside Shiners

Removal #	Length (cm)	Weight (gm)	Composite Wgt. (gm)	#Fish
1	--	--	200	100
1	--	--	180	56
1	--	--	64	3
2	--	--	24	5
2	--	--	81	165
2	--	--	225	29
3	--	--	90	77
4	--	--	10	2

Appendix 4

Agricultural BMP Implementation Data

1982

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Lined Ditch(ft)	----	1337	----	----	1337
Filter Strips (acres)	----	1.511	----	----	1.511
Gated Pipe (feet)	----	3470	600	----	4070
Sediment Ponds (number)	----	----	2	----	2

1983

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Ditch Lining(ft)	----	6432	----	----	6432
Filter Strips (acres)	----	1.51	0.53	----	2.04
Gated Pipe (feet)	----	6264	882	----	7146
Mini-Basins (number)	----	56	----	----	56
Pipeline (feet)	----	3599	----	----	3599
Sediment Ponds (number)	----	5	----	----	5
Structures,Water Control	----	7	----	----	7

1984

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Alleyway (no.)	----	----	1	----	1
Concrete Ditch Lining(ft)	----	5463	1919	----	7382
Filter Strips (acres)	----	8	4.74	1.24	13.98
Gated Pipe (feet)	300	9889	15725	4980	30894
I-Slots (cubic yards)	----	2270	----	----	2270
I-Slots (number)	----	----	19	----	19
Land Smoothing (acres)	----	15	7	27.73	49.73
Mini-Basins (cubic yards)	----	199	----	----	199
Mini-Basins (number)	----	----	13	----	13
Pipeline (feet)	----	1924	5012	4054	10990
Sediment Basins (cu.yd.)	----	----	----	495	495
Sediment Basins (number)	----	10	2	1	13
Structures,Water Control	----	11	17	10	38
Structures,Waste Storage	----	----	2	----	2

1985

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Ditch (feet)	----	4583	3017	----	7600
Filter Strips (acres)	----		11.73	2.38	14.11
Gated Pipe (feet)	----	9790	13327	5190	28307
Irrig. Water Man. (acres)	----		285		285
I-Slots (number)	----	2	7	40	49
(cubic yards)	----	709	490	664	1863
Land Smoothing (acres)	----	12	4		16
Mini-Basins (number)	----	3	---	18	21
(cubic yards)	----	558	---	811	1369
Pasture Man. (acres)	----	----	69	----	69
Pipeline (feet)	----	2085	510	546	3141
Sediment Basins (number)	----	7	4	2	13
(cu yds)	----	2756	2271	1574	6601
Structures (number)	----	13	4	4	21

1986

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Filter Strips (acres)	---	0.92	11.9	---	12.82
Gated Pipe (feet)	---	8800	5220	---	14020
Irrig. Water Man. (acres)	---	---	1185	---	1185
I-Slots (number)	---	---	---	3	3
I-Slots (cubic yards)	---	724	1128	766	2618
Land Smoothing (acres)	---	8	---	4	12
Mini-Basins (cubic yards)	---	---	127	---	127
Pasture Man. (acres)	---	---	125	---	125
Pipeline (feet)	---	3643	440	200	4283
Sediment Basins (number)	---	4	8	4	16
(cu yds)	---	1344	3113	919	5376
Structures (number)	---	15	7	3	25

1987

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Ditch (feet)	---	2453	---	---	2453
Filter Strips (acres)	0.67	11.8	0.42	---	12.89
Gated Pipe (feet)	---	15659	6000	642	22301
I-Slots (cubic yards)	---	1335	1590	1189	4114
Land Smoothing (acres)	8	---	---	14	22
Mini-Basins (cubic yards)	90	---	---	1012	1102
Pasture Man. (acres)	---	---	---	---	0
Pipeline (feet)	---	3893	2530	1165	7588
Reduced Tillage (acres)	---	13	---	---	13
Sediment Basins (cu yds)	150	1401	1182	3209	5942
Structures (number)	---	20	9	8	37

1988

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Ditch (feet)	2593	2318	---	---	4911
Conservation Tillage (ac)	---	---	40	---	40
Filter Strips (acres)	---	5.4	1.25	---	6.65
Gated Pipe (feet)	3642	7084	4140	3360	18226
I-Slots (cubic yards)	---	387	1330	591	2308
Land Smoothing (acres)	13	54	---	---	67
No-Till Planting (acres)	---	---	33	---	33
Pipeline (feet)	2008	3782	2522	1824	10136
Sediment Basins (cu yds)	4706	626	1250	272	6854
Structures (number)	10	12	8	7	37

1989

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Chiseling & Sub-soil (ac)	22	---	---	28	50
Concrete Ditch (feet)	---	418	---	---	418
Conservation Tillage (ac)	---	63	---	---	63
Filter Strips (acres)	1.29	2.16	---	0.41	3.86
Gated Pipe (feet)	1320	12450	1740	1500	17010
I-Slots (cubic yards)	1250	668	---	---	1918
Land Smoothing (acres)	19	19	---	---	38
Pipeline (feet)	2266	7124	284	---	9674
Sediment Basins (cu yds)	---	---	235	---	235
Structures (number)	7	19	4	3	33

1990

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Ditch (feet)	---	1271	---	---	1271
Conservation Tillage (ac)	---	---	16	---	16
Filter Strips (acres)	0.25	---	1.05	0.41	1.71
Gated Pipe (feet)	---	5597	4470		10067
I-Slots (cubic yards)	1919	---	---	218.9	2137.9
Land Smoothing (acres)	3.8	---	---	---	3.8
Perm Vegetative Cover(ac)	---	4	---	---	4
Pipeline (feet)	1370	501	620	2917	5408
Sediment Basins (cu yds)	1687	---	---	---	1687
Structures (number)	2	12	2	6	22

1991

BMP Type	Quarter 1	Quarter 2	Quarter 3	Quarter 4	TOTAL
Concrete Ditch (feet)	---	2166			2166
Filter Strips (acres)	---	---			0
Gated Pipe (feet)	---	---			0
Irrig. Water Man. (acres)	---	---			0
I-Slots (cubic yards)	495	---			495
Land Smoothing (acres)	---	---			0
Mini-Basins (cubic yards)	194	118			312
Pasture Man. (acres)	---	---			0
Pipeline (feet)	---	4756			4756
Sediment Basins (cu yds)	---	---			0
Structures (number)	---	6			6

Costs associated with this publication are available from Dept. of Health and Welfare in accordance with Section 60-202, Idaho Code. 04-93/F-8552/100/136001-48-85-921/$9.70 = $969.68