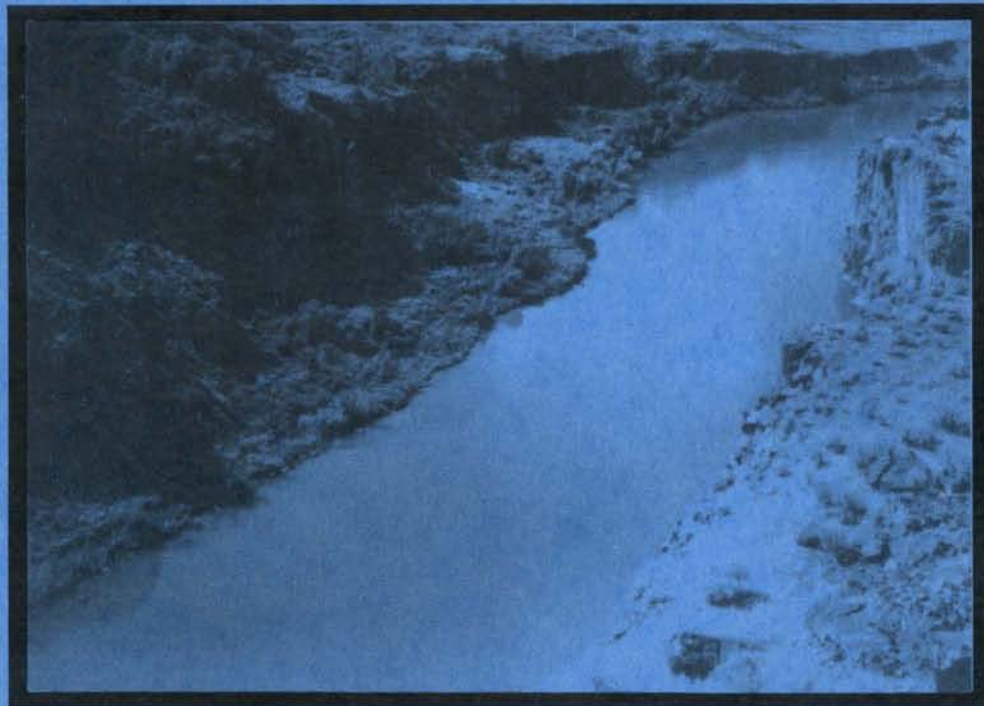


# MIDDLE SNAKE RIVER WATER QUALITY STUDY PHASE I

## Final Report



SUBMITTED TO

Idaho Department of Health and Welfare  
Division of Environmental Quality

by

Charles E. Brockway, P.E.  
Clarence W. Robison, P.E.



**University of Idaho**  
**Idaho Water Resources Research Institute**  
**Kimberly Research and Extension Center**

February 1992

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## **ABSTRACT**

The purpose of the project was to collect, analyze, assemble, and assess water quality data and resulting chemical/nutrient loads entering and transported in the Middle Snake River Reach of Idaho. This reach is defined as the reach between Milner Dam and King Hill. A database of historical, pertinent water quality data were prepared and formatted for inclusion in the STORET national water quality database. Concurrent sampling of 55 sites, including 13 instream sites, effluent from 10 fish hatcheries, 19 irrigation return flow streams, and 13 tributary streams, was conducted for the period June 1, 1990 through July 25, 1991. Data will be utilized in a river water quality model being developed by the EPA. This reach of the Snake River accumulates and transports up to 30 tons/day of nitrate+nitrite N, 2 tons/day of phosphate P, and 350 tons/day of suspended solids. Water quality in the reach is impaired by the nutrient and sediment loads and extreme low flows experienced over the last four years.

## **INTRODUCTION**

### **PROBLEM STATEMENT**

The 94 mile reach of the Snake River from Milner Dam to King Hill receives and transports sediment, nutrients, bacteria, and other chemicals from various point and nonpoint sources. This reach has been designated as the Middle Snake River for purposes of this study (Figure 1). This reach of the river has been listed as water quality limited by the Idaho Division of Environmental Quality and as an interim protected reach by the Idaho Department of Water Resources (section 303(d) of the Clean Water Act and section 42-1734D of the Idaho Code).

Water resources planning and water quality planning and regulation in this reach have been hampered by the lack of water quality and hydraulic data. Permits issued for point sources, primarily aquaculture facilities, have been based on best management

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# Middle Snake River Water Quality Survey

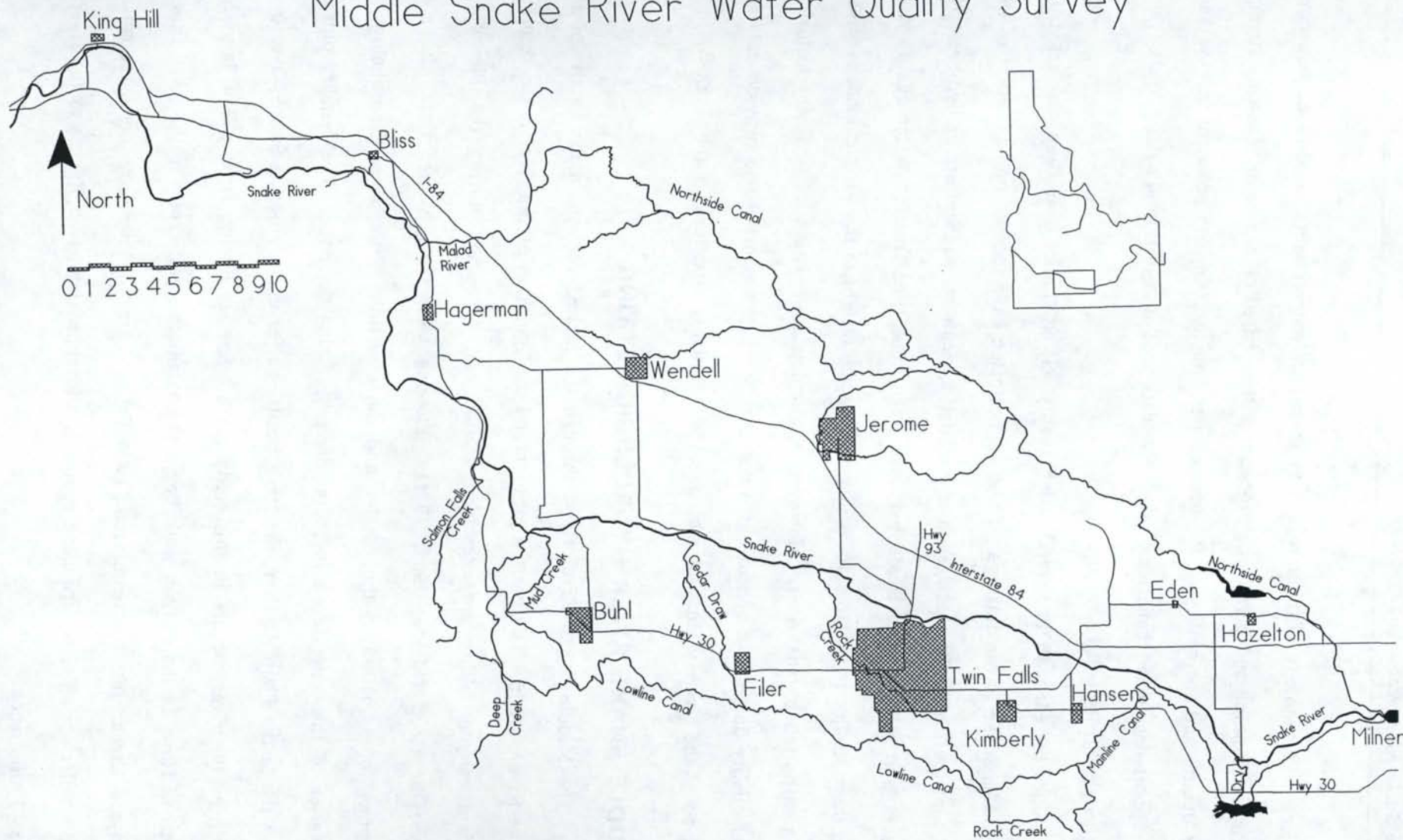


Figure 1. Location and extent of study area, Middle Snake River Reach.

practices or technology without regard to in-stream water quality conditions. Current and future planning and permitting processes will be based on source or receiving stream water quality and the ability of the receiving stream to assimilate pollutant inflows and still support designated beneficial uses. Evaluation of total maximum daily loads from permitted facilities will be required.

Since the early 1970s several water quality related studies have been conducted on the Middle Snake River drainage. These studies often have focused on one aspect of the total contribution to the reach, such as irrigated agriculture, aquaculture or hydroelectric impacts, and seldom were conducted during the same time frame. Water quality data from these studies is valuable and will provide some insight to the various loads received and transported by the river. However, a complete compilation of pertinent historical water quality data and a concurrent water quality study was needed to provide data for analysis of the river system and subsequent water quality modelling of the reach.

## **MIDDLE SNAKE RIVER HYDROLOGIC SETTING**

The Middle Snake River flows through the incised canyon in the basalts of the Snake River Group. The present location and configuration of the river is the result of ancient canyon filling processes and erosion and deposition during the Pleistocene Bonneville flood (Malde, 1968, 1971). Flowing west from Milner Dam, the river becomes more incised in the basalts, and the elevation of the river drops below the elevation of the water levels in the aquifers bordering the river. The primary outflow from the Snake Plain Aquifer, the large basalt aquifer underlying the Snake River plain north of the river, occurs in this study reach. Springs issuing from pillow lavas and interbed flows in the canyon walls begin to contribute significantly to the river flow at Vinyard Creek, just upstream from Twin Falls. Large inflows from northside springs and smaller spring flows from the southside add approximately 6,000 cfs to the river in this 80 mile reach.

---

Irrigation return flows from the 202,000 acre Twin Falls Canal Company on the south and the 160,000 acre Northside Canal Company lands on the north contribute significant flow directly into the river and into tributaries which reach the river. These inflows are generally non-perennial and flow only during the normal April 15 to October 15 irrigation season. Some of these streams, however, discharge ground-water return flow during the wintertime and account for significant flow in the river. The tributaries entering the river, primarily from the south side, include flows from surface irrigation returns, ground-water, and natural runoff during the spring time.

Flows in this reach are controlled by Water District No. 1 and the U.S. Bureau of Reclamation to meet storage and irrigation diversion rights upstream from Milner Dam. During July, August, and September the river flow at the USGS gage below Milner Dam may be zero due to upstream diversions for irrigation. Between the Milner and Kimberly USGS gages, the river gains an average of 250 cfs. Spring flows and surface returns continue to add to the flow throughout the reach causing normal summertime flows of 8000 cfs at King Hill. Figure 2 shows the average daily flows at the five operating USGS gages in the reach for the period 1947 to 1991. Seasonal flow patterns are similar showing the normal spring time high flows and low summer time flows indicative of a regulated river.

The nonpoint sources entering the reach are primarily surface return flow from irrigated agriculture. These flows are normally non-perennial surface flows with discharge directly into the river occurring during the irrigation season from approximately April 15 through October 15. Some of the irrigation return flow streams are perennial and include discharge from spring flow during the winter months. Major tributary streams including Dry Creek, Rock Creek, Cedar Draw, Mud Creek, Deep Creek, and Salmon Falls Creek on the south side discharge surface and ground-water return flow all year. Northside tributaries include Vinyard Creek, Riley Creek,

MIDDLE SNAKE RIVER  
AVERAGE DAILY FLOWS 1947-91

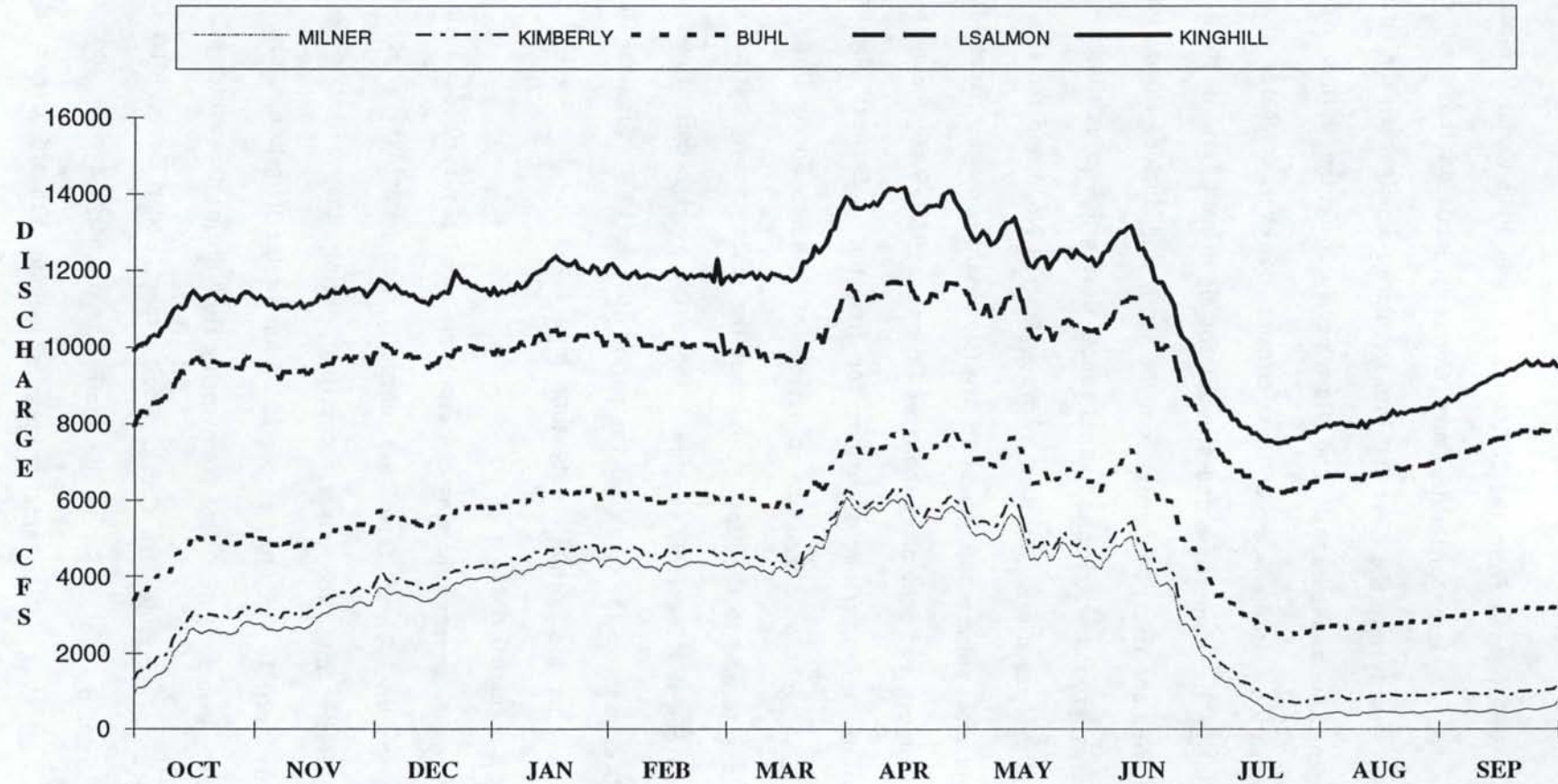


Figure 2. Snake River average daily flows at five USGS gaging stations

Billingsley Creek, Blue Lakes, Clear Lakes, Warm Creek, and the Malad River. Point sources along the river are primarily from aquacultural activities and occur throughout the year. There are approximately 18 commercial and governmental aquaculture facilities that discharge directly into the river in the study reach. These facilities support rainbow trout producing facilities which in the aggregate constitute the largest trout producing area in the U.S. and reportedly accounting for more than 80% of the national production. The City of Twin Falls sewage treatment plant effluent and the City of Hagerman sewage treatment lagoon facility discharge directly into the river. Additionally, five impoundments by hydropower facilities exist on the river reach and modify the water quality and the ability of the reach to assimilate the various loadings. During the low flow summer conditions these factors appear to significantly degrade the water quality and potentially impair the ability of the river to support the designated beneficial uses of agricultural water supply, cold water biota, salmonid spawning, primary contact recreation, and secondary contact recreation.

### **NEEDS AND OBJECTIVES**

The defined needs in this study reach for water quality planning and administration of applicable water quality regulations were to secure adequate data and information to:

- a. Assess the cumulative impact of irrigation return flows on the river water quality.
  - b. Prioritize agricultural subbasins for treatment under the available water quality improvement programs.
  - c. Assess cumulative impacts of aquacultural activities on river water quality.
  - d. Assess main river water quality conditions during summertime low flow conditions.
  - e. Provide a framework for an on-going water quality database.
-

- f. Provide input data for river water quality modeling efforts.

The primary objectives of the study were to:

- (1) consolidate available water quality data collected in the Middle Snake River reach into a single relational database
- (2) collect concurrent water quality and discharge data and resulting chemical loads in the main river and tributaries, return flows, and point discharges; and,
- (3) explore and develop relationships between the water quality of point and nonpoint sources and their activities.

The University of Idaho/Idaho Water Resources Research Institute entered into a contract with the Idaho Department of Health and Welfare/Division of Environmental Quality and cooperatively defined three primary tasks to meet the objectives. A scope of work was developed based on these tasks which included:

- 1. Preparation of an Historical Database
  - a. Database System Selection
  - b. Historical Water Quality Data Selection
    - Instream Data
    - Irrigation Return Flow Data
    - Aquaculture Data
    - Municipal Sewage Treatment Plant Data
- 2. Additional Concurrent Water Quality Monitoring
  - a. Irrigation Return Flows
  - b. Tributary Streams
  - c. Aquaculture Effluents
  - d. Instream Stations
- 3. Data Analysis and Database Preparation
  - a. Database Preparation for STORET

- b. Determination of Contaminant Loadings
  - Measured Irrigation Return Flows
  - Measured Fish Hatcheries
  - Measured Tributaries
  - Measured Instream Stations
- c. Analysis of historical and current fish hatchery nutrient concentrations
- d. Statistical Analysis of Irrigation Return Flow Loadings
- e. Analysis of Ungaged Irrigation Return Flow Loadings

## PROCEDURES

### CONCURRENT WATER QUALITY MONITORING

The concurrent water quality sampling was performed by the University of Idaho, while the laboratory analyses of the samples was performed by the Department of Health and Welfare Bureau of Laboratories. During contract negotiations in late spring and early summer of 1990, a list of tributaries, return flows, springs, and point discharges into the Middle Snake River was formulated by both agencies with input from the Soil Conservation Service and the area irrigation companies. While formulating the list of potential stations, a water quality parameter package was derived by both agencies along with a quality control and assurance program. Figure 3 shows the location of all concurrent monitoring sites, and Table 1 lists the site names, type of station, and locations.

#### Types of Stations

##### **Aquaculture Effluents**

The fish hatchery/processing plant network includes ten (10) stations. The locations of these stations are Blue Lakes Trout Processing Plant (FH14N), Blue Lakes

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# Middle Snake River Water Quality Survey Concurrent Monitoring Stations

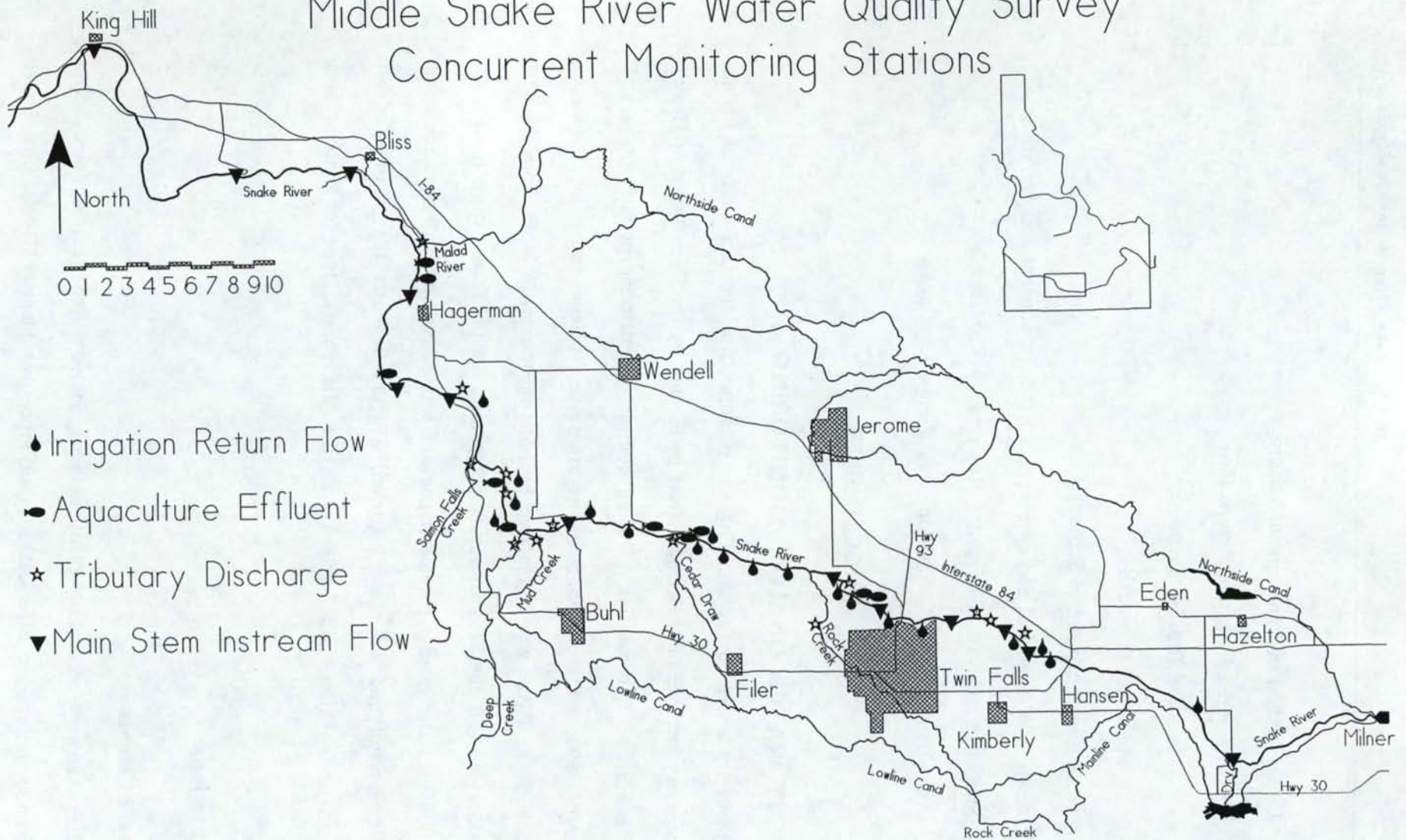


Figure 3. Concurrent water quality monitoring site locations in the reach.



Table 1. Middle Snake River Water Quality Survey Station List

Site Code	Description	Type	Elevation	Latitude	Longitude	River Mile
FH14N	Blue Lakes Trout Farm Fish Processing Plant	Fish Hatchery	3130.	42°36'39"	114°28'54"	610.0
FH15N	Blue Lakes Trout Farm Hatchery	Fish Hatchery	3130.	42°36'41"	114°29'03"	609.9
FH25N	Crystal Springs Hatchery	Fish Hatchery	2990.	42°39'30"	114°38'28"	600.5
FH26S	Magic Valley Fish Hatchery	Fish Hatchery	2990.	42°39'34"	114°39'15"	600.0
FH28N	Rim View Hatchery	Fish Hatchery	3010.	42°39'49"	114°40'36"	598.7
FH35S	Idaho Fish Breeders -- ( N drain with geothermal water )	Fish Hatchery	2900.	42°40'02"	114°48'53"	591.5
FH38S	Box Canyon Fish Hatchery	Fish Hatchery	2920.	42°42'13"	114°49'37"	588.4
FH46N	Buckeye Farm Fish Hatchery	Fish Hatchery	2800.	42°46'24"	114°55'48"	578.6
FH48N	White Springs Fish Hatchery	Fish Hatchery	2790.	42°50'54"	114°54'00"	572.4
FH49N	Birch Creek Fish Hatchery	Fish Hatchery	2780.	42°51'05"	114°54'01"	572.2
IR02N	Northside A Drain	Irrigation RF	4030.	42°32'06"	114°10'35"	627.6
IR03S	Southside A10 Drain	Irrigation RF	3830.	42°34'15"	114°19'08"	619.5
IR04N	Northside C55 Drain	Irrigation RF	3850.	42°34'38"	114°19'43"	619.0
IR07S	Southside Twin Falls Coulee	Irrigation RF	3750.	42°34'53"	114°21'16"	618.0
IR11S	Southside East Perrine Coulee	Irrigation RF	3640.	42°35'31"	114°26'02"	612.9
IR12S	Southside Main Perrine Coulee	Irrigation RF	3160.	42°36'02"	114°28'16"	611.0
IR16S	Southside West Perrine Coulee	Irrigation RF	3140.	42°36'53"	114°29'53"	609.1
IR17S	Southside 43 Drainage	Irrigation RF	3130.	42°37'14"	114°30'39"	608.3
IR20S	Southside 30 Drain	Irrigation RF	3500.	42°37'55"	114°33'33"	605.3
IR21S	Southside Pigeon Cove Hydro Plant -- LQ and LS Drains	Irrigation RF	3000.	42°38'25"	114°35'23"	603.6
IR22S	Southside LS2/39A Drain	Irrigation RF	3010.	42°38'52"	114°36'53"	602.2
IR23N	Northside N42 Drain	Irrigation RF	3000.	42°39'10"	114°37'42"	601.4
IR23NT	Northside N42 Drain on Canyon Rim	Irrigation RF	--	--	--	601.4
IR24S	Southside 39 Drain	Irrigation RF	2990.	42°39'16"	114°38'14"	600.9
IR29S	Southside I Drain	Irrigation RF	3000.	42°39'42"	114°41'25"	598.0
IR30N	Northside J8 Drain	Irrigation RF	3295.	42°40'38"	114°44'32"	595.1
IR35S	Southside N drain prior to Idaho Fish Breeders	Irrigation RF	3000.	42°39'58"	114°49'20"	591.5
IR36N	Northside S29 Drain	Irrigation RF	3200.	42°41'19"	114°48'26"	589.5
IR39N	Northside S19/S Drains	Irrigation RF	3010.	42°42'00"	114°48'52"	588.4
IR42N	Northside W26 Drain	Irrigation RF	3145.	42°45'29"	114°50'47"	584.3
IS01N	Snake River at Murtaugh Bridge	Instream	3840.	42°29'58"	114°09'04"	630.5
IS05M	Snake River above Twin Falls Pool	Instream	3525.	42°34'27"	114°20'03"	619.0
IS08S	Snake River below Twin Falls	Instream	3370.	42°35'22"	114°21'39"	617.3
IS10N	Snake River below Shoshone Falls	Instream	3150.	42°35'50"	114°24'13"	614.6
IS13S	Snake River at Blue Lakes Bridge	Instream	3140.	42°36'24"	114°28'32"	610.5
IS19S	Snake River below Warm Creek	Instream	3100.	42°37'41"	114°31'00"	607.6
IS31S	Snake River at Clear Lakes Bridge	Instream	2970.	42°40'14"	114°45'32"	594.6
IS44M	Snake River at Gridley Bridge -- Grab Samples	Instream	2875.	42°45'24"	114°52'29"	583.0

Continued

Site Code	Description	Type	Elevation	Latitude	Longitude	River Mile
IS44MDI	Snake River at Gridley Bridge -- Depth Integrated Sampling	Instream	2875.	42°45'24"	114°52'29"	583.0
IS45S	Snake River below Upper Salmon Falls Power Plant	Instream	2810.	42°46'04"	114°55'25"	579.6
IS47N	Snake River below Lower Salmon Falls Power Plant	Instream	2800.	42°50'29"	114°54'11"	573.0
IS51N	Snake River below Bliss Dam	Instream	2655.	42°54'50"	115°04'12"	559.9
IS52S	Snake River at King Hill Bridge	Instream	2525.	43°00'06"	115°12'27"	545.2
IS53N	Snake River at Bliss Bridge	Instream	2675.	42°54'56"	114°57'55"	565.6
TS06N	Vineyard Lake	Tributary	3530.	42°35'15"	114°21'14"	617.7
TS09NE	Devils Corral Springs -- East Leg	Tributary	3400.	42°35'40"	114°21'54"	616.7
TS09NW	Devils Corral Springs -- West Leg	Tributary	3400.	42°36'00"	114°22'33"	616.0
TS18N	Warm Creek	Tributary	3100.	42°37'33"	114°30'25"	608.1
TS19.5S	Rock Creek at Poleline Road	Tributary	--	--	--	--
TS27S	Southside Cedar Draw Creek	Tributary	2990.	42°39'24"	114°39'53"	599.1
TS32N	Clear Lakes Outlet	Tributary	2970.	42°40'05"	114°46'44"	593.5
TS33S	Southside Mud Creek	Tributary	2980.	42°39'34"	114°47'15"	592.2
TS34S	Southside Deep Creek	Tributary	2910.	42°39'29"	114°48'33"	592.0
TS37N	Banbury Springs	Tributary	2875.	42°41'31"	114°49'21"	589.2
TS40N	Blind Canyon Creek	Tributary	2920.	42°42'16"	114°49'09"	588.4
TS41S	Salmon Falls Creek	Tributary	2890.	42°42'39"	114°51'16"	586.7
TS43N	Riley Creek	Tributary	2945.	42°45'49"	114°51'46"	583.1
TS50N	Malad River	Tributary	2760.	42°51'47"	114°54'07"	571.4

Trout Hatchery (FH15N), Crystal Springs Hatchery (FH25N), Magic Valley Fish Hatchery (FH26S), Rim View Hatchery (FH28N), Idaho Fish Breeders (FH35S), Box Canyon Hatchery (FH38S), Buckeye Fish Farm (FH46N), White Springs Fish Hatchery (FH48N), and Birch Creek Fish Farm (FH49N). These stations were sampled on a weekly basis. On odd weeks the station visits were spread over Monday, Tuesday, and Wednesday. On the even weeks all sites were sampled on Mondays. Detailed information for each site is included in Appendix A.

### Main Stem Instream Flows

The instream station network originally consisted of twelve (12) locations along the Snake River. The locations are Snake River at Murtaugh Bridge (IS01N), Snake River

above Twin Falls pool (IS05N), Snake River at Twin Falls Power Plant tailrace (IS08S), Snake River at Shoshone Falls Power Plant tailrace (IS10N), Snake River at Blue Lakes Bridge (IS13S), Snake River at Warm Springs Creek Bridge (IS19S), Snake River at Clear Lakes Bridge (IS31S), Snake River at Gridley Bridge (IS44M), Snake River at Upper Salmon Falls Power Plant tailrace (IS45S), Snake River at Lower Salmon Falls Power Plant tailrace (IS47N), Snake River at Bliss Power Plant tailrace (IS51N), and the Snake River at King Hill Bridge (IS52S). These stations were sampled biweekly, and, due to the parameter package and laboratory receiving requirements, they were sampled only on Tuesday or Wednesday of the even weeks. An additional main stem station was added August 15, 1991 located at the Bliss Bridge (IS53N). Detailed site information is in Appendix A.

### **Irrigation Return Flows**

The irrigation return flow network consists of 19 monitoring stations along the reach. The return flows monitored are Northside A drain (IR02N), Southside A drain (IR03S), Northside C55 drain (IR04N), Twin Falls Coulee (IR07S), East Perrine Coulee (IR11S), Main Perrine Coulee (IR12S), West Perrine Coulee (IR16S), Southside N43 drain (IR17S), Southside 30 drain (IR20S), Pigeon Cove Hydroplant/LQ-LS Drain (IR21S), Southside LS2 Drain (IR22S), Northside N42 Drain (IR23N), Southside 39A Drain (IR24S), Southside I Drain (IR29S), Northside J8 Drain (IR31N), Southside N drain (IR35S), Northside S29 drain (IR36N), Northside S/S19 drain (IR39N), and Northside W26 drain (IR42N). The return flow stations were sampled on a biweekly basis on odd weeks. Flow information for these stations typically involves a current meter measurement and development of a head versus discharge relationship. Additional location information for these stations is included in Appendix A.

### Tributary Stream Flows

The tributary stream network originally involved 12 streams and springs along the Snake River. The streams/springs were Vinyard Creek (TS06N), Devils Corral Springs (TS09NE and TS09NW), Warm Creek (TS18N), Cedar Draw (TS27S), Clear Lakes (TS32N), Mud Creek (TS33S), Deep Creek (TS34S), Banbury Springs (TS37N), Blind Canyon (TS40N), Salmon Falls Creek (TS41S), Riley Creek (TS43N), and Malad River (TS50N). These stations were visited and sampled on a biweekly basis except for Devils Corral, Warm Creek, Riley Creek, and Banbury Springs which were be sampled periodically as time permitted. Some of the stations were sampled on odd weeks while the others were sampled on even weeks. Additional site information is included in Appendix A. Due to the termination of the RCWP Rock Creek Project, an additional station was added, Rock Creek at Poleline Road (TS19.5S).

### Water Quality Parameters

The water quality parameter package for each concurrent monitoring station was selected based on the type and source of the discharge entering the river at that station. For the aquacultural stations, fish hatcheries, and farms, the basic package consisted of:

#### Field Data

- |                             |                        |
|-----------------------------|------------------------|
| a. Discharge,               | (cfs)                  |
| b. Air Temperature,         | (° Celsius)            |
| c. Water Temperature,       | (° Celsius)            |
| d. Electrical Conductivity, | (µmho/cm)              |
| e. Dissolved Oxygen,        | (mg/l O <sub>2</sub> ) |
| f. pH.                      |                        |

#### Laboratory Samples

- |  |          |
|--|----------|
| 1. Total Suspended Solids (TSS),                                     | (mg/l)   |
| 2. Turbidity,  | (NTU)    |
| 3. Total Kjeldahl Nitrogen (TKN),                                    | (mg/l-N) |
| 4. Nitrite and Nitrate Nitrogen (NO <sub>2</sub> +NO <sub>3</sub> ), | (mg/l-N) |
| 5. Ammonia Nitrogen (NH <sub>3</sub> ),                              | (mg/l-N) |
| 6. Total Phosphorus,   | (mg/l-P) |
| 7. Ortho Phosphate.  | (mg/l-P) |

This basic set of parameters was also used in the other station packages with some additions. The irrigation return flow and tributary stations had field data sets identical

to aquacultural stations with additional laboratory analyses. For these stations the laboratory sample package was increased from the fish hatchery package to include bacteria samples:

- Additional Laboratory Samples
- 8. Fecal Coliform bacteria, (colonies/100 ml)
  - 9. Fecal Strep bacteria. (colonies/100 ml)

The instream stations parameter package consists of the previously mentioned parameters plus:

- Additional Field Data
- g. Transparency, Secchi Disk. (feet)
- Additional Laboratory Samples
- 10. Five day Biological Oxygen Demand (BOD5), (mg/l)
  - 11. Chlorophyll A. (µg/l)

Discharges for the irrigation return flow stations were determined by current meter and rating curves for selected stations. Tributary inflow was determined from existing USGS discharge stations or rating curves established from USGS or other agency data. Fish hatchery discharges were measured through company water measuring devices or USGS gaging stations. The discharge for the main stem instream stations was estimated from the nearest USGS gaging station with appropriate estimates of reach gains where necessary.

## **Methods**

The concurrent water quality data were collected using standard methods and procedures. Field data were collected using portable electronic instruments. The instruments were calibrated to a stock solution(s) each morning prior to sampling. The stock solutions were taken with the instruments into the field which allowed re-calibration of the instruments in the field if the observed reading appeared in error. The electrical conductivity was measured with a Hanna Model 0661-30 DiST 3 ATC Dissolved Solids Tester. This instrument has a range of 10 - 1990 µmhos with an accuracy of ±30 µmhos. The field pH was measured using a Hanna Model 0624-00

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pHep - pH electronic paper dip stick. The pHep stick has a pH range of 0.0 to 14.0 with a resolution of 0.1 and an accuracy of  $\pm 0.2$  pH. The pH pen was calibrated to a pH 7 buffer solution each morning and checked against pH 4 and 10 buffers after calibration. The dissolved oxygen was measured with a Hanna Model HI8543 Dissolved Oxygen Wand. The wand has a range of 0.0 to 19.9 ppm O<sub>2</sub> with a resolution of 0.1 ppm and an accuracy of  $\pm 0.2$  ppm. The wands were calibrated each morning using a zero oxygen solution and air calibration according to manufacturers' specifications. Air and water temperatures were obtained using glass precision thermometers with 0.5°C divisions during the beginning of the project and then with metal thermometer probes with an accuracy of  $\pm 0.2$ °C. The water quality sampling supplies consisted of 1 liter plastic cubiconainers, 15 ml tissue culture vials, 30 ml and 60 ml plastic syringes, 25 and 47 mm filter holders and filters, and 60 mm plastic petri dishes. Discharge measurements utilizing current metering procedures were made with Ott current meters and standard metering methods (USGS, 1982).

### **Water Quality Sampling Procedures**

The following procedures were used in collecting the water quality samples from the stations. Upon arrival at each station, all sampling tools, collectors, buckets, and splitting churn (bucket, lid, churn, and valve) were triple rinsed with water from the station downstream of a sampling point. After rinsing the tools, water was collected from the various sampling point(s) associated with the station. A minimum of 3 gallons to a maximum of 5.5 gallons of solution was obtained and placed in a churn splitter.

The following event sequence was performed by the sampling personnel:

- | Event | Description:   |
|-------|--|
| 1.    | Arrive at station, collect forms, sample containers, and tools.  |
| 2.    | Determine/Estimate collection amounts for compositing based on discharge. Total collection volume must exceed 3 gallons. |
| 3.    | Triple rinse all collection tools in typical effluent stream downstream of sampling site.                                |
| 4.    | Collect sample volume and place in churn.  |
| 5.    | Quickly churn sample and extract 1 to 2 liters for field parameters, i.e.  |

6. Temperature, pH, EC, DO.
7. Churn sample and extract 250 ml Fecal Bacteria sample (Orange).
8. Churn sample and extract Ortho Phosphate syringe volume ( 20ml ).  
First 5ml of filtrate for rinse of vial and lid.
9. Record field parameters on field data sheet.
10. Churn sample and extract 1 liter TSS and Turbidity sample (Blue).
11. Churn sample and extract 1 liter Nitrogen Series and Total P. sample (Yellow).
12. Churn sample and extract 1 liter BOD 5 Day sample (Red).
13. Churn sample and extract syringe volumes for Chlorophyll A samples.  
Minimum of 250 ml, record filtered volume on data sheets and petri dish label (Green). Wrap in tin foil.
14. Record all sample container numbers on data forms, place containers on ice and finish filling out data sheets.
15. Collect flow data, staff gage or stage readings/sticking weirs/current metering.
16. Collect equipment and make entry in log book.

The procedure for Chlorophyll-A samples was changed during the winter season. Due to water freezing in the syringes and filter holders and the need to filter quantities in excess of 500 ml, one liter samples were obtained and transported to the research station. Upon arrival at the station the samples were then filtered. This procedure remained the same for the rest of the project.

Each of the sample containers was identified with a prenumbered mailing label. One cubcontainer was collected for TSS and turbidity and identified with a blue color dot. The nitrogen series and total phosphorous cubcontainer was identified with a yellow color dot and was pretreated with 2 ml of sulfuric acid,  $H_2SO_4$ . The ortho phosphate sample was collected in the 15 ml tissue culture vial. The bacteria samples were collected in pre-treated 250 or 500 ml bottles supplied by IDHW Bureau of Laboratories and identified with an orange color dot. The instream stations had two additional samples collected,  $BOD_5$  and Chlorophyll-A. The  $BOD_5$  samples were collected in a 1 liter cubcontainer with a red color dot. The chlorophyll-A sample filters were placed in the 60 mm petri dish and wrapped aluminum foil. They were identified with green color dots on the pre-numbered labels.

### **Sample Handling and Laboratory Analysis**

After collection, the samples were placed on ice in field coolers. Upon arrival

back at the Research Center, the samples were checked in and transferred to shipping coolers packed with ice. A local delivery firm was used to ship the coolers to the IDHW Water Quality Laboratories in Boise and Pocatello. The Boise laboratory performed all the chemical analyses while the Pocatello laboratory performed all the bacteria analyses. The laboratory analysis code and the minimum detection level of the analysis are shown in Table 2. The minimum detection limit of Chlorophyll A was dependent on sample volume. For a 1 liter sample it was 0.4  $\mu\text{g}/\text{l}$ , and for a 250 ml sample it was 1.6  $\text{mg}/\text{l}$ . The sample volume ranged from 250 ml to 1 liter in the study.

Table 2. Laboratory Water Quality Analyses

<u>Analysis</u>	<u>STORET Analysis Code</u>	<u>Minimum Detection Limit</u>	
Total Suspended Solids	00530	2.0	mg/l
Turbidity	00076	0.1	NTU
Ammonia Nitrogen	00610	0.005	mg-N/l
Nitrite+Nitrate Nitrogen	00630	0.005	mg-N/l
Kjeldahl Nitrogen	00625	0.05	mg-N/l
Total Phosphorus	00665	0.05	mg-P/l
Ortho Phosphate	70507	0.005	mg-P/l
BOD <sub>5</sub>	00310		
Chlorophyll-A	32211	0.4 $\mu\text{g}/\text{l}$	$\mu\text{g}/\text{l}$
Fecal Coliform Bacteria	31616		
Fecal Strep Bacteria	31679		

### Data Analysis Procedures

Field data, sample containers numbers, and comments recorded on the field sheets and log books were entered into the relational database at the end of the sampling for the week. Discharge rating curves for irrigation return flow streams and some tributaries were developed by using standard USGS techniques. Staff gages were installed and a series of discharge measurements made at different staff gage elevations to develop an initial relationship between stage and discharge. These relationships were defined mathematically by least squares fit polynomial equations. Subsequent discharge



measurements were used to shift the rating curve where necessary. The discharge rating curve was used when current-meter measurements could not be made at specific sites. Discharge was determined from USGS developed rating curves for Mud Creek and Deep Creek, and the discharge from operating USGS gaging stations was used for Cedar Draw, Rock Creek, and Salmon Falls Creek.

Water quality analysis data received from the reporting laboratory was entered into the relational database immediately after receipt of the report from the lab. In addition to several scans by project personnel for keyboard errors, the data in the relational database was examined using Chauvenet's outlier procedure (Kennedy, 1976) for identifying unusual data for each sampling station. The resulting list of data points was again reviewed with the laboratory reports and field sheets and rejected or retained. Outlying data points still remaining were not used in loading analyses but were not removed from the database. In the parameter loading analysis, concentration data below minimum detection limits was replaced with one half the detection limit. This method preserves the information that the parameter was less than a known value and is the most common method according to Spooner (1991). For trend analyses, censoring intensities greater than twenty percent, half the detection limit method will bias the mean downward and the variance upwards. In loading analyses, the computed loads would likewise be biased. Table 3 shows the censoring intensities of the constituents used in the loading computations for the various station types. Total suspended solids, nitrate+nitrite, and total phosphorus had the highest overall number of samples below the minimum detection limit of 4.0, 4.1 and 10.5 percent of the samples respectively. Only one parameter at one type of station exceeded twenty percent censoring intensity, 23.4 percent of the total phosphorus samples taken at tributary stations were below minimum detection limits.

Table 3. Below Detection Limit Sample Intensities as Percent of Samples.

Constituent	Aquaculture Effluents	Irrigation Return Flows	Tributary Streams	Instream Stations	Totals
Total Suspended Solids	6.3	0.9	2.5	6.3	4.0
Nitrogen as Ammonia	0.4	7.1	3.0	5.8	3.6
Nitrite+Nitrate	4.7	9.1	0.0	0.4	4.1
Total Kjeldahl Nitrogen	0.2	0.2	0.3	4.3	0.9
Total Phosphorus	8.2	5.7	10.6	23.4	10.5
Ortho Phosphate	0.5	0.9	0.5	0.0	0.6

### Quality Control and Assurance

Quality control and assurance (QC/QA) procedures were set up by DEQ and the University to provide an assessment of the quality of the data collected and field and laboratory procedures used to obtain the data in addition to meet current EPA requirements. One main stem station, one fish hatchery, one irrigation return flow site, and one tributary site were selected for QC/QA determinations providing approximately 20 percent of the samples for QC/QA as recommended by Bauer, Clark, and Dodds (1986). The procedure included, duplicates, blanks, and spikes at the selected stations. All laboratory parameters were duplicated and blank samples submitted for these stations. The parameters for which spiked samples were submitted are Total Suspended Solids (TSS), Ammonia (NH<sub>3</sub>-N), Nitrite+Nitrate (NO<sub>2</sub>+NO<sub>3</sub>), Organic Nitrogen (TKN), Total Phosphorous, and Ortho Phosphate.

The QC/QA stations were the Snake River below Twin Falls (IS08S), an instream station; the Main Perrine Coulee (IR12S), an irrigation return flow station; Salmon Falls Creek (TS41S), a tributary stream station, and White Springs Fish Hatchery (FH48N). Initial quality control consisted of duplicate samples which started when sampling was initiated in late June. Blank samples at these stations were initiated during the third and fourth week of sampling. The spiking portion of the QC/QA program was delayed until spiking material from the IDHW laboratory was received. The spiking material was

received by the University in the third week of August or the eighth week of sampling.

The QC/QA sampling required additional field procedures. For these stations the sample collection procedures were as follows:

1. Obtain the sample solution from the stream station according to compositing instructions for the station.
2. Churn the solution in the splitter and extract the fecal bacteria samples, standard and duplicate, for those stations which include bacteria samples.
3. Obtain the remaining field parameters.
4. Churn the solution in the splitter and extract the following TSS and turbidity samples while churning in the following order:
  - A) The standard TSS/Turbidity sample.
  - B) 900 ml of solution and carefully transfer to the Suspended Sediment Spiking cubicontainer.
  - C) The duplicate TSS/Turbidity sample.
5. Churn the solution in the splitter and extract the following nitrogen samples while churning.
  - A) The standard N series sample.
  - B) 900 ml of solution for the Spiked Ammonia sample container and carefully transfer to the container.
  - C) The duplicate N series sample.
  - D) 900 ml of solution for the Spiked NO<sub>2</sub>+NO<sub>3</sub>/TKN/TP sample and carefully transfer to the container.
6. Churn the solution in the splitter and extract the following Ortho Phosphate samples while churning.
  - A) The standard P sample.
  - B) 900 ml of solution for the Spiked O-Phosphate sample and carefully transfer to the container.
  - C) The duplicate P sample.
7. Churn the solution and extract the standard and duplicate samples while churning for:
  - A) BOD, if needed
  - B) Chlorophyll-A, if needed.
8. Process the blank samples.
9. Inside the vehicle, transfer the contents of the spiking vials to the appropriate cubicontainer. Mark the vial number on the container, i.e remove tape, place on container and report form. Drop the vial in the container:
  - A) Suspended Sediment Vial: Remove cubicontainer cap, then vial cap, drop vial lid in container, drop vial into container, close cubicontainer.
  - B) NO<sub>2</sub>+NO<sub>3</sub>/TKN/TP Vial (74): Remove cubicontainer cap, using gloves break the 74 vial at the gold line, transfer contents of vial into container, drop vial into cubicontainer, close cubicontainer.
  - C) O-Phosphate (72): Remove cubicontainer cap, break the 72 vial at gold line with gloved hand, transfer contents of vial into cubicontainer, drop vial into cubicontainer, close cubicontainer. Mix contents of container by shaking for two to five minutes. Open container and extract filtering solution, filter standard amount into sample vial. Mark sample vial.
  - D) Ammonia (73): Remove cubicontainer cap, break the 73 vial at gold line, transfer contents, drop vial into container, close container. Quickly place container into cooler with ice.

## **HISTORICAL DATA**

The historical water quality data for the middle Snake River reach was obtained from several sources. The primary source of historical data was from the two national water information databases, STORET and WATSTORE, which contain water quality data. Additional data were obtained from the University of Idaho Kimberly Research and Extension Center archives for the LQ Drain demonstration project and the Rock Creek Rural Clean Water Project. Additional water quality data on irrigation return flows collected by personnel at the USDA-ARS facility at Kimberly exists; however, it was not available for inclusion into the historical data set.

### **National Water Quality Databases**

The two national water quality databases, WATSTORE and STORET, were searched for sites along the reach that had water quality data for any of the parameters used in the concurrent water quality sampling. The search also limited the sites to surface waters and to sites located on or near the mouth of tributaries and/or irrigation return flows entering the reach. Data for several of the sites along the river were duplicated in the two systems. Based on discussions with personnel at the USGS and IDHW/DEQ agencies, only the data found in the WATSTORE system was included in the historical database when duplication was present.

### **WATSTORE Water Quality Database**

The WATSTORE data system is maintained by the USGS and includes water resources data from throughout the United States. The system contains primarily data collected by USGS at their water resource stations. Only the Idaho database was explored. The station search was limited to those parameters previously mentioned and a polygon surrounding the middle Snake River Reach. Additionally, the station search was

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limited to stations with water quality data for water years 1970 to present. The search resulted in 94 stations along the reach with information. These stations are listed in Appendix B.

### **STORET Water Quality Database**

The STORET water quality information system is maintained by the USEPA for data relating to the quality of surface and ground water in America's waterways. Observations are available for all 50 states, the U.S. Territories and portions of Canada. The system serves as a data repository for most of the federal agencies, state agencies, and others involved with water quality monitoring and analysis. The database was searched in a similar method to that used with the WATSTORE system. The search resulted in an additional 71 stations being included in the historical database and are listed in Appendix B. The stations with retired data residing on the STORET system were not accessed during the station searches.

### **University of Idaho Data**

Applicable archived data collected by the University of Idaho Kimberly Research and Extension Center for the LQ drain demonstration project, 1976 through 1980, was included in the historical data set. Additionally, the total suspended sediment data collected at the LQ drain during 1980 was included the historical data set. The LQ and LS drains now are combined into a single return flow by the Pigeon Cove hydropower plant, station IR21S.

## **WATER QUALITY DATABASES**

The water quality data from samples collected during this project were initially kept in a separate database. Upon completion of the data quality checking and review the data were transferred into the historical database.

The relational historical database implemented in R:Base 3.1 consists of several

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tables to eliminate redundant data and save disk space. Table 4 contains a description of each data table in the database, and Table 5 contains a listing and description of all the data fields in the database. Figure 4 depicts the relational database and the various table linkages. The AGENCY table contains four fields which allow characterization of agency information pertaining to the data included in the historical database. The AGCODE field typically is the agency identification code used in the STORET system and uniquely identifies data collected by that agency by a text string up to 15 characters in length. The AGNAME field is the common name of the agency collecting the data; while, the CONTACT field contains information on who and how to contact for questions regarding the agency's data. The last field, AGNOTES, is a note field which contains comments and remarks generated in the compilation process of the historical data. They will contain multiple entries for an agency with different divisions/offices collecting and storing data.

The AGSITES table contains agency/organization information for each of the water quality sampling stations found in the historical database. The AGCODE field relates this information back to the AGENCY table. The AGSITEID field is the sampling station identification used by the collection agency in storing and/or reporting the sites water quality data. The last field, AGREMARK, contains agency comments and remarks for the site deemed important in the compilation process.

The SITEINFO table contains static information regarding water quality sampling stations with data included in the historical database. It consists of 25 fields of information. The first field, SITECODE, is an internal identification code for a water quality station in the database. The SITENAME field contains the customary name associated with the sampling site. It was derived from the various agency names associated with the site. The next eight fields; LATDEG, LATMIN, LATSEC, LATSITE, LONDEG, LONMIN, LONSEC, and LONSITE, describe the physical location of the site in terms of latitude

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Table 4. Historical Database Table Descriptions

<u>Table</u>	<u>Description</u>
Agency	Agency Information and contacts
Agsites	Agency Sampling Site Information
Observed	Reported Parameter Value and qualifiers for a sampling visit.
ParmInfo	Parameter Information
SamplInfo	Type of Sampling Description and Codes associated with a sampling visit
Sampling	Site Sampling Visit Information
SiteInfo	Historical Database Site Description Information
Quality	Reported Parameter Value Qualification Codes and Descriptions

Table 5. Historical Database Column/Field Descriptions

<u>Column</u>	<u>Description</u>	<u>Data Type</u>
AgDesc	Agency Site Description	TEXT 56
AgName	Agency Name	TEXT 56
AgNotes	Compilation comments associated with an Agency.	NOTE
AgRemark	Compilation and Agency notes associated with site	NOTE
AgSiteID	Agency Site Identification	TEXT 15
DQCode	Reported Data Qualification Code	Text 1
DQDesc	Reported Data Qualification Description	TEXT 56
EDate	Ending Date associated with composites	DATE
ETime	Ending Time associated with composites	TIME
LatSite	Site Latitude	REAL
LonSite	Site Longitude	REAL
ObsValue	Observed/Reported Parameter Value	REAL
ObsNotes	Sample Visit Observation Notes/Comments	NOTE
ParmCode	Parameter Identification Code	INTEGER
ParmDesc	Parameter Description	TEXT 56
ParmUnit	Parameter Units	TEXT 6
RivMile	Snake River Mile associated with site	Real
SDate	Sampling Date, Start if Time Composite	DATE
SiteCode	Historical Database Site Identification	Text 8
SiteName	Descriptive Name associated with site	Text 56
SiteNote	Historical Data compilation notes	NOTE
SmplCode	Type of Sampling Code	TEXT 1
SmplDesc	Type of Sampling Description	TEXT 56
STime	Sampling Time, Start if Time Composite	TIME
VisitID	Internal Sampling Visit Identification	Integer
TwnLegal	Township of site legal description	TEXT 4
RngLegal	Range of site legal description	TEXT 4
SecLegal	Section Number of site legal description	INTEGER
QtrLegal	Quarter section of site legal description	TEXT 2
QQtrSec	Quarter/Quarter section of site legal description	TEXT 2
QQQtrSec	Quarter/Quarter/Quarter section of legal description	TEXT 2

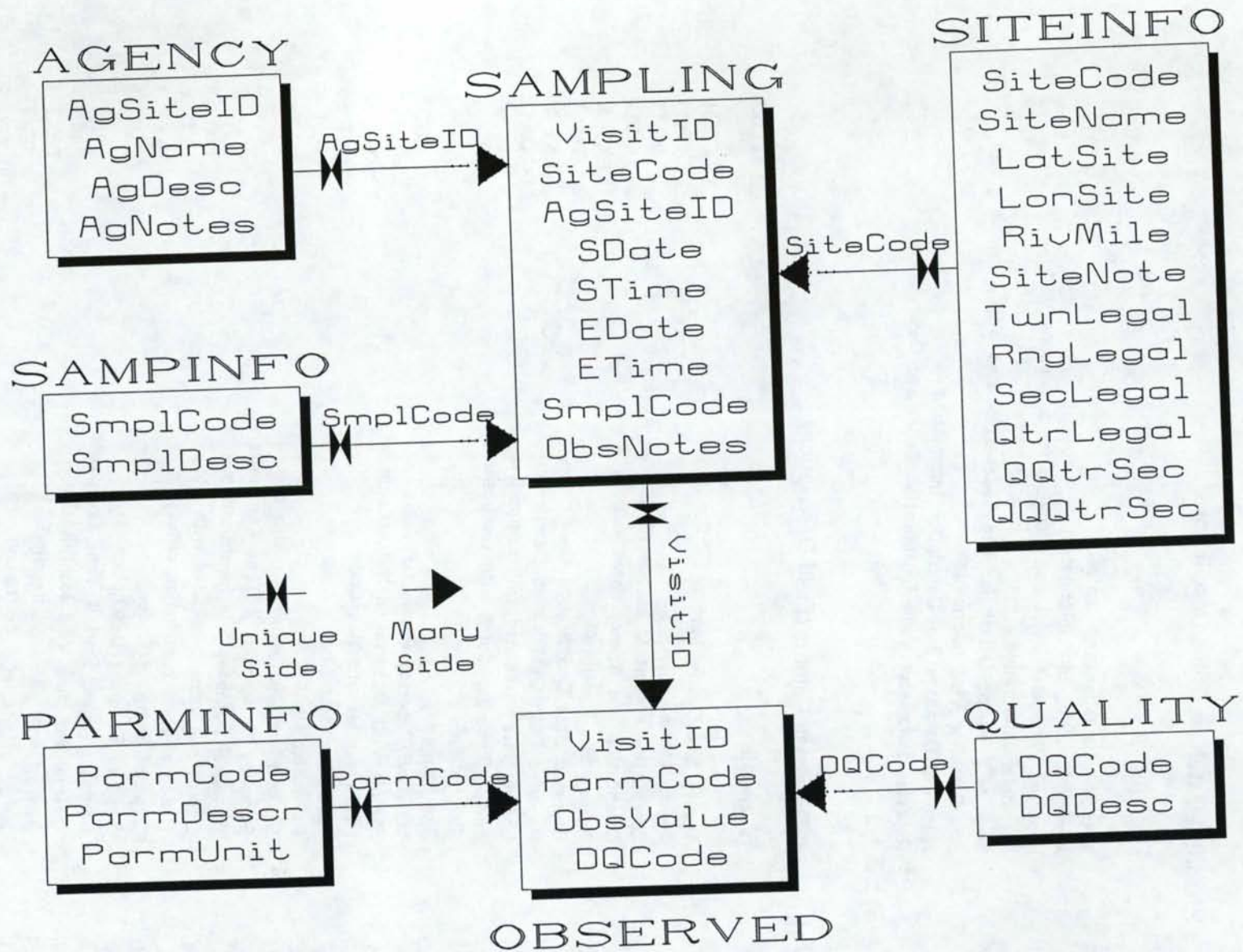


Figure 4. Historical Database Table Relationships



and longitude. The LATSITE and LONSITE are computed internally from the degrees, minutes, and seconds, and are in terms of decimal degrees. The next two fields incorporated the standard Federal Information Processing codes for the state and county of the sampling site, STATEFIP and CNTYFIP. Six fields (TWNLGL, RNLGL, SECLGL, QSEC, QQSEC, QQSEC) provide site location information in terms of the state survey. Seven additional fields were included to provide information on the site with regard to water body and river mile, type, elevation, hydrologic unit, administrative basin, and USGS quad map associated with the sampling site (RIVMILE, HUCCODE, SITETYPE, SITEELEV, SITEBASN, WTRBODY, QUADMAP).

The PARMINFO table contains information regarding the water quality parameters contained in the historical database. The table consists of three fields, PARMCODE, PARMDESC, and PARMUNIT. The parameter code is an integer parameter code which typically follows the codes defined in the WATSTORE system. The description and unit fields contains the common names of the parameters and the units associated with the data stored in the historical database.

The SAMPINFO table contains generic information on all of the various types of sampling encompassed in the historical database. It consists of two fields, SMPLCODE and SMPLDESC. The first field is a two character field identification code used in the other tables and the last field is the description of the type of sampling effort. These are intended to identify grab, integrated, composited, or quality control samples.

Two tables, SAMPLING and OBSERVED, comprised the heart of the historical database. The first table contains the information with regard to a sampling visit to a water quality site and contains ten fields. (VISITID, SITECODE, AGCODE, AGSITEID, SDATE, STIME, EDATE, ETIME, SMPLCODE, and OBSNOTES). The first field relates the information to the OBSERVED data table, while the next three fields link the sampling visit to the SITEINFO and AGSITES tables. The next four fields identify sampling time, followed by the type of

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sampling. The last field contains any comments associated with the sampling visit and are primary for University of Idaho sampling sites. The OBSERVED table contains six fields associating a sampled parameter and the resulting value with a sampling visit to a station and the resulting quality of the value and a control flag for the value.

This relational database allows for the reporting of water quality measured at a site with or without regard to the agency or organization collecting the data.

### **SEWAGE TREATMENT PLANTS**

Nutrient loadings from the two sewage treatment plants which discharge into the Middle Snake River reach were to be determined from data collected by the treatment plant operators. It was assumed, erroneously, that discharge, phosphorus, and nitrogen had been measured with a reasonable frequency over the study period to allow computation of loads entering the river. That data is not available and estimates of loads from these sources is not possible.

### **SPECIAL SAMPLING EFFORTS**

Two special sampling efforts were undertaken during the collection of the concurrent water quality data. One effort involved the collection of vertically integrated water quality samples at the Gridley Bridge instream station. The procedure involved lowering a submersible pump to the stream bottom while collecting the effluent from a hose attached to the pump. Results from these vertically integrated samples were compared with surface grab samples at the same sites.

The other sampling effort involved the collection of samples from an irrigation return flow stream prior to the canyon edge and after the return flow re-emerges from the talus on the canyon floor.

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## IRRIGATION RETURN FLOWS

### Watershed Characterization

The major physical characteristics of irrigation return flow stream watersheds entering the river were catalogued in an effort to determine estimate nutrient and suspended solids contributions from the unmeasured return flow streams. Characteristics of each return flow stream included discharge, discharge water quality, land use, and physical characteristics of a defined drainage area. Discharge and water quality data were readily available only for those drains that were monitored in this study. No concurrent data were available for those that were not monitored. Relationships among physical variables and measured nutrient or suspended solids loads for the monitored return flow watersheds were evaluated to develop estimates of loadings from unmeasured watersheds.

The first step in the analysis was the identification of drainage areas for both the monitored and unmeasured irrigation drains. It was not possible to define explicit drainage areas for return flow streams because of the interference of laterals and man-made channels within normal watershed boundaries. Contributions to flow seldom occurs from natural drainage areas indicated by topography. Land use obstacles to a clear definition of drainage areas include:

- 1) Canal system networking: flows are highly regulated by man and delivery channels cross natural watersheds. The canal system is really a dynamic network because changes in water management are always being made.
  - 2) Irrigation return flows to drains: Surface return flows drain back into canals throughout the systems so that drainage water is mixed with delivery water near the head of the watersheds and throughout.
  - 3) Man made obstacles: Canals, roads, railways, houses, and other obstacles interfere with natural drainage. Even though these features could be
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identified, the resulting drainage patterns could not be determined with certainty.

- 4) On farm practices: Land leveling and other activities may affect drainage patterns.

Using USGS topographic maps, recent (1986, 87, and 88) aerial photographs, and Twin Falls and North Side canal system maps, all drainage areas associated with irrigation return flows that appeared to discharge into the Snake River were identified. The 19 monitored drains, 11 on the south side of the river and seven on the north side, are described in Table 1 and in Appendix A. There were 11 unmeasured drains defined, 10 on the north and 1 on the south. These watersheds included only those which were topographically tributary to the Snake River and not to tributaries such as Cedar Draw and Mud Creek. The upper limit of each identified area generally corresponded to the point at which the primary drainage channel became indistinguishable from other channels. For the North Side Canal system, this was generally at a major network distribution point and for the Twin Falls Canal system it was generally the Low Line Canal.

Physical characteristics of the areas were estimated from the USGS maps, Soil Conservation Service soil survey maps, and personal knowledge. Specifically, characteristics identified and estimated were:

- 1) Overall length of the main drainage channel: This value includes channel sinuosity
  - 2) Elevation extremes of the main drainage channel: These extremes are also generally representative of the drainage elevation extremes
  - 3) Overall slope of the drainage area main drainage channel
  - 4) Total acreage of the drainage area
  - 5) Percent surface irrigated and percent sprinkler irrigated: Based on these
-

values, total percent of the area irrigated and non- irrigated were established

- 6) Number of major channels entering, or contributing significantly to the drain and conversely the number of channels diverting from the drain
- 7) Predominant soil texture and general land slope: These values were all based on SCS soil survey information

### **Drainage Area Results**

Table 6 lists the characteristics of the measured and unmeasured drainage areas in downstream order of the drain discharge location. Drainage areas are illustrated in Figure 5. The drain identification (ID) for measured drains is consistent with the ID given in Table 1. Unmeasured drains are listed with the prefix UM, 1 through 10N for the north side drains and 1S for the only identified unmeasured drain on the south side of the river.

Return flow stream IR02N, the North Side A canal drain, probably has the most well defined drainage area of the entire sample. The A Canal is relatively isolated from the rest of the Northside distribution system so nodal points and artificial control of drainage is not as significant on this stream. Although IR02N is shown as having the largest drainage area, IR39N and IR42N probably include larger topographic drainage areas but their areal definitions were arbitrarily cut off when there was no longer any possible distinction among source canals/ditches; see Figure 5.

In general, surface irrigation methods are still prevalent on the south side of the river while sprinkler irrigation is the primary method on the north side. Low total percentages of irrigated area are indicative of waste areas and/or urban zones. One explanation for the larger degree of sprinkler irrigation on the north side is the coarser grained soil types. On both sides of the river there is a general downstream trend toward sandier soils but the trend is especially apparent on the north side.

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# Middle Snake River Water Quality Survey

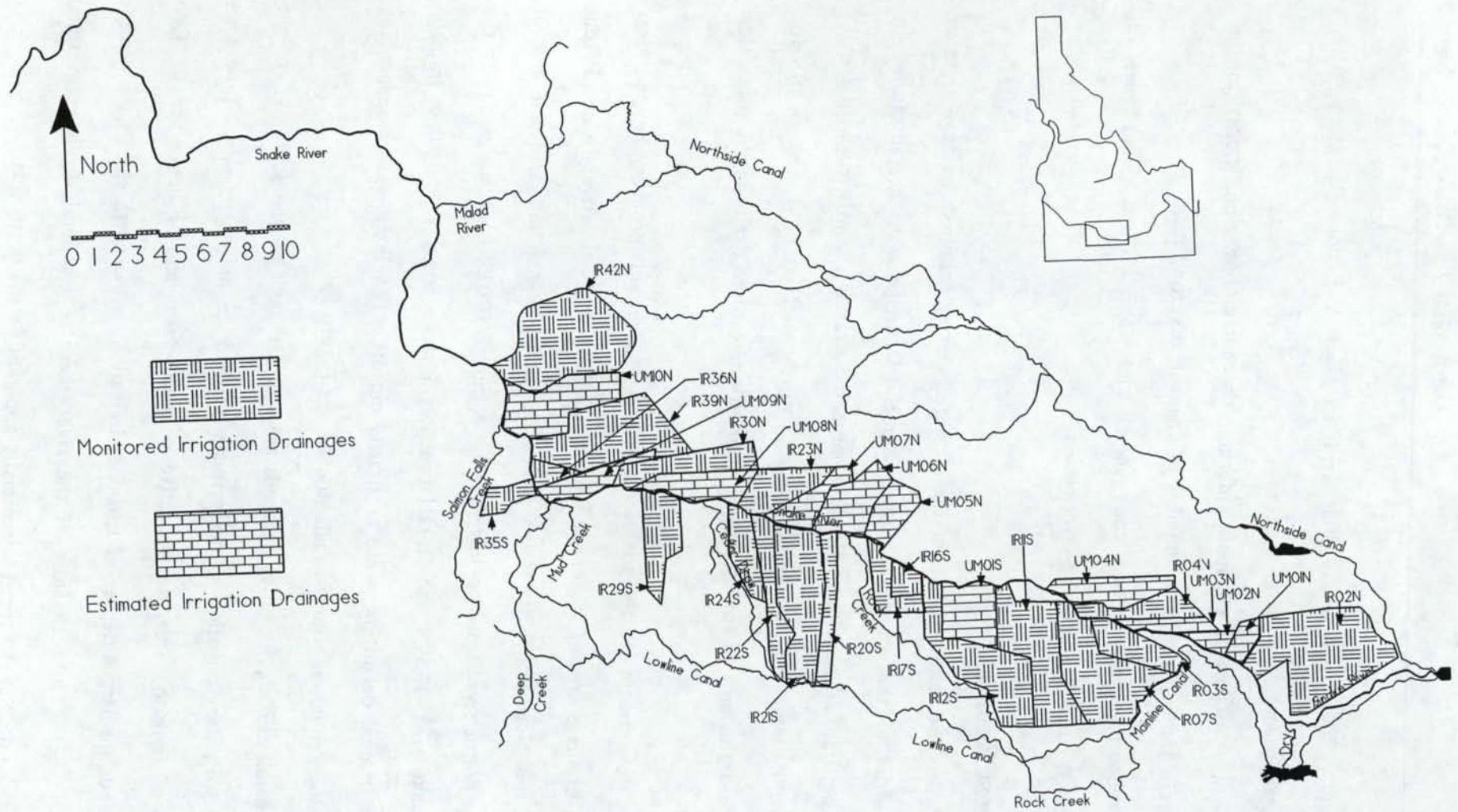


Figure 5. Irrigation return flow drainages into the Middle Snake River.

Table 6. Middle Snake River Irrigation Return Flow Drainage Areas

Drain ID	Location (river mile)	Area <sup>2</sup> (mile <sup>2</sup> )	Drain Length (mile)	Elevation		Drain Slope (ft/mi)	Irrigated Area			Land Slope %	Soil Type	Treatment
				High (ft)	Low (ft)		Surface %	Sprinkler %	Total %			
IR02N	627.6	18.8	14.205	4130	4050	5.6	20	75	95	4.0	silt loam	none
UM01N	627.3	1.1	2.273	4100	4040	26.4	25	65	90	3.0	silt loam	none
UM02N	625.0	2.5	0.947	4130	4075	58.1	25	65	90	3.0	silt loam	none
UM03N	621.7	2.0	3.788	4070	3950	31.7	20	60	80	2.5	silt loam	none
IR03S	619.5	4.1	4.924	4100	3850	50.8	60	30	90	1.0	silt loam	wetland
IR04N	618.5	3.9	4.735	4050	3840	44.4	20	60	80	5.0	silt loam	pond
IR07S	618.0	12.0	6.818	4100	3800	44.0	60	25	85	1.0	silt loam	none
UM04N	618.0	3.9	6.629	4060	3760	45.3	10	75	85	3.0	sandy loam	none
IR11S	612.7	18.8	10.417	3925	3650	26.4	60	20	80	1.0	silt loam	none
UM01S	611.8	2.3	3.788	3740	3630	29.0	20	5	25	1.0	silt loam	none
IR12S	610.9	11.9	11.364	3900	3600	26.4	40	10	50	2.0	silt loam	none
IR16S	609.2	1.9	3.030	3650	3570	26.4	60	10	70	1.0	silt loam	none
IR17S	608.6	3.4	4.167	3650	3560	21.6	50	10	60	1.0	silt loam	none
UM05N	607.6	3.1	3.788	3670	3570	26.4	10	65	75	2.5	silt loam	pond
UM06N	605.5	4.7	4.735	3670	3510	33.8	10	65	75	2.5		pond
IR20S	605.3	2.0	11.364	3900	3500	35.2	85	5	90	1.0	silt loam	none
IR21S	604.0	14.5	12.311	3900	3450	36.6	85	5	90	2.0	silt loam	none
UM07N	602.5	3.6	3.314	3610	3475	40.7	10	50	60	2.5		none
IR22S	602.1	4.5	13.258	3890	3450	33.2	75	5	80	2.0	silt loam	pond
IR23N(T)	601.2	3.6	4.356	3570	3440	29.8	10	75	85	3.5	fine sand	pond
IR24S	600.9	3.4	5.682	3650	3400	44.0	85	5	90	2.5	silt loam	none
IR29S	598.0	3.9	6.629	3450	3350	15.1	85	5	90	2.5	silt loam	none
UM08N	598.0	4.7	2.652	3450	3380	26.4	20	70	90	2.5	fine sand	none
IR30N	595.0	4.4	5.682	3430	3300	22.9	20	65	85	2.5	fine sand	wetland
IR35S	591.4	1.9	1.705	3480	3300	105.6	90	0	90	2.5	loam	none
UM09N	590.5	2.5	4.545	3270	3200	15.4	20	65	85	2.5	fine sand	none
IR36N	588.9	1.1	1.894	3210	3180	15.8	25	50	75	2.5	fine sand	none
IR39N	588.4	18.0	9.470	3350	3180	18.0	25	55	80	5.5	fine sand	none
UM10N	585.7	9.4	5.682	3300	3170	22.9	10	50	60	2.5	fine sand	none
IR42N	584.2	15.6	7.576	3380	3150	30.4	10	60	70	2.5	fine sand	none

### Regression Procedures

After the drainage areas were identified and characterized a statistical analysis was performed in an attempt to develop relationships among measured seasonal loads for each water quality parameter and the drainage area characteristics. The samples of measured loads for the 19 irrigation return flow sites were not normally distributed and all of the numerical watershed characterization indicators were not normally distributed.

Non-parametric correlation analysis (Spearman rho) was performed on the measured loads and numerical watershed indicators. From this analysis, characterization indicators were identified for inclusion in the stepwise multi-variable linear regression. The categorical variables of soil type, drain location and treatment relationships to measured loads were explored using a non-parameteric analysis of variance (Kruskal-Wallis) procedures. Again, the results of the categorical AOV were addressed in the regression procedure. An automatic stepwise procedure was first employed to produce multi-variable linear models (equations) for each of the six load types (TSS, NH<sub>3</sub>, NO<sub>3</sub>+NO<sub>2</sub>, TKN, Total P, and ortho P). The automatic procedure utilized the established parameter group and two additional categorical variables, one classifying drain location as either north or south of the river and the other describing a level of drainage treatment (none, wetland, or settling pond). The stepwise procedure identified the significant variables in decreasing order. Default conditional criteria were used for this procedure.

Based on results of the automatic stepwise procedure and analysis of the categorical variables (including soil texture), a set of three parameters were chosen to be regressed for each of the load types, thereby providing a common set of terms for each load. These parameters are: 1) drainage area, 2) percent surface irrigated, and 3) drain length.

## **MIDDLE SNAKE RIVER HYDROLOGY**

To quantify the discharge in the Middle Snake River during the current and previous three years compared to normal discharge levels, an analysis of the published USGS data for the gages in the reach was performed. Average daily flows for the gages at Milner, near Kimberly, near Buhl, at Lower Salmon Dam, and at King Hill were computed for the period 1947 through 1991 and for the period 1988 through 1991. The period of record for Milner and King Hill began in 1909; however, to compare similar periods of record, the 1947-1991 record at Buhl was selected since it is the shortest

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period of record of all USGS gages in the reach.

## **RIVER WATER QUALITY MODEL REACHES**

The river study reach was evaluated to determine subreaches for inclusion in a water quality model to be developed for the Division of Environmental Quality by the Environmental Protection Agency. Nineteen subreaches from Milner to King Hill were selected. Criteria for selection included 1) reasonably uniform hydraulic sections, 2) available discharge measuring sites, 3) reach water quality data availability, and 4) inflow water quality and discharge data. It was assumed that the model to be developed would be similar to or a modified version of the EPA QUAL2E or QUAL2EU model utilizing a completely mixed reactor concept for computation. Table 7 outlines the subreaches and specific comments on major inflows and Figure 6 shows subreach locations by number.

## **RESULTS**

### **CONCURRENT MONITORING**

#### **Data Quality Control and Assurance**

The data quality control and assurance portion of the project involved the collection of duplicate, blank and spiked samples from one site of each station type. The QC/QA site for aquaculture was the White Springs Fish Hatchery, FH48N. For irrigation return flow stations the QC/QA site was the Main Perrine Coulee, IR12S. The Snake River below Twin Falls Power Plant station, IS08S was the QC/QA station for the instream sites. QC/QA data for the tributary stations was collected at the Salmon Falls Creek station, TS41S. At each QC/QA station duplicate and blank samples were taken and submitted for all laboratory analyses. Spiked samples were collected and submitted for Total Suspended Solids and nutrient parameters. The resulting duplicated and spiked

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**Table 7. Middle Snake River Proposed Water Quality Model Reaches**

Reach Number	Name	Beginning River Mile	Discharge	Water Quality Data	Comments
1.	Milner to Murtaugh	638.7	USGS Gage	some	Southside seepage and minor ag returns on south side. No northside return flows.
2.	Murtaugh to Twin Falls Pool	630.5	Est.as Milner	yes	Southside subsurface and surface returns, north side surface return flows.
3.	Twin Falls to Kimberly Gage	618.5	Estimate	yes	Vinyard and TF Coulee measured. Both sides subsurface inflow.
4.	Kimberly gage to Shoshone Falls	617.2	USGS	no	No northside surface return, Devil's Washbowl and Dierke's Lake inflow.
5.	Shoshone Falls to Blue Lakes Bridge	614.8	Estimate	yes	No northside but major south side surface return — east and main Perrine Coulees measured, some north side GW inflow
6.	Blue Lakes to Jerome CC Bridge	610.5	Kimberly+gain	yes	Sewer plant, Warm Creek, no north side surface return, south side surface and subsurface returns.
7.	Jerome CC Bridge to Rock Creek	607.6	Estimate	yes	Northside surface returns, north side subsurface flows.
8.	Rock Creek to Crystal Springs	606.5	Estimate	no	North and south side subsurface and surface return flows, unchanging hydraulic section.
9.	Above Crystal to Boulder Rapids	601.0	Estimate	no	Niagra and Crystal springs, Cedar Draw inflow
10.	Above Boulder to Clear Lakes Bridge	597.1	USGS Buhl	some	Minimal inflow
11.	Above Clear Lakes Bridge to Kanaka	594.7	USGS Buhl	yes	Mud Creek, Deep Creek, Clear Springs
12.	Kanaka Rapids to Salmon Falls	592.0	Estimate	some	Briggs and Banberry Spring, Box Canyon, South Side irrigation return
13.	Salmon Falls Creek to Gridley Bridge	586.7	Estimate	no	Thousand Springs, Bickel Springs
14.	Gridley Bridge to Upper Salmon	582.4	Estimate	yes	Riley Creek
15.	Below Upper Salmon to Lower Salmon	580.5	Estimate	yes	Irrigation returns, Billingsley Creek
16.	Below Lower Salmon to Wiley Bridge	572.6	USGS Lower Sal.	yes	Malad River, springs
17.	Wiley/Bliss Bridge to Bliss Dam	565.7	Estimate	yes	Minimal inflow
18.	Below Bliss Dam to Dike Dam site	559.9	Estimate	yes	Minimal inflow irrigation diversions
19.	Dike Dam site to King Hill	553.8	Estimate	no	Northside canal irrigation return, Clover Creek.

# Middle Snake River Water Quality Survey

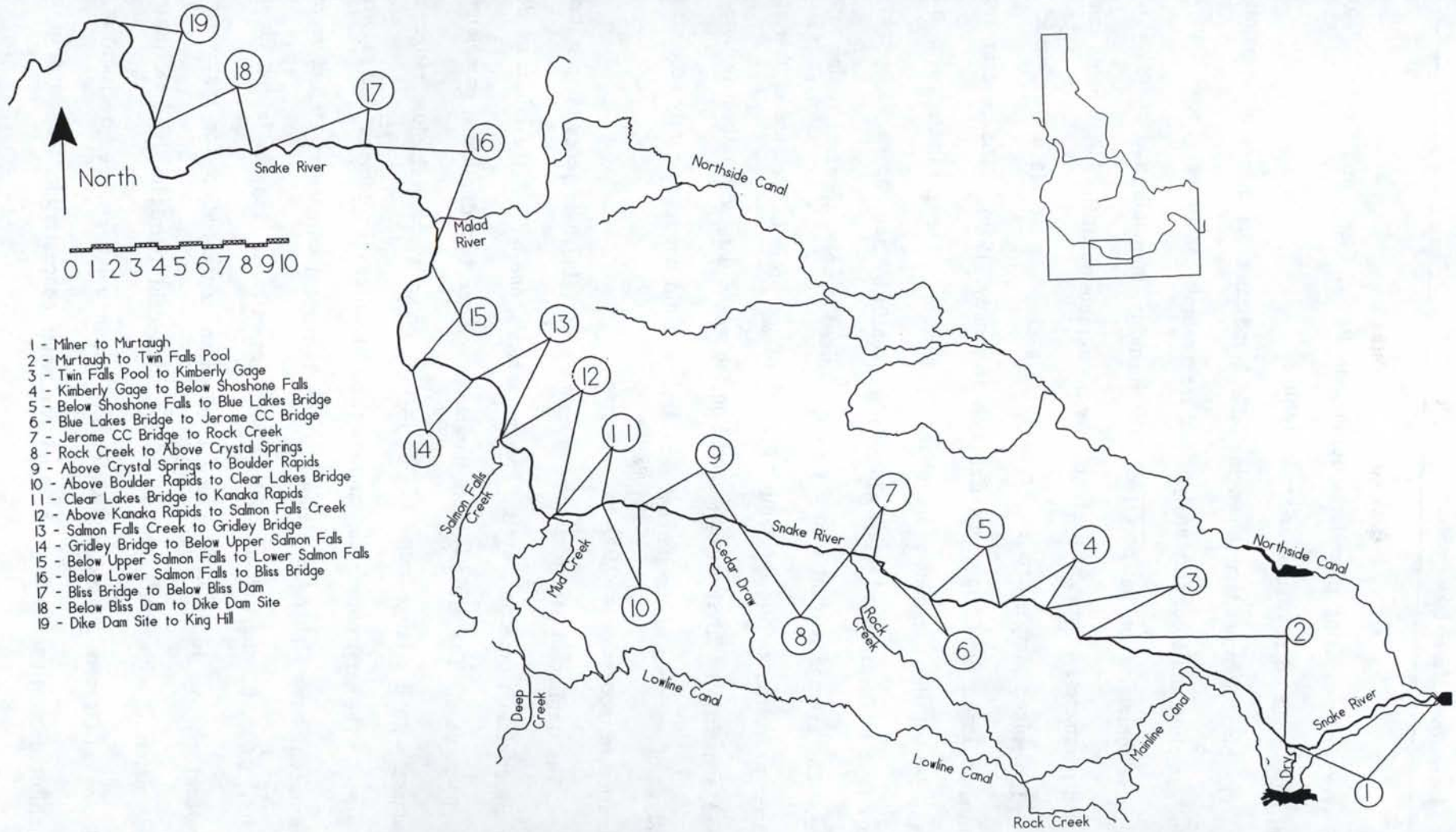


Figure 6. Location of proposed Middle Snake water quality model reaches.

data were analyzed using procedures outlined in Bauer, Clark, and Dodds (1986) and Bauer (1986). The data is summarized in Table 8.

The blank sample data shown in Table 8 indicates the degree of contamination during sampling and laboratory analysis and from sample containers. These data indicate that some contamination has occurred. The turbidity, ammonia, and biological oxygen demand parameters were most likely to have measurable quantities in the blank samples.

The spiked sample data shown in Table 8 does not include outliers which were eliminated based on Chauvenet's Criterion (Kennedy, 1976). The percent recovery means for all the parameters are above 90 percent. The parameter with the best recovery is total suspended solids which is between 91.6% and 102.6%, 95 percent of the time. The average percent recovery of the spiked samples appeared to increase from quarter to quarter during the sampling phase of the project. Because of this apparent trend, a statistical analysis was conducted on the spiked data with respect to time. In an analysis of variance of the percent recovery, time did not significantly account for the variation in recoveries ( $\alpha=0.05$ ).

The duplicated sampling summary shown in Table 8 includes samples that were below minimum detection levels. For the analysis, one half of the minimum detection level was used. The nitrite+nitrate parameter was the best duplicated parameter of the package with a relative range of 4.7 percent or an average absolute range of 0.053 mg/liter. The total phosphorus, ammonia, biological oxygen demand, and chlorophyll A parameters have high relative ranges above 25 percent with average absolute ranges of 0.037, 0.020, 0.7 mg/liter and 7.2 ug/liter, respectively. Figures 7a and 7b show the percent relative range as a function of mean concentration for the water quality parameters. With the exception of total Kjeldahl Nitrogen, Nitrite+Nitrate, 5-day Biological Oxygen Demand, and Chlorophyll A, the relative range (precision) of the data exhibit decreasing trends with mean parameter concentration. Because of the non-

Table 8. Quality Control and Assurance Sampling Results.

**Middle Snake River Water Quality Survey  
Quality Control and Assurance Sampling**

Parameter	Units	Duplicated Sampling									Blank Samples			
		Pairs	Pair Averages		Range			% Relative Range			Total Obs	Exceeding MDL		
			Mean	Std. Dev.	Mean	Std. Dev.	95% CI	Mean	Std. Dev.	95% CI		No.	%	Mean
Total Suspended Solids	mg/l	91	45	83	4.2	6.7	13.2	17.7	21.0	41.2	95	27	28.4	5
Turbidity	NTU	85	11.4	17.2	0.7	1.2	2.4	12.5	15.1	29.6	89	67	75.3	0.5
Ammonia - N	mg-N/l	91	0.137	0.119	0.020	0.024	0.048	25.9	30.5	59.9	97	56	57.7	0.038
Nitrite + Nitrate - N	mg-N/l	99	1.555	0.941	0.053	0.088	0.173	4.7	11.8	23.1	97	16	16.5	0.012
Total Organic Nitrogen - TKN-N	mg-N/l	99	0.480	0.277	0.082	0.109	0.213	18.0	19.6	38.3	97	21	21.6	0.303
Ortho Phosphate - P	mg-P/l	98	0.067	0.039	0.006	0.010	0.019	10.6	13.4	26.2	97	27	27.8	0.010
Total Phosphorus - P	mg-P/l	83	0.131	0.105	0.018	0.019	0.037	15.4	16.5	32.4	97	3	3.1	0.067
5 Day BOD	mg/l	26	2.1	0.7	0.4	0.4	0.7	21.9	21.7	42.5	25	21	84.0	1.3
Chlorophyll A	ug/l	25	8.2	7.1	2.7	3.7	7.2	39.4	35.4	69.3	25	5	20.0	0.8

Parameter	Spiked Samples			
	Obs	%Recovery		
		Mean	Std. Dev.	95% CI
Total Suspended Solids	83	97.1	2.80	5.5
Ammonia - N	85	97.1	15.08	29.6
Nitrite + Nitrate - N	86	94.0	8.58	16.8
Total Organic Nitrogen - TKN-N	86	92.2	13.94	27.3
Total Phosphorus - P	86	98.3	14.65	28.7
Ortho Phosphate - P	83	95.0	7.41	14.5

# Relative Range of Duplicated Samples Versus Mean Concentration

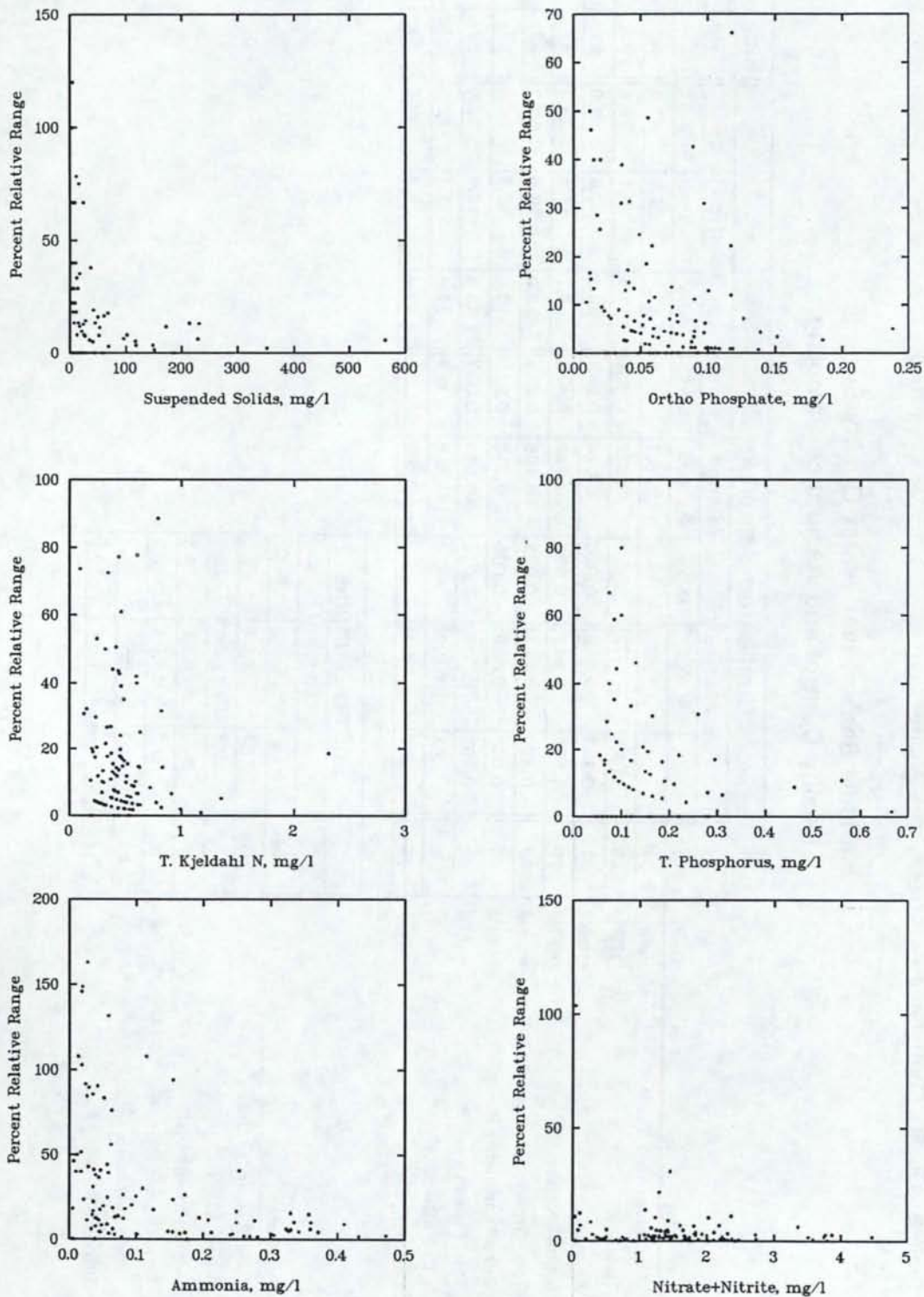


Figure 7a. Relative range of duplicated sampling versus mean concentration

# Relative Range of Duplicated Samples Versus Duplicate Mean

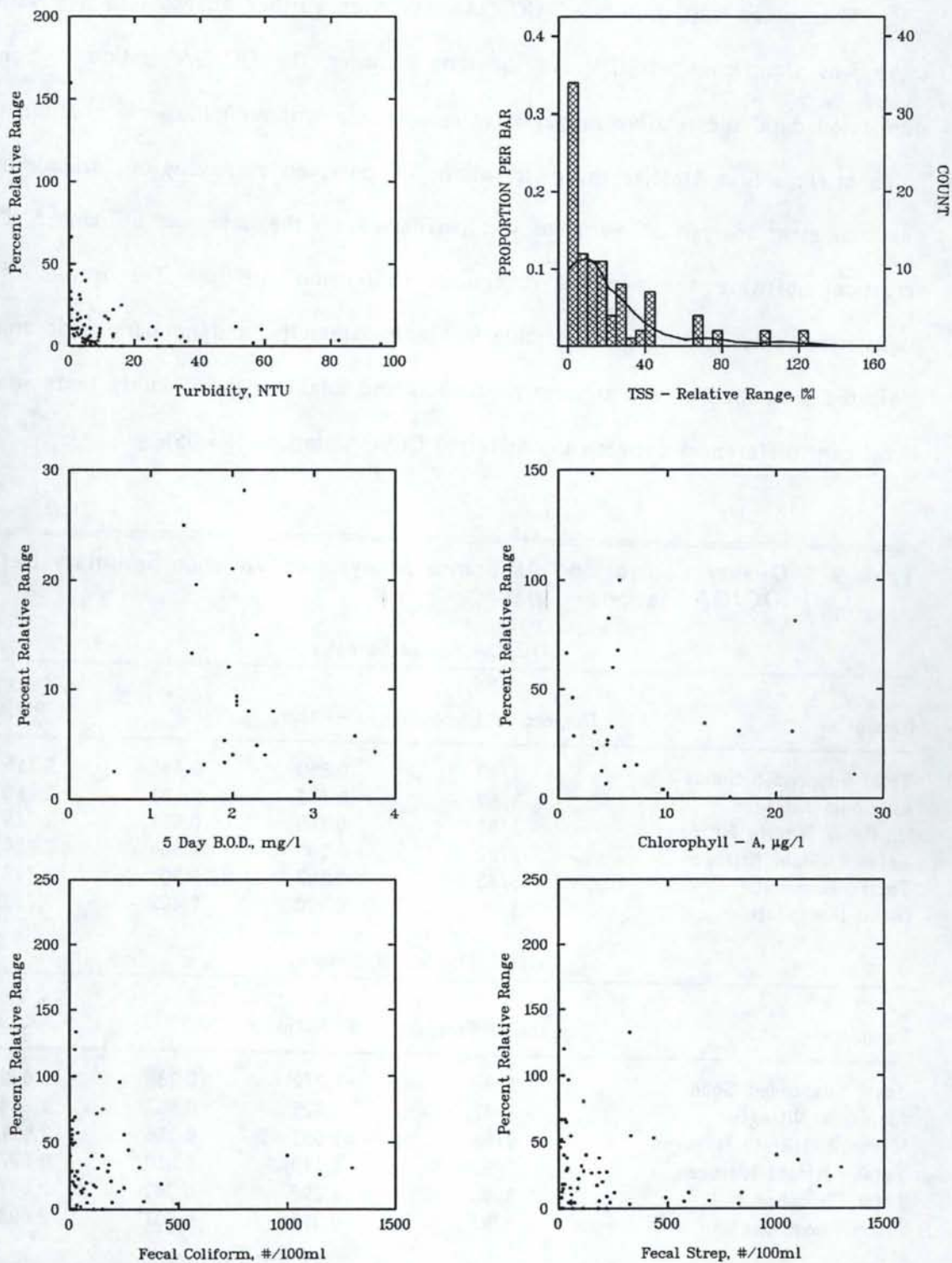


Figure 7b. Relative range of duplicated sampling versus mean concentration

normal distribution of relative ranges for the parameters (upper right chart of figure 7b which shows the distribution of relative range for total suspended solids) and the high percentage of points below detection limits, no trend analysis was performed.

The spiked and duplicated QC/QA data were further analyzed to determine if there was significant variation in the data between the QC/QA stations. For the duplicated data, the relative ranges were recomputed without taking the absolute value in an attempt to normalize the distribution. A parametric analysis of variance and a nonparametric analysis of variance was performed on the data sets utilizing SYSTAT statistical software for personal computers (Wilkinson, 1990). The results of the parametric analysis are shown in table 9. Both parametric and nonparametric analyses indicated that, for the five nutrient parameters and total suspended solids, there were no significant differences between the different QC/QA stations ( $\alpha=.05$ ).

Table 9. Quality Control and Assurance Analysis of Variance Summary Between QC/QA Stations

QC/QA Spiked Samples				
Parameter	Degrees of Freedom	F-Ratio	P	5% LS F. Ratio
Total Suspended Solids	3/83	0.860	0.466	2.715
Ammonia Nitrogen	3/82	0.757	0.521	2.716
Nitrite & Nitrate Nitrogen	3/83	0.489	0.691	2.715
Total Kjeldahl Nitrogen	3/82	0.090	0.966	2.716
Total Phosphorus	3/83	0.183	0.907	2.715
Ortho Phosphate	3/79	0.990	0.402	2.720
QC/QA Duplicated Samples				
Parameter	Degrees of Freedom	F-Ratio	P	5% LS F. Ratio
Total Suspended Solids	3/96	1.272	0.288	2.699
Ammonia Nitrogen	3/92	0.325	0.807	2.704
Nitrite & Nitrate Nitrogen	3/98	1.093	0.356	2.697
Total Kjeldahl Nitrogen	3/98	0.179	0.910	2.697
Total Phosphorus	3/98	1.292	0.282	2.697
Ortho Phosphate	3/97	0.326	0.807	2.698



### **Water Quality Databases**

The concurrent water quality monitoring data is presented in Appendix C and the data for the primary laboratory parameters are summarized in Appendix D. The appendix lists the statistical summary of the laboratory parameters associated with each station. The extreme value/outlier data is listed in Appendix E with the assumed values used in loading computations.

### **Special Monitoring Tasks**

Sampling at the Gridley Bridge location involved collection of surface grab samples at three different locations along the bridge in addition to vertically integrated samples at the same three locations during the beginning of the project. Comparison of the resulting water quality data analyses resulted in discontinuing the vertically integrated sampling. Table 10 shows the differences in the water quality data collected by the two sampling methods for three samplings at the location. The overall average relative range between the sampling methods for most parameters was less than the relative range in the duplicated sampling of the QC/QA program. The exception was the Ammonia Nitrogen parameter which was significantly higher in the surface grab samples. After discussion with DEQ and IDHW laboratory personnel, it was concluded that the measured differences were not significant enough to justify the additional effort and hazards associated with performing the vertically integrated sampling.

Differences between the water quality of irrigation return flows prior to dropping off the canyon wall and prior to entering the Snake River were explored further with additional sampling at the IR23N location. Differences are shown in Table 11. Sampling of the lower, canyon floor station was impossible during the winter, spring, and summer of 1991 due to effluent disposal from the cleaning project associated with Crystal Springs Lake.

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Table 10. Differences between sampling methods at Gridley Bridge, IS44M.

**Middle Snake River Water Quality Survey  
Gridley Bridge Sampling Methods**

Parameter	Sampling Method		Difference	% Relative Range
	IS44M Grab	IS44MDI Integrated		
<b>1-Aug</b>				
TSS	4.0	4.0	0.0	0.00%
Turbidity	1.7	2.0	-0.3	16.22%
Ammonia-N	0.073	0.054	0.019	29.92%
Nitrate + Nitrite-N	1.120	1.130	-0.010	0.89%
TKN-N	0.370	0.370	0.000	0.00%
Ortho Phosphate	0.077	0.079	-0.002	2.56%
Total Phosphorus	0.060	0.070	-0.010	15.38%
5-Day BOD	2.4	2.5	-0.1	4.08%
Chlorophyll-A	1.1	0.5	0.6	75.00%
<b>15-Aug</b>				
TSS	6.0	6.0	0.0	0.00%
Turbidity	1.6	1.5	0.1	6.45%
Ammonia-N	0.094	0.039	0.055	82.71%
Nitrate + Nitrite-N	1.390	1.460	-0.070	4.91%
TKN-N	0.990	0.800	0.190	21.23%
Ortho Phosphate	0.066	0.083	-0.017	22.82%
Total Phosphorus	0.060	0.070	-0.010	15.38%
5-Day BOD	2.9	1.7	1.2	52.17%
Chlorophyll-A	0.6	0.2	0.5	120.00%
<b>29-Aug</b>				
TSS	10.0	10.0	0.0	0.00%
Turbidity	2.5	2.7	-0.2	7.69%
Ammonia-N	0.141	0.088	0.053	46.29%
Nitrate + Nitrite-N	1.560	1.430	0.130	8.70%
TKN-N	0.290	0.290	0.000	0.00%
Ortho Phosphate	0.085	0.091	-0.006	6.82%
Total Phosphorus	0.080	0.090	-0.010	11.76%
5-Day BOD	1.7	1.7	0.0	0.00%
Chlorophyll-A	0.3	0.9	-0.6	100.00%
<b>Average</b>				
TSS	6.7	6.7	0.0	0.00%
Turbidity	1.9	2.1	-0.1	6.67%
Ammonia-N	0.103	0.060	0.042	51.94%
Nitrate + Nitrite-N	1.357	1.340	0.017	1.24%
TKN-N	0.550	0.487	0.063	12.22%
Ortho Phosphate	0.076	0.084	-0.008	10.40%
Total Phosphorus	0.067	0.077	-0.010	13.95%
5-Day BOD	2.3	2.0	0.4	17.05%
Chlorophyll-A	0.7	0.5	0.2	25.35%

Table 11. Differences in Water Quality Due to Canyon Plunge at IR23N.

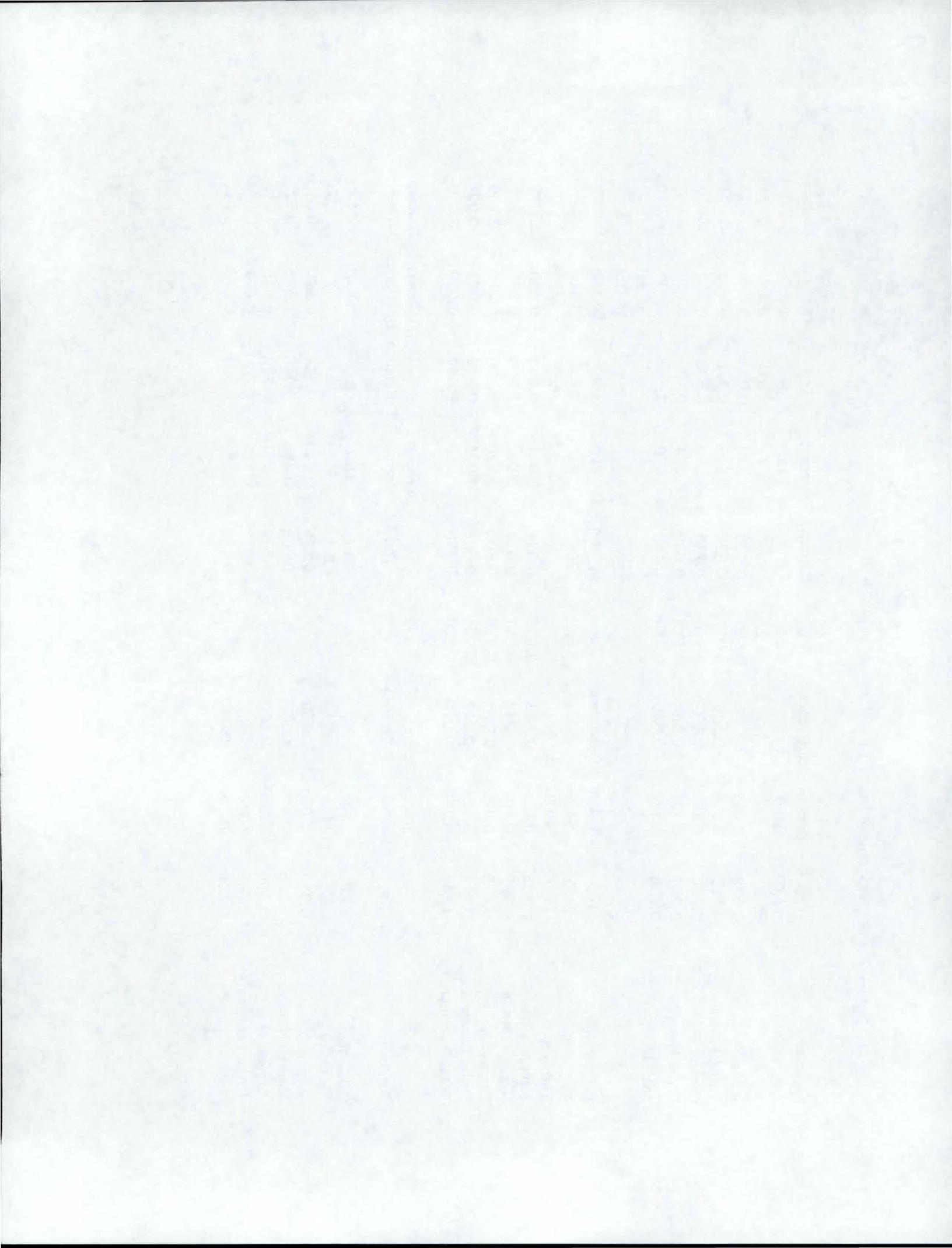
Parameter	24-Jul			7-Aug			21-Aug		
	Top	Bottom	Difference	Top	Bottom	Difference	Top	Bottom	Difference
TSS, mg/l	14.0	28.0	-14.0	22.0	8.0	14.0	28.0	30.0	-2.0
Turbidity	7.8	3.6	4.2	8.2	0.5	7.7	13.0	12.0	1.0
Ammonia-N	0.078	0.051	0.027	0.850	0.030	0.820	0.069	0.079	-0.010
Nitrite + Nitrate	0.123	0.356	-0.233	0.003	0.527	-0.525	0.375	0.446	-0.071
Organic-N	0.650	0.290	0.360	0.720	0.210	0.510	0.530	0.520	0.010
Ortho Phosphate	0.081	0.175	-0.094	0.112	0.088	0.024	0.132	0.136	-0.004
Total Phosphorus	0.130	0.170	-0.040	0.180	0.110	0.070	0.150	0.160	-0.010

Parameter	4-Sep			18-Sep			16-Oct		
	Top	Bottom	Difference	Top	Bottom	Difference	Top	Bottom	Difference
TSS, mg/l	21.0	24.0	-3.0	48.0	30.0	18.0	10.0	10.0	0.0
Turbidity	11.0	10.0	1.0				5.0	4.0	1.0
Ammonia-N	0.195	0.035	0.160	0.022	0.021	0.001	0.043	0.030	0.013
Nitrite + Nitrate	0.360	0.402	-0.042	0.011	0.033	-0.022	1.910	0.285	1.625
Organic-N	0.410	0.400	0.010	0.770	0.500	0.270	0.390	0.210	0.180
Ortho Phosphate	0.112	0.124	-0.012	0.064	0.063	0.001	0.035	0.061	-0.026
Total Phosphorus	0.140	0.150	-0.010	0.200	0.150	0.050	0.050	0.050	0.000

Parameter	30-Oct			Averages			Maximum Difference	Minimum Difference
	Top	Bottom	Difference	Top	Bottom	Difference		
TSS, mg/l	8.0	1.0	7.0	21.6	18.7	2.9	18.0	-14.0
Turbidity	5.5	0.1	5.4	8.4	5.0	3.4	7.7	1.0
Ammonia-N	0.317	0.037	0.280	0.225	0.040	0.184	0.820	-0.010
Nitrite + Nitrate	0.076	0.472	-0.396	0.408	0.360	0.048	1.625	-0.525
Organic-N	0.550	0.050	0.500	0.574	0.311	0.263	0.510	0.010
Ortho Phosphate	0.045	0.075	-0.030	0.083	0.103	-0.020	0.024	-0.094
Total Phosphorus	0.050	0.060	-0.010	0.129	0.121	0.007	0.070	-0.040



Differences in concentrations are not consistent throughout the July 24 to October 30 sampling period and are generally smaller than the differences between duplicate samples obtained in the QC/QA program, see Table 8. The sample size is small (7 samples); however, the average differences indicate improvements in water quality between the samples on the rim versus those taken at the base. Average differences for TSS, turbidity, ammonia-N, nitrate+nitrite-N, TKN, and total phosphorus indicate improvement; however, the ortho phosphate appears to increase due to the plunge. The difference for orthophosphate is small and may be due to sampling and analysis variance. The October 16<sup>th</sup> nitrate+nitrite-N measurement at the top appears to be in error although the 1.91 mg/l is the reported laboratory value. This entry was treated as an outlier using Chauvenet's procedure. Elimination of that entry in the average of nitrate+nitrite-N values at the top would indicate an increase in nitrate+nitrite-N due to the plunge. Without more sensitive collection and analysis procedures and additional sampling sites, the effect of the plunge and filtering through talus slopes cannot be determined.

## **IRRIGATION RETURN FLOWS**

### **Concurrent Monitoring Data**

All field and laboratory data for the irrigation return flow sites measured under the concurrent monitoring task are included in Appendix C. Nutrient and total suspended solids data were used, along with measured or estimated flows, for calculation of loadings from all sites.

Medians, ranges, outliers, and confidence intervals for the irrigation return flow field data parameters, water temperature, dissolved oxygen, electrical conductivity, and pH are shown graphically in Appendix F. These plots show specific statistical parameters as box plots for each site. The rectangular box shows the range containing

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all data points lying within one quartile above or below the median, referred to as the Hspread. The median is indicated by the line crossing the box. The 95% confidence limits for the median are depicted by the limits of the 'pinched' area of the box. Limits depicted by the 'whiskers' extending from the box include all measured values within the range 1.5 times the Hspread below the end of the box to 1.5 times the Hspread above the box. Outside points, depicted by the symbol \*, are those measured values from 1.5 to 3.0 times the Hspread below or above the box. Far outside points, depicted by the O, include data points falling farther than 3.0 times the Hspread above or below the box (Wilkinson, 1990).

Water temperature for the irrigation return flow sites is highly variable due to both seasonal and source factors. Sites with higher proportions of ground-water return flows show lower variability than those sites with only surface return flows. Generally, the range of water temperatures for most sites was less than 10 degrees C. Dissolved oxygen levels for irrigation return flows ranged from lows near 5 ppm to 14 ppm with no significant differences depending on location. Electrical conductivity is extremely site dependent for the irrigation return flow stations. Generally, the EC has low variability with median values between 400 and 450  $\mu$ mhos. However, many southside return flow streams show high variability and higher median values. Values of pH are generally between 8 and 8.5 with some streams exhibiting large outliers, many of which are likely due to instrument error.

### **Loads**

The total suspended solids and nutrient loadings from the monitored return flows are contained in Appendix G and summarized in Table 12. The southside Pigeon Cove return flow (LQ and LS drains) had the highest loads for all the parameters of the return flow stations. Of the return flows which are seasonal, the Northside S/S19 drain complex had the highest loads for all parameters.

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Table 12. Total suspended solids and nutrient loads from Irrigation Return Flows — June 1990 through July 1991

Name	Suspended Solids tons	Ammonia Nitrogen tons	NO <sub>2</sub> +NO <sub>3</sub> Nitrogen tons	Organic Nitrogen tons	Total Phosphorus tons	Ortho Phosphate tons
Northside A Drain	918	0.28	0.70	2.94	1.23	0.19
Southside A Drain	148	0.15	0.50	1.45	0.45	0.22
Northside C55 Drain	178	0.25	0.99	1.71	0.58	0.24
Twin Falls Coulee	646	0.16	0.64	2.65	1.01	0.24
East Perrine Coulee	2994	3.24	61.46	20.91	5.45	2.00
Main Perrine Coulee	1586	0.51	4.33	6.55	2.55	0.51
West Perrine Coulee	322	0.07	0.29	1.29	0.44	0.09
Southside 43 Drain	24	0.01	0.05	0.07	0.03	0.01
Southside 30 Drain	801	0.17	1.02	1.71	0.99	0.22
Southside LQ/LS Drain	6368	3.47	61.20	21.35	8.97	1.99
Southside LS2/39A Drain	1481	0.32	7.25	3.91	1.87	0.37
Northside N42 Drain	144	0.43	0.81	2.82	0.71	0.39
Southside 39 Drain	2211	0.35	8.21	4.17	2.29	0.32
Southside I Drain	1187	1.30	34.78	8.84	2.31	1.20
Northside J8 Drain	157	0.21	0.44	2.15	0.54	0.26
Northside S29 Drain	12	0.10	0.27	0.75	0.21	0.15
Northside S/S19 Drain	1250	1.86	4.46	18.48	6.02	2.97
Northside W26 Drain	711	0.56	1.21	4.31	1.29	0.48
Total Monitored Load	21149	13.46	188.61	106.06	36.95	11.84

### Statistical Analysis and Transfer Functions

The regression analysis of drainage area characteristics and seasonal loads produced linear regression equations using the three most significant variables. The resulting regression based equations, all with  $R^2$  values greater than 0.5, produced load estimates that were often unreasonable. Several estimates were negative and the differences between computed and measured values were large. Due primarily to the negative estimates, the regression was performed again without a constant in the model, thereby effecting a near zero intercept. Although estimates and measured values differed even more in some cases the overall results were somewhat better.

The final regression equations, with associated  $R^2$  values, are:

	$R^2$
TSS = 95.0*AREA + 18.5*SURF - 35.4*DRAN	0.645
NH3 = 0.125*AREA + 0.013*SURF - 0.095*DRAN	0.647
NO <sub>2,3</sub> = 1.71*AREA + 0.307*SURF - 2.03*DRAN	0.500
TKN = 0.849*AREA + 0.074*SURF - 0.499*DRAN	0.744
P = 0.232*AREA + 0.026*SURF - 0.098*DRAN	0.726
OP = 0.100*AREA + 0.008*SURF - 0.061*DRAN	0.671

where:

TSS = Total Suspended Solids (Sediment), tons

NH<sub>3</sub> = Ammonia, tons

NO<sub>2,3</sub> = Nitrogen as nitrite or nitrate, tons

TKN = Total Kjeldahl Nitrogen (elemental N), tons

P = Total Phosphorus as elemental phosphorus, tons

OP = Ortho Phosphate, tons

AREA = return flow drainage area, square miles

SURF = surface irrigated land in AREA, percent

DRAN = return flow drain length, miles

The regression coefficients for each independent variable reflect the expected response on each dependent variable. For example, the coefficients for drainage area and surface irrigated area are positive for each parameter, indicating that increased contributing area increases total seasonal load. The coefficient for drain length is negative, indicating that longer flow paths result in decreased loads for all parameters. However, the variability accounted for by the three primary variables is not sufficient to warrant utilization of these equations for estimating unmeasured return flow loads. The  $R^2$  values are relatively low and differences between estimated and measured loads are



too large to warrant utilization of the equations as shown in Table 13.

The primary reasons for the lack of reasonable regression equations are the small sample size, inaccuracy in drainage area determinations, inconsistent irrigation water management, flow contributions from ground-water sources, and scatter in measured data due to factors not included in this analysis, such as possible effects of dairy effluent and urban areas.

## **FISH HATCHERY EFFLUENT**

### **Concurrent Monitoring Data**

All field and laboratory data for the fish hatchery sites measured under the concurrent monitoring task are included in Appendix C. Nutrient and total suspended solids data were used, along with measured or estimated flows, for calculation of loadings from all sites.

Medians, ranges, outliers, and confidence intervals for the irrigation return flow field data parameters, water temperature, dissolved oxygen, electrical conductivity, and pH are shown graphically in Appendix F. Descriptions of the statistical parameters on the plots in Appendix F were outlined previously in the irrigation return flow results section.

Water temperature for the fish hatchery effluent generally shows a narrow range over the season with median values between 14 and 16 degrees C. Those sites with large proportions of irrigation return flow and large ponds, such as FH46N, show greater variations in water temperature. The Idaho Fish Breeders facility, FH35S, utilizes geothermal ground-water in the system, so the median water temperature is approximately 25 degrees C. The level of dissolved oxygen in fish hatchery effluent is very site specific and depends on hatchery management and source water DO levels. Electrical conductivity of fish hatchery effluent is primarily dependent on water source

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**Table 13 Measured and Predicted Annual Nutrient and Suspended Solids Loads for Irrigation Return Flows**

Drain ID	Meas.			Meas			Meas			Meas.			Meas.			Meas.		
	TSS M	TSS E	tons	NH3 tons	est.	res.	NO2+NO3 tons	est.	res.	TKN tons	est.	res.	Tot. P tons	est.	res.	Orth.P tons	est.	res.
IR02N	919	1649	730	0.30	1.25	0.95	0.70	9.29	8.59	2.94	10.31	7.37	1.23	3.48	2.25	0.217	1.169	0.952
IR03S	149	1321	1172	0.15	0.82	0.67	0.50	15.35	14.85	1.45	5.43	3.98	0.45	2.02	1.57	0.215	0.586	0.371
IR04N	179	573	394	0.25	0.30	0.05	0.99	3.19	2.20	1.71	2.43	0.72	0.58	0.96	0.38	0.236	0.262	0.026
IR07S	647	2011	1365	0.19	1.64	1.45	0.64	25.11	24.48	2.65	11.25	8.60	1.01	3.68	2.67	0.247	1.267	1.020
IR11S	2994	2522	-472	3.24	2.13	-1.11	61.46	29.28	-32.18	20.91	15.16	-5.75	5.45	4.89	-0.56	2.000	1.720	-0.280
IR12S	1586	1466	-120	0.57	0.92	0.35	4.33	9.46	5.13	7.14	7.37	0.23	2.55	2.68	0.13	0.544	0.814	0.270
IR16S	323	1180	857	0.09	0.73	0.64	0.29	15.46	15.17	1.29	4.52	3.23	0.44	1.70	1.26	0.089	0.483	0.394
IR17S	25	1103	1078	0.01	0.68	0.67	0.07	12.75	12.68	0.08	4.54	4.46	0.03	1.69	1.66	0.008	0.490	0.482
IR20S	801	1362	561	0.17	0.28	0.11	1.02	6.45	5.43	2.09	2.34	0.25	1.38	1.57	0.19	0.223	0.190	-0.033
IR21S	6369	2517	-3852	3.83	1.75	-2.08	61.20	25.89	-35.31	21.99	12.48	-9.51	8.97	4.37	-4.60	2.106	1.382	-0.724
IR22S	1482	1348	-134	0.32	0.28	-0.04	7.25	3.80	-3.45	3.91	2.78	-1.13	1.87	1.70	-0.17	0.368	0.244	-0.124
IR23NT	357	372	15	0.76	0.17	-0.59	1.26	0.35	-0.91	3.74	1.62	-2.12	1.28	0.67	-0.61	0.567	0.174	-0.393
IR24S	2211	1697	-514	0.42	0.99	0.57	8.22	20.41	12.20	4.17	6.37	2.20	2.77	2.45	-0.32	0.332	0.677	0.345
IR29S	1188	1708	520	1.39	0.96	-0.43	34.78	19.29	-15.49	8.84	6.30	-2.54	2.31	2.47	0.16	1.229	0.666	-0.563
IR30N	158	584	426	0.21	0.27	0.06	0.44	2.06	1.62	2.15	2.36	0.21	0.54	0.98	0.44	0.262	0.251	-0.011
IR36N	12	499	487	0.10	0.28	0.18	0.27	5.69	5.42	0.75	1.83	1.08	0.22	0.72	0.50	0.158	0.194	0.036
IR39N	1251	1835	584	1.86	1.67	-0.19	4.46	19.12	14.66	18.48	12.38	-6.10	6.02	3.89	-2.13	2.975	1.419	-1.556
IR42N	712	1402	690	0.64	1.36	0.72	1.21	14.36	13.15	4.88	10.23	5.35	1.45	3.14	1.69	0.482	1.180	0.698
IR35S		1781			1.24			27.37			7.40			2.61			0.804	
UM09N		875			0.76			7.54			5.86			1.88			0.671	
UM08N		446			0.14			1.17			1.33			0.65			0.133	
UM07N		721			0.59			8.76			4.14			1.35			0.467	
UM06N		409			0.26			2.47			2.14			0.77			0.237	
UM05N		429			0.15			1.91			1.31			0.62			0.132	
UM05.75N		463			0.27			1.45			2.36			0.88			0.260	
UM05.50N		348			0.16			0.71			1.50			0.61			0.161	
UM05.25N		322			-0.01			-3.74			0.75			0.52			0.066	
UM04N		666			0.55			10.02			3.50			1.14			0.392	
UM03N		486			0.25			4.92			1.64			0.68			0.171	
UM01S		458			0.19			2.44			1.58			0.69			0.163	

and location within the reach. The plot of EC for each fish hatchery site shows a trend of decreasing EC with distance downstream; however, this trend has not been examined statistically. Median EC levels range from approximately 620  $\mu\text{mhos}$  to 310  $\mu\text{mhos}$ . Median pH levels for fish hatchery effluent are generally between 7.8 and 8.1 except for site FH46N.

### **Loads**

The total suspended solids and nutrient loadings from the monitored fish hatcheries are contained in Appendix H and summarized in Table 14.

Table 14. Total suspended solids and nutrients load for Aquaculture facilities – June 1990 through July 1991.

Name	Suspended Solids tons	Ammonia Nitrogen tons	NO <sub>2</sub> +NO <sub>3</sub> Nitrogen tons	Organic Nitrogen tons	Total Phosphorus tons	Ortho Phosphate tons
Blue Lake Processing Plant	5	1.83	0.01	2.86	0.42	0.27
Blue Lakes Fish Farm	1196	39.85	353.24	86.79	16.52	11.66
Crystal Springs Hatchery	964	68.20	467.93	119.25	20.10	16.93
Magic Valley Fish Hatchery	627	18.12	217.82	39.48	5.74	6.14
Rim View Hatchery	589	47.33	224.12	84.46	13.25	11.63
Idaho Fish Breeders	229	11.90	11.74	21.30	3.36	2.32
Box Canyon Hatchery	1690	167.72	248.89	278.15	45.91	31.38
Buckeye Fish Farm	415	2.79	11.78	15.08	1.85	0.75
White Springs Hatchery	120	11.40	39.58	18.82	3.57	3.24
Birch Creek Fish Farm	80	4.29	11.54	8.54	1.40	1.14
Total Monitored Load	5918	373.43	1586.65	674.72	112.12	85.45

## **TRIBUTARY STREAMS**

### **Concurrent Monitoring Data**

All field and laboratory data for the tributary streams measured under the concurrent monitoring task are included in Appendix C. Nutrient and total suspended solids data were used along with measured or estimated flows for calculation of loadings

from all sites.

Medians, ranges, outliers, and confidence intervals for the tributary stream field data parameters, water temperature, dissolved oxygen, electrical conductivity, and pH are shown graphically in Appendix F. Descriptions of the statistical parameters on the plots in Appendix F were outlined previously in the irrigation return flow results section.

Water temperature measured in the tributary streams shows high variability as a result of the number of different sources which enter each tributary. The Malad River, TS50N, shows low variability and a high, 16 degree C, median temperature as a result of the high proportion of spring flow in the stream. Cedar Draw creek, TS27S, shows the lowest median temperature, 11 degrees C, and the greatest seasonal variability. Median dissolved oxygen values in measured tributary streams vary from 8 to 9 ppm. Median electrical conductivity values range from 370 to 780  $\mu$ mhos in tributary streams with the southside streams showing the greatest variability. Northside tributaries are composed primarily of ground-water returns and exhibit relatively low variability in EC. Median pH values for tributary streams are consistently between 8.3 and 8.5 except for TS32N, Clear Lakes Outlet, which shows a median pH of 7.8.

### **Loads**

The total suspended solids and nutrient loadings from the monitored tributaries entering the Snake River are contained in Appendix I and summarized in Table 15.

## **MAIN STEM INSTREAM FLOWS**

### **Concurrent Monitoring Data**

All field and laboratory data for the main stem instream flow sites measured under the concurrent monitoring task are included in Appendix C. Nutrient and total

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Table 15. Total suspended solids and nutrients loads for Tributary Stations -- June 1990 through July 1991

Name	Suspended Solids tons	Ammonia Nitrogen tons	NO <sub>2</sub> +NO <sub>3</sub> Nitrogen tons	Organic Nitrogen tons	Total Phosphorus tons	Ortho Phosphate tons
Vineyard Lake	337	0.66	32.14	4.38	0.78	0.52
Rock Creek at Poleline Road	4318	5.74	116.56	34.17	10.33	4.89
Cedar Draw	18576	15.26	202.73	78.06	26.27	9.01
Clear Lakes	1791	118.87	812.45	228.52	68.37	63.18
Mud Creek	5539	19.39	272.47	79.57	17.50	10.91
Deep Creek	8317	7.22	228.51	66.71	15.22	6.84
Blind Canyon	1840	5.27	15.25	27.37	7.53	4.75
Salmon Falls Creek	6018	8.38	417.70	70.71	12.95	8.26
Malad River	5788	42.51	1478.59	127.91	60.04	48.62
Total Monitored Load	52528	223.28	3576.40	717.40	219.00	156.98

suspended solids data were used along with measured or estimated flows for calculation of loadings from all sites.

Medians, ranges, outliers, and confidence intervals for the mainstem instream flow site field data parameters, water temperature, dissolved oxygen, electrical conductivity, and pH are shown graphically in Appendix F. Descriptions of the statistical parameters on the plots in Appendix F were outlined previously in the irrigation return flow results section.

Instream water temperatures exhibit median values between 12 and 16 degrees C with no apparent trend with river station. Median dissolved oxygen levels range from approximately 8.2 to 10.6 ppm with a significant decrease from below Shoshone Falls to below Warm Creek. Dissolved oxygen variability is greater at stations from Shoshone Falls upstream. Median electrical conductivity values for main stem sites range from approximately 460 to 610  $\mu$ mhos. EC values at stations above Gridley Bridge, IS44M, are significantly higher than below Gridley Bridge. Median pH values for main stem stations are generally between 8.0 and 8.5 with no apparent trends with river mile

location. Plotted pH values show a large number of outliers due primarily to instrument error or calibration.

### **Loads**

The instream total suspended solids and nutrient loads along the middle Snake River reach are contained in Appendix J and summarized in Table 16. Figures 8a, 8b, and 8c show average daily instream suspended solids and nutrient loads for May, July, and February.

Table 16. Total suspended solids and nutrients loads for Snake River Instream Stations -- June 1990 through July 1991

Name	Suspended Solids tons	Ammonia Nitrogen tons	NO <sub>2</sub> +NO <sub>3</sub> Nitrogen tons	Organic Nitrogen tons	Total Phosphorus tons	Ortho Phosphate tons
Snake River @ Murtaugh	3367	43.84	369.90	153.81	60.37	48.53
Snake River above Twin Falls Falls	7836	43.92	1009.24	203.46	80.31	76.95
Snake River below Twin Falls Falls	6834	45.78	1075.64	241.20	75.24	72.93
Snake River below Shoshone Falls	7942	67.40	1181.56	270.47	71.51	68.29
Snake River at Blue Lakes	16219	55.44	1579.17	419.84	101.20	77.63
Snake River below Warm Creek	14756	333.92	1854.11	796.36	199.13	174.03
Snake River at Clear Lakes	19131	235.49	4584.30	1004.07	289.51	276.30
Snake River at Gridley Bridge	48730	643.67	9030.76	2027.60	524.78	508.95
Snake River below Upper Salmon Falls	44089	557.18	9038.26	1864.39	539.16	516.44
Snake River below Lower Salmon Falls	46289	598.31	8643.29	1878.16	497.19	458.59
Snake River below Bliss Dam	59812	640.68	11069.24	2303.12	630.03	572.88
Snake River at Bliss Bridge	47848	524.34	10005.02	1961.85	551.86	511.36
Snake River at King Hill	70342	425.32	10902.81	2166.86	615.14	566.65
Total Monitored Load	393201	4215.30	70343.29	15291.20	4235.43	3929.54

### **Main Stem Hydrology**

Figure 2 shows the average daily discharge at the USGS gages in the reach for the period 1947-1991. Seasonal flow patterns show normally higher flows during the April-June period caused by drafting of upstream reservoirs for flood control purposes. July through September flows are low due to upstream irrigation diversions. The period

**MIDDLE SNAKE RIVER WATER QUALITY  
Total Suspended Solids**

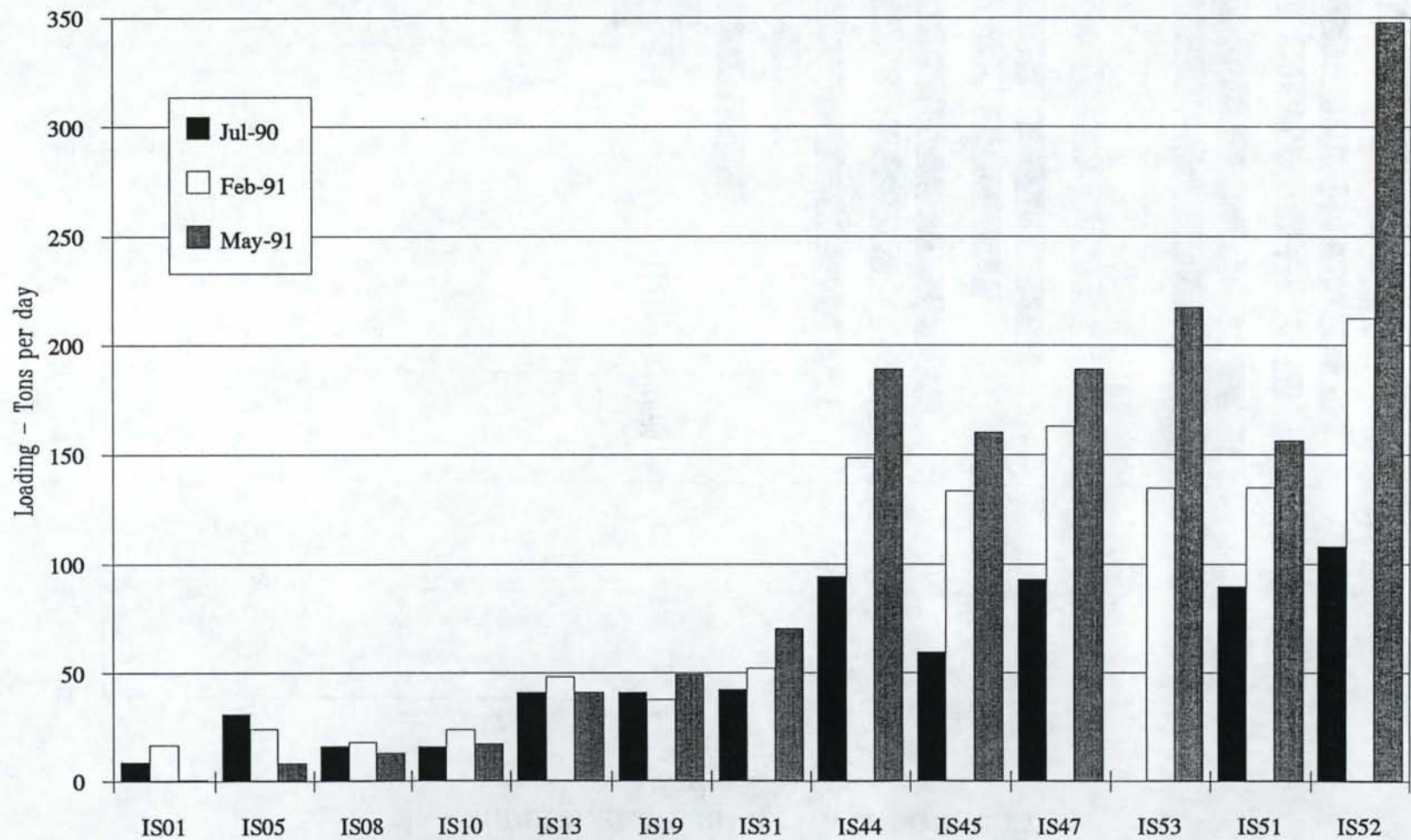


Figure 8a. Middle Snake River total suspended solids loads for July, February and March

**MIDDLE SNAKE RIVER WATER QUALITY**  
**Nitrite + Nitrate**

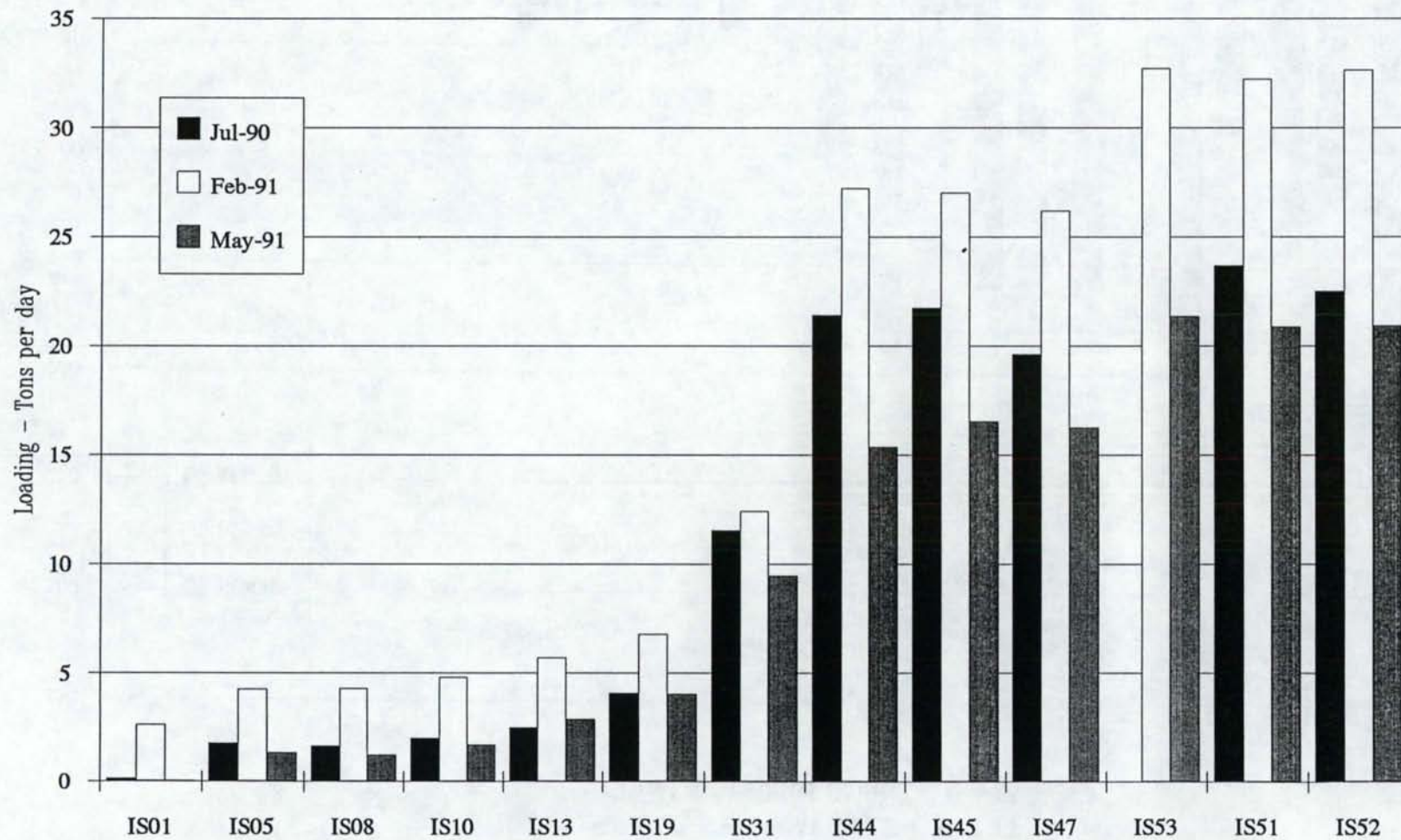


Figure 8b. Middle Snake River nitrite+nitrate loads for July, February and March.



**MIDDLE SNAKE RIVER WATER QUALITY**  
**Total Phosphorus**

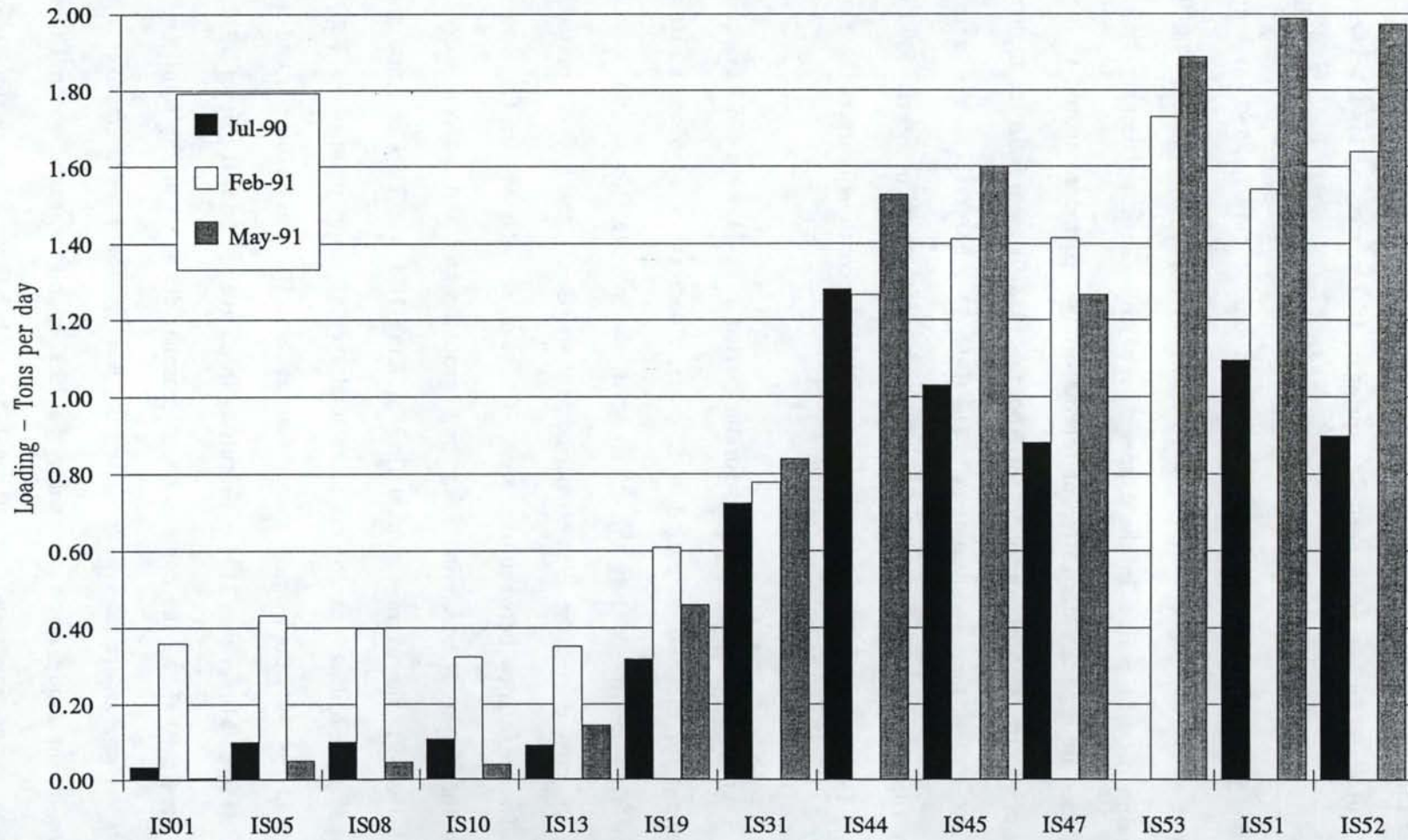


Figure 8c. Middle Snake River total phosphorus loads for July, February and March.

October through March is characterized by relatively constant flows primarily influenced by ground-water inflow from northside springs. Differences in flows between stations are relatively constant throughout the season with the magnitude of the differences indicating the level of inflow between gaging stations. Figure 9 shows the average daily discharge at the USGS gages for the period 1988 through 1991 which corresponds to the continuing drought period in the Upper Snake River Basin. Discharge patterns and magnitudes are significantly different for the drought period compared to the 1947-91 period of record. Conspicuously absent from the 1988-91 record are the higher flows in April, May, and June at all stations. The 1988-91 records show near zero flows at Milner for this period compared to long term average flows of nearly 5000 cfs. The seasonal flow patterns for the drought period show continually receding flows at all stations after the irrigation season.

Average annual flows at Buhl for the period 1988-91 were 2395 cfs compared to the average for the 1947-91 period of 5235 cfs, a decrease of 54 percent. However, for the low flow months of July through August, the average flow at the Buhl gage was nearly the same during the 1988-91 period as it was during the 1947-91 period.

The difference between the King Hill gage and the Milner Gage reflects total inflow for the study reach including both ground-water and surface water. For the period 1988-91, the average annual flow at King Hill was 7799 cfs, and the average annual flow at Milner was 467 cfs for a total average annual gain of 7332 cfs. During the period 1947-91, the average annual flow at King Hill was 11106 cfs, and the average annual flow at Milner was 3174 cfs resulting in an average annual gain of 7932 cfs.

Figure 10 shows the comparison of seasonal discharge at the Buhl gage for both periods. The seasonal flow patterns for the Buhl gage are representative of all gaging stations in the study reach and show the lack of higher early season flows and the declining winter-time flow. July through September flows are very similar for the two

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MIDDLE SNAKE RIVER  
AVERAGE DAILY DISCHARGE 1988-91

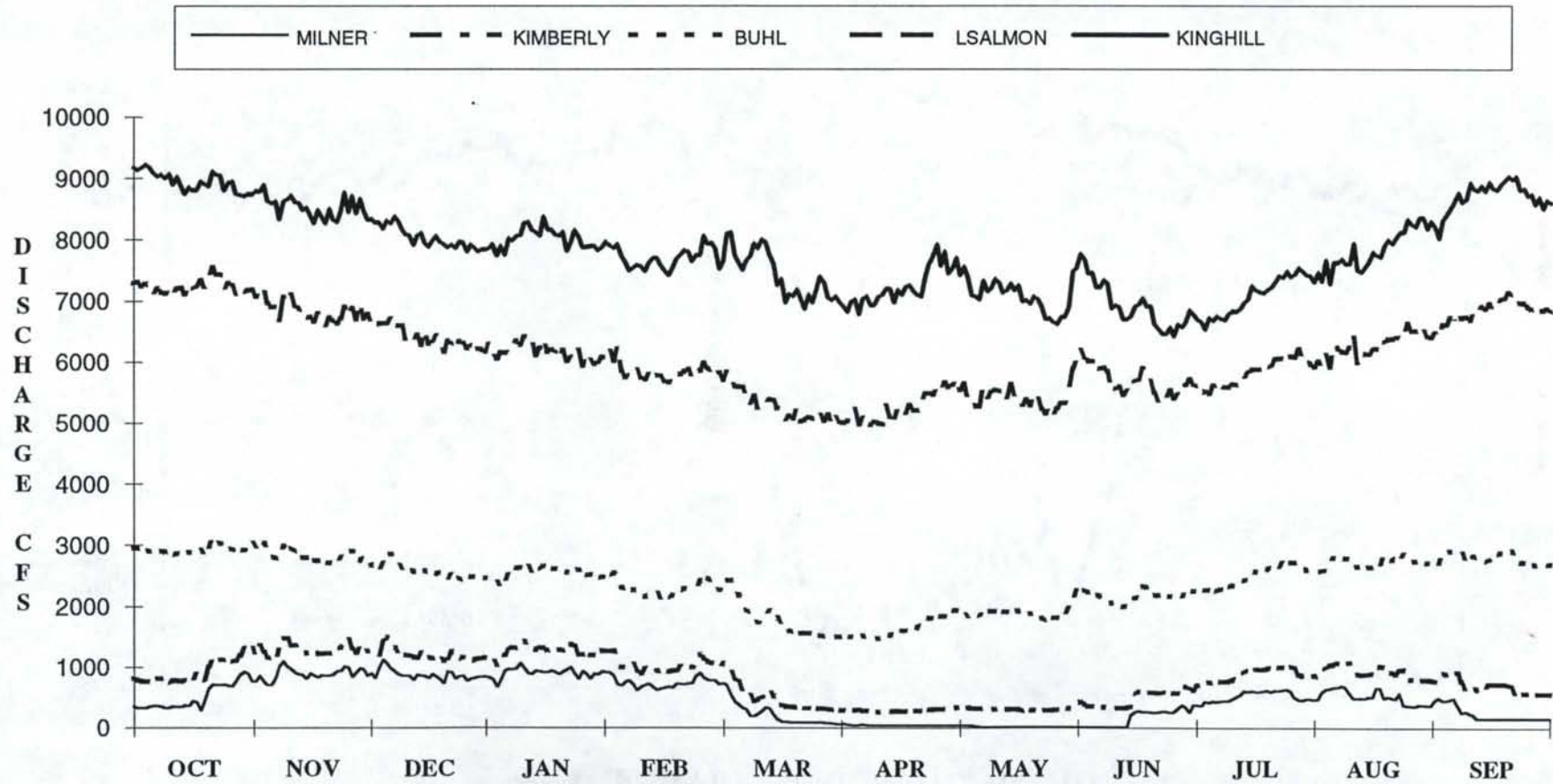


Figure 9. Average daily discharges at the USGS gages in the Middle Snake River reach for water years 1988-1991.

### MEAN DAILY DISCHARGE SNAKE RIVER NEAR BUHL, IDAHO

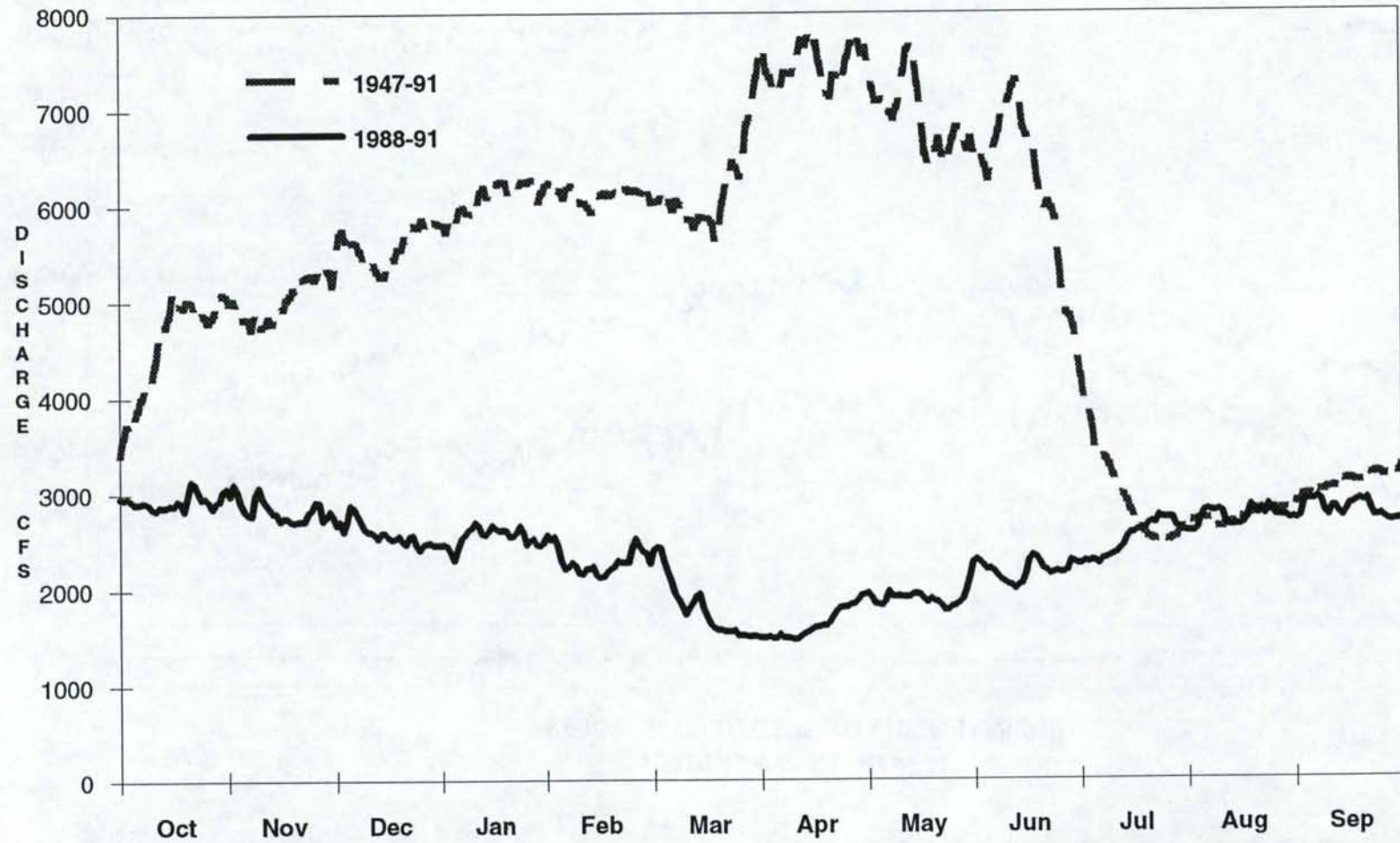


Figure 10. Long and short term average daily discharges of the Snake River near Buhl.

periods, reflecting the base flows supported primarily by ground-water returns from the northside and southside springs.

## WATER QUALITY CRITERIA

Applicable water quality standards for the State of Idaho for the beneficial uses designated for the Middle Snake are contained in *IDAPA 16.01 General Water Quality Criteria*. These criteria include hazardous materials, deleterious materials, radioactive materials, floating, suspended or submerged matter, excess nutrients, oxygen-demanding materials, and sediment. In addition, *IDAPA 16.01.2250, Specific Water Quality Criteria for Use Classifications*, is applicable to this reach of the Snake River. Beneficial uses covered include agriculture, primary contact recreation, secondary contact recreation, cold water biota, and salmonid spawning which are designated beneficial uses for this reach. The *General Water Quality Criteria* are narrative and generally state that as a result of man-caused point or nonpoint source discharge, waters of the State must not contain specific substances or materials which adversely affect designated beneficial uses. In particular, *IDAPA 16.01.2200,05, Excess Nutrients*, is applicable to the Middle Snake reach. This narrative criteria specifies that surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated or protected beneficial uses. In addition, the U.S. EPA published the "Gold Book" in 1986 (EPA 1986) which recommended maximum concentrations of specific contaminants that were toxic or deleterious to fish, invertebrates, and some aquatic vegetation. These recommendations are utilized by the Division of Environmental Quality but have not been adopted by the State.

Since the primary objective of this study is to identify current water quality in the Snake river related to inflows from both point and non-point sources, the applicable water quality criteria will be discussed only in relation to measured concentrations at the in-stream sampling sites. The adopted criteria and recommended contaminant levels are

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specific to beneficial uses designated for the main stem of the river.

### **Salmonid Spawning and Cold Water Biota**

#### **Dissolved Oxygen**

The dissolved oxygen minimum concentration of 6 mg/l for both salmonid spawning and cold water biota was exceeded in all except two (2) samples. On July 30, 1990 the dissolved oxygen concentrations were 6.0 mg/l at the Murtaugh bridge site and 4.8 mg/l at the site below Shoshone Falls. All dissolved oxygen measurements were made during the daytime hours for this study. Diurnal fluctuations occur, which can result in nighttime DO levels considerably below daytime levels. In addition, measurements for this study were grab samples and do not reflect depressed DO levels in deeper pools.

#### **Hydrogen Ion Concentration**

Hydrogen ion concentrations, pH, were within the 6.5 to 9.0 recommended range for all samples.

#### **Water Temperature**

Water temperature criteria for cold water biota require temperatures of 22°C or less with a maximum daily average of no greater than 19°C, and salmonid spawning requires temperatures of 13°C with a maximum daily average of 9°C. Water temperature was measured in this study every two weeks at varying times of day, and no continuous temperature measurements were obtained. The maximum daily average water temperature criteria cannot be addressed.

Measured, in-stream water temperatures at the 13 measuring sites generally exceeded the criteria for salmonid spawning at some time during the sampling period. Generally, the October through April water temperatures measured were below 13°C.

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The cold water biota temperature criteria of 22°C was exceeded only twice, at Murtaugh bridge on July 17, 1990 and below Shoshone Falls on July 16, 1991.

### **Turbidity**

A turbidity criteria of 50 NTU's has been recommended for Idaho for protection of salmonid sight feeding under the cold-water biota criteria (Harvey 1989). Turbidity levels at the Snake River in-stream sampling sites ranged from less than 1 NTU to 18 NTU with the maximums occurring at the Murtaugh bridge site during the irrigation season.

### **Total Suspended Solids**

Although not adopted as regulation by the State of Idaho, a recommended level of total suspended solids for a moderate level of protection of cold water habitat is 100 mg/l (Loyd, 1987). Measured TSS levels at the 13 main stem stations exceeded 100 mg/l only once, at the Murtaugh bridge site on August 28, 1990. The measured value was 160 mg/l. Total suspended solids concentrations at main stem stations were generally less than 20 mg/l as compared with irrigation return flow streams which sometimes exhibited TSS concentrations in excess of 3000 mg/l.

### **Total Phosphorus**

Total phosphorus in flowing water can be used as a reflection of the degree of eutrophication and nuisance plant growth. A desired criteria not to exceed 0.1 mg/l is suggested (Mackenthun, 1973).

Total phosphorus exceeded 0.1 mg/l at all main stem stations at some time during the sampling period. The stations above Blue Lakes bridge normally exhibited higher concentrations during the November through February period whereas the stations below Blue Lakes exhibited lower seasonal fluctuations. A maximum value of 0.33 mg/l was measured at the Murtaugh bridge site on December 19, 1990, and the station below

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Warm Creek had a measured concentration of 0.33 mg/l on June 18, 1991. Average total phosphorus concentrations for all in-stream stations was approximately 0.08 mg/l.

### **Ammonia**

Ammonia can be toxic to fishes and cause reductions in hatching success, growth rate, and morphological development. Acutely toxic concentrations may cause loss of equilibrium, hyperexcitability, increased breathing, cardiac output and oxygen uptake, and, in extreme cases, convulsions, coma, and death (EPA, 1986). Allowable ammonia levels are dependent on water temperature and pH and not-to-exceed concentrations are listed for daily maximum and weekly average concentrations for specific pH and temperature conditions. Samples for this study were grab samples and do not represent either the daily maximum or weekly average concentrations. However, total ammonia concentrations were generally below 0.3 mg/l, and in no sample did total ammonia exceed the allowable based on pH and temperature.

### **Nitrate+Nitrite**

It is recognized that salmonid fishes show distress or even mortality at specific concentrations of nitrate and nitrite nitrogen. However, concentrations of nitrate or nitrite that would exhibit toxic effects on warm- or cold-water fish could rarely occur in nature, and restrictive criteria are not recommended (EPA, 1976). A concentration level of 0.3 mg/l nitrate+nitrite N is used by the Division of Environmental Quality as a guideline indicator of stream eutrophication (IDHW, 1980). This concentration was exceeded at all 13 instream stations for all samples except for two (2) at the Murtaugh Bridge site.

### **Primary Contact Recreation**

Criteria for this beneficial use requires that between May 1 and September 30 of each calendar year, waters designated for primary contact recreation are not to contain

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fecal coliform bacteria significant to the public health in concentrations exceeding 500/100 ml at any time. Further, that levels must not exceed 200/100 ml in more than ten percent of the samples taken over a 30 day period and a geometric mean of 50/100 ml based on a minimum of five samples taken over a 30 day period. This study can only address the first criteria since the sampling frequency was too low.

Of the approximately 312 in-stream samples taken, the fecal coliform bacteria count exceeded 500/100 ml in only one sample, at the station below Warm Creek on July 31, 1990. Reported fecal strep bacteria counts exceeded 500/100 ml six (6) times during the sampling period.

### **Secondary Contact Recreation**

Fecal coliform bacteria concentrations of 800/100 ml are the maximum limits for secondary contact recreation. For the in-stream sampling sites, this fecal coliform bacteria criteria was exceeded once on July 31, 1990 below the Warm Creek site. Fecal strep bacteria concentrations exceeding 800/100 ml were reported six (6) times during the sampling period.

## **CONCLUSIONS**

Water Quality in the Middle Snake River reach has been impacted by nutrient inflows and sediment from agricultural activities, commercial, and governmental fish rearing facilities, and diffuse ground-water inflow containing nitrate nitrogen significantly above background levels. The ability of the river to assimilate these nutrient and sediment inflows has been severely hampered for at least the last four years by extremely low flows caused by drought conditions in the Snake River Basin.

The water quality database prepared for the Middle Snake River reach is a commercial menu-driven relational computer database. The database contains pertinent water quality data for the mainstream, irrigation return flow, tributary inflow, and

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aquaculture effluent.

Water quality samples from 55 stations for the period June 1990 through July 1991 were successfully obtained and field and laboratory data entered into the database. The weekly sampling on aquaculture facilities, and biweekly sampling on the main river, irrigation return flows, and tributaries, provides adequate data for determination of nutrient and sediment loads entering the river. The concurrent water quality data and computed loadings are adequate for preparation of an initial input data set for a river water quality model of the reach. The recommended subreaches for the model reflect both hydraulic and hydrologic uniformity and should suffice for the initial modelling effort.

Average seasonal concentrations of nutrients in the main river reflect the locations of nutrient inflows as well as the inflow of spring water from the Snake Plain aquifer. Average nitrate+nitrite N concentrations increase from approximately 1 mg/l at Milner to over 1.6 mg/l from Twin Falls Pool to Clear Lakes Bridge. The nitrate+nitrite level decreases and remains relatively constant at about 1.4 mg/l from Clear Lakes to King Hill. Except for the reach from the Jerome Country Club bridge to Clear Lakes, average total and ortho phosphate concentrations in the main river are approximately 0.08 mg/l. In the reach from Blue Lakes to the Jerome Country Club bridge, which includes inflow from the Twin Falls sewage treatment plant, the average yearly total phosphate level increases from 0.08 to 0.17 mg/l.

Average concentrations of nitrate+nitrite N in fish hatchery effluent range from 0.3 mg/l to 2.2 mg/l. The variation in nitrate+nitrite N concentration levels is influenced by the variation in concentration in spring inflow to the fish hatcheries, which was not measured in this study. Average total phosphate concentrations in fish hatchery effluent varied from 0.9 mg/l to 2.7 mg/l. Ammonia-N in fish hatchery effluent was higher than in the main river or in irrigation return flow streams, with

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average concentrations as high as 0.7 mg/l.

Nitrate+nitrite N concentrations in irrigation return flow streams depends primarily on the percentage of ground-water return flow in the stream. Irrigation return flow streams which enter the river from the south side and which contain significant ground-water exhibit average nitrate+nitrite N concentrations from 2.0 to 3.2 mg/l. Northside return flow streams or southside returns with primarily surface return flow show concentrations below 0.5 mg/l and many as low as 0.1 mg/l. Ammonia N concentrations are less than 0.2 mg/l in irrigation return flows; however, average total Kjeldahl N, which indicates the level of organic material, was as high as 0.8 mg/l. Total phosphate levels in irrigation return flows ranged from 0.1 to 0.5 mg/l, with the higher concentrations reflected in the southside return flow streams. Ortho phosphate concentrations were below 0.1 mg/l in most return flow streams, reflecting the fact that most phosphate is associated with sediments in surface streams.

Computed seasonal loadings for suspended solids and phosphates in irrigation return flow streams show elevated values during the irrigation season; however, nitrate+nitrite N levels in perennial irrigation return flow streams reflect higher levels during the winter because of increased ground-water return flow. Total nutrient loads in effluent from fish facilities are relatively constant throughout the year, however, nitrate+nitrite N levels decrease during spring and early summer when spring flows from the Snake Plain aquifer decrease. Tributary stream nutrient load levels reflect integrated effects of surface irrigation return flow, ground-water returns, and aquacultural activities but show significant increases in suspended solids during the irrigation season.

Suspended solids loads in the main river increase from below 10 tons per day (tons/day) at Murtaugh bridge to as much as 350 tons/day at the King Hill gaging station. Main river suspended solids loadings below Clear Lakes are lowest in mid summer and increase through the winter with maximums in the spring.

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For the period June 1990 through July 1991, the total inflow of suspended solids from the 18 measured irrigation return flow streams is estimated at 21,000 tons as compared to the 6,000 tons entering from fish facilities. The nine measured tributaries contributed 53,000 tons of suspended solids. Rock Creek was measured for only six months of the monitoring period. Irrigation return flows generally show the highest suspended solids loads during early spring when pre-plant early irrigations occur.

Total phosphate loadings, which are well correlated with sediment or suspended solids, show similar inflow levels with 37 tons contributed from measured irrigation return flows, 112 tons from measured fish hatcheries, and 219 tons from measured tributary streams. Total phosphorus loads for the monitoring period in the main river increase from 100 tons at Blue Lakes to over 600 tons at the King Hill station. Total phosphorus loadings in the main river are generally lowest in July or mid-summer and highest in the spring.

Nitrate+nitrite N contributions from measured fish facilities for the twelve month period were 1,600 tons compared with 190 tons from irrigation return flow and 3,600 tons from the nine measured tributaries. For the twelve month period, nitrate+nitrite N loads in the main river increase from approximately 370 tons at Murtaugh to over 11,000 tons at the King Hill gage. Nitrate+nitrite N and total phosphate concentrations and water temperature exceed guidelines or adopted water quality criteria for the designated beneficial uses in the main stem of the Snake River.

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## RECOMMENDATIONS

Additional studies should be conducted to further define the effect on water quality of percolation of surface irrigation return flow through talus materials. The river water quality modelling effort by EPA should be pursued quickly to provide insights into areas needing additional data and estimate loading impacts with more normal hydrologic regimes.

Additional monitoring to define daily and weekly variations in water quality parameters of irrigation return flow streams and tributary streams will allow determination of confidence levels for periodic measurements.

Additional monitoring of undeveloped ground-water inflow sites will allow better definition of water quality for unmeasured ground-water inflows within the reach. This effort is proceeding under the University of Idaho Middle Snake Phase II project.

Additional hydraulic evaluations of the effects of increased discharges on specific subreaches will assist in determining the benefits of increased instream flows.

For future water quality evaluations, refined laboratory procedures should be used for samples near current detection limits. Computed loads at sites with large flow volumes and low parameter concentrations are extremely sensitive to analysis errors.

A program to monitor sewage plant effluent in the reach should be initiated.

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## REFERENCES

- Bauer, S.B. 1986. Pilot Study of Quality Assurance Sample Procedures 1986. Water Quality Bureau Report, Idaho Department of Health and Welfare Division of Environment, Boise, ID. January 1986.
- Bauer, S.B., W.H. Clark and J.A. Dodds. 1986. Quality Assurance Sample Procedures for Water Quality Surveys, Journal of the Idaho Academy of Science. Vol 22, No. 2. December 1986.
- Harvey, G.W. 1989. Technical Review of Sediment Criteria. IDHW-Div. Environ. Quality, Boise. 29 pp.
- IDHW, 1980. Idaho Water Quality Status Report, IDHW-DEQ, Boise. 65pp.
- Kennedy, John B. and Adam M. Neville. 1976. Basic Statistical Methods of Engineers and Scientists, 2nd Edition. IEP, A Dunn-Donnelley, Publisher, New York.
- Loyd, D.S. 1987. Turbidity as a Water Quality Standard for Salmonid Habitats in Alaska. North American Journal of Fisheries Management. 7:34-35.
- Mackenthun, K.M. 1973. Toward a Cleaner Environment. U.S. Environmental Protection Agency, Washington, D.C. 290 pp.
- Rance, S.E., et al., 1982. Measurement and Computation of Stream Flow. USGS Water Supply Paper 2175, Vol. I & II.
- Sand, Susan and David R. Hershey, 1990. Pocket Electrical Conductivity Meters With and Without Automatic Temperature Compensation, HortScience, Vol 25(6), June 1990. American Society for Horticultural Science, Alexandria, VA.
- Spooner, J. 1991. Censored Data Values: Part 2, Description and Effect of Censoring on Statistical Trend Analyses. NWQEP NOTES, National Water Quality Evaluation Project, No. 48. North Carolina State University Agricultural Extension Service, July 1991.
- USGS, 1989. Water Resources Data, Idaho, Water Year 1988. United States Geological Survey Report No. ID-88-1. U. S. Geological Survey Water Resources Division, Boise, ID.
- USGS, 1990. Water Resources Data, Idaho, Water Year 1989. United States Geological Survey Report No. ID-89-1. U. S. Geological Survey Water Resources Division, Boise, ID.
- USGS, 1991. Water Resources Data, Idaho, Water Year 1990. United States Geological Survey Report No. ID-90-1. U. S. Geological Survey Water Resources Division, Boise, ID.
- Maddy, David V., et. al. 1991. National Water Information System User's Manual, Volume 2, Chapter 2. Water-Quality System, Version 91.1. U. S. Geological Survey, Reston, VA, January 1991.
- U.S. Environmental Protection Agency, Quality Criteria for Water 1986, EPA 440/5-86-001, 1986.
- Wilkinson, Leland. 1990. SYSTAT: The System for Statistics. SYSTAT, Inc., Evanston, IL.

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX A

Concurrent Monitoring  
Station Descriptions

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UI/IWRRRI: FH14N      STORET: 2060306      Type: Fish Hatchery  
NAME: Blue Lakes Trout Farm Fish Processing Plant

Elevation:      3130.0              River Mile:      610.0  
Latitude:      42° 36' 39"      Longitude:      114° 28' 54"  
USGS Township/Range/Section: T09S R17E S29 DAC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Twin Falls Quad). River mile indicates the discharge point into the Snake River. Access is via the Blue Lakes Country Club road. The station monitors the effluent from the Blue Lakes Trout Farm processing plant. Station is located on the outlet of the final treatment pond at the 90 degree V notch weir. The v-notch weir was used to determine the flow.

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UI/IWRRRI: FH15N      STORET: 2060307      Type: Fish Hatchery  
NAME: Blue Lakes Trout Farm Hatchery

Elevation:      3130.0              River Mile:      609.9  
Latitude:      42° 36' 41"      Longitude:      114° 29' 03"  
USGS Township/Range/Section: T09S R17E S29 DBD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Twin Falls Quad). River mile indicates the confluence with the Snake River. The effluent from Blue Lakes Trout Farm hatchery raceways is sampled in three locations using a 1 - 1 - 3 composite. The first composite site was the discharge location for the eastern ponds, where one part of the total sample volume was obtained. The second composite site was the discharge from the central ponds, where one part of the sample volume was obtained. The last compositing site was the combined discharge from the western pond just upstream of confluence with the central effluent discharge where three parts of the sample were obtained. Discharge was obtained from the rating curve for the inflow channel minus the flow from the hatchery complex Pristine Springs Trout Farm to the west which was measured through a rectangular weir.

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UI/IWRRRI: FH25N      STORET: 2060318      Type: Fish Hatchery  
NAME: Crystal Springs Hatchery

Elevation:      2990.0              River Mile:      600.5  
Latitude:      42° 39' 30"      Longitude:      114° 38' 28"  
USGS Township/Range/Section: T09S R15E S12 DBB



Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Niagara Springs Quad). Access is from Crystal Springs Road. Sample was derived from four compositing locations with equal portions of the sample from each location.

The four locations were the major discharges from the hatchery. The flow was determined by the three hatchery inflow measurement devices installed by the facility.

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UI/IWRRI: FH26S      STORET: 2060319      Type: Fish Hatchery  
NAME: Magic Valley Fish Hatchery

Elevation:      2990.0              River Mile:      600.0  
Latitude:      42° 39' 34"      Longitude:      114° 39' 15"  
USGS Township/Range/Section: T09S R15E S11 ADD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Niagara Springs Quad). Access is from River Road. Go north 0.5 miles from Cedar Draw. The sampling location is at the overflow structure of the final treatment pond prior to discharge into the river. The flow was estimated from hatchery records and by using a broad crested weir formula in conjunction the overflow structure of the final treatment pond.

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UI/IWRRI: FH28N      STORET: 2060321      Type: Fish Hatchery  
NAME: Rim View Hatchery

Elevation:      3010.0              River Mile:      598.8  
Latitude:      42° 39' 49"      Longitude:      114° 40' 36"  
USGS Township/Range/Section: T09S R15E S10 AAC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Niagara Springs Quad). Access is from Niagara Springs Road. Sample was an equal composite of the two discharges from the hatchery. Flow was determined from the effluent measurement weirs installed by the facility.

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UI/IWRRI: FH35S      STORET: 2060328      Type: Fish Hatchery  
NAME: Idaho Fish Breeders -- ( N drain with geothermal water )

Elevation:      2900.0              River Mile:      591.5  
Latitude:      42° 40' 02"      Longitude:      114° 48' 53"  
USGS Township/Range/Section: T09S R14E S04 DDC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Access is from River Road on Snake River side. Sampled at overflow of outlet of final treatment pond. The flow was estimated by applying a weir equation to the overflow outlet structure. The inflow to the fish hatchery consists of irrigation return flows and geothermal well water.

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UI/IWRRI: FH38S      STORET: 2060332      Type: Fish Hatchery  
NAME: Box Canyon Fish Hatchery

Elevation:    2920.0              River Mile:    588.4  
Latitude:     42° 42' 13"      Longitude:    114° 49' 37"  
USGS Township/Range/Section: T08S R14E S28 BCD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile is the location of the effluent discharge into the Snake River. Access is from River Road. Sample was an equal composite of the two primary effluent streams taken from the forebays of the discharge power plants. Flow was estimated from company reports.

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UI/IWRRI: FH46N      STORET: 2060343      Type: Fish Hatchery  
NAME: Buckeye Farm Fish Hatchery

Elevation:    2800.0              River Mile:    578.6  
Latitude:     42° 46' 24"      Longitude:    114° 55' 48"  
USGS Township/Range/Section: T07S R13E S33 DAC

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Hagerman). River mile indicates the confluence with the Snake River. Access is from U.S. Highway 30. Sampling location was at the culvert discharge from the last large pond into the Snake River. The flow was estimated from weir formulas applied to two overflow inlet structures to the pond.

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UI/IWRRI: FH48N      STORET: 2060345      Type: Fish Hatchery  
NAME: White Springs Fish Hatchery

Elevation:    2790.0              River Mile:    572.5  
Latitude:     42° 50' 54"      Longitude:    114° 54' 00"  
USGS Township/Range/Section: T07S R13E S02 BAD

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Hagerman). River mile indicates the confluence with the Snake River. Access to the sampling location is off from U.S. Highway 30 through Idaho Power Lower Salmon Falls lower substation via a gravel road leading north to the hatchery. The sampling location was at the hatchery tailrace outlet weir structure. The flow was obtain from the weir rating table.

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UI/IWRRI: FH49N      STORET: 2060348      Type: Fish Hatchery  
NAME: Birch Creek Fish Hatchery

Elevation:    2780.0              River Mile:    572.3  
Latitude:    42° 51' 05"      Longitude:    114° 54' 01"  
USGS Township/Range/Section: T06S R13E S34 CDD

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Hagerman). River mile indicates the confluence with the Snake River. Access to the sampling site was made through private property off of U. S. Highway 30. The sampling location was at the culvert discharge into the Snake River. The flow was estimated by application of a weir formula to a set of pond level overflow control structures.

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UI/IWRRI: IR02N      STORET: 2060289      Type: Irrigation RF  
NAME: Northside A Drain

Elevation:    4030.0              River Mile:    627.6  
Latitude:    42° 32' 06"      Longitude:    114° 10' 35"  
USGS Township/Range/Section: T10S R19E S24 DCA

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map. Sampling location on top of canyon rim approximately 0.25 miles above the mouth. This station could have a section subdivision legal description of either DCA or DCB since it is on the border between the two subsections. To reach this station go to the Valley road interchange with I-84 east of the Travelers Oasis. Take Valley road south for approximately 2.6 miles to Mr Cutlers farm, a white house with blue trim. Proceed west on farm road through draw until you cross the drain, turn south and proceed until you reach fence, park and follow drain on foot for approximately 300 yards. A large tree is located beside the sampling station. Flow was measured using current metering methods.

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UI/IWRRI: IRO3S      STORET: 2060290      Type: Irrigation RF  
NAME: Southside A10 Drain

Elevation:    3830.0              River Mile:    619.5  
Latitude:     42° 34' 15"      Longitude:    114° 19' 08"  
USGS Township/Range/Section: T10S R18E S11 BCC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map. Sampling location is on the canyon rim. Prior to the sampling location the drain flows through approximately 0.5 miles of wetlands with cattails. The flow is measured prior to the wetland reach through a pond discharge structure. To reach station go to intersection of 3700 east and 3900 north (Addison Ave), proceed east approximately 1/8 mile to farm road on northside of Addison Ave. Take farm road north to the last pond, then go west on the pond embankment to the north edge of the farm field. Follow edge of field north until road disappears, walk to canyon's edge. Sample stream approximately 150 feet upstream of canyon rim. Flow was determined by using a glory hole discharge equation and the head over the discharge pipe.

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UI/IWRRI: IRO4N      STORET: 2060291      Type: Irrigation RF  
NAME: Northside C55 Drain

Elevation:    3850.0              River Mile:    619.0  
Latitude:     42° 34' 38"      Longitude:    114° 19' 43"  
USGS Township/Range/Section: T10S R18E S03 DDC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map. River mile indicates point of discharge into the Snake River, at the upper end of Twin Falls pool. Sampling station is on top of the canyon rim, approximately 0.37 miles from the river immediately downstream of a farm pond. From the intersection of the I84 freeway, take the access road approximately 1.1 miles west to the farm pond. The flow was determined using current meter methods just downstream of the outlet structure from the pond.

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UI/IWRRI: IRO7S      STORET: 2060294      Type: Irrigation RF  
NAME: Southside Twin Falls Coulee

Elevation:    3750.0              River Mile:    618.0  
Latitude:     42° 35' 22"      Longitude:    114° 21' 01"  
USGS Township/Range/Section: T10S R18E S04 DAC

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map, Kimberly. The river mile indicates the confluence with the Snake River. Sampling location is on top of canyon rim just prior to the falls. Access is from the Falls Avenue East road and overland by foot for 0.75 miles. The flow of the station was determined by current metering the stream at the sampling site. Prior to the sampling site, the return flow stream flows approximately a half a mile through grazed pasture and is used by the landowner for irrigation of the pasture lands.

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UI/IWRRI: IR11S      STORET: 2060301      Type: Irrigation RF  
NAME: Southside East Perrine Coulee

Elevation:    3640.0              River Mile:    612.9  
Latitude:     42° 35' 31"      Longitude:    114° 25' 41"  
USGS Township/Range/Section: T09S R17E S35 DCD

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 Minute USGS quad map, Twin Falls. The sampling location was on top the canyon rim, 100 ft above the hydro power plant penstock inlet. The flow was measured using current metering methods off a wooden beam placed across the stream. Access is from Pole Line Road East. This irrigation return flow incorporates sub-surface ground-water returns and fish facility effluents.

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UI/IWRRI: IR12S      STORET: 2060302      Type: Irrigation RF  
NAME: Southside Main Perrine Coulee

Elevation:    3161.0              River Mile:    610.9  
Latitude:     42° 36' 26"      Longitude:    114° 27' 56"  
USGS Township/Range/Section: T09S R17E S33 CBC

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Twin Falls Quad). Sampling location is on the canyon floor approximately .15 miles from the mouth upstream of an old bridge, next to the eastern edge of the Canyon Springs Golf Course. The flow was determined using current metering methods.

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UI/IWRRI: IR16S      STORET: 2060308      Type: Irrigation RF  
NAME: Southside West Perrine Coulee

Elevation:    3140.0              River Mile:    609.2  
Latitude:     42° 36' 53"      Longitude:    114° 29' 53"  
USGS Township/Range/Section: T09S R17E S29 BDD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Twin Falls Quad). Sampling location on the canyon floor at the exit of a culvert across the ShoRock hydro power plant road. The flow was determined by current metering the discharge from the two culverts.

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UI/IWRRRI: IR17S      STORET: 2060309      Type: Irrigation RF  
NAME: Southside 43 Drainage

Elevation:    3130.0            River Mile:    608.3  
Latitude:     42° 37' 14"      Longitude:    114° 30' 39"  
USGS Township/Range/Section: T09S R17E S30 BAC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Jerome Quad). Sampling location on canyon floor at culvert crossing on ShoRock Hydropower access road. Flow was determined by current metering the culvert discharge.

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UI/IWRRRI: IR20S      STORET: 2060312      Type: Irrigation RF  
NAME: Southside 30 Drain

Elevation:    3500.0            River Mile:    605.3  
Latitude:     42° 37' 55"      Longitude:    114° 33' 33"  
USGS Township/Range/Section: T09S R16E S22 ADB

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Jerome Quad). River mile indicates the confluence with the Snake River. Sampling location is on the canyon rim above the mouth. Access is through private property owned by Elsie Hunt. Flow was determined by current metering.

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UI/IWRRRI: IR21S      STORET: 2060313      Type: Irrigation RF  
NAME: Southside Pigeon Cove Hydro Plant -- LQ and LS Drains

Elevation:    3000.0            River Mile:    603.6  
Latitude:     42° 38' 25"      Longitude:    114° 35' 23"  
USGS Township/Range/Section: T09S R16E S16 CCA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Jerome Quad). Sampling was performed in the tailrace of the power plant and flow was estimated from power production by the power plant owners. Access was made via the power plant access road with operator notification.

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UI/IWRRI: IR22S      STORET: 2060314      Type: Irrigation RF  
NAME: Southside LS2/39A Drain

Elevation:    3010.0              River Mile:    602.2  
Latitude:     42° 38' 52"      Longitude:    144° 36' 53"  
USGS Township/Range/Section: T09S R16E S18 ADA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Jerome Quad). River mile indicates its confluence with the Snake River. Sampling location is in the canyon near the river and just downstream of a farm road culvert. Access to the station is through Crystal Springs ranch at the bottom of Crystal Springs grade. Flow was determined by current metering.

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UI/IWRRI: IR23N      STORET: 2060315      Type: Irrigation RF  
NAME: Northside N42 Drain

Elevation:    3000.0              River Mile:    601.4  
Latitude:     42° 39' 10"      Longitude:    114° 37' 42"  
USGS Township/Range/Section: T09S R16E S07 CDC

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Niagara Springs Quad). River mile indicates the drain confluence with the Snake River. Sampling location in the canyon near the river. Flow rate is determined from a structure located on top of the canyon (Station IR23NT). Access is through Crystal Springs Fish Hatchery. Station was discontinued to access when the Crystal Lake dredging project was initiated.

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UI/IWRRI: IR23NT      STORET: 2060316      Type: Irrigation RF  
NAME: Northside N42 Drain on Canyon Rim

Elevation:    3420.0              River Mile:    601.4  
Latitude:     42° 39' 12"      Longitude:    114° 37' 47"  
USGS Township/Range/Section: T09S R16E S07 DAD

Description

This station monitors the N42 drain prior to falling over the canyon wall and disappearing into the talus. The drain is also monitored on the canyon floor where the amount of water in the channel is significantly less than that on top of the rim. Flow was estimated using a weir equation in conjunction with the outlet check structure of the pond located on the end of the drain upstream of the canyon rim. The sampling location

was just downstream of the check structure. The land surrounding the pond was grazed pasture land and animals use the pond for drinking and cooling.

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UI/IWRRI: IR24S      STORET: 2060317      Type: Irrigation RF  
NAME: Southside 39 Drain

Elevation: 2990.0      River Mile: 600.9  
Latitude: 42° 39' 16"      Longitude: 114° 38' 14"  
USGS Township/Range/Section: T09S R15E S12 DDB

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Niagara Springs Quad). River mile indicates the drain confluence with the Snake River. Sampling location is in the canyon, 100 yards upstream from the river confluence at the old Crystal Springs Ranch homestead. Flow was determined by current metering.

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UI/IWRRI: IR29S      STORET: 2060322      Type: Irrigation RF  
NAME: Southside I Drain

Elevation: 3000.0      River Mile: 598.0  
Latitude: 42° 39' 42"      Longitude: 114° 41' 25"  
USGS Township/Range/Section: T09S R15E S10 BCA

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Niagara Springs). River mile indicates the confluence with the Snake River. Sampling location is in the canyon near the mouth just above the River Road crossing on the eastern leg of the drain. Flow was determined by current metering the eastern leg culvert discharge and the western leg culvert. The drain splits into two streams as it cascades down the canyon face.

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UI/IWRRI: IR30N      STORET: 2060323      Type: Irrigation RF  
NAME: Northside J8 Drain

Elevation: 3295.0      River Mile: 595.1  
Latitude: 42° 40' 38"      Longitude: 114° 44' 32"  
USGS Township/Range/Section: T09S R15E S06 BDA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Niagara Springs). River mile indicates the confluence with the Snake River. Sampling location was on the canyon rim, downstream of farm ponds prior to the canyon rim. Flow was estimated from pond inlet trapezoidal flume



measurements and a weir formula applied to the pond bypass overflow structure. The drain flows through grazed pasture prior to sampling.

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UI/IWRRI: IR35S      STORET: 2060329      Type: Irrigation RF  
NAME: Southside N drain prior to Idaho Fish Breeders

Elevation:    3000.0              River Mile:    591.5  
Latitude:     42° 39' 58"      Longitude:    114° 49' 20"  
USGS Township/Range/Section: T09S R14E S09 BAA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile indicates the confluence with the Snake River after passing through the fish hatchery. Access is from River Road, through Idaho Fish Breeders hatchery and by foot. Sampling location is in the inflow stream above hatchery and pre-hatchery treatment ponds. Flow was estimated.

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UI/IWRRI: IR36N      STORET: 2060330      Type: Irrigation RF  
NAME: Northside S29 Drain

Elevation:    3200.0              River Mile:    589.5  
Latitude:     42° 41' 19"      Longitude:    114° 48' 26"  
USGS Township/Range/Section: T08S R14E S34 CBA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sampling location is on the canyon rim approximately 0.9 miles from the mouth just below a control structure. Flow was estimated by applying a weir equation to the control structure overflow. .

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UI/IWRRI: IR39N      STORET: 2060333      Type: Irrigation RF  
NAME: Northside S19/S Drains

Elevation:    3010.0              River Mile:    588.4  
Latitude:     42° 42' 00"      Longitude:    114° 48' 52"  
USGS Township/Range/Section: T08S R14E S28 DAD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). Access is from Box Canyon road through private property. River mile indicates the confluence of Blind Canyon stream with the Snake River after passing TS40N. Sampling location is approximately 0.5 miles from confluence with river at road crossing in Blind Canyon

upstream of fish hatchery. Flow was estimated by subtracting the Fish Hatchery discharge from the flow measured at TS40N.

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UI/IWRRI: IR42N      STORET: 2060338      Type: Irrigation RF  
NAME: Northside W26 Drain

Elevation:    3145.0            River Mile:    584.3  
Latitude:     42° 45' 29"      Longitude:    114° 50' 47"  
USGS Township/Range/Section: T08S R14E S05 CBD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Tuttle). River mile indicates the confluence with the Snake River. Sampling location is about 0.5 mile from mouth, on the canyon rim at the county road crossing. Flow was determined by current metering downstream of the county road bridge.

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UI/IWRRI: IS01N      STORET: 2060288      Type: Instream  
NAME: Snake River at Murtaugh Bridge

Elevation:    3840.0            River Mile:    630.5  
Latitude:     42° 29' 58"      Longitude:    114° 09' 04"  
USGS Township/Range/Section: T11S R20E S06 ADB

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map. Sampling location is at rapids upstream of Cottonwood Creek mouth, east of the Murtaugh Bridge. To reach the station go to the north side of Murtaugh Bridge and take the river access road to river's edge. The road has a BLM sign describing dangers to floaters of the river reach between Murtaugh Bridge and Twin Falls. Flow was estimated from the reported flow at the Milner USGS gage with no reach-gain adjustment.

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UI/IWRRI: IS05M      STORET: 2060292      Type: Instream  
NAME: Snake River above Twin Falls Pool

Elevation:    3525.0            River Mile:    619.0  
Latitude:     42° 34' 27"      Longitude:    114° 20' 03"  
USGS Township/Range/Section: T10S R18E S10 ABC

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad sheet. Sampling location is at upper end of pool just below the confluence of the C55 drain -- as far as a boat can travel upstream. The flow was estimated to be the average daily flow at the Kimberly gaging station less the flow

entering from the Vineyard Creek and Twin Falls Coulee.

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UI/IWRRI: IS08S      STORET: 2060295      Type: Instream  
NAME: Snake River below Twin Falls

Elevation:    3575.0            River Mile:    617.3  
Latitude:     42° 36' 35"      Longitude:    114° 22' 11"  
USGS Township/Range/Section: T10S R18E S04 BAD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map, Kimberly. The sampling location was on the south side of the river 100 to 150 yards below the power plant tailrace at the point where the power plant flow rejoins the flow from the northern portion of the falls. A grab sample was obtained using a bucket thrown out into the stream. The flow was taken from the USGS Kimberly gage located approximately 0.25 to 0.50 mile downstream of the sampling location.

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UI/IWRRI: IS10N      STORET: 2060300      Type: Instream  
NAME: Snake River below Shoshone Falls

Elevation:    3150.0            River Mile:    614.6  
Latitude:     42° 35' 55"      Longitude:    114° 24' 13"  
USGS Township/Range/Section: T09S R17E S36 CAD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map, Twin Falls. The sampling location was on the north bank 100 feet below the tail race of power plant. A bucket was thrown out into the middle of the river to obtain the sample. The flow for this station was estimated from the USGS Kimberly gage located approximately two miles upstream of the station with adjustments for Devils Corral Spring complex and Dierkes Lake of approximately 50 cfs.

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UI/IWRRI: IS13S      STORET: 2060305      Type: Instream  
NAME: Snake River at Blue Lakes Bridge

Elevation:    3140.0            River Mile:    610.5  
Latitude:     42° 36' 24"      Longitude:    114° 28' 32"  
USGS Township/Range/Section: T09S R17E S28 CCD

Description

Elevation, river miles, latitude and longitude taken from 7.5 minute USGS quad map (Twin Falls Quad). Sampling location is between the third and fourth piers of the old Blue Lakes bridge from the downstream side. A bucket was thrown over the bridge

railing to collect the sample. Flow was determined by correlation of discharge from the historical rating for the discontinued USGS gaging station at the bridge and the average daily flow at the USGS Kimberly gage.

---

UI/IWRRI: IS19S      STORET: 2060311      Type: Instream  
NAME: Snake River below Warm Creek

Elevation:    3100.0              River Mile:    607.6  
Latitude:     42° 37' 41"      Longitude:    114° 31' 00"  
USGS Township/Range/Section: T09S R17E S19 CBB

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Jerome Quad). River was sampled from the south side just downstream of the old bridge. The flow was estimated as the Snake River at Blue Lakes bridge station plus flow from Blue Lakes Trout Farm, Warm Creek, and irrigation return flows.

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UI/IWRRI: IS31S      STORET: 2060324      Type: Instream  
NAME: Snake River at Clear Lakes Bridge

Elevation:    2970.0              River Mile:    594.6  
Latitude:     42° 40' 14"      Longitude:    114° 45' 32"  
USGS Township/Range/Section: T09S R14E S01 DBD

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Thousand Springs). The river was sampled from the south side downstream of the Clear Lakes Bridge. The flow was estimated as the average daily discharge at the USGS Buhl gaging station upstream of the sampling location.

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UI/IWRRI: IS44M      STORET: 2060340      Type: Instream  
NAME: Snake River at Gridley Bridge -- Grab Samples

Elevation:    2875.0              River Mile:    583.0  
Latitude:     42° 45' 24"      Longitude:    114° 52' 29"  
USGS Township/Range/Section: T08S R13E S01 DCA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Tuttle and Hagerman). Composite sample obtained by grab bucket from upstream side of the bridge at three different locations along the bridge. Flow estimated from USGS gaging station at Lower Falls.

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UI/IWRRRI: IS44MDI STORET: 2060341 Type: Instream  
NAME: Snake River at Gridley Bridge -- Depth Integrated Sampling

Elevation: 2875.0 River Mile: 583.0  
Latitude: 42° 45' 24" Longitude: 114° 52' 29"  
USGS Township/Range/Section: T08S R13E S01 DCA

Description

This sampling procedure involved a composite of three depth integrated samples off the bridge at the same compositing locations used for the surface grab samples. All other information is the same IS44M.

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UI/IWRRRI: IS45S STORET: 2060342 Type: Instream  
NAME: Snake River below Upper Salmon Falls Power Plant

Elevation: 2810.0 River Mile: 579.6  
Latitude: 42° 46' 04" Longitude: 114° 55' 25"  
USGS Township/Range/Section: T08S R13E S03 BBA

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Hagerman). Sampled from tailrace of power plant and flows taken from the Lower Salmon Falls USGS gaging station with no adjustments. Sample composited from two different locations across the tailrace.

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UI/IWRRRI: IS47N STORET: 2060344 Type: Instream  
NAME: Snake River below Lower Salmon Falls Power Plant

Elevation: 2800.0 River Mile: 573.0  
Latitude: 42° 50' 29" Longitude: 114° 54' 11"  
USGS Township/Range/Section: T07S R13E S02 CCD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Hagerman). Access is from U.S. Highway 30. Composited sample from different locations along the Lower Salmon Falls power tailrace depending on which turbines were operating. The flow was taken as the average daily flow reported by the USGS from their Lower Salmon Falls gaging station located downstream of the dam.

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UI/IWRRRI: IS51N STORET: 2060351 Type: Instream  
NAME: Snake River below Bliss Dam

Elevation: 2655.0 River Mile: 559.9  
Latitude: 42° 54' 50" Longitude: 115° 04' 12"  
USGS Township/Range/Section: T06S R12E S07 DAC

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Ticeska). Sampled from the tailrace of the power plant on the north side. The flows were estimated from average daily flows reported by the USGS for the King Hill gage adjusted for Clover Creek flows and irrigation diversions.

Access to sampling site is through Idaho Power maintenance road after notification of power plant personnel.

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UI/IWRRRI: IS52S      STORET: 2060352      Type: Instream  
NAME: Snake River at King Hill Bridge

Elevation:    2525.0            River Mile:    545.3  
Latitude:     43° 00' 06"      Longitude:    115° 12' 27"  
USGS Township/Range/Section: T05S R10E S12 DAC

Description

Elevation, river mile, latitude and longitude taken from USGS 15 minute quad map (King Hill). Sampled from penstock tap of the King Hill Irrigation District pumping station located on the south bank of the Snake River downstream of the King Hill Bridge during the irrigation season. Grab sample obtained off of pumping station pier during the winter months.

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UI/IWRRRI: IS53N      STORET: 2060350      Type: Instream  
NAME: Snake River at Bliss Bridge

Elevation:    2675.0            River Mile:    565.7  
Latitude:     42° 54' 56"      Longitude:    114° 57' 55"  
USGS Township/Range/Section: T06S R13E S07 CBA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Bliss). Sampling location was on the northside of the river immediately downstream of the Bliss (Wiley) bridge. The flow was estimated as the average daily flow from the King Hill USGS gage adjusted for USGS reported average daily irrigation diversions and Clover Creek flows. Access to the station is made from Bliss via the Bliss to Bell Rapids road.

UI/IWRRRI: TS06N      STORET: 2060293      Type: Tributary  
NAME: Vineyard Lake

Elevation:    3450.0            River Mile:    617.8  
Latitude:     42° 35' 14"      Longitude:    114° 20' 19"  
USGS Township/Range/Section: T10S R18E S04 AAD

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map, Kimberly. Sampling location was located just above the estuary formed by the creek and Twin Falls Pool, at remains of an old water wheel. Access is by boat from the Twin Falls Pool. The flow was derived from the reported average daily flow at the USGS gage of the springs and estimates of the irrigation return flow entering the creek between the gaging station and the sampling station. This tributary integrates Snake Plain aquifer spring flow and irrigation return flows.

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UI/IWRRI: TS09NE      STORET: 2060298      Type: Tributary  
NAME: Devils Corral Springs -- East Leg

Elevation:      3400.0              River Mile:      616.8  
Latitude:      42° 36' 39"      Longitude:      114° 22' 01"  
USGS Township/Range/Section: T09S R18E S32 ADB

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map, Kimberly. This is the eastern discharge of the Devils Corral Spring complex. The site was sampled only one time due to access problems. Access is by walking from the north canyon rim on BLM land. The sampling location was in the pool just above the falls which discharge into the Snake River. The flow was estimated.

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UI/IWRRI: TS09NW      STORET: 2060299      Type: Tributary  
NAME: Devils Corral Springs -- West Leg

Elevation:      3400.0              River Mile:      616.0  
Latitude:      42° 36' 00"      Longitude:      114° 22' 33"  
USGS Township/Range/Section: T09S R18E S32 BDD

#### Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map, Kimberly. This station was located on the west leg of the spring complex which discharges into the Shoshone Falls power pool, due to access problems the station was never sampled.

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UI/IWRRI: TS18N      STORET: 2060310      Type: Tributary  
NAME: Warm Creek

Elevation:      3100.0              River Mile:      608.1  
Latitude:      42° 37' 33"      Longitude:      114° 30' 25"  
USGS Township/Range/Section: T09S R17E S19 DCA

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Jerome Quad). Access is via Blue Lakes Country Club road through Blue Lakes Trout Farm and Pristine Springs Trout Farm. Sampled at the culvert discharge into the Snake River and the flow was determined using weir equations in conjunction with a check structure upstream of the culvert.

---

UI/IWRRRI: TS19.5S    STORET: 2060148    Type: Tributary  
NAME: Rock Creek at Poleline Road

Elevation:    3200.0            River Mile:    3.7  
Latitude:    42° 35' 20"    Longitude:    114° 31' 45"  
USGS Township/Range/Section: T09S R16E S36 BCC

Description

Originally, this station was the S2 station in the Rock Creek Rural Clean Water Project. The Division of Environmental Quality quit sampling this station in October 1990. Flow was determined by reading the USGS staff gage at the location and applying the last USGS rating curve for Rock Creek at Poleline Road. The USGS discontinued flow data collection at this station in September 1990. (Filer Quad)

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UI/IWRRRI: TS27S            STORET: 2060320    Type: Tributary  
NAME: Southside Cedar Draw Creek

Elevation:    2990.0            River Mile:    599.1  
Latitude:    42° 39' 24"    Longitude:    114° 39' 53"  
USGS Township/Range/Section: T09S R15E S11 CAD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Niagara Springs Quad). River mile indicates the confluence with the Snake River. Access is from River Road. The sampling location is approximately 0.3 mile from mouth immediately downstream of River Road Bridge. Flow was taken as the average daily flow reported by the USGS at the gaging station upstream of the sampling location.

---

UI/IWRRRI: TS32N            STORET: 2060325    Type: Tributary  
NAME: Clear Lakes Outlet

Elevation:    2970.0            River Mile:    593.5  
Latitude:    42° 40' 05"    Longitude:    114° 46' 44"  
USGS Township/Range/Section: T09S R14E S02 DCC



Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sample is a composite of the stream prior to the power plant (3 parts) and 1 part of the stream after the power plant diversion prior to Washboard Falls. The flow was estimated from power company records and by current metering the stream above the falls. This tributary integrates Snake Plain aquifer discharges, fish hatchery effluents and recreational activities.

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UI/IWRRI: TS33S      STORET: 2060326      Type: Tributary  
NAME: Southside Mud Creek

Elevation:    2980.0              River Mile:    592.2  
Latitude:     42° 39' 34"      Longitude:    114° 47' 15"  
USGS Township/Range/Section: T09S R14E S11 BCD

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sampling location is approximately 0.9 mile upstream from the mouth at River Road bridge crossing at a discontinued USGS gaging station. Flow was estimated by applying the old rating equation to observed stages on the USGS staff gauge.

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UI/IWRRI: TS34S      STORET: 2060327      Type: Tributary  
NAME: Southside Deep Creek

Elevation:    2910.0              River Mile:    592.0  
Latitude:     42° 39' 29"      Longitude:    114° 48' 33"  
USGS Township/Range/Section: T09S R14E S10 CBB

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sampling location is approximately 0.4 mile from mouth at River Road crossing at an old USGS gaging station. Flow was estimated from USGS staff gauge observations and applying the old rating table.

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UI/IWRRI: TS37N      STORET: 2060331      Type: Tributary  
NAME: Banbury Springs

Elevation:    2875.0              River Mile:    589.3  
Latitude:     42° 41' 31"      Longitude:    114° 49' 21"  
USGS Township/Range/Section: T08S R14E S33 BDA

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sampling location is at the culvert near mouth and access to the site is through Camp Roach Boy Scout facility at the end of Bob Barton Highway. Flow estimated by current metering.

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UI/IWRRI: TS40N      STORET: 2060334      Type: Tributary  
NAME: Blind Canyon Creek

Elevation:    2920.0              River Mile:    588.4  
Latitude:     42° 42' 16"      Longitude:    114° 49' 09"  
USGS Township/Range/Section: T08S R14E S28 ACD

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sampling location was approximately 0.25 mile upstream of the mouth. Flow was determined by current metering.

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UI/IWRRI: TS41S      STORET: 2060335      Type: Tributary  
NAME: Salmon Falls Creek

Elevation:    2890.0              River Mile:    586.8  
Latitude:     42° 42' 39"      Longitude:    114° 51' 16"  
USGS Township/Range/Section: T08S R14E S30 AAB

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Thousand Springs). River mile indicates the confluence with the Snake River. Sampling location is at the old highway bridge on River Road approximately 0.5 miles above mouth. Flow is reported as the average daily flow published by the USGS at the gaging station upstream of the sampling station (upstream of the HWY 30 crossing). The stream flows through a grazed pasture upstream of the sampling station.

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UI/IWRRI: TS43N      STORET: 2060339      Type: Tributary  
NAME: Riley Creek

Elevation:    2945.0              River Mile:    583.1  
Latitude:     42° 45' 49"      Longitude:    114° 51' 46"  
USGS Township/Range/Section: T08S R14E S06 BDB

Description

Elevation, river mile, latitude and longitude taken from 7.5 minute USGS quad map (Tuttle). River mile indicates the confluence with the Snake River. Sampling location was at the county road bridge just northwest of the federal fish hatchery. Flow was determined by current metering.

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UI/IWRRI: TS50N      STORET: 2060349      Type: Tributary  
NAME: Malad River

Elevation:    2760.0              River Mile:    571.4  
Latitude:     42° 51' 47"      Longitude:    114° 54' 07"  
USGS Township/Range/Section: T06S R13E S34 BAC

Description

Elevation, river mile, latitude and longitude taken from USGS 7.5 minute quad map (Hagerman). River mile indicates the confluence with the Snake River. Sampled above bridge about 0.3 miles upstream of mouth at the USGS gaging station. The flow was taken as the USGS reported flow for the gaging station and the power flume. Access is made via gravel road off of Highway 30 to the south and west of US-30 Malad River crossing. The station legal description could be either BAC or BAD.

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX B

Historical Data Base  
Station List

Appendix B. Historical Water Quality Stations Selected from the National Water Quality Information Systems.

DATABASE	AGENCY	STATION ID	DESCRIPTIVE NAME	LATITUDE	LONGITUDE	TYPE
WATSTORE	USGS	13089500	DEVILS WASHBOWL SPRING NR KIMBERLY 10S 18E 04AAD1S	42-35-18	114-20-45	SPRING
WATSTORE	USGS	13089600	DEVILS WASHBOWL SPRING NR KIMBERLY 10S 18E 04AAD2S	42-35-18	114-20-45	SPRING
WATSTORE	USGS	13090100	DEVILS CORRAL SPRING UPPER OUTLET 09S 18E 32DD 1S	42-35-38	114-21-55	SPRING
WATSTORE	USGS	13090101	DEVILS CORRAL SPRING LOWER OUTLET 09S 18E 32BD 1S	42-36-01	114-22-30	SPRING
WATSTORE	USGS	13090300	09S 18E 31AC 1S UNNAMED SPR NO.1 NR TWIN FALLS	42-36-03	114-23-36	SPRING
WATSTORE	USGS	13090350	09S 18E 31AC 2S UNNAMED SPR NO.2 NR TWIN FALLS	42-35-52	114-23-55	SPRING
WATSTORE	USGS	13090900	BLUE LAKES SPRING AT HEAD NR TWIN 09S 17E 28ADD1S	42-36-54	114-27-52	SPRING
WATSTORE	USGS	13091000	BLUE LAKES SPRING NR TWIN FALLS ID 09S 17E 28DBA1S	42-36-53	114-28-06	SPRING
WATSTORE	USGS	13091200	PERRINE DITCH OUTLET TO BLUE LK SP NR TWIN FALLS	42-36-34	114-28-40	SPRING
WATSTORE	USGS	13091695	WARM CREEK SPRING NR TWIN FALLS ID 09S 17E 29BAB1S	42-37-10	114-29-19	SPRING
WATSTORE	USGS	13093300	ELLISON SPRING UPPER OUTLET 09S 16E 15DDC1S	42-38-17	114-33-40	SPRING
WATSTORE	USGS	13093391	CRYSTAL SPRING TRIB NO.1 09S 15E 12DAB2S	42-39-29	114-38-18	SPRING
WATSTORE	USGS	13093392	CRYSTAL SPRING TRIB NO.2 09S 15E 12DAB1S	42-39-29	114-38-19	SPRING
WATSTORE	USGS	13093396	CRYSTAL SPRINGS OUTLET NO.11 NR BUHL ID	42-39-39	114-38-50	SPRING
WATSTORE	USGS	13093398	CRYSTAL SPRINGS TRIB NO.8 NR BUHL 09S 15E 12BCA1S	42-39-42	114-38-59	SPRING
WATSTORE	USGS	13093650	CEDAR DRAW AT CRYSTAL SPRINGS ORCHARD NR BUHL ID	42-39-30	114-39-50	SPRING
WATSTORE	USGS	13093689	NIAGARA SPRING AT DIV NO.3 09S 15E 10AAA1S	42-39-53	114-40-26	SPRING
WATSTORE	USGS	13093700	NIAGARA SPRINGS NR BUHL ID 09S 15E 10AA 1S	42-39-48	114-40-25	SPRING
WATSTORE	USGS	13094300	CLEAR LAKES SPRING AT HEAD NR BUHL ID	42-40-29	114-46-17	SPRING
WATSTORE	USGS	13094320	CLEAR LAKES SPRING TRIB NO.2 09S 14E 01ADD1S	42-40-30	114-46-16	SPRING
WATSTORE	USGS	13094500	CLEAR LAKES SPRING AT OUTLET 09S 14E 02DCC1S	42-40-01	114-46-45	SPRING
WATSTORE	USGS	13094599	CLEAR LAKES SPRING NR BUHL ID (TAILRACE)	42-40-01	114-46-45	SPRING
WATSTORE	USGS	13095050	DEEP CREEK AT MOUTH NR BUHL ID	42-39-30	114-48-30	SPRING
WATSTORE	USGS	13095175	BRIGGS SPRING AT HEAD NR BUHL ID	42-40-26	114-48-30	SPRING
WATSTORE	USGS	13095190	BRIGGS CREEK R BANK DIV NR BUHL ID 09S 14E 03BA 1S	42-40-48	114-48-41	SPRING
WATSTORE	USGS	13095195	BRIGGS CREEK AT MOUTH NR BUHL ID 09S 14E 04DBD1S	42-40-20	114-48-59	SPRING
WATSTORE	USGS	13095300	BANBURY SPRINGS NR BUHL ID 08S 14E 33DAB1S	42-41-31	114-49-21	SPRING
WATSTORE	USGS	13095350	UNNAMED SP AB BLIND CYN NR BUHL ID 08S 14E 28CD 1S	42-41-51	114-49-21	SPRING
WATSTORE	USGS	13095400	BLIND CANYON SPRING NR BUHL ID 08S 14E 28BDD1S	42-42-12	114-49-20	SPRING
WATSTORE	USGS	13132595	SAND SPRING NR HAGERMAN ID 08S 14E 21ABA1S	42-43-28	114-49-00	SPRING
WATSTORE	USGS	13132600	SAND SPR CR BL PONDS NR HAGERMAN 08S 14E 17DDC1S	42-43-36	114-50-00	SPRING
WATSTORE	USGS	13132700	THOUSAND SPRINGS AT N TUNNEL 08S 14E 08DBA1S	42-44-44	114-50-25	SPRING
WATSTORE	USGS	13132790	08S 14E 06DAC1S	42-45-29	114-51-19	SPRING
WATSTORE	USGS	13132800	THOUSAND SPRINGS AT MOUTH 08S 14E 08DBC1S	42-44-23	114-50-27	SPRING
WATSTORE	USGS	13133300	LEWIS SPRING AT HEAD NR HAGERMAN ID	42-45-41	114-51-18	SPRING
WATSTORE	USGS	13133400	HATCHERY DOMESTIC SPRING 08S 14E 06ACD1S	42-45-42	114-51-20	SPRING
WATSTORE	USGS	13133800	RILEY CR BL LEWIS CR NR HAGERMAN 08S 14E 06AC 1S	42-45-50	114-51-40	SPRING
WATSTORE	USGS	13134600	BILLINGSLEY CREEK NR HAGERMAN ID 07S 14E 32BCD1S	42-46-35	114-50-55	SPRING
WATSTORE	USGS	13134800	BILLINGSLEY CR AT MOUTH NR HAGERMAN 07S 13E 11AC 1S	42-50-10	114-53-40	SPRING

DATABASE	AGENCY	STATION ID	DESCRIPTIVE NAME	LATITUDE	LONGITUDE	TYPE
WATSTORE	USGS	13135100	BIRCH CREEK NR HAGERMAN ID 06S 13E 34DD 1S	42-51-10	114-53-30	SPRING
WATSTORE	USGS	13152930	MALAD SPRING 3 AB LOWER MALAD DAM NR HAGERMAN ID	42-51-51	114-52-26	SPRING
WATSTORE	USGS	13153400	06S 13E 35BAA1S	42-51-53	114-53-12	SPRING
WATSTORE	USGS	13153713	SHORT CREEK NR BLISS ID 06S 13E 27BBB1S	42-52-46	114-54-26	SPRING
WATSTORE	USGS	4239541144025	09S 15E 10AAA1S	42-39-54	114-40-25	SPRING
WATSTORE	USGS	4240281144640	09S 14E 02ACD1S	42-40-28	114-46-40	SPRING
WATSTORE	USGS	424028114464002	09S 14E 02ACD2S	42-40-28	114-46-40	SPRING
WATSTORE	USGS	424028114464003	09S 14E 02ACD3S	42-40-28	114-46-40	SPRING
WATSTORE	USGS	424028114464004	09S 14E 02ACD4S	42-40-28	114-46-40	SPRING
WATSTORE	USGS	424028114464005	09S 14E 02ACD5S	42-40-28	114-46-40	SPRING
WATSTORE	USGS	424125114491100	08S 14E 33ACC1S	42-41-25	114-49-11	SPRING
WATSTORE	USGS	424128114491100	08S 14E 33ACB2S	42-41-28	114-49-11	SPRING
WATSTORE	USGS	424132114491100	08S 14E 33ACB1S	42-41-32	114-49-11	SPRING
WATSTORE	USGS	424239114494301	08S 14E 21CCC1S	42-42-39	114-49-43	SPRING
WATSTORE	USGS	425142114531601	06S 13E 35BCB1S	42-51-42	114-53-16	SPRING
WATSTORE	USGS	425246114542601	06S 13E 27BBB1S	42-52-46	114-54-26	SPRING
WATSTORE	USGS	425426114563101	06S 13E 17BAB1S	42-54-26	114-56-31	SPRING
WATSTORE	USGS	13085990	SNAKE RIVER AB MILNER DAM NR MILNER ID	42-31-37	114-00-15	SW
WATSTORE	USGS	13087900	MILNER LAKE AT MILNER DAM ID	42-31-26	114-00-40	SW
WATSTORE	USGS	13088000	SNAKE RIVER AT MILNER ID	42-31-41	114-01-04	SW
WATSTORE	USGS	13090000	SNAKE RIVER NR KIMBERLY ID	42-35-28	114-21-34	SW
WATSTORE	USGS	13090995	SNAKE RIVER AB BLUE LAKES SPRING NR TWIN FALLS ID	42-36-00	114-27-40	SW
WATSTORE	USGS	13091500	BLUE LAKES OUTLET NR TWIN FALLS ID	42-36-30	114-28-34	SW
WATSTORE	USGS	13091700	WARM CREEK NR TWIN FALLS ID	42-37-15	114-29-55	SW
WATSTORE	USGS	13093000	ROCK CREEK NR TWIN FALLS ID	42-35-37	114-31-44	SW
WATSTORE	USGS	13093040	LQ2 COULEE NR TWIN FALLS ID	42-37-07	114-32-03	SW
WATSTORE	USGS	13093095	ROCK CREEK NR MOUTH NR TWIN FALLS ID	42-37-25	114-31-58	SW
WATSTORE	USGS	13093375	SNAKE RIVER AB CRYSTAL SPRINGS NR JEROME ID	42-38-58	114-36-59	SW
WATSTORE	USGS	13093394	CRYSTAL SPRING AT HEAD NR BUHL ID	42-39-34	114-38-32	SW
WATSTORE	USGS	13093499	INFLOW AT CEDAR DRAW NR FILER ID	42-37-20	114-39-11	SW
WATSTORE	USGS	13093510	LF COULEE NR MOUTH NR FILER ID	42-37-22	114-39-47	SW
WATSTORE	USGS	13093520	I10 COULEE NR FILER ID	42-38-32	114-40-24	SW
WATSTORE	USGS	13093530	CEDAR DRAW AB MOUTH NR FILER ID	42-38-57	114-39-33	SW
WATSTORE	USGS	13094000	SNAKE RIVER NR BUHL ID	42-39-58	114-42-41	SW
WATSTORE	USGS	13094600	SNAKE RIVER BL CLEAR LAKES SPRING NR BUHL ID	42-39-54	114-46-52	SW
WATSTORE	USGS	13094700	MUD CREEK NR BUHL ID	42-39-34	114-47-16	SW
WATSTORE	USGS	13095200	BRIGGS CREEK NR BUHL ID	42-40-20	114-49-00	SW
WATSTORE	USGS	13095500	BOX CANYON SPRING NR WENDELL ID	42-42-25	114-48-45	SW
WATSTORE	USGS	13095600	BOX CANYON SPRINGS AT MOUTH NR WENDELL ID	42-42-20	114-49-20	SW
WATSTORE	USGS	13108150	SALMON FALLS CREEK NR HAGERMAN ID	42-41-47	114-51-15	SW
WATSTORE	USGS	13108160	SNAKE RIVER AB 100 SPRINGS NR HAGERMAN ID	42-43-27	114-50-48	SW
WATSTORE	USGS	13132801	SNAKE RIVER BL THOUSAND SPRINGS NR HAGERMAN ID	42-45-26	114-52-01	SW
WATSTORE	USGS	13135000	SNAKE RIVER BL LOWER SALMON FALLS NR HAGERMAN ID	42-50-55	114-54-02	SW

DATABASE	AGENCY	STATION ID	DESCRIPTIVE NAME	LATITUDE	LONGITUDE	TYPE
WATSTORE	USGS	13152850	BIG WOOD RIVER AT UPPER MALAD DAM NR HAGERMAN ID	42-51-57	114-52-05	SW
WATSTORE	USGS	13152900	COVE CREEK NR HAGERMAN ID	42-52-01	114-52-06	SW
WATSTORE	USGS	13153772	SNAKE RIVER AT SHOESTRING RD NR BLISS ID	42-54-54	114-57-53	SW
WATSTORE	USGS	13154500	SNAKE RIVER AT KING HILL ID	43-00-08	115-12-06	SW
WATSTORE	USGS	423601114273500	SNAKE RIVER BL PERRINE BRIDGE NR TWIN FALLS ID	42-36-01	114-27-35	SW
WATSTORE	USGS	423638114290500	SNAKE R AT BLUE LAKES SPR OUTLET	42-36-38	114-29-05	SW
WATSTORE	USGS	423638114291800	SNAKE RIVER BL BLUE LAKES OUTLET	42-36-38	114-29-18	SW
WATSTORE	USGS	423822114332900	IRRIG RETURN FLOW TO SNAKE RIVER09S-16E-15DDA	42-38-22	114-33-29	SW
WATSTORE	USGS	424749114531901	07S 13E 26AAA1 DRAIN WELL INFLOW FROM POND	42-47-49	114-53-19	SW
WATSTORE	USGS	424858114535401	07S 13E 14CAD2 DRAIN WELL INFLOW	42-48-58	114-53-54	SW
WATSTORE	USGS	424859114540001	07S 13E 14CAD1 DRAIN WELL INFLOW	42-48-59	114-54-00	SW
WATSTORE	USGS	424913114534901	07S 13E 14ACC1 DRAIN WELL INFLOW	42-49-13	114-53-49	SW
STORET	EPA/INT	062068	DRY CREEK AT 3425 NORTH ROAD	42-29-33	114-08-36	STREAM
STORET	1119C050	153001	LAKE MILNER AT MILNER DAM	42-31-26	114-00-40	LAKE
STORET	1119C050	153024	LAKE MILNER AT MILNER DAM - AUTO MONITOR DAILY AVE	42-31-26	114-00-40	LAKE
STORET	IDHW/DEQ	2060111	SNAKE RIVER AT MILNER DAM	42-31-30	114-00-40	STREAM
STORET	1119C050	150029	SNAKE RIVER BELOW MILNER DAM	42-31-40	114-01-00	STREAM
STORET	USBR	CSP110	SNAKE RIVER BELOW MILNER DAM, 0.4 MILE	42-31-41	114-01-04	STREAM
STORET	EPA/INT	062067	DRAIN TO SNAKE @ RD @ T10S-R19E NE/NE SEC 24	42-32-21	114-10-13	STREAM
STORET	EPA/INT	062069	DRAIN BELOW SEDIMENT POND @ T10S-R18E NE/NE SEC 10	42-34-37	114-18-56	STREAM
STORET	IDHW/DEQ	2060234	VINYARD CREEK BELOW DRAIN CONFLUENCE	42-35-10	114-20-46	STREAM
STORET	EPA/INT	062061	PERRINE COULEE AT POLELINE ROAD	42-35-30	114-28-15	STREAM
STORET	EPA/INT	062063	PERRINE 1 DRAIN @ T9S-R17E SE/SW SEC 35	42-35-31	114-26-02	STREAM
STORET	IDHW/DEQ	2060242	PERRINE COULEE AT MOUTH	42-35-33	114-26-01	STREAM
STORET	EPA/INT	062065	DRAIN TO SNAKE @ RD @ T9S-R18E SW/SW SEC 35	42-35-35	114-19-31	STREAM
STORET	EPA/INT	06J001	ROCK CREEK AT 4100 NORTH ROAD (POLELINE)	42-35-40	114-31-48	STREAM
STORET	EPA/INT	062062	39 LATERAL AT HWY 93 T9S-R17E NW/SW SEC 34	42-35-43	114-27-21	STREAM
STORET	EPA/INT	062060	PERRINE COULEE AT ROAD IN SNAKE CANYON	42-35-52	114-28-18	STREAM
STORET	EPA/NEIC	710603	SNAKE R ABOVE PERRINE COULEE	42-36-15	114-27-45	STREAM
STORET	EPA/NEIC	710604	PERRINE COULEE NEAR MOUTH	42-36-15	114-27-55	STREAM
STORET	IDHW/DEQ	2060225	SNAKE R @ CANYON SPRGS GOLF COURSE IN TWIN FALLS	42-36-25	114-28-30	STREAM
STORET	IDHW/DEQ	2060137	COULEE @ N 4200 RD E OF 2600 E RD	42-36-30	114-32-17	STREAM
STORET	EPA/INT	062059	43 LATERAL AT 4200 N ROAD T9S-R17E NW/NW SEC 30	42-36-43	114-30-54	STREAM
STORET	EPA/NEIC	710613	TWIN FALLS WWTP - EFFLUENT	42-37-00	114-29-13	WASTE
STORET	EPA/NEIC	710602	SNAKE R ABOVE ROCK CREEK	42-37-00	114-29-15	STREAM
STORET	1119C050	150035	ROCK CR NR MOUTH BLW TWIN FALLS	42-37-00	114-33-00	STREAM
STORET	EPA/INT	062055	LQ DRAIN AT 2400 EAST ROAD	42-37-12	114-34-25	STREAM
STORET	IDHW/DEQ	2060138	COULEE NR ROCK CR MOUTH	42-37-12	114-32-05	STREAM
STORET	EPA/INT	062056	30 LATERAL AT 4300 NORTH ROAD	42-37-22	114-33-21	STREAM
STORET	IDHW/DEQ	151163	ROCK CR NR MOUTH NR TWIN FALLS	42-37-25	114-31-58	STREAM
STORET	IDHW/DEQ	2060146	ROCK CR NR MOUTH NR TWIN FALLS	42-37-25	114-31-58	STREAM
STORET	IDHW/DEQ	2060021	CEDAR DRAW @ USGS NW OF FILER NR BUHL	42-37-25	114-39-10	STREAM
STORET	EPA/INT	062054	LS DRAIN AT ROAD T9S R16E SW/NW SEC 21	42-37-50	114-35-38	STREAM

DATABASE	AGENCY	STATION ID	DESCRIPTIVE NAME	LATITUDE	LONGITUDE	TYPE
STORET	IDHW/DEQ	2060226	SNAKE RIVER BL ROCK CR NR JEROME	42-38-00	114-33-35	STREAM
STORET	IDHW/DEQ	2060024	IRRIGATION DITCH NR CRYSTAL SPG NR FISH HATC	42-38-00	114-40-00	STREAM
STORET	IDHW/DEQ	2060281	WESTSIDE DRAIN - N23	42-38-02	114-31-00	STREAM
STORET	EPA/INT	062058	"K" DRAIN AT JEROME GOLF COURSE DRIVE	42-38-12	114-30-28	STREAM
STORET	EPA/INT	062053	13 LATERAL AT ROAD N BUNDY SEC 20 T9S-R16E	42-38-13	114-36-12	STREAM
STORET	EPA/INT	062050	LN2 DRAIN AT T9S-R16E SE/SE SEC 18 AT ROAD	42-38-13	114-37-00	STREAM
STORET	EPA/INT	062051	39A LATERAL AT ROAD T9S-R16E SE/SW SEC 18	42-38-13	114-37-27	STREAM
STORET	EPA/NEIC	710605	ROCK CREEK NEAR MOUTH	42-38-20	114-31-30	STREAM
STORET	EPA/INT	062057	DRAIN TO SNAKE AT ROAD T9S-R16E SE/SE SEC 15	42-38-23	114-33-27	STREAM
STORET	IDHW/DEQ	2060280	EASTSIDE DRAIN - N30	42-38-25	114-33-00	STREAM
STORET	EPA/NEIC	710601	SNAKE R BELOW ROCK CREEK	42-38-32	114-40-24	STREAM
STORET	IDHW/DEQ	2060153	CEDAR DRAW NEAR FILER	42-39-05	114-39-32	STREAM
STORET	EPA/INT	062052	DRAIN TO SNAKE AT ROAD T9S-R16E NE/NE SEC 17	42-39-07	114-35-55	STREAM
STORET	IDHW/DEQ	2060213	NIAGARA SPGS CR ABOUT 100M UPSTRM OF MOUTH	42-39-09	114-40-18	STREAM
STORET	USBR	SAL105	CEDAR DRAW .5 MI FROM MOUTH	42-39-20	114-39-35	STREAM
STORET	EPA/INT	062048	CEDAR DRAW AT ROAD IN SNAKE CANYON	42-39-24	114-39-52	STREAM
STORET	EPA/INT	062049	DRAIN TO SNAKE RIVER AT 450 EAST ROAD	42-39-25	114-36-55	STREAM
STORET	EPA/INT	062041	DEEP CREEK AT ROAD T9S-R14E NW/SE SEC 10	42-39-28	114-48-35	STREAM
STORET	EPA/INT	062047	31A LATERAL AT ROAD IN SNAKE CANYON	42-39-30	114-40-37	STREAM
STORET	IDHW/DEQ	2060249	DEEP CR AB MOUTH - SECTION 10	42-39-30	114-48-33	STREAM
STORET	IDHW/DEQ	2060085	DEEP CR AT MOUTH	42-39-30	114-38-45	STREAM
STORET	USBR	SAL104	DEEP CREEK NEAR AUTO WRECKING YARD	42-39-35	114-48-45	STREAM
STORET	IDHW/DEQ	2060196	CRYSTAL SPGS HATCHERY RACEWAY EFFL	42-39-39	114-38-33	STREAM
STORET	EPA/INT	062046	"I" DRAIN AT ROAD IN SNAKE CANYON	42-39-40	114-41-22	STREAM
STORET	IDHW/DEQ	2060197	CRYSTAL SPGS DISCHARGE TO LAKE SYSTEM	42-39-43	114-38-39	STREAM
STORET	IDHW/DEQ	2060212	NIAGARA SPRINGS CF BL ID POWER HATCHERY OUTFLALL	42-39-45	114-40-23	STREAM
STORET	IDHW/DEQ	2060217	IDAHO POWER RACEWAY EFFLUENT	42-39-46	114-40-27	STREAM
STORET	IDHW/DEQ	2060216	RIM VIEW RACEWAY EFFLUENT	42-39-47	114-40-41	STREAM
STORET	IDHW/DEQ	2060022	CEDAR DRAW NR MOUTH, COUNTY RD	42-39-50	114-39-55	STREAM
STORET	IDHW/DEQ	151056	SNAKE RIVER NORTH OF BUHL, IDAHO	42-40-00	114-42-40	STREAM
STORET	EPA/INT	062040	"N" DRAIN AT ROAD AT MOUTH	42-40-02	114-48-52	STREAM
STORET	IDHW/DEQ	2060227	SNAKE R 5 MI N OF BUHL @ BR	42-40-10	114-45-30	STREAM
STORET	EPA/INT	062045	J DRAIN BLW SETTLING PONDS @ SNAKE CANYON LIP	42-40-41	114-44-26	STREAM
STORET	EPA/INT	062039	CEDAR DRAW (GOODING CO) AT BOB BARTON HWY	42-41-46	114-48-18	STREAM
STORET	EPA/INT	061001	SALMON FALLS CREEK AT ROAD BLW HWY 30	42-42-38	114-52-15	STREAM
STORET	IDHW/DEQ	2060228	SNAKE R 2 HWY 30 BR NYR HAGERMAN @ GRIDLEY BR	42-45-25	114-52-30	STREAM
STORET	IDHW/DEQ	2060048	RILEY CREEK AT MOUTH	42-45-30	114-52-50	STREAM
STORET	EPA/INT	062036	BILLINGSLEY CREEK AT HWY 30	42-47-38	114-56-00	STREAM
STORET	EPA/INT	062037	BUCKEYE DITCH AT MOUTH T7S-R13E SE/NE SEC 28	42-47-38	114-56-00	STREAM
STORET	IDHW/DEQ	151167	BANCROFT SPRINGS	42-56-16	115-09-20	STREAM



MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX C

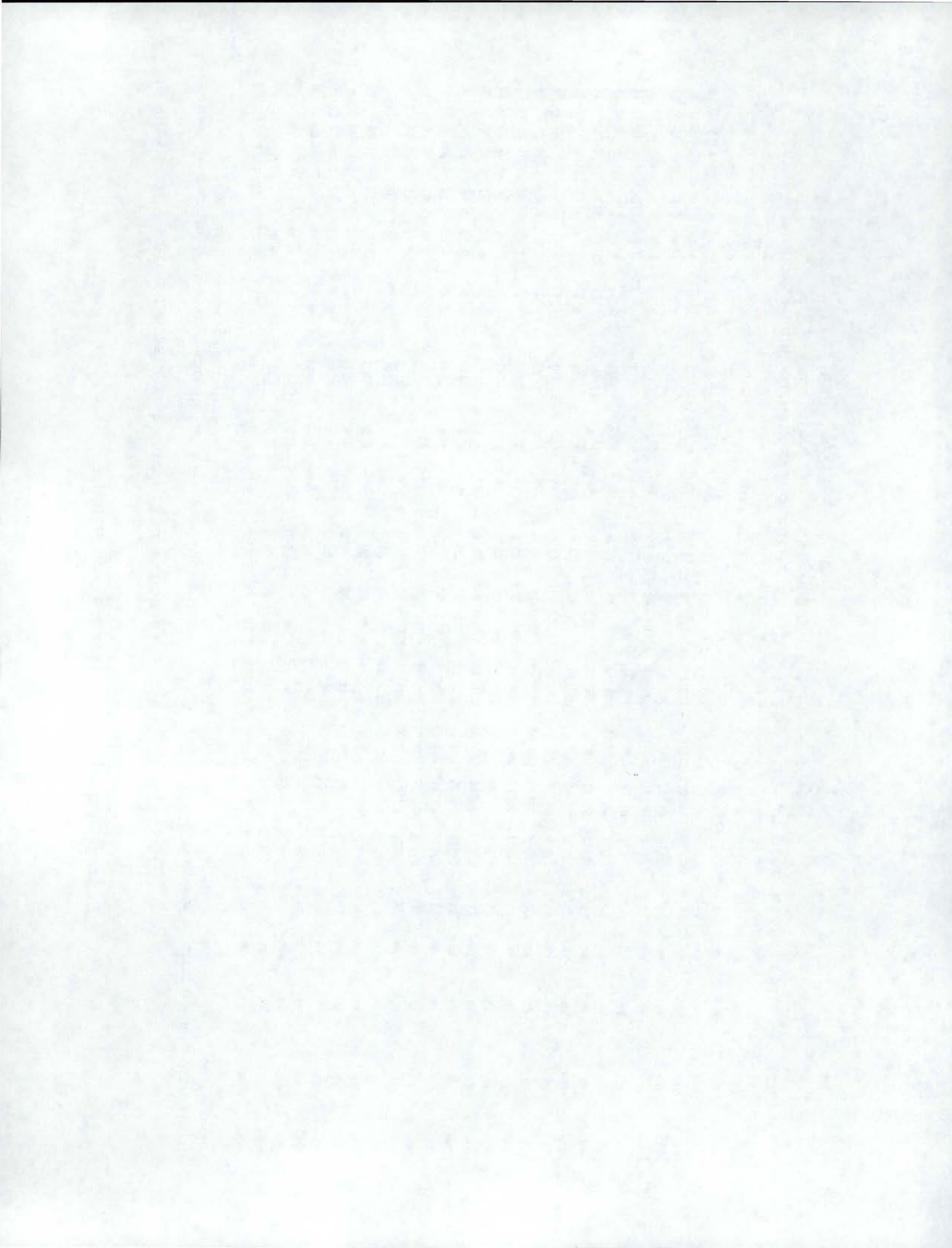
Concurrent Monitoring  
Water Quality Data

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

FH14N -- Blue Lakes Trout Farm Fish Processing Plant

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity µmhos						Ammonia mg/l-N	NO2+NO3	Organic	Ortho	Total	BOD mg/l	A µg/l	Coliform	Strep
06-25-90	1550	22.2	20.6	1.1	-NA-	-NA-	-NA-	0.06	50	32.0	35.100	0.026	41.10	0.684	5.85	-NA-	-NA-	-NA-	-NA-
07-02-90	1100	30.6	19.8	2.4	1780	6.6	-NA-	0.19	46	99.0	27.200	0.008	43.20	5.150	5.13	-NA-	-NA-	-NA-	-NA-
07-09-90	1050	26.7	19.6	1.5	1650	6.3	-NA-	0.09	50	46.0	33.900	0.011	47.10	6.960	6.68	-NA-	-NA-	-NA-	-NA-
07-16-90	0940	26.4	19.9	2.9	1600	6.3	-NA-	0.09	42	87.0	31.700	(0.005)	44.10	6.850	6.05	-NA-	-NA-	-NA-	-NA-
07-23-90	0950	26.7	20.9	2.6	1750	6.6	-NA-	0.08	60	108.0	42.000	(0.005)	50.60	10.000	8.74	-NA-	-NA-	-NA-	-NA-
07-30-90	1325	36.5	20.2	3.1	1650	6.5	-NA-	0.08	38	100.0	44.100	(0.005)	40.60	5.420	6.68	-NA-	-NA-	-NA-	-NA-
08-06-90	1010	24.0	19.2	2.3	1780	6.8	-NA-	0.08	70	104.0	42.500	0.006	36.30	5.180	6.04	-NA-	-NA-	-NA-	-NA-
08-13-90	0930	20.5	19.0	2.2	1690	6.8	-NA-	0.07	56	93.0	16.800	(0.005)	26.20	6.700	6.56	-NA-	-NA-	-NA-	-NA-
08-20-90	0935	17.5	17.0	1.2	1780	6.9	-NA-	0.01	56	135.0	13.800	0.013	40.20	5.220	5.49	-NA-	-NA-	-NA-	-NA-
08-27-90	0930	19.5	16.5	1.5	1990	6.9	-NA-	0.03	100	160.0	24.900	(0.005)	35.90	5.360	6.06	-NA-	-NA-	-NA-	-NA-
09-04-90	0940	24.2	18.5	2.3	1650	6.7	-NA-	0.06	106	114.0	23.400	(0.005)	30.60	5.360	5.14	-NA-	-NA-	-NA-	-NA-
09-10-90	1505	26.5	20.0	0.7	1610	6.7	-NA-	0.07	98	105.0	27.800	(0.005)	55.90	5.460	6.33	-NA-	-NA-	-NA-	-NA-
09-17-90	0945	16.8	17.5	2.5	1710	7.1	-NA-	0.10	80	-NA-	21.500	(0.005)	51.90	6.140	8.02	-NA-	-NA-	-NA-	-NA-
09-24-90	1016	25.9	17.6	0.2	1700	6.6	-NA-	0.05	94	-NA-	44.300	0.015	48.00	5.560	7.37	-NA-	-NA-	-NA-	-NA-
10-01-90	1044	20.8	16.4	1.6	1840	7.5	-NA-	0.07	102	140.0	35.800	(0.005)	45.00	6.450	7.89	-NA-	-NA-	-NA-	-NA-
10-08-90	0935	7.9	13.0	1.0	2720	6.7	-NA-	0.05	92	120.0	43.600	(0.005)	47.50	5.210	6.20	-NA-	-NA-	-NA-	-NA-
10-15-90	0950	12.2	12.3	2.1	1830	6.7	-NA-	0.07	106	125.0	46.800	0.007	49.40	6.390	7.59	-NA-	-NA-	-NA-	-NA-
10-29-90	0945	15.6	12.2	1.9	1470	7.8	-NA-	0.02	72	35.0	38.700	0.018	35.80	3.400	3.42	-NA-	-NA-	-NA-	-NA-
11-05-90	0930	6.3	8.1	2.7	1800	7.1	-NA-	0.05	90	141.0	30.200	0.021	37.30	4.600	5.14	-NA-	-NA-	-NA-	-NA-
11-19-90	0940	4.3	7.4	1.3	1600	7.4	-NA-	0.08	48	23.0	29.400	(0.005)	42.50	3.840	4.85	-NA-	-NA-	-NA-	-NA-
11-26-90	1040	2.2	6.2	1.7	1500	7.4	-NA-	0.11	42	16.0	18.400	0.006	32.20	3.300	5.00	-NA-	-NA-	-NA-	-NA-
12-03-90	1030	0.5	4.0	1.6	1140	7.5	-NA-	0.10	48	13.0	11.600	0.040	17.40	1.670	2.97	-NA-	-NA-	-NA-	-NA-
12-10-90	1000	5.0	4.1	1.3	1170	7.4	-NA-	0.05	80	22.0	1.340	0.334	28.10	1.740	4.00	-NA-	-NA-	-NA-	-NA-
12-17-90	1005	-2.8	2.9	0.5	1090	7.5	-NA-	0.13	64	19.0	9.840	0.287	23.60	1.180	3.13	-NA-	-NA-	-NA-	-NA-
01-07-91	1330	3.9	4.6	3.8	800	8.0	-NA-	0.11	42	13.0	5.000	0.602	11.00	0.810	1.83	-NA-	-NA-	-NA-	-NA-
01-14-91	1042	6.2	8.0	2.4	1030	7.5	-NA-	0.14	84	19.0	12.600	0.021	29.20	2.260	3.80	-NA-	-NA-	-NA-	-NA-
01-21-91	1255	0.1	5.3	3.0	1010	7.6	-NA-	0.05	80	27.0	14.100	0.027	23.30	2.370	2.27	-NA-	-NA-	-NA-	-NA-

A number in parentheses indicates a value below minimum detection limit -- (MDL).



Middle Snake River Water Quality Survey  
Water Quality Data Report

FH15N -- Blue Lakes Trout Farm Hatchery

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-25-90	1600	34.3	18.7	6.2	-NA-	-NA-	-NA-	188.80	4	0.4	0.013	0.022	0.41	0.044	(0.05)	-NA-	-NA-	-NA-	-NA-
07-02-90	1015	28.6	17.0	6.6	550	7.8	-NA-	188.80	2	1.0	0.161	2.010	0.40	0.041	0.07	-NA-	-NA-	-NA-	-NA-
07-09-90	1015	26.6	16.2	7.1	580	7.4	-NA-	189.72	2	0.9	0.150	1.930	0.42	0.042	0.08	-NA-	-NA-	-NA-	-NA-
07-16-90	1005	28.2	16.8	7.7	525	7.3	-NA-	188.80	6	0.5	0.154	1.980	0.40	0.064	(0.05)	-NA-	-NA-	-NA-	-NA-
07-23-90	1020	27.9	17.1	7.5	550	7.3	-NA-	188.12	10	22.0	0.117	1.710	0.54	0.075	0.07	-NA-	-NA-	-NA-	-NA-
07-30-90	1345	36.5	18.8	7.3	580	7.4	-NA-	188.12	(2)	0.6	0.288	1.720	1.17	0.075	0.11	-NA-	-NA-	-NA-	-NA-
08-06-90	1035	29.3	16.9	7.2	510	7.9	-NA-	188.46	4	1.0	0.208	1.900	0.50	0.063	0.05	-NA-	-NA-	-NA-	-NA-
08-13-90	1000	21.0	16.5	7.3	520	8.1	-NA-	179.82	6	0.4	0.133	1.790	0.78	0.069	0.06	-NA-	-NA-	-NA-	-NA-
08-20-90	0955	19.0	16.0	7.9	560	8.0	-NA-	175.40	6	0.8	0.143	2.030	0.33	0.065	0.23	-NA-	-NA-	-NA-	-NA-
08-27-90	0955	19.5	16.0	7.7	630	8.1	-NA-	173.50	6	0.6	0.276	1.940	0.36	0.053	0.07	-NA-	-NA-	-NA-	-NA-
09-04-90	1000	24.2	17.0	7.8	570	8.1	-NA-	175.60	18	1.0	0.205	1.840	0.37	0.067	0.08	-NA-	-NA-	-NA-	-NA-
09-10-90	1520	26.5	18.0	7.7	450	8.0	-NA-	166.80	4	1.2	0.287	1.770	0.49	0.057	0.07	-NA-	-NA-	-NA-	-NA-
09-17-90	1005	19.2	15.9	7.9	500	8.0	-NA-	179.47	3	-NA-	0.298	1.850	0.31	0.063	0.07	-NA-	-NA-	-NA-	-NA-
09-24-90	1110	25.8	17.1	10.1	570	8.0	-NA-	175.45	4	-NA-	0.175	2.010	0.44	0.067	0.09	-NA-	-NA-	-NA-	-NA-
10-01-90	1003	18.2	15.7	7.4	600	7.9	-NA-	178.30	3	(1.0)	0.217	1.900	0.34	0.055	0.06	-NA-	-NA-	-NA-	-NA-
10-08-90	1010	10.1	14.2	8.0	630	7.8	-NA-	175.90	10	1.0	0.240	2.070	1.02	0.074	0.14	-NA-	-NA-	-NA-	-NA-
10-15-90	1015	11.9	14.8	7.9	610	7.8	-NA-	176.38	4	(1.0)	0.219	1.980	0.38	0.073	0.06	-NA-	-NA-	-NA-	-NA-
10-22-90	0943	11.1	14.8	7.9	640	7.7	-NA-	172.30	4	0.3	0.140	1.950	0.51	0.062	0.06	-NA-	-NA-	-NA-	-NA-
10-29-90	1015	16.7	15.3	7.6	580	7.8	-NA-	172.80	5	1.0	0.263	1.900	0.48	0.064	0.05	-NA-	-NA-	-NA-	-NA-
11-05-90	0946	5.8	13.6	7.7	610	5.8	-NA-	171.30	8	1.3	0.189	1.980	0.49	0.088	0.08	-NA-	-NA-	-NA-	-NA-
11-19-90	1012	4.0	14.1	7.7	640	7.8	-NA-	173.90	2	0.3	0.164	1.930	0.43	0.062	0.07	-NA-	-NA-	-NA-	-NA-
11-26-90	1100	2.1	12.6	8.1	600	7.8	-NA-	173.86	17	0.7	0.205	1.950	0.48	0.048	0.10	-NA-	-NA-	-NA-	-NA-
12-03-90	1100	2.5	13.3	8.0	620	7.7	-NA-	177.40	2	1.3	0.279	1.940	0.48	0.067	0.10	-NA-	-NA-	-NA-	-NA-
12-10-90	1045	6.8	13.6	7.4	600	7.6	-NA-	175.90	2	0.5	0.376	1.140	0.35	0.051	0.06	-NA-	-NA-	-NA-	-NA-
12-17-90	1028	-2.2	13.2	6.9	610	7.6	-NA-	176.87	2	1.0	0.271	1.980	0.57	0.093	0.09	-NA-	-NA-	-NA-	-NA-
01-07-91	1350	3.5	14.0	8.0	600	8.1	-NA-	176.40	14	3.0	0.121	1.950	0.49	0.067	0.06	-NA-	-NA-	-NA-	-NA-
01-14-91	1113	6.4	13.8	7.7	580	8.1	-NA-	177.15	6	1.2	0.246	1.950	0.45	0.064	0.07	-NA-	-NA-	-NA-	-NA-
01-21-91	1320	0.5	14.1	7.8	600	8.1	-NA-	176.15	5	1.3	0.295	2.020	0.52	0.076	0.05	-NA-	-NA-	-NA-	-NA-

A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

FH25N -- Crystal Springs Hatchery

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total			BOD	A
06-26-90	1130	28.5	16.2	5.2	510	8.1	-NA-	190.00	6	0.5	0.329	2.260	0.73	0.085	0.10	-NA-	-NA-	-NA-	-NA-
07-02-90	1400	23.0	15.5	7.8	530	8.3	-NA-	191.50	6	0.8	0.416	2.130	0.73	0.088	0.11	-NA-	-NA-	-NA-	-NA-
07-10-90	1204	27.3	15.0	5.5	-NA-	8.3	-NA-	194.00	4	0.6	0.332	2.290	0.41	0.054	0.08	-NA-	-NA-	-NA-	-NA-
07-16-90	1010	20.5	15.0	8.9	500	6.6	-NA-	196.00	6	0.5	0.305	2.350	0.62	0.089	0.07	-NA-	-NA-	-NA-	-NA-
07-24-90	1045	24.0	15.0	8.4	560	-NA-	-NA-	197.50	6	0.7	0.303	2.070	0.58	0.101	0.09	-NA-	-NA-	-NA-	-NA-
07-30-90	1315	31.0	16.0	8.2	480	8.2	-NA-	201.50	4	0.8	0.332	1.880	0.75	0.106	0.09	-NA-	-NA-	-NA-	-NA-
08-07-90	1040	17.5	15.5	7.6	560	8.1	-NA-	200.00	10	0.5	0.287	1.540	0.53	0.095	0.10	-NA-	-NA-	-NA-	-NA-
08-13-90	0945	17.7	15.5	7.5	620	8.2	-NA-	202.50	4	0.7	0.276	1.930	0.61	0.101	0.12	-NA-	-NA-	-NA-	-NA-
08-21-90	0945	17.5	14.5	7.8	660	7.3	-NA-	204.75	12	0.5	0.885	0.043	0.53	0.087	0.10	-NA-	-NA-	-NA-	-NA-
08-27-90	1100	21.0	16.5	8.0	620	8.1	-NA-	207.00	4	0.7	0.418	2.370	0.51	0.092	0.11	-NA-	-NA-	-NA-	-NA-
09-04-90	1300	31.5	17.5	6.0	550	7.4	-NA-	207.50	1	2.0	0.403	2.230	0.44	0.100	0.10	-NA-	-NA-	-NA-	-NA-
09-10-90	1350	32.0	16.5	8.3	520	8.0	-NA-	207.50	6	1.0	0.342	2.230	0.85	0.100	0.14	-NA-	-NA-	-NA-	-NA-
09-18-90	1150	22.0	15.7	8.3	530	8.1	-NA-	211.25	4	-NA-	0.362	2.320	0.41	0.084	0.08	-NA-	-NA-	-NA-	-NA-
09-24-90	1235	28.4	16.6	10.4	630	7.9	-NA-	212.00	4	-NA-	0.228	2.470	0.67	0.090	0.08	-NA-	-NA-	-NA-	-NA-
10-02-90	1315	14.5	14.3	8.5	620	8.1	-NA-	213.50	4	2.0	0.324	2.400	0.71	0.082	0.09	-NA-	-NA-	-NA-	-NA-
10-08-90	1120	8.4	13.9	8.0	670	7.8	-NA-	216.25	8	1.0	0.354	2.590	0.56	0.085	0.11	-NA-	-NA-	-NA-	-NA-
10-16-90	1320	14.8	13.8	8.5	630	8.1	-NA-	217.50	6	(1.0)	0.378	2.450	0.61	0.089	0.10	-NA-	-NA-	-NA-	-NA-
10-22-90	1110	9.3	13.7	8.3	680	7.7	-NA-	219.00	4	0.7	0.357	2.480	0.87	0.104	0.11	-NA-	-NA-	-NA-	-NA-
10-30-90	1225	20.4	15.2	7.8	630	8.0	-NA-	217.63	6	1.7	0.313	2.240	0.67	0.103	0.09	-NA-	-NA-	-NA-	-NA-
11-05-90	1130	7.6	13.1	8.2	660	7.8	-NA-	216.25	9	0.8	0.331	2.500	0.73	0.093	0.11	-NA-	-NA-	-NA-	-NA-
11-13-90	1215	19.1	14.8	8.6	620	6.6	-NA-	214.00	3	0.5	0.338	2.380	0.65	0.082	0.10	-NA-	-NA-	-NA-	-NA-
11-19-90	1140	7.8	13.6	7.9	660	7.9	-NA-	214.25	4	0.4	0.377	2.600	0.84	0.091	0.12	-NA-	-NA-	-NA-	-NA-
11-27-90	1115	5.4	12.2	-NA-	660	7.8	-NA-	210.50	6	1.0	0.284	2.330	0.26	0.077	0.11	-NA-	-NA-	-NA-	-NA-
12-03-90	1240	6.1	13.1	8.5	660	7.9	-NA-	210.50	2	1.2	0.452	2.500	0.63	0.075	0.09	-NA-	-NA-	-NA-	-NA-
12-11-90	1138	5.4	12.1	8.2	670	8.6	-NA-	205.25	3	0.3	0.475	2.270	0.49	0.075	0.08	-NA-	-NA-	-NA-	-NA-
12-17-90	1140	-1.1	12.4	7.5	650	7.7	-NA-	204.75	5	0.5	0.454	2.580	0.57	0.087	0.08	-NA-	-NA-	-NA-	-NA-
01-08-91	1340	5.1	13.8	8.2	540	7.1	-NA-	197.75	10	1.2	0.325	2.420	0.67	0.086	0.10	-NA-	-NA-	-NA-	-NA-
01-14-91	1230	10.9	13.7	7.9	620	8.2	-NA-	198.50	3	0.7	0.328	2.410	0.44	0.087	0.10	-NA-	-NA-	-NA-	-NA-

Degrees C      ppm      μmhos      feet      cfs      mg/l      NTU      ----- mg/L-N -----      -- mg/L-P --      mg/l      μg/l      - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

FH26S -- Magic Valley Fish Hatchery

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
06-26-90	1430	34.1	17.8	11.5	-NA-	-NA-	-NA-	4.60	2	0.4	0.135	1.550	0.35	0.033	(0.05)	-NA-	-NA-	-NA-	-NA-
07-02-90	1200	26.8	16.6	9.5	550	7.8	-NA-	4.60	4	0.6	0.093	1.650	0.35	0.025	(0.05)	-NA-	-NA-	-NA-	-NA-
07-10-90	1455	35.2	16.9	12.4	580	7.7	-NA-	38.30	34	0.4	0.065	1.710	0.23	0.011	0.08	-NA-	-NA-	-NA-	-NA-
07-16-90	1345	36.9	16.8	10.4	550	7.8	-NA-	42.30	10	0.3	0.062	1.750	0.22	0.035	(0.05)	-NA-	-NA-	-NA-	-NA-
07-24-90	1420	29.5	16.4	10.8	550	7.8	-NA-	92.40	64	0.6	0.040	1.630	0.33	0.050	(0.05)	-NA-	-NA-	-NA-	-NA-
07-30-90	1120	32.2	15.8	8.9	540	7.8	-NA-	93.00	4	0.6	0.074	1.460	0.58	0.038	(0.05)	-NA-	-NA-	-NA-	-NA-
08-07-90	1355	34.8	16.8	10.2	450	7.8	-NA-	95.00	8	0.1	0.090	1.690	0.24	0.049	(0.05)	-NA-	-NA-	-NA-	-NA-
08-13-90	1055	30.5	15.5	9.7	520	8.3	-NA-	97.02	36	0.4	0.033	1.710	0.21	0.042	(0.05)	-NA-	-NA-	-NA-	-NA-
08-21-90	1440	27.0	15.5	9.9	490	8.1	-NA-	105.60	14	0.5	0.098	1.870	0.24	0.051	0.06	-NA-	-NA-	-NA-	-NA-
08-27-90	1515	35.0	16.5	9.6	490	8.2	-NA-	100.98	2	0.8	0.142	1.850	0.23	0.050	(0.05)	-NA-	-NA-	-NA-	-NA-
09-03-90	1310	32.5	15.5	9.9	430	8.1	-NA-	83.57	1	1.0	0.106	1.760	0.28	0.042	(0.05)	-NA-	-NA-	-NA-	-NA-
09-10-90	1250	26.3	16.0	10.0	470	8.1	-NA-	101.12	(2)	0.6	0.134	1.710	0.31	0.045	(0.05)	-NA-	-NA-	-NA-	-NA-
09-18-90	1135	20.3	15.1	10.0	440	8.1	-NA-	101.10	(2)	-NA-	0.106	1.870	0.18	0.045	0.06	-NA-	-NA-	-NA-	-NA-
09-24-90	1800	28.9	15.2	10.2	600	7.4	-NA-	115.00	2	-NA-	0.064	0.543	0.27	0.045	(0.05)	-NA-	-NA-	-NA-	-NA-
10-02-90	1211	14.3	14.1	9.2	600	8.1	-NA-	132.18	2	1.0	0.117	1.910	0.26	0.051	(0.05)	-NA-	-NA-	-NA-	-NA-
10-08-90	1730	16.7	14.1	9.2	610	8.0	-NA-	125.05	5	0.5	0.063	2.070	0.82	0.050	0.15	-NA-	-NA-	-NA-	-NA-
10-17-90	1320	13.8	14.3	9.2	640	7.9	-NA-	119.81	(1)	0.7	0.082	1.940	0.07	0.037	(0.05)	-NA-	-NA-	-NA-	-NA-
10-22-90	1530	16.0	14.4	8.5	630	7.7	-NA-	126.85	(2)	0.6	0.123	1.980	0.34	0.053	(0.05)	-NA-	-NA-	-NA-	-NA-
10-30-90	1105	18.2	14.6	8.2	600	7.8	-NA-	139.47	1	0.7	0.203	1.200	0.24	0.058	(0.05)	-NA-	-NA-	-NA-	-NA-
11-05-90	1552	9.7	13.5	9.1	630	7.9	-NA-	160.12	6	0.6	0.144	1.900	0.33	0.047	(0.05)	-NA-	-NA-	-NA-	-NA-
11-13-90	1300	21.1	14.5	7.4	600	8.1	-NA-	165.98	(1)	0.2	0.097	1.890	0.25	0.041	(0.05)	-NA-	-NA-	-NA-	-NA-
11-19-90	1635	11.7	14.0	8.4	640	7.8	-NA-	175.74	(1)	0.3	0.126	2.050	0.27	0.050	(0.05)	-NA-	-NA-	-NA-	-NA-
11-27-90	1040	4.6	13.4	9.0	620	7.8	-NA-	146.88	5	1.0	0.151	1.880	0.28	0.035	0.05	-NA-	-NA-	-NA-	-NA-
12-03-90	1715	4.2	13.4	6.4	620	7.6	-NA-	175.74	(2)	0.5	0.247	2.000	0.27	0.043	0.19	-NA-	-NA-	-NA-	-NA-
12-11-90	1115	4.8	13.8	9.0	610	7.8	-NA-	171.79	2	0.5	0.260	1.870	0.25	0.046	(0.05)	-NA-	-NA-	-NA-	-NA-
12-17-90	1610	2.3	13.6	7.3	620	7.6	-NA-	160.15	2	0.5	0.182	1.960	0.35	0.060	0.05	-NA-	-NA-	-NA-	-NA-
01-08-91	1213	1.9	13.9	8.3	590	8.1	-NA-	183.73	12	1.0	0.122	1.890	0.29	0.073	0.06	-NA-	-NA-	-NA-	-NA-
01-14-91	1624	6.7	14.0	7.9	580	8.1	-NA-	187.76	(2)	0.8	0.182	1.920	0.78	0.064	(0.05)	-NA-	-NA-	-NA-	-NA-

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N -----   -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

FH28N -- Rim View Hatchery

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity µmhos						Ammonia mg/l-N	NO2+NO3 mg/l-N	Organic mg/l-P	Ortho mg/l-P	Total			Coliform	Strep
06-26-90	1250	29.8	14.9	6.9	450	8.3	-NA-	140.52	6	0.3	0.374	1.410	0.73	0.068	0.08	-NA-	-NA-	-NA-	-NA-
07-02-90	1430	28.0	15.2	6.5	450	8.3	-NA-	106.63	6	0.7	0.326	1.560	0.67	0.081	0.08	-NA-	-NA-	-NA-	-NA-
07-10-90	1235	30.2	14.5	6.7	-NA-	10.1	-NA-	142.07	4	0.5	0.341	1.520	0.70	0.074	0.08	-NA-	-NA-	-NA-	-NA-
07-16-90	1035	28.0	15.0	7.4	490	7.7	-NA-	142.50	(2)	0.5	0.330	1.630	0.61	0.092	0.08	-NA-	-NA-	-NA-	-NA-
07-24-90	1135	28.0	15.0	7.1	490	-NA-	-NA-	140.21	8	0.9	0.360	1.500	0.74	0.110	0.11	-NA-	-NA-	-NA-	-NA-
07-30-90	1335	36.0	16.0	7.5	490	8.1	-NA-	141.07	(2)	0.6	0.283	1.310	0.64	0.070	(0.05)	-NA-	-NA-	-NA-	-NA-
08-07-90	1105	30.0	15.5	7.0	430	8.0	-NA-	141.38	8	0.4	0.344	2.290	0.53	0.081	0.08	-NA-	-NA-	-NA-	-NA-
08-13-90	1010	21.0	14.7	6.9	540	8.3	-NA-	141.74	2	0.3	0.286	1.500	0.60	0.089	0.09	-NA-	-NA-	-NA-	-NA-
08-21-90	1020	19.5	14.5	6.5	570	7.5	-NA-	141.00	12	0.4	0.381	1.660	0.53	0.085	0.06	-NA-	-NA-	-NA-	-NA-
08-27-90	1120	23.5	15.5	6.4	530	8.0	-NA-	143.31	4	0.8	0.406	1.700	0.50	0.092	0.10	-NA-	-NA-	-NA-	-NA-
09-04-90	1320	32.5	17.0	7.2	570	7.3	-NA-	146.03	5	1.0	0.295	1.590	0.39	0.079	0.08	-NA-	-NA-	-NA-	-NA-
09-10-90	1415	31.8	16.0	7.0	390	7.9	-NA-	117.53	(2)	0.8	0.271	1.550	0.63	0.083	0.07	-NA-	-NA-	-NA-	-NA-
09-18-90	1235	23.6	15.5	6.4	510	7.9	-NA-	145.03	2	-NA-	0.508	1.650	0.66	0.087	0.13	-NA-	-NA-	-NA-	-NA-
09-24-90	1300	30.8	15.9	8.9	540	7.8	-NA-	144.86	3	-NA-	0.338	1.790	0.61	0.079	0.10	-NA-	-NA-	-NA-	-NA-
10-02-90	1400	18.5	14.6	7.9	540	8.0	-NA-	144.55	2	1.0	0.334	1.680	0.43	0.075	0.06	-NA-	-NA-	-NA-	-NA-
10-08-90	1200	13.6	14.0	7.9	590	7.7	-NA-	144.55	10	0.5	0.313	1.840	0.35	0.087	0.08	-NA-	-NA-	-NA-	-NA-
10-16-90	1400	16.9	14.1	6.8	600	7.9	-NA-	147.72	3	(1.0)	0.389	1.800	0.94	0.090	0.07	-NA-	-NA-	-NA-	-NA-
10-22-90	1142	9.4	13.8	7.5	590	7.6	-NA-	145.29	(2)	0.6	0.266	1.740	0.69	0.103	0.09	-NA-	-NA-	-NA-	-NA-
10-30-90	1310	21.9	14.5	6.6	550	7.9	-NA-	139.83	3	1.8	0.529	1.220	0.80	0.063	(0.05)	-NA-	-NA-	-NA-	-NA-
11-05-90	1200	10.6	13.4	6.9	600	7.9	-NA-	138.74	7	0.8	0.528	1.770	0.64	0.095	0.11	-NA-	-NA-	-NA-	-NA-
11-13-90	1310	20.6	14.7	7.0	540	6.5	-NA-	142.95	2	1.0	0.396	1.710	0.62	0.079	0.09	-NA-	-NA-	-NA-	-NA-
11-19-90	1205	9.0	13.6	6.7	570	7.8	-NA-	145.48	4	0.7	0.300	1.780	0.62	0.069	0.09	-NA-	-NA-	-NA-	-NA-
11-27-90	1200	1.5	9.6	-NA-	620	7.9	-NA-	136.10	8	0.6	0.378	1.670	0.56	0.059	0.09	-NA-	-NA-	-NA-	-NA-
12-03-90	1307	10.5	13.6	6.8	580	7.6	-NA-	139.09	2	2.2	0.288	1.680	0.49	0.062	0.09	-NA-	-NA-	-NA-	-NA-
12-11-90	1210	5.7	12.8	6.8	520	8.0	-NA-	138.31	4	0.7	0.494	1.750	0.47	0.058	0.08	-NA-	-NA-	-NA-	-NA-
12-17-90	1200	0.0	13.3	6.0	580	7.6	-NA-	138.36	6	0.8	0.313	1.750	0.63	0.106	0.10	-NA-	-NA-	-NA-	-NA-
01-08-91	1143	2.9	13.2	6.8	490	7.1	-NA-	132.84	10	1.9	0.277	1.670	0.64	0.087	0.10	-NA-	-NA-	-NA-	-NA-
01-14-91	1200	6.9	13.7	6.2	510	8.0	-NA-	129.28	3	1.2	0.260	1.620	0.52	0.091	0.11	-NA-	-NA-	-NA-	-NA-

Degrees C      ppm      µmhos      feet      cfs      mg/l      NTU      ----- mg/l-N -----      -- mg/l-P --      mg/l      µg/l      - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

FH35S -- Idaho Fish Breeders -- ( N drain with geothermal water )

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-27-90	1230	31.5	27.6	5.9	550	7.6	-NA-	11.53	10	5.0	0.700	0.597	1.23	0.161	0.22	-NA-	-NA-	1880	33500
07-11-90	1135	34.2	27.5	5.1	600	7.5	-NA-	12.00	18	7.2	0.747	0.694	1.65	0.121	0.23	-NA-	-NA-	540	8300
07-16-90	1130	35.2	27.2	5.7	580	7.4	-NA-	12.00	18	4.5	0.853	0.693	1.68	0.145	0.21	-NA-	-NA-	320	310
07-25-90	1125	24.6	25.6	5.9	550	7.6	-NA-	12.00	16	5.8	0.764	0.744	1.07	0.149	0.20	-NA-	-NA-	610	1160
07-30-90	1005	27.7	25.8	6.0	490	7.9	-NA-	11.25	(2)	5.9	0.844	0.695	1.90	0.135	0.26	-NA-	-NA-	1600	2600
08-08-90	1400	37.7	29.4	5.7	550	8.1	-NA-	10.81	20	4.5	0.787	0.696	1.48	0.102	0.17	-NA-	-NA-	1900	160
08-13-90	1140	30.5	27.0	6.1	450	8.0	-NA-	12.59	20	6.2	0.626	0.743	2.31	0.109	0.21	-NA-	-NA-	1700	270
08-22-90	1415	26.5	-NA-	6.2	-NA-	8.1	-NA-	13.51	24	6.0	0.602	0.747	1.36	0.123	0.18	-NA-	-NA-	1100	450
08-27-90	1440	30.5	27.0	5.7	460	8.0	-NA-	13.05	16	4.8	0.686	0.749	1.06	0.133	0.19	-NA-	-NA-	310	440
09-05-90	1340	29.0	26.5	6.2	440	7.9	-NA-	11.91	20	6.0	0.732	0.707	1.57	0.124	0.18	-NA-	-NA-	180	7200
09-10-90	1215	28.4	25.5	6.6	470	8.0	-NA-	11.91	10	3.7	0.594	0.698	1.31	0.116	0.18	-NA-	-NA-	60	60
09-18-90	1320	23.3	24.8	6.9	450	8.1	-NA-	11.47	9	-NA-	0.778	0.624	1.14	0.180	0.16	-NA-	-NA-	80	260
09-24-90	1700	29.6	26.7	6.2	520	7.9	-NA-	16.65	14	-NA-	0.735	0.735	1.23	0.115	0.19	-NA-	-NA-	410	4700
10-03-90	1345	18.7	22.6	6.7	540	7.8	-NA-	16.65	9	3.0	0.522	0.700	0.92	0.100	0.14	-NA-	-NA-	50	7300
10-08-90	1655	16.9	22.8	6.8	550	8.0	-NA-	16.40	19	3.4	0.668	0.840	0.72	0.114	0.14	-NA-	-NA-	70	4500
10-16-90	1245	15.1	22.1	6.8	530	7.8	-NA-	16.65	14	3.0	0.685	0.794	1.68	0.156	0.19	-NA-	-NA-	280	870
10-22-90	1500	15.2	23.0	6.9	530	7.7	-NA-	16.40	10	3.6	0.675	0.875	1.36	0.144	0.19	-NA-	-NA-	70	9500
10-31-90	1250	16.4	23.2	6.1	510	7.9	-NA-	15.17	8	2.6	0.560	0.854	1.12	0.150	0.18	-NA-	-NA-	10	500
11-05-90	1520	8.8	20.6	7.5	520	7.7	-NA-	15.66	12	3.3	0.558	0.839	1.00	0.118	0.12	-NA-	-NA-	(10)	2600
11-14-90	1235	13.8	22.4	5.6	530	7.7	-NA-	15.42	11	2.5	0.900	0.908	1.35	0.216	0.29	-NA-	-NA-	111	86000
11-19-90	1600	11.4	22.6	5.0	510	7.5	-NA-	14.22	13	3.8	0.947	0.922	1.72	0.212	0.28	-NA-	-NA-	37	2700
11-28-90	1200	6.7	21.1	5.2	470	7.9	-NA-	14.22	15	3.6	0.966	0.826	1.46	0.221	0.34	-NA-	-NA-	120	590
12-03-90	1645	5.9	21.1	4.4	460	7.5	-NA-	14.22	10	3.5	1.060	0.944	1.27	0.160	0.20	-NA-	-NA-	53	400
12-17-90	1529	3.8	21.5	4.7	460	7.3	-NA-	14.45	10	3.5	0.975	0.930	1.50	0.214	0.32	-NA-	-NA-	810	6700
01-09-91	1135	0.5	20.3	7.1	460	8.0	-NA-	13.98	22	6.3	0.617	0.937	1.18	0.150	0.28	-NA-	-NA-	330	6100
01-14-91	1545	7.8	22.5	6.5	470	7.9	-NA-	13.98	14	5.8	0.680	0.924	1.17	0.145	0.27	-NA-	-NA-	60	21000
01-23-91	1140	-1.7	20.2	6.6	490	7.9	-NA-	12.36	11	4.2	0.731	0.984	1.00	0.160	0.19	-NA-	-NA-	10	8000
01-28-91	1616	2.6	18.0	6.7	480	7.9	-NA-	13.28	9	4.4	0.727	0.777	1.38	0.172	0.20	-NA-	-NA-	37	1100

A number in parentheses indicates a value below minimum detection limit -- (MDL).



## Middle Snake River Water Quality Survey Water Quality Data Report

FH38S -- Box Canyon Fish Hatchery

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
06-27-90	1315	27.9	16.0	7.7	335	7.0	-NA-	300.00	6	0.5	0.552	0.735	0.90	0.128	0.17	-NA-	-NA-	-NA-	-NA-
07-02-90	1330	26.7	17.1	6.7	340	7.4	-NA-	298.00	6	1.0	0.498	0.763	0.92	0.098	0.17	-NA-	-NA-	-NA-	-NA-
07-11-90	1210	34.7	16.0	6.1	355	7.1	-NA-	297.00	6	1.2	0.537	0.761	1.01	0.099	0.16	-NA-	-NA-	-NA-	-NA-
07-16-90	1230	33.1	17.0	6.4	350	6.9	-NA-	297.80	10	1.2	0.540	0.771	0.96	0.161	0.24	-NA-	-NA-	-NA-	-NA-
07-25-90	1150	23.5	16.2	6.2	330	7.2	-NA-	297.00	6	1.4	0.566	0.809	0.97	0.136	0.17	-NA-	-NA-	-NA-	-NA-
07-30-90	1035	30.7	15.7	6.6	340	7.2	-NA-	297.80	10	1.2	0.485	0.806	0.99	0.112	0.16	-NA-	-NA-	-NA-	-NA-
08-08-90	1320	33.5	17.2	5.8	250	7.8	-NA-	297.80	14	1.3	0.581	0.765	1.04	0.110	0.16	-NA-	-NA-	-NA-	-NA-
08-13-90	1215	32.5	16.5	6.3	320	7.8	-NA-	297.80	8	1.3	0.535	0.762	1.43	0.119	0.23	-NA-	-NA-	-NA-	-NA-
08-22-90	1440	-NA-	-NA-	6.3	-NA-	7.9	-NA-	297.00	16	1.0	0.544	0.810	1.05	0.108	0.14	-NA-	-NA-	-NA-	-NA-
08-27-90	1415	30.0	16.0	6.3	310	7.8	-NA-	296.67	4	0.8	0.695	0.831	0.90	0.123	0.16	-NA-	-NA-	-NA-	-NA-
09-05-90	1415	31.1	16.1	6.4	260	7.7	-NA-	296.67	8	1.0	0.585	0.805	1.14	0.119	0.18	-NA-	-NA-	-NA-	-NA-
09-10-90	1155	25.7	16.0	6.8	310	7.9	-NA-	296.67	12	1.9	0.482	0.834	1.22	0.150	0.23	-NA-	-NA-	-NA-	-NA-
09-18-90	1345	24.1	15.9	6.9	290	7.8	-NA-	296.67	2	-NA-	0.700	0.800	0.86	0.124	0.15	-NA-	-NA-	-NA-	-NA-
09-24-90	1630	30.9	16.5	8.0	370	7.7	-NA-	300.00	3	-NA-	0.536	0.867	0.89	0.099	0.12	-NA-	-NA-	-NA-	-NA-
10-03-90	1230	17.0	14.5	6.3	390	7.5	-NA-	300.00	6	2.0	0.652	0.830	0.84	0.111	0.20	-NA-	-NA-	-NA-	-NA-
10-08-90	1500	18.0	14.9	6.1	370	7.5	-NA-	300.00	9	1.2	0.553	0.877	0.52	0.095	0.08	-NA-	-NA-	-NA-	-NA-
10-16-90	1345	13.2	14.0	5.6	380	7.5	-NA-	300.00	10	1.0	0.540	0.851	1.22	0.137	0.15	-NA-	-NA-	-NA-	-NA-
10-22-90	1440	14.0	14.7	5.7	390	7.4	-NA-	300.00	2	0.5	0.664	0.886	1.13	0.128	0.16	-NA-	-NA-	-NA-	-NA-
10-31-90	1405	17.3	14.5	5.9	380	7.6	-NA-	298.00	5	0.5	0.569	0.961	0.95	0.124	0.13	-NA-	-NA-	-NA-	-NA-
11-05-90	1457	9.9	13.4	6.6	400	7.5	-NA-	300.00	8	1.0	0.529	0.818	0.80	0.111	0.13	-NA-	-NA-	-NA-	-NA-
11-14-90	1400	12.7	14.1	5.4	390	7.9	-NA-	300.00	5	0.8	0.667	0.853	1.14	0.103	0.17	-NA-	-NA-	-NA-	-NA-
11-19-90	1540	11.9	13.9	5.6	390	7.7	-NA-	297.00	1	1.2	0.665	0.938	1.15	0.101	0.15	-NA-	-NA-	-NA-	-NA-
11-28-90	1240	7.8	11.7	6.3	380	7.7	-NA-	296.00	6	1.7	0.755	0.861	0.98	0.100	0.16	-NA-	-NA-	-NA-	-NA-
12-03-90	1615	6.2	13.2	4.7	390	7.5	-NA-	300.00	4	1.3	0.652	0.884	1.01	0.095	0.14	-NA-	-NA-	-NA-	-NA-
12-12-90	1249	3.6	9.9	6.6	340	7.8	-NA-	298.00	(2)	0.8	0.452	0.886	0.81	0.098	0.14	-NA-	-NA-	-NA-	-NA-
12-17-90	1506	3.5	13.4	5.0	410	7.4	-NA-	300.00	4	1.5	0.601	0.892	0.86	0.089	0.10	-NA-	-NA-	-NA-	-NA-
01-09-91	1326	-2.1	9.7	8.1	350	7.4	-NA-	200.00	10	1.1	0.518	0.876	0.72	0.100	0.10	-NA-	-NA-	-NA-	-NA-
01-14-91	1525	8.0	13.8	5.8	360	7.9	-NA-	225.00	5	1.8	0.524	0.880	0.86	0.102	0.11	-NA-	-NA-	-NA-	-NA-

A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

FH46N -- Buckeye Farm Fish Hatchery

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Disk	Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform
06-27-90	1230	27.3	24.3	5.8	310	8.9	-NA-	15.26	6	5.0	0.103	0.023	0.66	0.044	0.07	-NA-	-NA-	-NA-	-NA-
07-02-90	1220	28.2	25.7	6.1	310	8.9	-NA-	11.60	26	7.0	0.013	(0.005)	0.79	0.015	0.08	-NA-	-NA-	-NA-	-NA-
07-11-90	1155	32.5	26.0	7.7	-NA-	-NA-	-NA-	9.20	14	5.0	(0.005)	(0.005)	0.59	0.008	0.06	-NA-	-NA-	-NA-	-NA-
07-16-90	1220	32.5	22.0	7.7	330	7.2	-NA-	12.24	34	12.0	0.022	0.005	0.98	0.049	0.13	-NA-	-NA-	-NA-	-NA-
07-25-90	1145	26.5	23.0	8.5	330	-NA-	-NA-	7.41	34	13.0	0.014	(0.005)	0.84	0.022	0.09	-NA-	-NA-	-NA-	-NA-
07-30-90	1145	32.0	25.0	9.6	270	8.9	-NA-	7.99	16	7.6	0.023	(0.005)	0.82	0.036	0.05	-NA-	-NA-	-NA-	-NA-
08-13-90	1050	25.5	21.0	8.5	320	8.9	-NA-	12.60	22	7.5	0.035	(0.005)	0.91	0.022	0.09	-NA-	-NA-	-NA-	-NA-
08-22-90	1340	26.0	19.5	6.8	290	8.2	-NA-	12.85	30	10.0	0.033	(0.005)	0.73	0.017	0.07	-NA-	-NA-	-NA-	-NA-
08-27-90	1335	27.0	22.0	9.6	280	8.9	-NA-	15.29	24	10.6	0.108	(0.005)	0.68	0.022	0.05	-NA-	-NA-	-NA-	-NA-
09-05-90	1450	31.0	24.5	9.1	300	8.5	-NA-	43.52	17	6.0	0.098	0.031	0.73	0.019	0.06	-NA-	-NA-	-NA-	-NA-
09-10-90	1110	21.4	21.0	9.6	300	9.0	-NA-	17.00	16	6.5	0.039	(0.005)	0.74	0.013	(0.05)	-NA-	-NA-	-NA-	-NA-
09-19-90	1430	24.6	16.7	10.1	280	9.0	-NA-	14.33	21	-NA-	0.130	0.030	0.75	0.017	0.05	-NA-	-NA-	-NA-	-NA-
09-24-90	1545	30.3	21.6	11.2	320	8.9	-NA-	19.22	14	-NA-	0.017	0.063	0.56	0.016	0.05	-NA-	-NA-	-NA-	-NA-
10-03-90	1555	18.6	13.6	12.9	300	8.8	-NA-	26.50	20	7.0	0.040	0.169	0.62	0.011	0.06	-NA-	-NA-	-NA-	-NA-
10-08-90	1400	14.5	10.0	9.5	330	8.1	-NA-	25.50	15	4.5	0.034	0.384	(0.05)	0.048	(0.05)	-NA-	-NA-	-NA-	-NA-
10-16-90	0850	11.7	11.8	10.3	340	8.7	-NA-	19.67	10	3.0	0.031	0.457	0.22	0.022	(0.05)	-NA-	-NA-	-NA-	-NA-
10-22-90	1355	15.0	9.7	10.8	320	8.7	-NA-	29.71	14	5.2	0.010	0.521	0.63	0.017	(0.05)	-NA-	-NA-	-NA-	-NA-
10-30-90	0850	7.7	11.9	9.2	340	8.8	-NA-	30.61	15	5.4	0.062	0.475	0.44	0.027	(0.05)	-NA-	-NA-	-NA-	-NA-
11-05-90	1415	9.0	7.9	10.4	330	8.4	-NA-	35.91	15	4.2	0.137	0.639	0.66	0.020	(0.05)	-NA-	-NA-	-NA-	-NA-
11-13-90	0900	6.7	9.2	10.6	340	6.3	-NA-	45.44	11	3.2	0.104	0.783	0.71	0.023	0.12	-NA-	-NA-	-NA-	-NA-
11-19-90	1435	11.3	8.6	10.7	310	8.5	-NA-	38.70	8	3.0	0.125	0.798	0.76	0.029	(0.05)	-NA-	-NA-	-NA-	-NA-
11-27-90	0900	2.6	2.7	-NA-	330	8.0	-NA-	50.48	15	4.2	0.205	0.804	0.48	0.032	0.07	-NA-	-NA-	-NA-	-NA-
12-03-90	1530	7.5	5.2	8.8	310	8.3	-NA-	45.80	7	4.2	0.199	0.847	0.45	0.043	0.07	-NA-	-NA-	-NA-	-NA-
12-11-90	0900	4.0	5.8	10.8	320	8.7	-NA-	33.11	12	3.7	0.445	0.754	0.48	0.046	0.08	-NA-	-NA-	-NA-	-NA-
12-17-90	1417	2.2	2.8	10.0	310	8.4	-NA-	36.38	7	3.2	0.217	0.847	0.45	0.063	0.07	-NA-	-NA-	-NA-	-NA-
01-08-91	1020	-2.9	2.1	11.3	250	6.8	-NA-	10.02	16	3.5	0.243	0.761	0.40	0.059	0.12	-NA-	-NA-	-NA-	-NA-
01-23-91	1342	4.5	3.6	11.5	290	8.5	-NA-	12.33	13	6.5	0.278	0.962	0.55	0.067	(0.05)	-NA-	-NA-	-NA-	-NA-
01-28-91	1510	2.1	3.4	12.1	340	8.8	-NA-	39.42	13	2.7	0.176	0.852	0.40	0.059	(0.05)	-NA-	-NA-	-NA-	-NA-

Degrees C      ppm      μmhos      feet      cfs      mg/l      NTU      ----- mg/l-N -----      -- mg/l-P --      mg/l      μg/l      - counts/100ml -

A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

FH48N -- White Springs Fish Hatchery

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-27-90	1115	24.1	15.6	6.6	330	8.3	-NA-	34.61	4	0.6	0.419	1.250	0.80	0.096	0.12	-NA-	-NA-	-NA-	-NA-
07-02-90	1140	21.5	15.8	6.1	330	8.4	-NA-	35.65	4	0.6	0.267	1.310	0.50	0.095	0.08	-NA-	-NA-	-NA-	-NA-
07-11-90	1105	19.8	15.0	8.3	-NA-	-NA-	-NA-	33.92	(2)	0.3	0.201	1.360	0.41	0.075	0.07	-NA-	-NA-	-NA-	-NA-
07-16-90	1325	28.0	15.0	7.4	410	7.2	-NA-	36.00	4	0.8	0.258	1.340	0.50	0.099	0.08	-NA-	-NA-	-NA-	-NA-
07-25-90	1115	26.0	15.0	6.7	360	-NA-	-NA-	26.40	6	1.0	0.394	1.330	0.65	0.124	0.12	-NA-	-NA-	-NA-	-NA-
07-30-90	1105	29.0	15.5	7.1	290	7.8	-NA-	35.65	(2)	0.6	0.237	1.100	0.53	0.075	0.07	-NA-	-NA-	-NA-	-NA-
08-08-90	1200	32.5	16.9	6.3	370	7.7	-NA-	36.70	8	0.8	0.447	1.210	0.82	0.099	0.14	-NA-	-NA-	-NA-	-NA-
08-13-90	1130	28.0	16.0	6.3	330	7.9	-NA-	36.35	8	0.5	0.283	1.200	0.44	0.102	0.09	-NA-	-NA-	-NA-	-NA-
08-22-90	1400	22.5	16.3	6.1	350	7.1	-NA-	37.40	16	(1.0)	0.411	1.320	0.75	0.144	0.19	-NA-	-NA-	-NA-	-NA-
08-27-90	1300	24.0	16.5	5.8	360	7.7	-NA-	37.76	8	0.9	0.436	1.360	0.66	0.095	0.10	-NA-	-NA-	-NA-	-NA-
09-05-90	1343	33.5	17.0	5.7	400	7.3	-NA-	36.70	12	2.0	0.439	1.260	0.93	0.128	0.23	-NA-	-NA-	-NA-	-NA-
09-10-90	1030	22.1	16.0	8.6	350	7.9	-NA-	35.65	8	1.0	0.182	1.220	0.42	0.082	0.06	-NA-	-NA-	-NA-	-NA-
09-19-90	1350	24.0	16.0	7.5	350	7.8	-NA-	35.65	1	-NA-	0.376	1.170	0.59	0.103	0.12	-NA-	-NA-	-NA-	-NA-
09-24-90	1440	30.7	17.1	8.0	410	7.7	-NA-	36.35	3	-NA-	0.207	1.450	0.36	0.087	0.07	-NA-	-NA-	-NA-	-NA-
10-03-90	1455	19.5	15.9	9.1	400	7.7	-NA-	34.95	1	1.0	0.367	1.560	0.54	0.108	0.11	-NA-	-NA-	-NA-	-NA-
10-08-90	1540	15.0	14.5	7.4	430	7.7	-NA-	33.58	6	1.0	0.301	1.460	0.40	0.082	0.07	-NA-	-NA-	-NA-	-NA-
10-17-90	1410	13.8	15.3	6.7	420	7.5	-NA-	33.58	2	1.5	0.372	1.370	0.76	0.121	0.10	-NA-	-NA-	-NA-	-NA-
10-22-90	1300	11.4	15.2	7.7	420	7.5	-NA-	32.90	(2)	0.5	0.196	1.350	0.53	0.108	0.10	-NA-	-NA-	-NA-	-NA-
10-31-90	1150	15.4	15.2	7.1	410	7.7	-NA-	32.56	2	0.3	0.239	1.520	0.53	0.122	0.11	-NA-	-NA-	-NA-	-NA-
11-05-90	1331	8.7	15.0	7.7	430	7.6	-NA-	32.23	5	0.5	0.217	1.460	0.50	0.091	0.08	-NA-	-NA-	-NA-	-NA-
11-14-90	1310	13.1	15.0	5.4	410	7.6	-NA-	32.56	3	0.5	0.514	1.420	0.59	0.138	0.15	-NA-	-NA-	-NA-	-NA-
11-19-90	1345	11.1	15.2	6.6	425	7.6	-NA-	31.56	3	0.5	0.380	1.500	0.56	0.101	0.10	-NA-	-NA-	-NA-	-NA-
11-28-90	1135	7.7	14.3	6.0	410	7.7	-NA-	33.92	6	1.1	0.585	2.110	0.72	0.124	0.13	-NA-	-NA-	-NA-	-NA-
12-03-90	1430	7.0	15.1	5.1	420	7.3	-NA-	29.58	3	1.3	0.349	1.420	0.50	0.088	0.08	-NA-	-NA-	-NA-	-NA-
12-12-90	1146	2.9	13.3	6.6	360	7.7	-NA-	28.94	8	1.5	0.332	1.400	0.50	0.116	0.14	-NA-	-NA-	-NA-	-NA-
12-17-90	1327	1.6	14.4	6.3	450	7.4	-NA-	28.94	3	0.7	0.296	1.550	0.43	0.108	0.08	-NA-	-NA-	-NA-	-NA-
01-09-91	1230	2.2	13.1	7.3	350	7.7	-NA-	21.30	10	1.1	0.269	1.400	0.74	0.116	0.13	-NA-	-NA-	-NA-	-NA-
01-14-91	1402	9.4	15.1	6.7	380	8.0	-NA-	22.35	(2)	0.9	0.162	1.290	0.27	0.077	(0.05)	-NA-	-NA-	-NA-	-NA-

Degrees C      ppm      μmhos      feet      cfs      mg/l      NTU      ----- mg/l-N -----      -- mg/l-P --      mg/l      μg/l      - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

FH49N -- Birch Creek Fish Hatchery

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity μmhos						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD mg/l	A μg/l	Coliform	Strep counts/100ml
06-27-90	1045	25.0	15.8	8.3	380	8.6	-NA-	8.17	(2)	1.0	0.329	0.960	0.81	0.086	0.09	-NA-	-NA-	-NA-	-NA-
07-02-90	1010	28.7	16.6	7.7	-NA-	8.5	-NA-	9.40	4	1.2	0.311	0.955	0.73	0.044	0.09	-NA-	-NA-	-NA-	-NA-
07-11-90	1045	18.7	15.5	8.9	-NA-	-NA-	-NA-	7.72	2	1.1	0.387	1.020	0.78	0.088	0.09	-NA-	-NA-	-NA-	-NA-
07-16-90	1405	26.5	18.2	8.8	460	7.7	-NA-	8.48	6	1.2	0.484	0.973	0.87	0.100	0.09	-NA-	-NA-	-NA-	-NA-
07-25-90	1055	25.0	16.0	8.7	430	-NA-	-NA-	8.78	8	1.4	0.412	1.000	0.66	0.115	0.11	-NA-	-NA-	-NA-	-NA-
07-30-90	1045	31.0	16.5	8.6	400	8.1	-NA-	8.14	(2)	1.3	0.316	1.030	0.68	0.100	0.09	-NA-	-NA-	-NA-	-NA-
08-08-90	1225	36.5	18.1	8.1	460	8.0	-NA-	10.23	4	1.0	0.325	0.974	0.67	0.090	0.09	-NA-	-NA-	-NA-	-NA-
08-13-90	1150	28.7	17.0	8.0	450	8.0	-NA-	12.47	4	1.0	0.387	1.060	0.86	0.094	0.10	-NA-	-NA-	-NA-	-NA-
08-22-90	1420	27.5	18.5	5.8	470	7.6	-NA-	11.95	10	2.0	0.407	1.090	0.73	0.118	0.11	-NA-	-NA-	-NA-	-NA-
08-27-90	1220	28.5	17.5	8.2	460	8.2	-NA-	12.00	4	1.3	0.302	0.912	0.43	0.095	0.07	-NA-	-NA-	-NA-	-NA-
09-05-90	1320	34.5	19.0	6.7	480	7.5	-NA-	12.98	5	2.0	0.517	1.030	0.90	0.122	0.11	-NA-	-NA-	-NA-	-NA-
09-10-90	1010	18.0	15.0	9.3	460	8.2	-NA-	11.88	6	1.8	0.386	2.650	0.63	0.103	0.09	-NA-	-NA-	-NA-	-NA-
09-19-90	1320	23.7	16.6	8.7	410	8.2	-NA-	12.61	2	-NA-	0.446	1.150	0.73	0.110	0.10	-NA-	-NA-	-NA-	-NA-
09-24-90	1410	33.7	18.5	8.8	490	8.0	-NA-	11.94	3	-NA-	0.317	1.210	0.72	0.108	0.11	-NA-	-NA-	-NA-	-NA-
10-03-90	1415	21.6	14.9	8.8	480	8.1	-NA-	11.58	8	2.0	0.137	1.520	0.34	0.090	0.09	-NA-	-NA-	-NA-	-NA-
10-08-90	1300	16.7	13.6	8.9	500	7.9	-NA-	11.23	7	1.3	0.321	1.270	0.38	0.103	0.11	-NA-	-NA-	-NA-	-NA-
10-17-90	1330	13.8	3.4	9.0	490	8.0	-NA-	14.41	7	2.8	0.343	2.850	0.43	0.128	0.10	-NA-	-NA-	-NA-	-NA-
10-22-90	1231	11.7	13.6	8.8	500	7.8	-NA-	14.04	2	1.4	0.365	1.180	0.87	0.124	0.12	-NA-	-NA-	-NA-	-NA-
10-31-90	1240	19.6	13.9	8.9	480	8.1	-NA-	13.48	5	2.1	0.152	1.610	0.55	0.078	0.09	-NA-	-NA-	-NA-	-NA-
11-05-90	1254	10.0	12.2	9.2	480	7.9	-NA-	11.72	9	2.1	0.396	1.270	0.79	0.131	0.15	-NA-	-NA-	-NA-	-NA-
11-14-90	1230	15.4	13.1	8.4	450	7.8	-NA-	8.63	5	2.2	0.268	1.450	0.27	0.101	0.10	-NA-	-NA-	-NA-	-NA-
11-19-90	1315	9.7	12.2	9.0	460	8.0	-NA-	11.25	7	0.3	0.262	1.280	0.61	0.103	0.12	-NA-	-NA-	-NA-	-NA-
11-28-90	1055	6.7	11.0	8.9	450	7.8	-NA-	10.54	11	3.5	0.371	1.230	0.69	0.102	0.15	-NA-	-NA-	-NA-	-NA-
12-03-90	1403	8.9	11.1	9.5	440	7.8	-NA-	10.88	13	5.0	0.211	1.200	0.62	0.094	0.13	-NA-	-NA-	-NA-	-NA-
12-12-90	1106	0.5	8.8	9.6	390	8.1	-NA-	10.38	5	2.5	0.264	1.160	0.60	0.107	0.13	-NA-	-NA-	-NA-	-NA-
12-17-90	1258	-0.4	9.9	9.9	440	7.9	-NA-	10.55	15	4.5	0.418	1.210	0.81	0.094	0.12	-NA-	-NA-	-NA-	-NA-
01-09-91	1140	3.0	8.0	10.1	360	7.6	-NA-	9.40	64	20.0	0.215	1.120	1.27	0.154	0.30	-NA-	-NA-	-NA-	-NA-
01-14-91	1340	9.1	12.0	8.5	390	8.2	-NA-	10.41	16	1.6	0.324	1.170	0.67	0.109	0.14	-NA-	-NA-	-NA-	-NA-

Degrees C      ppm      μmhos      feet      cfs      mg/l      NTU      ----- mg/l-N ----- -- mg/l-P --      mg/l      μg/l      - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

IR02N -- Northside A Drain

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-25-90	1145	25.3	23.8	5.5	-NA-	-NA-	-NA-	15.13	64	9.0	0.017	(0.005)	0.45	(0.005)	0.08	-NA-	-NA-	165	700
07-09-90	1425	28.8	25.9	8.5	400	8.5	-NA-	4.60	22	7.5	0.032	0.017	0.47	0.028	0.06	-NA-	-NA-	140	520
07-23-90	1220	30.1	23.8	7.8	435	8.2	-NA-	9.71	732	90.0	0.037	0.063	1.18	0.070	0.67	-NA-	-NA-	1200	1400
08-06-90	1410	27.3	26.2	8.0	400	8.3	-NA-	7.64	312	51.0	0.058	0.103	0.77	0.059	0.27	-NA-	-NA-	450	820
08-20-90	1220	20.5	19.5	8.5	410	8.5	-NA-	11.95	154	24.0	0.107	0.294	0.60	0.101	0.22	-NA-	-NA-	540	980
09-03-90	1000	23.9	19.5	8.2	410	8.5	-NA-	15.91	110	21.0	0.080	0.346	0.41	0.060	0.14	-NA-	-NA-	300	1000
09-17-90	1215	19.9	16.8	9.6	350	8.7	-NA-	15.28	110	-NA-	0.062	0.094	0.63	0.034	0.30	-NA-	-NA-	230	850
10-01-90	1403	27.0	19.1	8.7	390	8.4	-NA-	9.08	140	53.0	0.140	0.351	0.70	0.042	0.21	-NA-	-NA-	300	420
10-15-90	1430	16.2	11.4	9.1	400	8.0	-NA-	9.45	454	65.0	0.037	0.305	0.78	0.044	0.52	-NA-	-NA-	150	770
10-29-90	1230	17.4	10.4	9.6	410	8.3	-NA-	1.35	6	3.6	0.027	0.014	0.18	0.012	(0.05)	-NA-	-NA-	10	60
04-29-91	0855	6.4	5.7	9.0	420	8.9	-NA-	4.77	100	22.0	0.095	(0.005)	0.32	0.013	0.17	-NA-	-NA-	28	320
05-07-91	0923	12.3	11.8	8.9	420	8.4	-NA-	7.01	141	23.0	0.081	0.005	0.98	0.063	0.31	-NA-	-NA-	41	330
05-13-91	0930	13.8	10.8	7.7	390	8.6	-NA-	5.97	168	29.0	0.059	0.018	0.92	0.024	0.26	-NA-	-NA-	70	850
05-21-91	0920	13.3	12.8	8.0	420	8.4	-NA-	8.46	110	24.0	0.033	0.026	0.33	0.026	0.16	-NA-	-NA-	120	330
05-30-91	0905	8.8	13.3	8.5	380	8.6	-NA-	9.09	55	15.0	0.110	0.011	0.42	0.013	0.18	-NA-	-NA-	68	180
06-10-91	0845	13.9	16.7	8.0	370	8.5	-NA-	8.00	65	-NA-	0.047	0.034	0.35	0.041	0.16	-NA-	-NA-	300	5800
06-24-91	0935	17.1	17.6	8.3	460	8.7	-NA-	9.25	74	13.0	(0.005)	(0.005)	0.24	(0.005)	0.11	-NA-	-NA-	240	470
07-08-91	0902	18.1	21.0	7.4	420	8.4	-NA-	6.49	69	18.0	(0.005)	(0.005)	0.59	0.039	0.16	-NA-	-NA-	1100	12000

Degrees C    ppm    μmhos    feet    cfs    mg/l    NTU    ----- mg/l-N -----    -- mg/l-P --    mg/l    μg/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).  
 Appendix C - 21

Middle Snake River Water Quality Survey  
Water Quality Data Report

IR04N -- Northside C55 Drain

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-25-90	1359	30.2	22.5	6.0	-NA-	-NA-	-NA-	2.05	42	14.0	0.012	0.005	0.48	0.010	0.08	-NA-	-NA-	73	695
07-09-90	1550	28.5	23.2	7.9	440	8.0	-NA-	4.49	68	25.0	0.011	0.070	0.45	0.024	0.09	-NA-	-NA-	330	830
07-23-90	1355	33.3	23.3	7.2	440	8.0	-NA-	8.09	78	32.0	0.037	0.144	0.70	0.076	0.17	-NA-	-NA-	490	1300
08-06-90	1510	37.0	27.2	7.3	380	7.7	-NA-	0.38	38	18.0	0.055	0.190	0.54	0.097	0.12	-NA-	-NA-	210	950
08-20-90	1415	22.0	20.0	8.0	380	8.4	-NA-	25.75	34	13.0	0.101	0.359	0.38	0.103	0.15	-NA-	-NA-	270	570
09-03-90	1100	24.1	19.0	7.3	390	8.4	-NA-	5.14	18	10.0	0.032	0.415	0.39	0.074	0.10	-NA-	-NA-	500	710
09-17-90	1325	23.3	16.5	9.8	330	8.4	-NA-	12.32	16	-NA-	0.070	0.146	0.21	0.039	0.08	-NA-	-NA-	70	240
10-01-90	1116	25.5	16.3	7.8	430	8.0	-NA-	15.24	16	8.0	0.046	0.536	0.25	0.060	0.08	-NA-	-NA-	130	180
10-15-90	1530	22.1	10.7	9.8	420	7.9	-NA-	2.23	8	6.0	0.042	0.352	0.27	0.039	0.05	-NA-	-NA-	10	40
10-29-90	1335	18.4	10.0	9.4	440	7.9	-NA-	6.35	8	7.0	0.029	0.574	0.18	0.050	0.06	-NA-	-NA-	(10)	20
04-29-91	0950	5.7	6.8	9.1	470	9.0	-NA-	5.23	56	17.0	0.070	(0.005)	0.33	0.008	0.19	-NA-	-NA-	4	220
05-09-91	1217	5.9	8.9	10.9	410	8.8	-NA-	8.90	64	20.0	(0.005)	0.017	0.65	0.007	0.20	-NA-	-NA-	70	320
05-13-91	1110	18.3	10.8	8.5	420	8.8	-NA-	9.80	74	18.0	0.089	0.021	1.12	0.011	0.15	-NA-	-NA-	36	390
05-23-91	0921	16.5	14.6	8.7	390	8.7	-NA-	0.81	31	21.0	0.137	0.016	0.60	0.019	0.10	-NA-	-NA-	220	150
05-30-91	0950	8.3	13.4	8.4	410	8.4	-NA-	9.03	142	49.0	0.144	0.037	0.52	0.027	0.19	-NA-	-NA-	590	1200
06-10-91	0940	23.5	17.4	7.8	380	8.6	-NA-	8.30	50	-NA-	0.029	(0.005)	0.43	0.033	0.35	-NA-	-NA-	200	250
06-24-91	1030	22.0	18.1	7.8	480	8.6	-NA-	6.08	40	12.0	(0.005)	0.019	0.20	0.030	0.11	-NA-	-NA-	110	210
07-08-91	1202	29.7	22.0	7.4	410	8.4	-NA-	2.42	69	28.0	(0.005)	0.039	0.62	0.101	0.24	-NA-	-NA-	42	330

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

IR11S -- Southside East Perrine Coulee

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			----- PHOSPHORUS -----		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity µmhos						Ammonia mg/l-N	NO2+NO3 mg/l-N	Organic mg/l-N	Ortho mg/l-P	Total mg/l-P			Coliform counts/100ml	Strep counts/100ml
06-25-90	1050	25.3	18.6	7.4	540	8.3	-NA-	30.21	58	18.0	0.029	1.320	0.65	0.048	0.10	-NA-	-NA-	510	970
07-09-90	1530	29.0	20.0	8.9	-NA-	8.4	-NA-	37.00	92	38.0	0.095	2.330	0.71	0.075	0.17	-NA-	-NA-	200	820
07-23-90	1235	21.0	20.0	7.6	600	7.8	-NA-	45.42	398	96.0	0.066	1.120	1.00	0.110	0.50	-NA-	-NA-	660	2400
08-06-90	1305	29.5	17.0	5.9	740	7.7	-NA-	41.78	158	50.0	0.076	1.960	0.73	0.107	0.22	-NA-	-NA-	410	750
08-20-90	1240	23.0	18.0	7.8	670	7.8	-NA-	52.11	132	46.0	0.093	1.830	0.63	0.108	0.25	-NA-	-NA-	1900	1300
09-03-90	1405	35.0	19.5	9.6	580	7.7	-NA-	57.18	65	18.0	0.115	1.510	0.65	0.080	0.15	-NA-	-NA-	290	900
09-17-90	1550	25.0	17.5	8.7	470	8.2	-NA-	45.88	36	-NA-	0.220	0.857	0.46	0.059	(0.05)	-NA-	-NA-	220	690
10-01-90	1630	30.0	18.1	8.9	570	8.0	-NA-	44.45	26	10.0	0.079	2.470	0.66	0.055	0.09	-NA-	-NA-	70	370
10-15-90	1550	20.8	13.9	9.3	670	8.0	-NA-	46.57	28	12.0	0.114	2.550	0.49	0.081	0.08	-NA-	-NA-	170	380
10-29-90	1425	18.3	13.2	8.1	680	8.1	-NA-	39.90	20	6.7	0.120	2.860	0.47	0.078	0.07	-NA-	-NA-	30	560
11-26-90	1105	0.8	7.8	9.4	920	7.8	-NA-	22.40	164	28.0	0.060	4.100	1.10	0.042	0.23	-NA-	-NA-	61	31
12-10-90	1148	9.9	11.6	8.4	930	7.6	-NA-	19.88	154	25.0	0.384	4.300	1.38	0.061	0.30	-NA-	-NA-	20	540
01-07-91	0944	-1.2	9.4	7.7	860	8.4	-NA-	14.72	152	36.0	0.239	4.490	0.81	0.074	0.20	-NA-	-NA-	47	2060
01-21-91	0944	-2.8	8.9	8.6	900	8.0	-NA-	12.93	260	18.0	0.164	4.980	1.15	0.066	0.30	-NA-	-NA-	510	3100
02-04-91	0950	3.8	10.5	8.1	1090	8.1	-NA-	11.14	34	6.1	0.133	4.530	0.58	0.089	0.13	-NA-	-NA-	81	1100
03-04-91	0957	8.4	10.9	8.0	1050	8.1	-NA-	9.33	28	2.6	0.193	5.000	0.48	0.069	0.11	-NA-	-NA-	74	188
03-18-91	0945	12.4	10.7	9.4	980	8.2	-NA-	7.69	44	4.3	0.154	4.240	0.35	0.073	0.11	-NA-	-NA-	23	100
04-01-91	0945	14.5	11.2	9.1	960	8.2	-NA-	7.49	21	2.9	0.061	3.630	0.49	0.062	0.08	-NA-	-NA-	150	180
04-15-91	1300	13.3	12.3	11.1	610	8.8	-NA-	14.58	76	25.0	0.041	0.510	1.12	0.051	0.33	-NA-	-NA-	53	660
04-29-91	1440	9.8	8.7	10.7	620	8.5	-NA-	18.99	122	28.0	0.103	0.740	0.65	0.048	0.23	-NA-	-NA-	38	570
05-07-91	1140	16.7	13.0	9.2	510	8.5	-NA-	33.65	120	32.0	0.101	0.833	1.06	0.062	0.24	-NA-	-NA-	200	2100
05-13-91	1156	19.2	12.3	10.0	430	8.5	-NA-	56.17	148	38.0	0.011	0.453	1.80	0.033	0.50	-NA-	-NA-	87	1600
05-21-91	1135	17.6	14.0	9.3	480	8.4	-NA-	41.49	153	54.0	0.084	0.611	0.40	0.026	0.16	-NA-	-NA-	120	970
05-30-91	1500	15.9	15.0	10.1	610	8.5	-NA-	14.76	63	30.0	0.125	1.520	0.34	0.038	0.12	-NA-	-NA-	280	900
06-10-91	1315	32.0	20.3	8.7	550	8.5	-NA-	32.35	60	-NA-	0.092	0.730	0.59	0.039	0.16	-NA-	-NA-	380	1900
06-24-91	1203	22.5	17.2	-NA-	690	8.4	-NA-	19.77	25	13.0	0.031	1.450	0.44	0.062	0.13	-NA-	-NA-	380	550
07-08-91	1242	30.2	21.5	8.3	650	8.2	-NA-	8.88	70	35.0	(0.005)	1.520	0.65	0.058	0.23	-NA-	-NA-	230	840

Degrees C    ppm    µmhos    feet    cfs    mg/l    NTU    ----- mg/l-N ----- -- mg/l-P --    mg/l    µg/l    - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IR16S      -- Southside West Perrine Coulee

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-25-90	1510	21.3	19.7	8.1	350	8.6	-NA-	1.66	92	24.0	0.017	0.044	0.72	0.054	0.20	-NA-	-NA-	110	350
07-09-90	1015	20.2	18.0	8.2	390	8.7	-NA-	4.78	256	54.0	0.040	0.150	0.88	0.050	0.33	-NA-	-NA-	270	690
07-23-90	1015	20.0	18.0	8.2	430	7.9	-NA-	2.61	410	93.0	0.027	0.212	1.03	0.076	0.51	-NA-	-NA-	600	1300
08-06-90	1035	30.5	16.5	8.8	430	8.4	-NA-	2.07	570	114.0	0.043	0.247	1.78	0.106	0.68	-NA-	-NA-	1300	2200
08-20-90	1020	23.0	17.0	8.5	440	8.2	-NA-	2.77	404	85.0	0.046	0.424	1.03	0.129	0.49	-NA-	-NA-	2500	3500
09-03-90	1025	21.0	15.5	10.7	410	8.4	-NA-	1.83	129	24.0	0.076	0.342	0.52	0.100	0.19	-NA-	-NA-	310	370
09-17-90	1020	18.4	12.6	9.2	410	8.7	-NA-	1.22	54	-NA-	0.054	0.286	0.53	0.069	0.16	-NA-	-NA-	380	750
10-01-90	1043	22.4	13.1	10.0	480	8.6	-NA-	2.12	112	30.0	0.034	0.755	0.55	0.080	0.20	-NA-	-NA-	420	1100
10-15-90	1025	13.2	8.8	10.5	450	8.6	-NA-	1.22	54	17.0	0.038	0.637	0.41	0.046	0.10	-NA-	-NA-	180	170
10-29-90	1015	14.7	8.0	9.3	480	8.6	-NA-	2.00	54	17.0	0.104	0.770	0.34	0.063	0.11	-NA-	-NA-	30	120
04-29-91	1116	8.8	4.9	11.7	450	8.6	-NA-	2.41	288	58.0	0.087	0.139	0.46	0.069	0.36	-NA-	-NA-	730	4600
05-07-91	1201	17.1	12.5	8.5	410	8.1	-NA-	1.92	358	56.0	0.104	0.030	1.72	0.087	0.52	-NA-	-NA-	450	1000
05-13-91	1443	25.9	13.9	9.3	400	8.6	-NA-	1.90	190	46.0	(0.005)	0.027	1.18	0.052	0.32	-NA-	-NA-	160	1600
05-21-91	1130	20.4	13.5	8.0	420	8.5	-NA-	2.90	452	100.0	0.300	0.064	0.48	0.036	0.40	-NA-	-NA-	250	1600
05-30-91	1345	14.7	12.8	9.4	410	8.7	-NA-	3.54	172	53.0	0.133	0.036	0.61	0.031	0.24	-NA-	-NA-	210	970
06-10-91	0948	27.5	15.8	8.6	440	8.5	-NA-	5.75	167	-NA-	0.066	(0.005)	1.80	0.028	0.26	-NA-	-NA-	240	740
06-24-91	1050	21.8	15.4	9.1	480	8.6	-NA-	3.26	81	24.0	(0.005)	0.017	0.19	0.071	0.17	-NA-	-NA-	220	500
07-08-91	1235	31.0	19.5	7.6	410	8.3	-NA-	1.62	174	61.0	0.086	0.113	1.48	0.050	0.32	-NA-	-NA-	260	1000

Degrees C    ppm     $\mu$ mhos    feet    cfs    mg/l    NTU    ----- mg/l-N ----- -- mg/l-P --    mg/l     $\mu$ g/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).



## Middle Snake River Water Quality Survey Water Quality Data Report

IR20S -- Southside 30 Drain

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-26-90	1010	26.0	20.0	8.2	-NA-	-NA-	-NA-	6.10	196	37.0	0.122	(0.005)	0.75	0.010	0.22	-NA-	-NA-	445	835
07-10-90	1025	26.7	20.1	7.1	430	8.0	-NA-	2.24	246	66.0	0.018	0.113	0.69	0.034	0.27	-NA-	-NA-	220	1240
07-24-90	0935	20.8	20.1	7.6	425	7.8	-NA-	7.27	582	220.0	0.049	0.222	2.03	0.086	1.89	-NA-	-NA-	3300	4300
08-07-90	0915	16.8	20.1	8.0	470	8.4	-NA-	4.62	538	165.0	0.054	0.237	1.11	0.054	0.77	-NA-	-NA-	200	1400
08-21-90	1030	15.5	16.5	8.4	450	8.5	-NA-	10.38	276	44.0	0.123	0.367	0.84	0.117	0.40	-NA-	-NA-	1700	3100
09-03-90	1230	26.7	19.5	7.8	370	8.5	-NA-	3.84	109	21.0	0.106	0.314	0.42	0.063	0.16	-NA-	-NA-	180	1100
09-18-90	0950	15.6	15.8	9.1	390	8.5	-NA-	12.83	130	-NA-	0.022	0.059	0.44	0.027	0.19	-NA-	-NA-	100	450
10-02-90	1045	15.7	12.9	8.7	430	8.1	-NA-	9.60	96	26.0	0.031	0.554	0.38	0.079	0.19	-NA-	-NA-	140	1700
10-16-90	1000	9.6	8.9	9.5	420	8.0	-NA-	11.25	82	28.0	0.051	0.561	0.32	0.085	0.17	-NA-	-NA-	110	3000
10-30-90	0908	10.4	7.7	9.7	460	8.0	-NA-	16.42	40	14.0	0.032	0.749	0.14	0.120	0.11	-NA-	-NA-	40	290
04-30-91	0910	9.9	4.9	9.4	420	8.7	-NA-	1.24	120	33.0	0.172	0.018	0.36	0.066	0.26	-NA-	-NA-	46	1500
05-09-91	0850	5.0	8.3	9.2	410	8.6	-NA-	11.82	550	76.0	(0.005)	0.022	0.60	0.016	0.48	-NA-	-NA-	300	1700
05-14-91	0845	7.9	9.9	8.4	400	8.6	-NA-	5.61	356	76.0	0.019	0.038	0.31	0.019	0.40	-NA-	-NA-	470	1100
05-23-91	0905	15.8	12.2	8.2	410	8.4	-NA-	1.89	182	48.0	0.006	(0.005)	0.40	0.027	0.21	-NA-	-NA-	81	640
05-28-91	0907	13.6	11.4	8.1	420	8.4	-NA-	1.02	152	48.0	0.021	(0.005)	0.28	0.076	0.14	-NA-	-NA-	104	1300
06-11-91	0845	21.3	16.9	8.0	370	8.4	-NA-	2.82	208	-NA-	0.117	0.078	0.60	0.053	0.26	-NA-	-NA-	200	960
06-25-91	0907	17.5	14.6	8.3	370	8.3	-NA-	0.45	2060	360.0	0.019	0.021	0.60	0.080	1.89	-NA-	-NA-	460	1600
07-09-91	0900	25.2	18.8	7.6	370	8.1	-NA-	0.48	760	315.0	0.129	0.030	1.35	0.075	0.83	-NA-	-NA-	860	6400

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P -- mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IR21S     -- Southside Pigeon Cove Hydro Plant -- LQ and LS Drains

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity		Disk				Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
07-09-91	1035	28.8	18.6	7.8	510	8.1	-NA-	40.98	608	156.0	0.104	1.340	0.92	0.066	0.64	-NA-	-NA-	570	3800

Degrees C    ppm    μmhos            feet    cfs    mg/l    NTU    ----- mg/l-N -----    -- mg/l-P --    mg/l    μg/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IR23N -- Northside N42 Drain

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
07-24-90	1030	26.5	19.5	8.2	410	8.3	-NA-	3.37	28	3.6	0.051	0.356	0.29	0.175	0.17	-NA-	-NA-	690	420
08-07-90	1040	32.0	17.0	7.9	430	8.2	-NA-	1.50	8	0.5	0.030	0.527	0.21	0.088	0.11	-NA-	-NA-	380	320
08-21-90	0935	16.0	15.5	8.4	480	8.2	-NA-	18.84	30	12.0	0.079	0.446	0.52	0.136	0.16	-NA-	-NA-	1600	710
09-04-90	1210	31.0	20.0	6.1	370	7.9	-NA-	17.51	24	10.0	0.035	0.402	0.40	0.124	0.15	-NA-	-NA-	120	980
09-18-90	1025	20.0	15.6	9.0	400	8.5	-NA-	19.74	30	-NA-	0.021	0.033	0.50	0.063	0.15	-NA-	-NA-	1200	950
10-02-90	1235	15.6	13.1	9.2	430	8.4	-NA-	11.00	18	8.0	0.033	0.468	0.35	0.099	0.13	-NA-	-NA-	550	440
10-16-90	1215	15.5	10.7	9.9	410	8.3	-NA-	6.98	10	4.0	0.030	0.285	0.21	0.061	(0.05)	-NA-	-NA-	160	100
10-30-90	1120	21.7	13.6	8.4	440	8.1	-NA-	0.36	(2)	0.7	0.037	0.472	(0.05)	0.075	0.06	-NA-	-NA-	20	40
11-13-90	1120	13.3	11.9	9.2	450	6.6	-NA-	0.30	2	0.3	0.078	0.062	0.60	0.087	0.09	-NA-	-NA-	110	200
11-27-90	1040	5.9	7.6	-NA-	480	7.7	-NA-	-NA-	8	1.0	0.031	0.446	0.07	0.056	0.05	-NA-	-NA-	150	560
12-11-90	1048	4.5	7.9	8.6	520	8.6	-NA-	-NA-	12	0.8	0.215	0.465	0.22	0.057	0.06	-NA-	-NA-	300	2300

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N -----   -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IR24S -- Southside 39 Drain

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-26-90	1300	30.6	22.3	7.8	-NA-	-NA-	-NA-	7.25	3110	310.0	0.041	0.859	2.32	0.027	2.65	-NA-	-NA-	1850	1600
07-10-90	1400	35.6	22.4	8.3	620	8.0	-NA-	4.92	1340	245.0	0.078	1.620	1.93	0.146	3.34	-NA-	-NA-	800	2460
07-24-90	1345	29.1	20.5	7.9	600	8.0	-NA-	4.66	1430	240.0	0.045	1.750	2.45	0.106	1.47	-NA-	-NA-	910	5200
08-07-90	1105	33.7	18.7	8.5	700	8.4	-NA-	2.32	864	140.0	0.058	1.320	1.73	0.088	0.82	-NA-	-NA-	400	1300
08-21-90	1415	23.5	18.0	8.2	490	8.5	-NA-	4.97	386	60.0	0.051	2.800	0.89	0.129	0.52	-NA-	-NA-	1400	3200
09-04-90	1455	33.6	21.0	8.0	440	8.5	-NA-	9.22	183	31.0	0.104	1.860	0.75	0.081	0.28	-NA-	-NA-	260	470
09-19-90	1410	21.4	15.7	8.2	510	8.4	-NA-	9.43	144	-NA-	0.028	1.890	0.82	0.045	0.23	-NA-	-NA-	280	7000
10-03-90	1520	17.9	13.1	8.7	630	7.9	-NA-	10.22	130	28.0	0.034	2.700	0.62	0.091	0.22	-NA-	-NA-	290	13000
10-17-90	1444	14.9	9.7	8.5	620	7.8	-NA-	10.04	66	11.8	0.104	2.480	0.29	0.081	0.11	-NA-	-NA-	160	650
10-30-90	1243	21.2	12.9	7.5	830	7.5	-NA-	2.02	10	1.4	0.170	4.790	0.40	0.044	(0.05)	-NA-	-NA-	10	250
11-13-90	1430	20.0	12.1	8.1	870	8.5	-NA-	1.75	10	1.1	0.011	6.280	0.48	0.036	(0.05)	-NA-	-NA-	290	550
11-27-90	1212	4.9	7.7	10.4	890	8.2	-NA-	1.33	8	1.2	(0.005)	6.070	0.35	0.026	(0.05)	-NA-	-NA-	540	820
12-11-90	1238	6.2	8.9	10.0	880	8.2	-NA-	0.93	8	0.8	0.127	6.060	0.38	0.033	(0.05)	-NA-	-NA-	48	2800
01-08-91	1115	2E-2	5.8	9.8	850	8.7	-NA-	0.65	24	1.8	0.158	6.200	0.33	0.043	(0.05)	-NA-	-NA-	94	990
01-22-91	1145	-0.1	5.0	9.9	860	8.8	-NA-	0.50	8	2.0	0.040	6.420	0.23	0.050	(0.05)	-NA-	-NA-	120	360
02-05-91	1115	7.5	7.4	9.8	940	8.7	-NA-	0.60	10	2.0	0.042	6.180	0.27	0.048	(0.05)	-NA-	-NA-	41	360
02-19-91	1055	12.1	8.1	10.0	930	8.6	-NA-	0.21	2	1.3	0.030	6.310	0.28	0.042	(0.05)	-NA-	-NA-	63	530
03-05-91	1005	3.1	6.1	10.2	950	8.7	-NA-	0.58	2	2.3	0.036	7.000	0.49	0.033	(0.05)	-NA-	-NA-	170	750
03-19-91	1050	11.7	7.5	10.0	910	8.5	-NA-	0.47	12	1.2	0.292	6.060	0.27	0.032	0.07	-NA-	-NA-	29	400
04-02-91	1058	15.7	10.5	10.1	890	8.5	-NA-	1.01	27	2.6	0.044	4.740	0.34	0.012	0.06	-NA-	-NA-	18	45
04-16-91	1055	9.7	9.5	9.6	870	8.6	-NA-	1.22	(1)	1.0	(0.005)	4.720	0.87	0.018	(0.05)	-NA-	-NA-	240	250
04-30-91	1135	15.2	8.9	9.3	510	8.7	-NA-	8.67	492	78.0	0.150	0.587	0.41	0.105	0.56	-NA-	-NA-	620	3100
05-08-91	1340	14.8	12.3	8.6	480	8.7	-NA-	7.12	580	106.0	(0.005)	0.425	1.94	0.074	0.74	-NA-	-NA-	1000	5100
05-14-91	1110	13.1	10.9	8.8	460	8.6	-NA-	8.28	514	82.0	0.082	0.286	0.31	0.063	0.67	-NA-	-NA-	390	1300
05-22-91	1025	21.9	13.3	8.6	490	8.5	-NA-	8.06	452	106.0	0.240	0.709	0.31	0.083	0.43	-NA-	-NA-	460	910
05-28-91	1055	20.3	13.3	8.2	470	8.5	-NA-	8.03	608	108.0	0.430	0.470	0.46	0.041	0.52	-NA-	-NA-	500	1700
06-11-91	1035	31.1	18.4	7.8	410	8.3	-NA-	11.99	750	-NA-	0.051	0.433	1.83	0.060	0.84	-NA-	-NA-	1200	12000
06-25-91	1105	24.7	16.6	8.1	440	8.6	-NA-	5.51	269	57.0	0.101	0.849	0.49	0.052	0.30	-NA-	-NA-	210	1200

Degrees C      ppm      μmhos      feet      cfs      mg/l      NTU      ----- mg/l-N -----      -- mg/l-P --      mg/l      μg/l      - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

IR29S -- Southside I Drain

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity µmhos						Ammonia mg/l-N	NO2+NO3	Organic	Ortho	Total	BOD mg/l	A µg/l	Coliform	Strep
06-26-90	1430	-NA-	19.7	8.8	-NA-	8.7	-NA-	7.73	50	11.0	0.039	1.860	0.61	0.087	0.16	-NA-	-NA-	150	410
07-10-90	1510	23.7	20.5	7.3	-NA-	8.8	-NA-	11.11	134	27.0	0.033	1.850	0.79	0.060	0.19	-NA-	-NA-	2400	670
07-24-90	1345	29.5	18.0	8.4	710	-NA-	-NA-	8.88	150	54.0	0.040	1.810	0.93	0.099	0.27	-NA-	-NA-	630	870
08-07-90	1305	32.5	18.9	8.0	750	8.5	-NA-	7.11	254	44.0	0.058	2.220	0.86	0.083	0.32	-NA-	-NA-	1300	670
08-21-90	1220	21.0	15.5	8.8	700	8.2	-NA-	12.73	186	40.0	0.044	2.200	0.88	0.109	0.31	-NA-	-NA-	950	1500
09-04-90	1515	32.0	20.0	7.8	640	7.9	-NA-	14.79	200	27.0	0.013	2.130	0.74	0.113	0.30	-NA-	-NA-	720	4000
09-18-90	1530	24.2	16.5	8.9	610	8.6	-NA-	9.71	88	-NA-	0.022	2.430	0.67	0.081	0.20	-NA-	-NA-	580	440
10-02-90	1550	15.5	12.7	10.1	730	9.9	-NA-	16.11	104	20.0	0.283	2.720	0.69	0.092	0.16	-NA-	-NA-	170	3400
10-17-90	1630	15.0	11.4	7.5	730	8.4	-NA-	12.28	122	11.2	0.029	2.940	0.46	0.090	0.12	-NA-	-NA-	330	1100
10-30-90	1500	18.5	13.6	9.2	780	8.6	-NA-	15.02	64	6.7	0.144	2.500	0.64	0.098	0.09	-NA-	-NA-	100	650
11-13-90	1425	20.7	12.2	10.0	710	6.9	-NA-	15.71	22	6.3	0.045	3.890	0.63	0.091	0.12	-NA-	-NA-	40	310
11-27-90	1300	5.1	7.2	-NA-	780	8.2	-NA-	17.11	52	4.5	(0.005)	4.020	0.63	0.083	0.11	-NA-	-NA-	48	920
12-11-90	1316	5.6	8.1	10.0	700	9.4	-NA-	16.54	30	3.0	0.219	3.920	0.60	0.107	0.12	-NA-	-NA-	270	2200
01-08-91	1431	1.2	7.0	10.2	680	8.1	-NA-	12.25	86	29.0	0.137	4.100	0.92	0.110	0.20	-NA-	-NA-	230	2300
01-22-91	1330	2.7	6.9	11.3	750	8.8	-NA-	14.34	48	10.0	0.292	4.140	0.92	0.128	0.11	-NA-	-NA-	36	560
02-05-91	1245	9.7	9.1	9.2	840	8.8	-NA-	11.77	78	8.3	0.222	4.020	0.88	0.142	0.19	-NA-	-NA-	22	130
02-19-91	1218	13.4	10.2	10.0	840	8.6	-NA-	11.76	22	7.0	0.098	4.170	1.01	0.175	0.21	-NA-	-NA-	40	400
03-05-91	1330	3.6	7.3	10.3	800	8.8	-NA-	-NA-	52	6.5	0.337	5.080	0.80	0.124	0.15	-NA-	-NA-	8	100
03-19-91	1236	11.7	9.7	9.9	770	8.6	-NA-	9.36	38	3.8	0.236	4.080	0.77	0.144	0.20	-NA-	-NA-	120	69
04-02-91	1215	16.3	12.5	12.3	770	8.8	-NA-	8.72	22	1.3	0.062	3.500	0.22	0.128	0.06	-NA-	-NA-	29	76
04-16-91	1237	12.9	11.2	10.0	800	8.7	-NA-	4.75	20	3.6	0.036	3.140	0.56	0.113	0.16	-NA-	-NA-	72	1100
04-30-91	1339	16.8	12.5	9.4	610	8.6	-NA-	10.01	114	26.0	0.141	1.340	0.32	0.098	0.22	-NA-	-NA-	240	1700
05-09-91	1000	7.9	8.0	9.4	610	8.6	-NA-	11.02	386	55.0	0.025	1.200	0.42	0.097	0.46	-NA-	-NA-	540	2700
05-14-91	1305	17.1	13.2	9.3	590	8.7	-NA-	10.91	124	28.0	0.023	1.090	1.37	0.083	0.23	-NA-	-NA-	250	830
05-20-91	1020	15.0	11.6	8.3	560	8.5	-NA-	13.29	336	68.0	0.092	0.988	1.91	0.089	0.54	-NA-	-NA-	1400	1400
05-28-91	1409	24.3	17.2	8.5	530	8.6	-NA-	11.80	186	50.0	0.105	1.020	0.42	0.062	0.26	-NA-	-NA-	960	1300
06-11-91	1325	30.7	19.9	8.1	720	8.6	-NA-	10.65	81	-NA-	0.058	1.440	0.94	0.075	0.19	-NA-	-NA-	1400	1400
06-25-91	1332	23.4	17.8	8.4	660	6.8	-NA-	8.52	113	28.0	0.014	1.360	0.28	-NA-	0.19	-NA-	-NA-	640	430

A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

IR30N -- Northside J8 Drain

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-26-90	1415	32.3	28.1	8.1	410	8.7	-NA-	4.35	40	13.0	0.037	0.011	0.80	0.029	0.11	-NA-	-NA-	260	830
07-10-90	1255	27.0	23.5	9.3	-NA-	10.4	-NA-	2.64	28	13.0	0.069	0.079	0.56	0.079	0.10	-NA-	-NA-	320	210
07-24-90	1200	28.5	21.0	8.4	440	-NA-	-NA-	11.76	34	15.0	0.029	0.110	0.51	0.076	0.12	-NA-	-NA-	350	250
08-07-90	1140	33.5	23.0	7.6	470	8.3	-NA-	7.39	14	5.4	0.055	0.012	0.56	0.093	0.12	-NA-	-NA-	180	120
08-21-90	1050	20.5	17.0	8.3	440	7.9	-NA-	16.69	28	12.0	0.054	0.324	0.55	0.117	0.17	-NA-	-NA-	100	700
09-04-90	1415	32.5	22.0	9.1	400	8.1	-NA-	9.60	19	7.0	0.089	0.279	0.41	0.082	0.12	-NA-	-NA-	440	340
09-18-90	1330	22.6	17.1	9.8	340	8.8	-NA-	12.80	20	-NA-	0.022	(0.005)	0.59	0.040	0.12	-NA-	-NA-	270	330
10-02-90	1430	17.6	14.4	11.9	420	10.2	-NA-	4.10	8	5.0	0.021	0.239	0.31	0.067	0.09	-NA-	-NA-	2300	1400
10-16-90	1000	14.7	10.0	10.4	390	8.5	-NA-	7.70	4	3.0	0.030	0.124	0.18	0.025	(0.05)	-NA-	-NA-	100	40
04-30-91	1248	20.1	10.3	10.3	420	8.5	-NA-	11.35	74	22.0	0.109	(0.005)	0.46	0.028	0.15	-NA-	-NA-	86	360
05-08-91	1120	12.8	13.3	9.1	410	8.5	-NA-	9.60	112	28.0	0.024	(0.005)	0.39	0.013	0.20	-NA-	-NA-	1000	4000
05-14-91	1159	14.9	13.0	9.6	390	8.6	-NA-	12.88	84	23.0	0.055	0.020	0.31	0.028	0.14	-NA-	-NA-	330	830
05-20-91	1155	16.9	14.8	9.4	400	8.6	-NA-	14.48	82	24.0	0.035	0.029	0.87	0.025	0.19	-NA-	-NA-	410	550
05-28-91	1318	20.7	16.7	9.1	370	8.5	-NA-	8.29	74	23.0	(0.005)	(0.005)	0.22	0.067	0.11	-NA-	-NA-	140	380
06-11-91	1225	28.8	22.5	7.6	460	8.6	-NA-	10.81	23	-NA-	0.114	0.012	0.75	0.050	0.10	-NA-	-NA-	330	320
06-25-91	1229	26.2	23.9	7.6	400	8.5	-NA-	0.02	13	5.0	0.043	0.016	0.47	0.060	0.13	-NA-	-NA-	2500	1000

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IR35S    -- Southside N drain prior to Idaho Fish Breeders

Date	Time	Temperature	Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	-----	NITROGEN	-----	PHOSPHORUS	5-DAY	Chlorophyll	FECAL BACTERIA			
		Air	Water	Oxygen	Conductivity	Disk					Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep

Degrees C    ppm     $\mu$ hos    feet    cfs    mg/l    NTU    -----    mg/L-N    -----    -- mg/L-P --    mg/l     $\mu$ g/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
Water Quality Data Report

IR39N -- Northside S19/S Drains

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
06-27-90	1615	31.1	24.3	7.8	400	8.9	-NA-	43.10	56	14.0	0.044	0.037	0.79	0.066	0.19	-NA-	-NA-	270	80
07-11-90	1355	37.2	24.5	8.6	-NA-	-NA-	-NA-	60.95	48	18.0	0.054	0.047	0.64	0.053	0.11	-NA-	-NA-	550	160
07-25-90	1310	32.0	22.5	8.2	440	8.4	-NA-	46.65	38	16.0	0.028	0.121	0.55	0.131	0.14	-NA-	-NA-	220	100
08-08-90	1029	27.5	22.0	7.6	440	8.4	-NA-	29.60	24	7.8	0.047	0.068	0.56	0.098	0.13	-NA-	-NA-	680	560
08-22-90	1040	21.0	17.5	8.5	430	8.1	-NA-	34.76	18	6.0	0.050	0.399	0.52	0.117	0.13	-NA-	-NA-	550	320
09-05-90	1100	28.0	20.5	6.6	400	7.8	-NA-	50.85	17	7.0	0.158	0.367	0.56	0.124	0.15	-NA-	-NA-	580	530
09-19-90	1050	17.2	16.0	9.3	380	8.7	-NA-	46.49	18	-NA-	0.025	0.029	0.65	0.066	0.13	-NA-	-NA-	270	200
10-03-90	1020	13.2	9.5	12.9	410	8.5	-NA-	84.45	22	11.0	0.035	0.472	0.37	0.102	0.14	-NA-	-NA-	350	290
10-17-90	1020	6.8	5.9	11.0	420	8.5	-NA-	37.90	14	9.5	0.051	0.444	0.17	0.156	0.17	-NA-	-NA-	190	210
10-31-90	1010	14.0	8.8	9.0	440	8.4	-NA-	5.47	6	2.1	0.061	0.223	0.50	0.095	0.29	-NA-	-NA-	390	110
04-17-91	0955	9.2	8.1	11.3	410	8.7	-NA-	50.79	241	63.0	0.224	0.120	3.31	0.460	1.70	-NA-	-NA-	660	3300
05-01-91	1037	16.4	9.7	10.2	430	8.6	-NA-	84.78	86	25.0	0.152	(0.005)	0.82	0.075	0.20	-NA-	-NA-	210	390
05-09-91	1300	11.5	9.7	8.4	420	8.3	-NA-	93.42	62	17.0	(0.005)	0.013	1.12	0.061	0.25	-NA-	-NA-	170	450
05-15-91	1114	16.6	12.1	9.9	390	8.5	-NA-	99.46	44	17.0	0.040	0.074	0.36	0.061	0.14	-NA-	-NA-	270	780
05-23-91	1250	27.4	17.2	8.2	410	8.3	-NA-	73.18	40	13.0	0.076	(0.005)	0.28	0.074	0.13	-NA-	-NA-	95	240
05-30-91	1015	14.1	14.3	9.0	400	8.5	-NA-	69.69	29	11.0	0.031	0.010	0.27	0.051	0.11	-NA-	-NA-	780	700
06-12-91	1357	25.3	21.3	8.1	450	8.8	-NA-	35.01	24	-NA-	0.081	0.106	0.57	0.121	0.19	-NA-	-NA-	280	310
06-26-91	1118	25.7	17.7	8.7	420	8.7	-NA-	44.94	20	7.0	0.018	0.088	0.38	0.089	0.17	-NA-	-NA-	470	410
07-10-91	1100	28.2	20.6	8.7	400	8.7	-NA-	15.39	17	8.0	0.056	0.010	0.74	0.106	0.17	-NA-	-NA-	540	500

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).



## Middle Snake River Water Quality Survey Water Quality Data Report

IS01N -- Snake River at Murtaugh Bridge

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity µmhos						Ammonia mg/l-N	NO2+NO3 mg/l-N	Organic mg/l-N	Ortho mg/l-P	Total mg/l-P			Coliform counts/100ml	Strep counts/100ml
07-03-90	0835	12.7	19.3	6.0	510	8.1	2.5+	9.60	10	3.3	0.045	0.906	0.98	0.006	0.08	6.4	17.3	100	10
07-17-90	0900	23.9	22.0	7.3	430	7.9	2.8	518.00	18	5.0	0.071	0.243	0.58	0.059	0.07	2.4	2.3	10	30
07-31-90	0925	24.8	18.4	7.8	490	8.1	1.3	3.60	60	17.0	0.040	0.697	0.63	0.072	0.11	3.5	1.4	170	360
08-14-90	0905	22.0	18.0	8.1	550	8.5	1.0	2.20	76	18.0	0.045	0.794	0.82	0.088	0.15	3.3	5.2	270	400
08-28-90	1000	20.5	17.0	9.0	530	8.5	0.85	3.20	160	18.0	0.070	0.808	0.70	0.077	0.21	1.3	-NA-	160	270
09-11-90	0915	16.7	16.8	8.9	440	8.3	2.1	3.50	38	6.7	0.081	0.983	0.43	0.065	0.08	1.1	2.2	100	80
09-25-90	1228	30.4	18.3	-NA-	470	8.1	2.5	2.90	12	-NA-	0.013	0.910	0.61	0.029	0.06	3.6	11.5	10	40
10-09-90	0930	2.6	10.3	9.6	560	8.2	2.3	3.20	18	2.7	0.030	1.420	0.20	0.043	(0.05)	3.4	7.3	10	40
10-23-90	1630	15.4	11.8	9.6	530	7.8	3	1.70	4	2.5	0.073	1.580	0.37	0.021	(0.05)	-NA-	5.5	(10)	20
11-06-90	1615	4.9	7.6	10.4	550	8.1	2.3	350.00	18	4.4	0.011	1.400	0.39	0.107	0.12	3.0	20.9	(10)	90
11-20-90	1630	0.1	4.8	11.3	530	8.5	2.5	608.00	8	6.8	0.038	1.390	0.43	0.268	0.27	3.1	-NA-	(1)	31
12-04-90	1630	6.1	1.6	10.8	500	8.6	2.4	764.00	6	6.9	0.040	1.400	0.40	0.163	0.21	2.3	9.0	(1)	48
12-19-90	1022	-3.4	0.3	13.0	440	7.5	3.3+	586.00	10	5.2	0.503	1.650	0.82	0.153	0.33	2.4	6.1	(1)	12
01-15-91	1530	4.9	1.3	12.3	450	8.6	2.7	1440.00	10	5.2	0.284	0.850	0.54	0.158	0.16	2.8	4.2	5	150
01-29-91	0920	-5.8	0.7	13.1	530	8.9	-NA-	1240.00	8	3.1	0.166	1.240	0.40	0.149	0.16	2.6	6.9	(1)	8
02-12-91	0920	5.0	2.3	9.6	550	8.7	2+	569.00	8	3.2	0.049	1.510	0.21	0.230	0.27	3.6	14.4	18	600
02-26-91	0917	3.5	4.5	9.8	530	8.9	2.5+	563.00	14	6.1	0.143	1.920	0.22	0.139	0.20	3.6	23.9	0	1
03-12-91	0915	5.1	5.7	9.3	540	8.7	3.5+	62.00	12	3.5	0.059	2.160	0.16	0.286	0.19	3.2	2.6	0	8
03-26-91	0850	5.1	6.6	9.0	570	8.9	3	72.00	12	4.4	0.019	1.480	1.45	0.222	0.25	3.5	40.7	1	12
04-09-91	0855	7.0	8.9	8.1	580	8.7	4	5.40	15	5.5	0.116	1.240	0.62	0.178	0.22	3.3	21.2	25	10
04-23-91	0900	8.2	11.2	9.2	510	9.0	2.5+	11.00	20	6.5	0.149	0.980	1.05	0.026	0.11	6.5	58.6	0	16
05-07-91	0853	12.0	12.3	7.6	520	8.8	2.5	11.00	22	4.0	0.037	0.934	0.96	0.015	0.22	5.9	39.4	3	26
05-21-91	0840	11.7	13.4	8.2	510	8.8	2	10.00	15	4.0	0.120	0.717	0.80	0.013	0.12	5.0	39.4	1	19
06-04-91	0840	11.8	15.9	7.8	470	8.6	2.5	12.00	8	-NA-	0.047	0.747	0.71	0.042	0.06	3.1	-NA-	6	4
06-18-91	0835	15.0	17.1	7.7	530	8.4	3	15.00	8	4.0	0.252	0.560	0.46	0.022	0.08	3.2	16.3	11	6
07-02-91	0840	19.8	18.0	7.4	520	8.3	2	207.00	19	10.0	0.061	0.561	1.03	0.044	0.13	5.0	16.8	49	330
07-17-91	0925	22.2	21.8	7.7	380	8.3	3	630.00	13	5.0	0.113	0.209	0.36	0.051	0.09	2.0	6.4	7	29

Degrees C      ppm      µmhos      feet      cfs      mg/l      NTU      ----- mg/l-N -----      -- mg/l-P --      mg/l      µg/l      - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

IS08S -- Snake River below Twin Falls

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
07-03-90	1015	17.7	18.9	9.1	500	8.6	3.8	333.00	10	3.2	0.028	1.230	0.41	0.005	(0.05)	3.4	5.1	(10)	10
07-17-90	1040	25.5	21.0	7.8	510	7.8	2.9	882.00	14	4.1	0.041	0.915	0.38	0.049	0.09	2.2	-NA-	30	20
07-31-90	1215	31.5	19.0	8.5	430	8.2	2.3	378.00	6	5.9	0.067	1.660	0.36	0.053	0.06	1.8	5.4	20	70
08-14-90	1040	22.5	20.0	8.4	520	8.2	3.30	385.00	12	2.9	0.028	1.540	0.48	0.068	0.06	1.7	1.6	(10)	40
08-28-90	1150	29.0	19.5	7.9	500	7.3	3.5	437.00	10	4.2	0.039	1.690	0.06	0.065	0.06	0.6	3.1	10	10
09-11-90	1050	26.2	19.0	9.3	470	8.4	4	449.00	6	3.2	0.050	1.430	0.19	0.050	0.05	1.7	0.5	30	40
09-25-90	1030	24.1	17.4	10.2	570	8.5	3.9	459.00	8	-NA-	0.008	1.870	0.30	0.029	(0.05)	0.7	3.6	30	20
10-09-90	1150	14.2	13.8	8.4	590	8.3	3	430.00	16	3.9	0.052	2.250	19.00	0.058	(0.05)	2.0	3.8	10	(10)
10-23-90	1740	12.8	12.2	8.9	600	8.2	5.0	397.00	2	2.0	0.067	2.350	0.18	0.045	(0.05)	2.2	1.6	(10)	40
11-06-90	1420	6.1	8.6	10.0	510	8.2	3	621.00	16	5.7	0.023	1.790	0.24	0.070	0.07	1.8	5.0	40	20
11-20-90	1630	0.6	7.6	10.4	560	8.3	3.0	961.00	14	6.8	0.015	1.810	0.41	0.183	0.22	3.0	19.1	2	22
12-04-90	1612	7.8	4.4	11.7	530	7.9	2.5	1020.00	8	6.0	0.015	1.700	0.31	0.105	0.11	1.8	6.5	1	45
01-15-91	1230	3.7	3.1	12.2	500	8.7	3	2050.00	10	4.9	0.270	1.220	0.40	0.149	0.14	1.9	5.7	5	120
01-29-91	1303	-0.7	1.7	11.9	510	8.6	3.8	1690.00	10	3.7	0.151	1.300	0.39	0.137	0.13	1.9	9.3	(1)	17
02-12-91	1220	8.6	5.1	11.5	550	8.3	5.2	918.00	6	2.7	0.045	1.650	0.11	0.131	0.12	2.6	6.6	2	25
02-26-91	1150	11.3	7.3	11.0	560	8.5	4.6	776.00	10	3.2	0.150	2.150	0.29	0.244	0.24	2.6	6.5	0	1
03-12-91	1245	8.4	9.5	10.4	620	8.3	6+	295.00	2	2.3	0.126	2.740	0.18	0.142	0.14	1.3	4.2	1	93
03-26-91	1130	9.9	10.3	9.7	610	7.5	4.1	302.00	6	2.3	0.137	2.420	0.30	0.104	0.06	1.1	3.7	2	1
04-09-91	1250	12.4	12.2	10.1	600	8.5	4.8	220.00	13	5.0	0.046	1.960	0.48	0.031	0.08	2.2	28.8	1	1
04-23-91	1201	18.1	15.4	11.6	620	8.6	3.7	240.00	7	4.2	0.228	2.490	0.27	0.027	0.07	2.2	15.7	1	8
05-07-91	1452	19.5	14.4	11.6	520	8.5	2.5	286.00	16	5.0	0.060	1.740	0.41	0.016	0.09	2.3	18.2	8	30
05-21-91	1446	22.5	16.4	11.9	540	8.4	2	305.00	16	7.0	0.262	1.360	0.41	0.011	(0.05)	3.9	12.9	12	54
06-04-91	1049	15.5	17.0	10.4	560	8.5	3.8	304.00	8	-NA-	0.035	1.870	0.51	0.020	(0.05)	2.1	11.1	13	8
06-18-91	0930	18.6	17.4	10.1	610	8.5	3	303.00	10	6.0	0.064	0.702	0.32	0.012	(0.05)	2.4	9.4	31	15
07-02-91	1054	27.4	18.4	9.9	590	8.4	3.4	459.00	7	4.0	(0.005)	1.660	0.21	0.025	0.05	2.0	6.5	13	17
07-16-91	1148	26.5	21.5	8.0	480	8.3	2.4	959.00	12	4.0	0.038	0.820	0.40	0.069	0.10	1.4	2.8	9	12

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

IS13S -- Snake River at Blue Lakes Bridge

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
07-03-90	1030	20.2	20.7	8.4	575	8.1	3.4	654.04	16	5.0	0.038	1.660	0.62	0.005	(0.05)	4.8	7.2	(10)	(10)
07-17-90	1030	32.9	21.5	8.0	550	7.9	3.1	1056.46	22	6.2	0.034	1.140	0.38	0.044	0.05	2.1	5.0	40	(10)
07-31-90	1045	27.6	21.1	8.9	540	8.1	1.9	542.08	22	8.0	0.043	0.862	0.62	0.030	0.06	4.3	6.7	40	(10)
08-14-90	1035	29.0	21.3	9.2	590	8.5	2.7	499.58	24	6.4	0.032	0.954	0.89	0.036	0.09	3.1	4.7	30	30
08-28-90	1120	25.5	19.5	9.0	440	8.3	2.4	580.38	22	7.3	0.076	1.280	0.49	0.062	0.08	1.6	3.7	(10)	80
09-11-90	1025	25.4	19.7	9.2	430	8.3	2.4	654.54	22	7.3	0.056	1.140	0.71	0.027	0.06	-NA-	3.7	20	10
09-25-90	1453	27.9	18.0	9.8	510	7.9	2	697.54	20	-NA-	0.041	2.910	0.64	0.020	0.08	4.1	26.8	20	30
10-09-90	1035	11.1	11.9	9.5	630	8.2	3.0	720.33	26	6.6	0.020	2.130	0.12	0.061	(0.05)	2.2	16.0	10	30
10-23-90	1336	15.3	11.6	9.3	600	7.4	4.3	672.96	8	3.9	(0.005)	2.370	0.14	0.041	(0.05)	2.2	7.5	(10)	(10)
11-06-90	1340	10.1	9.4	9.7	600	7.9	4.2	914.79	16	3.5	0.014	2.110	0.23	0.048	(0.05)	1.1	4.2	(10)	10
11-20-90	1400	3.2	7.2	10.5	600	8.4	2.9	1350.17	18	6.7	0.032	1.950	0.44	0.138	0.19	-NA-	22.7	9	38
12-04-90	1327	8.6	4.5	10.6	550	8.4	3.7	1426.96	8	4.8	(0.005)	1.700	0.36	0.116	0.14	2.5	10.9	2	29
01-15-91	1300	6.2	3.8	10.4	500	8.7	3.0	2350.71	14	6.3	0.278	1.320	0.54	0.142	0.15	1.9	4.4	4	120
01-29-91	1025	-4.8	1.4	11.1	570	8.8	-NA-	1959.75	16	3.2	0.138	1.330	0.27	0.126	0.12	2.6	6.4	1	13
02-12-91	1035	6.9	5.7	9.3	610	8.7	5	1251.71	16	4.2	0.054	1.740	0.06	0.090	0.09	2.2	8.5	1	17
02-26-91	1031	10.4	7.3	7.5	580	8.6	4	988.71	16	4.8	0.151	2.080	0.19	0.204	0.15	2.0	8.6	2	6
03-12-91	1015	8.2	7.7	9.4	630	8.6	3	563.63	18	5.9	0.044	2.520	0.34	0.146	0.19	4.4	1.6	0	4
03-26-91	0955	9.5	9.4	9.6	660	8.4	3	506.71	14	4.5	0.041	2.340	0.87	0.076	0.13	3.4	26.2	1	14
04-09-91	1010	8.0	11.0	10.8	640	8.6	2.6	575.00	22	6.5	0.068	1.680	0.58	0.008	0.06	3.8	47.4	3	6
04-23-91	1105	20.1	13.6	10.4	600	8.7	2.4	585.33	20	6.4	0.122	1.930	0.77	0.014	0.07	4.2	18.7	1	22
05-07-91	1050	16.5	13.3	10.5	600	8.6	2.5	472.21	26	7.0	0.059	1.620	0.60	0.012	0.11	2.9	26.4	7	40
05-21-91	1035	18.8	15.2	9.7	570	8.5	2.5	907.75	20	7.0	0.086	1.510	0.41	0.012	0.06	3.5	21.3	3	48
06-04-91	0955	17.6	17.7	9.9	530	8.6	3	650.29	21	-NA-	(0.005)	1.740	0.41	0.013	(0.05)	2.5	4.4	15	23
06-18-91	0925	19.5	18.0	9.4	600	8.5	2.5	494.50	23	7.0	0.034	0.664	0.38	0.010	0.05	3.3	-NA-	15	32
07-02-91	0955	28.3	19.2	9.6	620	8.4	3	734.63	13	5.0	0.289	1.410	0.52	0.011	0.05	3.5	13.3	40	880
07-16-91	1205	32.2	21.4	8.9	480	8.2	2.5	1172.42	18	7.0	0.010	1.180	0.49	0.026	0.09	2.3	5.5	27	41

Degrees C    ppm    μmhos    feet    cfs    mg/l    NTU    ----- mg/L-N -----    -- mg/L-P --    mg/l    μg/l    - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

IS31S -- Snake River at Clear Lakes Bridge

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
07-03-90	1230	23.5	18.5	8.6	590	7.6	5.0	1920.00	6	2.6	0.072	2.270	0.38	0.092	0.11	2.8	(0.3)	40	30
07-17-90	1325	32.5	20.6	8.4	600	7.7	3.4	2540.00	6	3.1	0.083	1.820	0.42	0.101	0.16	2.5	1.5	120	40
07-31-90	1310	33.3	19.9	8.7	620	7.7	3.0	2080.00	20	4.7	0.069	1.850	0.51	0.109	0.09	3.1	0.7	60	60
08-14-90	1250	36.0	20.0	8.5	440	8.0	3.0	2040.00	12	3.6	0.109	1.770	0.67	0.108	0.12	2.2	1.4	30	20
08-28-90	1310	30.0	19.0	8.7	450	8.0	2.5	2250.00	12	4.8	0.148	1.960	0.47	0.132	0.11	2.0	3.1	30	40
09-11-90	1220	30.4	19.0	8.4	450	8.0	3.2	2370.00	4	4.0	0.102	1.720	0.57	0.119	0.09	2.9	0.9	40	30
09-25-90	1910	22.2	17.3	8.2	600	7.8	3.5	2530.00	(2)	-NA-	0.041	1.920	0.30	0.093	0.09	2.1	7.6	70	40
10-09-90	1330	17.9	12.4	9.4	620	7.8	2.7	2510.00	16	4.8	0.022	2.140	0.39	0.091	0.05	2.6	9.8	30	180
10-23-90	1200	12.1	11.4	9.4	640	7.7	4.0	2390.00	4	3.0	0.049	2.340	0.27	0.110	0.08	1.9	5.2	(10)	30
11-06-90	1210	6.8	10.0	10.3	620	7.8	3.4	2410.00	8	2.5	0.055	2.340	0.29	0.097	0.08	2.4	2.2	10	20
11-20-90	1200	6.6	9.9	9.9	650	8.1	3.4	2430.00	2	3.2	0.101	2.420	0.33	0.129	0.15	-NA-	7.8	7	63
12-04-90	1140	5.4	7.2	9.9	620	8.1	3.3	2250.00	(2)	3.8	0.147	2.170	0.43	0.144	0.16	3.1	5.8	2	69
12-18-90	1028	6.1	6.6	10.3	530	7.6	2.5	2390.00	12	3.7	0.183	2.500	0.39	0.135	0.16	2.3	3.2	8	94
01-15-91	1025	6.8	6.8	9.0	560	8.4	3.1	3410.00	10	5.6	0.267	1.910	0.54	0.169	0.15	2.7	4.3	4	800
01-29-91	1230	-1.7	4.4	13.1	630	8.6	-NA-	3150.00	12	3.2	0.189	1.930	0.32	0.134	0.12	2.9	5.0	6	45
02-12-91	1220	10.8	9.2	8.3	660	8.4	4.4	2060.00	10	2.2	0.115	2.230	0.34	0.139	0.14	3.8	7.4	7	47
02-26-91	1300	15.3	10.1	10.0	640	8.5	4+	1800.00	10	3.6	0.204	2.560	0.30	0.164	0.16	-NA-	4.8	3	13
03-12-91	1201	10.2	10.2	9.5	660	8.2	4.5	1300.00	10	3.3	0.171	2.510	0.37	0.170	0.19	3.2	-NA-	3	35
03-26-91	1158	9.2	11.1	9.3	670	8.1	3.5	1410.00	10	3.3	0.165	2.360	0.56	0.176	0.19	2.5	10.5	9	42
04-09-91	1150	15.9	12.4	8.9	650	8.4	4	1380.00	10	3.0	0.103	2.100	0.45	0.102	0.13	2.5	9.2	18	14
04-23-91	1156	24.0	14.6	8.4	610	8.4	3	1680.00	8	5.7	0.130	1.820	0.91	0.128	0.15	3.7	10.0	22	38
05-07-91	1305	19.5	14.5	8.5	560	8.0	3	1930.00	14	5.0	0.109	1.750	0.84	0.121	0.16	2.3	6.8	38	84
05-21-91	1230	22.9	15.4	8.6	560	8.2	3	2090.00	12	6.0	0.043	1.740	0.34	0.100	0.15	5.1	2.1	44	56
06-04-91	1120	17.3	16.9	8.2	550	8.2	4	2000.00	-NA-	-NA-	0.046	1.780	0.65	0.109	0.12	1.3	4.3	43	30
06-18-91	1045	22.2	17.1	8.0	600	8.2	3.5	2110.00	10	5.0	0.074	0.693	0.65	0.095	0.11	1.7	3.0	49	62
07-02-91	1110	30.0	18.2	8.1	610	8.1	4	1960.00	8	4.0	0.061	1.630	0.44	0.107	0.14	1.9	3.0	38	54
07-16-91	1010	28.1	20.1	7.9	550	8.0	2.5	2390.00	10	5.0	0.109	1.600	0.44	0.085	0.16	1.5	3.1	190	84

Degrees C    ppm     $\mu$ mhos    feet    cfs    mg/l    NTU    ----- mg/l-N -----    -- mg/l-P --    mg/l     $\mu$ g/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IS44MDI -- Snake River at Gridley Bridge -- Depth Integrated Sampling

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
08-01-90	1230	30.4	20.9	8.6	500	7.6	-NA-	5580.00	4	2.0	0.054	1.130	0.37	0.079	0.07	2.5	0.5	10	(10)
08-15-90	1204	28.5	21.0	8.1	430	7.9	7.5	5610.00	6	1.5	0.039	1.460	0.80	0.083	0.07	1.7	(0.3)	10	(10)
08-29-90	1140	24.0	19.5	7.2	490	7.6	-NA-	6330.00	10	2.7	0.088	1.430	0.29	0.091	0.09	1.7	0.9	20	20

Degrees C    ppm    μmhos    feet    cfs    mg/l    NTU    ----- mg/l-N -----    -- mg/l-P --    mg/l    μg/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).  
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## Middle Snake River Water Quality Survey Water Quality Data Report

IS47N -- Snake River below Lower Salmon Falls Power Plant

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			----- PHOSPHORUS -----		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
07-03-90	1545	21.0	19.0	7.2	420	8.6	5.8	5150.00	2	1.6	0.043	1.310	0.23	0.084	0.07	2.4	1.2	20	(10)
07-18-90	1135	27.0	19.3	8.4	470	8.1	7.9	5870.00	10	1.4	0.061	1.330	0.39	0.081	0.05	1.9	0.8	(10)	(10)
08-01-90	1340	33.5	19.4	9.6	480	7.7	6.4	5580.00	4	1.7	0.055	1.070	0.41	0.081	0.07	2.2	-NA-	10	10
08-15-90	1335	38.0	19.5	9.0	480	8.0	8.8	5610.00	2	1.4	0.074	1.330	0.34	0.080	0.08	1.7	1.2	(10)	(10)
08-29-90	1300	24.0	19.5	8.8	420	8.1	7	6330.00	4	2.2	0.195	1.450	0.42	0.064	0.07	1.4	0.6	(10)	(10)
09-12-90	1120	23.9	18.2	8.7	420	8.1	6	6550.00	2	1.8	0.072	1.510	0.21	0.080	0.07	1.9	0.9	(10)	10
09-26-90	1315	22.4	17.7	8.9	460	7.8	5	6880.00	4	-NA-	0.017	1.420	0.21	0.079	0.10	1.5	1.2	(10)	(10)
10-10-90	1307	21.5	13.6	8.9	500	7.4	4.1	6910.00	10	3.0	0.043	1.550	0.28	0.069	0.07	2.1	6.3	(10)	50
10-24-90	1248	16.8	12.9	8.9	550	7.7	6	6810.00	6	2.6	0.067	1.670	0.15	0.073	0.06	1.5	1.7	(10)	(10)
11-07-90	1305	9.2	10.6	9.5	510	8.2	5.5	6450.00	10	3.6	0.129	1.900	0.23	0.065	0.06	1.8	2.1	(10)	(10)
12-05-90	1320	7.3	8.9	8.9	510	8.2	5	6240.00	2	3.6	0.097	1.580	0.33	0.102	0.07	1.7	3.3	14	48
12-19-90	1331	-4.3	7.9	9.2	410	7.3	3.55	6210.00	8	3.0	0.137	1.820	0.40	0.063	0.10	2.0	2.1	17	44
01-16-91	1215	5.4	8.6	8.9	490	8.4	3.5	7090.00	16	4.7	0.190	1.640	0.38	0.117	0.11	2.0	3.2	27	660
01-30-91	1255	1.8	6.5	10.2	530	8.4	4.4	6600.00	8	2.3	0.134	1.560	0.26	0.090	0.09	1.1	1.8	6	28
02-13-91	1225	10.0	10.9	9.8	520	8.3	4	5600.00	10	3.0	0.104	1.940	0.22	0.094	0.11	1.7	2.9	7	20
02-27-91	1140	9.8	11.6	8.6	480	6.8	3.9	5410.00	12	3.3	0.119	1.580	0.17	0.097	0.08	2.6	2.0	7	8
03-27-91	1150	9.3	12.1	9.6	480	8.2	5	4800.00	22	6.0	0.063	1.570	0.31	0.074	0.06	1.8	6.7	11	26
04-10-91	1225	6.8	11.9	9.8	480	8.4	6.3	4720.00	10	4.0	0.055	1.140	0.29	0.045	0.11	1.6	9.1	11	6
04-24-91	1135	16.7	15.1	8.3	470	8.4	3.7	5080.00	9	4.5	0.203	1.310	0.28	0.066	0.10	2.9	13.4	14	26
05-08-91	0830	13.1	15.1	8.8	460	8.3	4	5390.00	10	3.0	0.035	0.944	0.39	0.068	0.14	1.6	6.6	16	61
05-22-91	1212	23.4	16.7	9.3	430	8.4	4.2	5400.00	16	5.0	0.150	1.290	0.30	0.069	0.09	1.5	2.3	11	9
06-05-91	1320	12.9	15.8	9.0	430	8.4	5.8	5440.00	2	-NA-	0.096	0.904	0.56	0.063	0.06	1.3	2.0	3	6
06-19-91	1000	23.6	17.6	9.4	480	8.4	7.3	5510.00	5	2.0	0.084	0.667	0.72	0.061	0.09	2.8	1.6	2	1
07-03-91	1300	30.1	19.6	9.7	540	7.6	7	5340.00	3	2.0	0.043	1.130	0.24	0.087	0.10	1.8	1.3	3	7
07-17-91	0938	24.1	20.4	8.4	480	8.2	6.3	5840.00	1	2.0	0.063	0.900	0.28	0.072	0.07	1.3	1.5	5	2

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N -----   -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

IS52S      -- Snake River at King Hill Bridge

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
07-03-90	1655	25.4	19.8	7.2	400	8.7	9.4	6140.00	6	1.4	0.030	1.150	0.23	0.070	0.05	1.6	1.6	10	30
07-18-90	1005	25.0	19.1	8.2	420	7.4	8.2	7190.00	6	1.2	0.052	1.340	0.38	0.070	0.05	2.2	0.2	10	10
08-01-90	1505	37.3	20.4	8.6	460	8.1	-NA-	7170.00	6	1.5	0.035	0.971	0.31	0.053	(0.05)	2.5	1.2	(10)	(10)
08-15-90	1500	38.0	21.0	8.4	460	8.4	10.0	7200.00	6	1.5	0.063	1.290	0.29	0.068	0.07	1.4	0.3	20	(10)
08-29-90	1500	32.0	19.5	7.5	460	8.5	7.7	8200.00	14	4.3	0.132	1.380	0.53	0.080	0.10	0.5	1.1	(10)	(10)
09-12-90	1315	32.5	19.9	10.2	370	8.5	6.0	8420.00	(2)	1.3	0.033	1.350	0.22	0.074	0.06	2.9	-NA-	30	80
09-26-90	1540	29.6	18.9	9.9	470	8.0	6.5	8920.00	(2)	-NA-	(0.005)	1.430	0.21	0.066	0.10	1.5	3.3	(10)	(10)
10-10-90	1645	15.9	13.1	9.5	490	7.9	3.8	9050.00	16	3.6	0.035	1.420	0.27	0.066	0.07	1.8	1.3	30	(10)
10-24-90	1530	21.9	14.1	9.7	540	7.6	4.8	8500.00	10	2.6	0.043	1.610	0.24	0.061	0.06	1.6	7.3	(10)	(10)
11-07-90	1545	7.4	10.5	10.4	500	8.4	6	8220.00	12	2.5	0.031	1.760	0.20	0.062	(0.05)	1.1	1.8	(10)	10
12-05-90	1535	6.9	8.2	9.9	490	8.3	5	7970.00	6	3.7	0.050	1.520	0.26	0.092	(0.05)	0.8	4.5	3	28
12-18-90	1530	3.9	8.2	9.8	490	8.4	4.8	7830.00	8	2.7	0.107	1.710	0.23	0.106	0.09	1.5	2.3	5	25
01-16-91	1403	5.1	9.6	9.4	480	8.4	3	8730.00	16	5.1	0.111	1.710	0.29	0.108	0.11	1.6	2.3	19	220
01-30-91	1454	3.5	7.2	11.9	520	8.6	3.9	8300.00	8	2.6	0.081	1.570	0.22	0.087	0.09	1.4	2.3	13	11
02-13-91	1435	13.2	11.3	11.9	490	8.4	3.6	7180.00	16	4.8	0.062	1.890	0.18	0.087	0.11	2.1	3.3	11	29
02-27-91	1410	15.7	12.5	9.3	440	8.2	3.4	7090.00	6	3.0	0.031	1.500	0.15	0.083	0.06	2.1	4.6	3	8
03-13-91	1312	11.5	12.0	10.5	460	8.3	9.7	-NA-	8	2.8	0.159	1.620	0.20	0.064	0.12	1.0	2.8	4	9
03-27-91	1355	12.2	12.6	10.3	450	8.6	5	-NA-	2	2.7	0.064	1.540	0.27	0.057	(0.05)	1.5	9.2	0	6
04-10-91	1002	4.0	10.8	9.8	470	8.4	5	-NA-	8	2.2	0.007	1.130	0.10	0.039	0.09	1.7	6.5	480	7
04-24-91	0955	12.0	14.3	8.6	460	8.2	3	-NA-	14	5.3	0.051	1.240	0.43	0.060	0.11	2.7	14.6	9	120
05-08-91	0940	13.9	15.0	7.8	450	8.1	4	6940.00	21	4.0	(0.005)	0.885	0.28	0.071	0.13	1.4	5.0	5	270
05-22-91	1340	25.6	16.9	8.0	430	8.4	4	7000.00	16	3.0	0.132	1.340	0.51	0.067	0.08	1.6	5.1	75	56
06-05-91	1015	13.0	16.0	8.8	420	6.8	5	6440.00	5	-NA-	0.031	0.843	0.60	0.055	0.22	1.0	2.5	19	6
06-19-91	1300	30.0	19.6	9.5	480	8.6	6.6	6290.00	4	1.0	0.007	0.696	0.20	0.050	0.07	3.1	1.8	36	9
07-03-91	1010	29.9	19.3	8.7	530	8.2	7.4	5900.00	7	2.0	0.045	1.080	0.24	0.074	0.08	1.2	2.9	42	39
07-17-91	1258	31.0	22.0	8.9	420	8.3	8.8	6670.00	1	1.0	0.043	1.150	0.33	0.065	0.07	2.2	1.5	81	26

Degrees C      ppm      μmhos      feet      cfs      mg/l      NTU      ----- mg/l-N -----      -- mg/l-P --      mg/l      μg/l      - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

TS06N -- Vineyard Lake

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
07-03-90	0915	14.5	15.2	8.6	450	8.6	-NA-	18.00	18	4.7	0.018	1.820	0.23	0.015	(0.05)	-NA-	-NA-	190	450
07-17-90	0920	22.5	16.0	8.7	520	7.2	-NA-	18.00	50	12.0	0.031	1.820	0.52	0.035	0.17	-NA-	-NA-	150	280
07-31-90	1035	23.5	16.0	8.8	360	8.3	-NA-	19.00	62	17.0	0.032	1.620	0.52	0.036	0.08	-NA-	-NA-	190	800
08-14-90	1000	25.0	17.0	8.2	550	8.3	-NA-	18.00	24	6.8	0.040	1.680	0.29	0.043	0.05	-NA-	-NA-	110	360
08-28-90	1020	22.5	16.5	8.1	560	8.0	-NA-	19.00	62	11.0	0.069	1.580	0.51	0.055	0.09	-NA-	-NA-	200	510
09-11-90	0940	18.6	15.5	9.0	530	8.4	-NA-	20.00	34	5.4	0.029	1.750	0.30	0.038	(0.05)	-NA-	-NA-	210	430
09-25-90	0940	16.4	14.9	8.5	590	8.4	-NA-	20.00	10	-NA-	0.024	2.030	0.16	0.037	(0.05)	-NA-	-NA-	230	380
10-09-90	0955	5.6	11.2	9.6	600	8.4	-NA-	21.00	34	12.0	0.033	1.950	0.24	0.055	0.06	-NA-	-NA-	130	310
10-23-90	1700	15.9	13.9	8.7	570	8.3	-NA-	21.00	10	4.2	0.012	1.930	0.23	0.043	(0.05)	-NA-	-NA-	20	220
11-06-90	1603	5.5	12.9	10.0	510	8.2	-NA-	19.00	10	1.0	0.092	2.180	0.10	0.033	(0.05)	-NA-	-NA-	(10)	(10)
11-20-90	1550	1.4	12.2	9.8	630	8.3	-NA-	18.00	4	0.8	0.101	2.290	0.17	0.022	(0.05)	-NA-	-NA-	9	85
12-04-90	1537	7.9	12.3	9.3	600	7.9	-NA-	16.00	2	0.8	0.012	2.050	0.20	0.033	(0.05)	-NA-	-NA-	2	94
01-15-91	1526	5.4	12.0	9.7	590	8.7	-NA-	15.00	4	1.5	0.015	2.210	0.16	0.030	(0.05)	-NA-	-NA-	2	94
01-29-91	1514	1.5	11.2	10.1	650	8.5	-NA-	14.00	10	0.2	0.020	2.280	0.12	0.033	(0.05)	-NA-	-NA-	2	120
02-12-91	1506	10.9	13.3	9.0	630	8.4	-NA-	14.00	2	0.7	0.029	2.260	0.14	0.024	(0.05)	-NA-	-NA-	3	102
02-26-91	1429	17.4	14.1	9.3	600	8.2	-NA-	13.00	10	0.7	0.105	2.360	0.12	0.022	(0.05)	-NA-	-NA-	2	64
03-12-91	1500	9.0	12.8	9.4	610	8.3	-NA-	13.00	(2)	0.8	0.043	2.350	0.11	0.018	(0.05)	-NA-	-NA-	1	84
03-26-91	1430	12.9	14.0	9.9	560	8.5	-NA-	13.00	2	0.7	0.099	2.140	(0.05)	0.018	(0.05)	-NA-	-NA-	0	20
04-09-91	1153	13.8	13.7	10.5	580	8.5	-NA-	12.00	1	1.3	(0.005)	1.890	0.77	0.015	(0.05)	-NA-	-NA-	(1)	9
04-23-91	1345	14.4	15.2	9.0	600	8.0	-NA-	13.00	12	3.2	0.153	2.150	0.30	0.025	(0.05)	-NA-	-NA-	35	180
05-07-91	1401	19.2	16.2	9.3	520	8.6	-NA-	12.00	71	18.0	0.049	1.600	0.53	0.026	0.15	-NA-	-NA-	65	150
05-21-91	1403	25.7	17.4	9.5	510	8.5	-NA-	15.00	15	4.0	0.006	2.010	0.10	0.018	(0.05)	-NA-	-NA-	4	31
06-04-91	1307	19.3	16.0	8.8	540	8.5	-NA-	15.00	20	-NA-	0.101	4.750	0.81	0.024	(0.05)	-NA-	-NA-	210	97
06-18-91	1100	21.2	15.8	8.9	590	8.5	-NA-	17.00	13	10.0	0.033	0.661	0.19	0.023	0.07	-NA-	-NA-	310	180
07-02-91	0937	16.2	15.9	9.2	610	8.4	-NA-	17.00	18	4.0	(0.005)	1.850	0.27	0.014	0.06	-NA-	-NA-	65	74
07-16-91	0947	19.9	17.3	8.4	550	8.4	-NA-	17.00	50	18.0	0.037	1.600	0.50	0.026	0.11	-NA-	-NA-	260	560

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).



# Middle Snake River Water Quality Survey

## Water Quality Data Report

TS18N -- Warm Creek

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
11-26-90	1138	2.8	10.3	10.8	650	8.1	-NA-	43.40	16	1.2	0.068	3.100	0.29	0.035	0.06	-NA-	-NA-	8	11
12-10-90	1115	9.0	12.1	8.4	590	7.8	-NA-	41.40	14	2.2	0.256	2.390	0.28	0.042	(0.05)	-NA-	-NA-	21	81

Degrees C    ppm     $\mu$ mhos    feet    cfs    mg/l    NTU    ----- mg/l-N ----- -- mg/l-P --    mg/l     $\mu$ g/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).  
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**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

TS27S     -- Southside Cedar Draw Creek

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	----- NITROGEN -----			----- PHOSPHORUS -----		5-DAY BOD	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total		A	Coliform	Strep
06-26-90	1515	36.9	22.5	8.4	-NA-	-NA-	-NA-	149.00	50	9.8	0.032	0.797	0.52	0.039	0.10	-NA-	-NA-	435	505
07-11-90	1520	38.0	21.0	8.0	-NA-	8.8	-NA-	85.00	46	22.0	0.088	2.150	0.68	0.105	0.11	-NA-	-NA-	560	2400
07-24-90	1415	29.5	19.0	8.4	660	-NA-	-NA-	109.00	282	82.0	0.194	1.910	1.17	0.118	0.41	-NA-	-NA-	1300	1500
08-07-90	1322	35.0	19.5	8.2	760	8.5	-NA-	90.00	176	60.0	0.087	1.860	0.95	0.096	0.35	-NA-	-NA-	930	3500
08-21-90	1235	22.5	15.5	8.8	710	8.1	-NA-	119.00	174	50.0	0.107	2.390	0.83	0.104	0.28	-NA-	-NA-	950	1100
09-03-90	1320	28.6	17.5	8.7	550	8.4	-NA-	119.00	130	30.0	0.391	0.998	0.91	0.077	0.17	-NA-	-NA-	560	2900
09-18-90	1110	20.6	14.8	9.5	520	8.2	-NA-	204.00	122	-NA-	0.086	1.620	0.69	0.058	0.19	-NA-	-NA-	1000	580
10-02-90	1226	14.1	12.7	8.8	620	8.1	-NA-	209.00	100	24.0	0.046	1.860	0.57	0.093	0.19	-NA-	-NA-	300	1500
10-17-90	1300	12.1	8.7	9.4	600	8.0	-NA-	212.00	68	15.0	0.084	1.990	0.27	0.089	0.14	-NA-	-NA-	130	220
10-30-90	1040	16.0	9.9	8.5	620	7.8	-NA-	196.00	46	9.8	0.070	1.740	0.50	0.122	0.11	-NA-	-NA-	50	440
11-13-90	1245	16.4	9.3	8.4	790	8.6	-NA-	97.00	16	3.2	0.127	3.380	0.62	0.062	0.08	-NA-	-NA-	20	40
11-27-90	1112	3.1	4.6	10.9	870	8.4	-NA-	68.00	18	2.2	(0.005)	4.270	0.56	0.074	0.09	-NA-	-NA-	62	490
12-11-90	1047	4.4	8.3	10.5	870	8.3	-NA-	58.00	12	2.2	0.525	4.360	0.67	0.094	0.10	-NA-	-NA-	30	1600
01-08-91	1233	-1.9	4.9	10.3	830	8.7	-NA-	39.00	26	6.8	0.120	4.430	0.76	0.114	0.12	-NA-	-NA-	35	210
01-22-91	1255	0.0	2.1	10.7	820	8.9	-NA-	43.00	24	5.4	0.055	4.510	0.46	0.100	0.11	-NA-	-NA-	7	71
02-05-91	1215	8.4	6.3	10.4	910	8.8	-NA-	44.00	10	1.9	0.057	3.980	0.51	0.101	0.09	-NA-	-NA-	10	160
02-19-91	1145	12.6	6.5	13.4	890	8.9	-NA-	37.00	(2)	1.8	0.040	4.010	0.26	0.071	(0.05)	-NA-	-NA-	30	78
03-05-91	1050	3.6	6.8	13.2	910	8.9	-NA-	38.00	6	1.3	0.125	5.080	0.40	0.091	0.08	-NA-	-NA-	43	66
03-19-91	1201	16.0	8.8	9.5	920	8.7	-NA-	37.00	26	2.6	0.287	4.310	0.70	0.089	0.13	-NA-	-NA-	90	64
04-02-91	1140	16.6	11.4	9.4	900	8.7	-NA-	32.00	21	2.5	0.111	3.650	0.80	0.093	0.14	-NA-	-NA-	19	43
04-16-91	1135	11.7	9.1	8.9	530	8.9	-NA-	110.00	241	47.0	0.119	0.209	1.59	0.053	0.28	-NA-	-NA-	190	1100
04-30-91	1230	15.7	8.6	9.4	510	8.7	-NA-	272.00	800	78.0	0.149	0.333	0.88	0.053	0.66	-NA-	-NA-	76	1300
05-14-91	1210	14.3	11.0	9.0	500	8.5	-NA-	217.00	144	34.0	0.010	0.528	0.66	0.047	0.21	-NA-	-NA-	240	1000
05-28-91	1140	19.2	12.7	8.2	580	8.5	-NA-	114.00	140	43.0	0.168	1.430	0.59	0.060	0.26	-NA-	-NA-	710	1200
06-11-91	1115	30.4	18.1	7.9	460	8.2	-NA-	183.00	129	-NA-	0.113	0.732	0.87	0.067	0.30	-NA-	-NA-	1100	840
06-25-91	1155	24.5	15.9	8.1	570	8.5	-NA-	119.00	50	17.0	0.098	(0.005)	0.55	0.087	0.16	-NA-	-NA-	1100	730
07-09-91	1235	29.7	19.3	7.5	580	8.2	-NA-	110.00	56	27.0	0.245	1.770	1.15	0.061	0.16	-NA-	-NA-	920	1400

Degrees C   ppm   μmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   μg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

Middle Snake River Water Quality Survey  
Water Quality Data Report

TS33S -- Southside Mud Creek

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge	TSS	Turbidity	----- NITROGEN -----			PHOSPHORUS		5-DAY	Chlorophyll	FECAL BACTERIA	
		Air	Water	Oxygen	Conductivity						Ammonia	NO2+NO3	Organic	Ortho	Total	BOD	A	Coliform	Strep
06-27-90	1000	22.5	16.5	10.6	690	8.2	-NA-	82.00	30	9.7	0.041	1.690	0.68	0.074	0.11	-NA-	-NA-	1900	15750
07-10-90	1530	33.0	22.2	8.8	-NA-	8.8	-NA-	100.00	38	11.0	0.132	2.070	0.76	0.078	0.13	-NA-	-NA-	210	620
07-25-90	0930	19.5	15.5	8.3	700	7.8	-NA-	107.00	138	33.0	0.125	2.230	0.87	0.113	0.23	-NA-	-NA-	1200	4700
08-08-90	1350	36.5	21.0	7.6	810	8.2	-NA-	72.00	90	23.0	0.095	1.950	0.80	0.099	0.20	-NA-	-NA-	1300	21000
08-22-90	1255	27.5	17.5	8.5	730	8.4	-NA-	138.00	80	19.0	0.104	2.200	0.90	0.121	0.17	-NA-	-NA-	1230	710
09-05-90	1220	25.0	18.0	8.9	480	8.3	-NA-	122.00	47	11.0	0.068	1.990	0.82	0.116	0.16	-NA-	-NA-	970	1700
09-18-90	1210	22.6	15.4	9.3	590	8.1	-NA-	138.00	32	-NA-	0.125	2.130	0.46	0.097	0.13	-NA-	-NA-	870	770
10-02-90	1415	16.3	13.6	8.7	790	8.1	-NA-	147.00	48	14.0	0.229	2.260	0.71	0.098	0.15	-NA-	-NA-	490	650
10-16-90	1200	13.5	12.0	8.8	790	8.1	-NA-	192.00	48	16.0	0.113	2.220	0.89	0.103	0.17	-NA-	-NA-	350	510
10-31-90	1200	14.0	11.9	8.5	800	7.9	-NA-	138.00	34	6.5	0.158	2.850	0.69	0.100	0.11	-NA-	-NA-	360	600
11-14-90	1144	14.9	11.7	8.8	850	8.4	-NA-	107.00	36	8.1	0.172	3.440	0.57	0.124	0.15	-NA-	-NA-	143	5500
11-28-90	1011	4.0	8.5	8.3	840	8.6	-NA-	94.00	34	7.0	0.229	4.540	0.95	0.103	0.16	-NA-	-NA-	120	710
12-12-90	1230	2.4	7.9	10.2	830	8.2	-NA-	94.00	54	6.0	0.267	3.990	1.00	0.128	0.19	-NA-	-NA-	40	560
01-09-91	1045	-1.8	6.2	9.9	800	8.6	-NA-	82.00	82	30.0	0.370	3.940	0.92	0.140	0.18	-NA-	-NA-	240	3600
01-23-91	1100	-3.4	6.3	10.1	820	8.5	-NA-	72.00	58	14.0	0.301	4.270	0.89	0.136	0.14	-NA-	-NA-	88	760
02-06-91	1055	3.9	9.1	8.3	920	8.6	-NA-	70.30	48	6.2	0.375	3.890	1.05	0.152	0.23	-NA-	-NA-	320	28000
02-20-91	1117	14.1	10.0	8.4	830	8.6	-NA-	67.75	40	8.7	1.020	4.270	1.10	0.245	0.32	-NA-	-NA-	89	2700
03-06-91	1050	3.7	8.0	8.7	870	8.5	-NA-	66.90	46	7.2	0.480	4.920	0.68	0.109	0.12	-NA-	-NA-	340	860
03-20-91	1040	12.6	10.6	8.6	850	8.4	-NA-	63.50	66	8.5	0.337	3.960	0.82	0.075	0.14	-NA-	-NA-	93	530
04-03-91	1100	17.1	12.8	8.7	820	8.5	-NA-	57.10	35	6.2	0.120	3.240	0.99	0.045	0.12	-NA-	-NA-	65	700
04-17-91	1135	12.1	11.3	8.6	700	8.6	-NA-	65.20	146	27.0	0.103	2.560	0.74	0.056	0.31	-NA-	-NA-	440	840
05-01-91	1220	22.5	13.2	8.4	740	8.5	-NA-	65.20	90	24.0	0.166	1.880	1.10	0.102	0.26	-NA-	-NA-	230	710
05-15-91	1145	17.7	12.9	8.5	710	8.5	-NA-	104.40	90	26.0	0.078	1.570	0.50	0.077	0.22	-NA-	-NA-	660	1700
05-29-91	1120	18.4	14.8	8.4	700	8.5	-NA-	101.80	87	22.0	0.173	1.820	0.55	0.290	0.18	-NA-	-NA-	930	1100
06-12-91	0840	16.4	14.5	8.6	650	8.3	-NA-	107.00	65	-NA-	0.086	1.840	0.92	0.079	0.18	-NA-	-NA-	1300	3900
06-26-91	1115	20.7	15.7	8.5	680	8.4	-NA-	94.00	36	7.0	0.031	1.730	0.57	0.156	0.18	-NA-	-NA-	1000	1000
07-10-91	1050	25.8	17.6	8.0	680	8.3	-NA-	78.00	85	27.0	0.111	2.040	0.99	0.080	0.23	-NA-	-NA-	850	860

Degrees C    ppm    μmhos    feet    cfs    mg/l    NTU    ----- mg/l-N -----    -- mg/l-P --    mg/l    μg/l    - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

**Middle Snake River Water Quality Survey**  
**Water Quality Data Report**

TS37N     -- Banbury Springs

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge	TSS	Turbidity	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
08-22-90	1150	23.5	16.5	8.6	360	8.1	-NA-	-NA-	10	(1.0)	0.041	0.992	0.09	0.031	(0.05)	-NA-	-NA-	150	1400

Degrees C    ppm    μmhos            feet    cfs    mg/l    NTU    ----- mg/l-N ----- -- mg/l-P --    mg/l    μg/l    - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

## Middle Snake River Water Quality Survey Water Quality Data Report

TS41S -- Salmon Falls Creek

Date	Time	Temperature		Dissolved	Electrical	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water	Oxygen ppm	Conductivity µmhos						Ammonia mg/l-N	NO2+NO3 mg/l-N	Organic mg/l-N	Ortho mg/l-P	Total mg/l-P			Coliform counts/100ml	Strep counts/100ml
07-03-90	1430	24.9	21.8	15.2	710	8.4	-NA-	57.00	6	3.5	0.013	2.130	0.36	0.009	(0.05)	-NA-	-NA-	70	20
07-18-90	1225	31.0	21.4	10.2	760	7.7	-NA-	54.00	8	2.9	0.041	2.210	0.42	0.038	(0.05)	-NA-	-NA-	170	110
08-01-90	0925	24.5	19.2	7.4	700	8.3	-NA-	76.00	20	9.0	0.039	1.760	0.48	0.048	(0.05)	-NA-	-NA-	240	100
08-15-90	1205	32.0	22.0	11.2	760	8.2	-NA-	52.00	6	3.2	(0.005)	2.470	0.28	0.036	(0.05)	-NA-	-NA-	120	30
08-29-90	0930	18.5	12.0	7.4	700	7.8	-NA-	165.00	36	13.0	0.177	2.260	0.45	0.073	0.08	-NA-	-NA-	70	240
09-12-90	0920	18.4	17.0	8.0	630	8.3	-NA-	200.00	54	13.8	0.022	2.360	0.50	0.062	0.09	-NA-	-NA-	120	100
09-26-90	1015	20.9	16.2	10.8	690	8.0	-NA-	233.00	44	-NA-	(0.005)	2.250	0.44	0.059	0.13	-NA-	-NA-	190	220
10-10-90	1100	13.2	10.6	9.5	690	7.8	-NA-	228.00	34	9.0	0.034	2.320	0.38	0.057	0.07	-NA-	-NA-	50	190
10-24-90	0959	6.2	9.7	9.4	710	8.0	-NA-	271.00	26	9.2	0.021	2.220	0.33	0.059	0.06	-NA-	-NA-	20	170
11-07-90	1011	1.9	7.5	10.7	780	8.5	-NA-	191.00	30	6.7	0.032	3.710	0.37	0.047	(0.05)	-NA-	-NA-	10	40
12-05-90	1030	5.4	7.9	10.5	800	8.3	-NA-	181.00	22	7.0	0.070	3.480	0.56	0.059	(0.05)	-NA-	-NA-	12	70
12-18-90	1330	0.6	5.8	10.4	730	7.9	-NA-	178.00	22	5.5	0.091	3.810	0.43	0.064	0.06	-NA-	-NA-	29	230
01-16-91	1018	5.2	6.9	9.5	760	8.6	-NA-	138.00	48	15.0	0.054	3.800	0.55	0.053	0.06	-NA-	-NA-	24	240
01-30-91	1050	-4.1	4.1	10.9	770	8.0	-NA-	143.00	56	13.0	0.084	3.710	0.53	0.056	0.07	-NA-	-NA-	18	66
02-13-91	1036	8.3	9.6	10.5	840	8.6	-NA-	143.00	62	14.0	0.076	4.430	0.60	0.050	0.11	-NA-	-NA-	21	47
02-27-91	0947	3.7	8.0	8.9	800	8.4	-NA-	141.00	68	16.0	0.137	3.570	0.64	0.048	0.09	-NA-	-NA-	35	61
03-13-91	0956	7.7	10.1	9.5	830	8.4	-NA-	130.00	44	12.0	0.258	3.590	0.33	0.038	0.07	-NA-	-NA-	10	45
03-27-91	0930	8.0	8.8	9.6	800	8.5	-NA-	116.00	30	8.3	0.042	3.250	0.18	0.039	(0.05)	-NA-	-NA-	33	55
04-10-91	1340	6.8	10.0	10.7	790	8.5	-NA-	112.00	25	7.7	0.056	2.680	0.41	0.016	0.06	-NA-	-NA-	18	34
04-24-91	1242	17.4	13.6	8.7	680	8.6	-NA-	165.00	106	27.0	0.202	2.260	0.43	0.058	0.16	-NA-	-NA-	150	1300
05-08-91	1241	13.3	14.4	8.9	640	8.5	-NA-	226.00	116	27.0	0.028	1.300	0.35	0.066	0.20	-NA-	-NA-	95	110
05-22-91	0940	19.7	15.5	9.3	590	8.4	-NA-	190.00	99	29.0	0.069	2.020	0.69	0.051	0.17	-NA-	-NA-	330	250
06-05-91	0945	9.8	13.2	8.6	580	8.3	-NA-	151.00	58	-NA-	0.059	1.760	0.76	0.069	0.16	-NA-	-NA-	460	590
06-19-91	1105	26.6	18.5	8.4	610	8.3	-NA-	108.00	22	10.0	0.034	0.498	0.53	0.038	0.09	-NA-	-NA-	84	160
07-03-91	1010	25.9	20.4	8.7	600	8.4	-NA-	91.00	10	5.0	0.032	1.670	0.39	0.043	0.07	-NA-	-NA-	150	250
07-17-91	1135	27.1	20.3	9.2	640	8.4	-NA-	45.00	4	3.0	0.042	2.110	0.31	0.022	(0.05)	-NA-	-NA-	110	63

Degrees C   ppm   µmhos   feet   cfs   mg/l   NTU   ----- mg/l-N ----- -- mg/l-P --   mg/l   µg/l   - counts/100ml -  
 A number in parentheses indicates a value below minimum detection limit -- (MDL).

# Middle Snake River Water Quality Survey Water Quality Data Report

TS50N -- Malad River

Date	Time	Temperature		Dissolved Oxygen	Electrical Conductivity	pH	Secchi Disk	Discharge cfs	TSS mg/l	Turbidity NTU	NITROGEN			PHOSPHORUS		5-DAY BOD	Chlorophyll A	FECAL BACTERIA	
		Air	Water								Ammonia	NO2+NO3	Organic	Ortho	Total			Coliform	Strep
06-27-90	0945	25.3	15.8	9.2	300	8.7	-NA-	1300.00	(2)	0.7	0.035	1.040	(0.05)	0.027	(0.05)	-NA-	-NA-	30	20
07-11-90	1015	20.4	15.5	6.9	-NA-	8.8	-NA-	1270.00	(2)	0.5	(0.005)	1.010	0.09	0.035	(0.05)	-NA-	-NA-	30	50
07-25-90	1035	21.0	15.2	9.3	340	6.4	-NA-	1310.00	8	0.9	0.016	1.080	0.15	0.045	(0.05)	-NA-	-NA-	20	(10)
08-08-90	1240	37.5	18.1	9.1	350	8.2	-NA-	1330.00	8	0.6	0.020	0.981	0.52	0.042	0.12	-NA-	-NA-	10	40
08-22-90	1440	27.7	17.0	6.3	360	7.9	-NA-	1450.00	10	(1.0)	0.033	1.020	(0.05)	0.040	(0.05)	-NA-	-NA-	30	(10)
09-05-90	1300	32.5	18.5	7.1	360	7.6	-NA-	1430.00	3	(1.0)	0.112	1.070	0.18	0.042	(0.05)	-NA-	-NA-	130	110
09-19-90	1220	26.5	16.6	9.1	320	8.5	-NA-	1570.00	(2)	-NA-	0.016	1.070	0.06	0.037	(0.05)	-NA-	-NA-	20	20
10-03-90	1330	19.3	14.9	15.9	360	8.2	-NA-	1480.00	6	2.0	0.015	1.130	0.12	0.042	0.06	-NA-	-NA-	20	30
10-17-90	1225	14.0	14.4	9.4	390	8.2	-NA-	1320.00	8	2.6	0.025	2.930	(0.05)	0.044	(0.05)	-NA-	-NA-	(10)	10
10-31-90	1330	19.3	15.2	9.4	380	8.5	-NA-	1220.00	(2)	0.8	0.015	1.300	0.06	0.050	(0.05)	-NA-	-NA-	(10)	10
11-14-90	1150	14.0	14.7	9.4	380	8.1	-NA-	1210.00	4	0.5	0.034	1.190	(0.05)	0.046	(0.05)	-NA-	-NA-	4	14
11-28-90	1015	5.1	11.7	9.1	400	8.0	-NA-	1210.00	6	0.7	0.052	1.290	(0.05)	0.042	0.05	-NA-	-NA-	13	34
12-12-90	1008	-1.7	11.8	9.6	350	8.4	-NA-	1230.00	8	0.5	0.031	1.220	(0.05)	0.036	(0.05)	-NA-	-NA-	1	20
01-09-91	1043	3.5	12.5	9.3	320	7.7	-NA-	1120.00	12	2.3	0.014	1.320	(0.05)	0.044	(0.05)	-NA-	-NA-	4	110
01-23-91	1000	0.8	12.4	9.7	350	8.6	-NA-	1220.00	2	0.3	0.023	1.310	(0.05)	0.042	(0.05)	-NA-	-NA-	4	26
02-06-91	1200	9.3	14.1	10.3	390	8.5	-NA-	1220.00	2	0.3	0.048	1.270	0.06	0.042	0.10	-NA-	-NA-	(1)	54
02-20-91	1012	6.3	13.2	9.7	390	8.5	-NA-	1250.00	(2)	1.0	0.100	1.310	0.06	0.043	(0.05)	-NA-	-NA-	1	120
03-06-91	1040	3.5	12.4	10.1	360	6.8	-NA-	1230.00	(2)	0.6	0.046	1.400	(0.05)	0.073	(0.05)	-NA-	-NA-	2	50
03-20-91	1347	13.9	15.9	10.9	370	8.5	-NA-	1210.00	16	1.8	0.046	1.280	0.29	0.029	0.06	-NA-	-NA-	10	320
04-03-91	1240	19.4	16.4	9.8	340	7.1	-NA-	1220.00	3	0.5	(0.005)	1.060	0.11	0.020	0.06	-NA-	-NA-	1	58
04-17-91	1619	15.6	14.7	9.2	340	8.4	-NA-	1460.00	8	2.9	0.077	1.000	0.25	0.024	0.08	-NA-	-NA-	16	130
05-01-91	1445	23.9	16.8	9.5	350	8.1	-NA-	1290.00	2	1.0	0.098	0.955	0.14	0.027	0.10	-NA-	-NA-	66	26
05-15-91	1514	24.8	17.2	10.0	350	8.4	-NA-	1357.00	2	2.0	0.007	1.010	(0.05)	0.027	0.05	-NA-	-NA-	5	10
05-29-91	1207	19.5	16.5	10.1	330	8.6	-NA-	1256.00	3	1.0	(0.005)	0.922	0.48	0.038	(0.05)	-NA-	-NA-	22	20
06-12-91	0935	17.7	15.7	9.8	410	8.6	-NA-	1204.00	(1)	-NA-	0.049	0.892	0.17	0.030	(0.05)	-NA-	-NA-	31	23
06-26-91	1405	21.5	16.6	9.2	360	8.6	-NA-	1193.00	2	1.0	(0.005)	1.030	0.18	0.033	0.11	-NA-	-NA-	12	11
07-10-91	1455	30.2	18.6	8.8	370	8.4	-NA-	1163.00	1	1.0	0.038	1.070	0.14	0.025	0.07	-NA-	-NA-	7	36

Degrees C    ppm    μmhos    feet    cfs    mg/l    NTU    ----- mg/l-N ----- -- mg/l-P --    mg/l    μg/l    - counts/100ml -  
A number in parentheses indicates a value below minimum detection limit -- (MDL).

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX D

Concurrent Monitoring  
Statistical Summaries  
for  
Total Suspended Solids  
and  
Nutrients

APPENDIX D  
Middle Snake River Water Quality Survey  
Statistical Summary for Stations

ParmID	-- Number --		Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range	
	Miss	<MDL #Obs									
Station: FH14N      -- Blue Lakes Trout Farm Fish Processing											
S00530	0	0	51	3003.00	58.882	106.000	24.000	23.363	545.8659	204117.000	60.213
S00610	0	0	51	1067.08	20.923	46.800	1.340	11.994	143.8786	29520.590	30.913
S00625	0	0	51	1598.80	31.349	55.900	11.000	11.139	124.0990	56325.760	28.710
S00630	0	15	36	6.14	0.170	2.700	0.006	0.463	0.2146	8.564	1.137
S00665	0	0	51	236.89	4.644	8.740	1.780	1.743	3.0404	1252.353	4.493
S70507	0	0	51	162.73	3.190	10.000	0.082	2.305	5.3138	784.972	5.940
Station: FH15N      -- Blue Lakes Trout Farm Hatchery											
S00530	0	1	51	340.00	6.666	18.000	2.000	4.072	16.5866	3096.000	10.496
S00610	0	0	52	11.13	0.214	0.455	0.013	0.094	0.0088	2.834	0.243
S00625	0	0	52	25.30	0.486	1.170	0.250	0.172	0.0296	13.821	0.444
S00630	0	0	52	96.07	1.847	2.310	0.022	0.350	0.1229	183.764	0.906
S00665	0	2	50	4.73	0.094	0.230	0.050	0.036	0.0013	0.514	0.094
S70507	0	0	50	3.21	0.064	0.095	0.038	0.013	0.0001	0.216	0.035
Station: FH25N      -- Crystal Springs Hatchery											
S00530	0	1	53	256.00	4.830	12.000	1.000	2.363	5.5859	1527.000	6.122
S00610	0	0	54	18.50	0.342	0.885	0.100	0.111	0.0124	6.998	0.289
S00625	0	0	54	32.17	0.595	1.030	0.260	0.158	0.0251	20.499	0.412
S00630	0	0	54	121.90	2.257	4.270	0.043	0.516	0.2666	289.317	1.340
S00665	0	0	54	5.42	0.100	0.160	0.070	0.017	0.0002	0.559	0.044
S70507	0	0	54	4.46	0.082	0.107	0.054	0.012	0.0001	0.377	0.033
Station: FH26S      -- Magic Valley Fish Hatchery											
S00530	0	13	41	304.50	7.426	64.000	1.000	11.715	137.2445	7751.250	29.306
S00610	0	0	54	7.61	0.141	0.401	0.020	0.077	0.0059	1.388	0.200



ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00625	0	0	54	19.13	0.354	0.930	0.070	0.189	0.0359	8.681	0.492
S00630	0	0	54	91.39	1.692	2.380	0.543	0.360	0.1302	161.603	0.937
S00665	0	29	25	1.91	0.076	0.190	0.050	0.034	0.0011	0.173	0.079
S70507	0	0	54	2.39	0.044	0.076	0.011	0.015	0.0002	0.119	0.041
Station: FH28N		-- Rim View Hatchery									
S00530	0	5	49	225.50	4.602	12.000	1.000	2.702	7.3018	1388.250	6.927
S00610	0	0	54	18.43	0.341	0.529	0.148	0.084	0.0071	6.671	0.219
S00625	0	0	54	34.13	0.632	1.380	0.350	0.187	0.0353	23.442	0.487
S00630	0	0	54	84.75	1.569	2.290	0.475	0.277	0.0772	137.134	0.721
S00665	0	2	52	5.28	0.101	0.260	0.060	0.030	0.0009	0.585	0.079
S70507	0	0	54	4.50	0.083	0.117	0.051	0.013	0.0001	0.385	0.035
Station: FH35S		-- Idaho Fish Breeders -- ( N drain with									
S00530	0	1	52	819.00	15.750	36.000	8.000	5.763	33.2205	14593.500	14.892
S00610	0	0	53	39.69	0.748	1.260	0.401	0.199	0.0396	31.791	0.515
S00625	0	0	53	72.19	1.362	2.620	0.720	0.398	0.1584	106.565	1.031
S00630	0	0	53	37.33	0.704	0.984	0.431	0.142	0.0204	27.362	0.370
S00665	0	0	53	11.29	0.213	0.400	0.120	0.062	0.0038	2.605	0.160
S70507	0	0	53	7.24	0.136	0.235	0.013	0.048	0.0023	1.111	0.125
Station: FH38S		-- Box Canyon Fish Hatchery									
S00530	0	1	53	311.50	5.877	16.000	1.000	3.259	10.6240	2383.250	8.443
S00610	0	0	54	29.83	0.552	0.755	0.301	0.091	0.0084	16.928	0.238
S00625	0	0	54	49.68	0.920	1.430	0.420	0.198	0.0392	47.786	0.514
S00630	0	0	54	43.93	0.813	0.988	0.554	0.072	0.0052	36.023	0.188
S00665	0	0	54	8.29	0.153	0.250	0.080	0.040	0.0016	1.358	0.104
S70507	0	0	54	5.75	0.106	0.175	0.054	0.020	0.0004	0.636	0.052
Station: FH46N		-- Buckeye Farm Fish Hatchery									
S00530	0	0	50	880.40	17.608	34.000	0.400	7.748	60.0423	18444.160	19.917

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00610	0	2	48	5.26	0.109	0.537	0.010	0.108	0.0117	1.128	0.276
S00625	0	1	49	30.94	0.631	1.260	0.220	0.227	0.0515	22.013	0.582
S00630	0	11	39	17.27	0.443	0.962	0.005	0.311	0.0968	11.333	0.773
S00665	0	12	38	3.42	0.090	0.220	0.050	0.035	0.0012	0.353	0.087
S70507	0	3	47	1.34	0.028	0.067	0.006	0.017	0.0003	0.052	0.044
Station: FH48N -- White Springs Fish Hatchery											
S00530	0	6	47	205.50	4.372	16.000	1.000	3.130	9.7985	1349.250	7.979
S00610	0	0	53	19.90	0.375	0.813	0.156	0.151	0.0228	8.659	0.391
S00625	0	0	53	32.68	0.616	1.020	0.270	0.191	0.0367	22.062	0.496
S00630	0	0	53	67.63	1.276	2.110	0.378	0.231	0.0537	89.109	0.600
S00665	0	1	52	6.25	0.120	0.230	0.060	0.042	0.0018	0.843	0.109
S70507	0	0	53	5.82	0.109	0.330	0.071	0.037	0.0014	0.715	0.098
Station: FH49N -- Birch Creek Fish Hatchery											
S00530	0	2	52	482.00	9.269	64.000	1.000	10.595	112.2692	10193.500	27.378
S00610	0	0	54	22.96	0.425	0.819	0.137	0.164	0.0272	11.210	0.428
S00625	0	0	54	45.04	0.834	1.650	0.270	0.286	0.0819	41.909	0.743
S00630	0	0	54	64.31	1.190	3.000	0.636	0.440	0.1944	86.892	1.145
S00665	0	0	54	7.65	0.141	0.300	0.070	0.049	0.0024	1.213	0.128
S70507	0	0	54	6.38	0.118	0.410	0.009	0.054	0.0029	0.911	0.140
Station: IR02N -- Northside A Drain											
S00530	0	0	18	2886.00	160.333	732.000	6.000	177.629	31552.1200	999108.000	390.696
S00610	0	2	16	1.02	0.063	0.140	0.017	0.035	0.0012	0.083	0.075
S00625	0	0	18	10.32	0.573	1.180	0.180	0.273	0.0747	7.187	0.601
S00630	0	4	14	1.68	0.120	0.351	0.005	0.137	0.0189	0.448	0.289
S00665	0	1	17	3.98	0.234	0.670	0.060	0.155	0.0241	1.318	0.338
S70507	0	2	16	0.66	0.041	0.101	0.012	0.024	0.0005	0.036	0.052
Station: IR03S -- Southside A10 Drain											

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00530	0	0	17	757.00	44.529	176.000	3.000	39.848	1587.8900	59115.000	86.764
S00610	0	2	15	0.89	0.059	0.160	0.020	0.045	0.0020	0.081	0.096
S00625	0	0	17	9.16	0.538	1.100	0.220	0.243	0.0593	5.885	0.530
S00630	0	0	17	2.82	0.166	0.487	0.018	0.143	0.0206	0.799	0.312
S00665	0	0	17	2.61	0.153	0.370	0.070	0.073	0.0054	0.487	0.160
S70507	0	0	17	1.31	0.077	0.127	0.040	0.026	0.0006	0.112	0.057
Station: IR04N -- Northside C55 Drain											
S00530	0	0	18	852.00	47.333	142.000	8.000	32.900	1082.4710	58730.000	72.365
S00610	0	3	15	0.90	0.060	0.144	0.011	0.041	0.0017	0.078	0.088
S00625	0	0	18	8.32	0.462	1.120	0.180	0.230	0.0531	4.748	0.506
S00630	0	2	16	2.94	0.183	0.574	0.005	0.198	0.0392	1.129	0.426
S00665	0	0	18	2.51	0.139	0.350	0.050	0.075	0.0056	0.446	0.165
S70507	0	0	18	0.80	0.044	0.103	0.007	0.032	0.0010	0.054	0.072
Station: IR07S -- Southside Twin Falls Coulee											
S00530	0	0	18	2184.00	121.333	492.000	4.000	121.433	14746.0000	515674.000	267.092
S00610	0	6	12	0.54	0.045	0.129	0.006	0.036	0.0013	0.039	0.074
S00625	0	0	18	11.42	0.634	1.900	0.200	0.376	0.1420	9.660	0.828
S00630	0	7	11	1.89	0.172	0.520	0.017	0.187	0.0352	0.678	0.376
S00665	0	0	18	4.43	0.246	0.790	0.100	0.181	0.0328	1.649	0.398
S70507	0	0	18	1.14	0.063	0.161	0.018	0.035	0.0012	0.094	0.078
Station: IR11S -- Southside East Perrine Coulee											
S00530	0	0	27	2707.00	100.259	398.000	20.000	84.965	7219.1990	459101.000	199.829
S00610	0	1	26	2.98	0.114	0.384	0.011	0.078	0.0061	0.496	0.183
S00625	0	0	27	19.84	0.734	1.800	0.340	0.345	0.1196	17.689	0.813
S00630	0	0	27	62.44	2.312	5.000	0.453	1.535	2.3565	205.686	3.610
S00665	0	1	26	5.19	0.199	0.500	0.070	0.115	0.0132	1.366	0.268
S70507	0	0	27	1.75	0.064	0.110	0.026	0.022	0.0004	0.126	0.051

ParmID	-- Number --		Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range	
	Miss	<MDL #Obs									
Station: IR12S			-- Southside Main Perrine Coulee								
S00530	0	0	25	3004.00	120.160	580.000	14.000	132.354	17517.7200	781386.000	307.530
S00610	0	2	24	1.49	0.062	0.240	0.006	0.051	0.0026	0.153	0.118
S00625	0	0	26	15.80	0.607	2.100	0.140	0.444	0.1973	14.534	1.038
S00630	0	0	26	15.93	0.612	1.870	0.035	0.580	0.3367	18.185	1.356
S00665	0	0	26	5.15	0.198	0.660	0.050	0.164	0.0271	1.698	0.385
S70507	0	0	26	1.21	0.046	0.130	0.015	0.030	0.0009	0.079	0.071
Station: IR16S			-- Southside West Perrine Coulee								
S00530	0	0	18	4017.00	223.166	570.000	54.000	156.714	24559.4400	1313971.000	344.694
S00610	0	2	16	1.25	0.078	0.300	0.017	0.067	0.0045	0.166	0.145
S00625	0	0	18	15.71	0.872	1.800	0.190	0.522	0.2729	18.351	1.149
S00630	0	1	17	4.29	0.252	0.770	0.017	0.254	0.0645	2.117	0.553
S00665	0	0	18	5.56	0.309	0.680	0.100	0.159	0.0255	2.157	0.351
S70507	0	0	18	1.19	0.066	0.129	0.028	0.026	0.0007	0.091	0.059
Station: IR17S			-- Southside 43 Drainage								
S00530	0	0	14	2516.00	179.714	716.000	28.000	202.656	41069.4500	986064.000	425.757
S00610	0	0	14	1.03	0.074	0.193	0.008	0.051	0.0026	0.111	0.108
S00625	0	0	14	9.91	0.707	1.620	0.200	0.426	0.1821	9.382	0.896
S00630	0	0	14	6.52	0.466	1.880	0.006	0.488	0.2388	6.149	1.026
S00665	0	0	14	3.60	0.257	0.780	0.070	0.195	0.0382	1.423	0.410
S70507	0	0	14	0.82	0.059	0.125	0.018	0.028	0.0008	0.059	0.060
Station: IR20S			-- Southside 30 Drain								
S00530	0	0	18	6683.00	371.277	2060.000	40.000	468.582	*****	6213925.000	1030.648
S00610	0	1	17	1.09	0.064	0.172	0.006	0.051	0.0026	0.113	0.112
S00625	0	0	18	11.62	0.645	2.030	0.140	0.460	0.2116	11.100	1.012
S00630	0	3	15	3.38	0.225	0.749	0.018	0.236	0.0560	1.547	0.503
S00665	0	0	18	8.84	0.491	1.890	0.110	0.547	0.2996	9.435	1.204
S70507	0	0	18	1.08	0.060	0.120	0.010	0.032	0.0010	0.084	0.072

ParmID	-- Number --		Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range	
	Miss	<MDL #Obs									
Station: IR21S      -- Southside Pigeon Cove Hydro Plant --											
S00530	0	0	29	6249.00	215.482	1236.000	10.000	260.805	68019.4000	3251095.000	620.189
S00610	0	0	29	5.01	0.173	0.591	0.012	0.158	0.0251	1.572	0.377
S00625	0	0	29	23.54	0.811	2.110	0.310	0.418	0.1753	24.018	0.995
S00630	0	0	29	68.71	2.369	4.810	0.524	1.389	1.9306	216.887	3.304
S00665	0	0	29	8.90	0.306	1.260	0.060	0.274	0.0752	4.837	0.652
S70507	0	0	29	2.08	0.071	0.168	0.035	0.025	0.0006	0.168	0.060
Station: IR22S      -- Southside LS2/39A Drain											
S00530	0	0	27	5774.00	213.851	972.000	3.000	271.964	73964.4400	3157856.000	639.628
S00610	0	2	25	1.56	0.062	0.152	0.019	0.038	0.0014	0.133	0.089
S00625	0	0	27	16.12	0.597	1.640	0.190	0.378	0.1435	13.357	0.891
S00630	0	0	27	53.45	1.979	4.290	0.396	1.382	1.9121	155.559	3.252
S00665	0	6	21	7.19	0.342	1.070	0.050	0.280	0.0784	4.031	0.632
S70507	0	0	27	1.56	0.057	0.119	0.028	0.024	0.0005	0.105	0.056
Station: IR23N      -- Northside N42 Drain											
S00530	0	1	10	170.00	17.000	30.000	2.000	10.381	107.7778	3860.000	20.377
S00610	0	0	11	0.64	0.058	0.215	0.021	0.055	0.0030	0.068	0.111
S00625	0	1	10	3.37	0.337	0.600	0.070	0.167	0.0280	1.388	0.328
S00630	0	0	11	3.96	0.360	0.527	0.033	0.167	0.0281	1.708	0.335
S00665	0	1	10	1.13	0.113	0.170	0.050	0.045	0.0020	0.146	0.089
S70507	0	0	11	1.02	0.092	0.175	0.056	0.038	0.0014	0.109	0.076
Station: IR23NT      -- Northside N42 Drain on Canyon Rim											
S00530	0	0	17	548.00	32.235	84.000	8.000	22.233	494.3162	25574.000	48.410
S00610	0	0	17	1.70	0.100	0.317	0.022	0.085	0.0073	0.289	0.186
S00625	0	0	17	10.44	0.614	0.950	0.250	0.205	0.0423	7.089	0.448
S00630	0	4	13	3.58	0.275	1.910	0.011	0.511	0.2617	4.130	1.059
S00665	0	1	16	2.42	0.151	0.230	0.050	0.050	0.0025	0.403	0.108

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S70507	0	0	17	1.21	0.071	0.132	0.027	0.028	0.0008	0.099	0.062
Station: IR24S -- Southside 39 Drain											
S00530	0	1	28	11919.00	425.678	3110.000	2.000	658.104	*****	*****	1556.543
S00610	0	3	26	2.69	0.103	0.430	0.011	0.095	0.0091	0.509	0.224
S00625	0	0	29	23.42	0.807	2.450	0.230	0.685	0.4699	32.071	1.630
S00630	0	0	29	92.75	3.198	7.000	0.286	2.441	5.9613	463.590	5.806
S00665	0	10	19	14.40	0.757	3.340	0.060	0.864	0.7474	24.368	1.919
S70507	0	0	29	1.84	0.063	0.156	0.012	0.037	0.0014	0.156	0.089
Station: IR29S -- Southside I Drain											
S00530	0	0	29	3244.00	111.862	386.000	20.000	91.227	8322.4800	595910.000	216.937
S00610	0	1	28	2.86	0.102	0.337	0.013	0.096	0.0092	0.543	0.227
S00625	0	0	29	21.73	0.749	1.910	0.220	0.332	0.1108	19.386	0.791
S00630	0	0	29	77.06	2.657	5.080	0.988	1.203	1.4493	245.392	2.862
S00665	0	0	29	6.06	0.208	0.540	0.060	0.103	0.0108	1.568	0.247
S70507	0	0	28	2.89	0.103	0.175	0.060	0.026	0.0006	0.317	0.061
Station: IR30N -- Northside J8 Drain											
S00530	0	0	16	657.00	41.062	112.000	4.000	33.022	1090.4630	43335.000	71.120
S00610	0	1	15	0.78	0.052	0.114	0.021	0.030	0.0009	0.054	0.064
S00625	0	0	16	7.94	0.496	0.870	0.180	0.197	0.0388	4.523	0.424
S00630	0	4	12	1.25	0.104	0.324	0.011	0.114	0.0131	0.275	0.233
S00665	0	1	15	1.97	0.131	0.200	0.090	0.032	0.0010	0.273	0.070
S70507	0	0	16	0.87	0.054	0.117	0.013	0.029	0.0008	0.061	0.064
Station: IR35S -- Southside N drain prior to Idaho Fish											
S00530	0	0	28	1030.00	36.785	198.000	4.000	47.299	2237.2860	98296.000	111.873
S00610	0	0	28	1.81	0.064	0.180	0.014	0.043	0.0018	0.169	0.102
S00625	0	0	28	18.56	0.662	1.510	0.310	0.264	0.0699	14.190	0.625
S00630	0	0	28	76.66	2.737	4.580	1.620	0.910	0.8282	232.248	2.152

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00665	0	2	26	3.00	0.115	0.380	0.050	0.076	0.0057	0.490	0.177
S70507	0	0	28	1.99	0.071	0.126	0.022	0.025	0.0006	0.159	0.061
Station: IR36N		-- Northside S29 Drain									
S00530	0	1	16	201.00	12.562	34.000	2.000	9.451	89.3291	3865.000	20.355
S00610	0	0	17	1.30	0.076	0.177	0.009	0.053	0.0028	0.144	0.115
S00625	0	0	17	10.05	0.591	1.470	0.330	0.256	0.0660	6.997	0.559
S00630	0	3	14	2.76	0.197	0.733	0.005	0.259	0.0674	1.423	0.545
S00665	0	0	17	2.82	0.165	0.310	0.100	0.051	0.0027	0.511	0.113
S70507	0	0	17	1.93	0.114	0.276	0.048	0.060	0.0037	0.280	0.132
Station: IR39N		-- Northside S19/S Drains									
S00530	0	0	19	824.00	43.368	241.000	6.000	51.822	2685.5790	84076.000	115.060
S00610	0	1	18	1.23	0.068	0.224	0.018	0.054	0.0029	0.135	0.120
S00625	0	0	19	13.16	0.692	3.310	0.170	0.672	0.4520	17.252	1.492
S00630	0	2	17	2.62	0.154	0.472	0.010	0.162	0.0262	0.826	0.352
S00665	0	0	19	4.64	0.244	1.700	0.110	0.355	0.1264	3.408	0.789
S70507	0	0	19	2.10	0.110	0.460	0.051	0.089	0.0080	0.377	0.198
Station: IR42N		-- Northside W26 Drain									
S00530	0	1	17	1100.00	64.705	390.000	6.000	94.434	8917.8460	213862.000	205.619
S00610	0	2	16	1.02	0.063	0.150	0.015	0.038	0.0014	0.087	0.082
S00625	0	0	18	8.83	0.490	1.510	0.140	0.280	0.0788	5.672	0.617
S00630	0	10	8	1.28	0.160	0.500	0.017	0.181	0.0330	0.436	0.339
S00665	0	1	17	2.42	0.142	0.430	0.060	0.098	0.0096	0.498	0.213
S70507	0	2	16	0.88	0.055	0.103	0.016	0.030	0.0009	0.062	0.065
Station: IS01N		-- Snake River at Murtaugh Bridge									
S00530	0	0	27	622.00	23.037	160.000	4.000	31.760	1008.7290	40556.000	74.697
S00610	0	0	27	2.67	0.099	0.503	0.011	0.105	0.0110	0.553	0.247
S00625	0	0	27	16.33	0.604	1.450	0.160	0.310	0.0965	12.386	0.730

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00630	0	0	27	29.28	1.084	2.160	0.209	0.478	0.2290	37.727	1.125
S00665	0	2	25	3.95	0.158	0.330	0.060	0.075	0.0057	0.761	0.175
S70507	0	0	27	2.72	0.100	0.286	0.006	0.082	0.0068	0.452	0.194
Station: IS05M			-- Snake River above Twin Falls Pool								
S00530	0	1	25	261.00	10.440	29.000	2.000	6.292	39.5900	3675.000	14.619
S00610	0	1	25	1.80	0.072	0.232	0.010	0.056	0.0031	0.205	0.130
S00625	0	1	25	7.35	0.294	0.840	0.110	0.180	0.0326	2.943	0.419
S00630	0	0	26	45.84	1.763	2.760	0.704	0.504	0.2540	87.196	1.178
S00665	0	6	20	2.14	0.107	0.250	0.050	0.057	0.0033	0.292	0.129
S70507	0	0	26	2.14	0.082	0.236	0.020	0.057	0.0032	0.259	0.133
Station: IS08S			-- Snake River below Twin Falls								
S00530	0	0	26	255.00	9.807	16.000	2.000	4.069	16.5615	2915.000	9.514
S00610	0	1	25	2.04	0.081	0.270	0.008	0.076	0.0058	0.307	0.177
S00625	0	0	26	27.00	1.038	19.000	0.060	3.665	13.4341	363.893	8.569
S00630	0	0	26	44.31	1.704	2.740	0.702	0.510	0.2606	82.054	1.193
S00665	0	7	19	1.94	0.102	0.240	0.050	0.053	0.0029	0.250	0.119
S70507	0	0	26	1.89	0.073	0.244	0.005	0.060	0.0036	0.228	0.140
Station: IS10N			-- Snake River below Shoshone Falls								
S00530	0	1	25	262.00	10.480	22.000	2.000	4.984	24.8433	3342.000	11.581
S00610	0	2	24	1.87	0.078	0.401	0.011	0.093	0.0086	0.345	0.215
S00625	0	0	26	9.33	0.358	0.640	0.100	0.141	0.0200	3.850	0.331
S00630	0	0	26	44.97	1.729	2.680	0.700	0.477	0.2282	83.486	1.116
S00665	0	7	19	1.79	0.094	0.190	0.050	0.041	0.0017	0.200	0.092
S70507	0	2	24	1.55	0.064	0.177	0.011	0.051	0.0026	0.161	0.119
Station: IS13S			-- Snake River at Blue Lakes Bridge								
S00530	0	0	25	459.00	18.360	26.000	8.000	4.777	22.8233	8975.000	11.100
S00610	0	3	22	1.70	0.077	0.289	0.010	0.076	0.0058	0.255	0.174



ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00625	0	0	25	11.36	0.454	0.890	0.060	0.219	0.0483	6.322	0.510
S00630	0	0	25	42.13	1.685	2.910	0.664	0.544	0.2961	78.105	1.264
S00665	0	5	20	2.01	0.100	0.190	0.050	0.045	0.0020	0.240	0.100
S70507	0	0	25	1.49	0.059	0.204	0.005	0.055	0.0030	0.163	0.129
Station: IS19S			-- Snake River below Warm Creek								
S00530	0	0	26	377.00	14.500	24.000	6.000	5.077	25.7800	6111.000	11.871
S00610	0	0	26	7.31	0.281	0.543	0.103	0.111	0.0125	2.370	0.261
S00625	0	0	26	19.18	0.737	1.810	0.240	0.343	0.1177	17.092	0.802
S00630	0	0	26	46.59	1.792	3.370	0.704	0.520	0.2707	90.269	1.216
S00665	0	1	25	4.47	0.178	0.330	0.090	0.054	0.0030	0.871	0.127
S70507	0	0	26	3.64	0.140	0.218	0.076	0.038	0.0014	0.547	0.089
Station: IS31S			-- Snake River at Clear Lakes Bridge								
S00530	0	2	24	236.00	9.833	20.000	2.000	3.908	15.2753	2672.000	9.022
S00610	0	0	27	2.96	0.109	0.267	0.022	0.059	0.0034	0.416	0.138
S00625	0	0	27	12.57	0.465	0.910	0.270	0.164	0.0270	6.554	0.386
S00630	0	0	27	53.83	1.993	2.560	0.693	0.390	0.1525	111.300	0.918
S00665	0	0	27	3.52	0.130	0.190	0.050	0.035	0.0012	0.491	0.082
S70507	0	0	27	3.25	0.120	0.176	0.085	0.026	0.0006	0.411	0.062
Station: IS44M			-- Snake River at Gridley Bridge -- Grab								
S00530	0	1	24	194.00	8.083	15.000	3.000	3.598	12.9492	1866.000	8.306
S00610	0	0	26	2.84	0.109	0.271	0.024	0.052	0.0027	0.378	0.121
S00625	0	0	26	9.52	0.366	0.990	0.180	0.169	0.0287	4.205	0.396
S00630	0	0	26	38.04	1.463	1.980	0.757	0.302	0.0914	57.957	0.707
S00665	0	0	26	2.28	0.087	0.120	0.050	0.021	0.0004	0.211	0.050
S70507	0	0	26	2.17	0.083	0.116	0.058	0.013	0.0001	0.186	0.031
Station: IS44MDI			-- Snake River at Gridley Bridge -- Dept								
S00530	0	0	3	20.00	6.666	10.000	4.000	3.055	9.3333	152.000	4.221

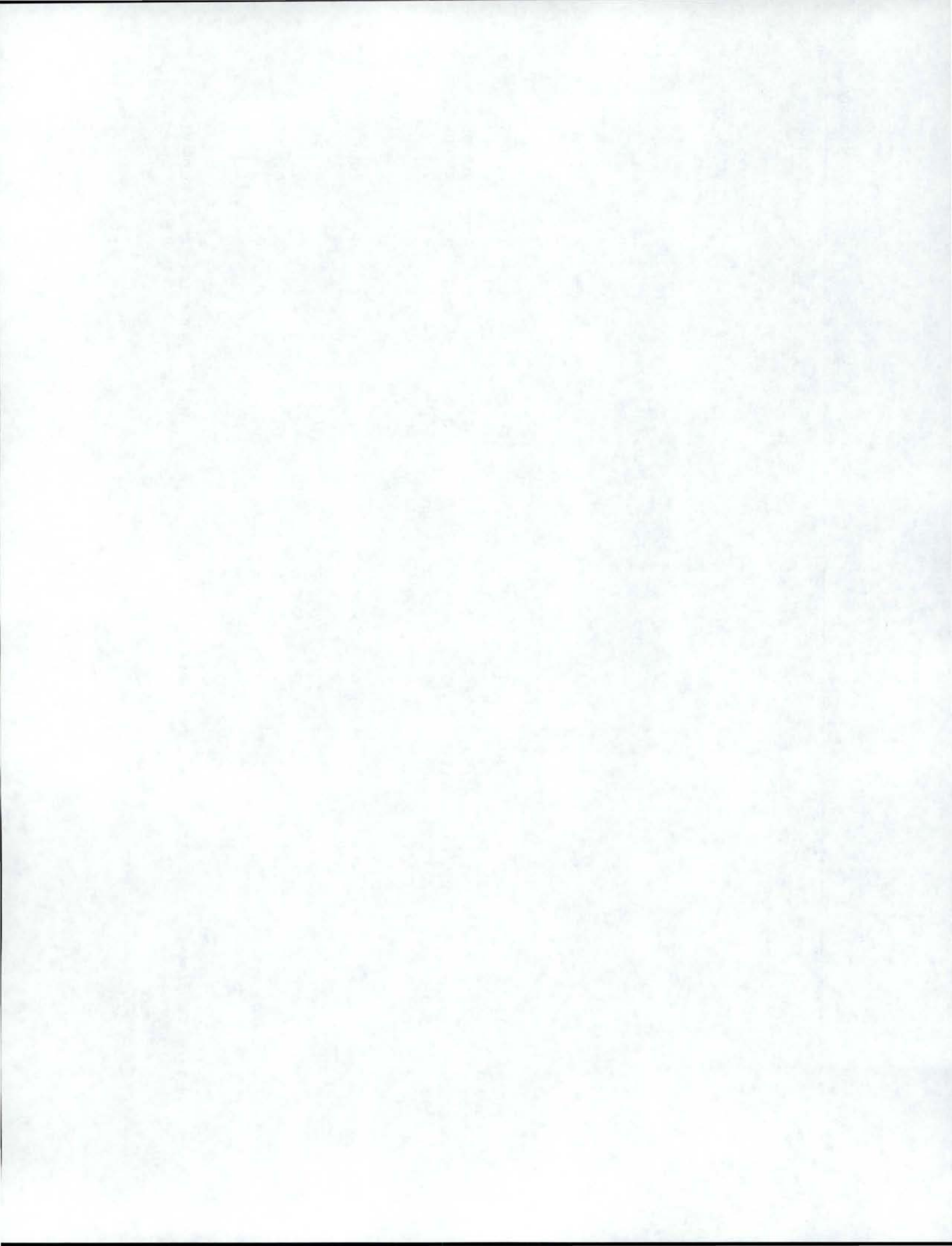
ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00610	0	0	3	0.18	0.060	0.088	0.039	0.025	0.0006	0.012	0.034
S00625	0	0	3	1.46	0.486	0.800	0.290	0.274	0.0752	0.861	0.378
S00630	0	0	3	4.02	1.340	1.460	1.130	0.182	0.0333	5.453	0.252
S00665	0	0	3	0.23	0.076	0.090	0.070	0.011	0.0001	0.017	0.015
S70507	0	0	3	0.25	0.084	0.091	0.079	0.006	*****	0.021	0.008
Station: IS45S -- Snake River below Upper Salmon Falls											
S00530	0	1	25	178.00	7.120	14.000	2.000	3.320	11.0266	1532.000	7.715
S00610	0	0	26	2.47	0.095	0.235	0.013	0.055	0.0030	0.312	0.129
S00625	0	0	26	8.74	0.336	1.000	0.140	0.163	0.0266	3.603	0.381
S00630	0	0	26	37.99	1.461	2.040	0.840	0.331	0.1101	58.275	0.776
S00665	0	0	26	2.37	0.091	0.130	0.050	0.021	0.0004	0.227	0.050
S70507	0	0	26	2.22	0.085	0.116	0.057	0.014	0.0001	0.194	0.032
Station: IS47N -- Snake River below Lower Salmon Falls											
S00530	0	0	26	192.00	7.384	22.000	1.000	5.238	27.4461	2104.000	12.248
S00610	0	0	26	2.60	0.100	0.273	0.017	0.061	0.0038	0.356	0.144
S00625	0	0	26	8.44	0.324	0.720	0.150	0.124	0.0155	3.127	0.291
S00630	0	0	26	35.84	1.378	1.940	0.667	0.317	0.1010	51.944	0.743
S00665	0	0	26	2.19	0.084	0.140	0.050	0.021	0.0004	0.196	0.050
S70507	0	0	26	2.01	0.077	0.117	0.045	0.015	0.0002	0.161	0.035
Station: IS51N -- Snake River below Bliss Dam											
S00530	0	0	25	188.00	7.520	17.000	1.000	3.809	14.5100	1762.000	8.850
S00610	0	0	26	2.34	0.090	0.377	0.006	0.078	0.0061	0.364	0.183
S00625	0	0	26	7.97	0.306	0.960	0.170	0.163	0.0265	3.107	0.381
S00630	0	0	26	35.45	1.363	1.800	0.640	0.283	0.0803	50.348	0.662
S00665	0	0	26	2.12	0.081	0.140	0.050	0.024	0.0005	0.187	0.056
S70507	0	0	26	1.86	0.071	0.108	0.038	0.017	0.0003	0.140	0.040
Station: IS52S -- Snake River at King Hill Bridge											
S00530	0	2	24	222.00	9.250	21.000	1.000	5.168	26.7173	2668.000	11.931

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00610	0	2	24	1.43	0.059	0.159	0.007	0.040	0.0016	0.123	0.093
S00625	0	0	26	7.37	0.283	0.600	0.100	0.118	0.0141	2.442	0.277
S00630	0	0	26	35.12	1.350	1.890	0.696	0.301	0.0907	49.721	0.704
S00665	0	4	22	1.99	0.090	0.220	0.050	0.036	0.0013	0.208	0.083
S70507	0	0	26	1.83	0.070	0.108	0.039	0.016	0.0002	0.135	0.037
Station: IS53N      -- Snake River at Bliss Bridge											
S00530	0	1	21	149.00	7.095	16.000	1.000	3.713	13.7904	1333.000	8.386
S00610	0	1	21	1.56	0.074	0.133	0.006	0.036	0.0013	0.143	0.082
S00625	0	0	22	6.89	0.313	0.900	0.090	0.193	0.0373	2.942	0.439
S00630	0	0	22	30.38	1.381	1.860	0.722	0.300	0.0901	43.864	0.683
S00665	0	0	22	1.78	0.080	0.120	0.050	0.017	0.0003	0.150	0.039
S70507	0	0	22	1.60	0.072	0.101	0.044	0.013	0.0001	0.120	0.030
Station: TS06N      -- Vineyard Lake											
S00530	0	1	25	548.00	21.920	71.000	1.000	21.150	447.3267	22748.000	49.143
S00610	0	2	24	1.18	0.049	0.153	0.006	0.038	0.0014	0.092	0.089
S00625	0	1	25	7.59	0.303	0.810	0.100	0.205	0.0422	3.317	0.477
S00630	0	0	26	52.81	2.031	4.750	0.661	0.658	0.4338	118.116	1.540
S00665	0	17	9	0.84	0.093	0.170	0.050	0.042	0.0017	0.092	0.080
S70507	0	0	26	0.76	0.029	0.055	0.014	0.011	0.0001	0.025	0.026
Station: TS18N      -- Warm Creek											
S00530	0	0	2	30.00	15.000	16.000	14.000	1.414	2.0000	452.000	1.594
S00610	0	0	2	0.32	0.162	0.256	0.068	0.132	0.0176	0.070	0.149
S00625	0	0	2	0.57	0.285	0.290	0.280	0.007	*****	0.162	0.007
S00630	0	0	2	5.49	2.745	3.100	2.390	0.502	0.2520	15.322	0.566
S00665	0	1	1	0.06	0.060	0.060	0.060			0.003	
S70507	0	0	2	0.07	0.038	0.042	0.035	0.004	*****	0.002	0.005
Station: TS19.5S      -- Rock Creek at Poleline Road											

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
S00530	0	0	13	843.00	64.846	178.000	17.000	51.553	2657.8080	86559.000	106.774
S00610	0	2	11	1.45	0.132	0.326	0.060	0.075	0.0056	0.248	0.151
S00625	0	0	13	6.81	0.523	0.820	0.290	0.146	0.0214	3.824	0.303
S00630	0	0	13	28.35	2.181	3.660	0.658	0.972	0.9460	73.212	2.014
S00665	0	1	12	1.88	0.156	0.260	0.100	0.055	0.0030	0.328	0.112
S70507	0	0	13	1.12	0.086	0.190	0.051	0.034	0.0011	0.110	0.071
Station: TS27S -- Southside Cedar Draw Creek											
S00530	0	1	26	2913.00	112.038	800.000	6.000	158.930	25258.8400	957839.000	371.581
S00610	0	1	26	3.53	0.135	0.525	0.010	0.115	0.0132	0.811	0.268
S00625	0	0	27	19.12	0.708	1.590	0.260	0.286	0.0818	15.667	0.672
S00630	0	1	26	64.29	2.472	5.080	0.209	1.517	2.3018	216.549	3.547
S00665	0	1	26	5.02	0.193	0.660	0.080	0.130	0.0169	1.392	0.304
S70507	0	0	27	2.21	0.082	0.122	0.039	0.022	0.0005	0.195	0.053
Station: TS32N -- Clear Lakes Outlet											
S00530	0	7	20	88.00	4.400	10.000	1.000	2.500	6.2526	506.000	5.600
S00610	0	0	27	6.57	0.243	0.505	0.108	0.115	0.0133	1.949	0.272
S00625	0	0	27	13.16	0.487	0.890	0.240	0.170	0.0289	7.167	0.400
S00630	0	0	27	42.74	1.583	2.060	0.667	0.329	0.1088	70.508	0.775
S00665	0	0	27	3.74	0.138	0.240	0.070	0.036	0.0013	0.552	0.085
S70507	0	0	27	3.45	0.127	0.184	0.087	0.023	0.0005	0.455	0.054
Station: TS33S -- Southside Mud Creek											
S00530	0	0	27	1683.00	62.333	146.000	30.000	30.925	956.3846	129773.000	72.733
S00610	0	0	27	5.60	0.207	1.020	0.031	0.197	0.0390	2.180	0.464
S00625	0	0	27	21.92	0.811	1.100	0.460	0.182	0.0331	18.658	0.428
S00630	0	0	27	75.49	2.795	4.920	1.570	1.049	1.1009	239.689	2.467
S00665	0	0	27	4.87	0.180	0.320	0.110	0.055	0.0030	0.958	0.130
S70507	0	0	27	3.09	0.114	0.290	0.045	0.052	0.0027	0.425	0.122

ParmID	-- Number --			Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range
	Miss	<MDL	#Obs								
Station: TS34S				-- Southside Deep Creek							
S00530	0	0	27	1775.00	65.740	242.000	10.000	64.276	4131.4300	224107.000	151.170
S00610	0	1	26	2.53	0.097	0.408	0.009	0.099	0.0098	0.494	0.232
S00625	0	0	27	17.54	0.649	1.240	0.210	0.269	0.0728	13.287	0.634
S00630	0	0	27	74.00	2.740	5.280	0.220	1.401	1.9630	253.864	3.295
S00665	0	5	22	3.35	0.152	0.380	0.050	0.088	0.0079	0.676	0.202
S70507	0	0	27	1.71	0.063	0.104	0.009	0.025	0.0006	0.125	0.059
Station: TS37N				-- Banbury Springs							
S00530	0	0	1	10.00	10.000	10.000	10.000			100.000	
S00610	0	0	1	0.04	0.041	0.041	0.041			0.001	
S00625	0	0	1	0.09	0.090	0.090	0.090			0.008	
S00630	0	0	1	0.99	0.992	0.992	0.992			0.984	
S00665	0	1	0								
S70507	0	0	1	0.03	0.031	0.031	0.031			0.000	
Station: TS40N				-- Blind Canyon Creek							
S00530	0	0	26	754.00	29.000	220.000	2.000	43.890	1926.4000	70026.000	102.617
S00610	0	0	26	4.52	0.174	0.389	0.036	0.094	0.0088	1.009	0.219
S00625	0	0	26	15.36	0.590	1.500	0.260	0.289	0.0838	11.169	0.676
S00630	0	0	26	15.30	0.588	1.300	0.060	0.414	0.1714	13.298	0.968
S00665	0	0	25	3.91	0.156	0.800	0.011	0.142	0.0201	1.096	0.330
S70507	0	0	26	2.83	0.109	0.425	0.045	0.070	0.0049	0.432	0.163
Station: TS41S				-- Salmon Falls Creek							
S00530	0	0	25	1022.00	40.880	116.000	4.000	31.141	969.7767	65054.000	72.357
S00610	0	2	23	1.67	0.073	0.258	0.013	0.062	0.0039	0.209	0.144
S00625	0	0	25	11.32	0.452	0.760	0.180	0.134	0.0180	5.557	0.311
S00630	0	0	25	65.30	2.612	4.430	0.498	0.951	0.9060	192.349	2.211
S00665	0	8	17	1.73	0.101	0.200	0.060	0.045	0.0020	0.208	0.098
S70507	0	0	25	1.20	0.048	0.073	0.009	0.016	0.0002	0.063	0.037

ParmID	-- Number --		Sum	Mean	Maximum	Minimum	St.Dev.	Variance	SumofSqs	Ch.Range	
	Miss	<MDL #Obs									
Station: TS43N			-- Riley Creek								
S00530	0	0	12.00	12.000	12.000	12.000			144.000		
S00610	0	0	0.10	0.103	0.103	0.103			0.010		
S00625	0	0	0.08	0.080	0.080	0.080			0.006		
S00630	0	0	0.71	0.716	0.716	0.716			0.512		
S00665	0	1	0								
S70507	0	0	0.05	0.059	0.059	0.059			0.003		
Station: TS50N			-- Malad River								
S00530	0	7	20	114.00	5.700	16.000	1.000	4.014	16.1157	956.000	8.991
S00610	0	4	23	0.95	0.041	0.112	0.007	0.029	0.0008	0.058	0.067
S00625	0	10	17	3.06	0.180	0.520	0.060	0.137	0.0188	0.851	0.298
S00630	0	0	27	32.16	1.191	2.930	0.892	0.375	0.1410	41.974	0.883
S00665	0	16	11	0.86	0.078	0.120	0.050	0.025	0.0006	0.073	0.050
S70507	0	0	27	1.02	0.037	0.073	0.020	0.010	0.0001	0.041	0.024



MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX E

Concurrent Monitoring  
Water Quality Data  
Outlier Analysis Results



Appendix E. Middle Snake River Water Quality Concurrent Monitoring  
Data Extreme Value/Data Outliers.

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
<b>FH14N -- Blue Lakes Trout Processing Plant Effluent.</b>					
Nitrite - Nitrate Nitrogen, mg/l	03-11-1991	2.700	0.171	1.138	0.171
Ortho Phosphate Phosphorus, mg/l	07-23-1990	10.000	3.191	6.809	3.191
<b>FH15N -- Blue Lakes Trout Hatchery Effluent.</b>					
Total Suspended Solids, mg/l	09-04-1990	18.	6.7	10.5	6.7
Total Kjeldahl Nitrogen, mg/l	07-30-1990	1.17	0.486	0.445	0.486
	10-08-1990	1.02	0.486	0.445	0.486
Nitrite and Nitrate Nitrogen, mg/l	06-25-1990	0.022	1.848	0.906	1.848
	06-17-1991	0.739	1.848	0.906	1.848
Total Phosphorus, mg/l	08-20-1990	0.23	0.095	0.095	0.095
<b>FH25N -- Cyrstal Springs Fish Hatchery Effluent.</b>					
Total Suspended Solids, mg/l	08-21-1990	12.	4.8	6.1	4.8
Ammonia Nitrogen, mg/l-N	08-21-1990	0.885	0.342	0.289	0.342
Total Kjeldahl Nitrogen, mg/l-N	04-16-1991	1.03	0.595	0.412	0.595
Nitrite and Nitrate Nitrogen, mg/l-N	08-21-1990	0.043	2.257	1.340	2.257
	04-30-1991	4.27	2.257	1.340	2.257
	06-17-1991	0.769	2.257	1.340	2.257
Total Phosphorus, mg/l-P	07-15-1991	0.16	0.100	0.044	0.100
<b>FH26S -- Magic Valley Fish Hatchery Effluent</b>					
Total Suspended Solids, mg/l	07-24-1990	64.	7.4	29.3	7.4
Ammonia Nitrogen, mg/l-N	03-25-1991	0.401	0.141	0.200	0.141
Total Kjeldahl Nitrogen, mg/l-N	05-06-1991	0.93	0.354	0.492	0.354
Nitrite and Nitrate Nitrogen, mg/l-N	09-24-1990	0.543	1.692	0.937	1.692
	06-17-1991	0.69	1.692	0.937	1.692

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Total Phosphorus, mg/l-P	12-03-1990	0.19	0.076	0.079	0.076
<b>FH28N -- Rim View Fish Hatchery Effluent</b>					
Total Suspended Solids, mg/l	08-21-1990	12.	4.6	6.9	4.6
Total Kjeldahl Nitrogen, mg/l-N	03-25-1991	1.38	0.632	0.487	0.632
	07-09-1991	1.18	0.632	0.487	0.632
Nitrite and Nitrate Nitrogen, mg/l-N	02-19-1991	0.475	1.569	0.721	1.569
	06-17-1991	0.694	1.569	0.721	1.569
Total Phosphorus, mg/l-P	03-11-1991	0.26	0.102	0.079	0.102
<b>FH35S -- Leo Ray's Fish Hatchery Effluent</b>					
Total Suspended Solids, mg/l	06-12-91	36.	15.7	14.9	15.7
Total Kjeldahl Nitrogen, mg/l-N	06-12-91	2.42	1.362	1.031	2.46
	06-17-91	2.62	1.362	1.031	2.62
Total Phosphorus, mg/l-P	02-11-91	0.4	0.213	0.160	0.213
<b>FH38S -- Box Canyon Fish Hatchery</b>					
Total Suspended Solids, mg/l	08-22-90	16.	5.9	8.4	5.9
Ammonia Nitrogen, mg/l-N	02-11-91	0.301	0.552	0.238	0.301
Nitrite and Nitrate Nitrogen, mg/l-N	06-17-91	0.554	0.814	0.189	0.814
Ortho Phosphate, mg/l-P	07-16-90	0.161	0.107	0.053	0.161
	02-20-91	0.175	0.107	0.053	0.175
<b>FH46N -- Buckeye Farm Fish Pond Effluent</b>					
Ammonia Nitrogen, mg/l-N	12-11-90	0.445	0.110	0.277	0.110
	05-01-91	0.537	0.110	0.277	0.110
Total Kjeldahl Nitrogen, mg/l-N	06-17-91	1.26	0.631	0.582	1.26
Total Phosphorus, mg/l-P	06-17-91	0.22	0.090	0.087	0.090

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
<b>FH48N -- White Springs Fish Hatchery Effluent</b>					
Total Suspended Solids, mg/l	08-22-90	16.	4.4	8.0	4.4
Ammonia Nitrogen, mg/l-N	03-06-91	0.813	0.376	0.391	0.813
	05-29-91	0.777	0.376	0.391	0.777
Nitrite and Nitrate Nitrogen, mg/l-N	11-28-90	2.11	1.276	0.600	1.276
	06-17-91	0.649	1.276	0.600	0.649
	06-26-91	0.378	1.276	0.600	1.276
Ortho Phosphate, mg/l-P	05-15-91	0.330	0.110	0.098	0.110
<b>FH49N -- Birch Creek Fish Hatchery Effluent</b>					
Total Suspended Solids, mg/l	01-09-91	64.	9.3	27.4	9.3
	01-23-91	37.	9.3	27.4	9.3
Total Kjeldahl Nitrogen, mg/l-N	06-17-91	1.650	0.834	0.743	1.650
Nitrite and Nitrate Nitrogen, mg/l-N	09-10-90	2.650	1.191	1.145	1.191
	10-17-90	2.850	1.191	1.145	1.191
	02-25-91	3.000	1.191	1.145	1.191
Total Phosphorus, mg/l-P	01-09-91	0.300	0.142	0.129	0.142
	06-17-91	0.280	0.142	0.129	0.280
Ortho Phosphate, mg/l-P	05-15-91	0.410	0.118	0.141	0.118
	06-26-91	0.303	0.118	0.141	0.118
<b>IR02N --</b>					
Total Suspended Solids, mg/l	07-23-90	732.	160.3	390.7	732.
Ammonia Nitrogen, mg/l-N	10-01-90	0.14	0.064	0.076	0.064
Total Kjeldahl Nitrogen, mg/l-N	07-23-90	1.18	0.573	0.601	1.18
Total Phosphorus, mg/l-P	07-23-90	0.67	0.234	0.338	0.670
Ortho Phosphate, mg/l-P	08-20-90	0.101	0.042	0.052	0.042
<b>IR03S --</b>					
Total Suspended Solids, mg/l	06-10-91	176.	44.5	86.8	176.

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Ammonia Nitrogen, mg/l-N	07-23-90	0.160	0.059	0.097	0.160
Total Kjeldahl Nitrogen, mg/l-N	06-10-91	1.10	0.539	0.531	1.10
	07-08-91	1.08	0.539	0.531	1.08
Nitrite and Nitrate Nitrogen, mg/l-N	10-01-90	0.487	0.166	0.313	0.487
Total Phosphorus, mg/l-P	06-10-91	0.37	0.154	0.161	0.37
IR04N --					
Total Suspended Solids, mg/l	05-30-91	142.	47.3	72.4	142.
Total Kjeldahl Nitrogen, mg/l-N	05-13-91	1.12	0.462	0.507	1.12
Total Phosphorus, mg/l-P	06-10-91	0.35	0.139	0.165	0.35
IR07S --					
Total Suspended Solids, mg/l	04-15-91	492.	121.3	267.1	492
Ammonia Nitrogen, mg/l-N	04-29-91	0.129	0.045	0.074	0.045
Total Kjeldahl Nitrogen, mg/l-N	04-15-91	1.90	0.634	0.829	1.90
Total Phosphorus, mg/l-P	04-15-91	0.79	0.246	0.399	0.79
Ortho Phosphate, mg/l-P	08-20-90	0.161	0.064	0.078	0.064
IR11S					
Total Suspended Solids, mg/l	07-23-90	398.	100.3	199.8	398
Ammonia Nitrogen, mg/l-N	12-10-90	0.384	0.115	0.183	0.384
Total Kjeldahl Nitrogen, mg/l-N	05-13-91	1.80	0.735	0.814	1.80
Total Phosphorus, mg/l-P	07-23-90	0.50	0.200	0.269	0.50
	05-13-91	0.50	0.200	0.269	0.50
IR12S					
Total Suspended Solids, mg/l	08-20-90	580.	120.2	307.5	580
Ammonia Nitrogen, mg/l-N	09-17-90	0.240	0.062	0.119	0.062

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Total Kjeldahl Nitrogen, mg/l-N	04-15-91	2.100	0.608	1.039	0.608
Total Phosphorus, mg/l-P	08-20-90	0.660	0.198	0.385	0.660
	04-15-91	0.590	0.198	0.385	0.590
Ortho Phosphate, mg/l-P	08-06-90	0.130	0.047	0.071	0.047
	08-20-90	0.119	0.047	0.071	0.119
<b>IR16S</b>					
Total Suspended Solids, mg/l	08-06-90	570.	223.2	344.7	570.
Ammonia Nitrogen, mg/l-N	05-21-91	0.3	0.078	0.145	0.078
Total Phosphorus, mg/l-P	08-06-90	0.68	0.309	0.352	0.68
Ortho Phosphate, mg/l-P	08-20-90	0.129	0.067	0.059	0.129
<b>IR17S</b>					
Total Suspended Solids, mg/l	08-20-90	716.	179.7	425.8	716.
Ammonia Nitrogen, mg/l-N	06-25-90	0.193	0.074	0.110	0.074
Total Kjeldahl Nitrogen, mg/l-N	07-09-90	1.62	0.708	0.897	0.708
Nitrite and Nitrate Nitrogen, mg/l-N	06-25-90	1.88	0.466	1.027	0.466
Total Phosphorus, mg/l-P	08-20-90	0.78	0.257	0.411	0.78
Ortho Phosphate, mg/l-P	08-20-90	0.125	0.059	0.060	0.125
<b>IR20S</b>					
Total Suspended Solids, mg/l	06-25-91	2060.	371.3	1030.6	2060.
Total Kjeldahl Nitrogen, mg/l-N	07-24-90	2.03	0.646	1.012	0.646
Nitrite and Nitrate Nitrogen, mg/l-N	10-30-90	0.749	0.226	0.504	0.749
Total Phosphorus, mg/l-P	07-24-90	1.89	0.491	1.204	0.491
	06-25-91	1.89	0.491	1.204	1.89

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
<b>IR21S</b>					
Total Suspended Solids, mg/l					
	07-24-90	1236.	215.5	620.2	1236.
Ammonia Nitrogen, mg/l-N					
	12-11-90	0.591	0.173	0.377	0.173
Total Kjeldahl Nitrogen, mg/l-N					
	07-24-90	2.01	0.812	0.996	2.01
	02-05-91	2.11	0.812	0.996	0.812
Total Phosphorus, mg/l-P					
	07-24-90	1.26	0.307	0.652	1.26
Ortho Phosphate, mg/l-P					
	08-21-90	0.168	0.072	0.060	0.072
<b>IR22S</b>					
Total Suspended Solids, mg/l					
	08-07-90	972.	213.9	639.6	972.
	04-30-91	916.	213.9	639.6	916.
Ammonia Nitrogen, mg/l-N					
	03-19-91	0.152	0.062	0.089	0.152
Total Kjeldahl Nitrogen, mg/l-N					
	08-07-90	1.64	0.597	0.891	1.64
Total Phosphorus, mg/l-P					
	08-07-90	1.07	0.342	0.633	1.07
Ortho Phosphate, mg/l-P					
	08-21-90	0.119	0.058	0.057	0.119
<b>IR23N</b>					
Ammonia Nitrogen, mg/l-N					
	12-11-90	0.215	0.058	0.111	0.058
Ortho Phosphate, mg/l-P					
	07-24-90	0.175	0.093	0.076	0.093
<b>IR23NT</b>					
Total Suspended Solids, mg/l					
	04-30-91	84.	32.2	48.4	32.2
Ammonia Nitrogen, mg/l-N					
	10-30-90	0.317	0.100	0.187	0.100
Nitrite and Nitrate Nitrogen, mg/l-N					
	10-16-90	1.91	0.276	1.060	0.276
<b>IR24S</b>					
Total Suspended Solids, mg/l					
	06-26-90	3110.	425.7	1556.5	3110.
Ammonia Nitrogen, mg/l-N					
	05-28-91	0.43	0.104	0.224	0.104

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Total Kjeldahl Nitrogen, mg/l-N	07-24-90	2.45	0.808	1.630	2.45
Total Phosphorus, mg/l-P	07-10-90	3.34	0.758	1.920	0.758
Ortho Phosphate, mg/l-P	07-09-91	0.156	0.064	0.089	0.064
<b>IR29S</b>					
Total Suspended Solids, mg/l	05-09-91	386.	111.9	216.9	386.
	05-20-91	336.	111.9	216.9	336.
Ammonia Nitrogen, mg/l-N	03-05-91	0.337	0.102	0.228	0.102
Total Kjeldahl Nitrogen, mg/l-N	05-20-91	1.91	0.749	0.792	1.91
Total Phosphorus, mg/l-P	05-09-91	0.46	0.209	0.247	0.46
	05-20-91	0.54	0.209	0.247	0.54
Ortho Phosphate, mg/l-P	02-19-91	0.175	0.103	0.062	0.103
<b>IR35S</b>					
Total Suspended Solids, mg/l	04-17-91	198.	36.8	111.9	198.
	05-06-91	172.	36.8	111.9	172.
Ammonia Nitrogen, mg/l-N	03-06-91	0.18	0.065	0.103	0.065
Total Kjeldahl Nitrogen, mg/l-N	05-06-91	1.51	0.663	0.625	1.51
Total Phosphorus, mg/l-P	04-17-91	0.38	0.115	0.178	0.38
<b>IR36N</b>					
Total Suspended Solids, mg/l	05-01-91	34.	12.6	20.4	34.
Total Kjeldahl Nitrogen, mg/l-N	05-06-91	1.47	0.591	0.560	1.47
Total Phosphorus, mg/l-P	10-17-90	0.31	0.166	0.113	0.166
Ortho Phosphate, mg/l-P	10-17-90	0.276	0.114	0.133	0.114
<b>IR39N</b>					
Total Suspended Solids, mg/l	04-17-91	241.	43.4	115.1	241.

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Ammonia Nitrogen, mg/l-N	04-17-91	0.224	0.068	0.120	0.224
Total Kjeldahl Nitrogen, mg/l-N	04-17-91	3.31	0.693	1.493	3.31
Total Phosphorus, mg/l-P	04-17-91	1.70	0.244	0.789	1.70
Ortho Phosphate, mg/l-P	04-17-91	0.460	0.111	0.199	0.460
<b>IR42N</b>					
Total Suspended Solids, mg/l	05-22-91	390.	64.7	205.6	390
Ammonia Nitrogen, mg/l-N	05-30-91	0.15	0.064	0.082	0.064
Total Kjeldahl Nitrogen, mg/l-N	04-17-91	1.51	0.491	0.618	0.491
Nitrite and Nitrate Nitrogen, mg/l-N	10-03-90	0.500	0.160	0.340	0.500
Total Phosphorus, mg/l-P	04-17-91	0.43	0.142	0.213	0.142
<b>IS01N</b>					
Total Suspended Solids, mg/l	08-28-90	160.	23.0	74.7	23.
Ammonia Nitrogen, mg/l-N	12-19-90	0.503	0.099	0.248	0.099
Total Kjeldahl Nitrogen, mg/l-N	03-26-91	1.45	0.605	0.731	0.605
<b>IS05M</b>					
Total Suspended Solids, mg/l	07-16-91	29.	10.4	14.6	10.4
Ammonia Nitrogen, mg/l-N	01-15-91	0.232	0.072	0.130	0.072
Total Kjeldahl Nitrogen, mg/l-N	04-23-91	0.84	0.294	0.420	0.294
	06-04-91	0.80	0.294	0.420	0.294
Total Phosphorus, mg/l-P	02-26-91	0.25	0.107	0.129	0.25
Ortho Phosphate, mg/l-P	02-26-91	0.236	0.083	0.134	0.236
<b>IS08S</b>					
Ammonia Nitrogen, mg/l-N	01-15-91	0.270	0.082	0.178	0.082
	05-21-91	0.262	0.082	0.178	0.082



Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Total Kjeldahl Nitrogen, mg/l-N	10-09-90	19.000	1.038	8.569	1.038
Total Phosphorus, mg/l-P	02-26-91	0.240	0.102	0.120	0.240
Ortho Phosphate, mg/l-P	02-26-91	0.244	0.073	0.141	0.244
<b>IS10N</b>					
Ammonia Nitrogen, mg/l-N	01-29-91	0.401	0.078	0.215	0.078
Total Phosphorus, mg/l-P	11-20-90	0.19	0.094	0.093	0.094
<b>IS13S</b>					
Ammonia Nitrogen, mg/l-N	01-15-91	0.278	0.077	0.174	0.077
	07-02-91	0.289	0.077	0.174	0.077
Ortho Phosphate, mg/l-P	02-26-91	0.204	0.060	0.129	0.060
<b>IS19S</b>					
Ammonia Nitrogen, mg/l-N	12-04-90	0.543	0.281	0.262	0.281
Total Kjeldahl Nitrogen, mg/l-N	06-18-91	1.81	0.738	0.802	1.81
Nitrite and Nitrate Nitrogen, mg/l-N	07-31-90	3.37	1.792	1.217	1.792
Total Phosphorus, mg/l-P	06-18-91	0.330	0.179	0.128	0.33
<b>IS31S</b>					
Total Suspended Solids, mg/l	07-31-90	20.	9.8	9.0	9.8
Ammonia Nitrogen, mg/l-N	01-15-91	0.267	0.110	0.139	0.110
Total Kjeldahl Nitrogen, mg/l-N	04-23-91	0.91	0.466	0.387	0.466
Nitrite and Nitrate Nitrogen, mg/l-N	06-18-91	0.693	1.994	0.919	1.994
<b>IS44M</b>					
Ammonia Nitrogen, mg/l-N	03-13-91	0.271	0.109	0.122	0.109
Total Kjeldahl Nitrogen, mg/l-N	08-15-90	0.99	0.366	0.397	0.366

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Ortho Phosphate, mg/l-P	01-16-91	0.116	0.084	0.031	0.084
<b>IS45S</b>					
Ammonia Nitrogen, mg/l-N	03-13-91	0.235	0.095	0.130	0.095
Total Kjeldahl Nitrogen, mg/l-N	03-27-91	1.000	0.336	0.381	0.336
<b>IS47N</b>					
Total Suspended Solids, mg/l	03-27-91	22.	7.4	12.2	22
Ammonia Nitrogen, mg/l-N	03-13-91	0.273	0.100	0.145	0.100
Total Kjeldahl Nitrogen, mg/l-N	06-19-91	0.72	0.325	0.291	0.325
Total Phosphorus, mg/l-P	05-08-91	0.14	0.084	0.051	0.084
Ortho Phosphate, mg/l-P	01-16-91	0.117	0.077	0.036	0.077
<b>IS51N</b>					
Total Suspended Solids, mg/l	05-22-91	17.	7.5	8.8	7.5
Ammonia Nitrogen, mg/l-N	06-19-91	0.377	0.090	0.183	0.090
Total Kjeldahl Nitrogen, mg/l-N	08-01-90	0.96	0.307	0.381	0.960
Nitrite and Nitrate Nitrogen, mg/l-N	06-19-91	0.64	1.364	0.663	1.364
Total Phosphorus, mg/l-P	08-01-90	0.14	0.082	0.056	0.14
<b>IS52S</b>					
Ammonia Nitrogen, mg/l-N	03-13-91	0.159	0.060	0.093	0.060
Total Kjeldahl Nitrogen, mg/l-N	06-05-91	0.60	0.283	0.278	0.60
Total Phosphorus, mg/l-P	06-05-91	0.22	0.090	0.084	0.22
<b>IS53N</b>					
Total Suspended Solids, mg/l	01-16-91	16.	7.1	8.4	7.1
Total Kjeldahl Nitrogen, mg/l-N	08-15-90	0.9	0.313	0.440	0.313

Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
<b>TS06N</b>					
Ammonia Nitrogen, mg/l-N	04-23-91	0.153	0.049	0.089	0.049
Total Kjeldahl Nitrogen, mg/l-N	06-04-91	0.810	0.304	0.477	0.304
Nitrite and Nitrate Nitrogen, mg/l-N	06-04-91	4.750	2.031	1.540	2.031
<b>TS19.5S</b>					
Total Suspended Solids, mg/l	04-29-91	178.	64.8	106.8	64.8
Ammonia Nitrogen, mg/l-N	03-18-91	0.326	0.132	0.151	0.132
Ortho Phosphate, mg/l-P	05-30-91	0.190	0.086	0.071	0.086
<b>TS27S</b>					
Total Suspended Solids, mg/l	04-30-91	800.	112.0	371.6	800
Ammonia Nitrogen, mg/l-N	12-11-90	0.525	0.136	0.269	0.136
Total Kjeldahl Nitrogen, mg/l-N	04-16-91	1.590	0.708	0.673	0.708
Total Phosphorus, mg/l-P	04-30-91	0.660	0.193	0.304	0.66
<b>TS32N</b>					
Total Kjeldahl Nitrogen, mg/l-N	05-23-91	0.890	0.487	0.400	0.487
Nitrite and Nitrate Nitrogen, mg/l-N	06-18-91	0.667	1.583	0.776	1.583
Total Phosphorus, mg/l-P	07-17-90	0.240	0.139	0.086	0.240
	05-09-91	0.230	0.139	0.086	0.230
Ortho Phosphate, mg/l-P	07-17-90	0.184	0.128	0.054	0.184
<b>TS33S</b>					
Total Suspended Solids, mg/l	07-25-90	138.	62.3	72.7	62.3
	04-17-91	146	62.3	72.7	62.3
Ammonia Nitrogen, mg/l-N	02-20-91	1.020	0.208	0.465	1.020
Total Phosphorus, mg/l-P	02-20-91	0.320	0.180	0.131	0.320

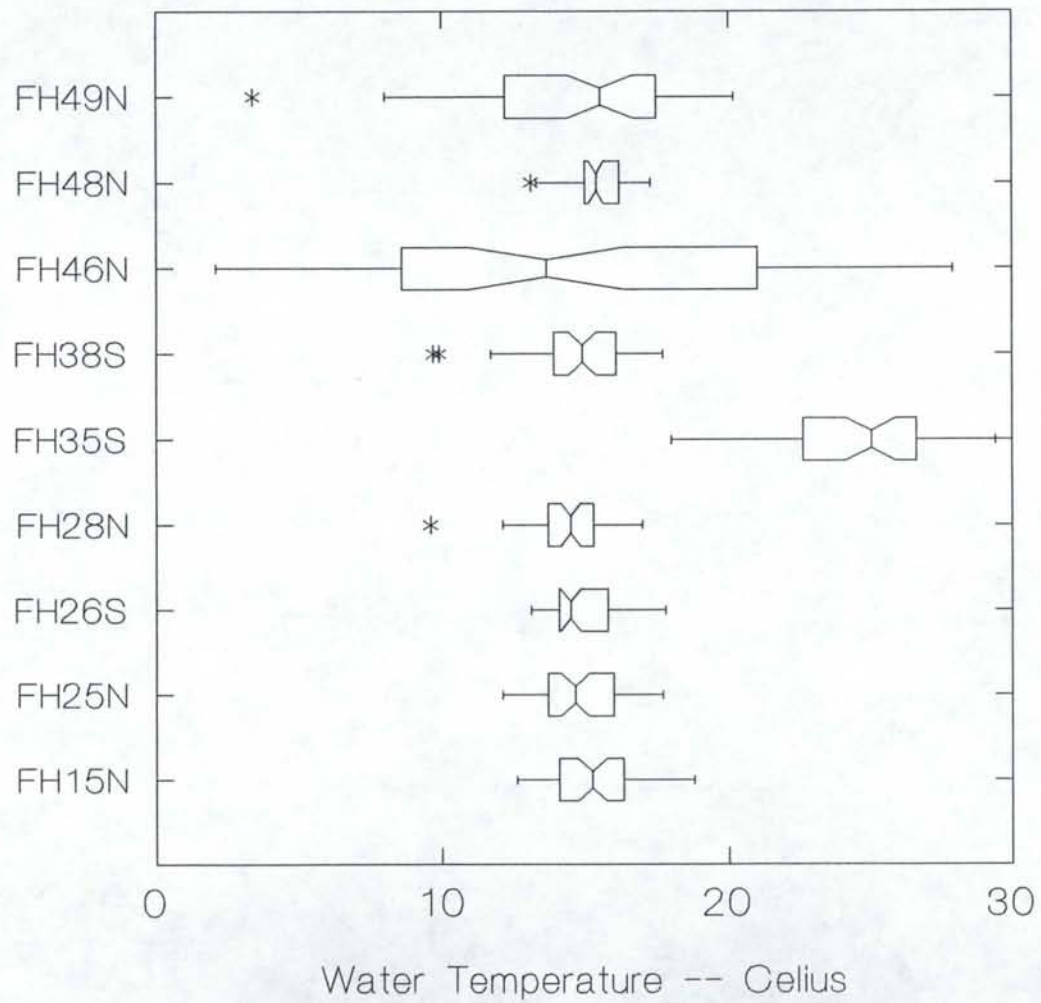
Station Parameter	Date	Observed Value	Station Average	Confidence Limits	Value Used
Ortho Phosphate, mg/l-P					
	02-20-91	0.245	0.115	0.122	0.245
	05-29-91	0.290	0.115	0.122	0.115
<b>TS34S</b>					
Total Suspended Solids, mg/l					
	09-05-90	218.	65.7	151.2	218
	04-17-91	242.	65.7	151.2	242
Ammonia Nitrogen, mg/l-N					
	06-12-91	0.408	0.098	0.232	0.098
Total Phosphorus, mg/l-P					
	04-17-91	0.380	0.152	0.202	0.380
<b>TS40N</b>					
Total Suspended Solids, mg/l					
	04-17-91	220.	29.	102.6	220
Total Kjeldahl Nitrogen, mg/l-N					
	04-17-91	1.500	0.591	0.677	1.500
	05-01-91	1.310	0.591	0.677	1.310
Total Phosphorus, mg/l-P					
	04-17-91	0.800	0.156	0.330	0.800
Ortho Phosphate, mg/l-P					
	04-17-91	0.425	0.109	0.164	0.425
<b>TS41S</b>					
Total Suspended Solids, mg/l					
	05-08-91	116.	40.9	72.4	40.9
Ammonia Nitrogen, mg/l-N					
	03-13-91	0.258	0.073	0.144	0.073
Ortho Phosphate, mg/l-P					
	07-03-90	0.009	0.048	0.037	0.048
<b>TS50N</b>					
Total Suspended Solids, mg/l					
	03-20-91	16.	5.7	9.0	5.7
Ammonia Nitrogen, mg/l-N					
	09-05-90	0.112	0.041	0.068	0.041
Total Kjeldahl Nitrogen, mg/l-N					
	08-08-90	0.52	0.180	0.299	0.180
	05-29-91	0.48	0.180	0.299	0.180
Nitrite and Nitrate Nitrogen, mg/l-N					
	10-17-90	2.93	1.191	0.883	1.191
Ortho Phosphate, mg/l-P					
	03-06-91	0.073	0.038	0.025	0.083

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

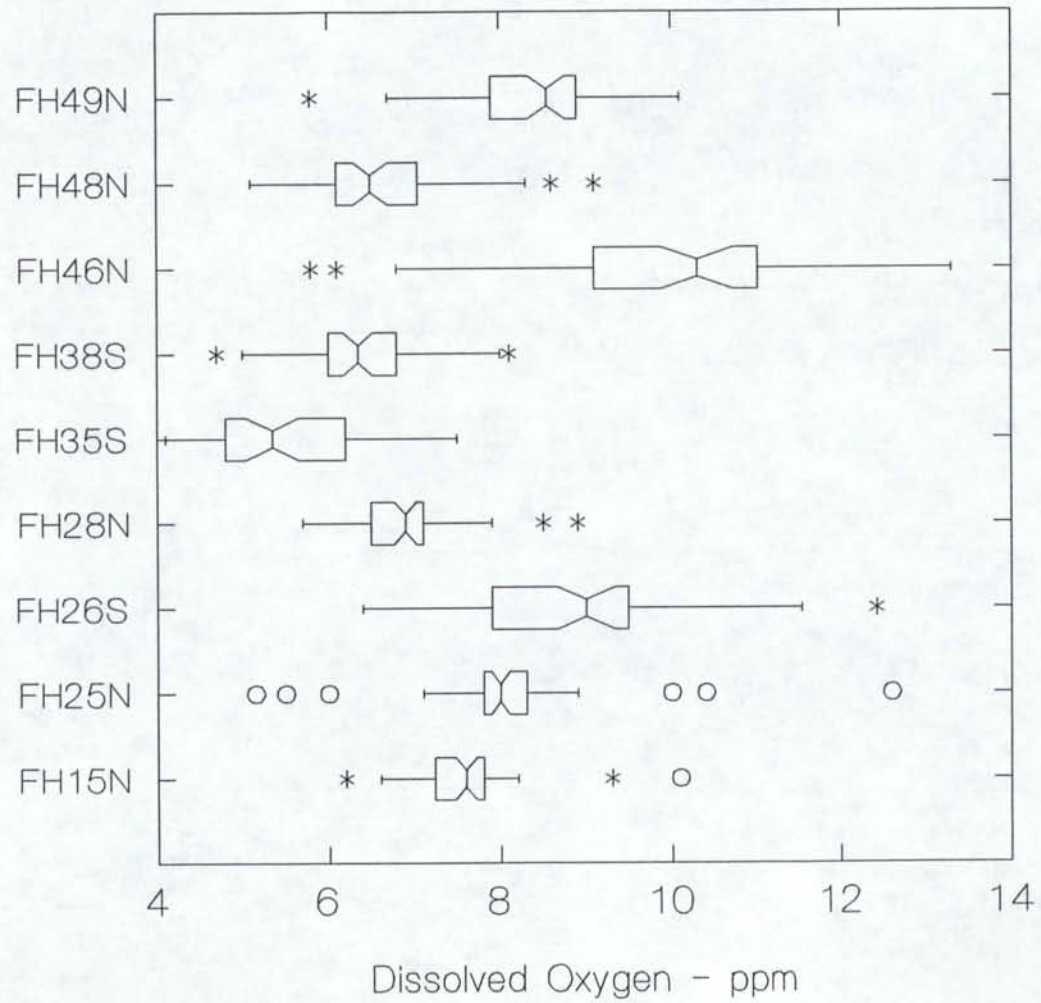
APPENDIX F

Concurrent Monitoring  
Selected Field Data Conditions  
for  
Fish Hatcheries  
Irrigation Return Flows  
Main Stem Instream Stations  
Tributary Streams

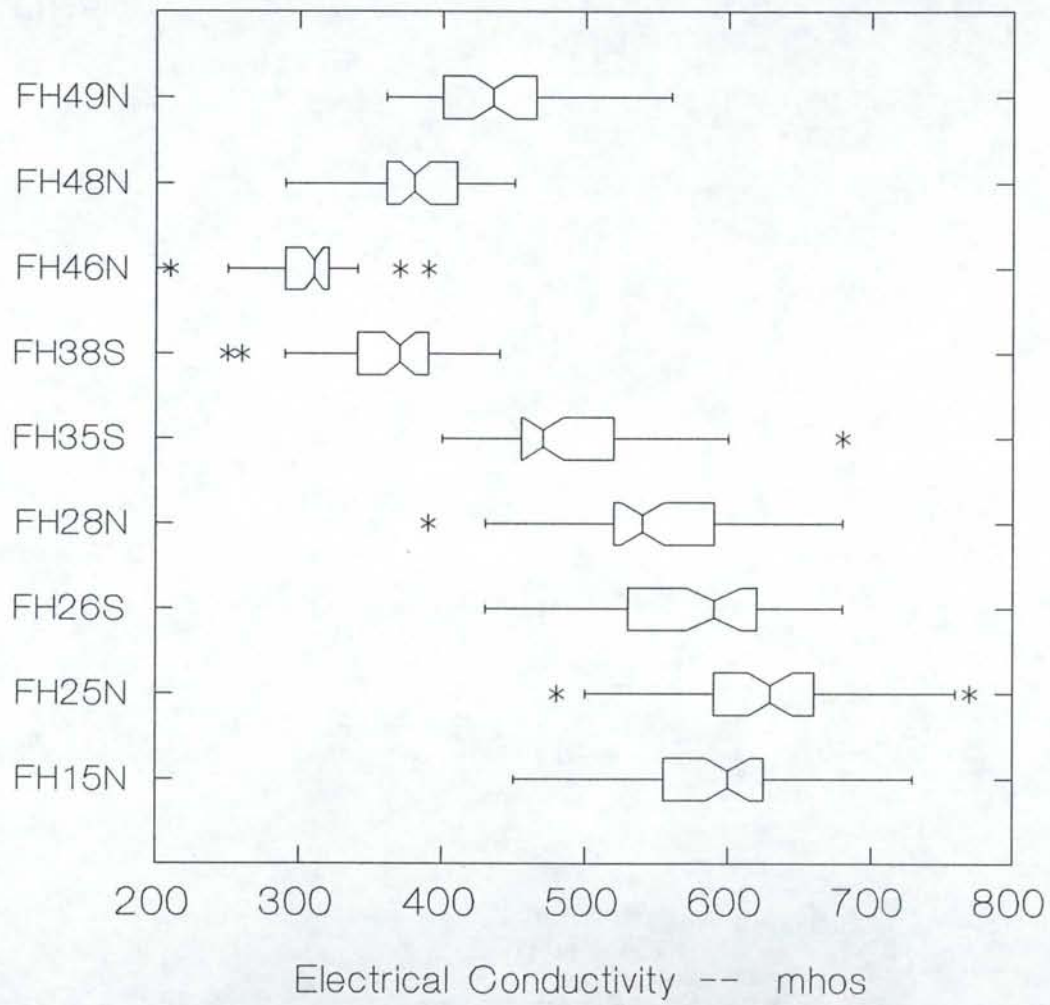
# Fish Hatchery Effluents



# Fish Hatchery Effluents

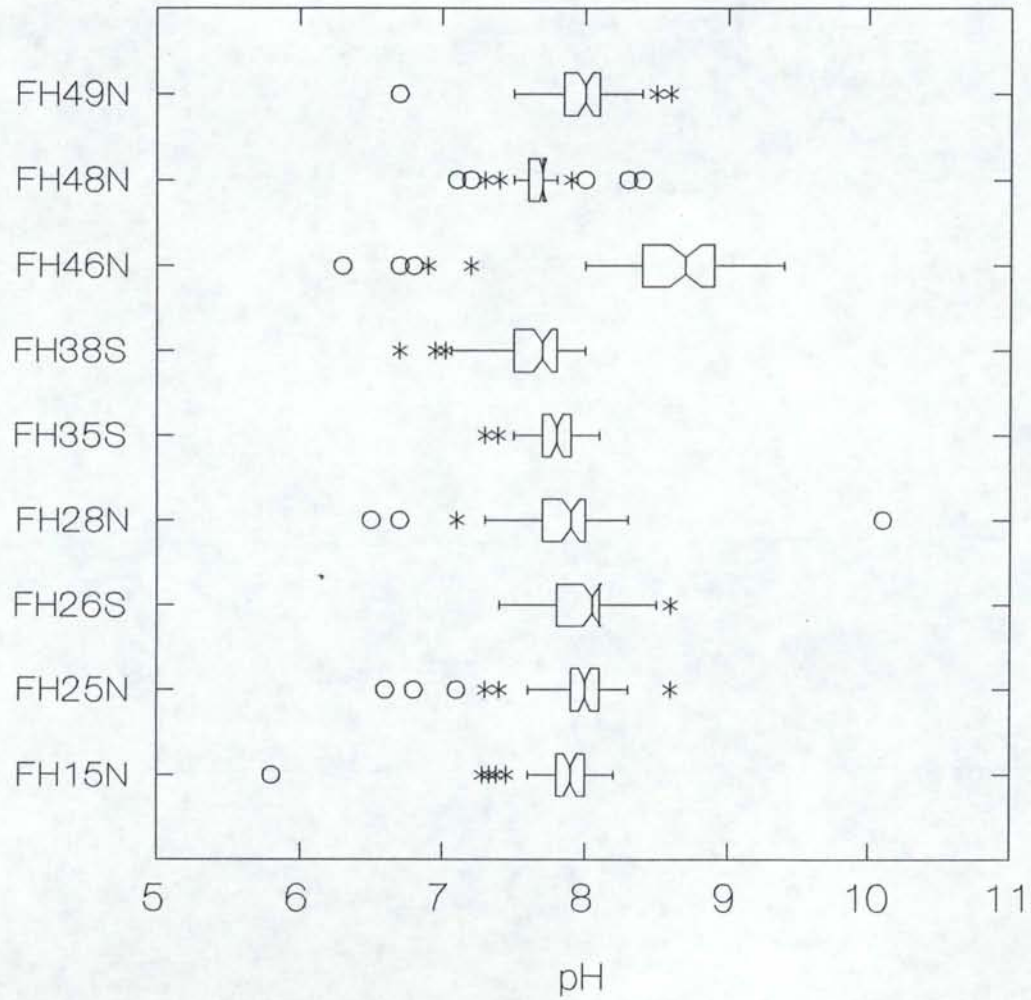


# Fish Hatchery Effluents

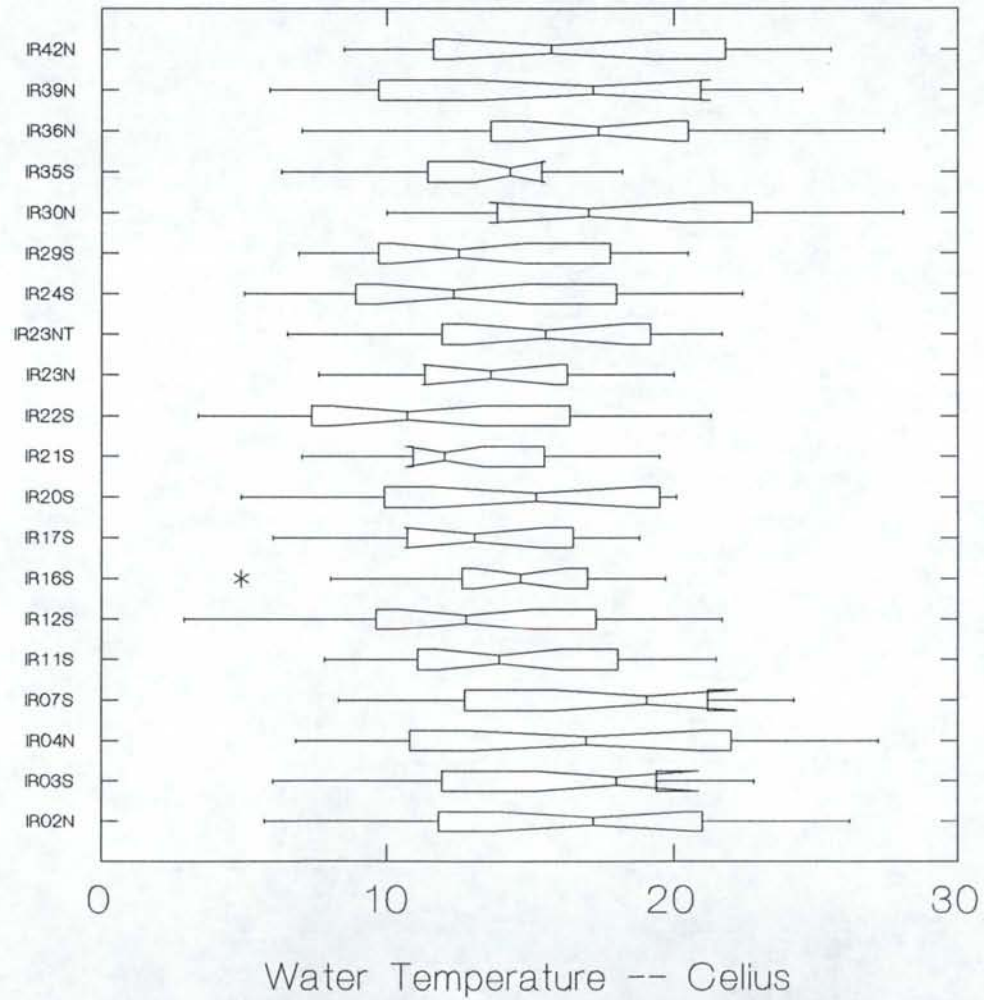




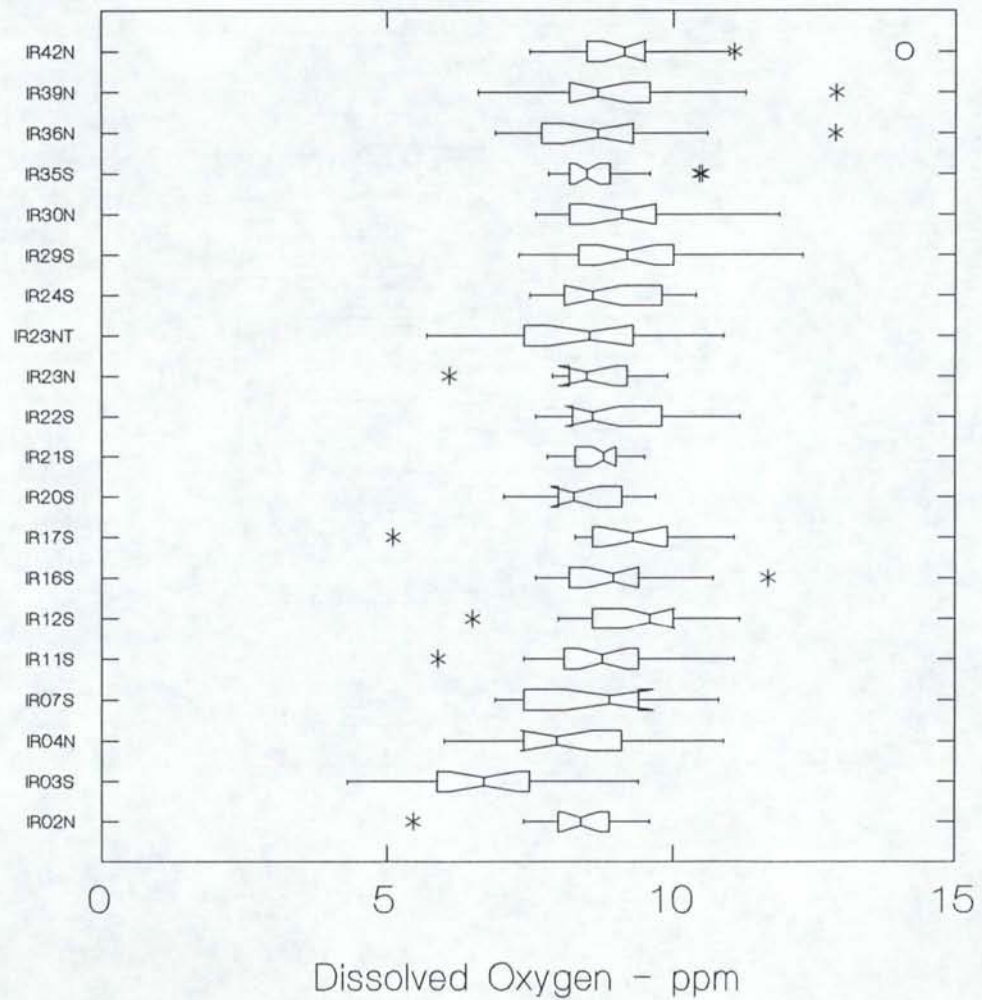
# Fish Hatchery Effluents



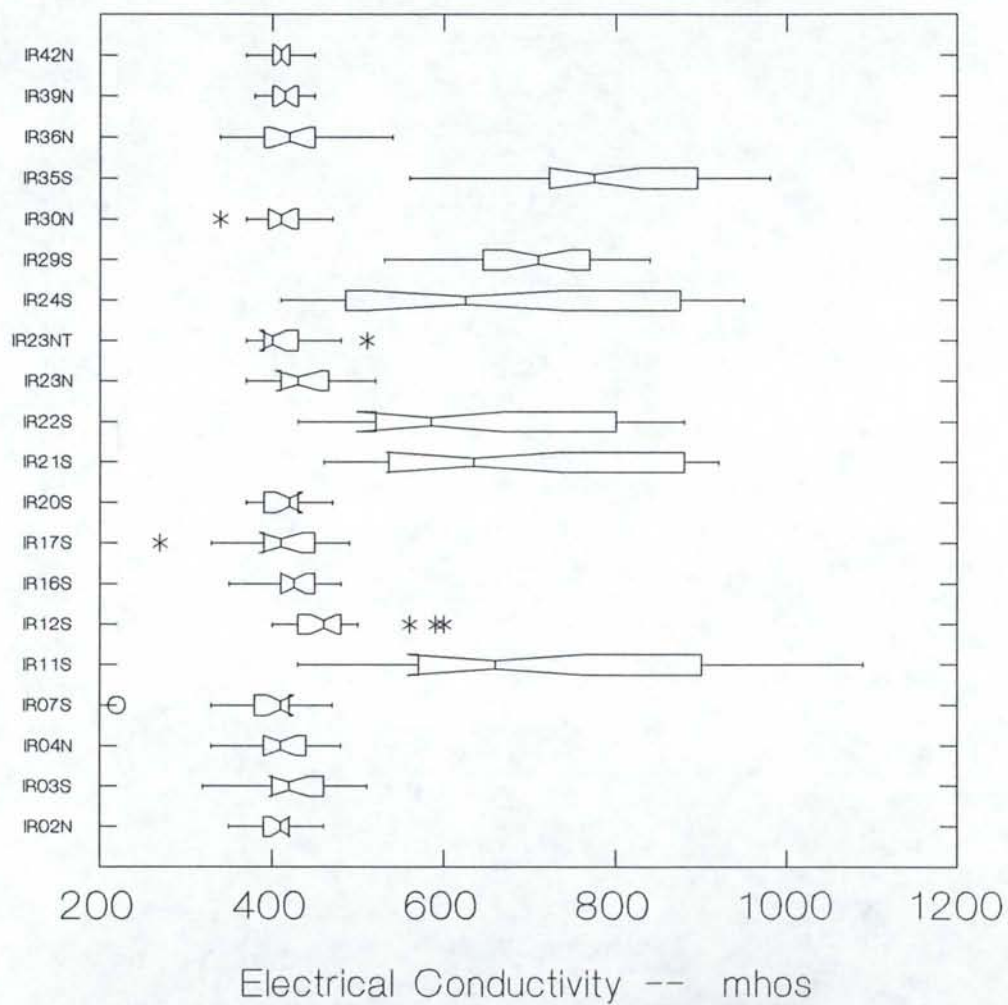
# Irrigation Return Flows



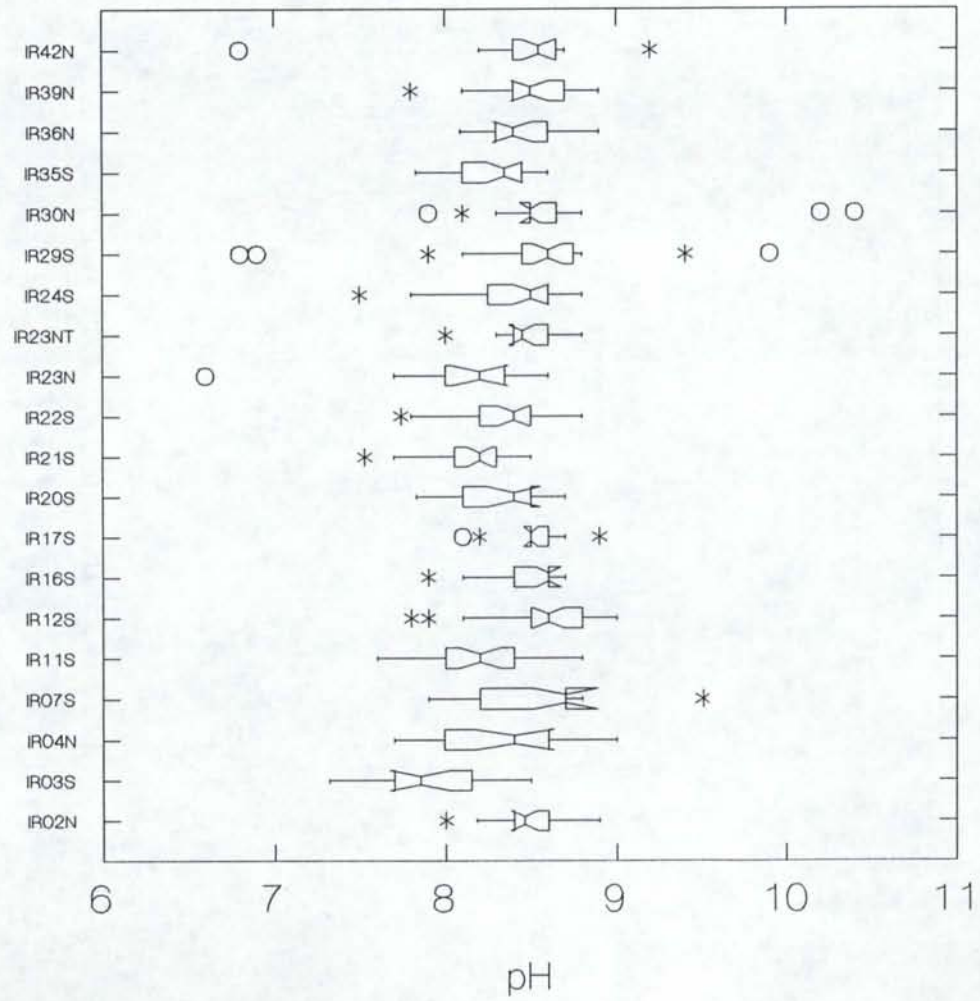
# Irrigation Return Flows



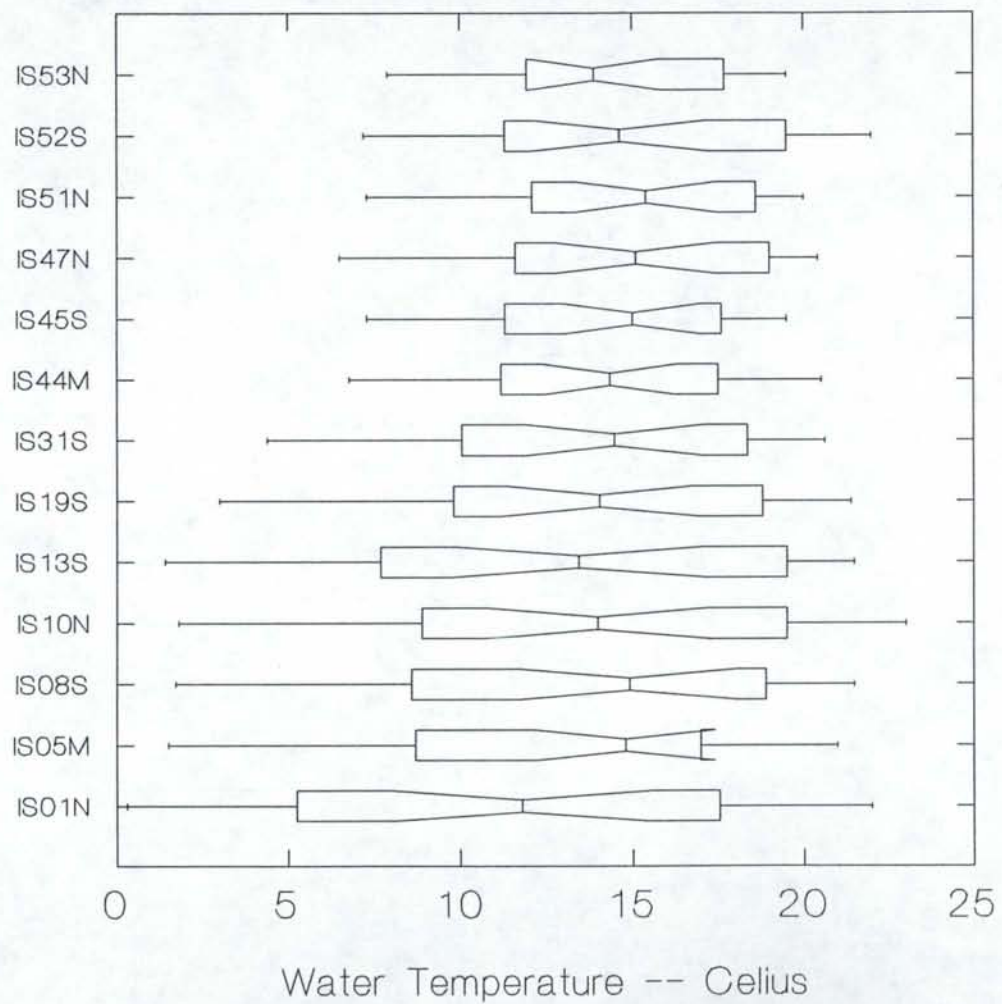
# Irrigation Return Flows



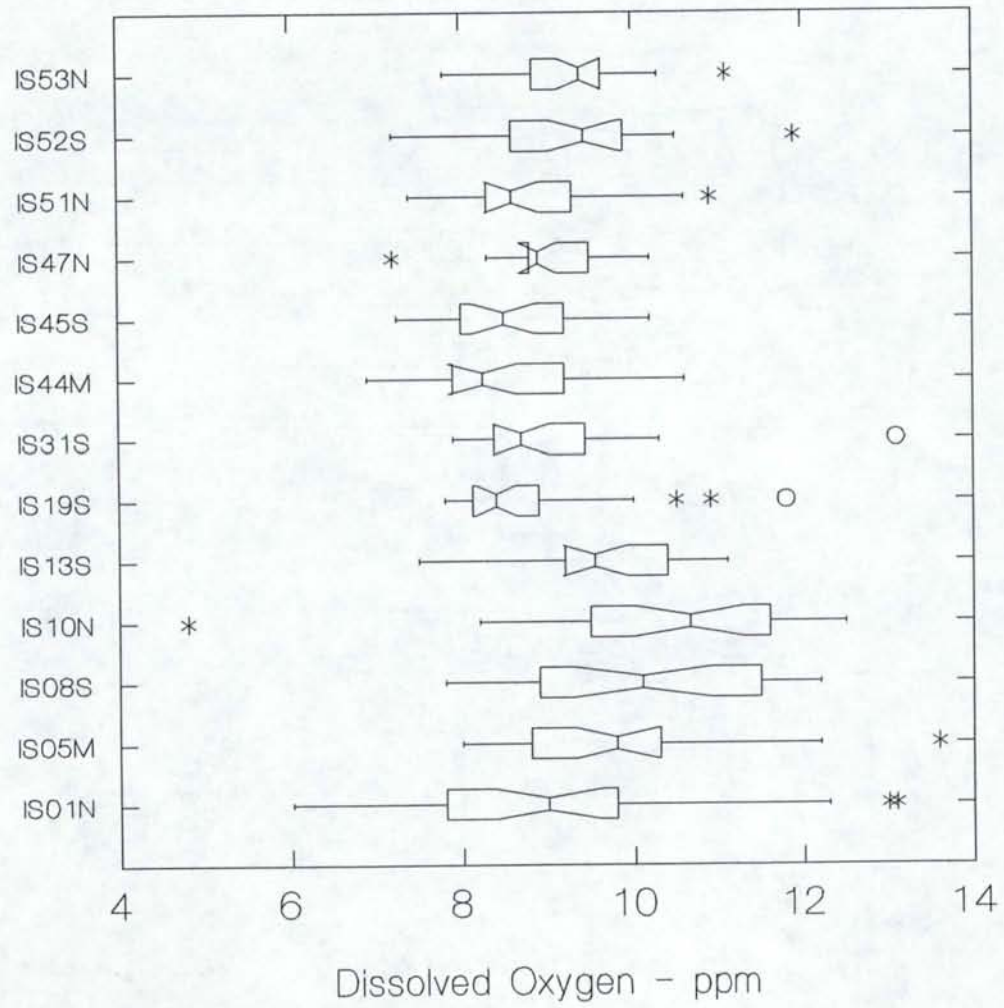
# Irrigation Return Flows



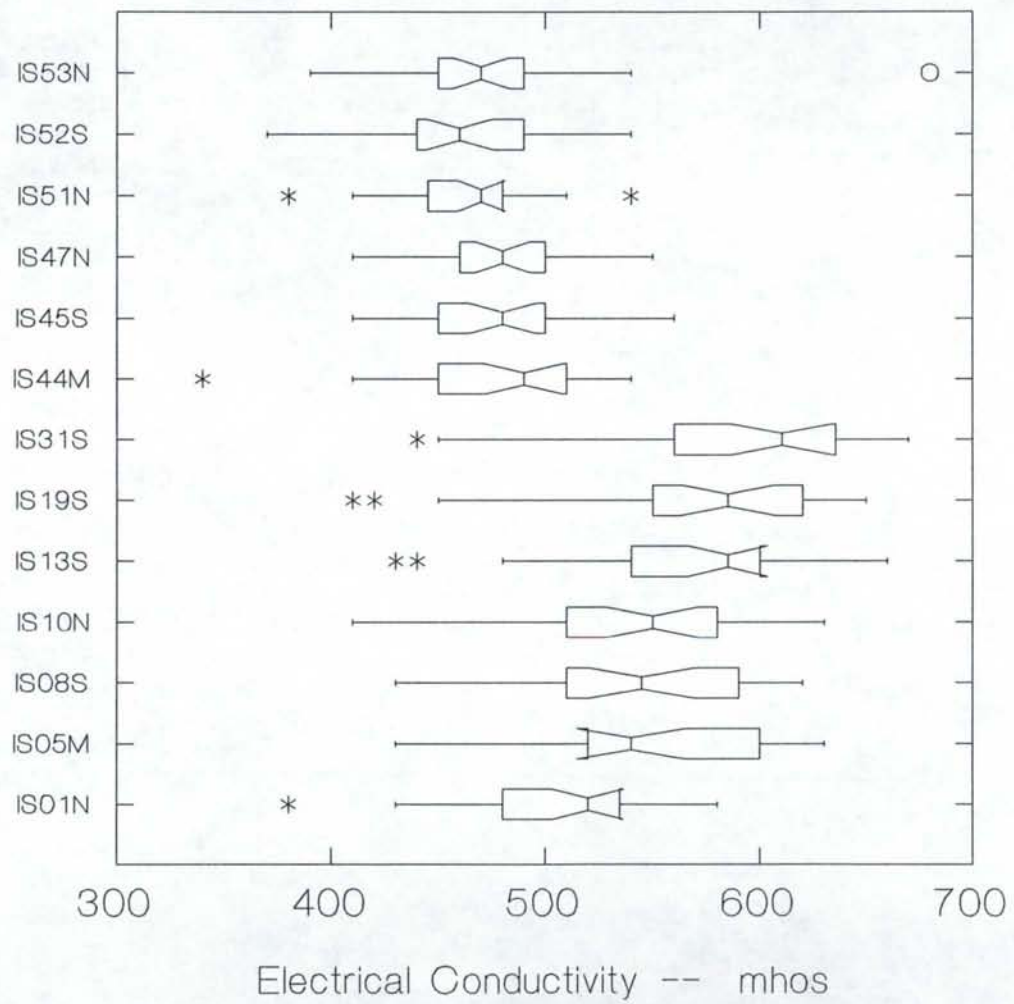
# Instream Conditions



# Instream Conditions

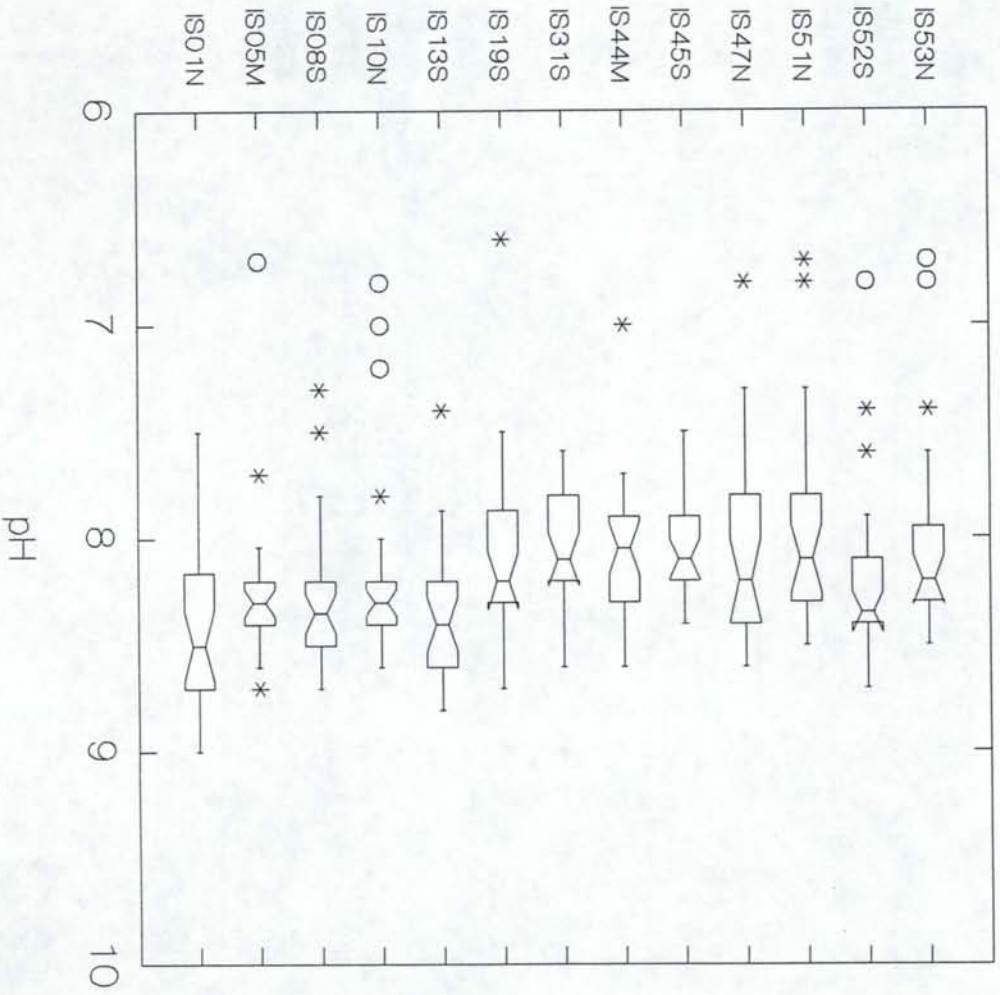


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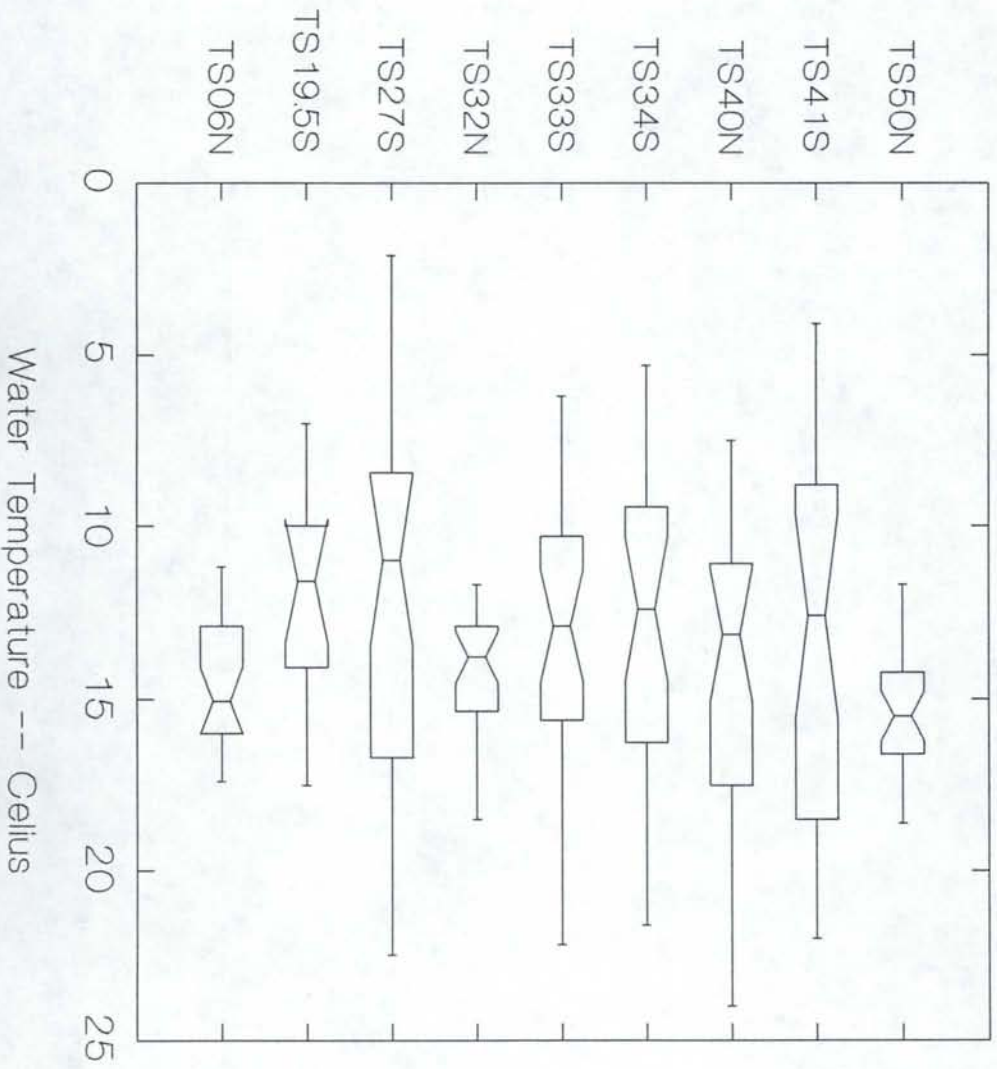




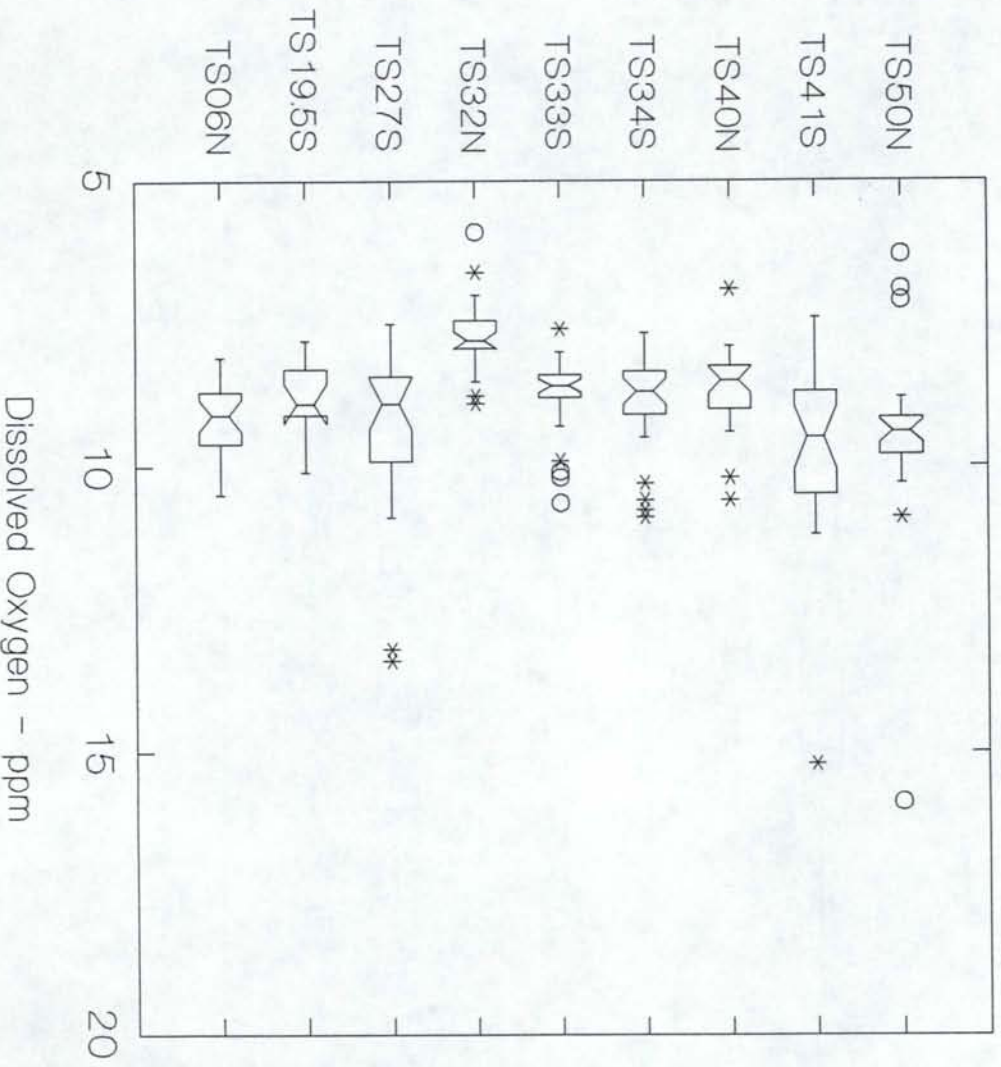
# Instream Conditions



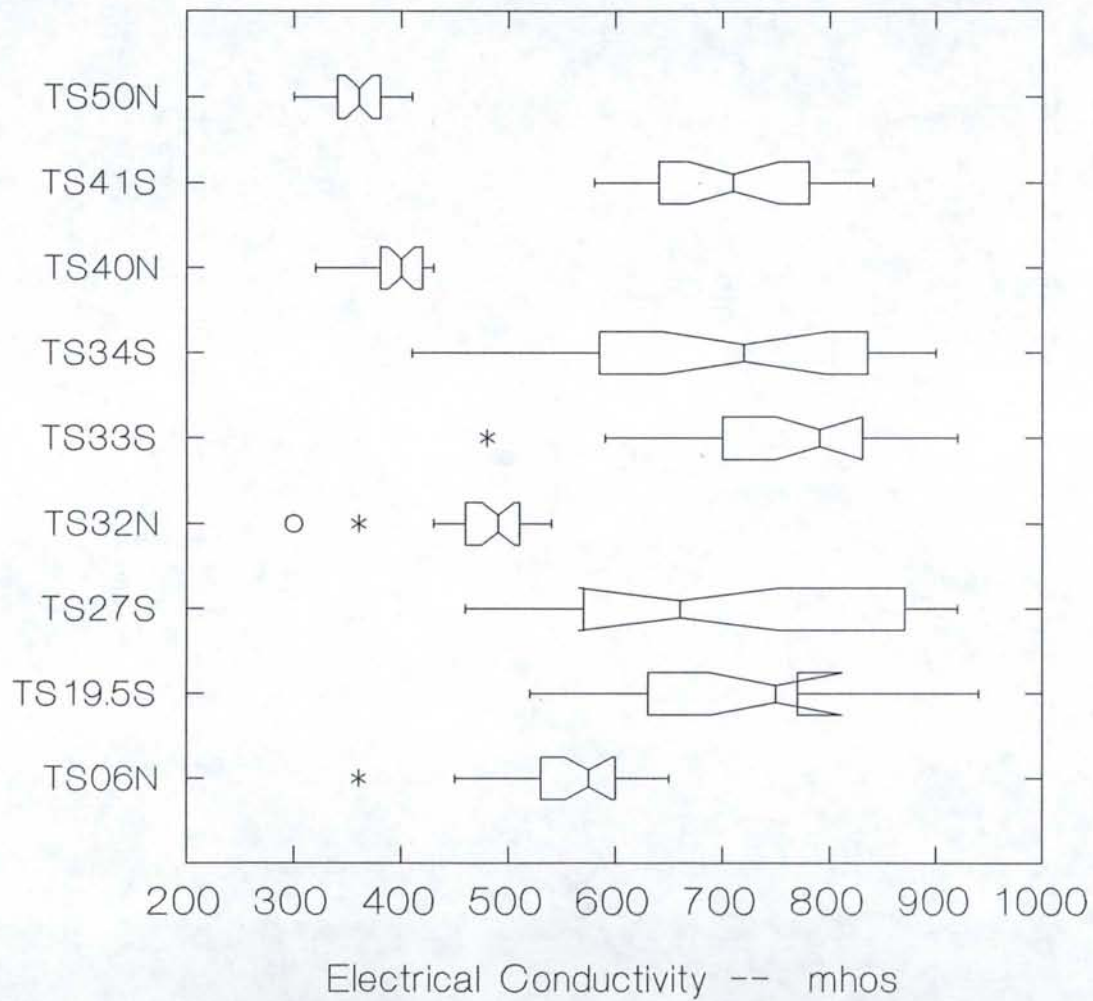
# Tributary Discharges



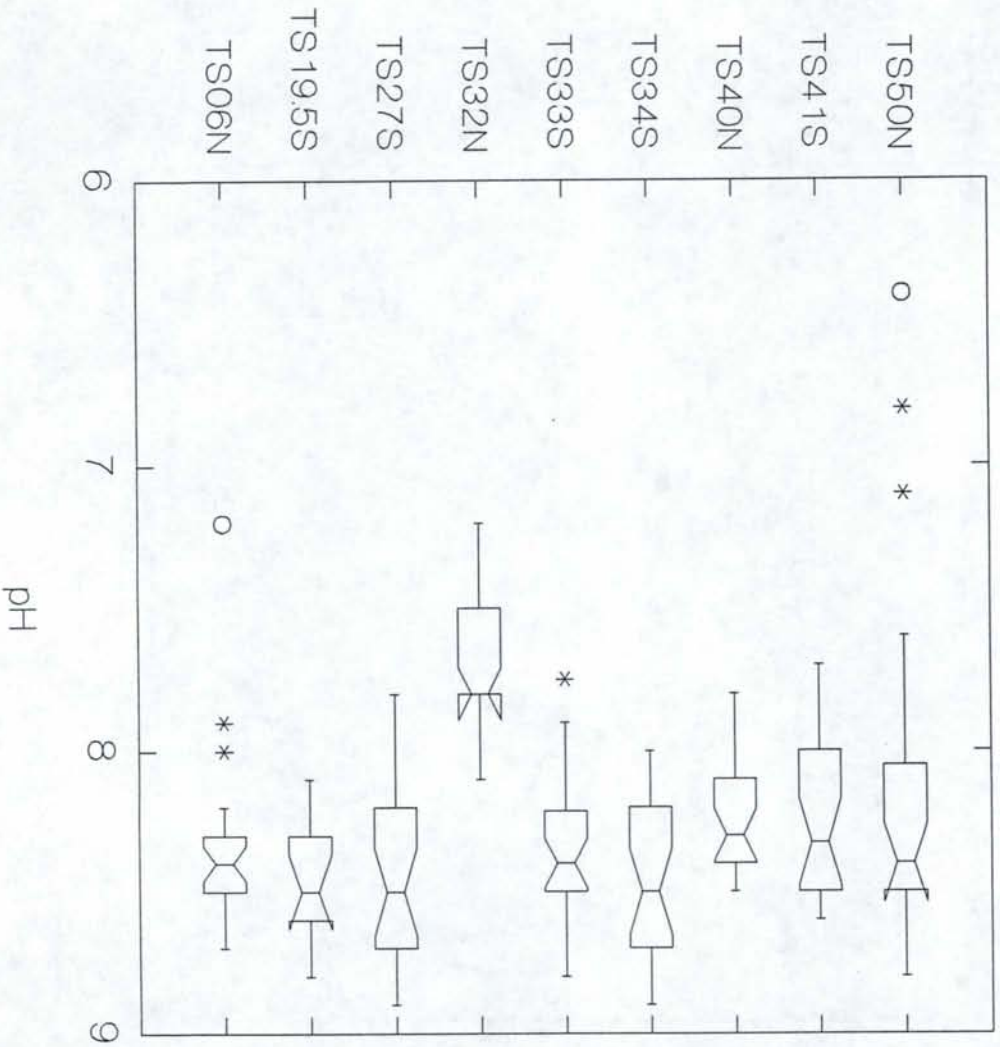
# Tributary Discharges



# Tributary Discharges



# Tributary Discharges



MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX G

Concurrent Monitoring  
Irrigation Return Flow Nutrient Loadings

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IR02N</b>																				
6/25/90		15.1	64	5223		0.017	1.39		<i>0.003</i>	0.20		0.45	36.7		0.08	6.5		<i>0.003</i>	0.20	
7/9/90	14	4.6	22	546	20	0.032	0.79	0.01	0.017	0.42	0.00	0.47	11.7	0.17	0.06	1.5	0.03	0.028	0.69	0.003
7/23/90	14	9.7	732	38337	156	0.037	1.94	0.02	0.063	3.30	0.02	1.18	61.8	0.43	0.67	35.1	0.16	0.070	3.67	0.018
8/6/90	14	7.6	312	12857	335	0.058	2.39	0.03	0.103	4.24	0.04	0.77	31.7	0.75	0.27	11.1	0.32	0.059	2.43	0.040
8/20/90	14	12.0	154	9926	415	0.107	6.90	0.06	0.294	18.95	0.12	0.60	38.7	1.00	0.22	14.2	0.41	<i>0.042</i>	2.71	0.058
9/3/90	14	15.9	110	9440	483	0.080	6.87	0.11	0.346	29.69	0.29	0.41	35.2	1.26	0.14	12.0	0.50	0.060	5.15	0.085
9/17/90	14	15.3	110	9066	548	0.062	5.11	0.15	0.094	7.75	0.42	0.63	51.9	1.56	0.30	24.7	0.63	0.034	2.80	0.113
10/1/90	14	9.1	140	6856	603	<i>0.064</i>	3.13	0.18	0.351	17.19	0.51	0.70	34.3	1.87	0.21	10.3	0.75	0.042	2.06	0.130
10/15/90	14	9.5	454	23141	708	0.037	1.89	0.20	0.305	15.55	0.63	0.78	39.8	2.12	0.52	26.5	0.88	0.044	2.24	0.145
10/29/90	14	1.4	6	44	790	0.027	0.20	0.21	0.014	0.10	0.68	0.18	1.3	2.27	<i>0.03</i>	0.2	0.97	0.012	0.09	0.153
4/29/91		4.8	100	2573	790	0.095	2.44	0.21	<i>0.003</i>	0.06	0.68	0.32	8.2	2.27	0.17	4.4	0.97	0.013	0.33	0.153
5/7/91	8	7.0	141	5331	805	0.081	3.06	0.22	0.005	0.19	0.68	0.98	37.1	2.36	0.31	11.7	1.00	0.063	2.38	0.159
5/13/91	6	6.0	168	5410	822	0.059	1.90	0.23	0.018	0.58	0.68	0.92	29.6	2.46	0.26	8.4	1.03	0.024	0.77	0.163
5/21/91	8	8.5	110	5019	842	0.033	1.51	0.23	0.026	1.19	0.69	0.33	15.1	2.55	0.16	7.3	1.07	0.026	1.19	0.167
5/30/91	9	9.1	55	2697	860	0.110	5.39	0.25	0.011	0.54	0.69	0.42	20.6	2.63	0.18	8.8	1.10	0.013	0.64	0.171
6/10/91	11	8.0	65	2805	875	0.047	2.03	0.27	0.034	1.47	0.70	0.35	15.1	2.73	0.16	6.9	1.14	0.041	1.77	0.178
6/24/91	14	9.3	74	3692	898	<i>0.003</i>	0.12	0.28	<i>0.003</i>	0.12	0.70	0.24	12.0	2.82	0.11	5.5	1.19	<i>0.003</i>	0.12	0.185
7/8/91	14	6.5	69	2415	919	<i>0.003</i>	0.09	0.28	<i>0.003</i>	0.09	0.70	0.59	20.7	2.94	0.16	5.6	1.23	0.039	1.37	0.190
Totals					919			0.28			0.70			2.94			1.23			0.190

<b>IR03S</b>																				
6/25/90		5.3	40	1141		0.021	0.60		0.085	2.4		0.71	20.3		0.12	3.4		0.058	1.65	
7/9/90	14	4.9	30	793	7	0.022	0.58	0.00	0.110	2.9	0.02	0.41	10.8	0.11	0.13	3.4	0.02	0.078	2.06	0.013
7/23/90	14	6.5	58	2043	17	0.160	5.64	0.03	0.155	5.5	0.05	0.67	23.6	0.23	0.16	5.6	0.06	0.108	3.80	0.034
8/6/90	14	3.8	40	818	27	0.048	0.98	0.05	0.207	4.2	0.08	0.48	9.8	0.35	0.16	3.3	0.09	0.109	2.23	0.055
8/20/90	14	8.1	38	1654	35	0.050	2.18	0.06	0.258	11.2	0.14	0.49	21.3	0.46	0.17	7.4	0.12	0.127	5.53	0.082
9/3/90	14	2.2	23	268	42	0.058	0.68	0.07	0.288	3.4	0.19	0.35	4.1	0.54	0.09	1.0	0.15	0.069	0.80	0.104
9/17/90	14	6.5	76	2677	52	0.082	2.89	0.08	0.130	4.6	0.21	0.53	18.7	0.62	0.19	6.7	0.18	0.055	1.94	0.114
10/1/90	14	9.8	32	1698	68	0.020	1.06	0.10	0.487	25.8	0.32	0.33	17.5	0.75	0.13	6.9	0.23	0.095	5.04	0.138
10/15/90	14	3.1	10	165	74	0.030	0.49	0.10	0.379	6.2	0.43	0.22	3.6	0.82	0.10	1.6	0.26	0.074	1.22	0.160
4/29/91		2.8	54	807	74	0.050	0.75	0.10	0.088	1.3	0.43	0.61	9.1	0.82	0.18	2.7	0.26	0.085	1.27	0.160
5/9/91	10	1.7	3	28	76	<i>0.003</i>	0.02	0.10	0.018	0.2	0.44	0.46	4.3	0.86	0.12	1.1	0.27	0.049	0.46	0.164

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Sediment				Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
		Flow	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
		cfs	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
5/13/91	4	0.6	22	66	76	<b>0.003</b>	0.01	0.10	0.033	0.1	0.44	0.43	1.3	0.86	0.09	0.3	0.27	0.040	0.12	0.165
5/23/91	10	4.7	12	305	77	0.144	3.66	0.11	0.079	2.0	0.44	0.51	13.0	0.90	0.07	1.8	0.27	0.048	1.22	0.168
5/30/91	7	5.7	18	552	79	0.113	3.47	0.13	0.050	1.5	0.45	0.28	8.6	0.94	0.10	3.1	0.28	0.045	1.38	0.173
6/10/91	11	10.2	176	9695	107	0.042	2.31	0.14	0.024	1.3	0.46	1.10	60.6	1.13	0.37	20.4	0.35	0.077	4.24	0.188
6/24/91	14	0.7	55	196	142	0.020	0.07	0.15	0.054	0.2	0.46	0.50	1.8	1.35	0.16	0.6	0.42	0.086	0.31	0.204
7/8/91	14	4.9	70	1850	149	0.030	0.79	0.15	0.380	10.0	0.50	1.08	28.5	1.45	0.27	7.1	0.45	0.110	2.91	0.215
Totals					149			0.15			0.50			1.45			0.45			0.215
<b>IR04N</b>																				
6/25/90		2.1	42	464		0.012	0.13		0.005	0.1		0.48	5.3		0.08	0.9		0.010	0.11	
7/9/90	14	4.5	68	1647	7	0.011	0.27	0.00	0.070	1.7	0.01	0.45	10.9	0.06	0.09	2.2	0.01	0.024	0.58	0.002
7/23/90	14	8.1	78	3404	25	0.037	1.61	0.01	0.144	6.3	0.03	0.70	30.5	0.20	0.17	7.4	0.04	0.076	3.32	0.016
8/6/90	14	0.4	38	78	37	0.055	0.11	0.01	0.190	0.4	0.06	0.54	1.1	0.31	0.12	0.2	0.07	0.097	0.20	0.028
8/20/90	14	25.8	34	4722	54	0.101	14.03	0.06	0.359	49.9	0.23	0.38	52.8	0.50	0.15	20.8	0.14	0.103	14.31	0.079
9/3/90	14	5.1	18	499	72	0.032	0.89	0.12	0.415	11.5	0.45	0.39	10.8	0.72	0.10	2.8	0.23	0.074	2.05	0.136
9/17/90	14	12.3	16	1063	78	0.070	4.65	0.14	0.146	9.7	0.52	0.21	14.0	0.81	0.08	5.3	0.26	0.039	2.59	0.153
10/1/90	14	15.2	16	1315	86	0.046	3.78	0.16	0.536	44.1	0.71	0.25	20.6	0.93	0.08	6.6	0.30	0.060	4.93	0.179
10/15/90	14	2.2	8	96	91	0.042	0.51	0.18	0.352	4.2	0.88	0.27	3.2	1.01	0.05	0.6	0.32	0.039	0.47	0.198
10/29/90	14	6.4	8	274	92	0.029	0.99	0.18	0.574	19.7	0.96	0.18	6.2	1.05	0.06	2.1	0.33	0.050	1.71	0.206
4/29/91	182	5.2	56	1580	92	0.070	1.97	0.18	<b>0.003</b>	0.1	0.96	0.33	9.3	1.05	0.19	5.4	0.33	0.008	0.23	0.206
5/9/91	10	8.9	64	3072	104	<b>0.003</b>	0.12	0.19	0.017	0.8	0.97	0.65	31.2	1.15	0.20	9.6	0.37	0.007	0.34	0.207
5/13/91	4	9.8	74	3912	111	0.089	4.70	0.19	0.021	1.1	0.97	1.12	59.2	1.24	0.15	7.9	0.39	0.011	0.58	0.208
5/23/91	10	0.8	31	135	121	0.137	0.60	0.21	0.016	0.1	0.97	0.60	2.6	1.39	0.10	0.4	0.41	0.019	0.08	0.209
5/30/91	7	9.0	142	6916	133	0.144	7.01	0.22	0.037	1.8	0.97	0.52	25.3	1.44	0.19	9.3	0.42	0.027	1.32	0.212
6/10/91	11	8.3	50	2238	159	0.029	1.30	0.24	<b>0.003</b>	0.1	0.98	0.43	19.3	1.57	0.35	15.7	0.49	0.033	1.48	0.220
6/24/91	14	6.1	40	1312	171	<b>0.003</b>	0.08	0.25	0.019	0.6	0.98	0.20	6.6	1.66	0.11	3.6	0.56	0.030	0.98	0.228
7/8/91	14	2.4	69	901	179	<b>0.003</b>	0.03	0.25	0.039	0.5	0.99	0.62	8.1	1.71	0.24	3.1	0.58	0.101	1.32	0.236
Totals					179			0.25			0.99			1.71			0.58			0.236
<b>IR07S</b>																				
6/25/90		7.7	40	1659	0	0.015	0.62	0.00	<b>0.003</b>	0.1		0.65	27.0	0.00	0.10	4.1	0.00	0.035	1.45	0.000
7/9/90	14	3.6	64	1225	10	0.021	0.40	0.00	0.042	0.8	0.00	0.47	9.0	0.13	0.12	2.3	0.02	0.049	0.94	0.008
7/23/90	14	9.7	320	16777	73	0.035	1.83	0.01	0.151	7.9	0.03	0.97	50.9	0.34	0.38	19.9	0.10	0.093	4.88	0.029
8/6/90	14	0.6	18	54	132	0.037	0.11	0.02	0.027	0.1	0.06	0.47	1.4	0.52	0.14	0.4	0.17	0.108	0.33	0.047



### Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
8/20/90	14	2.4	18	230	133	0.033	0.42	0.02	0.098	1.3	0.07	0.50	6.4	0.55	0.17	2.2	0.18	<i>0.064</i>	0.82	0.051
9/3/90	14	10.7	111	6376	156	0.089	5.11	0.04	0.268	15.4	0.12	0.65	37.3	0.70	0.20	11.5	0.23	0.095	5.46	0.073
9/17/90	14	21.1	114	12943	224	0.086	9.76	0.09	0.222	25.2	0.27	0.66	74.9	1.09	0.17	19.3	0.34	0.053	6.02	0.113
10/1/90	14	12.5	72	4843	286	0.026	1.75	0.13	0.501	33.7	0.47	0.35	23.5	1.44	0.17	11.4	0.44	0.086	5.78	0.154
10/15/90	14	2.6	58	813	306	0.032	0.45	0.14	0.520	7.3	0.62	0.61	8.6	1.55	0.61	8.6	0.51	0.079	1.11	0.178
4/15/91		12.8	492	33861	306	<i>0.003</i>	0.17	0.14	<i>0.003</i>	0.2	0.62	1.90	130.8	1.55	0.79	54.4	0.51	0.064	4.40	0.178
4/29/91	14	11.1	132	7931	452	<i>0.045</i>	2.70	0.15	<i>0.003</i>	0.2	0.62	0.30	18.0	2.07	0.21	12.6	0.75	0.018	1.08	0.198
5/9/91	10	11.4	166	10162	497	<i>0.003</i>	0.15	0.16	<i>0.003</i>	0.2	0.62	0.60	36.7	2.21	0.24	14.7	0.82	0.032	1.96	0.205
5/9/91	0	11.4	166	10162	497	<i>0.003</i>	0.15	0.16	<i>0.003</i>	0.2	0.62	0.60	36.7	2.21	0.24	14.7	0.82	0.032	1.96	0.205
5/13/91	4	14.0	166	12553	520	<i>0.003</i>	0.19	0.16	0.029	2.2	0.62	0.72	54.4	2.30	0.23	17.4	0.85	0.019	1.44	0.209
5/23/91	10	18.3	185	18230	597	0.006	0.59	0.16	0.017	1.7	0.63	0.20	19.7	2.48	0.19	18.7	0.94	0.042	4.14	0.223
5/30/91	7	0.2	4	4	629	<i>0.003</i>	0.00	0.16	<i>0.003</i>	0.0	0.63	0.64	0.7	2.52	0.16	0.2	0.97	0.057	0.06	0.230
6/24/91	25	0.8	28	125	630	<i>0.003</i>	0.01	0.16	<i>0.003</i>	0.0	0.63	0.33	1.5	2.53	0.11	0.5	0.98	0.061	0.27	0.232
7/8/91	14	6.0	144	4683	647	<i>0.003</i>	0.08	0.16	0.020	0.7	0.64	0.96	31.2	2.65	0.30	9.8	1.01	0.046	1.50	0.238
Totals					647			0.16			0.64			2.65			1.01			0.238

IR11S																				
6/25/90		30.2	58	9451		0.029	4.7		1.320	215.1		0.65	105.9		0.10	16.3		0.048	7.82	
7/9/90	14	37.0	92	18360	97	0.095	19.0	0.08	2.330	465.0	2.38	0.71	141.7	0.87	0.17	33.9	0.18	0.075	14.97	0.080
7/23/90	14	45.4	398	97503	503	0.066	16.2	0.21	1.120	274.4	4.97	1.00	245.0	2.22	0.50	122.5	0.72	0.110	26.95	0.226
8/6/90	14	41.8	158	35605	969	0.076	17.1	0.32	1.960	441.7	7.47	0.73	164.5	3.65	0.22	49.6	1.33	0.107	24.11	0.405
8/20/90	14	52.1	132	37101	1223	0.093	26.1	0.47	1.830	514.4	10.82	0.63	177.1	4.85	0.25	70.3	1.74	0.108	30.36	0.596
9/3/90	14	57.2	65	20047	1423	0.115	35.5	0.69	1.510	465.7	14.25	0.65	200.5	6.17	0.15	46.3	2.15	0.080	24.67	0.788
9/17/90	14	45.9	36	8909	1525	0.220	54.4	1.00	0.857	212.1	16.62	0.46	113.8	7.27	<i>0.03</i>	6.2	2.34	0.059	14.60	0.926
10/1/90	14	44.5	26	6234	1578	0.079	18.9	1.26	2.470	592.2	19.44	0.66	158.2	8.22	0.09	21.6	2.43	0.055	13.19	1.023
10/15/90	14	46.6	28	7033	1624	0.114	28.6	1.43	2.550	640.5	23.75	0.49	123.1	9.21	0.08	20.1	2.58	0.081	20.35	1.140
10/29/90	14	39.9	20	4304	1664	0.120	25.8	1.62	2.860	615.5	28.15	0.47	101.1	9.99	0.07	15.1	2.70	0.078	16.79	1.270
11/26/90	28	22.4	164	19814	1833	0.060	7.2	1.85	4.100	495.4	35.92	1.10	132.9	11.63	0.23	27.8	3.00	0.042	5.07	1.423
12/10/90	14	19.9	154	16513	1960	0.384	41.2	2.02	4.300	461.1	39.27	1.38	148.0	12.61	0.30	32.2	3.21	0.061	6.54	1.464
1/7/91	28	14.7	152	12068	2160	0.239	19.0	2.44	4.490	356.5	44.99	0.81	64.3	14.10	0.20	15.9	3.55	0.074	5.88	1.551
1/21/91	14	12.9	260	18133	2265	0.164	11.4	2.55	4.980	347.3	47.46	1.15	80.2	14.60	0.30	20.9	3.68	0.066	4.60	1.588
2/4/91	14	11.1	34	2043	2336	0.133	8.0	2.61	4.530	272.2	49.63	0.58	34.8	15.01	0.13	7.8	3.78	0.089	5.35	1.623
3/4/91	28	9.3	28	1409	2360	0.193	9.7	2.74	5.000	251.6	53.29	0.48	24.2	15.42	0.11	5.5	3.87	0.069	3.47	1.684

### Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
3/18/91	14	7.7	44	1825	2372	0.154	6.4	2.79	4.240	175.9	54.79	0.35	14.5	15.56	0.11	4.6	3.91	0.073	3.03	1.707
4/1/91	14	7.5	21	848	2381	0.061	2.5	2.83	3.630	146.6	55.92	0.49	19.8	15.68	0.08	3.2	3.93	0.062	2.50	1.726
4/15/91	14	14.6	76	5977	2405	0.041	3.2	2.85	0.510	40.1	56.57	1.12	88.1	16.05	0.33	26.0	4.04	0.051	4.01	1.749
4/29/91	14	19.0	122	12496	2469	0.103	10.5	2.89	0.740	75.8	56.98	0.65	66.6	16.59	0.23	23.6	4.21	0.048	4.92	1.780
5/7/91	8	33.7	120	21780	2538	0.101	18.3	2.95	0.833	151.2	57.43	1.06	192.4	17.11	0.24	43.6	4.34	0.062	11.25	1.813
5/13/91	6	56.2	148	44839	2638	0.011	3.3	2.98	0.453	137.2	57.86	1.80	545.3	18.22	0.50	151.5	4.64	0.033	10.00	1.845
5/21/91	8	41.5	153	34239	2796	0.084	18.8	3.03	0.611	136.7	58.41	0.40	89.5	19.49	0.16	35.8	5.01	0.026	5.82	1.876
5/30/91	9	14.8	63	5016	2884	0.125	10.0	3.09	1.520	121.0	58.99	0.34	27.1	19.75	0.12	9.6	5.11	0.038	3.03	1.896
6/10/91	11	32.4	60	10469	2927	0.092	16.1	3.16	0.730	127.4	59.67	0.59	102.9	20.11	0.16	27.9	5.22	0.039	6.80	1.923
6/24/91	14	19.8	25	2666	2973	0.031	3.3	3.23	1.450	154.6	60.66	0.44	46.9	20.63	0.13	13.9	5.36	0.062	6.61	1.970
7/8/91	14	8.9	70	3353	2994	<b>0.003</b>	0.1	3.24	1.520	72.8	61.46	0.65	31.1	20.91	0.23	11.0	5.45	0.058	2.78	2.003
Totals					2994			3.24			61.46			20.91			5.45			2.003

#### IR12S

6/25/90		18.5	42	4186		0.042	4.2		0.035	3.5		0.72	71.8		0.09	9.0		0.016	1.59	
7/9/90	14	9.2	236	11736	56	0.064	3.2	0.03	0.203	10.1	0.05	0.98	48.7	0.42	0.32	15.9	0.09	0.038	1.89	0.012
7/23/90	14	26.4	356	50654	274	0.046	6.5	0.06	0.295	42.0	0.23	1.39	197.8	1.28	0.48	68.3	0.38	0.074	10.53	0.056
8/6/90	14	11.3	150	9134	483	0.047	2.9	0.09	0.403	24.5	0.46	0.94	57.2	2.18	0.27	16.4	0.68	<b>0.047</b>	2.86	0.103
8/20/90	14	19.0	580	59345	723	0.086	8.8	0.13	0.498	51.0	0.73	1.17	119.7	2.80	0.66	67.5	0.97	0.119	12.18	0.155
9/3/90	14	24.0	146	18884	997	0.030	3.9	0.18	0.452	58.5	1.11	0.60	77.6	3.49	0.20	25.9	1.30	0.069	8.92	0.229
9/17/90	14	8.9	186	8969	1094	<b>0.062</b>	3.0	0.20	0.368	17.7	1.38	0.59	28.4	3.86	0.28	13.5	1.44	0.044	2.12	0.268
10/1/90	14	9.8	44	2335	1134	0.050	2.7	0.22	0.781	41.5	1.58	0.37	19.6	4.03	0.12	6.4	1.51	0.092	4.88	0.292
10/15/90	14	14.6	228	17942	1205	0.033	2.6	0.24	0.721	56.7	1.93	0.62	48.8	4.27	0.29	22.8	1.61	0.064	5.04	0.327
10/29/90	14	9.1	16	786	1270	0.032	1.6	0.25	0.810	39.8	2.27	0.22	10.8	4.47	0.08	3.9	1.70	0.070	3.44	0.357
11/26/90	28	3.5	16	303	1278	<b>0.003</b>	0.0	0.27	1.870	35.4	2.79	0.32	6.1	4.59	0.07	1.3	1.74	0.032	0.61	0.385
12/10/90	14	3.1	20	338	1280	0.097	1.6	0.27	1.700	28.7	3.02	0.27	4.6	4.63	0.05	0.8	1.75	0.036	0.61	0.389
1/7/91	28	2.6	56	785	1288	0.078	1.1	0.29	1.490	20.9	3.36	0.37	5.2	4.70	0.08	1.1	1.76	0.044	0.62	0.398
1/21/91	14	1.9	28	284	1292	0.037	0.4	0.30	1.610	16.3	3.49	0.27	2.7	4.73	0.05	0.5	1.77	0.048	0.49	0.402
2/4/91	14	1.9	26	264	1294	0.044	0.4	0.30	1.160	11.8	3.59	0.26	2.6	4.74	0.08	0.8	1.77	0.044	0.45	0.405
3/4/91	28	3.0	38	619	1300	0.029	0.5	0.31	1.430	23.3	3.84	0.28	4.6	4.80	0.07	1.1	1.78	0.015	0.24	0.410
3/18/91	14	1.5	24	195	1303	0.151	1.2	0.31	0.742	6.0	3.94	0.45	3.7	4.82	0.07	0.6	1.79	0.022	0.18	0.411
4/1/91	14	1.5	14	112	1304	0.019	0.2	0.32	0.496	4.0	3.97	0.28	2.2	4.84	0.06	0.5	1.79	0.015	0.12	0.412
4/15/91	14	10.4	216	12128	1347	0.112	6.3	0.34	0.283	15.9	4.04	<b>0.61</b>	34.1	4.97	0.59	33.1	1.91	0.025	1.40	0.418
4/29/91	14	18.0	182	17699	1451	0.100	9.7	0.39	0.112	10.9	4.14	0.43	41.8	5.24	0.24	23.3	2.11	0.018	1.75	0.429

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
5/7/91	8	14.3	138	10622	1508	0.031	2.4	0.42	0.088	6.8	4.17	0.95	73.1	5.47	0.23	17.7	2.19	0.030	2.31	0.437
5/13/91	6	15.4	120	9955	1539	0.006	0.5	0.42	0.046	3.8	4.19	0.77	63.9	5.67	0.22	18.3	2.25	0.043	3.57	0.446
5/21/91	8	8.0	63	2712	1564	0.044	1.9	0.43	0.082	3.5	4.20	0.14	6.0	5.81	0.10	4.3	2.29	0.018	0.77	0.454
6/10/91	20	24.3		0	1578	0.068	8.9	0.48	0.081	10.6	4.27	0.55	72.1	6.20	0.19	24.9	2.44	0.041	5.37	0.485
6/24/91	14		25	0	1578	<b>0.003</b>	0.0	0.51	0.060	0.0	4.31	0.18	0.0	6.46	0.09	0.0	2.52	0.033	0.00	0.504
7/8/91	14	8.6	54	2516	1586	0.008	0.4	0.51	0.119	5.5	4.33	0.58	27.0	6.55	0.17	7.9	2.55	0.030	1.40	0.509
Totals					1586			0.51			4.33			6.55			2.55			0.509

IR16S																				
6/25/90		1.7	92	826		0.017	0.2		0.044	0.4		0.72	6.5		0.20	1.8		0.054	0.48	
7/9/90	14	4.8	256	6606	26	0.040	1.0	0.00	0.150	3.9	0.01	0.88	22.7	0.10	0.33	8.5	0.04	0.050	1.29	0.006
7/23/90	14	2.6	410	5774	69	0.027	0.4	0.01	0.212	3.0	0.04	1.03	14.5	0.23	0.51	7.2	0.09	0.076	1.07	0.014
8/6/90	14	2.1	570	6364	112	0.043	0.5	0.01	0.247	2.8	0.06	1.78	19.9	0.35	0.68	7.6	0.14	0.106	1.18	0.022
8/20/90	14	2.8	404	6032	155	0.046	0.7	0.02	0.424	6.3	0.09	1.03	15.4	0.48	0.49	7.3	0.19	0.129	1.93	0.033
9/3/90	14	1.8	129	1275	181	0.076	0.8	0.02	0.342	3.4	0.12	0.52	5.1	0.55	0.19	1.9	0.23	0.100	0.99	0.043
9/17/90	14	1.2	54	355	186	0.054	0.4	0.03	0.286	1.9	0.14	0.53	3.5	0.58	0.17	1.1	0.24	0.069	0.45	0.048
10/1/90	14	2.1	112	1278	192	0.034	0.4	0.03	0.755	8.6	0.18	0.55	6.3	0.61	0.20	2.3	0.25	0.080	0.91	0.053
10/15/90	14	1.2	54	356	198	0.038	0.3	0.03	0.637	4.2	0.22	0.41	2.7	0.64	0.10	0.7	0.26	0.046	0.30	0.058
10/29/90	14	2.0	54	583	201	0.104	1.1	0.03	0.770	8.3	0.27	0.34	3.7	0.67	0.11	1.2	0.27	0.063	0.68	0.061
4/29/91		2.4	288	3741	201	0.087	1.1	0.03	0.139	1.8	0.27	0.46	6.0	0.67	0.36	4.7	0.27	0.069	0.90	0.061
5/7/91	8	1.9	358	3704	216	0.104	1.1	0.04	0.030	0.3	0.27	1.72	17.8	0.71	0.52	5.4	0.29	0.087	0.90	0.065
5/13/91	6	1.9	190	1944	225	<b>0.003</b>	0.0	0.04	0.027	0.3	0.27	1.18	12.1	0.76	0.32	3.3	0.30	0.052	0.53	0.067
5/21/91	8	2.9	452	7060	243	<b>0.078</b>	1.2	0.04	0.064	1.0	0.28	0.48	7.5	0.80	0.40	6.2	0.32	0.036	0.56	0.069
5/30/91	9	3.5	172	3283	266	0.133	2.5	0.05	0.036	0.7	0.28	0.61	11.6	0.84	0.24	4.6	0.34	0.031	0.59	0.071
6/10/91	11	5.8	167	5179	289	0.066	2.0	0.06	<b>0.003</b>	0.1	0.28	1.80	55.8	1.03	0.26	8.1	0.38	0.028	0.87	0.076
6/24/91	14	3.3	81	1424	312	<b>0.003</b>	0.0	0.07	0.017	0.3	0.28	0.19	3.3	1.23	0.17	3.0	0.42	0.071	1.25	0.083
7/8/91	14	1.6	174	1518	323	0.086	0.8	0.07	0.113	1.0	0.29	1.48	12.9	1.29	0.32	2.8	0.44	0.050	0.44	0.089
Totals					323			0.07			0.29			1.29			0.44			0.089

IR17S																				
6/25/90		0.52	144	405	0	<b>0.074</b>	0.2	0.000	<b>0.466</b>	1.3		0.76	2.1		0.22	0.62		0.018	0.05	
7/9/90	14	0.20	390	421	3	0.034	0.0	0.001	0.180	0.2	0.005	0.71	0.8	0.010	0.49	0.53	0.004	0.049	0.05	0.000
7/23/90	14	0.10	188	99	5	0.020	0.0	0.001	0.215	0.1	0.006	0.89	0.5	0.014	0.31	0.16	0.006	0.084	0.04	0.001
8/6/90	14	0.03	156	26	5	0.040	0.0	0.001	0.391	0.1	0.007	1.08	0.2	0.017	0.27	0.05	0.007	0.080	0.01	0.001

### Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
8/20/90	14	0.40	716	1545	11	0.059	0.1	0.002	0.661	1.4	0.012	1.29	2.8	0.027	0.78	1.68	0.013	0.125	0.27	0.002
9/3/90	14	0.57	92	285	17	0.088	0.3	0.003	0.334	1.0	0.021	0.61	1.9	0.043	0.15	0.46	0.021	0.062	0.19	0.004
9/17/90	14	0.38	62	126	18	0.062	0.1	0.004	0.234	0.5	0.026	0.50	1.0	0.054	0.12	0.24	0.023	0.031	0.06	0.004
10/1/90	14	0.32	52	89	19	0.087	0.1	0.005	0.780	1.3	0.032	0.37	0.6	0.059	0.13	0.22	0.025	0.062	0.11	0.005
10/15/90	14	0.29	30	47	20	0.040	0.1	0.006	0.675	1.1	0.041	0.37	0.6	0.064	0.09	0.14	0.026	0.049	0.08	0.006
10/29/90	14	0.50	28	76	20	0.100	0.3	0.007	0.813	2.2	0.052	0.20	0.5	0.068	0.07	0.19	0.027	0.082	0.22	0.007
4/29/91		0.86	458	2127	20	0.069	0.3	0.007	0.130	0.6	0.052	0.33	1.5	0.068	0.44	2.04	0.027	0.072	0.33	0.007
5/7/91	8	0.02	84	9	24	0.072	0.0	0.008	0.006	0.0	0.054	1.09	0.1	0.071	0.22	0.02	0.031	0.025	0.00	0.007
5/13/91	6	0.01	40	3	24	0.008	0.0	0.008	0.037	0.0	0.054	0.45	0.0	0.071	0.17	0.01	0.031	0.031	0.00	0.007
5/30/91	17	0.29	76	119	25	0.164	0.3	0.009	0.193	0.3	0.055	0.35	0.5	0.074	0.14	0.22	0.032	0.057	0.09	0.008
Totals					25			0.009			0.055			0.074			0.032			0.008

IR20S																				
Date	Days	Flow cfs	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
6/26/90		6.1	196	6449		0.122	4.0		<b>0.003</b>	0.1		0.75	24.7		0.22	7.2		0.010	0.33	
7/10/90	14	2.2	246	2972	33	0.018	0.2	0.01	0.113	1.4	0.01	0.69	8.3	0.12	0.27	3.3	0.04	0.034	0.41	0.003
7/24/90	14	7.3	582	22822	123	0.049	1.9	0.02	0.222	8.7	0.04	<b>0.65</b>	25.3	0.23	<b>0.49</b>	19.3	0.12	0.086	3.37	0.016
8/7/90	14	4.6	538	13406	250	0.054	1.3	0.03	0.237	5.9	0.09	1.11	27.7	0.42	0.77	19.2	0.25	0.054	1.35	0.032
8/21/90	14	10.4	276	15452	351	0.123	6.9	0.06	0.367	20.5	0.18	0.84	47.0	0.68	0.40	22.4	0.40	0.117	6.55	0.060
9/3/90	13	3.8	109	2258	409	0.106	2.2	0.09	0.314	6.5	0.27	0.42	8.7	0.86	0.16	3.3	0.48	0.063	1.30	0.086
9/18/90	15	12.8	130	8996	451	0.022	1.5	0.11	0.059	4.1	0.31	0.44	30.4	1.01	0.19	13.1	0.54	0.027	1.87	0.097
10/2/90	14	9.6	96	4971	500	0.031	1.6	0.12	0.554	28.7	0.43	0.38	19.7	1.18	0.19	9.8	0.62	0.079	4.09	0.118
10/16/90	14	11.3	82	4976	535	0.051	3.1	0.13	0.561	34.0	0.65	0.32	19.4	1.32	0.17	10.3	0.69	0.085	5.16	0.151
10/30/90	14	16.4	40	3543	564	0.032	2.8	0.15	0.749	66.3	1.00	0.14	12.4	1.43	0.11	9.7	0.76	0.120	10.63	0.206
4/30/91		1.2	120	803	564	0.172	1.2	0.15	0.018	0.1	1.00	0.36	2.4	1.43	0.26	1.7	0.76	0.066	0.44	0.206
5/9/91	9	11.8	550	35065	645	<b>0.003</b>	0.2	0.16	0.022	1.4	1.00	0.60	38.3	1.52	0.48	30.6	0.83	0.016	1.02	0.209
5/14/91	5	5.6	356	10772	702	0.019	0.6	0.16	0.038	1.1	1.00	0.31	9.4	1.58	0.40	12.1	0.89	0.019	0.57	0.211
5/23/91	9	1.9	182	1855	731	0.006	0.1	0.16	<b>0.003</b>	0.0	1.01	0.40	4.1	1.61	0.21	2.1	0.92	0.027	0.28	0.213
5/28/91	5	1.0	152	836	734	0.021	0.1	0.16	<b>0.003</b>	0.0	1.01	0.28	1.5	1.62	0.14	0.8	0.92	0.076	0.42	0.214
6/11/91	14	2.8	208	3164	748	0.117	1.8	0.17	0.078	1.2	1.01	0.60	9.1	1.66	0.26	4.0	0.94	0.053	0.81	0.218
6/25/91	14	0.5	2060	5000	777	0.019	0.0	0.17	0.021	0.1	1.02	0.60	1.5	1.69	1.89	4.6	0.97	0.080	0.19	0.222
7/9/91	14	0.5	760	1968	801	0.129	0.3	0.17	0.030	0.1	1.02	1.35	3.5	1.71	0.83	2.1	0.99	0.075	0.19	0.223
Totals					801			0.17			1.02			1.71			0.99			0.223

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IR21S</b>																				
6/26/90		39	208	43754		0.037	7.8		1.130	237.7		0.76	159.9	0.00	0.32	67.3	0.00	0.043	9.05	0.000
7/10/90	14	31	272	45480	312	0.041	6.9	0.05	1.700	284.2	1.83	0.89	148.8	1.08	0.37	61.9	0.45	0.056	9.36	0.064
7/24/90	14	31	1236	206665	1195	0.119	19.9	0.14	1.580	264.2	3.75	2.01	336.1	2.78	1.26	210.7	1.41	0.084	14.05	0.146
8/7/90	14	30	658	106472	2291	0.043	7.0	0.24	2.890	467.6	6.31	1.29	208.7	4.68	0.91	147.2	2.66	0.082	13.27	0.242
8/21/90	14	33	196	34887	2786	0.056	10.0	0.30	1.990	354.2	9.18	0.71	126.4	5.86	0.31	55.2	3.37	0.072	12.82	0.333
9/4/90	14	35	163	30771	3015	0.060	11.3	0.37	1.920	362.5	11.69	0.79	149.1	6.82	0.24	45.3	3.72	0.094	17.75	0.440
9/19/90	15	45	80	19417	3204	0.046	11.2	0.46	1.690	410.2	14.59	0.79	191.7	8.10	0.18	43.7	4.05	0.047	11.41	0.550
10/2/90	13	55	100	29665	3363	0.029	8.6	0.52	2.040	605.2	17.89	0.50	148.3	9.21	0.19	56.4	4.38	0.075	22.25	0.659
10/17/90	15	55	52	15426	3532	0.065	19.3	0.63	2.120	628.9	22.52	0.31	92.0	10.11	0.12	35.6	4.72	0.083	24.62	0.835
10/30/90	13	33	44	7832	3608	0.233	41.5	0.82	3.050	542.9	26.33	0.57	101.5	10.73	0.09	16.0	4.89	0.088	15.66	0.966
11/13/90	14	22	14	1661	3641	0.243	28.8	1.07	4.100	486.5	29.93	0.69	81.9	11.38	0.07	8.3	4.98	0.059	7.00	1.045
11/27/90	14	18	18	1748	3653	0.195	18.9	1.24	4.040	392.2	33.00	0.69	67.0	11.90	0.06	5.8	5.03	0.051	4.95	1.087
12/11/90	14	15	18	1456	3664	0.173	14.0	1.35	3.920	317.2	35.49	0.65	52.6	12.32	0.08	6.5	5.07	0.053	4.29	1.119
1/8/91	28	12	266	17217	3795	0.440	28.5	1.65	4.040	261.5	39.54	1.00	64.7	13.14	0.42	27.2	5.30	0.076	4.92	1.184
1/22/91	14	15	14	1133	3859	0.316	25.6	1.84	4.110	332.5	41.62	0.70	56.6	13.56	0.08	6.5	5.42	0.074	5.99	1.222
2/5/91	14	13	482	33797	3981	0.308	21.6	2.00	4.060	284.7	43.78	0.81	56.9	13.96	0.71	49.8	5.62	0.083	5.82	1.263
2/19/91	14	13	10	701	4102	0.462	32.4	2.19	4.190	293.8	45.80	0.70	49.1	14.33	0.09	6.3	5.81	0.078	5.47	1.303
3/5/91	14	16	16	1381	4109	0.283	24.4	2.39	4.810	415.1	48.28	0.55	47.5	14.67	0.07	6.0	5.86	0.090	7.77	1.349
3/19/91	14	16	20	1753	4120	0.423	37.1	2.61	3.960	347.1	50.95	1.00	87.6	15.14	0.13	11.4	5.92	0.105	9.20	1.408
4/2/91	14	7	25	944	4130	0.333	12.6	2.78	3.300	124.6	52.60	0.92	34.7	15.57	0.11	4.2	5.97	0.080	3.02	1.451
4/16/91	14	22	188	22308	4211	0.102	12.1	2.87	1.320	156.6	53.59	1.05	124.6	16.13	0.39	46.3	6.15	0.051	6.05	1.483
4/30/91	14	39	222	46699	4453	0.067	14.1	2.96	0.787	165.5	54.71	0.55	115.7	16.97	0.35	73.6	6.57	0.072	15.15	1.557
5/8/91	8	44	260	61704	4669	0.012	2.8	2.99	0.596	141.4	55.33	1.01	239.7	17.68	0.41	97.3	6.91	0.076	18.04	1.623
5/14/91	6	45	208	50485	4838	0.084	20.4	3.03	0.524	127.2	55.73	0.46	111.6	18.21	0.26	63.1	7.15	0.054	13.11	1.670
5/22/91	8	41	198	43786	5026	0.127	28.1	3.12	0.883	195.3	56.38	0.47	103.9	18.64	0.23	50.9	7.38	0.043	9.51	1.715
5/28/91	6	38	354	72556	5201	0.117	24.0	3.20	0.697	142.9	56.88	0.31	63.5	18.89	0.29	59.4	7.55	0.035	7.17	1.740
6/11/91	14	33	183	32573	5569	0.067	11.9	3.33	0.830	147.7	57.90	0.81	144.2	19.62	0.29	51.6	7.93	0.060	10.68	1.803
6/25/91	14	42	136	30809	5791	0.015	3.4	3.38	1.100	249.2	59.29	0.33	74.8	20.38	0.23	52.1	8.30	0.060	13.59	1.888
7/9/91	14	41	608	134389	6369	0.104	23.0	3.47	1.340	296.2	61.20	0.92	203.4	21.35	0.64	141.5	8.97	0.066	14.59	1.986
<b>Totals</b>					6369			3.47			61.20			21.35			8.97			1.986

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL -- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate			
		Flow cfs	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IR22S</b>																				
6/26/90		7.2	146	5630		0.032	1.2		0.565	21.8		0.91	35.1		0.22	8.5		0.046	1.77	
7/10/90	14	9.5	384	19573	88	0.049	2.5	0.01	0.708	36.1	0.20	1.18	60.1	0.33	0.51	26.0	0.12	0.064	3.26	0.018
7/24/90	14	7.5	608	24464	242	0.068	2.7	0.03	0.927	37.3	0.46	1.34	53.9	0.73	0.75	30.2	0.32	0.095	3.82	0.042
8/7/90	14	9.2	972	48338	497	0.064	3.2	0.05	1.320	65.6	0.82	1.64	81.6	1.21	1.07	53.2	0.61	0.099	4.92	0.073
8/21/90	14	9.8	394	20911	740	0.065	3.4	0.08	1.320	70.1	1.29	1.20	63.7	1.72	0.55	29.2	0.90	0.119	6.32	0.112
9/4/90	14	6.7	213	7674	840	0.129	4.6	0.10	1.450	52.2	1.72	0.78	28.1	2.04	0.31	11.2	1.04	0.111	4.00	0.148
10/3/90	29	14.2	90	6874	945	0.049	3.7	0.16	1.290	98.5	2.82	0.65	49.6	2.60	0.17	13.0	1.21	0.072	5.50	0.217
10/22/90	19	3.6	14	268	979	0.019	0.4	0.18	2.600	49.8	3.52	0.48	9.2	2.88	<b>0.03</b>	0.5	1.28	0.049	0.94	0.248
10/30/90	8	3.3	8	141	980	0.028	0.5	0.19	2.480	43.7	3.71	0.19	3.4	2.90	<b>0.03</b>	0.4	1.28	0.048	0.85	0.251
11/13/90	14	2.6	14	196	981	0.028	0.4	0.19	3.060	42.9	4.01	0.43	6.0	2.94	<b>0.03</b>	0.4	1.28	0.033	0.46	0.256
11/27/90	14	2.3	12	150	982	<b>0.003</b>	0.0	0.19	3.240	40.4	4.30	0.31	3.9	2.97	<b>0.03</b>	0.3	1.28	0.028	0.35	0.259
12/11/90	14	2.2	20	233	984	0.113	1.3	0.20	3.190	37.2	4.57	0.29	3.4	3.00	<b>0.03</b>	0.3	1.29	0.031	0.36	0.261
1/22/91	42	1.6	8	69	987	0.035	0.3	0.21	3.910	33.5	5.32	0.31	2.7	3.06	<b>0.03</b>	0.2	1.29	0.056	0.48	0.270
2/5/91	14	1.4	18	140	987	0.026	0.2	0.21	3.700	28.7	5.53	0.30	2.3	3.08	0.07	0.5	1.29	0.049	0.38	0.273
2/19/91	14	1.1	4	23	988	0.031	0.2	0.22	4.010	22.7	5.71	0.29	1.6	3.09	0.05	0.3	1.30	0.049	0.28	0.276
3/5/91	14	1.2	6	39	988	0.041	0.3	0.22	4.290	28.2	5.89	0.20	1.3	3.10	0.05	0.3	1.30	0.037	0.24	0.277
3/19/91	14	1.2	8	50	989	0.152	1.0	0.22	3.880	24.5	6.08	0.51	3.2	3.12	0.08	0.5	1.30	0.051	0.32	0.279
4/2/91	14	0.7	7	26	989	0.056	0.2	0.23	3.320	12.4	6.21	0.33	1.2	3.13	0.05	0.2	1.31	0.029	0.11	0.281
4/16/91	14	0.8	3	12	989	0.042	0.2	0.23	3.320	13.4	6.30	0.54	2.2	3.15	0.05	0.2	1.31	0.036	0.15	0.282
4/30/91	14	6.4	916	31422	1099	0.096	3.3	0.24	0.542	18.6	6.41	0.63	21.6	3.23	0.73	25.0	1.39	0.050	1.72	0.288
5/8/91	8	6.4	376	13020	1188	0.057	2.0	0.25	0.396	13.7	6.47	0.43	14.9	3.30	0.52	18.0	1.48	0.072	2.49	0.297
5/14/91	6	6.2	256	8575	1220	0.053	1.8	0.25	0.518	17.4	6.52	0.46	15.4	3.35	0.34	11.4	1.53	0.052	1.74	0.303
5/22/91	8	7.2	294	11402	1260	0.101	3.9	0.27	0.811	31.5	6.62	0.46	17.8	3.41	0.30	11.6	1.57	0.046	1.78	0.310
5/28/91	6	7.4	436	17355	1303	<b>0.003</b>	0.1	0.27	0.661	26.3	6.70	0.40	15.9	3.46	0.40	15.9	1.61	0.047	1.87	0.316
6/11/91	14	6.9	88	3280	1376	0.064	2.4	0.28	0.626	23.3	6.88	0.60	22.4	3.60	0.19	7.1	1.69	0.064	2.39	0.330
6/25/91	14	8.7	141	6647	1410	0.020	0.9	0.29	0.526	24.8	7.05	0.27	12.7	3.72	0.22	10.4	1.75	0.057	2.69	0.348
7/9/91	14	7.6	338	13801	1482	0.143	5.8	0.32	0.798	32.6	7.25	0.99	40.4	3.91	0.56	22.9	1.87	0.074	3.02	0.368
Totals								0.32			7.25			3.91			1.87			0.368
<b>IR23N</b>																				
7/24/90		3.4	28	509		0.051	0.9		0.356	6.5		0.29	5.3		0.17	3.1		<b>0.093</b>	1.69	
8/7/90	14	1.5	8	65	2	0.030	0.2	0.00	0.527	4.3	0.04	0.21	1.7	0.02	0.11	0.9	0.01	0.088	0.71	0.008
8/21/90	14	18.8	30	3049	13	0.079	8.0	0.03	0.446	45.3	0.21	0.52	52.8	0.22	0.16	16.3	0.07	0.136	13.82	0.059

### Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
9/4/90	14	17.5	24	2267	32	0.035	3.3	0.07	0.402	38.0	0.50	0.40	37.8	0.53	0.15	14.2	0.18	0.124	11.71	0.149
9/18/90	14	19.7	30	3194	51	0.021	2.2	0.09	0.033	3.5	0.65	0.50	53.2	0.85	0.15	16.0	0.29	0.063	6.71	0.213
10/2/90	14	11.0	18	1068	66	0.033	2.0	0.11	0.468	27.8	0.76	0.35	20.8	1.11	0.13	7.7	0.37	0.099	5.87	0.257
10/16/90	14	7.0	10	376	71	0.030	1.1	0.12	0.285	10.7	0.89	0.21	7.9	1.21	<b>0.03</b>	0.9	0.40	0.061	2.30	0.286
10/30/90	14	0.4	<b>1</b>	2	72	0.037	0.1	0.12	0.472	0.9	0.93	<b>0.03</b>	0.0	1.24	0.06	0.1	0.40	0.075	0.15	0.294
11/13/90	14	0.3	2	3	72	0.078	0.1	0.12	0.062	0.1	0.94	0.60	1.0	1.24	0.09	0.1	0.40	0.087	0.14	0.295
11/27/90	14	0.3	8	13	72	0.031	0.1	0.12	0.446	0.7	0.94	0.07	0.1	1.25	0.05	0.1	0.40	0.056	0.09	0.296
12/11/90	14	0.3	12	19	72	<b>0.058</b>	0.1	0.12	0.465	0.8	0.94	0.22	0.4	1.25	0.06	0.1	0.41	0.057	0.09	0.297
Totals					72			0.12			0.94			1.25			0.41			0.297

#### IR23NT

7/24/90		3.4	14	254	0	0.078	1.4	0.00	0.123	2.2		0.65	11.8		0.13	2.4		0.081	1.47	
8/7/90	14	0.0	22	0	1	0.850	0.0	0.00	<b>0.003</b>	0.0	0.01	0.72	0.0	0.04	0.18	0.0	0.01	0.112	0.00	0.005
8/21/90	14	18.8	28	2845	11	0.069	7.0	0.03	0.375	38.1	0.14	0.53	53.9	0.23	0.15	15.2	0.06	0.132	13.41	0.052
9/4/90	14	17.5	21	1983	28	0.195	18.4	0.12	0.360	34.0	0.39	0.41	38.7	0.55	0.14	13.2	0.16	0.112	10.58	0.136
9/18/90	14	19.7	48	5111	53	0.022	2.3	0.19	0.011	1.2	0.52	0.77	82.0	0.98	0.20	21.3	0.28	0.064	6.81	0.197
10/2/90	14	11.0	16	949	74	0.094	5.6	0.22	0.399	23.7	0.60	0.33	19.6	1.33	0.11	6.5	0.38	0.078	4.63	0.237
10/16/90	14	7.0	10	376	78	0.043	1.6	0.24	<b>0.276</b>	10.4	0.72	0.39	14.7	1.45	0.05	1.9	0.41	0.035	1.32	0.258
10/30/90	14	0.4	8	16	80	<b>0.100</b>	0.2	0.25	0.076	0.1	0.76	0.55	1.1	1.51	<b>0.03</b>	0.0	0.42	0.045	0.09	0.263
4/30/91		10.1	32	1749	80	0.120	6.5	0.25	<b>0.003</b>	0.1	0.76	0.35	19.0	1.51	0.23	12.5	0.42	0.071	3.86	0.263
5/6/91	6	7.5	60	2417	86	0.045	1.8	0.26	<b>0.003</b>	0.1	0.76	0.95	38.3	1.59	0.17	6.8	0.44	0.027	1.09	0.270
5/14/91	8	17.7	48	4590	100	0.277	26.5	0.32	0.021	2.0	0.76	0.77	73.6	1.82	0.23	22.0	0.50	0.075	7.17	0.287
5/20/91	6	16.4	44	3899	113	0.039	3.5	0.36	0.066	5.8	0.78	0.83	73.6	2.04	0.15	13.3	0.56	0.042	3.72	0.303
5/28/91	8	10.4	34	1915	124	0.026	1.5	0.37	0.016	0.9	0.79	0.25	14.1	2.21	0.08	4.5	0.59	0.051	2.87	0.316
6/11/91	14	2.4	10	130	132	0.100	1.3	0.38	0.039	0.5	0.79	0.64	8.3	2.29	0.11	1.4	0.61	0.060	0.78	0.329
6/25/91	14	12.0	21	1354	137	0.050	3.2	0.40	0.036	2.3	0.80	0.79	50.9	2.50	0.15	9.7	0.65	0.094	6.06	0.353
7/9/91	14	10.3	16	885	145	0.112	6.2	0.43	<b>0.003</b>	0.1	0.81	0.75	41.5	2.82	0.14	7.7	0.71	0.068	3.76	0.387
Totals					145			0.43			0.81			2.82			0.71			0.387

#### IR24S

6/26/90		7.3	3110	121615		0.041	1.6		0.859	33.6		2.32	90.7		2.65	103.6		0.027	1.06	
7/10/90	14	4.9	1340	35560	550	0.078	2.1	0.01	1.620	43.0	0.27	1.93	51.2	0.50	0.76	20.1	0.43	0.146	3.87	0.017
7/24/90	14	4.7	1430	35943	800	0.045	1.1	0.02	1.750	44.0	0.57	2.45	61.6	0.89	1.47	36.9	0.63	0.106	2.66	0.040
8/7/90	14	2.3	864	10812	964	0.058	0.7	0.03	1.320	16.5	0.78	1.73	21.6	1.18	0.82	10.3	0.80	0.088	1.10	0.053

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
8/21/90	14	5.0	386	10347	1038	0.051	1.4	0.04	2.800	75.1	1.10	0.89	23.9	1.34	0.52	13.9	0.88	0.129	3.46	0.069
9/4/90	14	9.2	183	9101	1106	0.104	5.2	0.06	1.860	92.5	1.69	0.75	37.3	1.56	0.28	13.9	0.98	0.081	4.03	0.095
9/19/90	15	9.4	144	7324	1168	0.028	1.4	0.09	1.890	96.1	2.40	0.82	41.7	1.85	0.23	11.7	1.08	0.045	2.29	0.119
10/3/90	14	10.2	130	7166	1218	0.034	1.9	0.10	2.700	148.8	3.26	0.62	34.2	2.12	0.22	12.1	1.16	0.091	5.02	0.145
10/17/90	14	10.0	66	3574	1256	0.104	5.6	0.12	2.480	134.3	4.25	0.29	15.7	2.29	0.11	6.0	1.22	0.081	4.39	0.178
10/30/90	13	2.0	10	109	1268	0.170	1.9	0.15	4.790	52.2	4.85	0.40	4.4	2.36	<b>0.03</b>	0.3	1.24	0.044	0.48	0.193
11/13/90	14	1.8	10	94	1269	0.011	0.1	0.15	6.280	59.3	5.24	0.48	4.5	2.39	<b>0.03</b>	0.2	1.25	0.036	0.34	0.196
11/27/90	14	1.3	8	57	1269	<b>0.003</b>	0.0	0.15	6.070	43.5	5.60	0.35	2.5	2.41	<b>0.03</b>	0.2	1.25	0.026	0.19	0.198
12/11/90	14	0.9	8	40	1270	0.127	0.6	0.16	6.060	30.4	5.86	0.38	1.9	2.43	<b>0.03</b>	0.1	1.25	0.033	0.17	0.199
1/8/91	28	0.7	24	84	1270	0.158	0.6	0.17	6.200	21.7	6.23	0.33	1.2	2.45	<b>0.03</b>	0.1	1.25	0.043	0.15	0.202
1/22/91	14	0.5	8	22	1271	0.040	0.1	0.17	6.420	17.3	6.36	0.23	0.6	2.46	<b>0.03</b>	0.1	1.25	0.050	0.13	0.203
2/5/91	14	0.6	10	32	1271	0.042	0.1	0.17	6.180	20.0	6.49	0.27	0.9	2.46	<b>0.03</b>	0.1	1.25	0.048	0.16	0.204
2/19/91	14	0.2	2	2	1271	0.030	0.0	0.17	6.310	7.1	6.59	0.28	0.3	2.47	<b>0.03</b>	0.0	1.25	0.042	0.05	0.204
3/5/91	14	0.6	2	6	1271	0.036	0.1	0.17	7.000	21.9	6.69	0.49	1.5	2.47	<b>0.03</b>	0.1	1.25	0.033	0.10	0.205
3/19/91	14	0.5	12	30	1271	0.292	0.7	0.17	6.060	15.4	6.82	0.27	0.7	2.48	0.07	0.2	1.25	0.032	0.08	0.206
4/2/91	14	1.0	27	147	1272	0.044	0.2	0.18	4.740	25.8	6.97	0.34	1.9	2.49	0.06	0.3	1.25	0.012	0.07	0.206
4/16/91	14	1.2	<b>1</b>	3	1272	<b>0.003</b>	0.0	0.18	4.720	31.1	7.16	0.87	5.7	2.52	<b>0.03</b>	0.2	1.26	0.018	0.12	0.207
4/30/91	14	8.7	492	23008	1353	0.150	7.0	0.20	0.587	27.5	7.37	0.41	19.2	2.60	0.56	26.2	1.35	0.105	4.91	0.224
5/8/91	8	7.1	580	22274	1444	<b>0.003</b>	0.1	0.22	0.425	16.3	7.46	1.94	74.5	2.79	0.74	28.4	1.46	0.074	2.84	0.240
5/14/91	6	8.3	514	22955	1511	0.082	3.7	0.22	0.286	12.8	7.50	0.31	13.8	2.92	0.67	29.9	1.54	0.063	2.81	0.248
5/22/91	8	8.1	452	19650	1597	0.240	10.4	0.25	0.709	30.8	7.59	0.31	13.5	2.98	0.43	18.7	1.64	0.083	3.61	0.261
5/28/91	6	8.0	608	26333	1666	<b>0.104</b>	4.5	0.27	0.470	20.4	7.66	0.46	19.9	3.03	0.52	22.5	1.70	0.041	1.78	0.269
6/11/91	14	12.0	750	48503	1927	0.051	3.3	0.30	0.433	28.0	7.83	1.83	118.3	3.51	0.84	54.3	1.97	0.060	3.88	0.289
6/25/91	14	5.5	269	7995	2125	0.101	3.0	0.32	0.849	25.2	8.02	0.49	14.6	3.98	0.30	8.9	2.19	0.052	1.55	0.308
7/9/91	14	6.4	480	16518	2211	0.151	5.2	0.35	0.887	30.5	8.21	1.18	40.6	4.17	0.57	19.6	2.29	<b>0.064</b>	2.20	0.321
Totals					2211			0.35			8.21			4.17			2.29			0.321

### IR29S

6/26/90		7.7	50	2085		0.039	1.6		1.860	77.5		0.61	25.4		0.16	6.7		0.087	3.63	
7/10/90	14	11.1	134	8030	35	0.033	2.0	0.01	1.850	110.9	0.66	0.79	47.3	0.25	0.19	11.4	0.06	0.060	3.60	0.025
7/24/90	14	8.9	150	7184	89	0.040	1.9	0.03	1.810	86.7	1.35	0.93	44.5	0.58	0.27	12.9	0.15	0.099	4.74	0.054
8/7/90	14	7.1	254	9741	148	0.058	2.2	0.04	2.220	85.1	1.95	0.86	33.0	0.85	0.32	12.3	0.24	0.083	3.18	0.082
8/21/90	14	12.7	186	12771	227	0.044	3.0	0.06	2.200	151.1	2.78	0.88	60.4	1.17	0.31	21.3	0.35	0.109	7.48	0.120
9/4/90	14	14.8	200	15955	327	0.013	1.0	0.07	2.130	169.9	3.90	0.74	59.0	1.59	0.30	23.9	0.51	0.113	9.01	0.177



## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL -- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C \* 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
9/18/90	14	9.7	88	4609	399	0.022	1.2	0.08	2.430	127.3	4.94	0.67	35.1	1.92	0.20	10.5	0.63	0.081	4.24	0.224
10/2/90	14	16.1	104	9037	447	0.283	24.6	0.17	2.720	236.3	6.22	0.69	60.0	2.25	0.16	13.9	0.72	0.092	7.99	0.267
10/17/90	15	12.3	122	8081	511	0.029	1.9	0.27	2.940	194.7	7.83	0.46	30.5	2.59	0.12	7.9	0.80	0.090	5.96	0.319
10/30/90	13	15.0	64	5185	554	0.144	11.7	0.31	2.500	202.5	9.12	0.64	51.8	2.86	0.09	7.3	0.85	0.098	7.94	0.364
11/13/90	14	15.7	22	1864	579	0.045	3.8	0.37	3.890	329.6	10.99	0.63	53.4	3.23	0.12	10.2	0.91	0.091	7.71	0.419
11/27/90	14	17.1	52	4799	602	<b>0.003</b>	0.2	0.38	4.020	371.0	13.44	0.63	58.1	3.62	0.11	10.2	0.98	0.083	7.66	0.473
12/11/90	14	16.5	30	2676	628	0.219	19.5	0.45	3.920	349.7	15.96	0.60	53.5	4.01	0.12	10.7	1.05	0.107	9.55	0.533
1/8/91	28	12.3	86	5682	687	0.137	9.1	0.65	4.100	270.9	20.30	0.92	60.8	4.81	0.20	13.2	1.22	0.110	7.27	0.650
1/22/91	14	14.3	48	3713	720	0.292	22.6	0.76	4.140	320.2	22.37	0.92	71.2	5.27	0.11	8.5	1.30	0.128	9.90	0.711
2/5/91	14	11.8	78	4952	750	0.222	14.1	0.89	4.020	255.2	24.39	0.88	55.9	5.72	0.19	12.1	1.37	0.142	9.01	0.777
2/19/91	14	11.8	22	1395	772	0.098	6.2	0.96	4.170	264.5	26.21	1.01	64.1	6.14	0.21	13.3	1.46	<b>0.103</b>	6.53	0.831
3/5/91	14	10.0	52	2805	787	<b>0.102</b>	5.5	1.00	5.080	274.0	28.09	0.80	43.1	6.51	0.15	8.1	1.53	0.124	6.69	0.877
3/19/91	14	9.4	38	1918	804	0.236	11.9	1.06	4.080	206.0	29.77	0.77	38.9	6.80	0.20	10.1	1.60	0.144	7.27	0.926
4/16/91	28	4.8	20	512	821	0.036	0.9	1.15	3.140	80.4	31.78	0.56	14.3	7.17	0.16	4.1	1.70	0.113	2.90	0.997
4/30/91	14	10.0	114	6155	844	0.141	7.6	1.18	1.340	72.3	32.31	0.32	17.3	7.28	0.22	11.9	1.75	0.098	5.29	1.026
5/9/91	9	11.0	386	22943	909	0.025	1.5	1.20	1.200	71.3	32.63	0.42	25.0	7.38	0.46	27.3	1.84	0.097	5.77	1.051
5/14/91	5	10.9	124	7297	947	0.023	1.4	1.21	1.090	64.1	32.80	1.37	80.6	7.51	0.23	13.5	1.89	0.083	4.88	1.064
5/20/91	6	13.3	336	24085	994	0.092	6.6	1.22	0.988	70.8	33.01	1.91	136.9	7.84	0.54	38.7	1.97	0.089	6.38	1.081
5/28/91	8	11.8	186	11838	1066	0.105	6.7	1.25	1.020	64.9	33.28	0.42	26.7	8.16	0.26	16.5	2.08	0.062	3.95	1.102
6/11/91	14	10.7	81	4653	1124	0.058	3.3	1.28	1.440	82.7	33.79	0.94	54.0	8.45	0.19	10.9	2.18	0.075	4.31	1.131
6/25/91	14	8.5	113	5193	1158	0.014	0.6	1.30	1.360	62.5	34.30	0.28	12.9	8.68	0.19	8.7	2.25	<b>0.103</b>	4.73	1.162
7/9/91	14	7.2	82	3189	1188	0.021	0.8	1.30	1.910	74.3	34.78	0.86	33.4	8.84	0.22	8.6	2.31	0.134	5.21	1.197
Totals					1188			1.30			34.78			8.84			2.31			1.197

IR30N																				
6/26/90		4.4	40	939		0.037	0.9		0.011	0.3		0.80	18.8		0.11	2.58		0.029	0.68	
7/10/90	14	2.6	28	399	5	0.069	1.0	0.01	0.079	1.1	0.00	0.56	8.0	0.09	0.10	1.42	0.01	0.079	1.12	0.006
7/24/90	14	11.8	34	2157	14	0.029	1.8	0.02	0.110	7.0	0.03	0.51	32.3	0.23	0.12	7.61	0.05	0.076	4.82	0.027
8/7/90	14	7.4	14	558	23	0.055	2.2	0.03	0.012	0.5	0.06	0.56	22.3	0.43	0.12	4.78	0.09	0.093	3.71	0.057
8/21/90	14	16.7	28	2521	34	0.054	4.9	0.06	0.324	29.2	0.16	0.55	49.5	0.68	0.17	15.30	0.16	0.117	10.53	0.107
9/4/90	14	9.6	19	984	46	0.089	4.6	0.09	0.279	14.4	0.32	0.41	21.2	0.93	0.12	6.21	0.23	0.082	4.25	0.159
9/18/90	14	12.8	20	1381	54	0.022	1.5	0.11	<b>0.003</b>	0.2	0.37	0.59	40.7	1.14	0.12	8.28	0.29	0.040	2.76	0.183
10/2/90	14	4.1	8	177	60	0.021	0.5	0.12	0.239	5.3	0.39	0.31	6.9	1.31	0.09	1.99	0.32	0.067	1.48	0.198
10/16/90	14	7.7	4	166	61	0.030	1.2	0.12	0.124	5.1	0.42	0.18	7.5	1.36	<b>0.03</b>	1.04	0.33	0.025	1.04	0.207

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
4/30/91		11.4	74	4530	61	0.109	6.7	0.12	<b>0.003</b>	0.2	0.42	0.46	28.2	1.36	0.15	9.18	0.33	0.028	1.71	0.207
5/8/91	8	9.6	112	5800	82	0.024	1.2	0.14	<b>0.003</b>	0.1	0.42	0.39	20.2	1.46	0.20	10.36	0.37	0.013	0.67	0.212
5/14/91	6	12.9	84	5834	99	0.055	3.8	0.15	0.020	1.4	0.43	0.31	21.5	1.52	0.14	9.72	0.40	0.028	1.94	0.215
5/20/91	6	14.5	82	6404	118	0.035	2.7	0.16	0.029	2.3	0.43	0.87	67.9	1.65	0.19	14.84	0.44	0.025	1.95	0.221
5/28/91	8	8.3	74	3310	137	<b>0.003</b>	0.1	0.16	<b>0.003</b>	0.1	0.44	0.22	9.8	1.81	0.11	4.92	0.48	0.067	3.00	0.231
6/11/91	14	10.8	23	1341	153	0.114	6.6	0.19	0.012	0.7	0.44	0.75	43.7	2.00	0.10	5.83	0.52	0.050	2.92	0.252
6/25/91	14	0.0	13	2	158	0.043	0.0	0.21	0.016	0.0	0.44	0.47	0.1	2.15	0.13	0.02	0.54	0.060	0.01	0.262
Totals					158			0.21			0.44			2.15			0.54			0.262

IR35S																				
6/27/90		4.0	14	302		0.034	0.7		1.920	41.4		0.62	13.4		0.09	1.9		0.085	1.83	
7/11/90	14	4.0	20	431	3	0.069	1.5	0.01	1.970	42.5	0.29	0.57	12.3	0.09	0.08	1.7	0.01	0.072	1.55	0.012
7/25/90	14	4.0	16	345	5	0.033	0.7	0.02	2.180	47.0	0.61	0.58	12.5	0.18	0.08	1.7	0.02	0.099	2.14	0.025
8/8/90	14	3.3	14	251	7	0.087	1.6	0.02	2.180	39.2	0.91	1.13	20.3	0.29	0.09	1.6	0.04	0.080	1.44	0.037
8/22/90	14	4.5	4	97	9	0.059	1.4	0.03	2.070	50.2	1.22	0.57	13.8	0.41	0.06	1.5	0.05	0.083	2.01	0.049
9/5/90	14	4.0	6	129	9	0.014	0.3	0.04	2.090	45.1	1.56	0.53	11.4	0.50	0.06	1.3	0.06	0.074	1.60	0.062
9/18/90	13	3.8	24	492	11	0.029	0.6	0.04	1.620	33.2	1.81	0.38	7.8	0.56	0.09	1.8	0.07	0.075	1.54	0.072
10/3/90	15	10.6	14	800	16	0.017	1.0	0.05	2.590	148.1	2.49	0.49	28.0	0.70	<b>0.03</b>	1.4	0.08	0.023	1.31	0.083
10/16/90	13	10.6	8	457	20	0.031	1.8	0.06	2.400	137.2	3.42	0.91	52.0	0.96	0.11	6.3	0.10	0.089	5.09	0.104
10/31/90	15	9.9	12	641	24	0.042	2.2	0.07	2.950	157.5	4.52	0.70	37.4	1.29	0.06	3.2	0.14	0.077	4.11	0.138
11/14/90	14	10.2	12	660	29	0.090	5.0	0.10	3.490	192.0	5.75	0.53	29.2	1.52	0.06	3.3	0.16	0.063	3.47	0.165
11/28/90	14	4.7	16	406	33	0.032	0.8	0.12	3.460	87.7	6.72	0.51	12.9	1.67	0.05	1.3	0.18	0.051	1.29	0.181
1/9/91	42	4.7	78	1977	58	0.026	0.7	0.13	4.380	111.0	8.81	1.13	28.6	2.11	0.21	5.3	0.25	0.064	1.62	0.212
1/23/91	14	4.1	28	619	67	0.066	1.5	0.14	4.580	101.3	9.55	0.48	10.6	2.25	0.05	1.1	0.27	0.066	1.46	0.223
2/6/91	14	4.4	18	427	71	0.087	2.1	0.15	4.240	100.6	10.26	0.61	14.5	2.33	0.08	1.9	0.28	0.064	1.52	0.233
2/20/91	14	4.6	18	447	74	0.090	2.2	0.17	4.280	106.2	10.98	0.53	13.1	2.43	0.07	1.7	0.29	0.068	1.69	0.244
3/6/91	14	3.5	20	378	76	<b>0.065</b>	1.2	0.18	3.520	66.5	11.59	0.31	5.9	2.50	<b>0.03</b>	0.5	0.30	0.043	0.81	0.253
3/20/91	14	3.5	18	340	79	0.115	2.2	0.19	4.000	75.5	12.09	0.76	14.3	2.57	0.06	1.1	0.31	0.038	0.72	0.259
4/3/91	14	4.0	17	367	81	0.040	0.9	0.20	3.420	73.8	12.61	0.77	16.6	2.68	0.06	1.3	0.32	0.022	0.47	0.263
4/17/91	14	3.8	198	4058	97	0.090	1.8	0.21	2.640	54.1	13.06	1.00	20.5	2.81	0.38	7.8	0.35	0.101	2.07	0.272
5/1/91	14	4.6	78	1935	118	0.049	1.2	0.22	2.120	52.6	13.43	0.61	15.1	2.93	0.22	5.5	0.39	0.099	2.46	0.287
5/6/91	5	4.4	172	4082	125	0.064	1.5	0.23	2.000	47.5	13.55	1.51	35.8	2.99	0.23	5.5	0.41	0.064	1.52	0.292
5/15/91	9	4.9	84	2220	140	0.026	0.7	0.23	2.200	58.1	13.79	0.41	10.8	3.10	0.15	4.0	0.43	0.126	3.33	0.303

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
5/20/91	5	<i>4.4</i>	48	1139	144	0.155	3.7	0.24	1.940	46.0	13.92	0.69	16.4	3.13	0.13	3.1	0.44	0.040	0.95	0.309
5/29/91	9	<i>4.4</i>	47	1115	149	0.035	0.8	0.25	1.930	45.8	14.13	0.46	10.9	3.19	0.10	2.4	0.45	0.049	1.16	0.313
6/12/91	14	<i>3.1</i>	25	418	154	0.056	0.9	0.25	1.810	30.3	14.40	0.65	10.9	3.27	0.16	2.7	0.47	0.117	1.96	0.324
6/26/91	14	<i>3.2</i>	10	173	156	0.155	2.7	0.27	2.420	41.8	14.65	0.43	7.4	3.33	0.10	1.7	0.48	0.060	1.04	0.335
7/10/91	14	<i>4.4</i>	11	261	158	0.048	1.1	0.28	2.260	53.6	14.98	0.69	16.4	3.42	0.17	4.0	0.50	0.100	2.37	0.347
Totals					158			0.28			14.98			3.42			0.50			0.347

IR36N																				
6/27/90		2.7	<i>7</i>	15		0.034	0.5		0.023	0.3		0.64	9.3		0.10	1.5		0.075	1.09	
7/11/90	14	2.1	6	69	0	0.131	1.5	0.01	0.048	0.6	0.00	0.64	7.4	0.06	0.10	1.1	0.01	0.090	1.03	0.007
7/25/90	14	2.4	14	177	1	0.058	0.7	0.01	0.143	1.8	0.01	0.57	7.2	0.11	0.13	1.6	0.02	0.126	1.60	0.017
8/8/90	14	2.7	8	116	2	0.061	0.9	0.02	<i>0.003</i>	0.0	0.02	0.66	9.6	0.17	0.14	2.0	0.03	0.111	1.61	0.028
8/22/90	14	2.7	2	29	3	0.140	2.0	0.03	0.333	4.8	0.03	0.63	9.1	0.23	0.22	3.2	0.05	0.218	3.16	0.045
9/5/90	14	4.5	7	168	3	0.026	0.6	0.04	0.495	11.9	0.09	0.44	10.6	0.30	0.19	4.6	0.08	0.160	3.84	0.069
9/19/90	14	3.3	6	106	4	0.025	0.4	0.04	0.126	2.2	0.14	0.70	12.4	0.38	0.18	3.2	0.10	0.107	1.90	0.089
10/2/90	13	3.4	6	110	5	0.162	3.0	0.05	0.695	12.8	0.19	0.36	6.6	0.44	0.17	3.1	0.12	0.151	2.78	0.104
10/17/90	15	1.4	14	108	6	0.119	0.9	0.07	0.733	5.7	0.26	0.33	2.5	0.48	<i>0.17</i>	1.3	0.14	<i>0.114</i>	0.88	0.118
5/1/91		2.8	34	515	6	0.177	2.7	0.07	<i>0.003</i>	0.0	0.26	0.68	10.3	0.48	0.21	3.2	0.14	0.072	1.09	0.118
5/6/91	5	2.5	26	346	7	0.034	0.5	0.07	<i>0.003</i>	0.0	0.26	1.47	19.6	0.52	0.19	2.5	0.15	0.052	0.69	0.120
5/15/91	9	2.8	28	424	9	0.020	0.3	0.08	0.026	0.4	0.26	0.46	7.0	0.58	0.15	2.3	0.16	0.075	1.14	0.124
5/20/91	5	1.9	19	197	9	0.051	0.5	0.08	0.020	0.2	0.26	0.45	4.7	0.59	0.12	1.2	0.16	0.055	0.57	0.127
5/29/91	9	3.0	11	180	10	0.087	1.4	0.08	0.005	0.1	0.26	0.62	10.2	0.62	0.11	1.8	0.17	0.048	0.79	0.130
6/12/91	14	1.7	5	47	11	0.062	0.6	0.09	0.071	0.7	0.27	0.38	3.5	0.67	0.17	1.6	0.18	0.132	1.23	0.137
6/26/91	14	2.6	10	139	12	0.009	0.1	0.09	0.039	0.5	0.27	0.43	6.0	0.71	0.16	2.2	0.20	0.078	1.08	0.145
7/10/91	14	2.4	5	63	12	0.104	1.3	0.10	0.008	0.1	0.27	0.59	7.5	0.75	0.17	2.2	0.21	0.113	1.43	0.154
Totals					12			0.10			0.27			0.75			0.21			0.154

IR39N																				
6/27/90		43.1	56	13018		0.044	10.2		0.037	8.6		0.79	183.7		0.19	44.2		0.066	15.34	
7/11/90	14	61.0	48	15780	101	0.054	17.8	0.10	0.047	15.5	0.08	0.64	210.4	1.38	0.11	36.2	0.28	0.053	17.42	0.115
7/25/90	14	46.7	38	9561	189	0.028	7.0	0.18	0.121	30.4	0.24	0.55	138.4	2.60	0.14	35.2	0.53	0.131	32.96	0.291
8/8/90	14	29.6	24	3832	236	0.047	7.5	0.24	0.068	10.9	0.39	0.56	89.4	3.40	0.13	20.8	0.73	0.098	15.65	0.461
8/22/90	14	34.8	18	3375	262	0.050	9.4	0.29	0.399	74.8	0.69	0.52	97.5	4.05	0.13	24.4	0.88	0.117	21.94	0.593
9/5/90	14	50.9	17	4663	290	0.158	43.3	0.48	0.367	100.7	1.30	0.56	153.6	4.93	0.15	41.1	1.11	0.124	34.01	0.789

## Middle Snake River Water Quality Survey Loading Computations

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*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.3171\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
9/19/90	14	46.5	18	4514	322	0.025	6.3	0.65	0.029	7.3	1.68	0.65	163.0	6.04	0.13	32.6	1.37	0.066	16.55	0.965
10/3/90	14	84.5	22	10021	373	0.035	15.9	0.73	0.472	215.0	2.46	0.37	168.5	7.20	0.14	63.8	1.71	0.102	46.46	1.186
10/17/90	14	37.9	14	2862	418	0.051	10.4	0.82	0.444	90.8	3.53	0.17	34.8	7.91	0.17	34.8	2.05	0.156	31.89	1.460
10/31/90	14	5.5	6	177	428	0.061	1.8	0.87	0.223	6.6	3.87	0.50	14.8	8.08	0.29	8.6	2.21	0.095	2.80	1.582
4/17/91		50.8	241	66021	428	0.224	61.4	0.87	0.120	32.9	3.87	3.31	906.8	8.08	1.70	465.7	2.21	0.460	####	1.582
5/1/91	14	84.8	86	39326	797	0.152	69.5	1.32	<b>0.003</b>	1.1	3.99	0.82	375.0	12.57	0.20	91.5	4.16	0.075	34.30	2.143
5/9/91	8	93.4	62	31241	938	<b>0.003</b>	1.3	1.47	0.013	6.6	4.00	1.12	564.3	14.45	0.25	126.0	4.59	0.061	30.74	2.273
5/15/91	6	99.5	44	23604	1021	0.040	21.5	1.50	0.074	39.7	4.07	0.36	193.1	15.58	0.14	75.1	4.89	0.061	32.72	2.368
5/23/91	8	73.2	40	15788	1099	0.076	30.0	1.60	<b>0.003</b>	1.0	4.16	0.28	110.5	16.19	0.13	51.3	5.15	0.074	29.21	2.492
5/30/91	7	69.7	29	10901	1146	0.031	11.7	1.68	0.010	3.8	4.16	0.27	101.5	16.56	0.11	41.3	5.31	0.051	19.17	2.577
6/12/91	13	35.0	24	4532	1196	0.081	15.3	1.76	0.106	20.0	4.24	0.57	107.6	17.24	0.19	35.9	5.56	0.121	22.85	2.713
6/26/91	14	44.9	20	4848	1229	0.018	4.4	1.83	0.088	21.3	4.39	0.38	92.1	17.94	0.17	41.2	5.83	0.089	21.57	2.869
7/10/91	14	15.4	17	1411	1251	0.056	4.6	1.86	0.010	0.8	4.46	0.74	61.4	18.48	0.17	14.1	6.02	0.106	8.80	2.975
Totals					1251			1.86			4.46			18.48			6.02			2.975

IR42N																				
6/27/90		1.5	<b>1</b>	8		0.030	0.2		0.048	0.4		0.59	4.8		0.08	0.6		0.035	0.28	
7/11/90	14	1.3	10	72	0	0.200	1.4	0.01	<b>0.003</b>	0.0	0.00	0.56	4.0	0.03	0.07	0.5	0.00	0.046	0.33	0.002
7/25/90	14	3.6	18	346	2	0.020	0.4	0.01	<b>0.003</b>	0.0	0.00	0.40	7.7	0.07	0.10	1.9	0.01	0.091	1.75	0.009
8/8/90	14	6.9	24	897	6	0.052	1.9	0.02	<b>0.003</b>	0.1	0.00	0.14	5.2	0.12	0.14	5.2	0.04	0.098	3.66	0.028
8/22/90	14	10.4	8	448	11	0.053	3.0	0.04	0.221	12.4	0.05	0.52	29.1	0.24	0.10	5.6	0.08	0.091	5.10	0.059
9/5/90	14	23.3	44	5527	32	0.102	12.8	0.09	0.356	44.7	0.25	0.59	74.1	0.60	0.13	16.3	0.15	0.103	12.94	0.122
9/19/90	14	16.8	10	906	54	0.015	1.4	0.14	<b>0.003</b>	0.2	0.40	0.50	45.3	1.02	0.06	5.4	0.23	0.022	1.99	0.174
10/3/90	14	39.0	32	6738	81	0.055	11.6	0.19	0.500	105.3	0.77	0.44	92.7	1.50	0.12	25.3	0.34	0.063	13.27	0.228
10/17/90	14	8.4	6	273	106	0.072	3.3	0.24	0.082	3.7	1.15	0.36	16.4	1.88	<b>0.03</b>	1.1	0.43	0.018	0.82	0.277
4/17/91		29.5	156	24797	106	0.106	16.8	0.24	0.019	3.0	1.15	<b>0.49</b>	78.0	1.88	<b>0.14</b>	22.6	0.43	<b>0.003</b>	0.40	0.277
5/1/91	14	15.5	134	11203	232	0.097	8.1	0.33	<b>0.003</b>	0.2	1.17	0.36	30.1	2.26	0.19	15.9	0.56	0.069	5.77	0.299
5/8/91	7	28.6	50	7702	265	<b>0.003</b>	0.4	0.34	<b>0.003</b>	0.4	1.17	0.33	50.8	2.40	0.13	20.0	0.63	0.024	3.70	0.315
5/15/91	7	28.4	30	4595	286	0.062	9.5	0.36	0.038	5.8	1.18	0.33	50.5	2.58	0.12	18.4	0.69	0.081	12.41	0.343
5/22/91	7	31.6	390	66388	410	0.102	17.4	0.41	<b>0.003</b>	0.4	1.19	0.36	61.3	2.77	0.34	57.9	0.83	0.041	6.98	0.377
5/30/91	8	<b>31.5</b>	89	15121	573	<b>0.064</b>	10.9	0.46	<b>0.003</b>	0.4	1.19	0.55	93.4	3.08	0.10	17.0	0.98	0.037	6.29	0.404
6/12/91	13	31.9	49	8418	650	0.042	7.2	0.52	0.017	2.9	1.20	0.50	85.9	3.67	0.14	24.1	1.11	0.045	7.73	0.449
6/26/91	14	20.9	38	4278	694	<b>0.003</b>	0.3	0.55	<b>0.003</b>	0.3	1.21	0.30	33.8	4.09	0.10	11.3	1.23	<b>0.003</b>	0.28	0.478

### Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.3171\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
7/10/91	14	11.3	12	733	712	0.045	2.7	0.56	<b><i>0.003</i></b>	0.2	1.21	0.49	29.9	4.31	0.07	4.3	1.29	0.016	0.98	0.482
Totals					712			0.56			1.21			4.31			1.29			0.482

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX H

Concurrent Monitoring  
Aquacultural Facility Nutrient Loadings

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C \quad 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>FH14N</b>																				
6/25/90		0.06	50	17		35.1	12.1		0.026	0.009		41.1	14.2		5.85	2.0		0.684	0.24	
7/2/90	7	0.19	46	46	0.11	27.2	27.3	0.07	0.008	0.008	0.000	43.2	43.3	0.10	5.13	5.1	0.013	5.150	5.17	0.009
7/9/90	7	0.09	50	24	0.23	33.9	16.1	0.14	0.011	0.005	0.000	47.1	22.4	0.22	6.68	3.2	0.027	6.960	3.30	0.024
7/16/90	7	0.09	42	20	0.31	31.7	15.0	0.20	<i>0.003</i>	0.001	0.000	44.1	20.9	0.29	6.05	2.9	0.038	6.850	3.25	0.036
7/23/90	7	0.08	60	26	0.39	42.0	18.1	0.26	<i>0.003</i>	0.001	0.000	50.6	21.8	0.37	8.74	3.8	0.049	<i>3.919</i>	1.69	0.044
7/30/90	7	0.08	38	16	0.46	44.1	19.0	0.32	<i>0.003</i>	0.001	0.000	40.6	17.5	0.44	6.68	2.9	0.061	5.420	2.34	0.051
8/6/90	7	0.08	70	30	0.55	42.5	18.3	0.39	0.006	0.003	0.000	36.3	15.7	0.49	6.04	2.6	0.071	5.180	2.24	0.059
8/13/90	7	0.07	56	22	0.64	16.8	6.5	0.43	<i>0.003</i>	0.001	0.000	26.2	10.2	0.54	6.56	2.5	0.080	6.700	2.60	0.068
8/20/90	7	0.01	56	4	0.68	13.8	1.0	0.44	0.013	0.001	0.000	40.2	2.8	0.56	5.49	0.4	0.085	5.220	0.37	0.073
8/27/90	7	0.03	100	14	0.71	24.9	3.5	0.45	<i>0.003</i>	0.000	0.000	35.9	5.0	0.57	6.06	0.8	0.087	5.360	0.75	0.075
9/4/90	8	0.07	106	37	0.82	23.4	8.2	0.48	<i>0.003</i>	0.001	0.000	30.6	10.7	0.61	5.14	1.8	0.092	5.360	1.88	0.080
9/10/90	6	0.07	98	38	0.93	27.8	10.8	0.50	<i>0.003</i>	0.001	0.000	55.9	21.7	0.66	6.33	2.5	0.099	5.460	2.12	0.086
9/17/90	7	0.10	80	41	1.07	21.5	11.1	0.54	<i>0.003</i>	0.001	0.000	51.9	26.9	0.74	8.02	4.2	0.110	6.140	3.18	0.096
9/24/90	7	0.05	94	23	1.18	44.3	11.0	0.58	0.015	0.004	0.000	48.0	11.9	0.81	7.37	1.8	0.121	5.560	1.38	0.104
10/1/90	7	0.07	102	40	1.29	35.8	13.9	0.62	<i>0.003</i>	0.001	0.000	45.0	17.5	0.86	7.89	3.1	0.129	6.450	2.50	0.110
10/8/90	7	0.05	92	23	1.40	43.6	10.8	0.67	<i>0.003</i>	0.001	0.000	47.5	11.8	0.91	6.20	1.5	0.137	5.210	1.29	0.117
10/15/90	7	0.07	106	41	1.51	46.8	18.2	0.72	0.007	0.003	0.000	49.4	19.2	0.96	7.59	2.9	0.145	6.390	2.48	0.124
10/29/90	14	0.02	72	9	1.69	38.7	4.8	0.80	0.018	0.002	0.000	35.8	4.4	1.05	3.42	0.4	0.157	3.400	0.42	0.134
11/5/90	7	0.05	90	22	1.74	30.2	7.5	0.82	0.021	0.005	0.000	37.3	9.3	1.07	5.14	1.3	0.160	4.600	1.14	0.137
11/19/90	14	0.08	48	21	1.89	29.4	12.7	0.89	<i>0.003</i>	0.001	0.000	42.5	18.3	1.17	4.85	2.1	0.172	3.840	1.66	0.146
11/26/90	7	0.11	42	24	1.97	18.4	10.5	0.93	0.006	0.003	0.000	32.2	18.4	1.23	5.00	2.9	0.180	3.300	1.89	0.153
12/3/90	7	0.10	48	25	2.06	11.6	6.0	0.96	0.040	0.021	0.000	17.4	9.0	1.28	2.97	1.5	0.188	1.670	0.86	0.157
12/10/90	7	0.05	80	20	2.13	1.3	0.3	0.97	0.334	0.083	0.000	28.1	7.0	1.31	4.00	1.0	0.192	1.740	0.43	0.160
12/17/90	7	0.13	64	43	2.24	9.8	6.6	0.98	0.287	0.193	0.001	23.6	15.9	1.35	3.13	2.1	0.198	1.180	0.80	0.162
1/7/91	21	0.11	42	24	2.60	5.0	2.9	1.03	0.602	0.344	0.004	11.0	6.3	1.46	1.83	1.0	0.214	0.810	0.46	0.168
1/14/91	7	0.14	84	62	2.75	12.6	9.2	1.06	0.021	0.015	0.004	29.2	21.4	1.51	3.80	2.8	0.221	2.260	1.66	0.172
1/21/91	7	0.05	80	20	2.89	14.1	3.5	1.08	0.027	0.007	0.004	23.3	5.8	1.56	2.27	0.6	0.227	2.370	0.59	0.176
1/28/91	7	0.13	40	27	2.97	9.1	6.2	1.09	0.388	0.264	0.005	14.6	9.9	1.59	2.66	1.8	0.231	1.840	1.25	0.179
2/4/91	7	0.13	76	52	3.11	10.9	7.4	1.12	0.030	0.020	0.005	22.8	15.5	1.63	3.78	2.6	0.239	1.630	1.11	0.183
2/11/91	7	0.13	28	19	3.23	9.7	6.6	1.14	0.017	0.012	0.005	28.4	19.3	1.69	4.45	3.0	0.249	2.120	1.44	0.188
2/25/91	14	0.09	52	25	3.39	14.9	7.1	1.19	0.040	0.019	0.006	23.0	10.9	1.80	3.00	1.4	0.264	2.080	0.99	0.196
3/4/91	7	0.12	40	25	3.47	10.6	6.6	1.21	0.017	0.011	0.006	20.7	13.0	1.84	3.24	2.0	0.270	2.200	1.38	0.200
3/11/91	7	0.15	62	49	3.60	15.4	12.3	1.25	<i>0.171</i>	0.137	0.006	21.9	17.5	1.89	3.10	2.5	0.278	1.680	1.34	0.205

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb}/\text{kg} * 28.317\text{l}/\text{cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
3/18/91	7	0.13	50	34	3.75	9.9	6.7	1.28	0.124	0.084	0.006	19.3	13.1	1.95	2.83	1.9	0.286	1.520	1.03	0.209
3/25/91	7	0.12	52	33	3.87	11.4	7.1	1.31	0.237	0.148	0.007	23.5	14.7	2.00	3.14	2.0	0.293	1.120	0.70	0.212
4/1/91	7	0.15	72	57	4.02	13.9	11.1	1.34	0.110	0.088	0.007	31.8	25.4	2.07	1.78	1.4	0.298	1.600	1.28	0.216
4/8/91	7	0.15	76	61	4.23	13.1	10.5	1.37	0.080	0.064	0.007	25.8	20.6	2.15	6.25	5.0	0.310	2.400	1.92	0.221
4/15/91	7	0.13	44	30	4.39	11.8	8.0	1.41	0.670	0.455	0.008	18.8	12.8	2.21	3.56	2.4	0.323	1.240	0.84	0.226
4/22/91	7	0.13	48	33	4.50	14.4	9.8	1.44	<b>0.003</b>	0.002	0.009	16.3	11.1	2.25	3.00	2.0	0.330	1.800	1.22	0.230
4/29/91	7	0.13	28	19	4.59	1.5	1.0	1.46	0.033	0.022	0.009	15.3	10.4	2.29	2.88	2.0	0.337	2.020	1.37	0.234
5/6/91	7	0.12	64	40	4.69	18.9	11.8	1.48	<b>0.003</b>	0.002	0.009	30.3	19.0	2.34	3.91	2.4	0.345	1.550	0.97	0.239
5/13/91	7	0.13	52	35	4.82	19.0	12.9	1.52	0.007	0.005	0.009	30.5	20.7	2.41	5.83	4.0	0.356	5.300	3.60	0.247
5/20/91	7	0.11	34	19	4.92	10.9	6.2	1.56	<b>0.003</b>	0.001	0.009	30.3	17.3	2.47	4.10	2.3	0.367	2.200	1.26	0.255
5/30/91	10	0.09	24	11	5.00	15.9	7.5	1.59	0.025	0.012	0.009	20.5	9.7	2.54	3.18	1.5	0.377	1.800	0.85	0.260
6/3/91	4	0.01	26	2	5.01	11.7	0.8	1.60	0.027	0.002	0.009	25.7	1.8	2.55	3.75	0.3	0.379	2.560	0.18	0.261
6/10/91	7	0.13	25	17	5.04	17.5	11.9	1.62	0.018	0.012	0.009	19.0	12.9	2.58	2.10	1.4	0.382	0.283	0.19	0.262
6/17/91	7	0.11	28	16	5.10	12.2	7.0	1.65	0.008	0.005	0.009	23.8	13.6	2.62	3.34	1.9	0.388	0.187	0.11	0.263
6/24/91	7	0.05	40	10	5.15	18.9	4.7	1.67	0.127	0.032	0.009	37.5	9.3	2.66	5.58	1.4	0.393	0.227	0.06	0.263
7/1/91	7	0.13	66	45	5.24	22.4	15.2	1.71	0.027	0.018	0.009	27.2	18.5	2.71	4.52	3.1	0.401	0.082	0.06	0.263
7/8/91	7	0.15	30	24	5.36	23.6	18.8	1.77	<b>0.003</b>	0.002	0.009	27.4	21.9	2.78	4.05	3.2	0.412	1.800	1.44	0.266
7/15/91	7	0.13	50	34	5.46	23.1	15.7	1.83	0.022	0.015	0.009	30.4	20.7	2.86	4.63	3.1	0.423	0.234	0.16	0.268
Totals					5.46			1.83			0.009			2.86		0.423				0.268

FH15N																				
6/25/90		189	4	4073		0.013	13.2		<b>1.848</b>	1881.9		0.41	417.5		<b>0.03</b>	25.5		0.044	44.8	
7/2/90	7	189	2	2037	11	0.161	164.0	0.31	2.010	2046.8	6.9	0.40	407.3	1.44	0.07	71.3	0.17	0.041	41.8	0.15
7/9/90	7	190	2	2047	18	0.150	153.5	0.87	1.930	1975.0	13.9	0.42	429.8	2.91	0.08	81.9	0.44	0.042	43.0	0.30
7/16/90	7	189	6	6110	32	0.154	156.8	1.41	1.980	2016.3	20.9	0.40	407.3	4.37	<b>0.03</b>	25.5	0.63	0.064	65.2	0.49
7/23/90	7	188	10	10147	61	0.117	118.7	1.89	1.710	1735.1	27.5	0.54	547.9	6.05	0.07	71.0	0.79	0.075	76.1	0.74
7/30/90	7	188	<b>1</b>	1015	80	0.288	292.2	2.61	1.720	1745.2	33.6	<b>0.49</b>	493.1	7.87	0.11	111.6	1.11	0.075	76.1	1.00
8/6/90	7	188	4	4066	89	0.208	211.4	3.49	1.900	1931.3	40.0	0.50	508.2	9.62	0.05	50.8	1.40	0.063	64.0	1.25
8/13/90	7	180	6	5819	106	0.133	129.0	4.09	1.790	1736.1	46.4	0.78	756.5	11.83	0.06	58.2	1.59	0.069	66.9	1.48
8/20/90	7	175	6	5676	126	0.143	135.3	4.55	2.030	1920.5	52.8	0.33	312.2	13.70	<b>0.10</b>	89.9	1.85	0.065	61.5	1.70
8/27/90	7	174	6	5615	146	0.276	258.3	5.24	1.940	1815.5	59.3	0.36	336.9	14.84	0.07	65.5	2.12	0.053	49.6	1.90
9/4/90	8	176	7	6346	170	0.205	194.2	6.14	1.840	1742.7	66.5	0.37	350.4	16.21	0.08	75.8	2.40	0.067	63.5	2.12
9/10/90	6	167	4	3599	185	0.287	258.2	6.82	1.770	1592.4	71.5	0.49	440.8	17.40	0.07	63.0	2.61	0.057	51.3	2.29
9/17/90	7	179	3	2904	196	0.298	288.5	7.78	1.850	1790.8	77.4	0.31	300.1	18.70	0.07	67.8	2.84	0.063	61.0	2.49



## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
9/24/90	7	175	4	3785	208	0.175	165.6	8.57	2.010	1902.1	83.8	0.44	416.4	19.95	0.09	85.2	3.11	0.067	63.4	2.71
10/1/90	7	178	3	2885	220	0.217	208.7	9.23	1.900	1827.2	90.4	0.34	327.0	21.25	0.06	57.7	3.36	0.055	52.9	2.91
10/8/90	7	176	10	9488	241	0.240	227.7	9.99	2.070	1963.9	97.0	<i>0.49</i>	461.1	22.63	0.14	132.8	3.69	0.074	70.2	3.13
10/15/90	7	176	4	3805	265	0.219	208.3	10.75	1.980	1883.7	103.7	0.38	361.5	24.07	0.06	57.1	4.02	0.073	69.4	3.37
10/22/90	7	172	4	3717	278	0.140	130.1	11.35	1.950	1812.2	110.2	0.51	474.0	25.53	0.06	55.8	4.22	0.062	57.6	3.59
10/29/90	7	173	5	4660	292	0.263	245.1	12.00	1.900	1770.9	116.5	0.48	447.4	27.14	0.05	46.6	4.40	0.064	59.7	3.80
11/5/90	7	171	8	7392	314	0.189	174.6	12.74	1.980	1829.4	122.8	0.49	452.7	28.72	0.08	73.9	4.61	0.088	81.3	4.05
11/19/90	14	174	2	1876	346	0.164	153.8	13.89	1.930	1810.3	135.5	0.43	403.3	31.72	0.07	65.7	5.10	0.062	58.2	4.53
11/26/90	7	174	17	15942	377	0.205	192.2	14.49	1.950	1828.6	141.9	0.48	450.1	33.21	0.10	93.8	5.38	0.048	45.0	4.71
12/3/90	7	177	2	1914	408	0.279	267.0	15.30	1.940	1856.3	148.3	0.48	459.3	34.80	0.10	95.7	5.71	0.067	64.1	4.91
12/10/90	7	176	2	1898	415	0.376	356.7	16.39	1.140	1081.6	153.5	0.35	332.1	36.19	0.06	56.9	5.98	0.051	48.4	5.10
12/17/90	7	177	2	1908	422	0.271	258.5	17.47	1.980	1888.9	158.7	0.57	543.8	37.72	0.09	85.9	6.23	0.093	88.7	5.34
1/7/91	21	176	14	13320	502	0.121	115.1	19.43	1.950	1855.3	178.3	0.49	466.2	43.02	0.06	57.1	6.98	0.067	63.7	6.14
1/14/91	7	177	6	5733	535	0.246	235.1	20.04	1.950	1863.2	184.8	0.45	430.0	44.59	0.07	66.9	7.19	0.064	61.2	6.36
1/21/91	7	176	5	4751	553	0.295	280.3	20.94	2.020	1919.2	191.5	0.52	494.1	46.21	0.05	47.5	7.39	0.076	72.2	6.59
1/28/91	7	175	5	4710	570	0.243	228.9	21.83	2.030	1912.3	198.2	0.44	414.5	47.80	0.05	47.1	7.56	0.074	69.7	6.84
2/4/91	7	176	12	11417	598	0.282	268.3	22.70	1.940	1845.8	204.7	0.61	580.4	49.54	0.17	161.7	7.92	0.078	74.2	7.10
2/11/91	7	176	4	3806	625	0.160	152.2	23.44	1.970	1874.4	211.2	0.70	666.0	51.72	0.11	104.7	8.39	0.067	63.7	7.34
2/25/91	14	176	12	11401	678	0.395	375.3	25.29	2.100	1995.2	224.8	0.50	475.1	55.71	0.11	104.5	9.12	0.070	66.5	7.79
3/4/91	7	179	3	2901	703	0.455	440.0	26.71	2.310	2234.0	232.2	0.53	512.6	57.44	0.10	96.7	9.48	0.071	68.7	8.03
3/11/91	7	179	3	2901	713	0.396	383.0	28.15	2.080	2011.6	239.6	0.50	483.5	59.18	0.10	96.7	9.81	0.087	84.1	8.30
3/18/91	7	180	16	15517	745	0.410	397.6	29.52	2.120	2056.0	246.7	0.36	349.1	60.64	0.13	126.1	10.20	0.088	85.3	8.59
3/25/91	7	180	7	6318	784	0.240	233.3	30.62	1.900	1846.7	253.6	0.47	456.8	62.05	0.10	97.2	10.59	0.095	92.3	8.90
4/1/91	7	180	13	12149	816	0.147	142.9	31.28	1.740	1691.2	259.8	0.25	243.0	63.28	0.06	58.3	10.87	0.074	71.9	9.19
4/8/91	7	179	8	7243	850	0.113	109.1	31.72	1.820	1757.7	265.8	0.45	434.6	64.46	0.08	77.3	11.10	0.052	50.2	9.41
4/15/91	7	178	9	8142	877	0.270	258.6	32.37	1.620	1551.8	271.6	0.63	603.5	66.28	0.14	134.1	11.47	0.075	71.8	9.62
4/22/91	7	177	8	7633	904	0.129	123.1	33.03	1.880	1793.8	277.4	0.79	753.8	68.65	0.15	143.1	11.96	0.084	80.1	9.88
4/29/91	7	178	12	11508	938	0.126	120.8	33.46	1.670	1601.5	283.4	0.46	441.1	70.74	0.14	134.3	12.44	0.045	43.2	10.10
5/6/91	7	178	6	5748	968	0.119	114.0	33.87	1.780	1705.1	289.2	0.48	459.8	72.32	0.10	95.8	12.85	0.049	46.9	10.26
5/13/91	7	178	8	7694	992	0.133	127.9	34.29	1.540	1481.0	294.7	0.63	605.9	74.19	0.13	125.0	13.23	0.050	48.1	10.42
5/20/91	7	179	10	9644	1022	0.145	139.8	34.76	1.890	1822.7	300.5	0.25	241.1	75.67	0.07	67.5	13.57	0.038	36.6	10.57
5/30/91	10	178	5	4795	1058	0.385	369.2	36.04	2.020	1937.2	309.9	0.60	575.4	77.71	0.14	134.3	14.07		0.0	10.66
6/3/91	4	180	3	2916	1066	0.221	214.8	36.62	2.140	2080.0	313.9	0.42	408.2	78.69	0.09	87.5	14.30	0.061	59.3	10.72
6/10/91	7	182	5	4911	1080	0.242	237.7	37.41	1.900	1866.2	320.9	0.62	609.0	80.47	0.15	147.3	14.71	0.059	57.9	10.93

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.3171/\text{cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
6/17/91	7	179	7	6770	1100	0.115	111.2	38.02	<i>1.848</i>	1787.2	327.2	0.29	280.5	82.03	0.06	58.0	15.07	0.044	42.6	11.10
6/24/91	7	179	11	10638	1130	0.125	120.9	38.43	2.070	2001.9	333.9	0.34	328.8	83.10	0.11	106.4	15.35		0.0	11.18
7/1/91	7	179	6	5803	1159	0.196	189.6	38.97	1.840	1779.5	340.5	0.30	290.1	84.18	0.13	125.7	15.76	0.066	63.8	11.29
7/8/91	7	179	6	5803	1180	0.070	67.7	39.42	1.850	1789.1	346.7	0.47	454.5	85.48	0.11	106.4	16.17	0.048	46.4	11.48
7/15/91	7	180	4	3888	1196	0.182	176.9	39.85	1.980	1924.5	353.2	0.30	291.6	86.79	0.10	97.2	16.52	0.055	53.5	11.66
Totals					1196			39.85			353.2			86.79			16.52			11.66

### FH25N

6/26/90		190	6	6149		0.329	337.2		2.260	2316.1		0.73	748.1		0.10	102.5		0.085	87.1	
7/2/90	6	192	6	6197	19	0.416	429.7	1.15	2.130	2200.1	6.8	0.73	754.0	2.3	0.11	113.6	0.32	0.088	90.9	0.27
7/10/90	8	194	4	4186	39	0.332	347.4	2.70	2.290	2396.2	16.0	0.41	429.0	4.6	0.08	83.7	0.72	0.054	56.5	0.56
7/16/90	6	196	6	6343	55	0.305	322.4	3.71	2.350	2484.3	23.3	0.62	655.4	6.2	0.07	74.0	0.96	0.089	94.1	0.79
7/24/90	8	198	6	6392	81	0.303	322.8	5.00	2.070	2205.1	32.7	0.58	617.8	8.8	0.09	95.9	1.30	0.101	107.6	1.19
7/30/90	6	202	4	4347	97	0.332	360.8	6.03	1.880	2043.2	39.0	0.75	815.1	10.9	0.09	97.8	1.59	0.106	115.2	1.53
8/7/90	8	200	10	10787	127	0.287	309.6	7.37	1.540	1661.3	46.4	0.53	571.7	13.7	0.10	107.9	2.00	0.095	102.5	1.96
8/13/90	6	203	4	4369	150	0.276	301.5	8.28	1.930	2108.0	52.1	0.61	666.3	15.6	0.12	131.1	2.36	0.101	110.3	2.28
8/21/90	8	205	5	5301	169	<i>0.342</i>	377.7	9.64	2.257	2492.5	61.3	0.53	585.3	18.1	0.10	110.4	2.84	0.087	96.1	2.69
8/27/90	6	207	4	4466	184	0.418	466.7	10.91	2.370	2646.1	69.0	0.51	569.4	19.8	0.11	122.8	3.19	0.092	102.7	2.99
9/4/90	8	208	1	1119	195	0.403	451.0	12.74	2.230	2495.8	79.3	0.44	492.4	21.9	0.10	111.9	3.66	0.100	111.9	3.42
9/10/90	6	208	6	6715	207	0.342	382.8	13.99	2.230	2495.8	86.8	0.85	951.3	24.1	0.14	156.7	4.06	0.100	111.9	3.76
9/18/90	8	211	4	4558	229	0.362	412.5	15.58	2.320	2643.5	97.1	0.41	467.2	26.9	0.08	91.2	4.56	0.084	95.7	4.17
9/24/90	6	212	4	4574	243	0.228	260.7	16.59	2.470	2824.4	105.3	0.67	766.1	28.8	0.08	91.5	4.83	0.090	102.9	4.47
10/2/90	8	214	4	4606	261	0.324	373.1	17.86	2.400	2763.7	116.4	0.71	817.6	32.0	0.09	103.6	5.22	0.082	94.4	4.86
10/8/90	6	216	8	9331	282	0.354	412.9	19.04	2.590	3021.0	125.1	0.56	653.2	34.2	0.11	128.3	5.57	0.085	99.1	5.15
10/16/90	8	218	6	7039	315	0.378	443.4	20.75	2.450	2874.2	136.9	0.61	715.6	36.9	0.10	117.3	6.06	0.089	104.4	5.56
10/22/90	6	219	4	4725	332	0.357	421.7	22.05	2.480	2929.4	145.6	0.87	1027.7	39.5	0.11	129.9	6.43	0.104	122.8	5.90
10/30/90	8	218	6	7043	356	0.313	367.4	23.63	2.240	2629.3	156.7	0.67	786.5	43.1	0.09	105.6	6.90	0.103	120.9	6.39
11/5/90	6	216	9	10498	382	0.331	386.1	24.76	2.500	2916.0	165.0	0.73	851.5	45.6	0.11	128.3	7.25	0.093	108.5	6.73
11/13/90	8	214	3	3463	410	0.338	390.1	26.31	2.380	2747.1	176.4	0.65	750.3	48.8	0.10	115.4	7.74	0.082	94.6	7.14
11/19/90	6	214	4	4622	422	0.377	435.7	27.55	2.600	3004.6	185.0	0.84	970.7	51.4	0.12	138.7	8.12	0.091	105.2	7.44
11/27/90	8	211	6	6812	445	0.284	322.4	29.07	2.330	2645.4	196.3	0.26	295.2	53.9	0.11	124.9	8.65	0.077	87.4	7.82
12/3/90	6	211	2	2271	459	0.452	513.2	30.32	2.500	2838.4	204.5	0.63	715.3	55.4	0.09	102.2	8.99	0.075	85.2	8.08
12/11/90	8	205	3	3321	470	0.475	525.9	32.40	2.270	2513.0	215.2	0.49	542.5	57.9	0.08	88.6	9.37	0.075	83.0	8.42
12/17/90	6	205	5	5522	483	0.454	501.4	33.94	2.580	2849.3	223.3	0.57	629.5	59.7	0.08	88.3	9.64	0.087	96.1	8.69

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
			mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
1/8/91	22	198	10	10666	572	0.325	346.6	38.60	2.420	2581.2	253.1	0.67	714.6	67.1	0.10	106.7	10.71	0.086	91.7	9.72
1/14/91	6	199	3	3212	593	0.328	351.2	39.65	2.410	2580.3	260.9	0.44	471.1	68.9	0.10	107.1	11.03	0.087	93.1	10.00
1/22/91	8	195	4	4207	608	0.319	335.5	41.02	2.410	2534.8	271.1	0.47	494.3	70.8	0.10	105.2	11.45	0.079	83.1	10.35
1/28/91	6	197	3	3180	619	0.284	301.0	41.98	2.380	2522.5	278.7	0.47	498.1	72.3	0.09	95.4	11.75	0.084	89.0	10.61
2/5/91	8	193	2	2077	630	0.344	357.2	43.29	2.430	2523.0	288.8	0.48	498.4	74.3	0.08	83.1	12.11	0.087	90.3	10.97
2/11/91	6	193	8	8306	645	0.180	186.9	44.11	2.460	2554.2	296.4	0.78	809.9	76.2	0.09	93.4	12.38	0.077	79.9	11.22
2/19/91	8	190	5	5117	672	0.142	145.3	44.77	2.580	2640.5	306.8	0.50	511.7	78.9	0.10	102.3	12.77	0.088	90.1	11.56
2/25/91	6	189	8	8166	692	0.421	429.7	45.64	2.410	2460.0	314.4	0.51	520.6	80.4	0.09	91.9	13.06	0.082	83.7	11.82
3/5/91	8	187	2	2020	712	0.388	391.9	47.28	2.940	2969.3	325.3	0.47	474.7	82.4	0.09	90.9	13.42	0.092	92.9	12.18
3/11/91	6	189	3	3058	720	0.505	514.8	48.64	2.360	2405.8	333.4	0.61	621.8	84.1	0.12	122.3	13.74	0.089	90.7	12.45
3/19/91	8	188	10	10120	746	0.329	332.9	50.34	2.350	2378.2	342.9	0.27	273.2	85.9	0.10	101.2	14.19	0.082	83.0	12.80
3/25/91	6	187	4	3535	767	0.210	212.1	51.15	2.380	2403.7	350.1	0.27	272.7	86.7	0.08	80.8	14.46	0.107	108.1	13.09
4/2/91	8	184	7	6460	787	0.271	269.3	52.12	1.990	1977.6	358.9	0.52	516.8	88.3	0.10	99.4	14.82	0.059	58.6	13.42
4/8/91	6	184	4	3464	802	0.267	264.3	52.92	2.110	2088.4	365.0	0.62	613.6	90.0	0.08	79.2	15.09	0.070	69.3	13.61
4/16/91	8	183	7	6407	821	0.260	256.3	53.96	1.880	1853.1	372.9	0.60	586.5	92.4	0.12	118.3	15.49	0.067	66.0	13.88
4/22/91	6	181	3	2925	835	0.423	412.4	54.96	2.220	2164.3	378.9	0.49	477.7	94.0	0.09	87.7	15.80	0.079	77.0	14.10
4/30/91	8	180	4	3881	849	0.239	231.9	56.25	2.257	2189.7	387.6	0.46	446.3	95.8	0.11	106.7	16.19	0.065	63.1	14.38
5/6/91	6	179	3	2898	859	0.322	311.1	57.06	1.990	1922.6	393.8	0.86	830.9	97.7	0.09	87.0	16.48	0.067	64.7	14.57
5/14/91	8	177	4	3821	873	0.100	95.5	57.88	1.740	1662.3	400.9	0.50	477.7	100.3	0.10	95.5	16.84	0.063	60.2	14.82
5/20/91	6	179	4	3857	884	0.390	376.0	58.58	2.250	2169.3	406.7	0.57	549.6	101.9	0.12	115.7	17.16	0.059	56.9	14.99
5/28/91	8	177	4	3813	899	0.559	532.9	60.40	2.230	2125.9	415.3	0.60	572.0	104.1	0.13	123.9	17.64	0.074	70.5	15.25
6/3/91	6	177	2	1909	908	0.310	296.0	61.65	2.460	2348.5	422.0	0.73	696.9	106.0	0.10	95.5	17.97	0.067	64.0	15.45
6/11/91	8	179	1	484	913	0.276	267.0	62.77	2.140	2070.4	430.8	0.67	648.2	108.7	0.09	87.1	18.33	0.064	61.9	15.70
6/17/91	6	179	3	2892	918	0.328	316.2	63.65	2.257	2176.0	437.2	0.55	530.3	110.5	0.08	77.1	18.58	0.066	63.6	15.89
6/25/91	8	180	3	2905	929	0.308	298.2	64.88	2.150	2081.6	445.7	0.54	522.8	112.6	0.10	96.8	18.93	0.082	79.4	16.18
7/1/91	6	185	4	3991	940	0.304	303.3	65.78	2.070	2065.5	451.9	0.50	498.9	114.1	0.13	129.7	19.27	0.072	71.8	16.40
7/9/91	8	186	3	3002	954	0.369	369.2	67.12	2.430	2431.3	460.9	0.84	840.4	116.8	0.12	120.1	19.76	0.074	74.0	16.70
7/15/91	6	186	4	4013	964	0.346	347.1	68.20	2.240	2247.2	467.9	0.79	792.6	119.2	0.10	100.3	20.10	0.082	82.3	16.93
Totals					964			68.20			467.9			119.2			20.10			16.93

### FH26S

6/26/90		5	2	50		0.135	3.3		1.550	38.5		0.35	8.7		0.03	0.6		0.033	0.8	
7/2/90	6	5	4	99	0	0.093	2.3	0.01	1.650	40.9	0.1	0.35	8.7	0.03	0.03	0.6	0.00	0.025	0.6	0.00
7/10/90	8	38	7	1529	3	0.065	13.4	0.04	1.710	353.3	0.9	0.23	47.5	0.14	0.08	16.5	0.04	0.011	2.3	0.01

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
7/16/90	6	42	10	2282	9	0.062	14.1	0.08	1.750	399.3	2.0	0.22	50.2	0.29	<i><b>0.03</b></i>	5.7	0.07	0.035	8.0	0.02
7/24/90	8	92	64	31896	78	0.040	19.9	0.15	1.630	812.4	4.5	0.33	164.5	0.71	<i><b>0.03</b></i>	12.5	0.11	0.050	24.9	0.09
7/30/90	6	93	4	2006	128	0.074	37.1	0.24	1.460	732.4	6.8	0.58	290.9	1.40	<i><b>0.03</b></i>	12.5	0.14	0.038	19.1	0.16
8/7/90	8	95	8	4099	141	0.090	46.1	0.40	1.690	866.0	10.0	0.24	123.0	2.23	<i><b>0.03</b></i>	12.8	0.19	0.049	25.1	0.24
8/13/90	6	97	36	18839	175	0.033	17.3	0.50	1.710	894.8	12.6	0.21	109.9	2.57	<i><b>0.03</b></i>	13.1	0.23	0.042	22.0	0.31
8/21/90	8	106	14	7974	229	0.098	55.8	0.64	1.870	1065.1	16.5	0.24	136.7	3.07	0.06	34.2	0.33	0.051	29.0	0.42
8/27/90	6	101	2	1089	242	0.142	77.3	0.84	1.850	1007.6	19.6	0.23	125.3	3.46	<i><b>0.03</b></i>	13.6	0.40	0.050	27.2	0.50
9/3/90	7	84	1	451	245	0.106	47.8	1.06	1.760	793.3	22.8	0.28	126.2	3.90	<i><b>0.03</b></i>	11.3	0.44	0.042	18.9	0.58
9/10/90	7	101	1	545	247	0.134	73.1	1.27	1.710	932.7	25.8	0.31	169.1	4.42	<i><b>0.03</b></i>	13.6	0.49	0.045	24.5	0.66
9/18/90	8	101	1	545	249	0.106	57.8	1.53	1.870	1019.7	29.7	0.18	98.2	4.95	0.06	32.7	0.58	0.045	24.5	0.76
9/24/90	6	115	2	1241	252	0.064	39.7	1.68	<i><b>1.692</b></i>	1049.5	32.8	0.27	167.5	5.35	<i><b>0.03</b></i>	15.5	0.65	0.045	27.9	0.83
10/2/90	8	132	2	1426	257	0.117	83.4	1.93	1.910	1361.7	37.6	0.26	185.4	6.06	<i><b>0.03</b></i>	17.8	0.72	0.051	36.4	0.96
10/8/90	6	125	5	3373	264	0.063	42.5	2.12	2.070	1396.2	41.8	0.82	553.1	7.16	0.15	101.2	0.90	0.050	33.7	1.07
10/17/90	9	120	1	323	272	0.082	53.0	2.33	1.940	1253.6	47.7	0.07	45.2	8.51	<i><b>0.03</b></i>	16.2	1.16	0.037	23.9	1.20
10/22/90	5	127	1	684	274	0.123	84.2	2.50	1.980	1354.7	51.0	0.34	232.6	8.86	<i><b>0.03</b></i>	17.1	1.20	0.053	36.3	1.27
10/30/90	8	139	1	752	277	0.203	152.7	2.98	1.200	902.7	55.5	0.24	180.5	9.68	<i><b>0.03</b></i>	18.8	1.27	0.058	43.6	1.43
11/5/90	6	160	6	5182	285	0.144	124.4	3.39	1.900	1641.0	59.3	0.33	285.0	10.38	<i><b>0.03</b></i>	21.6	1.33	0.047	40.6	1.56
11/13/90	8	166	1	448	297	0.097	86.8	3.81	1.890	1692.0	66.0	0.25	223.8	11.40	<i><b>0.03</b></i>	22.4	1.42	0.041	36.7	1.71
11/19/90	6	176	1	474	298	0.126	119.4	4.12	2.050	1943.2	71.5	0.27	255.9	12.12	<i><b>0.03</b></i>	23.7	1.49	0.050	47.4	1.84
11/27/90	8	147	5	3961	307	0.151	119.6	4.60	1.880	1489.3	78.3	0.28	221.8	13.07	0.05	39.6	1.62	0.035	27.7	1.99
12/3/90	6	176	1	948	314	0.247	234.1	5.13	2.000	1895.8	83.4	0.27	255.9	13.79	<i><b>0.08</b></i>	72.0	1.79	0.043	40.8	2.09
12/11/90	8	172	2	1853	320	0.260	240.9	6.08	1.870	1732.7	90.7	0.25	231.6	14.77	<i><b>0.03</b></i>	23.2	1.98	0.046	42.6	2.26
12/17/90	6	160	2	1728	325	0.182	157.2	6.68	1.960	1693.1	95.8	0.35	302.3	15.57	0.05	43.2	2.08	0.060	51.8	2.40
1/8/91	22	184	12	11892	400	0.122	120.9	8.21	1.890	1872.9	115.4	0.29	287.4	18.81	0.06	59.5	2.64	0.073	72.3	3.08
1/14/91	6	188	1	1013	420	0.182	184.3	8.67	1.920	1944.5	121.1	0.78	789.9	20.43	<i><b>0.03</b></i>	25.3	2.77	0.064	64.8	3.29
1/22/91	8	176	2	1896	425	0.164	155.5	9.35	2.080	1971.6	129.0	0.20	189.6	22.39	0.05	47.4	2.91	0.062	58.8	3.54
1/28/91	6	186	1	1002	430	0.182	182.3	9.85	0.940	941.8	133.3	0.30	300.6	23.12	<i><b>0.03</b></i>	25.0	3.02	0.059	59.1	3.71
2/5/91	8	168	6	5434	443	0.241	218.3	10.65	1.930	1747.8	138.7	0.28	253.6	24.23	0.06	54.3	3.18	0.070	63.4	3.96
2/11/91	6	172	6	5560	459	0.268	248.3	11.35	2.040	1890.2	144.2	0.55	509.6	25.37	0.09	83.4	3.39	0.060	55.6	4.14
2/19/91	8	164	1	885	472	0.250	221.2	12.29	2.230	1972.7	151.9	0.20	176.9	26.75	0.05	44.2	3.64	0.053	46.9	4.34
2/25/91	6	154	12	9994	488	0.321	267.3	13.03	1.980	1649.0	157.3	0.40	333.1	27.51	0.07	58.3	3.80	0.076	63.3	4.51
3/5/91	8	170	3	2748	514	0.193	176.8	13.91	2.380	2180.2	165.0	0.20	183.2	28.55	0.06	55.0	4.02	0.074	67.8	4.77
3/11/91	6	182	2	1961	521	0.214	209.8	14.49	1.850	1813.8	171.0	0.38	372.6	29.38	0.11	107.8	4.27	0.064	62.7	4.97
3/19/91	8	166	10	8949	543	0.283	253.3	15.42	1.870	1673.5	178.0	0.35	313.2	30.75	0.09	80.5	4.64	0.066	59.1	5.21

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l}/\text{cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
			mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
3/25/91	6	164	4	3096	561	<i>0.141</i>	124.7	15.99	1.860	1645.1	182.9	0.84	743.0	32.33	0.08	70.8	4.87	0.068	60.1	5.39
4/2/91	8	174	6	5624	578	0.090	84.4	16.41	1.620	1518.4	189.3	0.23	215.6	34.25	0.05	46.9	5.11	0.036	33.7	5.58
4/8/91	6	168	3	2716	591	0.131	118.6	16.71	1.740	1575.5	193.9	0.23	208.3	34.89	<i>0.03</i>	22.6	5.21	0.033	29.9	5.67
4/16/91	8	162	4	3496	603	0.020	17.5	16.98	1.520	1328.6	199.7	0.11	96.2	35.50	<i>0.03</i>	21.9	5.30	0.044	38.5	5.81
4/22/91	6	134	1	723	609	0.142	102.6	17.16	1.680	1214.2	203.5	0.41	296.3	36.08	<i>0.03</i>	18.1	5.36	0.029	21.0	5.90
4/30/91	8	18	9	869	613	0.100	9.7	17.39	1.560	150.6	206.3	0.56	54.1	36.79	0.11	10.6	5.42	0.026	2.5	5.94
5/6/91	6	14	2	155	614	0.112	8.7	17.41	1.010	78.1	206.6	<i>0.35</i>	27.4	36.91	0.08	6.2	5.44	0.033	2.6	5.95
5/14/91	8	15	3	246	615	0.125	10.3	17.45	0.976	80.1	206.9	0.52	42.7	37.05	0.09	7.4	5.47	0.023	1.9	5.96
5/20/91	6	19	4	407	616	0.221	22.5	17.50	1.170	119.0	207.2	0.49	49.8	37.19	<i>0.03</i>	2.5	5.48	0.025	2.5	5.97
5/28/91	8	21	2	224	617	0.135	15.1	17.58	1.460	163.6	207.8	0.47	52.7	37.39	0.05	5.6	5.50	0.054	6.0	5.98
6/3/91	6	19	1	102	618	0.139	14.1	17.62	1.440	146.5	208.2	0.42	42.7	37.53	0.05	5.1	5.52	0.025	2.5	6.00
6/11/91	8	23	1	61	618	0.102	12.5	17.67	1.510	185.2	208.9	0.84	103.0	37.83	<i>0.03</i>	3.1	5.53	0.028	3.4	6.01
6/17/91	6	33	5	902	619	0.138	24.9	17.73	<i>1.692</i>	305.2	209.6	0.28	50.5	38.06	<i>0.03</i>	4.5	5.54	0.020	3.6	6.02
6/25/91	8	67	2	724	623	0.057	20.6	17.82	1.620	586.5	211.4	0.21	76.0	38.31	<i>0.03</i>	9.1	5.57	0.020	7.2	6.04
7/1/91	6	67	2	724	625	0.054	19.5	17.88	1.630	590.1	213.2	0.31	112.2	38.59	<i>0.03</i>	9.1	5.60	0.024	8.7	6.07
7/9/91	8	76	1	205	627	0.106	43.4	18.01	1.670	683.8	215.7	0.36	147.4	39.11	0.06	24.6	5.66	0.027	11.1	6.10
7/15/91	6	76	1	205	627	0.086	35.2	18.12	1.730	708.3	217.8	0.24	98.3	39.48	0.06	24.6	5.74	0.031	12.7	6.14
Totals					627			18.12			217.8			39.48			5.74			6.14

### FH28N

6/26/90		141	6	4548		0.374	283.5		1.410	1068.7		0.73	553.3		0.08	60.6		0.068	51.5	
7/2/90	6	107	6	3451	12	0.326	187.5	0.71	1.560	897.2	2.9	0.67	385.3	1.41	0.08	46.0	0.16	0.081	46.6	0.15
7/10/90	8	142	4	3065	25	0.341	261.3	1.60	1.520	1164.8	7.1	0.70	536.4	3.25	0.08	61.3	0.37	0.074	56.7	0.35
7/16/90	6	143	1	769	31	0.330	253.6	2.38	1.630	1252.8	10.7	0.61	468.8	4.76	0.08	61.5	0.56	0.092	70.7	0.54
7/24/90	8	140	8	6050	44	0.360	272.3	3.43	1.500	1134.4	15.5	0.74	559.6	6.82	0.11	83.2	0.85	0.110	83.2	0.85
7/30/90	6	141	1	761	55	0.283	215.3	4.16	1.310	996.8	18.7	0.64	487.0	8.39	<i>0.03</i>	19.0	1.00	0.070	53.3	1.06
8/7/90	8	141	8	6101	68	0.344	262.3	5.11	2.290	1746.3	24.2	0.53	404.2	10.17	0.08	61.0	1.16	0.081	61.8	1.29
8/13/90	6	142	2	1529	80	0.286	218.6	5.84	1.500	1146.8	28.5	0.60	458.7	11.46	0.09	68.8	1.36	0.089	68.0	1.48
8/21/90	8	141	5	3498	90	0.381	289.8	6.85	1.660	1262.5	33.3	0.53	403.1	13.19	0.06	45.6	1.59	0.085	64.6	1.75
8/27/90	6	143	4	3092	100	0.406	313.8	7.76	1.700	1314.1	37.2	0.50	386.5	14.37	0.10	77.3	1.77	0.092	71.1	1.95
9/4/90	8	146	5	3938	114	0.295	232.4	8.85	1.590	1252.4	42.3	0.39	307.2	15.76	0.08	63.0	2.05	0.079	62.2	2.22
9/10/90	6	118	1	634	121	0.271	171.8	9.46	1.550	982.6	45.7	0.63	399.4	16.82	0.07	44.4	2.21	0.083	52.6	2.39
9/18/90	8	145	2	1564	125	0.508	397.4	10.60	1.650	1290.7	50.2	0.66	516.3	18.65	0.13	101.7	2.50	0.087	68.1	2.63
9/24/90	6	145	3	2344	131	0.338	264.1	11.59	1.790	1398.6	54.2	0.61	476.6	20.14	0.10	78.1	2.77	0.079	61.7	2.83

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
10/2/90	8	145	2	1559	139	0.334	260.4	12.64	1.680	1309.8	59.7	0.43	335.3	21.76	0.06	46.8	3.02	0.075	58.5	3.07
10/8/90	6	145	10	7797	153	0.313	244.0	13.39	1.840	1434.6	63.8	0.35	272.9	22.67	0.08	62.4	3.19	0.087	67.8	3.26
10/16/90	8	148	3	2390	173	0.389	309.9	14.50	1.800	1434.2	69.5	0.94	749.0	24.72	0.07	55.8	3.42	0.090	71.7	3.54
10/22/90	6	145	1	784	178	0.266	208.5	15.28	1.740	1363.6	73.7	0.69	540.7	26.65	0.09	70.5	3.61	0.103	80.7	3.76
10/30/90	8	140	3	2263	184	0.529	399.0	16.49	1.220	920.1	78.3	0.80	603.4	28.94	<b>0.03</b>	18.9	3.79	0.063	47.5	4.02
11/5/90	6	139	7	5238	195	0.528	395.1	17.68	1.770	1324.5	81.6	0.64	478.9	30.56	0.11	82.3	3.94	0.095	71.1	4.20
11/13/90	8	143	2	1542	209	0.396	305.3	19.09	1.710	1318.5	86.9	0.62	478.0	32.48	0.09	69.4	4.25	0.079	60.9	4.46
11/19/90	6	145	4	3139	216	0.300	235.4	19.90	1.780	1396.7	91.0	0.62	486.5	33.92	0.09	70.6	4.46	0.069	54.1	4.63
11/27/90	8	136	8	5873	234	0.378	277.5	20.92	1.670	1225.9	96.3	0.56	411.1	35.72	0.09	66.1	4.73	0.059	43.3	4.83
12/3/90	6	139	2	1500	245	0.288	216.1	21.66	1.680	1260.4	100.0	0.49	367.6	36.89	0.09	67.5	4.93	0.062	46.5	4.96
12/11/90	8	138	4	2984	254	0.494	368.5	22.83	1.750	1305.5	105.1	0.47	350.6	38.32	0.08	59.7	5.18	0.058	43.3	5.14
12/17/90	6	138	6	4478	265	0.313	233.6	23.74	1.750	1306.0	109.0	0.63	470.2	39.56	0.10	74.6	5.39	0.106	79.1	5.33
1/8/91	22	133	10	7165	329	0.277	198.5	26.11	1.670	1196.6	122.8	0.64	458.6	44.66	0.10	71.7	6.19	0.087	62.3	6.11
1/14/91	6	129	3	2092	343	0.260	181.3	26.68	1.620	1129.6	126.3	0.52	362.6	45.90	0.11	76.7	6.41	0.091	63.5	6.29
1/22/91	8	127	7	4797	357	0.338	231.6	27.51	1.700	1165.1	130.9	0.53	363.2	47.35	0.15	102.8	6.77	0.102	69.9	6.56
1/28/91	6	126	8	5434	372	0.299	203.1	28.16	1.700	1154.8	134.4	0.58	394.0	48.48	0.12	81.5	7.05	0.108	73.4	6.78
2/5/91	8	124	2	1338	386	0.328	219.4	29.00	1.650	1103.7	138.9	0.37	247.5	49.77	0.09	60.2	7.33	0.088	58.9	7.04
2/11/91	6	123	6	3969	394	0.180	119.1	29.51	1.640	1084.9	142.2	0.58	383.7	50.71	0.13	86.0	7.55	0.085	56.2	7.21
2/19/91	8	123	4	2661	407	0.368	244.8	30.24	<i>1.569</i>	1043.6	146.4	0.62	412.4	52.30	0.12	79.8	7.88	0.096	63.9	7.45
2/25/91	6	121	10	6537	421	0.451	294.8	31.05	1.700	1111.2	149.6	0.51	333.4	53.42	0.12	78.4	8.12	0.068	44.4	7.62
3/5/91	8	122	5	3287	440	0.370	243.3	32.13	1.960	1288.6	154.4	0.68	447.1	54.98	0.10	65.7	8.41	0.067	44.0	7.79
3/11/91	6	127	2	1372	447	0.367	251.7	32.87	1.590	1090.4	158.0	0.57	390.9	56.24	<i>0.10</i>	70.0	8.61	0.078	53.5	7.94
3/19/91	8	127	8	5472	461	0.496	339.3	34.05	1.660	1135.4	162.5	0.49	335.1	57.69	0.12	82.1	8.92	0.078	53.4	8.15
3/25/91	6	125	2	1014	471	0.286	193.3	34.85	1.560	1054.1	165.7	<i>0.63</i>	427.1	58.84	0.08	54.1	9.12	0.087	58.8	8.32
4/2/91	8	123	5	3309	479	0.325	215.1	35.66	1.340	886.8	169.6	0.75	496.3	60.68	0.12	76.1	9.38	0.086	56.9	8.55
4/8/91	6	123	4	2662	488	0.148	98.5	36.14	1.540	1024.9	172.5	0.57	379.4	62.00	0.08	53.2	9.57	0.069	45.9	8.71
4/16/91	8	120	6	3899	501	0.277	180.0	36.69	1.340	870.9	176.3	0.86	558.9	63.87	0.11	71.5	9.82	0.090	58.5	8.92
4/22/91	6	126	1	338	508	0.369	249.8	37.34	1.510	1022.1	179.1	0.46	311.4	65.18	0.10	67.7	10.03	0.089	60.2	9.09
4/30/91	8	123	5	3329	515	0.242	161.1	38.16	1.850	1231.7	183.6	0.92	612.5	67.03	0.15	99.9	10.37	0.097	64.6	9.34
5/6/91	6	124	2	1335	522	0.265	176.9	38.67	1.330	887.6	186.8	0.69	460.5	68.64	0.07	46.7	10.59	0.090	60.1	9.53
5/14/91	8	130	3	2097	529	0.337	235.5	39.49	1.100	768.8	190.1	0.60	419.4	70.40	0.12	83.9	10.85	0.076	53.1	9.76
5/20/91	6	133	5	3574	538	0.409	292.4	40.28	1.190	850.6	192.6	0.46	328.8	71.52	0.12	85.8	11.10	0.084	60.0	9.93
5/28/91	8	133	3	2156	549	0.315	226.4	41.32	1.740	1250.7	196.8	0.37	265.9	72.71	0.07	50.3	11.38	0.051	36.7	10.12
6/3/91	6	139	3	2254	556	0.276	207.4	41.97	1.650	1239.6	200.5	0.69	518.4	73.88	0.11	82.6	11.58	0.082	61.6	10.27

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.3171/\text{cf} = Q * C \quad 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
6/11/91	8	136	2	1470	563	0.386	283.6	42.95	1.420	1043.4	205.1	0.90	661.3	76.24	0.09	66.1	11.87	0.077	56.6	10.50
6/17/91	6	137	3	2224	569	0.153	113.4	43.55	<i>1.569</i>	1163.1	208.4	0.47	348.4	77.76	0.10	74.1	12.08	0.071	52.6	10.67
6/25/91	8	142	1	764	575	0.377	287.9	44.35	1.440	1099.6	212.9	0.84	641.5	79.74	0.10	76.4	12.38	0.083	63.4	10.90
7/1/91	6	137	3	2219	579	0.356	263.3	45.18	1.440	1065.2	216.1	0.62	458.6	81.39	0.12	88.8	12.63	0.088	65.1	11.09
7/9/91	8	134	2	1443	586	0.513	370.2	46.44	1.620	1168.9	220.6	<i>0.63</i>	456.0	83.22	0.12	86.6	12.98	0.117	84.4	11.39
7/15/91	6	137	1	740	590	0.295	218.3	47.33	1.580	1169.2	224.1	0.50	370.0	84.46	0.12	88.8	13.25	0.101	74.7	11.63
Totals					590			47.33			224.1			84.46			13.25			11.63

FH35S																				
6/27/90		11.5	10	622		0.700	43.5		0.597	37.1		1.23	76.5		0.22	13.7		0.161	10.0	
7/11/90	14	12.0	18	1165	6	0.747	48.3	0.32	0.694	44.9	0.29	1.65	106.8	0.64	0.23	14.9	0.10	0.121	7.8	0.06
7/16/90	5	12.0	18	1165	9	0.853	55.2	0.45	0.693	44.9	0.40	1.68	108.7	0.91	0.21	13.6	0.14	0.145	9.4	0.08
7/25/90	9	12.0	16	1036	14	0.764	49.4	0.69	0.744	48.2	0.61	1.07	69.3	1.31	0.20	12.9	0.20	0.149	9.6	0.13
7/30/90	5	11.3	7	61	15	0.844	51.2	0.81	0.695	42.2	0.72	1.90	115.3	1.54	0.26	15.8	0.23	0.135	8.2	0.15
8/8/90	9	10.8	20	1166	18	0.787	45.9	1.03	0.696	40.6	0.91	1.48	86.3	2.00	0.17	9.9	0.29	0.102	5.9	0.18
8/13/90	5	12.6	20	1358	21	0.626	42.5	1.14	0.743	50.5	1.02	2.31	156.9	2.30	0.21	14.3	0.32	0.109	7.4	0.20
8/22/90	9	13.5	24	1749	28	0.602	43.9	1.34	0.747	54.4	1.26	1.36	99.1	2.88	0.18	13.1	0.38	0.123	9.0	0.23
8/27/90	5	13.1	16	1126	32	0.686	48.3	1.45	0.749	52.7	1.39	1.06	74.6	3.09	0.19	13.4	0.41	0.133	9.4	0.26
9/5/90	9	11.9	20	1285	37	0.732	47.0	1.67	0.707	45.4	1.61	1.57	100.9	3.49	0.18	11.6	0.47	0.124	8.0	0.30
9/10/90	5	11.9	10	642	40	0.594	38.2	1.77	0.698	44.8	1.73	1.31	84.2	3.72	0.18	11.6	0.50	0.116	7.5	0.32
9/18/90	8	11.5	9	557	42	0.778	48.1	1.94	0.624	38.6	1.89	1.14	70.5	4.03	0.16	9.9	0.54	0.180	11.1	0.35
9/24/90	6	31.8	14	2403	47	0.735	126.1	2.21	0.735	126.1	2.14	1.23	211.1	4.45	0.19	32.6	0.61	0.115	19.7	0.40
10/3/90	9	31.8	9	1545	56	0.522	89.6	2.69	0.700	120.1	2.69	0.92	157.9	5.28	0.14	24.0	0.73	0.100	17.2	0.48
10/8/90	5	31.5	19	3229	62	0.668	113.5	2.95	0.840	142.8	3.02	0.72	122.4	5.63	0.14	23.8	0.79	0.114	19.4	0.53
10/16/90	8	31.8	14	2403	73	0.685	117.6	3.41	0.794	136.3	3.58	1.68	288.3	6.45	0.19	32.6	0.91	0.156	26.8	0.62
10/22/90	6	31.5	10	1700	79	0.675	114.7	3.76	0.875	148.7	4.01	1.36	231.1	7.23	0.19	32.3	1.00	0.144	24.5	0.70
10/31/90	9	30.0	8	1294	86	0.560	90.6	4.22	0.854	138.1	4.65	1.12	181.1	8.16	0.18	29.1	1.14	0.150	24.3	0.81
11/5/90	5	30.6	12	1980	90	0.558	92.1	4.45	0.839	138.4	5.00	1.00	165.0	8.59	0.12	19.8	1.20	0.118	19.5	0.86
11/14/90	9	30.3	11	1797	98	0.900	147.0	4.98	0.908	148.3	5.64	1.35	220.5	9.46	0.29	47.4	1.35	0.216	35.3	0.98
11/19/90	5	14.2	13	997	102	0.947	72.6	5.26	0.922	70.7	5.92	1.72	131.9	9.90	0.28	21.5	1.44	0.212	16.3	1.05
11/28/90	9	14.2	15	1150	107	0.966	74.1	5.59	0.826	63.4	6.22	1.46	112.0	10.45	0.34	26.1	1.55	0.221	17.0	1.12
12/3/90	5	14.2	10	767	109	1.060	81.3	5.78	0.944	72.4	6.39	1.27	97.4	10.71	0.20	15.3	1.60	0.160	12.3	1.16
12/17/90	14	14.5	10	779	114	0.975	76.0	6.33	0.930	72.5	6.90	1.50	116.9	11.46	0.32	24.9	1.74	0.214	16.7	1.26
1/9/91	23	14.0	22	1659	128	0.617	46.5	7.04	0.937	70.7	7.72	1.18	89.0	12.64	0.28	21.1	2.00	0.150	11.3	1.42

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate			
		Flow	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
		cfs	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
1/9/91	0	14.0	10	754	128	0.518	39.1	7.04	0.876	66.1	7.72	0.72	54.3	12.64	0.10	7.5	2.00	0.100	7.5	1.42
1/14/91	5	14.0	14	1056	131	0.680	51.3	7.15	0.924	69.7	7.89	1.17	88.2	12.82	0.27	20.4	2.04	0.145	10.9	1.45
1/23/91	9	12.4	11	733	135	0.731	48.7	7.38	0.984	65.6	8.19	1.00	66.7	13.17	0.19	12.7	2.11	0.160	10.7	1.49
1/28/91	5	13.3	9	645	136	0.727	52.1	7.50	0.777	55.7	8.34	1.38	98.8	13.38	0.20	14.3	2.15	0.172	12.3	1.52
2/6/91	9	13.3	11	788	140	0.821	58.8	7.75	0.721	51.6	8.59	1.18	84.5	13.79	0.22	15.8	2.21	0.157	11.2	1.58
2/11/91	5	14.2	14	1074	142	0.622	47.7	7.88	0.732	56.1	8.72	1.63	125.0	14.05	0.21	16.3	2.25	0.182	14.0	1.61
2/20/91	9	13.8	13	964	147	1.080	80.1	8.17	0.604	44.8	8.95	1.24	92.0	14.54	0.27	20.0	2.34	0.235	17.4	1.68
2/25/91	5	10.6	22	1258	149	1.080	61.7	8.35	0.700	40.0	9.05	2.04	116.6	14.80	0.36	20.6	2.39	0.218	12.5	1.72
3/6/91	9	10.6	11	629	154	1.260	72.0	8.65	0.748	42.8	9.24	1.32	75.5	15.23	0.28	16.0	2.47	0.190	10.9	1.77
3/11/91	5	10.6	18	1029	156	1.210	69.2	8.83	0.560	32.0	9.33	1.56	89.2	15.44	0.30	17.2	2.51	0.160	9.1	1.79
3/20/91	9	10.6	16	915	160	0.937	53.6	9.10	0.555	31.7	9.48	1.44	82.3	15.83	0.23	13.1	2.58	0.160	9.1	1.83
3/25/91	5	11.5	19	1175	163	0.665	41.1	9.22	0.550	34.0	9.56	1.76	108.9	16.06	0.25	15.5	2.62	0.218	13.5	1.86
4/3/91	9	11.9	11	675	167	0.794	51.0	9.43	0.639	41.0	9.73	1.44	92.5	16.52	0.21	13.5	2.68	0.120	7.7	1.91
4/8/91	5	10.6	24	1372	169	0.857	49.0	9.55	0.541	30.9	9.82	1.64	93.8	16.75	0.24	13.7	2.71	0.128	7.3	1.93
4/17/91	9	11.5	14	835	174	0.570	35.3	9.74	0.580	35.9	9.97	0.91	56.3	17.09	0.15	9.3	2.77	0.104	6.4	1.96
4/22/91	5	13.2	14	998	177	0.662	47.2	9.85	0.536	38.2	10.06	0.83	59.1	17.23	0.20	14.3	2.80	0.122	8.7	1.98
5/1/91	9	13.8	22	1632	183	0.534	39.6	10.04	0.576	42.7	10.24	0.78	57.8	17.50	0.14	10.4	2.85	0.111	8.2	2.02
5/6/91	5	13.3	21	1504	186	0.419	30.0	10.13	0.666	47.7	10.36	1.12	80.2	17.67	0.14	10.0	2.88	0.066	4.7	2.03
5/15/91	9	14.7	18	1426	193	0.539	42.7	10.29	0.625	49.5	10.57	1.33	105.4	18.09	0.19	15.1	2.93	0.093	7.4	2.06
5/20/91	5	13.3	12	860	196	1.150	82.4	10.45	0.544	39.0	10.69	1.48	106.0	18.35	0.19	13.6	2.97	0.125	9.0	2.08
5/29/91	9	13.3	22	1576	201	0.615	44.1	10.73	0.462	33.1	10.85	0.93	66.6	18.74	0.14	10.0	3.02	0.036	2.6	2.11
6/3/91	5	12.8	24	1660	205	0.735	50.8	10.85	0.431	29.8	10.93	1.31	90.6	18.93	0.17	11.8	3.05	0.013	0.9	2.11
6/12/91	9	12.4	16	1047	212	0.895	59.7	11.10	0.451	30.1	11.06	2.42	161.3	19.50	0.21	14.0	3.11	0.092	6.1	2.13
6/17/91	5	13.3	18	1289	214	0.437	31.3	11.21	0.444	31.8	11.14	2.62	187.7	19.94	0.27	19.3	3.15	0.061	4.4	2.14
6/26/91	9	12.8	12	830	219	1.110	76.8	11.46	0.655	45.3	11.31	1.60	110.6	20.61	0.36	24.9	3.25	0.480	33.2	2.22
6/26/91	0	12.8	12	830	219	1.110	76.8	11.46	0.655	45.3	11.31	1.60	110.6	20.61	0.36	24.9	3.25	0.480	33.2	2.22
7/1/91	5	12.8	14	968	221	0.425	29.4	11.59	0.518	35.8	11.41	0.77	53.2	20.81	0.12	8.3	3.29	0.070	4.8	2.27
7/10/91	9	13.3	18	1289	227	0.724	51.9	11.77	0.717	51.4	11.61	1.05	75.2	21.10	0.15	10.7	3.33	0.111	8.0	2.30
7/15/91	5	13.3	10	716	229	0.679	48.6	11.90	0.732	52.4	11.74	1.20	86.0	21.30	0.15	10.7	3.36	0.073	5.2	2.32
Totals					229			11.90			11.74			21.30			3.36			2.32

### FH38S

6/27/90		300	6	9709		0.552	893		0.735	1189		0.90	1456		0.17	275.1		0.128	207.1	
7/2/90	5	298	6	9644	24	0.498	800	2.1	0.763	1226	3.0	0.92	1479	3.7	0.17	273.2	0.69	0.098	157.5	0.46



## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q \* C 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
			mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
7/11/90	9	297	6	9612	68	0.537	860	5.9	0.761	1219	8.5	1.01	1618	10.6	0.16	256.3	1.88	0.099	158.6	1.17
7/16/90	5	298	10	16062	100	0.540	867	8.0	0.771	1238	11.6	0.96	1542	14.6	0.24	385.5	2.68	0.107	171.9	1.58
7/25/90	9	297	6	9612	157	0.566	907	12.0	0.809	1296	17.3	0.97	1554	21.6	0.17	272.3	4.16	0.136	217.9	2.46
7/30/90	5	298	10	16062	189	0.485	779	14.1	0.806	1295	20.5	0.99	1590	25.5	0.16	257.0	4.82	0.112	179.9	2.95
8/8/90	9	298	14	22487	276	0.581	933	18.0	0.765	1229	26.2	1.04	1670	32.8	0.16	257.0	5.98	0.110	176.7	3.76
8/13/90	5	298	8	12850	320	0.535	859	20.2	0.762	1224	29.3	1.43	2297	37.8	0.23	369.4	6.76	0.119	191.1	4.22
8/22/90	9	297	6	9451	371	0.544	871	24.1	0.810	1298	35.0	1.05	1682	46.7	0.14	224.3	8.10	0.108	173.0	5.04
8/27/90	5	297	4	6401	390	0.695	1112	26.6	0.831	1330	38.2	0.90	1440	50.6	0.16	256.0	8.70	0.123	196.8	5.50
9/5/90	9	297	8	12801	434	0.585	936	31.2	0.805	1288	44.1	1.14	1824	58.0	0.18	288.0	9.92	0.119	190.4	6.37
9/10/90	5	297	12	19202	474	0.482	771	33.3	0.834	1335	47.4	1.22	1952	62.7	0.23	368.0	10.74	0.150	240.0	6.91
9/18/90	8	297	2	3200	518	0.700	1120	37.1	0.800	1280	52.6	0.86	1376	69.4	0.15	240.0	11.96	0.124	198.4	7.78
9/24/90	6	300	3	4854	530	0.536	867	40.1	0.867	1403	56.7	0.89	1440	73.6	0.12	194.2	12.61	0.099	160.2	8.32
10/3/90	9	300	6	9709	563	0.652	1055	44.4	0.830	1343	62.8	0.84	1359	79.9	0.20	323.6	13.77	0.111	179.6	9.09
10/8/90	5	300	9	14563	594	0.553	895	46.8	0.877	1419	66.3	0.52	841	82.6	0.08	129.4	14.34	0.095	153.7	9.50
10/16/90	8	300	10	16181	655	0.540	874	50.4	0.851	1377	71.9	1.22	1974	88.3	0.15	242.7	15.08	0.137	221.7	10.25
10/22/90	6	300	2	3236	684	0.664	1074	53.3	0.886	1434	76.1	1.13	1828	94.0	0.16	258.9	15.84	0.128	207.1	10.90
10/31/90	9	298	5	8037	710	0.569	915	57.8	0.961	1545	82.8	0.95	1527	101.5	0.13	209.0	16.89	0.124	199.3	11.81
11/5/90	5	300	8	12945	736	0.529	856	60.0	0.818	1324	86.4	0.80	1294	105.0	0.13	210.4	17.41	0.111	179.6	12.29
11/14/90	9	300	5	8091	783	0.667	1079	64.4	0.853	1380	92.5	1.14	1845	112.1	0.17	275.1	18.51	0.103	166.7	13.06
11/19/90	5	297	1	1602	795	0.665	1065	67.0	0.938	1503	96.1	1.15	1842	116.7	0.15	240.3	19.15	0.101	161.8	13.48
11/28/90	9	296	6	9579	820	0.755	1205	72.1	0.861	1375	102.5	0.98	1565	124.4	0.16	255.4	20.27	0.100	159.7	14.20
12/3/90	5	300	4	6472	840	0.652	1055	75.0	0.884	1430	106.1	1.01	1634	128.4	0.14	226.5	20.87	0.095	153.7	14.59
12/12/90	9	298	7	1607	859	0.452	727	79.0	0.886	1424	112.5	0.81	1302	135.0	0.14	225.0	21.88	0.098	157.5	15.29
12/17/90	5	300	4	6472	869	0.601	972	81.1	0.892	1443	116.1	0.86	1392	138.3	0.10	161.8	22.37	0.089	144.0	15.67
1/9/91	23	200	10	10787	968	0.518	559	89.9	0.876	945	129.8	0.72	777	150.8	0.10	107.9	23.92	0.100	107.9	17.12
1/14/91	5	225	5	6068	989	0.524	636	91.4	0.880	1068	132.3	0.86	1044	153.1	0.11	133.5	24.22	0.102	123.8	17.41
1/23/91	9	300	4	6472	1017	0.478	773	94.6	0.859	1390	137.8	0.54	874	157.4	0.10	161.8	24.88	0.090	145.6	18.01
1/28/91	5	300	4	6472	1033	0.443	717	96.4	0.868	1405	141.3	0.67	1084	159.9	0.08	129.4	25.25	0.096	155.3	18.39
2/6/91	9	298	2	3215	1055	0.424	682	99.6	0.870	1398	147.6	0.67	1077	164.7	0.10	160.7	25.90	0.099	159.1	19.10
2/11/91	5	300	6	9709	1071	0.301	487	101.0	0.878	1421	151.2	0.76	1230	167.6	0.15	242.7	26.41	0.098	158.6	19.49
2/20/91	9	300	2	3236	1101	0.494	799	103.9	0.863	1396	157.5	0.42	680	171.9	0.10	161.8	27.32	0.107	173.1	20.24
2/25/91	5	300	10	16181	1125	0.620	1003	106.2	0.848	1372	161.0	0.68	1100	174.1	0.22	356.0	27.96	0.094	152.1	20.65
3/6/91	9	298	5	8037	1179	0.745	1197	111.1	0.988	1588	167.6	0.82	1318	179.6	0.15	241.1	29.31	0.117	188.1	21.41
3/11/91	5	300	6	9709	1201	0.684	1107	114.0	0.813	1316	171.2	1.03	1667	183.3	0.19	307.4	29.99	0.104	168.3	21.86

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
3/20/91	9	300	10	16181	1260	0.477	772	118.2	0.805	1303	177.1	0.94	1521	190.5	0.18	291.3	31.34	0.095	153.7	22.58
3/25/91	5	300	10	16181	1300	0.565	914	120.4	0.793	1283	180.4	0.91	1472	194.2	0.11	178.0	31.93	0.108	174.8	22.99
4/3/91	9	300	3	4045	1346	0.537	869	124.4	0.819	1325	186.2	0.77	1246	200.3	0.13	210.4	32.80	0.087	140.8	23.70
4/8/91	5	300	5	8091	1361	0.475	769	126.4	0.752	1217	189.4	1.12	1812	204.1	0.12	194.2	33.30	0.106	171.5	24.09
4/17/91	9	300	4	6472	1394	0.481	778	129.9	0.802	1298	195.1	0.93	1505	211.6	0.20	323.6	34.47	0.100	161.8	24.84
4/22/91	5	298	4	6429	1410	0.692	1112	132.3	0.795	1278	198.3	0.78	1254	215.1	0.13	209.0	35.14	0.102	163.9	25.25
5/1/91	9	300	3	4854	1435	0.487	788	136.5	0.729	1180	203.8	0.98	1586	221.4	0.19	307.4	36.30	0.099	160.2	25.98
5/6/91	5	290	4	6257	1449	0.478	748	138.4	0.747	1168	206.8	1.07	1674	225.5	0.16	250.3	36.99	0.109	170.5	26.39
5/15/91	9	296	4	6386	1477	0.443	707	141.7	0.809	1292	212.3	1.12	1788	233.3	0.19	303.3	38.24	0.079	126.1	27.06
5/20/91	5	295	8	12729	1501	0.714	1136	144.0	0.727	1157	215.4	0.86	1368	237.3	0.13	206.8	38.88	0.098	155.9	27.41
5/29/91	9	296	2	3193	1537	0.532	849	148.5	0.752	1201	220.7	0.72	1150	242.9	0.11	175.6	39.74	0.054	86.2	27.96
6/3/91	5	300	7	11327	1555	0.535	866	150.6	0.661	1070	223.5	1.00	1618	246.4	0.19	307.4	40.34	0.085	137.5	28.24
6/12/91	9	300	1	1618	1584	0.541	875	154.6	0.751	1215	228.6	0.99	1602	253.6	0.11	178.0	41.43	0.089	144.0	28.87
6/17/91	5	300	4	6472	1595	0.481	778	156.6	<i>0.814</i>	1317	231.8	1.37	2217	258.4	0.25	404.5	42.16	0.092	148.9	29.24
6/26/91	9	300	4	6472	1624	0.502	812	160.2	0.760	1230	237.5	0.65	1052	265.8	0.14	226.5	43.58	0.072	116.5	29.83
7/1/91	5	280	5	7551	1641	0.409	618	162.0	0.744	1124	240.5	0.73	1102	268.4	0.16	241.6	44.17	0.111	167.6	30.19
7/10/91	9	300	4	6472	1673	0.572	926	165.5	0.763	1235	245.8	0.94	1521	274.3	0.14	226.5	45.22	0.102	165.0	30.94
7/15/91	5	300	5	8091	1691	0.547	885	167.7	0.772	1249	248.9	0.94	1521	278.2	0.20	323.6	45.91	0.118	190.9	31.38
Totals					1691			167.7			248.9			278.2			45.91			31.38

### FH46N

6/27/90		15.3	6	494		0.103	8.5		0.023	1.9		0.66	54.3		0.07	5.8		0.044	3.6	
7/2/90	5	11.6	26	1627	3	0.013	0.8	0.01	<i>0.003</i>	0.2	0.00	0.79	49.4	0.13	0.08	5.0	0.01	0.015	0.9	0.01
7/11/90	9	9.2	14	695	8	<i>0.003</i>	0.1	0.01	<i>0.003</i>	0.1	0.00	0.59	29.3	0.31	0.06	3.0	0.03	0.008	0.4	0.01
7/16/90	5	12.2	34	2245	12	0.022	1.5	0.02	0.005	0.3	0.00	0.98	64.7	0.42	0.13	8.6	0.05	0.049	3.2	0.01
7/25/90	9	7.4	34	1359	20	0.014	0.6	0.02	<i>0.003</i>	0.1	0.00	0.84	33.6	0.65	0.09	3.6	0.07	0.022	0.9	0.02
7/30/90	5	8.0	16	690	22	0.023	1.0	0.02	<i>0.003</i>	0.1	0.00	0.82	35.3	0.73	0.05	2.2	0.08	0.036	1.6	0.03
8/13/90	14	12.6	22	1495	30	0.035	2.4	0.03	<i>0.003</i>	0.2	0.01	0.91	61.8	1.07	0.09	6.1	0.11	0.022	1.5	0.04
8/22/90	9	12.9	30	2079	38	0.033	2.3	0.04	<i>0.003</i>	0.2	0.01	0.73	50.6	1.32	0.07	4.9	0.13	0.017	1.2	0.04
8/27/90	5	15.3	24	1979	43	0.108	8.9	0.06	<i>0.003</i>	0.2	0.01	0.68	56.1	1.46	0.05	4.1	0.15	0.022	1.8	0.05
9/5/90	9	43.5	17	3990	56	0.098	23.0	0.13	0.031	7.3	0.02	0.73	171.4	1.97	0.06	14.1	0.19	0.019	4.5	0.06
9/10/90	5	17.0	16	1467	63	0.039	3.6	0.16	<i>0.003</i>	0.2	0.03	0.74	67.9	2.27	<i>0.03</i>	2.3	0.21	0.013	1.2	0.07
9/19/90	9	14.3	21	1623	70	0.130	10.0	0.19	0.030	2.3	0.04	0.75	58.0	2.55	0.05	3.9	0.22	0.017	1.3	0.07
9/24/90	5	19.2	14	1451	74	0.017	1.8	0.21	0.063	6.5	0.05	0.56	58.1	2.70	0.05	5.2	0.23	0.016	1.7	0.08

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg/1,000,000mg} * 2.205\text{lb/kg} * 28.3171\text{cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
10/3/90	9	26.5	20	2859	84	0.040	5.7	0.23	0.169	24.2	0.12	0.62	88.6	3.03	0.06	8.6	0.26	0.011	1.6	0.08
10/8/90	5	25.5	15	2063	90	0.034	4.7	0.24	0.384	52.8	0.22	<b>0.03</b>	3.4	3.14	<b>0.03</b>	3.4	0.28	0.048	6.6	0.09
10/16/90	8	19.7	10	1061	96	0.031	3.3	0.25	0.457	48.5	0.42	0.22	23.3	3.20	<b>0.03</b>	2.7	0.29	0.022	2.3	0.11
10/22/90	6	29.7	14	2243	101	0.010	1.6	0.26	0.521	83.5	0.62	0.63	101.0	3.38	<b>0.03</b>	4.0	0.30	0.017	2.7	0.12
10/30/90	8	30.6	15	2477	111	0.062	10.2	0.29	0.475	78.4	0.94	0.44	72.6	3.73	<b>0.03</b>	4.1	0.32	0.027	4.5	0.13
11/5/90	6	35.9	15	2905	119	0.137	26.5	0.34	0.639	123.8	1.24	0.66	127.8	4.03	<b>0.03</b>	4.8	0.33	0.020	3.9	0.15
11/13/90	8	45.4	11	2696	130	0.104	25.5	0.44	0.783	191.9	1.87	0.71	174.0	4.63	0.12	29.4	0.40	0.023	5.6	0.17
11/19/90	6	38.7	8	1670	136	0.125	26.1	0.52	0.798	166.6	2.41	0.76	158.6	5.13	<b>0.03</b>	5.2	0.45	0.029	6.1	0.18
11/27/90	8	50.5	15	4084	148	0.205	55.8	0.69	0.804	218.9	3.18	0.48	130.7	5.71	0.07	19.1	0.50	0.032	8.7	0.21
12/3/90	6	45.8	7	1729	157	0.199	49.2	0.84	0.847	209.2	3.83	0.45	111.2	6.07	0.07	17.3	0.55	0.043	10.6	0.24
12/11/90	8	33.1	12	2143	164	<i>0.110</i>	19.6	0.98	0.754	134.7	4.51	0.48	85.7	6.47	0.08	14.3	0.62	0.046	8.2	0.28
12/17/90	6	36.4	7	1374	170	0.217	42.6	1.07	0.847	166.2	4.96	0.45	88.3	6.73	0.07	13.7	0.66	0.063	12.4	0.31
1/8/91	22	10.0	16	865	182	0.243	13.1	1.38	0.761	41.1	6.10	0.40	21.6	7.33	0.12	6.5	0.77	0.059	3.2	0.40
1/23/91	15	12.3	13	865	188	0.278	18.5	1.50	0.962	64.0	6.50	0.55	36.6	7.55	<b>0.03</b>	1.7	0.80	0.067	4.5	0.42
1/28/91	5	39.4	13	2764	193	0.176	37.4	1.57	0.852	181.2	6.81	0.40	85.0	7.70	<b>0.03</b>	5.3	0.81	0.059	12.5	0.45
2/6/91	9	46.7	14	3526	207	0.231	58.2	1.78	0.759	191.1	7.64	0.32	80.6	8.08	0.08	20.1	0.87	0.057	14.4	0.51
2/11/91	5	37.8	0	82	212	0.068	13.9	1.87	0.723	147.4	8.07	0.51	104.0	8.31	0.09	18.3	0.91	0.046	9.4	0.54
2/20/91	9	35.4	12	2291	217	0.099	18.9	1.95	0.646	123.3	8.68	0.33	63.0	8.68	<b>0.03</b>	4.8	0.97	0.033	6.3	0.57
2/25/91	5	34.5	18	3350	224	0.053	9.9	1.98	0.638	118.8	8.98	0.43	80.0	8.86	0.07	13.0	0.99	0.029	5.4	0.59
3/6/91	9	33.9	15	2740	238	0.281	51.3	2.12	0.806	147.2	9.58	0.40	73.1	9.21	0.08	14.6	1.05	0.042	7.7	0.61
3/11/91	5	34.1	24	4419	247	0.091	16.8	2.21	0.632	116.4	9.91	0.73	134.4	9.47	0.13	23.9	1.10	0.009	1.7	0.63
3/20/91	9	38.6	10	2080	261	0.072	15.0	2.28	0.540	112.3	10.42	0.64	133.1	10.07	0.12	25.0	1.21	0.010	2.1	0.63
3/25/91	5	31.7	18	3075	268	0.076	13.0	2.31	0.402	68.7	10.65	0.97	165.7	10.44	0.12	20.5	1.27	0.008	1.4	0.64
4/3/91	9	29.4	32	5081	286	0.114	18.1	2.38	0.142	22.5	10.85	0.77	122.3	11.09	0.11	17.5	1.35	0.054	8.6	0.66
4/8/91	5	31.3	27	4558	298	0.090	15.2	2.42	0.237	40.0	10.93	1.03	173.9	11.46	0.10	16.9	1.39	0.006	1.0	0.67
4/17/91	9	26.3	21	2978	315	0.074	10.5	2.48	0.253	35.9	11.10	0.22	31.2	11.92	0.05	7.1	1.45	0.008	1.1	0.68
4/22/91	5	25.3	20	2725	322	0.065	8.9	2.51	0.098	13.4	11.16	0.78	106.3	12.09	0.11	15.0	1.48	0.012	1.6	0.68
5/1/91	9	25.5	17	2335	334	<i>0.110</i>	15.1	2.56	0.419	57.6	11.32	0.55	75.6	12.50	0.11	15.1	1.54	0.020	2.7	0.69
5/6/91	5	25.9	13	1816	339	0.061	8.5	2.59	0.324	45.3	11.45	0.60	83.8	12.70	0.06	8.4	1.57	0.020	2.8	0.70
5/15/91	9	29.3	30	4741	354	0.046	7.3	2.63	0.092	14.5	11.58	0.33	52.2	13.01	0.06	9.5	1.61	<b>0.003</b>	0.4	0.71
5/20/91	5	30.3	28	4581	365	0.029	4.7	2.64	0.158	25.8	11.64	0.83	135.8	13.24	0.09	14.7	1.64	0.006	1.0	0.71
5/29/91	9	19.5	25	2631	381	<b>0.003</b>	0.3	2.65	0.071	7.5	11.71	0.39	41.0	13.64	<b>0.03</b>	2.6	1.68	0.051	5.4	0.72
6/3/91	5	20.0	20	2160	387	0.036	3.9	2.66	<b>0.003</b>	0.3	11.72	0.31	33.5	13.73	<b>0.03</b>	2.7	1.69	<b>0.003</b>	0.3	0.73
6/12/91	9	15.8	25	2126	397	0.067	5.7	2.68	<b>0.003</b>	0.2	11.72	0.99	84.2	14.00	0.11	9.4	1.72	<b>0.003</b>	0.2	0.73

## Middle Snake River Water Quality Survey Loading Computations

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$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
6/17/91	5	17.7	27	2575	403	0.034	3.2	2.69	0.021	2.0	11.72	1.26	120.2	14.25	<i>0.09</i>	8.6	1.74	0.007	0.7	0.73
6/26/91	9	13.0	6	420	410	0.153	10.7	2.72	0.111	7.8	11.75	0.67	46.9	14.63	0.11	7.7	1.78	0.027	1.9	0.74
7/15/91	19	10.5	13	737	415	0.049	2.8	2.79	<i>0.003</i>	0.1	11.78	0.85	48.2	15.08	0.16	9.1	1.85	0.034	1.9	0.75
Totals					415			2.79			11.78			15.08			1.85			0.75

FH48N																				
6/27/90		34.6	4	747		0.419	78.2		1.250	233.3		0.80	149.3		0.12	22.4		0.096	17.9	
7/2/90	5	35.7	4	769	2	0.267	51.3	0.16	1.310	251.9	0.61	0.50	96.1	0.31	0.08	15.4	0.05	0.095	18.3	0.05
7/11/90	9	33.9	<i>1</i>	183	4	0.201	36.8	0.36	1.360	248.8	1.73	0.41	75.0	0.69	0.07	12.8	0.11	0.075	13.7	0.12
7/16/90	5	36.0	4	777	5	0.258	50.1	0.47	1.340	260.2	2.37	0.50	97.1	0.91	0.08	15.5	0.15	0.099	19.2	0.16
7/25/90	9	26.4	6	854	9	0.394	56.1	0.71	1.330	189.4	3.38	0.65	92.6	1.33	0.12	17.1	0.22	0.124	17.7	0.24
7/30/90	5	35.7	<i>1</i>	192	10	0.237	45.6	0.83	1.100	211.5	3.88	0.53	101.9	1.58	0.07	13.5	0.26	0.075	14.4	0.28
8/8/90	9	36.7	8	1584	14	0.447	88.5	1.14	1.210	239.5	4.90	0.82	162.3	2.17	0.14	27.7	0.35	0.099	19.6	0.36
8/13/90	5	36.4	8	1568	18	0.283	55.5	1.32	1.200	235.3	5.49	0.44	86.3	2.48	0.09	17.6	0.41	0.102	20.0	0.41
8/22/90	9	37.4	<i>4</i>	888	24	0.411	82.9	1.63	1.320	266.3	6.62	0.75	151.3	3.02	0.19	38.3	0.53	0.144	29.0	0.52
8/27/90	5	37.8	8	1629	27	0.436	88.8	1.84	1.360	277.0	7.30	0.66	134.4	3.37	0.10	20.4	0.61	0.095	19.3	0.58
9/5/90	9	36.7	12	2375	36	0.439	86.9	2.24	1.260	249.4	8.48	0.93	184.1	4.09	0.23	45.5	0.75	0.128	25.3	0.68
9/10/90	5	35.7	8	1538	41	0.182	35.0	2.39	1.220	234.6	9.09	0.42	80.8	4.42	0.06	11.5	0.83	0.082	15.8	0.73
9/19/90	9	35.7	1	192	45	0.376	72.3	2.63	1.170	225.0	10.12	0.59	113.4	4.86	0.12	23.1	0.90	0.103	19.8	0.81
9/24/90	5	36.4	3	588	46	0.207	40.6	2.77	1.450	284.3	10.76	0.36	70.6	5.09	0.07	13.7	0.95	0.087	17.1	0.86
10/3/90	9	35.0	1	189	47	0.367	69.2	3.02	1.560	294.1	12.06	0.54	101.8	5.48	0.11	20.7	1.03	0.108	20.4	0.94
10/8/90	5	33.6	6	1087	49	0.301	54.5	3.17	1.460	264.4	12.76	0.40	72.4	5.69	0.07	12.7	1.07	0.082	14.9	0.98
10/17/90	9	33.6	2	362	52	0.372	67.4	3.45	1.370	248.1	13.91	0.76	137.7	6.17	0.10	18.1	1.14	0.121	21.9	1.07
10/22/90	5	32.9	<i>1</i>	177	53	0.196	34.8	3.58	1.350	239.6	14.52	0.53	94.1	6.46	0.10	17.7	1.18	0.108	19.2	1.12
10/31/90	9	32.6	2	351	54	0.239	42.0	3.75	1.520	266.9	15.66	0.53	93.1	6.88	0.11	19.3	1.27	0.122	21.4	1.21
11/5/90	5	32.2	5	869	56	0.217	37.7	3.85	1.460	253.8	16.31	0.50	86.9	7.10	0.08	13.9	1.31	0.091	15.8	1.26
11/14/90	9	32.6	3	527	59	0.514	90.3	4.14	1.420	249.4	17.44	0.59	103.6	7.53	0.15	26.3	1.40	0.138	24.2	1.35
11/19/90	5	31.6	3	511	60	0.380	64.7	4.33	1.500	255.3	18.07	0.56	95.3	7.78	0.10	17.0	1.45	0.101	17.2	1.40
11/28/90	9	33.9	6	1098	64	0.585	107.0	4.72	1.276	233.5	19.17	0.72	131.7	8.29	0.13	23.8	1.54	0.124	22.7	1.49
12/3/90	5	29.6	3	479	66	0.349	55.7	4.92	1.420	226.6	19.75	0.50	79.8	8.56	0.08	12.8	1.59	0.088	14.0	1.53
12/12/90	9	28.9	8	1249	70	0.332	51.8	5.16	1.400	218.5	20.75	0.50	78.0	8.91	0.14	21.9	1.67	0.116	18.1	1.61
12/17/90	5	28.9	3	468	72	0.296	46.2	5.28	1.550	241.9	21.33	0.43	67.1	9.09	0.08	12.5	1.71	0.108	16.9	1.65
1/9/91	23	21.3	10	1149	81	0.269	30.9	5.73	1.400	160.8	23.64	0.74	85.0	9.97	0.13	14.9	1.87	0.116	13.3	1.82
1/14/91	5	22.4	<i>1</i>	121	83	0.162	19.5	5.79	1.290	155.5	24.04	0.27	32.5	10.11	<i>0.03</i>	3.0	1.89	0.077	9.3	1.85

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
1/23/91	9	22.2	3	359	84	0.398	47.6	5.94	1.390	166.2	24.76	0.47	56.2	10.31	0.13	15.5	1.93	0.122	14.6	1.91
1/28/91	5	22.8	4	491	85	0.343	42.1	6.05	1.360	167.0	25.18	0.71	87.2	10.49	0.16	19.6	1.98	0.116	14.2	1.94
2/6/91	9	22.2	3	359	87	0.539	64.5	6.29	1.300	155.5	25.90	0.85	101.6	10.92	0.21	25.1	2.08	0.138	16.5	2.01
2/11/91	5	21.6	8	932	88	0.170	19.8	6.40	1.370	159.5	26.30	0.47	54.7	11.11	0.09	10.5	2.12	0.102	11.9	2.05
2/20/91	9	21.9	2	236	91	0.670	79.1	6.62	1.290	152.2	27.00	0.83	98.0	11.46	0.16	18.9	2.19	0.150	17.7	2.11
2/25/91	5	21.6	10	1165	93	0.318	37.0	6.77	1.280	149.1	27.37	0.32	37.3	11.63	0.09	10.5	2.23	0.088	10.2	2.15
3/6/91	9	24.6	4	530	96	0.813	107.7	7.09	1.490	197.4	28.15	0.79	104.7	11.94	0.08	10.6	2.27	0.082	10.9	2.20
3/11/91	5	24.6	1	132	97	0.392	51.9	7.29	1.150	152.3	28.59	0.55	72.9	12.17	0.10	13.2	2.30	0.092	12.2	2.22
3/20/91	9	25.2	4	543	99	0.156	21.2	7.46	1.240	168.3	29.31	0.54	73.3	12.50	0.14	19.0	2.37	0.106	14.4	2.28
3/25/91	5	24.9	2	268	100	0.384	51.5	7.55	1.230	164.9	29.73	0.69	92.5	12.70	0.16	21.5	2.43	0.101	13.5	2.32
4/3/91	9	23.4	5	567	102	0.485	61.1	7.80	1.060	133.5	30.40	0.73	91.9	13.12	0.14	17.6	2.51	0.116	14.6	2.38
4/8/91	5	25.8	2	278	103	0.176	24.5	7.91	1.210	168.3	30.78	0.44	61.2	13.31	0.10	13.9	2.55	0.080	11.1	2.41
4/17/91	9	27.0	2	292	104	0.421	61.4	8.10	1.240	180.8	31.56	0.99	144.3	13.77	0.13	19.0	2.63	0.113	16.5	2.48
4/22/91	5	27.7	1	75	104	0.333	49.7	8.24	1.190	177.5	32.01	0.48	71.6	14.04	0.08	11.9	2.67	0.089	13.3	2.51
5/1/91	9	26.7	3	432	106	0.544	78.4	8.53	1.050	151.3	32.75	1.00	144.1	14.53	0.22	31.7	2.76	0.160	23.1	2.60
5/6/91	5	28.0	1	151	106	0.350	52.8	8.69	1.060	160.0	33.14	0.53	80.0	14.81	0.11	16.6	2.82	0.094	14.2	2.64
5/15/91	9	29.3	2	316	107	0.563	88.9	9.01	1.170	184.6	33.92	0.89	140.5	15.30	0.17	26.8	2.92	0.110	17.4	2.71
5/20/91	5	29.6	3	479	108	0.467	74.5	9.21	1.120	178.7	34.37	0.83	132.4	15.64	0.12	19.1	2.98	0.075	12.0	2.75
5/29/91	9	30.2	3	489	111	0.777	126.7	9.67	1.110	181.0	35.18	0.96	156.6	16.29	0.17	27.7	3.08	0.078	12.7	2.81
6/3/91	5	29.9	2	323	112	0.355	57.3	9.90	1.280	206.5	35.66	0.43	69.4	16.58	0.08	12.9	3.14	0.078	12.6	2.84
6/12/91	9	29.9	1	81	112	0.600	96.8	10.24	1.270	204.9	36.59	0.81	130.7	17.03	0.12	19.4	3.21	0.114	18.4	2.91
6/17/91	5	30.9	3	500	113	0.321	53.5	10.43	0.649	108.2	36.98	0.45	75.0	17.28	0.06	10.0	3.24	0.071	11.8	2.94
6/26/91	9	30.6	3	495	115	0.400	66.0	10.70	1.276	210.4	37.70	0.65	107.2	17.69	0.18	29.7	3.33	0.129	21.3	3.02
7/1/91	5	31.9	4	688	117	0.292	50.2	10.85	1.160	199.5	38.21	0.40	68.8	17.91	0.09	15.5	3.39	0.157	27.0	3.08
7/10/91	9	32.2	2	348	119	0.617	107.3	11.20	1.090	189.5	39.09	1.02	177.3	18.47	0.17	29.6	3.49	0.115	20.0	3.18
7/15/91	5	32.9	4	710	121	0.318	56.4	11.40	1.170	207.6	39.58	0.58	102.9	18.82	0.17	30.2	3.57	0.124	22.0	3.24
Totals					121			11.40			39.58			18.82			3.57			3.24

### FH49N

6/27/90		8.2	1	44		0.329	14.5		0.960	42.3		0.81	35.7		0.09	4.0		0.086	3.8	
7/2/90	5	9.4	4	203	0	0.311	15.8	0.04	0.955	48.4	0.11	0.73	37.0	0.09	0.09	4.6	0.01	0.044	2.2	0.01
7/11/90	9	7.7	2	83	1	0.387	16.1	0.11	1.020	42.5	0.32	0.78	32.5	0.25	0.09	3.7	0.03	0.088	3.7	0.02
7/16/90	5	8.5	6	274	1	0.484	22.1	0.16	0.973	44.5	0.43	0.87	39.8	0.34	0.09	4.1	0.04	0.100	4.6	0.03
7/25/90	9	8.8	8	379	3	0.412	19.5	0.25	1.000	47.4	0.63	0.66	31.3	0.50	0.11	5.2	0.06	0.115	5.4	0.05

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.3171\text{/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
7/30/90	5	8.1	<i>1</i>	44	3	0.316	13.9	0.29	1.030	45.2	0.75	0.68	29.9	0.57	0.09	4.0	0.07	0.100	4.4	0.07
8/8/90	9	10.2	4	221	4	0.325	17.9	0.36	0.974	53.7	0.97	0.67	37.0	0.72	0.09	5.0	0.09	0.090	5.0	0.09
8/13/90	5	12.5	4	269	5	0.387	26.0	0.42	1.060	71.3	1.13	0.86	57.8	0.84	0.10	6.7	0.11	0.094	6.3	0.10
8/22/90	9	12.0	10	645	7	0.407	26.2	0.54	1.090	70.3	1.45	0.73	47.1	1.08	0.11	7.1	0.14	0.118	7.6	0.13
8/27/90	5	12.0	4	259	8	0.302	19.5	0.59	0.912	59.0	1.61	0.43	27.8	1.17	0.07	4.5	0.15	0.095	6.1	0.15
9/5/90	9	13.0	5	350	9	0.517	36.2	0.72	1.030	72.1	1.90	0.90	63.0	1.38	0.11	7.7	0.18	0.122	8.5	0.18
9/10/90	5	11.9	6	384	10	0.386	24.7	0.80	<i>1.191</i>	76.3	2.09	0.63	40.4	1.51	0.09	5.8	0.20	0.103	6.6	0.20
9/19/90	9	12.6	2	136	11	0.446	30.3	0.92	1.150	78.2	2.44	0.73	49.7	1.71	0.10	6.8	0.22	0.110	7.5	0.23
9/24/90	5	11.9	3	193	12	0.317	20.4	0.98	1.210	77.9	2.63	0.72	46.4	1.83	0.11	7.1	0.24	0.108	7.0	0.25
10/3/90	9	11.6	8	500	13	0.137	8.6	1.05	1.520	94.9	3.02	0.34	21.2	1.98	0.09	5.6	0.27	0.090	5.6	0.28
10/8/90	5	11.2	7	424	14	0.321	19.4	1.08	1.270	76.9	3.24	0.38	23.0	2.04	0.11	6.7	0.29	0.103	6.2	0.29
10/17/90	9	14.4	7	544	17	0.343	26.7	1.19	<i>1.191</i>	92.6	3.62	0.43	33.4	2.16	0.10	7.8	0.32	0.128	9.9	0.33
10/22/90	5	14.0	2	151	17	0.365	27.6	1.25	1.180	89.4	3.84	0.87	65.9	2.29	0.12	9.1	0.34	0.124	9.4	0.36
10/31/90	9	13.5	5	364	19	0.152	11.1	1.34	1.610	117.1	4.31	0.55	40.0	2.53	0.09	6.5	0.37	0.078	5.7	0.39
11/5/90	5	11.7	9	569	20	0.396	25.0	1.39	1.270	80.3	4.56	0.79	49.9	2.64	0.15	9.5	0.39	0.131	8.3	0.41
11/14/90	9	8.6	5	233	22	0.268	12.5	1.47	1.450	67.5	4.89	0.27	12.6	2.78	0.10	4.7	0.43	0.101	4.7	0.44
11/19/90	5	11.3	7	425	22	0.262	15.9	1.51	1.280	77.7	5.07	0.61	37.0	2.84	0.12	7.3	0.44	0.103	6.2	0.45
11/28/90	9	10.5	11	625	25	0.371	21.1	1.59	1.230	69.9	5.40	0.69	39.2	3.01	0.15	8.5	0.48	0.102	5.8	0.48
12/3/90	5	10.9	13	763	26	0.211	12.4	1.63	1.200	70.4	5.58	0.62	36.4	3.11	0.13	7.6	0.50	0.094	5.5	0.49
12/12/90	9	10.4	5	280	29	0.264	14.8	1.69	1.160	64.9	5.88	0.60	33.6	3.26	0.13	7.3	0.53	0.107	6.0	0.52
12/17/90	5	10.6	15	854	30	0.418	23.8	1.74	1.210	68.9	6.05	0.81	46.1	3.36	0.12	6.8	0.55	0.094	5.3	0.53
1/9/91	23	9.4	9	472	38	0.215	10.9	1.94	1.120	56.8	6.77	1.27	64.4	4.00	<i>0.14</i>	7.2	0.63	0.154	7.8	0.61
1/14/91	5	10.4	16	898	40	0.324	18.2	1.98	1.170	65.7	6.92	0.67	37.6	4.13	0.14	7.9	0.65	0.109	6.1	0.62
1/23/91	9	9.8	9	490	43	0.354	18.6	2.06	1.240	65.3	7.22	0.97	51.1	4.33	0.18	9.5	0.69	0.136	7.2	0.65
1/28/91	5	10.0	33	1781	46	0.329	17.8	2.11	1.160	62.6	7.38	0.88	47.5	4.45	0.16	8.6	0.71	0.131	7.1	0.67
2/6/91	9	9.1	9	441	51	0.422	20.7	2.19	1.180	57.8	7.65	0.65	31.8	4.63	0.22	10.8	0.75	0.129	6.3	0.70
2/11/91	5	9.7	20	1041	52	0.256	13.3	2.23	1.130	58.8	7.80	0.78	40.6	4.72	0.19	9.9	0.78	0.110	5.7	0.72
2/20/91	9	9.4	18	914	57	0.475	24.1	2.32	1.110	56.3	8.05	0.46	23.3	4.86	0.12	6.1	0.81	0.145	7.4	0.75
2/25/91	5	9.5	18	925	59	0.604	31.0	2.39	<i>1.191</i>	61.2	8.20	0.95	48.8	4.95	0.19	9.8	0.83	0.128	6.6	0.76
3/6/91	9	9.3	10	500	62	0.614	30.7	2.53	1.410	70.5	8.50	0.61	30.5	5.13	0.12	6.0	0.87	0.128	6.4	0.79
3/11/91	5	9.1	10	491	64	0.485	23.8	2.59	1.150	56.4	8.66	0.89	43.7	5.22	0.18	8.8	0.89	0.126	6.2	0.81
3/20/91	9	8.8	16	759	66	0.424	20.1	2.69	1.140	54.1	8.90	0.94	44.6	5.42	0.14	6.6	0.92	0.009	0.4	0.82
3/25/91	5	8.8	2	95	67	0.337	16.0	2.74	1.160	55.1	9.04	1.09	51.7	5.54	0.11	5.2	0.94	0.102	4.8	0.83
4/3/91	9	8.2	16	708	69	0.384	17.0	2.81	0.997	44.1	9.26	0.96	42.5	5.75	0.17	7.5	0.97	0.116	5.1	0.85

## Middle Snake River Water Quality Survey Loading Computations

*Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.*

*Concentrations in italics indicate extreme data value --- Mean Concentration used in place of extreme value.*

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q * C * 5.39$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
			mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
4/8/91	5	8.6	7	300	70	0.263	12.2	2.85	1.100	50.8	9.38	0.75	34.7	5.85	0.13	6.0	0.98	0.100	4.6	0.86
4/17/91	9	7.5	3	101	71	0.586	23.8	2.93	1.120	45.4	9.60	1.23	49.9	6.04	0.16	6.5	1.01	0.124	5.0	0.89
4/22/91	5	6.2	1	33	72	0.408	13.5	2.98	0.960	31.8	9.70	0.85	28.2	6.14	0.16	5.3	1.03	0.128	4.2	0.90
5/1/91	9	5.2	5	141	72	0.484	13.6	3.04	0.900	25.3	9.83	1.16	32.7	6.28	0.23	6.5	1.05	0.150	4.2	0.92
5/6/91	5	7.8	3	126	72	0.367	15.4	3.07	0.991	41.6	9.91	0.86	36.1	6.36	0.15	6.3	1.07	0.125	5.2	0.93
5/15/91	9	8.4	5	226	73	0.807	36.5	3.19	0.945	42.7	10.10	1.04	47.0	6.55	0.20	9.0	1.10	0.118	5.3	0.95
5/20/91	5	9.5	6	307	74	0.771	39.5	3.29	0.979	50.1	10.21	1.34	68.6	6.69	0.15	7.7	1.12	0.120	6.1	0.97
5/29/91	9	8.9	2	96	75	0.819	39.5	3.46	0.867	41.8	10.42	1.22	58.8	6.98	0.13	6.3	1.16	0.071	3.4	0.99
6/3/91	5	10.7	3	172	75	0.757	43.5	3.57	0.931	53.5	10.54	1.22	70.1	7.14	0.16	9.2	1.18	0.125	7.2	1.00
6/12/91	9	11.0	3	178	76	0.659	39.1	3.75	1.060	62.8	10.80	1.55	91.9	7.51	0.18	10.7	1.22	0.142	8.4	1.04
6/17/91	5	9.9	3	161	76	0.433	23.2	3.83	0.636	34.1	10.92	1.65	88.5	7.73	0.28	15.0	1.25	0.109	5.8	1.05
6/26/91	9	9.7	6	314	77	0.765	40.1	3.97	0.718	37.6	11.08	1.12	58.7	8.06	0.23	12.0	1.31	0.118	6.2	1.08
7/1/91	5	10.8	3	174	78	0.541	31.4	4.06	1.020	59.2	11.21	0.72	41.8	8.19	0.15	8.7	1.34	0.117	6.8	1.10
7/10/91	9	9.4	9	455	79	0.708	35.8	4.21	0.762	38.5	11.43	1.14	57.6	8.41	0.20	10.1	1.38	0.085	4.3	1.12
7/15/91	5	8.8	3	142	80	0.542	25.6	4.29	1.110	52.4	11.54	0.91	43.0	8.54	0.17	8.0	1.40	0.129	6.1	1.14
Totals					80			4.29			11.54			8.54			1.40			1.14

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX I

Concurrent Monitoring  
Tributary Stream Nutrient Loadings



## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \cdot 5.39$$

Date	Days	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate			
		Flow cfs	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>TS06N</b>																				
7/3/90		18	18	1748		0.018	1.7		1.820	176.7		0.23	22.3		0.03	2.43		0.015	1.46	
7/17/90	14	18	50	4854	23	0.031	3.0	0.02	1.820	176.7	1.24	0.52	50.5	0.25	0.17	16.50	0.07	0.035	3.40	0.02
7/31/90	14	19	62	6354	62	0.032	3.3	0.04	1.620	166.0	2.44	0.52	53.3	0.62	0.08	8.20	0.15	0.036	3.69	0.04
8/14/90	14	18	24	2330	93	0.040	3.9	0.06	1.680	163.1	3.59	0.29	28.2	0.90	0.05	4.85	0.20	0.043	4.17	0.07
8/28/90	14	19	62	6354	123	0.069	7.1	0.10	1.580	161.9	4.73	0.51	52.3	1.18	0.09	9.22	0.25	0.055	5.64	0.10
9/11/90	14	20	34	3668	158	0.029	3.1	0.14	1.750	188.8	5.95	0.30	32.4	1.48	0.03	2.70	0.29	0.038	4.10	0.14
9/25/90	14	20	10	1079	175	0.024	2.6	0.16	2.030	219.0	7.38	0.16	17.3	1.65	0.03	2.70	0.31	0.037	3.99	0.17
10/9/90	14	21	34	3851	192	0.033	3.7	0.18	1.950	220.9	8.92	0.24	27.2	1.81	0.06	6.80	0.34	0.055	6.23	0.20
10/23/90	14	21	10	1133	210	0.012	1.4	0.20	1.930	218.6	10.46	0.23	26.1	2.00	0.03	2.83	0.38	0.043	4.87	0.24
11/6/90	14	19	10	1025	217	0.092	9.4	0.24	2.180	223.4	12.01	0.10	10.2	2.12	0.03	2.56	0.39	0.033	3.38	0.27
11/20/90	14	18	4	388	222	0.101	9.8	0.30	2.290	222.3	13.57	0.17	16.5	2.22	0.03	2.43	0.41	0.022	2.14	0.29
12/4/90	14	16	2	173	224	0.012	1.0	0.34	2.050	176.9	14.96	0.20	17.3	2.34	0.03	2.16	0.43	0.033	2.85	0.31
1/15/91	42	15	4	324	229	0.015	1.2	0.36	2.210	178.8	18.70	0.16	12.9	2.65	0.03	2.02	0.47	0.030	2.43	0.36
1/29/91	14	14	10	755	233	0.020	1.5	0.37	2.280	172.2	19.93	0.12	9.1	2.73	0.03	1.89	0.49	0.033	2.49	0.38
2/12/91	14	14	2	151	236	0.029	2.2	0.39	2.260	170.7	21.13	0.14	10.6	2.80	0.03	1.89	0.50	0.024	1.81	0.39
2/26/91	14	13	10	701	239	0.105	7.4	0.42	2.360	165.5	22.30	0.12	8.4	2.86	0.03	1.75	0.51	0.022	1.54	0.41
3/12/91	14	13	1	70	242	0.043	3.0	0.46	2.350	164.8	23.46	0.11	7.7	2.92	0.03	1.75	0.52	0.018	1.26	0.42
3/26/91	14	13	2	140	243	0.099	6.9	0.49	2.140	150.1	24.56	0.03	1.8	2.95	0.03	1.75	0.54	0.018	1.26	0.42
4/9/91	14	12	1	65	243	0.003	0.2	0.52	1.890	122.3	25.51	0.77	49.8	3.13	0.03	1.62	0.55	0.015	0.97	0.43
4/23/91	14	13	12	841	246	<i>0.049</i>	3.4	0.53	2.150	150.8	26.47	0.30	21.0	3.38	0.03	1.75	0.56	0.025	1.75	0.44
5/7/91	14	12	71	4595	265	0.049	3.2	0.55	1.600	103.6	27.36	0.53	34.3	3.58	0.15	9.71	0.60	0.026	1.68	0.45
5/21/91	14	15	15	1214	286	0.006	0.5	0.56	2.010	162.6	28.29	0.10	8.1	3.72	0.03	2.02	0.64	0.018	1.46	0.46
6/4/91	14	15	20	1618	296	0.101	8.2	0.60	<i>2.031</i>	164.3	29.44	<i>0.30</i>	24.6	3.84	0.03	2.02	0.65	0.024	1.94	0.48
6/18/91	14	17	13	1192	306	0.033	3.0	0.63	0.661	60.6	30.22	0.19	17.4	3.99	0.07	6.42	0.68	0.023	2.11	0.49
7/2/91	14	17	18	1650	315	0.003	0.2	0.65	1.850	169.6	31.03	0.27	24.8	4.13	0.06	5.50	0.73	0.014	1.28	0.50
7/16/91	14	17	50	4585	337	0.037	3.4	0.66	1.600	146.7	32.14	0.50	45.8	4.38	0.11	10.09	0.78	0.026	2.38	0.52
Totals					337			0.66			32.14		4.38			0.78				0.52

<b>TS19.5S</b>																				
1/21/91		134	46	33331		0.171	123.9		3.210	2325.9		0.71	514.5		0.11	79.7		0.092	66.7	
2/4/91	14	96	38	19676	186	0.060	31.1	0.54	3.160	1636.2	13.87	0.56	290.0	2.82	0.15	77.7	0.55	0.102	52.8	0.42
2/20/91	16	83	30	13430	318	0.149	66.7	0.93	3.040	1360.9	25.86	0.29	129.8	4.49	0.03	11.2	0.91	0.086	38.5	0.78
3/4/91	12	107	26	15021	403	0.153	88.4	1.40	3.660	2114.5	36.28	0.47	271.5	5.70	0.15	86.7	1.20	0.087	50.3	1.05
3/18/91	14	83	38	17012	515	<i>0.132</i>	59.1	1.91	2.970	1329.6	48.34	0.36	161.2	7.21	0.10	44.8	1.66	0.083	37.2	1.36
4/15/91	28	76	25	10203	706	0.078	31.8	2.55	2.100	857.1	63.64	0.46	187.7	9.66	0.13	53.1	2.34	0.051	20.8	1.76
4/29/91	14	153	65	53500	929	0.084	69.4	2.91	0.658	543.3	68.54	0.50	412.8	11.76	0.24	198.1	3.22	0.062	51.2	2.01
5/13/91	14	200	148	159654	1675	0.151	162.9	3.72	1.050	1132.7	74.41	0.82	884.6	16.30	0.26	280.5	4.90	0.076	82.0	2.48

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
5/30/91	17	172	112	103801	2795	0.126	116.8	4.91	1.470	1362.4	85.01	0.65	602.4	22.62	0.18	166.8	6.80	<i>0.086</i>	79.7	3.17
6/10/91	11	215	92	106575	3373	0.067	77.6	5.44	1.270	1471.2	92.81	0.55	637.1	26.03	0.21	243.3	7.93	0.085	98.5	3.66
6/24/91	14	205	55	60769	3959	0.003	2.8	5.72	1.620	1789.9	104.22	0.47	519.3	30.07	0.15	165.7	9.36	0.083	91.7	4.32
7/8/91	14	205	38	41986	4318	0.003	2.8	5.74	1.570	1734.7	116.56	0.59	651.9	34.17	0.10	110.5	10.33	0.065	71.8	4.89
Totals					4318			5.74			116.56			34.17			10.33			4.89

### TS27S

6/26/90		149	50	40183		0.032	25.7		0.797	640.5		0.52	417.9		0.10	80.4		0.039	31.3	
7/11/90	15	85	46	21089	230	0.088	40.3	0.25	2.150	985.7	6.10	0.68	311.8	2.74	0.11	50.4	0.49	0.105	48.1	0.30
7/24/90	13	109	282	165792	837	0.194	114.1	0.75	1.910	1122.9	12.95	1.17	687.9	5.98	0.41	241.0	1.44	0.118	69.4	0.68
8/7/90	14	90	176	85436	1716	0.870	422.3	2.63	1.860	902.9	20.04	0.95	461.2	10.01	0.35	169.9	2.88	0.096	46.6	1.09
8/21/90	14	119	174	111682	2406	0.107	68.7	4.35	2.390	1534.0	28.57	0.83	532.7	13.49	0.28	179.7	4.10	0.104	66.8	1.48
9/3/90	13	119	130	83441	3040	0.391	251.0	5.38	0.998	640.6	35.64	0.91	584.1	17.11	0.17	109.1	5.04	0.077	49.4	1.86
9/18/90	15	204	122	134239	3857	0.086	94.6	6.68	1.620	1782.5	44.72	0.69	759.2	22.15	0.19	209.1	6.23	0.058	63.8	2.28
10/2/90	14	209	100	112729	4721	0.046	51.9	7.19	1.860	2096.8	58.30	0.57	642.6	27.06	0.19	214.2	7.71	0.093	104.8	2.88
10/17/90	15	212	68	77756	5435	0.084	96.1	7.75	1.990	2275.5	74.70	0.27	308.7	30.63	0.14	160.1	9.12	0.089	101.8	3.65
10/30/90	13	196	46	48630	5846	0.070	74.0	8.30	1.740	1839.5	88.07	0.50	528.6	33.35	0.11	116.3	10.01	0.122	129.0	4.40
11/13/90	14	97	16	8371	6046	0.127	66.4	8.79	3.380	1768.4	100.70	0.62	324.4	36.33	0.08	41.9	10.57	0.062	32.4	4.96
11/27/90	14	68	18	6602	6098	0.003	0.9	9.03	4.270	1566.1	112.37	0.56	205.4	38.19	0.09	33.0	10.83	0.074	27.1	5.17
12/11/90	14	58	12	3754	6134	<i>0.136</i>	42.5	9.18	4.360	1364.0	122.63	0.67	209.6	39.64	0.10	31.3	11.06	0.094	29.4	5.37
1/8/91	28	39	26	5469	6199	0.120	25.2	9.65	4.430	931.9	138.70	0.76	159.9	42.23	0.12	25.2	11.45	0.114	24.0	5.74
1/22/91	14	43	24	5566	6238	0.055	12.8	9.79	4.510	1046.0	145.62	0.46	106.7	43.16	0.11	25.5	11.63	0.100	23.2	5.91
2/5/91	14	44	10	2373	6265	0.057	13.5	9.88	3.980	944.5	152.59	0.51	121.0	43.96	0.09	21.4	11.79	0.101	24.0	6.08
2/19/91	14	37	1	200	6274	0.040	8.0	9.95	4.010	800.3	158.69	0.26	51.9	44.56	0.03	5.0	11.88	0.071	14.2	6.21
3/5/91	14	38	6	1230	6279	0.125	25.6	10.07	5.080	1041.2	165.14	0.40	82.0	45.03	0.08	16.4	11.96	0.091	18.7	6.32
3/19/91	14	37	26	5189	6302	0.287	57.3	10.36	4.310	860.1	171.79	0.70	139.7	45.81	0.13	25.9	12.11	0.089	17.8	6.45
4/2/91	14	32	21	3625	6333	0.111	19.2	10.63	3.650	630.0	177.01	0.80	138.1	46.78	0.14	24.2	12.28	0.093	16.1	6.57
4/16/91	14	110	241	142987	6846	0.119	70.6	10.94	0.209	124.0	179.65	0.71	420.1	48.73	0.28	166.1	12.95	0.053	31.4	6.74
4/30/91	14	272	800	#####	11454	0.149	218.6	11.96	0.333	488.5	181.79	0.88	1291.0	54.72	0.66	968.3	16.92	0.053	77.8	7.12
5/14/91	14	217	144	168543	16152	0.010	11.7	12.76	0.528	618.0	185.66	0.66	772.5	61.94	0.21	245.8	21.17	0.047	55.0	7.58
5/28/91	14	114	140	86084	17043	0.168	103.3	13.16	1.430	879.3	190.90	0.59	362.8	65.92	0.26	159.9	22.59	0.060	36.9	7.90
6/11/91	14	183	129	127329	17790	0.113	111.5	13.92	0.732	722.5	196.51	0.87	858.7	70.19	0.30	296.1	24.18	0.067	66.1	8.26
6/25/91	14	119	50	32093	18348	0.098	62.9	14.53	0.003	1.6	199.04	0.55	353.0	74.43	0.16	102.7	25.58	0.087	55.8	8.69
7/9/91	14	110	56	33225	18577	0.245	145.4	15.26	1.770	1050.2	202.73	1.15	682.3	78.06	0.16	94.9	26.27	0.061	36.2	9.01
Totals					18577			15.26			202.73			78.06			26.27			9.01

### TS32N

7/3/90		500	4	10787		0.110	296.7		1.600	4315.0		0.61	1645.1		0.13	350.6		0.098	264.3	
7/17/90	14	546	4	11784	79	0.219	645.2	3.3	1.730	5096.7	32.94	0.64	1885.5	12.4	0.24	707.1	3.70	0.184	542.1	2.82

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.	Conc.	Load	Acc.
			mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons	mg/l	lb/day	tons
7/31/90	14	492	1	2652	130	0.148	392.5	6.9	1.690	4482.0	66.47	0.40	1060.8	22.7	0.11	291.7	7.20	0.098	259.9	5.63
8/14/90	14	497	8	21435	214	0.123	329.6	9.5	1.720	4608.4	98.28	0.55	1473.6	31.5	0.16	428.7	9.72	0.155	415.3	7.99
8/28/90	14	505	10	27218	384	0.185	503.5	12.4	1.920	5225.8	132.70	0.43	1170.4	40.8	0.16	435.5	12.74	0.154	419.2	10.91
9/11/90	14	525	4	11324	519	0.182	515.2	15.9	2.060	5831.9	171.40	0.36	1019.2	48.5	0.13	368.0	15.56	0.140	396.3	13.77
9/25/90	14	502	1	2707	568	0.108	292.3	18.8	2.060	5576.3	211.33	0.31	839.2	55.0	0.15	406.0	18.27	0.165	446.6	16.72
10/9/90	14	538	10	29040	679	0.460	1335.8	24.5	1.680	4878.7	247.93	0.76	2207.0	65.6	0.14	406.6	21.11	0.109	316.5	19.39
10/23/90	14	539	4	11636	822	0.108	314.2	30.2	2.060	5992.4	285.97	0.25	727.2	75.9	0.16	465.4	24.16	0.167	485.8	22.20
11/6/90	14	548	6	17734	924	0.125	369.4	32.6	1.950	5763.4	327.12	0.28	827.6	81.3	0.09	266.0	26.72	0.128	378.3	25.22
11/20/90	14	512	2	5523	1006	0.156	430.8	35.4	1.970	5439.7	366.33	0.39	1076.9	88.0	0.11	303.7	28.72	0.122	336.9	27.72
12/18/90	28	480	2	5178	1081	0.166	429.8	41.5	1.710	4427.2	435.40	0.38	983.8	102.4	0.11	284.8	32.83	0.087	225.2	31.66
1/15/91	28	493	4	10626	1191	0.198	526.0	48.1	1.490	3958.2	494.10	0.44	1168.9	117.5	0.12	318.8	37.06	0.137	363.9	35.78
1/29/91	14	504	6	16297	1286	0.195	529.6	51.8	1.600	4345.8	523.16	0.29	787.7	124.3	0.12	325.9	39.32	0.111	301.5	38.11
2/12/91	14	480	4	10356	1379	0.232	600.6	55.8	1.630	4220.0	553.14	0.33	854.4	130.1	0.11	284.8	41.45	0.124	321.0	40.29
2/26/91	14	463	4	9990	1450	0.505	1261.2	62.3	1.560	3896.1	581.55	0.54	1348.7	137.8	0.13	324.7	43.59	0.126	314.7	42.52
3/12/91	14	463	1	2496	1494	0.365	911.0	69.9	1.550	3868.7	608.72	0.45	1123.2	146.5	0.13	324.5	45.86	0.111	277.0	44.59
3/26/91	14	475	1	2560	1511	0.225	576.0	75.1	1.500	3839.9	635.70	0.24	614.4	152.5	0.07	179.2	47.62	0.128	327.7	46.70
4/9/91	14	456	4	9829	1555	0.244	599.6	79.2	1.240	3046.9	659.81	0.64	1572.6	160.2	0.14	344.0	49.45	0.118	290.0	48.87
4/23/91	14	450	1	1214	1593	0.367	891.1	84.5	1.360	3302.3	682.03	0.65	1578.3	171.2	0.14	339.9	51.85	0.118	286.5	50.88
5/9/91	16	453	1	1222	1603	0.475	1160.6	92.7	1.290	3151.9	707.85	0.50	1221.6	182.4	0.23	562.0	55.45	0.120	293.2	53.20
5/23/91	14	449	4	9695	1641	0.314	761.1	99.4	1.140	2763.1	728.55	0.49	1180.4	190.8	0.16	387.8	58.78	0.115	278.7	55.20
6/5/91	13	448	2	4832	1689	0.323	780.4	104.4	1.360	3286.1	748.21	0.67	1618.9	199.9	0.18	434.9	61.45	0.155	374.5	57.33
6/18/91	13	424	2	4574	1719	0.309	706.6	109.2	1.583	3620.1	770.65	0.50	1143.4	208.9	0.14	320.2	63.91	0.109	249.3	59.35
7/2/91	14	427	3	6911	1759	0.287	661.2	114.0	1.110	2557.2	792.27	0.60	1382.3	217.7	0.14	322.5	66.16	0.121	278.8	61.20
7/16/91	14	444	1	2394	1792	0.303	725.5	118.9	1.340	3208.5	812.45	0.71	1700.0	228.5	0.13	311.3	68.37	0.120	287.3	63.18
Totals					1792			118.9			812.45			228.5			68.37			63.18

TS33S																				
Date	Days	Flow cfs	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
6/27/90		82	30	13269		0.041	18.1		1.690	747.5		0.68	300.8		0.11	48.7		0.074	32.7	
7/10/90	13	100	38	20496	110	0.132	71.2	0.29	2.070	1116.5	6.06	0.76	409.9	2.31	0.13	70.1	0.39	0.078	42.1	0.24
7/25/90	15	107	62	35955	321	0.125	72.1	0.83	2.230	1287.0	15.07	0.87	502.1	5.73	0.23	132.7	1.15	0.113	65.2	0.65
8/8/90	14	72	90	34951	570	0.095	36.9	1.21	1.950	757.3	22.23	0.80	310.7	8.57	0.20	77.7	1.88	0.099	38.4	1.01
8/22/90	14	138	80	59547	900	0.104	77.4	1.61	2.200	1637.5	30.61	0.90	669.9	12.01	0.17	126.5	2.60	0.121	90.1	1.46
9/5/90	14	122	47	30928	1217	0.068	44.7	2.04	1.990	1309.5	40.92	0.82	539.6	16.24	0.16	105.3	3.41	0.116	76.3	2.04
9/18/90	13	138	32	23819	1395	0.125	93.0	2.48	2.130	1585.4	50.33	0.46	342.4	19.11	0.13	96.8	4.07	0.097	72.2	2.52
10/2/90	14	147	48	38058	1611	0.229	181.6	3.45	2.260	1791.9	62.15	0.71	562.9	22.27	0.15	118.9	4.82	0.098	77.7	3.05
10/16/90	14	192	48	49708	1919	0.113	117.0	4.49	2.220	2299.0	76.47	0.89	921.7	27.47	0.17	176.1	5.85	0.103	106.7	3.69
10/31/90	15	138	34	25307	2200	0.158	117.6	5.37	2.850	2121.3	93.05	0.69	513.6	32.85	0.11	81.9	6.82	0.100	74.4	4.37
11/14/90	14	107	36	20777	2361	0.172	99.3	6.13	3.440	1985.3	107.42	0.57	329.0	35.80	0.15	86.6	7.41	0.124	71.6	4.88

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italicics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
11/28/90	14	94	34	17238	2494	0.229	116.1	6.88	4.540	2301.8	122.42	0.95	481.7	38.64	0.16	81.1	8.00	0.103	52.2	5.32
12/12/90	14	94	54	27378	2650	0.267	135.4	7.76	3.990	2023.0	137.56	1.00	507.0	42.10	0.19	96.3	8.62	0.128	64.9	5.73
1/9/91	28	82	82	36267	3096	0.370	163.6	9.86	3.940	1742.6	163.92	0.92	406.9	48.50	0.18	79.6	9.85	0.140	61.9	6.61
1/23/91	14	72	58	22524	3302	0.301	116.9	10.84	4.270	1658.2	175.82	0.89	345.6	51.13	0.14	54.4	10.32	0.136	52.8	7.02
2/6/91	14	70	48	18201	3444	0.375	142.2	11.75	3.890	1475.0	186.79	1.05	398.1	53.73	0.23	87.2	10.81	0.152	57.6	7.40
2/20/91	14	68	40	14617	3559	1.020	372.7	13.55	4.270	1560.4	197.41	1.10	402.0	56.53	0.32	116.9	11.53	0.245	89.5	7.92
3/6/91	14	67	46	16599	3668	0.480	173.2	15.46	4.920	1775.3	209.09	0.68	245.4	58.80	0.12	43.3	12.09	0.109	39.3	8.37
3/20/91	14	64	66	22605	3806	0.337	115.4	16.47	3.960	1356.3	220.05	0.82	280.9	60.64	0.14	48.0	12.41	0.075	25.7	8.60
4/3/91	14	57	35	10779	3922	0.120	37.0	17.00	3.240	997.9	228.29	0.99	304.9	62.69	0.12	37.0	12.71	0.045	13.9	8.73
4/17/91	14	65	62	21909	4037	0.103	36.2	17.26	2.560	900.3	234.93	0.74	260.2	64.67	0.31	109.0	13.22	0.056	19.7	8.85
5/1/91	14	65	90	31650	4224	0.166	58.4	17.59	1.880	661.1	240.40	1.10	386.8	66.93	0.26	91.4	13.92	0.102	35.9	9.05
5/15/91	14	104	90	50679	4513	0.078	43.9	17.95	1.570	884.1	245.80	0.50	281.6	69.27	0.22	123.9	14.67	0.077	43.4	9.32
5/29/91	14	102	87	47770	4857	0.173	95.0	18.43	1.820	999.3	252.40	0.55	302.0	71.32	0.18	98.8	15.45	0.115	63.1	9.70
6/12/91	14	107	65	37513	5156	0.086	49.6	18.94	1.840	1061.9	259.61	0.92	531.0	74.23	0.18	103.9	16.16	0.079	45.6	10.08
6/26/91	14	94	36	18252	5351	0.031	15.7	19.17	1.730	877.1	266.40	0.57	289.0	77.10	0.18	91.3	16.84	0.156	79.1	10.51
7/10/91	14	78	85	35760	5540	0.111	46.7	19.39	2.040	858.2	272.47	0.99	416.5	79.57	0.23	96.8	17.50	0.080	33.7	10.91
Totals					5540			19.39			272.47			79.57			17.50			10.91

TS34S																				
6/27/90		81	16	7011		0.038	16.7		1.790	784.4		0.59	258.5		0.05	21.9		0.033	14.5	
7/11/90	14	56	10	3035	35	0.009	2.7	0.07	2.610	792.0	5.52	0.47	142.6	1.40	0.03	7.6	0.10	0.009	2.7	0.06
7/25/90	14	121	90	58697	251	0.048	31.3	0.19	0.220	143.5	8.79	0.77	502.2	3.66	0.18	117.4	0.54	0.101	65.9	0.30
8/8/90	14	57	20	6175	478	0.050	15.4	0.35	2.580	796.5	12.08	0.52	160.5	5.98	0.03	7.7	0.98	0.046	14.2	0.58
8/22/90	14	112	104	63061	721	0.072	43.7	0.56	2.340	1418.9	19.84	0.88	533.6	8.41	0.19	115.2	1.41	0.104	63.1	0.85
9/5/90	14	140	218	164950	1519	0.072	54.5	0.90	2.160	1634.4	30.52	1.24	938.2	13.56	0.31	234.6	2.63	0.092	69.6	1.32
9/18/90	13	164	104	92205	2354	0.028	24.8	1.16	1.820	1613.6	41.08	0.48	425.6	17.99	0.16	141.9	3.86	0.056	49.6	1.70
10/2/90	14	229	100	123302	3109	0.024	29.6	1.35	1.940	2392.1	55.10	0.59	727.5	22.03	0.18	221.9	5.13	0.089	109.7	2.26
10/16/90	14	229	54	66583	3773	0.075	92.5	1.78	2.020	2490.7	72.19	0.72	887.8	27.68	0.12	148.0	6.42	0.095	117.1	3.05
10/31/90	15	123	66	43805	4187	0.134	88.9	2.46	2.730	1811.9	88.32	0.69	458.0	32.73	0.12	79.6	7.28	0.074	49.1	3.68
11/14/90	14	61	12	3959	4354	0.043	14.2	2.82	4.120	1359.3	99.42	0.21	69.3	34.57	0.03	8.2	7.59	0.042	13.9	3.90
11/28/90	14	51	10	2772	4378	0.003	0.7	2.87	4.100	1136.6	108.16	0.45	124.8	35.25	0.03	6.9	7.64	0.030	8.3	3.98
12/12/90	14	51	12	3327	4399	0.035	9.7	2.91	4.490	1244.8	116.49	0.35	97.0	36.03	0.03	6.9	7.69	0.050	13.9	4.05
1/9/91	28	81	38	16651	4539	0.175	76.7	3.51	4.520	1980.6	139.07	0.68	298.0	38.80	0.05	21.9	7.89	0.075	32.9	4.38
1/23/91	14	47	22	5528	4617	0.046	11.6	3.82	4.560	1145.9	150.01	0.43	108.1	40.22	0.07	17.6	8.03	0.069	17.3	4.56
2/6/91	14	46	20	4923	4653	0.053	13.0	3.91	4.190	1031.3	157.63	0.27	66.5	40.83	0.08	19.7	8.16	0.077	19.0	4.68
2/20/91	14	51	16	4436	4686	0.106	29.4	4.05	4.390	1217.0	165.50	0.44	122.0	41.49	0.10	27.7	8.32	0.080	22.2	4.83
3/6/91	14	44	16	3774	4715	0.195	46.0	4.32	5.280	1245.4	174.12	0.47	110.9	42.30	0.07	16.5	8.48	0.068	16.0	4.96
3/20/91	14	46	32	7876	4756	0.327	80.5	4.76	4.290	1055.9	182.18	1.02	251.1	43.57	0.11	27.1	8.63	0.083	20.4	5.09

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
4/3/91	14	55	10	2982	4794	0.082	24.5	5.13	3.540	1055.6	189.57	1.05	313.1	45.54	0.09	26.8	8.82	0.054	16.1	5.22
4/17/91	14	123	242	160618	5366	0.051	33.8	5.33	0.852	565.5	195.24	1.10	730.1	49.19	0.38	252.2	9.80	0.022	14.6	5.32
5/1/91	14	106	150	85836	6229	0.045	25.8	5.54	1.020	583.7	199.26	0.99	566.5	53.73	0.28	160.2	11.24	0.091	52.1	5.56
5/15/91	14	106	128	73247	6786	0.023	13.2	5.68	1.210	692.4	203.73	0.41	234.6	56.54	0.24	137.3	12.28	0.066	37.8	5.87
5/29/91	14	145	138	107654	7419	0.145	113.1	6.12	1.400	1092.1	209.97	0.52	405.7	58.78	0.21	163.8	13.34	0.047	36.7	6.13
6/12/91	14	129	71	49586	7969	<i>0.098</i>	68.4	6.75	1.310	914.9	217.00	0.84	586.7	62.25	0.16	111.7	14.30	0.073	51.0	6.44
6/26/91	14	92	43	21222	8217	0.010	4.9	7.01	1.780	878.5	223.27	0.50	246.8	65.17	0.14	69.1	14.93	0.057	28.1	6.72
7/10/91	14	42	33	7446	8317	0.241	54.4	7.22	2.740	618.3	228.51	0.86	194.1	66.71	0.06	13.5	15.22	0.029	6.5	6.84
Totals					8317			7.22			228.51			66.71			15.22			6.84

TS40N																				
6/27/90		52	40	11143		0.036	10.0		0.179	49.9		0.73	203.4		0.17	47.4		0.069	19.2	
7/11/90	14	67	42	15155	92	0.092	33.2	0.15	0.158	57.0	0.37	0.69	249.0	1.58	0.10	36.1	0.29	0.063	22.7	0.15
7/25/90	14	54	38	11113	184	0.066	19.3	0.34	0.236	69.0	0.82	0.46	134.5	2.93	<i>0.16</i>	45.6	0.58	0.114	33.3	0.34
8/8/90	14	39	14	2938	233	0.134	28.1	0.50	0.246	51.6	1.24	0.64	134.3	3.87	0.14	29.4	0.84	0.099	20.8	0.53
8/22/90	14	43	14	3270	255	0.250	58.4	0.80	0.585	136.6	1.90	0.43	100.4	4.69	0.12	28.0	1.04	0.117	27.3	0.70
9/5/90	14	59	12	3837	280	0.150	48.0	1.18	0.489	156.4	2.92	0.71	227.0	5.83	0.15	48.0	1.31	0.123	39.3	0.93
9/19/90	14	57	12	3673	306	0.076	23.3	1.43	0.246	75.3	3.73	0.74	226.5	7.42	0.16	49.0	1.65	0.071	21.7	1.15
10/3/90	14	93	24	12076	361	0.062	31.2	1.62	0.560	281.8	4.98	0.60	301.9	9.27	0.01	5.5	1.84	0.099	49.8	1.40
10/17/90	14	48	10	2577	412	0.137	35.3	1.85	0.599	154.4	6.51	0.30	77.3	10.60	0.17	43.8	2.01	0.156	40.2	1.71
10/31/90	14	15	2	165	422	0.195	16.1	2.03	1.300	107.3	7.42	0.52	42.9	11.02	0.10	8.3	2.19	0.094	7.8	1.88
11/14/90	14	11	2	115	423	0.261	15.0	2.14	1.130	65.0	8.03	0.28	16.1	11.23	0.11	6.3	2.24	0.098	5.6	1.93
11/28/90	14	11	10	583	425	0.193	11.3	2.23	1.180	68.8	8.50	0.40	23.3	11.36	0.10	5.8	2.29	0.070	4.1	1.96
12/12/90	14	10	6	324	429	0.205	11.1	2.31	1.160	62.6	8.96	0.39	21.0	11.52	0.09	4.9	2.32	0.091	4.9	1.99
1/23/91	42	10	8	431	437	0.335	18.1	2.61	0.995	53.7	10.18	0.48	25.9	12.01	0.14	7.6	2.45	0.137	7.4	2.12
2/6/91	14	9	4	204	439	0.389	19.8	2.75	1.050	53.5	10.55	0.51	26.0	12.19	0.14	7.1	2.51	0.124	6.3	2.17
2/20/91	14	11	6	359	441	0.301	18.0	2.88	0.991	59.3	10.95	0.26	15.6	12.34	0.08	4.8	2.55	0.104	6.2	2.21
3/6/91	14	11	10	585	444	0.294	17.2	3.00	1.100	64.4	11.38	0.53	31.0	12.50	0.06	3.5	2.58	0.094	5.5	2.26
3/20/91	14	10	10	517	448	0.258	13.3	3.11	0.879	45.4	11.76	0.46	23.8	12.69	0.11	5.7	2.61	0.099	5.1	2.29
4/3/91	14	9	8	404	451	0.238	12.0	3.20	0.839	42.4	12.07	0.63	31.8	12.89	0.10	5.1	2.65	0.052	2.6	2.32
4/17/91	14	64	220	75991	719	0.118	40.8	3.38	0.337	116.4	12.63	1.50	518.1	14.81	0.80	276.3	3.63	0.425	146.8	2.84
5/1/91	14	100	90	48543	1154	0.119	64.2	3.75	0.060	32.4	13.15	1.31	706.6	19.10	0.24	129.4	5.05	0.082	44.2	3.51
5/15/91	14	117	56	35488	1449	0.049	31.1	4.08	0.103	65.3	13.49	0.40	253.5	22.46	0.17	107.7	5.88	0.074	46.9	3.83
5/29/91	14	84	39	17714	1635	0.143	65.0	4.42	0.106	48.1	13.89	0.36	163.5	23.92	0.13	59.0	6.46	0.045	20.4	4.07
6/12/91	14	51	32	8813	1728	0.126	34.7	4.77	0.236	65.0	14.28	0.62	170.7	25.09	0.20	55.1	6.86	0.131	36.1	4.26
6/26/91	14	63	31	10554	1795	0.112	38.1	5.02	0.231	78.6	14.78	0.47	160.0	26.25	0.16	54.5	7.25	0.132	44.9	4.55
7/10/91	14	32	14	2399	1841	0.189	32.4	5.27	0.312	53.5	15.25	0.94	161.1	27.37	0.16	27.4	7.53	0.075	12.9	4.75
Totals					1841			5.27			15.25			27.37			7.53			4.75

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italic indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>TS41S</b>																				
7/3/90		57	6	1845		0.013	4.0		2.130	654.9		0.36	110.7		0.03	7.7		<b>0.048</b>	14.8	
7/18/90	15	54	8	2330	16	0.041	11.9	0.06	2.210	643.7	4.87	0.42	122.3	0.87	0.03	7.3	0.06	0.038	11.1	0.10
8/1/90	14	76	20	8198	53	0.039	16.0	0.16	1.760	721.5	9.65	0.48	196.8	1.99	0.03	10.2	0.12	0.048	19.7	0.20
8/15/90	14	52	6	1683	87	0.003	0.7	0.22	2.470	692.8	14.60	0.28	78.5	2.95	0.03	7.0	0.18	0.036	10.1	0.31
8/29/90	14	165	36	32039	205	0.177	157.5	0.77	2.260	2011.3	24.06	0.45	400.5	4.63	0.08	71.2	0.45	0.073	65.0	0.57
8/29/90	0	165	36	32039	205	0.177	157.5	0.77	2.260	2011.3	24.06	0.45	400.5	4.63	0.08	71.2	0.45	0.073	65.0	0.57
9/12/90	14	200	54	58252	521	0.022	23.7	1.40	2.360	2545.8	40.01	0.50	539.4	7.92	0.09	97.1	1.04	0.062	66.9	1.03
9/26/90	14	233	44	55296	919	0.003	3.1	1.50	2.250	2827.7	58.82	0.44	553.0	11.74	0.13	163.4	1.95	0.059	74.1	1.53
10/10/90	14	228	34	41812	1258	0.034	41.8	1.66	2.320	2853.1	78.70	0.38	467.3	15.31	0.07	86.1	2.83	0.057	70.1	2.03
10/24/90	14	271	26	38004	1538	0.021	30.7	1.91	2.220	3245.0	100.04	0.33	482.4	18.64	0.06	87.7	3.43	0.059	86.2	2.58
11/7/90	14	191	30	30906	1779	0.032	33.0	2.13	3.710	3822.0	124.78	0.37	381.2	21.66	0.03	25.8	3.83	0.047	48.4	3.05
12/5/90	28	181	22	21478	2146	0.070	68.3	2.84	3.480	3397.4	175.31	0.56	546.7	28.16	0.03	24.4	4.18	0.059	57.6	3.79
12/18/90	13	178	22	21122	2284	0.091	87.4	3.35	3.810	3657.9	198.24	0.43	412.8	31.27	0.06	57.6	4.45	0.064	61.4	4.18
1/16/91	29	138	48	35728	2696	0.054	40.2	4.27	3.800	2828.5	245.27	0.55	409.4	37.24	0.06	44.7	5.19	0.053	39.4	4.91
1/30/91	14	143	56	43193	2972	0.084	64.8	4.64	3.710	2861.5	265.19	0.53	408.8	40.10	0.07	54.0	5.54	0.056	43.2	5.20
2/13/91	14	143	62	47821	3291	0.076	58.6	5.07	4.430	3416.9	287.16	0.60	462.8	43.15	0.11	84.8	6.02	0.050	38.6	5.49
2/27/91	14	141	68	51715	3639	0.137	104.2	5.64	3.570	2715.0	308.62	0.64	486.7	46.47	0.09	68.4	6.56	0.048	36.5	5.75
3/13/91	14	130	44	30852	3928	0.073	51.2	6.19	3.590	2517.2	326.93	0.33	231.4	48.99	0.07	49.1	6.97	0.038	26.6	5.97
3/27/91	14	116	30	18770	4102	0.042	26.3	6.46	3.250	2033.4	342.86	0.18	112.6	50.19	0.03	15.6	7.20	0.039	24.4	6.15
4/10/91	14	112	25	15102	4221	0.056	33.8	6.67	2.680	1619.0	355.65	0.41	247.7	51.45	0.06	36.2	7.38	0.016	9.7	6.27
5/8/91	28	226	41	49856	4675	0.028	34.1	7.14	1.300	1584.7	378.07	0.35	426.6	56.17	0.20	243.8	9.34	0.066	80.5	6.90
5/22/91	14	190	99	101456	5205	0.069	70.7	7.51	2.020	2070.1	390.86	0.69	707.1	60.14	0.17	174.2	10.80	0.051	52.3	7.36
6/5/91	14	151	58	47238	5725	0.059	48.1	7.92	1.760	1433.4	403.13	0.76	619.0	64.78	0.16	130.3	11.87	0.069	56.2	7.74
6/19/91	14	108	22	12815	5936	0.034	19.8	8.16	0.498	290.1	409.16	0.53	308.7	68.03	0.09	52.4	12.51	0.038	22.1	8.02
7/3/91	14	91	10	4908	5998	0.032	15.7	8.29	1.670	819.7	413.04	0.39	191.4	69.78	0.07	34.4	12.81	0.043	21.1	8.17
7/17/91	14	45	4	971	6018	0.042	10.2	8.38	2.110	512.1	417.70	0.31	75.2	70.71	0.03	6.1	12.95	0.022	5.3	8.26
Totals					6018			8.38			417.70			70.71			12.95			8.26
<b>TS50N</b>																				
6/27/90		1300	1	7012		0.035	245.4		1.040	7292		0.03	175.3		0.03	175.3		0.027	189.3	
7/11/90	14	1270	1	6850	49	0.003	17.1	0.92	1.010	6919	49.7	0.09	616.5	2.8	0.03	171.3	1.21	0.035	239.8	1.50
7/25/90	14	1310	8	56526	270	0.016	113.1	1.37	1.080	7631	100.7	0.15	1059.9	8.6	0.03	176.6	2.43	0.045	318.0	3.45
8/8/90	14	1330	8	57389	669	0.020	143.5	2.27	0.981	7037	152.0	0.18	1291.3	16.9	0.12	860.8	6.06	0.042	301.3	5.62
8/22/90	14	1450	10	78209	1144	0.033	258.1	3.68	1.020	7977	204.6	0.03	195.5	22.1	0.03	195.5	9.76	0.040	312.8	7.77
9/5/90	14	1430	3	23139	1498	0.041	316.2	5.69	1.070	8253	261.4	0.18	1388.3	27.6	0.03	192.8	11.12	0.042	323.9	10.00
9/19/90	14	1570	1	8468	1609	0.016	135.5	7.27	1.070	9061	322.0	0.06	508.1	34.3	0.03	211.7	12.53	0.037	313.3	12.23
10/3/90	14	1480	6	47896	1806	0.015	119.7	8.16	1.130	9020	385.2	0.12	957.9	39.4	0.06	479.0	14.95	0.042	335.3	14.50

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
10/17/90	14	1320	8	56958	2173	0.025	178.0	9.20	<i>1.191</i>	8480	446.5	0.03	178.0	43.4	0.03	178.0	17.25	0.044	313.3	16.77
10/31/90	14	1220	1	6580	2396	0.015	98.7	10.17	1.300	8554	506.1	0.06	394.8	45.4	0.03	164.5	18.45	0.050	329.0	19.02
11/14/90	14	1210	4	26106	2510	0.034	221.9	11.29	1.190	7766	563.2	0.03	163.2	47.3	0.03	163.2	19.60	0.046	300.2	21.22
11/28/90	14	1210	6	39158	2738	0.052	339.4	13.26	1.290	8419	619.9	0.03	163.2	48.5	0.05	326.3	21.31	0.042	274.1	23.23
12/12/90	14	1230	8	53074	3061	0.031	205.7	15.17	1.220	8094	677.7	0.03	165.9	49.6	0.03	165.9	23.03	0.036	238.8	25.03
1/9/91	28	1120	12	72491	3940	0.014	84.6	17.20	1.320	7974	790.2	0.03	151.0	51.8	0.03	151.0	25.25	0.044	265.8	28.56
1/23/91	14	1220	2	13161	4240	0.023	151.3	18.02	1.310	8620	848.2	0.03	164.5	52.9	0.03	164.5	26.35	0.042	276.4	30.46
2/6/91	14	1220	2	13161	4332	0.048	315.9	19.66	1.270	8357	907.7	0.06	394.8	54.9	0.10	658.0	29.23	0.042	276.4	32.39
2/20/91	14	1250	1	6742	4402	0.100	674.2	23.12	1.310	8832	967.8	0.06	404.5	57.7	0.03	168.6	32.13	0.043	289.9	34.37
3/6/91	14	1230	1	6634	4449	0.046	305.2	26.55	1.400	9288	1031.2	0.03	165.9	59.7	0.03	165.9	33.30	0.038	252.1	36.27
3/20/91	14	1210	6	37200	4602	0.046	300.2	28.67	1.280	8354	1093.0	0.29	1892.7	66.9	0.06	391.6	35.25	0.029	189.3	37.81
4/3/91	14	1220	3	19741	4801	0.003	16.5	29.78	1.060	6975	1146.6	0.11	723.8	76.0	0.06	394.8	38.00	0.020	131.6	38.94
4/17/91	14	1460	8	62999	5091	0.077	606.4	31.96	1.000	7875	1198.6	0.25	1968.7	85.5	0.08	630.0	41.59	0.024	189.0	40.06
5/1/91	14	1290	2	13916	5360	0.098	681.9	36.47	0.955	6645	1249.4	0.14	974.1	95.8	0.10	695.8	46.23	0.027	187.9	41.38
5/15/91	14	1357	2	14639	5460	0.007	51.2	39.03	1.010	7392	1298.6	0.03	183.0	99.8	0.05	366.0	49.94	0.027	197.6	42.73
5/29/91	14	1256	3	20324	5582	0.003	16.9	39.27	0.922	6246	1346.3	0.18	1219.4	104.7	0.03	169.4	51.82	0.038	257.4	44.32
6/12/91	14	1204	1	3247	5665	0.049	318.2	40.45	0.892	5793	1388.4	0.17	1104.0	112.9	0.03	162.4	52.98	0.030	194.8	45.90
6/26/91	14	1193	2	12869	5721	0.003	16.1	41.62	1.030	6628	1431.9	0.18	1158.2	120.8	0.11	707.8	56.02	0.033	212.3	47.33
7/10/91	14	1163	1	6273	5788	0.038	238.4	42.51	1.070	6712	1478.6	0.14	878.2	127.9	0.07	439.1	60.04	0.025	156.8	48.62
Totals					5788			42.51			1478.6			127.9			60.04			48.62

MIDDLE SNAKE RIVER  
WATER QUALITY SURVEY

APPENDIX J

Concurrent Monitoring  
Main Stem Instream Nutrient Loadings



## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS01N</b>																				
7/3/90		10	10	518		0.045	2.3		0.906	46.9		0.98	50.7		0.08	4.1		0.006	0.3	
7/17/90	14	518	18	50291	178	0.071	198.4	0.70	0.243	678.9	2.5	0.58	1620.5	5.8	0.07	195.6	0.70	0.059	164.8	0.58
7/31/90	14	4	60	1165	358	0.040	0.8	1.40	0.697	13.5	5.0	0.63	12.2	11.6	0.11	2.1	1.39	0.072	1.4	1.16
8/14/90	14	2	76	902	365	0.045	0.5	1.40	0.794	9.4	5.0	0.82	9.7	11.6	0.15	1.8	1.40	0.088	1.0	1.17
8/28/90	14	3	23	397	370	0.070	1.2	1.41	0.808	13.9	5.1	0.70	12.1	11.7	0.21	3.6	1.42	0.077	1.3	1.18
9/11/90	14	4	38	717	374	0.081	1.5	1.42	0.983	18.6	5.2	0.43	8.1	11.8	0.08	1.5	1.44	0.065	1.2	1.19
9/25/90	14	3	12	188	377	0.013	0.2	1.43	0.910	14.2	5.4	0.61	9.5	11.8	0.06	0.9	1.45	0.029	0.5	1.19
10/9/90	14	3	18	311	379	0.030	0.5	1.43	1.420	24.5	5.5	0.20	3.5	11.9	<b>0.03</b>	0.4	1.45	0.043	0.7	1.20
10/23/90	14	2	4	37	380	0.073	0.7	1.43	1.580	14.5	5.6	0.37	3.4	11.9	<b>0.03</b>	0.2	1.46	0.021	0.2	1.20
11/6/90	14	350	18	33980	499	0.011	20.8	1.51	1.400	2642.9	14.9	0.39	736.2	14.5	0.12	226.5	2.25	0.107	202.0	1.91
11/20/90	14	608	8	26235	710	0.038	124.6	2.02	1.390	4558.3	40.1	0.43	1410.1	22.0	0.27	885.4	6.14	0.268	878.9	5.69
12/4/90	14	764	6	24725	888	0.040	164.8	3.03	1.400	5769.1	76.3	0.40	1648.3	32.7	0.21	865.4	12.27	0.163	671.7	11.12
12/19/90	15	586	10	31607	1099	<i>0.099</i>	312.9	4.82	1.650	5215.2	117.5	0.82	2591.8	48.6	0.33	1043.0	19.43	0.153	483.6	15.45
1/15/91	27	1440	10	77669	1837	0.284	2205.8	21.82	0.850	6601.9	197.2	0.54	4194.2	94.4	0.16	1242.7	34.86	0.158	1227.2	27.00
1/29/91	14	1240	8	53506	2296	0.166	1110.2	33.43	1.240	8293.4	249.4	0.40	2675.3	118.5	0.16	1070.1	42.95	0.149	996.5	34.78
2/12/91	14	569	8	24552	2569	0.049	150.4	37.84	1.510	4634.2	294.6	0.21	644.5	130.1	0.27	828.6	49.60	0.230	705.9	40.74
2/26/91	14	563	14	42513	2804	0.143	434.2	39.89	1.920	5830.4	331.2	0.22	668.1	134.7	0.20	607.3	54.62	0.139	422.1	44.69
3/12/91	14	62	12	4013	2967	0.059	19.7	41.48	2.160	722.3	354.2	0.16	53.5	137.2	0.19	63.5	56.97	0.286	95.6	46.50
3/26/91	14	72	12	4660	2997	0.019	7.4	41.57	1.480	574.8	358.7	<i>0.61</i>	235.0	138.2	0.25	97.1	57.53	0.222	86.2	47.13
4/9/91	14	5	15	437	3015	0.116	3.4	41.61	1.240	36.1	360.9	0.62	18.1	139.1	0.22	6.4	57.89	0.178	5.2	47.45
4/23/91	14	11	20	1187	3021	0.149	8.8	41.65	0.980	58.1	361.2	1.05	62.3	139.4	0.11	6.5	57.94	0.026	1.5	47.48
5/7/91	14	11	22	1305	3029	0.037	2.2	41.69	0.934	55.4	361.6	0.96	57.0	139.8	0.22	13.1	58.01	0.015	0.9	47.49
5/21/91	14	10	15	809	3037	0.120	6.5	41.72	0.717	38.7	361.9	0.80	43.1	140.2	0.12	6.5	58.08	0.013	0.7	47.49
6/4/91	14	12	8	518	3041	0.047	3.0	41.75	0.747	48.3	362.2	0.71	46.0	140.5	0.06	3.9	58.11	0.042	2.7	47.50
6/18/91	14	15	8	647	3045	0.252	20.4	41.84	0.560	45.3	362.5	0.46	37.2	140.8	0.08	6.5	58.15	0.022	1.8	47.52
7/2/91	14	207	19	21213	3122	0.061	68.1	42.15	0.561	626.4	364.9	1.03	1150.0	144.9	0.13	145.1	58.68	0.044	49.1	47.70
7/17/91	15	630	13	44174	3367	0.113	384.0	43.84	0.209	710.2	369.9	0.36	1223.3	153.8	0.09	305.8	60.37	0.051	173.3	48.53
Total					3367			43.84			369.9			153.8		60.37				48.53

### Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS05M</b>																				
7/3/90		291	10	15717		0.059	92.7		2.040	3206		0.23	361.5		<b>0.03</b>	39.3		0.020	31.4	
7/17/90	14	839	24	108660	435	0.054	244.5	1.18	0.862	3903	24.9	0.38	1720.4	7.3	0.08	362.2	1.41	0.054	244.5	0.97
8/14/90	28	348	14	26240	1380	0.023	43.1	3.19	1.680	3149	74.2	0.21	393.6	22.1	0.07	131.2	4.86	0.065	121.8	3.53
8/28/90	14	393	6	12702	1516	0.015	31.8	3.46	1.840	3895	98.9	0.11	232.9	24.3	0.06	127.0	5.76	0.084	177.8	4.58
9/11/90	14	393	4	8483	1590	0.032	67.9	3.80	1.680	3563	125.0	0.16	339.3	26.3	<b>0.03</b>	53.0	6.39	0.055	116.6	5.61
9/25/90	14	402	4	8677	1650	<b>0.003</b>	5.4	4.06	2.010	4360	152.7	0.27	585.7	29.5	<b>0.03</b>	54.2	6.77	0.042	91.1	6.34
10/9/90	14	381	14	28732	1781	0.030	61.6	4.30	2.200	4515	183.8	<b>0.03</b>	51.3	31.7	<b>0.03</b>	51.3	7.14	0.062	127.2	7.10
11/6/90	28	583	18	56602	2378	0.019	59.7	5.14	1.710	5377	253.0	0.25	786.1	37.6	0.07	220.1	9.04	0.086	270.4	9.88
11/20/90	14	925	10	49892	2751	0.060	299.4	6.40	1.760	8781	302.6	0.36	1796.1	46.6	0.22	1097.6	13.65	0.202	1007.8	14.36
12/4/90	14	988	10	53290	3112	0.033	175.9	8.06	1.610	8580	363.4	0.35	1865.1	59.5	0.15	799.3	20.29	0.128	682.1	20.27
1/15/91	42	2020	14	152534	5273	<b>0.072</b>	784.5	18.15	1.110	12094	580.4	0.45	4902.9	130.5	0.15	1634.3	45.84	0.151	1645.2	44.71
1/29/91	14	1662	8	71715	6058	0.125	1120.5	24.82	1.310	11743	663.9	0.31	2778.9	157.4	0.13	1165.4	55.64	0.137	1228.1	54.77
2/12/91	14	890	10	48004	6477	0.114	547.2	30.65	1.770	8497	734.7	0.16	768.1	169.8	0.15	720.1	62.24	0.159	763.3	61.74
2/26/91	14	750	12	48543	6815	0.130	525.9	34.41	2.120	8576	794.5	0.13	525.9	174.4	0.25	1011.3	68.30	0.236	954.7	67.75
3/12/91	14	269	2	2902	6995	0.129	187.2	36.90	2.760	4005	838.5	0.27	391.7	177.6	0.14	203.1	72.55	0.136	197.3	71.78
3/26/91	14	276	4	5955	7026	0.077	114.6	37.96	2.360	3513	864.8	0.24	357.3	180.2	0.13	193.5	73.94	0.106	157.8	73.02
4/9/91	14	190	8	8181	7076	0.048	49.1	38.53	2.110	2158	884.6	0.24	245.4	182.3	0.07	71.6	74.87	0.057	58.3	73.78
4/23/91	14	202	9	9806	7139	0.182	198.3	39.40	2.250	2451	900.8	<b>0.29</b>	320.3	184.3	0.06	65.4	75.35	0.033	36.0	74.11
5/7/91	14	237	15	19209	7240	0.048	61.5	40.31	1.790	2292	917.4	0.30	384.2	186.7	0.10	128.1	76.02	0.033	42.3	74.38
5/21/91	14	259	10	13964	7356	0.125	174.6	41.13	2.170	3030	936.0	0.12	167.6	188.7	0.05	69.8	76.72	0.033	46.1	74.69
6/4/91	14	253	6	8196	7434	0.042	57.4	41.95	1.680	2295	954.6	<b>0.29</b>	401.6	190.7	0.05	68.3	77.20	0.043	58.7	75.06
6/18/91	14	246	8	10613	7500	0.094	124.7	42.58	0.704	934	965.9	0.17	225.5	192.9	<b>0.03</b>	33.2	77.55	0.029	38.5	75.40
7/2/91	14	405	8	17457	7598	0.010	21.8	43.10	1.780	3884	982.8	0.34	741.9	196.2	0.05	109.1	78.05	0.037	80.7	75.82
7/16/91	14	905	<b>10</b>	50765	7837	0.044	214.8	43.92	0.751	3666	1009.2	0.27	1317.9	203.5	0.11	536.9	80.31	0.050	244.1	76.95
Total					7837			43.92			1009.2			203.5			80.31			76.95

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS08S</b>																				
7/3/90		333	10	17961		0.028	50.3		1.230	2209		0.41	736.4		<b>0.03</b>	44.9		0.005	9.0	
7/17/90	14	882	14	66602	296	0.041	195.0	0.86	0.915	4353	23	0.38	1807.8	8.9	0.09	428.2	1.66	0.049	233.1	0.85
7/31/90	14	378	6	12233	572	0.067	136.6	2.02	1.660	3384	50	0.36	734.0	17.8	0.06	122.3	3.58	0.053	108.1	2.04
8/14/90	14	385	12	24919	702	0.028	58.1	2.70	1.540	3198	73	0.48	996.8	23.9	0.06	124.6	4.45	0.068	141.2	2.91
8/28/90	14	437	10	23571	872	0.039	91.9	3.23	1.690	3983	98	0.06	141.4	27.8	0.06	141.4	5.38	0.065	153.2	3.94
9/11/90	14	449	6	14531	1005	0.050	121.1	3.97	1.430	3463	124	0.19	460.1	29.9	0.05	121.1	6.30	0.050	121.1	4.90
9/25/90	14	459	8	19806	1125	0.008	19.8	4.46	1.870	4630	153	0.30	742.7	34.2	<b>0.03</b>	61.9	6.94	0.029	71.8	5.58
10/9/90	14	430	16	37109	1324	0.052	120.6	4.96	2.250	5218	187	<b>1.04</b>	2407.4	45.2	<b>0.03</b>	58.0	7.36	0.058	134.5	6.30
10/23/90	14	397	2	4283	1469	0.067	143.5	5.88	2.350	5032	223	0.18	385.4	55.0	<b>0.03</b>	53.5	7.75	0.045	96.4	7.11
11/6/90	14	621	16	53592	1672	0.023	77.0	6.65	1.790	5996	262	0.24	803.9	59.1	0.07	234.5	8.75	0.070	234.5	8.27
11/20/90	14	961	14	72567	2113	0.015	77.8	7.19	1.810	9382	315	0.41	2125.2	69.4	0.22	1140.3	13.57	0.183	948.6	12.41
12/4/90	14	1020	8	44013	2521	0.015	82.5	7.76	1.700	9353	381	0.31	1705.5	82.8	0.11	605.2	19.68	0.105	577.7	17.75
1/15/91	42	2050	10	110571	4145	<b>0.082</b>	906.7	18.14	1.220	13490	621	0.40	4422.8	147.1	0.14	1548.0	42.28	0.149	1647.5	41.11
1/29/91	14	1690	10	91154	4851	0.151	1376.4	26.13	1.300	11850	709	0.39	3555.0	175.0	0.13	1185.0	51.85	0.137	1248.8	51.25
2/12/91	14	918	6	29709	5274	0.045	222.8	31.73	1.650	8170	780	0.11	544.7	189.4	0.12	594.2	58.08	0.131	648.6	57.89
2/26/91	14	776	10	41855	5524	0.150	627.8	34.71	2.150	8999	840	0.29	1213.8	195.6	0.24	1004.5	63.67	0.244	1021.3	63.74
3/12/91	14	295	2	3182	5682	0.126	200.5	37.61	2.740	4360	886	0.18	286.4	200.8	0.14	222.8	67.97	0.142	225.9	68.10
3/26/91	14	302	6	9773	5727	0.137	223.2	39.09	2.420	3942	915	0.30	488.7	203.5	0.06	97.7	69.09	0.104	169.4	69.49
4/9/91	14	220	13	15426	5815	0.046	54.6	40.06	1.960	2326	937	0.48	569.6	207.2	0.08	94.9	69.76	0.031	36.8	70.21
4/23/91	14	240	7	9061	5901	0.228	295.1	41.29	2.490	3223	957	0.27	349.5	210.4	0.07	90.6	70.41	0.027	35.0	70.46
5/7/91	14	286	16	24682	6019	0.060	92.6	42.64	1.740	2684	977	0.41	632.5	213.9	0.09	138.8	71.22	0.016	24.7	70.67
5/21/91	14	305	16	26321	6198	<b>0.082</b>	134.9	43.44	1.360	2237	995	0.41	674.5	218.4	<b>0.03</b>	41.1	71.85	0.011	18.1	70.82
6/4/91	14	304	8	13118	6336	0.035	57.4	44.11	1.870	3066	1013	0.51	836.2	223.7	<b>0.03</b>	41.0	72.13	0.020	32.8	71.00
6/18/91	14	303	10	16343	6439	0.064	104.6	44.68	0.702	1147	1028	0.32	523.0	228.5	<b>0.03</b>	40.9	72.42	0.012	19.6	71.18
7/2/91	14	459	7	17330	6557	<b>0.003</b>	6.2	45.07	1.660	4110	1046	0.21	519.9	232.1	0.05	123.8	73.00	0.025	61.9	71.46
7/16/91	14	959	12	62071	6834	0.038	196.6	45.78	0.820	4242	1076	0.40	2069.0	241.2	0.10	517.3	75.24	0.069	356.9	72.93
Total					6834			45.78			1076			241.2		75.24				72.93

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS10N</b>																				
7/3/90		383	10	20658		0.038	78.5		1.820	3760		0.45	929.6		<b>0.03</b>	51.6		<b>0.003</b>	5.2	
7/17/90	14	932	12	60323	283	0.029	145.8	0.78	1.160	5831	34	0.32	1608.6	8.9	0.09	452.4	1.76	0.043	216.2	0.77
7/31/90	14	428	6	13851	543	0.123	283.9	2.29	1.070	2470	63	0.55	1269.7	19.0	0.06	138.5	3.83	0.044	101.6	1.89
8/14/90	14	435	10	23463	674	0.016	37.5	3.41	1.400	3285	83	0.51	1196.6	27.6	0.06	140.8	4.81	0.044	103.2	2.60
8/28/90	14	487	8	21014	829	0.039	102.4	3.90	1.540	4045	108	0.13	341.5	33.0	0.06	157.6	5.85	0.065	170.7	3.56
9/11/90	14	499	22	59212	1110	0.035	94.2	4.59	1.680	4522	138	0.43	1157.3	38.2	0.06	161.5	6.97	0.043	115.7	4.57
9/25/90	14	509	8	21963	1394	0.019	52.2	5.10	1.590	4365	170	0.58	1592.3	47.8	0.05	137.3	8.02	0.027	74.1	5.23
10/9/90	14	480	2	5178	1489	0.021	54.4	5.48	2.250	5825	205	0.30	776.7	56.1	<b>0.03</b>	64.7	8.72	0.053	137.2	5.97
10/23/90	14	447	7	2411	1516	0.045	108.5	6.05	2.410	5810	246	0.18	434.0	60.4	<b>0.03</b>	60.3	9.16	0.041	98.9	6.80
11/6/90	14	671	6	21715	1600	0.011	39.8	6.57	1.980	7166	291	0.24	868.6	64.9	0.05	181.0	10.01	0.048	173.7	7.75
11/20/90	14	1011	14	76343	1943	0.077	419.9	8.18	1.920	10470	353	0.49	2672.0	77.3	<b>0.09</b>	512.6	12.43	0.177	965.2	11.74
12/4/90	14	1070	8	46170	2372	<b>0.003</b>	14.4	9.70	1.760	10157	425	0.28	1616.0	92.3	0.11	634.8	16.45	0.103	594.4	17.19
1/15/91	42	2100	14	158575	4522	0.238	2695.8	38.15	1.240	14045	679	0.49	5550.1	167.6	0.14	1585.8	39.77	0.143	1619.7	40.44
1/29/91	14	1740	10	93851	5406	<b>0.078</b>	732.0	50.15	1.290	12107	771	0.31	2909.4	197.2	0.12	1126.2	49.26	0.123	1154.4	50.15
2/12/91	14	968	8	41769	5880	0.051	266.3	53.64	1.720	8980	845	0.10	522.1	209.2	0.12	626.5	55.39	0.101	527.3	56.04
2/26/91	14	826	12	53462	6214	0.155	690.6	56.99	2.300	10247	912	0.20	891.0	214.1	0.15	668.3	59.92	0.176	784.1	60.63
3/12/91	14	345	2	3722	6414	0.072	134.0	59.88	2.680	4987	965	0.22	409.4	218.7	0.16	297.7	63.30	0.124	230.7	64.18
3/26/91	14	352	8	15189	6480	0.032	60.8	60.56	2.460	4671	999	0.34	645.5	222.4	0.09	170.9	64.94	0.075	142.4	65.49
4/9/91	14	270	17	24757	6620	0.032	46.6	60.94	1.700	2476	1024	0.49	713.6	227.1	0.07	101.9	65.90	<b>0.003</b>	3.6	66.00
4/23/91	14	290	12	18770	6772	0.236	369.1	62.39	2.050	3207	1044	0.39	610.0	231.8	<b>0.03</b>	39.1	66.39	0.016	25.0	66.10
5/7/91	14	336	16	28997	6939	0.026	47.1	63.85	1.750	3172	1066	0.64	1159.9	238.0	0.06	108.7	66.91	0.013	23.6	66.27
5/21/91	14	355	21	40210	7181	0.033	63.2	64.23	1.900	3638	1090	0.28	536.1	243.9	<b>0.03</b>	47.9	67.46	0.012	23.0	66.43
6/4/91	14	354	13	24822	7409	0.052	99.3	64.80	1.930	3685	1116	0.47	897.4	248.9	<b>0.03</b>	47.7	67.79	0.011	21.0	66.58
6/18/91	14	353	9	17136	7556	0.067	127.6	65.60	0.700	1333	1133	0.33	628.3	254.3	<b>0.03</b>	47.6	68.13	0.013	24.8	66.74
7/16/91	28	1009	7	38096	7942	0.024	130.6	67.40	1.020	5551	1182	0.31	1687.1	270.5	0.08	435.4	71.51	0.036	195.9	68.29
Total					7942			67.40			1182			270.5		71.51				68.29

### Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.3171\text{}/\text{cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS13S</b>																				
7/3/90		654	16	56443		0.038	134.1		1.660	5856		0.62	2187.2		0.03	88.2		0.005	17.6	
7/17/90	14	1056	22	125361	636	0.034	193.7	1.1	1.140	6496	43	0.38	2165.3	15.2	0.05	284.9	1.3	0.044	250.7	0.94
7/31/90	14	542	22	64324	1300	0.043	125.7	2.3	0.862	2520	75	0.62	1812.8	29.2	0.06	175.4	2.9	0.030	87.7	2.12
8/14/90	14	500	24	64670	1752	0.032	86.2	3.0	0.954	2571	93	0.89	2398.2	43.9	0.09	242.5	4.4	0.036	97.0	2.77
8/28/90	14	580	22	68869	2219	0.076	237.9	4.1	1.280	4007	116	0.49	1533.9	57.7	0.08	250.4	6.1	0.062	194.1	3.79
9/11/90	14	655	22	77669	2732	0.056	197.7	5.7	1.140	4025	144	0.71	2506.6	71.8	0.06	211.8	7.7	0.027	95.3	4.80
9/25/90	14	698	20	75247	3267	0.041	154.3	6.9	2.910	10948	196	0.64	2407.9	89.0	0.08	301.0	9.5	0.020	75.2	5.40
10/9/90	14	720	26	101017	3884	0.020	77.7	7.7	2.130	8276	263	0.12	466.2	99.1	<b>0.03</b>	97.1	10.9	0.061	237.0	6.49
10/23/90	14	673	8	29038	4339	<b>0.003</b>	9.1	8.0	2.370	8603	323	0.14	508.2	102.5	<b>0.03</b>	90.7	11.6	0.041	148.8	7.84
11/6/90	14	915	16	78946	4717	0.014	69.1	8.3	2.110	10411	389	0.23	1134.8	108.2	<b>0.03</b>	123.4	12.3	0.048	236.8	9.19
11/20/90	14	1350	18	131084	5452	0.032	233.0	9.3	1.950	14201	475	0.44	3204.3	123.4	0.19	1383.7	17.6	0.138	1005.0	13.54
12/4/90	14	1427	8	61573	6127	<b>0.003</b>	19.2	10.2	1.700	13084	571	0.36	2770.8	144.3	0.14	1077.5	26.2	0.116	892.8	20.18
1/15/91	42	2351	14	177507	8637	<b>0.077</b>	976.3	20.7	1.320	16736	884	0.54	6846.7	245.3	0.15	1901.9	57.5	0.142	1800.4	48.46
1/29/91	14	1960	16	169125	9850	0.138	1458.7	29.2	1.330	14059	992	0.27	2854.0	279.3	0.12	1268.4	68.6	0.126	1331.9	59.42
2/12/91	14	1252	16	108022	10820	0.054	364.6	35.6	1.740	11747	1082	0.06	405.1	290.7	0.09	607.6	75.2	0.090	607.6	66.21
2/26/91	14	989	16	85325	11497	0.151	805.3	39.7	2.080	11092	1162	0.19	1013.2	295.6	0.15	799.9	80.1	<b>0.060</b>	320.0	69.46
3/12/91	14	564	18	54721	11987	0.044	133.8	43.0	2.520	7661	1227	0.34	1033.6	302.8	0.19	577.6	84.9	0.146	443.8	72.13
3/26/91	14	507	14	38263	12313	0.041	112.1	43.8	2.340	6395	1277	0.87	2377.8	314.7	0.13	355.3	88.2	0.076	207.7	74.41
4/9/91	14	575	22	68230	12685	0.068	210.9	45.0	1.680	5210	1317	0.58	1798.8	329.3	0.06	186.1	90.1	0.008	24.8	75.23
4/23/91	14	585	20	63142	13145	0.122	385.2	47.0	1.930	6093	1357	0.77	2431.0	344.2	0.07	221.0	91.5	0.014	44.2	75.47
5/7/91	14	472	26	66221	13598	0.059	150.3	48.9	1.620	4126	1393	0.60	1528.2	358.0	0.11	280.2	93.2	0.012	30.6	75.73
5/21/91	14	908	20	97923	14172	0.086	421.1	50.9	1.510	7393	1433	0.41	2007.4	370.4	0.06	293.8	95.2	0.012	58.8	76.04
6/4/91	14	650	21	73657	14773	<b>0.003</b>	8.8	52.4	1.740	6103	1480	0.41	1438.1	382.4	<b>0.03</b>	87.7	96.6	0.013	45.6	76.41
6/18/91	14	495	23	61345	15245	0.034	90.7	52.8	0.664	1771	1508	0.38	1013.5	391.0	0.05	133.4	97.4	0.010	26.7	76.66
7/2/91	14	735	13	51511	15640	<b>0.077</b>	305.1	54.2	1.410	5587	1533	0.52	2060.4	401.8	0.05	198.1	98.5	0.011	43.6	76.90
7/16/91	14	1172	18	113827	16219	0.010	63.2	55.4	1.180	7462	1579	0.49	3098.6	419.8	0.09	569.1	101.2	0.026	164.4	77.63
Total					16219			55.4			1579			419.8			101.2			77.63

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS19S</b>																				
7/3/90		828	10	44662		0.103	460.0		1.870	8352		0.83	3707.0		0.13	580.6		0.076	339.4	
7/17/90	14	1233	20	133059	622	0.194	1290.7	6.1	1.380	9181	61	0.61	4058.3	27.2	0.09	598.8	4.1	0.091	605.4	3.3
7/31/90	14	714	18	69328	1330	0.230	885.9	13.7	<i>1.792</i>	6902	118	0.83	3196.8	52.6	0.19	731.8	8.8	0.131	504.6	7.2
8/14/90	14	669	12	43274	1724	0.270	973.7	20.3	1.280	4616	158	0.73	2632.5	73.0	0.15	540.9	13.2	0.119	429.1	10.5
8/28/90	14	749	18	72755	2131	0.291	1176.2	27.8	1.500	6063	195	0.59	2384.7	90.5	0.13	525.5	17.0	0.141	569.9	14.0
9/11/90	14	834	14	62942	2606	0.196	881.2	35.0	1.370	6159	238	0.71	3192.1	110.1	0.14	629.4	21.0	0.123	553.0	17.9
9/25/90	14	889	10	47925	2994	0.185	886.6	41.2	1.540	7380	286	0.73	3498.5	133.5	0.19	910.6	26.4	0.114	546.3	21.7
10/9/90	14	914	22	108496	3541	0.136	670.7	46.6	2.110	10406	348	0.35	1726.1	151.8	<b>0.03</b>	123.3	30.0	0.090	443.8	25.2
10/23/90	14	868	8	37452	4052	0.233	1090.8	52.8	2.270	10627	421	0.40	1872.6	164.4	0.12	561.8	32.4	0.131	613.3	28.9
11/6/90	14	1111	8	47930	4351	0.314	1881.3	63.2	2.240	13420	506	0.55	3295.2	182.4	0.11	659.0	36.7	0.124	742.9	33.6
11/20/90	14	1542	14	116452	4926	0.366	3044.4	80.4	0.020	166	553	0.79	6571.2	217.0	0.23	1913.1	45.7	0.191	1588.7	41.8
12/4/90	14	1616	6	52296	5517	<i>0.281</i>	2449.2	99.7	1.820	15863	609	0.69	6014.1	261.0	0.24	2091.8	59.7	0.184	1603.7	53.0
1/15/91	42	2535	10	136715	7501	0.409	5591.6	184.1	1.470	20097	987	0.73	9980.2	429.0	0.16	2187.4	104.6	0.177	2419.9	95.2
1/29/91	14	2133	8	92028	8302	0.287	3301.5	215.2	1.430	16450	1115	0.42	4831.4	480.8	0.13	1495.4	117.5	0.145	1668.0	109.5
2/12/91	14	1416	10	76359	8891	0.143	1091.9	230.6	1.840	14050	1221	0.24	1832.6	504.1	0.14	1069.0	126.5	0.161	1229.4	119.7
2/26/91	14	1153	12	74609	9420	0.212	1318.1	239.0	2.100	13057	1316	0.26	1616.5	516.2	0.22	1367.8	135.0	0.202	1255.9	128.4
3/12/91	14	728	14	54945	9873	0.312	1224.5	247.9	2.460	9655	1396	0.58	2276.3	529.8	0.26	1020.4	143.4	0.218	855.6	135.8
3/26/91	14	672	14	50722	10243	0.371	1344.1	256.9	2.230	8079	1458	1.03	3731.7	550.8	0.21	760.8	149.6	0.188	681.1	141.1
4/9/91	14	736	23	91305	10740	0.388	1540.3	267.0	1.940	7701	1513	1.18	4684.3	580.3	0.19	754.3	154.9	0.149	591.5	145.6
4/23/91	14	742	20	80078	11340	0.446	1785.7	278.6	1.960	7848	1568	0.92	3683.6	609.6	0.23	920.9	160.8	0.190	760.7	150.3
5/7/91	14	631	24	81710	11906	0.338	1150.7	288.9	1.540	5243	1613	1.04	3540.7	634.9	0.22	749.0	166.6	0.130	442.6	154.5
5/21/91	14	1067	20	115075	12595	0.199	1145.0	297.0	1.890	10875	1670	0.86	4948.2	664.6	0.19	1093.2	173.1	0.136	782.5	158.8
6/4/91	14	810	18	78668	13273	0.432	1888.0	307.6	1.750	7648	1735	1.28	5594.2	701.5	0.15	655.6	179.2	0.122	533.2	163.4
6/18/91	14	654	15	52872	13733	0.362	1276.0	318.6	0.704	2481	1770	1.81	6379.9	743.4	0.33	1163.2	185.6	0.115	405.4	166.7
7/2/91	14	892	13	62520	14137	0.228	1096.5	327.0	1.450	6973	1803	0.59	2837.4	775.7	0.17	817.6	192.5	0.105	505.0	169.9
7/16/91	14	1327	16	114556	14757	0.125	895.0	333.9	1.060	7589	1854	0.43	3078.7	796.4	0.15	1074.0	199.1	0.094	673.0	174.0
Total					14757			333.9			1854			796.4			199.1			174.0

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS31S</b>																				
7/3/90		1920	6	62136		0.072	745.6		2.270	23508		0.38	3935.3		0.11	1139.2		0.092	952.7	
7/17/90	14	2540	6	82200	505	0.083	1137.1	6.6	1.820	24934	170	0.42	5754.0	34	0.16	2192.0	11.7	0.101	1383.7	8.2
7/31/90	14	2080	<i>10</i>	109945	1178	0.069	774.1	13.3	1.850	20755	329	0.51	5721.6	74	0.09	1009.7	22.9	0.109	1222.9	17.3
8/14/90	14	2040	12	132038	2025	0.109	1199.3	20.2	1.770	19476	470	0.67	7372.1	120	0.12	1320.4	31.0	0.108	1188.3	25.7
8/28/90	14	2250	12	145630	2996	0.148	1796.1	30.7	1.960	23786	622	0.47	5703.8	166	0.11	1334.9	40.3	0.132	1601.9	35.5
9/11/90	14	2370	4	51132	3685	0.102	1303.9	41.5	1.720	21987	782	0.57	7286.4	211	0.09	1150.5	49.0	0.119	1521.2	46.4
9/25/90	14	2530	<i>1</i>	13646	3912	0.041	559.5	48.0	1.920	26200	951	0.30	4093.8	251	0.09	1228.1	57.3	0.093	1269.1	56.2
10/9/90	14	2510	16	216611	4718	0.022	297.8	51.0	2.140	28972	1144	0.39	5279.9	284	0.05	676.9	64.0	0.091	1232.0	65.0
10/23/90	14	2390	4	51564	5656	0.049	631.7	54.3	2.340	30165	1351	0.27	3480.6	314	0.08	1031.3	70.0	0.110	1418.0	74.2
11/6/90	14	2410	8	103991	6201	0.055	714.9	59.0	2.340	30417	1563	0.29	3769.7	340	0.08	1039.9	77.2	0.097	1260.9	83.6
11/20/90	14	2430	2	26213	6657	0.101	1323.8	66.1	2.420	31718	1780	0.33	4325.2	368	0.15	1966.0	87.8	0.129	1690.8	93.9
12/4/90	14	2250	<i>1</i>	12136	6791	0.147	1784.0	77.0	2.170	26335	1983	0.43	5218.4	402	0.16	1941.7	101.4	0.144	1747.6	106.0
12/18/90	14	2390	12	154692	7375	0.183	2359.0	91.5	2.500	32227	2188	0.39	5027.5	437	0.16	2062.6	115.4	0.135	1740.3	118.2
1/15/91	28	3410	10	183926	9745	<i>0.110</i>	2023.2	122.2	1.910	35130	2660	0.54	9932.0	542	0.15	2758.9	149.2	0.169	3108.3	152.1
1/29/91	14	3150	12	203882	11102	0.189	3211.1	140.5	1.930	32791	2898	0.32	5436.9	596	0.12	2038.8	166.0	0.134	2276.7	171.0
2/12/91	14	2060	10	111110	12205	0.115	1277.8	156.2	2.230	24778	3099	0.34	3777.8	628	0.14	1555.5	178.6	0.139	1544.4	184.3
2/26/91	14	1800	10	97087	12933	0.204	1980.6	167.6	2.560	24854	3273	0.30	2912.6	652	0.16	1553.4	189.5	0.164	1592.2	195.3
3/12/91	14	1300	10	70118	13519	0.171	1199.0	178.8	2.510	17600	3421	0.37	2594.4	671	0.19	1332.2	199.5	0.170	1192.0	205.1
3/26/91	14	1410	10	76051	14030	0.165	1254.8	187.4	2.360	17948	3546	0.56	4258.9	695	0.19	1445.0	209.3	0.176	1338.5	213.9
4/9/91	14	1380	10	74433	14557	0.103	766.7	194.4	2.100	15631	3663	0.45	3349.5	721	0.13	967.6	217.7	0.102	759.2	221.3
4/23/91	14	1680	8	72491	15071	0.130	1178.0	201.2	1.820	16492	3776	<i>0.47</i>	4222.6	748	0.15	1359.2	225.9	0.128	1159.9	228.0
5/7/91	14	1930	14	145738	15835	0.109	1134.7	209.3	1.750	18217	3897	0.84	8744.3	793	0.16	1665.6	236.4	0.121	1259.6	236.4
5/21/91	14	2090	12	135274	16819	0.043	484.7	215.0	1.740	19615	4030	0.34	3832.8	837	0.15	1690.9	248.2	0.100	1127.3	244.8
6/4/91	14	2000		0	17292	0.046	496.2	218.4	1.780	19202	4165	0.65	7011.8	875	0.12	1294.5	258.6	0.109	1175.8	252.9
6/18/91	14	2110	10	113807	17690	0.074	842.2	223.1	<i>1.994</i>	22693	4312	0.65	7397.5	926	0.11	1251.9	267.6	0.095	1081.2	260.8
7/2/91	14	1960	8	84573	18385	0.061	644.9	228.3	1.630	17232	4452	0.44	4651.5	968	0.14	1480.0	277.1	0.107	1131.2	268.5
7/16/91	14	2390	10	128910	19132	0.109	1405.1	235.5	1.600	20626	4584	0.44	5672.0	1004	0.16	2062.6	289.5	0.085	1095.7	276.3
Total					19132			235.5			4584			1004			289.5			276.3

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS44M</b>																				
7/3/90		5150	9	249999		0.049	1361.1		1.460	40555		0.32	8889		0.07	1944.4		0.083	2305.5	
7/17/90	14	5890	4	127076	1320	0.065	2065.0	12.0	1.420	45112	300	0.36	11437	71	0.10	3176.9	17.9	0.090	2859.2	18.1
8/1/90	15	5580	4	120388	2248	0.073	2197.1	28.0	1.120	33709	595	0.37	11136	156	0.06	1805.8	36.6	0.077	2317.5	37.5
8/15/90	14	5610	6	181552	3305	0.094	2844.3	45.6	1.390	42060	861	0.37	11075	234	0.06	1815.5	49.3	0.066	1997.1	52.6
8/29/90	14	6330	10	341422	5135	0.141	4814.0	72.4	1.560	53262	1194	0.29	9901	307	0.08	2731.4	65.2	0.085	2902.1	69.7
9/12/90	14	6550	9	317959	7443	0.041	1448.5	94.3	1.670	58999	1587	0.28	9892	376	0.06	2119.7	82.2	0.077	2720.3	89.4
9/26/90	14	6880	7	37109	8686	0.024	890.6	102.5	1.580	58632	1999	0.18	6680	434	0.10	3710.9	102.6	0.076	2820.3	108.8
10/10/90	14	6910	12	447247	10381	0.068	2534.4	114.5	1.630	60751	2417	0.28	10436	494	0.07	2608.9	124.7	0.075	2795.3	128.5
10/24/90	14	6810	4	146925	12460	0.100	3673.1	136.2	1.660	60974	2843	0.22	8081	559	0.07	2571.2	142.8	0.086	3158.9	149.3
11/7/90	14	6450	12	417473	14436	0.116	4035.6	163.2	1.860	64708	3283	0.26	9045	619	0.05	1739.5	157.9	0.064	2226.5	168.2
12/5/90	28	6240	4	134627	18300	0.118	3971.5	219.3	1.640	55197	4122	0.33	11107	760	0.09	3029.1	191.3	0.101	3399.3	207.5
12/18/90	13	6090	8	262782	19592	0.173	5682.7	250.6	1.860	61097	4500	0.28	9197	826	0.10	3284.8	211.8	0.080	2627.8	227.1
1/16/91	29	7090	14	535380	25379	0.153	5850.9	334.3	1.650	63098	5400	0.38	14532	998	0.11	4206.6	266.1	0.116	4436.0	278.3
1/30/91	14	6600	12	427182	28748	0.136	4841.4	371.7	1.460	51974	5803	0.27	9612	1082	0.10	3559.8	293.3	0.098	3488.7	306.1
2/13/91	14	5600	10	302048	31300	0.128	3866.2	402.2	1.980	59805	6194	0.30	9061	1148	0.10	3020.5	316.3	0.096	2899.7	328.4
2/27/91	14	5410	10	291800	33378	0.115	3355.7	427.4	1.680	49022	6575	0.33	9629	1213	0.07	2042.6	334.1	0.097	2830.5	348.5
3/13/91	14	5050	8	217906	35162	0.109	2969.0	449.6	1.760	47939	6915	0.33	8989	1278	0.12	3268.6	352.7	0.102	2778.3	368.1
3/27/91	14	4800	10	258898	36831	0.122	3158.6	471.0	1.660	42977	7233	0.40	10356	1346	0.05	1294.5	368.6	0.079	2045.3	385.0
4/10/91	14	4720	9	229125	38539	0.096	2444.0	490.6	1.380	35132	7506	0.31	7892	1410	0.11	2800.4	383.0	0.058	1476.6	397.3
4/24/91	14	5080	6	164400	39917	0.151	4137.4	513.7	1.320	36168	7756	0.50	13700	1486	0.09	2466.0	401.4	0.088	2411.2	410.9
5/8/91	14	5390	11	319793	41611	0.115	3343.3	539.9	1.020	29654	7986	0.37	10757	1571	0.12	3488.7	422.2	0.094	2732.8	428.9
5/22/91	14	5400	15	436891	44260	0.181	5271.8	570.0	1.090	31747	8201	0.27	7864	1636	0.09	2621.3	443.6	0.074	2155.3	446.0
6/5/91	14	5440	4	117367	46200	0.108	3168.9	599.5	0.978	28696	8413	0.41	12030	1706	0.11	3227.6	464.1	0.080	2347.3	461.8
6/19/91	14	5510	5	148597	47130	0.056	1664.3	616.5	0.757	22498	8592	0.70	20804	1821	0.10	2971.9	485.8	0.069	2050.6	477.2
7/3/91	14	5340	4	115210	48054	0.068	1958.6	629.1	1.200	34563	8791	0.58	16705	1952	0.09	2592.2	505.3	0.087	2505.8	493.1
7/16/91	13	5750	3	93042	48731	0.081	2512.1	643.7	1.260	39077	9031	0.21	6513	2028	0.11	3411.5	524.8	0.076	2357.1	508.9
Total					48731			643.7			9031			2028			524.8			508.9



## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600 \text{ s/h} * 24 \text{ h/d} * 1 \text{ kg/1,000,000 mg} * 2.205 \text{ lb/kg} * 28.317 \text{ l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS45S</b>																				
7/3/90		5150	4	111110		0.055	1527.8		1.440	40000		0.24	6667		0.08	2222.2		0.091	2527.8	
7/18/90	15	5890	4	127076	893	0.070	2223.8	14.1	1.480	47018	326	0.37	11755	69	0.06	1906.1	15.5	0.085	2700.4	19.6
8/1/90	14	5580	<b>7</b>	30098	1443	0.070	2106.8	29.2	1.140	34310	611	0.50	15048	163	0.11	3310.7	33.7	0.095	2859.2	39.1
8/15/90	14	5610	4	121035	1972	0.046	1391.9	41.5	1.430	43270	882	0.24	7262	241	0.08	2420.7	53.8	0.086	2602.3	58.2
8/29/90	14	6330	6	204853	3113	0.200	6828.4	70.2	0.840	28679	1134	0.25	8536	296	0.06	2048.5	69.4	0.075	2560.7	76.2
9/12/90	14	6550	2	70658	4077	0.050	1766.4	100.3	1.550	54760	1426	0.23	8126	355	0.06	2119.7	84.0	0.069	2437.7	93.7
9/26/90	14	6880	6	222652	5104	0.030	1113.3	110.4	2.040	75702	1883	0.26	9648	417	0.10	3710.9	104.4	0.086	3191.4	113.4
10/10/90	14	6910	12	447247	7448	0.051	1900.8	121.0	1.600	59633	2357	0.29	10808	488	0.07	2608.9	126.6	0.076	2832.6	134.5
10/24/90	14	6810	10	367312	10299	0.066	2424.3	136.1	1.710	62810	2785	0.14	5142	544	0.07	2571.2	144.7	0.069	2534.5	153.3
11/7/90	14	6450	8	278316	12559	0.069	2400.5	153.0	1.900	66100	3236	0.26	9045	594	0.05	1739.5	159.8	0.066	2296.1	170.2
12/5/90	28	6240	4	134627	15450	0.087	2928.1	190.3	1.630	54861	4083	0.30	10097	728	0.09	3029.1	193.2	0.116	3904.2	213.6
12/18/90	13	6090	12	394172	17168	0.126	4138.8	213.2	1.830	60111	4457	0.36	11825	799	0.10	3284.8	213.7	0.075	2463.6	234.3
1/16/91	29	7090	12	458897	23353	0.175	6692.2	291.8	1.670	63863	5356	0.37	14149	987	0.11	4206.6	268.0	0.115	4397.8	284.1
1/30/91	14	6600	10	355985	26205	0.145	5161.8	333.3	1.580	56246	5776	0.25	8900	1068	0.11	3915.8	296.4	0.098	3488.7	311.7
2/13/91	14	5600	8	241638	28297	0.123	3715.2	364.3	2.010	60712	6185	0.17	5135	1117	0.10	3020.5	320.7	0.102	3080.9	334.7
2/27/91	14	5410	10	291800	30164	0.107	3122.3	388.3	1.620	47272	6563	0.28	8170	1164	0.09	2626.2	340.5	0.090	2626.2	354.6
3/13/91	14	5050	6	163429	31757	<i>0.095</i>	2587.6	408.2	1.690	46033	6890	0.34	9261	1225	0.13	3541.0	362.0	0.092	2505.9	372.6
3/27/91	14	4800	10	258898	33235	0.169	4375.4	432.6	1.620	41942	7198	<i>0.34</i>	8699	1288	0.07	1812.3	380.8	0.080	2071.2	388.6
4/10/91	14	4720	5	127292	34587	0.093	2367.6	456.2	1.250	31823	7456	0.30	7637	1345	0.12	3055.0	397.8	0.057	1451.1	400.9
4/24/91	14	5080	9	246600	35896	0.146	4000.4	478.5	1.370	37538	7699	0.36	9864	1406	0.10	2740.0	418.1	0.080	2192.0	413.7
5/8/91	14	5390	8	232577	37573	0.064	1860.6	499.0	0.981	28520	7930	0.37	10757	1478	0.12	3488.7	439.9	0.081	2354.8	429.6
5/22/91	14	5400	14	407765	39814	0.105	3058.2	516.2	1.290	37573	8161	0.30	8738	1546	0.10	2912.6	462.3	0.074	2155.3	445.4
6/5/91	14	5440	4	117367	41652	0.038	1115.0	530.8	0.970	28462	8392	0.56	16431	1635	0.09	2640.8	481.7	0.095	2787.5	462.7
6/19/91	14	5510	5	148597	42583	0.013	386.4	536.1	0.843	25053	8580	0.30	8916	1723	0.08	2377.5	499.3	0.085	2526.1	481.3
7/3/91	14	5340	3	86407	43405	0.059	1699.3	543.4	1.260	36291	8794	0.42	12097	1797	0.10	2880.2	517.7	0.084	2419.4	498.6
7/16/91	13	5750	4	124055	44089	0.082	2543.1	557.2	1.250	38767	9038	0.28	8684	1864	0.12	3721.7	539.2	0.099	3070.4	516.4
Total					44089			557.2			9038			1864		539.2				516.4

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

$$\text{Load} = Q \text{ cfs} * C \text{ mg/l} * 3600\text{s/h} * 24\text{h/d} * 1\text{kg}/1,000,000\text{mg} * 2.205\text{lb/kg} * 28.317\text{l/cf} = Q \text{ 5.39}$$

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS47N</b>																				
7/3/90		5150	2	55555		0.043	1194.4		1.310	36389		0.23	6389		0.07	1944.4		0.084	2333.3	
7/18/90	15	5870	10	316611	1396	0.061	1931.3	11.7	1.330	42109	294	0.39	12348	70	0.05	1583.1	13.2	0.081	2564.5	18.4
8/1/90	14	5580	4	120388	2925	0.055	1655.3	24.3	1.070	32204	554	0.41	12340	157	0.07	2106.8	26.1	0.081	2437.8	35.9
8/15/90	14	5610	2	60517	3558	0.074	2239.1	37.9	1.330	40244	808	0.34	10288	236	0.08	2420.7	42.0	0.080	2420.7	52.9
8/29/90	14	6330	4	136569	4248	0.195	6657.7	69.0	1.450	49506	1122	0.42	14340	322	0.07	2390.0	58.8	0.064	2185.1	69.0
9/12/90	14	6550	2	70658	4973	0.072	2543.7	101.2	1.510	53347	1482	0.21	7419	398	0.07	2473.0	75.8	0.080	2826.3	86.5
9/26/90	14	6880	4	148435	5740	0.017	630.8	112.4	1.420	52694	1853	0.21	7793	451	0.10	3710.9	97.5	0.079	2931.6	106.7
10/10/90	14	6910	10	372705	7564	0.043	1602.6	120.2	1.550	57769	2240	0.28	10436	515	0.07	2608.9	119.6	0.069	2571.7	126.0
10/24/90	14	6810	6	220387	9640	0.067	2461.0	134.4	1.670	61341	2657	0.15	5510	571	0.06	2203.9	136.5	0.073	2681.4	144.3
11/7/90	14	6450	10	347894	11629	0.129	4487.8	158.7	1.900	66100	3103	0.23	8002	618	0.06	2087.4	151.5	0.065	2261.3	161.6
12/5/90	28	6240	2	67314	14535	0.097	3264.7	213.0	1.580	53178	3938	0.33	11107	752	0.07	2356.0	182.6	0.102	3433.0	201.5
12/19/90	14	6210	8	267960	15709	0.137	4588.8	240.5	1.820	60961	4337	0.40	13398	838	0.10	3349.5	202.5	0.063	2110.2	220.9
1/16/91	28	7090	16	611863	21868	0.190	7265.9	323.5	1.640	62716	5203	0.38	14532	1033	0.11	4206.6	255.4	0.077	2944.6	256.3
1/30/91	14	6600	8	284788	25006	0.134	4770.2	365.6	1.560	55534	5617	0.26	9256	1117	0.09	3203.9	281.4	0.090	3203.9	277.8
2/13/91	14	5600	10	302048	27060	0.104	3141.3	393.3	1.940	58597	6016	0.22	6645	1172	0.11	3322.5	304.2	0.094	2839.2	299.0
2/27/91	14	5410	12	350160	29343	0.119	3472.4	416.4	1.580	46104	6383	0.17	4961	1213	0.08	2334.4	324.0	0.097	2830.5	318.8
3/13/91	14	5050	4	108953	30949	0.100	2723.8	438.1	1.330	36227	6671	0.44	11985	1272	0.11	2996.2	342.7	0.088	2397.0	337.1
3/27/91	14	4800	22	569576	33324	0.063	1631.1	453.4	1.570	40647	6940	0.31	8026	1342	0.06	1553.4	358.6	0.074	1915.8	352.2
4/10/91	14	4720	10	254583	36209	0.055	1400.2	464.0	1.140	29022	7184	0.29	7383	1396	0.11	2800.4	373.8	0.045	1145.6	362.9
4/24/91	14	5080	9	246600	37963	0.203	5562.2	488.3	1.310	35894	7411	0.28	7672	1449	0.10	2740.0	393.2	0.066	1808.4	373.2
5/8/91	14	5390	10	290721	39844	0.035	1017.5	511.4	0.944	27444	7633	0.39	11338	1515	0.08	2442.1	411.4	0.068	1976.9	386.5
5/22/91	14	5400	16	466017	42492	0.150	4368.9	530.2	1.290	37573	7860	0.30	8738	1586	0.09	2621.3	429.1	0.069	2009.7	400.4
6/5/91	14	5440	2	58684	44329	0.096	2816.8	555.4	0.904	26525	8085	0.56	16431	1674	0.06	1760.5	444.4	0.063	1848.5	413.9
6/19/91	14	5510	5	148597	45054	0.084	2496.4	574.0	0.667	19823	8247	0.33	9659	1765	0.09	2674.7	459.9	0.061	1812.9	426.8
7/3/91	14	5340	3	86407	45877	0.043	1238.5	587.0	1.130	32547	8430	0.24	6913	1823	0.10	2880.2	479.4	0.087	2505.8	441.9
7/17/91	14	5840	1	31499	46289	0.063	1984.5	598.3	0.900	28349	8643	0.28	8820	1878	0.07	2204.9	497.2	0.072	2267.9	458.6
Total					46289			598.3			8643			1878			497.2			458.6

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS51N</b>																				
7/3/90		6237	6	201843		0.037	1244.7		1.240	41714		0.21	7065		0.06	2018.4		0.043	1446.5	
7/18/90	15	7281	4	157089	1346	0.043	1688.7	11.0	1.350	53017	355	0.39	15316	84	0.06	2356.3	16.4	0.071	2788.3	15.9
8/1/90	14	7261	10	391637	3267	0.040	1566.5	22.4	1.050	41122	685	0.96	37597	269	0.14	5482.9	43.8	0.075	2937.3	35.9
8/15/90	14	7286	4	157186	5187	0.088	3458.1	40.0	1.320	51871	1010	0.19	7466	427	0.07	2750.7	72.7	0.074	2907.9	56.4
8/29/90	14	8270	14	624484	7923	0.124	5531.1	71.4	1.400	62448	1410	0.18	8029	481	0.06	2676.4	91.7	0.079	3523.9	78.9
9/12/90	14	8497	10	458298	11713	0.069	3162.3	101.9	1.510	69203	1871	0.18	8249	538	0.05	2291.5	109.0	0.064	2933.1	101.5
9/12/90	0	8497	6	274979	11713	0.024	1099.9	101.9	1.440	65995	1871	0.21	9624	538	0.05	2291.5	109.0	0.064	2933.1	101.5
9/26/90	14	8976	8	363105	13946	0.006	290.5	106.7	1.410	68264	2341	0.17	8230	601	0.11	5325.5	135.7	0.066	3195.3	122.9
10/10/90	14	9053	8	390634	16584	0.034	1660.2	113.6	1.500	73244	2836	0.25	12207	672	0.06	2929.8	164.6	0.078	3808.7	147.5
10/24/90	14	8478	6	274367	18912	0.065	2972.3	129.8	1.610	73622	3350	0.35	16005	771	0.06	2743.7	184.5	0.062	2835.1	170.7
11/7/90	14	8214	12	531628	21733	0.125	5537.8	159.6	1.770	78415	3882	0.20	8860	858	0.05	2215.1	201.8	0.062	2746.7	190.2
12/5/90	28	7959	4	171714	26656	0.059	2532.8	216.1	1.490	63964	4879	0.30	12879	1010	0.08	3434.3	241.4	0.090	3863.6	236.5
12/18/90	13	7818	8	337344	28311	0.113	4765.0	239.8	1.720	72529	5323	0.25	10542	1086	0.08	3373.4	263.5	0.103	4343.3	263.2
1/16/91	29	8722	12	564527	34849	0.122	5739.4	315.9	1.610	75741	6398	0.30	14113	1265	0.11	5174.8	325.5	0.103	4845.5	329.8
1/30/91	14	8295	12	536884	38704	0.119	5324.1	354.7	1.540	68900	6904	0.25	11185	1353	0.09	4026.6	357.7	0.088	3937.1	360.5
2/13/91	14	7173	8	309530	41667	0.076	2940.5	383.6	1.800	69644	7389	0.17	6578	1416	0.10	3869.1	385.3	0.108	4178.7	389.0
2/27/91	14	7085	6	229283	43553	0.062	2369.3	402.2	1.550	59232	7840	0.17	6496	1461	0.06	2292.8	406.9	0.080	3057.1	414.3
3/13/91	14	7000	4	151024	44884	0.233	8797.1	441.2	1.620	61165	8261	0.28	10572	1521	0.09	3398.0	426.8	0.073	2756.2	434.6
3/27/91	14	7000	8	302048	46469	0.094	3549.1	484.5	1.570	59277	8683	0.31	11704	1599	0.06	2265.4	446.6	0.060	2265.4	452.2
4/10/91	14	7000	8	302048	48584	0.023	868.4	499.9	1.190	44930	9048	0.21	7929	1668	0.08	3020.5	465.1	0.038	1434.7	465.1
4/24/91	14	7000	8	302048	50698	0.013	490.8	504.7	1.240	46817	9369	0.40	15102	1748	0.08	3020.5	486.2	0.050	1887.8	476.8
5/8/91	14	6996	9	339610	52944	0.171	6452.6	529.0	0.921	34753	9654	0.33	12452	1845	0.13	4905.5	514.0	0.073	2754.6	493.0
5/22/91	14	7059	8	285557	55132	0.103	3921.6	565.3	1.280	48735	9946	0.24	9138	1920	0.08	3045.9	541.8	0.062	2360.6	510.9
6/5/91	14	6501	3	105200	56500	0.099	3471.6	591.2	0.941	32998	10232	0.40	14027	2001	0.08	2805.3	562.3	0.057	1998.8	526.2
6/19/91	14	6378	7	240808	57711	0.090	3096.1	614.2	1.364	46923	10512	0.56	19265	2118	0.10	3440.1	584.2	0.056	1926.5	539.9
7/3/91	14	5996	5	161703	59119	0.040	1293.6	629.5	1.070	34605	10797	0.30	9702	2219	0.11	3557.5	608.6	0.078	2522.6	555.5
7/17/91	14	6762	1	36474	59813	0.052	1896.7	640.7	1.180	43040	11069	0.39	14225	2303	0.07	2553.2	630.0	0.067	2443.8	572.9
Total					59813			640.7			11069			2303		630.0				572.9

## Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS52S</b>																				
7/3/90		6140	6	198704		0.030	993.5		1.150	38085		0.23	7617		0.05	1655.9		0.070	2318.2	
7/18/90	15	7190	6	232685	1618	0.052	2016.6	11.3	1.340	51966	338	0.38	14737	84	0.05	1939.0	13.5	0.070	2714.7	18.9
8/1/90	14	7170	6	232037	3244	0.035	1353.6	23.1	0.971	37551	651	0.31	11989	177	<b>0.03</b>	966.8	23.7	0.053	2049.7	35.5
8/15/90	14	7200	6	233008	4872	0.063	2446.6	36.4	1.290	50097	958	0.29	11262	259	0.07	2718.4	36.5	0.068	2640.8	52.0
8/29/90	14	8200	14	619198	7855	0.132	5838.2	65.4	1.380	61035	1347	0.53	23441	380	0.10	4422.8	61.5	0.080	3538.3	73.6
9/12/90	14	8420	<b>7</b>	45416	10181	0.033	1498.7	91.1	1.350	61310	1775	0.22	9991	497	0.06	2724.9	86.6	0.074	3360.7	97.7
9/26/90	14	8920	<b>7</b>	48113	10508	<b>0.003</b>	120.3	96.7	1.430	68800	2230	0.21	10104	568	0.10	4811.2	112.9	0.066	3175.4	120.6
10/10/90	14	9050	16	781009	13410	0.035	1708.5	103.1	1.420	69315	2714	0.27	13180	649	0.07	3416.9	141.7	0.066	3221.7	143.0
10/24/90	14	8500	10	458465	17748	0.043	1971.4	116.0	1.610	73813	3215	0.24	11003	734	0.06	2750.8	163.3	0.061	2796.6	164.1
11/7/90	14	8220	12	532036	21215	0.031	1374.4	127.7	1.760	78032	3746	0.20	8867	803	<b>0.03</b>	1108.4	176.8	0.062	2748.9	183.5
12/5/90	28	7970	6	257927	26745	0.050	2149.4	152.4	1.520	65342	4750	0.26	11177	944	<b>0.03</b>	1074.7	192.1	0.092	3954.9	230.4
12/18/90	13	7830	8	337862	28681	0.107	4518.9	174.1	1.710	72218	5197	0.23	9714	1011	0.09	3800.9	208.0	0.106	4476.7	257.8
1/16/91	29	8730	16	753394	36593	0.111	5226.7	244.7	1.710	80519	6304	0.29	13655	1181	0.11	5179.6	273.1	0.108	5085.4	327.1
1/30/91	14	8300	8	358142	40483	0.081	3626.2	275.7	1.570	70285	6832	0.22	9849	1263	0.09	4029.1	305.3	0.087	3894.8	358.6
2/13/91	14	7180	16	619630	43905	0.062	2401.1	296.8	1.890	73194	7334	0.18	6971	1322	0.11	4260.0	334.3	0.087	3369.2	384.0
2/27/91	14	7090	6	229448	46877	0.031	1185.5	309.3	1.500	57362	7791	0.15	5736	1366	0.06	2294.5	357.2	0.083	3174.0	406.9
3/13/91	14	<b>7516</b>	8	324309	48815	<b>0.060</b>	2432.3	322.0	1.620	65673	8222	0.20	8108	1415	0.12	4864.6	382.3	0.064	2594.5	427.1
3/27/91	14	<b>7516</b>	2	81077	50234	0.064	2594.5	339.6	1.540	62430	8670	0.27	10945	1482	<b>0.03</b>	1013.5	402.9	0.057	2310.7	444.2
4/10/91	14	<b>7516</b>	8	324309	51653	0.007	283.8	349.7	1.130	45809	9049	0.10	4054	1534	0.09	3648.5	419.2	0.039	1581.0	457.9
4/24/91	14	<b>7516</b>	14	567541	54774	0.051	2067.5	357.9	1.240	50268	9385	0.43	17432	1609	0.11	4459.3	447.6	0.060	2432.3	471.9
5/8/91	14	6940	21	786080	59512	<b>0.003</b>	93.6	365.5	0.885	33128	9677	0.28	10481	1707	0.13	4866.2	480.2	0.071	2657.7	489.7
5/22/91	14	7000	16	604096	64378	0.132	4983.8	383.2	1.340	50593	9970	0.51	19256	1811	0.08	3020.5	507.8	0.067	2529.7	507.9
6/5/91	14	6440	5	173678	67100	0.031	1076.8	404.4	0.843	29282	10250	0.60	20841	1951	0.22	7641.8	545.1	0.055	1910.5	523.4
6/19/91	14	6290	4	135706	68183	0.007	237.5	409.0	0.696	23613	10435	0.20	6785	2048	0.07	2374.9	580.2	0.050	1696.3	536.0
7/3/91	14	5900	7	222760	69437	0.045	1432.0	414.9	1.080	34369	10638	0.24	7637	2099	0.08	2545.8	597.4	0.074	2354.9	550.2
7/17/91	14	6670	1	35976	70343	0.043	1547.0	425.3	1.150	41372	10903	0.33	11872	2167	0.07	2518.3	615.1	0.065	2338.4	566.7
Total					70343			425.3			10903			2167		615.1				566.7

### Middle Snake River Water Quality Survey Loading Computations

Concentrations in bold italics indicate sample below MDL --- 1/2 MDL was used.

Load = Q cfs \* C mg/l \* 3600s/h \* 24h/d \* 1kg/1,000,000mg \* 2.205lb/kg \* 28.317l/cf = Q 5.39

Date	Days	Flow cfs	Sediment			Ammonia			Nitrite + Nitrate N			Organic Nitrogen			Total Phosphate			Ortho Phosphate		
			Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons	Conc. mg/l	Load lb/day	Acc. tons
<b>IS53N</b>																				
8/15/90		7255	4	156517		0.040	1565.2		1.310	51259		<i>0.31</i>	12247		0.05	1956.5		0.082	3208.6	
8/29/90	14	8246	6	266859	1482	0.121	5381.7	24.3	1.360	60488	391	0.23	10230	79	0.06	2668.6	16.2	0.063	2802.0	21.0
9/12/90	14	8473	10	457004	4015	0.069	3153.3	54.2	1.510	69008	844	0.18	8226	143	0.05	2285.0	33.5	0.064	2924.8	41.1
9/26/90	14	8956	6	289836	6629	<i>0.003</i>	120.8	65.6	1.500	72459	1339	0.25	12077	214	0.10	4830.6	58.4	0.073	3526.3	63.7
10/10/90	14	9045	10	487845	9351	0.078	3805.2	79.4	1.470	71713	1844	0.35	17075	316	0.07	3414.9	87.3	0.066	3219.8	87.3
10/24/90	14	8478	6	274367	12019	0.047	2149.2	100.2	1.600	73165	2351	0.21	9603	410	0.07	3201.0	110.4	0.081	3704.0	111.5
11/7/90	14	8214	10	443023	14530	0.061	2702.4	117.2	1.730	76643	2875	0.30	13291	490	0.05	2215.1	129.4	0.063	2791.0	134.2
12/5/90	28	7959	4	171714	18833	0.093	3992.4	164.1	1.500	64393	3863	0.29	12449	670	0.08	3434.3	168.9	0.095	4078.2	182.3
12/19/90	14	7779	6	251746	20315	0.091	3818.1	191.4	1.780	74685	4350	0.26	10909	752	0.07	2937.0	191.2	0.063	2643.3	205.8
1/16/91	28	8722	7	334012	24415	0.133	6256.8	261.9	1.640	77152	5412	0.30	14113	927	0.09	4234.0	241.4	0.101	4751.4	257.6
1/30/91	14	8295	10	447403	27150	0.128	5726.8	303.9	1.500	67110	5917	0.25	11185	1015	0.08	3579.2	268.8	0.085	3802.9	287.6
2/13/91	14	7173	6	232148	29529	0.117	4526.9	339.8	1.860	71966	6404	0.14	5417	1074	0.10	3869.1	294.9	0.086	3327.4	312.5
2/27/91	14	7085	8	305711	31411	0.060	2292.8	363.6	1.540	58849	6862	0.09	3439	1105	0.08	3057.1	319.1	0.086	3286.4	335.7
3/13/91	14	<i>7516</i>	<i>7</i>	40539	32623	0.104	4216.0	386.4	1.660	67294	7303	0.32	12972	1162	0.09	3648.5	342.6	0.070	2837.7	357.1
3/27/91	14	<i>7516</i>	6	243232	33616	0.093	3770.1	414.4	1.500	60808	7752	0.64	25945	1298	0.07	2837.7	365.3	0.077	3121.5	377.9
4/10/91	14	<i>7516</i>	8	324309	35603	0.062	2513.4	436.4	1.210	49052	8136	0.14	5675	1409	0.11	4459.3	390.8	0.044	1783.7	395.1
4/24/91	14	<i>7516</i>	9	364848	38015	0.027	1094.5	449.0	1.090	44187	8463	0.39	15810	1484	0.09	3648.5	419.2	0.060	2432.3	409.9
5/8/91	14	6971	9	338396	40476	0.029	1090.4	456.6	0.940	35344	8741	0.39	14664	1591	0.12	4511.9	447.7	0.072	2707.2	427.9
5/22/91	14	7031	14	530925	43519	0.116	4399.1	475.8	1.320	50059	9040	0.20	7585	1669	0.08	3033.9	474.2	0.064	2427.1	445.8
6/5/91	14	6480	1	34953	45499	0.062	2167.1	498.8	0.935	32681	9329	0.28	9787	1729	0.08	2796.3	494.6	0.060	2097.2	461.7
6/19/91	14	6349	5	171223	46221	0.006	205.5	507.1	0.722	24725	9530	0.11	3767	1777	0.09	3082.0	515.1	0.079	2705.3	478.5
7/3/91	14	5964	4	128672	47271	0.045	1447.6	512.9	1.080	34742	9739	0.65	20909	1863	0.07	2251.8	533.8	0.069	2219.6	495.7
7/17/91	14	6733	1	36318	47848	0.050	1815.9	524.3	1.140	41403	10005	0.20	7264	1962	0.08	2905.4	551.9	0.062	2251.7	511.4
Total					47848			524.3			10005			1962			551.9			511.4