SECTION 4

PRELIMINARY SITE CHARACTERIZATION AQUATIC BIOTA TECHNICAL MEMORANDUM

MOLYCORP MINE RI/FS

REVISION 0

Prepared for
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Questa, New Mexico

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SECTIONFOUR Aquatic Biota

Sampling methods for aquatic biota parameters were conducted in accordance with the Molycorp RI Work Plan (URS 2002b). Four methods were modified because of unexpected conditions encountered in the field or at the request of EPA. Juvenile white suckers were substituted for juvenile brown trout for tissue analysis in lakes because brown trout were rare or absent in the lakes. Tissues were collected from three age class (YOY [young of year], juvenile, and adult) of brown trout in 2003, as opposed to two age classes in 2002 (juvenile and adult), and adult rainbow trout were not collected in 2003. Bryophytes in streams and algae in lakes were substituted for aquatic macrophytes for tissue analysis because aquatic macrophytes were rare to absent at all sampling sites. Water samples from the lakes for bioassay tests were collected from near the shore instead of in the middle of the lake, because it was determined that the water quality was sufficiently homogeneous to allow an easier collection method. All modifications to sampling methods were approved by EPA representatives prior to the modification.

4.1 RI/FS DATA

Data collected from fall 2002 through fall 2003 in conjunction with the RI/FS Work Plan and in fall 2004 for the RI/FS addendum are presented below. These data do not include sampling conducted prior to the initiation of the RI/FS, data collected after the RI/FS studies, or data collected at sites not specified for the RI/FS.

4.1.1 Reference Sites

Reference sites were chosen to be representative of the aquatic environment in the Red River drainage that are outside the zone of influence of the mine exposure area and the tailings facility exposure area. Four sites on the Red River, one tributary, and one lake were chosen as reference sites for the RI/FS study.

4.1.1.1 Red River, Cabresto Creek

Four reference sites were located on the mainstem of the Red River. One site, Zwergle, is located on the Red River approximately 0.6 mile upstream from the Goose Creek confluence and 0.2 mile upstream from the abandoned USGS gaging station (USGS 08264500) at an elevation of approximately 8,900 feet.

Site RR-4 is the first site downstream of the town of Red River. It is located near the upstream end of June Bug Campground at an elevation of approximately 8,530 feet.

Site RR-5 is located 0.4 mile downstream from Elephant Rock campground at an elevation of approximately 8,360 feet.

Site RR-6 is located 0.8 mile upstream from the Molycorp mill facility access road and 0.7 mile downstream from Hansen Creek, at an elevation of approximately 8,200 feet.

One reference site was located on Cabresto Creek, a tributary to the Red River. The Cabresto Creek site is located 1.6 mile upstream of the Carson National Forest boundary, at an elevation of approximately 7,640 feet.

4.1.1.1.1 Fish

Fish were collected from the five stream reference sites to determine fish population status and for fish tissue analysis for concentrations of metals in fall 2002 and fall 2003.

Populations

Fish populations were sampled at all five stream reference sites in fall 2002 and fall 2003 (Tables 4-1 and 4-2, Appendix A-4a). Brook trout, brown trout, rainbow trout, and cutthroat trout/rainbow trout hybrids were collected at the Cabresto Creek site in fall 2002 and fall 2003. These same species were found at the Zwergle site in addition to cutthroat trout in fall 2002 and fall 2003. Site RR-4 had brown trout and rainbow trout in fall 2002 and fall 2003. Cutthroat trout/rainbow trout hybrids and white suckers were also present in fall 2003. Site RR-5 had only rainbow trout in fall 2002, but also had brown trout, cutthroat trout/rainbow trout hybrids, and white suckers in fall 2003. Site RR-6 had no fish in fall 2002, and a few brown trout and cutthroat trout/rainbow trout hybrids in fall 2003.

The Cabresto Creek and Zwergle sites were characterized by high density and biomass estimates in both years, while sites RR-4, RR-5, and RR-6 had considerably lower density and biomass estimates in both years (Tables 4-1 and 4-2, Appendix A-4a).

Tissues

At the Zwergle and Cabresto Creek sites, three replicate brown trout tissues were collected from all size classes in both years. At Site RR-4 in fall 2002, two adult brown trout were collected for fish tissue analysis, but no juvenile brown trout were captured. At Site RR-4 in fall 2003, two YOY and three juvenile brown trout were collected, but no adults were collected.

At Site AR-5 in fall 2002, no juvenile or adult brown trout were collected for tissue analysis. At Site AR-5 in fall 2003, one YOY, three juvenile, and two adult brown trout were collected for tissue analysis.

At Site AR-6 in fall 2002, no juvenile or adult brown trout were collected for tissue analysis. At Site AR-6 in fall 2003, three YOY brown trout were collected for tissue analysis, but no juvenile or adult brown trout were collected.

In fall 2002, three adult rainbow trout were collected at the Zwergle and Cabresto Creek sites and Site RR-4 and Site RR-5. No adult rainbow trout were collected at Site RR-6.

Metal concentrations from fish tissue collected at the reference sites showed considerable variation between sites and between years for many metals, while several metals were often non-detect limits (Tables 4-3 and 4-4, Appendix A-4b).

4.1.1.1.2 Benthic Invertebrates

Benthic invertebrates were collected from the stream reference sites to determine the benthic invertebrate population status and for benthic invertebrate tissue analysis for concentrations of metals in fall 2002, spring 2003, and fall 2003.

Populations

Benthic invertebrate populations were sampled at all stream reference sites in fall 2002, spring 2003, and fall 2003 (Tables 4-5, 4-6, and 4-7, Appendix A-4c). The Cabresto Creek and Zwergle sites were generally characterized by higher invertebrate density, total number of taxa, number of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa, and diversity during the sampling period, while sites RR-4, RR-5, and RR-6 had lower values for these invertebrate parameters over the sampling period (Tables 4-5, 4-6, and 4-7, Appendix A-4c).

Tissues

Benthic invertebrate tissue samples were collected at all stream reference sites in fall 2002, spring 2003, and fall 2003. Metal concentrations in benthic invertebrate tissues were variable between sites and between sampling events, with several metals being non-detect limits (Tables 4-8, 4-9, and 4-10, Appendix A-4d).

4.1.1.1.3 Periphyton/Bryophytes

Periphyton were collected for population analysis at all stream reference sites in fall 2002 and fall 2003. Bryophytes were collected for metals analysis at all stream reference sites in fall 2002 and fall 2003.

Populations

Periphyton were collected for population analysis at all stream references sites in fall of 2002 and fall 2003. Periphyton populations were generally dominated by diatoms in terms of total density and the total number of taxa in fall 2002 and fall 2003 (Tables 4-11 and 4-12, Appendix A-4e). The only exception was at Site RR-4 in 2002 which had a higher density of blue-green algae than diatoms (Table 4-11).

Tissues

Bryophytes were collected for metals analysis at all stream reference sites in fall 2002 and fall 2003. Metal concentrations in bryophyte tissues were variable between sites and between years, with several metals being non-detect limits (Tables 4-13 and 4-14, Appendix A-4f).

4.1.1.1.4 Surface Water Bioassay

Three-brood screening-level chronic toxicity testing using *Ceriodaphnia dubia* was conducted on water from all five stream reference sites during base flow conditions in October 2002. Three-brood chronic water toxicity testing using *C. dubia* was conducted on water from Site RR-6 during snowmelt runoff conditions in April 2003. Five 48-hour acute toxicity tests were performed on storm water collected from Site RR-6 in July through September 2003.

Base Flow

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from all five stream reference sites during base flow conditions in October 2002. Tests were

conducted between October 1 and 9, 2002. No toxicity in either survival or reproduction endpoints was observed for any of the reference sites (Tables 4-15 and 4-16, Appendix A-4g).

Snowmelt Runoff

Three-brood chronic water toxicity testing using *C. dubia* was conducted on water from Site RR-6 during snowmelt runoff conditions. The test was conducted between April 21 and 28, 2003. No toxicity in survival or reproduction was observed at this site (Table 4-17, Appendix A-4g).

Storms

Five 48-hour acute toxicity tests using *C. dubia* were performed on stormwater collected from Site RR-6. Significant effects were observed during two tests. Significant effects were observed for the water collected from July 28, 2003, and September 6, 2003, but no toxicity was observed during the tests for water collected August 14, September 5, or September 11, 2003 (Tables 4-18 through 4-22, Appendix A-4g).

4.1.1.1.5 Sediment Bioassay

Ten-day chronic sediment tests using *Hyalella azteca* and *Chironomus tentans* were conducted on samples collected from all five stream reference sites in October 2002. No significant effect was observed at any site for biomass (Tables 4-23 and 4-24, Appendix A-4h). Toxicity was observed for survival endpoints for *C. tentans* at Site RR-5 in October 2002. Toxicity was observed for survival endpoints for *H. azteca* at the Cabresto Creek site and the Zwergle site (Tables 4-23 and 4-24, Appendix A-4h) in October 2002.

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were also conducted on samples collected from the Zwergle reference site and Red River Reference near the upstream mine boundary site (RR-5BB) (a site near aquatic biota reference site RR-5) in October 2003. No significant effects were observed at either site for survival (Table 4-25, Appendix A-4h). A significant effect was observed for growth endpoints for *C. tentans* at Site RR-5BB. No significant effects were observed for growth endpoints for *H. azteca* (Table 4-25, Appendix A-4h).

4.1.1.1.6 Habitat Evaluation

Fish habitat measurements were taken at all five stream reference sites in fall 2002 and fall 2003. Habitat parameters were fairly consistent within sites between years (Tables 4-26 and 4-27, Appendix A-4i). The Cabresto Creek and Zwergle sites had more habitat units, lower sediment measures, and higher mean habitat quality ratings than Site RR-4, Site RR-5, and Site RR-6. Depth variables were generally similar between all stream reference sites.

4.1.1.2 Upper Fawn Lake

Upper Fawn Lake is located 0.1 mile downstream of Elephant Rock Campground approximately 200 feet south of the Red River channel at an elevation of approximately 8,440 feet. Upper Fawn Lake was chosen to be a reference site for potentially affected lakes in the Red River basin.

4.1.1.2.1 Fish

Fish were collected from upper Fawn Lake to determine fish population status and for fish tissue analysis for concentrations of metals in fall 2002 and fall 2003.

Populations

Fish populations were sampled at upper Fawn Lake in fall 2002 and fall 2003 (Tables 4-1 and 4-2, Appendix A-4a). Brown trout, rainbow trout, and white suckers were collected in fall 2002 and fall 2003. White suckers were the dominant species in upper Fawn Lake in fall 2002 and fall 2003 (Tables 4-1 and 4-2, Appendix A-4a).

Tissues

In upper Fawn Lake, two adult brown trout, three adult rainbow trout, and three juvenile white suckers were collected for tissue analysis in 2002. In fall 2003, three adult brown trout, three juvenile white suckers, and three adult white suckers were collected for tissue analysis.

Metal concentrations from fish tissue collected in upper Fawn Lake showed considerable variation between species and between years for many metals while several metals were often non-detect limits (Tables 4-3 and 4-4, Appendix A-4b).

4.1.1.2.2 Benthic Invertebrates

Benthic invertebrates were collected from upper Fawn Lake to determine the benthic invertebrate population status and for benthic invertebrate tissue analysis for concentrations of metals in fall 2002, spring 2003, and fall 2003.

Populations

Edge habitats in upper Fawn Lake had higher densities and higher total number of taxa than the mid-lake habitats during all three sampling events (Tables 4-5, 4-6, and 4-7, Appendix A-4c). Dipterans dominated the benthic invertebrate assemblage in fall 2002 and fall 2003, while oligochaetes dominated the benthic invertebrate assemblage in spring 2003 (Tables 4-5, 4-6, and 4-7, Appendix A-4c).

Tissues

Benthic invertebrate tissue samples were collected from upper Fawn Lake in fall 2002, spring 2003, and fall 2003. Most metal concentrations in benthic invertebrate tissues were fairly consistent between sampling events and several metals were non-detect limits (Tables 4-8, 4-9, and 4-10, Appendix A-4d).

4.1.1.2.3 Macrophytes

No aquatic macrophytes could be found in upper Fawn Lake in fall 2002 or fall 2003. Filamentous algae were collected instead for metals analysis from upper Fawn Lake in fall 2002 and fall 2003.

Tissues

Filamentous algae were collected instead for metals analysis from upper Fawn Lake in fall 2002 and fall 2003. Metal concentrations were generally higher in fall 2003 than in fall 2002 and most metals were above detection limits in both fall 2002 and fall 2003 (Tables 4-13 and 4-14, Appendix A-4f).

4.1.1.2.4 Surface Water Bioassay

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from upper Fawn Lake in October 2002. Tests were conducted between October 1 and 9, 2002. No toxicity in either survival or reproduction endpoints was observed for upper Fawn Lake (Table 4-15, Appendix A-4g).

4.1.1.2.5 Sediment Bioassay

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were conducted on samples collected from upper Fawn Lake. No toxicity was observed for either organism for survival or growth endpoints for upper Fawn Lake (Tables 4-23, 4-24, and 4-25, Appendix A-4h).

4.1.2 Red River Sites

Exposure sites were chosen to be representative of the aquatic environment in the Red River drainage that are within the zone of influence of the mine exposure area and the tailings facility exposure area. Nine sites on the Red River and one lake were chosen as exposure sites for the RI/FS study.

Exposure sites were chosen to be representative of the aquatic environment in the Red River drainage that are within the zone of influence of the mine and tailings facility exposure areas. Sites RR-7, RR-8, RR-11-A1, RR-12, RR-15, and RR-2 are generically referred to as the "upstream" exposure sites and Sites LR-1, LR-8A, and LR-16 are referred to as the "downstream" exposure sites throughout this report.

Site RR-7 is located 1.4 miles downstream of Hansen Creek and 0.1 mile downstream of the eastern mine property boundary at an elevation of approximately 8,140 feet. The site is adjacent to the Molycorp mine but is upstream of the mill and the diversion.

Site RR-8 is located 1.1 miles downstream from the mill access road at an elevation of approximately 8,100 feet.

Site RR-11A1 is located 0.4 mile downstream of the confluence with Columbine Creek at an elevation of approximately 7,800 feet.

Site RR-12 is located at the upstream end of Goathill Campground at an elevation of approximately 7,670 feet.

Site RR-15 is located 0.4 mile upstream from the ranger station access road, just upstream of where the tailings pipes cross over the Red River. This site is downstream of Capulin Canyon and the area of groundwater upwelling near Spring 13. The elevation at this site is approximately 7,480 feet.

Site RR-20 is located immediately upstream of the Highway 522 bridge at an elevation of approximately 7,260 feet.

Site LR-1 is located 0.4 mile downstream of the Highway 522 bridge and just downstream of the Questa Waste Water Treatment Plant, at an elevation of approximately 7,240 feet.

Site LR-8A is located 0.6 mile downstream of the Highway 522 bridge and 0.2 mile downstream of the NPDES Outfall 002 at an elevation of approximately 7,220 feet.

Site LR-16 is located 0.3 mile upstream of the Red River fish hatchery diversion, at an elevation of approximately 7,120 feet.

4.1.2.1 Fish

Fish were collected from the nine exposure sites to determine fish population status and for fish tissue analysis for concentrations of metals in fall 2002 and fall 2003.

4.1.2.1.1 Populations

Fish populations were sampled at all exposure sites in fall 2002 and fall 2003 (Tables 4-1 and 4-2, Appendix A-4a). Brown trout and rainbow trout were collected at Site RR-7 in fall 2002 and fall 2003. No fish were collected at Site RR-8 in fall 2002 but brown trout and rainbow trout were collected in fall 2003. At Site RR-11A1, brown trout and white suckers were collected in fall 2002 and fall 2003. Rainbow trout were also collected at this site in fall 2003. At Site RR-12, brown trout and rainbow trout were collected in fall 2002 and fall 2003. White suckers were also collected at this site in fall 2002. Rainbow trout and white suckers were collected at Site RR-15 in fall 2002 and fall 2003. Brown trout and rainbow trout were collected at Site RR-20 in fall 2002 and fall 2003.

All six upstream exposure sites had densities less than or equal to 30 fish/acre and biomass less than 11 lbs/acre in fall 2002 (Tables 4-1 and 4-2, Appendix A-4a). All sites except Site RR-20 had higher density and biomass values in 2003 (Tables 4-1 and 4-2, Appendix A-4a).

Fish populations were sampled at all three downstream exposure stream sites in fall 2002 and fall 2003 (Tables 4-1 and 4-2, Appendix A-4a). Brown trout and rainbow trout were collected at all three downstream exposure sites in fall 2002 and fall 2003. White suckers were also collected at Site LR-16 in fall 2003.

Density and biomass increased in a downstream direction in both fall 2002 and fall 2003 for these three downstream sites (Tables 4-1 and 4-2, Appendix A-4a). Density and biomass were variable between years within these three sites (Tables 4-1 and 4-2, Appendix A-4a).

4.1.2.1.2 Tissues

At Site RR-7 in fall 2002 and fall 2003, no brown trout in any size class were collected for tissue analysis. One adult rainbow trout was collected for tissue analysis in fall 2002.

At Site RR-8 in fall 2002, no brown trout in either size class and no adult rainbow trout were collected for tissue analysis. In fall 2003, no YOY brown trout were collected, but three juvenile brown trout and three adult brown trout were collected for tissue analysis.

At Site RR-11A1 in fall 2002, no juvenile brown trout or adult brown trout were collected for tissue analysis. Two adult rainbow trout were collected for tissue analysis. In fall 2003, no adult brown trout were collected for tissue analysis, but one YOY and three juvenile brown trout were collected for tissue analysis.

At Site RR-12 in fall 2002, no juvenile brown trout were collected for tissue analysis, but two adult brown trout and three adult rainbow trout were collected for tissue analysis. In fall 2003, no YOY brown trout were collected for tissue analysis, but one juvenile and one adult brown trout were collected for tissue analysis.

At Site RR-15 in fall 2002, no juvenile brown trout were collected for tissue analysis, but two adult brown trout and one adult rainbow trout were collected for tissue analysis. In fall 2003, no YOY brown trout were collected for tissue analysis, but one juvenile and three adult brown trout were collected for tissue analysis.

At Site RR-20 in fall 2002, three adult and juvenile brown trout and three adult rainbow trout were collected for tissue analysis. In fall 2003, three YOY and three adult brown trout were collected for tissue analysis, but no juvenile brown trout were collected for tissue analysis.

At Site LR-1, LR-8A, and LR-16 in fall 2002 and fall 2003, three brown trout from all size classes were collected for tissue analysis. Three adult rainbow trout were also collected for tissue analysis at all three sites in fall 2002.

Metal concentrations from fish tissue collected at the six upstream exposure stream sites showed considerable variation between sites, between years, between size classes, and between species for many metals while several metals were often non-detect limits (Tables 4-3 and 4-4, Appendix A-4b).

Metal concentrations from fish tissue collected at the three downstream exposure stream sites showed considerable variation between sites, between years, between size classes, and between species for many metals, although some metals were non-detect limits (Tables 4-3 and 4-4, Appendix A-4b).

4.1.2.2 Benthic Invertebrates

Benthic invertebrates were collected from the nine exposure stream sites to determine the benthic invertebrate population status and for benthic invertebrate tissue analysis for concentrations of metals in fall 2002, spring 2003, and fall 2003.

4.1.2.2.1 Populations

Benthic invertebrate populations were sampled at all six upstream exposure stream sites in fall 2002, spring 2003, and fall 2003 (Tables 4-5, 4-6, and 4-7, Appendix A-4c). In fall 2002, total density was highest at Site RR-12, total number of taxa were highest at Site RR-20, and the number of EPT taxa was highest at Site RR-11A1 and Site RR-12 (Table 4-5, Appendix A-4c). In spring 2003, total invertebrate density were highest at Site RR-20 while the total number of taxa and the total number of EPT taxa were highest at Site RR-11A1 (Table 4-6, Appendix A-4c). In fall 2003 Site RR-11A1 had the highest values for density, total number of taxa, and total number of EPT taxa (Table 4-7, Appendix A-4c)

Benthic invertebrate populations were sampled at all three downstream exposure stream sites in fall 2002, spring 2003, and fall 2003 (Tables 4-5, 4-6, and 4-7, Appendix A-4c). In fall 2002 and spring 2003, total density was highest at Site LR-16, total number of taxa were highest at Site LR-8A, and the number of EPT taxa were highest at Site LR-1 (Tables 4-5 and 4-6, Appendix A-4c). In fall 2003, Site LR-8A had the highest values for density, total number of taxa, and total number of EPT taxa (Table 4-7, Appendix A-4c).

4.1.2.2.2 Tissues

Benthic invertebrate tissue samples were collected at all six upstream exposure stream sites in fall 2002, spring 2003, and fall 2003. Metal concentrations in benthic invertebrate tissues were variable between sites and between sampling events, with several metals being non-detect limits (Tables 4-8, 4-9, and 4-10, Appendix A-4d).

Benthic invertebrate tissue samples were collected at all three downstream exposure stream sites in fall 2002, spring 2003, and fall 2003. Metal concentrations in benthic invertebrate tissues were variable between sites and between sampling events, with some metals being non-detect limits (Tables 4-8, 4-9, and 4-10, Appendix A-4d).

4.1.2.3 Periphyton/Bryophytes

Periphyton was collected for population analysis at all nine exposure stream sites in fall 2002 and fall 2003. Bryophytes were collected for metals analysis at all nine exposure stream sites in fall 2002 and fall 2003.

4.1.2.3.1 Populations

Periphyton was collected for population analysis at five of the six upstream exposure sites in fall of 2002. A sample was taken at Site RR-20, but the jar broke in transit to the lab and could not be analyzed. Periphyton was collected for population analysis at all six upstream exposure stream sites in fall 2003. Periphyton populations were dominated by diatoms in terms of the total number of taxa in fall 2002 and fall 2003 (Tables 4-11 and 4-12, Appendix A-4e). Periphyton populations were dominated by diatoms or blue-green algae in terms of total density (Tables 4-11 and 4-12, Appendix A-4e).

Periphyton was collected for population analysis at all three downstream exposure stream sites in fall 2002 and fall 2003. Periphyton populations were dominated by diatoms in terms of the total

number of taxa in fall 2002 and fall 2003 (Tables 4-11 and 4-12, Appendix A-4e). Periphyton populations were dominated by diatoms in terms of total density except at Site LR-8A where green algae were dominant (Tables 4-11 and 4-12, Appendix A-4e).

4.1.2.3.2 Tissues

Bryophytes were collected for metals analysis at all six upstream exposure stream sites in fall 2002 and fall 2003. Metal concentrations in bryophyte tissues were variable between sites and between years with several metals being non-detect limits (Tables 4-13 and 4-14, Appendix A-4f).

Bryophytes were collected for metals analysis at all three downstream exposure stream sites in fall 2002 and fall 2003. Metal concentrations in bryophyte tissues were variable between sites and between years with some metals at a few sites being non-detect limits (Tables 4-13 and 4-14, Appendix A-4f).

4.1.2.4 Surface Water Bioassay

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from all nine exposure stream sites during base flow conditions in October 2002. Follow-up full-dilution testing was conducted on Sites LR-1 and LR-8A in October 2002. Three-brood chronic water toxicity testing using *C. dubia* was conducted on water from Site RR-8, Site RR-12, Site RR-15, and Site LR-16 during snowmelt runoff conditions in April 2003. Three 48-hour acute toxicity tests were performed on storm water collected from Site RR-8 in August through September 2003. Four 48-hour acute toxicity tests were performed on storm water collected from Site RR-12 in July through September 2003. Two 48-hour acute toxicity tests were performed on storm water collected from Site RR-15 in August through September 2003. Three 48-hour acute toxicity tests were performed on storm water collected from Site LR-16 in July through September 2003.

4.1.2.4.1 Base Flow

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from all six upstream exposure stream sites during base flow conditions in October 2002. Tests were conducted between October 1 and 9, 2002. No toxicity in either survival or reproduction endpoints was observed for any of the mine exposure stream sites (Table 4-15, Appendix A-4g).

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from all three downstream exposure stream sites during base flow conditions in October 2002. Tests were conducted between October 1 and 9, 2002. No toxicity in survival endpoints was observed for any of the three exposure stream sites (Table 4-15, Appendix A-4g). For reproduction endpoints, significant differences were detected at Site LR-1 and Site LR-8A.

In an effort to confirm the observed toxicity at Sites LR-1 and LR-8A, Site LR-1 and Site LR-8A were sampled again and full-dilution tests conducted between October 11 and 18, 2002. This

follow-up testing did not detect survival or reproduction toxicity in water samples from either Site LR-1 or Site LR-8A (Table 4-16, Appendix A-4g).

4.1.2.4.2 Snowmelt Runoff

Three-brood chronic water toxicity testing using *C. dubia* was conducted on water from Site RR-8, Site RR-12, and Site RR-15 during snowmelt runoff conditions in April 2003. The test was conducted between April 21 and 28, 2003. No significant effects on survival were observed at any of the three mine exposure sites (Table 4-17, Appendix A-4g). There were significant reproductive effects for Site RR-15 (Table 4-17, Appendix A-4g).

Three-brood chronic water toxicity testing using *C. dubia* was conducted on water from Site LR-16 during snowmelt runoff conditions in April 2003. The test was conducted between April 21 and 28, 2003. No significant effects on survival were observed at Site LR-16 (Table 4-17, Appendix A-4g). There were significant reproductive effects for Site LR-16 (Table 4-17, Appendix A-4g).

4.1.2.4.3 Storms

Three 48-hour acute toxicity tests were performed on storm water collected from Site RR-8 in August through September 2003. No significant effects on survival were detected from the August 14, 2003 or the September 5, 2003 tests. Significant effects on survival were detected at Site RR-8 in the September 6, 2003 test (Tables 4-18 through 4-22, Appendix A-4g).

Four 48-hour acute toxicity tests were performed on storm water collected from Site RR-12 in July through September 2003. No significant effects on survival were detected from any of the four storm tests.

Two 48-hour acute toxicity tests were performed on storm water collected from Site RR-15 in August through September 2003. No significant effects on survival were detected from either of the storm tests.

Three 48-hour acute toxicity tests were performed on storm water collected from Site LR-16 in July through September 2003. No toxicity was observed during any of the three tests for Site LR-16 (Tables 4-18 through 4-22, Appendix A-4g).

4.1.2.5 Sediment Bioassay

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were conducted on samples collected from all six upstream exposure stream sites. No toxicity was observed at any site for either organism for biomass (Tables 4-23 and 4-24, Appendix A-4h). Toxicity was not observed for survival endpoints for *H. azteca* at any of the six upstream exposure stream sites. Toxicity was observed for survival endpoints for *C. tentans* at Site RR-7 (Tables 4-23 and 4-24, Appendix A-4h).

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were conducted on samples collected from all three downstream exposure stream sites. No toxicity was observed at any site for either organism for biomass (Tables 4-23 and 4-24, Appendix A-4h). Toxicity was not

observed for survival endpoints for *C. tentans* at any of the three tailings facility exposure stream sites. Toxicity was observed for survival endpoints for *H. azteca* at Site LR-16 (Tables 4-23 and 4-24, Appendix A-4h).

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were also conducted on samples collected from Site RR-15 in October 2003. No significant effects were observed for survival (Table 4-25, Appendix A-4h). A significant effect was observed for growth endpoints for *C. tentans* at Site RR-15. No significant effects were observed for growth endpoints for *H. azteca* (Table 4-25, Appendix A-4h).

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were also conducted on samples collected from Site LR-1, Site LR-8A, and Site LR-15 in October 2003. No significant effects were observed for survival or for growth (Table 4-25, Appendix A-4h).

4.1.2.6 Habitat Evaluation

Fish habitat measurements were taken at all six upstream exposure stream sites in fall 2002 and fall 2003. Habitat parameters were fairly consistent within sites between years (Tables 4-26 and 4-27, Appendix A-4i). Sediment measures were generally lower in fall 2003 than 2002 (Tables 4-26 and 4-27, Appendix A-4i).

Fish habitat measurements were taken at all three downstream exposure stream sites in fall 2002 and fall 2003. Habitat parameters were fairly consistent within sites between years (Tables 4-26 and 4-27, Appendix A-4i). Sediment measures tended to be lower at Sites LR-1 and LR-8A in fall 2003 than 2002 (Tables 4-26 and 4-27, Appendix A-4i).

4.1.3 Eagle Rock Lake

Eagle Rock Lake is located 0.3 mile downstream of the USGS gaging station (USGS 08265000) on the south side of State Highway 38 and the north side of the Red River at an elevation of approximately 7,440 feet. Eagle Rock Lake lies within the exposure area and receives water from the Red River.

4.1.3.1 Fish

Fish were collected from Eagle Rock Lake to determine fish population status and for fish tissue analysis for concentrations of metals in fall 2002 and fall 2003.

4.1.3.1.1 Populations

Fish populations were sampled at Eagle Rock Lake in fall 2002 and fall 2003 (Tables 4-1 and 4-2, Appendix A-4a). Rainbow trout and white suckers were collected in 2002 and 2003. Rainbow trout were the dominant species in Eagle Rock Lake in fall 2002 and white suckers were the dominant species in Eagle Rock Lake in fall 2003 (Tables 4-1 and 4-2, Appendix A-4a).

4.1.3.1.2 Tissues

In Eagle Rock Lake, three adult rainbow trout, and three juvenile white suckers were collected for tissue analysis in fall 2002. In fall 2003, three composite YOY white suckers (30 fish per replicate), three juvenile white suckers, and three adult white suckers were collected for tissue analysis.

Metal concentrations from fish tissue collected in Eagle Rock Lake showed considerable variation between age classes and between years for many metals, while several metals were often non-detect limits (Tables 4-3 and 4-4, Appendix A-4b).

4.1.3.2 Benthic Invertebrates

Benthic invertebrates were collected from Eagle Rock Lake to determine the benthic invertebrate population status and for benthic invertebrate tissue analysis for concentrations of metals in fall 2002, spring 2003, and fall 2003.

4.1.3.2.1 Populations

Edge habitats in Eagle Rock Lake had higher total number of taxa than the mid-lake habitats during all three sampling events, but densities were higher in mid-lake habitats (Tables 4-5, 4-6, and 4-7, Appendix A-4c). Dipterans and oligochaetes dominated the benthic invertebrate assemblage in all three sampling periods (Tables 4-5, 4-6, and 4-7, Appendix A-4c).

4.1.3.2.2 Tissues

Benthic invertebrate tissue samples were collected from Eagle Rock Lake in fall 2002, spring 2003, and fall 2003. Metal concentrations in benthic invertebrate tissues were variable between sampling events and several metals were non-detect limits (Tables 4-8, 4-9, and 4-10, Appendix A-4d).

4.1.3.3 Macrophytes

No aquatic macrophytes could be found in Eagle Rock Lake in fall 2002. Rooted aquatic macrophytes were found in fall 2003. Filamentous algae were collected in place of macrophytes for metals analysis in Eagle Rock Lake in fall 2002.

4.1.3.3.1 Tissues

Filamentous algae were collected instead for metals analysis in Eagle Rock Lake in fall 2002. Rooted aquatic macrophytes were found in fall 2003. Metal concentrations were generally higher in fall 2002 than in fall 2003 and most metals were above detection limits in both fall 2002 and fall 2003 (Tables 4-13 and 4-14, Appendix A-4f).

4.1.3.4 Surface Water Bioassay

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from Eagle Rock Lake in October 2002. Tests were conducted between October 1 and 9, 2002.

No toxicity in either survival or reproduction endpoints was observed for Eagle Rock Lake (Table 4-15, Appendix A-4g).

4.1.3.5 Sediment Bioassay

Ten-day chronic sediment tests using *H. aztca azteca* and *H. & C. tentans* were conducted on samples collected from Eagle Rock Lake. No toxicity was observed for either organism for survival or growth endpoints for Eagle Rock Lake (Tables 4-23, 4-24, and 4-25, Appendix A-4h).

4.1.4 Unique Habitat Area

One beaver pond was sampled in March 2003. The beaver pond was located upstream of Goathill Campground.

4.1.4.1 Benthic Invertebrates

Benthic invertebrates were collected from one beaver pond to determine the benthic invertebrate population status and for benthic invertebrate tissue analysis for concentrations of metals in spring 2003. Benthic invertebrates were sampled according to benthic invertebrate protocols for lakes (URS 2002d).

4.1.4.1.1 Populations

Density was greater in the edge habitat of the beaver pond but the total number of taxa were the same for both edge and mid-pond habitat. Edge habitat was dominated by oligochaetes and mid-pond habitat was dominated by dipterans in terms of total density (Table 4-6, Appendix A-4c).

4.1.4.1.2 Tissues

Benthic invertebrate tissue samples were collected from the beaver pond in spring 2003. Metal concentrations in benthic invertebrate tissues were within the range seen at other stream sites and some metals were non-detect limits (Appendix A-4d).

4.1.5 Tailings Pond

Two sites were chosen on the east tailings pond for aquatic biological sampling in fall 2002. Site SW12-9 was located in the northwest corner of the east tailings pond. Site SW12-10 was located in the southeast corner of the east tailings pond. In spring 2003, samples were not taken from the east tailings pond, but were instead taken from one site, Site SW12-WTP, from the west tailings pond. Tailings ponds were not sampled in fall 2003.

4.1.5.1 Fish

Attempts were made to collect fish in the tailings pond in fall 2002 to determine fish population status and for fish tissue analysis for concentrations of metals in the tailings pond. Methods followed those in the Work Plan for lakes (URS 2002d). Sampling failed to collect any fish in the tailings pond in 2002 so fish sampling efforts were suspended for the tailings ponds.

4.1.5.2 Benthic Invertebrates

Benthic invertebrates were sampled in fall 2002 at Site SW12-9 and Site SW12-10. In spring 2003, samples were taken from Site SW12-WTP. Tailings ponds were not sampled for benthic invertebrates in fall 2003. Benthic invertebrates were collected to determine the benthic invertebrate population status and for benthic invertebrate tissue analysis for concentrations of metals in fall 2002 and spring 2003. Benthic invertebrates were sampled according to benthic invertebrate protocols for lakes (URS 2002d).

4.1.5.2.1 Populations

Oligochaetes dominated the edge habitat and dipterans dominated the mid-lake habitat in terms of total density at Site SW12-9 in fall 2002 (Appendix A-4c). Dipterans dominated both the edge and mid-lake habitat in terms of total density at Site SW12-10 in fall 2002 (Appendix A-4c). Mayflies dominated the edge habitat and dipterans dominated the mid-lake habitat in terms of total density at Site SW12-WTP in spring 2003 (Appendix A-4c).

4.1.5.2.2 Tissues

Benthic invertebrate tissue samples were collected from Site SW12-9 and SW12-10 in fall 2002 and from Site SW12-WTP in spring 2003. Metal concentrations in benthic invertebrate tissues were within the range seen at other stream and lake sites (Appendix A-4d).

4.1.5.3 Macrophytes

No aquatic macrophytes could be found at Site SW12-9 and SW12-10 in fall 2002. Filamentous algae were collected instead for metals analysis in the tailings pond in fall 2002. Tailings ponds were not sampled in fall 2003.

4.1.5.3.1 Tissues

Filamentous algae tissue samples were collected from Site SW12-9 and Site SW12-10 in fall 2002. Metal concentrations in algae tissue were within the range seen at other stream and lake sites (Appendix A-4f).

4.1.5.4 Surface Water Bioassay

Three-brood screening-level chronic toxicity testing using *C. dubia* was conducted on water from Site SW12-9 and Site SW12-10 in October 2002. Tests were conducted between October 1

and 9, 2002. No toxicity in survival endpoints was observed for either site (Table 4-15, Appendix A-4g). Toxicity in reproductive endpoints was observed at Site SW12-9 (Table 4-15, Appendix A-4g).

4.1.5.5 Sediment Bioassay

Ten-day chronic sediment tests using *H. azteca* and *C. tentans* were conducted on samples collected from Site SW12-9 and Site SW12-10 in October 2002. No toxicity was observed for growth or survival of *C. tentans* for either site (Tables 4-23, 4-24, and 4-25, Appendix A-4h). Significant effects on survival were detected in the *H. azteca* test for site SW12-10 site (Tables 4-23, 4-24, and 4-25, Appendix A-4h).

4.1.6 Red River State Fish Hatchery

The Red River State Fish Hatchery is located adjacent to the Red River downstream of Site LR-16, the lowest sampling site in the tailings facility exposure area.

4.1.6.1 Fish

Ten rainbow trout were collected from the Red River State Fish Hatchery for fish tissue analysis for concentrations of metals in fall 2002.

4.1.6.1.1 Tissues

Metal concentrations from rainbow trout tissue collected from the Red River State Fish Hatchery were generally within the range of other fish tissue values seen at other stream and lake sites (Appendix A-4b).

4.2 RI ADDENDUM

In September 2004, the EPA requested additional data be collected to determine environmental impacts of groundwater discharge to the Red River in the exposure area (EPA 2004). The addendum required focused sampling to identify potential sources of water quality impacts to the Red River, with emphasis on Spring 13 and Spring 39.

4.2.1 Transect Study

Twenty transects were sampled approximately every 1,000 feet in the reach of the Red River between RI/FS exposure site RR-15 and RI/FS exposure site RR-8.

4.2.1.1 Benthic Invertebrate Populations

Benthic invertebrate populations were sampled according to methods presented in the RI/FS Work Plan Addendum (EPA 2004). Benthic invertebrate samples were taken within 60 feet of

the established transect, except Transect 6, which was moved 350 feet downstream to correspond to Spring 13, and Transect 13, which was moved 100 feet upstream to avoid a beaver dam.

All transects supported invertebrates, including some sensitive species (Appendix A-4j). Consistent declines in abundance were observed at Transects 15, 11, and 4.

4.2.1.2 Habitat Assessment

Physical habitat was assessed in following the RI/FS Work Plan Addendum (EPA 2004). The habitat assessment provided data on substrate and available cover, embeddedness, the velocity and depth regime, frequency of riffles, bank stability, and individual substrate components (Appendix A-4k).

4.2.2 Serial Dilution

Chronic 7-day rainbow trout toxicity tests were conducted on water samples collected from Spring 13 and Spring 39. Tests were conducted September 23 to 30, 2004. Two concurrent tests were conducted on each sample. The first test consisted of spring water diluted with upstream Red River water, and the second test consisted of spring water diluted with reconstituted laboratory water.

There were significant chronic effects on survival and growth in all tests (Table 4-28, Appendix A-4l).

4.3 OTHER DATA

In addition to the data collected specifically for the RI/FS, CEC has collected data from other years and other sites in the Red River drainage. Historical and post-RI/FS sampling site names do not use the RI/FS site names. The historical and post-RI/FS site names which correspond to RI/FS sampling sites are given below.

Zwergle = Upstream of Town

RR-4 = June Bug

RR-5 = Elephant Rock

RR-6 = Downstream of Hansen

RR-7 = Upstream of Mill

RR-8 = Upstream of Columbine

RR-11A1 = Downstream of Cabin Springs

RR-12 = Goathill

RR-15 = Questa Ranger Station

RR-20 = Upstream of Highway 522

LR-1 = Downstream of Highway 522

LR-8A = Downstream of Outfall 002

LR-16 = Upstream of Hatchery

4.3.1 Reference Sites

Data has been collected at Zwergle, Cabresto Creek, Site RR-4, Site RR-5, and Site RR-6 prior to and after the RI/FS studies. In addition, two other sites outside the zone of influence of the exposure area have also been sampled. One site on the Middle Fork of the Red River was sampled. Another site on Columbine Creek has also been sampled.

4.3.1.1 Red River, Cabresto Creek

The Zwergle and Cabresto Creek sites, Site RR-4, Site RR-5, and Site RR-6 are located in the same locations as they were for the RI/FS studies. The Middle Fork site is located approximately 6 miles upstream of the town of Red River and approximately 0.6 mile upstream of the confluence with the East Fork, at an elevation of approximately 9,510 feet. The Columbine Creek site is located approximately 400 yards upstream from its confluence with the Red River, at an elevation of approximately 7,880 feet.

4.3.1.1.1 Fish

Fish were sampled in Cabresto Creek, Columbine Creek, Zwergle, Site RR-4, Site RR-5, and Site RR-6, in spring 1997, and every fall from 1997 through 2004. Fish were sampled on the Middle Fork in every fall from 1999 through 2003. Sampling stopped on the Middle Fork in fall 2003.

Populations

Fish density and biomass have shown similar results prior to and after the RI/FS study at the Cabresto Creek site, Zwergle, Site RR-4, and Site RR-6, while fish populations have been more variable at Site RR-5. Fish density and biomass for Columbine Creek and the Middle Fork more closely resemble the Cabresto Creek and Zwergle sites than the other Red River reference sites (Tables 4-29 through 4-37, Appendix B-4a).

4.3.1.1.2 Benthic Invertebrates

Benthic invertebrates were sampled in Cabresto Creek, Columbine Creek, Zwergle, Site RR-4, Site RR-5, and Site RR-6, in every fall from 1997 through 2004 and every spring from 2000 through 2004. Benthic invertebrates were sampled on the Middle Fork in every fall from 1999 through 2003 and every spring from 2000 through 2003. Sampling stopped on the Middle Fork in fall 2003.

Populations

Benthic invertebrate population parameters have been variable but have shown similar results prior to and after the RI/FS study at the RI/FS study sites. Benthic invertebrate parameters for Columbine Creek and the Middle Fork more closely resemble the Cabresto Creek and Zwergle sites than the other Red River reference sites (Tables 4-38 through 4-49, Appendix B-4b).

Tissues

Benthic invertebrate tissues were collected at the Middle Fork, Zwergle, RR-4, RR-5, and RR-6 in spring 2002 prior to the initiation of RI/FS sampling (Table 4-50, Appendix B-4c).

4.3.1.1.3 Surface Water Bioassay

Chronic *C. dubia* and fathead minnow surface water toxicity tests were performed October 26 to November 7, 2000, for the total maximum daily load (TMDL) study in conjunction with NMED with surface water collected from Zwergle, Site RR-4, and Site RR-6. No significant effects for *C. dubia* survival were observed. Significant effects for *C. dubia* reproduction were observed at the Zwergle site and Site RR-6. No significant effects were observed for fathead minnow tests (Table 4-51, Appendix B-4d).

4.3.1.1.4 Sediment Bioassay

Chronic *C. dubia* and fathead minnow sediment toxicity tests were performed October 26 to November 7, 2000 for the TMDL study in conjunction with NMED with sediment collected from Zwergle, Site RR-4, and Site RR-6. Significant effects for *C. dubia* survival were observed at the Zwergle site. Significant effects for *C. dubia* reproduction were observed at the Zwergle site and Site RR-4. Significant effects were observed for fathead minnow tests at Site RR-4 (Table 4-52, Appendix B-4e).

4.3.1.1.5 Habitat Evaluation

A habitat evaluation was conducted at the Cabresto Creek, Columbine Creek, Middle Fork, and Zwergle sites and Site RR-4, RR-5, and RR-6 in fall 1999. A few parameters were the same as the RI/FS habitat evaluation, but several were unique to fall 1999 sampling (Table 4-53, Appendix B-4f).

Habitat evaluations were conducted at the Middle Fork and Columbine Creek sites in fall 2002 and fall 2003. These habitat evaluations were identical to the RI/FS habitat evaluations (Tables 4-54 and 4-55, Appendix B-4f).

In spring 2004, a subset of habitat variables was collected on the Cabresto Creek, Columbine Creek, and Zwergle sites and Site RR-4, Site RR-5, and Site RR-6. These measures focused on the sediment deposition parameters of the RI/FS habitat evaluation (Table 4-56, Appendix B-4f).

In fall 2004, habitat evaluations identical to the RI/FS habitat evaluations were continued at the Columbine Creek, Cabresto Creek, and Zwergle sites, and Site RR-4, RR-5, and RR-6 (Table 4-57, Appendix B-4f).

4.3.2 Red River Sites

Data have been collected at Site RR-8, Site RR-12, Site RR-15, and Site LR-16 prior to and after the RI/FS studies. Data have been collected at Site RR-7, Site RR-11A1, Site RR-20, Site LR-1, and Site LR-8A after the RI/FS studies. In addition, one other site downstream of the tailings facility exposure area has also been sampled. This site is on the Red River downstream of the Red River State Fish Hatchery.

Site locations for Site RR-7, Site RR-8, Site RR-11A1, Site RR-12, Site RR-15, and Site RR-20 are the same locations as they were for the RI/FS studies.

Site locations for Site LR-1, Site LR-8A, and Site LR-16 are the same locations as they were for the RI/FS studies. The site downstream of the hatchery is located 0.3 mile downstream of the Red River State Fish Hatchery adjacent to the USGS gage (USGS 08266820), at an elevation of approximately 7,070 feet.

4.3.2.1 Fish

Fish were sampled at Site RR-8, Site RR-12, and Site RR-15 in spring 1997 and in every fall from 1997 through 2004. Fish have been sampled in every fall since 2002 at Site RR-7, Site RR-11A1, and Site RR-20.

Fish were sampled at Site LR-16 in spring 1997 and in every fall from 1997 through 2004. Fish have been sampled in every fall since 1999 at the site downstream of the hatchery. Fish have been sampled every fall since 2002 at Site LR-1 and Site LR-8A.

4.3.2.1.1 Populations

Fish density and biomass have shown similar results prior to and after the RI/FS study at Site RR-8, Site RR-12, and Site RR-15. Additionally, fish density and biomass at Site RR-7, Site RR-11A1, and RR-20 have also been fairly similar since the end of the RI/FS study (Tables 4-29 through 4-37, Appendix B-4a).

Fish density and biomass have shown similar results prior to and after the RI/FS study at Site LR-16. Additionally, fish density and biomass at Site LR-1 and Site LR-8A have also been fairly similar since the end of the RI/FS study. Fish density and biomass at the site downstream of the hatchery is generally the highest observed in any given year (Tables 4-29 through 4-37, Appendix B-4a).

4.3.2.2 Benthic Invertebrates

Benthic invertebrates were sampled at Site RR-8, Site RR-12, and Site RR-15 in every fall from 1997 through 2004 and every spring from 2000 through 2004. Benthic invertebrates were sampled at Site RR-7, RR-11A1, and Site RR-20 in every fall since 2002 and in every spring since 2003.

Benthic invertebrates were sampled at Site LR-16 in every fall from 1997 through 2004 and every spring from 2000 through 2004. Benthic invertebrates were sampled at Site LR-1 and Site

LR-8A in every fall since 2002 and in every spring since 2003. The site downstream of the hatchery has been sampled every fall since 1999 and every spring since 2000.

4.3.2.2.1 Populations

Benthic invertebrate population parameters from the upstream sites have been variable but have shown similar results prior to and after the RI/FS study at the RI/FS study sites. (Tables 4-38 through 4-49, Appendix B-4b).

Benthic invertebrate population parameters from the downstream sites have been variable but have shown similar results prior to and after the RI/FS study at Site LR-16. The site downstream of the hatchery has had invertebrate population parameters similar to Site LR-16. (Tables 4-38 through 4-49, Appendix B-4b).

4.3.2.2.2 Tissues

Benthic invertebrate tissues were collected at Site RR-8, Site RR-12, and Site RR-15 in spring 2002 prior to the initiation of RI/FS sampling (Table 4-50, Appendix B-4c).

Benthic invertebrate tissues were collected at Site LR-16 and at the site downstream of the hatchery in spring 2002 prior to the initiation of RI/FS sampling (Table 4-50, Appendix B-4c).

4.3.2.3 Surface Water Bioassay

Chronic *C. dubia* and fathead minnow surface water toxicity tests were performed October 26 to November 7, 2000 for the TMDL study in conjunction with NMED with surface water collected from Site RR-12 and Site RR-15. No significant effects for *C. dubia* survival were observed. Significant effects for *C. dubia* reproduction were observed from Site RR-12 and Site RR-15. No significant effects were observed for fathead minnow tests (Table 4-51, Appendix B-4d).

Chronic *C. dubia* and fathead minnow surface water toxicity tests were performed October 26 to November 7, 2000 for the TMDL study in conjunction with NMED with surface water collected near Site LR-8A. No significant effects for *C. dubia* survival were observed. Significant effects for *C. dubia* reproduction were observed from Site LR-16. No significant effects were observed for fathead minnow tests (Table 4-51, Appendix B-4d).

4.3.2.4 Sediment Bioassay

Chronic *C. dubia* and fathead minnow sediment toxicity tests were performed October 26 to November 7, 2000 for the TMDL study in conjunction with NMED with sediment collected from Site RR-12 and Site RR-15. Significant effects for *C. dubia* survival and reproduction were observed at Site RR-15. No significant effects were observed for fathead minnow tests (Table 4-52, Appendix B-4e).

Chronic *C. dubia* and fathead minnow sediment toxicity tests were performed October 26 to November 7, 2000 for the TMDL study in conjunction with NMED with sediment collected

from Site LR-16. No significant effects for *C. dubia* survival or reproduction were observed. No significant effects were observed for fathead minnow tests (Table 4-52, Appendix B-4e).

4.3.2.5 Habitat Evaluation

A habitat evaluation was conducted at Site RR-8, Site RR-12, and Site RR-15 in fall 1999. A few parameters were the same as the RI/FS habitat evaluation, but several were unique to fall 1999 sampling (Table 4-53, Appendix B-4f).

A habitat evaluation was conducted at Site LR-16 and at the site downstream of the hatchery in fall 1999. A few parameters were the same as the RI/FS habitat evaluation, but several were unique to fall 1999 sampling (Table 4-53, Appendix B-4f).

In spring 2004, a subset of habitat variables was collected at Site RR-7, Site RR-8, Site RR-11A1, Site RR-12, Site RR-15, and Site RR-20. These measures focused on the sediment deposition parameters of the RI/FS habitat evaluation (Table 4-56, Appendix B-4f).

In spring 2004, a subset of habitat variables was collected at Site LR-1, LR-8A, Site LR-16, and at the site downstream of the hatchery. These measures focused on the sediment deposition parameters of the RI/FS habitat evaluation (Table 4-56, Appendix B-4f).

In fall 2004, habitat evaluations identical to the RI/FS habitat evaluations were continued Site RR-7, Site RR-8, Site RR-11A1, Site RR-12, Site RR-15, and Site RR-20 (Table 4-57, Appendix B-4f).

In fall 2004, habitat evaluations identical to the RI/FS habitat evaluations were continued at Site LR-1, Site LR-8A, Site LR-16, and the site downstream of the hatchery (Table 4-57, Appendix B-4f).

4.3.3 Benthic Macroinvertebrate Study

In September 2004, the EPA requested additional data be collected to determine environmental impacts of ground water discharge to the Red River in the mine exposure area (EPA 2004). The addendum required focused sampling to identify potential sources of water quality impacts to the Red River with emphasis on Spring 13 and Spring 39. However, four additional transects outside of the EPA data request were sampled upstream of the EPA focus area to characterize the Red River directly upstream of the EPA focus area.

4.3.3.1 Transect Study

Four transects were sampled approximately every 1,000 feet in the reach of the Red River directly upstream of RI/FS exposure Site RR-7 to just downstream of RI/FS reference Site RR-6.

4.3.3.1.1 Benthic Invertebrate Populations

Benthic invertebrate populations were sampled according to methods presented in the RI/FS Work Plan addendum (EPA 2004). Benthic invertebrate samples were taken within 50 feet of

the established transect. All transects supported invertebrates, including some sensitive species (Appendix B-4g).

4.3.3.1.2 Habitat Assessment

Physical habitat was assessed in following the RI/FS Work Plan Addendum (EPA 2004). The habitat assessment provided data on substrate and available cover, embeddedness, the velocity and depth regime, frequency of riffles, bank stability, and individual substrate components (Appendix B-4h).

SECTION 4

AQUATIC BIOTA

TABLES

Tables 4-1 - 4-2
RI/FS Fish Population Summaries

Key to fish species abbreviations:

BRK = Brook trout, *Salvelinus fontinalis*
BRN = Brown trout, *Salmo trutta*
CUT = Cutthroat trout, *Oncorhynchus clarki*
HYBRID = Cutthroat trout x rainbow trout hybrid
RBT = Rainbow trout, *Oncorhynchus mykiss*
WS = White sucker, *Catostomus commersoni*

Table 4-1
Aquatic Biota
RI/FS Sites - Fish Population Summary
Fall 2002

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Cabresto Creek	BRK	7	119	86	5.2
	BRN	14	237	173	13.2
	HYBRID	124	2,203	1,605	62.3
	RBT	23	390	284	143.5
	Total	**168**	**2,949**	**2,148**	**224.2**
Zwergle -- Upstream of Town	BRK	40	519	258	19.5
	BRN	46	636	316	26.6
	CUT	3	39	19	2.9
	HYBRID	82	1,182	587	8.9
	RBT	14	182	90	68.4
	Total	**185**	**2,558**	**1,270**	**126.3**
RR-4 - Junebug Campground	BRN	7	117	60	0.6
	RBT	1	17	9	2.1
	Total	**8**	**134**	**69**	**2.7**
RR-5 - Elephant Rock Campground	RBT	3	55	27	13.9
RR-6 - DS of Hansen Creek, US of Mill	No fish	0	--	--	--
RR-7 - DS of Mine Boundary US of Mill	BRN	1	13	7	0.1
	RBT	1	13	7	4.9
	Total	**2**	**26**	**14**	**5**
RR-8 - DS of Mill, US of Columbine Creek	No fish	0	--	--	--
RR-11A1 - DS of Cabin Springs and Columbine Well Field	BRN	3	36	21	0.2
	WS	1	12	7	0.1
	Total	**4**	**48**	**28**	**0.3**
RR-12 - Goathill Campground	BRN	1	14	6	1.9
	RBT	2	27	12	4.9
	WS	2	27	12	0.3
	Total	**5**	**68**	**30**	**7.1**
RR-15 US of Questa Ranger Sta.	RBT	1	13	6	2.1
	WS	1	13	6	0.1
	Total	**2**	**26**	**12**	**2.2**

Table 4-1
Aquatic Biota
RI/FS Sites - Fish Population Summary
Fall 2002

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
RR-20 - US of Highway 522	BRN	3	34	14	4.3
	RBT	3	34	14	6.1
	Total	**6**	**68**	**28**	**10.4**
LR-1 - DS of Highway 522 and	BRN	16	246	107	33.1
Questa WWTP	RBT	1	14	6	1.6
	Total	**17**	**260**	**113**	**34.7**
LR-8A - DS of NPDES Outfall 002	BRN	26	302	142	45.3
	RBT	6	70	33	11.7
	Total	**32**	**372**	**175**	**57**
LR-16 - US of Hatchery Diversion	BRN	97	1,726	677	93.1
	RBT	35	565	222	90.9
	Total	**132**	**2,291**	**899**	**184**
UFL - Upper Fawn Lake					
Gill Net	BRN	2	--	--	--
	RBT	13	--	--	--
	WS	23	--	--	--
Minnow Trap	WS	75	--	--	--
	Total	**113**	--	--	--
ERL - Eagle Rock Lake					
Gill Net	RBT	67	--	--	--
	WS	13	--	--	--
Minnow Trap	WS	1	--	--	--
	Total	**81**	--	--	--
SW12-9					
Gill Net	No Fish	0	--	--	--
Minnow Trap	No Fish	0	--	--	--
SW12-10					
Gill Net	No Fish	0	--	--	--
Minnow Trap	No Fish	0	--	--	--

Table 4-2
Aquatic Biota
RI/FS Sites - Fish Population Summary
Fall 2003

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Cabresto Creek	BRK	2	33	24	1.9
	BRN	15	246	183	12.5
	HYBRID	71	1,262	939	72.5
	RBT	13	213	159	50.8
	Total	**101**	**1,754**	**1,305**	**137.7**
Zwergle - Upstream of Town	CUT	1	13	6	1.9
	BRK	20	263	123	7.9
	BRN	38	500	233	50.6
	HYBRID	16	211	98	5.2
	RBT	8	105	49	61
	Total	**83**	**1,092**	**509**	**126.6**
RR-4 - Junebug Campground	BRN	22	355	193	11.2
	HYBRID	2	32	18	1.3
	RBT	1	16	9	4.1
	WS	3	48	26	3.1
	Total	**28**	**451**	**246**	**19.7**
RR-5 - Elephant Rock Campground	BRN	1	18	10	0.8
	HYBRID	1	18	10	2.2
	RBT	4	73	40	9.8
	WS	3	55	30	0.2
	Total	**9**	**164**	**90**	**13**
RR-6 - DS of Hansen Creek, US of Mill	BRN	2	25	13	6.3
	HYBRID	1	12	7	1.2
	Total	**3**	**37**	**20**	**7.5**
RR-7 - DS of Mine Boundary, US of Mill	BRN	2	26	16	5.4
	RBT	2	26	16	5.7
	WS	1	13	8	<0.1
	Total	**5**	**65**	**40**	**11.1**
RR-8 - DS of Mill, US of Columbine	BRN	2	32	17	2.2
	RBT	2	32	17	7.4
	Total	**4**	**64**	**34**	**9.6**
RR-11A1 - DS of Cabin Springs and Columbine Well Field	BRN	10	120	73	5.7
	RBT	1	12	7	1.4
	WS	4	48	29	3
	Total	**15**	**180**	**109**	**10.1**

Table 4-2
Aquatic Biota
RI/FS Sites - Fish Population Summary
Fall 2003

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
RR-12 - Goathill Campground	BRN	1	14	6	0.5
	RBT	7	95	40	12.8
	Total	**8**	**109**	**46**	**13.3**
RR-15 - US of Questa Ranger Sta.	RBT	2	25	11	4.4
	WS	1	13	5	0.1
	Total	**3**	**38**	**16**	**4.5**
RR-20 - US of Highway 522	BRN	4	43	16	4.2
	RBT	3	33	12	3.7
	Total	**7**	**76**	**28**	**7.9**
LR-1 - DS of Highway 522 and	BRN	20	299	146	25.2
Questa WWTP	RBT	1	15	7	2.2
	Total	**21**	**314**	**153**	**27.4**
LR-8A - DS of NPDES Outfall 002	BRN	41	519	248	43.7
	RBT	24	304	145	48.9
	Total	**65**	**823**	**393**	**92.6**
LR-16 - US of Hatchery Diversion	BRN	96	1,540	599	72.8
	RBT	16	254	99	28.4
	WS	1	16	6	0.2
	Total	**113**	**1,810**	**704**	**101.4**
UFL - Upper Fawn Lake					
Gill Net	BRN	7	--	--	--
	RBT	2	--	--	--
	WS	48	--	--	--
Minnow Trap	WS	1	--	--	--
	Total	**58**	--	--	--
ERL - Eagle Rock Lake					
Gill Net	RBT	8	--	--	--
	WS	15	--	--	--
Minnow Trap	WS	2	--	--	--
	Total	**25**	--	--	--

Tables 4-3 - 4-4
RI/FS Fish Tissues Summary

Table 4-3
Aquatic Biota
RI/FS Sites - Fish Tissue Summary
Fall 2002

Species/Size Class Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Brown Trout (> 8 in)																					
Cabresto Creek	45.0	U	U	0.70	U	U	U	U	U	1.1	U	U	4.2	0.013	U	U	0.97	U	U	0.13	44.0
Zwergle - Upstream of Town	23.3	U	U	0.56	U	U	0.02	0.42	U	1.2	U	U	2.8	U	U	U	1.05	U	U	U	33.3
RR-20 - US of Highway 522	29.2	U	U	1.27	U	U	0.27	0.79	0.23	U	U	U	12.8	U	0.06	U	U	U	U	U	53.3
LR-1 - DS of Highway 522	57.3	U	U	2.30	U	U	0.30	U	0.36	3.5	U	U	18.6	U	U	0.18	U	U	U	U	57.1
LR-8A - DS of Outfall 002	37.6	U	U	1.62	U	U	0.10	0.80	0.22	2.4	U	0.18	10.3	U	U	U	U	U	U	U	39.7
LR-16 - US of Hatchery	39.7	U	U	1.40	U	U	0.11	U	0.41	2.3	U	U	16.0	U	U	0.17	0.32	U	U	0.26	50.1
Brown Trout (< 8 in)																					
Cabresto Creek	16.9	U	U	U	U	0.25	U	0.5	U	1.9	41	U	1.6	0.018	U	U	1.03	U	U	0.113	33.9
Zwergle - Upstream of Town	8.2	U	U	0.57	U	U	0.016	0.9	U	1.8	26	U	2.7	U	0.05	U	1.37	U	U	U	29.8
RR-4 - June Bug	20.9	U	U	1.53	U	U	0.189	0.7	0.11	6.2	65	U	4.1	U	0.18	U	1.15	U	U	U	35.7
RR-11A1 - DS of Cabin Spgs	14.8	U	0.14	0.83	U	U	0.083	0.2	U	1.8	60	U	1.7	0.009	U	U	1.23	U	U	U	23.1
RR-12 - Goathill	21.6	U	0.11	1.19	U	U	0.208	U	U	U	53	U	10.9	0.015	U	U	U	U	U	U	44.3
RR-15 - Questa RS	28.1	U	0.21	0.95	U	U	0.293	U	U	7.8	50	U	7.9	0.013	U	U	U	U	U	U	42.3
RR-20 - US of Highway 522	23.2	U	U	0.93	U	U	0.261	U	0.21	3.4	48	U	12.2	U	U	U	U	U	U	U	63.9
LR-1 - DS of Highway 522	U	U	U	0.61	U	U	0.166	U	0.19	5.1	30	U	12.1	U	0.25	U	U	U	U	U	41.6
LR-8A - DS of Outfall 002	46.0	U	U	1.53	U	U	0.173	0.1	0.30	4.3	94	U	12.1	0.015	U	0.26	0.48	U	U	U	39.1
LR-16 - US of Hatchery	30.5	U	U	1.52	U	U	0.170	0.2	0.37	4.5	75	U	18.3	U	0.25	0.29	0.59	U	U	0.2	41.5
Lakes																					
UFL-1 - Upper Fawn Lake	119.6	U	U	0.65	U	U	0.025	0.1	U	1.4	16	U	1.1	U	0.05	U	0.82	U	U	U	29.3
White Suckers																					
UFL-1 - Upper Fawn Lake	177.0	U	U	3.90	0.03	U	0.112	0.2	0.21	1.7	286	1.02	26.3	U	U	U	U	U	U	U	29.4
ERL-1 - Eagle Rock Lake	20.5	U	U	2.13	U	U	0.038	0.1	U	1	65	U	8.1	0.011	0.05	U	U	U	U	U	22.8

U = below detection level

Table 4-3
Aquatic Biota
RI/FS Sites - Fish Tissue Summary
Fall 2002

Species/Size Class Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Rainbow Trout																					
Cabresto Creek	12.6	U	0.38	0.65	U	0.20	U	U	U	0.9	36	U	2.1	0.029	U	U	U	U	U	U	36.4
Zwergle - Upstream of Town	26.7	U	0.21	0.48	U	U	U	0.5	U	1.1	73	U	2.7	0.025	U	U	U	U	U	0.16	26.4
RR-4 - June Bug	36.0	U	U	4.64	U	U	0.038	0.7	0.13	2.6	96	U	4.0	U	0.19	0.64	0.63	U	U	0.16	27.2
RR-5 - Elephant Rock	32.6	U	0.23	2.38	U	U	0.036	0.6	U	1.8	109	0.77	5.5	0.034	U	U	U	U	U	U	30.4
RR-7 - US of Mill	U	U	U	U	U	U	U	0.8	U	2.1	19	U	U	0.032	U	U	U	U	U	U	33.9
RR-12 - Goathill	32.66	U	0.28	1.75	U	U	0.050	U	U	U	73	U	5.3	0.019	0.08	U	U	U	U	0.14	33.3
RR-15 - Questa RS	62.5	U	0.31	1.65	U	U	U	U	0.26	2.6	113	U	5.9	0.023	U	U	U	U	U	U	27.9
RR-20 - US of Highway 522	31	U	0.36	2.22	U	U	U	0.5	0.15	1.9	86	0.23	8.5	0.023	U	U	U	U	U	U	30.5
LR-1 - DS of Highway 522	40.4	U	0.19	1.65	U	U	0.084	0.1	U	1.5	97	0.16	6.1	0.03	U	U	U	U	U	U	35.1
LR-8A - DS of Outfall 002	112.9	U	0.19	3.63	0.02	U	0.080	1.9	0.52	2.7	231	0.55	37.3	0.02	0.54	1.05	U	U	U	0.21	41.8
LR-16 - US of Hatchery	45.7	U	0.19	1.67	U	0.3	0.043	0.1	0.38	2	99	U	23.1	0.024	0.28	0.49	0.22	U	U	0.21	32.2
Downstream of Hatchery	6.2	U	0.31	0.73	U	0.24	U	0.4	U	2.0	29	U	5.5	0.025	U	U	0.31	U	U	U	36.4
Lakes																					
UFL-1 - Upper Fawn Lake	8.4	U	0.32	0.82	U	U	0.024	0.1	U	1.0	40	U	2.8	0.017	U	U	U	U	U	0.16	34.6
ERL-1 - Eagle Rock Lake	U	U	0.15	U	U	U	U	1.4	U	0.2	27	U	1.3	0.021	U	U	U	U	U	U	29.1

U = below detection level

Table 4-4
Aquatic Biota
RI/FS Sites - Fish Tissue Summary -
Fall 2003

Species/Size Class Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Brown Trout (> 8 in)																					
Cabresto Creek	22.4	U	U	U	U	0.36	0.037	3.2	U	2.3	66	0.13	2.8	0.02	0.17	1.18	0.89	U	U	U	33
Zwergle - Upstream of Town	353.2	U	0.17	3.55	0.03	U	0.031	52	0.76	4.1	1,010	0.66	33.2	0.01	1.67	26.1	0.69	U	U	1.47	32.7
RR-5 - Elephant Rock	15.5	U	U	1.24	U	U	0.085	1.1	0.29	2.7	69	0.25	12.1	U	U	0.49	0.74	U	U	U	29.4
RR-8 - US of Columbine	U	U	U	0.68	U	U	0.095	U	U	2.4	21	U	2.6	U	U	U	0.67	U	U	U	33.4
RR-12 - Goathill	8.2	U	U	U	U	U	0.135	14	U	U	21	U	3.4	0.02	U	U	0.5	U	U	U	38.4
RR-15 - Questa RS	18.1	U	U	0.47	U	U	0.182	2.1	U	5.6	34	U	6.6	U	0.1	0.78	0.22	U	U	U	39.8
RR-20 - US of Highway 522	8.7	U	U	0.57	U	U	0.269	2.2	0.18	5.5	64	U	10.7	0.01	0.17	0.84	0.31	U	U	U	42.3
LR-1 - DS of Highway 522	11.6	U	U	U	U	U	0.181	0.7	U	U	29	U	8.9	0.02	0.16	0.15	0.2	U	U	U	46.9
LR-8A - DS of Outfall 002	32.5	U	U	0.92	0.03	U	0.122	2.4	0.21	U	77	U	21.2	0.02	0.26	0.88	0.56	U	U	0.18	47.3
LR-16 - US of Hatchery	U	U	U	U	U	0.33	0.289	U	0.27	6.9	28	U	11	0.02	U	U	0.43	U	U	U	50.3
Lakes																					
UFL-1 - Upper Fawn Lake	22.4	U	U	U	U	U	0.036	0.7	U	1.6	23	U	1.1	U	0.09	U	0.62	U	U	U	23.4
Brown Trout (< 8 in)																					
Cabresto Creek	U	U	U	U	U	U	U	2.7	U	U	25	U	1.3	0.01	U	0.94	0.6	U	U	U	40.5
Zwergle - Upstream of Town	22.6	U	U	0.7	U	U	U	3.7	U	0.9	62	0.34	4.3	U	U	1.6	0.77	U	U	U	36.5
RR-4 - June Bug	21.4	U	U	2.1	U	U	0.27	3.3	0.32	3.9	54	U	6.7	U	0.18	0.93	0.68	U	U	U	44.9
RR-5 - Elephant Rock	17.3	U	U	0.81	U	U	0.157	U	0.23	3.6	97	U	9.2	U	U	0.3	0.72	U	U	U	43.3
RR-8 - US of Columbine	4.6	U	U	0.67	U	U	0.08	U	U	2.1	22	U	3.6	U	0.08	U	0.56	U	U	U	35
RR-11A1 - DS of Cabin Spgs	U	U	U	0.67	U	U	0.125	U	0.28	2.1	33	U	9.7	0.02	U	U	0.49	U	U	U	42.6
RR-12 - Goathill	16.5	U	U	U	U	U	0.29	U	U	U	33	U	2.1	0.02	U	U	0.94	U	U	U	42.3
RR-15 - Questa RS	10.7	U	U	U	U	U	0.19	1.1	U	1.8	22	U	2.1	U	U	0.3	0.47	U	U	U	43.4
LR-1 - DS of Highway 522	17.5	U	U	U	U	U	0.173	0.7	0.19	U	37	U	7.8	0.02	0.13	0.23	0.29	U	U	U	41.6
LR-8A - DS of Outfall 002	33.3	U	U	1	U	U	0.187	1.8	0.19	U	66	U	7.8	0.02	U	0.69	0.9	U	U	U	55
LR-16 - US of Hatchery	31.7	U	U	1.82	0.02	U	0.17	U	0.44	3.1	113	U	36.6	0.03	U	0.73	0.65	U	U	U	51.8

U = below detection level

Table 4-4
Aquatic Biota
RI/FS Sites - Fish Tissue Summary -
Fall 2003

Species/Size Class Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn

U = below detection level

Table 4-4
Aquatic Biota
RI/FS Sites - Fish Tissue Summary -
Fall 2003

Species/Size Class Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Brown Trout - YOY																					
Cabresto Creek	U	U	U	U	U	U	U	2.7	U	U	45	U	4.1	U	U	0.95	1.09	U	U	U	54.4
Zwergle - Upstream of Town	15.1	U	U	U	U	U	0.032	1.2	U	0.6	30	0.24	3.9	U	U	U	1.18	U	U	U	36.9
RR-4 - June Bug	24.3	U	U	0.93	U	U	0.31	2.5	U	4	64	U	8.7	U	0.14	0.41	0.77	U	U	U	58.7
RR-5 - Elephant Rock	7.2	U	U	U	U	U	0.21	U	U	2.2	26	U	5.4	U	U	U	0.61	U	U	U	38.6
RR-11A1 - DS of Cabin Spgs	39.1	U	U	2.5	U	U	0.36	U	U	3	87	U	9.6	0.02	U	U	0.78	U	U	U	58
RR-20 - US of Highway 522	35.2	U	U	1	U	U	0.38	1.3	U	3	62	0.14	6	U	0.11	0.57	0.34	U	U	U	59.4
LR-1 - DS of Highway 522	36.2	U	U	0.83	U	U	0.3	0.9	0.18	U	53	U	13.3	0.02	0.11	0.53	0.42	U	U	U	71.1
LR-8A - DS of Outfall 002	44.4	U	U	1.3	U	U	0.217	1.6	U	U	92	U	7.6	0.19	U	0.72	0.97	U	U	U	64.2
LR-16 - US of Hatchery	U	U	U	1.33	U	U	0.417	U	0.27	2.3	70	U	16.4	0.02	U	U	0.31	U	U	U	71.2
White Suckers - YOY																					
UFL-1 - Upper Fawn Lake	N	U	N	N	N	U	N	N	N	N	N	N	N	U	N	N	N	U	U	U	N
ERL-1 - Eagle Rock Lake	247.7	U	0.15	6.07	0.05	U	0.183	1.8	0.19	4.3	370	1.43	23.7	U	U	1.53	0.36	U	U	U	43.3
White Suckers - Juvenile																					
UFL-1 - Upper Fawn Lake	42.8	U	U	2.3	U	U	0.038	3	U	1.7	118	U	18.3	U	0.12	1.24	0.69	U	U	U	27.7
ERL-1 - Eagle Rock Lake	98.9	U	U	2.27	0.02	U	0.145	2.9	U	2.3	141	0.51	16.4	U	U	1.66	0.45	U	U	U	29.8
White Suckers - Adult																					
UFL-1 - Upper Fawn Lake	48.9	U	U	3.6	U	U	0.027	2.9	U	1.5	168	U	7.7	U	0.19	0.76	0.59	U	U	U	23.4
ERL-1 - Eagle Rock Lake	107.4	U	U	2.37	0.02	U	0.1	1.4	U	1.8	140	0.53	24.9	U	U	0.8	0.36	U	U	U	31.9

U = below detection level

Tables 4-5 - 4-7
RI/FS Benthic Invertebrate Population Summaries

Table 4-5
Aquatic Biota
RI/FS Sites - Benthic Invertebrate Populations
Fall 2002

Site	Density (#/m²)	Total # of Taxa	# EPT Taxa	% EPT Taxa	% Density Mayflies	% Density Heptageniids	Diversity (H')
Cabresto Creek	6,424	50	26	52	21	<1	4.35
Zwergle - Upstream of Town	5,651	58	30	52	36	16	4.37
RR-4 - June Bug	467	27	13	48	53	4	3.35
RR-5 - Elephant Rock	1,260	38	10	26	24	1	3.83
RR-6 - DS of Hansen	53	8	5	63	23	0	2.63*
RR-7 - US of Mill	24	4	3	75	42	0	1.88*
RR-8 - US of Columbine	640	17	6	35	10	0	2.61
RR-11A1 - DS of Cabin Spgs.	447	19	9	47	28	<1	2.30
RR-12 - Goathill	1,631	23	9	39	31	6	2.92
RR-15 - Questa RS	508	21	7	33	32	3	3.08
RR-20 - US of Highway 522	1,556	28	7	25	45	0	2.99
LR-1 - DS of Highway 522	5,510	40	14	35	5	0	2.70
LR-8A - DS of Outfall 002	15,045	41	13	32	2	0	3.47
LR-16 - US of Hatchery	24,473	36	13	36	<1	<1	3.16

Site, Habitat	Density (#/m²)	Total # of Taxa	# ETO Taxa	% ETO Taxa	# Crustacea and Mollusca Taxa	% Density of Crustacea and Mollusca	Diversity (H')
UFL-1 - Upper Fawn Lake							
Edge	17,934	30	6	20	5	11	2.48
Mid-Lake	3,461	5	0	0	0	0	0.77
ERL-1 - Eagle Rock Lake							
Edge	1,193	21	0	0	2	2	2.65
Mid-Lake	3,488	7	1	14	1	1	0.35

* Should be interpreted cautiously when total abundance is less than 100 organisms.
EPT - Ephemeroptera, Plecoptera, Trichoptera
ETO - Ephemeroptera, Trichoptera, Odonata

Table 4-6
Aquatic Biota
RI/FS Sites - Benthic Invertebrate Populations
Spring 2003

Site	Density (#/m²)	Total # of Taxa	# EPT Taxa	% EPT Taxa	% Density Mayflies	% Density Heptageniids	Diversity (H')
Cabresto Creek	3,470	53	28	53	17	2	4.54
Zwergle - Upstream of Town	17,291	60	29	48	29	14	4.52
RR-4 - June Bug	1,454	36	15	42	50	3	3.42
RR-5 - Elephant Rock	1,643	34	7	21	3	0	3.2
RR-6 - DS of Hansen	184	22	10	45	17	1	3.64
RR-7 - US of Mill	199	26	6	23	14	0	3.78
RR-8 - US of Columbine	323	18	7	39	22	1	2.73
RR-11A1 - DS of Cabin Spgs.	1,228	31	13	42	42	0	3.21
RR-12 - Goathill	582	22	9	41	14	8	3.46
RR-15 - Questa RS	304	17	6	35	2	2	2.94
RR-20 - US of Highway 522	1,838	30	8	27	11	<1	3.42
LR-1 - DS of Highway 522	5,462	40	14	35	7	<1	3.48
LR-8A - DS of Outfall 002	6,977	45	11	24	3	0	3.57
LR-16 - US of Hatchery	23,513	29	10	34	2	0	3.22

Site, Habitat	Density (#/m²)	Total # of Taxa	# ETO Taxa	% ETO Taxa	# Crustacea and Mollusca Taxa	% Density of Crustacea and Mollusca	Diversity (H')
Upper Fawn Lake							
Edge	4,348	23	1	4	5	21	2.79
Mid-Lake	2,321	4	0	0	0	0	1.09
Eagle Rock Lake							
Edge	1,226	20	1	5	1	1	3.02
Mid-Lake	1,300	6	0	0	0	0	1.02

EPT - Ephemeroptera, Plecoptera, Trichoptera
ETO - Ephemeroptera, Trichoptera, Odonata

Table 4-7
Aquatic Biota
RI/FS Sites - Benthic Invertebrate Populations
Fall 2003

Site	Density (#/m²)	Total # of Taxa	# EPT Taxa	% EPT Taxa	% Density Mayflies	% Density Heptageniids	Diversity (H')
Cabresto Creek	5,134	46	18	39	30	0	4.25
Zwergle - Upstream of Town	5,825	47	24	51	20	4	3.69
RR-4 - June Bug	960	27	10	37	75	17	2.66
RR-5 - Elephant Rock	2,697	40	12	30	49	11	3.70
RR-6 - DS of Hansen	575	20	7	35	74	17	2.49
RR-7 - US of Mill	970	26	8	31	51	9	3.22
RR-8 - US of Columbine	940	23	9	39	54	12	2.95
RR-11A1 - DS of Cabin Spgs.	3,253	30	12	40	52	2	2.58
RR-12 - Goathill	1,862	29	8	28	53	9	3.05
RR-15 - Questa RS	1,099	25	10	40	43	5	2.95
RR-20 - US of Highway 522	2,536	27	8	30	37	1	2.65
LR-1 - DS of Highway 522	1,850	29	8	28	36	2	3.17
LR-8A - DS of Outfall 002	15,987	41	10	24	10	<1	3.60
LR-16 - US of Hatchery	4,544	28	9	32	23	<1	3.25

Site, Habitat	Density (#/m²)	Total # of Taxa	# ETO Taxa	% ETO Taxa	# Crustacea and Mollusca Taxa	% Density of Crustacea and Mollusca	Diversity (H')
Upper Fawn Lake							
Edge	5,083	22	1	5	4	2	2.52
Mid-Lake	922	5	0	0	0	0	1.05
Eagle Rock Lake							
Edge	174	8	1	13	0	0	2.39
Mid-Lake	905	6	0	0	0	0	1.10

EPT - Ephemeroptera, Plecoptera, Trichoptera
ETO - Ephemeroptera, Trichoptera, Odonata

Tables 4-8 - 4-10
RI/FS Benthic Invertebrate Tissue Summaries

Table 4-8
Aquatic Biota
RI/FS Sites - Benthic Invertebrate Tissue Summary
Fall 2002

Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Si	Tl	V	Zn
Cabresto Creek	152	U	0.14	3.2	0.025	U	0.17	0.8	0.19	3.7	369	1.2	11	U	U	U	U	U	U	0.3	85.7
Zwergle - Upstream of Town	448	U	0.24	7.2	0.02	U	0.14	4.1	0.95	7.1	722	0.6	49	U	U	1.4	U	U	U	1.4	40.6
RR-4 - June Bug	281	U	0.25	16.7	0.044	U	1.1	1	1.7	17.5	694	1.6	102	U	1	2.9	U	U	U	0.44	95.2
RR-5 - Elephant Rock	276	U	U	24.3	0.045	U	1.2	2.9	2	16	841	3.7	90	U	0.68	4.4	U	0.1	U	0.48	94.7
RR-6 - Downstream of Hansen	329	U	U	15	0.065	U	0.6	0.5	2.1	13	544	2.4	93	U	0.73	3.1	U	0.1	U	0.29	78.6
RR-7 - Upstream of Mill	371	U	U	16.7	0.071	U	1.1	0.5	2.7	13.8	696	2.5	100	U	0.66	2.8	U	U	U	0.33	132
RR-8 - US of Columbine	277	U	U	17.8	0.041	U	0.27	0.4	1.3	10	585	2.2	76	U	0.9	2.2	U	U	U	0.31	41
RR-11A1 - DS of Cabin Spgs.	474	U	U	38.4	0.069	U	0.41	0.5	2	12.6	1020	3.2	147	U	0.79	3.7	U	U	U	0.65	56.2
RR-12 - Goathill	259	U	U	11.3	0.064	U	0.35	0.7	1.1	9.9	492	1.7	81	U	0.39	2.6	U	U	U	0.23	48.5
RR-15 - Questa RS	655	U	U	9.9	0.15	U	0.63	0.5	1.1	18	609	1.3	50	U	U	2.4	U	U	U	0.31	77.9
RR-20 - US of Highway 522	606	U	0.26	16.7	0.096	U	0.87	0.9	2.1	11	1070	3.2	157	U	0.83	3.1	U	U	U	0.54	113
LR-1 - DS of Highway 522	590	U	0.27	24.8	0.12	U	0.95	0.9	2.2	12.8	1140	3.9	126	U	1.1	3.1	0.25	U	U	0.68	99.6
LR-8A - DS of Outfall 002	586	U	0.52	25.1	0.12	U	0.49	1.4	1.7	14.5	1180	3.5	162	U	4	2.8	0.39	U	U	0.88	69.5
LR-16 - US of Hatchery	787	U	0.88	27.5	0.14	2.7	0.31	1.7	2.8	12.9	1650	4.7	285	U	3.6	5.5	U	U	U	1.7	66.3
Lakes																					
UFL-1 - Upper Fawn Lake	72.4	U	0.43	8.9	U	2.6	0.3	0.3	0.32	16.4	190	U	29	U	0.27	0.3	0.36	U	U	0.15	14.7
ERL-1 - Eagle Rock Lake	589	U	0.42	11	0.14	2.2	1.3	0.7	2.4	22.7	769	2.5	221	U	0.71	6.3	0.26	U	U	0.51	74.9
SW 12-9 - Northwest	310	U	U	3.3	0.35	2.5	0.77	0.9	1.4	17.3	286	U	413	U	64.3	4.6	0.24	U	U	0.59	82.2
SW 12-10 - Southeast	556	U	U	6.6	0.39	U	1.3	3.5	1.6	27.1	856	2	462	U	31.4	6.1	0.28	U	U	2.3	72.4

U = below detection level

Table 4-9
Aquatic Biota
RI/FS Sites - Benthic Invertebrate Tissue Summary
Spring 2003

Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Cabresto Creek	78	U	0.2	1.6	U	U	0.31	U	U	4.7	124	U	11	U	0.16	0.4	1	U	U	U	137
Zwergle - Upstream of Town	250	U	0.24	4.2	U	U	0.09	0.7	0.4	4.8	349	0.5	29	U	0.18	0.4	U	U	U	0.57	33
RR-4 - June Bug	474	U	U	14.7	0.13	U	2.1	U	2.9	36.1	956	1.1	132	U	0.23	4	U	U	U	0.44	165
RR-5 - Elephant Rock	268	U	U	14.2	0.05	U	1.2	U	2.6	18.4	479	1.9	103	U	0.36	3.6	U	U	U	0.3	113
RR-6 - Downstream of Hansen	527	U	U	6.5	0.13	U	0.82	U	1.6	19.3	365	0.9	37	U	0.21	1.9	U	U	U	U	109
RR-7 - Upstream of Mill	344	U	U	6.8	0.06	U	0.51	U	1.6	12.4	281	0.9	47	U	0.33	2.1	U	U	U	U	73
RR-8 - US of Columbine	331	U	U	11.2	0.05	U	0.43	U	2.2	11.8	342	1.1	123	U	0.39	2.5	U	U	U	U	62
RR-11A1 - DS of Cabin Spgs.	209	U	U	7.9	0.31	U	0.35	U	1.8	10.4	263	0.8	88	U	0.31	2.5	U	U	U	U	51
RR-12 - Goathill	967	U	0.25	24.8	0.33	U	0.76	U	1.3	24.3	776	2.2	55	U	0.6	4.3	0.46	U	U	0.38	114
RR-15 - Questa RS	1,200	U	U	11.1	0.35	U	0.28	U	1.3	27	764	1.1	68	U	0.51	3	U	U	U	U	60
RR-20 - US of Highway 522	918	U	0.27	12.4	0.25	U	0.92	U	2.5	20.4	621	2	92	U	0.35	4.6	0.53	U	U	U	138
LR-1 - DS of Highway 522	1,000	U	0.26	12.4	0.26	U	0.79	U	2.2	22.7	642	1.8	111	U	0.61	3.9	0.5	U	U	0.29	130
LR-8A - DS of Outfall 002	854	U	0.23	10.2	0.22	U	1	U	2.4	25.7	613	1.7	126	U	4.3	3.1	U	U	U	0.33	161
LR-16 - US of Hatchery	886	U	0.42	12.2	0.23	U	0.81	U	2.8	21.3	634	2	194	U	2.7	5.6	0.51	U	U	0.44	152
Lakes																					
UFL-1 - Upper Fawn Lake	271	U	0.43	28.9	0.05	U	0.48	U	0.9	24.7	537	2.3	68	U	0.97	2.6	U	U	U	0.45	29
ERL-1 - Eagle Rock Lake	1,560	U	0.23	13.7	0.39	U	0.85	U	3.6	33.8	915	2.8	282	U	0.87	9.4	U	U	U	0.6	116

U = below detection level

Table 4-10
Aquatic Biota
RI/FS Sites - Benthic Invertebrate Tissue Summary
Fall 2003

Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Cabresto Creek	127	U	0.2	4	U	U	0.19	4.2	U	U	272	U	18	U	U	2.3	0.96	U	U	U	108
Zwergle - Upstream of Town	354	U	U	6.7	U	U	0.07	0.9	0.3	4.1	526	0.6	41	0.51	U	U	0.47	U	U	0.92	25
RR-4 - June Bug	450	U	0.23	14.3	0.09	U	0.94	1	1.3	32.6	834	U	79	U	0.22	2.8	0.52	U	U	0.58	105
RR-5 - Elephant Rock	289	U	0.25	19	0.04	U	1.3	2.4	1.6	23.3	725	2.4	81	U	0.27	3.2	0.4	U	U	0.37	97
RR-6 - Downstream of Hansen	498	U	0.28	23.2	0.11	U	1.1	1.8	1.9	20.1	507	1.5	105	U	U	3.5	0.47	U	U	0.26	125
RR-7 - Upstream of Mill	456	U	0.25	18.7	0.09	U	1.2	U	2.3	18.7	585	1.9	116	U	0.54	3.8	U	U	U	0.28	119
RR-8 - US of Columbine	377	U	0.17	13.4	0.09	U	1.7	U	2.2	16.5	473	1.4	105	U	0.28	2.8	U	U	U	U	135
RR-11A1 - DS of Cabin Spgs.	326	U	0.2	43.4	0.08	5.6	1.7	U	2.1	13	630	1.7	111	0.016	U	2.7	0.43	U	U	0.27	108
RR-12 - Goathill	290	U	0.26	8.7	0.1	2.5	0.47	U	1	13.1	440	1.9	74	0.018	0.27	3.8	U	U	U	U	81
RR-15 - Questa RS	863	U	U	11.6	0.3	U	0.62	0.6	0.8	18.6	472	1.2	59	U	0.35	2.9	U	U	U	U	89
RR-20 - US of Highway 522	638	U	U	15.6	0.18	U	0.72	1	1.1	15.6	664	1.8	94	U	0.63	3.4	U	U	U	0.33	97
LR-1 - DS of Highway 522	610	U	0.21	20.6	0.17	U	0.77	1.1	1.2	18.4	726	2	81	0.017	0.79	3	U	U	U	0.36	86
LR-8A - DS of Outfall 002	651	U	0.36	19.8	0.17	U	0.82	1.3	1.4	19.1	1,130	5.5	122	0.015	4	3.1	0.69	U	U	0.52	97
LR-16 - US of Hatchery	154	U	U	5	0.07	3.7	0.47	U	1.2	7.2	178	U	94	U	0.8	2.5	U	U	U	U	66
Lakes																					
UFL-1 - Upper Fawn Lake	222	U	0.57	35	U	2.8	0.57	U	0.6	23.2	399	1.8	63	0.02	U	1.3	0.66	U	U	0.32	29
ERL-1 - Eagle Rock Lake	724	U	U	9.8	0.17	6.5	1	U	1.7	36.2	568	2.8	145	U	U	5	U	U	U	U	119

U = below detection level

Tables 4-11 - 4-12
RI/FS Periphyton Population Summary

Table 4-11
Aquatic Biota
RI/FS Sites - Periphyton Populations
Fall 2002

Site	% Diatoms	% Blue-Green Algae	% Other Algae	Total # of Taxa	Total # of Diatom Taxa
Cabresto Creek	67	33	0	23	22
Upstream of Town	67.4	32.6	0	19	18
June Bug	48.6	50.6	0.8	19	16
Elephant Rock	100	0	0	25	25
Downstream of Hansen	76.3	22.9	0.8	23	21
Upstream of Mill	100	0	0	20	20
Upstream of Columbine	81.3	7.2	11.5	18	16
Downstream of Cabin Springs	32.3	67.7	0	22	21
Goathill	51.8	48.2	0	18	17
Questa Ranger Station	46.8	53.2	0	12	11
Upstream of Highway 522	Sample Broken	--	--	--	--
Downstream of Highway 522	57.3	42.7	0	18	17
Downstream of Outfall 002	91.2	6.3	2.5	22	20
Upstream of Hatchery	100	0	0	19	19

Table 4-12
Aquatic Biota
RI/FS Sites - Periphyton Populations
Fall 2003

Site	% Diatoms	% Blue-Green Algae	% Other Algae	Total # of Taxa	Total # of Diatom Taxa
Cabresto Creek	96	4	0	14	13
Upstream of Town	100	0	0	9	9
June Bug	57.2	6.8	36	29	27
Elephant Rock	81.4	0	18.6	15	14
Downstream of Hansen	63.5	35.9	0.6	16	14
Upstream of Mill	38.6	61.4	0	24	22
Upstream of Columbine	64.7	35.3	0	22	21
Downstream of Cabin Springs	49	51	0	21	20
Goathill	100	0	0	19	19
Questa Ranger Station	38	62	0	26	25
Upstream of Highway 522	23.8	69.3	6.9	24	21
Downstream of Highway 522	71.4	15.9	12.7	19	17
Downstream of Outfall 002	45.7	1.6	52.7	19	16
Upstream of Hatchery	92.1	7.9	0	19	18

Tables 4-13 - 4-14
RI/FS Macrophyte/Bryophyte Tissue Summaries

Table 4-13
Aquatic Biota
RI/FS Sites - Macrophyte/Bryophyte Tissue Summary
Fall 2002

Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Cabresto Creek	753	U	0.42	12.1	0.3	U	0.15	1	0.55	1.8	1760	5.8	94	U	0.57	2.9	U	U	U	1.3	44.6
Zwergle - US of Town	1120	U	0.21	17.6	0.07	2.6	U	2.9	0.9	3.2	1720	1.2	117	U	U	1.8	U	U	U	3.3	10.8
RR-4 - June Bug	1360	U	0.48	123	0.37	U	1.9	1.6	23.9	72	3790	6	2080	U	0.78	30.9	U	U	U	1.7	226
RR-5 - Elephant Rock	652	U	U	53.2	0.14	U	0.49	0.91	10	27.3	1860	7.3	842	U	0.59	11.2	U	U	U	0.8	65
RR-6 - Downstream of Hansen	2110	U	U	174	0.29	U	0.29	2.1	9.7	34.1	5820	18.2	486	U	4.1	10.5	U	0.22	U	2.4	59
RR-7 - Upstream of Mill	541	U	U	21.8	0.1	U	0.17	0.71	6.1	11.4	881	2.6	324	U	0.33	6.2	U	U	U	0.3	28.6
RR-8 - US of Columbine	1790	U	U	117	0.27	U	0.5	1.6	16.7	30.6	3870	12.7	905	U	1.8	18.2	U	U	U	1.7	91
RR-11A1 - DS of Cabin Spgs.	3220	U	U	120	0.82	U	1.7	2.2	21.3	56.4	3840	9.8	1420	U	1.8	25.3	U	0.13	U	2	222
RR-12 - Goathill	3865	U	2.9	267	0.82	U	0.75	4.55	10.2	48.7	8385	27.3	711	U	3.75	26.1	U	0.2	U	4.2	185
RR-15 - Questa RS	3370	U	U	82.8	1	U	0.38	1.3	5	54.4	3340	7.5	318	U	1.4	11.1	U	U	U	1.3	106
RR-20 - US of Highway 522	5270	U	2	201	1.1	U	2.6	4.1	43.1	81.4	8170	24.3	4090	U	7	61.6	U	U	U	4.3	547
LR-1 - DS of Highway 522	2570	U	1.1	93.7	0.59	2.3	0.88	2	17.5	53.2	4910	13.3	1580	U	5.4	22.7	U	U	U	2.1	157
LR-8A - DS of Outfall 002	3310	U	1.4	133	0.81	2.8	1.6	3	38.5	76.3	6930	17	3900	U	40.7	31.2	0.66	U	U	3.5	224
LR-16 - US of Hatchery	3000	U	2.2	126	0.68	2.3	1.7	3.9	34.5	49.4	6630	19	3140	U	13.7	41.3	0.81	U	0.1	6.3	228
Lakes																					
UFL-1 - Upper Fawn Lake	747	U	0.64	42.9	0.09	3.4	0.56	1.3	6.8	15.5	2130	11.6	885	U	0.97	14.6	0.21	U	U	1.1	74.4
ERL-1 - Eagle Rock Lake	6840	U	2	105	1.6	U	1.7	4.2	13.7	61.4	8730	31.3	1050	U	4	41	1.1	U	0.1	5	372
Tailings Pond																					
SW 12-9 - Northwest	1110	U	U	7.1	2.8	0.2	2.7	2.2	10.8	12.8	598	3.1	3960	U	225	52.2	0.27	0.4	U	1	502
SW 12-10 - Southeast	536	U	U	13.6	2.2	0.7	1.3	2	6.3	4.7	341	U	5000	U	69.6	39.5	U	0.42	U	0.7	147

U = below detection level

Table 4-14
Aquatic Biota
RI/FS Sites - Macrophyte/Bryophyte Tissue Summary
Fall 2003

Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Cabresto Creek	1,100	U	0.6	13	0.5	1.4	0.2	6.3	0.7	2	1,990	4.9	83	U	U	5	0.32	U	U	2	49
Zwergle - Upstream of Town	1,030	U	0.4	21	0.2	U	0.1	2.3	0.8	6	1,670	1.9	190	U	U	2	0.51	U	U	2.9	15
RR-4 - June Bug	2,470	U	1.1	145	1	U	5.4	3	54.9	149	6,560	7.6	5,880	U	0.1	55	0.7	U	U	3.6	567
RR-5 - Elephant Rock	2,170	U	1.1	208	0.5	U	3.6	5	63.7	102	4,470	17.2	5,880	U	0.6	58	0.78	0.5	U	2.6	410
RR-6 - Downstream of Hansen	3,110	U	0.6	106	0.9	U	2	U	50.6	67	3,000	8	3,320	U	0.6	43	0.51	U	U	1.6	400
RR-7 - Upstream of Mill	3,360	U	1.8	170	0.9	4.1	2.9	U	77.9	99	3,720	10.7	5,750	U	1.1	67	0.77	U	U	1.8	517
RR-8 - US of Columbine	3,300	U	1.4	157	0.7	4	2.3	U	62.7	83	5,320	13.4	3,920	U	1.3	62	1	U	U	2.5	373
RR-11A1 - DS of Cabin Spgs.	1,820	U	0.9	94	0.4	2.3	1.1	U	25.1	40	2,400	6,8	2,210	0.021	1	24	0.44	U	U	1.3	179
RR-12 - Goathill	4,930	U	1.6	139	2.9	3.6	4.9	U	45.8	102	4,540	11.5	5,610	0.02	1.2	102	1.4	U	U	2.6	1,610
RR-15 - Questa RS	5,780	U	0.9	194	2.1	U	1.8	2.5	15.7	83	5,500	12.3	1,690	U	2.1	38	0.37	U	U	2.3	401
RR-20 - US of Highway 522	4,060	U	0.9	120	1.5	U	2.3	2.6	23.1	72	5,540	10.2	2,990	U	3.2	44	U	U	U	2.2	464
LR-1 - DS of Highway 522	3,790	U	1	97	1.3	4.1	1.3	2.2	14.9	59	4,330	66.4	1,690	0.021	2.4	31	0.74	U	U	2.1	301
LR-8A - DS of Outfall 002	2,720	U	0.8	86	1	2.3	1.3	1.8	15.3	45	3,560	9.4	1,650	0.02	16.8	27	1.2	0.5	U	1.9	255
LR-16 - US of Hatchery	2,810	U	1.4	127	1.3	9	1.8	U	24.7	U	4,790	13.6	3,000	0.019	5.3	56	0.35	U	U	3.6	422
Lakes																					
UFL-1 - Upper Fawn Lake	2,280	U	2	117	0.2	U	1	5.6	8.3	32	6,530	28	875	U	3	16	0.72	U	U	3.6	111
ERL-1 - Eagle Rock Lake	508	U	0.2	10	0.1	U	0.7	0.6	3.9	9	642	1.8	413	U	U	12	U	U	U	U	88

U = below detection level

Tables 4-15 - 4-22
RI/FS Surface Water Bioassay Summaries

Table 4-15
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Baseline)
October 1, 2002

Organism	100% Effluent	
Ceriodaphnia dubia	% Survival	Mean Reproduction
Site		
Control	100	37.4
LR-1	80	* 29.6
LR-8A	60	* 23.4
LR-16	90	34.3
RR-4	100	39.6
RR-5	90	37.3
Control	100	34.1
RR-6	100	36.6
RR-7	100	37.2
RR-8	90	32.9
RR-11A1	90	30.3
RR-12	100	35
Control	90	30.2
RR-15	80	26.4
RR-20	100	31.8
Cabresto	100	34.3
ERL	100	33.6
UFL	100	26
Control	100	27.9
TP1	66.7	18.8
TP2	70	* 18.6
Zwergle	80	34
* Significant effects ($p < 0.05$)		

Table 4-16
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Baseline)
October 11, 2002

Organism	Serial Dilution			
Ceriodaphnia dubia	Survival	Survival	Reproduction	Reproduction
Site	NOEC	IC25	NOEC	IC25
LR-1	100%	>100%	100%	>100%
LR-8A	100%	>100%	100%	>100%
Outfall 002	100%	93.80%	100%	95.90%

NOEC - No observed effect concentration
IC25 - Inhibition concentration (25%)

Table 4-17
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Snowmelt)
April 21, 2003

Organism	Serial Dilution			
Ceriodaphnia dubia	Survival	Survival	Reproduction	Reproduction
Site	NOEC	IC25	NOEC	IC25
RR-6	100%	>100%	100%	>100%
RR-8	100%	>100%	100%	>100%
RR-12	100%	>100%	100%	>100%
RR-15	100%	>100%	* 75%	* 83.10%
LR-16	100%	>100%	* 75%	* 89.20%
* Significant effects ($p < 0.05$)				

NOEC - No observed effect concentration
IC25 - Inhibition concentration (25%)

Table 4-18
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Storm)
July 28, 2003

Organism	**Serial Dilution**
Ceriodaphnia dubia	**Reproduction**
Site	**IC25**
RR-6	* 51.40%
RR-12	>100%
LR-16	>100%
* Significant effects (p < 0.05)	

IC25 - Inhibition concentration (25%)

Table 4-19
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Storm)
August 14, 2003

Organism *Ceriodaphnia dubia* **Site**	**Serial Dilution LC50**
RR-6	>100%
RR-8	>100%
RR-12	>100%
RR-15	>100%
LR-16	>100%

LC50 - Lethal concentration (50%)

Table 4-20
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Storm)
Spetember 5, 2003

Organism	Serial Dilution
Ceriodaphnia dubia	LC50
Site	
RR-6	>100%
RR-8	>100%
RR-12	>100%

LC50 - Lethal concentration (50%)

Table 4-21
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Storm)
September 6, 2003

Organism	**Serial Dilution**
Ceriodaphnia dubia	**LC50**
Site	
RR-6	* 62.40%
RR-8	* 36.30%
RR-12	>100%
RR-15	>100%
LR-16	>100%
* Significant effects ($p < 0.05$)	

LC50 - Lethal concentration (50%)

Table 4-22
Aquatic Biota
RI/FS Sites - Surface Water Bioassay (Storm)
September 11, 2003

Organism	Serial Dilution
Ceriodaphnia dubia	LC50
Site	
RR-6	>100%

LC50 - Lethal concentration (50%)

Tables 4-23 - 4-25
RI/FS Sediment Bioassay Summaries

Table 4-23
Aquatic Biota
RI/FS Sites - Sediment Bioassay
October 4, 2002

Organism *Chironomus tentans*	**100% Effluent**	
Site	**% Survival**	**AFDW (g)**
Control	78.8	2.107
LR-1	72.5	1.952
RR-4	76.3	1.773
RR-5	* 52.5	2.414
RR-6	95.0	2.789
RR-7	* 52.5	4.371
RR-8	91.3	3.301
RR-11A1	95.0	3.671
RR-12	93.8	2.735
RR-15	95.0	2.576
RR-20	82.5	4.857

Organism *Hyalella azteca*	**100% Effluent**	
Site	**% Survival**	**AFDW (g)**
Control	88.8	0.050
LR-1	91.3	0.065
RR-4	93.8	0.063
RR-5	96.3	0.062
RR-6	96.3	0.058
RR-7	92.5	0.087
RR-8	96.3	0.072
RR-11A1	92.5	0.073
RR-12	96.3	0.071
RR-15	91.3	0.041
RR-20	91.3	0.052

* Significant effects ($p < 0.05$)

AFDW - Ash free dry weight

Table 4-24
Aquatic Biota
RI/FS Sites - Sediment Bioassay
October 18, 2002

Organism *Chironomus tentans*	**100% Effluent**	
Site	**% Survival**	**AFDW (g)**
Control	86.3	2.469
LR-8A	85.0	2.107
LR-16	71.3	0.753
UFL	82.5	3.209
ERL	86.3	1.987
Cabresto	87.5	5.718
Zwergle	98.8	3.312
SW12-9	61.3	2.366
SW12-10	92.5	1.187
Organism *Hyalella azteca*	**100% Effluent**	
Site	**% Survival**	**AFDW (g)**
Control	97.5	0.039
LR-8A	88.8	0.029
LR-16	* 71.3	0.073
UFL	92.5	0.048
ERL	90.0	0.041
Cabresto	* 82.5	0.051
Zwergle	* 77.5	0.097
SW12-9	87.5	0.025
SW12-10	* 75.0	0.045
* Significant effects ($p < 0.05$)		

AFDW - Ash free dry weight

Table 4-25
Aquatic Biota
RI/FS Sites - Sediment Bioassay
October 14, 2003

Organism *Chironomus tentans*	**100% Effluent**	
Site	**% Survival**	**AFDW (g)**
Control	77.1	1.487
LR-1	68.8	1.523
LR-8A	72.5	1.479
LR-16	72.5	1.468
RR-5BB	76.3	* 1.375
RR-15	76.3	1.450
Zwergle	60.0	1.502
Organism *Hyalella azteca*	**100% Effluent**	
Site	**% Survival**	**AFDW (g)**
Control	93.8	0.125
LR-1	100.0	0.143
LR-8A	95.0	0.162
LR-16	97.5	0.144
RR-5BB	100.0	0.151
RR-15	100.0	0.145
Zwergle	91.3	0.170
* Significant effects ($p < 0.05$)		

AFDW - Ash free dry weight

Tables 4-26 - 4-27
RI/FS Habitat Evaluation Summaries

Table 4-26
Aquatic Biota
RI/FS Sites - Habitat Evaluation Summary
Fall 2002

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Cabresto Creek	11	0.7	1.1	0.5	2.5
Zwergle - Upstream of Town	10	0.8	1.2	0.8	2.8
RR-4 - Junebug CG	7	0.7	1.4	0.5	1.7
RR-5 - DS of Elephant Rock CG	7	0.7	1.3	0.5	2
RR-6 - DS of Hansen Cr.	8	0.5	1.1	0.2	1
RR-7 - DS of Boundary, US of Mill	8	0.6	1.1	0.7	1.3
RR-8 - DS of Mill, US of Columbine	8	0.8	1.3	0.3	1.9
RR-11A1 - DS of Cabin Springs	12	0.9	1.4	0.6	2
RR-12 - Goathill CG	9	1	1.7	0.8	2.8
RR-15 - US of Questa Ranger Sta.	8	0.8	1.5	0.5	2.4
RR-20 - US of Highway 522	2	0.8	1.4	0.4	2.5
LR-1 - DS of Highway 522	4	0.8	1.4	0.4	3.3
LR-8A - DS of Outfall 002	7	1.1	1.7	0.6	2.6
LR-16 - US of Hatchery	8	1.3	2.1	1.1	3.4

Table 4-27
Aquatic Biota
RI/FS Sites - Habitat Evaluation Summary
Fall 2003

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Cabresto Creek	11	0.6	1	0.4	2.7
Zwergle - Upstream of Town	11	0.7	1.2	0.8	2.8
RR-4 - Junebug CG	8	0.7	1.2	0.5	1.6
RR-5 - DS of Elephant Rock CG	8	0.8	1.4	0.5	1.9
RR-6 - DS of Hansen Cr.	7	0.8	1.2	0.5	1.7
RR-7 - DS of Boundary, US of Mill	8	0.9	1.3	0.9	1.8
RR-8 - DS of Mill, US of Columbine	8	0.9	1.4	0.5	1.9
RR-11A1 - DS of Cabin Springs	12	0.9	1.5	0.7	2
RR-12 - Goathill CG	9	0.9	1.7	0.9	3
RR-15 - US of Questa Ranger Sta.	8	0.7	1.3	0.5	2.4
RR-20 - US of Highway 522	5	0.5	1	0.4	2.4
LR-1 - DS of Highway 522	4	0.7	1.4	0.6	2.5
LR-8A - DS of Outfall 002	8	0.9	1.7	0.7	2.5
LR-16 - US of Hatchery	8	1.4	2.5	0.9	3.6

Table 4-28
Serial Dilution Study - RI Addendum

Table 4-28
Aquatic Biota
Serial Dilution Study - RI Addendum
September 23, 2004

Organism	Serial Dilution - Red River Water			
Oncorhynchus mykiss	Survival	Growth		
Site	IC50	NOEC	LOEC	IC25
Spring 13	7.5	5	10	5.9
Spring 39	28.9	20	50	22.6
Organism	**Serial Dilution - Reconstituted Water**			
Oncorhynchus mykiss	Survival	Growth		
Site	IC50	NOEC	LOEC	IC25
Spring 13	7.5	5	10	5.9
Spring 39	32.4	10	20	22.1

NOEC - No observed effect concentration
IC25 - Inhibition concentration (25%)
LC50 - Lethal concentration (50%)

Tables 4-29 - 4-37
Other Data - Fish Population Summaries

Key to fish species abbreviations:

BRK = Brook trout, *Salvelinus fontinalis*
BRN = Brown trout, *Salmo trutta*
CUT = Cutthroat trout, *Oncorhynchus clarki*
HYBRID = Cutthroat trout x rainbow trout hybrid
RBT = Rainbow trout, *Oncorhynchus mykiss*
WS = White sucker, *Catostomus commersoni*

Table 4-29
Aquatic Biota
Other Data - Fish Population Summary
Spring 1997

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Cabresto Cr.	CUT	2	82	56	5.5
	BRK	4	165	111	5.1
	RBT	3	124	83	28.4
	HYBRID	18	784	528	35.4
	Total	**27**	**1155**	**778**	**74.4**
Columbine Cr.	BRN	22	426	474	27.3
Upstream of Town of Red River	CUT	34	551	261	19.1
	BRK	19	291	138	5.9
	RBT	5	76	36	14.1
	BRN	5	199	94	8.4
	Total	**63**	**1117**	**529**	**47.5**
June Bug CG	BRK	2	33	15	0.4
	RBT	8	133	60	14.5
	BRN	23	433	194	5.7
	HYBRID	10	200	90	8.1
	Total	**43**	**799**	**359**	**28.7**
DS of Elephant Rock CG	RBT	1	19	7	2.9
	BRN	28	570	220	16.5
	Total	**29**	**589**	**227**	**19.4**
DS of Hansen Cr	BRN	3	34	13	2.4
US of Columbine	RBT	1	19	9	3.3
	BRN	6	116	55	9.7
	Total	**7**	**135**	**64**	**13**
Goathill CG	BRN	13	243	107	6.8
US of Questa RS	NO FISH	--	--	--	--
US of Hatchery Diversion	RBT	20	395	164	43.1
	BRN	50	934	388	21.3
	Total	**70**	**1329**	**552**	**64.4**

Table 4-30
Aquatic Biota
Other Data - Fish Population Summary
Fall 1997

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Cabresto Creek	CUT	1	31	20	2.6
	BRK	10	309	204	5.1
	RBT	18	556	367	135.5
	BRN	15	464	306	2.4
	HYBRID	57	1792	1183	82.9
	Total	**101**	**3152**	**2080**	**228.5**
Columbine Cr.	CUT	1	23	14	1.8
	BRN	20	460	282	21.4
	Total	**21**	**483**	**296**	**23.2**
Upstream of Town of Red River	CUT	2	34	16	3.6
	BRK	8	135	62	2.4
	RBT	4	68	31	32.4
	BRN	10	169	78	1.5
	HYBRID	10	169	78	14.7
	Total	**34**	**575**	**265**	**54.6**
June Bug Campground	BRK	1	18	8	1
	RBT	62	1153	507	202.4
	BRN	10	183	81	5.9
	HYBRID	1	18	8	0.9
	Total	**74**	**1372**	**604**	**210.2**
DS of Elephant Rock CG	BRK	3	59	25	5
	RBT	9	177	75	23.5
	BRN	45	926	390	73.1
	WS	1	20	8	0.6
	Total	**58**	**1182**	**498**	**102.2**
DS of Hansen Cr	RBT	7	116	42	16.9
	BRN	10	166	61	2.5
	Total	**17**	**282**	**103**	**19.4**
DS of mill, UP of Columbine	RBT	1	17	7	3.3
	BRN	19	331	130	27.4
	Total	**20**	**348**	**137**	**30.7**
Goathill CG	BRN	8	169	72	6.8
US of Questa Ranger Sta.	CUT	1	12	4	1.7
	RBT	1	12	4	1.9
	BRN	9	109	37	1.1
	Total	**11**	**133**	**45**	**4.7**

Table 4-30
Aquatic Biota
Other Data - Fish Population Summary
Fall 1997

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
US of Hatchery Diversion	RBT	28	490	189	52.6
	BRN	41	788	303	52.2
	Total	**69**	**1278**	**492**	**104.8**

Table 4-31
Aquatic Biota
Other Data - Fish Population Summary
Fall 1998

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Cabresto Creek	BRK	2	44	32	2.9
	RBT	12	263	193	75
	HYBRID	78	1,862	1,369	77.6
	Total	**92**	**2,169**	**1,594**	**155.5**
Columbine Creek	CUT	4	77	46	1.2
	BRN	22	480	290	37.3
	Total	**26**	**557**	**336**	**38.5**
Upstream of Town of Red River	CUT	3	52	25	0.5
	BRK	45	822	390	8.8
	RBT	3	52	25	18.3
	BRN	10	175	83	13.2
	HYBRID	19	332	158	7.4
	Total	**80**	**1,433**	**681**	**48.2**
June Bug Campground	RBT	29	515	229	59.5
	BRN	14	249	111	16.3
	Total	**43**	**764**	**340**	**75.8**
Downstream of Elephant Rock Campground, upstream of Hansen Creek	BRK	1	18	7	0.7
	RBT	1	18	7	2.4
	BRN	59	1,114	445	115.3
	Total	**61**	**1,150**	**459**	**118.4**
Downstream of Hansen Creek, upstream of mill	RBT	2	37	15	5.6
	BRN	14	259	104	12.8
	Total	**16**	**296**	**119**	**18.4**
Downstream of mill, upstream of Columbine Creek	RBT	1	17	6	1.7
	BRN	29	512	198	45.8
	Total	**30**	**529**	**204**	**47.5**
Goathill Campground	RBT	1	17	7	1.7
	BRN	17	287	116	20.9
	Total	**18**	**304**	**123**	**22.6**
Upstream of Questa Ranger Station	BRN	12	178	64	3.2
Upstream of hatchery diversion	RBT	29	433	160	51.4
	BRN	39	597	220	25.6
	Total	**68**	**1,030**	**380**	**77**

Table 4-32
Aquatic Biota
Other Data - Fish Population Summary
Fall 1999

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Cabresto Creek	BRK	9	162	106	4.2
	RBT	11	198	129	49.9
	BRN	2	36	24	2.8
	HYBRID	70	1,586	1,035	81.7
	Total	**92**	**1,982**	**1,294**	**138.6**
Columbine Creek	CUT	1	19	13	2.4
	BRN	35	706	500	55.8
	Total	**36**	**725**	**513**	**58.2**
Middle Fork	BRK	25	532	472	56.8
	RBT	7	149	132	44.3
	Total	**32**	**681**	**604**	**101.1**
Upstream of Town of Red River	BRK	23	326	139	16.4
	RBT	13	163	70	49.8
	BRN	6	75	32	9.1
	HYBRID	4	50	21	1.2
	Total	**46**	**614**	**262**	**76.5**
June Bug Campground	RBT	5	78	36	16.2
	BRN	16	296	137	23.7
	Total	**21**	**374**	**173**	**39.9**
Downstream of Elephant Rock Campground, upstream of Hansen Cr	BRK	2	36	16	0.1
	RBT	3	54	23	10.5
	BRN	39	796	344	85.2
	Total	**44**	**886**	**383**	**95.8**
Downstream of Hansen Creek, upstream of mill	RBT	1	16	7	3.7
	BRN	14	225	103	25.5
	Total	**15**	**241**	**110**	**29.2**
Downstream of mill, upstream of Columbine Creek	CUT	2	37	18	3.8
	RBT	2	37	18	15.2
	BRN	17	312	155	45.2
	Total	**21**	**386**	**191**	**64.2**
Goathill Campground	RBT	2	24	10	5.9
	BRN	30	378	153	27
	WHS	3	37	15	1.2
	Total	**35**	**439**	**178**	**34.1**

Table 4-32
Aquatic Biota
Other Data - Fish Population Summary
Fall 1999

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Upstream of Questa Ranger Station	RBT	1	12	5	2.6
	BRN	13	173	71	10.8
	WHS	3	37	15	0.6
	Total	**17**	**222**	**91**	**14**
Upstream of hatchery diversion	RBT	23	351	146	42.5
	BRN	27	443	185	26.3
	Total	**50**	**794**	**331**	**68.8**
Downstream of hatchery	RBT	10	138	47	12.2
	BRN	60	883	302	107.2
	Total	**70**	**1,021**	**349**	**119.4**

Table 4-33
Aquatic Biota
Other Data - Fish Population Summary
Fall 2000

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Cabresto Creek	BRK	17	315	254	7.8
	RBT	28	518	418	164.1
	BRN	5	93	75	3
	HYBRID	121	2,333	1,881	70.5
	Total	**171**	**3,259**	**2,628**	**245.4**
Columbine Creek	CUT	1	18	12	0.1
	BRN	114	2,241	1,512	63.3
	Total	**115**	**2,259**	**1,524**	**63.4**
Middle Fork	BRK	67	1,372	1,750	57.9
	RBT	2	39	50	12.2
	Total	**69**	**1,411**	**1,800**	**70.1**
Upstream of Town of Red River	BRK	109	1,562	748	26.4
	CUT	5	62	30	4.7
	RBT	41	512	246	141
	BRN	65	825	395	24.4
	HYBRID	61	762	365	4.8
	Total	**281**	**3,723**	**1,784**	**201.3**
June Bug Campground	BRK	1	16	8	1.4
	RBT	2	32	17	6.4
	BRN	30	484	250	29.2
	WHS	1	16	8	1.4
	Total	**34**	**548**	**283**	**38.4**
Downstream of Elephant Rock Campground, upstream of Hansen Creek	RBT	5	88	41	20
	BRN	51	895	418	95.9
	WHS	1	18	8	<0.1
	Total	**57**	**1,001**	**467**	**115.9**
Downstream of Hansen Creek, upstream of mill	RBT	1	15	9	3.6
Downstream of mill, upstream of Columbine Creek	BRN	18	353	202	68.6
Goathill Campground	BRN	50	675	287	36.1
Upstream of Questa Ranger Station	BRN	26	313	136	16.5

Table 4-33
Aquatic Biota
Other Data - Fish Population Summary
Fall 2000

Site	Species	# Collected	Density		Biomass
			#/Mile	#/Acre	Lbs/Acre
Upstream of hatchery diversion	RBT	33	556	246	87.3
	BRN	43	698	310	30.1
	HYBRID	1	16	7	0.2
	Total	**77**	**1,270**	**563**	**117.6**
Downstream of hatchery	RBT	13	242	75	18.4
	BRN	194	3,273	1,009	275.9
	Total	**207**	**3,515**	**1,084**	**294.3**

Table 4-34
Aquatic Biota
Other Data - Fish Population Summary
Fall 2001

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Cabresto Creek	BRK	11	222	164	6.9
	RBT	4	74	55	17.6
	BRN	16	296	219	10.2
	HYBRID	94	1,852	1,370	65.2
	Total	**125**	**2,444**	**1,808**	**99.9**
Columbine Creek	BRN	72	865	510	27.8
Middle Fork	BRK	36	706	667	53
	RBT	4	78	74	24.1
	Total	**40**	**784**	**741**	**77.1**
Upstream of Town of Red River	BRK	28	366	167	15.5
	CUT	4	49	22	4.3
	RBT	19	244	111	76.5
	BRN	21	293	133	22.1
	HYBRID	13	171	78	1.2
	Total	**85**	**1,123**	**511**	**119.6**
June Bug Campground	BRN	20	317	155	18.7
	WHS	1	16	8	1.7
	Total	**21**	**333**	**163**	**20.4**
Downstream of Elephant Rock Campground, upstream of Hansen Creek	RBT	1	18	7	5.7
	BRN	5	88	36	11.4
	Total	**6**	**106**	**43**	**17.1**
Downstream of Hansen Creek, upstream of mill	NO FISH				
Downstream of mill, upstream of Columbine Creek	NO FISH				
Goathill Campground	BRN	36	404	171	22.8
Upstream of Questa Ranger Station	BRN	14	179	71	16.2
Upstream of hatchery diversion	RBT	12	182	69	18.1
	BRN	27	409	155	26.6
	Total	**39**	**591**	**224**	**44.7**
Downstream of hatchery	RBT	14	203	61	29.3
	BRN	181	2,554	765	172.4
	Total	**195**	**2,757**	**826**	**201.7**

Table 4-35
Aquatic Biota
Other Data - Fish Population Summary
Fall 2002

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Columbine Creek	BRN	169	3,203	2,739	69.4
Middle Fork	BRK	157	3,176	3,857	68.9
	RBT	1	20	24	6
	Total	**158**	**3,196**	**3,881**	**74.9**
Downstream of Hatchery	BRN	214	3,329	1,089	282.3
	RBT	6	86	28	10.3
	Total	**220**	**3,415**	**1,117**	**292.6**

Table 4-36
Aquatic Biota
Other Data - Fish Population Summary
Fall 2003

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Columbine Creek	BRN	44	763	542	36.4
Middle Fork	BRK	43	843	860	51.2
	RBT	5	98	100	25
	Total	**48**	**941**	**960**	**76.2**
Downstream of Hatchery	BRN	181	2,771	970	166.6
	RBT	10	143	50	13.3
	Total	**191**	**2,914**	**1,020**	**179.9**

Table 4-37
Aquatic Biota
Other Data - Fish Population Summary
Fall 2004

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Cabresto Creek	BRK	1	16	12	2.0
	BRN	27	468	354	26.8
	HYBRID	72	1,387	1,049	62.4
	RBT	29	468	354	95.8
	Total	**129**	**2,339**	**1,769**	**187.0**
Columbine Creek	BRN	60	851	525	42.6
Upstream of Town	BRK	16	198	86	2.8
	BRN	42	523	228	40.5
	HYBRID	1	12	5	1.2
	RBT	62	721	315	139.7
	Total	**121**	**1,454**	**634**	**184.1**
June Bug	BRN	8	127	63	9.7
	RBT	23	365	183	52.9
	Total	**31**	**492**	**246**	**62.6**
Elephant Rock	BRN	12	214	111	15.0
	RBT	4	71	37	11.0
	Total	**16**	**285**	**148**	**26.0**
Downstream of Hansen	RBT	5	62	33	13.9
Upstream of Mill	RBT	9	117	66	25.9
Upstream of Columbine	NO FISH				
Downstream of Cabin Springs	BRN	14	165	101	20.8
	RBT	9	106	65	18.9
	Total	**23**	**271**	**166**	**39.7**
Goathill	BRN	7	93	40	1.8
	RBT	7	93	40	12.1
	Total	**14**	**186**	**80**	**13.9**
Questa Ranger Station	BRN	7	85	34	5.5
	RBT	4	49	20	5.0
	Total	**11**	**134**	**54**	**10.5**
Upstream of Highway 522	BRN	17	175	67	15.6
	RBT	21	216	82	24.8
	Total	**38**	**391**	**149**	**40.4**

Table 4-37
Aquatic Biota
Other Data - Fish Population Summary
Fall 2004

Site	Species	# Collected	Density		Biomass
			#/mile	#/acre	lbs/acre
Downstream of Highway 522	BRN	36	521	245	33.2
	RBT	15	211	99	27.2
	WS	1	14	7	0.6
	Total	**52**	**746**	**351**	**61.0**
Downstream of Outfall 002	BRN	78	1,150	520	74.6
	RBT	28	375	169	56.8
	Total	**106**	**1,525**	**689**	**131.4**
Upstream of Hatchery	BRN	126	2,015	762	47.7
	RBT	22	338	128	114.7
	Total	**148**	**2,353**	**890**	**162.4**
Downstream of Hatchery	BRN	190	3,104	1,005	141.8
	RBT	9	134	43	30.4
	Total	**199**	**3,238**	**1,048**	**172.2**

Tables 4-38 - 4-49
Other Benthic Invertebrate Population Summaries

Table 4-38
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 1997

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	3,450	36	21	58	3.84
Columbine Creek	748	32	17	53	3.68
Upstream of Town of Red River	1,550	22	9	41	3.30
June Bug Campground	528	23	11	48	3.38
Elephant Rock CG	3,170	21	10	48	2.85
DS of Hansen Creek	4232	24	12	50	2.63
DS of Mill, US of Columbine Cr.	1682	23	13	57	3.21
Goathill CG	1,150	20	10	50	2.84
Upstream of Questa RS	548	15	10	67	2.59
Upstream of Hatchery	1,606	21	9	43	2.68

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-39
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 1998

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	2,686	34	21	62	3.73
Columbine Creek	3,254	41	24	59	3.59
Upstream of Town of Red River	3,126	28	11	39	2.55
June Bug Campground	5,618	27	15	56	1.65
Elephant Rock CG	5,622	23	10	43	2.04
DS of Hansen Creek	2,114	22	9	41	1.89
DS of Mill, US of Columbine Cr.	1,306	22	11	50	3.11
Goathill Campground	1,946	16	9	56	2.43
Upstream of Questa RS	942	8	6	75	2.14
Upstream of Hatchery	5,156	20	10	50	2.30

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-40
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 1999

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	9,584	41	24	59	4.06
Columbine Creek	2,036	35	21	60	3.99
Middle Fork Red River	4,900	33	19	58	3.92
Upstream of Town of Red River	7,424	36	17	47	3.78
June Bug Campground	4,180	28	10	36	2.68
Elephant Rock CG	6,630	26	10	38	3.15
DS of Hansen Creek	3,824	35	16	46	2.65
DS of Mill, US of Columbine Cr.	2,740	30	13	43	3.36
Goathill Campground	2,732	27	12	44	2.78
Upstream of Questa RS	1,240	22	13	59	2.42
Upstream of Hatchery	5,536	29	14	48	2.60
Downstream of Hatchery	2,908	28	13	46	2.49

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-41
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Spring 2000

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	8,318	46	26	57	4.23
Columbine Creek	2,520	52	34	65	4.42
Middle Fork Red River	8,862	42	25	60	3.46
Upstream of Town of Red River (	9,316	43	22	51	3.78
June Bug Campground	1,072	30	15	50	3.38
Elephant Rock CG	4,640	27	12	44	2.68
DS of Hansen Creek	3,456	29	17	59	2.72
DS of Mill, US of Columbine Cr.	1,422	31	18	58	3.43
Goathill Campground	616	21	14	67	2.70
Upstream of Questa RS	202	24	11	46	3.33
Upstream of Hatchery	4,588	27	13	48	2.85
Downstream of Hatchery	3,176	29	13	45	3.00

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-42
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 2000

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	7,700	47	26	55	4.22
Columbine Creek	5,414	45	24	53	3.72
Middle Fork Red River	9,124	44	20	45	4.25
Upstream of Town of Red River	10,156	53	26	49	4.39
June Bug Campground	1,874	34	14	41	2.90
Elephant Rock CG	4,140	35	12	34	3.08
DS of Hansen Creek	3,112	23	8	35	2.89
DS of Mill, US of Columbine Cr.	5,240	33	16	48	2.82
Goathill Campground	3,204	32	14	44	3.21
Upstream of Questa RS	770	18	8	44	2.70
Upstream of Hatchery	28,396	34	14	41	2.46
Downstream of Hatchery	27,208	27	9	33	3.11

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-43
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Spring 2001

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	10,193	60	30	50	4.43
Columbine Creek	6,761	54	31	57	4.31
Middle Fork Red River	6,846	53	26	49	3.98
Upstream of Town of Red River	9,112	48	29	60	4.20
June Bug Campground	4,038	44	20	45	2.61
Elephant Rock CG	4,111	46	14	30	3.44
DS of Hansen Creek	2,133	38	14	37	2.60
DS of Mill, US of Columbine Cr.	1,829	29	14	48	2.84
Goathill Campground	2,280	44	17	39	3.52
Upstream of Questa RS	146	21	8	38	3.81
Upstream of Hatchery	8,270	43	17	40	3.48
Downstream of Hatchery	11,862	37	12	32	2.63

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-44
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 2001

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	7,478	54	28	52	4.16
Columbine Creek	1,385	47	23	49	4.40
Middle Fork Red River	3,794	52	23	44	4.41
Upstream of Town of Red River	9,373	46	19	41	3.75
June Bug Campground	1,423	37	16	43	3.50
Elephant Rock CG	1,880	30	11	37	3.18
DS of Hansen Creek	3,555	25	9	36	2.06
DS of Mill, US of Columbine Cr.	1,065	24	12	50	3.01
Goathill Campground	1,355	20	9	45	3.23
Upstream of Questa RS	1,605	16	8	50	2.91
Upstream of Hatchery	4,174	33	11	33	2.84
Downstream of Hatchery	8,553	36	10	28	2.69

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-45
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Spring 2002

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	2,071	50	28	56	4.23
Columbine Creek	1,453	35	24	69	3.48
Middle Fork	7,550	50	25	50	4.02
Upstream of Town of Red River	8,769	47	26	55	4.12
June Bug Campground	647	33	15	45	3.91
Elephant Rock CG	1,832	28	9	32	3.25
DS of Hansen Creek	2,162	21	8	38	2.17
DS of Mill, US of Columbine Cr.	797	20	10	50	2.92
Goathill Campground	503	25	10	40	3.05
Upstream of Questa RS	106	10	5	50	2.77
Downstream of Highway 522	5,527	31	15	48	2.48
Upstream of Hatchery	4,944	31	14	45	3.12
Downstream of Hatchery	7,699	28	12	43	2.86

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-46
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 2002

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	6,424	50	26	52	4.35
Columbine Creek	3,129	54	28	52	4.29
Middle Fork	9,386	50	29	58	4.11
Downstream of Hatchery	32,944	39	12	31	3.88

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-47
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Spring 2003

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	3,470	53	28	53	4.54
Columbine Creek	5,218	52	24	46	4.04
Middle Fork	20,515	60	25	42	3.74
Downstream of Hatchery	18,382	40	14	35	3.48

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-48
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Fall 2003

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	5,134	46	18	39	4.25
Columbine Creek	2,075	53	29	55	4.28
Middle Fork	6,168	63	32	51	4.85
Downstream of Hatchery	4,011	37	10	27	3.60

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-49
Aquatic Biota
Other Data - Benthic Invertebrate Population Summary
Spring 2004

Site	Density (#/m²)	Total # of Taxa	# of EPT Taxa	% EPT Taxa	Diversity Index (H')
Cabresto Creek	4,543	54	24	44	4.12
Columbine Creek	5,110	52	27	52	3.92
Upstream of Town of Red River	11,582	58	29	50	3.90
June Bug Campground	645	27	14	52	3.49
Elephant Rock CG	3,668	35	9	26	3.05
DS of Hansen Creek	2187	31	14	45	2.30
Upstream of Mill	2044	25	11	44	2.01
DS of Mill, US of Columbine Cr.	1239	27	13	48	2.88
Downstream of Cabin Springs	1,954	36	15	42	2.95
Goathill Campground	1,516	23	9	39	2.52
Upstream of Questa RS	114	19	10	53	3.50
Upstream of Highway 522	1,241	17	9	53	2.82
Downstream of Highway 522	1,655	22	11	50	3.21
Downstream of Outfall 002	11,065	39	12	31	2.90
Upstream of Hatchery	8,174	37	13	35	3.30
Downstream of Hatchery	3,932	39	13	33	3.01

EPT - Ephemeroptera, Plecoptera, Trichoptera

Table 4-50
Other Benthic Invertebrate Tissue Summary

Table 4-50
Aquatic Biota
Other Data - Benthic Invertebrate Tissue Summary
Spring 2002

Site	Al	Sb	As	Ba	Be	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Middle Fork	193	0.12	0.5	7.5	9	0.5	0.14	1.28	0.5	4.7	431	2	128	0.05	0.5	0.5	0.34	0.02	0.04	0.6	24
Upstream of Town	82	0.07	0.2	3.6	0.09	0.5	0.07	0.61	0.5	3.7	160	2	25.8	0.05	0.5	0.5	0.25	0.01	0.01	0.2	27
June Bug C.G.	481	0.05	0.5	15.2	0.1	0.5	1.68	0.64	2.3	53	1030	2	78.3	0.04	0.5	3.6	0.31	0.02	0.01	0.3	132
Elephant Rock C.G.	400	0.05	0.3	23.7	0.1	0.5	1.71	0.85	3.4	26.2	821	3	130	0.04	0.5	4.7	0.22	0.02	0.05	0.4	146
Downstream of Hansen	770	0.05	0.2	7.6	0.2	0.5	1.17	0.47	2.2	21.7	330	2	67.4	0.04	0.5	2.7	0.24	0.01	0.03	0.2	152
Upstream of Columbine	507	0.05	0.2	14.3	0.1	0.5	2.21	0.65	7.5	20.1	377	2	329	0.04	0.5	6.1	0.31	0.01	0.01	0.2	235
Goathill C.G.	700	0.05	0.3	9.8	0.2	0.5	1.27	0.66	1.1	18.5	435	2	53.2	0.05	0.5	3.5	0.19	0.01	0.01	0.2	118
Questa R.S.	1,950	0.05	0.1	9.9	0.6	0.8	0.51	0.47	1.2	38.4	1020	2	70.9	0.04	0.6	3.3	0.25	0.02	0.01	0.3	91
Downstream of Hwy 522	1,510	0.05	0.2	15.9	0.4	0.5	2.27	0.75	3.5	33.2	718	2	133	0.05	0.8	4.9	0.26	0.02	0.01	0.2	255
Upstream of Hatchery	790	0.05	0.5	14.8	0.2	0.5	1.62	0.75	6	17.5	675	2	370	0.05	3.9	7.1	0.27	0.02	0.01	1	137
Downstream of Hatchery	986	0.05	0.3	13.5	0.2	0.5	2.84	0.69	4.2	23.4	651	2	309	0.04	3.1	6.4	0.22	0.02	0.01	0.4	306

U = below detection level

Table 51
Other Surface Water Bioassay Summary

Table 4-51
Aquatic Biota
Other Data - Surface Water Bioassay
October 26, 2000

Organism	100% Effluent			Serial Dilution				
Ceriodaphnia dubia	% Survival	Mean Reproduction		Survival NOEC	Survival IC25	Reproduction NOEC	Reproduction IC25	LC50
Site								
Control	100	18.2		--	--	--	--	--
Upstream of Town	100	11.8		--	--	--	--	--
June Bug Campground	100	23.2		100	--	100	--	--
June Bug Campground (Control)	90	25.8		--	--	--	--	--
Downstream of Hansen	100	12.1		100	--	0	--	--
Downstream of Hansen (Control)	100	26.4		--	--	--	--	--
Goat Hill	90	11.7		100	--	0	--	--
Goat Hill (Control)	100	28.9		--	--	--	--	--
DS of Capulin Canyon	100	16.6		--	--	--	--	--
Downstream of Outfall 001	100	11.1		--	--	--	--	--
Organism	**100% Effluent**							
Pimephales promelas	% Affected							
Site								
June Bug Campground	27.5	--		--	--	--	--	--
June Bug Campground (Control)	10	--		--	--	--	--	--
Downstream of Hansen	5	--		--	--	--	--	--
Downstream of Hansen (Control)	10	--		--	--	--	--	--
Goat Hill	15	--		--	--	--	--	--
Goat Hill (Control)	7.5	--		--	--	--	--	--

NOEC - No observed effect concentration
IC25 - Inhibition concentration (25%)
LC50 - Lethal concentration (50%)

Table 52
Other Sediment Bioassay Summary

Table 4-52
Aquatic Biota
Other Data - Sediment Bioassay
October 26, 2000

Organism	100% Effluent			Serial Dilution				
Ceriodaphnia dubia	**% Survival**	**Mean Reproduction**		**Survival NOEC**	**Survival IC25**	**Reproduction NOEC**	**Reproduction IC25**	**LC50**
Site								
June Bug Campground	90	17.6		100	--	0	--	--
June Bug Campground (Control)	100	23.5		--	--	--	--	--
Downstream of Hansen	80	17.1		100	--	0	--	--
Downstream of Hansen (Control)	90	23.8		--	--	--	--	--
Goat Hill	100	7.5		100	--	0	--	--
Goat Hill (Control)	100	7.3		--	--	--	--	--
Organism	**100% Effluent**							
Pimephales promelas	**% Affected**							
Site								
June Bug Campground	55	--		--	--	--	--	--
June Bug Campground (Control)	7.5	--		--	--	--	--	--
Downstream of Hansen	17.5	--		--	--	--	--	--
Downstream of Hansen (Control)	10	--		--	--	--	--	--
Goat Hill	5	--		--	--	--	--	--
Goat Hill (Control)	22.5	--		--	--	--	--	--

Tables 4-53 - 4-57
Other Habitat Evaluation Summaries

Table 4-53
Aquatic Biota
Other Data - Habitat Evaluation Summary
Fall 1999

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Cabresto Creek	7	0.7	2.1	--	--
Columbine Creek	6	0.6	1.5	--	--
Middle Fork	11	0.6	1.2	--	--
Zwergle - Upstream of Town	10	0.7	2.2	--	--
RR-4 - Junebug CG	6	0.8	2.5	--	--
RR-5 - DS of Elephant Rock CG	6	0.9	2.6	--	--
RR-6 - DS of Hansen Cr.	4	1	1.6	--	--
RR-8 - DS of Mill, US of Columbine	5	1.1	1.8	--	--
RR-12 - Goathill CG	10	1.1	2.2	--	--
RR-15 - US of Questa Ranger Sta.	8	1	2.3	--	--
LR-16 - US of Hatchery	6	1.7	3.5	--	--
Downstream of Hatchery	7	1.5	3.6	--	--

Table 4-54
Aquatic Biota
Other Data - Habitat Evaluation Summary
Fall 2002

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Columbine Creek	9	0.5	1	0.5	1.9
Middle Fork	12	0.4	0.8	0.6	3.2
Downstream of Hatchery	8	1.2	2.3	1.6	3.4

Table 4-55
Aquatic Biota
Other Data - Habitat Evaluation Summary
Fall 2003

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Columbine Creek	12	0.4	0.8	0.4	2
Middle Fork	13	0.4	0.7	0.5	3
Downstream of Hatchery	10	1.1	2.2	1.1	3.5

Table 4-56
Aquatic Biota
Other Data - Habitat Evaluation Summary
Spring 2004

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Cabresto Creek	12	--	--	--	--
Columbine Creek	12	--	--	--	--
Zwergle - Upstream of Town	11	--	--	--	--
RR-4 - Junebug CG	8	--	--	--	--
RR-5 - DS of Elephant Rock CG	7	--	--	--	--
RR-6 - DS of Hansen Cr.	7	--	--	--	--
RR-7 - DS of Boundary, US of Mill	8	--	--	--	--
RR-8 - DS of Mill, US of Columbine	8	--	--	--	--
RR-11A1 - DS of Cabin Springs	12	--	--	--	--
RR-12 - Goathill CG	9	--	--	--	--
RR-15 - US of Questa Ranger Sta.	8	--	--	--	--
RR-20 - US of Highway 522	5	--	--	--	--
LR-1 - DS of Highway 522	4	--	--	--	--
LR-8A - DS of Outfall 002	8	--	--	--	--
LR-16 - US of Hatchery	8	--	--	--	--
Downstream of Hatchery	10	--	--	--	--

Table 4-57
Aquatic Biota
Other Data - Habitat Evaluation Summary
Fall 2004

Site	Habitat Units	Mean Depth (ft)	Mean Max Depth (ft)	Residual Pool Depth (ft)	Mean Habitat Quality Rating
Cabresto Creek	12	0.6	1.1	0.6	2.4
Columbine Creek	10	0.5	0.8	0.4	1.7
Zwergle - Upstream of Town	12	0.9	1.4	0.8	2.8
RR-4 - Junebug CG	8	0.8	1.4	0.8	2.3
RR-5 - DS of Elephant Rock CG	6	0.8	1.2	0.4	2
RR-6 - DS of Hansen Cr.	5	1	1.4	0.4	1.8
RR-7 - DS of Boundary, US of Mill	8	1	1.7	0.9	2.1
RR-8 - DS of Mill, US of Columbine	7	0.9	1.4	0.4	1.7
RR-11A1 - DS of Cabin Springs	12	1.1	1.4	0.7	2
RR-12 - Goathill CG	9	1.1	1.7	0.7	3
RR-15 - US of Questa Ranger Sta.	9	0.8	1.3	0.6	2.3
RR-20 - US of Highway 522	5	0.8	1.2	0.4	2.2
LR-1 - DS of Highway 522	4	0.8	1.2	0.6	2.6
LR-8A - DS of Outfall 002	8	1	1.5	0.7	2.6
LR-16 - US of Hatchery	8	1.5	2.5	1.4	3.6
Downstream of Hatchery	9	1.3	2.3	1	3.3

SECTION 4

AQUATIC BIOTA

NO FIGURES REQUIRED

APPENDIX A-4

AQUATIC BIOTA

VALIDATED ANALYTICAL RESULTS

APPENDIX A-4a
FISH POPULATIONS
VALIDATED ANALYTICAL RESULTS

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BKT	193	76		1.06	74.1	102.5
1	BKT	165	44		0.98	46.0	95.6
1	BKT	132	20		0.87	23.3	85.7
1	BKT	78	4.8		1.01		
1	BKT	76	4.5		1.03		
1	BRN	203	74		0.88	91.2	81.2
1	BRN	200	80		1.00	87.2	91.7
1	BRN	183	58		0.95	67.0	86.5
1	BRN	152	30		0.85	38.7	77.5
1	BRN	147	31		0.98	35.0	88.5
1	BRN	145	27		0.89	33.6	80.2
1	BRN	143	29		0.99	32.3	89.8
1	BRN	141	30		1.07	31.0	96.9
1	BRN	139	24		0.89		
1	BRN	135	24		0.98		
1	BRN	135	23		0.93		
1	BRN	125	29		1.48		
1	BRN	66	2.9		1.01		
1	HYBRID	214	74		0.76		
1	HYBRID	201	70		0.86		
1	HYBRID	196	66		0.88		
1	HYBRID	195	66		0.89		
1	HYBRID	195	52		0.70		
1	HYBRID	191	60		0.86		
1	HYBRID	186	48		0.75		
1	HYBRID	183	50		0.82		
1	HYBRID	182	50		0.83		
1	HYBRID	177	48		0.87		
1	HYBRID	170	40		0.81		
1	HYBRID	168	45		0.95		
1	HYBRID	167	39		0.84		
1	HYBRID	165	40		0.89		
1	HYBRID	164	40		0.91		
1	HYBRID	164	34		0.77		
1	HYBRID	164	32		0.73		
1	HYBRID	162	36		0.85		
1	HYBRID	160	36		0.88		
1	HYBRID	159	38		0.95		
1	HYBRID	159	32		0.80		
1	HYBRID	158	34		0.86		
1	HYBRID	156	32		0.84		
1	HYBRID	154	31		0.85		
1	HYBRID	152	39		1.11		
1	HYBRID	152	34		0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	HYBRID	152	30		0.85		
1	HYBRID	151	33		0.96		
1	HYBRID	150	30		0.89		
1	HYBRID	150	30		0.89		
1	HYBRID	150	30		0.89		
1	HYBRID	147	32		1.01		
1	HYBRID	147	29		0.91		
1	HYBRID	147	27		0.85		
1	HYBRID	145	31		1.02		
1	HYBRID	144	30		1.00		
1	HYBRID	142	24		0.84		
1	HYBRID	141	26		0.93		
1	HYBRID	136	28		1.11		
1	HYBRID	127	19		0.93		
1	HYBRID	120	17		0.98		
1	HYBRID	119	16		0.95		
1	HYBRID	119	14		0.83		
1	HYBRID	118	18		1.10		
1	HYBRID	118	14		0.85		
1	HYBRID	117	13		0.81		
1	HYBRID	116	16		1.03		
1	HYBRID	115	14		0.92		
1	HYBRID	114	14		0.94		
1	HYBRID	113	14		0.97		
1	HYBRID	112	12		0.85		
1	HYBRID	111	13		0.95		
1	HYBRID	111	13		0.95		
1	HYBRID	111	12		0.88		
1	HYBRID	109	13		1.00		
1	HYBRID	109	12		0.93		
1	HYBRID	109	12		0.93		
1	HYBRID	107	13		1.06		
1	HYBRID	107	11		0.90		
1	HYBRID	107	10		0.82		
1	HYBRID	106	13		1.09		
1	HYBRID	106	11		0.92		
1	HYBRID	105	12		1.04		
1	HYBRID	103	10		0.92		
1	HYBRID	98	8.4		0.89		
1	HYBRID	90	7.1		0.97		
1	HYBRID	89	5.5		0.78		
1	HYBRID	84	5.7		0.96		
1	HYBRID	80	5.5		1.07		
1	HYBRID	78	5		1.05		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	HYBRID	75	4.7		1.11		
1	HYBRID	75	4.4		1.04		
1	HYBRID	66	2.5		0.87		
1	HYBRID	66	2.4		0.83		
1	HYBRID	64	2.5		0.95		
1	HYBRID	62	2.4		1.01		
1	HYBRID	61	2.5		1.10		
1	HYBRID	60	2.4		1.11		
1	HYBRID	60	2.3		1.06		
1	HYBRID	59	1.8		0.88		
1	HYBRID	59	1.7		0.83		
1	HYBRID	58	2.3		1.18		
1	HYBRID	58	2		1.03		
1	HYBRID	58	1.9		0.97		
1	HYBRID	56	1.8		1.02		
1	HYBRID	56	1.7		0.97		
1	HYBRID	56	1.6		0.91		
1	HYBRID	54	1.8		1.14		
1	HYBRID	54	1.7		1.08		
1	HYBRID	54	1.6		1.02		
1	HYBRID	53	1.7		1.14		
1	HYBRID	53	1.5		1.01		
1	HYBRID	53	1.4		0.94		
1	HYBRID	50	1.3		1.04		
1	HYBRID	50	1.3		1.04		
1	HYBRID	50	1.2		0.96		
1	HYBRID	50	1		0.80		
1	HYBRID	49	1.4		1.19		
1	HYBRID	48	1		0.90		
1	HYBRID	47	1.1		1.06		
1	HYBRID	40	0.7		1.09		
1	RBT	318	370		1.15	350.2	105.6
1	RBT	312	290		0.95	330.6	87.7
1	RBT	305	290		1.02	308.7	93.9
1	RBT	303	340		1.22	302.6	112.4
1	RBT	302	350		1.27	299.6	116.8
1	RBT	299	300		1.12	290.7	103.2
1	RBT	295	290		1.13	279.1	103.9
1	RBT	295	290		1.13	279.1	103.9
1	RBT	288	260		1.09	259.5	100.2
1	RBT	287	276		1.17	256.8	107.5
1	RBT	269	270		1.39	211.1	127.9
1	RBT	266	210		1.12	204.1	102.9
1	RBT	265	128		0.69	201.8	63.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	RBT	262	222		1.23	195.0	113.9
1	RBT	254	174		1.06	177.5	98.0
1	RBT	253	188		1.16	175.4	107.2
1	RBT	253	178		1.10	175.4	101.5
1	RBT	246	150		1.01	161.1	93.1
1	RBT	242	150		1.06	153.3	97.8
1	RBT	241	154		1.10	151.4	101.7
1	RBT	231	140		1.14	133.2	105.1
1	RBT	230	148		1.22	131.5	112.6
1	RBT	222	104		0.95	118.1	88.0
2	BKT	163	39		0.90	44.3	88.0
2	BKT	67	2.5		0.83		
2	BRN	132	23		1.00		
2	HYBRID	167	42		0.90		
2	HYBRID	155	37		0.99		
2	HYBRID	150	32		0.95		
2	HYBRID	116	14		0.90		
2	HYBRID	110	13		0.98		
2	HYBRID	103	13		1.19		
2	HYBRID	95	7.5		0.87		
2	HYBRID	93	6.6		0.82		
2	HYBRID	92	7		0.90		
2	HYBRID	65	2.9		1.06		
2	HYBRID	65	2.5		0.91		
2	HYBRID	63	2.7		1.08		
2	HYBRID	61	2.8		1.23		
2	HYBRID	58	2.1		1.08		
2	HYBRID	57	1.7		0.92		
2	HYBRID	57	1.7		0.92		
2	HYBRID	56	2.6		1.48		
2	HYBRID	56	1.8		1.02		
2	HYBRID	56	1.7		0.97		
2	HYBRID	55	1.4		0.84		
2	HYBRID	54	1.7		1.08		
2	HYBRID	53	1.3		0.87		
2	HYBRID	52	1.4		1.00		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 10/2/2002

BKT

	LENGTH	WEIGHT	K	Wr
N:	7	7	7	4
Min:	67	2.5	0.83	85.7
Max:	193	76	1.06	102.5
Mean:	124.9	27.3	0.95	93.0

BRN

	LENGTH	WEIGHT	K	Wr
N:	14	14	14	8
Min:	66	2.9	0.85	77.5
Max:	203	80	1.48	96.9
Mean:	146.1	34.6	0.99	86.5

HYBRID

	LENGTH	WEIGHT	K	Wr
N:	124	124	124	N/A
Min:	40	0.7	0.70	N/A
Max:	214	74	1.48	N/A
Mean:	107.8	17.6	0.95	N/A

RBT

	LENGTH	WEIGHT	K	Wr
N:	23	23	23	23
Min:	222	104	0.69	63.4
Max:	318	370	1.39	127.9
Mean:	271.2	229.2	1.11	102.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	5	2	7	± 2.3	0.081	86	± 28.4	5.18
BRN	13	1	14	± 0.6	0.081	173	± 7.4	13.20
HYBRID	101	23	130	± 8.0	0.081	1605	± 98.8	62.28
RBT	23	0	23	± 0.0	0.081	284	± 0.0	143.50

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	5	2	7	± 2.3	0.059	119	± 39.0	7.16
BRN	13	1	14	± 0.6	0.059	237	± 10.2	18.08
HYBRID	101	23	130	± 8.0	0.059	2203	± 135.6	85.48
RBT	23	0	23	± 0.0	0.059	390	± 0.0	197.06

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BKT	221	82		0.76	111.9	73.3
1	BKT	211	92		0.98	97.2	94.6
1	BKT	197	80		1.05	78.9	101.4
1	BKT	195	66		0.89	76.5	86.3
1	BKT	194	74		1.01	75.3	98.3
1	BKT	193	64		0.89	74.1	86.3
1	BKT	190	66		0.96	70.7	93.4
1	BKT	190	62		0.90	70.7	87.7
1	BKT	187	58		0.89	67.3	86.1
1	BKT	179	58		1.01	58.9	98.4
1	BKT	179	48		0.84	58.9	81.4
1	BKT	177	48		0.87	57.0	84.3
1	BKT	176	56		1.03	56.0	100.0
1	BKT	176	52		0.95	56.0	92.9
1	BKT	174	46		0.87	54.1	85.1
1	BKT	172	47		0.92	52.2	90.0
1	BKT	169	38		0.79	49.5	76.8
1	BKT	167	43		0.92	47.7	90.1
1	BKT	164	38		0.86	45.2	84.1
1	BKT	153	30		0.84	36.6	82.1
1	BKT	130	22		1.00	22.3	98.8
1	BKT	119	19		1.13		
1	BKT	93	7.5		0.93		
1	BKT	91	6.4		0.85		
1	BKT	87	6		0.91		
1	BKT	84	5		0.84		
1	BKT	82	5.4		0.98		
1	BKT	81	5.4		1.02		
1	BKT	79	4.1		0.83		
1	BKT	74	4.2		1.04		
1	BKT	73	3.7		0.95		
1	BKT	71	3.2		0.89		
1	BKT	70	3.2		0.93		
1	BKT	69	3.8		1.16		
1	BRN	282	182		0.81	241.3	75.4
1	BRN	264	172		0.93	198.5	86.6
1	BRN	217	88		0.86	111.1	79.2
1	BRN	210	82		0.89	100.8	81.4
1	BRN	201	78		0.96	88.5	88.1
1	BRN	200	68		0.85	87.2	78.0
1	BRN	198	62		0.80	84.7	73.2
1	BRN	197	68		0.89	83.4	81.5
1	BRN	190	60		0.87	74.9	80.1
1	BRN	190	58		0.85	74.9	77.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	188	60		0.90	72.6	82.6
1	BRN	185	52		0.82	69.2	75.1
1	BRN	182	52		0.86	66.0	78.8
1	BRN	181	54		0.91	64.9	83.2
1	BRN	180	52		0.89	63.8	81.4
1	BRN	179	50		0.87	62.8	79.6
1	BRN	178	50		0.89	61.8	81.0
1	BRN	174	42		0.80	57.7	72.7
1	BRN	170	40		0.81	53.9	74.2
1	BRN	130	19		0.86		
1	BRN	130	18		0.82		
1	BRN	123	17		0.91		
1	BRN	123	17		0.91		
1	BRN	105	10		0.86		
1	BRN	82	5.2		0.94		
1	BRN	82	4.4		0.80		
1	BRN	79	4.7		0.95		
1	BRN	77	5.4		1.18		
1	BRN	75	4.2		1.00		
1	BRN	74	4.1		1.01		
1	BRN	73	4.3		1.11		
1	BRN	72	4.1		1.10		
1	BRN	71	3.7		1.03		
1	BRN	71	3.5		0.98		
1	BRN	65	3		1.09		
1	CUT	212	88		0.92	104.8	84.0
1	CUT	205	78		0.91	94.4	82.6
1	CUT	175	44		0.82	57.8	76.1
1	HYBRID	211	84		0.89		
1	HYBRID	187	68		1.04		
1	HYBRID	187	62		0.95		
1	HYBRID	146	31		1.00		
1	HYBRID	135	25		1.02		
1	HYBRID	133	22		0.94		
1	HYBRID	122	14		0.77		
1	HYBRID	111	13		0.95		
1	HYBRID	77	5.5		1.20		
1	HYBRID	76	4.5		1.03		
1	HYBRID	75	4.6		1.09		
1	HYBRID	74	4.5		1.11		
1	HYBRID	73	4		1.03		
1	HYBRID	71	4.4		1.23		
1	HYBRID	71	4.2		1.17		
1	HYBRID	71	3.8		1.06		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	HYBRID	70	4		1.17		
1	HYBRID	69	4.2		1.28		
1	HYBRID	69	3.8		1.16		
1	HYBRID	69	3.5		1.07		
1	HYBRID	69	3.2		0.97		
1	HYBRID	69	3.1		0.94		
1	HYBRID	68	3.6		1.14		
1	HYBRID	68	3.3		1.05		
1	HYBRID	68	3.1		0.99		
1	HYBRID	67	3.7		1.23		
1	HYBRID	67	3.5		1.16		
1	HYBRID	67	3.4		1.13		
1	HYBRID	67	3.1		1.03		
1	HYBRID	67	3.1		1.03		
1	HYBRID	67	2.9		0.96		
1	HYBRID	67	2.6		0.86		
1	HYBRID	66	3.2		1.11		
1	HYBRID	65	2.9		1.06		
1	HYBRID	65	2.8		1.02		
1	HYBRID	65	2.7		0.98		
1	HYBRID	65	2.6		0.95		
1	HYBRID	64	3.1		1.18		
1	HYBRID	64	2.7		1.03		
1	HYBRID	63	2.9		1.16		
1	HYBRID	63	2.6		1.04		
1	HYBRID	63	2.6		1.04		
1	HYBRID	63	2.3		0.92		
1	HYBRID	62	2.5		1.05		
1	HYBRID	62	2.3		0.97		
1	HYBRID	60	2.4		1.11		
1	HYBRID	60	2.1		0.97		
1	HYBRID	59	2		0.97		
1	HYBRID	59	1.9		0.93		
1	HYBRID	58	2		1.03		
1	HYBRID	57	2.2		1.19		
1	HYBRID	57	2		1.08		
1	HYBRID	57	1.8		0.97		
1	HYBRID	57	1.6		0.86		
1	HYBRID	56	1.9		1.08		
1	HYBRID	56	1.8		1.02		
1	HYBRID	56	1.5		0.85		
1	HYBRID	53	1.6		1.07		
1	HYBRID	53	1.5		1.01		
1	HYBRID	52	1.4		1.00		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	HYBRID	43	0.8		1.01		
1	RBT	435	970		1.18	903.2	107.4
1	RBT	430	940		1.18	872.2	107.8
1	RBT	380	650		1.18	600.2	108.3
1	RBT	310	330		1.11	324.2	101.8
1	RBT	306	240		0.84	311.8	77.0
1	RBT	287	220		0.93	256.8	85.7
1	RBT	280	216		0.98	238.3	90.6
1	RBT	277	218		1.03	230.7	94.5
1	RBT	277	212		1.00	230.7	91.9
1	RBT	271	188		0.94	215.9	87.1
1	RBT	265	188		1.01	201.8	93.2
1	RBT	261	172		0.97	192.7	89.2
1	RBT	246	168		1.13	161.1	104.3
1	RBT	225	114		1.00	123.0	92.7
2	BKT	163	41		0.95	44.3	92.5
2	BKT	152	33		0.94	35.8	92.1
2	BKT	151	37		1.07	35.1	105.3
2	BKT	78	4.6		0.97		
2	BKT	66	2.5		0.87		
2	BKT	60	1.9		0.88		
2	BRN	194	69		0.95	79.7	86.6
2	BRN	184	54		0.87	68.1	79.3
2	BRN	170	47		0.96	53.9	87.2
2	BRN	165	46		1.02	49.3	93.2
2	BRN	124	17		0.89		
2	BRN	82	5.1		0.92		
2	BRN	79	4.7		0.95		
2	BRN	78	4.4		0.93		
2	BRN	76	4.3		0.98		
2	BRN	74	4.1		1.01		
2	BRN	70	3.2		0.93		
2	HYBRID	137	25		0.97		
2	HYBRID	119	14		0.83		
2	HYBRID	89	6.4		0.91		
2	HYBRID	70	3.6		1.05		
2	HYBRID	68	3.2		1.02		
2	HYBRID	67	3.1		1.03		
2	HYBRID	66	3.2		1.11		
2	HYBRID	66	3.1		1.08		
2	HYBRID	65	3.5		1.27		
2	HYBRID	65	3.3		1.20		
2	HYBRID	65	2.8		1.02		
2	HYBRID	64	2.7		1.03		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
2	HYBRID	62	2.8		1.17		
2	HYBRID	61	2.4		1.06		
2	HYBRID	60	2.6		1.20		
2	HYBRID	60	2.6		1.20		
2	HYBRID	60	2.4		1.11		
2	HYBRID	60	2.4		1.11		
2	HYBRID	59	1.9		0.93		
2	HYBRID	59	1.8		0.88		
2	HYBRID	58	2.5		1.28		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

BKT

	LENGTH	WEIGHT	K	Wr
N:	40	40	40	24
Min:	60	1.9	0.76	73.3
Max:	221	92	1.16	105.3
Mean:	138.4	34.2	0.93	90.1

BRN

	LENGTH	WEIGHT	K	Wr
N:	46	46	46	23
Min:	65	3	0.80	72.7
Max:	282	182	1.18	93.2
Mean:	141.2	38.2	0.92	80.7

CUT

	LENGTH	WEIGHT	K	Wr
N:	3	3	3	3
Min:	175	44	0.82	76.1
Max:	212	88	0.92	84.0
Mean:	197.3	70.0	0.88	80.9

HYBRID

	LENGTH	WEIGHT	K	Wr
N:	82	82	82	N/A
Min:	43	0.8	0.77	N/A
Max:	211	84	1.28	N/A
Mean:	74.5	6.9	1.05	N/A

RBT

	LENGTH	WEIGHT	K	Wr
N:	14	14	14	14
Min:	225	114	0.84	77.0
Max:	435	970	1.18	108.3
Mean:	303.6	344.7	1.03	95.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	34	6	40	± 2.2	0.155	258	± 14.2	19.45
BRN	35	11	49	± 6.9	0.155	316	± 44.5	26.61
CUT	3	0	3	± 0.0	0.155	19	± 0.0	2.93
HYBRID	61	21	91	± 12.6	0.155	587	± 81.3	8.93
RBT	14	0	14	± 0.0	0.155	90	± 0.0	68.39

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2002

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	34	6	40	+ 2.20	0.077	519	± 28.6	39.13
BRN	35	11	49	+ 6.90	0.077	636	± 89.6	53.56
CUT	3	0	3	+ 0.0	0.077	39	± 0.0	6.02
HYBRID	61	21	91	+ 12.60	0.077	1182	± 163.6	17.98
RBT	14	0	14	+ 0.0	0.077	182	± 0.0	138.31

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results
Aquatic Biota - Fish Populations

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	93	7		0.87		
1	BRN	80	4.6		0.90		
1	BRN	77	4.7		1.03		
1	BRN	74	4.1		1.01		
1	BRN	54	1.5		0.95		
1	RBT	221	108		1.00	116.5	92.7
2	BRN	78	5.1		1.07		
2	BRN	76	4.5		1.03		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-4 - Junebug Campground - 10/2/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	7	7	7	N/A
Min:	54	1.5	0.87	N/A
Max:	93	7	1.07	N/A
Mean:	76.0	4.5	0.98	N/A

RBT

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	1
Min:	221	108	1.00	92.7
Max:	221	108	1.00	92.7
Mean:	221.0	108.0	1.00	92.7

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	5	2	7	± 2.3	0.117	60	± 19.7	0.60
RBT	1	0	1	± 0.0	0.117	9	± 0.0	2.14

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	5	2	7	± 2.3	0.060	117	± 38.3	1.16
RBT	1	0	1	± 0.0	0.060	17	± 0.0	4.05

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-5 - Downstream of Elephant Rock Campground, Upstream of Hansen Creek - 10/3/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	RBT	261	172		0.97	192.7	89.2
1	RBT	245	129		0.88	159.2	81.0
2	RBT	326	400		1.15	377.5	105.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-5 - Downstream of Elephant Rock Campground, Upstream of Hansen Creek - 10/3/2002

RBT

	LENGTH	WEIGHT	K	Wr
N:	3	3	3	3
Min:	245	129	0.88	81.0
Max:	326	400	1.15	105.9
Mean:	277.3	233.7	1.00	92.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
RBT	2	1	3	± 3.2	0.110	27	± 29.1	13.91

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
RBT	2	1	3	± 3.2	0.055	55	± 58.2	28.34

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-6 - Downstream of Hansen Creek, Upstream of Mill - 10/3/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-6 - Downstream of Hansen Creek, Upstream of Mill - 10/3/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-7 - Downstream of Mine Boundary, Upstream of Mill - 10/3/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	75	4.3		1.02		
1	RBT	302	320		1.16	299.6	106.8
2	NO FISH	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-7 - Downstream of Mine Boundary, Upstream of Mill - 10/3/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	N/A
Min:	75	4.3	1.02	N/A
Max:	75	4.3	1.02	N/A
Mean:	75.0	4.3	1.02	N/A

RBT

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	1
Min:	302	320	1.16	106.8
Max:	302	320	1.16	106.8
Mean:	302.0	320.0	1.16	106.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	1	0	1	± 0.0	0.138	7	± 0.0	0.07
RBT	1	0	1	± 0.0	0.138	7	± 0.0	4.94

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	1	0	1	± 0.0	0.076	13	± 0.0	0.12
RBT	1	0	1	± 0.0	0.076	13	± 0.0	9.17

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-8 - Downstream of Mill, Upstream of Columbine Creek - 10/3/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-8 - Downstream of Mill, Upstream of Columbine Creek - 10/3/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-11A1- Downstream of Cabin Springs and Columbine - 10/3/2002

Pass	Species	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	92	7.2		0.92		
1	BRN	65	3		1.09		
1	WS	90	6.8		0.93		
2	BRN	68	3.2		1.02		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-11A1- Downstream of Cabin Springs and Columbine - 10/3/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	3	3	3	N/A
Min:	65	3.2	0.92	N/A
Max:	92	7.2	1.09	N/A
Mean:	75.0	4.5	1.01	N/A

WS

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	N/A
Min:	90	6.8	0.93	N/A
Max:	90	6.8	0.93	N/A
Mean:	90.0	6.8	0.93	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	2	1	3	± 3.2	0.140	21	± 22.9	0.21
WS	1	0	1	± 0.0	0.140	7	± 0.0	0.10

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	2	1	3	± 3.2	0.083	36	± 38.6	0.36
WS	1	0	1	± 0.0	0.083	12	± 0.0	0.18

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-12 - Goathill Campground - 10/3/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	237	140		1.05	144.2	97.1
1	RBT	282	246		1.10	243.5	101.0
1	RBT	235	124		0.96	140.3	88.4
1	WS	84	6.7		1.13		
2	WS	109	12		0.93		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-12 - Goathill Campground - 10/3/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	1
Min:	237	140	1.05	97.1
Max:	237	140	1.05	97.1
Mean:	237.0	140.0	1.05	97.1

RBT

	LENGTH	WEIGHT	K	Wr
N:	2	2	2	2
Min:	235	124	0.96	88.4
Max:	282	246	1.10	101.0
Mean:	258.5	185.0	1.03	94.7

WS

	LENGTH	WEIGHT	K	Wr
N:	2	2	2	N/A
Min:	84	6.7	0.93	N/A
Max:	109	12	1.13	N/A
Mean:	96.5	9.4	1.03	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	1	0	1	± 0.0	0.165	6	± 0.0	1.85
RBT	2	0	2	± 0.0	0.165	12	± 0.0	4.89
WS	1	1	2	* --	0.165	12	--	0.25

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	1	0	1	± 0.0	0.073	14	± 0.0	4.32
RBT	2	0	2	± 0.0	0.073	27	± 0.0	11.01
WS	1	1	2	* --	0.073	27	--	0.56

*Sum of fish caught in 2 passes

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-15 - Upstream of Questa Ranger Station - 10/1/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	RBT	255	160		0.96	179.6	89.1
1	WS	84	6.1		1.03		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-15 - Upstream of Questa Ranger Station - 10/1/2002

RBT

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	1
Min:	255	160	0.96	89.1
Max:	255	160	0.96	89.1
Mean:	255.0	160.0	0.96	89.1

WS

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	N/A
Min:	84	6.1	1.03	N/A
Max:	84	6.1	1.03	N/A
Mean:	84.0	6.1	1.03	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
RBT	1	0	1	± 0.0	0.170	6	± 0.0	2.12
WS	1	0	1	± 0.0	0.170	6	± 0.0	0.08

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
RBT	1	0	1	± 0.0	0.079	13	± 0.0	4.59
WS	1	0	1	± 0.0	0.079	13	± 0.0	0.17

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-20 - Upstream of Highway 522 - 10/1/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	268	184		0.96	207.6	88.7
1	BRN	242	140		0.99	153.4	91.3
1	BRN	201	94		1.16	88.5	106.2
1	RBT	283	278		1.23	246.2	112.9
1	RBT	250	186		1.19	169.2	109.9
1	RBT	232	125		1.00	135.0	92.6
2	NO FISH	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-20 - Upstream of Highway 522 - 10/1/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	3	3	3	3
Min:	201	94	0.96	88.7
Max:	268	184	1.16	106.2
Mean:	237.0	139.3	1.03	95.4

RBT

	LENGTH	WEIGHT	K	Wr
N:	3	3	3	3
Min:	232	125	1.00	92.6
Max:	283	278	1.23	112.9
Mean:	255.0	196.3	1.14	105.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	3	0	3	± 0.0	0.218	14	± 0.0	4.30
RBT	3	0	3	± 0.0	0.218	14	± 0.0	6.06

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	3	0	3	± 0.0	0.088	34	± 0.0	10.44
RBT	3	0	3	± 0.0	0.088	34	± 0.0	14.71

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-1 - Downstream of Highway 522 and Questa WWTP - 10/1/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws		Wr
1	BRN	301	249	0.91	292.8		85.1
1	BRN	225	134	1.18	123.6		108.4
1	BRN	216	112	1.11	109.6		102.2
2	BRN	349	325	0.76	453.8		71.6
2	BRN	257	178	1.05	183.3		97.1
2	BRN	253	168	1.04	175.0		96.0
2	BRN	249	166	1.08	166.9		99.4
2	BRN	246	132	0.89	161.0		82.0
2	BRN	235	129	0.99	140.6		91.7
2	BRN	232	124	0.99	135.4		91.6
2	BRN	230	104	0.85	132.0		78.8
2	BRN	207	92	1.04	96.6		95.3
2	BRN	198	81	1.04	84.7		95.7
2	BRN	193	70	0.97	78.5		89.2
2	BRN	107	12	0.98			
2	RBT	242	124	0.87	153.3		80.9
3	BRN	250	167	1.07	168.9		98.9
4	NO FISH	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-1 - Downstream of Highway 522 and Questa WWTP - 10/1/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	16	16	16	15
Min:	107	12	0.76	71.6
Max:	349	325	1.18	108.4
Mean:	234.3	140.2	1.00	92.2

RBT

	LENGTH	WEIGHT	K	Wr
N:	1	1	1	1
Min:	242	124	0.87	80.9
Max:	242	124	0.87	80.9
Mean:	242.0	124.0	0.87	80.9

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	3	12	1	0	17	± 4.1	0.159	107	± 25.8	33.07
RBT	0	1	0	0	1	± 0.0	0.159	6	± 0.0	1.64

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	3	12	1	0	17	± 4.1	0.069	246	± 59.4	76.03
RBT	0	1	0	0	1	± 0.0	0.069	14	± 0.0	3.83

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-8A - Downstream of NPDES Outfall 002 - 9/30/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	304	281	1.00	301.5	93.2
1	BRN	285	228	0.98	249.0	91.6
1	BRN	282	205	0.91	241.3	84.9
1	BRN	280	216	0.98	236.3	91.4
1	BRN	270	194	0.99	212.2	91.4
1	BRN	261	176	0.99	191.9	91.7
1	BRN	258	167	0.97	185.4	90.1
1	BRN	258	163	0.95	185.4	87.9
1	BRN	257	172	1.01	183.3	93.8
1	BRN	251	155	0.98	170.9	90.7
1	BRN	250	153	0.98	168.9	90.6
1	BRN	248	160	1.05	165.0	97.0
1	BRN	248	148	0.97	165.0	89.7
1	BRN	248	147	0.96	165.0	89.1
1	BRN	247	124	0.82	163.0	76.1
1	BRN	244	132	0.91	157.2	84.0
1	BRN	224	121	1.08	122.0	99.2
1	BRN	212	89	0.93	103.7	85.9
1	BRN	212	86	0.90	103.7	83.0
1	BRN	206	101	1.16	95.2	106.1
1	BRN	177	48	0.87	60.7	79.0
1	BRN	168	44	0.93	52.0	84.5
1	BRN	118	17	1.03		
1	BRN	96	7.4	0.84		
1	RBT	297	238	0.91	284.8	83.6
1	RBT	248	130	0.85	165.1	78.7
1	RBT	242	135	0.95	153.3	88.0
1	RBT	228	115	0.97	128.1	89.8
2	BRN	292	232	0.93	267.6	86.7
2	BRN	272	197	0.98	216.9	90.8
2	RBT	271	215	1.08	215.9	99.6
2	RBT	232	132	1.06	135.0	97.8
3	NO FISH	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-8A - Downstream of NPDES Outfall 002 - 9/30/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	26	26	26	24
Min:	96	7.4	0.82	76.1
Max:	304	281	1.16	106.1
Mean:	237.2	144.7	0.97	89.5

RBT

	LENGTH	WEIGHT	K	Wr
N:	6	6	6	6
Min:	228	115	0.85	78.7
Max:	297	238	1.08	99.6
Mean:	253.0	160.8	0.97	89.6

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	24	2	0	26	± 0.2	0.183	142	± 1.1	45.30
RBT	4	2	0	6	± 1.0	0.183	33	± 5.5	11.70

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	24	2	0	26	± 0.2	0.086	302	± 2.3	96.34
RBT	4	2	0	6	± 1.0	0.086	70	± 11.6	24.81

Length measurement is in millimeters.
Weight measurement is in grams.

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Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/26/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	332	320		0.87	391.4	81.8
1	BRN	262	202		1.12	194.1	104.1
1	BRN	259	142		0.82	187.6	75.7
1	BRN	252	162		1.01	173.0	93.7
1	BRN	252	148		0.92	173.0	85.6
1	BRN	250	156		1.00	168.9	92.3
1	BRN	242	146		1.03	153.4	95.2
1	BRN	238	141		1.05	146.0	96.6
1	BRN	236	132		1.00	142.4	92.7
1	BRN	232	116		0.93	135.4	85.7
1	BRN	227	132		1.13	126.9	104.0
1	BRN	227	126		1.08	126.9	99.3
1	BRN	227	112		0.96	126.9	88.2
1	BRN	226	100		0.87	125.3	79.8
1	BRN	224	108		0.96	122.0	88.5
1	BRN	223	96		0.87	120.4	79.7
1	BRN	222	110		1.01	118.8	92.6
1	BRN	222	108		0.99	118.8	90.9
1	BRN	222	106		0.97	118.8	89.2
1	BRN	221	126		1.17	117.2	107.5
1	BRN	220	110		1.03	115.7	95.1
1	BRN	220	94		0.88	115.7	81.3
1	BRN	218	116		1.12	112.6	103.0
1	BRN	218	110		1.06	112.6	97.7
1	BRN	218	102		0.98	112.6	90.6
1	BRN	218	102		0.98	112.6	90.6
1	BRN	218	98		0.95	112.6	87.0
1	BRN	210	82		0.89	100.8	81.4
1	BRN	205	90		1.04	93.8	95.9
1	BRN	205	82		0.95	93.8	87.4
1	BRN	204	76		0.90	92.5	82.2
1	BRN	203	92		1.10	91.2	100.9
1	BRN	202	86		1.04	89.8	95.7
1	BRN	202	80		0.97	89.8	89.1
1	BRN	200	64		0.80	87.2	73.4
1	BRN	196	76		1.01	82.2	92.5
1	BRN	195	70		0.94	80.9	86.5
1	BRN	193	72		1.00	78.5	91.7
1	BRN	192	60		0.85	77.3	77.6
1	BRN	191	60		0.86	76.1	78.8
1	BRN	185	58		0.92	69.2	83.8
1	BRN	185	56		0.88	69.2	80.9
1	BRN	182	59		0.98	66.0	89.4
1	BRN	180	42		0.72	63.8	65.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/26/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	BRN	130	12		0.55		
1	BRN	128	24		1.14		
1	BRN	125	18		0.92		
1	BRN	121	18		1.02		
1	BRN	121	11		0.62		
1	BRN	120	18		1.04		
1	BRN	120	12		0.69		
1	BRN	119	17		1.01		
1	BRN	117	18		1.12		
1	BRN	116	20		1.28		
1	BRN	115	14		0.92		
1	BRN	115	12		0.79		
1	BRN	111	15		1.10		
1	BRN	110	15		1.13		
1	BRN	110	13		0.98		
1	BRN	108	13		1.03		
1	BRN	105	13		1.12		
1	BRN	105	9.2		0.79		
1	BRN	100	10		1.00		
1	BRN	99	10		1.03		
1	BRN	96	8.9		1.01		
1	BRN	94	8		0.96		
1	BRN	92	10		1.28		
1	BRN	90	7.8		1.07		
1	BRN	90	7.3		1.00		
1	BRN	81	6.2		1.17		
1	BRN	76	4.8		1.09		
1	BRN	75	5.2		1.23		
1	BRN	60	2.2		1.02		
1	RBT	310	310		1.04	324.2	95.6
1	RBT	307	340		1.18	314.9	108.0
1	RBT	305	290		1.02	308.7	93.9
1	RBT	293	276		1.10	273.4	100.9
1	RBT	291	310		1.26	267.8	115.8
1	RBT	286	280		1.20	254.1	110.2
1	RBT	286	240		1.03	254.1	94.4
1	RBT	283	246		1.09	246.2	99.9
1	RBT	283	242		1.07	246.2	98.3
1	RBT	282	216		0.96	243.5	88.7
1	RBT	278	200		0.93	233.2	85.8
1	RBT	276	214		1.02	228.2	93.8
1	RBT	274	214		1.04	223.2	95.9
1	RBT	271	199		1.00	215.9	92.2
1	RBT	269	194		1.00	211.1	91.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/26/2002

PASS	SPECIES	LENGTH	WEIGHT		K	Ws	Wr
1	RBT	262	204		1.13	195.0	104.6
1	RBT	262	202		1.12	195.0	103.6
1	RBT	260	184		1.05	190.5	96.6
1	RBT	258	178		1.04	186.1	95.6
1	RBT	257	142		0.84	183.9	77.2
1	RBT	251	156		0.99	171.2	91.1
1	RBT	250	152		0.97	169.2	89.8
1	RBT	248	146		0.96	165.1	88.4
1	RBT	247	142		0.94	163.1	87.1
1	RBT	239	140		1.03	147.7	94.8
1	RBT	238	118		0.88	145.8	80.9
1	RBT	233	132		1.04	136.7	96.5
1	RBT	228	110		0.93	128.1	85.9
1	RBT	221	110		1.02	116.5	94.4
1	RBT	220	94		0.88	114.9	81.8
1	RBT	219	110		1.05	113.4	97.0
1	RBT	217	130		1.27	110.3	117.9
1	RBT	205	78		0.91	92.8	84.0
1	RBT	200	93		1.16	86.2	107.9
2	BRN	306	260		0.91	307.4	84.6
2	BRN	241	140		1.00	151.5	92.4
2	BRN	220	110		1.03	115.7	95.1
2	BRN	216	100		0.99	109.6	91.3
2	BRN	192	60		0.85	77.3	77.6
2	BRN	187	60		0.92	71.5	83.9
2	BRN	185	50		0.79	69.2	72.2
2	BRN	140	30		1.09	30.3	98.9
2	BRN	127	20		0.98		
2	BRN	114	16		1.08		
2	BRN	113	15		1.04		
2	BRN	101	10		0.97		
2	BRN	100	10		1.00		
2	BRN	100	9.7		0.97		
2	BRN	99	10		1.03		
2	BRN	95	10		1.17		
2	BRN	92	10		1.28		
2	BRN	92	8.5		1.09		
2	BRN	89	10		1.42		
2	BRN	85	7		1.14		
2	BRN	85	6.5		1.06		
2	BRN	82	6.1		1.11		
2	BRN	81	6		1.13		
2	BRN	80	5.9		1.15		
2	RBT	245	110		0.75	159.2	69.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/26/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	97	97	97	52
Min:	60	2.2	0.55	65.8
Max:	332	320	1.42	107.5
Mean:	164.2	62.4	1.00	88.8

RBT

	LENGTH	WEIGHT	K	Wr
N:	35	35	35	35
Min:	200	78	0.75	69.1
Max:	310	340	1.27	117.9
Mean:	258.7	185.8	1.02	94.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	73	24	107	± 12.8	0.158	677	± 81.0	93.13
RBT	34	1	35	± 0.4	0.158	222	± 2.5	90.93

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	73	24	107	± 12.8	0.062	1726	± 206.5	237.44
RBT	34	1	35	± 0.4	0.062	565	± 6.5	231.43

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site UFL1 - Upper Fawn Lake - Minnow Traps - 9/26/2002

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
WS	136	23	0.91		
WS	104	10	0.89		
WS	103	11	1.01		
WS	98	9.7	1.03		
WS	98	9	0.96		
WS	98	9	0.96		
WS	97	9.2	1.01		
WS	97	8.8	0.96		
WS	95	9.6	1.12		
WS	95	9.3	1.08		
WS	94	9.9	1.19		
WS	94	7.8	0.94		
WS	94	7.7	0.93		
WS	93	7.9	0.98		
WS	93	7.6	0.94		
WS	93	6.8	0.85		
WS	92	8.3	1.07		
WS	91	7.8	1.04		
WS	91	7	0.93		
WS	91	6.7	0.89		
WS	90	7.1	0.97		
WS	89	8	1.13		
WS	89	7	0.99		
WS	88	7.8	1.14		
WS	88	7.5	1.10		
WS	88	6.6	0.97		
WS	87	7.5	1.14		
WS	87	7.2	1.09		
WS	87	7.2	1.09		
WS	87	6.2	0.94		
WS	87	5.6	0.85		
WS	85	6.8	1.11		
WS	85	6.7	1.09		
WS	85	6.2	1.01		
WS	84	5.5	0.93		
WS	84	4.8	0.81		
WS	83	6.2	1.08		
WS	83	6	1.05		
WS	82	5.8	1.05		
WS	82	5.6	1.02		
WS	80	5.2	1.02		
WS	80	5.2	1.02		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site UFL1 - Upper Fawn Lake - Minnow Traps - 9/26/2002

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
WS	79	5.3	1.07		
WS	79	4.8	0.97		
WS	79	4.8	0.97		
WS	78	5.4	1.14		
WS	78	5	1.05		
WS	78	4.9	1.03		
WS	77	4.7	1.03		
WS	77	4.6	1.01		
WS	77	4.1	0.90		
WS	76	5	1.14		
WS	76	3.8	0.87		
WS	75	4	0.95		
WS	74	4.4	1.09		
WS	74	4.2	1.04		
WS	74	3.8	0.94		
WS	74	3.3	0.81		
WS	73	3.9	1.00		
WS	73	3.7	0.95		
WS	72	3.9	1.04		
WS	72	3.8	1.02		
WS	72	3	0.80		
WS	70	3.4	0.99		
WS	69	3.3	1.00		
WS	68	3.5	1.11		
WS	68	3.4	1.08		
WS	68	3.2	1.02		
WS	68	3.2	1.02		
WS	68	2.8	0.89		
WS	68	2.1	0.67		
WS	68	2.1	0.67		
WS	66	2.5	0.87		
WS	65	3	1.09		
WS	57	1.9	1.03		

WS	LENGTH	WEIGHT	K	Wr
N:	75	75	75	N/A
Min:	57	1.9	0.67	N/A
Max:	136	23	1.19	N/A
Mean:	82.9	6.0	0.99	N/A

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site UFL1 - Upper Fawn Lake - Gill Net - 9/26/2002

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
BRN	343	420	1.04	431.1	97.4
BRN	275	204	0.98	224.0	91.1
RBT	448	950	1.06	987.3	96.2
RBT	441	1250	1.46	941.4	132.8
RBT	382	595	1.07	609.8	97.6
RBT	276	208	0.99	228.2	91.1
RBT	275	198	0.95	225.7	87.7
RBT	268	234	1.22	208.8	112.1
RBT	265	197	1.06	201.8	97.6
RBT	265	184	0.99	201.8	91.2
RBT	264	185	1.01	199.5	92.7
RBT	263	167	0.92	197.2	84.7
RBT	255	179	1.08	179.6	99.6
RBT	252	162	1.01	173.3	93.5
RBT	249	168	1.09	167.2	100.5
WS	366	605	1.23		
WS	362	610	1.29		
WS	285	226	0.98		
WS	282	244	1.09		
WS	271	223	1.12		
WS	268	223	1.16		
WS	268	202	1.05		
WS	267	185	0.97		
WS	263	210	1.15		
WS	197	78	1.02		
WS	186	66	1.03		
WS	184	59	0.95		
WS	183	61	1.00		
WS	182	59	0.98		
WS	177	54	0.97		
WS	177	52	0.94		
WS	174	54	1.03		
WS	174	51	0.97		
WS	171	57	1.14		
WS	168	49	1.03		
WS	168	46	0.97		
WS	167	56	1.20		
WS	163	42	0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site UFL1 - Upper Fawn Lake - Gill Net - 9/26/2002

BRN

	LENGTH	WEIGHT	K	Wr
N:	2	2	2	2
Min:	275	204	0.98	91.1
Max:	343	420	1.04	97.4
Mean:	309.0	312.0	1.01	94.3

RBT

	LENGTH	WEIGHT	K	Wr
N:	13	13	13	13
Min:	249	162	0.92	84.7
Max:	448	1250	1.46	132.8
Mean:	300.2	359.8	1.07	98.3

WS

	LENGTH	WEIGHT	K	Wr
N:	23	23	23	N/A
Min:	163	42	0.94	N/A
Max:	366	610	1.29	N/A
Mean:	221.9	152.7	1.05	N/A

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site ERL1 - Eagle Rock Lake - Minnow Traps - 9/26/2002

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
WS	158	36	0.91		

WS	LENGTH	WEIGHT	K	Wr
N:	1	1	1	N/A
Min:	158	36	0.91	N/A
Max:	158	36	0.91	N/A
Mean:	158	36	0.91	N/A

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site ERL1 - Eagle Rock Lake - Gill Net - 9/26/2002

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
RBT	347	500	1.20	456.0	109.7
RBT	340	440	1.12	428.7	102.6
RBT	337	450	1.18	417.4	107.8
RBT	335	470	1.25	410.0	114.6
RBT	335	470	1.25	410.0	114.6
RBT	334	470	1.26	406.3	115.7
RBT	333	410	1.11	402.6	101.8
RBT	325	410	1.19	374.1	109.6
RBT	324	440	1.29	370.6	118.7
RBT	320	380	1.16	356.9	106.5
RBT	318	360	1.12	350.2	102.8
RBT	317	380	1.19	346.9	109.5
RBT	314	350	1.13	337.1	103.8
RBT	310	320	1.07	324.2	98.7
RBT	307	340	1.18	314.9	108.0
RBT	307	320	1.11	314.9	101.6
RBT	307	310	1.07	314.9	98.5
RBT	305	370	1.30	308.7	119.9
RBT	305	340	1.20	308.7	110.1
RBT	305	320	1.13	308.7	103.7
RBT	305	310	1.09	308.7	100.4
RBT	304	320	1.14	305.6	104.7
RBT	304	310	1.10	305.6	101.4
RBT	303	300	1.08	302.6	99.1
RBT	302	315	1.14	299.6	105.1
RBT	302	310	1.13	299.6	103.5
RBT	300	320	1.19	293.6	109.0
RBT	300	300	1.11	293.6	102.2
RBT	298	280	1.06	287.8	97.3
RBT	297	300	1.15	284.8	105.3
RBT	297	298	1.14	284.8	104.6
RBT	297	290	1.11	284.8	101.8
RBT	297	290	1.11	284.8	101.8
RBT	295	296	1.15	279.1	106.1
RBT	293	300	1.19	273.4	109.7
RBT	292	290	1.16	270.6	107.2
RBT	292	272	1.09	270.6	100.5
RBT	292	270	1.08	270.6	99.8
RBT	292	260	1.04	270.6	96.1
RBT	291	260	1.06	267.8	97.1
RBT	290	310	1.27	265.0	117.0
RBT	288	282	1.18	259.5	108.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site ERL1 - Eagle Rock Lake - Gill Net - 9/26/2002

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
RBT	285	310	1.34	251.4	123.3
RBT	285	268	1.16	251.4	106.6
RBT	284	280	1.22	248.8	112.5
RBT	284	250	1.09	248.8	100.5
RBT	276	280	1.33	228.2	122.7
RBT	275	254	1.22	225.7	112.5
RBT	274	264	1.28	223.2	118.3
RBT	273	190	0.93	220.8	86.1
RBT	270	234	1.19	213.5	109.6
RBT	266	192	1.02	204.1	94.1
RBT	258	200	1.16	186.1	107.5
RBT	257	202	1.19	183.9	109.8
RBT	257	190	1.12	183.9	103.3
RBT	257	174	1.03	183.9	94.6
RBT	255	164	0.99	179.6	91.3
RBT	254	168	1.03	177.5	94.6
RBT	252	166	1.04	173.3	95.8
RBT	248	144	0.94	165.1	87.2
RBT	243	150	1.05	155.3	96.6
RBT	240	122	0.88	149.5	81.6
RBT	238	142	1.05	145.8	97.4
RBT	237	144	1.08	144.0	100.0
RBT	228	114	0.96	128.1	89.0
RBT	223	106	0.96	119.7	88.5
RBT	210	88	0.95	99.9	88.1
WS	303	290	1.04		
WS	255	168	1.01		
WS	250	154	0.99		
WS	248	140	0.92		
WS	242	132	0.93		
WS	238	130	0.96		
WS	234	126	0.98		
WS	233	132	1.04		
WS	226	120	1.04		
WS	225	118	1.04		
WS	225	118	1.04		
WS	224	116	1.03		
WS	214	116	1.18		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site ERL1 - Eagle Rock Lake - Gill Net - 9/26/2002

RBT

	LENGTH	WEIGHT	K	Wr
N:	67	67	67	67
Min:	210	88	0.88	81.6
Max:	347	500	1.34	123.3
Mean:	289.3	285.5	1.13	103.7

WS

	LENGTH	WEIGHT	K	Wr
N:	13	13	13	N/A
Min:	214	116	0.92	N/A
Max:	303	290	1.18	N/A
Mean:	239.8	143.1	1.02	N/A

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site SW12-9 - Tailings Pond, Northwest Corner - Minnow Traps - 9/26/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site SW12-9 - Tailings Pond, Northwest Corner - Gill Net - 9/26/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site SW12-10 - Tailings Pond, Southeast Corner - Minnow Traps - 9/26/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Site SW12-10 - Tailings Pond, Southeast Corner - Gill Net - 9/26/2002

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 9/26/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRK	1	170		50	1.02	50.4		99.2
BRK	1	134		20	0.83	24.4		81.9
BRN	1	236		126	0.96	142.4		88.5
BRN	1	224		118	1.05	122.0		96.7
BRN	1	188		68	1.02	72.6		93.6
BRN	1	177		52	0.94	60.7		85.6
BRN	1	77		4.4	0.96			
BRN	1	68		3	0.95			
BRN	1	65		3	1.09			
BRN	1	62		2.4	1.01			
BRN	1	60		2.2	1.02			
BRN	1	59		2.2	1.07			
BRN	1	54		1.3	0.83			
BRN	1	52		1.4	1.00			
HYB	1	219		94	0.89			
HYB	1	207		94	1.06			
HYB	1	199		66	0.84			
HYB	1	198		78	1.00			
HYB	1	194		72	0.99			
HYB	1	191		49	0.70			
HYB	1	188		62	0.93			
HYB	1	187		69	1.06			
HYB	1	185		69	1.09			
HYB	1	183		64	1.04			
HYB	1	180		64	1.10			
HYB	1	180		60	1.03			
HYB	1	177		59	1.06			
HYB	1	176		60	1.10			
HYB	1	176		54	0.99			
HYB	1	175		55	1.03			
HYB	1	174		58	1.10			
HYB	1	174		52	0.99			
HYB	1	172		47	0.92			
HYB	1	172		47	0.92			
HYB	1	167		51	1.10			
HYB	1	165		44	0.98			
HYB	1	163		47	1.09			
HYB	1	163		41	0.95			
HYB	1	162		45	1.06			
HYB	1	161		47	1.13			
HYB	1	161		35	0.84			
HYB	1	157		36	0.93			
HYB	1	153		32	0.89			
HYB	1	152		37	1.05			

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 9/26/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
HYB	1	150	35	1.04		
HYB	1	148	33	1.02		
HYB	1	144	38	1.27		
HYB	1	140	26	0.95		
HYB	1	140	25	0.91		
HYB	1	135	23	0.93		
HYB	1	133	22	0.94		
HYB	1	130	21	0.96		
HYB	1	128	18	0.86		
HYB	1	127	16	0.78		
HYB	1	117	14	0.87		
HYB	1	114	14	0.94		
HYB	1	112	13	0.93		
HYB	1	107	15	1.22		
HYB	1	104	11	0.98		
HYB	1	101	10	0.97		
HYB	1	100	9.5	0.95		
HYB	1	98	11	1.17		
HYB	1	76	4.1	0.93		
HYB	1	75	4.2	1.00		
HYB	1	72	3.3	0.88		
HYB	1	61	2.1	0.93		
HYB	1	61	2	0.88		
HYB	1	37	0.3	0.59		
RBT	1	273	180	0.88	220.8	81.5
RBT	1	270	190	0.97	213.5	89.0
RBT	1	269	184	0.95	211.1	87.1
RBT	1	262	168	0.93	195.0	86.2
RBT	1	259	168	0.97	188.3	89.2
RBT	1	252	159	0.99	173.3	91.7
RBT	1	244	138	0.95	157.2	87.8
RBT	1	236	130	0.99	142.1	91.5
RBT	1	234	112	0.87	138.5	80.9
RBT	1	228	118	1.00	128.1	92.1
BRN	2	192	72	1.02	77.3	93.2
BRN	2	72	3.8	1.02		
BRN	2	72	3.6	0.96		
HYB	2	189	62	0.92		
HYB	2	188	62	0.93		
HYB	2	165	47	1.05		
HYB	2	161	38	0.91		
HYB	2	150	33	0.98		
HYB	2	147	31	0.98		
HYB	2	144	29	0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 9/26/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
HYB	2	142		35	1.22			
HYB	2	118		17	1.03			
HYB	2	118		16	0.97			
HYB	2	115		14	0.92			
HYB	2	110		13	0.98			
HYB	2	108		12	0.95			
HYB	2	104		11	0.98			
HYB	2	68		2.8	0.89			
HYB	2	67		3.1	1.03			
HYB	2	65		2.4	0.87			
RBT	2	232		112	0.90	135.0		83.0
RBT	2	227		122	1.04	126.4		96.5
RBT	2	214		104	1.06	105.7		98.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Cabresto Creek - 9/26/2003

BRK		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	134	20	0.83	81.9
	MAX:	170	50	1.02	99.2
	MEAN:	152.0	35.0	0.92	90.6

BRN		LENGTH	WEIGHT	K	Wr
	N:	15	15	15	5
	MIN:	52	1.3	0.83	85.6
	MAX:	236	126	1.09	96.7
	MEAN:	110.5	30.9	0.99	91.5

HYB		LENGTH	WEIGHT	K	Wr
	N:	71	71	71	N/A
	MIN:	37	0.3	0.59	N/A
	MAX:	219	94	1.27	N/A
	MEAN:	142.0	35.0	1.00	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N:	13	13	13	13
	MIN:	214	104	0.87	80.9
	MAX:	273	190	1.06	98.4
	MEAN:	246.2	145.0	0.96	88.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	2	0	2	± 0.0	0.082	24	± 0.0	1.85
BRN	12	3	15	± 2.0	0.082	183	± 24.4	12.47
HYB	54	17	77	± 9.6	0.082	939	± 117.1	72.45
RBT	10	3	13	± 2.2	0.082	159	± 26.8	50.83

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	2	0	2	± 0.0	0.061	33	± 0.0	2.55
BRN	12	3	15	± 2.0	0.061	246	± 32.8	16.76
HYB	54	17	77	± 9.6	0.061	1262	± 157.4	97.38
RBT	10	3	13	± 2.2	0.061	213	± 36.1	68.09

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRK	1	235		110	0.85	134.9		81.5
BRK	1	214		110	1.12	101.5		108.4
BRK	1	205		88	1.02	89.1		98.8
BRK	1	200		83	1.04	82.6		100.5
BRK	1	177		53	0.96	57.0		93.0
BRK	1	120		16	0.93			
BRK	1	89		6.9	0.98			
BRK	1	83		4.7	0.82			
BRK	1	82		4.6	0.83			
BRK	1	80		4.5	0.88			
BRK	1	80		3.6	0.70			
BRK	1	76		3.1	0.71			
BRK	1	75		4	0.95			
BRK	1	72		3.5	0.94			
BRK	1	71		3.1	0.87			
BRK	1	70		3.5	1.02			
BRN	1	377		510	0.95	570.3		89.4
BRN	1	295		282	1.10	275.8		102.2
BRN	1	274		228	1.11	221.6		102.9
BRN	1	265		194	1.04	200.7		96.6
BRN	1	262		194	1.08	194.1		100.0
BRN	1	262		167	0.93	194.1		86.0
BRN	1	247		144	0.96	163.0		88.3
BRN	1	243		138	0.96	155.3		88.9
BRN	1	240		139	1.01	149.7		92.9
BRN	1	235		124	0.96	140.6		88.2
BRN	1	227		108	0.92	126.9		85.1
BRN	1	226		104	0.90	125.3		83.0
BRN	1	225		104	0.91	123.6		84.1
BRN	1	222		98	0.90	118.8		82.5
BRN	1	218		102	0.98	112.6		90.6
BRN	1	216		104	1.03	109.6		94.9
BRN	1	215		118	1.19	108.1		109.2
BRN	1	214		93	0.95	106.6		87.3
BRN	1	206		78	0.89	95.2		81.9
BRN	1	185		55	0.87	69.2		79.4
BRN	1	183		54	0.88	67.0		80.5
BRN	1	145		33	1.08	33.6		98.1
BRN	1	143		27	0.92	32.3		83.6
BRN	1	141		26	0.93	31.0		83.9
BRN	1	137		25	0.97			
BRN	1	137		25	0.97			
BRN	1	135		26	1.06			
BRN	1	130		19	0.86			

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	123	21	1.13		
BRN	1	117	16	1.00		
BRN	1	77	4.1	0.90		
BRN	1	66	2.5	0.87		
BRN	1	55	1.6	0.96		
CUT	1	239	145	1.06	151.9	95.4
HYB	1	208	102	1.13		
HYB	1	204	78	0.92		
HYB	1	185	77	1.22		
HYB	1	167	54	1.16		
HYB	1	71	2.8	0.78		
HYB	1	66	2.8	0.97		
HYB	1	57	1.7	0.92		
HYB	1	55	1.6	0.96		
HYB	1	52	1.6	1.14		
HYB	1	47	1	0.96		
HYB	1	47	0.9	0.87		
HYB	1	40	0.9	1.41		
RBT	1	495	1550	1.28	1335.0	116.1
RBT	1	420	870	1.17	812.3	107.1
RBT	1	404	835	1.27	722.3	115.6
RBT	1	334	400	1.07	406.3	98.5
RBT	1	310	315	1.06	324.2	97.1
RBT	1	274	227	1.10	223.2	101.7
RBT	1	252	190	1.19	173.3	109.6
RBT	1	230	133	1.09	131.5	101.2
BRK	2	176	43	0.79	56.0	76.8
BRK	2	150	29	0.86	34.4	84.2
BRK	2	82	5.9	1.07		
BRK	2	72	3.4	0.91		
BRN	2	242	122	0.86	153.4	79.5
BRN	2	235	128	0.99	140.6	91.0
BRN	2	182	49	0.81	66.0	74.3
BRN	2	170	47	0.96	53.9	87.2
BRN	2	147	28	0.88	35.0	79.9
HYB	2	145	33	1.08		
HYB	2	145	25	0.82		
HYB	2	33	0.5	1.39		
HYB	2	33	0.5	1.39		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

Zwergle - Upstream of Town of Red River - 10/2/2003

BRK		LENGTH	WEIGHT	K	Wr
	N:	20	20	20	7
	MIN:	70	3.1	0.70	76.8
	MAX:	235	110	1.12	108.4
	MEAN:	120.5	29.1	0.91	91.9

BRN		LENGTH	WEIGHT	K	Wr
	N:	38	38	38	29
	MIN:	55	1.6	0.81	74.3
	MAX:	377	510	1.19	109.2
	MEAN:	195.2	98.4	0.96	88.7

CUT		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	239	145	1.06	95.4
	MAX:	239	145	1.06	95.4
	MEAN:	239.0	145.0	1.06	95.4

HYB		LENGTH	WEIGHT	K	Wr
	N:	16	16	16	N/A
	MIN:	33	0.5	0.78	N/A
	MAX:	208	102	1.41	N/A
	MEAN:	97.2	24.0	1.10	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N:	8	8	8	8
	MIN:	230	133	1.06	97.1
	MAX:	495	1550	1.28	116.1
	MEAN:	339.9	565.0	1.15	105.9

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	16	4	20	± 2.2	0.163	123	± 13.5	7.89
BRN	33	5	38	± 1.8	0.163	233	± 11.0	50.55
CUT	1	0	1	± 0.0	0.163	6	± 0.0	1.92
HYB	12	4	16	± 2.6	0.163	98	± 16.0	5.19
RBT	8	0	8	± 0.0	0.163	49	± 0.0	61.03

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	16	4	20	± 2.2	0.076	263	± 28.9	16.87
BRN	33	5	38	± 1.8	0.076	500	± 23.7	108.47
CUT	1	0	1	± 0.0	0.076	13	± 0.0	4.16
HYB	12	4	16	± 2.6	0.076	211	± 34.2	11.16
RBT	8	0	8	± 0.0	0.076	105	± 0.0	130.79

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-4 - Junebug Campground - 10/1/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRN	1	175		52	0.97	58.7		88.5
BRN	1	171		41	0.82	54.8		74.8
BRN	1	168		44	0.93	52.0		84.5
BRN	1	167		43	0.92	51.1		84.1
BRN	1	166		40	0.87	50.2		79.6
BRN	1	160		37	0.90	45.0		82.1
BRN	1	159		40	1.00	44.2		90.5
BRN	1	151		34	0.99	37.9		89.6
BRN	1	151		32	0.93	37.9		84.3
BRN	1	147		30	0.94	35.0		85.6
BRN	1	143		25	0.85	32.3		77.4
BRN	1	141		26	0.93	31.0		83.9
BRN	1	140		24	0.87	30.3		79.1
BRN	1	135		22	0.89			
BRN	1	134		21	0.87			
BRN	1	132		21	0.91			
BRN	1	120		16	0.93			
BRN	1	115		15	0.99			
BRN	1	77		4.4	0.96			
BRN	1	72		4.1	1.10			
BRN	1	69		3.5	1.07			
HYB	1	152		35	1.00			
HYB	1	150		32	0.95			
RBT	1	273		206	1.01	220.8		93.3
WS	1	185		68	1.07	73.7		92.2
WS	1	170		51	1.04	56.9		89.6
BRN	2	70		3.4	0.99			
WS	2	163		44	1.02	50.0		87.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-4 - Junebug Campground - 10/1/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	22	22	22	13
	MIN:	69	3.4	0.82	74.8
	MAX:	175	52	1.10	90.5
	MEAN:	134.7	26.3	0.94	83.4

HYB		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	N/A
	MIN:	150	32	0.95	N/A
	MAX:	152	35	1.00	N/A
	MEAN:	151.0	33.5	0.98	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	273	206	1.01	93.3
	MAX:	273	206	1.01	93.3
	MEAN:	273.0	206.0	1.01	93.3

WS		LENGTH	WEIGHT	K	Wr
	N:	3	3	3	3
	MIN:	163	44	1.02	87.9
	MAX:	185	68	1.07	92.2
	MEAN:	172.7	54.3	1.04	89.9

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	21	1	22	± 0.5	0.114	193	± 4.4	11.19
HYB	2	0	2	± 0.0	0.114	18	± 0.0	1.33
RBT	1	0	1	± 0.0	0.114	9	± 0.0	4.09
WS	2	1	3	± 3.2	0.114	26	± 28.1	3.11

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	21	1	22	± 0.5	0.062	355	± 8.1	20.58
HYB	2	0	2	± 0.0	0.062	32	± 0.0	2.36
RBT	1	0	1	± 0.0	0.062	16	± 0.0	7.27
WS	2	1	3	± 3.2	0.062	48	± 51.6	5.75

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-5 - Downstream of Elephant Rock Campground, Upstream of Hansen Creek - 10/1/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	160	36	0.88	45.0	79.9
HYB	1	219	100	0.95		
RBT	1	245	128	0.87	159.2	80.4
RBT	1	206	88	1.01	94.2	93.4
RBT	1	193	70	0.97		
WS	1	96	9.7	1.10	9.9	98.0
WS	1	47	1.3	1.25	1.1	116.8
RBT	2	257	160	0.94	183.9	87.0
WS	2	37	0.1	0.20	0.5	18.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-5 - Downstream of Elephant Rock Campground, Upstream of Hansen Creek - 10/1/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	160	36	0.88	79.9
	MAX:	160	36	0.88	79.9
	MEAN:	160.0	36.0	0.88	79.9

HYB		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	N/A
	MIN:	219	100	0.95	N/A
	MAX:	219	100	0.95	N/A
	MEAN:	219.0	100.0	0.95	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N:	4	4	4	3
	MIN:	193	70	0.87	80.4
	MAX:	257	160	1.01	93.4
	MEAN:	225.3	111.5	0.95	86.9

WS		LENGTH	WEIGHT	K	Wr
	N:	3	3	3	3
	MIN:	37	0.1	0.20	18.7
	MAX:	96	9.7	1.25	116.8
	MEAN:	60.0	3.7	0.85	77.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	1	0	1	± 0.0	0.100	10	± 0.0	0.79
HYB	1	0	1	± 0.0	0.100	10	± 0.0	2.20
RBT	3	1	4	± 1.9	0.100	40	± 19.0	9.83
WS	2	1	3	± 3.2	0.100	30	± 32.0	0.24

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	1	0	1	± 0.0	0.055	18	± 0.0	1.43
HYB	1	0	1	± 0.0	0.055	18	± 0.0	3.97
RBT	3	1	4	± 1.9	0.055	73	± 34.5	17.94
WS	2	1	3	± 3.2	0.055	55	± 58.2	0.45

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-6 - Downstream of Hansen Creek, Upstream of Mill - 9/30/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRN	1	294		258	1.02	273.1		94.5
BRN	1	266		182	0.97	203.0		89.7
HYB	1	191		80	1.15			
NO FISH	2	---						

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-6 - Downstream of Hansen Creek, Upstream of Mill - 9/30/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	266	182	0.97	89.7
	MAX:	294	258	1.02	94.5
	MEAN:	280.0	220.0	0.99	92.1

HYB		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	N/A
	MIN:	191	80	1.15	N/A
	MAX:	191	80	1.15	N/A
	MEAN:	191.0	80.0	1.15	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	2	0	2	± 0.0	0.149	13	± 0.0	6.31
HYB	1	0	1	± 0.0	0.149	7	± 0.0	1.23

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	2	0	2	± 0.0	0.081	25	± 0.0	12.13
HYB	1	0	1	± 0.0	0.081	12	± 0.0	2.12

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-7 - Downstream of Mine Boundary, Upstream of Mill - 9/30/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	288	235	0.98	256.9	91.5
BRN	1	193	72	1.00	78.5	91.7
RBT	1	263	174	0.96	197.2	88.2
RBT	1	247	151	1.00	163.1	92.6
WS	1	36	0.1	0.21	0.5	20.3
NO FISH	2	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-7 - Downstream of Mine Boundary, Upstream of Mill - 9/30/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	193	72	0.98	91.5
	MAX:	288	235	1.00	91.7
	MEAN:	240.5	153.5	0.99	91.6

RBT		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	247	151	0.96	88.2
	MAX:	263	174	1.00	92.6
	MEAN:	255.0	162.5	0.98	90.4

WS		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	36	0.1	0.21	20.3
	MAX:	36	0.1	0.21	20.3
	MEAN:	36.0	0.1	0.21	20.3

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	2	0	2	± 0.0	0.128	16	± 0.0	5.41
RBT	2	0	2	± 0.0	0.128	16	± 0.0	5.73
WS	1	0	1	± 0.0	0.128	8	± 0.0	< 0.01

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	2	0	2	± 0.0	0.078	26	± 0.0	8.80
RBT	2	0	2	± 0.0	0.078	26	± 0.0	9.31
WS	1	0	1	± 0.0	0.078	13	± 0.0	< 0.01

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-8 - Downstream of Mill, Upstream of Columbine Creek - 9/30/2003

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	175	60		1.12	58.7	102.2
RBT	1	260	230		1.31	190.5	120.7
RBT	1	245	163		1.11	159.2	102.4
BRN	2	176	55		1.01	59.7	92.1
NO FISH	3	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-8 - Downstream of Mill, Upstream of Columbine Creek - 9/30/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	175	55	1.01	92.1
	MAX:	176	60	1.12	102.2
	MEAN:	175.5	57.5	1.06	97.1

RBT		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	245	163	1.11	102.4
	MAX:	260	230	1.31	120.7
	MEAN:	252.5	196.5	1.21	111.6

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	1	1	0	2	± 4.9	0.118	17	± 41.5	2.15
RBT	2	0	0	2	± 0.0	0.118	17	± 0.0	7.36

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	1	1	0	2	± 4.9	0.063	32	± 77.8	4.06
RBT	2	0	0	2	± 0.0	0.063	32	± 0.0	13.86

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-11A1 - Downstream of Cabin Springs and Columbine - 9/25/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	198	69	0.89	84.7	81.5
BRN	1	181	52	0.88	64.9	80.1
BRN	1	161	36	0.86	45.9	78.5
BRN	1	160	38	0.93	45.0	84.4
BRN	1	156	38	1.00	41.8	90.9
BRN	1	143	28	0.96	32.3	86.7
BRN	1	70	3.5	1.02		
RBT	1	215	91	0.92	107.2	84.9
WS	1	230	144	1.18	143.5	100.3
WS	1	135	22	0.89	28.1	78.3
WS	1	101	11	1.07	11.6	95.1
WS	1	94	9.2	1.11	9.3	99.1
BRN	2	171	44	0.88	54.8	80.2
BRN	2	165	42	0.93	49.3	85.1
BRN	2	72	3.1	0.83		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-11A1 - Downstream of Cabin Springs and Columbine - 9/25/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	10	10	10	8
	MIN:	70	3.1	0.83	78.5
	MAX:	198	69	1.02	90.9
	MEAN:	147.7	35.4	0.92	83.4

RBT		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	215	91	0.92	84.9
	MAX:	215	91	0.92	84.9
	MEAN:	215.0	91.0	0.92	84.9

WS		LENGTH	WEIGHT	K	Wr
	N:	4	4	4	4
	MIN:	94	9.2	0.89	78.3
	MAX:	230	144	1.18	100.3
	MEAN:	140.0	46.6	1.06	93.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	7	3	10	± 2.7	0.137	73	± 19.7	5.70
RBT	1	0	1	± 0.0	0.137	7	± 0.0	1.40
WS	4	0	4	± 0.0	0.137	29	± 0.0	2.98

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	7	3	10	± 2.7	0.083	120	± 32.5	9.37
RBT	1	0	1	± 0.0	0.083	12	± 0.0	2.41
WS	4	0	4	± 0.0	0.083	48	± 0.0	4.93

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-12 - Goathill Campground - 9/25/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRN	1	149		35	1.06	36.5		96.0
RBT	1	275		220	1.06	225.7		97.5
RBT	1	260		176	1.00	190.5		92.4
RBT	1	242		150	1.06	153.3		97.8
RBT	1	237		141	1.06	144.0		97.9
RBT	1	214		88	0.90	105.7		83.2
RBT	1	204		82	0.97	91.5		89.6
RBT	2	259		156	0.90	188.3		82.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-12 - Goathill Campground - 9/25/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	149	35	1.06	96.0
	MAX:	149	35	1.06	96.0
	MEAN:	149.0	35.0	1.06	96.0

RBT		LENGTH	WEIGHT	K	Wr
	N:	7	7	7	7
	MIN:	204	82	0.90	82.9
	MAX:	275	220	1.06	97.9
	MEAN:	241.6	144.7	0.99	91.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	1	0	1	± 0.0	0.176	6	± 0.0	0.46
RBT	6	1	7	± 1.0	0.176	40	± 5.7	12.76

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	1	0	1	± 0.0	0.074	14	± 0.0	1.08
RBT	6	1	7	± 1.0	0.074	95	± 13.5	30.31

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-15 - Upstream of Questa Ranger Station - 9/25/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	274	186	0.90	223.2	83.3
RBT	1	270	180	0.91	213.5	84.3
WS	1	84	5.4	0.91	6.6	82.1
NO FISH	2					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-15 - Upstream of Questa Ranger Station - 9/25/2003

RBT		LENGTH	WEIGHT	K	Wr
	N:	2	2	2	2
	MIN:	270	180	0.90	83.3
	MAX:	274	186	0.91	84.3
	MEAN:	272.0	183.0	0.91	83.8

WS		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	84	5.4	0.91	82.1
	MAX:	84	5.4	0.91	82.1
	MEAN:	84.0	5.4	0.91	82.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
RBT	2	0	2	± 0.0	0.184	11	± 0.0	4.44
WS	1	0	1	± 0.0	0.184	5	± 0.0	0.06

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
RBT	2	0	2	± 0.0	0.080	25	± 0.0	10.09
WS	1	0	1	± 0.0	0.080	13	± 0.0	0.15

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-20 - Upstream of Highway 522 - 9/24/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	265	176	0.95	200.7	87.7
BRN	1	251	162	1.02	170.9	94.8
BRN	1	237	130	0.98	144.2	90.1
BRN	1	106	11	0.92		
RBT	1	255	177	1.07	179.6	98.5
RBT	1	250	137	0.88	169.2	81.0
RBT	1	217	107	1.05	110.3	97.0
NO FISH	2					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

RR-20 - Upstream of Highway 522 - 9/24/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	4	4	4	3
	MIN:	106	11	0.92	87.7
	MAX:	265	176	1.02	94.8
	MEAN:	214.8	119.8	0.97	90.9

RBT		LENGTH	WEIGHT	K	Wr
	N:	3	3	3	3
	MIN:	217	107	0.88	81.0
	MAX:	255	177	1.07	98.5
	MEAN:	240.7	140.3	1.00	92.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	4	0	4	± 0.0	0.256	16	± 0.0	4.23
RBT	3	0	3	± 0.0	0.256	12	± 0.0	3.71

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	4	0	4	± 0.0	0.092	43	± 0.0	11.36
RBT	3	0	3	± 0.0	0.092	33	± 0.0	10.21

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-1 - Downstream of Highway 522 and Questa WWTP - 9/24/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRN	1	287		234	0.99	254.2		92.0
BRN	1	272		185	0.92	216.9		85.3
BRN	1	271		194	0.97	214.5		90.4
BRN	1	266		172	0.91	203.0		84.7
BRN	1	265		177	0.95	200.7		88.2
BRN	1	263		166	0.91	196.3		84.6
BRN	1	226		95	0.82	125.3		75.8
BRN	1	210		83	0.90	100.8		82.4
BRN	1	185		54	0.85	69.2		78.0
BRN	1	176		49	0.90	59.7		82.0
BRN	1	170		46	0.94	53.9		85.3
BRN	1	164		42	0.95	48.5		86.7
BRN	1	115		12	0.79			
BRN	1	107		11	0.90			
BRN	1	105		11	0.95			
BRN	1	93		7.1	0.88			
BRN	1	85		5.3	0.86			
RBT	1	259		140	0.81	188.3		74.4
BRN	2	99		9.2	0.95			
BRN	2	96		7.4	0.84			
BRN	2	88		6.2	0.91			

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-1 - Downstream of Highway 522 and Questa WWTP - 9/24/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	20	20	20	12
	MIN:	85	5.3	0.79	75.8
	MAX:	287	234	0.99	92.0
	MEAN:	177.2	78.3	0.90	84.6

RBT		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	259	140	0.81	74.4
	MAX:	259	140	0.81	74.4
	MEAN:	259.0	140.0	0.81	74.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	17	3	20	± 1.6	0.137	146	± 11.7	25.20
RBT	1	0	1	± 0.0	0.137	7	± 0.0	2.16

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	17	3	20	± 1.6	0.067	299	± 23.9	51.61
RBT	1	0	1	± 0.0	0.067	15	± 0.0	4.63

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-8A - Downstream of NPDES Outfall 002 - 9/24/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	351	395	0.91	461.5	85.6
BRN	1	324	319	0.94	364.1	87.6
BRN	1	291	244	0.99	264.9	92.1
BRN	1	287	218	0.92	254.2	85.7
BRN	1	277	204	0.96	228.9	89.1
BRN	1	271	209	1.05	214.5	97.4
BRN	1	267	194	1.02	205.3	94.5
BRN	1	252	168	1.05	173.0	97.1
BRN	1	237	116	0.87	144.2	80.4
BRN	1	233	136	1.08	137.1	99.2
BRN	1	233	114	0.90	137.1	83.1
BRN	1	229	117	0.97	130.3	89.8
BRN	1	228	112	0.94	128.6	87.1
BRN	1	221	97	0.90	117.2	82.7
BRN	1	219	106	1.01	114.1	92.9
BRN	1	217	104	1.02	111.1	93.6
BRN	1	201	84	1.03	88.5	94.9
BRN	1	185	63	1.00	69.2	91.0
BRN	1	185	58	0.92	69.2	83.8
BRN	1	173	52	1.00	56.8	91.6
BRN	1	110	12	0.90		
BRN	1	105	11	0.95		
BRN	1	105	11	0.95		
BRN	1	102	10	0.94		
BRN	1	99	9.4	0.97		
BRN	1	95	8.8	1.03		
BRN	1	95	8.7	1.01		
BRN	1	94	8.5	1.02		
BRN	1	93	8.5	1.06		
BRN	1	93	7.7	0.96		
BRN	1	91	7.7	1.02		
BRN	1	90	6.9	0.95		
BRN	1	86	6.1	0.96		
BRN	1	82	5.3	0.96		
BRN	1	79	5.2	1.05		
BRN	1	67	3.1	1.03		
RBT	1	273	209	1.03	220.8	94.7
RBT	1	272	195	0.97	218.3	89.3
RBT	1	272	176	0.87	218.3	80.6
RBT	1	271	191	0.96	215.9	88.5
RBT	1	269	189	0.97	211.1	89.5
RBT	1	266	194	1.03	204.1	95.1
RBT	1	262	156	0.87	195.0	80.0
RBT	1	259	154	0.89	188.3	81.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-8A - Downstream of NPDES Outfall 002 - 9/24/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
RBT	1	258		177	1.03	186.1		95.1
RBT	1	255		158	0.95	179.6		88.0
RBT	1	254		173	1.06	177.5		97.5
RBT	1	254		153	0.93	177.5		86.2
RBT	1	249		138	0.89	167.2		82.6
RBT	1	244		138	0.95	157.2		87.8
RBT	1	241		124	0.89	151.4		81.9
RBT	1	237		144	1.08	144.0		100.0
RBT	1	236		145	1.10	142.1		102.0
RBT	1	236		141	1.07	142.1		99.2
RBT	1	231		119	0.97	133.2		89.3
RBT	1	224		106	0.94	121.4		87.3
RBT	1	209		106	1.16	98.4		107.7
RBT	1	207		73	0.82	95.6		76.4
BRN	2	103		11	1.01			
BRN	2	96		8.9	1.01			
BRN	2	92		7.3	0.94			
BRN	2	90		7.4	1.02			
BRN	2	90		6.6	0.91			
RBT	2	262		170	0.95	195.0		87.2
RBT	2	243		144	1.00	155.3		92.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-8A - Downstream of NPDES Outfall 002 - 9/24/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	41	41	41	20
	MIN:	67	3.1	0.87	80.4
	MAX:	351	395	1.08	99.2
	MEAN:	166.8	80.0	0.98	90.0

RBT		LENGTH	WEIGHT	K	Wr
	N:	24	24	24	24
	MIN:	207	73	0.82	76.4
	MAX:	273	209	1.16	107.7
	MEAN:	249.3	153.0	0.97	90.0

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	36	5	41	± 1.7	0.165	248	± 10.3	43.74
RBT	22	2	24	± 0.9	0.165	145	± 5.5	48.91

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	36	5	41	± 1.7	0.079	519	± 21.5	91.53
RBT	22	2	24	± 0.9	0.079	304	± 11.4	102.54

Length measurement is in millimeters.
Weight measurement is in grams.

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Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/23/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRN	1	279		253	1.16	233.8		108.2
BRN	1	271		167	0.84	214.5		77.9
BRN	1	268		181	0.94	207.6		87.2
BRN	1	257		157	0.92	183.3		85.6
BRN	1	254		168	1.03	177.1		94.9
BRN	1	249		133	0.86	166.9		79.7
BRN	1	241		136	0.97	151.5		89.7
BRN	1	241		129	0.92	151.5		85.1
BRN	1	238		137	1.02	146.0		93.8
BRN	1	238		124	0.92	146.0		84.9
BRN	1	234		128	1.00	138.9		92.2
BRN	1	232		124	0.99	135.4		91.6
BRN	1	231		119	0.97	133.7		89.0
BRN	1	230		109	0.90	132.0		82.6
BRN	1	226		109	0.94	125.3		87.0
BRN	1	226		108	0.94	125.3		86.2
BRN	1	225		101	0.89	123.6		81.7
BRN	1	224		102	0.91	122.0		83.6
BRN	1	223		104	0.94	120.4		86.4
BRN	1	222		102	0.93	118.8		85.8
BRN	1	219		106	1.01	114.1		92.9
BRN	1	219		98	0.93	114.1		85.9
BRN	1	219		93	0.89	114.1		81.5
BRN	1	217		99	0.97	111.1		89.1
BRN	1	217		96	0.94	111.1		86.4
BRN	1	209		78	0.85	99.4		78.5
BRN	1	208		84	0.93	98.0		85.7
BRN	1	208		82	0.91	98.0		83.7
BRN	1	202		73	0.89	89.8		81.3
BRN	1	198		78	1.00	84.7		92.1
BRN	1	196		66	0.88	82.2		80.3
BRN	1	193		67	0.93	78.5		85.4
BRN	1	191		64	0.92	76.1		84.1
BRN	1	189		69	1.02	73.8		93.5
BRN	1	188		62	0.93	72.6		85.4
BRN	1	188		57	0.86	72.6		78.5
BRN	1	186		61	0.95	70.4		86.7
BRN	1	182		61	1.01	66.0		92.5
BRN	1	176		55	1.01	59.7		92.1
BRN	1	175		55	1.03	58.7		93.6
BRN	1	174		49	0.93	57.7		84.9
BRN	1	174		47	0.89	57.7		81.4
BRN	1	167		41	0.88	51.1		80.2
BRN	1	158		38	0.96	43.4		87.6

Length measurement is in millimeters.
Weight measurement is in grams.

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Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/23/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
BRN	1	157		34	0.88	42.6		79.8
BRN	1	151		32	0.93	37.9		84.3
BRN	1	134		21	0.87			
BRN	1	122		17	0.94			
BRN	1	121		15	0.85			
BRN	1	116		15	0.96			
BRN	1	115		15	0.99			
BRN	1	114		14	0.94			
BRN	1	114		13	0.88			
BRN	1	113		12	0.83			
BRN	1	112		13	0.93			
BRN	1	112		13	0.93			
BRN	1	108		12	0.95			
BRN	1	108		11	0.87			
BRN	1	107		12	0.98			
BRN	1	105		11	0.95			
BRN	1	105		11	0.95			
BRN	1	104		11.5	1.02			
BRN	1	102		11	1.04			
BRN	1	102		10	0.94			
BRN	1	100		10.5	1.05			
BRN	1	100		10	1.00			
BRN	1	100		9.7	0.97			
BRN	1	99		9.8	1.01			
BRN	1	98		9.5	1.01			
BRN	1	98		9.2	0.98			
BRN	1	96		8.3	0.94			
BRN	1	95		8.3	0.97			
BRN	1	95		8	0.93			
BRN	1	94		8.5	1.02			
BRN	1	93		8.3	1.03			
BRN	1	91		7.6	1.01			
BRN	1	90		7.5	1.03			
BRN	1	88		6.9	1.01			
BRN	1	88		6.4	0.94			
BRN	1	86		6.8	1.07			
BRN	1	86		6.6	1.04			
BRN	1	86		6.1	0.96			
BRN	1	85		5.9	0.96			
BRN	1	85		5.7	0.93			
BRN	1	81		6.1	1.15			
BRN	1	73		3.5	0.90			
RBT	1	285		238	1.03	251.4		94.7
RBT	1	257		178	1.05	183.9		96.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/23/2003

SPECIES	PASS	LENGTH		WEIGHT	K	Ws		Wr
RBT	1	255		173	1.04	179.6		96.3
RBT	1	253		168	1.04	175.4		95.8
RBT	1	246		128	0.86	161.1		79.4
RBT	1	242		134	0.95	153.3		87.4
RBT	1	242		126	0.89	153.3		82.2
RBT	1	235		122	0.94	140.3		86.9
RBT	1	232		114	0.91	135.0		84.5
RBT	1	231		110	0.89	133.2		82.6
RBT	1	230		114	0.94	131.5		86.7
RBT	1	227		110	0.94	126.4		87.1
RBT	1	224		106	0.94	121.4		87.3
RBT	1	219		100	0.95	113.4		88.2
RBT	1	216		95	0.94	108.7		87.4
RBT	1	202		67	0.81	88.8		75.5
WS	1	102		11	1.04	11.9		92.3
BRN	2	247		126	0.84	163.0		77.3
BRN	2	198		71	0.91	84.7		83.9
BRN	2	187		58	0.89	71.5		81.1
BRN	2	186		58	0.90	70.4		82.4
BRN	2	184		57	0.92	68.1		83.7
BRN	2	165		42	0.93	49.3		85.1
BRN	2	100		9.9	0.99			
BRN	2	100		9.3	0.93			
BRN	2	95		9.1	1.06			
BRN	2	90		7.5	1.03			

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

LR-16 - Upstream of Hatchery Diversion - 9/23/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	96	96	96	52
	MIN:	73	3.5	0.83	77.3
	MAX:	279	253	1.16	108.2
	MEAN:	159.8	55.1	0.95	86.0

RBT		LENGTH	WEIGHT	K	Wr
	N:	16	16	16	16
	MIN:	202	67	0.81	75.5
	MAX:	285	238	1.05	96.8
	MEAN:	237.3	130.2	0.95	87.4

WS		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	102	11	1.04	92.3
	MAX:	102	11	1.04	92.3
	MEAN:	102.0	11.0	1.04	92.3

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	86	10	97	± 3.7	0.162	599	± 22.8	72.76
RBT	16	0	16	± 0.0	0.162	99	± 0.0	28.42
WS	1	0	1	± 0.0	0.162	6	± 0.0	0.15

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	86	10	97	± 3.7	0.063	1540	± 58.7	187.07
RBT	16	0	16	± 0.0	0.063	254	± 0.0	72.91
WS	1	0	1	± 0.0	0.063	16	± 0.0	0.39

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

UFL 1 - 10/1/2003

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
BRN	515	1050	0.77	1436.7	73.1
BRN	405	540	0.81	705.2	76.6
BRN	401	548	0.85	684.7	80.0
BRN	348	392	0.93	449.9	87.1
BRN	332	297	0.81	391.4	75.9
BRN	324	320	0.94	364.1	87.9
BRN	295	268	1.04	275.8	97.2
RBT	478	1140	1.04	1201.1	94.9
RBT	364	555	1.15	527.0	105.3
WS	320	400	1.22	394.2	101.5
WS	276	165	0.78	250.7	65.8
WS	245	160	1.09	174.1	91.9
WS	245	130	0.88	174.1	74.7
WS	240	162	1.17	163.5	99.1
WS	237	132	0.99	157.3	83.9
WS	236	128	0.97	155.3	82.4
WS	235	139	1.07	153.3	90.7
WS	235	135	1.04	153.3	88.1
WS	235	126	0.97	153.3	82.2
WS	233	136	1.08	149.3	91.1
WS	231	121	0.98	145.4	83.2
WS	231	119	0.97	145.4	81.8
WS	229	124	1.03	141.6	87.6
WS	227	112	0.96	137.9	81.2
WS	227	105	0.90	137.9	76.2
WS	226	112	0.97	136.0	82.3
WS	226	110	0.95	136.0	80.9
WS	225	115	1.01	134.2	85.7
WS	225	112	0.98	134.2	83.5
WS	225	107	0.94	134.2	79.7
WS	224	118	1.05	132.4	89.2
WS	223	113	1.02	130.6	86.5
WS	222	118	1.08	128.8	91.6
WS	222	103	0.94	128.8	80.0
WS	221	125	1.16	127.0	98.4
WS	221	103	0.95	127.0	81.1
WS	221	102	0.94	127.0	80.3
WS	220	117	1.10	125.3	93.4
WS	220	116	1.09	125.3	92.6
WS	220	110	1.03	125.3	87.8
WS	220	107	1.00	125.3	85.4
WS	218	108	1.04	121.8	88.7
WS	218	101	0.97	121.8	82.9
WS	217	105	1.03	120.1	87.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

UFL 1 - 10/1/2003

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
WS	217	103	1.01	120.1	85.8
WS	217	98	0.96	120.1	81.6
WS	216	118	1.17	118.4	99.6
WS	215	104	1.05	116.8	89.1
WS	215	101	1.02	116.8	86.5
WS	214	102	1.04	115.1	88.6
WS	212	98	1.03	111.8	87.6
WS	210	104	1.12	108.6	95.7
WS	210	100	1.08	108.6	92.0
WS	210	97	1.05	108.6	89.3
WS	208	97	1.08	105.5	91.9
WS	204	90	1.06	99.4	90.5
WS	201	96	1.18	95.0	101.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

UFL 1 - 10/1/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	7	7	7	7
	MIN:	295	268	0.77	73.1
	MAX:	515	1050	1.04	97.2
	MEAN:	374.3	487.9	0.88	82.5
RBT		**LENGTH**	**WEIGHT**	**K**	**Wr**
	N:	2	2	2	2
	MIN:	364	555	1.04	94.9
	MAX:	478	1140	1.15	105.3
	MEAN:	421.0	847.5	1.10	100.1
WS		**LENGTH**	**WEIGHT**	**K**	**Wr**
	N:	48	48	48	48
	MIN:	201	90	0.78	65.8
	MAX:	320	400	1.22	101.5
	MEAN:	225.9	120.9	1.03	87.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

ERL 1 - 10/2/2003

SPECIES	LENGTH	WEIGHT	K	Ws	Wr
RBT	250	166	1.06	169.2	98.1
RBT	246	148	0.99	161.1	91.8
RBT	240	142	1.03	149.5	95.0
RBT	228	122	1.03	128.1	95.3
RBT	228	120	1.01	128.1	93.7
RBT	226	116	1.00	124.7	93.0
RBT	220	108	1.01	114.9	94.0
RBT	205	90	1.04	92.8	96.9
WS	259	154	0.89	206.4	74.6
WS	248	115	0.75	180.7	63.6
WS	245	144	0.98	174.1	82.7
WS	243	142	0.99	169.8	83.6
WS	241	138	0.99	165.6	83.4
WS	240	150	1.09	163.5	91.8
WS	235	134	1.03	153.3	87.4
WS	235	132	1.02	153.3	86.1
WS	235	116	0.89	153.3	75.7
WS	232	140	1.12	147.4	95.0
WS	232	138	1.11	147.4	93.6
WS	231	114	0.92	145.4	78.4
WS	230	128	1.05	143.5	89.2
WS	218	98	0.95	121.8	80.5
WS	113	12	0.83	16.3	73.6
WS	92	6.6	0.85		
WS	85	5.8	0.94		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix A-4a
Aquatic Biota - Fish Populations
Validated Analytical Results

ERL 1 - 10/2/2003

RBT		LENGTH	WEIGHT	K	Wr
	N:	8	8	8	8
	MIN:	205	90	0.99	91.8
	MAX:	250	166	1.06	98.1
	MEAN:	230.4	126.5	1.02	94.7
WS		**LENGTH**	**WEIGHT**	**K**	**Wr**
	N:	17	17	17	15
	MIN:	85	5.8	0.75	63.6
	MAX:	259	154	1.12	95.0
	MEAN:	212.6	109.8	0.96	82.6

Length measurement is in millimeters.
Weight measurement is in grams.

APPENDIX A4-b
FISH TISSUES
VALIDATED ANALYTICAL RESULTS

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		Cabresto / 2-Oct-2002 / CABRESTO-T01N-BRT-100202 / Brown Trout Whole Body - Smaller than 20 cm		Cabresto / 2-Oct-2002 / CABRESTO-T01N-BRT2-100202 / Brown Trout Fillet		CABRESTO / 2-Oct-2002 / CABRESTO-T01N-RBT2-100202 / Rainbow Trout Fillet		Cabresto / 2-Oct-2002 / CABRESTO-T02N-BRT-100202 / Brown Trout Whole Body - Smaller than 20 cm		Cabresto / 2-Oct-2002 / CABRESTO-T02N-BRT2-100202 / Brown Trout Fillet	
Metals											
Aluminum	mg/Kg	29.6	J	1.7	J	4.7	J	42.6	J	99	J
Antimony	mg/Kg	0.15	:	0.15	:	0.16	:	0.16	:	0.17	:
Arsenic	mg/Kg	0.15	:	0.15	:	0.33	:	0.16	:	0.17	:
Barium	mg/Kg	0.66	:	0.69	:	0.7	:	0.76	:	0.77	:
Beryllium	mg/Kg	0.014	:	0.015	:	0.015	:	0.015	:	0.017	:
Boron	mg/Kg	0.34	:	0.36	:	0.36	:	0.35	:	0.4	:
Cadmium	mg/Kg	0.077	:	0.024	:	0.042	:	0.065	:	0.025	:
Calcium	mg/Kg	6740	:	713	:	955	:	4170	:	2950	:
Chromium	mg/Kg	0.21	:	0.15	:	0.39	:	0.3	:	0.25	:
Cobalt	mg/Kg	0.16	:	0.16	:	0.17	:	0.16	:	0.18	:
Copper	mg/Kg	1.2	:	0.5	:	0.55	:	1.2	:	0.51	:
Iron	mg/Kg	62.1	J	7.2	J	11.1	J	88.9	J	149	J
Lead	mg/Kg	0.24	:	0.18	:	0.085	:	0.21	:	0.29	:
Magnesium	mg/Kg	340	:	293	:	306	:	310	:	396	:
Manganese	mg/Kg	2.9	:	0.28	:	0.4	:	3.6	:	1.7	:
Mercury	mg/Kg	0.024	:	0.032	:	0.043	:	0.015	:	0.038	:
Molybdenum	mg/Kg	0.096	:	0.075	:	0.16	:	0.073	:	0.083	:
Nickel	mg/Kg	0.96	:	1	:	1	:	0.99	:	1.1	:
Potassium	mg/Kg	3530	J	4120	J	4050	J	3360	J	3990	J
Selenium	mg/Kg	0.86	J	0.6	J	0.28	J	0.95	J	0.67	J
Silver	mg/Kg	0.1	:	0.1	:	0.11	J	0.1	:	0.12	:
Sodium	mg/Kg	1080	:	518	:	451	:	870	:	656	:
Thallium	mg/Kg	0.074	:	0.075	:	0.082	:	0.078	:	0.083	:
Vanadium	mg/Kg	0.2	:	0.21	:	0.21	:	0.2	:	0.29	:
Zinc	mg/Kg	43.8	:	16.1	:	9.3	:	36.2	:	12.3	:
Laboratory Parameters											
Lipids, Percent	%	1.2	:	0.2	:	3.6	:	2.8	:	0.4	:
Solids, Percent	%	22.3	:	21	:	25.7	:	24	:	20.9	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		CABRESTO		Cabresto		CABRESTO		CABRESTO		ERL		ERL	
		2-Oct-2002		2-Oct-2002		2-Oct-2002		2-Oct-2002		26-Sep-2002		26-Sep-2002	
		CABRESTO-T02N-RBT2-100202		CABRESTO-T03N-BRT-100202		CABRESTO-T03N-BRT2-100202		CABRESTO-T03N-RBT2-100202		ERL1-T01N-RBT2-092602		ERL1-T01N-WS1-092602	
		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Fillet		Rainbow Trout Fillet		Rainbow Trout Fillet		Sucker Whole Body	
Metals													
Aluminum	mg/Kg	6.3	J	62.8	J	9.6	J	2.2	J	1.3	J	202	J
Antimony	mg/Kg	0.17	:	0.16	:	0.17	:	0.17	:	0.16	:	0.17	:
Arsenic	mg/Kg	0.28	:	0.16	:	0.17	:	0.41	:	0.17	:	0.17	:
Barium	mg/Kg	0.77	:	1	:	0.77	:	0.71	:	0.77	:	3.9	:
Beryllium	mg/Kg	0.017	:	0.015	:	0.017	:	0.015	:	0.017	:	0.04	:
Boron	mg/Kg	0.4	:	0.35	:	0.4	:	0.39	:	0.4	:	0.38	:
Cadmium	mg/Kg	0.034	:	0.067	:	0.077	:	0.024	:	0.025	:	0.14	:
Calcium	mg/Kg	849	:	11100	:	757	:	654	:	687	:	7820	:
Chromium	mg/Kg	0.51	:	0.35	:	0.31	:	0.26	:	0.14	:	0.25	:
Cobalt	mg/Kg	0.18	:	0.16	:	0.18	:	0.17	:	0.18	:	0.32	:
Copper	mg/Kg	0.8	:	1	:	0.54	:	0.55	:	0.15	J	1.9	J
Iron	mg/Kg	18.2	J	127	J	11.6	J	8.8	J	4.7	J	283	J
Lead	mg/Kg	0.12	:	0.17	:	0.21	:	0.15	:	0.092	J	0.97	:
Magnesium	mg/Kg	344	:	435	:	322	:	291	:	297	:	384	:
Manganese	mg/Kg	0.54	:	6	:	0.42	:	0.22	:	0.26	:	35.7	:
Mercury	mg/Kg	0.04	:	0.016	:	0.019	:	0.042	:	0.03	:	0.017	:
Molybdenum	mg/Kg	0.19	:	0.099	:	0.18	:	0.14	:	0.13	:	0.19	:
Nickel	mg/Kg	1.1	:	0.98	:	1.1	:	1	:	1.1	:	1.1	:
Potassium	mg/Kg	4610	J	3250	J	4490	J	4000	J	3820	J	3040	J
Selenium	mg/Kg	0.27	J	1.1	J	0.75	J	0.45	J	0.32	J	0.32	J
Silver	mg/Kg	0.12	J	0.1	:	0.12	J	0.11	:	0.12	:	0.11	:
Sodium	mg/Kg	496	:	949	:	486	:	480	:	549	:	1020	:
Thallium	mg/Kg	0.083	:	0.08	:	0.083	:	0.083	:	0.081	:	0.083	:
Vanadium	mg/Kg	0.23	:	0.2	:	0.23	:	0.22	:	0.23	:	0.22	:
Zinc	mg/Kg	12.2	:	51.9	:	10	:	8.2	:	8.2	:	39.2	:
Laboratory Parameters													
Lipids, Percent	%	2.1	:	3.7	:	1.2	:	2.2	:	1.1	:	1.6	:
Solids, Percent	%	22.7	:	25.9	:	21	:	25.1	:	24.7	:	21.5	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID Sample Date Sample ID Fraction	ERL 26-Sep-2002 ERL1-T02N-RBT2-092602 Rainbow Trout Fillet		ERL 26-Sep-2002 ERL1-T02N-WS2-092602 Sucker Whole Body		ERL 26-Sep-2002 ERL1-T03N-RBT2-092602 Rainbow Trout Fillet		ERL 26-Sep-2002 ERL1-T03N-WS3-092602 Sucker Whole Body		Hatchery1 27-Sep-2002 HATCHERY1-T01N-RBT2-092702 Rainbow Trout Fillet		Hatchery10 27-Sep-2002 HATCHERY10-T01N-RBT2-092702 Rainbow Trout Fillet	
Metals														
Aluminum	mg/Kg		2.1	J	147	J	6.6	J	182	J	3.6	J	7.6	J
Antimony	mg/Kg		0.16	:	0.16	:	0.14	:	0.16	:	0.16	:	0.15	:
Arsenic	mg/Kg		0.17	:	0.16	:	0.25	:	0.16	:	0.31	:	0.29	:
Barium	mg/Kg		0.66	:	4	:	0.68	:	3.8	:	0.68	:	0.53	:
Beryllium	mg/Kg		0.014	:	0.017	:	0.015	:	0.029	:	0.015	:	0.024	J
Boron	mg/Kg		0.34	:	0.34	:	0.35	:	0.34	:	0.36	:	0.39	:
Cadmium	mg/Kg		0.021	:	0.096	:	0.022	:	0.1	:	0.022	:	0.055	:
Calcium	mg/Kg		1210	:	8730	:	189	:	5880	:	1410	:	2150	:
Chromium	mg/Kg		0.17	:	0.22	:	0.2	:	0.17	:	0.19	:	0.074	J
Cobalt	mg/Kg		0.16	:	0.15	:	0.16	:	0.22	:	0.16	:	0.17	:
Copper	mg/Kg		0.13	J	1.6	J	0.13	J	1.6	J	0.39	:	0.17	J
Iron	mg/Kg		11.2	J	304	J	3.4	J	271	J	7.7	J	8.5	J
Lead	mg/Kg		0.097	J	1.1	:	0.15	:	1	:	0.19	:	0.15	:
Magnesium	mg/Kg		288	:	382	:	271	:	317	:	330	:	349	:
Manganese	mg/Kg		0.54	:	19.5	:	0.21	:	23.8	:	0.39	:	0.6	:
Mercury	mg/Kg		0.046	:	0.015	:	0.035	:	0.015	:	0.029	:	0.032	J
Molybdenum	mg/Kg		0.098	:	0.28	:	0.11	:	0.13	:	0.13	:	0.32	:
Nickel	mg/Kg		0.96	:	0.94	:	0.99	:	0.96	:	1	:	0.24	:
Potassium	mg/Kg		3580	J	2780	J	3620	J	2940	J	4460	J	4290	J
Selenium	mg/Kg		0.16	J	0.39	J	0.2	J	0.38	J	0.35	J	0.27	J
Silver	mg/Kg		0.1	:	0.098	:	0.1	:	0.1	:	0.1	:	0.15	:
Sodium	mg/Kg		621	:	928	:	413	:	868	:	458	:	340	:
Thallium	mg/Kg		0.08	:	0.082	:	0.072	:	0.082	:	0.081	:	0.074	:
Vanadium	mg/Kg		0.2	:	0.2	:	0.21	:	0.2	:	0.21	:	0.3	:
Zinc	mg/Kg		15.7	:	23.1	:	4.1	:	25.8	:	8.2	:	13.7	:
Laboratory Parameters														
Lipids, Percent	%		2.5	:	1.7	:	1.8	:	2.2	:	1.4	:	1.4	:
Solids, Percent	%		29.6	:	23.6	:	22.8	:	24.2	:	24.8	:	21.1	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction													
		Hatchery2		Hatchery3		Hatchery4		Hatchery5		Hatchery6		Hatchery7			
		27-Sep-2002		27-Sep-2002		27-Sep-2002		27-Sep-2002		27-Sep-2002		27-Sep-2002			
		HATCHERY2-T01N-RBT2-092702		HATCHERY3-T01N-RBT2-092702		HATCHERY4-T01N-RBT2-092702		HATCHERY5-T01N-RBT2-092702		HATCHERY6-T01N-RBT2-092702		HATCHERY7-T01N-RBT2-092702			
		Rainbow Trout Fillet		Rainbow Trout Fillet		Rainbow Trout Fillet		Rainbow Trout Fillet		Rainbow Trout Fillet		Rainbow Trout Fillet			
Metals															
Aluminum	mg/Kg	3.3	J	2	J	1.8	J	4	J	1.6	J	1.4	J		
Antimony	mg/Kg	0.15	:	0.17	:	0.14	:	0.15	:	0.14	:	0.16	:		
Arsenic	mg/Kg	0.34	:	0.25	:	0.35	:	0.17	:	0.28	:	0.25	:		
Barium	mg/Kg	0.67	:	0.75	:	0.55	:	0.66	:	0.75	:	0.74	:		
Beryllium	mg/Kg	0.015	:	0.016	:	0.012	:	0.014	:	0.016	:	0.016	:		
Boron	mg/Kg	0.35	:	0.39	:	0.29	:	0.35	:	0.39	:	0.38	:		
Cadmium	mg/Kg	0.034	:	0.025	:	0.018	:	0.022	:	0.025	:	0.029	:		
Calcium	mg/Kg	1550	:	537	:	1210	:	3090	:	861	:	1410	:		
Chromium	mg/Kg	0.19	:	0.2	:	0.19	:	0.27	:	0.17	:	0.16	:		
Cobalt	mg/Kg	0.16	:	0.18	:	0.13	:	0.16	:	0.18	:	0.18	:		
Copper	mg/Kg	0.5	:	0.46	:	0.66	:	0.13	J	0.53	:	0.43	:		
Iron	mg/Kg	9.1	J	6.8	J	6.9	J	5.8	J	5.7	J	6.3	J		
Lead	mg/Kg	0.099	:	0.14	:	0.13	:	0.079	:	0.15	:	0.13	:		
Magnesium	mg/Kg	317	:	297	:	279	:	352	:	323	:	306	:		
Manganese	mg/Kg	0.45	:	0.32	:	0.26	:	0.6	:	0.36	:	0.34	:		
Mercury	mg/Kg	0.018	:	0.043	:	0.043	:	0.019	:	0.038	:	0.035	:		
Molybdenum	mg/Kg	0.11	:	0.16	:	0.06	:	0.14	:	0.082	:	0.08	:		
Nickel	mg/Kg	0.99	:	1.1	:	0.81	:	0.97	:	1.1	:	1.1	:		
Potassium	mg/Kg	4210	J	4140	J	3780	J	4220	J	4520	J	3970	J		
Selenium	mg/Kg	0.41	J	0.22	J	0.43	J	0.15	J	0.3	J	0.26	J		
Silver	mg/Kg	0.1	:	0.11	:	0.084	:	0.1	:	0.11	:	0.11	:		
Sodium	mg/Kg	544	:	398	:	465	:	577	:	640	:	470	:		
Thallium	mg/Kg	0.076	:	0.083	:	0.072	:	0.073	:	0.071	:	0.082	:		
Vanadium	mg/Kg	0.2	:	0.23	:	0.17	:	0.2	:	0.23	:	0.22	:		
Zinc	mg/Kg	10.1	:	7.1	:	10.1	:	14	:	7.9	:	10.2	:		
Laboratory Parameters															
Lipids, Percent	%	3.3	:	3.1	:	3.8	:	1.4	:	1.7	:	2.3	:		
Solids, Percent	%	25.5	:	21.6	:	24.2	:	23.1	:	23.6	:	25	:		

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction													
		Hatchery8		Hatchery9		LR-1		LR-1		LR-1		LR-1	
		27-Sep-2002		27-Sep-2002		1-Oct-2002		1-Oct-2002		1-Oct-2002		1-Oct-2002	
		HATCHERY8-T01N-RBT2-092702		HATCHERY9-T01N-RBT2-092702		LR-1-T01N-BRT-100102		LR-1-T01N-BRT2-100102		LR-1-T01N-RBT2-100102		LR-1-T02N-BRT-100102	
		Rainbow Trout Fillet		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Fillet		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm	
Metals													
Aluminum	mg/Kg	6.7	J	7.3	J	56.5	J	7.1	J	7.4	J	40.9	J
Antimony	mg/Kg	0.17	:	0.15	:	0.14	:	0.16	:	0.17	:	0.14	:
Arsenic	mg/Kg	0.2	:	0.22	:	0.14	:	0.16	:	0.19	:	0.14	:
Barium	mg/Kg	0.51	:	0.56	:	2.8	:	0.54	:	0.54	:	1.5	:
Beryllium	mg/Kg	0.023	J	0.025	J	0.022	J	0.024	J	0.024	J	0.024	J
Boron	mg/Kg	0.38	:	0.42	:	0.37	:	0.4	:	0.4	:	0.4	:
Cadmium	mg/Kg	0.053	:	0.059	:	0.46	:	0.056	:	0.056	:	0.19	:
Calcium	mg/Kg	1160	:	1920	:	7710	:	358	:	1220	:	6760	:
Chromium	mg/Kg	0.083	J	0.075	J	0.07	J	0.078	J	0.083	J	0.07	J
Cobalt	mg/Kg	0.17	:	0.18	:	0.25	:	0.18	:	0.18	:	0.36	:
Copper	mg/Kg	0.17	J	0.18	J	3.4	:	0.25	J	0.27	J	4	:
Iron	mg/Kg	5.6	J	6.3	J	146	J	7	J	9	J	76.7	J
Lead	mg/Kg	0.18	:	0.11	:	0.52	:	0.11	:	0.14	:	0.32	:
Magnesium	mg/Kg	327	:	315	:	382	:	260	:	268	:	416	:
Manganese	mg/Kg	0.31	:	0.45	:	13.6	:	0.63	:	0.52	:	26.8	:
Mercury	mg/Kg	0.033	J	0.031	J	0.015	J	0.016	J	0.022	J	0.016	J
Molybdenum	mg/Kg	0.31	:	0.34	:	0.31	:	0.33	:	0.33	:	0.33	:
Nickel	mg/Kg	0.24	:	0.26	:	0.23	:	0.25	:	0.25	:	0.25	:
Potassium	mg/Kg	4180	J	3890	J	2780	J	3440	J	4060	J	2990	J
Selenium	mg/Kg	0.41	J	0.15	J	0.87	J	0.3	J	0.46	J	0.61	J
Silver	mg/Kg	0.14	:	0.16	:	0.14	J	0.15	J	0.15	:	0.15	J
Sodium	mg/Kg	293	:	359	:	850	:	323	:	422	:	801	:
Thallium	mg/Kg	0.083	:	0.075	:	0.07	:	0.078	:	0.083	:	0.07	:
Vanadium	mg/Kg	0.29	:	0.32	:	0.28	:	0.3	:	0.3	:	0.3	:
Zinc	mg/Kg	9.6	:	10.2	:	62.3	:	7.3	:	9.8	:	50	:
Laboratory Parameters													
Lipids, Percent	%	2.1	:	1.6	:	4.4	:	2.4	:	0.5	:	4.4	:
Solids, Percent	%	22.6	:	22.1	:	26.2	:	27.7	:	21.2	:	27.7	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units												
	Site ID	LR-1		LR-1		LR-1		LR-1		LR-1		LR-16	
	Sample Date	1-Oct-2002		1-Oct-2002		1-Oct-2002		1-Oct-2002		1-Oct-2002		27-Sep-2002	
	Sample ID	LR-1-T02N-BRT2-100102		LR-1-T02N-RBT2-100102		LR-1-T03N-BRT-100102		LR-1-T03N-BRT2-100102		LR-1-T03N-RBT2-100102		LR-16-T01N-BRT-092702	
	Fraction	Brown Trout Fillet		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Fillet		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm	
Parameter	Units												
Metals													
Aluminum	mg/Kg	9.6	J	12.7	J	74.5	J	14.2	J	2.8	J	49.8	J
Antimony	mg/Kg	0.14	:	0.15	:	0.14	:	0.15	:	0.14	:	0.16	:
Arsenic	mg/Kg	0.14	:	0.15	:	0.14	:	0.15	:	0.21	:	0.16	:
Barium	mg/Kg	1.1	:	0.53	:	2.7	:	0.52	:	0.68	:	1.7	:
Beryllium	mg/Kg	0.023	J	0.024	J	0.021	J	0.023	J	0.015	:	0.023	J
Boron	mg/Kg	0.38	:	0.4	:	0.34	:	0.38	:	0.35	:	0.37	:
Cadmium	mg/Kg	0.054	:	0.056	:	0.26	:	0.054	:	0.022	:	0.12	:
Calcium	mg/Kg	858	:	855	:	3610	:	511	:	600	:	5510	:
Chromium	mg/Kg	0.072	J	0.075	J	0.071	J	0.073	J	0.11	:	0.079	J
Cobalt	mg/Kg	0.17	:	0.17	:	0.46	:	0.17	:	0.16	:	0.41	:
Copper	mg/Kg	0.46	J	0.5	J	3.1	:	0.47	J	0.43	:	2.1	:
Iron	mg/Kg	14.5	J	17.8	J	125	J	41.6	J	10.6	J	108	J
Lead	mg/Kg	0.19	:	0.17	:	0.47	:	0.3	:	0.15	:	0.26	:
Magnesium	mg/Kg	292	:	278	:	323	:	297	:	261	:	367	:
Manganese	mg/Kg	1.4	:	0.83	:	15.4	:	2.1	:	0.47	:	17.6	:
Mercury	mg/Kg	0.015	J	0.023	J	0.015	J	0.017	J	0.043	:	0.015	:
Molybdenum	mg/Kg	0.32	:	0.33	:	0.28	:	2.1	:	0.073	:	0.32	:
Nickel	mg/Kg	0.24	:	0.25	:	0.3	:	0.24	:	0.99	:	0.24	:
Potassium	mg/Kg	3890	J	3750	J	3120	J	3840	J	3800	J	3540	J
Selenium	mg/Kg	0.82	J	0.32	J	0.73	J	0.5	J	0.4	J	0.37	J
Silver	mg/Kg	0.15	:	0.15	:	0.13	J	0.15	:	0.1	:	0.28	:
Sodium	mg/Kg	377	:	375	:	723	:	387	:	590	:	779	:
Thallium	mg/Kg	0.072	:	0.075	:	0.071	:	0.073	:	0.069	:	0.079	:
Vanadium	mg/Kg	0.29	:	0.3	:	0.26	:	0.29	:	0.21	:	0.3	:
Zinc	mg/Kg	13.8	:	6.6	:	58.9	:	16.1	:	12.1	:	39.5	:
Laboratory Parameters													
Lipids, Percent	%	2.1	:	1.6	:	2.1	:	1.3	:	1.1	:	2.7	:
Solids, Percent	%	21	:	24.3	:	25.8	:	24.5	:	20.8	:	29	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	LR-16 27-Sep-2002 LR-16-T01N-BRT2-092702 Brown Trout Fillet	LR-16 27-Sep-2002 LR-16-T01N-RBT2-092702 Rainbow Trout Fillet	LR-16 27-Sep-2002 LR-16-T02N-BRT-092702 Brown Trout Whole Body - Smaller than 20 cm	LR-16 27-Sep-2002 LR-16-T02N-BRT-092702 Brown Trout Whole Body - Smaller than 20 cm	LR-16 27-Sep-2002 LR-16-T02N-RBT2-092702 Rainbow Trout Fillet	LR-16 27-Sep-2002 LR-16-T03N-BRT-092702 Brown Trout Whole Body - Smaller than 20 cm
Metals							
Aluminum	mg/Kg	19.8 J	10.4 J	31.8 J	31.8 J	6.5 J	37.4 J
Antimony	mg/Kg	0.17 :	0.17 :	0.15 :	0.15 :	0.16 :	0.16 :
Arsenic	mg/Kg	0.17 :	0.2 :	0.15 :	0.15 :	0.18 :	0.16 :
Barium	mg/Kg	0.65 :	0.56 :	1 :	1 :	0.51 :	1.5 :
Beryllium	mg/Kg	0.024 J	0.025 J	0.022 J	0.022 J	0.023 J	0.022 J
Boron	mg/Kg	0.38 :	0.4 :	0.36 :	0.36 :	0.36 :	0.36 :
Cadmium	mg/Kg	0.067 :	0.058 :	0.11 :	0.11 :	0.053 :	0.089 :
Calcium	mg/Kg	1010 :	464 :	11300 :	11300 :	544 :	8330 :
Chromium	mg/Kg	0.78 J	0.083 J	0.077 J	0.077 J	0.65 J	0.081 J
Cobalt	mg/Kg	0.27 :	0.28 :	0.35 :	0.35 :	0.26 :	0.47 :
Copper	mg/Kg	0.58 J	0.41 J	1.9 :	1.9 :	0.34 J	2.8 :
Iron	mg/Kg	48.4 J	17.8 J	61.7 J	61.7 J	17.6 J	70.4 J
Lead	mg/Kg	0.13 :	0.092 :	0.082 :	0.082 :	0.15 :	0.17 :
Magnesium	mg/Kg	291 :	293 :	398 :	398 :	272 :	372 :
Manganese	mg/Kg	3.1 :	0.53 :	16.1 :	16.1 :	0.79 :	14.3 :
Mercury	mg/Kg	0.015 :	0.049 :	0.015 :	0.015 :	0.018 :	0.015 :
Molybdenum	mg/Kg	0.33 :	0.34 :	0.31 :	0.31 :	0.31 :	0.3 :
Nickel	mg/Kg	0.62 :	0.26 :	0.23 :	0.23 :	0.9 :	0.28 :
Potassium	mg/Kg	3850 J	4290 J	3270 J	3270 J	4160 J	3340 J
Selenium	mg/Kg	0.17 J	0.22 J	0.45 J	0.45 J	0.16 J	0.32 J
Silver	mg/Kg	0.21 :	0.28 :	0.25 :	0.25 :	0.34 :	0.23 :
Sodium	mg/Kg	407 :	351 :	783 :	783 :	364 :	787 :
Thallium	mg/Kg	0.083 :	0.083 :	0.077 :	0.077 :	0.081 :	0.081 :
Vanadium	mg/Kg	0.3 :	0.32 :	0.33 :	0.33 :	0.29 :	0.28 :
Zinc	mg/Kg	18.6 :	10.4 :	60 :	60 :	6.9 :	50.8 :
Laboratory Parameters							
Lipids, Percent	%	1.2 :	0.4 :	3.1 :	3.1 :	1 :	4 :
Solids, Percent	%	24.7 :	22.3 :	27.1 :	27.1 :	21.2 :	28.7 :

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID	LR-16		LR-16		LR-8A		LR-8A		LR-8A		LR-8A	
		Sample Date	27-Sep-2002		27-Sep-2002		30-Sep-2002		30-Sep-2002		30-Sep-2002		30-Sep-2002	
		Sample ID	LR-16-T03N-BRT2-092702		LR-16-T03N-RBT2-092702		LR-8A-T01N-BRT-093002		LR-8A-T01N-BRT2-093002		LR-8A-T01N-RBT2-093002		LR-8A-T02N-BRT-093002	
		Fraction	Brown Trout Fillet		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Fillet		Rainbow Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm	
Metals														
Aluminum	mg/Kg		9	J	4	J	7.48	J	7.5	J	4.9	J	44.8	J
Antimony	mg/Kg		0.17	:	0.16	:	0.642	:	0.16	:	0.16	:	0.17	:
Arsenic	mg/Kg		0.17	:	0.22	:	10.76	:	0.16	:	0.19	:	0.17	:
Barium	mg/Kg		0.54	:	0.54	:	38.5	:	0.54	:	0.77	:	2.2	:
Beryllium	mg/Kg		0.024	J	0.024	J	3	:	0.024	J	0.017	:	0.017	:
Boron	mg/Kg		0.38	:	0.4	:	59.6	:	0.38	:	0.4	:	0.4	:
Cadmium	mg/Kg		0.061	:	0.056	:	6.8	:	0.066	:	0.031	:	0.084	:
Calcium	mg/Kg		1120	:	677	:	0.15	:	1280	:	1590	:	4800	:
Chromium	mg/Kg		1.9	:	0.081	J	0.15	:	0.35	J	0.53	:	0.64	:
Cobalt	mg/Kg		0.27	:	0.18	:	0.73	:	0.27	:	0.18	:	0.18	:
Copper	mg/Kg		0.5	J	0.33	J	0.016	:	0.48	J	0.48	:	2	:
Iron	mg/Kg		26.1	J	7.1	J	0.38	J	16.5	J	11	J	109	J
Lead	mg/Kg		0.088	:	0.14	:	0.12	:	0.18	:	0.092	:	0.19	:
Magnesium	mg/Kg		276	:	277	:	4210	:	276	:	270	:	324	:
Manganese	mg/Kg		3	:	0.29	:	0.82	:	2.7	:	1.7	:	4.7	:
Mercury	mg/Kg		0.015	:	0.026	J	0.17	:	0.015	:	0.016	:	0.014	:
Molybdenum	mg/Kg		0.33	:	0.33	:	2.8	:	0.33	:	0.098	:	0.32	:
Nickel	mg/Kg		1.4	:	0.25	:	23.7	:	0.39	:	1.1	:	1.1	:
Potassium	mg/Kg		3400	J	3790	J	0.087	J	3390	J	4240	J	3440	J
Selenium	mg/Kg		0.17	J	0.38	J	297	J	0.23	J	0.4	J	0.47	J
Silver	mg/Kg		0.23	:	0.15	J	1.6	:	0.22	:	0.12	:	0.12	:
Sodium	mg/Kg		323	:	433	:	0.016	:	395	:	542	:	848	:
Thallium	mg/Kg		0.084	:	0.081	:	0.15	:	0.081	:	0.081	:	0.083	:
Vanadium	mg/Kg		0.3	:	0.3	:	1.1	:	0.3	:	0.23	:	0.23	:
Zinc	mg/Kg		11.7	:	7.1	:	3520	:	16.3	:	18.4	:	39.3	:
Laboratory Parameters														
Lipids, Percent	%		1.7	:	2.8	:	73.5	:	1.7	:	0.3	:	4.9	:
Solids, Percent	%		19	:	23.6	:	95	:	43.5	:	83.1	:	15.5	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	LR-8A 30-Sep-2002 LR-8A-T02N-BRT2-093002 Brown Trout Fillet	LR-8A 30-Sep-2002 LR-8A-T02N-RBT2-093002 Rainbow Trout Fillet	LR-8A 30-Sep-2002 LR-8A-T03N-BRT-093002 Brown Trout Whole Body - Smaller than 20 cm	LR-8A 30-Sep-2002 LR-8A-T03N-BRT2-093002 Brown Trout Fillet	LR-8A 30-Sep-2002 LR-8A-T03N-RBT2-093002 Rainbow Trout Fillet	RR-11A1 3-Oct-2002 RR-11A1-T01N-BRT2-100302 Brown Trout Fillet
Metals							
Aluminum	mg/Kg	7.2 J	2.9 J	64.5 J	7.4 J	3.1 J	1.2 J
Antimony	mg/Kg	0.16 :	0.14 :	0.17 :	0.15 :	0.14 :	0.16 :
Arsenic	mg/Kg	0.16 :	0.21 :	0.17 :	0.15 :	0.16 :	0.16 :
Barium	mg/Kg	0.56 :	0.72 :	2.3 :	0.56 :	0.71 :	0.68 :
Beryllium	mg/Kg	0.025 J	0.016 :	0.015 :	0.025 J	0.015 :	0.015 :
Boron	mg/Kg	0.4 :	0.38 :	0.37 :	0.4 :	0.37 :	0.35 :
Cadmium	mg/Kg	0.058 :	0.023 :	0.1 :	0.058 :	0.023 :	0.022 :
Calcium	mg/Kg	895 :	2530 :	6370 :	554 :	1500 :	486 :
Chromium	mg/Kg	0.72 J	0.37 :	0.93 :	0.4 J	0.74 :	0.3 :
Cobalt	mg/Kg	0.28 :	0.17 :	0.49 :	0.28 :	0.17 :	0.16 :
Copper	mg/Kg	0.52 J	0.84 :	2.4 :	0.48 J	0.68 :	0.63 :
Iron	mg/Kg	12.6 J	9.9 J	136 J	17.8 J	8.4 J	11.8 J
Lead	mg/Kg	0.092 :	0.086 :	0.29 :	0.2 :	0.085 :	0.086 :
Magnesium	mg/Kg	304 :	326 :	352 :	293 :	293 :	282 :
Manganese	mg/Kg	1.4 :	1.8 :	24.5 :	0.97 :	1.3 :	0.31 :
Mercury	mg/Kg	0.023 :	0.03 :	0.016 :	0.027 :	0.039 :	0.018 :
Molybdenum	mg/Kg	0.34 :	0.1 :	0.18 :	0.34 :	0.15 :	0.12 :
Nickel	mg/Kg	0.3 :	1.1 :	1 :	0.62 :	1 :	0.99 :
Potassium	mg/Kg	3990 J	4110 J	3400 J	3840 J	3930 J	3960 J
Selenium	mg/Kg	0.16 J	0.32 J	0.54 J	0.51 J	0.41 J	0.74 J
Silver	mg/Kg	0.24 :	0.13 :	0.19 :	0.18 :	0.11 :	0.1 :
Sodium	mg/Kg	334 :	563 :	933 :	400 :	511 :	491 :
Thallium	mg/Kg	0.082 :	0.071 :	0.083 :	0.073 :	0.072 :	0.079 :
Vanadium	mg/Kg	0.32 :	0.22 :	0.22 :	0.32 :	0.22 :	0.21 :
Zinc	mg/Kg	11.7 :	9 :	47.7 :	13.1 :	10 :	8.5 :
Laboratory Parameters							
Lipids, Percent	%	1.7 :	0.3 :	3.2 :	1.7 :	0.7 :	0.8 :
Solids, Percent	%	79.1 :	38.5 :	41.8 :	22.6 :	59.6 :	22.5 :

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	RR-11A1 3-Oct-2002 RR-11A1-T02N-BRT2-100302 Brown Trout Fillet		RR-12 3-Oct-2002 RR-12-T01N-BRT2-100302 Brown Trout Fillet		RR-12 3-Oct-2002 RR-12-T01N-RBT2-100302 Rainbow Trout Fillet		RR-12 3-Oct-2002 RR-12-T02N-BRT2-100302 Brown Trout Fillet		RR-12 3-Oct-2002 RR-12-T02N-RBT2-100302 Rainbow Trout Fillet		RR-12 3-Oct-2002 RR-12-T03N-RBT2-100302 Rainbow Trout Fillet	
Metals													
Aluminum	mg/Kg	1.2	J	3.4	J	3.2	J	2.1	J	1.8	J	8	J
Antimony	mg/Kg	0.15	:	0.15	:	0.15	:	0.15	:	0.15	:	0.15	:
Arsenic	mg/Kg	0.15	:	0.15	:	0.3	:	0.15	:	0.2	:	0.3	:
Barium	mg/Kg	0.71	:	0.74	:	0.65	:	0.74	:	0.66	:	0.71	:
Beryllium	mg/Kg	0.015	:	0.016	:	0.014	:	0.016	:	0.014	:	0.015	:
Boron	mg/Kg	0.37	:	0.38	:	0.34	:	0.39	:	0.35	:	0.37	:
Cadmium	mg/Kg	0.023	:	0.035	:	0.021	:	0.024	:	0.022	:	0.023	:
Calcium	mg/Kg	1490	:	998	:	551	:	1020	:	2170	:	2000	:
Chromium	mg/Kg	0.18	:	0.32	:	0.14	:	0.14	:	0.19	:	0.17	:
Cobalt	mg/Kg	0.17	:	0.18	:	0.15	:	0.18	:	0.16	:	0.17	:
Copper	mg/Kg	0.41	:	2.9	:	2.6	:	2.8	:	2.6	:	2.9	:
Iron	mg/Kg	6.5	J	9.7	J	44.9	J	6.3	J	3.9	J	11.4	J
Lead	mg/Kg	0.092	:	0.17	:	0.15	:	0.18	:	0.16	:	0.1	:
Magnesium	mg/Kg	291	:	291	:	290	:	343	:	292	:	329	:
Manganese	mg/Kg	0.54	:	2	:	0.28	:	0.37	:	0.4	:	0.56	:
Mercury	mg/Kg	0.024	:	0.016	:	0.03	:	0.027	:	0.037	:	0.037	:
Molybdenum	mg/Kg	0.078	:	0.08	J	0.07	J	0.081	J	0.072	J	0.077	J
Nickel	mg/Kg	1	:	1.1	:	0.95	:	1.1	:	0.97	:	1	:
Potassium	mg/Kg	3880	J	3820	J	4040	J	4320	J	4060	J	3870	J
Selenium	mg/Kg	0.75	J	0.57	J	0.45	J	0.51	J	0.52	J	0.4	J
Silver	mg/Kg	0.11	:	0.11	J	0.099	J	0.11	J	0.1	J	0.11	J
Sodium	mg/Kg	506	:	480	:	414	:	469	:	527	:	547	:
Thallium	mg/Kg	0.075	:	0.075	:	0.077	:	0.077	:	0.077	:	0.075	:
Vanadium	mg/Kg	0.22	:	0.22	:	0.2	:	0.23	:	0.2	:	0.22	:
Zinc	mg/Kg	8.6	:	18.9	:	9	:	12.5	:	13.9	:	14	:
Laboratory Parameters													
Lipids, Percent	%	1.1	:	1.3	:	2.3	:	0.8	:	1	:	2.5	:
Solids, Percent	%	23.3	:	20.8	:	24	:	22.3	:	22.5	:	24.6	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID: RR-15 Sample Date: 1-Oct-2002 Sample ID: RR-15-T01N-BRT2-100102 Fraction: Brown Trout Fillet		Site ID: RR-15 Sample Date: 1-Oct-2002 Sample ID: RR-15-T01N-RBT2-100102 Fraction: Rainbow Trout Fillet		Site ID: RR-15 Sample Date: 1-Oct-2002 Sample ID: RR-15-T02N-BRT2-100102 Fraction: Brown Trout Fillet		Site ID: RR-20 Sample Date: 1-Oct-2002 Sample ID: RR-20-T01N-BRT-100102 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: RR-20 Sample Date: 1-Oct-2002 Sample ID: RR-20-T01N-BRT2-100102 Fraction: Brown Trout Fillet		Site ID: RR-20 Sample Date: 1-Oct-2002 Sample ID: RR-20-T01N-RBT2-100102 Fraction: Rainbow Trout Fillet	
Metals													
Aluminum	mg/Kg	6.7	J	1.7	J	10	J	21.2	J	5.7	J	1.3	J
Antimony	mg/Kg	0.17	:	0.15	:	0.16	:	0.15	:	0.15	:	0.16	:
Arsenic	mg/Kg	0.17	:	0.33	:	0.18	:	0.15	:	0.15	:	0.35	:
Barium	mg/Kg	0.71	:	0.75	:	0.72	:	0.91	:	0.71	:	0.74	:
Beryllium	mg/Kg	0.015	:	0.016	:	0.016	:	0.015	:	0.015	:	0.016	:
Boron	mg/Kg	0.37	:	0.39	:	0.38	:	0.44	:	0.37	:	0.39	:
Cadmium	mg/Kg	0.025	:	0.025	:	0.046	:	0.31	:	0.048	:	0.035	:
Calcium	mg/Kg	897	:	1670	:	1160	:	6220	:	1480	:	969	:
Chromium	mg/Kg	0.24	:	0.28	:	0.2	:	0.8	:	0.3	:	0.21	:
Cobalt	mg/Kg	0.17	:	0.18	:	0.17	:	0.24	:	0.17	:	0.18	:
Copper	mg/Kg	0.51	:	0.61	:	0.53	:	6.7	:	28.2	:	0.47	:
Iron	mg/Kg	9.3	J	7	J	13.5	J	46.1	J	10.4	J	4.5	J
Lead	mg/Kg	0.1	:	0.09	:	0.086	:	0.21	:	0.18	:	0.13	:
Magnesium	mg/Kg	267	:	287	:	301	:	325	:	275	:	239	:
Manganese	mg/Kg	1.1	:	0.51	:	1.9	:	13	:	3.7	:	0.26	:
Mercury	mg/Kg	0.016	:	0.037	:	0.015	:	0.016	:	0.016	:	0.027	:
Molybdenum	mg/Kg	0.085	:	0.18	:	0.15	:	0.1	J	0.077	J	0.14	:
Nickel	mg/Kg	1	:	1.1	:	1.1	:	1	:	1	:	1.1	:
Potassium	mg/Kg	3830	J	4240	J	4350	J	3200	J	3780	J	3560	J
Selenium	mg/Kg	0.58	J	0.39	J	0.89	J	0.89	J	0.51	J	0.63	J
Silver	mg/Kg	0.11	:	0.11	:	0.11	:	0.11	J	0.11	J	0.11	:
Sodium	mg/Kg	421	:	486	:	471	:	1090	:	568	:	421	:
Thallium	mg/Kg	0.083	:	0.077	:	0.081	:	0.073	:	0.073	:	0.078	:
Vanadium	mg/Kg	0.22	:	0.23	:	0.22	:	0.22	:	0.22	:	0.23	:
Zinc	mg/Kg	9.6	:	8.3	:	13.5	:	53.3	:	20.3	:	10.2	:
Laboratory Parameters													
Lipids, Percent	%	1.1	:	0.8	:	1.1	:	2.4	:	2.1	:	1.3	:
Solids, Percent	%	22	:	20.6	:	22.7	:	24.4	:	25.4	:	26.7	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		RR-20 / 1-Oct-2002 / RR-20-T02N-BRT-100102 / Brown Trout Whole Body - Smaller than 20 cm		RR-20 / 1-Oct-2002 / RR-20-T02N-BRT2-100102 / Brown Trout Fillet		RR-20 / 1-Oct-2002 / RR-20-T02N-RBT2-100102 / Rainbow Trout Fillet		RR-20 / 1-Oct-2002 / RR-20-T03N-BRT-100102 / Brown Trout Whole Body - Smaller than 20 cm		RR-20 / 1-Oct-2002 / RR-20-T03N-BRT2-100102 / Brown Trout Fillet		RR-20 / 1-Oct-2002 / RR-20-T03N-RBT2-100102 / Rainbow Trout Fillet	
Metals													
Aluminum	mg/Kg	44.2	J	3.7	J	5.5	J	22.1	J	2.4	J	2	J
Antimony	mg/Kg	0.16	:	0.16	:	0.16	:	0.14	:	0.14	:	0.17	:
Arsenic	mg/Kg	0.16	:	0.16	:	0.23	:	0.14	:	0.14	:	0.38	:
Barium	mg/Kg	2.5	:	0.63	:	0.72	:	0.77	:	0.59	:	0.71	:
Beryllium	mg/Kg	0.016	:	0.014	:	0.016	:	0.017	:	0.013	:	0.015	:
Boron	mg/Kg	0.38	:	0.33	:	0.38	:	0.4	:	0.31	:	0.37	:
Cadmium	mg/Kg	0.32	:	0.021	:	0.033	:	0.17	:	0.019	:	0.023	:
Calcium	mg/Kg	4260	:	1380	:	983	:	5550	:	1660	:	1870	:
Chromium	mg/Kg	0.84	:	0.18	:	0.21	:	0.72	:	0.16	:	0.25	:
Cobalt	mg/Kg	0.35	:	0.15	:	0.17	:	0.18	:	0.14	:	0.17	:
Copper	mg/Kg	7.7	:	2.5	:	0.78	:	6.1	:	2.6	:	0.51	:
Iron	mg/Kg	96.4	J	4.7	J	9.7	J	50.5	J	5.9	J	4.2	J
Lead	mg/Kg	0.44	:	0.14	:	0.1	:	0.23	:	0.12	:	0.085	:
Magnesium	mg/Kg	326	:	331	:	256	:	293	:	296	:	269	:
Manganese	mg/Kg	16.4	:	1.3	:	0.38	:	9	:	1.5	:	0.55	:
Mercury	mg/Kg	0.016	:	0.016	:	0.015	:	0.015	:	0.015	:	0.026	:
Molybdenum	mg/Kg	0.079	J	0.069	J	0.12	:	0.083	J	0.065	J	0.11	:
Nickel	mg/Kg	1.1	:	0.93	:	1.1	:	1.1	:	0.87	:	1	:
Potassium	mg/Kg	3070	J	3970	J	3770	J	3000	J	3900	J	3930	J
Selenium	mg/Kg	0.95	J	0.59	J	0.47	J	0.83	J	0.7	J	0.55	J
Silver	mg/Kg	0.11	J	0.097	J	0.11	:	0.12	J	0.09	J	0.11	:
Sodium	mg/Kg	986	:	476	:	465	:	875	:	497	:	456	:
Thallium	mg/Kg	0.081	:	0.079	:	0.081	:	0.069	:	0.068	:	0.083	:
Vanadium	mg/Kg	0.22	:	0.19	:	0.22	:	0.23	:	0.18	:	0.22	:
Zinc	mg/Kg	58.1	:	16.4	:	8.4	:	48.6	:	16.6	:	6.6	:
Laboratory Parameters													
Lipids, Percent	%	2.3	:	1.5	:	3.1	:	3.5	:	3.6	:	0.5	:
Solids, Percent	%	29.2	:	22.9	:	23.4	:	26.1	:	22.4	:	21.5	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID: RR-4		Site ID: RR-4		Site ID: RR-4		Site ID: RR-4		Site ID: RR-4		Site ID: RR-5	
		Sample Date: 2-Oct-2002		Sample Date: 2-Oct-2002		Sample Date: 2-Oct-2002		Sample Date: 2-Oct-2002		Sample Date: 2-Oct-2002		Sample Date: 3-Oct-2002	
		Sample ID: RR-4-T01N-BRT2-100202		Sample ID: RR-4-T01N-RBT2-100202		Sample ID: RR-4-T02N-BRT2-100202		Sample ID: RR-4-T02N-RBT2-100202		Sample ID: RR-4-T03N-RBT2-100202		Sample ID: RR-5-T01N-RBT2-100302	
		Fraction: Brown Trout Fillet		Fraction: Rainbow Trout Fillet		Fraction: Brown Trout Fillet		Fraction: Rainbow Trout Fillet		Fraction: Rainbow Trout Fillet		Fraction: Rainbow Trout Fillet	
Metals													
Aluminum	mg/Kg	1.2	J	1.1	J	1.9	J	1.1	J	1.9	J	1.2	J
Antimony	mg/Kg	0.16	:	0.13	:	0.13	:	0.16	:	0.13	:	0.15	:
Arsenic	mg/Kg	0.16	J	0.13	J	0.13	J	0.16	J	0.13	J	0.21	:
Barium	mg/Kg	0.71	:	0.65	:	0.72	:	0.62	:	0.69	:	0.66	:
Beryllium	mg/Kg	0.015	:	0.014	:	0.016	:	0.013	:	0.015	:	0.014	:
Boron	mg/Kg	0.37	:	0.34	:	0.38	:	0.32	:	0.36	:	0.34	:
Cadmium	mg/Kg	0.025	:	0.021	:	0.023	:	0.02	:	0.022	:	0.021	:
Calcium	mg/Kg	693	:	1010	:	1600	:	1760	:	820	:	1180	:
Chromium	mg/Kg	0.15	:	0.11	:	0.14	:	0.13	:	0.14	:	0.14	:
Cobalt	mg/Kg	0.17	:	0.16	:	0.17	:	0.15	:	0.16	:	0.16	:
Copper	mg/Kg	0.44	:	0.41	:	1	:	0.4	:	0.37	:	0.33	:
Iron	mg/Kg	5.5	J	3.7	J	9.9	J	5.3	J	4.1	J	4	J
Lead	mg/Kg	0.085	:	0.078	:	0.086	:	0.077	:	0.082	:	0.093	:
Magnesium	mg/Kg	297	:	266	:	304	:	290	:	276	:	280	:
Manganese	mg/Kg	0.34	:	0.27	:	2.9	:	0.47	:	0.31	:	0.28	:
Mercury	mg/Kg	0.021	:	0.03	:	0.018	:	0.026	:	0.048	:	0.04	:
Molybdenum	mg/Kg	0.12	:	0.074	J	0.13	:	0.07	J	0.075	J	0.074	:
Nickel	mg/Kg	1	:	0.96	:	1.1	:	0.91	:	1	:	0.96	:
Potassium	mg/Kg	3900	J	3980	J	3880	J	4120	J	4160	J	3760	J
Selenium	mg/Kg	1	J	0.67	J	0.85	J	0.46	J	0.58	J	0.29	J
Silver	mg/Kg	0.11	:	0.099	:	0.11	:	0.094	:	0.1	:	0.1	:
Sodium	mg/Kg	443	:	452	:	447	:	513	:	485	:	435	:
Thallium	mg/Kg	0.082	:	0.067	:	0.067	:	0.08	:	0.066	:	0.076	:
Vanadium	mg/Kg	0.22	:	0.2	:	0.22	:	0.19	:	0.21	:	0.2	:
Zinc	mg/Kg	6.5	:	6.5	:	11.5	:	10.1	:	9.5	:	10	:
Laboratory Parameters													
Lipids, Percent	%	0.4	:	1.1	:	0.8	:	0.2	:	0.6	:	2	:
Solids, Percent	%	21.3	:	20.1	:	21.4	:	17.6	:	19	:	24	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		RR-5 / 3-Oct-2002 / RR-5-T02N-RBT2-100302 / Rainbow Trout Fillet		RR-5 / 3-Oct-2002 / RR-5-T03N-RBT2-100302 / Rainbow Trout Fillet		RR-7 / 3-Oct-2002 / RR-7-T01N-RBT2-100302 / Rainbow Trout Fillet		UFL1 / 26-Sep-2002 / UFL1-T01N-BRT2-092602 / Brown Trout Fillet		UFL1 / 26-Sep-2002 / UFL1-T01N-RBT2-092602 / Rainbow Trout Fillet		UFL1 / 26-Sep-2002 / UFL1-T01N-WS1-092602 / Sucker Whole Body	
Metals													
Aluminum	mg/Kg	1.2	J	1.2	J	1.4	J	4	J	2.3	J	22.8	J
Antimony	mg/Kg	0.15	:	0.14	:	0.14	:	0.14	:	0.15	:	0.14	:
Arsenic	mg/Kg	0.17	:	0.21	:	0.14	:	0.37	:	0.27	:	0.34	:
Barium	mg/Kg	0.64	:	0.63	:	0.69	:	0.96	:	1	:	2	:
Beryllium	mg/Kg	0.014	:	0.014	:	0.015	:	0.015	:	0.015	:	0.015	:
Boron	mg/Kg	0.33	:	0.33	:	0.36	:	0.37	:	0.36	:	0.36	:
Cadmium	mg/Kg	0.021	:	0.021	:	0.023	:	0.023	:	0.022	:	0.027	:
Calcium	mg/Kg	1970	:	1040	:	1720	:	1060	:	892	:	7610	:
Chromium	mg/Kg	0.31	:	0.37	:	1.6	:	0.069	:	0.11	:	0.17	:
Cobalt	mg/Kg	0.15	:	0.15	:	0.17	:	0.17	:	0.16	:	0.16	:
Copper	mg/Kg	0.48	:	0.36	:	0.37	:	0.49	:	0.13	J	0.89	:
Iron	mg/Kg	8.1	J	6	J	22.9	J	7.4	J	10.2	J	81.4	J
Lead	mg/Kg	0.076	:	0.086	:	0.083	:	0.1	:	0.12	:	0.25	:
Magnesium	mg/Kg	302	:	280	:	291	:	273	:	310	:	371	:
Manganese	mg/Kg	0.72	:	0.28	:	0.51	:	0.51	:	0.61	:	5.9	:
Mercury	mg/Kg	0.025	:	0.061	:	0.031	:	0.017	J	0.038	:	0.015	J
Molybdenum	mg/Kg	0.069	:	0.084	:	0.14	:	0.09	:	0.096	:	0.084	:
Nickel	mg/Kg	0.94	:	0.92	:	1	:	1	:	1	:	1	:
Potassium	mg/Kg	4120	J	3680	J	3540	J	3850	J	4050	J	3250	J
Selenium	mg/Kg	0.22	J	0.26	J	0.23	J	1	J	0.24	J	0.62	J
Silver	mg/Kg	0.097	:	0.096	:	0.11	:	0.11	:	0.1	:	0.1	:
Sodium	mg/Kg	486	:	408	:	312	:	455	:	490	:	625	:
Thallium	mg/Kg	0.077	:	0.069	:	0.071	:	0.069	:	0.076	:	0.069	:
Vanadium	mg/Kg	0.19	:	0.19	:	0.21	:	0.22	:	0.21	:	0.21	:
Zinc	mg/Kg	7.8	:	6.4	:	8.5	:	8.5	:	6	:	21	:
Laboratory Parameters													
Lipids, Percent	%	0.2	:	1.9	:	1.4	:	3.6	:	2	:	1.7	:
Solids, Percent	%	19.2	:	24.9	:	23.2	:	25.7	:	23.6	:	22.4	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	UFL1 26-Sep-2002 UFL1-T02N-BRT2-092602 Brown Trout Fillet		UFL1 26-Sep-2002 UFL1-T02N-RBT2-092602 Rainbow Trout Fillet		UFL1 26-Sep-2002 UFL1-T02N-WS2-092602 Sucker Whole Body		UFL1 26-Sep-2002 UFL1-T03N-RBT2-092602 Rainbow Trout Fillet		UFL1 26-Sep-2002 UFL1-T03N-WS3-092602 Sucker Whole Body		Zwergle 2-Oct-2002 ZWERGEL-T01N-BRT-100202 Brown Trout Whole Body - Smaller than 20 cm	
Metals													
Aluminum	mg/Kg	1.2	J	1.3	J	30.1	J	1.2	J	8.7	J	41.4	J
Antimony	mg/Kg	0.15	:	0.14	:	0.15	:	0.15	:	0.15	:	0.16	:
Arsenic	mg/Kg	0.15	:	0.26	:	0.41	:	0.15	:	0.41	:	0.16	J
Barium	mg/Kg	0.69	:	0.74	:	2.4	:	0.66	:	2	:	1	:
Beryllium	mg/Kg	0.015	:	0.016	:	0.013	:	0.014	:	0.012	:	0.015	:
Boron	mg/Kg	0.36	:	0.38	:	0.32	:	0.35	:	0.29	:	0.36	:
Cadmium	mg/Kg	0.023	:	0.024	:	0.064	:	0.022	:	0.023	:	0.029	:
Calcium	mg/Kg	707	:	165	:	12300	:	377	:	10400	:	4440	:
Chromium	mg/Kg	0.29	:	0.4	:	0.18	:	0.2	:	0.099	:	0.56	:
Cobalt	mg/Kg	0.17	:	0.18	:	0.15	:	0.16	:	0.13	:	0.17	:
Copper	mg/Kg	0.26	J	0.14	J	1.4	:	0.13	J	0.82	:	1.3	:
Iron	mg/Kg	10.9	J	7.4	J	83.7	J	7.7	J	30.9	J	59.7	J
Lead	mg/Kg	0.11	:	0.2	:	0.39	:	0.079	:	0.2	:	0.083	:
Magnesium	mg/Kg	279	:	225	:	442	:	228	:	383	:	320	:
Manganese	mg/Kg	0.33	:	0.27	:	12.3	:	0.28	:	6.1	:	3.5	:
Mercury	mg/Kg	0.016	:	0.02	:	0.017	J	0.023	:	0.016	J	0.035	:
Molybdenum	mg/Kg	0.14	:	0.16	:	0.067	:	0.073	:	0.061	:	0.076	J
Nickel	mg/Kg	1	:	1.1	:	0.91	:	0.97	:	0.82	:	1	:
Potassium	mg/Kg	3810	J	3660	J	3030	J	3710	J	3090	J	3370	J
Selenium	mg/Kg	0.41	J	0.25	J	0.97	J	0.15	J	0.76	J	1.1	J
Silver	mg/Kg	0.11	:	0.11	:	0.094	:	0.1	:	0.085	:	0.11	:
Sodium	mg/Kg	594	:	462	:	649	:	389	:	727	:	839	:
Thallium	mg/Kg	0.075	:	0.072	:	0.076	:	0.077	:	0.074	:	0.079	:
Vanadium	mg/Kg	0.21	:	0.22	:	0.19	:	0.2	:	0.17	:	0.21	:
Zinc	mg/Kg	8.9	:	10.2	:	27.9	:	11.5	:	19.6	:	32.2	:
Laboratory Parameters													
Lipids, Percent	%	1.6	:	2.8	:	1.9	:	1.8	:	3.3	:	2.6	:
Solids, Percent	%	24.4	:	24.1	:	21.6	:	18.6	:	26	:	23.8	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		Zwergle 2-Oct-2002 ZWERGEL-T01N-BRT2-100202 Brown Trout Fillet		Zwergle 2-Oct-2002 ZWERGEL-T01N-RBT2 100202 Rainbow Trout Fillet		Zwergle 2-Oct-2002 ZWERGEL-T02N-BRT-100202 Brown Trout Whole Body - Smaller than 20 cm		Zwergle 2-Oct-2002 ZWERGEL-T02N-BRT2-100202 Brown Trout Fillet		Zwergle 2-Oct-2002 ZWERGEL-T02N-RBT2-100202 Rainbow Trout Fillet		Zwergle 2-Oct-2002 ZWERGEL-T03N-BRT-100202 Brown Trout Whole Body - Smaller than 20 cm	
Metals													
Aluminum	mg/Kg	1.8	J	1.4	J	16.7	J	1.2	J	1.6	J	11.8	J
Antimony	mg/Kg	0.16	:	0.15	:	0.12	:	0.16	:	0.14	:	0.14	:
Arsenic	mg/Kg	0.16	J	0.16	:	0.12	J	0.16	J	0.23	:	0.14	J
Barium	mg/Kg	0.69	:	0.73	:	0.69	:	0.71	:	0.65	:	0.71	:
Beryllium	mg/Kg	0.015	:	0.016	:	0.015	:	0.015	:	0.014	:	0.015	:
Boron	mg/Kg	0.36	:	0.38	:	0.36	:	0.37	:	0.34	:	0.37	:
Cadmium	mg/Kg	0.023	:	0.024	:	0.022	:	0.023	:	0.021	:	0.023	:
Calcium	mg/Kg	973	:	762	:	6930	:	1540	:	570	:	2740	:
Chromium	mg/Kg	0.15	:	0.41	:	0.26	:	0.25	:	0.23	:	0.43	:
Cobalt	mg/Kg	0.17	:	0.17	:	0.16	:	0.17	:	0.16	:	0.17	:
Copper	mg/Kg	0.47	:	0.62	:	1.5	:	0.5	:	0.61	:	0.83	:
Iron	mg/Kg	9.3	J	8.7	J	32.6	J	4.8	J	8.6	J	30	J
Lead	mg/Kg	0.083	:	0.12	:	0.082	:	0.085	:	0.078	:	0.085	:
Magnesium	mg/Kg	258	:	270	:	356	:	297	:	254	:	287	:
Manganese	mg/Kg	0.45	:	0.31	:	2.7	:	0.55	:	0.29	:	2.1	:
Mercury	mg/Kg	0.062	:	0.039	:	0.035	:	0.04	:	0.033	:	0.027	:
Molybdenum	mg/Kg	0.075	J	0.11	:	0.075	J	0.077	J	0.11	:	0.077	J
Nickel	mg/Kg	1	:	1.1	:	1	:	1	:	0.96	:	1	:
Potassium	mg/Kg	3770	J	3840	J	3430	J	3880	J	3680	J	3330	J
Selenium	mg/Kg	0.55	J	0.19	J	1.1	J	0.74	J	0.39	J	0.94	J
Silver	mg/Kg	0.11	:	0.11	:	0.1	:	0.11	:	0.099	:	0.11	:
Sodium	mg/Kg	570	:	466	:	875	:	486	:	530	:	765	:
Thallium	mg/Kg	0.079	:	0.076	:	0.062	:	0.08	:	0.07	:	0.072	:
Vanadium	mg/Kg	0.21	:	0.22	:	0.21	:	0.22	:	0.2	:	0.22	:
Zinc	mg/Kg	13.4	:	8.2	:	39.8	:	13.2	:	6.9	:	27.8	:
Laboratory Parameters													
Lipids, Percent	%	0.8	:	2.3	:	2.4	:	1.4	:	1.9	:	2.5	:
Solids, Percent	%	20.1	:	22.6	:	23.9	:	21.3	:	27.7	:	23.9	:

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID Sample Date Sample ID Fraction	Zwergle 2-Oct-2002 ZWERGEL-T03N-BRT2-100202 Brown Trout Fillet		Zwergle 2-Oct-2002 ZWERGEL-T03N-RBT2-100202 Rainbow Trout Fillet		CABRESTO 26-Sep-2003 CABRESTO-T01N-BRT-092603 Brown Trout Whole Body - Smaller than 20 cm		CABRESTO 26-Sep-2003 CABRESTO-T01N-BRT1-092603 Brown Trout Remains		CABRESTO 26-Sep-2003 CABRESTO-T01N-BRT2-092603 Brown Trout Fillet		CABRESTO 26-Sep-2003 CABRESTO-T02N-BRT-092603 Brown Trout Whole Body - Smaller than 20 cm	
Metals														
Aluminum	mg/Kg		1.1	J	1.3	J	2.3		33.4		3.1		4.1	
Antimony	mg/Kg		0.16		0.13		0.48		0.46		0.45		0.46	
Arsenic	mg/Kg		0.16	J	0.21		0.19		0.18		0.18		0.19	
Barium	mg/Kg		0.62		0.72		1		0.98		1		1	
Beryllium	mg/Kg		0.013		0.016		0.036		0.034		0.036		0.036	
Boron	mg/Kg		0.32		0.38		0.56		0.55		0.6		0.57	
Cadmium	mg/Kg		0.02		0.023		0.045		0.045		0.045		0.045	
Calcium	mg/Kg		539		269		5450		3340		2210		5190	
Chromium	mg/Kg		0.13		0.41		0.67		8		1.7		4.7	
Cobalt	mg/Kg		0.15		0.17		0.26		0.25		0.26		0.26	
Copper	mg/Kg		0.42		0.4		3		4.2		2.2		3	
Iron	mg/Kg		6	J	6.7	J	16.8		100	J	14.4		34.8	
Lead	mg/Kg		0.074		0.087		0.19		0.28		0.24		0.18	
Magnesium	mg/Kg		247		263		311		299		362		327	
Manganese	mg/Kg		0.24		0.2		1.2		3.3		0.78		1.5	
Mercury	mg/Kg		0.029		0.035		0.017		0.016		0.014		0.013	
Molybdenum	mg/Kg		0.067	J	0.086		0.14		0.38		0.2		0.37	
Nickel	mg/Kg		0.91		1.1		0.21		3.4		0.41		1.8	
Potassium	mg/Kg		3540	J	4110	J	3290	J	3210	J	4320	J	3140	J
Selenium	mg/Kg		0.75	J	0.4	J	0.34	J	0.79	J	0.45	J	0.62	J
Silver	mg/Kg		0.094		0.11		0.14	J	0.14		0.15	J	0.14	J
Sodium	mg/Kg		436		401		1020		986		667		961	
Thallium	mg/Kg		0.078		0.065		0.096		0.092		0.089		0.093	
Vanadium	mg/Kg		0.19		0.22		0.26		0.25		0.26		0.26	
Zinc	mg/Kg		20.6		6.6		42.5		38.6		17.6		42.3	
Laboratory Parameters														
Lipids, Percent	%		1.9		1.1		2.8		3.2		1.2		2.8	
Solids, Percent	%		23		22.5		25		24.6		22.2		24.1	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID Sample Date Sample ID Fraction	CABRESTO 26-Sep-2003 CABRESTO-T02N-BRT1-092603 Brown Trout Remains		CABRESTO 26-Sep-2003 CABRESTO-T02N-BRT2-092603 Brown Trout Fillet		CABRESTO 26-Sep-2003 CABRESTO-T03N-BRT-092603 Brown Trout Whole Body - Smaller than 20 cm		CABRESTO 26-Sep-2003 CABRESTO-T03N-BRT1-092603 Brown Trout Remains		CABRESTO 26-Sep-2003 CABRESTO-T03N-BRT2-092603 Brown Trout Fillet		ERL-1 2-Oct-2003 ERL1-T01N-WSA-100203 Sucker Whole Body	
Metals														
Aluminum	mg/Kg		45.3		2.7		5.9		9.8		2		63	
Antimony	mg/Kg		0.45		0.42		0.47		0.47		0.45		0.5	
Arsenic	mg/Kg		0.18		0.17		0.19		0.19		0.18		0.2	
Barium	mg/Kg		1		1.1		1		1.1		1		1.6	
Beryllium	mg/Kg		0.035		0.039		0.035		0.037		0.036		0.017	
Boron	mg/Kg		0.55		0.62		0.55		0.58		0.57		0.55	
Cadmium	mg/Kg		0.043		0.049		0.044		0.052		0.045		0.11	
Calcium	mg/Kg		6010		2220		3360		3890		1200		12100	
Chromium	mg/Kg		2		0.65		2.8		0.86		1.7		1.2	
Cobalt	mg/Kg		0.25		0.28		0.25		0.27		0.26		0.28	
Copper	mg/Kg		3		2.2		3.3		4.2		2.3		1.5	
Iron	mg/Kg		109		7.5		31.1		35.5		13.5		83	
Lead	mg/Kg		0.14		0.14		0.22		0.14		0.17		0.24	
Magnesium	mg/Kg		313		337		331		367		321		431	
Manganese	mg/Kg		4.4		0.65		1.2		2.4		0.52		20.7	
Mercury	mg/Kg		0.014		0.021		0.017		0.021		0.024		0.013	J
Molybdenum	mg/Kg		0.17		0.18		0.19		0.17		0.21		0.19	
Nickel	mg/Kg		0.64		0.24		0.91		0.22		0.41		0.54	
Potassium	mg/Kg		3100	J	4180	J	3770	J	3000	J	4280	J	2850	J
Selenium	mg/Kg		0.94	J	0.38	J	0.84	J	1.2	J	0.7	J	0.41	J
Silver	mg/Kg		0.14	J	0.16	J	0.14	J	0.15	J	0.14	J	0.37	
Sodium	mg/Kg		1090		583		994		1090		601		892	
Thallium	mg/Kg		0.091		0.084		0.094		0.093		0.09		0.1	
Vanadium	mg/Kg		0.25		0.28		0.25		0.27		0.26		0.2	
Zinc	mg/Kg		37.6		13.6		36.6		34.9		17.8		34.8	
Laboratory Parameters														
Lipids, Percent	%		4.4		2.1		3		3.6		1.3		3.6	
Solids, Percent	%		27		21.9		26.9		27.7		25		25.6	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction									
		ERL-1		ERL-1		ERL-1		ERL-1		ERL-1	
		2-Oct-2003		2-Oct-2003		2-Oct-2003		2-Oct-2003		2-Oct-2003	
		ERL1-T01N-WSJ-100203		ERL1-T02N-WSA-100203		ERL1-T02N-WSJ-100203		ERL1-T02N-WSY-100203		ERL1-T03N-WSA-100203	
		Sucker Whole Body		Sucker Whole Body		Sucker Whole Body		Sucker Whole Body		Sucker Whole Body	
Metals											
Aluminum	mg/Kg	155		79.2		106		206		180	
Antimony	mg/Kg	0.46		0.5		0.49		0.44		0.48	
Arsenic	mg/Kg	0.18		0.2		0.2		0.2		0.19	
Barium	mg/Kg	3		2.2		2.5		4.9		3.3	
Beryllium	mg/Kg	0.032		0.02		0.02		0.04		0.04	
Boron	mg/Kg	0.63		0.63		0.52		0.58		0.59	
Cadmium	mg/Kg	0.18		0.13		0.19		0.2		0.18	
Calcium	mg/Kg	9530		9490		9200		3920		11600	
Chromium	mg/Kg	8.1		2.9		0.65		3.6		0.45	
Cobalt	mg/Kg	0.32		0.32		0.26		0.3		0.29	
Copper	mg/Kg	2.8		1.6		2.5		4.1		2.4	
Iron	mg/Kg	212		144		138		341		194	
Lead	mg/Kg	0.8		0.66		0.6		1.2		0.81	
Magnesium	mg/Kg	433		384		402		312		420	
Manganese	mg/Kg	25.7		16.9		14		18.8		37.1	
Mercury	mg/Kg	0.014		0.016		0.016		0.017		0.013	
Molybdenum	mg/Kg	0.22		0.22		0.18	J	0.2	J	0.2	
Nickel	mg/Kg	4.3		0.91		0.47		2.6		0.95	
Potassium	mg/Kg	3110	J	2660	J	2990	J	2610	J	2570	J
Selenium	mg/Kg	0.3	J	0.32	J	0.48	J	0.42	J	0.34	J
Silver	mg/Kg	0.43		0.43		0.35		0.39		0.39	
Sodium	mg/Kg	845		724		957		708		763	
Thallium	mg/Kg	0.092		0.1		0.099		0.088		0.095	
Vanadium	mg/Kg	0.23		0.23		0.19		0.21		0.21	
Zinc	mg/Kg	34.2		24.2		33.8		35.9		36.8	
Laboratory Parameters											
Lipids, Percent	%	3.9		2.3		4.1		2.3		1.9	
Solids, Percent	%	25.4		24.8		24.2		19.1		25.2	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction															
		ERL-1		ERL-1		LR-1		LR-1		LR-1		LR-1					
		2-Oct-2003		2-Oct-2003		24-Sep-2003		24-Sep-2003		24-Sep-2003		24-Sep-2003					
		ERL1-T03N-WSJ-100203		ERL1-T03N-WSY-100203		LR-1-T01N-BRT-092403		LR-1-T01N-BRT1-092403		LR-1-T01N-BRT2-092403		LR-1-T02N-BRT-092403					
		Sucker Whole Body		Sucker Whole Body		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Remains		Brown Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm					
Metals																	
Aluminum	mg/Kg	35.8		325		16.4		17.9		1.8		8.9					
Antimony	mg/Kg	0.44		0.41		0.44		0.49		0.43		0.48					
Arsenic	mg/Kg	0.18		0.16		0.18		0.2		0.17		0.19					
Barium	mg/Kg	1.3		7.7		1.1		1.1		0.95		1.1					
Beryllium	mg/Kg	0.02		0.071		0.038		0.039		0.033		0.039					
Boron	mg/Kg	0.63		0.71		0.6		0.62		0.52		0.62					
Cadmium	mg/Kg	0.13		0.2		0.13		0.28		0.046		0.16					
Calcium	mg/Kg	7280		6110		5140		4580		1490		5050					
Chromium	mg/Kg	0.47		1.5		0.91		0.92		0.4		1					
Cobalt	mg/Kg	0.31		0.27		0.28		0.28		0.24		0.28					
Copper	mg/Kg	1.7		4.9		4.8		5.3		1.9		3.5					
Iron	mg/Kg	73.2		425		41.8		39.5		7.1		30.6					
Lead	mg/Kg	0.27		1.8		0.33		0.3		0.31		0.18					
Magnesium	mg/Kg	360		381		311		268		305		312					
Manganese	mg/Kg	9.4		30.1		5.5		12.5		3.7		4.1					
Mercury	mg/Kg	0.017		0.017	J	0.019		0.016		0.026		0.017					
Molybdenum	mg/Kg	0.22	J	0.28		0.17		0.26		0.091		0.11					
Nickel	mg/Kg	0.44		2		0.23		0.24		0.2		0.28					
Potassium	mg/Kg	3010	J	2690	J	3210	J	2890	J	3790	J	3330	J				
Selenium	mg/Kg	0.56	J	0.27	J	0.32	J	0.3	J	0.26	J	0.39	J				
Silver	mg/Kg	0.42		0.15		0.15		0.16		0.13		0.16					
Sodium	mg/Kg	825		816		987		945		519		945					
Thallium	mg/Kg	0.088		0.082		0.088		0.099		0.086		0.096					
Vanadium	mg/Kg	0.23		0.27		0.28		0.28		0.24		0.28					
Zinc	mg/Kg	21.5		50.5		41.7		47.6		17.5		40					
Laboratory Parameters																	
Lipids, Percent	%	2.1		2.6		3.3		3.4		1.6		3.3					
Solids, Percent	%	22.2		19.5		25.4		46.8		21.9		26.3					

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	LR-1 24-Sep-2003 LR-1-T02N-BRT1-092403 Brown Trout Remains	LR-1 24-Sep-2003 LR-1-T02N-BRT2-092403 Brown Trout Fillet	LR-1 24-Sep-2003 LR-1-T03N-BRT-092403 Brown Trout Whole Body - Smaller than 20 cm	LR-1 24-Sep-2003 LR-1-T03N-BRT1-092403 Brown Trout Remains	LR-1 24-Sep-2003 LR-1-T03N-BRT2-092403 Brown Trout Fillet	LR-16 23-Sep-2003 LR-16-T01N-BRT-092303 Brown Trout Whole Body - Smaller than 20 cm
Metals							
Aluminum	mg/Kg	5.3	2.2	27.2	18.4	2.1	13.4
Antimony	mg/Kg	0.47	0.43	0.49	0.49	0.48	0.46
Arsenic	mg/Kg	0.19	0.17	0.19	0.19	0.19	0.18
Barium	mg/Kg	1.2	1.1	1	1	1.1	1.5
Beryllium	mg/Kg	0.04	0.039	0.035	0.036	0.038	0.033
Boron	mg/Kg	0.63	0.62	0.55	0.57	0.61	0.52
Cadmium	mg/Kg	0.18	0.049	0.23	0.18	0.048	0.12
Calcium	mg/Kg	6620	2140	4840	7470	1450	5270
Chromium	mg/Kg	0.63	1	0.52	0.7	0.5	1.5
Cobalt	mg/Kg	0.29	0.28	0.3	0.26	0.28	0.24
Copper	mg/Kg	6.4	2.4	4.9	7.1	2.3	3.1
Iron	mg/Kg	21.4	10.7	39.2	40.6	8.2	38.5
Lead	mg/Kg	0.14	0.38	0.15	0.27	0.29	0.24
Magnesium	mg/Kg	316	345	327	323	328	313
Manganese	mg/Kg	8.7	2.3	13.8	8.9	1.5	15.6
Mercury	mg/Kg	0.021	0.015	0.018	0.016	0.013	0.021
Molybdenum	mg/Kg	0.22	0.15	0.16 J	0.1	0.11	0.09
Nickel	mg/Kg	0.24	0.24	0.3	0.22	0.23	0.2 J
Potassium	mg/Kg	3020 J	4080 J	3420 J	3070 J	3910 J	2970 J
Selenium	mg/Kg	0.28 J	0.26 J	0.29 J	0.32 J	0.36 J	0.62 J
Silver	mg/Kg	0.16	0.16	0.14	0.15	0.15	0.13 J
Sodium	mg/Kg	1190	610	1020	1180	600	898
Thallium	mg/Kg	0.094	0.086	0.097	0.097	0.095	0.092
Vanadium	mg/Kg	0.29	0.28	0.25	0.26	0.28	0.24
Zinc	mg/Kg	58.7	19.4	43.2	53.1	17.6	43.9
Laboratory Parameters							
Lipids, Percent	%	2.7	0.8	2.8	3.2	1.5	2
Solids, Percent	%	24.7	21.7	26.4	26.8	23.5	23.5

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		LR-16		LR-16		LR-16		LR-16		LR-16		LR-16	
		23-Sep-2003		23-Sep-2003		23-Sep-2003		23-Sep-2003		23-Sep-2003		23-Sep-2003	
		LR-16-T01N-BRT1-092303		LR-16-T01N-BRT2-092303		LR-16-T02N-BRT-092303		LR-16-T02N-BRT1-092303		LR-16-T02N-BRT2-092303		LR-16-T03N-BRT-092303	
		Brown Trout Remains		Brown Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Remains		Brown Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm	
Metals													
Aluminum	mg/Kg	7.1		2		53.4		11.1		2		35	
Antimony	mg/Kg	0.39		0.5		0.45		0.47		0.5		0.42	
Arsenic	mg/Kg	0.15		0.2		0.18		0.19		0.2		0.17	
Barium	mg/Kg	0.94		1		3.4		0.94		1.1		1.1	
Beryllium	mg/Kg	0.033		0.036		0.037		0.033		0.037		0.037	
Boron	mg/Kg	0.53		0.56		0.48		0.52		0.58		0.58	
Cadmium	mg/Kg	0.26		0.045		0.18		0.3		0.046		0.21	
Calcium	mg/Kg	9390		1570		7110		5780		2470		4480	J
Chromium	mg/Kg	1.1		1.2		2		1.5		1.4		1.5	
Cobalt	mg/Kg	0.32		0.26		0.79		0.36		0.27		0.42	
Copper	mg/Kg	5		0.47		3.4		5.7		0.43		2.8	
Iron	mg/Kg	30.7		9.8		222		35.9		10.9		77.4	
Lead	mg/Kg	0.17		0.19		0.4		0.28		0.14		0.2	
Magnesium	mg/Kg	383		308		365		327		300		326	
Manganese	mg/Kg	10.8		1.9		68		14.7		4.4		26.2	
Mercury	mg/Kg	0.017		0.038		0.044		0.02		0.025		0.019	
Molybdenum	mg/Kg	0.22		0.098		0.28		0.16		0.11		0.16	
Nickel	mg/Kg	0.2	J	0.21	J	1.6		0.2	J	0.22	J	0.5	J
Potassium	mg/Kg	2810	J	3860	J	3230	J	3060	J	3510	J	3100	J
Selenium	mg/Kg	0.51	J	0.3	J	0.4	J	0.4	J	0.3	J	0.93	J
Silver	mg/Kg	0.13	J	0.14	J	0.12	J	0.13	J	0.15	J	0.15	J
Sodium	mg/Kg	1250		601		1070		1210		658		972	
Thallium	mg/Kg	0.077		0.1		0.089		0.094		0.1		0.083	
Vanadium	mg/Kg	0.24		0.26		0.22		0.24		0.27		0.27	
Zinc	mg/Kg	58.1		13.2		58.2		44.2		21.3		53.3	J
Laboratory Parameters													
Lipids, Percent	%	2.1		0.6		1.9		1.7		0.8		2.7	
Solids, Percent	%	22		20		22.5		23.2		57.1		22.5	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	LR-16 23-Sep-2003 LR-16-T03N-BRT1-092303 Brown Trout Remains	LR-16 23-Sep-2003 LR-16-T03N-BRT2-092303 Brown Trout Fillet	LR-17S 22-Sep-2003 LR-17-T01N-BRT1-092203 Brown Trout Remains	LR-17S 22-Sep-2003 LR-17-T01N-BRT2-092203 Brown Trout Fillet	LR-17S 22-Sep-2003 LR-17-T01N-RBT1-092203 Brown Trout Remains	LR-17S 22-Sep-2003 LR-17-T01N-RBT2-092203 Rainbow Trout Fillet
Metals							
Aluminum	mg/Kg	7.8 :	2.7 :	8.6 :	2.1 :	33.3 :	1.8 :
Antimony	mg/Kg	0.45 :	0.5 :	0.49 :	0.47 :	0.49 :	0.47 :
Arsenic	mg/Kg	0.18 :	0.2 :	0.19 :	0.19 :	0.19 :	0.19 :
Barium	mg/Kg	0.88 :	1 :	1 :	1.1 :	2.1 :	0.94 :
Beryllium	mg/Kg	0.03 :	0.035 :	0.035 :	0.038 :	0.037 :	0.033 :
Boron	mg/Kg	0.48 :	0.55 :	0.56 :	0.61 :	0.59 :	0.52 :
Cadmium	mg/Kg	0.46 :	0.044 :	0.15 :	0.048 :	0.1 :	0.041 :
Calcium	mg/Kg	8440 :	1420 :	10400 :	724 :	7940 :	1170 :
Chromium	mg/Kg	1.1 :	1.3 :	0.9 :	0.34 :	1.3 :	0.19 :
Cobalt	mg/Kg	0.22 :	0.25 :	0.28 :	0.28 :	0.54 :	0.24 :
Copper	mg/Kg	13.5 :	0.58 :	4.3 :	2.2 :	4.8 :	1.9 :
Iron	mg/Kg	27.9 :	11.9 :	36.5 :	5.1 :	78.8 :	8.4 :
Lead	mg/Kg	0.24 :	0.17 :	0.27 :	0.25 :	0.35 :	0.2 :
Magnesium	mg/Kg	391 :	299 :	389 :	334 :	373 :	298 :
Manganese	mg/Kg	12.3 :	2.2 :	15.1 :	1.1 :	36.2 :	2.3 :
Mercury	mg/Kg	0.027 :	0.031 :	0.025 :	0.018 :	0.021 :	0.029 :
Molybdenum	mg/Kg	0.11 :	0.097 :	0.24 :	0.11 :	0.28 :	0.09 :
Nickel	mg/Kg	0.18 J	0.21 J	0.21 :	0.23 :	0.59 :	0.2 :
Potassium	mg/Kg	3090 J	3980 J	2750 J	3870 J	3010 J	3880 J
Selenium	mg/Kg	0.52 J	0.31 J	0.89 J	0.28 J	0.29 J	0.28 J
Silver	mg/Kg	0.12 J	0.14 J	0.14 :	0.15 :	0.15 :	0.13 :
Sodium	mg/Kg	1400 :	672 :	1040 :	548 :	1270 :	609 :
Thallium	mg/Kg	0.091 :	0.1 :	0.097 :	0.094 :	0.097 :	0.094 :
Vanadium	mg/Kg	0.22 :	0.25 :	0.26 :	0.28 :	0.27 :	0.24 :
Zinc	mg/Kg	66.6 :	25.5 :	53 :	10.6 :	56.3 :	9.8 :
Laboratory Parameters							
Lipids, Percent	%	2.2 :	1.3 :	5.9 :	1.5 :	1.5 :	0.5 :
Solids, Percent	%	24.6 :	16.4 :	27.9 :	23 :	22.6 :	20.9 :

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Fraction / Units	LR-17S 22-Sep-2003 LR-17-T02N-BRT1-092203 Brown Trout Remains	LR-17S 22-Sep-2003 LR-17-T02N-BRT2-092203 Brown Trout Fillet	LR-17S 22-Sep-2003 LR-17-T02N-RBT1-092203 Brown Trout Remains	LR-17S 22-Sep-2003 LR-17-T02N-RBT2-092203 Rainbow Trout Fillet	LR-17S 22-Sep-2003 LR-17-T03N-BRT1-092203 Brown Trout Remains	LR-17S 22-Sep-2003 LR-17-T03N-BRT2-092203 Brown Trout Fillet
Metals							
Aluminum	mg/Kg	21.1	2.1	56.9	1.9	30.5	1.9
Antimony	mg/Kg	0.44	0.43	0.46	0.48	0.49	0.42
Arsenic	mg/Kg	0.18	0.17	0.19	0.23	0.2	0.17
Barium	mg/Kg	1	1.1	3.1	1	0.93	0.97
Beryllium	mg/Kg	0.035	0.038	0.036	0.035	0.032	0.034
Boron	mg/Kg	0.56	0.61	0.57	0.55	0.51	0.53
Cadmium	mg/Kg	0.27	0.048	0.14	0.043	0.26	0.069
Calcium	mg/Kg	5250	835	10000	1230	5800	1750
Chromium	mg/Kg	0.83	0.46	1.7	0.54	2.6	0.24
Cobalt	mg/Kg	0.33	0.28	0.48	0.25	0.35	0.24
Copper	mg/Kg	14.5	2.2	7.9	1.9	9.5	1.6
Iron	mg/Kg	70.8	8.8	142	5.8	75.3	10.4
Lead	mg/Kg	0.3	0.13	0.38	0.16	0.24	0.12
Magnesium	mg/Kg	326	296	377	237	337	299
Manganese	mg/Kg	14.1	1.3	39.7	1.1	23.5	5.2
Mercury	mg/Kg	0.034	0.039	0.025	0.036	0.026	0.034
Molybdenum	mg/Kg	0.15	0.11	0.16	0.1	0.089	0.092
Nickel	mg/Kg	0.21	0.23	1.7	0.21	1.1	0.2
Potassium	mg/Kg	2520 J	3900 J	3120 J	3600 J	2640 J	3730 J
Selenium	mg/Kg	0.46 J	0.32 J	0.38 J	0.4 J	0.51 J	0.25 J
Silver	mg/Kg	0.14	0.15	0.14	0.14	0.13	0.13
Sodium	mg/Kg	1170	632	1640	636	1110	581
Thallium	mg/Kg	0.088	0.086	0.093	0.095	0.099	0.085
Vanadium	mg/Kg	0.35	0.28	0.26	0.25	0.34	0.24
Zinc	mg/Kg	62.4	13.5	63.8	15	58	20.1
Laboratory Parameters							
Lipids, Percent	%	2.4	1.6	0.4	0.1	3.9	1.2
Solids, Percent	%	25.3	21.5	20.5	23.2	26.4	21.2

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID Sample Date Sample ID Fraction	LR-17S 22-Sep-2003 LR-17-T03N-RBT1-092203 Brown Trout Remains	LR-17S 22-Sep-2003 LR-17-T03N-RBT2-092203 Rainbow Trout Fillet	LR-8A 24-Sep-2003 LR-8A-T01N-BRT-092403 Brown Trout Whole Body - Smaller than 20 cm	LR-8A 24-Sep-2003 LR-8A-T01N-BRT1-092403 Brown Trout Remains	LR-8A 24-Sep-2003 LR-8A-T01N-BRT2-092403 Brown Trout Fillet	LR-8A 24-Sep-2003 LR-8A-T02N-BRT-092403 Brown Trout Whole Body - Smaller than 20 cm
Metals								
Aluminum	mg/Kg		30.6	2	14.3	92.2	1.8	46.4
Antimony	mg/Kg		0.45	0.49	0.5	0.44	0.43	0.47
Arsenic	mg/Kg		0.2	0.25	0.2	0.18	0.17	0.19
Barium	mg/Kg		2	1.1	1	1.9	0.93	1.4
Beryllium	mg/Kg		0.032	0.037	0.035	0.051	0.032	0.04
Boron	mg/Kg		0.5	0.58	0.72	0.57	0.51	0.63
Cadmium	mg/Kg		0.063	0.046	0.17	0.18	0.04	0.2
Calcium	mg/Kg		6680	1650	4220	3910	1920	5860
Chromium	mg/Kg		8	14.5	0.56	5.6	2	1.4
Cobalt	mg/Kg		0.24	0.27	0.25	0.41	0.23	0.29
Copper	mg/Kg		4.8	2.1	3.8	7.2	2	5.1
Iron	mg/Kg		71.8	7.8	30.5	183	15	77
Lead	mg/Kg		0.25	0.13	0.3	1	0.14	0.41
Magnesium	mg/Kg		328	308	322	364	288	372
Manganese	mg/Kg		10.7	1.1	8.2	32.4	4.9	7.7
Mercury	mg/Kg		0.026	0.035	0.018	0.02	0.021	0.017
Molybdenum	mg/Kg		0.17	0.1	0.24	0.43 J	0.089 J	0.33
Nickel	mg/Kg		0.19	0.22	0.21 J	2.6	0.73	0.47 J
Potassium	mg/Kg		2890 J	4000 J	3300 J	2720 J	3650 J	3640 J
Selenium	mg/Kg		0.27 J	0.29 J	0.84 J	0.77 J	0.26 J	1.1 J
Silver	mg/Kg		0.13	0.15	0.14 J	0.14	0.13	0.16 J
Sodium	mg/Kg		1260	607	923	1090	593	1110
Thallium	mg/Kg		0.09	0.097	0.1	0.088	0.086	0.093
Vanadium	mg/Kg		0.23	0.27	0.25	0.29	0.23	0.29
Zinc	mg/Kg		49.1	10.4	43.9	44.6	16.7	69.8
Laboratory Parameters								
Lipids, Percent	%		3.1	1.1	3.1	3	1.6	4
Solids, Percent	%		28	20.4	27	28.7	24.6	26.7

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction															
		LR-8A		LR-8A		LR-8A		LR-8A		LR-8A		LR-8A		RR-11A1	
		24-Sep-2003		24-Sep-2003		24-Sep-2003		24-Sep-2003		24-Sep-2003		25-Sep-2003			
		LR-8A-T02N-BRT1-092403		LR-8A-T02N-BRT2-092403		LR-8A-T03N-BRT-092403		LR-8A-T03N-BRT1-092403		LR-8A-T03N-BRT2-092403		RR-11A1-T01N-BRT-092503			
		Brown Trout Remains		Brown Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Remains		Brown Trout Fillet		Brown Trout Whole Body - Smaller than 20 cm			
Metals															
Aluminum	mg/Kg	20.4		2		39.1		10.5		2.1		19.2			
Antimony	mg/Kg	0.41		0.41		0.5		0.45		0.47		0.4			
Arsenic	mg/Kg	0.16		0.16		0.2		0.18		0.19		0.16			
Barium	mg/Kg	1		1		1.1		1.1		1.1		0.96			
Beryllium	mg/Kg	0.035		0.035		0.034		0.037		0.039		0.033			
Boron	mg/Kg	0.56		0.56		0.53		0.58		0.59		0.53			
Cadmium	mg/Kg	0.18		0.044		0.19		0.057		0.047		0.13			
Calcium	mg/Kg	12700		1140		3860		2820	J	1600		6380			
Chromium	mg/Kg	1.1		0.76		3.4		0.99		0.64		0.56			
Cobalt	mg/Kg	0.26		0.26		0.29		0.27		0.27		0.4			
Copper	mg/Kg	7.1		2.1		4.3		5.5		2.2		2			
Iron	mg/Kg	51.6		12		89.4		32.3		7.9		36.9			
Lead	mg/Kg	0.12		0.12		0.28		0.14		0.21		0.22			
Magnesium	mg/Kg	482		272		316		285		333		346			
Manganese	mg/Kg	34		3.5		7.6		6.1		3.1		15.1			
Mercury	mg/Kg	0.014		0.019		0.02		0.015		0.017		0.017			
Molybdenum	mg/Kg	0.29	J	0.097	J	0.42		0.11		0.25	J	0.11			
Nickel	mg/Kg	0.21		0.21		1.5		0.23		0.23		0.2	J		
Potassium	mg/Kg	3290	J	3310	J	3290	J	3100	J	3840	J	3390	J		
Selenium	mg/Kg	0.71	J	0.24	J	0.76	J	0.43	J	0.28	J	0.53	J		
Silver	mg/Kg	0.14		0.14		0.13	J	0.15		0.15		0.13	J		
Sodium	mg/Kg	1380		570		969		1060		546		1040			
Thallium	mg/Kg	0.082		0.081		0.1		0.09		0.094		0.079			
Vanadium	mg/Kg	0.26		0.26		0.24		0.27		0.27		0.24			
Zinc	mg/Kg	76		21.2		51.4		37.1	J	16.7		48.7			
Laboratory Parameters															
Lipids, Percent	%	4		1.8		2.9		3.6		0.8		3.1			
Solids, Percent	%	28.6		24.1		26.1		24.8		23.1		22.4			

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction	RR-11A1 25-Sep-2003 RR-11A1-T02N-BRT-092503 Brown Trout Whole Body - Smaller than 20 cm	RR-11A1 25-Sep-2003 RR-11A1-T03N-BRT-092503 Brown Trout Whole Body - Smaller than 20 cm	RR-12 25-Sep-2003 RR-12-T01N-BRT-092503 Brown Trout Whole Body - Smaller than 20 cm	RR-12 25-Sep-2003 RR-12-T01N-BRT1-092503 Brown Trout Remains	RR-12 25-Sep-2003 RR-12-T02N-BRT2-092503 Brown Trout Fillet	RR-15 25-Sep-2003 RR-15-T01N-BRT-092503 Brown Trout Whole Body - Smaller than 20 cm
Metals								
Aluminum	mg/Kg		21.8	2.5	16.5	10.5	2.1	10.7
Antimony	mg/Kg		0.45	0.47	0.47	0.44	0.46	0.38
Arsenic	mg/Kg		0.18	0.19	0.19	0.18	0.19	0.15
Barium	mg/Kg		1.1	0.85	1	1.1	1.1	0.92
Beryllium	mg/Kg		0.034	0.03	0.036	0.039	0.038	0.032
Boron	mg/Kg		0.53	0.47	0.57	0.61	0.61	0.5
Cadmium	mg/Kg		0.16	0.086	0.29	0.17	0.048	0.19
Calcium	mg/Kg		4210	5130	2460	7160	1270	5030
Chromium	mg/Kg		0.54	0.45	1.5	13.8	13.8	1.1
Cobalt	mg/Kg		0.34	0.21	0.26	0.28	0.28	0.23
Copper	mg/Kg		2.5	1.9	4.4	3.8	2.3	1.8
Iron	mg/Kg		39.8	23.6	33.4	25.9	4	21.5
Lead	mg/Kg		0.26	0.1	0.26	0.2	0.2	0.15
Magnesium	mg/Kg		311	303	313	325	359	310
Manganese	mg/Kg		7.8	6.1	2.1	4	1.3	2.1
Mercury	mg/Kg		0.022	0.019	0.021	0.018	0.026	0.015
Molybdenum	mg/Kg		0.14	0.1	0.1	0.11	0.11	0.088
Nickel	mg/Kg		0.2 J	0.18 J	0.22	0.23	0.23	0.3
Potassium	mg/Kg		3330 J	3070 J	3360 J	2990 J	4230 J	3140 J
Selenium	mg/Kg		0.49 J	0.46 J	0.94 J	0.48 J	0.55 J	0.47 J
Silver	mg/Kg		0.13 J	0.12 J	0.15	0.16	0.15	0.13
Sodium	mg/Kg		955	931	982	1110	582	944
Thallium	mg/Kg		0.089	0.094	0.093	0.088	0.093	0.076
Vanadium	mg/Kg		0.24	0.21	0.26	0.28	0.28	0.23
Zinc	mg/Kg		38.7	40.3	42.3	46.1	13.9	43.4
Laboratory Parameters								
Lipids, Percent	%		3.4	2.9	3.9	3.7	1.2	3.2
Solids, Percent	%		25.5	25.8	23.5	25.7	20.4	27.6

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		RR-15 / 25-Sep-2003 / RR-15-T01N-BRT1-092503 / Brown Trout Remains		RR-15 / 25-Sep-2003 / RR-15-T01N-BRT2-092503 / Brown Trout Fillet		RR-15 / 25-Sep-2003 / RR-15-T02N-BRT1-092503 / Brown Trout Remains		RR-15 / 25-Sep-2003 / RR-15-T02N-BRT2-092503 / Brown Trout Fillet		RR-15 / 25-Sep-2003 / RR-15-T03N-BRT1-092503 / Brown Trout Remains		RR-15 / 25-Sep-2003 / RR-15-T03N-BRT2-092503 / Brown Trout Fillet	
Metals													
Aluminum	mg/Kg	42.8		2		11.2		2.1		11.8		2.2	
Antimony	mg/Kg	0.4		0.46		0.39		0.5		0.36		0.38	
Arsenic	mg/Kg	0.16		0.19		0.15		0.2		0.14		0.15	
Barium	mg/Kg	0.88		1.1		0.83		1.1		0.97		1.2	
Beryllium	mg/Kg	0.03		0.037		0.029		0.039		0.034		0.04	
Boron	mg/Kg	0.48		0.58		0.46		0.61		0.53		0.63	
Cadmium	mg/Kg	0.27		0.046		0.23		0.049		0.15		0.05	
Calcium	mg/Kg	3640		1310		3650		887		4300		1260	
Chromium	mg/Kg	1.8		1.2		4.6		0.93		0.72		0.22	
Cobalt	mg/Kg	0.22		0.27		0.21		0.28		0.25		0.29	
Copper	mg/Kg	6		0.49		7.7		0.61		6.2		0.88	
Iron	mg/Kg	43.9		11.1		46.6		11.7		26.9		5.3	
Lead	mg/Kg	0.13		0.18		0.19		0.14		0.31		0.14	
Magnesium	mg/Kg	288		333		282		297		298		300	
Manganese	mg/Kg	6.1		1.6		8.4		2.2		8.2		1.8	
Mercury	mg/Kg	0.016		0.016		0.017		0.016		0.017		0.016	
Molybdenum	mg/Kg	0.27		0.16		0.18		0.11		0.12		0.25	
Nickel	mg/Kg	0.69		0.33		1.9		0.23		0.2		0.24	
Potassium	mg/Kg	2950	J	3860	J	2770	J	3630	J	2820	J	3610	J
Selenium	mg/Kg	0.33	J	0.53	J	0.23	J	0.3	J	0.38	J	0.23	J
Silver	mg/Kg	0.12		0.15		0.12		0.16		0.14		0.16	
Sodium	mg/Kg	996		502		991		543		1030		535	
Thallium	mg/Kg	0.079		0.093		0.077		0.1		0.071		0.076	
Vanadium	mg/Kg	0.22		0.27		0.21		0.28		0.25		0.29	
Zinc	mg/Kg	51.3		12.3		43.7		17.5		41.3	J	11.5	
Laboratory Parameters													
Lipids, Percent	%	7.1		2.6		4.1		2.2		5.6		2.9	
Solids, Percent	%	29.4		24.9		25.7		31.6		28		25.2	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		RR-20		RR-20		RR-20		RR-20		RR-20		RR-20	
		25-Sep-2003		25-Sep-2003		25-Sep-2003		25-Sep-2003		25-Sep-2003		25-Sep-2003	
		RR-20-T01N-BRT1-092503		RR-20-T01N-BRT2-092503		RR-20-T02N-BRT1-092503		RR-20-T02N-BRT2-092503		RR-20-T03N-BRT1-092503		RR-20-T03N-BRT2-092503	
		Brown Trout Remains		Brown Trout Fillet		Brown Trout Remains		Brown Trout Fillet		Brown Trout Remains		Brown Trout Fillet	
Metals													
Aluminum	mg/Kg	2		2		2.5		2		25.2		6.9	J
Antimony	mg/Kg	0.47		0.39		0.38		0.41		0.42		0.49	
Arsenic	mg/Kg	0.19		0.15		0.15		0.16		0.17		0.2	
Barium	mg/Kg	1		1		0.94		1		0.9		2.7	
Beryllium	mg/Kg	0.036		0.036		0.033		0.036		0.031		0.032	
Boron	mg/Kg	0.56		0.57		0.51		0.57		0.49		0.5	
Cadmium	mg/Kg	0.26		0.045		0.25		0.045		0.43		0.051	
Calcium	mg/Kg	2440		2480		1520		1050		4580		14000	
Chromium	mg/Kg	0.97		1.7		1.9		0.22		2.6		11.7	
Cobalt	mg/Kg	0.26		0.26		0.24		0.26		0.28		0.26	
Copper	mg/Kg	6.1		0.76		3.6		0.71		9.3		1.1	
Iron	mg/Kg	20.5		15.1		30		7.9		53.6		65.6	
Lead	mg/Kg	0.12		0.18		0.22		0.13		0.27		0.11	
Magnesium	mg/Kg	266		317		261		303		313		481	
Manganese	mg/Kg	4.7		4.3		2.3		0.97		21.9		47.6	
Mercury	mg/Kg	0.017		0.016		0.016		0.016		0.017		0.025	
Molybdenum	mg/Kg	0.098		0.099		0.089		0.1		0.44		0.17	
Nickel	mg/Kg	0.22		0.5		0.66		0.22		1.2		4.9	
Potassium	mg/Kg	2470	J	3770	J	3210	J	3750	J	2660	J	3390	J
Selenium	mg/Kg	0.52	J	0.31	J	0.23	J	0.31	J	0.34	J	0.3	J
Silver	mg/Kg	0.14		0.14		0.13		0.15		0.12		0.13	
Sodium	mg/Kg	906		547		1080		595		1130		717	
Thallium	mg/Kg	0.094		0.077		0.076		0.081		0.083		0.099	
Vanadium	mg/Kg	0.26		0.26		0.24		0.26		0.23		0.23	
Zinc	mg/Kg	36.8		21		42.2		14.5		55.8		54.4	
Laboratory Parameters													
Lipids, Percent	%	4.7		2.2		3.1		2		3.1		1.3	
Solids, Percent	%	28.1		25.3		27.6		23.6		25.6		23.3	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Fraction											
		RR-4		RR-4		RR-4		RR-5		RR-5		RR-5	
		1-Oct-2003		1-Oct-2003		1-Oct-2003		1-Oct-2003		1-Oct-2003		1-Oct-2003	
		RR-4-T01N-BRT-100103		RR-4-T02N-BRT-100103		RR-4-T03N-BRT-100103		RR-5-T01N-BRT-100103		RR-5-T01N-BRT1-100103		RR-5-T01N-BRT2-100103	
		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Whole Body - Smaller than 20 cm		Brown Trout Remains		Brown Trout Fillet	
Metals													
Aluminum	mg/Kg	17.1		21.6		25.5		18.4		4.1		0.43	
Antimony	mg/Kg	0.46		0.46		0.49		0.4		0.49		0.17	
Arsenic	mg/Kg	0.18		0.19		0.19		0.16		0.2		1.2	
Barium	mg/Kg	1		2.5		3.2		0.97		1.1		0.02	
Beryllium	mg/Kg	0.035		0.036		0.035		0.017		0.019		0.63	
Boron	mg/Kg	0.56		0.57		0.55		0.53		0.62		0.13	
Cadmium	mg/Kg	0.19		0.25		0.37		0.21		0.12		916	
Calcium	mg/Kg	4760		3060		7160		4920		6350		1.6	
Chromium	mg/Kg	1.5		2.6		5.7		0.81		1.3		0.32	
Cobalt	mg/Kg	0.28		0.33		0.34		0.27		0.31		0.55	
Copper	mg/Kg	3.8		4.4		3.6		3.9		2.1		11.3	
Iron	mg/Kg	38.5		50.3		73.8		203		23.3		0.28	
Lead	mg/Kg	0.16		0.3		0.19		0.23		0.27		281	
Magnesium	mg/Kg	318		294		343		315		301		0.63	
Manganese	mg/Kg	5.1		7.5		7.4		4.2		2.4		0.017	
Mercury	mg/Kg	0.017		0.013		0.014		0.017		0.016		0.22	
Molybdenum	mg/Kg	0.097		0.21		0.29		0.18		0.21		0.45	
Nickel	mg/Kg	0.31	J	0.78	J	1.7		0.48		0.49		3690	J
Potassium	mg/Kg	3320	J	3480	J	3230	J	3260	J	2950	J	0.42	J
Selenium	mg/Kg	0.67	J	0.41	J	0.97	J	0.77	J	0.84	J	0.43	
Silver	mg/Kg	0.14		0.15		0.14		0.36		0.41		492	
Sodium	mg/Kg	970		965		919		822		1090		0.086	
Thallium	mg/Kg	0.092		0.093		0.097		0.08		0.099		0.23	
Vanadium	mg/Kg	0.26		0.26		0.25		0.19		0.22		7.3	
Zinc	mg/Kg	43.4		41.6		49.6		33.6		26.8		23	
Laboratory Parameters													
Lipids, Percent	%	2.5		2.3		2.9		7.2		4.1		23.4	
Solids, Percent	%	24.3		23.8		24.7		26.6		27.9		2.1	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID: RR-5 Sample Date: 1-Oct-2003 Sample ID: RR-5-T02N-BRT-100103 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: RR-5 Sample Date: 1-Oct-2003 Sample ID: RR-5-T02N-BRT1-100103 Fraction: Brown Trout Remains		Site ID: RR-5 Sample Date: 1-Oct-2003 Sample ID: RR-5-T02N-BRT2-100103 Fraction: Brown Trout Fillet		Site ID: RR-5 Sample Date: 1-Oct-2003 Sample ID: RR-5-T03N-BRT-100103 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: RR-8 Sample Date: 30-Sep-2003 Sample ID: RR-8-T01N-BRT-093003 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: RR-8 Sample Date: 30-Sep-2003 Sample ID: RR-8-T01N-BRT1-093003 Fraction: Brown Trout Remains	
Metals													
Aluminum	mg/Kg	10.4		24.3		39.7		0.45		6.2		5.3	
Antimony	mg/Kg	0.41		0.5		0.49		0.18		0.39		0.49	
Arsenic	mg/Kg	0.16		0.2		0.2		1.4		0.16		0.2	
Barium	mg/Kg	1.1		1.1		5.2		0.018		1		1	
Beryllium	mg/Kg	0.019		0.015		0.02		0.57		0.036		0.035	
Boron	mg/Kg	0.6		0.47		0.63		0.2		0.56		0.55	
Cadmium	mg/Kg	0.12		0.12		0.13		5360		0.084		0.086	
Calcium	mg/Kg	5660		5090		1050		0.52		5330		4910	
Chromium	mg/Kg	1		0.59		2.8		0.41		0.64		0.53	
Cobalt	mg/Kg	0.3		0.3		0.96		3.8		0.26		0.25	
Copper	mg/Kg	3.1		4		2.2		55.4		2.6		2.3	
Iron	mg/Kg	33.4		122		98.7		0.25		25.4		20.8	
Lead	mg/Kg	0.26		0.34		0.49		347		0.12		0.16	
Magnesium	mg/Kg	325		311		343		19.1		323		315	
Manganese	mg/Kg	4.2		8.7		75.2		0.017		6.3		3.2	
Mercury	mg/Kg	0.017		0.014		0.016		0.19		0.015	J	0.013	J
Molybdenum	mg/Kg	0.21		0.16		0.22		0.4		0.098		0.096	
Nickel	mg/Kg	0.42		0.33		2		3460	J	0.21	J	0.21	J
Potassium	mg/Kg	3390	J	3020	J	4120	J	0.77	J	3730	J	2630	J
Selenium	mg/Kg	0.62	J	0.75	J	0.53	J	0.38		0.37	J	0.75	J
Silver	mg/Kg	0.41		0.32		0.43		888		0.14		0.14	
Sodium	mg/Kg	907		861		411		0.091		968		921	
Thallium	mg/Kg	0.081		0.1		0.099		0.2		0.078		0.099	
Vanadium	mg/Kg	0.22		0.17		0.23		54.3		0.26		0.25	
Zinc	mg/Kg	42		40.3		15.9		10.5		36.7		31.8	
Laboratory Parameters													
Lipids, Percent	%	2.6		2.2		2.7		26		4.5		3	
Solids, Percent	%	27.2		27.6		26.7		23		27.4		29.6	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID	RR-8	RR-8	RR-8	RR-8	RR-8	RR-8
		Sample Date	30-Sep-2003	30-Sep-2003	30-Sep-2003	30-Sep-2003	30-Sep-2003	30-Sep-2003
		Sample ID	RR-8-T01N-BRT2-093003	RR-8-T01N-RBT1-093003	RR-8-T01N-RBT2-093003	RR-8-T02N-BRT-093003	RR-8-T02N-BRT1-093003	RR-8-T02N-BRT2-093003
		Fraction	Brown Trout Fillet	Rainbow Trout Remains	Rainbow Trout Fillet	Brown Trout Whole Body - Smaller than 20 cm	Brown Trout Remains	Brown Trout Fillet
Metals								
Aluminum	mg/Kg		1.9	51.6	1.9	1.9	8.3	2
Antimony	mg/Kg		0.44	0.48	0.42	0.5	0.37	0.47
Arsenic	mg/Kg		0.18	0.19	0.17	0.2	0.15	0.19
Barium	mg/Kg		0.99	1.5	0.97	1	1.1	1
Beryllium	mg/Kg		0.035	0.038	0.034	0.035	0.04	0.036
Boron	mg/Kg		0.54	0.6	0.53	0.55	0.62	0.57
Cadmium	mg/Kg		0.043	0.1	0.042	0.072	0.12	0.045
Calcium	mg/Kg		1130	3600 J	1300	3000	2560	1830
Chromium	mg/Kg		1.3	1.3	0.89	0.88	1	0.55
Cobalt	mg/Kg		0.25	0.46	0.24	0.25	0.29	0.26
Copper	mg/Kg		0.65	2.9	0.71	1.6	2.8	0.47
Iron	mg/Kg		9.7 J	97.2	9 J	15.6	23.3	4.8 J
Lead	mg/Kg		0.12	0.4	0.12	0.15	0.32	0.13
Magnesium	mg/Kg		216	277	288	277	275	321
Manganese	mg/Kg		1.3	28	2.1	2	1.8 U	0.8
Mercury	mg/Kg		0.021 J	0.015 J	0.014 J	0.013 J	0.016 J	0.017 J
Molybdenum	mg/Kg		0.095	0.17	0.092	0.096	0.11	0.1
Nickel	mg/Kg		0.21 J	0.5 J	0.2 J	0.21 J	0.24 J	0.22 J
Potassium	mg/Kg		2990 J	3090 J	3820 J	3370 J	3410 J	3980 J
Selenium	mg/Kg		0.3 J	0.37 J	0.45 J	0.78 J	0.71 J	0.42 J
Silver	mg/Kg		0.14	0.15	0.13	0.14	0.16	0.15
Sodium	mg/Kg		470	1320	665	889	1020	473
Thallium	mg/Kg		0.088	0.096	0.085	0.1	0.074	0.093
Vanadium	mg/Kg		0.25	0.28	0.24	0.25	0.29	0.26
Zinc	mg/Kg		12.8	28.8	11.7	31.6	38.9	13.6
Laboratory Parameters								
Lipids, Percent	%		1.9	1.8	0.9	5	6.3	2.6
Solids, Percent	%		23	24.1	21.6	27.9	27.4	23.8

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID: RR-8 Sample Date: 30-Sep-2003 Sample ID: RR-8-T03N-BRT-093003 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: RR-8 Sample Date: 30-Sep-2003 Sample ID: RR-8-T03N-BRT1-093003 RR-8-T03 Fraction: Brown Trout Remains		Site ID: RR-8 Sample Date: 30-Sep-2003 Sample ID: RR-8-T03N-BRT2-093003 Fraction: Brown Trout Fillet		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T01N-BRT1-100103 Fraction: Brown Trout Remains		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T01N-BRT2-100103 Fraction: Brown Trout Fillet		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T01N-WSA-100103 Fraction: Sucker Whole Body	
Metals													
Aluminum	mg/Kg	6.5		9.6		2		4.2		1.8		86	
Antimony	mg/Kg	0.43		0.45		0.4		0.44		0.43		0.41	
Arsenic	mg/Kg	0.17		0.18		0.16		0.18		0.17		0.16	
Barium	mg/Kg	1		1.1		1		0.97		0.94		5.5	
Beryllium	mg/Kg	0.035		0.035		0.036		0.034		0.033		0.029	
Boron	mg/Kg	0.55		0.55		0.57		0.53		0.52		0.46	
Cadmium	mg/Kg	0.091		0.13		0.045		0.043		0.041		0.04	
Calcium	mg/Kg	3390		4420		1490		3970		843		5830	
Chromium	mg/Kg	0.65		0.39		0.48		1.3		0.48		1.1	
Cobalt	mg/Kg	0.25		0.25		0.26		0.25		0.24		0.21	
Copper	mg/Kg	2.2		3.2		0.65		1.1		0.58		1.6	
Iron	mg/Kg	25.6		28.5		8.7	J	34.5		8.3		268	
Lead	mg/Kg	0.22		0.12		0.2		0.26		0.28		1.3	
Magnesium	mg/Kg	312		371		298		282		280		332	
Manganese	mg/Kg	3.4		4.8		0.8		1.3		0.4		7.7	
Mercury	mg/Kg	0.016	J	0.017	J	0.017	J	0.014	J	0.015		0.017	
Molybdenum	mg/Kg	0.15		0.097		0.1		0.093		0.11		0.25	
Nickel	mg/Kg	0.21	J	0.21	J	0.22	J	0.2	J	0.2	J	0.18	J
Potassium	mg/Kg	3580	J	3070	J	4000	J	3340	J	3950	J	2700	J
Selenium	mg/Kg	0.53	J	0.77	J	0.24	J	0.29	J	0.39	J	0.78	J
Silver	mg/Kg	0.14		0.14		0.15		0.14		0.13		0.12	
Sodium	mg/Kg	878		1040		670		1340		545		727	
Thallium	mg/Kg	0.086		0.09		0.08		0.088		0.086		0.082	
Vanadium	mg/Kg	0.25		0.25		0.26		0.25		0.24		0.21	
Zinc	mg/Kg	36.8		42		16.8		27.3	J	7.7		18.4	
Laboratory Parameters													
Lipids, Percent	%	4.6		3.8		1.8		3.1		2.1		8.6	
Solids, Percent	%	25.1		28.3		24.4		25.7		22.9		26.9	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T01N-WSJ-100103 Fraction: Sucker Whole Body		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T02N-BRT1-100103 Fraction: Brown Trout Remains		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T02N-BRT2-100103 Fraction: Brown Trout Fillet		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T02N-WSA-100103 Fraction: Sucker Whole Body		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T02N-WSJ-100103 Fraction: Sucker Whole Body		Site ID: UFL1 Sample Date: 1-Oct-2003 Sample ID: UFL1-T03N-BRT1-100103 Fraction: Brown Trout Remains	
Metals													
Aluminum	mg/Kg	2		3.8		2.1		52.4		76.1		2	
Antimony	mg/Kg	0.46		0.45		0.42		0.49		0.41		0.42	
Arsenic	mg/Kg	0.19		0.18		0.17		0.2		0.16		0.17	
Barium	mg/Kg	1		0.94		1.1		4.1		3.5		0.94	
Beryllium	mg/Kg	0.036		0.033		0.038		0.035		0.035		0.033	
Boron	mg/Kg	0.57		0.52		0.59		0.55		0.56		0.52	
Cadmium	mg/Kg	0.045		0.054		0.047		0.044		0.069		0.041	
Calcium	mg/Kg	5500		5220		1230		15500		8300		4150	
Chromium	mg/Kg	0.24	J	0.31	J	0.42	J	5.6		4.4		0.54	
Cobalt	mg/Kg	0.26		0.24		0.27		0.25		0.26		0.24	
Copper	mg/Kg	1.1		2.7		0.47		1.7		2.4		1.9	
Iron	mg/Kg	16.7		28.1		8.5		203		189		18.7	
Lead	mg/Kg	0.15		0.22		0.22		0.72		0.95		0.14	
Magnesium	mg/Kg	327		342		278		466		395		385	
Manganese	mg/Kg	5.5		1.3		0.36		8.8		29.8		1.3	
Mercury	mg/Kg	0.017		0.013		0.016		0.016		0.017		0.014	
Molybdenum	mg/Kg	0.1		0.13		0.1		0.29		0.18		0.09	
Nickel	mg/Kg	0.22	J	0.2	J	0.23	J	2.1		1.9		0.2	J
Potassium	mg/Kg	3090	J	3010	J	4050	J	2920	J	3260	J	2690	J
Selenium	mg/Kg	0.82	J	1.4	J	0.41	J	0.71	J	0.49	J	0.25	J
Silver	mg/Kg	0.15		0.13		0.15		0.14		0.14		0.13	
Sodium	mg/Kg	885		1140		564		791		974		989	
Thallium	mg/Kg	0.093		0.09		0.084		0.098		0.081		0.085	
Vanadium	mg/Kg	0.26		0.24		0.27		0.25		0.26		0.24	
Zinc	mg/Kg	26.8		26.7		10.1		22.8		28.9		29.9	
Laboratory Parameters													
Lipids, Percent	%	2.3		1.9		0.9		5		2		1.3	
Solids, Percent	%	21.6		26.3		22.3		24.7		21.1		25.2	

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID Sample Date Sample ID Fraction	UFL1 1-Oct-2003 UFL1-T03N-BRT2-100103 Brown Trout Fillet	UFL1 1-Oct-2003 UFL1-T03N-WSA-100103 Sucker Whole Body	UFL1 1-Oct-2003 UFL1-T03N-WSJ-100103 Sucker Whole Body	Zwergle 2-Oct-2003 ZWERGLE-T01N-BRT-100203 Brown Trout Whole Body - Smaller than 20 cm	Zwergle 2-Oct-2003 ZWERGLE-T01N-BRT1-100203 Brown Trout Remains	Zwergle 2-Oct-2003 ZWERGLE-T01N-BRT2-100203 Brown Trout Fillet
Metals								
Aluminum	mg/Kg		2.1	8.4	51.3	14.1	39.4	2.1
Antimony	mg/Kg		0.45	0.47	0.45	0.45	0.46	0.39
Arsenic	mg/Kg		0.18	0.19	0.18	0.18	0.19	0.16
Barium	mg/Kg		1.1	1.1	2.9	1.1	1.1	1.1
Beryllium	mg/Kg		0.037	0.031	0.036	0.038	0.038	0.038
Boron	mg/Kg		0.59	0.49	0.56	0.6	0.61	0.61
Cadmium	mg/Kg		0.047	0.039	0.045	0.048	0.048	0.048
Calcium	mg/Kg		429	8330	12500	3480	3920	997
Chromium	mg/Kg		0.49	1.9	4.3	3.4	11.3	0.47
Cobalt	mg/Kg		0.27	0.22	0.26	0.28	0.28	0.28
Copper	mg/Kg		0.4	1.1	1.5	0.79 J	2.6	0.5
Iron	mg/Kg		8	31.7	148	44.7	170 J	2.7 J
Lead	mg/Kg		0.13	0.24	0.74	0.47	0.4	0.46
Magnesium	mg/Kg		231	346	446	304	317	324
Manganese	mg/Kg		0.24	6.6	19.7	3.1	4.3	0.42 J
Mercury	mg/Kg		0.017	0.016	0.015	0.015 J	0.017 J	0.018 J
Molybdenum	mg/Kg		0.17	0.085	0.14	0.15	0.42	0.14
Nickel	mg/Kg		0.22 J	0.19 J	1.7	1.3 J	5.5	0.27
Potassium	mg/Kg		3700 J	2780 J	3120 J	3450 J	3420 J	4170 J
Selenium	mg/Kg		0.69 J	0.29 J	0.75 J	0.85 J	0.66 J	0.5 J
Silver	mg/Kg		0.15	0.12	0.14	0.15	0.15	0.15
Sodium	mg/Kg		529	752	988	883	1080	587
Thallium	mg/Kg		0.09	0.093	0.091	0.089	0.093	0.078
Vanadium	mg/Kg		0.27	0.22	0.26	0.28	0.28	0.28
Zinc	mg/Kg		10.3	28.9	27.4	35.9	37	12.5
Laboratory Parameters								
Lipids, Percent	%		0.8	5.5	2	3	2.8	1.9
Solids, Percent	%		19.4	23.8	21.4	23.7	25.7	21.8

J = Qualified as estimated during data validation

Appendix A-4b
Aquatic Biota - Fish Tissues
Validated Analytical Results

Parameter	Units	Site ID: Zwergle Sample Date: 2-Oct-2003 Sample ID: ZWERGLE-T02N-BRT-100203 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: Zwergle Sample Date: 2-Oct-2003 Sample ID: ZWERGLE-T02N-BRT1-100203 Fraction: Brown Trout Remains		Site ID: Zwergle Sample Date: 2-Oct-2003 Sample ID: ZWERGLE-T02N-BRT2-100203 Fraction: Brown Trout Fillet		Site ID: Zwergle Sample Date: 2-Oct-2003 Sample ID: ZWERGLE-T03N-BRT-100203 Fraction: Brown Trout Whole Body - Smaller than 20 cm		Site ID: Zwergle Sample Date: 2-Oct-2003 Sample ID: ZWERGLE-T03N-BRT1-100203 Fraction: Brown Trout Remains		Site ID: Zwergle Sample Date: 2-Oct-2003 Sample ID: ZWERGLE-T03N-BRT2-100203 Fraction: Brown Trout Fillet	
Metals													
Aluminum	mg/Kg	21.7		329		2		32		913		1.9	
Antimony	mg/Kg	0.41		0.49		0.44		0.39		0.43		0.46	
Arsenic	mg/Kg	0.17		0.19		0.18		0.16		0.36		0.18	
Barium	mg/Kg	1.1		4		1		0.99		8		0.97	
Beryllium	mg/Kg	0.037		0.033		0.035		0.033		0.058		0.034	
Boron	mg/Kg	0.58		0.51		0.56		0.52		0.61		0.53	
Cadmium	mg/Kg	0.046		0.041		0.044		0.041		0.053		0.042	
Calcium	mg/Kg	4120		4280		1730		3660		3520		1230	
Chromium	mg/Kg	3.2		60		0.4		4.6		117		0.7	
Cobalt	mg/Kg	0.27		0.73		0.26		0.24		1.8		0.25	
Copper	mg/Kg	0.95	J	4.1		0.38	J	1.1		7.9		0.28	J
Iron	mg/Kg	52.3		955		2.5	J	89.2		2540		2.4	J
Lead	mg/Kg	0.28		0.62		0.29		0.28		1.2		0.24	
Magnesium	mg/Kg	303		494		346		300		810		318	
Manganese	mg/Kg	3.4		29.2		0.56	J	6.4		86.8		0.65	J
Mercury	mg/Kg	0.016	J	0.017	J	0.016	J	0.017	J	0.015	J	0.017	J
Molybdenum	mg/Kg	0.17		2.1		0.097		0.3		3.7		0.17	
Nickel	mg/Kg	1.3	J	30.3	J	0.25	J	2.2	J	58.8	J	0.27	J
Potassium	mg/Kg	3380	J	3300	J	4370	J	3160	J	3060	J	4020	J
Selenium	mg/Kg	0.55	J	0.73	J	0.59	J	0.9	J	0.82	J	0.3	J
Silver	mg/Kg	0.15		0.13		0.14		0.13		0.16		0.14	
Sodium	mg/Kg	950		1000		539		834		904		513	
Thallium	mg/Kg	0.083		0.097		0.088		0.079		0.086		0.092	
Vanadium	mg/Kg	0.27		1.4		0.26		0.24		3.7		0.25	
Zinc	mg/Kg	41.6		37.8		12.1		32		35.3		15.2	
Laboratory Parameters													
Lipids, Percent	%	2		4.4		1.9		2.1		3		2.5	
Solids, Percent	%	24.9		27.1		22.6		23.2		31.6		23.6	

J = Qualified as estimated during data validation

APPENDIX A-4c
BENTHIC INVERTEBRATE POPULATION MONITORING RESULTS

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

CABRESTO CREEK
10/02/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**407**	**374**	**884**	**430**	**245**	**467**
Cultus sp.	140	163	233	58	151	149
Hesperoperla pacifica	35	35	93	58	35	51
Isoperla sp.	23	47		58	47	35
Megarcys signata		12				2
Sweltsa sp.	174	105	523	233	12	209
Zapada cinctipes	35	12	35	23		21
EPHEMEROPTERA	**1558**	**919**	**1698**	**1348**	**1199**	**1344**
Baetis bicaudatus				35	12	9
Baetis tricaudatus	558	372	465	314	547	451
Drunella doddsi	442	186	209	23	151	202
Drunella grandis			35	23	35	19
Epeorus sp.		12		23		7
Ephemerella infrequens	558	349	989	930	454	656
TRICHOPTERA	**2092**	**1477**	**3735**	**3174**	**2245**	**2546**
Arctopsyche grandis	35	23	58			23
Brachycentrus americanus	267	105	582	500	500	391
Chimarra sp.		23				5
Dolophilodes sp.	198	12		116	12	68
Glossosoma sp.	23	12	35		35	21
Glossosomatidae	23	12				7
Hydropsyche sp.	442	151	291	256	267	281
Hydroptila sp.	35					7
Lepidostoma sp.	209	58	233	209		142
Micrasema sp.	93	58	58	93	151	91
Ochrotrichia sp.	58					12
Oligophlebodes minutus	547	802	2245	1535	1210	1268
Rhyacophila brunnea gr.	81	35		116	70	60
Rhyacophila sibirica gr.	81	186	233	349		170
COLEOPTERA	**349**	**256**	**907**	**430**	**349**	**459**
Cleptelmis sp.				23		5
Heterlimnius corpulentus	326	256	814	384	244	405
Narpus concolor				23	70	19
Optioservus sp.	23		93		35	30
DIPTERA	**1639**	**664**	**2106**	**1627**	**1652**	**1537**
Antocha sp.	81	35	58	151	361	137
Ceratopogoninae	116	47	233	256	105	151
Cricotopus (N.) nostocicola	151	174	349	128	407	242
Diamesa sp.	35					7
Dicranota sp.	58		35	58	35	37
Eukiefferiella sp.	35		47	23	81	37
Micropsectra sp.	384	93	791	163		286
Neoplasta sp.	23	35		93	151	60
Orthocladius/Cricotopus sp.		35	81	35	349	100
Unid. Orthocladiinae				23		5
Pagastia sp.					23	5
Pericoma sp.	663	198	465	616	128	414
Protanyderus margrita		12				2
Rheotanytarsus sp.	35	35	47	58		35

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

CABRESTO CREEK
10/02/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Simulium sp.	58			23	12	19
TURBELLARIA	**35**	**12**	**58**			**21**
Girardia sp.	35	12	58			21
ANNELIDA						
OLIGOCHAETA	**23**					**5**
Nais sp.	23					5
HYDRACARINA	**46**	**24**	**58**	**93**		**45**
Lebertia sp.	23	12	58	35		26
Protzia sp.				35		7
Sperchon/Sperchonopsis	23	12		23		12

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ZWERGLE - UPSTREAM OF TOWN OF RED RIVER
10/02/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**732**	**234**	**187**	**1209**	**244**	**521**
Cultus sp.	58	12	12	93	12	37
Isoperla sp.				35	23	12
Nemouridae	23					5
Pteronarcella badia	151	47	12	81		58
Sweltsa sp.	349	116	151	907	186	342
Taenionema sp.		12		35		9
Zapada cinctipes	35					7
Zapada oregonensis gr.	116	47	12	58	23	51
EPHEMEROPTERA	**1976**	**1559**	**803**	**4478**	**1465**	**2055**
Acentrella insignificans	23	12	12			9
Baetis sp.		35				7
Baetis tricaudatus	616	547	233	756	186	468
Cinygmula sp.		35		58		19
Drunella doddsi	93	70	58	233	93	109
Drunella grandis	291	174	23	407	151	209
Epeorus deceptivus	81	58	35		23	39
Epeorus longimanus				116		23
Ephemerella infrequens	256	384	198	663	209	342
Paraleptophlebia sp.					12	2
Rhithrogena hageni	616	244	244	2245	791	828
TRICHOPTERA	**1255**	**898**	**385**	**1744**	**524**	**961**
Arctopsyche grandis	291	186	105	442	47	214
Brachycentrus americanus	372	105	93	349	47	193
Dolophilodes sp.				35		7
Glossosoma sp.		47	12	81	140	56
Glossosomatidae		47				9
Hydropsyche sp.	151	35	23	93	23	65
Lepidostoma sp.	23		12	35	23	19
Oligophlebodes minutus	267	198	58	500	221	249
Rhyacophila brunnea gr.	93	47	12	58		42
Rhyacophila rotunda gr.	23	12				7
Rhyacophila sibirica gr.	35	221	70	151	23	100
COLEOPTERA	**442**	**709**	**256**	**1082**	**407**	**579**
Heterlimnius corpulentus	407	709	256	1082	407	572
Optioservus sp.	35					7
DIPTERA	**1824**	**1014**	**606**	**1955**	**512**	**1182**
Antocha sp.	1012	547	326	1047	279	642
Ceratopogoninae	23					5
Conchapelopia/Thienemannimyia gr. sp.					12	2
Dicranota sp.	23					5
Dicrotendipes sp.		12				2
Eukiefferiella sp.	23	47	23	23		23
Hexatoma sp.		35		35		14
Micropsectra sp.	35	58	12	105	81	58
Microtendipes sp.			12			2
Orthocladius (Symposiocladius) sp.					12	2
Orthocladius/Cricotopus sp.	116	47		70		47

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ZWERGLE - UPSTREAM OF TOWN OF RED RIVER
10/02/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Unid. Orthocladiinae				47		9
Pagastia sp.	23			70		19
Pericoma sp.	488	221	209	465	116	300
Rheotanytarsus sp.	35	47	12	70	12	35
Simulium sp.	23					5
Tvetenia sp.	23		12	23		12
TURBELLARIA		**186**	**116**		**35**	**67**
Polycelis coronata		186	116		35	67
ANNELIDA						
OLIGOCHAETA		**117**	**70**	**58**	**12**	**51**
Enchytraeidae		12				2
Lumbriculidae			35	23		12
Nais sp.		81		35		23
Ophidonais serpentina		12	12			5
Rhynchelmis sp.		12	23			7
Unid. Immature Tubificidae w/ Capilliform Chaetae					12	2
HYDRACARINA	**163**	**198**	**139**	**500**	**174**	**235**
Lebertia sp.	140	186	116	500	174	223
Sperchon/Sperchonopsis	23	12	23			12

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-4 - JUNEBUG CAMPGROUND
10/02/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**12**			**5**
Sweltsa sp.	12		12			5
EPHEMEROPTERA	**267**	**221**	**105**	**152**	**488**	**246**
Baetis bicaudatus	23	23				9
Baetis tricaudatus	209	163	105	140	442	212
Drunella grandis	23	12				7
Rhithrogena hageni		23			23	9
Rhithrogena sp.	12			12	23	9
TRICHOPTERA	**93**	**94**	**23**	**59**	**175**	**88**
Arctopsyche grandis	12					2
Brachycentrus americanus	58	23			93	35
Glossosoma sp.		12				2
Hydropsyche sp.		12	23		12	9
Rhyacophila rotunda gr.		35			58	19
Rhyacophila sibirica gr.		12		12	12	7
Rhyacophila sp.	23			47		14
COLEOPTERA	**47**	**47**		**12**	**47**	**30**
Heterlimnius corpulentus		12			23	7
Narpus concolor		12		12	12	7
Optioservus sp.	47	23			12	16
DIPTERA	**47**	**47**	**46**	**24**	**198**	**72**
Antocha sp.	23	35	23	12	35	26
Hexatoma sp.					23	5
Micropsectra sp.	12					2
Neoplasta sp.			23		23	9
Orthocladius/Cricotopus sp.				12	35	9
Parametriocnemus sp.		12				2
Psilometriocnemus sp.					35	7
Simulium sp.	12				47	12
ANNELIDA						
OLIGOCHAETA			**35**			**7**
Enchytraeidae			23			5
Rhynchelmis sp.			12			2
HYDRACARINA	**70**	**23**				**19**
Lebertia sp.	70	23				19

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-5 - DS OF ELEPHANT ROCK CG, US OF HANSEN CR
10/03/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA			**12**		**59**	**14**
Pteronarcella badia			12		47	12
Sweltsa sp.					12	2
EPHEMEROPTERA	**291**	**198**	**128**	**197**	**698**	**303**
Baetis tricaudatus	233	140	128	116	442	212
Drunella grandis	23	58		81	233	79
Rhithrogena hageni	35				23	12
TRICHOPTERA	**152**	**35**	**35**		**443**	**131**
Arctopsyche grandis					12	2
Brachycentrus americanus	140	35	35		407	123
Glossosoma sp.					12	2
Hydropsyche sp.					12	2
Rhyacophila rotunda gr.	12					2
COLEOPTERA	**82**	**35**		**35**	**256**	**82**
Heterlimnius corpulentus	35	23		12	163	47
Narpus concolor	12					2
Optioservus divergens	35	12		23	93	33
DIPTERA	**118**	**58**	**118**	**81**	**700**	**212**
Antocha sp.	12	23	12		116	33
Atherix pachypus	12	12	12	23	58	23
Ceratopogoninae					12	2
Diamesa sp.	12		35		35	16
Dicranota sp.					12	2
Empididae					12	2
Heleniella sp.					12	2
Neoplasta sp.	47	23	35		209	63
Orthocladius/Cricotopus sp.	23		12	58	105	40
Pagastia sp.					35	7
Parametriocnemus sp.	12				35	9
Polypedilum sp.					12	2
Psilometriocnemus sp.					12	2
Rhabdomastix sp.					12	2
Simulium sp.			12			2
Tipula sp.					23	5
ANNELIDA						
OLIGOCHAETA	**430**	**23**	**93**	**175**	**1640**	**472**
Enchytraeidae	81		81	116	791	214
Ilyodrilus/Tubifex					116	23
Nais bretscheri	70	23		12	186	58
Nais sp.	267		12	47	547	175
Unid. Immature Tubificidae w/o Capilliform Chaetae	12					2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
RR-5 - DS OF ELEPHANT ROCK CG, US OF HANSEN CR
10/03/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA					**12**	**2**
Unid. Nematoda					12	2
HYDRACARINA	**47**	**23**	**12**	**59**	**82**	**44**
Hygrobates sp.				12		2
Lebertia sp.	47	23	12	47	70	40
Sperchon/Sperchonopsis					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-6 - DS OF HANSEN CR, US OF MILL
10/04/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA			NO	NO	**70**	**14**
Pteronarcella badia					70	14
EPHEMEROPTERA		**12**	BENTHIC	BENTHIC	**47**	**12**
Baetis tricaudatus		12			12	5
Drunella grandis					35	7
TRICHOPTERA	**12**				**58**	**14**
Brachycentrus americanus			MACROINVERTEBRATES	MACROINVERTEBRATES	58	12
Hydropsyche sp.	12					2
DIPTERA	**12**				**59**	**13**
Atherix pachypus					47	9
Eukiefferiella sp.					12	2
Psilometriocnemus sp.	12					2
			FOUND	FOUND		

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-7 - DS OF MINE BOUNDARY, US OF MILL
10/03/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**12**		**12**	**12**	**12**	**10**
Baetis tricaudatus	12		12	12	12	10
TRICHOPTERA	**23**	**12**	**12**	**12**		**12**
Brachycentrus americanus			12	12		5
Hydropsyche sp.	23	12				7
DIPTERA		**12**				**2**
Antocha sp.		12				2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-8 - DS OF MILL, US OF COLUMBINE CREEK
10/03/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**279**	**12**			**58**
Pteronarcella badia		279	12			58
EPHEMEROPTERA	**47**	**23**	**23**	**47**	**187**	**65**
Baetis tricaudatus	47	23	23	47	140	56
Drunella grandis					47	9
TRICHOPTERA	**116**	**175**	**290**	**547**	**837**	**392**
Brachycentrus americanus	35	128	81	186	81	102
Hydropsyche sp.	81	47	209	349	721	281
Rhyacophila rotunda gr.				12	35	9
COLEOPTERA	**12**	**12**	**12**		**12**	**9**
Heterlimnius corpulentus		12				2
Optioservus sp.	12		12		12	7
DIPTERA	**12**	**23**	**58**	**35**	**83**	**42**
Antocha sp.					12	2
Atherix pachypus	12		12		12	7
Eukiefferiella sp.				12	12	5
Neoplasta sp.			23	23	35	16
Pagastia sp.			23			5
Psilometriocnemus sp.		23				5
Simulium sp.					12	2
ANNELIDA						
OLIGOCHAETA		**12**	**81**	**93**	**186**	**74**
Enchytraeidae		12	81	93	174	72
Unid. Immature Tubificidae w/ Capilliform Chaetae					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-11A1 - DS OF CABIN SPRINGS AND COLUMBINE
10/03/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**					**2**
Pteronarcella badia	12					2
EPHEMEROPTERA	**186**	**93**	**82**	**58**	**221**	**127**
Baetis tricaudatus	174	93	70	58	221	123
Drunella grandis	12					2
Rhithrogena hageni			12			2
TRICHOPTERA	**256**	**117**	**187**	**222**	**535**	**262**
Arctopsyche grandis				12	12	5
Brachycentrus americanus	23	12	47	47	58	37
Hydropsyche sp.	221	105	128	163	465	216
Oligophlebodes minutus			12			2
Rhyacophila rotunda gr.	12					2
COLEOPTERA	**24**	**23**	**23**		**35**	**21**
Heterlimnius corpulentus	12					2
Narpus concolor			23		12	7
Optioservus sp.	12	23			23	12
DIPTERA	**24**		**71**	**24**	**36**	**30**
Atherix pachypus			35	12		9
Ceratopogoninae	12		12			5
Neoplasta sp.					12	2
Psilometriocnemus sp.				12	12	5
Rhabdomastix sp.			12			2
Simulium sp.	12		12		12	7
HYDRACARINA	**12**	**12**				**5**
Lebertia sp.	12	12				5

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-12 - GOATHILL CAMPGROUND
10/03/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**81**	**35**		**26**
Pteronarcella badia	12		81	35		26
EPHEMEROPTERA	**244**	**512**	**617**	**605**	**570**	**510**
Baetis sp.		23				5
Baetis tricaudatus	221	349	361	465	430	365
Drunella grandis		105	47	12	70	47
Rhithrogena hageni	23	35	209	128	70	93
TRICHOPTERA	**139**	**2710**	**117**	**361**	**907**	**846**
Arctopsyche grandis	23	12	12	12	93	30
Brachycentrus americanus	58	2407	35	198	244	588
Hydropsyche sp.	58	279	70	151	558	223
Rhyacophila rotunda gr.		12			12	5
COLEOPTERA	**58**	**128**	**58**		**24**	**54**
Heterlimnius corpulentus		12			12	5
Narpus concolor	35	35	23			19
Optioservus sp.	23	81	35		12	30
DIPTERA	**47**	**558**	**105**	**71**	**58**	**168**
Antocha sp.			12			2
Atherix pachypus	12	116	12	35	23	40
Eukiefferiella sp.					23	5
Neoplasta sp.		70	58	12		28
Orthocladius/Cricotopus sp.		70				14
Psilometriocnemus sp.	35	302	23	12		74
Simulium sp.				12	12	5
ANNELIDA						
OLIGOCHAETA			**12**	**12**		**4**
Enchytraeidae			12			2
Ophidonais serpentina				12		2
HYDARCARINA	**12**	**105**				**23**
Atractides sp.		12				2
Lebertia sp.	12	93				21

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-15 - UPSTREAM OF QUESTA RANGER STATION
10/01/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA				**12**		**2**
Pteronarcella badia				12		2
EPHEMEROPTERA	**210**	**81**	**93**	**209**	**221**	**163**
Baetis tricaudatus	198	81	81	174	209	149
Rhithrogena hageni	12		12	35		12
Rhithrogena sp.					12	2
TRICHOPTERA	**116**	**70**	**232**	**58**	**268**	**148**
Arctopsyche grandis			23		12	7
Brachycentrus americanus		23	81	23	105	46
Hydropsyche sp.	116	47	128	35	151	95
COLEOPTERA	**81**	**47**	**23**	**23**	**82**	**51**
Heterlimnius corpulentus					12	2
Narpus concolor	81	47	23	23	70	49
DIPTERA	**117**	**82**	**221**	**71**	**211**	**137**
Atherix pachypus					12	2
Chironomus sp.	12					2
Eukiefferiella sp.		12				2
Hexatoma sp.	12					2
Neoplasta sp.	58	58	93	12	70	58
Orthocladius/Cricotopus sp.	35		93	12	81	44
Phaenopsectra sp.					12	2
Protanyderus margarita		12	12			5
Psilometriocnemus sp.			23	47	12	16
Simulium sp.					12	2
Tvetenia sp.					12	2
HYDRACARINA	**12**				**23**	**7**
Lebertia sp.	12				23	7

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-20 - UPSTREAM OF HIGHWAY 522
10/01/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**582**	**710**	**1093**	**210**	**896**	**698**
Baetis tricaudatus	535	675	1058	198	861	665
Drunella grandis	47	35	35	12	35	33
TRICHOPTERA	**256**	**314**	**721**	**291**	**267**	**370**
Brachycentrus americanus	93	128	349	93	81	149
Hydropsyche sp.	163	163	349	198	174	209
Hydroptilidae		23				5
Lepidostoma sp.					12	2
Ochrotrichia sp.			23			5
COLEOPTERA	**58**	**116**	**198**	**104**	**82**	**111**
Heterlimnius corpulentus			12			2
Narpus concolor			12	23	12	9
Optioservus quadrimaculatus	58	116	174	81	70	100
DIPTERA	**153**	**151**	**397**	**117**	**338**	**229**
Antocha sp.			12			2
Atherix pachypus	70	58	151	12	128	84
Eukiefferiella sp.	47	35	93	35	93	61
Hexatoma sp.		23	12	12		9
Micropsectra sp.			35			7
Neoplasta sp.	12	23	35	23	47	28
Orthocladius/Cricotopus sp.	12	12	35		58	23
Pagastia sp.	12			23		7
Prosimulium sp.			12			2
Simuliidae			12			2
Simulium sp.					12	2
Thienemanniella sp.				12		2
ANNELIDA						
OLIGOCHAETA	**23**	**129**	**268**	**105**	**35**	**111**
Enchytraeidae		12	70			16
Nais sp.	23	105	198	105	35	93
Pristina sp.		12				2
HYDRACARINA	**94**	**12**	**47**	**35**		**37**
Atractides sp.	47					9
Lebertia sp.		12	47	35		19
Sperchon/Sperchonopsis	47					9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-1 - DOWNSTREAM OF HIGHWAY 522 AND QUESTA WWTP
10/01/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**117**	**129**	**82**	**58**	**245**	**127**
Isoperla sp.		12			12	5
Pteronarcella badia	47	105	35	23	198	82
Sweltsa sp.	70	12	47	35	35	40
EPHEMEROPTERA	**303**	**267**	**175**	**279**	**407**	**286**
Baetis tricaudatus	233	174	128	256	384	235
Drunella grandis	70	93	47	23	23	51
TRICHOPTERA	**7444**	**3561**	**1663**	**2525**	**2129**	**3463**
Arctopsyche grandis	23	12		12		9
Brachycentrus americanus	1210	442	395	140	233	484
Chimarra sp.	47					9
Culoptila sp.		12				2
Hydropsyche sp.	6141	3024	1256	2349	1861	2926
Hydroptilidae		12			12	5
Lepidostoma sp.	23	47		12	23	21
Leucotrichia sp.				12		2
Ochrotrichia sp.		12	12			5
COLEOPTERA	**675**	**582**	**477**	**326**	**361**	**483**
Heterlimnius corpulentus			12			2
Narpus concolor	47	12	23		35	23
Optioservus divergens	442	570	291	221	221	349
Optioservus quadrimaculatus	186		151	105	105	109
DIPTERA	**1929**	**1025**	**721**	**350**	**779**	**961**
Atherix pachypus	23	47	47		23	28
Ceratopogoninae	23	35			23	16
Clinocera sp.		12				2
Conchapelopia/Thienemannimyia gr. sp.		35	81	23		28
Dicranota sp.					12	2
Empididae		12				2
Eukiefferiella sp.	1244	465	395	198	500	560
Hexatoma sp.	93	12	58	47	35	49
Limnophora/Lispoides	23		12			7
Neoplasta sp.	70	35		12	12	26
Orthocladius/Cricotopus sp.	395	314	116	58	151	207
Pagastia sp.		23				5
Phaenopsectra sp.		23				5
Polypedilum sp.			12			2
Pseudochironomus sp.					23	5
Rheocricotopus sp.	58					12
Simulium sp.		12		12		5
ANNELIDA						
OLIGOCHAETA	**628**		**35**	**12**		**135**
Haplotaxis sp.	23					5
Nais sp.	605		35	12		130

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-1 - DOWNSTREAM OF HIGHWAY 522 AND QUESTA WWTP
10/01/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA		**12**				**2**
Unid. Nematoda		12				2
HYDRACARINA	**70**	**70**	**70**	**58**		**53**
Lebertia sp.		58	58	35		30
Sperchon/Sperchonopsis	70	12	12	23		23

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-8A - DOWNSTREAM OF NPDES OUTFALL 002
09/27/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**35**				**70**	**21**
Isoperla sp.	35				35	14
Sweltsa sp.					35	7
EPHEMEROPTERA	**384**		**232**	**232**	**581**	**286**
Baetis tricaudatus	233		151	116	465	193
Drunella grandis	151		81	116	116	93
TRICHOPTERA	**3988**	**4791**	**3769**	**4420**	**6046**	**4602**
Arctopsyche grandis					35	7
Brachycentrus americanus	2093	2756	2175	1745	3756	2505
Hydropsyche sp.	1396	1163	896	2093	1593	1428
Hydroptila sp.	35	35	81	35	81	53
Hydroptilidae	116	267		233	349	193
Lepidostoma sp.	81	151	384		81	139
Leucotrichia sp.		35				7
Ochrotrichia sp.	267	384	198	314	151	263
Oecetis avara/disjuncta			35			7
LEPIDOPTERA				**35**		**7**
Petrophila sp.				35		7
COLEOPTERA	**1744**	**2547**	**1593**	**2128**	**1815**	**1965**
Heterlimnius corpulentus					35	7
Narpus concolor		35		81	35	30
Optiosersvus quadrimaculatus	1477	2477	1163	1198		1263
Optioservus divergens	267		430	849	1745	658
Zaitzevia parvula		35				7
DIPTERA	**5338**	**3489**	**4687**	**3769**	**4313**	**4320**
Atherix pachypus				35		7
Ceratopogoninae	151		81	116		70
Clinocera sp.					35	7
Diamesa sp.	163		128	105		79
Eukiefferiella sp.	2593	1861	1989	2559	2512	2303
Hexatoma sp.	116		314	233	81	149
Limnophora/Lispoides	151			116	81	70
Metriocnemus sp.	163					33
Neoplasta sp.	35		35	81	81	46
Orthocladius/Cricotopus sp.	1931	1396	1849	419	1186	1356
Pagastia sp.					128	26
Polypedilum sp.		116	291		128	107
Rheotanytarsus sp.		116		105		44
Simulium sp.	35				81	23
TURBELLARIA	**3338**	**3605**	**2361**	**3140**	**4571**	**3403**
Girardia sp.	3338	3605	2361	3140	4571	3403

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Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-8A - DOWNSTREAM OF NPDES OUTFALL 002
09/27/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA		**430**	**198**			**125**
Ilyodrilus/Tubifex			35			7
Limnodrilus udekemianus			35			7
Nais bretscheri		116				23
Nais sp.		279	128			81
Pristina sp.		35				7
HYDRACARINA	**849**		**116**	**302**	**314**	**316**
Lebertia sp.	582		116	151	198	209
Sperchon/Sperchonopsis	267			151	116	107

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
LR-16 - UPSTREAM OF HATCHERY DIVERSION
09/26/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**93**	**35**	**116**		**116**	**71**
Claassenia sabulosa		12				2
Isoperla sp.	70		116			37
Pteronarcella badia	23	23			116	32
EPHEMEROPTERA	**70**	**186**		**174**	**116**	**109**
Baetis tricaudatus	70	174		174		84
Drunella grandis					116	23
Rhithrogena hageni		12				2
TRICHOPTERA	**5628**	**3548**	**19888**	**20353**	**21167**	**14117**
Brachycentrus americanus	233	105	233	2326	1047	789
Culoptila sp.	116	12		58		37
Hydropsyche sp.	2047	1733	12793	7967	11630	7234
Hydroptila sp.			1861	291	814	593
Hydroptilidae	1651	872	1047	3140	1628	1668
Lepidostoma sp.	23	58				16
Ochrotrichia sp.	1558	768	3954	6571	6048	3780
HEMIPTERA		**12**				**2**
Microvelia sp.		12				2
COLEOPTERA	**1930**	**1059**	**5350**	**4768**	**5466**	**3716**
Heterlimnius corpulentus		12			116	26
Narpus concolor			116	58		35
Optioservus divergens	465					93
Optioservus quadrimaculatus	1442	1035	5234	4710	5117	3508
Zaitzevia parvula	23	12			233	54
DIPTERA	**1094**	**920**	**12794**	**5583**	**8142**	**5706**
Atherix pachypus	70	70	349	291	465	249
Ceratopogoninae		12			116	26
Eukiefferiella sp.	628	477	9595	3454	5257	3882
Limnophora/Lispoides				174		35
Neoplasta sp.					116	23
Orthocladius/Cricotopus sp.	23	93			233	70
Unid. Orthocladiinae	70			140	233	89
Polypedilum sp.	23	70	384	140	454	214
Prosimulium sp.			698	291	233	244
Rheotanytarsus sp.	140	58	1151	570	686	521
Simulium sp.	140	105	233	465	349	258
Tipula sp.		12		58		14
Tvetenia sp.		23	384			81
TURBELLARIA	**605**	**128**	**1977**		**233**	**589**
Girardia sp.	605	128	1977		233	589

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Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
LR-16 - UPSTREAM OF HATCHERY DIVERSION
09/26/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA		23				5
Nais sp.		23				5
HYDRACARINA	**23**	**12**		**523**	**232**	**158**
Lebertia sp.	23			58	116	39
Sperchon/Sperchonopsis		12		465	116	119

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Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
UFL1 - UPPER FAWN LAKE- EDGE
09/25/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
COLLEMBOLA		**1335**	**258**	**43**		**327**
Podura aquatica		1335	258	43		327
EPHEMEROPTERA	**129**	**603**	**1335**	**1636**	**4693**	**1679**
Callibaetis sp.	129	560	1335	1636	4650	1662
Leptophlebiidae		43			43	17
TRICHOPTERA		**43**	**172**	**86**	**172**	**95**
Agraylea sp.		43	172	43	86	69
Oecetis avara/disjuncta				43	86	26
ODONATA		**43**	**43**			**18**
Coenagrionidae			43			9
Sympetrum corruptum		43				9
COLEOPTERA				**431**		**87**
Haliplus sp.				388		78
Optioservus sp.				43		9
DIPTERA	**46032**	**9344**	**1980**	**4778**	**4348**	**13299**
Ablabesmyia sp.				43		9
Ceratopogoninae	1292	2024	1249	3918	3789	2454
Chironomus sp.			43			9
Corynoneura sp.				86		17
Cricotopus sp.	1464	1206	86	86	86	586
Dicrotendipes sp.	42716	4650	86	215	301	9594
Eukiefferiella sp.				43		9
Limnophora/Lispoides	560					112
Orthocladius/Cricotopus sp.				129		26
Paratanytarsus sp.		1464	344	129	86	405
Pseudochironomus sp.			172		86	52
Tanytarsus sp.				129		26
ANNELIDA						
OLIGOCHAETA			**1464**			**293**
Nais sp.			1464			293
HIRUDINEA		**172**			**129**	**60**
Erpobdella punctata		172			129	60
CRUSTACEA						
ISOPODA		**43**		**301**	**86**	**86**
Caecidotea sp.		43		301	86	86

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Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

UFL1 - UPPER FAWN LAKE- EDGE
09/25/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
AMPHIPODA	**4478**	**689**	**2454**	**861**	**775**	**1852**
Gammarus lacustris	2885	258	43	43		646
Hyalella azteca	1593	431	2411	818	775	1206
HYDRACARINA		**43**	**43**			**18**
Aturus/Kongsbergia		43				9
Unionicola sp.			43			9
MOLLUSCA						
GASTROPODA	**129**	**129**		**215**	**129**	**120**
Menetus sp.				172	129	60
Stagnicola sp.	129	129		43		60

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: UFL1 - UPPER FAWN LAKE- MIDLAKE
SAMPLED: 9/25/2002

TAXA	COMPOSITE
INSECTA	
DIPTERA	**3022**
Chironomus sp.	3022
ANNELIDA	
OLIGOCHAETA	**439**
Ilyodrilus/Tubifex	69
Limnodrilus sp.	112
Unid. Immature Tubificidae w/ Capilliform Chaetae	43
Unid. Immature Tubificidae w/o Capilliform Chaetae	215

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: ERL1 - EAGLE ROCK LAKE-EDGE
SAMPLED: 9/25/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
HEMIPTERA	**215**		**129**			**69**
Corixidae	86		43			26
Sigara sp.	86		86			34
Trichocorixa sp.	43					9
DIPTERA	**129**	**559**	**129**	**1335**	**129**	**461**
Apedilum sp.		43		86		26
Ceratopogoninae		43				9
Chironomus sp.			43			9
Cladopelma sp.	43					9
Cricotopus sp.				43		9
Cryptochironomus sp.		43				9
Eukiefferiella sp.			43			9
Gonomyia sp.		129		560	129	164
Limnophyes sp.				43		9
Microchironomus sp.		43				9
Orthocladius/Cricotopus sp.	43	215	43	517		164
Unid. Orthocladiinae		43				9
Phaenopsectra sp.	43			43		17
Smittia sp.				43		9
ANNELIDA						
OLIGOCHAETA	**689**	**387**	**43**	**990**	**1076**	**637**
Enchytraeidae	689	301		990	1033	603
Lumbriculidae		86	43		43	34
CRUSTACEA						
			86			**17**
ISOPODA						
Caecidotea sp.			86			17
AMPHIPODA			**43**			**9**
Hyalella azteca			43			9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: ERL1 - EAGLE ROCK LAKE-MIDLAKE
SAMPLED: 9/25/2002

TAXA	COMPOSITE
INSECTA	
EPHEMEROPTERA	**34**
Baetidae	34
DIPTERA	**3393**
Ceratopogoninae	52
Chironomus sp.	3341
ANNELIDA	
OLIGOCHAETA	**9**
Ilyodrilus/Tubifex	9
NEMATODA	**9**
Unid. Nematoda	9
CRUSTACEA	
AMPHIPODA	**34**
Hyalella azteca	34
HYDRACARINA	**9**
Hygrobates sp.	9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SW12-9 - TAILINGS POND, NW CORNER- EDGE
09/26/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
ODONATA			**43**			**9**
Coenagrionidae			43			9
DIPTERA	**387**	**258**	**86**	**215**	**258**	**242**
Ceratopogoninae				43		9
Nimbocera sp.				86	43	26
Orthocladius/Cricotopus sp.	43					9
Pseudochironomus sp.	344	258	43	86	215	189
Pseudosmittia sp.			43			9
ANNELIDA						
OLIGOCHAETA			**43**	**1464**	**301**	**362**
Ilyodrilus/Tubifex				301	129	86
Unid. Immature Tubificidae w/ Capilliform Chaetae			43	1163	172	276
MOLLUSCA						
GASTROPODA			**86**	**86**		**34**
Physa/Physella			86	86		34

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SW12-9 - TAILINGS POND
NW CORNER- MIDLAKE
SAMPLED: 09/26/02

TAXA	COMPOSITE
INSECTA	
ODONATA	**17**
Coenagrion/Enallagma	17
COLEOPTERA	**26**
Haliplus sp.	26
DIPTERA	**52**
Chironomus sp.	52

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SW12-10 - TAILINGS POND, SE CORNER-EDGE
09/26/02

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
DIPTERA	**430**	**645**	**86**	**516**	**1162**	**570**
Apedilum sp.	86	129		86	172	95
Ceratopogoninae		43				9
Cladotanytarsus sp.	301	344	86	258	646	327
Cricotopus sp.				43		9
Cryptochironomus sp.		43				9
Dolichopodidae				86		17
Eukiefferiella sp.				43		9
Orthocladius/Cricotopus sp.	43					9
Phaenopsectra sp.					43	9
Pseudochironomus sp.		86			301	77
TURBELLARIA					**43**	**9**
Girardia sp.					43	9
ANNELIDA						
OLIGOCHAETA	**86**			**689**	**43**	**164**
Enchytraeidae	86			689	43	164
MOLLUSCA						
GASTROPODA		**43**		**43**		**17**
Physa/Physella		43		43		17

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

**SW12-10 - TAILINGS POND,
SE CORNER- MIDLAKE
SAMPLED: 09/26/02**

TAXA	COMPOSITE
INSECTA	
ODONATA	**18**
Coenagrionidae	9
Libellulidae	9
COLEOPTERA	**138**
Haliplus sp.	138
DIPTERA	**1257**
Ceratopogoninae	9
Chironomus sp.	491
Procladius sp.	86
Psectrocladius sp.	86
Pseudochironomus sp.	585
TURBELLARIA	**17**
Girardia sp.	17
NEMATODA	**26**
Unid. Nematoda	26
MOLLUSCA	
GASTROPODA	**17**
Physa/Physella	17

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

CABRESTO CREEK
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**523**	**569**	**966**	**291**	**605**	**589**
Baetis bicaudatus		23	35	23		16
Baetis tricaudatus	244	209	512	93	209	253
Cinygmula sp.	23	23	23			14
Drunella doddsi	23	23	35	12	47	28
Drunella grandis	12		23	12		9
Epeorus longimanus	93	47	47	70	93	70
Ephemerella infrequens	116	244	279	81	256	195
Fallceon quilleri	12					2
Rhithrogena hageni			12			2
PLECOPTERA	**58**	**129**	**291**	**175**	**419**	**215**
Cultus sp.	23	47	58	58	47	47
Hesperoperla pacifica			47	23	47	23
Isoperla sp.			12	12		5
Megarcys signata			23			5
Paraleuctra sp.		12	35	35	23	21
Prostoia besametsa	12	35	58			21
Sweltsa sp.	23	35	58	47	302	93
COLEOPTERA	**152**	**349**	**198**	**175**	**465**	**268**
Cleptelmis sp.		23				5
Heterlimnius corpulentus	140	314	186	163	465	254
Narpus concolor				12		2
Optioservus sp.	12	12	12			7
TRICHOPTERA	**1049**	**1746**	**1279**	**955**	**2629**	**1532**
Arctopsyche grandis	12	35	23			14
Brachycentrus americanus	105	663	140	151	349	282
Dolophilodes sp.		12	23	47		16
Glossosoma sp.	47		35	12	116	42
Hydropsyche sp.	151	186	244	140	488	242
Lepidostoma sp. A	70	128	128	81	326	147
Lepidostoma sp. B	12			12	70	19
Micrasema sp.	70	128	93	23	140	91
Oligophlebodes minutus	442	454	291	361	977	505
Rhyacophila brunnea gr.	12	35	81	35	47	42
Rhyacophila sibirica gr.	116	105	221	93	116	130
Rhyacophila sp.	12					2
DIPTERA	**153**	**793**	**732**	**571**	**1697**	**789**
Antocha sp.	35	35	58	23	209	72
Brillia sp.		12				2
Ceratopogoninae	12	12	70	93	186	75
Chaetocladius sp.		35	58	23	23	28
Cricotopus (N.) nostocicola	12	105	81	163	233	119
Dicranota sp.				12	47	12
Eukiefferiella sp.	12	47	23		105	37
Heleniella sp.					23	5
Hexatoma sp.					23	5
Micropsectra sp.	12	81	12	105	302	102
Neoplasta sp.	23	12	35	23		19

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

CABRESTO CREEK
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Orthocladius/Cricotopus		12	23	12		9
Pagastia sp.				12		2
Pericoma sp.	47	430	372	70	465	277
Rhabdomastix sp.				12		2
Rheotanytarsus sp.		12		23	81	23
HYDRACARINA		**35**		**12**	**70**	**23**
Lebertia sp.		35			47	16
Testudacarus/Torrenticola				12	23	7
TURBELLARIA	**23**	**47**	**58**	**35**	**70**	**47**
Polycelis coronata	23	47	58	35	70	47
NEMATODA	**23**					**5**
Unid. Nematoda	23					5
ANNELIDA						
OLIGOCHAETA				**12**		**2**
Lumbriculidae				12		2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ZWERGLE - UPSTREAM OF TOWN OF RED RIVER
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1815**	**1791**	**4408**	**8515**	**8897**	**5084**
Baetis bicaudatus	35		35		407	95
Baetis tricaudatus	384	326	1047	3815	1454	1405
Cinygmula sp.	93	70	35	279	523	200
Drunella doddsi	35	23	116	47	640	172
Drunella grandis	93	140	116	140	174	133
Epeorus longimanus	582	488	582	930	2675	1051
Ephemerella infrequens	291	302	349	1489	872	661
Fallceon quilleri	151	70	116	279	291	181
Paraleptophlebia sp.				47		9
Rhithrogena hageni	151	372	2012	1489	1861	1177
PLECOPTERA	**349**	**372**	**581**	**2791**	**988**	**1016**
Cultus sp.		116		93		42
Isoperla sp.		23				5
Prostoia besametsa	233	140	465	1721	698	651
Pteronarcella badia			116	186	174	95
Sweltsa sp.	116	70		512	58	151
Zapada cinctipes				186		37
Zapada oregonensis gr.		23		93	58	35
COLEOPTERA	**2198**	**1186**	**2908**	**3303**	**2617**	**2443**
Heterlimnius corpulentus	2163	1163	2908	3163	2617	2403
Optioservus divergens	35	23		140		40
TRICHOPTERA	**1768**	**1372**	**3209**	**3862**	**4360**	**2914**
Arctopsyche grandis		47		93	58	40
Brachycentrus americanus	291	209	465	1163	523	530
Glossosoma sp.			430	186		123
Hydropsyche sp.	151	23	349	279	116	184
Lepidostoma sp. A		23	35		116	35
Lepidostoma sp. B		70		47	233	70
Micrasema sp.				47		9
Oligophlebodes minutus	989	558	1430	1163	2442	1316
Rhyacophila brunnea gr.	35	47	81	326	174	133
Rhyacophila coloradensis gr.	35			93	58	37
Rhyacophila sibirica gr.	267	395	384	465	640	430
Rhyacophila sp.			35			7
DIPTERA	**3744**	**3594**	**2745**	**10330**	**5583**	**5199**
Antocha sp.	733	954	733	605	407	686
Brillia sp.		70		547		123
Ceratopogoninae	93					19
Diamesa sp.	81			279		72
Dicranota sp.	35	23		93		30
Eukiefferiella sp.				547		109
Hexatoma sp.	93	35	35		58	44
Micropsectra sp.	1907	1849	849	3035	2803	2089
Neoplasta sp.	35	23		47	58	33
Orthocladius (Euorthocladius) sp.				279		56
Orthocladius (Symposiocladius) sp.				279		56

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ZWERGLE - UPSTREAM OF TOWN OF RED RIVER
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTER (cont.)						
Orthocladius/Cricotopus	81					16
Pagastia sp.		221	116	1931	105	475
Pericoma sp.	326	326	779	1396	1686	903
Polypedilum sp.			35			7
Prosimulium sp.			35	140		35
Rhabdomastix sp.	93	23				23
Rheocricotopus sp.	81					16
Rheotanytarsus sp.	151		128	279	233	158
Tipula sp.	35			47		16
Tvetenia sp.		70	35	826	233	233
HYDRACARINA	**326**	**302**	**81**	**280**	**465**	**290**
Lebertia sp.	291	302	81	233	465	274
Sperchon/Sperchonopsis	35					7
Testudacarus/Torrenticola				47		9
TURBELLARIA	**35**		**384**		**58**	**95**
Polycelis coronata	35		384		58	95
ANNELIDA						
OLIGOCHAETA	**349**	**93**	**233**	**279**	**291**	**250**
Enchytraeidae	58					12
Lumbriculidae			35			7
Nais sp.	291	93	198	279	233	219
Rhynchelmis sp.					58	12

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-4 - JUNEBUG CAMPGROUND
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**721**	**395**	**152**	**2047**	**337**	**731**
Baetis bicaudatus		93	12	221	58	77
Baetis tricaudatus	605	279	140	1710	174	582
Drunella grandis	35	23		35	35	26
Rhithrogena hageni	81			81	70	46
PLECOPTERA	**12**	**82**		**105**	**82**	**56**
Capniidae	12	12		23	12	12
Prostoia besametsa				12		2
Pteronarcella badia		23		23	12	12
Sweltsa sp.		47		47	58	30
COLEOPTERA	**81**	**12**	**12**	**139**	**23**	**54**
Heterlimnius corpulentus	81		12	58	23	35
Optioservus sp.		12		81		19
TRICHOPTERA	**163**	**337**	**12**	**408**	**129**	**210**
Arctopsyche grandis	12			12		5
Brachycentrus americanus	116	302	12	326	47	161
Glossosoma sp.				12		2
Hydropsyche sp.				23		5
Rhyacophila coloradensis gr.	35			23	47	21
Rhyacophila sibirica gr.		23		12	35	14
Rhyacophila sp.		12				2
DIPTERA	**106**	**221**	**35**	**630**	**163**	**231**
Antocha sp.	12	23	23	70	35	33
Atherix pachypus		23		23		9
Brillia sp.		12			12	5
Ceratopogoninae	12			47		12
Diamesa sp.	12	12				5
Dicranota sp.				12		2
Eukiefferiella sp.				35	23	12
Hexatoma sp.				12		2
Muscidae		23				5
Neoplasta sp.	23	35	12	23	23	23
Orthocladius/Cricotopus	35	93		361	12	100
Unid. Orthocladiinae	12			35	58	21
Tvetenia sp.				12		2
HYDRACARINA	**47**	**373**		**244**	**23**	**137**
Lebertia sp.	47	361		221	23	130
Sperchon/Sperchonopsis				23		5
Testudacarus/Torrenticola		12				2
NEMATODA			**23**			**5**
Unid. Nematoda			23			5

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-4 - JUNEBUG CAMPGROUND
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**12**	**24**	**12**	**58**	**47**	**30**
Enchytraeidae	12	12	12	58	47	28
Nais sp.		12				2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-5 - DS OF ELEPHANT ROCK CG, US OF HANSEN CR
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**24**	**23**	**47**	**59**	**82**	**46**
Baetis bicaudatus			12			2
Baetis tricaudatus	12		35	12	12	14
Drunella grandis	12	23		47	70	30
PLECOPTERA	**12**			**12**	**70**	**19**
Pteronarcella badia	12			12	70	19
COLEOPTERA	**93**	**12**	**24**	**244**	**59**	**86**
Heterlimnius corpulentus	12		12	116	47	37
Optioservus sp.	81	12	12	128	12	49
TRICHOPTERA	**175**	**12**	**24**	**186**	**59**	**91**
Brachycentrus americanus	93		12	128	47	56
Hydropsyche sp.	12					2
Rhyacophila coloradensis gr.	70	12	12	58	12	33
DIPTERA	**790**	**234**	**244**	**1327**	**420**	**604**
Antocha sp.	35	12	23	93		33
Atherix pachypus	23			35	93	30
Ceratopogoninae					12	2
Conchapelopia/Thienemannimyia gr. sp.				35		7
Cryptochironomus sp.	23					5
Diamesa sp.	23	12	12	70	35	30
Diplocladius sp.	23					5
Eukiefferiella sp.	23	12				7
Hexatoma sp.	12				12	5
Neoplasta sp.	105	58	23	70	12	54
Orthocladius/Cricotopus	500	116	174	919	244	391
Unid. Orthocladiinae		12				2
Pagastia sp.	23					5
Parametriocnemus sp.			12		12	5
Parorthocladius sp.				35		7
Pericoma sp.		12				2
Pseudodiamesa sp.				35		7
Rheocricotopus sp.				35		7
HYDRACARINA	**23**		**12**	**93**		**26**
Lebertia sp.	23		12	93		26
ANNELIDA						
OLIGOCHAETA	**1105**	**280**	**151**	**1524**	**791**	**771**
Eiseniella tetraedra				58		12
Enchytraeidae	989	221	116	1303	605	647
Ilyodrilus/Tubifex	81				93	35
Nais bretscheri			23	105		26
Nais sp.	35	47	12	58	58	42
Unid. Immature Tubificidae w/ Capilliform Chaetae		12			35	9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-6 - DS OF HANSEN CREEK, US OF MILL
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**36**	**46**	**47**	**12**	**23**	**32**
Ameletus sp.	12					2
Baetis tricaudatus	12	23	35		23	19
Drunella grandis		23	12	12		9
Rhithrogena hageni	12					2
PLECOPTERA			**12**	**23**		**7**
Capniidae			12	23		7
COLEOPTERA	**12**	**23**	**12**			**9**
Narpus concolor	12	23	12			9
TRICHOPTERA	**12**	**36**	**94**	**47**	**35**	**44**
Brachycentrus americanus	12	12	35	35		19
Hydropsyche sp.		12				2
Rhyacophila alberta gr.					12	2
Rhyacophila coloradensis gr.		12	47	12	23	19
Rhyacophila sibirica gr.			12			2
DIPTERA	**163**	**23**	**118**	**95**		**78**
Antocha sp.			12			2
Corynoneura sp.			12			2
Diamesa sp.	23		35	12		14
Eukiefferiella sp.	12		12	12		7
Neoplasta sp.				12		2
Orthocladius (Euorthocladius) sp.				12		2
Orthocladius/Cricotopus	128	23	35	47		47
Parametriocnemus sp.			12			2
HYDRACARINA		**47**				**9**
Lebertia sp.		35				7
Testudacarus/Torrenticola		12				2
ANNELIDA						
OLIGOCHAETA	**12**			**12**		**5**
Enchytraeidae	12			12		5

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-7 - DS OF MINE BOUNDARY, US OF MILL
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**35**	**12**	**23**	**23**	**47**	**28**
Baetis bicaudatus					12	2
Baetis tricaudatus	12	12	23	23	35	21
Drunella doddsi	23					5
COLEOPTERA	**12**	**12**	**12**	**12**	**24**	**14**
Heterlimnius corpulentus	12					2
Narpus concolor			12		12	5
Optioservus sp.		12		12	12	7
TRICHOPTERA		**12**	**116**	**82**	**93**	**60**
Brachycentrus americanus		12	81	58	70	44
Hydropsyche sp.			35	12	23	14
Rhyacophila coloradensis gr.				12		2
DIPTERA	**82**	**24**	**24**	**59**	**24**	**40**
Atherix pachypus				12		2
Diamesa sp.				12		2
Dicranota sp.	12					2
Eukiefferiella sp.	12					2
Hexatoma sp.	23					5
Neoplasta sp.		12	12	23		9
Orthocladius/Cricotopus	35	12	12	12		14
Paraphaenocladius sp.					12	2
Pseudosmittia sp.					12	2
HYDRACARINA			**23**	**47**	**70**	**28**
Lebertia sp.			23	47	58	26
Sperchon/Sperchonopsis					12	2
NEMATODA			**12**			**2**
Unid. Nematoda			12			2
ANNELIDA						
OLIGOCHAETA	**35**	**58**	**24**	**24**		**27**
Enchytraeidae	35	58				19
Ilyodrilus/Tubifex				12		2
Lumbriculidae				12		2
Pristina sp.			12			2
Rhynchelmis sp.			12			2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
RR-8 - DS OF MILL, US OF COLUMBINE CREEK
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA		**35**	**197**	**81**	**47**	**72**
Baetis tricaudatus		35	174	81	35	65
Drunella grandis			23			5
Rhithrogena sp.					12	2
PLECOPTERA	**12**				**12**	**4**
Isoperla sp.					12	2
Pteronarcella badia	12					2
COLEOPTERA	**47**	**59**				**20**
Heterlimnius corpulentus		12				2
Narpus concolor	12					2
Optioservus quadrimaculatus	35	47				16
TRICHOPTERA	**93**	**291**	**383**	**70**	**81**	**184**
Brachycentrus americanus	12	140	209		58	84
Hydropsyche sp.	81	151	174	70	23	100
DIPTERA	**24**	**24**	**35**	**24**	**24**	**25**
Antocha sp.					12	2
Atherix pachypus			12	12		5
Eukiefferiella sp.					12	2
Neoplasta sp.	12	12	23			9
Orthocladius/Cricotopus	12	12				5
Rhabdomastix sp.				12		2
HYDRACARINA		**12**				**2**
Lebertia sp.		12				2
ANNELIDA						
OLIGOCHAETA	**23**		**23**		**35**	**16**
Enchytraeidae	23		23		35	16

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-11A1 - DS OF CABIN SPRINGS AND COLUMBINE CR
03/19/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
COLLEMBOLA			**12**			**2**
Unid. Collembola			12			2
EPHEMEROPTERA	**187**	**210**	**385**	**582**	**1210**	**515**
Baetis bicaudatus			47	70	256	75
Baetis tricaudatus	140	198	326	500	919	417
Drunella doddsi					12	2
Drunella grandis	47	12	12	12	23	21
PLECOPTERA	**93**	**23**	**23**	**140**	**93**	**74**
Prostoia besametsa				12		2
Pteronarcella badia	93	23	23	128	93	72
COLEOPTERA	**82**	**12**	**35**	**47**	**81**	**51**
Heterlimnius corpulentus	12			12		5
Optioservus divergens	58	12	35	35	81	44
Postelichus sp.	12					2
TRICHOPTERA	**384**	**163**	**267**	**512**	**745**	**413**
Brachycentrus americanus	174	105	116	337	372	221
Hydropsyche sp.	186	58	151	140	291	165
Lepidostoma sp. B					12	2
Oligophlebodes minutus	12					2
Rhyacophila coloradensis gr.				12	35	9
Rhyacophila sibirica gr.					12	2
Rhyacophila sp.	12			23	23	12
DIPTERA	**36**	**24**	**128**	**153**	**420**	**150**
Antocha sp.	12		47		23	16
Atherix pachypus	12	12		47	47	24
Ceratopogoninae					12	2
Chaetocladius sp.					12	2
Diamesa sp.			35	35	23	19
Eukiefferiella sp.				12	58	14
Gonomyia sp.		12				2
Neoplasta sp.			23	12	12	9
Orthocladius (Euorthocladius) sp.				12		2
Orthocladius/Cricotopus	12		23	35	186	51
Parorthocladius sp.					35	7
Pericoma sp.					12	2
HYDRACARINA	**12**		**12**		**47**	**14**
Lebertia sp.	12		12		47	14
ANNELIDA						
OLIGOCHAETA			**35**	**12**		**9**
Enchytraeidae			35	12		9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-12 - GOATHILL CAMPGROUND
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**117**	**70**	**81**	**35**	**116**	**84**
Baetis tricaudatus	12	12				5
Drunella grandis	47	35	23	12	58	35
Rhithrogena hageni	58	23	58	23	58	44
PLECOPTERA	**47**		**12**	**35**		**19**
Pteronarcella badia	47		12	12		14
Sweltsa sp.				23		5
COLEOPTERA	**187**	**12**		**35**	**24**	**51**
Heterlimnius corpulentus	12					2
Narpus concolor	163	12		35	12	44
Optioservus sp.	12				12	5
TRICHOPTERA	**500**	**232**	**221**	**268**	**245**	**293**
Arctopsyche grandis	70	35	23	12		28
Brachycentrus americanus	221	23	70	163	140	123
Hydropsyche sp.	209	151	128	81	105	135
Rhyacophila coloradensis gr.		23		12		7
DIPTERA	**106**	**24**	**117**	**59**	**257**	**112**
Atherix pachypus	47	12	58			23
Brillia sp.				12		2
Eukiefferiella sp.	12			35	12	12
Hexatoma sp.			12			2
Neoplasta sp.	47		47	12	163	54
Orthocladius/Cricotopus		12			12	5
Unid. Orthocladiinae					70	14
HYDRACARINA		**12**	**12**	**12**	**70**	**21**
Lebertia sp.		12	12	12	58	19
Sperchon/Sperchonopsis					12	2
ANNELIDA						
OLIGOCHAETA					**12**	**2**
Ilyodrilus/Tubifex					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-15 - UPSTREAM OF QUESTA RANGER STATION
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA		**12**		**24**		**7**
Baetis tricaudatus				12		2
Rhithrogena hageni		12		12		5
PLECOPTERA	**12**		**35**			**9**
Pteronarcella badia	12		35			9
COLEOPTERA	**35**	**93**	**46**	**152**	**12**	**68**
Narpus concolor	23	70	23	140	12	54
Optioservus sp.	12	23	23	12		14
TRICHOPTERA	**24**	**47**	**325**	**163**	**35**	**119**
Arctopsyche grandis			23	12		7
Brachycentrus americanus	12	35	302	151	35	107
Hydropsyche sp.	12	12				5
DIPTERA	**48**	**198**	**82**	**94**	**47**	**92**
Atherix pachypus			35	12		9
Brillia sp.			35	12		9
Ceratopogoninae	12	12				5
Dicranota sp.			12			2
Eukiefferiella sp.	12	35				9
Neoplasta sp.	12	151		70	47	56
Protanyderus sp.	12					2
NEMATODA	**12**					**2**
Unid. Nematoda	12					2
ANNELIDA						
OLIGOCHAETA		**35**				**7**
Enchytraeidae		35				7

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-20 - UPSTREAM OF HIGHWAY 522
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**105**	**93**	**210**	**407**	**233**	**209**
Baetis tricaudatus	58	70	93	186	93	100
Drunella grandis	47	23	105	221	140	107
Rhithrogena hageni			12			2
PLECOPTERA		**12**				**2**
Pteronarcella badia		12				2
COLEOPTERA	**58**	**93**	**349**	**489**	**314**	**260**
Heterlimnius corpulentus			12			2
Narpus concolor		12	70	35	35	30
Optioservus quadrimaculatus	58	81	267	454	279	228
TRICHOPTERA	**198**	**175**	**640**	**2163**	**803**	**796**
Arctopsyche grandis			12		23	7
Brachycentrus americanus	163	105	233	1675	512	538
Hydropsyche sp.	35	70	395	488	256	249
Lepidostoma sp. A					12	2
DIPTERA	**175**	**59**	**420**	**953**	**337**	**391**
Atherix pachypus	58	23	151	256	105	119
Ceratopogoninae			12	23	23	12
Cryptochironomus sp.		12				2
Eukiefferiella sp.			47	151	58	51
Hexatoma sp.	23	12	12		23	14
Limnophyes sp.				23		5
Neoplasta sp.	47		105	93	58	61
Orthocladius (Euorthocladius) sp.				23		5
Orthocladius/Cricotopus	12	12	93	361	70	110
Pseudosmittia sp.				23		5
Psilometriocnemus sp.	12					2
Tvetenia sp.	23					5
HYDRACARINA	**93**	**12**	**47**	**210**	**81**	**88**
Hygrobates sp.				12		2
Lebertia sp.	81	12	47	198	81	84
Sperchon/Sperchonopsis	12					2
ANNELIDA						
OLIGOCHAETA	**47**			**407**	**12**	**92**
Enchytraeidae	23			372	12	81
Nais bretscheri				12		2
Nais sp.	12			23		7
Unid. Immature Tubificidae w/o Capilliform Chaetae	12					2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
LR-1 - DS OF HIGHWAY 522 AND QUESTA WWTP
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**372**	**826**	**478**	**198**	**105**	**396**
Baetis tricaudatus	209	733	361	163	93	312
Drunella grandis	163	58	105	23	12	72
Paraleptophlebia sp.		35				7
Rhithrogena hageni			12	12		5
PLECOPTERA	**186**	**116**	**221**	**105**	**12**	**127**
Isoperla sp.			12			2
Pteronarcella badia	93	58	174	70	12	81
Sweltsa sp.	93	58	35	35		44
COLEOPTERA	**885**	**1174**	**535**	**279**	**140**	**603**
Heterlimnius corpulentus	47	58		12		23
Narpus concolor	47	58	93	58	12	54
Optioservus divergens	256	372				126
Optioservus quadrimaculatus	535	686	442	209	128	400
TRICHOPTERA	**1675**	**2651**	**2315**	**1117**	**2106**	**1972**
Arctopsyche grandis		58				12
Brachycentrus americanus	977	1430	593	361	1756	1023
Hydropsyche sp.	582	1105	1675	733	221	863
Hydroptila sp.					12	2
Lepidostoma sp. A	93	58	35	23	70	56
Oecetis avara/disjuncta	23				47	14
Rhyacophila brunnea gr.			12			2
DIPTERA	**2582**	**4175**	**1433**	**316**	**1827**	**2066**
Atherix pachypus	70	116	47	58		58
Ceratopogoninae		58	47	12	35	30
Conchapelopia/Thienemannimyia gr. sp.				12	58	14
Diamesa sp.		128				26
Dicranota sp.		58		12		14
Eukiefferiella sp.	233	500	81		326	228
Hexatoma sp.	93	116	12	23	70	63
Muscidae				12		2
Neoplasta sp.	70	35	47	12	47	42
Orthocladius (Euorthocladius) sp.		128				26
Orthocladius/Cricotopus	1942	2908	1140	163	1233	1477
Pagastia sp.	151	128		12	58	70
Parorthocladius sp.			47			9
Tipula sp.	23		12			7
HYDRACARINA	**117**	**233**	**210**	**302**	**221**	**217**
Lebertia sp.	70	233	151	174	116	149
Sperchon/Sperchonopsis	47		47	116	105	63
Testudacarus/Torrenticola			12	12		5

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
LR-1 - DS OF HIGHWAY 522 AND QUESTA WWTP
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
CRUSTACEA						
AMPHIPODA				**12**		**2**
Hyalella azteca				12		2
TURBELLARIA					**12**	**2**
Girardia sp.					12	2
ANNELIDA	**210**		**12**		**163**	**77**
Enchytraeidae	70					14
Nais sp.	140		12		151	61
Unid. Immature Tubificidae w/o Capilliform Chaetae					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
LR-8A - DOWNSTREAM OF NPDES OUTFALL 002
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**128**	**151**	**59**	**210**	**652**	**240**
Baetis tricaudatus	116	151	47	105	512	186
Drunella grandis	12		12	105	140	54
PLECOPTERA	**12**	**35**	**12**	**23**	**46**	**26**
Isoperla sp.	12	35	12	23	23	21
Zapada cinctipes					23	5
COLEOPTERA	**1803**	**349**	**756**	**256**	**2675**	**1168**
Narpus concolor			12	23		7
Optioservus divergens	896				907	361
Optioservus quadrimaculatus	907	349	744	233	1768	800
TRICHOPTERA	**536**	**1198**	**105**	**255**	**1418**	**702**
Brachycentrus americanus	314	814	81	209	1163	516
Hesperophylax sp.	12					2
Hydropsyche sp.	70	198		23	209	100
Hydroptila sp.	140	35	12			37
Lepidostoma sp. A		116			23	28
Limnephilus/Philarctus				23		5
Oecetis avara/disjuncta		35	12		23	14
DIPTERA	**1606**	**3919**	**1910**	**3432**	**9176**	**4007**
Atherix pachypus			12			2
Caloparyphus sp.	12				23	7
Ceratopogoninae	454	81	279	128	116	212
Diamesa sp.	267	372	198			167
Dicranota sp.	35					7
Dolichopodidae			12			2
Eukiefferiella sp.	256	2070	395	326	3570	1323
Forcipomyiinae	12					2
Hexatoma sp.	35		70	81	93	56
Macropelopia sp.			47			9
Muscidae	23	81	47	12	12	35
Neoplasta sp.			12			2
Orthocladius (Euorthocladius) sp.		128		105		47
Orthocladius/Cricotopus	419	989	791	2454	4594	1849
Pagastia sp.	35	128	47	326	768	261
Simulium sp.		35				7
Tipula sp.	58	35				19
HYDRACARINA	**70**	**733**	**12**	**23**	**163**	**200**
Lebertia sp.	35	733			163	186
Panisus sp.			12			2
Sperchon/Sperchonopsis	35			23		12
CRUSTACEA						
AMPHIPODA	**70**	**233**	**116**	**47**	**23**	**98**
Hyalella sp.	70	233	116	47	23	98

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-8A - DOWNSTREAM OF NPDES OUTFALL 002
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA	**349**	**384**	**12**	**291**	**884**	**384**
Girardia sp.	349	384	12	291	884	384
NEMATODA	**35**			**47**	**70**	**30**
Unid. Nematoda	35			47	70	30
ANNELIDA						
OLIGOCHAETA	**152**	**47**	**267**	**70**		**106**
Enchytraeidae	12					2
Ilyodrilus/Tubifex sp.			12			2
Limnodrilus sp.	47	47	116	47		51
Ophidonais serpentina	12		23			7
Unid. Immature Tubificidae w/ Capilliform Chaetae			23			5
Unid. Immature Tubificidae w/o Capilliform Chaetae	81		93	23		39
HIRUDINEA			**12**	**23**		**7**
Glossiphonia complanata			12	23		7
MOLLUSCA						
GASTROPODA	**12**		**12**	**23**		**9**
Physa/Physella	12		12	23		9

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Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-16 - UPSTREAM OF HATCHERY DIVERSION
03/18/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**233**	**849**	**186**	**395**	**558**	**444**
Baetis tricaudatus	233	849	93	314	558	409
Drunella grandis			93	81		35
PLECOPTERA	**233**	**1558**	**814**	**1698**	**268**	**914**
Isoperla sp.	233	81	291	384	256	249
Pteronarcella badia		1477	523	1314	12	665
COLEOPTERA	**4652**	**4187**	**3710**	**6594**	**4652**	**4759**
Narpus concolor			35	81		23
Optioservus divergens	1547	1628	989	1861	1396	1484
Optioservus quadrimaculatus	3105	2559	2593	4652	3256	3233
Zaitzevia parvula			93			19
LEPIDOPTERA				**81**		**16**
Petrophila sp.				81		16
TRICHOPTERA	**3024**	**5349**	**3733**	**12096**	**4337**	**5707**
Brachycentrus americanus	930	779	791	1861	465	965
Culoptila sp.				81		16
Hydropsyche sp.	1710	4419	2733	9688	3640	4438
Hydroptilidae		151				30
Lepidostoma sp. A	151		35	233	151	114
Oecetis avara/disjuncta	233		174	233	81	144
DIPTERA	**12036**	**17746**	**3152**	**14875**	**9479**	**11457**
Atherix pachypus	547	1779	326	2873	791	1263
Ceratopogoninae		81	35	384		100
Diamesa sp.		1023		744		353
Eukiefferiella sp.	9734	10258	2012	8257	5792	7211
Hexatoma sp.	81		35			23
Neoplasta sp.	81		35			23
Orthocladius/Cricotopus	1128	3070	349	1489	1733	1554
Pagastia sp.		1023	93	372	1163	530
Rheocricotopus sp.		512				102
Simulium sp.	81		93	384		112
Tvetenia sp.	384		174	372		186
HYDRACARINA	**314**	**151**	**151**		**232**	**169**
Lebertia sp.	233	151	116		151	130
Sperchon/Sperchonopsis	81		35		81	39
TURBELLARIA	**233**					**47**
Girardia sp.	233					47

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

UFL1 - UPPER FAWN LAKE, EDGE
04/10/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**43**					**9**
Callibaetis sp.	43					9
COLEOPTERA				**43**		**9**
Haliplus sp.				43		9
DIPTERA	**258**	**731**	**86**	**559**	**344**	**395**
Ceratopogoninae	43	43			43	26
Chaetocladius sp.				43	86	26
Cricotopus sp.	215	86		172	43	103
Diamesa sp.		215		129	86	86
Dicrotendipes sp.			43	43		17
Eukiefferiella sp.			43	43		17
Limnophyes sp.				43	43	17
Micropsectra sp.		86				17
Orthocladius/Cricotopus		301				60
Paratanytarsus sp.				86	43	26
CRUSTACEA						
ISOPODA	**43**	**43**	**129**	**43**	**129**	**77**
Caecidotea sp.	43	43	129	43	129	77
AMPHIPODA	**172**	**43**	**43**			**52**
Gammarus lacustris	172	43	43			52
NEMATODA			**43**	**43**		**17**
Unid. Nematoda			43	43		17
ANNELIDA						
OLIGOCHAETA	**430**	**9086**	**86**	**4263**	**1119**	**2996**
Enchytraeidae				86		17

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Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

UFL1 - UPPER FAWN LAKE, EDGE
04/10/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
OLIGOCHAETA (cont.)						
Limnodrilus sp.	43	3359		689	301	878
Lumbriculidae	301	689		1852	474	663
Unid. Immature Tubificidae w/ Capilliform Chaetae			43			9
Unid. Immature Tubificidae w/o Capilliform Chaetae	86	5038	43	1636	344	1429
MOLLUSCA						
GASTROPODA	**215**	**732**	**43**	**1550**	**1378**	**784**
Menetus sp.	215	732	43	1507	1292	758
Radix sp.				43	86	26
PELECYPODA	**43**					**9**
Sphaerium sp.	43					9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: UFL-1 - UPPER FAWN LAKE,
SAMPLED: 4/10/2003

TAXA	COMPOSITE
INSECTA	
DIPTERA	**1763**
Chironomus sp.	1763
ANNELIDA	
OLIGOCHAETA	**558**
Ilyodrilus/Tubifex	189
Limnodrilus sp.	34
Unid. Immature Tubificidae w/ Capilliform Chaetae	335

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

UNIQUE 1 - BEAVER POND UPSTREAM OF GOATHILL CAMPGROUND, EDGE
SAMPLED: 03/20/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**43**					**9**
Siphlonurus sp.	43					9
COLEOPTERA		**86**				**17**
Agabus sp.		86				17
DIPTERA	**344**	**86**	**1851**	**818**	**1291**	**882**
Ceratopogoninae				43		9
Chironomus sp.			129			26
Eukiefferiella sp.	43					9
Hydrobaenus sp.				43		9
Macropelopia sp.	43		818	388	344	319
Microtendipes sp.			43			9
Phaenopsectra sp.	86		301	172	689	250
Polypedilum cf. fallax gr. sp.					129	26
Polypedilum sp.			43			9
Prodiamesa sp.	172	86	517	129	129	207
Rheocricotopus sp.				43		9
ANNELIDA						
OLIGOCHAETA	**2454**	**86**	**344**	**43**	**44782**	**9542**
Ilyodrilus/Tubifex	990	43			20238	4254
Unid. Immature Tubificidae w/ Capilliform Chaetae	1464	43	344	43	24544	5288

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: UNIQUE 1 - BEAVER POND UPSTREAM OF GOATHILL CAMPGROUND, MIDPOND
SAMPLED: 3/20/2003

TAXA	COMPOSITE
INSECTA	
PLECOPTERA	**9**
Pteronarcella badia	9
TRICHOPTERA	**26**
Brachycentrus americanus	26
DIPTERA	**1965**
Ceratopogoninae	43
Heterotrissocladius sp.	319
Hydrobaenus sp.	319
Micropsectra sp.	258
Odontomesa sp.	456
Paracladopelma sp.	121
Phaenopsectra sp.	69
Polypedilum cf. fallax gr. sp.	69
Polypedilum sp.	121
Prodiamesa sp.	121
Pseudodiamesa sp.	69
ANNELIDA	
OLIGOCHAETA	**94**
Ilyodrilus/Tubifex	34
Unid. Immature Tubificidae w/ Capilliform Chaetae	60

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ERL-1 - EAGLE ROCK LAKE, EDGE
03/20/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA		**43**				**9**
Drunella grandis		43				9
PLECOPTERA				**43**		**9**
Capniidae				43		9
COLEOPTERA			**43**			**9**
Stictotarsus griseostriatus			43			9
DIPTERA	**387**	**1291**	**1033**	**904**	**645**	**853**
Brillia sp.					43	9
Ceratopogoninae		86				17
Dicranota sp. type 1			43	43	129	43
Empididae		43				9
Eukiefferiella sp.		129			43	34
Gonomyia sp.	129	43			43	43
Heterotrissocladius sp.		43	301	86	86	103
Limnophyes sp.		43			43	17
Orthocladius/Cricotopus	172	517	517	732		388
Unid. Orthocladiinae		129			43	34
Phaenopsectra sp.	43					9
Pseudodiamesa sp.				43		9
Pseudosmittia sp.	43	258	172		215	138
HYDRACARINA					**43**	**9**
Lebertia sp.					43	9
ANNELIDA						
OLIGOCHAETA		**947**		**86**	**603**	**328**
Enchytraeidae		947		86	560	319
Lumbriculidae					43	9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ERL-1 - EAGLE ROCK LAKE, EDGE
03/20/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
MOLLUSCA						
GASTROPODA	43					9
Radix sp.	43					9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: ERL-1 - EAGLE ROCK LAK
SAMPLED: 3/20/2003

TAXA	COMPOSITE
INSECTA	
DIPTERA	**1300**
Chaoborus sp.	9
Chironomus sp.	1076
Heterotrissocladius sp.	43
Macropelopia sp.	43
Odontomesa sp.	43
Orthocladius/Cricotopus	86

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SW12-WTP - TAILINGS POND, EDGE
03/20/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**4435**	**2110**	**172**	**1292**	**301**	**1662**
Caenis amica	4435	2110	86	1292	301	1645
Callibaetis sp.			86			17
ODONATA	**387**		**172**			**112**
Aeshna sp.	43					9
Coenagrion/Enallagma	258		172			86
Sympetrum corruptum	86					17
HEMIPTERA				**43**		**9**
Corisella sp.				43		9
COLEOPTERA	**689**	**86**	**43**	**43**		**172**
Berosus sp.	43			43		17
Haliplus sp.	603	86	43			146
Optioservus sp.	43					9
TRICHOPTERA	**344**			**301**	**43**	**138**
Triaenodes/Ylodes	344			301	43	138
DIPTERA	**1507**	**990**	**86**	**732**	**129**	**690**
Ablabesmyia sp.	646	258		129	43	215
Chironomus sp.		43				9
Cladotanytarsus sp.		43				9
Eukiefferiella sp.				86		17
Hydrobaenus sp.	43					9
Procladius sp.			43	43	43	26
Psectrocladius sp.	775	646	43	474	43	396
Tabanus sp.	43					9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SW12-WTP - TAILINGS POND, EDGE
03/20/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**861**	**1163**				**405**
Enchytraeidae	818	1163				396
Unid. Immature Tubificidae w/ Capilliform Chaetae	43					9
MOLLUSCA						
GASTROPODA	**2541**	**732**	**215**	**215**	**43**	**750**
Physa/Physella	1809	431	172	43	43	500
Radix sp.	732	301	43	172		250

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: SW12-WTP - TAILINGS P(
SAMPLED: 3/20/20

TAXA	COMPOSITE
INSECTA	
EPHEMEROPTERA	**17**
Caenis amica	17
COLEOPTERA	**60**
Haliplus sp.	60
DIPTERA	**250**
Ablabesmyia sp.	17
Chironomus sp.	198
Eukiefferiella sp.	9
Procladius sp.	17
Psectrocladius sp.	9
ANNELIDA	
OLIGOCHAETA	**26**
Enchytraeidae	26
MOLLUSCA	
GASTROPODA	**69**
Physa/Physella	60
Radix sp.	9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

CABRESTO CREEK
09/26/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1664**	**1803**	**1303**	**1873**	**1094**	**1547**
Baetis bicaudatus	651	582	419	640	419	542
Baetis tricaudatus	814	965	605	849	477	742
Drunella coloradensis	12					2
Drunella doddsi	12		70	58	93	47
Drunella grandis	12		23	35		14
Ephemerella infrequens	163	256	186	291	105	200
PLECOPTERA	**129**	**151**	**23**	**93**	**93**	**97**
Cultus sp.		116		35	23	35
Hesperoperla pacifica	12	35		23	12	16
Sweltsa sp.	12					2
Zapada cinctipes	105		23	35	58	44
COLEOPTERA	**104**	**383**	**162**	**222**	**372**	**248**
Heterlimnius corpulentus	81	93	116	140	267	139
Narpus concolor					12	2
Optioservus divergens		81	23	35	70	42
Optioservus quadrimaculatus	23	209	23	47	23	65
TRICHOPTERA	**1257**	**2907**	**2000**	**1755**	**815**	**1747**
Arctopsyche grandis			23	23	35	16
Brachycentrus americanus	198	349	372	256	47	244
Dolophilodes aequalis		35	23		12	14
Glossosoma sp.	35	35	23			19
Hydropsyche sp.	430	675	954	605	384	610
Micrasema bactro	105	174	163	267	105	163
Oligophlebodes minutus	477	1430	372	523	174	595
Rhyacophila sibirica gr.	12	209	70	81	58	86
DIPTERA	**1360**	**1709**	**1513**	**1290**	**663**	**1307**
Antocha sp.	70	35	70	151	47	75
Atherix pachypus		35				7
Ceratopogoninae	81	58	70	81	12	60
Cricotopus (N.) nostocicola	116	407	349	314	221	281
Diamesa sp.				35		7
Dicranota sp.		35				7
Eukiefferiella sp.	93	93	267			91
Heleniella sp.	35					7
Micropsectra sp.	163	47	35	128		75
Neoplasta sp.	116		47	23		37
Orthocladius/Cricotopus sp.	407	651	361	186	116	344
Unid. Orthocladiinae			70	35		21
Pagastia sp.	116	174	35	221	81	125
Pericoma sp.	151	174	209	23	151	142
Rheotanytarsus sp.				35		7
Simulium sp.	12			58	23	19
Tvetenia sp.					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

CABRESTO CREEK
09/26/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**245**	**174**	**94**	**186**	**47**	**149**
Lebertia sp.	151	174	47	140	23	107
Protzia sp.	12					2
Sperchon/Sperchonopsis	35			23	12	14
Testudacarus/Torrenticola	47		47	23	12	26
TURBELLARIA	**70**	**35**	**47**			**30**
Polycelis coronata	70	35	47			30
NEMATODA	**35**					**7**
Unid. Nematoda	35					7
ANNELIDA						
OLIGOCHAETA					**12**	**2**
Unid. Immature Tubificidae w/ Capilliform Chaetae					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ZWERGLE - UPSTREAM OF TOWN OF RED RIVER
10/02/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**849**	**988**	**1476**	**977**	**1432**	**1144**
Baetis bicaudatus	58	81	116	58	128	88
Baetis tricaudatus	558	582	965	733	1058	779
Cinygmula sp.	12	81	35	58	47	47
Drunella doddsi			93			19
Drunella grandis				35	12	9
Epeorus sp.					12	2
Ephemerella infrequens					47	9
Rhithrogena hageni	221	244	267	93	128	191
PLECOPTERA	**163**	**699**	**256**	**59**	**244**	**284**
Capniidae	35	512	58		12	123
Cultus sp.	12	47	58		116	47
Megarcys signata		12	47			12
Prostoia/Podmosta		12				2
Pteronarcella badia				12		2
Sweltsa sp.	116	116	93	47	81	91
Zapada cinctipes					35	7
COLEOPTERA	**361**	**337**	**558**	**477**	**489**	**444**
Helichus sp.					12	2
Heterlimnius corpulentus	361	337	558	477	477	442
TRICHOPTERA	**1140**	**1954**	**2954**	**1536**	**2106**	**1938**
Arctopsyche grandis	12		35	35		16
Brachycentrus americanus	58	70	58	35	47	54
Glossosoma sp.	174	81	1105	651	163	435
Hydropsyche sp.	35	12		12		12
Lepidostoma sp.	70		35			21
Oligophlebodes minutus	686	1593	1337	698	1663	1195
Rhyacophila brunnea gr.			35			7
Rhyacophila rotunda gr.			35	35	70	28
Rhyacophila sibirica gr.	105	198	314	70	163	170
DIPTERA	**1154**	**1024**	**4221**	**1385**	**408**	**1638**
Antocha sp.			35	12	12	12
Dicranota sp.	12	12	35	12		14
Hexatoma sp.	12	35	58			21
Micropsectra sp.	140	47	116			61
Orthocladius/Cricotopus sp.	12					2
Pagastia sp.		23			35	12
Paratanytarsus sp.	12					2
Pericoma sp.	326	628	81	93	70	240
Psilometriocnemus sp.		23	58			16
Rheocricotopus sp.		23			12	7
Simulium sp.	640	221	3838	1268	279	1249
Tipulidae		12				2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ZWERGLE - UPSTREAM OF TOWN OF RED RIVER
10/02/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**70**	**35**	**58**	**47**	**71**	**56**
Lebertia sp.	35	35	58	35	47	42
Protzia sp.					12	2
Sperchon/Sperchonopsis	35			12	12	12
TURBELLARIA	**105**	**81**	**93**	**47**	**233**	**112**
Girardia sp.	105	81	93	47	233	112
NEMATODA				**12**		**2**
Unid. Nematoda				12		2
ANNELIDA						
OLIGOCHAETA	**94**	**849**	**35**	**35**	**23**	**207**
Enchytraeidae	12					2
Lumbriculidae	12	70		23		21
Nais sp.	70	686	35	12	23	165
Rhynchelmis sp.		93				19

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-4 - JUNE BUG CAMPGROUND
10/01/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**512**	**535**	**895**	**663**	**989**	**719**
Baetis bicaudatus	47	12	93	105	128	77
Baetis tricaudatus	407	430	500	395	651	477
Drunella grandis				12	12	5
Rhithrogena hageni	58	93	302	151	198	160
PLECOPTERA			**47**		**12**	**11**
Cultus sp.					12	2
Pteronarcella badia			47			9
COLEOPTERA	**23**	**12**	**35**	**24**		**19**
Heterlimnius corpulentus	23		23	12		12
Narpus concolor				12		2
Optioservus sp.		12	12			5
TRICHOPTERA	**59**	**36**	**221**	**82**	**47**	**89**
Arctopsyche grandis			58			12
Brachycentrus americanus	47	12	163	70	35	65
Rhyacophila rotunda gr.		12			12	5
Rhyacophila sibirica gr.	12	12		12		7
DIPTERA	**12**	**23**	**199**	**71**	**94**	**78**
Atherix pachypus			12			2
Ceratopogoninae			12			2
Diplocladius sp.			12			2
Neoplasta sp.			23	12		7
Orthocladius (Euorthocladius) sp.				12	12	5
Pagastia sp.					12	2
Psilometriocnemus sp.			140	35	70	49
Simulium sp.	12	23		12		9
HYDRACARINA	**23**		**23**	**12**	**12**	**14**
Lebertia sp.	23		23	12	12	14
NEMATODA					**12**	**2**
Unid. Nematoda					12	2
ANNELIDA						
OLIGOCHAETA	**35**	**12**		**12**	**82**	**28**
Enchytraeidae	23					5
Lumbriculidae					47	9
Rhynchelmis sp.	12	12		12	23	12
Unid. Immature Tubificidae w/ Capilliform Chaetae					12	2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-5 - DS OF ELEPHANT ROCK CG, US OF HANSEN CREEK
10/01/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**884**	**628**	**1302**	**814**	**2988**	**1323**
Baetis bicaudatus	244	174	500	314	267	300
Baetis tricaudatus	407	361	628	384	1872	730
Cinygmula sp.	12					2
Drunella grandis		12	23			7
Rhithrogena hageni	221	81	151	116	849	284
PLECOPTERA			**58**		**47**	**21**
Pteronarcella badia			58		35	19
Taenionema sp.					12	2
COLEOPTERA	**23**		**24**	**12**	**12**	**14**
Heterlimnius corpulentus			12			2
Optioservus quadrimaculatus	23		12	12	12	12
TRICHOPTERA	**163**	**83**	**535**	**105**	**268**	**231**
Arctopsyche grandis	23	12			12	9
Brachycentrus americanus	93	47	477	93	244	191
Glossosoma sp.	12	12				5
Hydropsyche sp.	23	12	58	12		21
Rhyacophila rotunda gr.	12				12	5
DIPTERA	**616**	**293**	**943**	**395**	**1664**	**782**
Antocha sp.	35	47	163			49
Atherix pachypus	12					2
Ceratopogoninae	23	12	12		35	16
Dicranota sp.	23				35	12
Empididae			12		12	5
Eukiefferiella sp.	23	12	47	23	47	30
Micropsectra sp.					23	5
Neoplasta sp.	47	58	267	151	81	121
Orthocladius (Euorthocladius) sp.	12	12		12		7
Orthocladius/Cricotopus sp.			35	58		19
Unid. Orthocladiinae		12		23	47	16
Pagastia sp.	81	70	81	23	47	60
Parametriocnemus sp.					23	5
Pericoma sp.			12			2
Psilometriocnemus sp.	244	58	105	70	372	170
Rheocricotopus sp.					23	5
Simulium sp.	116	12	209	35	919	258
HYDRACARINA	**59**	**23**	**93**	**58**	**12**	**49**
Lebertia sp.	47	23	93	58	12	47
Sperchon/Sperchonopsis	12					2
TURBELLARIA	**23**					**5**
Girardia sp.	23					5
NEMATODA	**23**	**23**	**12**	**12**	**35**	**21**
Unid. Nematoda	23	23	12	12	35	21

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-5 - DS OF ELEPHANT ROCK CG, US OF HANSEN CREEK
10/01/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**198**	**152**	**94**	**199**	**616**	**251**
Enchytraeidae		58	12	47	93	42
Ilyodrilus/Tubifex					23	5
Nais bretscheri	23	47	12	47	23	30
Nais sp.	163	47	70	105	477	172
Unid. Immature Tubificidae w/ Capilliform Chaetae	12					2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-6 - DS OF HANSEN CREEK, US OF MILL
09/30/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**512**	**396**	**303**	**617**	**314**	**428**
Baetis bicaudatus	47	70	35		58	42
Baetis tricaudatus	337	221	198	454	209	284
Drunella grandis	12	12		12		7
Rhithrogena hageni	116	93	70	151	47	95
PLECOPTERA			**12**			**2**
Pteronarcella badia			12			2
COLEOPTERA			**12**			**2**
Optioservus sp.			12			2
TRICHOPTERA	**70**	**140**	**35**	**58**	**12**	**63**
Brachycentrus americanus	70	140	12	58	12	58
Hydropsyche sp.			23			5
DIPTERA	**94**	**93**	**47**	**106**	**12**	**69**
Atherix pachypus		23		12		7
Diamesa sp.				12		2
Dicranota sp.				12		2
Eukiefferiella sp.	12					2
Neoplasta sp.			12			2
Orthocladius/Cricotopus sp.	12	12				5
Pagastia sp.	35		23	23		16
Psilometriocnemus sp.	35	58	12	47	12	33
HYDRACARINA		**12**	**24**			**7**
Lebertia sp.			12			2
Sperchon/Sperchonopsis		12	12			5
ANNELIDA						
OLIGOCHAETA				**12**	**12**	**4**
Eiseniella tetraedra					12	2
Enchytraeidae				12		2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-7 - DS OF MINE BOUNDARY, US OF MILL
09/30/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**570**	**442**	**430**	**396**	**640**	**495**
Baetis bicaudatus		70	70	81	128	70
Baetis tricaudatus	488	267	267	233	361	323
Drunella grandis	35		12	12	23	16
Rhithrogena hageni	47	105	81	70	128	86
PLECOPTERA	**82**	**12**	**58**			**30**
Capniidae	12					2
Pteronarcella badia	70	12	58			28
COLEOPTERA	**35**	**24**	**24**		**12**	**18**
Heterlimnius corpulentus			12			2
Narpus concolor		12				2
Optioservus sp.	35	12	12		12	14
TRICHOPTERA	**163**	**93**	**314**	**465**	**93**	**225**
Brachycentrus americanus	163	81	302	384	81	202
Hydropsyche sp.		12	12	81	12	23
DIPTERA	**140**	**82**	**105**	**281**	**71**	**137**
Antocha sp.	12	12				5
Atherix pachypus	23			12		7
Eukiefferiella sp.	23					5
Neoplasta sp.	23		23	47	12	21
Orthocladius (Euorthocladius) sp.	12			12		5
Unid. Orthocladiinae	12	12	12			7
Pagastia sp.		23	12	47	12	19
Psilometriocnemus sp.	35	35	58	163	47	68
HYDRACARINA		**23**		**24**		**9**
Lebertia sp.		23		12		7
Sperchon/Sperchonopsis				12		2
ANNELIDA						
OLIGOCHAETA			**12**	**198**	**71**	**56**
Enchytraeidae			12	58	12	16
Lumbriculidae				12	12	5
Rhynchelmis sp.				93	47	28
Unid. Immature Tubificidae w/ Capilliform Chaetae				23		5
Unid. Immature Tubificidae w/o Capilliform Chaetae				12		2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-8 - DS OF MILL, US OF COLUMBINE CREEK
09/30/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**755**	**302**	**315**	**581**	**583**	**507**
Baetis bicaudatus	23	47	12	70	47	40
Baetis tricaudatus	500	174	256	337	384	330
Drunella grandis	58	23	12		12	21
Rhithrogena hageni	174	58	35	174	140	116
PLECOPTERA	**12**	**12**				**5**
Pteronarcella badia	12	12				5
COLEOPTERA	**35**		**12**	**12**		**12**
Narpus concolor	23			12		7
Optioservus divergens	12		12			5
TRICHOPTERA	**536**	**116**	**163**	**140**	**174**	**225**
Arctopsyche grandis	12					2
Brachycentrus americanus	12	35	23	35	81	37
Hydropsyche sp.	500	81	140	105	93	184
Rhyacophila rotunda gr.	12					2
DIPTERA	**222**	**23**	**233**	**140**	**198**	**163**
Atherix pachypus	12		35	12		12
Neoplasta sp.			58		35	19
Orthocladius/Cricotopus sp.			12			2
Pagastia sp.			23		58	16
Psilometriocnemus sp.	198	23	105	128	105	112
Simulium sp.	12					2
HYDRACARINA	**23**			**12**		**7**
Lebertia sp.	23					5
Sperchon/Sperchonopsis				12		2
NEMATODA		**12**				**2**
Unid. Nematoda		12				2
ANNELIDA						
OLIGOCHAETA	**70**	**12**	**12**			**19**
Aeolosoma sp.		12				2
Enchytraeidae	47		12			12
Nais sp.	23					5

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-11A1 - DOWNSTREAM OF CABIN SPRINGS AND COLUMBINE
09/25/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1093**	**1989**	**1966**	**1849**	**1570**	**1694**
Baetis bicaudatus	116	256	105	174	267	184
Baetis tricaudatus	965	1651	1756	1535	1244	1430
Drunella doddsi			12	12		5
Drunella grandis		12		47	47	21
Rhithrogena hageni	12	70	93	81	12	54
PLECOPTERA			**23**		**12**	**7**
Pteronarcella badia			23		12	7
COLEOPTERA	**24**	**47**	**70**	**24**	**141**	**62**
Narpus concolor	12	23	12		47	19
Optioservus divergens		12	23	12	47	19
Optioservus quadrimaculatus	12	12	35	12	47	24
TRICHOPTERA	**314**	**582**	**1163**	**1501**	**2245**	**1161**
Arctopsyche grandis	12					2
Brachycentrus americanus	151	233	488	814	1582	654
Glossosoma sp.		12	12			5
Hydropsyche sp.	151	337	663	675	628	491
Rhyacophila brunnea gr.				12		2
Rhyacophila rotunda gr.					35	7
DIPTERA	**47**	**187**	**223**	**397**	**245**	**217**
Atherix pachypus	35	35	47	58	35	42
Diamesa sp.				47		9
Empididae				12		2
Neoplasta sp.		12		12		5
Orthocladius/Cricotopus sp.			12			2
Unid. Orthocladiinae					12	2
Pagastia sp.	12	93	140	256	186	137
Protanyderus margarita					12	2
Psilometriocnemus sp.		47	12	12		14
Simulium sp.			12			2
HYDRACARINA	**24**	**12**	**59**	**187**	**245**	**106**
Lebertia sp.	12	12	47	140	198	82
Sperchon/Sperchonopsis	12		12	47	47	24
ANNELIDA						
OLIGOCHAETA			**12**	**12**	**12**	**6**
Enchytraeidae				12		2
Rhynchelmis sp.					12	2
Unid. Immature Tubificidae w/ Capilliform Chaetae			12			2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

RR-12 - GOATHILL CAMPGROUND
09/25/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**639**	**1198**	**1129**	**989**	**1013**	**994**
Baetis bicaudatus			47	70	47	33
Baetis tricaudatus	500	884	954	651	826	763
Drunella grandis	116	23		35		35
Rhithrogena hageni	23	291	128	233	140	163
PLECOPTERA	**70**	**23**	**221**		**35**	**70**
Pteronarcella badia	70	23	221		35	70
COLEOPTERA	**59**	**12**	**24**	**12**	**24**	**27**
Heterlimnius corpulentus		12			12	5
Narpus concolor	12		12			5
Optioservus divergens	47		12	12	12	17
TRICHOPTERA	**1244**	**163**	**245**	**152**	**70**	**374**
Arctopsyche grandis			12			2
Brachycentrus americanus	1186	105	221	105	23	328
Hydropsyche sp.	58	58	12	47	47	44
DIPTERA	**827**	**163**	**117**	**373**	**128**	**321**
Atherix pachypus	314	93	47	128	23	121
Ceratopogoninae	23					5
Empididae	12				12	5
Eukiefferiella sp.	174		23			39
Neoplasta sp.	116	23	12	23	12	37
Orthocladius (Euorthocladius) sp.	12					2
Orthocladius/Cricotopus sp.	105					21
Unid. Orthocladiinae	12					2
Pagastia sp.	12				23	7
Psilometriocnemus sp.	35	35	12	198	58	68
Rhabdomastix sp.		12		12		5
Simulium sp.	12		23	12		9
HYDRACARINA	**198**	**47**		**12**		**51**
Lebertia sp.	198	47				49
Sperchon/Sperchonopsis				12		2
NEMATODA	**23**	**23**		**23**		**14**
Unid. Nematoda	23	23		23		14
ANNELIDA						
OLIGOCHAETA	**35**			**24**		**11**
Eiseniella tetraedra				12		2
Enchytraeidae	23			12		7
Haplotaxis sp.	12					2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
RR-15 - UPSTREAM OF QUEST RANGER STATION
09/25/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**291**	**651**	**163**	**546**	**733**	**477**
Baetis bicaudatus	35	151	105	151	128	114
Baetis tricaudatus	256	372	23	337	523	302
Drunella grandis					35	7
Rhithrogena hageni		128	35	58	47	54
PLECOPTERA	**12**	**23**		**12**	**35**	**16**
Capniidae					12	2
Pteronarcella badia	12	23		12	23	14
COLEOPTERA	**12**	**12**		**12**	**82**	**24**
Narpus concolor					70	14
Optioservus quadrimaculatus	12	12		12	12	10
TRICHOPTERA	**209**	**174**	**326**	**209**	**1546**	**493**
Arctopsyche grandis	35		12		58	21
Brachycentrus americanus	116	116	198	116	686	246
Hydropsyche sp.	58	58	116	93	779	221
Rhyacophila rotunda gr.					23	5
DIPTERA	**59**	**12**	**48**	**93**	**164**	**73**
Dicranota sp.			12		12	5
Hexatoma sp.			12			2
Monodiamesa sp.			12			2
Neoplasta sp.				23	12	7
Orthocladius/Cricotopus sp.	12				23	7
Pagastia sp.					12	2
Polypedilum sp.					12	2
Psilometriocnemus sp.	35	12	12	70	93	44
Simulium sp.	12					2
HYDRACARINA	**12**	**12**		**12**		**7**
Lebertia sp.				12		2
Sperchon/Sperchonopsis	12	12				5
ANNELIDA						
OLIGOCHAETA			**12**	**12**	**23**	**9**
Enchytraeidae			12		23	7
Nais sp.				12		2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results
RR-20 - UPSTREAM OF HIGHWAY 522
09/25/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**233**	**1187**	**1686**	**1046**	**582**	**948**
Baetis bicaudatus	35	128	233	81	47	105
Baetis tricaudatus	198	1047	1337	942	535	812
Drunella grandis			58			12
Rhithrogena hageni		12	58	23		19
PLECOPTERA			**23**	**12**		**7**
Pteronarcella badia			23	12		7
COLEOPTERA	**12**	**81**	**291**	**140**	**12**	**107**
Narpus concolor		23		12		7
Optioservus quadrimaculatus	12	58	291	128	12	100
TRICHOPTERA	**256**	**500**	**3582**	**1233**	**628**	**1239**
Brachycentrus americanus	116	314	1256	593	337	523
Hydropsyche sp.	140	186	2326	628	291	714
Lepidostoma sp.				12		2
DIPTERA	**36**	**82**	**441**	**233**	**94**	**177**
Atherix pachypus			35			7
Conchapelopia/Thienemannimyia gr. sp.			23			5
Cricotopus sp.				12		2
Dicranota sp.	12					2
Empididae				23		5
Eukiefferiella sp.			35	12	12	12
Hexatoma sp.			35			7
Muscidae			23			5
Neoplasta sp.		23	93	35		30
Orthocladius/Cricotopus sp.	12	35	128	128	23	65
Pagastia sp.	12	12	23	23	47	23
Polypedilum sp.			23			5
Psilometriocnemus sp.		12	23			7
Simulium sp.					12	2
HYDRACARINA	**12**	**24**	**151**	**59**	**35**	**56**
Lebertia sp.		12	93	47	23	35
Sperchon/Sperchonopsis	12	12	58	12	12	21
ANNELIDA						
OLIGOCHAETA				**12**		**2**
Nais sp.				12		2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-1 - DS OF HIGHWAY 522 AND QUESTA WWTP
09/24/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**198**	**733**	**489**	**908**	**1035**	**672**
Baetis bicaudatus			12			2
Baetis tricaudatus	163	698	442	861	1000	633
Drunella grandis			12	12	12	7
Rhithrogena hageni	35	35	23	35	23	30
PLECOPTERA			**23**	**35**	**24**	**16**
Pteronarcella badia				35	12	9
Sweltsa sp.			23		12	7
COLEOPTERA	**197**	**245**	**175**	**233**	**94**	**189**
Narpus concolor	35	12	35	47		26
Optioservus divergens	81	105	70	81	47	77
Optioservus quadrimaculatus	81	128	70	105	47	86
TRICHOPTERA	**442**	**210**	**209**	**826**	**617**	**461**
Brachycentrus americanus	256	70	128	291	326	214
Hydropsyche sp.	186	140	81	535	291	247
DIPTERA	**259**	**210**	**141**	**1210**	**512**	**463**
Ceratopogoninae	12			12	23	9
Conchapelopia/Thienemannimyia gr. sp.				35		7
Cricotopus sp.	12			35	12	12
Dicranota sp.		12				2
Empididae	12	23				7
Eukiefferiella sp.	23		35	116	23	39
Hexatoma sp.	12	23	23	12	47	23
Neoplasta sp.	12	23	12	35	93	35
Orthocladius/Cricotopus sp.	128	105	47	872	279	286
Unid. Orthocladiinae		12				2
Pagastia sp.	12		12	70	35	26
Protanyderus margarita			12			2
Psilometriocnemus sp.	12					2
Simulium sp.	12	12		23		9
Tvetenia sp.	12					2
HYDRACARINA	**59**	**82**		**70**	**23**	**47**
Lebertia sp.	47	70		23		28
Sperchon/Sperchonopsis	12	12		47	23	19
NEMATODA			**12**			**2**
Unid. Nematoda			12			2

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-8A - DOWNSTREAM OF NPDES OUTFALL 002
09/24/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA	**2209**	**2151**	**535**	**1547**	**1511**	**1591**
EPHEMEROPTERA						
Baetis tricaudatus	1977	1977	488	1512	1430	1477
Drunella grandis	174	174	47	35	81	102
Rhithrogena hageni	58					12
PLECOPTERA	**70**	**116**		**47**		**46**
Pteronarcella badia	70			47		23
Sweltsa sp.		116				23
COLEOPTERA	**1512**	**2791**	**977**	**2047**	**1081**	**1681**
Heterlimnius corpulentus	116					23
Narpus concolor				35		7
Optioservus divergens	349	570	326	512	558	463
Optioservus quadrimaculatus	1047	2221	651	1465	523	1181
Paracymus sp.				35		7
TRICHOPTERA	**3722**	**5814**	**2326**	**4617**	**4443**	**4185**
Brachycentrus americanus	1163	174	721	2291	2361	1342
Hydropsyche sp.	2559	5582	1512	2291	2012	2791
Hydroptilidae			23		35	12
Lepidostoma sp.				35		7
Metrichia sp.		58	70		35	33
DIPTERA	**5443**	**7513**	**1607**	**6233**	**3873**	**4932**
Caloparyphus sp.	58	58				23
Ceratopogoninae	291	582	70	430	198	314
Cricotopus sp.		221				44
Diamesa sp.			47			9
Eukiefferiella sp.	2838	5059	1000	4396	2454	3149
Hexatoma sp.	35	128	70	35	116	77
Muscidae		116		35	35	37
Neoplasta sp.	58	233	23	81		79
Orthocladius/Cricotopus sp.	1663	1058	233	1105	779	968
Unid. Orthocladiinae					105	21
Pagastia sp.	500		47			109
Polypedilum sp.			47			9
Simulium sp.		58	70	151	151	86
Tipula sp.					35	7
HYDRACARINA	**1105**	**2559**	**768**	**1047**	**349**	**1165**
Lebertia sp.	582	1919	535	733	233	800
Sperchon/Sperchonopsis	523	640	233	314	116	365
CRUSTACEA						
AMPHIPODA	**23**	**174**	**23**	**233**	**35**	**98**
Gammarus lacustris	23					5
Hyalella azteca		174	23	233	35	93

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-8A - DOWNSTREAM OF NPDES OUTFALL 002
09/24/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA	**523**	**5757**	**768**	**1547**	**1082**	**1935**
Girardia sp.	523	5757	768	1547	1082	1935
NEMATODA				**151**	**35**	**37**
Unid. Nematoda				151	35	37
ANNELIDA						
OLIGOCHAETA	**116**	**174**	**163**	**931**	**198**	**317**
Enchytraeidae				35	35	14
Limnodrilus sp.				35		7
Nais bretscheri	58					12
Nais sp.	58	58	23	35		35
Ophidonais serpentina		58				12
Unid. Immature Tubificidae w/o Capilliform Chaetae		58	140	826	163	237

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

LR-16 - UPSTREAM OF HATCHERY DIVERSION
09/23/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
COLLEMBOLA		**12**				**2**
Entomobryidae		12				2
EPHEMEROPTERA	**523**	**1268**	**1442**	**617**	**1279**	**1026**
Baetis bicaudatus	23					5
Baetis tricaudatus	500	1268	1407	605	1279	1012
Drunella grandis				12		2
Rhithrogena hageni			35			7
PLECOPTERA		**35**			**116**	**30**
Pteronarcella badia		35			116	30
COLEOPTERA	**222**	**1071**	**977**	**1245**	**2314**	**1166**
Narpus concolor	12	12		12	35	14
Optioservus divergens	93	465	465	244	1756	605
Optioservus quadrimaculatus	105	547	465	977	523	523
Zaitzevia parvula	12	47	47	12		24
TRICHOPTERA	**232**	**1058**	**826**	**757**	**2977**	**1170**
Brachycentrus americanus	116	628	233	419	1663	612
Glossosoma sp.			58	12		14
Hydropsyche sp.	116	395	535	314	1314	535
Lepidostoma sp.		35		12		9
DIPTERA	**175**	**988**	**488**	**688**	**2547**	**978**
Atherix pachypus	47	116	302	140	430	207
Eukiefferiella sp.	70	663	81	454	1872	628
Hexatoma sp.	35	12	58	12	35	30
Neoplasta sp.					35	7
Orthocladius/Cricotopus sp.		23	35	35	140	47
Parametriocnemus sp.		23				5
Simulium sp.	23	151	12	47		47
Tipula sp.					35	7
HYDRACARINA	**12**	**163**	**35**	**198**	**197**	**121**
Lebertia sp.		35		105	116	51
Sperchon/Sperchonopsis	12	116	35	81	81	65
Testudacarus/Torrenticola		12		12		5
TURBELLARIA		**47**	**12**	**23**	**116**	**40**
Girardia sp.		47	12	23	116	40
ANNELIDA						
OLIGOCHAETA	**12**	**35**	**12**			**11**
Enchytraeidae		12				2
Unid. Immature Tubificidae w/o Capilliform Chaetae	12	23	12			9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

UFL1 - UPPER FAWN LAKE - EDGE
10/01/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA			**43**			**9**
Callibaetis sp.			43			9
DIPTERA	**4995**	**6976**	**2153**	**129**	**1851**	**3222**
Apedilum sp.			86			17
Ceratopogoninae	43					9
Cricotopus sp.					43	9
Dicrotendipes sp.	4478	5383	1249	43	1120	2455
Orthocladius/Cricotopus sp.	474	947	86	43	43	319
Unid. Orthocladiinae			86			17
Paratanytarsus sp.		431	474	43	258	241
Phaenopsectra sp.		215	86			60
Polypedilum sp.					43	9
Tanytarsus sp.			86		344	86
CRUSTACEA						
ISOPODA		**43**		**43**		**17**
Caecidotea sp.		43		43		17
AMPHIPODA	**43**	**86**	**172**			**61**
Gammarus lacustris	43	86	129			52
Hyalella azteca			43			9
ANNELIDA						
OLIGOCHAETA	**516**	**2368**	**3229**	**602**	**1852**	**1714**
Enchytraeidae		129				26
Megadrili	86					17
Nais behningi	86	474	172	172	474	276
Nais pseudobtusa				43	86	26
Nais sp.	301	344	689	86	215	327
Ophidonais serpentina	43	1421	2368	301	1077	1042
HIRUDINEA	**215**					**43**
Unid. Immature Hirudinea	215					43
MOLLUSCA						
GASTROPODA				**86**		**17**
Fossaria sp.				86		17

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: UFL1 - UPPER FAWN LAKE - MIDL
SAMPLED: 10/1/2003

TAXA	COMPOSITE
INSECTA	
DIPTERA	
Chironomus sp.	706
Polypedilum sp.	26
ANNELIDA	
OLIGOCHAETA	
Ilyodrilus/Tubifex	17
Unid. Immature Tubificidae w/ Capilliform Chaetae	164
Unid. Immature Tubificidae w/o Capilliform Chaetae	9

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

ERL-1 - EAGLE ROCK LAKE - EDGE
10/02/03

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA		NO				
TRICHOPTERA		MA	**43**			**9**
Brachycentrus americanus		CR	43			9
DIPTERA	**129**	OI		**172**	**129**	**88**
Cricotopus sp.		NV			43	9
Micropsectra sp.	43	VE				9
Orthocladius/Cricotopus sp.	86	ER		86	43	43
Paracladius sp		RT		43		9
Paratanytarsus sp.		TE			43	9
Phaenopsectra sp.		EB		43		9
ANNELIDA		RA				
OLIGOCHAETA	**43**	TE	**86**	**129**	**129**	**77**
Enchytraeidae	43	S	86	129	129	77

Appendix A-4c
Aquatic Biota - Macroinvertabrate Density
Validated Analytical Results

SITE: ERL-1 - EAGLE ROCK LAKE - MI
SAMPLED: 10/2/2003

TAXA	COMPOSITE
INSECTA	
DIPTERA	**844**
Chironomus sp.	732
Cryptochironomus sp.	26
Odontomesa sp.	60
Procladius sp.	26
HYDRACARINA	**52**
Lebertia sp.	52
ANNELIDA	
OLIGOCHAETA	**9**
Unid. Immature Tubificidae w/ Capilliform Chaetae	9

APPENDIX A4-d
BENTHIC INVERTEBRATE TISSUES MONITORING RESULTS

Appendix A-4d
Aquatic Biota - Benthic Invertebrate Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID / Units	Cabresto 2-Oct-2002 CABRESTO-T01N-BMI-100202		ERL 25-Sep-2002 ERL1-T01N-BMI-092502		LR-1 30-Sep-2002 LR-1-T01N-BMI-093002		LR-16 26-Sep-2002 LR-16-T01N-BMI-092602		LR-8A 27-Sep-2002 LR-8A-T01N-BMI-092702		RR-11A1 4-Oct-2002 RR-11A1-T01N-BMI-100402		RR-12 3-Oct-2002 RR-12-T01N-BMI-100302	
Metals															
Aluminum	mg/Kg	152		589		590		787		586		474		259	
Antimony	mg/Kg	0.12		0.12		0.14		0.28		0.13		0.13		0.12	
Arsenic	mg/Kg	0.14		0.42		0.27		0.88		0.52		0.26		0.28	
Barium	mg/Kg	3.2		11		24.8		27.5		25.1		38.4		11.3	
Beryllium	mg/Kg	0.025		0.14		0.12		0.14		0.12		0.069		0.064	
Boron	mg/Kg	0.39		2.2	J	0.37		2.7		0.32		0.76		0.39	
Cadmium	mg/Kg	0.17		1.3		0.95		0.31		0.49		0.41		0.35	
Calcium	mg/Kg	430		28400		403		5810		20900		580		373	
Chromium	mg/Kg	0.79		0.71	J	0.89		1.7		1.4		0.46		0.69	
Cobalt	mg/Kg	0.19		2.4		2.2		2.8		1.7		2		1.1	
Copper	mg/Kg	3.7		22.7		12.8		12.9		14.5		12.6		9.9	
Iron	mg/Kg	369		769		1140		1650		1180		1020		492	
Lead	mg/Kg	1.2		2.5		3.9		4.7		3.5		3.2		1.7	
Magnesium	mg/Kg	321		359		281		450		412		405		238	
Manganese	mg/Kg	10.7		221		126		285		162		147		81.2	
Mercury	mg/Kg	0.015		0.017	J	0.017	J	0.017	J	0.017	J	0.015	J	0.016	J
Molybdenum	mg/Kg	0.35		0.71	J	1.1		3.6		4		0.79		0.39	
Nickel	mg/Kg	1.1		6.3		3.1		5.5		2.8		3.7		2.6	
Potassium	mg/Kg	1760		1090		1200		1270		1290		1740		1230	
Selenium	mg/Kg	0.7		0.26	J	0.25	J	0.28	J	0.39	J	0.59		0.31	
Silver	mg/Kg	0.14		0.34		0.45		0.45		0.39		0.1		0.11	
Sodium	mg/Kg	859		650		727		1050		656		1040		759	
Thallium	mg/Kg	0.061		0.06		0.07		0.14		0.07		0.063		0.059	
Vanadium	mg/Kg	0.3		0.51	J	0.68		1.7		0.88		0.65		0.23	
Zinc	mg/Kg	85.7		74.9		99.6		66.3		69.5		56.2		48.5	
Laboratory Parameters															
Solids, Percent	%	19.2		29.4		16		18.9		24.6		31.2		23.5	

J = Qualified as estimated during data validation

RR-15 1-Oct-2002 RR-15-T01N-BMI-100102	RR-20 1-Oct-2002 RR-20-T01N-BMI-100102	RR-4 2-Oct-2002 RR-4-T01N-BMI-100202	RR-5 4-Oct-2002 RR-5-T01N-BMI-100402	RR-6 4-Oct-2002 RR-6-T01N-BMI-100402	RR-7 3-Oct-2002 RR-7-T01N-BMI-100302	RR-8 4-Oct-2002 RR-8-T01N-BMI-100402	SW12-10 26-Sep-2002 SW12-10-T01N-BMI 092602	SW12-9 26-Sep-2002 SW12-9-T01N-BMI-092602
655	606	281	276	329	371	277	556	310
0.29	0.13	0.13	0.14	0.15	0.17	0.11	0.13	0.14
0.29	0.26	0.25	0.41	0.36	0.17	0.15	0.13	0.14
9.9	16.7	16.7	24.3	15	16.7	17.8	6.6	3.3
0.15	0.096	0.044	0.045	0.065	0.071	0.041	0.39	0.35
0.74	0.48	0.56	0.47	0.48	0.73	0.7	0.32	2.5
0.63	0.87	1.1	1.2	0.6	1.1	0.27	1.3	0.77
413	487	372	391	328	382	402	16300	6210
0.52	0.88	1	2.9	0.48	0.54	0.4	3.5	0.85
1.1	2.1	1.7	2	2.1	2.7	1.3	1.6	1.4
18	11	17.5	16	13	13.8	10	27.1	17.3
609	1070	694	841	544	696	585	856	286
1.3	3.2	1.6	3.7	2.4	2.5	2.2	2	1.2
224	323	267	296	271	295	305	711	383
50.1	157	102	89.9	93.1	100	75.9	462	413
0.016	0.015	0.014	0.015 J	0.016 J	0.017 J	0.016 J	0.016 J	0.016 J
0.45	0.83	1	0.68	0.73	0.66	0.9	31.4	64.3
2.4	3.1	2.9	4.4	3.1	2.8	2.2	6.1	4.6
1460	1420	1640	1620	1650	1470	1480	1820	1580
0.69	0.56	0.55	0.62	0.79	0.76	0.54	0.28 J	0.24 J
0.15	0.13	0.11	0.096	0.089	0.11	0.086	0.39	0.4
728	1320	1050	952	887	1020	805	1220	1160
0.14	0.063	0.064	0.07	0.077	0.083	0.056	0.07	0.07
0.31	0.54	0.44	0.48	0.29	0.33	0.31	2.3	0.59
77.9	113	95.2	94.7	78.6	132	41	72.4	82.2
16	16	15.8	23.3	14.3	14.7	25	23.4	18.5

J = Qualified as estimated during data validation

UFL1 25-Sep-2002 UFL1-T01N-BMI-092502		Zwergle 2-Oct-2002 ZWERGEL-T01N-BMI-100202		CABRESTO 19-Mar-2003 CABRESTO-T01N-BMI-031903		CABRESTO 26-Sep-2003 CABRESTO-T01N-BMI-092603		ERL 20-Mar-2003 ERL-T01N-BMI-032003		ERL-1 22-Sep-2003 ERL1-T01N-BMI-092203		LR-1 18-Mar-2003 LR-1-T01N-BMI-031803		LR-1 24-Sep-2003 LR-1-T01N-BMI-092403		LR-16 18-Mar-2003 LR-16-T01N-BMI-031803	
72.4		448		78.5	J	127		1560	J	724	J	1000	J	610		886	J
0.16		0.16		0.28		0.43		0.3		2.1	J	0.28		0.44		0.21	
0.43		0.24		0.2		0.2		0.23		0.83	J	0.26		0.21		0.42	
8.9		7.2		1.6		4		13.7		9.8	J	12.4		20.6		12.2	
0.015		0.02		0.026		0.037		0.39		0.17	J	0.26		0.17		0.23	
2.6		0.61		4.6		2.4		4.7		6.5	J	3.5		3		3	
0.3		0.14		0.31		0.19		0.85		1	J	0.79		0.77		0.81	
6960		951		881		527		27700		855	J	346		615		2880	
0.29		4.1		0.27		4.2		0.51		1.2	J	0.53		1.1		0.49	
0.32		0.95		0.25		0.27		3.6		1.7	J	2.2		1.2		2.8	
16.4		7.1		4.7		6.4		33.8		36.2	J	22.7		18.4		21.3	
190		722		124	J	272		915	J	568	J	642	J	726		634	J
1.1		0.64		0.61		1.1		2.8		2.8	J	1.8		2		2	
213		342		301		292		283		277	J	248		277		286	
28.6		49.2		11.3		18.3		282		145	J	111		80.6		194	
0.016	J	0.016		0.016		0.017		0.017		0.47	J	0.016		0.017		0.015	
0.27		0.3		0.16		0.43		0.87		5	J	0.61		0.79		2.7	
0.33	J	1.4		0.35		2.3		9.4		2350	J	3.9		3		5.6	
1140		1500		1600	J	1710	J	1020	J	1.2	J	1180	J	1410	J	1250	J
0.36	J	0.67		1.1	J	0.96	J	0.5		0.67	J	0.5	J	0.26	J	0.51	J
0.44		0.17		0.15		0.15	J	0.16		1160	J	0.12		0.16		0.17	
810		797		921		886		524		0.42	J	647		910		877	
0.08		0.082		0.093		0.086		0.1		1.2	J	0.093		0.088		0.07	
0.15		1.4		0.26		0.27		0.6		119	J	0.29		0.36		0.44	
14.7		40.6		137		108		116		9.6		130		86.3		152	
15.4		17.5		18.4		15.2		28.6		30		20.8		16.7		20.4	

J = Qualified as estimated during data validation

LR-16 23-Sep-2003 LR-16-T01N-BMI-092303		LR-8A 18-Mar-2003 LR-8A-T01N-BMI-031803		LR-8A 24-Sep-2003 LR-8A-T01N-BMI-092403		RR-11A1 19-Mar-2003 RR-11A1-T01N-BMI-031903		RR-11A1 25-Sep-2003 RR-11A1-T01N-BMI-092503		RR-12 18-Mar-2003 RR-12-T01N-BMI-031803		RR-12 25-Sep-2003 RR-12-T01N-BMI-092503		RR-15 18-Mar-2003 RR-15-T01N-BMI-031803		RR-15 25-Sep-2003 RR-15-T01N-BMI-092503	
154		854	J	651		209	J	326		967	J	290		1200	J	863	
0.5		0.26		0.48		0.29		0.38		0.27		0.49		0.29		0.38	
0.2		0.23		0.36		0.19		0.2		0.25		0.26		0.19		0.15	
5		10.2		19.8		7.9		43.4		24.8		8.7		11.1		11.6	
0.071		0.22		0.17		0.031		0.077		0.33		0.098		0.35		0.3	
3.7		4.7		3.4		3.3		5.6		6.8		2.5		4.8		3.3	
0.47		1		0.82		0.35		1.7		0.76		0.47		0.28		0.62	
326		801		805		245		393		387		329		373		486	
1.3		0.43		1.3		0.27		0.71		0.45		1.4		0.18		0.63	
1.2		2.4		1.4		1.8		2.1		1.3		1		1.3		0.83	
7.2		25.7		19.1		10.4		13		24.3		13.1		27		18.6	
178		613	J	1130		263	J	630		776	J	440		764	J	472	
0.58		1.7		5.5		0.78		1.7		2.2		1.9		1.1		1.2	
243		246		292		188		267		256		228		188		227	
93.6		126		122		88.2		111		55.4		74.4		67.5		58.5	
0.015		0.016		0.015		0.016		0.016		0.015		0.018		0.016		0.016	
0.8		4.3		4		0.31		0.35		0.6		0.27		0.51		0.35	
2.5		3.1		3.1		2.5		2.7		4.3		3.8		3		2.9	
1230	J	1310	J	1460	J	1240		1310	J	1210	J	1450	J	1090	J	1230	J
0.3	J	0.43		0.69	J	0.49		0.43	J	0.46	J	0.29	J	0.48		0.23	J
0.16	J	0.12		0.14	J	0.12		0.13	J	0.12		0.15		0.16		0.16	
1180		579		957		728		907		872		916		886		834	
0.1		0.087		0.095		0.097		0.077		0.09		0.098		0.095		0.076	
0.29		0.33		0.52		0.22		0.27		0.38		0.26		0.28		0.29	
66.2		161		97.3		50.8		108		114		81		60.2		89.2	
19		16.2		14.3		14		35.6		16.3		12.1		16.7		15.9	

J = Qualified as estimated during data validation

RR-20 18-Mar-2003 RR-20-T01N-BMI-031803	RR-20 25-Sep-2003 RR-20-T01N-BMI-092503	RR-4 19-Mar-2003 RR-4-T01N-BMI-031903	RR-4 1-Oct-2003 RR-4-T01N-BMI-100103	RR-5 19-Mar-2003 RR-5-T01N-BMI-031903	RR-5 1-Oct-2003 RR-5-T01N-BMI-100103	RR-6 19-Mar-2003 RR-6-T01N-BMI-031903	RR-6 30-Sep-2003 RR-6-T01N-BMI-093003	RR-7 19-Mar-2003 RR-7-T01N-BMI-031903
918 J	638	474 J	450	268 J	289	527 J	498	344 J
0.26	0.44	0.3	0.43	0.24	0.4	0.27	0.49	0.28
0.27	0.18	0.2	0.23	0.16	0.25	0.18	0.28	0.19
12.4	15.6	14.7	14.3	14.2	19	6.5	23.2	6.8
0.25	0.18	0.13	0.086	0.045	0.043	0.13	0.11	0.061
2.6	2.6	3.1	0.67	2	2	1.5	0.99	2.1
0.92	0.72	2.1	0.94	1.2	1.3	0.82	1.1	0.51
365	434	342	542	335	410	273	417	241
0.36	0.97	0.52	0.98	0.45	2.4	0.35	1.8	0.36
2.5	1.1	2.9	1.3	2.6	1.6	1.6	1.9	1.6
20.4	15.6	36.1	32.6	18.4	23.3	19.3	20.1	12.4
621 J	664	956 J	834	479 J	725	365 J	507	281 J
2	1.8	1.1	1.4	1.9	2.4	0.89	1.5	0.93
190	248	236	293	273	302	240	247	175
91.7	93.6	132	79.3	103	81.4	36.8	105	47.4
0.015	0.017	0.015	0.016	0.015	0.014	0.015	0.016	0.016
0.35	0.63	0.23	0.22	0.36	0.27	0.21	0.44	0.33
4.6	3.4	4	2.8	3.6	3.2	1.9	3.5	2.1
1220 J	1360 J	1250 J	1580 J	1270 J	1490 J	1220 J	1520 J	1330 J
0.53 J	0.27 J	0.5	0.52 J	0.4	0.4 J	0.45	0.47 J	0.47
0.15	0.15	0.12	0.15	0.16	0.38	0.17	0.14 J	0.16
1020	972	788	956	927	814	737	850	979
0.086	0.088	0.1	0.087	0.079	0.081	0.089	0.098	0.093
0.27	0.33	0.44	0.58	0.3	0.37	0.29	0.26	0.28
138	96.7	165	105	113	96.8	109	125	72.6
18.6	38.3	16.3	15.2	15.4	20.1	14.5	16.5	12.9

J = Qualified as estimated during data validation

RR-7 30-Sep-2003 RR-7-T01N-BMI-093003	RR-8 19-Mar-2003 RR-8-T01N-BMI-031903	RR-8 30-Sep-2003 RR-8-T01N-BMI-093003	SW12-WTP 20-Mar-2003 SW12-WTP-T01N-BMI-032003	UFL1 10-Apr-2003 UFL1-T01N-BMI-041003	UFL1 22-Sep-2003 UFL1-T01N-BMI-092203	UNIQUE 1 20-Mar-2003 UNIQUE1-T01N-BMI-032003	Zwergle 19-Mar-2003 ZWERGEL-T01N-BMI-031903	Zwergle 2-Oct-2003 ZWERGLE-T01N-BMI-100203
456 :	331 J	377 :	416 J	271 J	222 :	497 J	250 J	354 :
0.46 :	0.27 :	0.41 :	0.26 :	0.28 :	0.49 :	0.27 :	0.28 :	0.39 :
0.25 :	0.18 :	0.17 :	0.18 :	0.43 :	0.57 :	0.31 :	0.24 :	0.16 :
18.7 :	11.2 :	13.4 :	10.2 :	28.9 :	35 :	11.1 :	4.2 :	6.7 :
0.092 :	0.048 :	0.094 :	0.12 :	0.046 :	0.038 :	0.081 :	0.028 :	0.033 :
0.55 :	3.8 :	0.59 :	4.1 :	0.85 :	2.8 :	4.9 :	2.2 :	0.77 :
1.2 :	0.43 :	1.7 :	0.22 :	0.48 :	0.57 :	1.7 :	0.093 :	0.071 :
377 :	303 :	396 :	25200 :	15900 :	16700 :	592 :	425 :	468 :
0.85 :	0.31 :	0.74 :	1.3 :	0.43 :	0.4 :	0.63 :	0.66 :	0.85 :
2.3 :	2.2 :	2.2 :	1.8 :	0.85 :	0.64 :	1.1 :	0.43 :	0.31 :
18.7 :	11.8 :	16.5 :	8.9 :	24.7 :	23.2 :	14.9 :	4.8 :	4.1 :
585 :	342 J	473 :	451 J	537 J	399 :	843 J	349 J	526 :
1.9 :	1.1 :	1.4 :	1.1 :	2.3 :	1.8 :	2.7 :	0.46 :	0.59 :
235 :	248 :	227 :	422 :	339 :	361 :	318 :	247 :	291 :
116 :	123 :	105 :	524 :	67.7 :	63.1 :	47.8 :	29 :	40.9 :
0.017 J	0.015 :	0.013 J	0.017 :	0.016 :	0.02 :	0.016 :	0.016 :	0.051 :
0.54 :	0.39 :	0.28 :	21.4 :	0.97 :	0.21 :	1.5 :	0.18 :	0.34 :
3.8 :	2.5 :	2.8 :	7.3 :	2.6 :	1.3 :	2.6 :	0.39 :	0.33 J
1400 J	1290 J	1200 J	1040 J	1290 J	1330 J	1670 J	1240 J	1560 J
0.28 J	0.45 :	0.25 J	0.43 :	0.47 :	0.66 J	1.9 J	0.46 :	0.47 J
0.14 :	0.13 :	0.15 :	0.14 :	0.13 :	0.15 :	0.15 :	0.16 :	0.13 :
812 :	985 :	782 :	796 :	968 :	1040 :	898 :	893 :	1100 :
0.092 :	0.091 :	0.082 :	0.087 :	0.094 :	0.097 :	0.089 :	0.092 :	0.078 :
0.28 :	0.23 :	0.27 :	1.4 :	0.45 :	0.32 :	0.56 :	0.57 :	0.92 :
119 :	61.6 :	135 :	35.7 :	28.5 :	29.4 :	76.5 :	32.5 :	25.1 :
12.9 :	16.5 :	15.6 :	13.9 :	16.9 :	14.3 :	23.7 :	15.7 :	24.6 :

J = Qualified as estimated during data validation

APPENDIX A-4e
PERIPHYTON POPULATION
VALIDATED ANALYTICAL RESULTS

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
Cabresto Creek - 10/02/2002

NUMBER OF TAXA	23
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Cyclotella meneghiniana	0.5
Order Pennales	
Achnanthes lanceolata	0.5
Achnanthes linearis	0.5
Achnanthes minutissima	18.1
Anomoeoneis vitrea	1.1
Cymbella minuta	10.4
Cymbella sinuata	2.2
Fragilaria construens venter	0.5
Fragilaria pinnata	2.7
Fragilaria vaucheria	0.5
Gomphonema angustatum	0.5
Navicula cryptocephala veneta	0.5
Navicula minima	1.1
Nitzschia dissipata	2.7
Nitzschia frustulum	8.2
Nitzschia palea	0.5
Nitzschia paleacea	1.6
Pinnularia sp.	0.5
Surirella ovata	0.5
Synedra rumpens	11.5
Synedra socia	1.1
Synedra ulna contracta	0.5
CYANOPHYTA	
Oscillatoria sp.	33

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
Zwergle - Upstream of Town of Red River - 10/02/2002

NUMBER OF TAXA	19
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Pennales	
Achnanthes linearis	3.7
Achnanthes minutissima	15.8
Cocconeis placentula	2.8
Cymbella affinis	2.3
Cymbella microcephala	0.5
Cymbella minuta	19.1
Cymbella sinuata	0.9
Fragilaria construens venter	1.4
Fragilaria leptostauron	6.5
Fragilaria pinnata	0.5
Fragilaria vaucheria	1.9
Frustulia rhomboides	0.5
Gomphonema angustatum	0.5
Navicula cryptocephala	2.3
Navicula cryptocephala veneta	6.5
Navicula tripunctata	0.5
Nitzschia paleacea	1.4
Synedra ulna contracta	0.5
CYANOPHYTA	
Oscillatoria sp.	32.6

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-4 - June Bug Campground - 10/02/2002

NUMBER OF TAXA	19
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira excurrens	0.8
Order Pennales	
Achnanthes linearis	0.8
Achnanthes minutissima	13.6
Cymbella minuta	4.3
Diatoma hiemale mesodon	0.4
Fragilaria construens venter	2.7
Fragilaria pinnata	4.3
Fragilaria vaucheria	0.4
Navicula cryptocephala	1.2
Navicula minima	0.4
Nitzschia fonticola	0.4
Nitzschia frustulum	0.4
Nitzschia paleacea	1.2
Surirella linearis	1.2
Surirella ovata	1.6
Synedra rumpens	15.2
CHLOROPHYTA	
Ankistrodesmus falcatus	0.4
CYANOPHYTA	
Oscillatoria sp.	50.6
CHRYSOPHYTA	
Chrysococcus rufescens	0.4

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-5 - Downstream of Elephant Rock Campground, Upstream of Hansen Creek
10/03/2002

NUMBER OF TAXA	25
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	12.4
Order Pennales	
Achnanthes lanceolata	0.7
Achnanthes minutissima	5.8
Amphora perpusilla	1.5
Cocconeis placentula	1.5
Cymbella affinis	1.5
Cymbella minuta	8
Epithemia sorex	0.7
Fragilaria construens	10.2
Fragilaria construens venter	4.4
Fragilaria pinnata	0.7
Fragilaria vaucheria	7.3
Gomphonema angustatum	1.5
Gomphonema subclavatum	0.7
Navicula cryptocephala	0.7
Navicula gregaria	21.2
Navicula tripunctata	0.7
Nitzschia dissipata	0.7
Nitzschia fonticola	1.5
Nitzschia frustulum	0.7
Nitzschia linearis	0.7
Nitzschia palea	1.5
Surirella linearis	2.2
Surirella ovata	11.7
Synedra rumpens	1.5

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-6 - Downstream of Hansen Creek, Upstream of Mill - 10/04/2002

NUMBER OF TAXA	23
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	2.3
Order Pennales	
Achnanthes minutissima	19.8
Cocconeis placentula	0.8
Cymbella minuta	5.3
Cymbella sinuata	0.8
Fragilaria construens	4.6
Fragilaria construens venter	4.6
Fragilaria pinnata	3.1
Fragilaria vaucheria	2.3
Gomphonema angustatum	4.6
Navicula cryptocephala	0.8
Navicula cryptocephala veneta	0.8
Navicula gregaria	4.6
Navicula minima	0.8
Nitzschia frustulum	3.1
Nitzschia paleacea	3.8
Pinnularia sp.	0.8
Rhopalodia musculus	0.8
Surirella linearis	1.5
Surirella ovata	0.8
Synedra rumpens	10.7
CYANOPHYTA	
Oscillatoria sp.	22.9
CRYPTOPHYTA	
Rhodomonas minuta	0.8

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-7 - Downstream of Mine Site Boundary, Upstream of Mill - 10/03/2002

NUMBER OF TAXA	20
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	3.6
Order Pennales	
Achnanthes linearis	0.7
Achnanthes minutissima	14.3
Cocconeis placentula	0.7
Cymbella affinis	0.7
Cymbella minuta	49.3
Cymbella sinuata	2.9
Fragilaria construens venter	0.7
Fragilaria pinnata	2.9
Fragilaria vaucheria	10
Gomphonema angustatum	1.4
Nitzschia dissipata	0.7
Nitzschia fonticola	1.4
Nitzschia frustulum	1.4
Nitzschia microcephala	0.7
Nitzschia palea	0.7
Nitzschia paleacea	1.4
Surirella linearis	0.7
Surirella ovata	2.1
Synedra rumpens	3.6

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-8 - Downstream of Mill, Upstream of Columbine Creek - 10/03/02

NUMBER OF TAXA	18
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Pennales	
Achnanthes minutissima	31.7
Amphora perpusilla	1.4
Cymbella minuta	12.2
Gomphonema angustatum	6.5
Navicula cryptocephala	1.4
Navicula cryptocephala veneta	1.4
Navicula gregaria	7.2
Navicula minuscula	0.7
Navicula sp.	0.7
Nitzschia fonticola	1.4
Nitzschia palea	1.4
Nitzschia paleacea	2.2
Surirella linearis	0.7
Surirella ovata	6.5
Synedra rumpens	5
Synedra ulna	0.7
CHLOROPHYTA	
Scenedesmus acuminatus	11.5
CYANOPHYTA	
Oscillatoria sp.	7.2

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-11A1 - Downstream of Cabin Springs and Columbine Well Field -
10/03/2002

NUMBER OF TAXA	22
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Pennales	
Achnanthes minutissima	2.8
Amphora ovalis	0.2
Cocconeis placentula	0.2
Cymbella cistula	0.2
Cymbella minuta	9.9
Diatoma hiemale mesodon	0.2
Fragilaria construens	3.3
Fragilaria construens venter	11.2
Fragilaria pinnata	0.2
Fragilaria vaucheria	0.3
Gomphonema angustatum	0.2
Gomphonema subclavatum	0.2
Navicula cryptocephala veneta	0.3
Navicula gregaria	0.5
Nitzschia communis	0.2
Nitzschia dissipata	0.2
Nitzschia frustulum	0.2
Nitzschia palea	0.7
Surirella linearis	0.2
Surirella ovata	0.5
Synedra rumpens	1
CYANOPHYTA	
Oscillatoria sp.	67.7

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-11A1 - Downstream of Cabin Springs and Columbine Well Field
(Duplicate sample) - 10/04/2002

NUMBER OF TAXA	21
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	4.8
Stephanodiscus hantzschii	0.3
Order Pennales	
Achnanthes minutissima	4.5
Cocconeis placentula	0.3
Cymbella minuta	3.5
Cymbella naviculiformis	0.6
Cymbella sinuata	0.3
Fragilaria leptostauron	0.3
Fragilaria vaucheria	1.6
Gomphonema angustatum	0.3
Gomphonema subclavatum	0.3
Navicula cryptocephala veneta	0.3
Navicula gregaria	13.4
Nitzschia dissipata	0.6
Nitzschia frustulum	1
Nitzschia linearis	1
Nitzschia paleacea	1.3
Surirella linearis	0.6
Surirella ovata	1
Synedra rumpens	0.3
CYANOPHYTA	
Oscillatoria sp.	63.7

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-12 - Goathill Campground - 10/03/2002

NUMBER OF TAXA	18
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	2.2
Order Pennales	
Achnanthes linearis	0.4
Achnanthes minutissima	15.4
Cymbella minuta	18
Cymbella sinuata	0.9
Fragilaria construens	0.9
Fragilaria vaucheria	3.1
Gomphonema angustatum	0.4
Navicula gregaria	1.8
Nitzschia frustulum	0.4
Nitzschia palea	0.9
Nitzschia paleacea	0.9
Nitzschia volcanica	0.4
Pinnularia sp.	0.4
Surirella linearis	0.4
Surirella ovata	0.9
Synedra rumpens	4.4
CYANOPHYTA	
Oscillatoria sp.	48.2

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-15, Upstream of Questa Ranger Station - 10/01/2002

NUMBER OF TAXA	12
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Pennales	
Achnanthes minutissima	23.4
Cymbella minuta	8
Fragilaria construens venter	0.5
Fragilaria leptostauron	0.5
Fragilaria vaucheria	0.5
Navicula gregaria	2.7
Navicula minima	0.5
Nitzschia frustulum	1.6
Nitzschia palea	0.5
Nitzschia sp.	0.5
Synedra rumpens	8
CYANOPHYTA	
Oscillatoria sp.	53.2

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
LR-1, Downstream of Highway 522 and Village of Questa WWTP - 09/30/2002

NUMBER OF TAXA	18
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	2.4
Order Pennales	
Achnanthes lanceolata	0.5
Achnanthes minutissima	17.5
Anomoeoneis vitrea	10.9
Asterionella formosa	0.5
Cymbella affinis	0.9
Cymbella minuta	10
Gomphonema angustatum	0.9
Navicula gregaria	1.9
Nitzschia frustulum	0.5
Nitzschia linearis	1.4
Nitzschia palea	0.9
Nitzschia paleacea	0.5
Nitzschia sp.	0.5
Surirella ovata	1.4
Synedra rumpens	6.2
Synedra ulna	0.5
CYANOPHYTA	
Oscillatoria sp.	42.7

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
LR-8A, Downstream of NPDES Outfall 002 - 09/27/2002

NUMBER OF TAXA	22
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	11.4
Order Pennales	
Achnanthes lanceolata	0.6
Achnanthes minutissima	25.9
Anomoeoneis vitrea	1.9
Cymbella minuta	10.8
Diatoma vulgare	0.6
Fragilaria construens venter	5.1
Fragilaria pinnata	0.6
Fragilaria vaucheria	1.9
Gomphonema angustatum	1.9
Navicula graciloides	0.6
Navicula gregaria	7
Navicula tripunctata	0.6
Nitzschia frustulum	1.9
Nitzschia linearis	0.6
Nitzschia palea	0.6
Surirella linearis	0.6
Surirella ovata	3.8
Synedra rumpens	12.7
Synedra ulna	1.9
CHLOROPHYTA	
Scenedesmus quadricauda	2.5
CYANOPHYTA	
Oscillatoria sp.	6.3

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
LR-16, Upstream of Hatchery Diversion - 09/27/2002

NUMBER OF TAXA	19
Organisms	**Relative Abundance (%)**
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	7.6
Stephanodiscus hantzschii	0.8
Order Pennales	
Achnanthes lanceolata	0.8
Achnanthes minutissima	38.2
Amphora ovalis	0.8
Anomoeoneis vitrea	3.8
Cocconeis placentula	0.8
Cymbella minuta	16.8
Fragilaria vaucheria	2.3
Gomphonema angustatum	1.5
Meridion circulare	0.8
Navicula gregaria	13
Navicula sp.	0.8
Navicula tripunctata	0.8
Nitzschia dissipata	1.5
Nitzschia linearis	0.8
Rhopalodia gibba	3.1
Surirella ovata	1.5
Synedra rumpens	4.6

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
Cabresto Creek - 09/26/2003

NUMBER OF TAXA	14
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes lanceolata	4.7
Achnanthes linearis	4.7
Achnanthes minutissima	66.7
Amphora perpusilla	2.0
Cocconeis placentula	2.0
Cymbella minuta	0.7
Fragilaria leptostauron	4.0
Fragilaria pinnata	1.3
Navicula cryptocephala veneta	6.0
Navicula gregaria	1.3
Nitzschia dissipata	1.3
Nitzschia linearis	0.7
Nitzschia paleacea	0.7
CYANOPHYTA	
Oscillatoria sp.	4.0

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
Zwergle, Upstream of Town of Red River - 10/02/2003

NUMBER OF TAXA	9
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes linearis	0.5
Achnanthes minutissima	93.5
Cymbella affinis	0.7
Cymbella minuta	2.7
Fragilaria pinnata	0.2
Gomphonema angustatum	0.2
Navicula cryptocephala veneta	1.5
Navicula tripunctata	0.2
Nitzschia paleacea	0.2

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-4, Junebug Campground - 10/01/2003

NUMBER OF TAXA	29
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes flexella	0.5
Achnanthes linearis	0.5
Achnanthes minutissima	6.8
Amphora perpusilla	0.5
Cocconeis placentula	4.5
Cymbella affinis	0.5
Cymbella microcephala	0.5
Cymbella minuta	11.7
Cymbella sinuata	1.8
Diatoma hiemale mesodon	0.5
Fragilaria construens	6.3
Fragilaria construens venter	3.2
Fragilaria leptostauron	4.1
Fragilaria pinnata	1.4
Gomphonema angustatum	2.3
Gomphonema olivaceum	0.9
Hannaea arcus	0.5
Navicula cryptocephala	0.5
Navicula cryptocephala veneta	0.9
Navicula minima	0.5
Navicula sp.	0.5
Navicula tripunctata	0.5
Nitzschia dissipata	0.5
Nitzschia palea	0.5
Nitzschia paleacea	1.4
Surirella ovata	2.7
Synedra rumpens	3.6
CHLOROPHYTA	
Ulothrix sp.	36.0
CYANOPHYTA	
Oscillatoria sp.	6.8

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-5, Downstream of Elephant Rock Campground, Upstream of Hansen Creek - 10/01/2003

NUMBER OF TAXA	15
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes linearis	1.9
Achnanthes minutissima	11.5
Cocconeis placentula	0.4
Cymbella affinis	0.4
Cymbella minuta	11.9
Cymbella sinuata	1.1
Fragilaria vaucheria	4.1
Navicula cryptocephala veneta	0.7
Navicula minima	17.8
Nitzschia dissipata	0.7
Nitzschia fonticola	1.1
Nitzschia paleacea	1.9
Nitzschia sp.	0.4
Synedra rumpens	27.5
CHLOROPHYTA	
Gloeocystis sp.	18.6

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-6, Downstream of Hansen Creek, Upstream of Mill - 09/30/2003

NUMBER OF TAXA	16
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes lanceolata	1.2
Achnanthes linearis	1.8
Achnanthes minutissima	15.0
Cocconeis placentula	0.6
Cymbella affinis	3.6
Cymbella minuta	31.7
Cymbella sinuata	2.4
Fragilaria construens venter	2.4
Fragilaria vaucheria	0.6
Gomphonema angustatum	1.2
Navicula gregaria	0.6
Navicula sp.	1.2
Nitzschia communis	0.6
Surirella ovata	0.6
CYANOPHYTA	
Oscillatoria sp.	35.9
CRYPTOPHYTA	
Rhodomonas minuta	0.6

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-7, Downstream of Mine Site Boundary, Upstream of Mill - 09/30/2003

NUMBER OF TAXA	24
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	0.5
Order Pennales	
Achnanthes linearis	0.9
Achnanthes minutissima	6.8
Amphora ovalis	0.5
Amphora perpusilla	0.9
Cocconeis placentula	0.9
Cymbella microcephala	0.5
Cymbella minuta	13.2
Fragilaria vaucheria	0.5
Navicula cryptocephala veneta	0.5
Navicula decussis	0.5
Navicula gregaria	2.3
Navicula minima	0.9
Navicula sp.	0.9
Nitzschia dissipata	1.4
Nitzschia fonticola	0.9
Nitzschia innominata	0.5
Nitzschia palea	0.5
Nitzschia paleacea	0.5
Surirella linearis	0.5
Surirella ovata	3.2
Synedra rumpens	1.4
CYANOPHYTA	
Oscillatoria sp.	61.4
CRYPTOPHYTA	
Rhodomonas minuta	0.5

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-8, Downstream of Mill, Upstream of Columbine Creek - 10/03/2003

NUMBER OF TAXA	22
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes flexella	0.6
Achnanthes linearis	0.6
Achnanthes minutissima	7.1
Amphora perpusilla	0.6
Cocconeis placentula	1.2
Cymbella affinis	0.6
Cymbella minuta	15.3
Cymbella sinuata	0.6
Fragilaria leptostauron	0.6
Fragilaria pinnata	0.6
Gomphonema angustatum	0.6
Navicula cryptocephala	0.6
Navicula cryptocephala veneta	1.2
Navicula gregaria	17.6
Navicula minima	1.2
Nitzschia palea	1.2
Nitzschia paleacea	0.6
Nitzschia sp.	0.6
Surirella linearis	2.4
Surirella ovata	10.6
Synedra rumpens	0.6
CYANOPHYTA	
Oscillatoria sp.	35.3

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-11A1, Downstream of Cabin Springs and Columbine Well Field - 09/25/2003

NUMBER OF TAXA	21
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes lanceolata	0.5
Achnanthes linearis	1.0
Achnanthes minutissima	3.4
Amphora perpusilla	1.0
Cocconeis placentula	1.0
Cymbella affinis	1.0
Cymbella minuta	15.0
Cymbella sinuata	0.5
Fragilaria construens venter	1.5
Fragilaria leptostauron	1.0
Fragilaria pinnata	1.9
Fragilaria vaucheria	1.0
Gomphonema angustatum	1.5
Navicula cryptocephala	0.5
Navicula gregaria	5.3
Nitzschia dissipata	1.5
Nitzschia linearis	1.9
Nitzschia paleacea	1.0
Surirella ovata	6.8
Synedra rumpens	1.9
CYANOPHYTA	
Oscillatoria sp.	51.0

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-12, Goathill Campground - 09/25/2003

NUMBER OF TAXA	19
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	0.7
Order Pennales	
Achnanthes linearis	0.7
Achnanthes minutissima	7.3
Cocconeis placentula	2.2
Cymbella minuta	58.4
Cymbella sinuata	0.7
Fragilaria construens venter	10.9
Fragilaria leptostauron	0.7
Fragilaria vaucheria	1.5
Gomphonema angustatum	1.5
Gomphonema olivaceum	1.5
Navicula cryptocephala venata	0.7
Navicula gregaria	3.6
Navicula mutica	0.7
Nitzschia dissipata	0.7
Nitzschia frustulum	1.5
NItzschia linearis	1.5
Surirella ovata	4.4
Synedra ulna	0.7

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-15, Upstream of Questa Ranger Station - 09/25/03

NUMBER OF TAXA	26
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	0.8
Order Pennales	
Achnanthes linearis	0.4
Achnanthes minutissima	6.4
Cocconeis placentula	1.1
Cymbella minuta	13.9
Cymbella muelleri	0.4
Cymbella sinuata	0.8
Diatoma hiemale mesodon	0.4
Fragilaria construens	0.8
Fragilaria construens venter	1.1
Fragilaria pinnata	3.0
Fragilaria vaucheria	1.9
Gomphonema angustatum	0.8
Gomphonema olivaceum	0.4
Gomphonema sp.	0.4
Gomphonema subclavatum	0.4
Navicula cryptocephala	0.4
Navicula cryptocephala veneta	0.4
Navicula gregaria	0.8
Nitzschia fonticola	0.4
Nitzschia palea	0.8
Nitzschia paleacea	0.4
Surirella ovata	1.1
Synedra rumpens	0.8
Synedra ulna	0.4
CYANOPHYTA	
Oscillatoria sp.	62.0

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
RR-20, Upstream of Highway 522 - 09/25/2003

NUMBER OF TAXA	24
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	0.2
Order Pennales	
Achnanthes minutissima	1.4
Anomoeoneis vitrea	0.5
Caloneis ventricosa minuta	0.2
Cocconeis placentula	0.2
Cymbella minuta	5.3
Fragilaria leptostauron	1.2
Fragilaria pinnata	0.5
Fragilaria vaucheria	0.2
Navicula gregaria	1.2
Navicula sp.	0.2
Navicula tripunctata	0.7
Neidium affine	0.2
Nitzschia fonticola	0.5
Nitzschia frustulum	0.2
Nitzschia linearis	0.7
Nitzschia palea	1.6
Nitzschia paleacea	0.2
Surirella linearis	0.7
Surirella ovata	4.8
Synedra rumpens	3.0
CHLOROPHYTA	
Cladophora sp.	3.2
Ulothrix sp.	3.7
CYANOPHYTA	
Oscillatoria sp.	69.3

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
LR-1, Downstream of Highway 522 and Village of Questa WWTP - 09/24/2003

NUMBER OF TAXA	19
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Centrales	
Melosira varians	0.5
Order Pennales	
Achnanthes minutissima	11.1
Cocconeis placentula	1.1
Cymbella minuta	10.1
Fragilaria construens venter	14.8
Fragilaria leptostauron	1.6
Fragilaria pinnata	1.1
Fragilaria vaucheria	2.6
Gomphonema subclavatum	0.5
Navicula cryptocephala veneta	0.5
Navicula gregaria	1.1
Navicula sp.	0.5
Nitzschia linearis	0.5
Nitzschia palea	0.5
Nitzschia paleacea	1.1
Surirella ovata	6.9
Synedra rumpens	16.9
CHLOROPHYTA	
Ulothrix sp.	12.7
CYANOPHYTA	
Oscillatoria sp.	15.9

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
LR-8A, Downstream of NPDES Outfall 002 - 08/09/2003

NUMBER OF TAXA	19
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes minutissima	7.5
Anomoeoneis vitrea	0.5
Cymbella minuta	12.9
Fragilaria vaucheria	2.7
Gomphonema angustatum	0.5
Navicula cryptocephala	0.5
Navicula cryptocephala veneta	0.5
Navicula gregaria	0.5
Nitzschia dissipata	0.5
Nitzschia fonticola	1.1
Nitzschia frustulum	1.1
Nitzschia linearis	0.5
Nitzschia paleacea	1.1
Surirella linearis	0.5
Surirella ovata	2.2
Synedra rumpens	12.9
CHLOROPHYTA	
Cladophora sp.	3.2
Ulothrix sp.	49.5
CYANOPHYTA	
Oscillatoria sp.	1.6

Appendix A-4e
Aquatic Biota - Periphyton Population
Validated Analytical Results
LR-16, Upstream of Hatchery Diversion - 09/23/2003

NUMBER OF TAXA	19
Organisms	Relative Abundance (%)
BACILLARIOPHYTA	
Order Pennales	
Achnanthes minutissima	5.6
Anomoeoneis vitrea	0.8
Cymbella minuta	16.7
Fragilaria leptostauron	1.6
Fragilaria vaucheria	7.1
Navicula gregaria	31.7
Navicula sp.	0.8
Navicula tripunctata	2.4
Nitzschia dissipata	2.4
Nitzschia fonticola	1.6
Nitzschia frustulum	0.8
Nitzschia linearis	0.8
Nitzschia palea	5.6
Nitzschia paleacea	0.8
Nitzschia sp.	0.8
Surirella linearis	2.4
Surirella ovata	7.1
Synedra rumpens	3.2
CYANOPHYTA	
Oscillatoria sp.	7.9

APPENDIX A4-f
MACROPHYTE TISSUES
VALIDATED ANALYTICAL RESULTS

Parameter	Site ID / Sample Date / Sample ID / Units	Cabresto 10/2/2002 CABRESTO-T01N-PLA-100202		ERL 9/25/2002 ERL1-T01N-PLA-092502		LR-1 10/1/2002 LR-1-T01N-PLA-100102		LR-16 9/27/2002 LR-16-T01N-PLA-092702		LR-8A 9/27/2002 LR-8A-T01N-PLA-092702		RR-11A1 10/3/2002 RR-11A1-T01N-PLA-100302		RR-12 10/3/2002 RR-12-T01N-PLA-100302	
Metals															
Aluminum	mg/Kg	753	J	6840	J	2570	J	3000	J	3310	J	3220	J	4110	J
Antimony	mg/Kg	0.16	J	0.13	J	0.16	J	0.12	J	0.12	J	0.14	:	0.17	J
Arsenic	mg/Kg	0.42	J	2	J	1.1	J	2.2	J	1.4	J	1.6	J	2.9	J
Barium	mg/Kg	12.1	J	105	J	93.7	J	126	J	133	J	120	J	296	J
Beryllium	mg/Kg	0.3	:	1.6	:	0.59	:	0.68	:	0.81	:	0.82	:	0.9	:
Boron	mg/Kg	1.5	:	0.36	:	2.3	:	2.3	:	2.8	:	1.9	:	1.3	:
Cadmium	mg/Kg	0.15	:	1.7	:	0.88	:	1.7	:	1.6	:	1.7	:	0.94	:
Calcium	mg/Kg	1360	:	1130	:	1410	:	2730	:	1920	:	1050	:	1220	:
Chromium	mg/Kg	1	J	4.2	J	2	J	3.9	J	3	J	2.2	J	4.5	J
Cobalt	mg/Kg	0.55	J	13.7	J	17.5	J	34.5	J	38.5	J	21.3	J	12.3	J
Copper	mg/Kg	1.8	J	61.4	J	53.2	J	49.4	J	76.3	J	56.4	J	53.9	J
Iron	mg/Kg	1760	:	8730	:	4910	:	6630	:	6930	:	3840	:	8700	:
Lead	mg/Kg	5.8	J	31.3	J	13.3	J	19	J	17	J	9.8	J	26.9	J
Magnesium	mg/Kg	289	J	1080	J	531	J	772	J	599	J	422	J	955	J
Manganese	mg/Kg	94	J	1050	J	1580	J	3140	J	3900	J	1420	J	862	J
Mercury	mg/Kg	0.016	:	0.017	J	0.015	:	0.015	J	0.017	J	0.015	J	0.015	J
Molybdenum	mg/Kg	0.57	J	4	J	5.4	J	13.7	J	40.7	J	1.8	J	4	J
Nickel	mg/Kg	2.9	:	41	:	22.7	:	41.3	:	31.2	:	25.3	:	29.9	:
Potassium	mg/Kg	1370	J	1070	J	1100	J	1000	J	1200	J	421	J	1210	J
Selenium	mg/Kg	0.6	J	1.1	J	0.76	J	0.81	J	0.66	J	1.2	J	0.91	J
Silver	mg/Kg	0.15	:	0.45	:	0.2	:	0.43	:	0.48	:	0.13	:	0.19	:
Sodium	mg/Kg	61.2	:	115	:	96.5	:	121	:	82.3	:	56.3	:	110	:
Thallium	mg/Kg	0.08	:	0.07	:	0.081	:	0.06	:	0.06	:	0.071	:	0.083	:
Vanadium	mg/Kg	1.3	:	5	:	2.1	:	6.3	:	3.5	:	2	:	4.4	:
Zinc	mg/Kg	44.6	J	372	J	157	J	228	J	224	J	222	J	217	J
Laboratory Parameters															
Solids, Percent	%	13	:	21.6	:	18.5	:	30.4	:	22.7	:	20.4	:	35.3	:

J = Qualified as estimated during data validation
T = Total Fraction

Parameter	Site ID / Sample Date / Sample ID / Units	RR-15 10/4/2002 RR-15-T01N-PLA-100402		RR-20 10/1/2002 RR-20-T01N-PLA-100102		RR-4 10/2/2002 RR-4-T01N-PLA-100202		RR-5 10/4/2002 RR-5-T01N-PLA-100402		RR-6 10/4/2002 RR-6-T01N-PLA-100402		RR-7 10/3/2002 RR-7-T01N-PLA-100302		RR-8 10/3/2002 RR-8-T01N-PLA-100302	
Metals															
Aluminum	mg/Kg	3370	J	5270	J	1360	J	652	J	2110	J	541	J	1790	J
Antimony	mg/Kg	0.14	:	0.15	J	0.14	J	0.15	:	0.17	:	0.16	:	0.15	:
Arsenic	mg/Kg	0.93	J	2	J	0.48	J	0.51	J	1.6	J	0.48	J	1.1	J
Barium	mg/Kg	82.8	J	201	J	123	J	53.2	J	174	J	21.8	J	117	J
Beryllium	mg/Kg	1	:	1.1	:	0.37	:	0.14	:	0.29	:	0.1	:	0.27	:
Boron	mg/Kg	0.59	:	0.52	:	0.98	:	1.2	:	1.2	:	0.62	:	1.2	:
Cadmium	mg/Kg	0.38	:	2.6	:	1.9	:	0.49	:	0.29	:	0.17	:	0.5	:
Calcium	mg/Kg	747	:	1490	:	1080	:	780	:	1220	:	341	:	851	:
Chromium	mg/Kg	1.3	J	4.1	J	1.6	J	0.91	J	2.1	J	0.71	J	1.6	J
Cobalt	mg/Kg	5	J	43.1	J	23.9	J	10	J	9.7	J	6.1	J	16.7	J
Copper	mg/Kg	54.4	J	81.4	J	72	J	27.3	J	34.1	J	11.4	J	30.6	J
Iron	mg/Kg	3340	:	8170	:	3790	:	1860	:	5820	:	881	:	3870	:
Lead	mg/Kg	7.5	J	24.3	J	6	J	7.3	J	18.2	J	2.6	J	12.7	J
Magnesium	mg/Kg	279	J	848	J	271	J	251	J	584	J	96.1	J	431	J
Manganese	mg/Kg	318	J	4090	J	2080	J	842	J	486	J	324	J	905	J
Mercury	mg/Kg	0.015	J	0.016	:	0.016	:	0.015	J	0.017	J	0.014	J	0.016	J
Molybdenum	mg/Kg	1.4	J	7	J	0.78	J	0.59	J	4.1	J	0.33	J	1.8	J
Nickel	mg/Kg	11.1	:	61.6	:	30.9	:	11.2	:	10.5	:	6.2	:	18.2	:
Potassium	mg/Kg	520	J	1210	J	662	J	515	J	1030	J	286	J	743	J
Selenium	mg/Kg	0.61	J	0.86	J	0.32	J	0.88	J	1	J	0.31	J	0.73	J
Silver	mg/Kg	0.1	:	0.23	:	0.17	:	0.099	:	0.22	:	0.11	:	0.11	:
Sodium	mg/Kg	64	:	136	:	87.2	:	59.3	:	96.7	:	51	:	107	:
Thallium	mg/Kg	0.071	:	0.076	:	0.068	:	0.073	:	0.083	:	0.079	:	0.076	:
Vanadium	mg/Kg	1.3	:	4.3	:	1.7	:	0.78	:	2.4	:	0.31	:	1.7	:
Zinc	mg/Kg	106	J	547	J	226	J	65	J	59	J	28.6	J	91	J
Laboratory Parameters															
Solids, Percent	%	9.9	:	14.7	:	20.7	:	9.5	:	24.5	:	11.8	:	14.3	:

J = Qualified as estimated during data valid
T = Total Fraction

Parameter	Site ID / Sample Date / Sample ID / Units	SW12-10 9/26/2002 SW12-10-T01N-PLA-092602		SW12-9 9/26/2002 SW12-9-T01N-PLA-092602		UFL1 9/25/2002 UFL1-T01N-PLA-092502		Zwergle 10/2/2002 ZWERGEL-T01N-PLA-100202		CABRESTO 9/26/2003 CABRESTO-T01N-PLA-092603		ERL-1 10/2/2003 ERL1-T01N-PLA-100203		LR-1 9/24/2003 LR-1-T01N-PLA-092403	
Metals															
Aluminum	mg/Kg	536	J	1220	J	747	J	1120	J	1100	:	508	:	3790	:
Antimony	mg/Kg	0.16	J	0.15	J	0.16	J	0.17	J	0.49	:	0.47	:	0.49	:
Arsenic	mg/Kg	0.16	J	0.15	J	0.64	J	0.21	J	0.57	:	0.24	:	0.97	:
Barium	mg/Kg	13.6	J	7.6	J	42.9	J	17.6	J	13.1	:	9.7	:	97.3	:
Beryllium	mg/Kg	2.2	:	2.8	:	0.09	:	0.069	:	0.45	:	0.12	:	1.3	:
Boron	mg/Kg	0.67	:	0.33	:	3.4	:	2.6	:	2.8	:	1.5	:	4.1	:
Cadmium	mg/Kg	1.3	:	2.7	:	0.56	:	0.025	:	0.15	:	0.69	:	1.3	:
Calcium	mg/Kg	13500	:	5610	:	2330	:	2910	:	2500	:	719	:	1750	:
Chromium	mg/Kg	2	J	2.4	J	1.3	J	2.9	J	6.3	:	0.56	:	2.2	:
Cobalt	mg/Kg	6.3	J	11	J	6.8	J	0.9	J	0.71	:	3.9	:	14.9	:
Copper	mg/Kg	4.7	J	14.2	J	15.5	J	3.2	J	4.8	:	9.4	:	59	:
Iron	mg/Kg	341	:	678	:	2130	:	1720	:	1990	:	642	:	4330	:
Lead	mg/Kg	1.2	J	3.5	J	11.6	J	1.2	J	4.9	:	1.8	:	66.4	:
Magnesium	mg/Kg	1040	J	1180	J	903	J	599	J	683	:	224	:	674	:
Manganese	mg/Kg	5000	J	4000	J	885	J	117	J	82.7	:	413	:	1690	:
Mercury	mg/Kg	0.016	J	0.017	J	0.016	J	0.016	:	0.017	:	0.015	J	0.021	:
Molybdenum	mg/Kg	69.6	J	248	J	0.97	J	0.33	J	0.71	:	0.49	:	2.4	:
Nickel	mg/Kg	39.5	:	52.6	:	14.6	:	1.8	:	4.7	:	11.7	:	30.8	:
Potassium	mg/Kg	703	J	730	J	4870	J	836	J	1420	J	2850	J	975	J
Selenium	mg/Kg	0.16	J	0.38	J	0.21	J	0.34	J	0.32	J	0.28	:	0.74	:
Silver	mg/Kg	0.42	:	0.42	:	0.41	:	0.12	:	0.16	J	0.15	:	0.14	:
Sodium	mg/Kg	74.6	:	112	:	110	:	50.6	:	190	:	273	:	153	:
Thallium	mg/Kg	0.08	:	0.07	:	0.08	:	0.083	:	0.097	:	0.094	:	0.097	:
Vanadium	mg/Kg	0.73	:	1.1	:	1.1	:	3.3	:	2	:	0.28	:	2.1	:
Zinc	mg/Kg	147	J	508	J	74.4	J	10.8	J	48.5	:	88	:	301	:
Laboratory Parameters															
Solids, Percent	%	13	:	11.8	:	18.2	:	14.2	:	18.1	:	9.6	:	27.4	:

J = Qualified as estimated during data valid
T = Total Fraction

Parameter	Site ID / Sample Date / Sample ID / Units	LR-16 9/23/2003 LR-16-T01N-PLA-092303	LR-8A 9/24/2003 LR-8A-T01N-PLA-092403	RR-11A1 9/25/2003 RR-11A1-T01N-PLA-092503	RR-12 9/25/2003 RR-12-T01N-PLA-092503	RR-15 9/25/2003 RR-15-T01N-PLA-092503	RR-20 9/24/2003 RR-20-T01N-PLA-092403	RR-4 10/1/2003 RR-4-T01N-PLA-100103
Metals								
Aluminum	mg/Kg	2810	2720	1820	4930	5780	4060	2470
Antimony	mg/Kg	0.45	0.49 J	0.43	0.49	0.49	0.47	0.42
Arsenic	mg/Kg	1.4	0.78	0.87	1.6	0.9	0.89	1.1
Barium	mg/Kg	127	85.5	93.6	139	194	120	145
Beryllium	mg/Kg	1.3	0.95	0.44	2.9	2.1	1.5	0.95
Boron	mg/Kg	9	4.5	2.3	3.6	2.4	2.5	2.9
Cadmium	mg/Kg	1.8	1.3	1.1	4.9	1.8	2.3	5.4
Calcium	mg/Kg	2510	1640	1300	2400	1820	1610	2500
Chromium	mg/Kg	2.9	1.8	2.1	4.8	2.5	2.6	3
Cobalt	mg/Kg	24.7	15.3	25.1	45.8	15.7	23.1	54.9
Copper	mg/Kg	50.3	44.9	39.6	102	83.1	71.5	149
Iron	mg/Kg	4790	3560	2400	4540	5500	5540	6560
Lead	mg/Kg	13.6	9.4	6.8	11.5	12.3	10.2	7.6
Magnesium	mg/Kg	969	548	481	769	625	549	598
Manganese	mg/Kg	3000	1650	2210	5610	1690	2990	5880
Mercury	mg/Kg	0.019	0.02	0.021	0.02	0.015	0.016	0.017
Molybdenum	mg/Kg	5.3	16.8	0.95	1.2	2.1	3.2	0.11
Nickel	mg/Kg	55.6	27.2	24.1	102	38	43.8	54.7
Potassium	mg/Kg	1400 J	1040 J	808 J	837 J	913 J	836 J	884 J
Selenium	mg/Kg	0.35	1.2 J	0.44 J	1.4 J	0.37 J	0.28 J	0.7
Silver	mg/Kg	0.14 J	0.15 J	0.15 J	0.16	0.16	0.16	0.14
Sodium	mg/Kg	198	153	179	274	170	182	191
Thallium	mg/Kg	0.09	0.098	0.086	0.098	0.099	0.094	0.083
Vanadium	mg/Kg	3.6	1.9	1.3	2.6	2.3	2.2	3.6
Zinc	mg/Kg	422	255	179	1610	401	464	567
Laboratory Parameters								
Solids, Percent	%	22.4	18.8	0.3	-- --	21.9	3.6	19.5

J = Qualified as estimated during data valid
T = Total Fraction

Appendix A-4f
Aquatic Biota - Macrophyte Tissues
Validated Analytical Results

Parameter	Site ID / Sample Date / Sample ID	Units	RR-5 10/1/2003 RR-5-T01N-PLA-100103		RR-6 9/30/2003 RR-6-T01N-PLA-093003		RR-7 9/30/2003 RR-7-T01N-PLA-093003		RR-8 9/30/2003 RR-8-T01N-PLA-093003		UFL1 10/1/2003 UFL1-T01N-PLA-100103		Zwergle 10/2/2003 ZWERGLE-T01N-PLA-100203	
Metals														
Aluminum		mg/Kg	2170		3110		3360		3300		2280		1030	
Antimony		mg/Kg	0.42		0.38		0.5		0.49		0.45		0.43	
Arsenic		mg/Kg	1.1		0.63		1.8		1.4		2		0.35	
Barium		mg/Kg	208		106		170		157		117		21.3	
Beryllium		mg/Kg	0.45		0.9		0.89		0.71		0.24		0.15	
Boron		mg/Kg	3.4		2.9		4.1		4		1.3		3.8	
Cadmium		mg/Kg	3.6		2		2.9		2.3		1		0.06	
Calcium		mg/Kg	2480		1700		2300		2500		4830		2740	
Chromium		mg/Kg	5		1.2		3.1		2.9		5.6		2.3	
Cobalt		mg/Kg	63.7		50.6		77.9		62.7		8.3		0.82	
Copper		mg/Kg	102		67.2		92.2		82.6		31.5		5.6	
Iron		mg/Kg	4470		3000		3720		5320		6530		1670	
Lead		mg/Kg	17.2		8		10.7		13.4		28		1.9	
Magnesium		mg/Kg	845		620		659		906		1460		699	
Manganese		mg/Kg	5580		3320		5750		3920		875		190	
Mercury		mg/Kg	0.016		0.015	J	0.017	J	0.017	J	0.014		0.016	J
Molybdenum		mg/Kg	0.58		0.63		1.1		1.3		3		0.67	
Nickel		mg/Kg	58.3		43.1		67.3		62.1		15.7		1.5	J
Potassium		mg/Kg	1170	J	720	J	1220	J	1320	J	2590	J	1130	J
Selenium		mg/Kg	0.78	J	0.51		0.77	J	1		0.72		0.51	J
Silver		mg/Kg	0.5		0.15		0.13		0.15		0.16		0.16	
Sodium		mg/Kg	80.6		171	U	187		205		198		130	
Thallium		mg/Kg	0.083		0.076		0.1		0.097		0.09		0.087	
Vanadium		mg/Kg	2.6		1.6		1.8		2.5		3.6		2.9	
Zinc		mg/Kg	410		400		517		373		111		15	
Laboratory Parameters														
Solids, Percent		%	23		13.9		21.2		21.5		22.5		17.4	

J = Qualified as estimated during data valid
T = Total Fraction

APPENDIX A-4g
SURFACE WATER BIOASSAYS

Molycorp RI/FS
Bioassay Tests - Surface Water/Baseflow
1 October - 18 October 2002

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC SCREENING-LEVEL TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* OPERATORS: HVW, NT

Start: 10/1/02 14:30
End: 10/8/02 13:55
Test Substance: LR-1, LR-8A, LR-16, RR-4, RR-5
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	LR-1 100	LR-8A 100	LR-16 100	RR-4 100	RR-5 100
# alive/exposed		10/10	8/10	6/10	9/10	10/10	9/10
% Survival		100	80	60	90	100	90
Normalized reprod./# females exposed ± SD		37.4 ± 10.0	29.6 ± 7.8	23.4 ± 15.0	34.3 ± 11.7	39.6 ± 8.2	37.3 ± 8.4
Dissolved O_2 (mg/L)	max. min.	7.0 5.9	6.9 5.9	7.0 5.9	7.0 5.8	7.0 5.8	7.0 5.8
pH	max. min.	8.26 7.69	8.19 7.70	8.32 7.85	8.36 7.91	8.45 7.97	8.45 7.95
Conductivity (µmho/cm)	max. min.	351 301	438 380	510 428	526 451	328 279	330 275
Temp. (°C)	max. min.	25.0 24.5	25.0 24.5	25.0 24.5	25.0 24.5	25.0 24.5	25.0 24.5

Statistical Analysis:

Survival:
- **LR-1:** No significant effect
- **LR-8A:** No significant effect
- **LR-16:** No significant effect
- **RR-4:** No significant effect
- **RR-5:** No significant effect

Reproduction:
- **LR-1:** Significantly lower than control
- **LR-8A:** Significantly lower than control
- **LR-16:** No significant effect
- **RR-4:** No significant effect
- **RR-5:** No significant effect

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC SCREENING-LEVEL TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: HVW, NT**

Start: 10/1/02 15:15
End: 10/8/02 14:20
Test Substance: RR-6, RR-7, RR-8, RR-11A1, RR-12
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	RR-6 100	RR-7 100	RR-8 100	RR-11A1 100	RR-12 100
# alive/exposed		10/10	10/10	10/10	9/10	9/10	10/10
% Survival		100	100	100	90	90	100
Normalized reprod./# females exposed ± SD		34.1 ± 3.0	36.6 ± 6.0	37.2 ± 5.0	32.9 ± 6.5	30.3 ± 11.8	35.0 ± 5.6
Dissolved O_2 (mg/L)	max. min.	7.0 5.5	6.9 5.5	6.9 5.5	7.0 5.5	7.1 5.6	7.1 5.6
pH	max. min.	8.31 7.80	8.35 7.85	8.29 7.91	8.32 7.89	8.32 7.91	8.28 7.93
Conductivity (µmho/cm)	max. min.	333 304	335 310	350 323	359 312	322 285	396 354
Temp. (°C)	max. min.	25.0 24.5	25.0 24.5	25.0 24.5	25.0 24.5	25.0 24.5	25.0 24.5

Statistical Analysis:

Survival and reproduction:	**RR-6:**	**No significant effect**
	RR-7:	**No significant effect**
	RR-8:	**No significant effect**
	RR11A1:	**No significant effect**
	RR-12:	**No significant effect**

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC SCREENING-LEVEL TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: HVW, NT**

Start: 10/1/02 15:50
End: 10/8/02 15:10
Test Substance: RR-15, RR-20, Cabresto Creek, Eagle Rock Lake, Upper Fawn Lake
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	RR-15 100	RR-20 100	Cabresto Creek 100	Eagle Rock Lake 100	Upper Fawn Lake 100
# alive/exposed		9/10	8/10	10/10	10/10	10/10	10/10
% Survival		90	80	100	100	100	100
Normalized reprod./# females exposed ± SD		30.2 ± 12.9	26.4 ± 10.3	31.8 ± 6.5	34.3 ± 3.3	33.6 ± 6.6	26.0 ± 9.0
Dissolved O_2 (mg/L)	max.	7.2	7.1	7.0	7.1	7.2	7.2
	min.	5.6	5.7	5.6	5.6	5.6	5.6
pH	max.	8.30	8.21	8.14	8.30	8.06	8.25
	min.	7.82	7.76	7.79	7.89	7.72	7.86
Conductivity (µmho/cm)	max.	341	430	427	223	427	321
	min.	311	378	370	173	359	283
Temp. (°C)	max.	25.0	25.0	25.0	25.0	25.0	25.0
	min.	24.5	24.5	24.5	24.5	24.5	24.5

Statistical Analysis:

Survival and reproduction:	**RR-15:**	**No significant effect**
	RR-20:	**No significant effect**
	Cabresto Creek:	**No significant effect**
	Eagle Rock Lake:	**No significant effect**
	Upper Fawn Lake:	**No significant effect**

TABLE 4
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC SCREENING-LEVEL TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: HVW, SP, PA, NT**

Start: 10/1/02 16:20
End: 10/9/02 15:50
Test Substance: TP1, TP2, Zwergle
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	TP1 100	TP2 100	Zwergle 100
# alive/exposed		10/10	6/9	7/10	8/10
% Survival		100	66.7	70	80
Normalized reprod./# females exposed ± SD		27.9 ± 7.5	18.8 ± 16.3	18.6 ± 11.6	34.0 ± 13.1
Dissolved O_2 (mg/L)	max. min.	7.1 5.4	7.1 5.5	7.2 5.5	7.4 5.5
pH	max. min.	8.30 7.81	7.89 7.50	7.93 7.51	8.43 8.10
Conductivity (µmho/cm)	max. min.	346 325	2300 1970	2540 2080	270 225
Temp. (°C)	max. min.	25.0 24.0	25.0 24.0	25.0 24.0	25.0 24.0

Statistical Analysis:

Survival and reproduction	**TP1:**	**No significant effect**
	TP2:	**Significantly lower than control**
	Zwergle:	**No significant effect**

TABLE 5
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: NT, AW**

Start: 10/11/02 13:45
End: 10/18/02 13:50
Test Substance: LR-1
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		10/10	10/10	10/10	10/10	10/10	10/10
% Survival		100	100	100	100	100	100
Normalized reprod./# females exposed ± SD		31.5 ± 5.3	30.3 ± 7.4	33.7 ± 10.7	35.7 ± 8.9	31.2 ± 11.3	29.8 ± 11.8
Dissolved O_2 (mg/L)	max.	6.7	6.9	6.8	6.7	6.6	6.6
	min.	5.3	5.4	5.3	5.3	5.4	5.2
pH	max.	8.27	8.39	8.34	8.25	8.24	8.28
	min.	7.92	7.91	7.95	7.90	7.87	7.88
Conductivity (µmho/cm)	max.	334	350	367	426	451	492
	min.	293	318	356	395	407	437
Temp. (°C)	max.	25.0	25.0	25.0	25.0	25.0	25.0
	min.	25.0	25.0	25.0	25.0	25.0	25.0

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

TABLE 6
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: NT, AW, SP**

Start: 10/11/02 14:15
End: 10/18/02 14:50
Test Substance: LR-8A
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		9/10	10/10	10/10	10/10	10/10	10/10
% Survival		90	100	100	100	100	100
Normalized reprod./# females exposed ± SD		26.7 ± 8.6	26.3 ± 8.9	30.3 ± 9.3	31.6 ± 10.2	26.6 ± 9.3	26.0 ± 11.9
Dissolved O_2 (mg/L)	max.	6.9	6.8	6.8	6.8	6.8	6.8
	min.	5.5	5.4	5.4	5.4	5.4	5.4
pH	max.	8.28	8.23	8.24	8.20	8.19	8.22
	min.	8.00	7.97	8.00	8.01	7.96	7.99
Conductivity (µmho/cm)	max.	333	367	396	443	508	585
	min.	296	325	364	414	451	502
Temp. (°C)	max.	25.0	25.0	25.0	25.0	25.0	25.0
	min.	25.0	25.0	25.0	25.0	25.0	25.0

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

TABLE 7
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site LR-1			Site LR-8A		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	182	190	188	192	200	216
pH	7.73	7.46	7.60	7.97	7.30	7.56
Alkalinity (mg $CaCO_3$/L)	50	52	50	56	58	60
Conductivity (µmho/cm)	391	416	395	436	454	457
Dissolved Oxygen (mg O_2/L)	7.1	6.6	6.6	6.9	6.9	6.8
Ammonia (mg NH_3/L)	0.08	0.07	0.05	0.16	0.12	0.04
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.03	<0.01	<0.01	0.03	<0.01	0.02

TABLE 8
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site LR-16			Site RR-4		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	200	202	202	132	130	132
pH	7.86	7.50	7.97	8.00	7.43	7.77
Alkalinity (mg $CaCO_3$/L)	60	64	66	72	68	72
Conductivity (µmho/cm)	430	436	424	265	271	260
Dissolved Oxygen (mg O_2/L)	7.0	6.8	6.7	6.9	5.8	6.7
Ammonia (mg NH_3/L)	0.13	0.06	0.03	0.11	0.11	0.09
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.05	0.04	<0.01	0.03	0.02	<0.01

TABLE 9
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-5			Site RR-6		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	132	130	130	152	146	146
pH	8.06	7.60	7.91	7.76	7.33	7.59
Alkalinity (mg $CaCO_3$/L)	70	66	70	64	62	64
Conductivity (µmho/cm)	279	269	266	306	321	289
Dissolved Oxygen (mg O_2/L)	6.9	6.9	6.8	6.9	6.3	6.8
Ammonia (mg NH_3/L)	0.07	0.24	0.05	0.13	0.25	0.05
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.04	0.02	<0.01	0.05	0.02	<0.01

TABLE 10
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-7			Site RR-8		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	144	138	152	142	142	150
pH	7.77	7.35	7.87	7.92	7.48	7.87
Alkalinity (mg $CaCO_3$/L)	64	60	62	64	60	64
Conductivity (µmho/cm)	309	303	299	315	319	306
Dissolved Oxygen (mg O_2/L)	6.4	6.4	6.8	6.6	7.0	6.8
Ammonia (mg NH_3/L)	0.13	0.07	0.02	0.23	0.10	0.04
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.02	0.03	<0.01	0.03	0.01	<0.01

TABLE 11
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-11A1			Site RR-12		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	128	130	130	162	174	172
pH	7.91	7.39	7.83	7.68	7.87	7.75
Alkalinity (mg $CaCO_3$/L)	66	60	64	58	62	60
Conductivity (µmho/cm)	287	283	272	344	335	370
Dissolved Oxygen (mg O_2/L)	6.7	7.0	6.9	6.7	7.1	6.8
Ammonia (mg NH_3/L)	0.07	0.03	0.03	0.15	0.04	0.02
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	<0.01	0.01	<0.01	0.03	0.04	<0.01

TABLE 12
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-15			Site RR-20		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	170	172	186	174	182	186
pH	7.29	7.13	7.25	7.42	7.09	7.59
Alkalinity (mg $CaCO_3$/L)	52	48	48	48	44	50
Conductivity (µmho/cm)	401	371	383	385	384	383
Dissolved Oxygen (mg O_2/L)	6.4	6.8	7.0	6.7	6.7	6.8
Ammonia (mg NH_3/L)	0.06	0.03	0.02	0.04	0.05	0.02
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.02	0.02	<0.01	0.03	0.04	<0.01

TABLE 13
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Cabresto Creek			Eagle Rock Lake		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	76	74	86	174	178	178
pH	7.76	7.57	7.72	7.70	7.53	7.60
Alkalinity (mg $CaCO_3$/L)	48	46	52	40	44	50
Conductivity (µmho/cm)	170	165	175	368	372	363
Dissolved Oxygen (mg O_2/L)	7.0	7.0	6.9	6.6	6.8	6.8
Ammonia (mg NH_3/L)	0.04	0.02	0.04	0.03	0.01	0.02
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.03	0.03	<0.01	0.02	0.02	<0.01

TABLE 14
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Upper Fawn Lake			Site TP1		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	130	132	132	1394	1350	1446
pH	7.93	8.17	8.31	7.96	7.53	7.56
Alkalinity (mg $CaCO_3$/L)	62	62	66	36	32	32
Conductivity (µmho/cm)	272	295	275	2030	2100	2120
Dissolved Oxygen (mg O_2/L)	7.0	7.0	6.7	7.0	7.8	7.0
Ammonia (mg NH_3/L)	0.09	0.08	0.02	0.03	0.14	0.05
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.03	0.04	0.01	0.04	0.05	<0.01

TABLE 15
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site TP2			Zwergle		
	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02	Sampled 9/30/02	Sampled 10/3/02	Sampled 10/5/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	1630	1900	1642	110	106	114
pH	8.27	7.61	7.64	8.16	8.00	8.12
Alkalinity (mg $CaCO_3$/L)	32	34	32	84	86	86
Conductivity (μmho/cm)	2400	2340	2300	233	213	200
Dissolved Oxygen (mg O_2/L)	6.8	7.6	7.0	6.9	6.5	7.0
Ammonia (mg NH_3/L)	0.05	0.04	0.04	0.05	0.06	0.03
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.06	0.04	<0.01	0.04	0.01	<0.01

TABLE 16
WATER CHEMISTRY RESULTS FROM MODERATELY HARD RECONSTITUTED WATER USED FOR CHRONIC SCREENING-LEVEL TOXICITY TESTS

Wet chemistry on reconstituted water:

Measurement	Recon. Water *
Analysis Temperature °C	25.0
Total Hardness (mg $CaCO_3$/L)	87
pH	7.99
Alkalinity (mg $CaCO_3$/L)	57
Conductivity (µmho/cm)	304
Dissolved Oxygen (mg O_2/L)	6.2
Ammonia (mg NH_3/L)	--
Un-ionized Ammonia	--
Total Residual Chlorine (mg/L)	--

*** Reconstituted water chemical analyses are a mean of 3 reconstituted waters used**

TABLE 17
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site LR-1			Site LR-8A		
	Sampled 10/10/02	Sampled 10/12/02	Sampled 10/15/02	Sampled 10/10/02	Sampled 10/12/02	Sampled 10/15/02
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	198	192	200	222	224	238
pH	7.34	7.74	7.67	7.45	7.87	7.59
Alkalinity (mg $CaCO_3$/L)	48	50	48	60	62	62
Conductivity (µmho/cm)	403	449	438	454	533	515
Dissolved Oxygen (mg O_2/L)	5.9	5.9	5.4	5.9	6.0	5.5
Ammonia (mg NH_3/L)	0.34	0.42	0.03	0.21	0.18	0.03
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.01	0.02	0.04	0.02	0.03	0.02

TABLE 18
WATER CHEMISTRY RESULTS FROM MODERATELY HARD RECONSTITUTED WATER USED FOR CHRONIC TOXICITY TESTS

Wet chemistry on reconstituted water:

Measurement	Recon. Water *
Analysis Temperature °C	25.0
Total Hardness (mg $CaCO_3$/L)	85
pH	7.98
Alkalinity (mg $CaCO_3$/L)	57
Conductivity (µmho/cm)	298
Dissolved Oxygen (mg O_2/L)	5.6
Ammonia (mg NH_3/L)	--
Un-ionized Ammonia	--
Total Residual Chlorine (mg/L)	--

*** Reconstituted water chemical analyses are a mean of 4 reconstituted waters used**

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*:

Chronic Test

Test date: September 10 to 17, 2002

mg NaCl/L	control	75	150	300	600	1200
# alive/# exp.	10/10	10/10	8/10	9/10	10/10	10/10
% survival	100	100	80	90	100	100
Normalized reprod. ± SD	17.9 ± 3.0	19.9 ± 2.5	20.3 ± 11.0	13.9 ± 8.0	14.0 ± 3.6	5.8 ± 3.3

Normalized reprod. IC_{25} (ICp analysis) = 284.1 mg NaCl/L (95% CI 193.9 to 665.0)

Note: This is within our accepted performance range (-27.8 to 912.6) determined by 12 previous reference tests performed.

Molycorp RI/FS
Bioassay Tests - Surface Water/Baseflow
10 October - 18 October 2002

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: NT, AW, SP, PA**

Start: 10/11/02 13:15
End: 10/18/02 13:50
Test Substance: 002
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		10/10	10/10	10/10	10/10	9/10	7/10
% Survival		100	100	100	100	90	70
Normalized reprod./# females exposed ± SD		27.0 ± 10.4	30.1 ± 10.2	29.4 ± 10.1	29.5 ± 9.8	26.6 ± 13.4	20.8 ± 12.2
Dissolved O_2 (mg/L)	max.	6.9	6.9	6.9	6.9	6.9	6.8
	min.	5.6	5.7	5.7	5.7	5.7	5.6
pH	max.	8.40	8.47	8.48	8.53	8.58	8.58
	min.	8.11	8.20	8.26	8.32	8.36	8.36
Conductivity (µmho/cm)	max.	337	553	757	1114	1472	1827
	min.	293	498	661	956	1301	1599
Temp. (°C)	max.	25.0	25.0	25.0	25.0	25.0	25.0
	min.	25.0	25.0	25.0	25.0	25.0	25.0

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = 93.8% (95% C.I. could not be determined)

Normalized Reproduction:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = 95.9% (95% C.I. could not be d7etermined)

TABLE 2
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water*	Site 002		
		Sampled 10/10/02	Sampled 10/12/02	Sampled 10/15/02
Analysis Temperature °C	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	85	790	830	900
pH	7.98	7.55	7.89	7.96
Alkalinity (mg $CaCO_3$/L)	57	150	154	148
Conductivity (µmho/cm)	298	1588	1722	1678
Dissolved Oxygen (mg O_2/L)	5.6	6.0	5.7	5.2
Ammonia (mg NH_3/L)	--	0.42	0.64	0.06
Un-ionized Ammonia	--	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	--	0.01	0.02	0.01

*** Reconstituted water chemical analyses are a mean of 4 reconstituted waters used.**

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*:

Chronic Test

Test date: September 10 to 17, 2002

mg NaCl/L	control	75	150	300	600	1200
# alive/# exp.	10/10	10/10	8/10	9/10	10/10	10/10
% survival	100	100	80	90	100	100
Normalized reprod. ± SD	17.9 ± 3.0	19.9 ± 2.5	20.3 ± 11.0	13.9 ± 8.0	14.0 ± 3.6	5.8 ± 3.3

Normalized reprod. IC_{25} (ICp analysis) = 284.1 mg NaCl/L (95% CI 193.9 to 665.0)

Note: This is within our accepted performance range (-27.8 to 912.6) determined by 12 previous reference tests performed.

Molycorp RI/FS
Bioassay Tests - Surface Water/Snowmelt
21 April - 28 April 2003

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: LO, SP, PA**

Start: 4/21/03 13:55
End: 4/28/03 12:55
Test Substance: RR-6
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		10/10	10/10	10/10	9/10	10/10	10/10
% Survival		100	100	100	90	100	100
Normalized reprod./# females exposed ± SD		28.5 ± 5.9	26.2 ± 8.5	31.6 ± 1.8	22.2 ± 11.7	30.9 ± 3.4	25.9 ± 6.0
Dissolved O_2 (mg/L)	max.	7.4	7.3	7.4	7.4	7.4	7.4
	min.	6.5	6.5	6.6	6.6	6.5	6.6
pH	max.	8.26	8.24	8.23	8.23	8.21	8.20
	min.	8.01	8.04	8.04	8.06	8.04	8.02
Conductivity (µmho/cm)	max.	361	348	349	352	330	311
	min.	293	305	310	316	288	272
Temp. (°C)	max.	25.5	25.5	25.5	25.5	25.5	25.5
	min.	25.0	25.0	25.0	25.0	25.0	25.0

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: NT, AW, SP, LO**

Start:4/21/0314:30
End: 4/28/0314:40
Test Substance: RR-8
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		9/10	10/10	10/10	10/10	10/10	10/10
% Survival		90	100	100	100	100	100
Normalized reprod./# females exposed ± SD		25.0 ± 7.7	28.2 ± 5.9	27.2 ± 8.9	32.2 ± 2.7	25.8 ± 9.5	23.2 ± 7.8
Dissolved O_2 (mg/L)	max.	6.8	6.8	6.9	6.8	6.8	6.8
	min.	6.5	6.4	6.4	6.4	6.3	6.3
pH	max.	8.36	8.30	8.25	8.25	8.24	8.24
	min.	8.06	8.08	8.07	8.05	8.01	7.99
Conductivity (µmho/cm)	max.	356	355	349	328	319	322
	min.	310	312	315	293	285	281
Temp. (°C)	max.	25.5	25.5	25.5	25.5	25.5	25.5
	min.	25.0	25.0	25.0	25.0	25.0	25.0

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: NT, AW, SP, LO**

Start:4/21/0315:05
End: 4/28/0315:15
Test Substance: RR-12
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		10/10	10/10	10/10	10/10	10/10	10/10
% Survival		100	100	100	100	100	100
Normalized reprod./# females exposed ± SD		25.9 ± 2.3	26.0 ± 2.5	25.3 ± 9.2	23.3 ± 7.8	25.7 ± 2.4	24.8 ± 5.2
Dissolved O_2 (mg/L)	max.	7.0	7.0	7.1	7.1	7.1	7.1
	min.	6.6	6.6	6.6	6.5	6.4	6.5
pH	max.	8.23	8.21	8.19	8.19	8.15	8.15
	min.	7.94	7.97	8.00	8.00	7.96	7.96
Conductivity (µmho/cm)	max.	349	338	338	337	337	339
	min.	297	299	301	305	303	304
Temp. (°C)	max.	25.5	25.5	25.5	25.5	25.5	25.5
	min.	25.5	25.5	25.5	25.5	25.5	25.5

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

TABLE 4
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: NT, AW, SP, PA**

Start:4/21/0315:30
End: 4/28/0315:20
Test Substance: RR-15
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		10/10	10/10	9/9*	9/10	10/10	8/8**
% Survival		100	100	100	90	100	100
Normalized reprod./# females exposed ± SD		32.0 ± 2.9	26.2 ± 9.1	25.4 ± 9.5	27.9 ± 10.3	28.5 ± 4.5	17.6 ± 11.7
Dissolved O_2 (mg/L)	max.	6.9	7.0	7.0	6.9	6.9	6.9
	min.	6.6	6.4	6.3	6.5	6.5	6.5
pH	max.	8.15	8.15	8.15	8.13	8.10	8.09
	min.	7.93	7.95	7.95	7.93	7.93	7.90
Conductivity (µmho/cm)	max.	334	343	338	341	345	346
	min.	295	290	296	302	308	306
Temp. (°C)	max.	25.5	25.5	25.5	25.5	25.5	25.5
	min.	25.0	25.0	25.0	25.0	25.0	25.0

***One test organism was killed due to technician error - data from this replicate was excluded from statistical analyses.**
****Two organisms were determined to be males and were excluded from statistical analyses.**

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Wilcoxon Rank Sum Test with Bonferroni Adjustment) = 75%
- IC_{25} = 83.1% (95% C.I. could not be determined)

TABLE 5
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* **OPERATORS: AW, SP, LO**

Start:4/21/0316:00
End: 4/28/0315:30
Test Substance: LR-16
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		10/10	10/10	10/10	10/10	10/10	9/9*
% Survival		100	100	100	100	100	100
Normalized reprod./# females exposed ± SD		17.7 ± 3.9	15.8 ± 6.7	17.2 ± 4.6	15.8 ± 3.2	16.4 ± 7.5	11.1 ± 7.3
Dissolved O_2 (mg/L)	max.	7.0	7.1	7.1	7.1	7.0	7.0
	min.	6.4	6.4	6.4	6.4	6.3	6.3
pH	max.	8.23	8.30	8.28	8.24	8.24	8.20
	min.	7.97	8.18	8.11	8.08	8.07	8.06
Conductivity (µmho/cm)	max.	424	349	360	376	390	414
	min.	306	315	320	336	355	374
Temp. (°C)	max.	26.0	26.0	26.0	26.0	26.0	26.0
	min.	24.5	24.5	24.5	24.5	24.5	24.5

***One organism was determined to be male and was excluded from statistical analyses.**

Statistical Analysis:

Survival:
- NOEC (Dunnett's Test) = 100%
- IC_{25} = >100%

Normalized Reproduction:
- NOEC (Wilcoxon Rank Sum Test with Bonferroni Adjustment) = 75%
- IC_{25} = 89.2% (95% C.I. could not be determined)

TABLE 6
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water*	Site RR-6		
		Sampled 4/20/03	Sampled 4/22/03	Sampled 4/24/03
Analysis Temperature °C	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	86	116	116	116
pH	8.02	7.75	7.64	7.59
Alkalinity (mg $CaCO_3$/L)	58	62	52	52
Conductivity (µmho/cm)	283	242	233	284
Dissolved Oxygen (mg O_2/L)	7.1	9.4	8.6	8.6
Ammonia (mg NH_3/L)	--	0.04	0.04	0.02
Un-ionized Ammonia	--	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	--	0.02	0.02	0.02

*** Reconstituted water chemical analyses are a mean of 5 reconstituted waters used.**

TABLE 7
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-8			Site RR-12		
	Sampled 4/20/03	Sampled 4/22/03	Sampled 4/24/03	Sampled 4/20/03	Sampled 4/22/03	Sampled 4/24/03
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	116	110	114	134	128	128
pH	7.78	7.60	7.66	7.72	7.61	7.59
Alkalinity (mg $CaCO_3$/L)	56	52	52	52	52	54
Conductivity (µmho/cm)	251	234	274	280	286	316
Dissolved Oxygen (mg O_2/L)	9.5	8.7	8.9	9.6	8.7	8.9
Ammonia (mg NH_3/L)	0.05	0.12	0.01	0.04	0.05	0.02
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.02	0.03	0.02	0.03	<0.01	0.02

TABLE 8
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-15			Site LR-16		
	Sampled 4/20/03	Sampled 4/22/03	Sampled 4/24/03	Sampled 4/20/03	Sampled 4/22/03	Sampled 4/24/03
Analysis Temperature °C	25.0	25.0	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	136	132	132	162	160	160
pH	7.75	7.42	7.78	7.91	7.88	7.84
Alkalinity (mg $CaCO_3$/L)	50	48	50	58	54	56
Conductivity (µmho/cm)	299	280	335	350	340	392
Dissolved Oxygen (mg O_2/L)	9.5	8.8	9.1	9.5	8.4	8.7
Ammonia (mg NH_3/L)	0.05	0.05	0.02	0.07	0.08	0.02
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.06	0.03	0.01	0.04	0.01	0.01

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*: Chronic Test

Test date: March 25 to April 1, 2003

mg NaCl/L	control	75	150	300	600	1200
# alive/# exp.	10/10	8/10	9/10	9/10	10/10	5/10
% survival	100	80	90	90	100	50
Normalized reprod. ± SD	37.4 ± 5.5	33.0 ± 11.6	33.1 ± 12.1	28.4 ± 11.1	27.4 ± 4.6	9.9 ± 9.3

Normalized reprod. IC_{25} (ICp analysis) = 405.0 mg NaCl/L (95% CI 127.2 to 661.3)

Note: This is within our accepted performance range (-82.1 to 876.2) determined by 20 previous reference tests performed.

Molycorp RI/FS
Bioassay Tests - Surface Water/Storms
27 July - 29 July 2003

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: SP, PA**

Start: 7/28/03 21:40
End: 7/30/03 20:40
Test Substance: RR-6
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		19/20	18/20	18/20	10/20	1/20	0/20
% Survival		95	90	90	50	5	0
Dissolved O_2 (mg/L)	max.	7.3	6.8	6.8	6.5	6.3	6.6
	min.	7.2	6.7	6.5	6.3	6.1	6.5
pH	max.	8.12	7.76	7.30	5.37	4.56	4.55
	min.	8.09	7.74	7.27	5.17	4.55	4.30
Conductivity (µmho/cm)	max.	330	389	438	557	682	827
	min.	315	381	435	556	667	801
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Probit) = 51.4% effluent (95% C.I. 41.0 to 57.8)

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: SP, PA**

Start:7/28/0320:40
End: 7/30/0319:40
Test Substance: RR-12
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		18/20	19/20	19/20	19/20	19/20	18/20
% Survival		90	95	95	95	95	90
Dissolved O_2 (mg/L)	max.	7.4	7.3	7.3	7.2	6.9	6.9
	min.	7.0	6.8	6.8	6.7	6.6	6.5
pH	max.	8.08	8.05	8.04	8.01	7.98	7.95
	min.	8.04	8.04	8.02	7.99	7.96	7.95
Conductivity (µmho/cm)	max.	330	339	339	338	331	324
	min.	317	328	325	326	319	322
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Probit) = >100%

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: SP, PA**

Start:7/28/0321:05
End: 7/30/0320:10
Test Substance: LR-16
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		18/20	19/20	20/20	20/20	20/20	16/20
% Survival		90	95	100	100	100	80
Dissolved O_2 (mg/L)	max.	7.2	7.2	7.1	7.0	7.0	6.8
	min.	6.7	6.6	6.4	6.4	6.4	6.3
pH	max.	8.12	8.06	8.03	7.97	7.93	7.90
	min.	8.08	8.05	8.03	7.97	7.92	7.90
Conductivity (µmho/cm)	max.	329	355	357	372	387	412
	min.	318	328	340	357	384	411
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Probit) = >100%

TABLE 6
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR ACUTE TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water*	Site RR-6	Site RR-12	Site LR-16
Analysis Temperature °C	25.0	20.0	20.0	20.0
Total Hardness (mg $CaCO_3$/L)	91	500	144	158
pH	8.15	4.35	6.85	6.85
Alkalinity (mg $CaCO_3$/L)	64	<2.0	56	56
Conductivity (µmho/cm)	318	779	294	373
Dissolved Oxygen (mg O_2/L)	6.5	8.7	7.4	7.0
Ammonia (mg NH_3/L)	--	0.13	0.05	0.05
Un-ionized Ammonia	--	<0.1	<0.1	<0.1

*** Reconstituted water chemical analyses are a mean of 2 reconstituted waters used.**

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*: Acute test

Test date: July 8 to 10, 2003

g NaCl/L	control	1.0	1.5	2.0	2.5	3.0
# alive/# exp.	20/20	20/20	20/20	19/20	18/20	3/20
% survival	100	100	100	95	90	15

LC_{50} (Spearman-Karber) = 2.73 g NaCl/L (95% CI, 2.58 to 2.91)

Note: This is within our accepted performance range (2.00 to 3.01) determined by 20 previous reference tests performed.

Molycorp RI/FS
Bioassay Test - Surface Water/Storms
14 August - 16 August 2003

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: NT, BE, LC**

Start: 8/14/03 15:50
End: 8/16/03 14:55
Test Substance: RR-6
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	19/20	20/20	20/20
% Survival		100	100	100	95	100	100
Dissolved O_2 (mg/L)	max.	6.6	6.5	6.6	6.5	6.5	6.5
	min.	6.4	6.3	6.4	6.2	6.3	6.4
pH	max.	8.19	8.20	8.16	8.18	8.10	8.11
	min.	8.06	8.08	8.07	8.02	8.03	7.96
Conductivity (µmho/cm)	max.	641	328	317	331	317	317
	min.	331	313	310	324	284	281
Temp. (°C)	max.	20.0	20.0	20.0	20.0	20.0	20.0
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100% effluent

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: NT, BE, LC**

Start:8/14/0316:10
End: 8/16/0315:10
Test Substance: RR-8
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	20/20	20/20	20/20
% Survival		100	100	100	100	100	100
Dissolved O_2 (mg/L)	max.	6.3	6.2	6.3	6.5	6.5	6.5
	min.	6.1	6.2	6.1	6.4	6.5	6.4
pH	max.	8.22	8.13	8.10	8.05	8.01	8.01
	min.	8.09	8.04	8.02	7.99	7.92	7.93
Conductivity (µmho/cm)	max.	318	330	327	320	322	318
	min.	317	321	309	313	316	316
Temp. (°C)	max.	20.0	20.0	20.0	20.0	20.0	20.0
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100% effluent

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: LC, NT, PA**

Start:8/14/0316:05
End: 8/16/0315:35
Test Substance: RR-12
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	19/20	20/20	20/20	20/20	20/20
% Survival		100	95	100	100	100	100
Dissolved O_2 (mg/L)	max.	7.1	7.0	7.1	7.0	6.9	6.6
	min.	6.5	6.9	6.7	6.5	6.5	6.5
pH	max.	8.15	8.07	8.04	8.02	8.00	7.96
	min.	8.02	8.01	8.00	8.00	7.96	7.90
Conductivity (µmho/cm)	max.	316	322	324	328	335	355
	min.	311	315	319	324	332	342
Temp. (°C)	max.	20.0	20.0	20.0	20.0	20.0	20.0
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 4
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: LC, NT, PA**

Start:8/14/0316:20
End: 8/16/0315:45
Test Substance: RR-15
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		19/20	20/20	20/20	20/20	20/20	20/20
% Survival		95	100	100	100	100	100
Dissolved O_2 (mg/L)	max.	6.9	6.8	6.8	6.8	6.8	6.8
	min.	6.7	6.8	6.7	6.6	6.6	6.5
pH	max.	8.13	8.09	8.07	8.03	8.00	7.98
	min.	8.01	8.02	8.01	7.98	7.89	7.88
Conductivity (µmho/cm)	max.	310	316	321	331	341	355
	min.	301	313	317	325	334	344
Temp. (°C)	max.	20.0	20.0	20.0	20.0	20.0	20.0
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 5
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: NT, PA, LC**

Start:8/14/0316:25
End: 8/16/0316:00
Test Substance: LR-16
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	20/20	20/20	20/20
% Survival		100	100	100	100	100	100
Dissolved O_2 (mg/L)	max.	6.9	6.8	6.8	6.8	6.8	6.7
	min.	6.6	6.5	6.6	6.6	6.6	6.6
pH	max.	8.14	8.14	8.13	8.13	8.15	8.16
	min.	8.09	8.08	8.08	8.08	8.10	8.11
Conductivity (µmho/cm)	max.	315	336	349	379	412	448
	min.	314	326	342	376	410	439
Temp. (°C)	max.	20.0	20.0	20.0	20.0	20.0	20.0
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 6
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR ACUTE TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water*	Site RR-6	Site RR-8	Site RR-12	Site RR-15	Site LR-16
Analysis Temperature °C	25.0	20.0	20.0	20.0	20.0	20.0
Total Hardness (mg $CaCO_3$/L)	86	134	140	156	162	198
pH	8.13	7.93	7.64	7.77	7.73	7.78
Alkalinity (mg $CaCO_3$/L)	59	54	50	54	52	74
Conductivity (µmho/cm)	277	274	307	329	338	428
Dissolved Oxygen (mg O_2/L)	7.2	6.8	7.0	6.8	6.9	6.8
Ammonia (mg NH_3/L)	--	0.01	0.01	0.01	0.01	0.02
Un-ionized Ammonia	--	<0.1	<0.1	<0.1	<0.1	<0.1

*** Reconstituted water chemical analyses are a mean of 2 reconstituted waters used.**

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*: Acute test

Test date: August 12 to 14, 2003

g NaCl/L	control	1.0	1.5	2.0	2.5	3.0
# alive/# exp.	20/20	20/20	20/20	18/20	7/20	1/20
% survival	100	100	100	90	35	5

LC_{50} (Spearman-Karber) = 2.38 g NaCl/L (95% CI, 2.23 to 2.52)

Note: This is within our accepted performance range (2.00 to 3.01) determined by 20 previous reference tests performed.

Molycorp RI/FS
Bioassay Tests - Surface Water/Storms
5 September - 7 September 2003
6 September - 8 September 2003

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: BE, PA, NT**

Start: 9/5/03 14:10
End: 9/7/03 14:50
Test Substance: RR-6
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		19/20	19/20	18/20	19/20	20/20	18/20
% Survival		95	95	90	95	100	90
Dissolved O_2 (mg/L)	max.	7.5	7.4	7.1	7.1	7.1	7.0
	min.	6.2	6.1	6.0	6.0	6.0	5.9
pH	max.	8.26	8.17	8.13	8.06	8.00	7.98
	min.	8.14	8.11	8.02	8.01	7.97	7.92
Conductivity (µmho/cm)	max.	350	348	342	347	340	341
	min.	276	250	289	309	316	320
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100% effluent

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: AW, PA, NT**

Start:9/5/0313:45
End: 9/7/0313:55
Test Substance: RR-8
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	19/20	17/20	15/20	19/20	19/20
% Survival		100	95	85	75	95	95
Dissolved O_2 (mg/L)	max.	7.3	7.1	7.0	6.9	6.8	6.8
	min.	6.4	6.0	5.9	5.9	6.0	6.1
pH	max.	8.20	8.16	8.02	7.90	7.79	7.60
	min.	8.19	8.14	7.96	7.85	7.66	7.20
Conductivity (µmho/cm)	max.	348	363	374	399	410	425
	min.	284	289	328	361	390	417
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100% effluent

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: AW, PA, NT**

Start:9/5/0314:20
End: 9/7/0315:10
Test Substance: RR-12
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	20/20	19/20	18/20
% Survival		100	100	100	100	95	90
Dissolved O_2 (mg/L)	max.	7.0	7.0	6.9	6.8	6.7	6.7
	min.	6.2	5.9	5.9	6.0	6.0	6.1
pH	max.	8.20	8.19	8.16	8.07	8.03	7.94
	min.	8.18	8.15	8.11	8.03	7.96	7.86
Conductivity (µmho/cm)	max.	345	354	368	373	385	399
	min.	264	278	325	340	357	387
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 4
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: SP, AW, BE**

Start:9/6/0320:00
End: 9/8/0319:00
Test Substance: RR-6
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	18/20	3/20	0/20
% Survival		100	100	100	90	15	0
Dissolved O_2 (mg/L)	max.	7.4	7.3	7.2	7.2	7.1	7.1
	min.	7.3	7.1	7.0	7.0	7.0	7.0
pH	max.	8.15	7.99	7.72	7.04	5.43	4.81
	min.	8.13	7.92	7.66	6.98	5.34	4.76
Conductivity (µmho/cm)	max.	305	343	354	407	436	524
	min.	288	336	349	401	429	522
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Probit) = 62.4% effluent (95% C.I. 56.7 to 68.3)

TABLE 5
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: SP, AW, BE**

Start:9/6/0320:30
End: 9/8/0319:40
Test Substance: RR-8
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	19/20	19/20	2/20	0/20	0/20
% Survival		100	95	95	10	0	0
Dissolved O_2 (mg/L)	max.	7.4	7.4	7.3	7.3	7.2	7.2
	min.	7.3	7.3	7.1	7.3	7.2	7.1
pH	max.	8.16	7.86	7.48	5.25	4.52	4.24
	min.	8.11	7.80	7.43	5.22	4.48	4.24
Conductivity (µmho/cm)	max.	302	376	406	481	607	716
	min.	295	354	402	462	580	664
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = 36.3 % effluent (95% C.I. 33.4 to 39.4)

TABLE 6
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: AW, BE**

Start:9/6/0320:55
End: 9/8/0320:10
Test Substance: RR-12
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	20/20	20/20	20/20
% Survival		100	100	100	100	100	100
Dissolved O_2 (mg/L)	max.	7.5	7.5	7.4	7.3	7.3	7.2
	min.	7.3	7.3	7.1	7.0	6.9	7.1
pH	max.	8.10	8.02	8.03	7.82	7.69	7.50
	min.	7.95	7.97	7.91	7.79	7.64	7.50
Conductivity (µmho/cm)	max.	289	316	328	344	373	382
	min.	283	316	325	337	355	366
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 7
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: AW, BE**

Start:9/6/0321:25
End: 9/8/0320:25
Test Substance: RR-15
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	19/20	20/20	19/19*
% Survival		100	100	100	95	100	100
Dissolved O_2 (mg/L)	max.	7.2	7.2	7.2	6.9	7.1	7.0
	min.	7.1	7.0	7.0	6.8	6.9	6.8
pH	max.	8.14	7.99	7.85	7.56	7.15	5.90
	min.	8.10	7.98	7.84	7.53	7.13	5.72
Conductivity (µmho/cm)	max.	302	338	356	394	427	473
	min.	301	335	352	389	427	472
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

***One organism accidently disposed of on day 1 of the test.**

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 8
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: SP, AW, BE**

Start:9/6/0321:35
End: 9/8/0320:50
Test Substance: LR-16
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		19/20	20/20	20/20	20/20	20/20	20/20
% Survival		95	100	100	100	100	100
Dissolved O_2 (mg/L)	max.	7.3	7.3	7.2	7.1	7.1	7.1
	min.	7.2	7.0	6.9	6.9	6.8	6.8
pH	max.	8.12	8.10	8.05	7.99	7.95	7.92
	min.	8.10	8.06	8.01	7.98	7.94	7.89
Conductivity (µmho/cm)	max.	304	327	350	394	431	474
	min.	283	322	348	388	431	472
Temp. (°C)	max.	20.5	20.5	20.5	20.5	20.5	20.5
	min.	19.5	19.5	19.5	19.5	19.5	19.5

Statistical Analysis:

- LC_{50} (Trimmed Spearman-Karber) = >100%

TABLE 9
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED 9/5/03 FOR ACUTE TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water*	Site RR-6	Site RR-8	Site RR-12
Analysis Temperature °C	25.0	20.0	20.0	20.0
Total Hardness (mg $CaCO_3$/L)	85	136	190	172
pH	8.03	7.44	6.13	7.27
Alkalinity (mg $CaCO_3$/L)	58	44	10	34
Conductivity (µmho/cm)	300	305	393	373
Dissolved Oxygen (mg O_2/L)	7.2	7.1	6.9	7.0
Ammonia (mg NH_3/L)	--	0.01	0.02	0.02
Un-ionized Ammonia	--	<0.1	<0.1	<0.1

*** Reconstituted water chemical analyses are a mean of 2 reconstituted waters used.**

TABLE 10
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED 9/6/03 FOR ACUTE TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water*	Site RR-6	Site RR-8	Site RR-12	Site RR-15	Site LR-16
Analysis Temperature °C	25.0	20.0	20.0	20.0	20.0	20.0
Total Hardness (mg $CaCO_3$/L)	83	210	240	160	200	210
pH	8.06	4.79	4.25	7.59	5.79	7.96
Alkalinity (mg $CaCO_3$/L)	58	6	<2	30	8	48
Conductivity (µmho/cm)	302	483	637	369	479	477
Dissolved Oxygen (mg O_2/L)	7.3	7.8	7.7	7.6	7.5	7.4
Ammonia (mg NH_3/L)	--	0.08	0.09	0.05	0.06	0.08
Un-ionized Ammonia	--	<0.1	<0.1	<0.1	<0.1	<0.1

*** Reconstituted water chemical analyses are a mean of 2 reconstituted waters used.**

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*: Acute test

Test date: August 12 to 14, 2003

g NaCl/L	control	1.0	1.5	2.0	2.5	3.0
# alive/# exp.	20/20	20/20	20/20	18/20	7/20	1/20
% survival	100	100	100	90	35	5

LC_{50} (Spearman-Karber) = 2.38 g NaCl/L (95% CI, 2.23 to 2.52)

Note: This is within our accepted performance range (2.00 to 3.01) determined by 20 previous reference tests performed.

Molycorp RI/FS
Bioassay Tests - Surface Water/Storms
15 September - 17 September 2003

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* ACUTE TOXICITY TEST

TEST: Acute 48 hr. with *Ceriodaphnia dubia* **OPERATORS: LC, PA**

Start: 9/11/03 16:25
End: 9/13/03 15:25
Test Substance: RR-6
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % Effluent		0	12.5	25	50	75	100
# alive/exposed		20/20	20/20	20/20	20/20	19/20	19/20
% Survival		100	100	100	100	95	95
Dissolved O_2 (mg/L)	max.	7.7	7.6	7.5	7.4	7.3	7.3
	min.	7.1	7.1	7.2	7.2	7.1	7.0
pH	max.	8.24	8.22	8.19	8.16	8.13	8.12
	min.	8.06	8.12	8.13	8.08	8.05	8.01
Conductivity (µmho/cm)	max.	329	317	306	289	272	258
	min.	292	309	306	281	264	244
Temp. (°C)	max.	20.0	20.0	20.0	20.0	20.0	20.0
	min.	20.0	20.0	20.0	20.0	20.0	20.0

Statistical Analysis:

- LC_{50} (Probit) = >100%

TABLE 2
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR ACUTE TOXICITY TESTS

Wet chemistry on samples and reconstituted water:

Measurement	Recon water	Site RR-6
Analysis Temperature °C	25.0	20.0
Total Hardness (mg $CaCO_3$/L)	84	106
pH	8.06	7.46
Alkalinity (mg $CaCO_3$/L)	60	46
Conductivity (µmho/cm)	309	218
Dissolved Oxygen (mg O_2/L)	7.3	7.5
Ammonia (mg NH_3/L)	--	0.03
Un-ionized Ammonia	--	<0.1

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*:

Acute test

Test date: August 12 to 14, 2003

g NaCl/L	control	1.0	1.5	2.0	2.5	3.0
# alive/# exp.	20/20	20/20	20/20	18/20	7/20	1/20
% survival	100	100	100	90	35	5

LC_{50} (Spearman-Karber) = 2.38 g NaCl/L (95% CI, 2.23 to 2.52)

Note: This is within our accepted performance range (2.00 to 3.01) determined by 20 previous reference tests performed.

APPENDIX A-4H
SEDIMENT BIOASSAYS

Molycorp RI/FS
Sediment Bioassay Tests
4 October - 14 October 2002

TABLE 1
SUMMARY RESULTS OF *CHIRONOMUS TENTANS*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Chironomus tentans*OPERATORS: PA, NT, AW, SP

Start:10/4/02
End:10/14/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Control 0	LR-1 100	RR-4 100	RR-5 100	RR-6 100	RR-7 100
# alive/exposed	63/80	58/80	61/80	42/80	76/80	42/80
% Survival	78.8	72.5	76.3	52.5	95	52.5
Ash Free Dry Weight (Mean wt./# Alive)	2.107 ± 0.236	1.952 ± 0.108	1.773 ± 0.284	2.414 ± 0.275	2.789 ± 1.843	4.371 ± 3.070
Dissolved O_2 max. (mg/L) min.	6.2 3.6	6.3 4.1	6.4 4.0	6.4 3.5	6.2 3.7	6.6 4.5
Temp. max. (°C) min.	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0

Statistical Analysis of Endpoints:

Survival:LR-1:No significant effect
RR-4:No significant effect
RR-5:Significantly lower than control
RR-6:No significant effect
RR-7:Significantly lower than control

AFDW:LR-1:No significant effect
RR-4:No significant effect
RR-5:No significant effect
RR-6:No significant effect
RR-7:No significant effect

TABLE 2
SUMMARY RESULTS OF *CHIRONOMUS TENTANS*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Chironomus tentans*OPERATORS: PA, NT, AW, SP

Start:10/4/02
End:10/14/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	RR-8 100	RR-11A1 100	RR-12 100	RR-15 100	RR-20 100
# alive/exposed	73/80	76/80	75/80	76/80	66/80
% Survival	91.3	95	93.8	95	82.5
Ash Free Dry Weight (Mean wt./# Alive)	3.301 ± 2.805	3.671 ± 2.606	2.735 ± 2.549	2.576 ± 1.912	4.857 ± 3.565
Dissolved O_2 max. (mg/L) min.	6.2 3.9	6.2 3.7	6.5 4.8	6.3 3.9	6.2 4.1
Temp. max. (°C) min.	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0

Statistical Analysis of Endpoints:

Survival:RR-8:No significant effect
RR-11A1:No significant effect
RR-12:No significant effect
RR-15:No significant effect
RR-20:No significant effect

AFDW:RR-8:No significant effect
RR-11A1:No significant effect
RR-12:No significant effect
RR-15:No significant effect
RR-20:No significant effect

TABLE 3
SUMMARY RESULTS OF *HYALELLA AZTECA*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Hyalella azteca* OPERATORS: PA, NT, AW, SP

Start:10/4/02
End:10/14/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Control 0	LR-1 100	RR-4 100	RR-5 100	RR-6 100	RR-7 100
# alive/exposed	71/80	73/80	75/80	77/80	77/80	74/80
% Survival	88.8	91.3	93.8	96.3	96.3	92.5
Biomass (Mean wt./# Alive)	0.050 ± 0.027	0.065 ± 0.027	0.063 ± 0.014	0.062 ± 0.014	0.058 ± 0.011	0.087 ± 0.022
Dissolved O_2 max. (mg/L) min.	7.1 6.4	6.8 6.1	7.0 6.3	7.1 6.4	7.0 6.3	6.9 6.4
Temp. max. (°C) min.	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0

Statistical Analysis of Endpoints:

Survival:LR-1:No significant effect
RR-4:No significant effect
RR-5:No significant effect
RR-6:No significant effect
RR-7:No significant effect

Biomass:LR-1:No significant effect
RR-4:No significant effect
RR-5:No significant effect
RR-6:No significant effect
RR-7:No significant effect

TABLE 4
SUMMARY RESULTS OF *HYALELLA AZTECA*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Hyalella azteca* OPERATORS: PA, NT, AW, SP

Start:10/4/02
End:10/14/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent		RR-8 100	RR-11A1 100	RR-12 100	RR-15 100	RR-20 100
# alive/exposed		77/80	74/80	77/80	73/80	73/80
% Survival		96.3	92.5	96.3	91.3	91.3
Biomass (Mean wt./# Alive)		0.072 ± 0.015	0.073 ± 0.016	0.071 ± 0.009	0.041 ± 0.012	0.052 ± 0.017
Dissolved O_2 (mg/L)	max. min.	7.0 6.3	7.0 6.2	7.1 6.3	6.9 6.2	6.9 6.1
Temp. (°C)	max. min.	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0	24.0 23.0

Statistical Analysis of Endpoints:

Survival:RR-8:No significant effect
RR-11A1:No significant effect
RR-12:No significant effect
RR-15:No significant effect
RR-20:No significant effect

Biomass:RR-8:No significant effect
RR-11A1:No significant effect
RR-12:No significant effect
RR-15:No significant effect
RR-20:No significant effect

TABLE 5
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *CHIRONOMUS TENTANS* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Control		Site LR-1		Site RR-4	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	80	90	118	106	100	96
pH	7.30	7.55	7.32	7.65	7.64	8.71
Alkalinity (mg $CaCO_3$/L)	42	58	44	50	58	72
Conductivity (µmho/cm)	318	356	397	388	317	351
Dissolved Oxygen (mg O_2/L)	6.6	5.9	6.6	5.9	6.6	6.3
Ammonia (mg NH_3/L)	0.09	1.3	0.06	1.1	0.02	0.65
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Measurement	Site RR-5		Site RR-6		Site RR-7	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	100	96	96	92	94	98
pH	7.67	7.70	7.32	7.75	7.51	7.88
Alkalinity (mg $CaCO_3$/L)	60	62	52	56	54	60
Conductivity (µmho/cm)	335	356	315	353	329	353
Dissolved Oxygen (mg O_2/L)	6.6	6.0	6.5	5.8	6.9	6.0
Ammonia (mg NH_3/L)	0.02	0.87	<0.01	0.82	0.01	1.0
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 6
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *CHIRONOMUS TENTANS* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-8		Site RR-11A1		Site RR-12	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	96	96	92	94	96	96
pH	7.71	7.74	7.48	7.64	7.39	7.64
Alkalinity (mg $CaCO_3$/L)	56	60	50	58	54	56
Conductivity (µmho/cm)	328	345	313	353	337	343
Dissolved Oxygen (mg O_2/L)	6.9	5.9	6.9	5.7	6.9	5.7
Ammonia (mg NH_3/L)	0.09	1.2	0.02	0.79	0.08	0.68
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Measurement	RR-15		Site RR-20	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	98	96	90	102
pH	7.40	7.60	7.18	7.44
Alkalinity (mg $CaCO_3$/L)	46	56	44	48
Conductivity (µmho/cm)	314	355	318	370
Dissolved Oxygen (mg O_2/L)	6.8	5.8	6.8	5.8
Ammonia (mg NH_3/L)	0.01	0.81	0.01	1.2
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

TABLE 7
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *HYALELLA AZTECA* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Control		Site LR-1		Site RR-4	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	80	96	120	112	214	100
pH	7.56	7.92	7.27	7.44	7.77	7.97
Alkalinity (mg $CaCO_3$/L)	46	58	44	56	102	60
Conductivity (µmho/cm)	325	364	393	374	330	348
Dissolved Oxygen (mg O_2/L)	6.7	6.2	6.9	6.2	6.7	6.1
Ammonia (mg NH_3/L)	0.05	0.61	0.36	1.60	0.04	0.26
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Measurement	Site RR-5		Site RR-6		Site RR-7	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	100	96	96	96	98	96
pH	7.78	7.97	7.96	7.93	7.61	7.96
Alkalinity (mg $CaCO_3$/L)	60	60	54	58	86	58
Conductivity (µmho/cm)	311	352	339	352	322	351
Dissolved Oxygen (mg O_2/L)	6.7	6.1	6.9	6.0	6.8	6.0
Ammonia (mg NH_3/L)	0.06	0.21	0.02	0.19	0.11	0.49
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 8
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *HYALELLA AZTECA* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-8		Site RR-11A1		Site RR-12	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	94	96	92	96	96	98
pH	7.72	7.97	5.37	8.00	7.79	7.90
Alkalinity (mg $CaCO_3$/L)	54	58	50	56	58	60
Conductivity (µmho/cm)	331	347	336	350	311	357
Dissolved Oxygen (mg O_2/L)	6.7	5.9	6.6	6.0	6.6	6.0
Ammonia (mg NH_3/L)	0.17	0.23	0.05	0.38	0.03	0.16
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Measurement	RR-15		Site RR-20	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	98	98	98	100
pH	7.60	7.93	7.43	7.80
Alkalinity (mg $CaCO_3$/L)	50	56	42	52
Conductivity (µmho/cm)	308	350	309	370
Dissolved Oxygen (mg O_2/L)	6.7	6.0	6.7	5.9
Ammonia (mg NH_3/L)	0.03	0.27	0.01	0.20
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

TABLE 9
WATER CHEMISTRY RESULTS FROM RECONSTITUTED WATER USED FOR CHRONIC SEDIMENT TOXICITY TESTS

Wet chemistry on reconstituted water:

Measurement	Recon. Water *
Analysis Temperature °C	23.0
Total Hardness (mg $CaCO_3$/L)	88
pH	7.99
Alkalinity (mg $CaCO_3$/L)	55
Conductivity (µmho/cm)	309
Dissolved Oxygen (mg O_2/L)	6.5
Ammonia (mg NH_3/L)	0.08
Un-ionized Ammonia	<0.1

*** Reconstituted water chemical analyses are a mean of 5 reconstituted waters used**

Molycorp RI/FS
Sediment Bioassay Tests
18 October - 28 October 2002

TABLE 1
SUMMARY RESULTS OF *CHIRONOMUS TENTANS*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Chironomus tentans*OPERATORS: PA, NT, AW, SP

Start:10/18/02
End:10/28/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Control 0	LR-8A 100	LR-16 100	UFL 100	ERL 100	Cabresto 100
# alive/exposed	69/80	68/80	57/80	66/80	69/80	70/80
% Survival	86.3	85	71.3	82.5	86.3	87.5
Ash Free Dry Weight (Mean wt./# Alive)	2.469 ± 3.128	2.107 ± 1.847	0.753 ± 0.182	3.209 ± 3.183	1.987 ± 1.249	5.718 ± 4.743
Dissolved O_2 max. (mg/L) min.	6.9 3.6	5.9 2.9	5.0 2.7	6.3 3.5	6.4 3.4	6.3 2.7
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:LR-8A:No significant effect
LR-16:No significant effect
UFL:No significant effect
ERL:No significant effect
Cabresto:No significant effect

AFDW:LR-8A:No significant effect
LR-16:No significant effect
UFL:No significant effect
ERL:No significant effect
Cabresto:No significant effect

TABLE 2
SUMMARY RESULTS OF *CHIRONOMUS TENTANS*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Chironomus tentans*OPERATORS: PA, NT, AW, SP

Start:10/18/02
End:10/28/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Zwergle 100	SW12-9 100	SW12-10 100
# alive/exposed	79/80	49/80	74/80
% Survival	98.8	61.3	92.5
Ash Free Dry Weight (Mean wt./# Alive)	3.312 ± 2.070	2.366 ± 2.550	1.187 ± 0.174
Dissolved O_2 max. (mg/L) min.	6.9 2.9	6.5 2.0	6.7 4.7
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:Zwergle:No significant effect
SW12-9:No significant effect
SW12-10:No significant effect

AFDW:Zwergle:No significant effect
SW12-9:No significant effect
SW12-10:No significant effect

TABLE 3
SUMMARY RESULTS OF *HYALELLA AZTECA*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Hyalella azteca*OPERATORS: PA, NT, AW, SP

Start:10/18/02
End:10/28/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Control 0	LR-8A 100	LR-16 100	UFL 100	ERL 100	Cabresto 100
# alive/exposed	78/80	71/80	57/80	74/80	72/80	66/80
% Survival	97.5	88.8	71.3	92.5	90	82.5
Biomass (Mean wt./# Alive)	0.039 ± 0.020	0.029 ± 0.006	0.073 ± 0.048	0.048 ± 0.015	0.041 ± 0.010	0.051 ± 0.021
Dissolved O_2 max. (mg/L) min.	7.6 5.7	7.7 5.5	5.5 3.3	7.4 5.4	7.9 5.5	6.8 4.8
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:LR-8A:No significant effect
LR-16:Significantly lower than control
UFL:No significant effect
ERL:No significant effect
Cabresto:Significantly lower than control

Biomass:LR-8A:No significant effect
LR-16:No significant effect
UFL:No significant effect
ERL:No significant effect
Cabresto:No significant effect

TABLE 4
SUMMARY RESULTS OF *HYALELLA AZTECA*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Hyalella azteca*OPERATORS: PA, NT, AW, SP

Start:10/18/02
End:10/28/02
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Zwergle 100	SW12-9 100	SW12-10 100
# alive/exposed	62/80	70/80	60/80
% Survival	77.5	87.5	75
Biomass (Mean wt./# Alive)	0.097 ± 0.084	0.025 ± 0.020	0.045 ± 0.024
Dissolved O_2 max. (mg/L) min.	6.9 5.4	7.4 5.2	7.7 5.5
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:Zwergle:Significantly lower than control
SW12-9:No significant effect
SW12-10:Significantly lower than control

Biomass:Zwergle:No significant effect
SW12-9:No significant effect
SW12-10:No significant effect

TABLE 5
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *CHIRONOMUS TENTANS* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Control		Site LR-8A		Site LR-16	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	78	88	136	124	102	106
pH	7.46	7.43	7.48	7.24	7.47	7.46
Alkalinity (mg $CaCO_3$/L)	44	56	66	74	66	68
Conductivity (µmho/cm)	325	304	454	391	374	361
Dissolved Oxygen (mg O_2/L)	7.2	5.6	6.6	4.5	5.1	5.0
Ammonia (mg NH_3/L)	1.1	1.2	0.29	1.3	0.41	1.4
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Measurement	Upper Fawn Lake		Eagle Rock Lake		Cabresto	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	92	102	94	82	95	106
pH	7.24	7.39	6.81	6.86	7.49	7.62
Alkalinity (mg $CaCO_3$/L)	44	48	28	30	62	84
Conductivity (µmho/cm)	353	336	369	333	337	329
Dissolved Oxygen (mg O_2/L)	6.5	5.8	6.5	5.1	7.1	5.3
Ammonia (mg NH_3/L)	0.55	1.3	0.49	1.3	0.18	1.2
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 6
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *CHIRONOMUS TENTANS* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Zwergle		Site SW12-9		Site SW12-10	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	108	116	210	146	178	130
pH	7.70	7.81	7.78	7.81	7.92	7.84
Alkalinity (mg $CaCO_3$/L)	70	90	66	92	58	80
Conductivity (µmho/cm)	330	346	594	407	499	368
Dissolved Oxygen (mg O_2/L)	7.1	5.0	6.5	5.7	7.3	5.7
Ammonia (mg NH_3/L)	0.24	1.2	0.10	0.87	0.05	0.46
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 7
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *HYALELLA AZTECA* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Control		Site LR-8A		Site LR-16	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	84	92	138	118	100	106
pH	7.55	7.71	7.53	7.46	7.68	7.44
Alkalinity (mg $CaCO_3$/L)	46	58	66	70	66	66
Conductivity (µmho/cm)	326	318	447	354	368	363
Dissolved Oxygen (mg O_2/L)	6.4	5.7	6.0	5.5	5.5	5.3
Ammonia (mg NH_3/L)	0.53	0.59	0.34	0.76	0.39	0.85
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Measurement	Upper Fawn Lake		Eagle Rock Lake		Cabresto	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	96	100	94	92	96	100
pH	7.84	7.15	7.77	7.17	7.73	7.62
Alkalinity (mg $CaCO_3$/L)	44	50	30	50	62	86
Conductivity (µmho/cm)	336	325	354	322	327	338
Dissolved Oxygen (mg O_2/L)	5.9	5.4	6.0	5.5	6.1	5.2
Ammonia (mg NH_3/L)	0.30	0.20	0.43	0.35	0.08	0.97
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 8
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *HYALELLA AZTECA* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Zwergle		Site SW12-9		Site SW12-10	
	Initial	Final	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	104	120	210	120	172	112
pH	7.96	8.03	7.91	7.70	7.88	7.88
Alkalinity (mg $CaCO_3$/L)	72	96	64	80	60	74
Conductivity (µmho/cm)	351	370	578	371	503	374
Dissolved Oxygen (mg O_2/L)	5.9	5.4	6.1	5.3	6.1	5.5
Ammonia (mg NH_3/L)	0.07	0.59	0.04	0.58	0.03	0.52
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 9
WATER CHEMISTRY RESULTS FROM RECONSTITUTED WATER USED FOR CHRONIC SEDIMENT TOXICITY TESTS

Wet chemistry on reconstituted water:

Measurement	Recon. Water *
Analysis Temperature °C	23.0
Total Hardness (mg $CaCO_3$/L)	87
pH	8.05
Alkalinity (mg $CaCO_3$/L)	57
Conductivity (µmho/cm)	320
Dissolved Oxygen (mg O_2/L)	6.0
Ammonia (mg NH_3/L)	0.05
Un-ionized Ammonia	<0.1

*** Reconstituted water chemical analyses are a mean of 4 reconstituted waters used**

Molycorp RI/FS
Sediment Bioassay Tests
14 October - 24 October 2003

TABLE 1
SUMMARY RESULTS OF *CHIRONOMUS TENTANS*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Chironomus tentans*OPERATORS: NT, BE, AW, LC, PA

Start:10/14/03
End:10/24/03
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Control 0	LR-1 100	LR-8A 100	LR-16 100
# alive/exposed	54/70	55/80	58/80	58/80
% Survival	77.1	68.8	72.5	72.5
Ash Free Dry Weight (Mean wt./# Alive)	1.487 ± 0.229	1.523 ± 0.358	1.479 ± 0.342	1.468 ± 0.407
Dissolved O_2 max. (mg/L) min.	7.1 5.0	6.9 5.1	6.9 4.8	7.0 4.9
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:LR-1:No significant effect
LR-8A:No significant effect
LR-16:No significant effect

AFDW:LR-1:No significant effect
LR-8A:No significant effect
LR-16:No significant effect

TABLE 2
SUMMARY RESULTS OF *CHIRONOMUS TENTANS*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Chironomus tentans*OPERATORS: PA, NT, AW, LC, BE

Start:10/14/03
End:10/24/03
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	RR-5BB 100	RR-15 100	Zwergle 100
# alive/exposed	61/80	61/80	48/80
% Survival	76.3	76.3	60
Ash Free Dry Weight (Mean wt./# Alive)	1.375 ± 0.285	1.450 ± 0.297	1.502 ± 0.251
Dissolved O_2 max. (mg/L) min.	6.9 5.1	6.8 5.1	6.7 4.8
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:RR-5BB:No significant effect
RR-15:No significant effect
Zwergle:No significant effect

AFDW:RR-5BB:Significantly lower than control
RR-15:No significant effect
Zwergle:No significant effect

TABLE 3
SUMMARY RESULTS OF *HYALELLA AZTECA*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Hyalella azteca*OPERATORS: PA, NT, AW, BE, SP

Start:10/14/03
End:10/24/03
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	Control 0	LR-1 100	LR-8A 100	LR-16 100
# alive/exposed	75/80	80/80	76/80	78/80
% Survival	93.8	100	95	97.5
Biomass (Mean wt./# Alive)	0.125 ± 0.017	0.143 ± 0.027	0.162 ± 0.024	0.144 ± 0.015
Dissolved O_2 max. (mg/L) min.	7.2 5.3	6.6 5.5	6.9 5.2	6.8 5.2
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:LR-1:No significant effect
LR-8A:No significant effect
LR-16:No significant effect

Biomass:LR-1:No significant effect
LR-8A:No significant effect
LR-16:No significant effect

TABLE 4
SUMMARY RESULTS OF *HYALELLA AZTECA*
CHRONIC SEDIMENT TOXICITY TEST

TEST: 10 day chronic with *Hyalella azteca* OPERATORS: PA, NT, AW, BE, SP

Start:10/14/03
End:10/24/03
Test Substance: Sediment
Client/Project: Chadwick Ecological Consultants, Inc.

Test results:

Treatment % Effluent	RR-5BB 100	RR-15 100	Zwergle 100
# alive/exposed	80/80	80/80	73/80
% Survival	100	100	91.3
Biomass (Mean wt./# Alive)	0.151 ± 0.040	0.145 ± 0.014	0.170 ± 0.027
Dissolved O_2 max. (mg/L) min.	7.0 5.4	6.9 5.4	6.7 5.3
Temp. max. (°C) min.	23.5 23.0	23.5 23.0	23.5 23.0

Statistical Analysis of Endpoints:

Survival:RR-5BB:No significant effect
RR-15:No significant effect
Zwergle:No significant effect

Biomass:RR-5BB:No significant effect
RR-15:No significant effect
Zwergle:No significant effect

TABLE 5
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *CHIRONOMUS TENTANS* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Control		Site LR-1	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	76	90	96	94
pH	7.05	7.71	7.73	7.54
Alkalinity (mg $CaCO_3$/L)	40	60	62	64
Conductivity (µmho/cm)	310	314	322	294
Dissolved Oxygen (mg O_2/L)	4.3	7.1	7.1	6.9
Ammonia (mg NH_3/L)	1.1	0.95	0.13	0.30
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

Measurement	Site LR-8A		Site LR-16	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	104	94	98	96
pH	7.72	7.63	7.73	8.08
Alkalinity (mg $CaCO_3$/L)	62	64	60	66
Conductivity (µmho/cm)	336	305	328	315
Dissolved Oxygen (mg O_2/L)	6.9	6.8	7.2	6.8
Ammonia (mg NH_3/L)	0.07	0.28	0.10	0.24
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

TABLE 6
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *CHIRONOMUS TENTANS* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-5BB		Site RR-15	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	84	86	94	94
pH	7.09	7.75	7.30	7.86
Alkalinity (mg $CaCO_3$/L)	26	50	52	60
Conductivity (µmho/cm)	312	295	322	301
Dissolved Oxygen (mg O_2/L)	4.3	6.9	4.2	6.9
Ammonia (mg NH_3/L)	0.23	0.42	0.20	0.34
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

Measurement	Zwergle	
	Initial	Final
Analysis Temperature °C	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	104	106
pH	7.79	8.02
Alkalinity (mg $CaCO_3$/L)	66	60
Conductivity (µmho/cm)	323	327
Dissolved Oxygen (mg O_2/L)	4.3	7.0
Ammonia (mg NH_3/L)	0.23	0.35
Un-ionized Ammonia	<0.1	<0.1

TABLE 7
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *HYALELLA AZTECA* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Control		Site LR-1	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	80	92	98	94
pH	7.18	7.79	7.64	7.97
Alkalinity (mg $CaCO_3$/L)	40	62	60	62
Conductivity (µmho/cm)	276	295	323	281
Dissolved Oxygen (mg O_2/L)	5.6	6.9	5.0	7.2
Ammonia (mg NH_3/L)	1.4	0.72	0.22	0.14
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

Measurement	Site LR-8A		Site LR-16	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	108	96	98	94
pH	7.70	8.03	7.77	8.14
Alkalinity (mg $CaCO_3$/L)	62	62	64	62
Conductivity (µmho/cm)	339	288	320	284
Dissolved Oxygen (mg O_2/L)	4.7	7.1	4.8	6.9
Ammonia (mg NH_3/L)	0.28	0.13	0.19	0.07
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

TABLE 8
WATER CHEMISTRY RESULTS FROM OVERLYING WATER USED IN CHRONIC *HYALELLA AZTECA* SEDIMENT TOXICITY TESTS

Wet chemistry on samples:

Measurement	Site RR-5BB		Site RR-15	
	Initial	Final	Initial	Final
Analysis Temperature °C	23.0	23.0	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	86	90	92	94
pH	6.86	8.06	7.47	7.96
Alkalinity (mg $CaCO_3$/L)	34	52	52	62
Conductivity (µmho/cm)	301	296	315	321
Dissolved Oxygen (mg O_2/L)	4.6	7.1	4.8	7.0
Ammonia (mg NH_3/L)	0.16	0.39	0.16	0.20
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1

Measurement	Zwergle	
	Initial	Final
Analysis Temperature °C	23.0	23.0
Total Hardness (mg $CaCO_3$/L)	114	104
pH	7.70	7.97
Alkalinity (mg $CaCO_3$/L)	68	70
Conductivity (µmho/cm)	324	317
Dissolved Oxygen (mg O_2/L)	4.9	6.6
Ammonia (mg NH_3/L)	0.36	0.29
Un-ionized Ammonia	<0.1	<0.1

TABLE 9
WATER CHEMISTRY RESULTS FROM RECONSTITUTED WATER USED FOR CHRONIC SEDIMENT TOXICITY TESTS

Wet chemistry on reconstituted water:

Measurement	Recon. Water *
Analysis Temperature °C	23.0
Total Hardness (mg $CaCO_3$/L)	91
pH	8.02
Alkalinity (mg $CaCO_3$/L)	59
Conductivity (µmho/cm)	295
Dissolved Oxygen (mg O_2/L)	6.4
Ammonia (mg NH_3/L)	---
Un-ionized Ammonia	---

*** Reconstituted water chemical analyses are a mean of 4 reconstituted waters used**

APPENDIX A-4i
HABITAT TYPES
VALIDATED ANALYTICAL RESULTS

HABITAT TYPES
defined according to Overton *et al.* (1997)

RIFFLES

HGR	-high gradient riffle
LGR	-low gradient riffle

RUNS AND POOLS

RUN	-run
DMA	-pool formed by an artificial dam in the middle of the channel
DMW	-pool formed by a log or large woody debris in the middle of the channel
DMO	-pool formed by a dam in the middle of the channel
SLW	-pool formed by scouring on the side of the channel, with woody debris
SLB	-pool formed by scouring on the side of the channel, with boulders
SLR	-pool formed by scouring on the side of the channel, with bedrock
SMW	-pool formed by scouring in the middle of the channel, with woody debris
SMB	-pool formed by scouring in the middle of the channel, with boulders
SPW	-plunge pool formed by scouring over woody debris
SPB	-plunge pool formed by scouring over boulders

Overton, C. K., S. P. Wollrab, B. C. Roberts, and M. A. Radko. 1997. R1/R4 (Northern/ Intermountain Regions) Fish and Fish Habitat Standard Inventory Procedures Handbook. General Technical Report INT-GTR-346. U.S. Department of Agriculture Forest Service, Boise, ID.

Appendix A-4i
Aquatic Biota - Habitat Types
Cabresto Creek - 10-02-02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	SMB	10	11	110	1.6	0.9	1.0	4	35	--	40
2	LGR	52	10	520	1.2	–	0.7	3	15	2	20
3	RUN	16	8	128	1.2	0.4	0.8	2	10	5	15
4	LGR	10	11	110	0.9	–	0.7	2	5	1	10
5	RUN	15	13	195	0.9	0.3	0.6	3	20	40	30
6	LGR	14	17	238	0.9	–	0.6	2	20	18	35
7	RUN	31	12	372	1.1	0.6	0.7	3	20	12	30
8	LGR	81	10	810	1.2	–	0.7	3	15	27	20
9	SPW	12	11	132	1.2	0.3	0.9	2	30	10	30
10	RUN	22	13	286	1.3	0.3	0.6	2	20	12	40
11	LGR	46	14	644	0.9	–	0.6	2	20	16	40

Appendix A-4i
Aquatic Biota - Habitat Types
Zwergle - 10-02-02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	64	18	1152	1.0	–	0.6	4	5	3	10
2	SLB	31	20	620	2.2	1.5	1.0	4	10	8	25
3	LGR	37	16	592	0.9	–	0.6	3	10	4	15
4	RUN	35	16	560	1.1	0.2	0.9	2	20	8	40
5	LGR	21	14	294	0.9	–	0.7	2	5	3	15
6	RUN	27	15	405	1.6	0.9	1.1	1	60	50	60
7	LGR	22	12	264	0.7	–	0.5	3	10	7	15
8	RUN	16	10	160	1.2	0.4	0.8	2	15	16	35
9	LGR	116	18	2088	1.0	–	0.5	3	15	10	15
10	RUN	39	16	624	1.7	1.0	0.9	4	20	10	35

Appendix A-4i
Aquatic Biota - Habitat Types
RR-4 - June Bug Campground - 10/02/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	80	15	1200	1.3	–	0.7	2	80	75	75
2	RUN	10	16	160	1.3	0.4	0.8	1	80	95	85
3	LGR	57	17	969	1.3	–	0.7	2	70	31	70
4	RUN	16	18	288	1.2	0.3	0.7	1	90	90	85
5	HGR	32	15	480	1.2	–	0.6	2	45	–	50
6	RUN	40	22	880	1.4	0.4	0.7	2	65	78	85
7	RUN	81	14	1134	2.0	0.7	0.9	2	90	87	95

Appendix A-4i
Aquatic Biota - Habitat Types
RR-5 - Elephant Rock Campground - 10/02/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	24	20	480	1.2	0.3	0.6	1	95	100	98
2	LGR	78	16	1248	0.9	–	0.5	2	70	24	85
3	SMB	21	11	231	1.6	0.7	1.0	3	95	54	98
4	LGR	49	16	784	1.2	–	0.7	2	65	22	70
5	RUN	40	11	440	1.5	0.4	0.7	2	70	12	90
6	SMW	15	23	345	1.6	0.5	1.0	2	50	5	95
7	LGR	61	21	1281	0.9	–	0.6	2	55	43	85

Appendix A-4i
Aquatic Biota - Habitat Types
RR-6 - Downstream of Hansen Creek/Upstream of Mill - 10/03/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	117	14	1638	1.1	–	0.6	1	55	26	85
2	RUN	15	14	210	1.0	0.1	0.5	1	65	21	90
3	LGR	82	15	1230	0.9	–	0.4	1	55	18	85
4	RUN	32	13	416	1.1	0.1	0.5	1	50	26	95
5	RUN	20	10	200	1.1	0.2	0.5	1	50	22	95
6	LGR	40	16	640	0.9	–	0.4	1	55	40	80
7	RUN	13	16	208	1.2	0.2	0.6	1	60	37	95
8	LGR	100	17	1700	1.1	–	0.5	1	45	37	90

Appendix A-4i
Aquatic Biota - Habitat Types
RR-7 - Downstream of Property Boundary/Upstream of Mill - 10-03-02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	42	17	714	1.1	0.5	0.5	1	95	100	98
2	LGR	104	14	1456	0.9	–	0.5	1	90	100	95
3	SLW	32	16	512	1.3	0.8	0.7	1	99	100	100
4	LGR	20	20	400	0.8	–	0.5	2	90	100	85
5	RUN	39	14	546	1.3	0.6	0.6	1	95	100	98
6	LGR	55	20	1100	1.3	–	0.6	2	60	100	75
7	RUN	94	12	1128	1.3	0.7	0.6	1	90	100	95
8	LGR	14	11	154	1.0	–	0.7	1	75	95	85

Appendix A-4i
Aquatic Biota - Habitat Types
RR-8 - Downstream of Mill/Upstream of Columbine Creek - 10/02/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	49	12	588	1.4	–	0.9	2	75	86	85
2	HGR	55	15	825	1.2	–	0.7	1	70	–	80
3	LGR	42	16	672	1.1	–	0.6	1	80	100	85
4	RUN	17	12	204	1.0	0.1	0.7	1	80	100	85
5	LGR	46	17	782	1.3	–	0.7	2	65	73	75
6	SMB	9	17	153	1.4	0.3	1.1	2	85	--	90
7	RUN	42	14	588	1.4	0.4	0.9	3	85	100	90
8	LGR	75	16	1200	1.4	–	0.8	3	75	27	85

Appendix A-4i
Aquatic Biota - Habitat Types
RR-11A1 - Downstream of Cabin Springs and Columbine Well Field - 10-03-02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	15	18	270	0.9	–	0.6	1	55	36	65
2	RUN	37	12	444	1.6	0.6	0.9	2	60	43	90
3	LGR	28	16	448	1.1	–	0.7	2	25	16	70
4	RUN	66	16	1056	1.1	0.3	0.7	2	85	72	95
5	LGR	42	12	504	1.3	–	0.8	2	25	5	60
6	SLR	41	9	369	2.1	1.0	1.1	2	60	50	90
7	SLR	29	10	290	2.3	0.9	1.6	3	60	37	85
8	LGR	31	14	434	1.1	–	0.7	2	30	40	55
9	RUN	25	15	375	1.3	0.3	0.7	1	55	31	60
10	LGR	66	14	924	1.2	–	0.8	2	30	5	55
11	SLR	41	17	697	1.4	0.4	1	3	70	6	55
12	RUN	19	15	285	1.5	0.5	1	--	35	--	60

Appendix A-4i
Aquatic Biota - Habitat Types
RR-12 - Goathill Campground - 10/03/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	70	21	1470	1.6	–	0.9	3	20	–	45
2	SLR	34	15	510	2.0	0.9	1.3	4	30	20	60
3	HGR	39	28	1092	1.2	–	0.8	3	30	–	40
4	RUN	31	21	651	2.1	0.8	1.1	2	65	3	70
5	RUN	26	15	390	1.7	0.7	1.0	3	30	1	70
6	LGR	42	14	588	1.7	–	0.8	2	50	50	60
7	HGR	45	23	1035	1.4	–	0.9	3	55	–	45
8	RUN	54	15	810	1.7	0.6	1.0	2	60	4	75
9	HGR	45	14	630	1.6	–	1.1	3	40	–	40

Appendix A-4i
Aquatic Biota - Habitat Types
RR-15 - Downstream of Questa Ranger Station - 10/01/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	93	19	1767	1.3	–	0.8	3	25	4	35
2	RUN	24	20	480	1.6	0.5	0.9	2	30	2	40
3	LGR	90	19	1710	1.1	–	0.6	3	25	4	40
4	RUN	76	18	1368	1.2	0.4	0.7	2	30	12	40
5	LGR	53	16	848	1.7	–	0.7	2	25	4	35
6	RUN	25	16	400	1.4	0.4	0.8	2	20	2	30
7	RUN	37	16	592	1.8	0.8	1.0	3	40	--	45
8	LGR	17	15	255	1.5	–	0.9	2	10	1	15

Appendix A-4i
Aquatic Biota - Habitat Types
RR-20 - Upstream of Highway 522 - 10/01/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	424	21	8904	1.5	–	0.8	3	20	11	40
2	RUN	42	14	588	1.2	0.4	0.8	2	20	15	45

Appendix A-4i
Aquatic Biota - Habitat Types
LR-1 - Downstream of Highway 522 and Questa WWTP - 10/01/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	51	20	1020	1.2	0.2	0.6	3	30	15	30
2	LGR	158	18	2844	1.4	–	0.8	3	25	6	25
3	RUN	80	18	1440	1.6	0.5	1.0	3	40	45	45
4	LGR	77	21	1617	1.2	–	0.7	4	15	4	20

Appendix A-4i
Aquatic Biota - Habitat Types
LR-8A - Downstream of NPDES Outfall 002 - 10/03/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	95	19	1805	1.8	0.8	1.1	2	45	55	40
2	LGR	76	15	1140	1.6	–	0.8	3	40	45	30
3	RUN	33	14	462	1.9	0.6	1.2	3	30	25	35
4	RUN	64	15	960	1.4	0.1	0.9	2	40	45	35
5	LGR	34	17	578	1.2	–	0.8	2	35	50	35
6	SMB	86	20	1720	2.3	1.0	1.7	4	40	50	40
7	LGR	68	19	1292	1.6	–	0.9	2	20	20	25

Appendix A-4i
Aquatic Biota - Habitat Types
LR-16 - Upstream of Hatchery Diversion - 10/03/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	59	24	1416	1.9	–	1.2	4	3	–	20
2	SPB	12	17	204	3.1	1.0	2.2	5	2	8	10
3	RUN	31	22	682	1.6	0.6	0.9	3	10	8	20
4	LGR	17	19	323	1.6	–	0.5	2	5	2	10
5	RUN	72	19	1368	3.1	1.9	1.6	4	15	10	15
6	HGR	83	24	1992	1.9	–	1.0	3	10	–	15
7	RUN	25	18	450	2.6	0.9	1.4	3	15	–	15
8	HGR	29	16	464	1.3	–	1.2	3	5	–	10

Appendix A-4i
Aquatic Biota - Habitat Types
Cabresto Creek - 09/26/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	SMB	9	13	117	1.8	1.0	1.2	4	20	--	35
2	LGR	13	9	117	1.0	--	0.6	3	5	6	15
3	RUN	21	8	168	1.3	0.4	0.5	2	10	9	30
4	LGR	47	11	517	1.0	--	0.6	3	5	6	20
5	RUN	12	12	144	0.9	0.2	0.6	3	5	3	20
6	LGR	21	9	189	0.9	--	0.5	3	5	4	15
7	RUN	22	13	286	1.2	0.6	0.6	2	12	5	30
8	LGR	88	10	880	1.0	--	0.6	3	5	8	20
9	SPW	11	12	132	1.4	0.2	1.0	3	30	22	30
10	RUN	30	14	420	1.0	0.1	0.5	2	15	9	40
11	LGR	47	13	611	0.9	--	0.6	2	10	4	35

Appendix A-4i
Aquatic Biota - Habitat Types
Zwergle - 10/02/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	24	18	432	1.0	0.3	0.7	2	5	4	15
2	LGR	46	20	920	0.9	--	0.5	3	5	6	10
3	SLB	34	20	680	2.2	1.6	1.1	4	25	13	35
4	LGR	35	16	560	1.0	--	0.7	3	5	8	15
5	RUN	18	16	288	1.0	0.1	0.8	2	20	5	15
6	LGR	23	14	322	0.8	--	0.5	3	10	3	20
7	DMB	27	18	486	2.0	1.3	1.2	4	60	--	45
8	LGR	16	16	256	0.9	--	0.6	2	15	12	20
9	RUN	24	12	288	1.1	0.4	0.8	2	20	7	25
10	LGR	118	19	2242	1.0	--	0.6	3	15	6	20
11	RUN	38	16	608	1.6	0.8	0.7	3	20	6	30

Appendix A-4i
Aquatic Biota - Habitat Types
RR-4 - June Bug Campground - 10/01/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	121	14	1694	1.0	--	0.7	2	10	4	80
2	RUN	12	16	192	1.0	0.3	0.6	1	15	3	75
3	LGR	21	18	378	0.9	--	0.6	1	10	10	65
4	RUN	31	17	527	1.2	0.3	0.7	1	15	8	65
5	HGR	30	18	540	1.1	--	0.5	2	20	--	60
6	RUN	34	18	612	1.4	0.5	0.8	2	35	9	70
7	LGR	26	16	416	0.9	--	0.6	1	15	11	70
8	RUN	54	11	594	1.8	1	0.9	3	25	14	75

Appendix A-4i
Aquatic Biota - Habitat Types
RR-5 - Elephant Rock Campground - 10/01/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	31	19	589	1.4	0.2	1.0	2	25	16	75
2	LGR	13	19	247	0.8	--	0.4	1	25	11	80
3	GLD	51	15	765	1.3	0.5	0.6	1	20	24	75
4	SMB	32	15	480	1.9	0.8	1.0	2	35	19	80
5	LGR	48	17	816	1.9	--	0.8	2	35	18	70
6	RUN	36	13	468	1.4	0.5	0.9	2	30	14	75
7	SMW	15	12	180	1.2	0.3	0.8	3	10	16	70
8	LGR	64	13	832	1.1	--	0.7	2	15	19	65

Appendix A-4i
Aquatic Biota - Habitat Types
RR-6 - Downstream of Hansen Creek/Upstream of Mill - 09/30/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	67	14	938	1.1	--	0.7	2	15	17	60
2	RUN	22	13	286	1.3	0.8	1.0	1	20	24	70
3	LGR	80	14	1120	1.1	--	0.8	2	12	13	65
4	RUN	19	14	266	1.1	0.2	1.0	1	20	20	80
5	LGR	51	13	663	1.1	--	0.9	2	10	14	70
6	RUN	30	12	360	1.4	0.6	1	2	25	9	75
7	LGR	159	18	2862	1.2	--	0.8	2	15	8	65

Appendix A-4i
Aquatic Biota - Habitat Types
RR-7 - Downstream of Property Boundary/Upstream of Mill - 09/30/02
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	56	13	728	2.1	1.3	1.4	2	40	27	80
2	LGR	116	14	1624	1.0	--	0.7	2	15	15	75
3	SLW	23	13	299	1.6	0.9	1.1	1	20	12	75
4	LGR	30	16	480	0.9	--	0.6	2	20	9	65
5	RUN	22	14	308	1.7	0.9	1.1	1	35	13	75
6	LGR	48	14	672	1.4	--	0.9	2	30	10	70
7	RUN	93	13	1209	1.2	0.5	0.9	2	20	12	75
8	LGR	25	10	250	1.2	--	0.8	2	10	15	65

Appendix A-4i
Aquatic Biota - Habitat Types
RR-8 - Downstream of Mill/Upstream of Columbine Creek - 09/30/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	47	13	611	1.6	--	0.9	2	15	26	55
2	HGR	52	12	624	1.3	--	0.8	2	30	--	50
3	RUN	62	16	992	1.3	0.4	0.8	1	20	15	45
4	LGR	41	16	656	1.1	--	0.7	2	15	13	50
5	SMB	9	18	162	1.4	0.5	1.0	2	20	12	60
6	RUN	46	17	782	1.5	0.5	1.1	2	15	5	55
7	LGR	58	17	986	1.5	--	0.9	2	12	10	45
8	RUN	20	16	320	1.6	0.6	0.9	2	25	8	50

Appendix A-4i
Aquatic Biota - Habitat Types
RR-11A1 - Downstream of Cabin Springs and Columbine Well Field - 09/25/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	16	18	288	0.9	--	0.7	1	50	30	60
2	RUN	37	13	481	1.6	0.5	0.8	2	60	37	80
3	LGR	27	16	432	1.2	--	0.7	2	25	14	70
4	RUN	64	14	896	1.4	0.5	0.9	2	80	58	60
5	LGR	41	11	451	1.3	--	0.8	2	20	7	80
6	SLR	47	12	564	2.4	1.1	1.6	2	60	42	90
7	SLR	27	10	270	2.3	1.0	1.2	3	60	31	90
8	LGR	30	14	420	1.3	--	0.9	--	25	28	60
9	RUN	27	14	378	1.3	0.6	0.8	1	50	16	60
10	LGR	62	16	992	1.2	--	0.8	2	30	4	50
11	SLR	34	15	510	1.3	0.5	1	3	60	12	50
12	LGR	25	12	300	1.6	--	1	2	30	4	50

Appendix A-4i
Aquatic Biota - Habitat Types
RR-12 - Goathill Campground - 09/25/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	70	21	1470	1.4	--	0.8	3	10	7	55
2	SLR	33	14	462	2.0	1.0	1.2	4	15	4	60
3	HGR	42	27	1134	1.6	--	1.0	3	15	--	50
4	RUN	32	25	800	2.2	0.8	1.2	3	15	5	65
5	RUN	25	16	400	1.7	0.6	1.0	3	15	4	65
6	RUN	43	17	731	1.6	0.9	1.1	2	20	10	55
7	HGR	45	23	1035	1.4	--	0.8	3	15	--	45
8	RUN	48	16	768	1.9	1.1	0.7	3	15	4	60
9	HGR	53	16	848	1.7	--	1.0	3	8	--	45

Appendix A-4i
Aquatic Biota - Habitat Types
RR-15 - Downstream of Questa Ranger Station - 09/25/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	100	19	1900	1.2	--	0.8	3	10	6	30
2	RUN	21	20	420	1.5	0.6	0.8	2	20	8	35
3	LGR	90	25	2250	1.2	--	0.7	3	12	6	40
4	RUN	79	17	1343	1.3	0.5	0.7	2	15	5	45
5	LGR	76	16	1216	1.4	--	0.7	2	10	4	40
6	RUN	35	15	525	1.8	0.5	0.9	2	20	4	45
7	RUN	12	15	180	1.8	0.4	1.1	3	10	8	45
8	LGR	11	18	198	1.0	--	0.6	2	5	5	30

Appendix A-4i
Aquatic Biota - Habitat Types
RR-20 - Upstream of Highway 522 - 09/25/03
Validated Analytical Results

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	23	18	414	1.2	0.4	0.8	2	5	6	30
2	LGR	34	17	578	1.0	--	0.6	3	3	2	30
3	RUN	21	19	399	1.3	0.4	0.7	2	5	10	30
4	LGR	364	25	9100	1	--	0.5	3	8	4	35
5	RUN	42	16	672	1.3	0.5	0.9	2	15	4	35

Appendix A-4i
Aquatic Biota - Habitat Types
LR-1 - Downstream of Highway 522 and Questa WWTP - 09/24/03
Validated Analytical Results

Unit #	Type	(ft)	Width (ft)	(ft^2)	Depth (ft)	pool depth (ft)	Depth (ft)	Rating	by Area	by Grid	Embeddedness
1	RUN	40	17	680	1.1	0.1	0.7	2	5	6	25
2	LGR	130	17	2210	1.0	--	0.6	3	5	6	30
3	RUN	101	17	1717	2.2	1.1	0.9	2	10	10	35
4	LGR	81	17	1377	1.2	--	0.7	3	5	5	30

Appendix A-4i
Aquatic Biota - Habitat Types
LR-8A - Downstream of NPDES Outfall 002 - 09/24/03
Validated Analytical Results

Unit #	Type	(ft)	Width (ft)	(ft^2)	Depth (ft)	pool depth (ft)	Depth (ft)	Rating	by Area	by Grid	Embeddedness
1	RUN	76	15	1140	1.8	1.0	0.9	2	5	10	40
2	LGR	72	22	1584	1.3	--	0.7	3	5	4	20
3	RUN	21	14	294	1.6	0.5	1.0	3	5	10	25
4	LGR	13	14	182	1.2	--	0.7	3	5	6	20
5	RUN	54	12	648	1.6	0.7	1.2	2	5	8	30
6	LGR	28	11	308	1.3	--	0.8	2	3	4	25
7	RUN	78	20	1560	2.3	0.6	1.3	3	15	4	55
8	LGR	73	20	1460	1.4	--	0.8	2	8	10	30

Appendix A-4i
Aquatic Biota - Habitat Types
LR-16 - Upstream of Hatchery Diversion - 09/23/03
Validated Analytical Results

Unit #	Type	(ft)	Width (ft)	(ft^2)	Depth (ft)	pool depth (ft)	Depth (ft)	Rating	by Area	by Grid	Embeddedness
1	HGR	48	23	1104	2.1	--	1.3	4	20	--	35
2	SPB	21	21	441	3.4	1.2	2.0	5	15	5	30
3	RUN	31	18	558	2.3	0.7	1.3	3	20	10	40
4	LGR	21	23	483	1.1	--	0.6	2	5	2	30
5	RUN	66	21	1386	3.3	1.1	1.6	4	15	8	35
6	HGR	87	21	1827	2.2	--	1.2	4	10	--	25
7	RUN	28	19	532	2.7	0.6	1.4	3	10	--	15
8	HGR	31	23	713	2.5	--	1.6	4	5	--	15

APPENDIX A-4j
TRANSECT STUDY
VALIDATED ANALYTICAL RESULTS

Appendix A-4j
Aquatic Biota - Transect Study
North Bank - Sept. 21-22, 2004
Validated Analytical Results

INSECTA TRANSECTS	1	2	3	4	5	6	7	8	9	10
EPHEMEROPTERA	**112**	**242**	**251**	**282**	**1338**	**923**	**1266**	**608**	**564**	**416**
Baetis bicaudatus	47	14	45	39	216	323	238	118	143	70
Baetis tricaudatus	52	210	192	225	1117	561	990	421	366	232
Drunella doddsi	0	0	0	0	0	0	0	0	0	0
Drunella grandis	5	16	7	7	2	14	29	67	42	91
Ephemerella dorothea	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia sp.	0	0	0	0	0	0	0	0	0	0
Rhithrogena hageni	8	2	7	11	3	25	9	2	13	23
PLECOPTERA	**11**	**31**	**7**	**1**	**6**	**36**	**8**	**5**	**11**	**30**
Capniidae	0	0	0	0	0	0	0	0	0	0
Isoperla sp.	0	0	0	0	0	0	0	0	0	0
Leuctridae	0	0	0	0	0	0	0	0	0	0
Megarcys signata	0	0	0	0	0	0	0	0	0	0
Pteronarcella badia	11	30	7	1	6	33	8	5	11	30
Sweltsa sp.	0	0	0	0	0	3	0	0	0	0
Zapada cinctipes	0	1	0	0	0	0	0	0	0	0
TRICHOPTERA	**114**	**57**	**86**	**50**	**9**	**72**	**37**	**225**	**116**	**176**
Arctopsyche grandis	13	13	7	4	0	17	2	4	5	7
Brachycentrus americanus	87	42	73	43	9	48	26	197	55	147
Glossosoma sp.	0	0	0	0	0	0	0	0	0	0
Hydropsyche sp.	14	1	6	3	0	4	7	22	33	16
Lepidostoma sp.	0	1	0	0	0	0	0	1	0	0
Oligophlebodes minutus	0	0	0	0	0	0	0	0	0	0
Rhyacophila coloradensis gr.	0	0	0	0	0	3	0	1	23	6
Rhyacophila sibirica gr.	0	0	0	0	0	0	0	0	0	0
Rhyacophila sp.	0	0	0	0	0	0	2	0	0	0
OTHER	**19**	**46**	**66**	**15**	**34**	**166**	**112**	**335**	**145**	**173**
TOTAL (#/1 min. kick)	256	376	410	348	1387	1197	1423	1173	836	795
TOTAL EPT TAXA	9	10	8	9	6	10	10	10	9	9
# EPHEMEROPTERA TAXA	4	4	4	4	4	4	4	4	4	4
% EPT (% of Total Density)	93	88	84	96	98	86	92	71	83	78
% EPHEMEROPTERA (% of Total Density)	44	64	61	81	96	77	89	52	67	52
% HEPTAGENIIDAE (% of Total Density)	3	<1	2	3	<1	2	1	<1	2	3

Appendix A-4j
Aquatic Biota - Transect Study
North Bank - Sept. 21-22, 2004
Validated Analytical Results

INSECTA TRANSECTS	11	12	13	14	15	16	17	18	19	20
EPHEMEROPTERA	**413**	**442**	**350**	**166**	**262**	**961**	**520**	**501**	**343**	**273**
Baetis bicaudatus	130	97	112	38	82	238	136	59	56	52
Baetis tricaudatus	248	287	193	100	173	640	344	400	251	212
Drunella doddsi	0	0	0	0	0	1	0	0	1	0
Drunella grandis	23	50	34	13	6	51	25	34	29	9
Ephemerella dorothea	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia sp.	0	0	0	0	0	0	0	0	0	0
Rhithrogena hageni	12	8	11	15	1	31	15	8	6	0
PLECOPTERA	**4**	**14**	**11**	**0**	**0**	**0**	**10**	**5**	**4**	**0**
Capniidae	0	0	10	0	0	0	0	0	0	0
Isoperla sp.	0	0	0	0	0	0	0	0	1	0
Leuctridae	0	0	0	0	0	0	0	0	0	0
Megarcys signata	0	0	0	0	0	0	0	0	1	0
Pteronarcella badia	1	12	0	0	0	0	8	3	1	0
Sweltsa sp.	3	2	1	0	0	0	2	2	1	0
Zapada cinctipes	0	0	0	0	0	0	0	0	0	0
TRICHOPTERA	**26**	**209**	**21**	**13**	**19**	**67**	**208**	**47**	**60**	**32**
Arctopsyche grandis	0	1	0	3	0	4	4	1	4	1
Brachycentrus americanus	23	206	17	8	15	49	188	43	32	28
Glossosoma sp.	0	0	0	0	0	1	0	0	0	0
Hydropsyche sp.	2	1	4	2	4	7	14	3	15	2
Lepidostoma sp.	1	1	0	0	0	0	1	0	0	0
Oligophlebodes minutus	0	0	0	0	0	0	0	0	0	0
Rhyacophila coloradensis gr.	0	0	0	0	0	5	1	0	9	0
Rhyacophila sibirica gr.	0	0	0	0	0	0	0	0	0	0
Rhyacophila sp.	0	0	0	0	0	1	0	0	0	1
OTHER	**63**	**174**	**208**	**244**	**60**	**394**	**203**	**145**	**91**	**39**
TOTAL (#/1 min. kick)	506	839	590	423	341	1422	941	698	498	344
TOTAL EPT TAXA	9	10	8	7	6	11	11	9	13	7
# EPHEMEROPTERA TAXA	4	4	4	4	4	5	4	4	5	3
% EPT (% of Total Density)	88	79	65	42	82	72	78	79	82	89
% EPHEMEROPTERA (% of Total Density)	82	53	59	39	77	68	55	72	69	79
% HEPTAGENIIDAE (% of Total Density)	2	1	2	4	<1	2	2	1	1	0

Appendix A-4j
Aquatic Biota - Transect Study
Center Bank - Sept. 21-22, 2004
Validated Analytical Results

INSECTA TRANSECT	1	2	3	4	5	6	7	8	9	10
EPHEMEROPTERA	**108**	**209**	**357**	**275**	**979**	**633**	**622**	**548**	**649**	**546**
Baetis bicaudatus	16	13	69	28	102	77	160	48	167	123
Baetis tricaudatus	83	179	272	235	851	529	406	461	417	322
Drunella doddsi	1	0	0	0	0	0	0	0	0	0
Drunella grandis	1	3	10	1	4	11	30	9	50	88
Ephemerella dorothea	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia sp.	0	0	0	0	0	0	0	0	0	0
Rhithrogena hageni	7	14	6	11	22	16	26	30	15	13
PLECOPTERA	**3**	**5**	**7**	**8**	**1**	**3**	**12**	**1**	**5**	**13**
Capniidae	0	0	0	0	0	0	0	0	0	0
Isoperla sp.	0	0	0	0	0	0	0	0	0	0
Leuctridae	0	0	0	0	0	0	0	0	0	0
Megarcys signata	0	0	0	0	0	0	0	0	0	0
Pteronarcella badia	3	5	7	8	1	3	12	1	4	13
Sweltsa sp.	0	0	0	0	0	0	0	0	1	0
Zapada cinctipes	0	0	0	0	0	0	0	0	0	0
TRICHOPTERA	**34**	**28**	**87**	**30**	**17**	**37**	**100**	**41**	**160**	**167**
Arctopsyche grandis	1	5	6	11	6	10	10	5	1	1
Brachycentrus americanus	33	18	71	18	10	26	62	25	143	155
Glossosoma sp.	0	0	0	0	0	0	0	0	0	0
Hydropsyche sp.	0	5	9	1	1	0	25	11	11	9
Lepidostoma sp.	0	0	0	0	0	0	0	0	0	0
Oligophlebodes minutus	0	0	0	0	0	0	0	0	0	0
Rhyacophila coloradensis gr.	0	0	0	0	0	1	3	0	5	0
Rhyacophila sibirica gr.	0	0	1	0	0	0	0	0	0	0
Rhyacophila sp.	0	0	0	0	0	0	0	0	0	2
OTHER	**13**	**5**	**41**	**29**	**14**	**35**	**286**	**134**	**169**	**203**
TOTAL (#/1 min. kick)	158	247	492	342	1011	708	1020	724	983	929
TOTAL EPT TAXA	23	23	23	23	23	23	23	23	23	23
#EPHEMEROPTERA TAXA	5	4	4	4	4	4	4	4	4	4
% EPT (% of Total Density)	92%	98%	92%	92%	99%	95%	72%	81%	83%	78%
% EPHEMEROPTERA (% of Total Density	68%	85%	73%	80%	97%	89%	61%	76%	66%	59%
% HEPTAGENIIDAE (% of Total Density)	4%	6%	1%	3%	2%	2%	3%	4%	2%	1%

Appendix A-4j
Aquatic Biota - Transect Study
Center Bank - Sept. 21-22, 2004
Validated Analytical Results

INSECTA TRANSECT	11	12	13	14	15	16	17	18	19	20
EPHEMEROPTERA	**172**	**309**	**240**	**709**	**143**	**356**	**171**	**246**	**62**	**208**
Baetis bicaudatus	67	48	59	241	38	59	52	72	6	27
Baetis tricaudatus	82	201	90	415	81	273	89	133	44	168
Drunella doddsi	0	0	0	0	0	0	1	7	1	0
Drunella grandis	9	35	19	49	10	16	10	13	4	7
Ephemerella dorothea	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia sp.	0	0	0	0	0	0	0	0	0	0
Rhithrogena hageni	14	25	72	4	14	8	19	21	7	6
PLECOPTERA	**2**	**0**	**2**	**3**	**0**	**0**	**5**	**1**	**0**	**4**
Capniidae	0	0	1	0	0	0	0	0	0	0
Isoperla sp.	0	0	0	0	0	0	0	0	0	0
Leuctridae	0	0	0	0	0	0	0	0	0	0
Megarcys signata	0	0	0	0	0	0	0	0	0	0
Pteronarcella badia	2	0	0	2	0	0	0	0	0	2
Sweltsa sp.	0	0	1	1	0	0	5	1	0	2
Zapada cinctipes	0	0	0	0	0	0	0	0	0	0
TRICHOPTERA	**7**	**115**	**9**	**424**	**71**	**43**	**12**	**63**	**46**	**113**
Arctopsyche grandis	1	1	0	0	0	2	0	0	1	4
Brachycentrus americanus	5	111	4	402	66	38	7	47	43	104
Glossosoma sp.	0	0	0	0	0	0	0	0	0	0
Hydropsyche sp.	0	2	5	20	4	2	5	14	1	5
Lepidostoma sp.	0	1	0	2	0	0	0	0	0	0
Oligophlebodes minutus	0	0	0	0	0	0	0	0	0	0
Rhyacophila coloradensis gr.	0	0	0	0	1	1	0	0	0	0
Rhyacophila sibirica gr.	0	0	0	0	0	0	0	0	0	0
Rhyacophila sp.	1	0	0	0	0	0	0	2	1	0
OTHER	**37**	**230**	**110**	**402**	**84**	**104**	**100**	**135**	**29**	**41**
TOTAL (#/1 min. kick)	218	654	361	1538	298	503	288	445	137	366
TOTAL EPT TAXA	23	23	23	23	23	23	23	23	23	23
#EPHEMEROPTERA TAXA	4	4	4	4	4	4	5	5	5	4
% EPT (% of Total Density)	83%	65%	70%	74%	72%	79%	65%	70%	79%	89%
% EPHEMEROPTERA (% of Total Density	79%	47%	66%	46%	48%	71%	59%	55%	45%	57%
% HEPTAGENIIDAE (% of Total Density)	6%	4%	20%	0%	5%	2%	7%	5%	5%	2%

Appendix A-4j
Aquatic Biota - Transect Study
South Bank - Sept. 21-22, 2004
Validated Analytical Results

INSECTA TRANSECT	1	2	3	4	5	6	7	8	9	10
EPHEMEROPTERA	**64**	**237**	**433**	**218**	**1274**	**926**	**353**	**466**	**731**	**512**
Baetis bicaudatus	13	49	66	29	170	165	57	96	237	145
Baetis tricaudatus	49	178	351	179	1088	733	269	340	404	259
Drunella doddsi	0	0	0	0	0	0	0	0	0	0
Drunella grandis	2	5	15		8	13	14	18	62	92
Ephemerella dorothea	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia sp.	0	0	0	0	0	0	0	0	0	0
Rhithrogena hageni	0	5	1	10	8	15	13	12	28	16
PLECOPTERA	**6**	**10**	**21**	**7**	**3**	**14**	**11**	**5**	**5**	**15**
Capniidae	0	0	0	0	1	0	0	0	1	0
Isoperla sp.	0	0	0	0	0	0	0	0	0	0
Leuctridae	0	0	0	0	0	0	0	0	0	0
Megarcys signata	0	0	0	0	0	0	0	0	0	0
Pteronarcella badia	6	10	21	6	2	14	10	5	4	15
Sweltsa sp.	0	0	0	0	0	0	1	0	0	0
Zapada cinctipes	0	0	0	1	0	0	0	0	0	0
TRICHOPTERA	**74**	**48**	**64**	**37**	**31**	**69**	**60**	**73**	**232**	**188**
Arctopsyche grandis	0	8	4	9	4	7	4	5	2	0
Brachycentrus americanus	69	28	55	24	27	60	49	59	181	170
Glossosoma sp.	0	0	0	0	0	0	0	0	0	0
Hydropsyche sp.	5	11	5	4	0	2	5	8	37	16
Lepidostoma sp.	0	0	0	0	0	0	1	0	0	0
Oligophlebodes minutus	0	0	0	0	0	0	0	0	0	0
Rhyacophila coloradensis gr.	0	0	0	0	0	0	1	1	12	0
Rhyacophila sibirica gr.	0	0	0	0	0	0	0	0	0	0
Rhyacophila sp.	0	1	0	0	0	0	0	0	0	2
OTHER	**144**	**37**	**41**	**18**	**94**	**120**	**100**	**84**	**121**	**200**
TOTAL (#/1 min. kick)	288	332	559	280	1402	1129	524	628	1089	915
TOTAL EPT TAXA	23	23	23	22	23	23	23	23	23	23
# EPHEMEROPTERA TAXA	3	4	4	3	4	4	4	4	4	4
% EPT (% of Total Density)	0	1	1	1	1	1	1	1	1	1
% EPHEMEROPTERA (% of Total Density)	0	1	1	1	1	1	1	1	1	1
% HEPTAGENIIDAE (% of Total Density)	0	0	0	0	0	0	0	0	0	0

Appendix A-4j
Aquatic Biota - Transect Study
South Bank - Sept. 21-22, 2004
Validated Analytical Results

INSECTA TRANSECT	11	12	13	14	15	16	17	18	19	20
EPHEMEROPTERA	**335**	**393**	**1138**	**934**	**661**	**608**	**400**	**752**	**584**	**307**
Baetis bicaudatus	80	74	356	243	249	143	130	155	144	42
Baetis tricaudatus	198	268	466	533	347	377	241	540	390	245
Drunella doddsi	0	0	0	0	0	0	1	1	0	0
Drunella grandis	49	37	205	147	58	86	14	47	31	16
Ephemerella dorothea	0	0	1	1	0	2	0	1	1	0
Paraleptophlebia sp.	0	0	0	0	0	0	0	0	1	0
Rhithrogena hageni	8	14	110	10	7	0	14	8	17	4
PLECOPTERA	**7**	**2**	**4**	**2**	**3**	**0**	**3**	**11**	**10**	**1**
Capniidae	0	0	2	0	0	0	0	0	0	0
Isoperla sp.	0	0	0	0	0	0	0	0	0	0
Leuctridae	0	0	0	0	0	0	0	0	0	0
Megarcys signata	0	0	0	0	0	0	0	0	0	0
Pteronarcella badia	7	2	0	2	1	0	0	1	2	0
Sweltsa sp.	0	0	2	0	2	0	3	10	8	1
Zapada cinctipes	0	0	0	0	0	0	0	0	0	0
TRICHOPTERA	**72**	**123**	**361**	**1088**	**81**	**1211**	**43**	**279**	**223**	**176**
Arctopsyche grandis	0	2	6	2	0	0	1	2	2	5
Brachycentrus americanus	71	118	325	1031	73	1189	38	263	198	151
Glossosoma sp.	0	0	0	0	0	0	0	0	0	0
Hydropsyche sp.	1	2	25	50	6	18	3	12	22	18
Lepidostoma sp.	0	0	4	1	1	0	0	0	0	0
Oligophlebodes minutus	0	0	1	0	0	0	0	0	0	0
Rhyacophila coloradensis gr.	0	1	0	0	0	4	0	0	0	0
Rhyacophila sibirica gr.	0	0	0	0	0	0	0	0	0	0
Rhyacophila sp.	0	0	0	4	1	0	1	2	1	2
OTHER	**71**	**207**	**1141**	**958**	**131**	**396**	**116**	**109**	**123**	**223**
TOTAL (#/1 min. kick)	485	725	2644	2982	876	2215	562	1151	940	707
TOTAL EPT TAXA	23	23	23	23	23	23	23	23	23	23
# EPHEMEROPTERA TAXA	4	4	5	5	4	4	5	6	6	4
% EPT (% of Total Density)	1	1	1	1	1	1	1	1	1	1
% EPHEMEROPTERA (% of Total Density)	1	1	0	0	1	0	1	1	1	0
% HEPTAGENIIDAE (% of Total Density)	0	0	0	0	0	0	0	0	0	0

APPENDIX A-4k
HABITAT EVALUATION
VALIDATED ANALYTICAL RESULTS

Appendix A-4k
Aquatic Beota - RI Addendum
Transect Study - Sept. 21-22, 2004
Validated Analytical Results

Transect #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PARAMETER																				
1. Epifaunal Substrate / Available Cover	17	16	15	16	17	16	17	18	17	15	12	15	17	15	16	14	11	9	10	10
2 Embeddedness	9	7	6	7	7	10	11	12	12	12	11	12	10	12	10	10	8	7	6	8
3. Velocity/Depth Regime	14	16	17	14	10	10	11	11	18	17	12	15	11	17	14	14	11	19	15	12
4. Sediment Deposition	15	13	16	16	14	17	18	17	16	14	11	12	5	10	8	9	9	7	8	14
7. Frequency of Riffles (or Bends)	20	20	20	20	20	20	20	20	20	20	20	20	15	20	20	20	20	20	20	17
8a. Bank Stability (Left)	4	3	9	9	5	5	6	9	7	6	3	6	2	5	2	4	6	4	5	9
8b. Bank Stability (Right)	6	6	8	8	8	4	6	9	6	6	4	7	2	5	2	3	4	2	8	8
SUBSTRATE (% COMPOSITION)																				
Bedrock	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boulder	25	18	5	7	4	9	13	15	25	20	45	3	0	3	5	7	15	5	7	15
Cobble	40	40	40	35	50	60	60	40	30	40	20	35	18	60	50	50	35	25	40	25
Gravel	15	25	25	40	30	25	20	35	27	25	15	35	60	20	15	10	10	15	10	20
Sand	10	13	28	15	15	5	5	8	15	13	20	20	20	15	30	30	38	53	40	37
Silt	5	2	2	2	1	1	2	1	2	2	0	7	2	2	0	2	2	1	2	2
Clay	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	1	1

APPENDIX A-4I
RI ADDENDUM SERIAL DILUTION STUDY

Molycorp RI/FS
RI Addendum - Bioassay Tests - Serial Dilution Study
23 October - 30 October 2004

TABLE 1
SUMMARY RESULTS OF *ONCORHYNCHUS MYKISS* CHRONIC TOXICITY TEST OF SPRING 13 PUMP AND UPSTREAM RED RIVER WATER

TEST: 7 day chronic with *Oncorhynchus mykiss* **OPERATORS: CU, AW**

Start:9/23/0411:50
End: 9/30/0411:00
Test Substance: Spring 13 Pump
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % spring water		0	2.5	5.0	10.0	20.0	50.0	100.0
# alive/exposed		20/20	15/15*	20/20	0/20	0/20	0/20	0/20
% Survival		100	100	100	0	0	0	0
Biomass (Mean wt./# Exposed)		13.213 ± 0.817	13.882 ± 0.858	12.267 ± 1.168	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.000
Dissolved O_2 (mg/L)	max.	7.7	7.1	8.3	10.1	7.1	7.1	7.0
	min.	4.7	5.1	5.0	6.9	7.1	7.1	7.0
pH	max.	7.70	7.55	7.44	6.85	4.68	4.25	3.62
	min.	7.24	7.28	7.17	6.31	4.68	4.25	3.62
Conductivity (µmho/cm)	max.	354	366	400	447	609	1060	1801
	min.	285	331	368	439	609	1060	1801
Temp. (°C)	max.	15.5	15.5	15.5	15.0	15.0	15.0	15.0
	min.	14.5	14.5	14.5	15.0	15.0	15.0	15.0

***One test replicate excluded from analysis - contained 1 extra fish from a different test concentration.**

Statistical Analysis:

Survival:
- IC_{50} = 7.5% spring water (95% C.I. 7.5 to 7.5)

Growth:
- NOEC (T-Test with Bonferroni Adjustment) = 5% spring water
- LOEC = 10% spring water
- IC_{25} = 5.9% spring water (95% C.I. 5.0 to 6.5)

TABLE 2
SUMMARY RESULTS OF *ONCORHYNCHUS MYKISS* CHRONIC TOXICITY TEST OF SPRING 13 PUMP AND RECONSTITUTED LABORATORY WATER

TEST: 7 day chronic with *Oncorhynchus mykiss* **OPERATORS: CU, AW**

Start:9/23/0413:40
End: 9/30/0412:40
Test Substance: Spring 13 Pump
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % spring water		0	2.5	5.0	10.0	20.0	50.0	100.0
# alive/exposed		20/20	20/20	15/15*	0/20	0/20	0/20	0/20
% Survival		100	100	100	0	0	0	0
Biomass (Mean wt./# Exposed)		12.986 ± 0.449	12.747 ± 0.740	11.799 ± 1.698	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.000
Dissolved O_2 (mg/L)	max.	8.2	7.7	8.5	9.5	7.2	7.2	7.0
	min.	4.9	4.9	5.2	6.5	7.2	7.2	7.0
pH	max.	7.57	7.46	7.33	6.40	4.68	4.31	3.62
	min.	7.38	7.32	7.18	6.15	4.68	4.31	3.62
Conductivity (µmho/cm)	max.	305	347	390	454	622	1069	1801
	min.	284	333	375	448	622	1069	1801
Temp. (°C)	max.	15.5	15.5	15.5	15.5	15.0	15.0	15.0
	min.	14.5	14.5	14.5	14.5	15.0	15.0	15.0

***One test replicate excluded from analysis - contained 1 extra fish from a different test concentration.**

Statistical Analysis:

Survival:
- IC_{50} = 7.5% spring water (95% C.I. 7.5 to 7.5)

Growth:
- NOEC (T-Test with Bonferroni Adjustment) = 5% spring water
- LOEC = 10% spring water
- IC_{25} = 5.9% spring water (95% C.I. 4.7 to 6.5)

TABLE 3
SUMMARY RESULTS OF *ONCORHYNCHUS MYKISS* CHRONIC TOXICITY TEST OF SPRING 39 PUMP AND UPSTREAM RED RIVER WATER

TEST: 7 day chronic with *Oncorhynchus mykiss* **OPERATORS: PA, AW, BE**

Start:9/23/0411:50
End: 9/30/0410:50
Test Substance: Spring 39 Pump
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % spring water		0	2.5	5.0	10.0	20.0	50.0	100.0
# alive/exposed		19/20	19/19*	19/19*	19/20	14/20	0/20	0/20
% Survival		95	100	100	95	70	0	0
Biomass (Mean wt./# Exposed)		12.943 ± 1.973	13.065 ± 0.620	13.843 ± 0.987	11.961 ± 1.473	10.923 ± 2.683	0.000 ± 0.000	0.000 ± 0.000
Dissolved O_2 (mg/L)	max.	8.3	7.3	6.9	7.3	7.7	6.9	7.0
	min.	4.9	4.7	4.8	4.9	5.0	6.9	7.0
pH	max.	7.74	7.72	7.67	7.59	7.44	5.55	4.58
	min.	7.39	7.37	7.37	7.30	7.16	5.55	4.58
Conductivity (µmho/cm)	max.	334	332	368	435	568	873	1434
	min.	258	297	339	407	521	873	1434
Temp. (°C)	max.	15.5	15.5	15.5	15.5	15.5	15.5	15.5
	min.	15.0	15.0	15.0	15.0	15.0	15.5	15.5

***One fish jumped from test chamber**

Statistical Analysis:

Survival:
- IC_{50} = 28.9% spring water (95% C.I. 15.2 to 36.4)

Growth:
- NOEC (Dunnett's Test) = 20% spring water
- LOEC = 50% spring water
- IC_{25} = 22.6% spring water (95% C.I. 11.0 to 29.3)

TABLE 4
SUMMARY RESULTS OF *ONCORHYNCHUS MYKISS* CHRONIC TOXICITY TEST OF SPRING 39 PUMP AND RECONSTITUTED LABORATORY WATER

TEST: 7 day chronic with *Oncorhynchus mykiss* **OPERATORS: PA, AW, BE**

Start:9/23/0413:40
End: 9/30/0413:05
Test Substance: Spring 39 Pump
Client/Project: Chadwick Ecological Consultants, Inc

Test results:

Treatment % spring water		0	2.5	5.0	10.0	20.0	50.0	100.0
# alive/exposed		17/17*	20/20	20/20	19/20	17/20	0/20	0/20
% Survival		100	100	100	95	85	0	0
Biomass (Mean wt./# Exposed)		13.864 ± 0.501	14.279 ± 0.554	14.423 ± 0.341	13.212 ± 0.749	11.428 ± 2.226	0.000 ± 0.000	0.000 ± 0.000
Dissolved O_2 (mg/L)	max.	7.3	7.3	7.4	7.5	7.4	6.5	7.0
	min.	5.2	5.0	5.0	5.2	5.1	6.5	7.0
pH	max.	7.55	7.51	7.47	7.42	7.23	5.45	4.58
	min.	7.30	7.39	7.35	7.29	7.10	5.45	4.58
Conductivity (µmho/cm)	max.	308	350	384	449	576	888	1434
	min.	283	334	374	440	558	888	1434
Temp. (°C)	max.	15.5	15.5	15.5	15.5	15.5	15.5	15.5
	min.	15.0	15.0	15.0	15.0	15.0	15.5	15.5

***Three fish jumped from test chamber**

Statistical Analysis:

Survival:
- IC_{50} = 32.4% spring water (95% C.I. 26.3 to 36.0)

Growth:
- NOEC (Dunnett's Test) = 10% spring water
- LOEC = 20% spring water
- IC_{25} = 22.1% spring water (95% C.I. 13.8 to 27.9)

TABLE 5
WATER CHEMISTRY RESULTS FROM SPRING 13 PUMP
and RED RIVER UPSTREAM OF PUMP 13

Measurement	100% Spring water collected 9/22/04	100% Spring water collected 9/24/04	100% Spring water collected 9/27/04	100% Red River water collected 9/22/04	100% Red River water collected 9/24/04	100% Red River water collected 9/27/04
Analysis Temperature °C	15.0	15.0	15.0	15.0	15.0	15.0
Total Hardness (mg $CaCO_3$/L)	1000	1000	1000	146	158	146
pH	3.53	3.57	3.59	7.83	7.82	7.86
Alkalinity (mg $CaCO_3$/L)	*	*	*	60	64	64
Conductivity (µmho/cm)	1790	1794	1819	283	303	310
Dissolved Oxygen (mg O_2/L)	5.5	6.9	4.8	8.7	11.3	8.5
Ammonia (mg NH_3/L)	0.05	0.03	0.04	0.04	0.03	0.03
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.03	<0.02	0.01	0.02	<0.02	<0.01

*Unable to determine due to low pH

TABLE 6
WATER CHEMISTRY RESULTS FROM SPRING 39 PUMP and RED RIVER UPSTREAM OF PUMP 39

Measurement	100% Spring water collected 9/22/04	100% Spring water collected 9/24/04	100% Spring water collected 9/27/04	100% Red River water collected 9/22/04	100% Red River water collected 9/24/04	100% Red River water collected 9/27/04
Analysis Temperature °C	15.0	15.0	15.0	15.0	15.0	15.0
Total Hardness (mg $CaCO_3$/L)	800	880	890	130	134	136
pH	4.65	4.61	4.60	7.89	7.74	7.60
Alkalinity (mg $CaCO_3$/L)	6	2	2	66	66	62
Conductivity (μmho/cm)	1368	1432	1422	263	256	297
Dissolved Oxygen (mg O_2/L)	5.0	8.7	5.2	8.3	11.5	8.1
Ammonia (mg NH_3/L)	0.04	0.03	0.02	0.03	0.03	0.03
Un-ionized Ammonia	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	0.02	0.02	0.02	0.02	<0.02	0.02

TABLE 7
WATER CHEMISTRY RESULTS FROM RECONSTITUTED WATER USED IN CHRONIC *ONCORHYNCHUS MYKISS* TESTS
Wet chemistry on control water:

Measurement	Recon Made 9/19/04	Recon Made 9/24/04
Analysis Temperature °C	25.0	25.0
Total Hardness (mg $CaCo_3$/L)	88	88
pH	8.05	7.99
Alkalinity (mg $CaCo_3$/L)	60	60
Conductivity (µmho/cm)	299	294
Dissolved Oxygen (mg O_2/L)	7.0	6.4

SUMMARY RESULTS OF $CuCl_2$ REFERENCE TEST ON RAINBOW TROUT:
Acute Test
Test date: September 24 to 28, 2004

µg Cu/L	control	7.5	15	30	60	120
# alive/# exp.	20/20	20/20	19/20	9/20	6/20	2/20
% survival	100	100	95	45	30	10

LC_{50} (Spearman-Karber) = 37.9 µg Cu/L (95% CI, 29.6 to 49.2)

Note: This is within our accepted performance range (13.5 to 59.3) determined by 6 previous reference tests performed.

APPENDIX B-4

AQUATIC BIOTA

OTHER VALIDATED ANALYTICAL RESULTS

APPENDIX B-4a
OTHER FISH POPULATIONS

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
4/2/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	205	70		0.81	89	78.6
BKT	2	82	4.1		0.74		
BKT	2	80	4.2		0.82		
BKT	3	92	5.9		0.76		
CUT	2	167	38		0.82		
CUT	3	177	50		0.90		
HYBRID	1	205	85		0.99		
HYBRID	1	173	45		0.87		
HYBRID	1	172	46		0.90		
HYBRID	1	171	42		0.84		
HYBRID	1	150	32		0.95		
HYBRID	1	141	25		0.89		
HYBRID	1	137	23		0.89		
HYBRID	1	117	15		0.94		
HYBRID	1	100	8		0.80		
HYBRID	1	70	2.7		0.79		
HYBRID	1	62	2.2		0.92		
HYBRID	2	174	72		1.37		
HYBRID	2	159	36		0.90		
HYBRID	2	119	15		0.89		
HYBRID	2	62	2.7		1.13		
HYBRID	3	173	51		0.98		
HYBRID	3	146	32		1.03		
HYBRID	3	109	13		1.00		
RBT	1	293	209		0.83	273	76.4
RBT	1	242	135		0.95	153	88.0
RBT	1	241	124		0.89	151	81.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
4/2/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	4	4	4	1
	MIN	80	4.1	0.74	78.6
	MAX	205	70	0.82	78.6
	MEAN	114.8	21.1	0.78	78.6

CUT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	N/A
	MIN	167	38	0.82	N/A
	MAX	177	50	0.90	N/A
	MEAN	172.0	44.0	0.86	N/A

HYBRID		LENGTH	WEIGHT	K	Wr
	N	18	18	18	N/A
	MIN	62	2.2	0.79	N/A
	MAX	205	85	1.37	N/A
	MEAN	135.6	30.4	0.95	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	3	3	3	3
	MIN	241	124	0.83	76.4
	MAX	293	209	0.95	88.0
	MEAN	258.7	156.0	0.89	82.1

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	1	2	1	4	± 4.7	0.036	111	± 130.6	5.16
CUT	0	1	1	2	± --	0.036	56	± --	5.43
HYBRID	11	4	3	19	± 4.2	0.036	528	± 116.7	35.39
RBT	3	0	0	3	± 0.0	0.036	83	± 0.0	28.55

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	1	2	1	4	± 4.7	0.024	167	± 195.8	7.77
CUT	0	1	1	2	± --	0.024	83	± --	8.05
HYBRID	11	4	3	19	± 4.2	0.024	792	± 175.0	53.08
RBT	3	0	0	3	± 0.0	0.024	125	± 0.0	42.99

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
4/2/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	254	132		0.81	177	74.6
BRN	1	127	17		0.83		
BRN	1	75	4		0.95		
BRN	1	63	2.6		1.04		
BRN	1	61	2.1		0.93		
BRN	1	58	1.7		0.87		
BRN	1	55	1.6		0.96		
BRN	1	54	1.2		0.76		
BRN	1	49	1.4		1.19		
BRN	1	43	0.6		0.75		
BRN	2	296	180		0.69	279	64.6
BRN	2	240	102		0.74	150	68.1
BRN	2	230	100		0.82	132	75.8
BRN	2	122	14		0.77		
BRN	2	66	2.1		0.73		
BRN	2	63	2.4		0.96		
BRN	2	56	1.7		0.97		
BRN	2	50	1.2		0.96		
BRN	3	69	3.2		0.97		
BRN	3	69	3.2		0.97		
BRN	3	52	1.3		0.92		
BRN	3	47	0.7		0.67		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
4/2/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	22	22	22	4
	MIN	43	0.6	0.67	64.6
	MAX	296	180	1.19	75.8
	MEAN	100.0	26.2	0.88	70.8

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	10	8	4	27	± 12.9	0.057	474	± 226.3	27.38

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	10	8	4	27	± 12.9	0.039	692	± 330.8	39.97

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
4/2/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	221	85		0.79	112	75.9
BKT	1	185	52		0.82	65	79.8
BKT	1	106	11		0.92		
BKT	1	93	6.7		0.83		
BKT	1	90	5.8		0.80		
BKT	1	88	6.2		0.91		
BKT	1	84	5.3		0.89		
BKT	1	81	4		0.75		
BKT	1	81	3.8		0.72		
BKT	1	79	4.5		0.91		
BKT	1	79	3.4		0.69		
BKT	1	73	3.7		0.95		
BRN	1	279	193		0.89	234	82.5
HYBRID	1	274	203		0.99		
HYBRID	1	260	178		1.01		
HYBRID	1	253	162		1.00		
HYBRID	1	224	105		0.93		
HYBRID	1	214	84		0.86		
HYBRID	1	210	78		0.84		
HYBRID	1	207	81		0.91		
HYBRID	1	175	51		0.95		
HYBRID	1	159	35		0.87		
HYBRID	1	103	8.5		0.78		
HYBRID	1	99	9.1		0.94		
HYBRID	1	96	9		1.02		
HYBRID	1	96	7.5		0.85		
HYBRID	1	88	6.1		0.90		
HYBRID	1	83	6.5		1.14		
HYBRID	1	83	5.6		0.98		
HYBRID	1	81	5.4		1.02		
HYBRID	1	81	5.1		0.96		
HYBRID	1	75	4		0.95		
HYBRID	1	72	4.1		1.10		
RBT	1	331	385		1.06	395	97.4
RBT	1	247	137		0.91	163	84.0
RBT	1	241	167		1.19	151	110.3
RBT	1	218	116		1.12	112	103.7
RBT	1	208	92		1.02	97	94.8
BKT	2	145	25		0.82	31	80.5
BKT	2	91	6.8		0.90		
BKT	2	87	6.6		1.00		
BKT	2	86	4.7		0.74		
BKT	2	84	4.9		0.83		
BRN	2	59	2.4		1.17		
BRN	2	48	1		0.90		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
4/2/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
HYBRID	2	92	7.8		1.00		
HYBRID	2	91	8.6		1.14		
HYBRID	2	90	7.6		1.04		
HYBRID	2	89	6.9		0.98		
HYBRID	2	86	5.3		0.83		
HYBRID	2	84	5.2		0.88		
HYBRID	2	81	5.3		1.00		
HYBRID	2	80	4.1		0.80		
HYBRID	2	67	3.1		1.03		
HYBRID	2	64	3.1		1.18		
BKT	3	241	123		0.88		
BKT	3	85	6.1		0.99		
BRN	3	65	2.3		0.84		
BRN	3	62	2.5		1.05		
HYBRID	3	103	10		0.92		
HYBRID	3	89	7		0.99		
HYBRID	3	84	5.9		1.00		
HYBRID	3	78	4.9		1.03		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
4/2/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	19	19	19	3
	MIN	73	3.4	0.69	75.9
	MAX	241	123	1.00	80.5
	MEAN	109.4	19.4	0.85	78.8

BRN		LENGTH	WEIGHT	K	Wr
	N	5	5	5	1
	MIN	48	1	0.84	82.5
	MAX	279	193	1.17	82.5
	MEAN	102.6	40.2	0.97	82.5

HYBRID		LENGTH	WEIGHT	K	Wr
	N	34	34	34	N/A
	MIN	64	3.1	0.78	N/A
	MAX	274	203	1.18	N/A
	MEAN	120.9	33.3	0.96	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	5	5	5	5
	MIN	208	92	0.91	84.0
	MAX	331	385	1.19	110.3
	MEAN	249.0	179.4	1.06	98.0

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	12	5	2	19	± 2.3	0.138	138	± 16.7	5.90
BRN	1	2	2	13	± 81.8	0.138	94	± 592.8	8.33
HYBRID	20	10	4	36	± 5.4	0.138	261	± 39.1	19.16
RBT	5	0	0	5	± 0.0	0.138	36	± 0.0	14.24

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	12	5	2	19	± 2.3	0.065	292	± 35.4	12.49
BRN	1	2	2	13	± 81.8	0.065	200	± 1258.5	17.72
HYBRID	20	10	4	36	± 5.4	0.065	554	± 83.1	40.67
RBT	5	0	0	5	± 0.0	0.065	77	± 0.0	30.45

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
4/3/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	145	25		0.82	31	80.5
BKT	1	92	5.5		0.71		
BRN	1	217	88		0.86	111	79.2
BRN	1	157	34		0.88	43	79.8
BRN	1	149	32		0.97	36	87.7
BRN	1	141	24		0.86	31	77.5
BRN	1	137	23		0.89		
BRN	1	93	3.3		0.41		
BRN	1	92	6.6		0.85		
BRN	1	85	5.8		0.94		
BRN	1	80	4.6		0.90		
BRN	1	79	4.6		0.93		
BRN	1	74	3.8		0.94		
BRN	1	68	3.2		1.02		
BRN	1	48	0.6		0.54		
BRN	2	165	43		0.96	49	87.2
BRN	2	83	4.8		0.84		
BRN	2	82	4.5		0.82		
BRN	2	81	4.3		0.81		
BRN	2	80	4.4		0.86		
BRN	3	84	4.8		0.81		
BRN	3	83	4.2		0.73		
BRN	3	76	3.8		0.87		
BRN	3	76	3.5		0.80		
BRN	3	74	3.3		0.81		
HYBRID	1	111	13		0.95		
HYBRID	1	107	12		0.98		
HYBRID	1	105	11		0.95		
HYBRID	1	78	4.2		0.89		
HYBRID	2	247	159		1.06		
HYBRID	2	225	109		0.96		
HYBRID	2	210	84		0.91		
HYBRID	2	104	9.5		0.84		
HYBRID	3	91	6.3		0.84		
HYBRID	3	79	3.6		0.73		
RBT	1	268	170		0.88	209	81.4
RBT	1	235	122		0.94	140	86.9
RBT	1	229	164		1.37	130	126.4
RBT	1	218	88		0.85	112	78.7
RBT	1	217	96		0.94	110	87.1
RBT	1	208	90		1.00	97	92.8
RBT	2	209	78		0.85	98	79.2
RBT	3	204	69		0.81	91	75.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
4/3/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	1
	MIN	92	5.5	0.71	80.5
	MAX	145	25	0.82	80.5
	MEAN	118.5	15.3	0.76	80.5

BRN		LENGTH	WEIGHT	K	Wr
	N	23	23	23	5
	MIN	48	0.6	0.41	77.5
	MAX	217	88	1.02	87.7
	MEAN	100.2	13.7	0.84	82.3

HYBRID		LENGTH	WEIGHT	K	Wr
	N	10	10	10	N/A
	MIN	78	3.6	0.73	N/A
	MAX	247	159	1.06	N/A
	MEAN	135.7	41.2	0.91	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	8	8	8	8
	MIN	204	69	0.81	75.4
	MAX	268	170	1.37	126.4
	MEAN	223.5	109.6	0.96	88.5

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	2	0	0	2	± 0	0.134	15	± 0.0	0.51
BRN	13	5	5	26	± 8.2	0.134	194	± 61.2	5.86
HYBRID	4	4	2	12	± 11.2	0.134	90	± 83.6	8.17
RBT	6	1	1	8	± 1.2	0.134	60	± 9.0	14.50

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	2	0	0	2	± 0	0.060	33	± 0.0	1.11
BRN	13	5	5	26	± 8.2	0.060	433	± 136.7	13.08
HYBRID	4	4	2	12	± 11.2	0.060	200	± 186.7	18.17
RBT	6	1	1	8	± 1.2	0.060	133	± 20.0	32.14

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
4/1/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	269	174		0.89	210	82.9
BRN	1	178	60		1.06	62	97.1
BRN	1	165	43		0.96	49	87.2
BRN	1	160	44		1.07	45	97.7
BRN	1	159	43		1.07	44	97.3
BRN	1	152	38		1.08	39	98.2
BRN	1	150	34		1.01	37	91.4
BRN	1	101	12		1.16		
BRN	1	95	8.2		0.96		
BRN	1	92	8.5		1.09		
BRN	1	90	8.5		1.17		
BRN	1	86	7.5		1.18		
BRN	1	83	6.7		1.17		
BRN	1	81	5.9		1.11		
BRN	1	77	4.7		1.03		
BRN	1	76	4.3		0.98		
BRN	2	247	131		0.87	163	80.4
BRN	2	240	168		1.22	150	112.2
BRN	2	182	61		1.01	66	92.5
BRN	2	137	26		1.01		
BRN	2	119	17		1.01		
BRN	2	93	9		1.12		
BRN	2	88	7.3		1.07		
BRN	2	83	6.4		1.12		
BRN	2	70	3.8		1.11		
BRN	3	95	9.3		1.08		
BRN	3	93	9.6		1.19		
BRN	3	80	5.9		1.15		
RBT	1	272	190		0.94	218	87.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
4/1/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	28	28	28	10
	MIN	70	3.8	0.87	80.4
	MAX	269	174	1.22	112.2
	MEAN	126.5	34.2	1.07	93.7

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	272	190	0.94	87.0
	MAX	272	190	0.94	87.0
	MEAN	272.0	190.0	0.94	87.0

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	16	9	3	30	± 5.4	0.136	221	± 39.7	16.66
RBT	1	0	0	1	± 0.0	0.136	7	± 0.0	2.93

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	16	9	3	30	± 5.4	0.053	566	± 101.9	42.67
RBT	1	0	0	1	± 0.0	0.053	19	± 0.0	7.96

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
4/1/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	174	48		0.91	58	83.1
BRN	1	235	119		0.92	141	84.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
4/1/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	2	2	2	2
	MIN	174	48	0.91	83.1
	MAX	235	119	0.92	84.6
	MEAN	204.5	83.5	0.91	83.9

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	2	0	0	2	± 0.0	0.156	13	± 0.0	2.39

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	2	0	0	2	± 0.0	0.060	33	± 0.0	6.07

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
4/1/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	300	280		1.04	290	96.6
BRN	1	254	160		0.98	177	90.4
BRN	1	90	7.8		1.07		
BRN	2	105	12		1.04		
BRN	2	79	5.2		1.05		
BRN	3	108	12		0.95		
RBT	1	254	164		1.00	178	92.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
4/1/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	6	6	6	2
	MIN	79	5.2	0.95	90.4
	MAX	300	280	1.07	96.6
	MEAN	156.0	79.5	1.02	93.5

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	254	164	1.00	92.4
	MAX	254	164	1.00	92.4
	MEAN	254.0	164.0	1.00	92.4

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	3	2	1	6	± 2.6	0.109	55	± 23.9	9.64
RBT	1	0	0	1	± 0.0	0.109	9	± 0.0	3.25

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	3	2	1	6	± 2.6	0.052	115	± 50.0	20.16
RBT	1	0	0	1	± 0.0	0.052	19	± 0.0	6.87

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
4/1/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	217	82		0.80	111	73.8
BRN	1	208	81		0.90	98	82.7
BRN	1	196	64		0.85	82	77.9
BRN	1	143	27		0.92	32	83.6
BRN	1	138	26		0.99		
BRN	1	75	3.9		0.92		
BRN	1	65	2.6		0.95		
BRN	2	158	36		0.91	43	83.0
BRN	2	118	15		0.91		
BRN	2	107	12		0.98		
BRN	2	74	4.8		1.18		
BRN	3	119	18		1.07		
BRN	3	63	2		0.80		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
4/1/1997

BRN		LENGTH	WEIGHT	K	Wr				
	N	13	13	13	5				
	MIN	63	2	0.80	73.8				
	MAX	217	82	1.18	83.6				
	MEAN	129.3	28.8	0.94	80.2				
	1st Pass	**2nd Pass**	**3rd Pass**	**Pop Est**	**95% CI**	**Site Area (Acres)**	**Density (#/acre)**	**95% CI**	**Biomass (lbs/acre)**
BRN	7	4	2	14	± 4.7	0.131	107	± 35.9	6.79
	1st Pass	**2nd Pass**	**3rd Pass**	**Pop Est**	**95% CI**	**Site Length (miles)**	**Density (#/mile)**	**95% CI**	**Biomass (lbs/mile)**
BRN	7	4	2	14	± 4.7	0.058	241	± 81.0	15.30

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
4/1/1997

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
4/1/1997

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
3/31/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	257	140		0.82	183	76.4
BRN	1	237	104		0.78	144	72.1
BRN	1	230	96		0.79	132	72.8
BRN	1	229	100		0.83	130	76.8
BRN	1	217	76		0.74	111	68.4
BRN	1	174	50		0.95	58	86.6
BRN	1	151	31		0.90	38	81.7
BRN	1	138	25		0.95		
BRN	1	132	18		0.78		
BRN	1	129	19		0.89		
BRN	1	128	18		0.86		
BRN	1	128	21		1.00		
BRN	1	126	20		1.00		
BRN	1	125	17		0.87		
BRN	1	125	19		0.97		
BRN	1	125	19		0.97		
BRN	1	124	20		1.05		
BRN	1	123	19		1.02		
BRN	1	121	19		1.07		
BRN	1	121	20		1.13		
BRN	1	119	19		1.13		
BRN	1	116	15		0.96		
BRN	1	113	14		0.97		
BRN	1	110	15		1.13		
BRN	1	106	13		1.09		
BRN	1	105	14		1.21		
BRN	1	105	14		1.21		
BRN	1	103	10		0.92		
BRN	1	100	9		0.90		
BRN	1	100	11		1.10		
BRN	1	94	8		0.96		
BRN	1	92	8.6		1.10		
BRN	1	85	5.8		0.94		
BRN	1	85	6.2		1.01		
BRN	1	75	4.8		1.14		
BRN	2	133	24		1.02		
BRN	2	123	17		0.91		
BRN	2	120	16		0.93		
BRN	2	113	14		0.97		
BRN	2	109	12		0.93		
BRN	2	98	9.7		1.03		
BRN	2	96	9.9		1.12		
BRN	2	94	8		0.96		
BRN	2	82	5.5		1.00		
BRN	3	154	35		0.96	40	87.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
3/31/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	3	126	20		1.00		
BRN	3	125	19		0.97		
BRN	3	122	17		0.94		
BRN	3	110	13		0.98		
BRN	3	88	6.8		1.00		
RBT	1	278	180		0.84	233	77.2
RBT	1	255	160		0.96	180	89.1
RBT	1	250	150		0.96	169	88.7
RBT	1	237	132		0.99	144	91.7
RBT	1	222	112		1.02	118	94.8
RBT	1	218	112		1.08	112	100.2
RBT	1	210	96		1.04	100	96.1
RBT	1	201	78		0.96	87	89.2
RBT	1	196	68		0.90		
RBT	1	190	74		1.08		
RBT	1	190	70		1.02		
RBT	1	184	66		1.06		
RBT	1	175	74		1.38		
RBT	2	195	77		1.04		
RBT	3	262	164		0.91	195	84.1
RBT	3	254	179		1.09	178	100.8
RBT	3	248	162		1.06	165	98.1
RBT	3	241	152		1.09	151	100.4
RBT	3	236	130		0.99	142	91.5
RBT	3	235	154		1.19	140	109.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
3/31/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	50	50	50	8
	MIN	75	4.8	0.74	68.4
	MAX	257	140	1.21	87.0
	MEAN	126.8	24.9	0.98	77.7

RBT		LENGTH	WEIGHT	K	Wr
	N	20	20	20	14
	MIN	175	66	0.84	77.2
	MAX	278	180	1.38	109.8
	MEAN	223.9	119.5	1.03	93.7

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	35	9	6	52	± 4.4	0.134	388	± 32.8	21.30
RBT	13	1	6	22	± 6.6	0.134	164	± 49.3	43.21

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	35	9	6	52	± 4.4	0.056	929	± 78.6	51.00
RBT	13	1	6	22	± 6.6	0.056	393	± 117.9	103.54

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/8/1997

SPECIES	PASS	LENGTH	WEIGHT	K		Ws	Wr
BKT	1	137	21	0.82		26.1	80.4
BKT	1	134	22	0.91		24.4	90.1
BKT	1	133	20	0.85		23.9	83.8
BKT	1	69	3.1	0.94			
BKT	1	43	0.7	0.88			
BKT	2	80	4.1	0.80			
BKT	3	138	27	1.03		26.7	101.1
BKT	3	74	3.9	0.96			
BKT	3	42	0.4	0.54			
BKT	4	38	0.4	0.73			
BRN	1	133	25	1.06			
BRN	1	73	3.4	0.87			
BRN	1	62	2.8	1.17			
BRN	1	57	1.8	0.97			
BRN	1	56	1.8	1.02			
BRN	1	51	1.5	1.13			
BRN	1	51	1.5	1.13			
BRN	1	50	1.2	0.96			
BRN	1	49	1	0.85			
BRN	1	34	0.8	2.04			
BRN	3	73	3.8	0.98			
BRN	3	71	3.7	1.03			
BRN	3	68	3.6	1.14			
BRN	4	57	1.8	0.97			
BRN	4	45	0.7	0.77			
CUT	1	184	58	0.93			
HYBRID	1	234	138	1.08			
HYBRID	1	201	86	1.06			
HYBRID	1	196	72	0.96			
HYBRID	1	191	64	0.92			
HYBRID	1	188	64	0.96			
HYBRID	1	184	60	0.96			
HYBRID	1	179	52	0.91			
HYBRID	1	177	56	1.01			
HYBRID	1	177	62	1.12			
HYBRID	1	165	46	1.02			
HYBRID	1	164	47	1.07			
HYBRID	1	161	40	0.96			
HYBRID	1	157	37	0.96			
HYBRID	1	156	41	1.08			
HYBRID	1	148	34	1.05			
HYBRID	1	148	39	1.20			
HYBRID	1	147	31	0.98			
HYBRID	1	145	32	1.05			
HYBRID	1	143	29	0.99			

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/8/1997

SPECIES	PASS	LENGTH	WEIGHT	K		Ws	Wr
HYBRID	1	143	30	1.03			
HYBRID	1	142	27	0.94			
HYBRID	1	142	29	1.01			
HYBRID	1	134	26	1.08			
HYBRID	1	133	26	1.11			
HYBRID	1	133	26	1.11			
HYBRID	1	130	24	1.09			
HYBRID	1	129	21	0.98			
HYBRID	1	129	23	1.07			
HYBRID	1	127	20	0.98			
HYBRID	1	125	22	1.13			
HYBRID	1	122	18	0.99			
HYBRID	1	122	19	1.05			
HYBRID	1	118	17	1.03			
HYBRID	1	105	13	1.12			
HYBRID	1	103	12	1.10			
HYBRID	1	65	2.7	0.98			
HYBRID	2	180	56	0.96			
HYBRID	2	175	58	1.08			
HYBRID	2	134	25	1.04			
HYBRID	2	127	21	1.03			
HYBRID	2	121	18	1.02			
HYBRID	2	118	15	0.91			
HYBRID	2	118	18	1.10			
HYBRID	2	116	17	1.09			
HYBRID	2	66	3.1	1.08			
HYBRID	2	64	2.6	0.99			
HYBRID	2	60	2	0.93			
HYBRID	2	55	1.8	1.08			
HYBRID	2	43	0.6	0.75			
HYBRID	3	162	44	1.03			
HYBRID	3	135	25	1.02			
HYBRID	3	122	19	1.05			
HYBRID	3	119	11	0.65			
HYBRID	3	118	18	1.10			
HYBRID	3	92	9.8	1.26			
HYBRID	4	154	38	1.04			
HYBRID	4	129	23	1.07			
RBT	1	315	290	0.93		351.4	82.5
RBT	1	279	240	1.11		241.3	99.5
RBT	1	274	250	1.22		228.1	109.6
RBT	1	265	242	1.30		205.7	117.7
RBT	1	259	204	1.17		191.6	106.5
RBT	1	259	208	1.20		191.6	108.6
RBT	1	246	184	1.24		163.3	112.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/8/1997

SPECIES	PASS	LENGTH	WEIGHT	K		Ws	Wr
RBT	1	241	156	1.11		153.3	101.8
RBT	1	239	150	1.10		149.4	100.4
RBT	1	233	124	0.98		138.1	89.8
RBT	1	233	150	1.19		138.1	108.6
RBT	1	229	142	1.18		130.8	108.5
RBT	1	225	124	1.09		123.9	100.1
RBT	1	178	56	0.99			
RBT	2	293	280	1.11		280.8	99.7
RBT	2	189	70	1.04			
RBT	3	203	100	1.20		90.1	111.0
RBT	3	162	45	1.06			

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/8/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	10	10	10	4
	MIN	38	0.4	0.54	80.4
	MAX	138	27	1.03	101.1
	MEAN	94.4	11.4	0.85	88.8

BRN		LENGTH	WEIGHT	K	Wr
	N	15	15	15	N/A
	MIN	34	0.7	0.77	N/A
	MAX	133	25	2.04	N/A
	MEAN	62.0	3.6	1.07	N/A

CUT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	N/A
	MIN	184	58	0.93	N/A
	MAX	184	58	0.93	N/A
	MEAN	184.0	58.0	0.93	N/A

HYBRID		LENGTH	WEIGHT	K	Wr
	N	57	57	57	N/A
	MIN	43	0.6	0.65	N/A
	MAX	234	138	1.26	N/A
	MEAN	136.3	31.8	1.02	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	18	18	18	15.0
	MIN	162	45	0.93	82.5
	MAX	315	290	1.30	117.7
	MEAN	240.1	167.5	1.12	103.8

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	5	1	3	1	10	± 2.8	0.049	204	± 57.1	5.13
BRN	10	0	3	2	15	± 2.3	0.049	306	± 46.9	2.43
CUT	1	0	0	0	1	± 0.0	0.049	20	± 0.0	2.56
HYBRID	36	13	6	2	58	± 2.7	0.049	1184	± 55.1	83.01
RBT	14	2	2	0	18	± 0.6	0.049	367	± 12.2	135.52

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/8/1997

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	5	1	3	1	10	± 2.8	0.032	313	± 87.5	7.87
BRN	10	0	3	2	15	± 2.3	0.032	469	± 71.9	3.72
CUT	1	0	0	0	1	± 0.0	0.032	31	± 0.0	3.96
HYBRID	36	13	6	2	58	± 2.7	0.032	1813	± 84.4	127.10
RBT	14	2	2	0	18	± 0.6	0.032	563	± 18.8	207.90

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/9/1997

SPECIES	PASS	LENGTH	WEIGHT	K		Ws	Wr
BRN	1	266	184	0.98		203.0	90.6
BRN	1	247	140	0.93		163.0	85.9
BRN	1	245	156	1.06		159.1	98.0
BRN	1	163	42	0.97		47.6	88.3
BRN	1	159	41	1.02		44.2	92.7
BRN	1	121	17	0.96			
BRN	1	116	13	0.83			
BRN	1	112	13	0.93			
BRN	1	108	12	0.95			
BRN	1	102	11	1.04			
BRN	1	90	7.2	0.99			
BRN	1	46	1	1.03			
BRN	1	43	0.8	1.01			
BRN	2	101	9.5	0.92			
BRN	2	98	10	1.06			
BRN	2	21	0.1	1.08			
BRN	3	117	15	0.94			
BRN	3	111	13	0.95			
BRN	3	48	1.1	0.99			
BRN	3	44	0.8	0.94			
CUT	1	179	58	1.01			
NO FISH	4	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/9/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	20	20	20	5
	MIN	21	0.1	0.83	85.9
	MAX	266	184	1.08	98.0
	MEAN	117.9	34.4	0.98	91.1

CUT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	N/A
	MIN	179	58	1.01	N/A
	MAX	179	58	1.01	N/A
	MEAN	179.0	58.0	1.01	N/A

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	13	3	4	0	20	± 1.4	0.071	282	± 19.7	21.39
CUT	1	0	0	0	1	± 0.0	0.071	14	± 0.0	1.79

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	13	3	4	0	20	± 1.4	0.044	455	± 31.8	34.51
CUT	1	0	0	0	1	± 0.0	0.044	23	± 0.0	2.94

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/9/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	143	29		0.99	29.8	97.4
BKT	1	129	21		0.98		
BKT	1	55	1.7		1.02		
BKT	2	141	25		0.89	28.5	87.7
BKT	2	139	25		0.93	27.3	91.6
BKT	2	134	22		0.91	24.4	90.1
BKT	2	121	15		0.85		
BKT	2	61	2.1		0.93		
BRN	1	120	17		0.98		
BRN	1	117	18		1.12		
BRN	1	111	14		1.02		
BRN	1	97	10		1.10		
BRN	1	61	2.3		1.01		
BRN	1	60	2.2		1.02		
BRN	1	46	1.2		1.23		
BRN	1	45	0.7		0.77		
BRN	2	133	22		0.94		
BRN	2	62	2		0.84		
CUT	1	197	84		1.10		
CUT	2	228	120		1.01		
HYBRID	1	334	390		1.05		
HYBRID	1	227	130		1.11		
HYBRID	1	175	57		1.06		
HYBRID	1	156	43		1.13		
HYBRID	1	145	31		1.02		
HYBRID	1	119	19		1.13		
HYBRID	2	176	56		1.03		
HYBRID	2	174	57		1.08		
HYBRID	2	159	39		0.97		
HYBRID	3	146	33		1.06		
RBT	1	396	750		1.21	713.9	105.1
RBT	1	352	510		1.17	495.7	102.9
RBT	1	279	218		1.00	241.3	90.4
RBT	2	330	420		1.17	405.8	103.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/9/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	8	8	8	4
	MIN	55	1.7	0.85	87.7
	MAX	143	29	1.02	97.4
	MEAN	115.4	17.6	0.94	91.7

BRN		LENGTH	WEIGHT	K	Wr
	N	10	10	10	N/A
	MIN	45	0.7	0.77	N/A
	MAX	133	22	1.23	N/A
	MEAN	85.2	8.9	1.00	N/A

CUT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	N/A
	MIN	197	84	1.01	N/A
	MAX	228	120	1.10	N/A
	MEAN	212.5	102.0	1.06	N/A

HYBRID		LENGTH	WEIGHT	K	Wr
	N	10	10	10	N/A
	MIN	119	19	0.97	N/A
	MAX	334	390	1.13	N/A
	MEAN	181.1	85.5	1.06	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	4	4	4	4
	MIN	279	218	1.00	90.4
	MAX	396	750	1.21	105.1
	MEAN	339.3	474.5	1.14	100.4

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	3	5	0	8	± 2.5	0.128	63	± 19.5	2.44
BRN	8	2	0	10	± 0.5	0.128	78	± 3.9	1.53
CUT	1	1	0	2	± 4.9	0.128	16	± 38.3	3.60
HYBRID	6	3	1	10	± 1.9	0.128	78	± 14.8	14.70
RBT	3	1	0	4	± 0.7	0.128	31	± 5.5	32.43

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	3	5	0	8	± 2.5	0.059	136	± 42.4	5.28
BRN	8	2	0	10	± 0.5	0.059	169	± 8.5	3.32
CUT	1	1	0	2	± 4.9	0.059	34	± 83.1	7.65
HYBRID	6	3	1	10	± 1.9	0.059	169	± 32.2	31.86
RBT	3	1	0	4	± 0.7	0.059	68	± 11.9	71.13

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/11/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	183	58		0.95	63.0	92.0
BRN	1	196	82		1.09	82.2	99.8
BRN	1	187	58		0.89	71.5	81.1
BRN	1	132	23		1.00		
BRN	1	130	24		1.09		
BRN	1	129	22		1.02		
BRN	1	124	22		1.15		
BRN	1	114	14		0.94		
BRN	2	118	19		1.16		
BRN	2	112	13		0.93		
BRN	3	171	56		1.12	54.8	102.1
HYBRID	1	179	52		0.91		
RBT	1	298	310		1.17	287.8	107.7
RBT	1	294	340		1.34	276.2	123.1
RBT	1	285	300		1.30	251.4	119.3
RBT	1	283	250		1.10	246.2	101.6
RBT	1	280	284		1.29	238.3	119.2
RBT	1	277	254		1.20	230.7	110.1
RBT	1	277	248		1.17	230.7	107.5
RBT	1	273	276		1.36	220.8	125.0
RBT	1	273	236		1.16	220.8	106.9
RBT	1	271	268		1.35	215.9	124.1
RBT	1	270	270		1.37	213.5	126.5
RBT	1	270	250		1.27	213.5	117.1
RBT	1	268	220		1.14	208.8	105.4
RBT	1	261	238		1.34	192.7	123.5
RBT	1	260	212		1.21	190.5	111.3
RBT	1	260	208		1.18	190.5	109.2
RBT	1	260	206		1.17	190.5	108.1
RBT	1	258	204		1.19	186.1	109.6
RBT	1	256	210		1.25	181.8	115.5
RBT	1	255	212		1.28	179.6	118.0
RBT	1	252	182		1.14	173.3	105.0
RBT	1	244	192		1.32	157.2	122.1
RBT	1	243	186		1.30	155.3	119.8
RBT	1	242	182		1.28	153.3	118.7
RBT	1	242	174		1.23	153.3	113.5
RBT	1	240	150		1.09	149.5	100.3
RBT	1	240	148		1.07	149.5	99.0
RBT	1	240	136		0.98	149.5	90.9
RBT	1	238	162		1.20	145.8	111.1
RBT	1	237	150		1.13	144.0	104.2
RBT	1	235	160		1.23	140.3	114.0
RBT	1	235	158		1.22	140.3	112.6
RBT	1	235	144		1.11	140.3	102.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/11/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
RBT	1	231	142		1.15	133.2	106.6
RBT	1	228	140		1.18	128.1	109.3
RBT	1	226	146		1.26	124.7	117.1
RBT	1	225	140		1.23	123.0	113.8
RBT	1	224	118		1.05	121.4	97.2
RBT	1	220	124		1.16	114.9	107.9
RBT	1	218	126		1.22	111.8	112.7
RBT	1	216	110		1.09	108.7	101.2
RBT	1	216	84		0.83	108.7	77.2
RBT	1	215	120		1.21	107.2	111.9
RBT	1	211	106		1.13	101.3	104.6
RBT	1	204	114		1.34	91.5	124.6
RBT	1	180	60		1.03		
RBT	2	295	331		1.29	279.1	118.6
RBT	2	268	229		1.19	208.8	109.7
RBT	2	265	239		1.28	201.8	118.4
RBT	2	261	215		1.21	192.7	111.6
RBT	2	253	183		1.13	175.4	104.3
RBT	2	252	213		1.33	173.3	122.9
RBT	2	246	177		1.19	161.1	109.8
RBT	2	238	151		1.12	145.8	103.6
RBT	2	224	188		1.67	121.4	154.9
RBT	2	210	111		1.20	99.9	111.2
RBT	2	183	69		1.13		
RBT	2	179	70		1.22		
RBT	3	253	186		1.15	175.4	106.0
RBT	3	215	118		1.19	107.2	110.0
RBT	3	185	60		0.95		
RBT	3	155	39		1.05		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/11/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	183	58	0.95	92.0
	MAX	183	58	0.95	92.0
	MEAN	183.0	58.0	0.95	92.0

BRN		LENGTH	WEIGHT	K	Wr
	N	10	10	10	3
	MIN	112	13	0.89	81.1
	MAX	196	82	1.16	102.1
	MEAN	141.3	33.3	1.04	94.4

HYBRID		LENGTH	WEIGHT	K	Wr
	N	1	1	1	N/A
	MIN	179	52	0.91	N/A
	MAX	179	52	0.91	N/A
	MEAN	179.0	52.0	0.91	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	62	62	62	57
	MIN	155	39	0.83	77.2
	MAX	298	340	1.67	154.9
	MEAN	242.7	181.1	1.20	111.7

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	1	0	0	1	± 0.0	0.124	8	± 0.0	1.02
BRN	7	2	1	10	± 1.4	0.124	81	± 11.3	5.95
HYBRID	1	0	0	1	± 0.0	0.124	8	± 0.0	0.92
RBT	46	12	4	63	± 2.8	0.124	508	± 22.6	202.82

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	1	0	0	1	± 0.0	0.055	18	± 0.0	2.30
BRN	7	2	1	10	± 1.4	0.055	182	± 25.5	13.36
HYBRID	1	0	0	1	± 0.0	0.055	18	± 0.0	2.06
RBT	46	12	4	63	± 2.8	0.055	1145	± 50.9	457.14

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/11/1997

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BKT	1	210	92	0.99	95.8	96.0
BKT	1	208	90	1.00	93.1	96.7
BKT	1	208	90	1.00	93.1	96.7
BRN	1	378	630	1.17	574.8	109.6
BRN	1	345	390	0.95	438.6	88.9
BRN	1	277	210	0.99	228.9	91.7
BRN	1	269	206	1.06	209.9	98.2
BRN	1	240	154	1.11	149.7	102.9
BRN	1	236	132	1.00	142.4	92.7
BRN	1	226	108	0.94	125.3	86.2
BRN	1	223	106	0.96	120.4	88.0
BRN	1	220	92	0.86	115.7	79.5
BRN	1	218	90	0.87	112.6	79.9
BRN	1	216	96	0.95	109.6	87.6
BRN	1	203	78	0.93	91.2	85.6
BRN	1	202	80	0.97	89.8	89.1
BRN	1	195	74	1.00	80.9	91.4
BRN	1	193	64	0.89	78.5	81.5
BRN	1	182	54	0.90	66.0	81.9
BRN	1	168	42	0.89	52.0	80.7
BRN	1	147	33	1.04	35.0	94.2
BRN	1	143	32	1.09	32.3	99.1
BRN	1	141	27	0.96	31.0	87.2
BRN	1	141	27	0.96	31.0	87.2
BRN	1	133	26	1.11		
BRN	1	132	23	1.00		
BRN	1	130	22	1.00		
BRN	1	130	22	1.00		
BRN	1	124	18	0.94		
BRN	1	114	15	1.01		
BRN	1	113	15	1.04		
BRN	1	108	13	1.03		
BRN	1	64	2.4	0.92		
BRN	2	261	168	0.94	191.9	87.5
BRN	2	215	102	1.03	108.1	94.4
BRN	2	208	84	0.93	98.0	85.7
BRN	2	202	74	0.90	89.8	82.4
BRN	2	179	52	0.91	62.8	82.8
BRN	2	146	28	0.90	34.3	81.5
BRN	2	62	1.1	0.46		
BRN	2	57	1.4	0.76		
BRN	3	295	232	0.90	275.8	84.1
BRN	3	186	62	0.96	70.4	88.1
BRN	3	167	45	0.97	51.1	88.0
BRN	3	149	34	1.03	36.5	93.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/11/1997

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	3	149	30	0.91	36.5	82.3
BRN	3	126	18	0.90		
BRN	3	108	13	1.03		
RBT	1	275	232	1.12	225.7	102.8
RBT	1	265	214	1.15	201.8	106.1
RBT	1	261	216	1.21	192.7	112.1
RBT	1	240	148	1.07	149.5	99.0
RBT	1	235	148	1.14	140.3	105.5
RBT	1	193	64	0.89		
RBT	1	186	74	1.15		
RBT	2	227	136	1.16	126.4	107.6
RBT	2	145	50	1.64		
WS	2	156	34	0.90	43.7	77.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/11/1997

BKT		LENGTH	WEIGHT	K	Wr
	N	3	3	3	3
	MIN	208	90	0.99	96.0
	MAX	210	92	1.00	96.7
	MEAN	208.7	90.7	1.00	96.5

BRN		LENGTH	WEIGHT	K	Wr
	N	45	45	45	32
	MIN	57	1.1	0.46	79.5
	MAX	378	630	1.17	109.6
	MEAN	180.5	85.0	0.96	88.5

RBT		LENGTH	WEIGHT	K	Wr
	N	9	9	9	6
	MIN	145	50	0.89	99.0
	MAX	275	232	1.64	112.1
	MEAN	225.2	142.4	1.17	105.5

WS		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	156	34	0.90	77.7
	MAX	156	34	0.90	77.7
	MEAN	156.0	34.0	0.90	77.7

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	3	0	0	3	± 0.0	0.121	25	± 0.0	5.00
BRN	30	8	7	47	± 5.1	0.121	388	± 42.1	72.71
RBT	7	2	0	9	± 0.6	0.121	74	± 5.0	23.23
WS	0	1	0	1	± 0.0	0.121	8	± 0.0	0.60

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	3	0	0	3	± 0.0	0.051	59	± 0.0	11.80
BRN	30	8	7	47	± 5.1	0.051	922	± 100.0	172.77
RBT	7	2	0	9	± 0.6	0.051	176	± 11.8	55.25
WS	0	1	0	1	± 0.0	0.051	20	± 0.0	1.50

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/10/1997

SPECIES	PASS	LENGTH	WEIGHT	K		Ws	Wr
BRN	1	85	5.7	0.93			
BRN	1	57	2	1.08			
BRN	1	57	1.9	1.03			
BRN	1	55	1.7	1.02			
BRN	2	157	39	1.01		42.6	91.6
BRN	2	65	2.9	1.06			
BRN	2	63	2.8	1.12			
BRN	3	202	92	1.12		89.8	102.4
BRN	3	147	32	1.01		35.0	91.3
BRN	3	64	2.4	0.92			
RBT	1	276	256	1.22		228.2	112.2
RBT	1	267	225	1.18		206.4	109.0
RBT	1	263	185	1.02		197.2	93.8
RBT	1	262	208	1.16		195.0	106.7
RBT	1	255	194	1.17		179.6	108.0
RBT	1	221	117	1.08		116.5	100.4
RBT	1	207	94	1.06		95.6	98.3
NO FISH	4	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/10/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	10	10	10	3
	MIN	55	1.7	0.92	91.3
	MAX	202	92	1.12	102.4
	MEAN	95.2	18.2	1.03	95.1

RBT		LENGTH	WEIGHT	K	Wr
	N	7	7	7	7
	MIN	207	94	1.02	93.8
	MAX	276	256	1.22	112.2
	MEAN	250.1	182.7	1.13	104.1

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	4	3	3	0	10	± 2.4	0.165	61	± 14.5	2.45
RBT	7	0	0	0	7	± 0.0	0.165	42	± 0.0	16.92

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	4	3	3	0	10	± 2.4	0.060	167	± 40.0	6.70
RBT	7	0	0	0	7	± 0.0	0.060	117	± 0.0	47.13

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/10/1997

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	331	360	0.99	387.9	92.8
BRN	1	233	130	1.03	137.1	94.8
BRN	1	229	124	1.03	130.3	95.2
BRN	1	203	84	1.00	91.2	92.1
BRN	1	195	78	1.05	80.9	96.4
BRN	1	191	78	1.12	76.1	102.5
BRN	1	184	68	1.09	68.1	99.8
BRN	1	178	64	1.13	61.8	103.6
BRN	1	174	58	1.10	57.7	100.4
BRN	1	171	52	1.04	54.8	94.8
BRN	1	168	50	1.05	52.0	96.1
BRN	1	168	52	1.10	52.0	99.9
BRN	1	161	40	0.96	45.9	87.2
BRN	1	159	47	1.17	44.2	106.3
BRN	1	132	23	1.00		
BRN	2	273	212	1.04	219.2	96.7
BRN	2	182	62	1.03	66.0	94.0
BRN	2	172	54	1.06	55.8	96.8
BRN	3	264	182	0.99	198.5	91.7
RBT	2	263	216	1.19	197.2	109.5
NO FISH	4					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/10/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	19	19	19	18
	MIN	132	23	0.96	87.2
	MAX	331	360	1.17	106.3
	MEAN	198.3	95.7	1.05	96.7

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	263	216	1.19	109.5
	MAX	263	216	1.19	109.5
	MEAN	263.0	216.0	1.19	109.5

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	15	3	1	0	19	± 0.4	0.146	130	± 2.7	27.43
RBT	0	1	0	0	1	± 0.0	0.146	7	± 0.0	3.33

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	15	3	1	0	19	± 0.4	0.058	328	± 6.9	69.20
RBT	0	1	0	0	1	± 0.0	0.058	17	± 0.0	8.10

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/10/1997

SPECIES	PASS	LENGTH	WEIGHT	K		Ws	Wr
BRN	1	170	49	1.00		53.9	90.9
BRN	2	196	78	1.04		82.2	94.9
BRN	2	192	76	1.07		77.3	98.3
BRN	2	179	69	1.20		62.8	109.9
BRN	2	151	23	0.67		37.9	60.6
BRN	2	126	20	1.00			
BRN	2	118	18	1.10			
BRN	2	104	12	1.07			
NO FISH	3	----------					
NO FISH	4	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/10/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	8	8	8	5
	MIN	104	12	0.67	60.6
	MAX	196	78	1.20	109.9
	MEAN	154.5	43.1	1.02	90.9

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	1	7	0	0	8	± 10.1	0.140	57	± 72.1	5.42

	1st Pass	2nd Pass	3rd Pass	4th Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	1	7	0	0	8	± 10.1	0.059	136	± 171.2	12.92

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/9/1997

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	204	104	1.23	92.5	112.4
BRN	1	91	8	1.06		
BRN	1	66	2.9	1.01		
BRN	1	56	1.8	1.02		
BRN	1	56	1.4	0.80		
BRN	1	55	1.5	0.90		
BRN	1	55	1.4	0.84		
BRN	2	63	3	1.20		
BRN	2	51	1.3	0.98		
CUT	1	259	190	1.09		
RBT	1	265	220	1.18	205.7	107.0
NO FISH	3	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/9/1997

BRN		LENGTH	WEIGHT	K	Wr
	N	9	9	9	1
	MIN	51	1.3	0.80	112.4
	MAX	204	104	1.23	112.4
	MEAN	77.4	13.9	1.00	112.4

CUT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	N/A
	MIN	259	190	1.09	N/A
	MAX	259	190	1.09	N/A
	MEAN	259.0	190.0	1.09	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	265	220	1.18	107.0
	MAX	265	220	1.18	107.0
	MEAN	265.0	220.0	1.18	107.0

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	7	2	0	9	± 0.6	0.242	37	± 2.5	1.13
CUT	1	0	0	1	± 0.0	0.242	4	± 0.0	1.68
RBT	1	0	0	1	± 0.0	0.242	4	± 0.0	1.94

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	7	2	0	9	± 0.6	0.083	108	± 7.2	3.31
CUT	1	0	0	1	± 0.0	0.083	12	± 0.0	5.03
RBT	1	0	0	1	± 0.0	0.083	12	± 0.0	5.82

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/11/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	391	580		0.97	635.4	91.3
BRN	1	257	158		0.93	183.3	86.2
BRN	1	254	158		0.96	177.1	89.2
BRN	1	235	118		0.91	140.6	83.9
BRN	1	220	90		0.85	115.7	77.8
BRN	1	205	84		0.98	93.8	89.5
BRN	1	190	74		1.08	74.9	98.8
BRN	1	187	64		0.98	71.5	89.5
BRN	1	184	64		1.03	68.1	93.9
BRN	1	181	70		1.18	64.9	107.9
BRN	1	179	58		1.01	62.8	92.4
BRN	1	178	52		0.92	61.8	84.2
BRN	1	175	54		1.01	58.7	91.9
BRN	1	165	46		1.02	49.3	93.2
BRN	1	163	41		0.95	47.6	86.2
BRN	1	159	38		0.95	44.2	85.9
BRN	1	154	42		1.15	40.2	104.4
BRN	1	154	36		0.99	40.2	89.5
BRN	1	83	5.1		0.89		
BRN	1	76	5.4		1.23		
BRN	1	69	3.2		0.97		
BRN	1	60	2.3		1.06		
BRN	1	59	1.8		0.88		
BRN	2	396	660		1.06	659.7	100.0
BRN	2	202	76		0.92	89.8	84.6
BRN	2	183	62		1.01	67.0	92.5
BRN	2	179	54		0.94	62.8	86.0
BRN	2	176	56		1.03	59.7	93.8
BRN	2	169	52		1.08	53.0	98.2
BRN	2	160	39		0.95	45.0	86.6
BRN	2	156	50		1.32	41.8	119.7
BRN	2	154	35		0.96	40.2	87.0
BRN	2	147	35		1.10	35.0	99.9
BRN	2	139	28		1.04		
BRN	2	126	20		1.00		
BRN	2	73	4		1.03		
BRN	3	169	48		0.99	53.0	90.6
BRN	3	159	39		0.97	44.2	88.2
BRN	3	157	37		0.96	42.6	86.9
BRN	3	146	31		1.00	34.3	90.3
BRN	3	145	31		1.02	33.6	92.1
RBT	1	277	232		1.09	230.7	100.6
RBT	1	275	234		1.13	225.7	103.7
RBT	1	272	230		1.14	218.3	105.3
RBT	1	257	198		1.17	183.9	107.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/11/1997

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
RBT	1	257	196		1.15	183.9	106.6
RBT	1	256	182		1.08	181.8	100.1
RBT	1	250	182		1.16	169.2	107.6
RBT	1	241	144		1.03	151.4	95.1
RBT	1	230	128		1.05	131.5	97.4
RBT	1	223	110		0.99	119.7	91.9
RBT	1	219	120		1.14	113.4	105.8
RBT	1	218	112		1.08	111.8	100.2
RBT	1	215	104		1.05	107.2	97.0
RBT	1	201	74		0.91	87.5	84.6
RBT	1	193	66		0.92		
RBT	1	185	72		1.14		
RBT	1	182	62		1.03		
RBT	1	170	50		1.02		
RBT	2	237	180		1.35	144.0	125.0
RBT	2	234	144		1.12	138.5	104.0
RBT	2	223	112		1.01	119.7	93.5
RBT	2	213	102		1.06	104.2	97.9
RBT	2	195	80		1.08		
RBT	2	189	78		1.16		
RBT	2	183	64		1.04		
RBT	2	171	58		1.16		
RBT	2	156	50		1.32		
RBT	3	256	170		1.01	181.8	93.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/11/1997

BNT		LENGTH	WEIGHT	K	Wr
	N	41	41	41	33
	MIN	59	1.8	0.85	77.8
	MAX	396	660	1.32	119.7
	MEAN	171.1	78.1	1.01	91.9

RBT		LENGTH	WEIGHT	K	Wr
	N	28	28	28	19
	MIN	156	50	0.91	84.6
	MAX	277	234	1.35	125.0
	MEAN	220.6	126.2	1.09	100.9

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	23	13	5	45	± 7.9	0.148	304	± 53.4	52.34
RBT	18	9	1	28	± 2.1	0.148	189	± 14.2	52.58

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	23	13	5	45	± 7.9	0.057	789	± 138.6	135.85
RBT	18	9	1	28	± 2.1	0.057	491	± 36.8	136.61

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
10/9/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	165	41		0.91	46.0	89.1
BKT	1	163	42		0.97	44.3	94.7
HYBRID	1	205	92		1.07		
HYBRID	1	203	84		1.00		
HYBRID	1	192	97		1.37		
HYBRID	1	180	59		1.01		
HYBRID	1	178	58		1.03		
HYBRID	1	178	61		1.08		
HYBRID	1	176	58		1.06		
HYBRID	1	175	64		1.19		
HYBRID	1	169	48		0.99		
HYBRID	1	168	52		1.10		
HYBRID	1	167	40		0.86		
HYBRID	1	163	48		1.11		
HYBRID	1	163	43		0.99		
HYBRID	1	161	47		1.13		
HYBRID	1	161	39		0.93		
HYBRID	1	158	36		0.91		
HYBRID	1	154	33		0.90		
HYBRID	1	153	37		1.03		
HYBRID	1	149	34		1.03		
HYBRID	1	144	28		0.94		
HYBRID	1	143	29		0.99		
HYBRID	1	127	20		0.98		
HYBRID	1	125	18		0.92		
HYBRID	1	124	16		0.84		
HYBRID	1	124	17		0.89		
HYBRID	1	123	18		0.97		
HYBRID	1	123	21		1.13		
HYBRID	1	122	21		1.16		
HYBRID	1	121	19		1.07		
HYBRID	1	120	16		0.93		
HYBRID	1	116	16		1.03		
HYBRID	1	115	16		1.05		
HYBRID	1	115	16		1.05		
HYBRID	1	113	14		0.97		
HYBRID	1	111	14		1.02		
HYBRID	1	103	12		1.10		
HYBRID	1	103	13		1.19		
HYBRID	1	102	9.5		0.90		
HYBRID	1	101	11		1.07		
HYBRID	1	100	10		1.00		
HYBRID	1	96	11		1.24		
HYBRID	1	75	4.2		1.00		
HYBRID	1	74	4.1		1.01		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
10/9/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
HYBRID	1	70	3		0.87		
HYBRID	1	67	3.2		1.06		
HYBRID	1	65	3.2		1.17		
HYBRID	1	64	2.9		1.11		
HYBRID	1	63	2.8		1.12		
HYBRID	1	62	2.5		1.05		
HYBRID	1	59	2.3		1.12		
HYBRID	1	58	1.8		0.92		
HYBRID	1	58	2.2		1.13		
HYBRID	1	55	1.7		1.02		
HYBRID	1	55	2		1.20		
HYBRID	1	53	1.3		0.87		
HYBRID	1	50	1.2		0.96		
HYBRID	1	44	0.7		0.82		
HYBRID	1	42	0.6		0.81		
HYBRID	1	40	1		1.56		
HYBRID	2	209	102		1.12		
HYBRID	2	196	82		1.09		
HYBRID	2	170	58		1.18		
HYBRID	2	168	47		0.99		
HYBRID	2	165	48		1.07		
HYBRID	2	163	45		1.04		
HYBRID	2	163	44		1.02		
HYBRID	2	153	37		1.03		
HYBRID	2	129	22		1.02		
HYBRID	2	128	19		0.91		
HYBRID	2	123	18		0.97		
HYBRID	2	113	15		1.04		
HYBRID	2	108	12		0.95		
HYBRID	2	80	4.3		0.84		
HYBRID	2	72	3.5		0.94		
HYBRID	2	66	3		1.04		
HYBRID	2	63	3		1.20		
HYBRID	2	59	1.9		0.93		
HYBRID	2	53	1.4		0.94		
RBT	1	311	276		0.92	327.4	84.3
RBT	1	278	269		1.25	233.2	115.3
RBT	1	264	231		1.26	199.5	115.8
RBT	1	264	242		1.32	199.5	121.3
RBT	1	258	186		1.08	186.1	99.9
RBT	1	254	176		1.07	177.5	99.2
RBT	1	246	186		1.25	161.1	115.4
RBT	1	240	143		1.03	149.5	95.6
RBT	1	236	126		0.96	142.1	88.7
RBT	1	226	108		0.94	124.7	86.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
10/9/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
RBT	1	215	107		1.08	107.2	99.8
RBT	1	185	66		1.04		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
10/9/1998

BKT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	2
	MIN	163	41	0.91	89.1
	MAX	165	42	0.97	94.7
	MEAN	164	41.5	0.94	91.9

HYBRID		LENGTH	WEIGHT	K	Wr
	N	78	78	78	N/A
	MIN	40	0.6	0.81	N/A
	MAX	209	102	1.56	N/A
	MEAN	118.7	25.7	1.03	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	12	12	12	11
	MIN	185	66	0.92	84.3
	MAX	311	276	1.32	121.3
	MEAN	248.1	176.3	1.10	102.0

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	2	0	2	± 0.0	0.062	32	± 0.0	2.93
HYBRID	59	19	85	± 10.5	0.062	1371	± 169.4	77.68
RBT	12	0	12	± 0.0	0.062	194	± 0.0	75.40

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	2	0	2	± 0.0	0.046	43	± 0.0	3.93
HYBRID	59	19	85	± 10.5	0.046	1848	± 228.3	104.70
RBT	12	0	12	± 0.0	0.046	261	± 0.0	101.44

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
10/9/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	276	212		1.01	226.5	93.6
BRN	1	257	194		1.14	183.3	105.8
BRN	1	243	151		1.05	155.3	97.2
BRN	1	216	101		1.00	109.6	92.2
BRN	1	208	86		0.96	98.0	87.8
BRN	1	206	86		0.98	95.2	90.3
BRN	1	205	87		1.01	93.8	92.7
BRN	1	185	60		0.95	69.2	86.7
BRN	1	154	38		1.04	40.2	94.5
BRN	1	132	22		0.96		
BRN	1	109	14		1.08		
BRN	1	105	12		1.04		
BRN	1	96	9.9		1.12		
BRN	1	59	2		0.97		
BRN	1	59	1.8		0.88		
BRN	2	174	46		0.87	57.7	79.7
BRN	2	174	54		1.03	57.7	93.5
BRN	2	170	42		0.85	53.9	77.9
BRN	2	154	31		0.85	40.2	77.1
BRN	2	152	32		0.91	38.7	82.7
BRN	2	60	2.2		1.02		
BRN	2	57	1.6		0.86		
CUT	1	171	45		0.90	53.8	83.6
CUT	1	41	0.5		0.73		
CUT	1	39	0.5		0.84		
CUT	2	38	0.4		0.73		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
10/9/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	22	22	22	14
	MIN	57	1.6	0.85	77.1
	MAX	276	212	1.14	105.8
	MEAN	156.9	58.4	0.98	89.4

CUT		LENGTH	WEIGHT	K	Wr
	N	4	4	4	1
	MIN	38	0.4	0.73	83.6
	MAX	171	45	0.90	83.6
	MEAN	72.3	11.6	0.80	83.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	15	7	25	± 9.0	0.086	291	± 104.7	37.47
CUT	3	1	4	± 1.9	0.086	47	± 22.1	1.20

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	15	7	25	± 9.0	0.052	481	± 173.1	61.93
CUT	3	1	4	± 1.9	0.052	77	± 36.5	1.97

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
10/8/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	210	94		1.02	95.8	98.1
BKT	1	170	43		0.88	50.4	85.4
BKT	1	158	37		0.94	40.3	91.8
BKT	1	135	24		0.98	25.0	96.1
BKT	1	90	7.6		1.04		
BKT	1	89	6.7		0.95		
BKT	1	88	6.6		0.97		
BKT	1	86	7.8		1.23		
BKT	1	85	6.6		1.07		
BKT	1	84	5.8		0.98		
BKT	1	82	4.9		0.89		
BKT	1	82	6		1.09		
BKT	1	82	4.7		0.85		
BKT	1	81	5.2		0.98		
BKT	1	80	5		0.98		
BKT	1	78	4		0.84		
BKT	1	77	4.8		1.05		
BKT	1	76	4.6		1.05		
BKT	1	76	3.8		0.87		
BKT	1	76	4.2		0.96		
BKT	1	75	4.3		1.02		
BKT	1	75	3.6		0.85		
BKT	1	75	4.7		1.11		
BKT	1	73	3.4		0.87		
BKT	1	73	3.8		0.98		
BKT	1	73	4		1.03		
BKT	1	72	3.6		0.96		
BKT	1	72	3.8		1.02		
BKT	1	71	3.7		1.03		
BKT	1	69	3.2		0.97		
BKT	1	69	3.2		0.97		
BKT	1	68	3		0.95		
BKT	1	66	3.1		1.08		
BKT	1	65	3.2		1.17		
BKT	1	65	3.7		1.35		
BKT	1	58	2.1		1.08		
BKT	2	200	80		1	82.6	96.8
BKT	2	86	6.7		1.05		
BKT	2	86	6.4		1.01		
BKT	2	77	5.1		1.12		
BKT	2	77	4.8		1.05		
BKT	2	75	3.7		0.88		
BKT	2	74	4.1		1.01		
BKT	2	71	3		0.84		
BKT	2	66	2.6		0.9		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
10/8/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	291	250		1.01	264.9	94.4
BRN	1	259	163		0.94	187.6	86.9
BRN	1	258	146		0.85	185.4	78.7
BRN	1	200	76		0.95	87.2	87.1
BRN	1	169	46		0.95	53.0	86.8
BRN	1	120	20		1.16		
BRN	1	58	1.6		0.82		
BRN	1	53	1.2		0.81		
BRN	1	49	0.8		0.68		
BRN	2	124	19		1		
CUT	1	113	13		0.9		
CUT	1	94	7.9		0.95		
CUT	2	98	8.6		0.91		
HYBRID	1	229	131		1.09		
HYBRID	1	228	132		1.11		
HYBRID	1	188	68		1.02		
HYBRID	1	181	53		0.89		
HYBRID	1	69	3.4		1.03		
HYBRID	1	60	2.1		0.97		
HYBRID	1	56	1.8		1.02		
HYBRID	1	50	1.2		0.96		
HYBRID	1	48	1		0.9		
HYBRID	1	48	0.9		0.81		
HYBRID	1	47	0.8		0.77		
HYBRID	1	47	0.9		0.87		
HYBRID	1	47	0.9		0.87		
HYBRID	1	46	0.7		0.72		
HYBRID	1	45	0.8		0.88		
HYBRID	2	68	3.4		1.08		
HYBRID	2	50	1.2		0.96		
HYBRID	2	48	0.9		0.81		
HYBRID	2	43	0.6		0.75		
RBT	1	319	385		1.19	353.6	108.9
RBT	1	302	300		1.09	299.6	100.1
RBT	1	295	310		1.21	279.1	111.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
10/8/1998

BKT		LENGTH	WEIGHT	K	Wr
	N	45	45	45	5
	MIN	58	2.1	0.84	85.4
	MAX	210	94	1.35	98.1
	MEAN	87.0	10.2	1.00	93.6

BRN		LENGTH	WEIGHT	K	Wr
	N	10	10	10	5
	MIN	49	0.8	0.68	78.7
	MAX	291	250	1.16	94.4
	MEAN	158.1	72.3	0.92	86.8

CUT		LENGTH	WEIGHT	K	Wr
	N	3	3	3	N/A
	MIN	94	7.9	0.9	N/A
	MAX	113	13	0.95	N/A
	MEAN	101.7	9.8	0.92	N/A

HYBRID		LENGTH	WEIGHT	K	Wr
	N	19	19	19	N/A
	MIN	43	0.6	0.72	N/A
	MAX	229	132	1.11	N/A
	MEAN	84.1	21.3	0.92	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	3	3	3	3
	MIN	295	300	1.09	100.1
	MAX	319	385	1.21	111.1
	MEAN	305.3	331.7	1.16	106.7

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	36	9	47	± 5.0	0.120	392	± 41.7	8.81
BRN	9	1	10	± 0.8	0.120	83	± 6.7	13.23
CUT	2	1	3	± 3.2	0.120	25	± 26.7	0.54
HYBRID	15	4	19	± 2.3	0.120	158	± 19.2	7.42
RBT	3	0	3	± 0.0	0.120	25	± 0.0	18.28

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	36	9	47	± 5.0	0.057	825	± 87.7	18.55
BRN	9	1	10	± 0.8	0.057	175	± 14.0	27.89
CUT	2	1	3	± 3.2	0.057	53	± 56.1	1.15
HYBRID	15	4	19	± 2.3	0.057	333	± 40.4	15.64
RBT	3	0	3	± 0.0	0.057	53	± 0.0	38.75

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
10/8/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	251	157		0.99	170.9	91.8
BRN	1	242	169		1.19	153.4	110.2
BRN	1	224	109		0.97	122.0	89.3
BRN	1	189	69		1.02	73.8	93.5
BRN	1	187	68		1.04	71.5	95.1
BRN	1	186	67		1.04	70.4	95.2
BRN	1	184	64		1.03	68.1	93.9
BRN	1	175	53		0.99	58.7	90.2
BRN	1	170	47		0.96	53.9	87.2
BRN	1	152	35		1.00	38.7	90.5
BRN	1	124	19		1.00		
BRN	2	185	62		0.98	69.2	89.5
BRN	2	114	16		1.08		
BRN	2	40	0.5		0.78		
RBT	1	276	251		1.19	228.2	110.0
RBT	1	261	208		1.17	192.7	107.9
RBT	1	253	194		1.20	175.4	110.6
RBT	1	251	180		1.14	171.2	105.1
RBT	1	247	145		0.96	163.1	88.9
RBT	1	243	156		1.09	155.3	100.5
RBT	1	231	124		1.01	133.2	93.1
RBT	1	226	111		0.96	124.7	89.0
RBT	1	225	133		1.17	123.0	108.1
RBT	1	222	110		1.01	118.1	93.1
RBT	1	216	93		0.92	108.7	85.5
RBT	1	214	116		1.18	105.7	109.7
RBT	1	214	117		1.19	105.7	110.7
RBT	1	210	125		1.35	99.9	125.2
RBT	1	204	94		1.11	91.5	102.8
RBT	1	201	86		1.06	87.5	98.3
RBT	1	200	86		1.08	86.2	99.8
RBT	1	198	86		1.11		
RBT	1	196	89		1.18		
RBT	1	195	96		1.29		
RBT	1	195	74		1.00		
RBT	1	188	95		1.43		
RBT	1	184	66		1.06		
RBT	1	180	88		1.51		
RBT	2	247	169		1.12	163.1	103.6
RBT	2	226	123		1.07	124.7	98.6
RBT	2	204	107		1.26	91.5	117.0
RBT	2	166	55		1.20		
RBT	2	157	42		1.09		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
10/8/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	14	14	14	11
	MIN	40	0.5	0.78	87.2
	MAX	251	169	1.19	110.2
	MEAN	173.1	66.8	1.01	93.3

RBT		LENGTH	WEIGHT	K	Wr
	N	29	29	29	20
	MIN	157	42	0.92	85.5
	MAX	276	251	1.51	125.2
	MEAN	214.8	117.9	1.14	102.9

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	11	3	14	± 2.1	0.126	111	± 16.7	16.35
RBT	24	5	29	± 2.2	0.126	230	± 17.5	59.78

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	11	3	14	± 2.1	0.056	250	± 37.5	36.82
RBT	24	5	29	± 2.2	0.056	518	± 39.3	134.64

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
10/8/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BKT	1	173	48		0.93	53.1	90.3
BRN	1	361	480		1.02	498.3	96.3
BRN	1	298	266		1.01	278.0	95.7
BRN	1	296	310		1.20	272.4	113.8
BRN	1	280	239		1.09	230.0	103.9
BRN	1	278	211		0.98	225.0	93.8
BRN	1	272	234		1.16	210.6	111.1
BRN	1	265	218		1.17	194.5	112.1
BRN	1	265	227		1.22	194.5	116.7
BRN	1	262	166		0.92	187.9	88.4
BRN	1	261	193		1.09	185.7	103.9
BRN	1	259	200		1.15	181.4	110.2
BRN	1	252	176		1.10	166.9	105.5
BRN	1	244	158		1.09	151.3	104.4
BRN	1	242	140		0.99	147.6	94.9
BRN	1	240	139		1.01	143.9	96.6
BRN	1	236	162		1.23	136.7	118.5
BRN	1	235	124		0.96	134.9	91.9
BRN	1	235	140		1.08	134.9	103.7
BRN	1	230	128		1.05	126.4	101.3
BRN	1	228	142		1.20	123.1	115.4
BRN	1	226	114		0.99	119.8	95.1
BRN	1	223	113		1.02	115.1	98.2
BRN	1	221	116		1.07	111.9	103.6
BRN	1	213	95		0.98	100.1	94.9
BRN	1	211	96		1.02	97.2	98.7
BRN	1	210	112		1.21	95.8	116.9
BRN	1	198	79		1.02	80.1	98.6
BRN	1	197	77		1.01	78.9	97.6
BRN	1	197	91		1.19	78.9	115.3
BRN	1	196	79		1.05	77.7	101.7
BRN	1	195	74		1.00	76.5	96.8
BRN	1	194	75		1.03	75.3	99.6
BRN	1	189	71		1.05	69.5	102.1
BRN	1	187	71		1.09	67.3	105.4
BRN	1	183	70		1.14	63.0	111.0
BRN	1	163	46		1.06	44.3	103.8
BRN	1	146	32		1.03	31.7	100.9
BRN	1	144	33		1.11	30.4	108.5
BRN	1	141	28		1.00	28.5	98.2
BRN	1	136	24		0.95		
BRN	1	124	19		1.00		
BRN	1	124	21		1.10		
BRN	1	82	5.2		0.94		
BRN	1	79	4.8		0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
10/8/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	77	3.8		0.83		
BRN	1	74	4.4		1.09		
BRN	1	71	4		1.12		
BRN	1	65	3.2		1.17		
BRN	2	319	330		1.02		
BRN	2	316	325		1.03		
BRN	2	280	228		1.04		
BRN	2	253	179		1.11		
BRN	2	241	151		1.08		
BRN	2	174	45		0.85		
BRN	2	156	41		1.08		
BRN	2	80	4.8		0.94		
BRN	2	75	4.2		1.00		
BRN	2	74	4.6		1.14		
BRN	2	73	3.9		1.00		
RBT	1	245	154		1.05	153.2	100.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
10/8/1998

BKT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	173	48	0.93	90.3
	MAX	173	48	0.93	90.3
	MEAN	173.0	48.0	0.93	90.3

BRN		LENGTH	WEIGHT	K	Wr
	N	59	59	59	39
	MIN	65	3.2	0.83	88.4
	MAX	361	480	1.23	118.5
	MEAN	199.1	117.5	1.06	103.2

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	245	154	1.05	100.5
	MAX	245	154	1.05	100.5
	MEAN	245.0	154.0	1.05	100.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	1	0	1	± 0.0	0.137	7	± 0.0	0.74
BRN	48	11	61	± 4.9	0.137	445	± 35.8	115.27
RBT	1	0	1	± 0.0	0.137	7	± 0.0	2.38

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	1	0	1	± 0.0	0.055	18	+ 0.0	1.90
BRN	48	11	61	± 4.9	0.055	1109	+ 89.1	287.28
RBT	1	0	1	± 0.0	0.055	18	+ 0.0	6.11

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
10/7/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	271	235		1.18	214.5	109.6
BRN	1	263	158		0.87	196.3	80.5
BRN	1	262	164		0.91	194.1	84.5
BRN	1	227	112		0.96	126.9	88.2
BRN	1	164	48		1.09	48.5	99.1
BRN	1	94	8.5		1.02		
BRN	1	90	6.9		0.95		
BRN	1	79	5.3		1.07		
BRN	1	69	2.8		0.85		
BRN	1	67	3.1		1.03		
BRN	1	66	2.8		0.97		
BRN	2	134	24		1.00		
BRN	2	84	5.9		1.00		
BRN	2	80	5.1		1.00		
RBT	1	255	174		1.05	179.6	96.9
RBT	1	249	165		1.07	167.2	98.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
10/7/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	14	14	14	5
	MIN	66	2.8	0.85	80.5
	MAX	271	235	1.18	109.6
	MEAN	139.3	55.8	0.99	92.4

RBT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	2
	MIN	249	165	1.05	96.9
	MAX	255	174	1.07	98.7
	MEAN	252.0	169.5	1.06	97.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	11	3	14	± 2.1	0.136	103	± 15.4	12.67
RBT	2	0	2	± 0.0	0.136	15	± 0.0	5.61

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	11	3	14	± 2.1	0.054	259	± 38.9	31.86
RBT	2	0	2	± 0.0	0.054	37	± 0.0	13.83

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
10/7/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	285	236		1.02	249.0	94.8
BRN	1	277	228		1.07	228.9	99.6
BRN	1	265	191		1.03	200.7	95.1
BRN	1	265	196		1.05	200.7	97.6
BRN	1	257	175		1.03	183.3	95.5
BRN	1	255	179		1.08	179.1	99.9
BRN	1	253	176		1.09	175.0	100.6
BRN	1	251	164		1.04	170.9	95.9
BRN	1	248	164		1.08	165.0	99.4
BRN	1	241	178		1.27	151.5	117.5
BRN	1	227	113		0.97	126.9	89.0
BRN	1	226	118		1.02	125.3	94.2
BRN	1	225	126		1.11	123.6	101.9
BRN	1	221	110		1.02	117.2	93.8
BRN	1	204	79		0.93	92.5	85.4
BRN	1	198	87		1.12	84.7	102.8
BRN	1	163	46		1.06	47.6	96.7
BRN	1	158	43		1.09	43.4	99.1
BRN	1	89	7.4		1.05		
BRN	1	84	5.7		0.96		
BRN	1	75	4		0.95		
BRN	1	63	2.8		1.12		
BRN	2	254	181		1.10	177.1	102.2
BRN	2	248	176		1.15	165.0	106.7
BRN	2	154	37		1.01	40.2	92.0
BRN	2	85	6.1		0.99		
BRN	2	83	6.5		1.14		
BRN	2	78	5.1		1.07		
BRN	2	74	4.3		1.06		
RBT	2	256	132		0.79	181.8	72.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
10/7/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	29	29	29	21
	MIN	63	2.8	0.93	85.4
	MAX	285	236	1.27	117.5
	MEAN	189.9	105.0	1.06	98.1

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	256	132	0.79	72.6
	MAX	256	132	0.79	72.6
	MEAN	256.0	132.0	0.79	72.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	22	7	31	± 5.7	0.156	199	± 36.5	46.07
RBT	0	1	1*	--	0.156	6	--	1.75

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	22	7	31	± 5.7	0.061	508	± 93.4	117.59
RBT	0	1	1*	±	0.061	16	--	4.66

* Sum of fish caught in 2 passes.

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
10/7/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	262	196		1.09	194.1	101.0
BRN	1	242	155		1.09	153.4	101.0
BRN	1	231	138		1.12	133.7	103.2
BRN	1	230	126		1.04	132.0	95.5
BRN	1	218	114		1.10	112.6	101.3
BRN	1	217	110		1.08	111.1	99.0
BRN	1	212	95		1.00	103.7	91.6
BRN	1	186	68		1.06	70.4	96.7
BRN	1	184	61		0.98	68.1	89.5
BRN	1	142	28		0.98	31.6	88.5
BRN	1	81	5.8		1.09		
BRN	1	80	5.4		1.05		
BRN	1	79	5.3		1.07		
BRN	2	216	107		1.06	109.6	97.7
BRN	2	215	113		1.14	108.1	104.6
BRN	2	142	30		1.05	31.6	94.9
BRN	2	140	29		1.06	30.3	95.6
RBT	2	220	112		1.05	114.9	97.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
10/7/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	17	17	17	14
	MIN	79	5.3	0.98	88.5
	MAX	262	196	1.14	104.6
	MEAN	181.0	81.6	1.06	97.1

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	220	112	1.05	97.4
	MAX	220	112	1.05	97.4
	MEAN	220.0	112.0	1.05	97.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	13	4	17	± 2.5	0.148	115	± 16.9	20.69
RBT	0	1	1*	± --	0.148	7	--	1.73

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	13	4	17	± 2.5	0.059	288	± 42.4	51.81
RBT	0	1	1*	± --	0.059	17	--	4.20

*Sum of fish caught in 2 passes

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
10/7/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	186	67		1.04	70.4	95.2
BRN	1	151	32		0.93	37.9	84.3
BRN	1	149	36		1.09	36.5	98.7
BRN	1	137	25		0.97		
BRN	1	79	5.1		1.03		
BRN	1	74	4.1		1.01		
BRN	1	59	2.3		1.12		
BRN	2	155	39		1.05	41.0	95.1
BRN	2	146	29		0.93	34.3	84.4
BRN	2	132	23		1.00		
BRN	2	72	4		1.07		
BRN	2	65	3.1		1.13		
NO FISH	3	----------					

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
10/7/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	12	12	12	5
	MIN	59	2.3	0.93	84.3
	MAX	186	67	1.13	98.7
	MEAN	117.1	22.5	1.03	91.6

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	7	5	0	12	± 1.6	0.190	63	± 8.4	3.13

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	7	5	0	12	± 1.6	0.067	179	± 23.9	8.88

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
10/6/1998

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	318	310		0.96	344.5	90.0
BRN	1	261	198		1.11	191.9	103.2
BRN	1	233	131		1.04	137.1	95.5
BRN	1	230	119		0.98	132.0	90.2
BRN	1	229	116		0.97	130.3	89.0
BRN	1	218	96		0.93	112.6	85.3
BRN	1	217	95		0.93	111.1	85.5
BRN	1	208	88		0.98	98.0	89.8
BRN	1	206	91		1.04	95.2	95.6
BRN	1	200	83		1.04	87.2	95.2
BRN	1	195	69		0.93	80.9	85.3
BRN	1	187	66		1.01	71.5	92.3
BRN	1	175	52		0.97	58.7	88.5
BRN	1	168	48		1.01	52.0	92.2
BRN	1	106	11		0.92		
BRN	1	105	13		1.12		
BRN	1	105	12		1.04		
BRN	1	101	11		1.07		
BRN	1	100	10		1.00		
BRN	1	99	10		1.03		
BRN	1	97	8.3		0.91		
BRN	1	96	9		1.02		
BRN	1	95	8.7		1.01		
BRN	1	95	7.9		0.92		
BRN	1	94	9		1.08		
BRN	1	93	8		0.99		
BRN	1	91	7.2		0.96		
BRN	1	77	5.5		1.20		
BRN	1	76	5.2		1.18		
BRN	1	73	3.4		0.87		
BRN	1	64	3		1.14		
BRN	2	217	102		1.00	111.1	91.8
BRN	2	194	68		0.93	79.7	85.3
BRN	2	182	57		0.95	66.0	86.4
BRN	2	179	58		1.01	62.8	92.4
BRN	2	164	44		1.00	48.5	90.8
BRN	2	98	6.6		0.70		
BRN	2	93	8.6		1.07		
BRN	2	79	5.6		1.14		
RBT	1	320	335		1.02	356.9	93.9
RBT	1	300	305		1.13	293.6	103.9
RBT	1	284	236		1.03	248.8	94.9
RBT	1	278	228		1.06	233.2	97.8
RBT	1	275	255		1.23	225.7	113.0
RBT	1	273	210		1.03	220.8	95.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
10/6/1998

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	269	204	1.05	211.1	96.6
RBT	1	263	193	1.06	197.2	97.9
RBT	1	262	191	1.06	195.0	98.0
RBT	1	241	161	1.15	151.4	106.3
RBT	1	236	146	1.11	142.1	102.7
RBT	1	229	137	1.14	129.8	105.6
RBT	1	228	134	1.13	128.1	104.6
RBT	1	227	143	1.22	126.4	113.2
RBT	1	214	104	1.06	105.7	98.4
RBT	1	214	95	0.97	105.7	89.9
RBT	1	213	84	0.87	104.2	80.6
RBT	1	213	96	0.99	104.2	92.1
RBT	1	211	156	1.66	101.3	154.0
RBT	1	210	87	0.94	99.9	87.1
RBT	1	203	86	1.03	90.1	95.4
RBT	1	202	89	1.08	88.8	100.2
RBT	1	196	84	1.12		
RBT	1	195	76	1.02		
RBT	1	183	66	1.08		
RBT	1	182	79	1.31		
RBT	1	175	84	1.57		
RBT	2	212	110	1.15	102.8	107.0
RBT	2	174	55	1.04		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
10/6/1998

BRN		LENGTH	WEIGHT	K	Wr
	N	39	39	39	19
	MIN	64	3	0.70	85.3
	MAX	318	310	1.20	103.2
	MEAN	149.2	52.7	CI	

RBT		LENGTH	WEIGHT	K	Wr
	N	29	29	29	23
	MIN	174	55	0.87	80.6
	MAX	320	335	1.66	154
	MEAN	230.4	145.8	1.11	101.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (Acres)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	31	8	40	± 4.0	0.181	221	± 22.1	25.68
RBT	27	2	29	± 0.8	0.181	160	± 4.4	51.43

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	31	8	40	± 4.0	0.067	597	± 59.7	69.36
RBT	27	2	29	± 0.8	0.067	433	± 11.9	139.18

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	1	195	74	1.00	76.5	96.8
BRK	1	167	48	1.03	47.7	100.6
BRK	1	124	15	0.79		
BRK	1	80	5	0.98		
BRK	1	79	4.5	0.91		
BRK	1	78	4.8	1.01		
BRK	1	77	4.6	1.01		
BRK	1	64	2.5	0.95		
BRK	1	63	2.4	0.96		
BRN	1	197	72	0.94	83.4	86.3
BRN	1	153	37	1.03	39.5	93.8
HYBRID	1	214	105	1.07		
HYBRID	1	211	96	1.02		
HYBRID	1	200	76	0.95		
HYBRID	1	198	68	0.88		
HYBRID	1	196	69	0.92		
HYBRID	1	189	68	1.01		
HYBRID	1	188	67	1.01		
HYBRID	1	187	66	1.01		
HYBRID	1	186	68	1.06		
HYBRID	1	184	55	0.88		
HYBRID	1	181	60	1.01		
HYBRID	1	180	58	0.99		
HYBRID	1	180	56	0.96		
HYBRID	1	175	59	1.10		
HYBRID	1	175	54	1.01		
HYBRID	1	173	57	1.10		
HYBRID	1	170	45	0.92		
HYBRID	1	168	31	0.65		
HYBRID	1	164	46	1.04		
HYBRID	1	161	36	0.86		
HYBRID	1	160	40	0.98		
HYBRID	1	157	39	1.01		
HYBRID	1	155	23	0.62		
HYBRID	1	148	35	1.08		
HYBRID	1	137	38	1.48		
HYBRID	1	136	24	0.95		
HYBRID	1	136	22	0.87		
HYBRID	1	134	23	0.96		
HYBRID	1	129	19	0.89		
HYBRID	1	127	21	1.03		
HYBRID	1	127	21	1.03		
HYBRID	1	125	20	1.02		
HYBRID	1	125	19	0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
HYBRID	1	123	18	0.97		
HYBRID	1	120	18	1.04		
HYBRID	1	114	14	0.94		
HYBRID	1	113	15	1.04		
HYBRID	1	112	15	1.07		
HYBRID	1	112	13	0.93		
HYBRID	1	111	14	1.02		
HYBRID	1	108	13	1.03		
HYBRID	1	102	11	1.04		
HYBRID	1	98	9.6	1.02		
HYBRID	1	95	9	1.05		
HYBRID	1	47	0.8	0.77		
HYBRID	1	43	0.6	0.75		
HYBRID	1	42	0.7	0.94		
HYBRID	2	211	82	0.87		
HYBRID	2	203	78	0.93		
HYBRID	2	190	70	1.02		
HYBRID	2	188	62	0.93		
HYBRID	2	183	57	0.93		
HYBRID	2	175	54	1.01		
HYBRID	2	170	45	0.92		
HYBRID	2	169	42	0.87		
HYBRID	2	152	39	1.11		
HYBRID	2	151	33	0.96		
HYBRID	2	150	36	1.07		
HYBRID	2	144	31	1.04		
HYBRID	2	143	27	0.92		
HYBRID	2	135	23	0.93		
HYBRID	2	130	25	1.14		
HYBRID	2	125	19	0.97		
HYBRID	2	116	14	0.90		
HYBRID	2	109	12	0.93		
HYBRID	2	105	9.5	0.82		
HYBRID	2	100	10	1.00		
HYBRID	2	46	0.7	0.72		
HYBRID	2	45	0.7	0.77		
HYBRID	2	43	1	1.26		
RBT	1	300	302	1.12	293.6	102.8
RBT	1	296	260	1.00	282.0	92.2
RBT	1	266	172	0.91	204.1	84.3
RBT	1	255	172	1.04	179.6	95.8
RBT	1	255	162	0.98	179.6	90.2
RBT	1	248	158	1.04	165.1	95.7
RBT	1	245	140	0.95	159.2	88.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	235	122	0.94	140.3	86.9
RBT	1	214	100	1.02	105.7	94.6
RBT	2	259	194	1.12	188.3	103.0
RBT	2	242	140	0.99	153.3	91.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/1999

BRK		LENGTH	WEIGHT	K	Wr
	N	9	9	9	2
	MIN	63	2.4	0.79	96.8
	MAX	195	74	1.03	100.6
	MEAN	103.0	17.9	0.96	98.7

BRN		LENGTH	WEIGHT	K	Wr
	N	2	2	2	2
	MIN	153	37	0.94	86.3
	MAX	197	72	1.03	93.8
	MEAN	175.0	54.5	0.985	90.1

HYBRID		LENGTH	WEIGHT	K	Wr
	N	70	70	70	N/A
	MIN	42	0.6	0.62	N/A
	MAX	214	105	1.48	N/A
	MEAN	142.8	35.8	0.971	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	11	11	11	11
	MIN	214	100	0.91	84.3
	MAX	300	302	1.12	103.0
	MEAN	255.9	174.7	1.01	93.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	9	0	9	± 0.00	0.085	106	± 0.00	4.17
BRN	2	0	2	± 0.00	0.085	24	± 0.00	2.83
HYBRID	47	23	88	± 12.96	0.085	1035	± 152.47	81.69
RBT	9	2	11	± 0.70	0.085	129	± 8.24	49.86

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	9	0	9	± 0.00	0.055	164	± 0.00	6.47
BRN	2	0	2	± 0.00	0.055	36	± 0.00	4.33
HYBRID	47	23	88	± 12.96	0.055	1600	± 235.64	126.28
RBT	9	2	11	± 0.70	0.055	200	± 12.73	77.03

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/15/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	277	200	0.94	228.9	87.4
BRN	1	255	158	0.95	179.1	88.2
BRN	1	249	166	1.08	166.9	99.4
BRN	1	222	110	1.01	118.8	92.6
BRN	1	203	72	0.86	91.2	79.0
BRN	1	200	72	0.90	87.2	82.5
BRN	1	198	74	0.95	84.7	87.4
BRN	1	197	76	0.99	83.4	91.1
BRN	1	195	68	0.92	80.9	84.0
BRN	1	190	62	0.90	74.9	82.7
BRN	1	190	58	0.85	74.9	77.4
BRN	1	183	54	0.88	67.0	80.5
BRN	1	149	33	1.00	36.5	90.5
BRN	1	148	30	0.93	35.8	83.9
BRN	1	112	13	0.93		
BRN	1	98	10	1.06		
BRN	1	96	9	1.02		
BRN	1	95	11	1.28		
BRN	1	53	1.4	0.94		
BRN	1	50	1.3	1.04		
BRN	1	50	1.3	1.04		
BRN	1	50	1.1	0.88		
BRN	2	226	124	1.07	125.3	99.0
BRN	2	207	82	0.92	96.6	84.9
BRN	2	201	80	0.99	88.5	90.4
BRN	2	177	50	0.90	60.7	82.3
BRN	2	149	31	0.94	36.5	85.0
BRN	2	145	32	1.05	33.6	95.1
BRN	2	102	11	1.04		
BRN	2	50	1.4	1.12		
BRN	2	50	1.2	0.96		
BRN	2	48	1.4	1.27		
BRN	2	46	1.3	1.34		
BRN	2	45	1	1.10		
BRN	2	40	0.5	0.78		
CUT	1	207	82	0.92		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/15/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	35	35	35	20
	MIN	40	0.5	0.78	77.4
	MAX	277	200	1.34	99.4
	MEAN	141.3	48.5	1.00	87.2

CUT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	N/A
	MIN	207	82	0.92	N/A
	MAX	207	82	0.92	N/A
	MEAN	207.0	82.0	0.92	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN < 100	7	6	13	± --	0.076	171	± --	1.22
CUT	1	0	1	± 0.00	0.076	13	± 0.00	2.38

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN < 100	7	6	13	± --	0.054	241	± --	25.77
CUT	1	0	1	± 0.00	0.054	19	± 0.00	3.43

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/15/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	1	218	120	1.16	107.4	111.8
BRK	1	213	102	1.06	100.1	101.9
BRK	1	210	98	1.06	95.8	102.3
BRK	1	205	104	1.21	89.1	116.8
BRK	1	203	92	1.10	86.4	106.4
BRK	1	197	84	1.10	78.9	106.5
BRK	1	190	72	1.05	70.7	101.9
BRK	1	190	62	0.90	70.7	87.7
BRK	1	189	62	0.92	69.5	89.1
BRK	1	186	72	1.12	66.2	108.7
BRK	1	185	58	0.92	65.2	89.0
BRK	1	182	60	1.00	62.0	96.8
BRK	1	174	46	0.87	54.1	85.1
BRK	1	170	56	1.14	50.4	111.2
BRK	1	169	50	1.04	49.5	101.0
BRK	1	167	41	0.88	47.7	85.9
BRK	1	149	31	0.94	33.7	91.9
BRK	1	143	32	1.09	29.8	107.5
BRK	1	139	27	1.01	27.3	98.9
BRK	1	112	14	1.00		
BRK	1	56	1.4	0.80		
BRK	1	55	1.6	0.96		
BRK	2	187	76	1.16	67.3	112.9
BRK	2	54	1.3	0.83		
BRK	2	48	1	0.90		
RBT	1	294	265	1.04	276.2	95.9
RBT	1	277	200	0.94	230.7	86.7
RBT	1	244	148	1.02	157.2	94.1
RBT	1	237	144	1.08	144.0	100.0
RBT	1	231	146	1.18	133.2	109.6
RBT	1	226	130	1.13	124.7	104.3
RBT	1	150	33	0.98		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/15/1999

BRK		LENGTH	WEIGHT	K	Wr
	N	25	25	25	20
	MIN	48	1	0.80	85.1
	MAX	218	120	1.21	116.8
	MEAN	159.6	54.6	1.01	100.7

RBT		LENGTH	WEIGHT	K	Wr
	N	7	7	7	6
	MIN	150	33	0.94	86.7
	MAX	294	265	1.18	109.6
	MEAN	237.0	152.3	1.05	98.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	22	3	25	± 0.67	0.053	472	± 12.64	56.82
RBT	7	0	7	± 0.00	0.053	132	± 0.00	44.32

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	22	3	25	± 0.67	0.047	532	± 14.26	64.04
RBT	7	0	7	± 0.00	0.047	149	± 0.00	50.03

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/15/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	1	238	156	1.16	140.3	111.2
BRK	1	237	136	1.02	138.5	98.2
BRK	1	235	146	1.12	134.9	108.2
BRK	1	212	105	1.10	98.6	106.5
BRK	1	210	101	1.09	95.8	105.4
BRK	1	198	91	1.17	80.1	113.6
BRK	1	160	38	0.93	41.9	90.7
BRK	1	146	29	0.93	31.7	91.5
BRK	1	145	29	0.95	31.0	93.4
BRK	1	143	28	0.96	29.8	94.1
BRK	1	140	25	0.91	27.9	89.6
BRK	1	138	25	0.95	26.7	93.6
BRK	1	133	22	0.94	23.9	92.2
BRK	1	120	18	1.04		
BRK	1	74	5	1.23		
BRK	1	70	4	1.17		
BRK	2	194	62	0.85	75.3	82.3
BRK	2	188	86	1.29	68.4	125.7
BRK	2	156	42	1.11	38.8	108.3
BRK	2	143	27	0.92	29.8	90.7
BRK	2	138	23	0.88	26.7	86.1
BRK	2	137	28	1.09	26.1	107.2
BRK	2	65	2.5	0.91		
BRN	1	305	290	1.02	304.4	95.3
BRN	1	257	173	1.02	183.3	94.4
BRN	1	195	81	1.09	80.9	100.1
BRN	1	131	21	0.93		
BRN	2	276	201	0.96	226.5	88.8
BRN	2	58	2.5	1.28		
HYBRID	1	119	17	1.01		
HYBRID	1	106	12	1.01		
HYBRID	2	170	48	0.98		
HYBRID	2	140	26	0.95		
RBT	1	353	450	1.02	480.3	93.7
RBT	1	336	460	1.21	413.7	111.2
RBT	1	331	365	1.01	395.3	92.3
RBT	1	326	370	1.07	377.5	98.0
RBT	1	313	390	1.27	333.8	116.8
RBT	1	313	315	1.03	333.8	94.4
RBT	1	311	355	1.18	327.4	108.4
RBT	1	310	310	1.04	324.2	95.6
RBT	1	290	276	1.13	265.0	104.1
RBT	1	283	295	1.30	246.2	119.8
RBT	1	282	218	0.97	243.5	89.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/15/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	280	286	1.30	238.3	120.0
RBT	1	235	132	1.02	140.3	94.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/15/1999

BRK		LENGTH	WEIGHT	K	Wr
	N	23	23	23	19
	MIN	65	2.5	0.85	82.3
	MAX	238	156	1.29	125.7
	MEAN	157.4	53.4	1.03	99.4

BRN		LENGTH	WEIGHT	K	Wr
	N	6	6	6	4
	MIN	58	2.5	0.93	88.8
	MAX	305	290	1.28	100.1
	MEAN	203.7	128.1	1.05	94.6

HYBRID		LENGTH	WEIGHT	K	Wr
	N	4	4	4	N/A
	MIN	106	12	0.95	N/A
	MAX	170	48	1.01	N/A
	MEAN	133.8	25.8	0.99	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	13	13	13	13
	MIN	235	132	0.97	89.5
	MAX	353	460	1.30	120.0
	MEAN	304.8	324.8	1.12	102.9

	1st Pass	2nd Pass	Pop Est	CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	16	7	26	± 4.21	0.187	139	± 22.51	16.38
BRN	4	2	6	± 1.05	0.187	32	± 5.61	9.06
HYBRID	2	2	4	± 0.00	0.187	21	± 0.00	1.21
RBT	13	0	13	± 0.00	0.187	70	± 0.00	49.78

	1st Pass	2nd Pass	Pop Est	CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	16	7	26	± 4.21	0.080	325	± 52.63	38.26
BRN	4	2	6	± 1.05	0.080	75	± 13.13	21.18
HYBRID	2	2	4	± 0.00	0.080	50	± 0.00	2.84
RBT	13	0	13	± 0.00	0.080	163	± 0.00	116.72

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/16/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	254	164	1.00	177.1	92.6
BRN	1	217	102	1.00	111.1	91.8
BRN	1	215	100	1.01	108.1	92.5
BRN	1	214	90	0.92	106.6	84.4
BRN	1	211	88	0.94	102.2	86.1
BRN	1	182	52	0.86	66.0	78.8
BRN	2	217	100	0.98	111.1	90.0
BRN	2	214	88	0.90	106.6	82.6
BRN	2	213	98	1.01	105.1	93.2
BRN	2	207	98	1.10	96.6	101.5
BRN	2	201	68	0.84	88.5	76.8
BRN	2	198	74	0.95	84.7	87.4
BRN	2	175	52	0.97	58.7	88.5
BRN	2	140	31	1.13	30.3	102.2
BRN	3	161	40	0.96	45.9	87.2
BRN	3	106	11	0.92		
RBT	1	320	360	1.10	356.9	100.9
RBT	1	284	280	1.22	248.8	112.5
RBT	1	265	184	0.99	201.8	91.2
RBT	1	232	138	1.11	135.0	102.2
RBT	1	195	62	0.84		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/16/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	16	16	16	15
	MIN	106	11	0.84	76.8
	MAX	254	164	1.13	102.2
	MEAN	195.3	78.5	0.97	89.1

RBT		LENGTH	WEIGHT	K	Wr
	N	5	5	5	4
	MIN	195	62	0.84	91.2
	MAX	320	360	1.22	112.5
	MEAN	259.2	204.8	1.05	101.7

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	6	8	2	19	± 9.99	0.139	137	± 0.00	23.66
RBT	5	0	0	5	± 0.00	0.139	36	± 0.00	16.24

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	6	8	2	19	± 0.00	0.064	297	± 0.00	51.40
RBT	5	0	0	5	± 0.00	0.064	78	± 0.00	35.22

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/16/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	1	69	3.3	1.00		
BRK	1	67	2.8	0.93		
BRN	1	304	260	0.93	301.5	86.2
BRN	1	291	238	0.97	264.9	89.9
BRN	1	277	232	1.09	228.9	101.4
BRN	1	270	222	1.13	212.2	104.6
BRN	1	267	172	0.90	205.3	83.8
BRN	1	266	162	0.86	203.0	79.8
BRN	1	265	172	0.92	200.7	85.7
BRN	1	250	158	1.01	168.9	93.5
BRN	1	248	150	0.98	165.0	90.9
BRN	1	247	148	0.98	163.0	90.8
BRN	1	245	154	1.05	159.1	96.8
BRN	1	242	140	0.99	153.4	91.3
BRN	1	239	132	0.97	147.8	89.3
BRN	1	235	120	0.92	140.6	85.3
BRN	1	221	112	1.04	117.2	95.5
BRN	1	215	98	0.99	108.1	90.7
BRN	1	206	86	0.98	95.2	90.3
BRN	1	198	72	0.93	84.7	85.0
BRN	1	189	64	0.95	73.8	86.8
BRN	1	184	66	1.06	68.1	96.9
BRN	1	151	36	1.05	37.9	94.9
BRN	1	146	35	1.12	34.3	101.9
BRN	1	142	29	1.01	31.6	91.7
BRN	1	134	22	0.91		
BRN	1	122	16	0.88		
BRN	1	114	15	1.01		
BRN	1	112	14	1.00		
BRN	1	67	3.5	1.16		
BRN	2	314	230	0.74	331.8	69.3
BRN	2	272	194	0.96	216.9	89.5
BRN	2	255	174	1.05	179.1	97.1
BRN	2	226	134	1.16	125.3	107.0
BRN	2	223	110	0.99	120.4	91.4
BRN	2	213	96	0.99	105.1	91.3
BRN	2	212	112	1.18	103.7	108.0
BRN	2	209	94	1.03	99.4	94.6
BRN	2	161	44	1.05	45.9	95.9
BRN	2	158	37	0.94	43.4	85.3
BRN	2	142	30	1.05	31.6	94.9
RBT	1	274	218	1.06	223.2	97.7
RBT	1	269	224	1.15	211.1	106.1
RBT	1	254	168	1.03	177.5	94.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/16/1999

BRK		LENGTH	WEIGHT	K	Wr
	N	2	2	2	N/A
	MIN	67	2.8	0.93	N/A
	MAX	69	3.3	1.00	N/A
	MEAN	68.0	3.1	0.965	N/A

BRN		LENGTH	WEIGHT	K	Wr
	N	39	39	39	34
	MIN	67	3.5	0.74	69.3
	MAX	314	260	1.18	108.0
	MEAN	211.1	112.4	1.00	92.0

RBT		LENGTH	WEIGHT	K	Wr
	N	3	3	3	3
	MIN	254	168	1.03	94.6
	MAX	274	224	1.15	106.1
	MEAN	265.7	203.3	1.08	99.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	2	0	2	± 0.00	0.128	16	± 0.00	0.11
BRN	28	11	44	± 5.15	0.128	344	± 40.21	85.19
RBT	3	0	3	± 0.00	0.128	23	± 0.00	10.51

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	2	0	2	± 0.00	0.055	36	± 0.00	0.24
BRN	28	11	44	± 5.15	0.055	800	± 93.58	198.24
RBT	3	0	3	± 0.00	0.055	55	± 0.00	24.65

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/16/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	290	285	1.17	262.2	108.7
BRN	1	280	246	1.12	236.3	104.1
BRN	1	278	232	1.08	231.3	100.3
BRN	1	277	196	0.92	228.9	85.6
BRN	1	233	142	1.12	137.1	103.6
BRN	1	227	100	0.85	126.9	78.8
BRN	1	226	118	1.02	125.3	94.2
BRN	1	183	64	1.04	67.0	95.5
BRN	1	155	36	0.97	41.0	87.8
BRN	1	152	39	1.11	38.7	100.8
BRN	1	148	35	1.08	35.8	97.9
BRN	1	143	31	1.06	32.3	96.0
BRN	1	139	30	1.12		
BRN	1	120	17	0.98		
RBT	1	276	230	1.09	228.2	100.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/16/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	14	14	14	12
	MIN	120	17	0.85	78.8
	MAX	290	285	1.17	108.7
	MEAN	203.6	112.2	1.05	96.1

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	276	230	1.09	100.8
	MAX	276	230	1.09	100.8
	MEAN	276.0	230.0	1.09	100.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	14	0	14	± 0.00	0.136	103	± 0.00	25.47
RBT	1	0	1	± 0.00	0.136	7	± 0.00	3.73

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	14	0	14	± 0.00	0.062	226	± 0.00	55.90
RBT	1	0	1	± 0.00	0.062	16	± 0.00	8.11

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/16/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	291	255	1.03	264.9	96.3
BRN	1	282	240	1.07	241.3	99.4
BRN	1	273	232	1.14	219.2	105.8
BRN	1	273	204	1.00	219.2	93.1
BRN	1	265	200	1.07	200.7	99.6
BRN	1	245	158	1.07	159.1	99.3
BRN	1	221	102	0.94	117.2	87.0
BRN	1	219	102	0.97	114.1	89.4
BRN	1	214	108	1.10	106.6	101.3
BRN	1	164	46	1.04	48.5	94.9
BRN	1	164	44	1.00	48.5	90.8
BRN	1	160	43	1.05	45.0	95.5
BRN	1	160	37	0.90	45.0	82.1
BRN	1	156	39	1.03	41.8	93.3
BRN	2	252	158	0.99	173.0	91.4
BRN	2	247	164	1.09	163.0	100.6
BRN	2	226	121	1.05	125.3	96.6
CUT	1	213	95	0.98		
CUT	1	210	94	1.02		
RBT	1	340	448	1.14	428.7	104.5
RBT	1	305	310	1.09	308.7	100.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/16/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	17	17	17	17
	MIN	156	37	0.9	82.1
	MAX	291	255	1.14	105.8
	MEAN	224.2	132.5	1.03	95.1

CUT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	N/A
	MIN	210	94	0.98	N/A
	MAX	213	95	1.02	N/A
	MEAN	211.5	94.5	1.00	N/A

RBT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	2
	MIN	305	310	1.09	100.4
	MAX	340	448	1.14	104.5
	MEAN	322.5	379.0	1.12	102.5

	1st	2nd	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	14	3	17	± 0.85	0.110	155	± 7.73	45.28
CUT	2	0	2	± 0.00	0.110	18	± 0.00	3.75
RBT	2	0	2	± 0.00	0.110	18	± 0.00	15.04

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	14	3	17	± 0.85	0.055	309	± 15.45	90.26
CUT	2	0	2	± 0.00	0.055	36	± 0.00	7.50
RBT	2	0	2	± 0.00	0.055	36	± 0.00	30.08

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/13/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	259	160	0.92	187.6	85.3
BRN	1	258	180	1.05	185.4	97.1
BRN	1	251	156	0.99	170.9	91.3
BRN	1	239	138	1.01	147.8	93.3
BRN	1	230	116	0.95	132.0	87.9
BRN	1	227	122	1.04	126.9	96.1
BRN	1	225	126	1.11	123.6	101.9
BRN	1	222	106	0.97	118.8	89.2
BRN	1	220	112	1.05	115.7	96.8
BRN	1	219	114	1.09	114.1	99.9
BRN	1	218	98	0.95	112.6	87.0
BRN	1	214	106	1.08	106.6	99.5
BRN	1	183	60	0.98	67.0	89.5
BRN	1	175	58	1.08	58.7	98.8
BRN	1	174	58	1.1	57.7	100.4
BRN	1	146	27	0.87	34.3	78.6
BRN	1	140	28	1.02	30.3	92.3
BRN	1	124	20	1.05		
BRN	1	121	21	1.19		
BRN	1	119	18	1.07		
BRN	1	101	11	1.07		
BRN	1	64	2.9	1.11		
BRN	1	55	1.9	1.14		
BRN	2	226	122	1.06	125.3	97.4
BRN	2	219	98	0.93	114.1	85.9
BRN	2	211	88	0.94	102.2	86.1
BRN	2	200	72	0.9	87.2	82.5
BRN	2	198	72	0.93	84.7	85.0
BRN	2	175	60	1.12	58.7	102.2
BRN	2	162	43	1.01	46.7	92.0
RBT	1	300	350	1.3	293.6	119.2
RBT	1	257	190	1.12	183.9	103.3
WHS	1	171	62	1.24		
WHS	1	126	25	1.25		
WHS	2	118	19	1.16		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/13/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	30	30	30	24
	MIN	55	1.9	0.87	78.6
	MAX	259	180	1.19	102.2
	MEAN	185.8	79.8	1.03	92.3

RBT		LENGTH	WEIGHT	K	Wr
	N	2	2	2	2
	MIN	257	190	1.12	103.3
	MAX	300	350	1.3	119.2
	MEAN	278.5	270.0	1.21	111.2

WHS		LENGTH	WEIGHT	K	Wr
	N	3	3	3	N/A
	MIN	118	19	1.16	N/A
	MAX	171	62	1.25	N/A
	MEAN	138.3	35.3	1.2	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	23	7	31	± 2.11	0.202	153	± 10.45	27.01
RBT	2	0	2	± 0.00	0.202	10	± 0.00	5.89
WHS	2	1	3	± 0.75	0.202	15	± 3.71	1.16

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	23	7	31	± 2.11	0.082	378	± 25.73	66.50
RBT	2	0	2	± 0.00	0.082	24	± 0.00	14.29
WHS	2	1	3	± 0.75	0.082	37	± 8.78	2.88

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/13/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	281	226	1.02	238.8	94.6
BRN	1	239	138	1.01	147.8	93.3
BRN	1	197	80	1.05	83.4	95.9
BRN	1	189	70	1.04	73.8	94.9
BRN	1	187	66	1.01	71.5	92.3
BRN	1	187	58	0.89	71.5	81.1
BRN	1	154	35	0.96	40.2	87.0
BRN	1	115	14	0.92		
BRN	1	73	4.8	1.23		
BRN	2	227	134	1.15	126.9	105.6
BRN	2	154	37	1.01	40.2	92.0
BRN	2	129	20	0.93		
BRN	2	113	14	0.97		
RBT	1	289	234	0.97	262.3	89.2
WHS	1	132	24	1.04		
WHS	2	136	29	1.15		
WHS	2	71	3.4	0.95		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/13/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	13	13	13	9
	MIN	73	4.8	0.89	81.1
	MAX	281	226	1.23	105.6
	MEAN	172.7	69.0	1.01	93.0

RBT		LENGTH	WEIGHT	K	Wr
	N	1	1	1	1
	MIN	289	234	0.97	89.32
	MAX	289	234	0.97	89.2
	MEAN	289.0	234.0	0.97	89.2

WHS		LENGTH	WEIGHT	K	Wr
	N	3	3	3	N/A
	MIN	71	3.4	0.95	N/A
	MAX	136	29	1.15	N/A
	MEAN	113.0	18.8	1.05	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	9	4	14	± 2.40	0.197	71	± 12.18	10.81
RBT	1	0	1	± 0.00	0.197	5	± 0.00	2.62
WHS	1	2	3	± 0.00	0.197	15	± 0.00	0.63

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	9	4	14	± 2.40	0.081	173	±29.63	26.32
RBT	1	0	1	± 0.00	0.081	12	± 0.00	6.19
WHS	1	2	3	± 0.00	0.081	37	± 0.00	1.53

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/14/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	284	236	1.03	246.5	95.8
BRN	1	239	147	1.08	147.8	99.4
BRN	1	207	84	0.95	96.6	87.0
BRN	1	205	92	1.07	93.8	98.0
BRN	1	199	68	0.86	85.9	79.1
BRN	1	196	70	0.93	82.2	85.2
BRN	1	195	71	0.96	80.9	87.7
BRN	1	195	70	0.94	80.9	86.5
BRN	1	195	56	0.76	80.9	69.2
BRN	1	189	61	0.90	73.8	82.7
BRN	1	175	49	0.91	58.7	83.4
BRN	1	170	50	1.02	53.9	92.8
BRN	1	170	49	1.00	53.9	90.9
BRN	1	167	50	1.07	51.1	97.8
BRN	1	164	46	1.04	48.5	94.9
BRN	1	154	40	1.10	40.2	99.5
BRN	1	105	14	1.21		
BRN	1	99	10	1.03		
BRN	1	77	4.6	1.01		
BRN	1	76	4.4	1.00		
BRN	2	255	163	0.98	179.1	91.0
BRN	2	195	82	1.11	80.9	101.3
BRN	2	195	72	0.97	80.9	89.0
BRN	2	195	72	0.97	80.9	89.0
BRN	2	183	63	1.03	67.0	94.0
BRN	2	100	10	1.00		
BRN	2	84	7	1.18		
RBT	1	277	240	1.13	230.7	104.0
RBT	1	267	188	0.99	206.4	91.1
RBT	1	265	190	1.02	201.8	94.2
RBT	1	259	187	1.08	188.3	99.3
RBT	1	250	147	0.94	169.2	86.9
RBT	1	243	174	1.21	155.3	112.1
RBT	1	236	130	0.99	142.1	91.5
RBT	1	235	152	1.17	140.3	108.3
RBT	1	228	138	1.16	128.1	107.8
RBT	1	227	125	1.07	126.4	98.9
RBT	1	221	107	0.99	116.5	91.8
RBT	1	217	100	0.98	110.3	90.7
RBT	1	216	102	1.01	108.7	93.8
RBT	1	216	96	0.95	108.7	88.3
RBT	1	215	101	1.02	107.2	94.2
RBT	1	215	99	1.00	107.2	92.3
RBT	1	210	88	0.95	99.9	88.1
RBT	1	208	96	1.07	97.0	99.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/14/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	207	85	0.96	95.6	88.9
RBT	1	153	48	1.34		
RBT	2	264	204	1.11	199.5	102.3
RBT	2	226	124	1.07	124.7	99.4
RBT	2	218	103	0.99	111.8	92.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/14/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	27	27	27	21
	MIN	76	4.4	0.76	69.2
	MAX	284	236	1.21	101.3
	MEAN	172.9	64.5	1.00	90.2

RBT		LENGTH	WEIGHT	K	Wr
	N	23	23	23	22
	MIN	153	48	0.94	86.9
	MAX	277	240	1.34	112.1
	MEAN	229.3	131.5	1.05	96.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	20	7	29	± 2.96	0.157	185	± 18.85	26.26
RBT	20	3	23	± 0.70	0.157	146	± 4.46	42.47

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	20	7	29	± 2.96	0.066	439	± 44.85	62.42
RBT	20	3	23	± 0.70	0.066	348	± 10.61	100.89

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/14/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	497	1250	1.02	1293.0	96.7
BRN	1	463	1050	1.06	1048.2	100.2
BRN	1	455	1350	1.43	995.5	135.6
BRN	1	412	620	0.89	741.9	83.6
BRN	1	313	310	1.01	328.7	94.3
BRN	1	305	290	1.02	304.4	95.3
BRN	1	301	278	1.02	292.8	95.0
BRN	1	292	264	1.06	267.6	98.7
BRN	1	286	248	1.06	251.6	98.6
BRN	1	261	195	1.10	191.9	101.6
BRN	1	261	188	1.06	191.9	98.0
BRN	1	249	162	1.05	166.9	97.0
BRN	1	246	152	1.02	161.0	94.4
BRN	1	245	164	1.12	159.1	103.1
BRN	1	236	136	1.03	142.4	95.5
BRN	1	235	132	1.02	140.6	93.9
BRN	1	234	125	0.98	138.9	90.0
BRN	1	232	148	1.19	135.4	109.3
BRN	1	225	132	1.16	123.6	106.8
BRN	1	225	112	0.98	123.6	90.6
BRN	1	224	112	1.00	122.0	91.8
BRN	1	221	110	1.02	117.2	93.8
BRN	1	220	114	1.07	115.7	98.5
BRN	1	216	108	1.07	109.6	98.6
BRN	1	207	82	0.92	96.6	84.9
BRN	1	204	84	0.99	92.5	90.8
BRN	1	200	86	1.08	87.2	98.6
BRN	1	198	80	1.03	84.7	94.5
BRN	1	151	40	1.16	37.9	105.4
BRN	1	114	15	1.01		
BRN	1	112	15	1.07		
BRN	1	110	14	1.05		
BRN	1	109	13	1.00		
BRN	1	106	12	1.01		
BRN	1	105	12	1.04		
BRN	1	103	11	1.01		
BRN	1	97	9	0.99		
BRN	1	96	9.8	1.11		
BRN	1	92	8.6	1.10		
BRN	1	90	7.9	1.08		
BRN	1	90	7.7	1.06		
BRN	1	87	7	1.06		
BRN	1	84	6.1	1.03		
BRN	1	80	5.3	1.04		
BRN	1	79	5.3	1.07		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/14/1999

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	77	5.3	1.16		
BRN	2	334	410	1.10	398.4	102.9
BRN	2	295	246	0.96	275.8	89.2
BRN	2	251	158	1.00	170.9	92.4
BRN	2	244	140	0.96	157.2	89.1
BRN	2	224	104	0.93	122.0	85.2
BRN	2	223	108	0.97	120.4	89.7
BRN	2	196	74	0.98	82.2	90.1
BRN	2	195	74	1.00	80.9	91.4
BRN	2	131	24	1.07		
BRN	2	108	12	0.95		
BRN	2	94	8.7	1.05		
BRN	2	86	7.7	1.21		
BRN	2	86	7.1	1.12		
BRN	2	79	4.5	0.91		
RBT	1	279	216	0.99	235.8	91.6
RBT	1	268	174	0.90	208.8	83.3
RBT	1	248	150	0.98	165.1	90.8
RBT	1	242	152	1.07	153.3	99.1
RBT	1	214	102	1.04	105.7	96.5
RBT	1	155	40	1.07		
RBT	2	280	214	0.97	238.3	89.8
RBT	2	175	62	1.16		
RBT	2	162	46	1.08		
RBT	2	123	19	1.02		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/14/1999

BRN		LENGTH	WEIGHT	K	Wr
	N	60	60	60	37
	MIN	77	4.5	0.89	83.6
	MAX	497	1350	1.43	135.6
	MEAN	199.9	161.1	1.05	96.3

RBT		LENGTH	WEIGHT	K	Wr
	N	10	10	10	6
	MIN	123	19	0.90	83.3
	MAX	280	216	1.16	99.1
	MEAN	214.6	117.5	1.03	91.9

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	46	14	64	± 3.86	0.212	302	± 18.21	107.22
RBT	6	4	10	± 0.00	0.212	47	± 0.00	12.22

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	46	14	64	± 3.86	0.073	877	± 52.88	311.48
RBT	6	4	10	± 0.00	0.073	137	± 0.00	35.49

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	63	1.9	0.76		
1	BKT	66	2.1	0.73		
1	BKT	70	2.7	0.79		
1	BKT	71	2.8	0.78		
1	BKT	74	3	0.74		
1	BKT	77	3.5	0.77		
1	BKT	80	4.1	0.80		
1	BKT	82	4.5	0.82		
1	BKT	87	5.8	0.88		
1	BKT	92	5.7	0.73		
1	BKT	137	21	0.82	26.1	80.4
1	BKT	140	23	0.84	27.9	82.4
1	BKT	142	24	0.84	29.1	82.4
1	BKT	142	26	0.91	29.1	89.2
1	BKT	216	95	0.94	104.4	91.0
1	BRN	80	4.3	0.84		
1	BRN	85	5.5	0.90		
1	BRN	137	23	0.89		
1	BRN	142	28	0.98	31.6	88.5
1	BRN	143	28	0.96	32.3	86.7
1	HYBRID	41	0.4	0.58		
1	HYBRID	42	0.4	0.54		
1	HYBRID	45	0.7	0.77		
1	HYBRID	46	0.6	0.62		
1	HYBRID	47	0.7	0.67		
1	HYBRID	47	0.7	0.67		
1	HYBRID	49	0.9	0.76		
1	HYBRID	49	0.9	0.76		
1	HYBRID	50	0.9	0.72		
1	HYBRID	50	1.1	0.88		
1	HYBRID	50	1.2	0.96		
1	HYBRID	51	1	0.75		
1	HYBRID	51	1.1	0.83		
1	HYBRID	52	1	0.71		
1	HYBRID	52	1.2	0.85		
1	HYBRID	52	1.2	0.85		
1	HYBRID	52	1.3	0.92		
1	HYBRID	54	1.4	0.89		
1	HYBRID	55	1	0.60		
1	HYBRID	55	1.5	0.90		
1	HYBRID	56	1.3	0.74		
1	HYBRID	57	2	1.08		
1	HYBRID	58	1.2	0.62		
1	HYBRID	58	1.4	0.72		
1	HYBRID	58	1.4	0.72		
1	HYBRID	59	1.6	0.78		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	HYBRID	59	1.9	0.93		
1	HYBRID	59	2	0.97		
1	HYBRID	60	1.4	0.65		
1	HYBRID	60	1.5	0.69		
1	HYBRID	60	1.6	0.74		
1	HYBRID	60	1.6	0.74		
1	HYBRID	60	2	0.93		
1	HYBRID	61	1.6	0.70		
1	HYBRID	61	2	0.88		
1	HYBRID	62	2.7	1.13		
1	HYBRID	63	2.1	0.84		
1	HYBRID	63	2.4	0.96		
1	HYBRID	64	2.4	0.92		
1	HYBRID	65	2	0.73		
1	HYBRID	65	2.1	0.76		
1	HYBRID	65	2.5	0.91		
1	HYBRID	65	2.5	0.91		
1	HYBRID	65	2.7	0.98		
1	HYBRID	65	3.1	1.13		
1	HYBRID	67	2.4	0.80		
1	HYBRID	69	2.9	0.88		
1	HYBRID	70	2.9	0.85		
1	HYBRID	70	2.9	0.85		
1	HYBRID	70	3.2	0.93		
1	HYBRID	71	2.7	0.75		
1	HYBRID	74	3.2	0.79		
1	HYBRID	90	6.5	0.89		
1	HYBRID	95	8	0.93		
1	HYBRID	101	9	0.87		
1	HYBRID	104	11	0.98		
1	HYBRID	105	11	0.95		
1	HYBRID	105	11	0.95		
1	HYBRID	106	11	0.92		
1	HYBRID	107	11	0.90		
1	HYBRID	107	11	0.90		
1	HYBRID	108	14	1.11		
1	HYBRID	112	12	0.85		
1	HYBRID	112	13	0.93		
1	HYBRID	115	14	0.92		
1	HYBRID	120	15	0.87		
1	HYBRID	121	13	0.73		
1	HYBRID	125	15	0.77		
1	HYBRID	135	22	0.89		
1	HYBRID	138	22	0.84		
1	HYBRID	139	27	1.01		
1	HYBRID	145	32	1.05		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	HYBRID	148	35	1.08		
1	HYBRID	149	35	1.06		
1	HYBRID	151	36	1.05		
1	HYBRID	151	37	1.07		
1	HYBRID	158	33	0.84		
1	HYBRID	158	36	0.91		
1	HYBRID	160	40	0.98		
1	HYBRID	161	46	1.10		
1	HYBRID	165	42	0.93		
1	HYBRID	165	47	1.05		
1	HYBRID	170	50	1.02		
1	HYBRID	171	50	1.00		
1	HYBRID	178	62	1.10		
1	HYBRID	180	48	0.82		
1	HYBRID	180	68	1.17		
1	HYBRID	181	60	1.01		
1	HYBRID	186	68	1.06		
1	HYBRID	187	58	0.89		
1	HYBRID	190	64	0.93		
1	HYBRID	192	75	1.06		
1	HYBRID	195	70	0.94		
1	HYBRID	198	76	0.98		
1	HYBRID	198	80	1.03		
1	HYBRID	206	84	0.96		
1	HYBRID	211	84	0.89		
1	HYBRID	212	104	1.09		
1	HYBRID	222	95	0.87		
1	RBT	200	85	1.06	86.2	98.7
1	RBT	201	83	1.02	87.5	94.9
1	RBT	206	82	0.94	94.2	87.0
1	RBT	208	82	0.91	97.0	84.5
1	RBT	214	100	1.02	105.7	94.6
1	RBT	230	130	1.07	131.5	98.9
1	RBT	235	150	1.16	140.3	106.9
1	RBT	237	120	0.90	144.0	83.4
1	RBT	238	135	1.00	145.8	92.6
1	RBT	239	145	1.06	147.7	98.2
1	RBT	240	135	0.98	149.5	90.3
1	RBT	245	150	1.02	159.2	94.2
1	RBT	245	180	1.22	159.2	113.1
1	RBT	246	180	1.21	161.1	111.7
1	RBT	246	185	1.24	161.1	114.8
1	RBT	251	170	1.08	171.2	99.3
1	RBT	251	180	1.14	171.2	105.1
1	RBT	255	210	1.27	179.6	116.9
1	RBT	264	210	1.14	199.5	105.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	RBT	267	205	1.08	206.4	99.3
1	RBT	268	190	0.99	208.8	91.0
1	RBT	272	210	1.04	218.3	96.2
1	RBT	276	265	1.26	228.2	116.1
1	RBT	278	220	1.02	233.2	94.3
1	RBT	287	255	1.08	256.8	99.3
1	RBT	288	250	1.05	259.5	96.3
1	RBT	307	330	1.14	314.9	104.8
1	RBT	320	360	1.10	356.9	100.9
2	BKT	62	1.9	0.80		
2	BKT	77	3.9	0.85		
2	HYBRID	50	1	0.80		
2	HYBRID	50	1	0.80		
2	HYBRID	51	1	0.75		
2	HYBRID	51	1.3	0.98		
2	HYBRID	52	1.1	0.78		
2	HYBRID	53	1.1	0.74		
2	HYBRID	53	1.7	1.14		
2	HYBRID	55	1.5	0.90		
2	HYBRID	56	1.3	0.74		
2	HYBRID	58	1.2	0.62		
2	HYBRID	59	1.6	0.78		
2	HYBRID	59	1.8	0.88		
2	HYBRID	59	2	0.97		
2	HYBRID	60	2.1	0.97		
2	HYBRID	62	2.3	0.97		
2	HYBRID	64	2.3	0.88		
2	HYBRID	73	2.8	0.72		
2	HYBRID	98	10	1.06		
2	HYBRID	105	11	0.95		
2	HYBRID	106	12	1.01		
2	HYBRID	114	15	1.01		
2	HYBRID	118	16	0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/22/2000

BKT

	Length	Weight	K	Wr
N:	17	17	17	5
Min:	62	1.9	0.73	80.4
Max:	216	95	0.94	91.0
Mean:	99	14	0.81	85.1

BRN

	Length	Weight	K	Wr
N:	5	5	5	2
Min:	80	4.3	0.84	86.7
Max:	143	28	0.98	88.5
Mean:	117	18	0.91	87.6

HYBRID

	Length	Weight	K	Wr
N:	121	121	121	N/A
Min:	41	0.4	0.54	N/A
Max:	222	104	1.17	N/A
Mean:	96	17	0.88	N/A

RBT

	Length	Weight	K	Wr
N:	28	28	28	28
Min:	200	82	0.90	83.4
Max:	320	360	1.27	116.9
Mean:	251	178	1.08	99.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	15	2	17	± 1.1	0.067	254	± 16	7.8
BRN	5	0	5	± 0	0.067	75	± 0	3.0
HYBRID	99	22	126	± 7.3	0.067	1881	± 109	70.5
RBT	28	0	28	± 0	0.067	418	± 0	164.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	15	2	17	± 1.1	0.054	315	± 20	9.7
BRN	5	0	5	± 0	0.054	93	± 0	3.7
HYBRID	99	22	126	± 7.3	0.054	2333	± 135	87.4
RBT	28	0	28	± 0	0.054	518	± 0	203.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	44	0.3	0.35		
1	BRN	48	0.5	0.45		
1	BRN	50	0.8	0.64		
1	BRN	53	0.7	0.47		
1	BRN	53	1.2	0.81		
1	BRN	53	1.7	1.14		
1	BRN	54	0.9	0.57		
1	BRN	54	1.2	0.76		
1	BRN	54	1.4	0.89		
1	BRN	54	1.5	0.95		
1	BRN	55	1.3	0.78		
1	BRN	55	1.5	0.90		
1	BRN	56	1.6	0.91		
1	BRN	57	1.7	0.92		
1	BRN	58	1.2	0.62		
1	BRN	58	1.5	0.77		
1	BRN	58	1.6	0.82		
1	BRN	58	1.9	0.97		
1	BRN	58	2	1.03		
1	BRN	59	1.7	0.83		
1	BRN	59	1.8	0.88		
1	BRN	59	2	0.97		
1	BRN	59	2	0.97		
1	BRN	60	2	0.93		
1	BRN	60	2	0.93		
1	BRN	60	2	0.93		
1	BRN	60	2.1	0.97		
1	BRN	61	2	0.88		
1	BRN	61	2.1	0.93		
1	BRN	61	2.3	1.01		
1	BRN	61	2.4	1.06		
1	BRN	61	2.4	1.06		
1	BRN	62	1.2	0.50		
1	BRN	62	1.8	0.76		
1	BRN	62	2.1	0.88		
1	BRN	62	2.3	0.97		
1	BRN	62	2.7	1.13		
1	BRN	63	2.3	0.92		
1	BRN	64	2	0.76		
1	BRN	64	2	0.76		
1	BRN	64	2.2	0.84		
1	BRN	64	2.2	0.84		
1	BRN	64	2.2	0.84		
1	BRN	64	2.2	0.84		
1	BRN	65	2.6	0.95		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	65	2.9	1.06		
1	BRN	66	2.9	1.01		
1	BRN	67	2.6	0.86		
1	BRN	67	2.8	0.93		
1	BRN	72	3.3	0.88		
1	BRN	92	6.9	0.89		
1	BRN	98	8	0.85		
1	BRN	101	9	0.87		
1	BRN	103	10	0.92		
1	BRN	103	11	1.01		
1	BRN	104	9	0.80		
1	BRN	105	10	0.86		
1	BRN	105	10	0.86		
1	BRN	105	12	1.04		
1	BRN	106	9	0.76		
1	BRN	106	11	0.92		
1	BRN	107	11	0.90		
1	BRN	108	13	1.03		
1	BRN	109	10	0.77		
1	BRN	109	11	0.85		
1	BRN	110	13	0.98		
1	BRN	110	13	0.98		
1	BRN	111	12	0.88		
1	BRN	112	11	0.78		
1	BRN	113	11	0.76		
1	BRN	115	12	0.79		
1	BRN	115	14	0.92		
1	BRN	115	14	0.92		
1	BRN	116	14	0.90		
1	BRN	125	17	0.87		
1	BRN	148	25	0.77	35.8	69.9
1	BRN	160	36	0.88	45.0	79.9
1	BRN	162	40	0.94	46.7	85.6
1	BRN	174	48	0.91	57.7	83.1
1	BRN	183	56	0.91	67.0	83.5
1	BRN	200	74	0.93	87.2	84.8
1	BRN	207	82	0.92	96.6	84.9
1	BRN	208	84	0.93	98.0	85.7
1	BRN	218	96	0.93	112.6	85.3
1	BRN	220	102	0.96	115.7	88.2
1	BRN	246	152	1.02	161.0	94.4
1	BRN	248	124	0.81	165.0	75.2
1	BRN	252	138	0.86	173.0	79.8
1	BRN	255	147	0.89	179.1	82.1
1	BRN	275	174	0.84	224.0	77.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/22/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	49	1	0.85		
2	BRN	52	0.9	0.64		
2	BRN	54	1.4	0.89		
2	BRN	54	1.4	0.89		
2	BRN	55	1	0.60		
2	BRN	55	1.2	0.72		
2	BRN	55	2.4	1.44		
2	BRN	57	1.8	0.97		
2	BRN	60	1.3	0.60		
2	BRN	60	1.8	0.83		
2	BRN	62	1.5	0.63		
2	BRN	64	2.8	1.07		
2	BRN	65	2.3	0.84		
2	BRN	66	2.4	0.83		
2	BRN	68	2.8	0.89		
2	BRN	102	7	0.66		
2	BRN	103	10	0.92		
2	BRN	111	14	1.02		
2	BRN	149	29	0.88	36.5	79.5
2	BRN	173	42	0.81	56.8	74.0
2	BRN	199	75	0.95	85.9	87.3
2	BRN	203	98	1.17	91.2	107.5
2	BRN	206	80	0.92	95.2	84.0
2	BRN	207	85	0.96	96.6	88.0
2	CUT	87	5.4	0.82		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/22/2000

BRN

	Length	Weight	K	Wr
N:	114	114	114	21
Min:	44	0.3	0.35	69.9
Max:	275	174	1.44	107.5
Mean:	98	19	0.87	83.8

CUT

	Length	Weight	K	Wr
N:	1	1	1	N/A
Min:	87	5.4	0.82	N/A
Max:	87	5.4	0.82	N/A
Mean:	87	5.4	0.82	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	90	24	121	± 9.4	0.080	1512	± 118	63.3
CUT	0	1	1*	--	0.080	12*	--	0.1*

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	90	24	121	± 9.4	0.054	2241	± 174	93.9
CUT	0	1	1*	--	0.054	18*	--	0.2*

* Based on number collected (1)

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	49	0.4	0.34		
1	BKT	49	0.6	0.51		
1	BKT	55	1.8	1.08		
1	BKT	55	1.9	1.14		
1	BKT	56	2.1	1.20		
1	BKT	58	1.3	0.67		
1	BKT	58	1.4	0.72		
1	BKT	58	1.7	0.87		
1	BKT	58	1.9	0.97		
1	BKT	59	1.8	0.88		
1	BKT	59	2.3	1.12		
1	BKT	61	1.7	0.75		
1	BKT	62	1.5	0.63		
1	BKT	63	2.3	0.92		
1	BKT	63	2.3	0.92		
1	BKT	63	2.4	0.96		
1	BKT	64	2.1	0.80		
1	BKT	64	2.2	0.84		
1	BKT	65	2.1	0.76		
1	BKT	65	3.1	1.13		
1	BKT	65	3.2	1.17		
1	BKT	67	2.8	0.93		
1	BKT	67	3.1	1.03		
1	BKT	68	2.6	0.83		
1	BKT	68	2.7	0.86		
1	BKT	68	3.1	0.99		
1	BKT	69	2.3	0.70		
1	BKT	69	2.9	0.88		
1	BKT	70	2.8	0.82		
1	BKT	70	3.1	0.90		
1	BKT	70	3.3	0.96		
1	BKT	70	3.4	0.99		
1	BKT	71	3.9	1.09		
1	BKT	73	3.6	0.93		
1	BKT	74	2.9	0.72		
1	BKT	76	2.9	0.66		
1	BKT	76	4.2	0.96		
1	BKT	78	4.4	0.93		
1	BKT	101	10	0.97		
1	BKT	103	11	1.01		
1	BKT	105	11	0.95		
1	BKT	140	29	1.06	27.9	103.9
1	BKT	142	25	0.87	29.1	85.8
1	BKT	144	32	1.07	30.4	105.3
1	BKT	148	34	1.05	33.0	102.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	151	31	0.90	35.1	88.3
1	BKT	168	49	1.03	48.6	100.8
1	BKT	182	65	1.08	62.0	104.8
1	BKT	186	62	0.96	66.2	93.6
1	BKT	201	97	1.19	83.9	115.7
1	BKT	206	82	0.94	90.4	90.7
1	BKT	206	100	1.14	90.4	110.6
1	BKT	213	92	0.95	100.1	91.9
1	BKT	220	93	0.87	110.4	84.2
1	RBT	200	82	1.03	86.2	95.2
1	RBT	240	139	1.01	149.5	93.0
2	BKT	47	0.9	0.87		
2	BKT	52	1	0.71		
2	BKT	54	1.2	0.76		
2	BKT	55	1.4	0.84		
2	BKT	62	1.9	0.80		
2	BKT	63	1.6	0.64		
2	BKT	63	1.9	0.76		
2	BKT	65	2.2	0.80		
2	BKT	69	3.2	0.97		
2	BKT	72	2.7	0.72		
2	BKT	72	3.3	0.88		
2	BKT	148	31	0.96	33.0	93.8
2	BKT	174	52	0.99	54.1	96.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/21/2000

BKT

	Length	Weight	K	Wr
N:	67	67	67	15
Min:	47	0.4	0.34	84.2
Max:	220	100	1.20	115.7
Mean:	91	15	0.90	97.9

RBT

	Length	Weight	K	Wr
N:	2	2	2	2
Min:	200	82	1.01	95.2
Max:	240	139	1.03	93.0
Mean:	220	111	1.02	94.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	54	13	70	± 5.9	0.040	1750	± 148	57.9
RBT	2	0	2	± 0	0.040	50	± 0	12.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	54	13	70	± 5.9	0.051	1372	± 116	45.4
RBT	2	0	2	± 0	0.051	39	± 0	9.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	60	1.7	0.79		
1	BKT	65	2.7	0.98		
1	BKT	66	3.1	1.08		
1	BKT	67	2.3	0.76		
1	BKT	67	2.4	0.80		
1	BKT	68	3.0	0.95		
1	BKT	69	2.7	0.82		
1	BKT	70	2.6	0.76		
1	BKT	70	2.9	0.85		
1	BKT	70	3.7	1.08		
1	BKT	71	4.1	1.15		
1	BKT	72	2.7	0.72		
1	BKT	72	3.3	0.88		
1	BKT	74	3.7	0.91		
1	BKT	74	3.7	0.91		
1	BKT	74	3.7	0.91		
1	BKT	74	3.7	0.91		
1	BKT	74	4.3	1.06		
1	BKT	75	4.0	0.95		
1	BKT	75	4.0	0.95		
1	BKT	75	4.4	1.04		
1	BKT	75	4.8	1.14		
1	BKT	75	4.8	1.14		
1	BKT	77	4.6	1.01		
1	BKT	78	4.1	0.86		
1	BKT	78	4.7	0.99		
1	BKT	78	4.8	1.01		
1	BKT	79	4.2	0.85		
1	BKT	79	4.4	0.89		
1	BKT	79	4.7	0.95		
1	BKT	80	4.2	0.82		
1	BKT	80	4.4	0.86		
1	BKT	80	4.4	0.86		
1	BKT	80	4.6	0.90		
1	BKT	80	4.8	0.94		
1	BKT	81	4.0	0.75		
1	BKT	81	4.4	0.83		
1	BKT	81	4.4	0.83		
1	BKT	81	5.8	1.09		
1	BKT	82	4.3	0.78		
1	BKT	82	4.4	0.80		
1	BKT	82	4.8	0.87		
1	BKT	82	5.3	0.96		
1	BKT	82	5.5	1.00		
1	BKT	83	5.2	0.91		
1	BKT	83	5.3	0.93		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	83	5.7	1.00		
1	BKT	85	5.7	0.93		
1	BKT	85	5.8	0.94		
1	BKT	85	6.2	1.01		
1	BKT	85	6.3	1.03		
1	BKT	86	5.3	0.83		
1	BKT	86	5.3	0.83		
1	BKT	86	7.0	1.10		
1	BKT	87	5.8	0.88		
1	BKT	88	6.6	0.97		
1	BKT	88	7.1	1.04		
1	BKT	89	6.4	0.91		
1	BKT	89	6.9	0.98		
1	BKT	89	7.1	1.01		
1	BKT	91	6.0	0.80		
1	BKT	93	8.1	1.01		
1	BKT	95	7.8	0.91		
1	BKT	95	8.2	0.96		
1	BKT	95	9.2	1.07		
1	BKT	96	7.6	0.86		
1	BKT	120	17	0.98		
1	BKT	126	19	0.95		
1	BKT	156	36	0.95	38.8	92.8
1	BKT	167	46	0.99	47.7	96.4
1	BKT	182	58	0.96	62.0	93.5
1	BKT	190	66	0.96	70.7	93.4
1	BKT	200	77	0.96	82.6	93.2
1	BKT	201	80	0.99	83.9	95.4
1	BKT	201	82	1.01	83.9	97.8
1	BKT	223	116	1.05	115.1	100.8
1	BKT	226	116	1.00	119.8	96.8
1	BKT	236	147	1.12	136.7	107.5
1	BKT	250	146	0.93	162.9	89.6
1	BRN	56	1.6	0.91		
1	BRN	57	1.3	0.70		
1	BRN	57	1.8	0.97		
1	BRN	63	2.3	0.92		
1	BRN	66	2.6	0.90		
1	BRN	68	2.7	0.86		
1	BRN	69	2.5	0.76		
1	BRN	69	2.9	0.88		
1	BRN	69	3.9	1.19		
1	BRN	70	2.8	0.82		
1	BRN	72	2.8	0.75		
1	BRN	72	3.8	1.02		
1	BRN	73	3.5	0.90		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	73	3.7	0.95		
1	BRN	73	4.2	1.08		
1	BRN	73	4.3	1.11		
1	BRN	74	3.5	0.86		
1	BRN	74	3.9	0.96		
1	BRN	74	4.1	1.01		
1	BRN	75	3.7	0.88		
1	BRN	75	3.7	0.88		
1	BRN	75	3.8	0.90		
1	BRN	75	4.1	0.97		
1	BRN	75	4.4	1.04		
1	BRN	75	4.5	1.07		
1	BRN	75	4.7	1.11		
1	BRN	76	4.2	0.96		
1	BRN	76	44	10.02		
1	BRN	77	4.1	0.90		
1	BRN	77	4.8	1.05		
1	BRN	78	4.3	0.91		
1	BRN	78	4.4	0.93		
1	BRN	78	4.8	1.01		
1	BRN	78	4.8	1.01		
1	BRN	79	4.7	0.95		
1	BRN	79	4.7	0.95		
1	BRN	80	4.6	0.90		
1	BRN	80	5.6	1.09		
1	BRN	81	5.2	0.98		
1	BRN	82	4.9	0.89		
1	BRN	82	5.0	0.91		
1	BRN	83	5.4	0.94		
1	BRN	120	16	0.93		
1	BRN	123	16	0.86		
1	BRN	135	22	0.89		
1	BRN	137	24	0.93		
1	BRN	157	36	0.93	42.6	84.5
1	BRN	165	42	0.93	49.3	85.1
1	BRN	195	65	0.88	80.9	80.3
1	BRN	203	83	0.99	91.2	91.0
1	BRN	258	185	1.08	185.4	99.8
1	BRN	274	214	1.04	221.6	96.6
1	BRN	286	226	0.97	251.6	89.8
1	BRN	300	244	0.90	289.9	84.2
1	BRN	305	274	0.97	304.4	90.0
1	CUT	165	37	0.82	48.2	76.8
1	CUT	175	51	0.95	57.8	88.2
1	CUT	177	50	0.90	59.9	83.5
1	CUT	205	73	0.85	94.4	77.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	CUT	257	145	0.85	190.3	76.2
1	HYBRID	43	0.6	0.75		
1	HYBRID	43	0.7	0.88		
1	HYBRID	44	0.3	0.35		
1	HYBRID	45	0.3	0.33		
1	HYBRID	45	0.5	0.55		
1	HYBRID	45	0.5	0.55		
1	HYBRID	48	0.7	0.63		
1	HYBRID	59	1.7	0.83		
1	HYBRID	59	2.1	1.02		
1	HYBRID	60	1.8	0.83		
1	HYBRID	60	1.9	0.88		
1	HYBRID	60	2.1	0.97		
1	HYBRID	61	2.1	0.93		
1	HYBRID	62	2.1	0.88		
1	HYBRID	62	2.5	1.05		
1	HYBRID	63	2.3	0.92		
1	HYBRID	63	2.3	0.92		
1	HYBRID	64	2.5	0.95		
1	HYBRID	65	2.7	0.98		
1	HYBRID	66	2.3	0.80		
1	HYBRID	66	2.6	0.90		
1	HYBRID	68	2.5	0.80		
1	HYBRID	68	2.7	0.86		
1	HYBRID	69	2.5	0.76		
1	HYBRID	69	3.4	1.03		
1	HYBRID	70	2.8	0.82		
1	HYBRID	70	3.2	0.93		
1	HYBRID	70	3.4	0.99		
1	HYBRID	72	3.5	0.94		
1	HYBRID	102	9.1	0.86		
1	HYBRID	110	12	0.90		
1	HYBRID	141	33	1.18		
1	RBT	201	85	1.05	87.5	97.2
1	RBT	225	122	1.07	123.0	99.2
1	RBT	257	168	0.99	183.9	91.3
1	RBT	257	174	1.03	183.9	94.6
1	RBT	268	207	1.08	208.8	99.1
1	RBT	270	192	0.98	213.5	89.9
1	RBT	272	194	0.96	218.3	88.9
1	RBT	273	194	0.95	220.8	87.9
1	RBT	274	192	0.93	223.2	86.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	RBT	274	219	1.06	223.2	98.1
1	RBT	275	202	0.97	225.7	89.5
1	RBT	275	221	1.06	225.7	97.9
1	RBT	275	226	1.09	225.7	100.1
1	RBT	277	194	0.91	230.7	84.1
1	RBT	278	219	1.02	233.2	93.9
1	RBT	278	246	1.14	233.2	105.5
1	RBT	278	246	1.14	233.2	105.5
1	RBT	280	211	0.96	238.3	88.5
1	RBT	280	236	1.08	238.3	99.0
1	RBT	283	236	1.04	246.2	95.9
1	RBT	284	243	1.06	248.8	97.7
1	RBT	287	254	1.07	256.8	98.9
1	RBT	288	254	1.06	259.5	97.9
1	RBT	295	240	0.93	279.1	86.0
1	RBT	295	254	0.99	279.1	91.0
1	RBT	296	274	1.06	282.0	97.2
1	RBT	296	315	1.21	282.0	111.7
1	RBT	298	271	1.02	287.8	94.2
1	RBT	298	305	1.15	287.8	106.0
1	RBT	302	274	0.99	299.6	91.5
1	RBT	302	300	1.09	299.6	100.1
1	RBT	303	278	1.00	302.6	91.9
1	RBT	305	315	1.11	308.7	102.0
1	RBT	305	325	1.15	308.7	105.3
1	RBT	312	305	1.00	330.6	92.3
1	RBT	321	335	1.01	360.3	93.0
1	RBT	321	410	1.24	360.3	113.8
1	RBT	374	545	1.04	572.0	95.3
1	RBT	405	745	1.12	727.7	102.4
2	BKT	59	2.1	1.02		
2	BKT	61	1.9	0.84		
2	BKT	67	2.3	0.76		
2	BKT	71	2.6	0.73		
2	BKT	72	3.2	0.86		
2	BKT	72	3.5	0.94		
2	BKT	74	3.8	0.94		
2	BKT	74	4.0	0.99		
2	BKT	75	3.3	0.78		
2	BKT	75	4.5	1.07		
2	BKT	76	3.8	0.87		
2	BKT	77	3.8	0.83		
2	BKT	77	4.5	0.99		
2	BKT	79	3.0	0.61		
2	BKT	79	3.8	0.77		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BKT	79	4.4	0.89		
2	BKT	80	4.6	0.90		
2	BKT	80	4.6	0.90		
2	BKT	80	4.8	0.94		
2	BKT	81	4.8	0.90		
2	BKT	84	6.3	1.06		
2	BKT	85	4.9	0.80		
2	BKT	89	5.6	0.79		
2	BKT	92	5.8	0.74		
2	BKT	92	6.8	0.87		
2	BKT	95	72	8.40		
2	BKT	120	15	0.87		
2	BKT	145	28	0.92	31.0	90.2
2	BKT	206	86	0.98	90.4	95.1
2	BKT	226	128	1.11	119.8	106.8
2	BRN	58	1.3	0.67		
2	BRN	62	2.3	0.97		
2	BRN	77	4.2	0.92		
2	BRN	78	4.7	0.99		
2	BRN	78	4.9	1.03		
2	BRN	80	5.0	0.98		
2	BRN	83	3.8	0.66		
2	BRN	83	6.2	1.08		
2	BRN	85	4.9	0.80		
2	BRN	228	116	0.98	128.6	90.2
2	HYBRID	49	0.8	0.68		
2	HYBRID	52	1.1	0.78		
2	HYBRID	52	1.8	1.28		
2	HYBRID	53	1.3	0.87		
2	HYBRID	53	1.6	1.07		
2	HYBRID	54	1.4	0.89		
2	HYBRID	55	1.3	0.78		
2	HYBRID	55	1.4	0.84		
2	HYBRID	59	1.3	0.63		
2	HYBRID	59	1.7	0.83		
2	HYBRID	60	1.9	0.88		
2	HYBRID	60	2.0	0.93		
2	HYBRID	61	2.1	0.93		
2	HYBRID	61	2.2	0.97		
2	HYBRID	61	2.3	1.01		
2	HYBRID	62	2.4	1.01		
2	HYBRID	65	2.3	0.84		
2	HYBRID	65	2.5	0.91		
2	HYBRID	66	3.1	1.08		
2	HYBRID	67	3.4	1.13		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	HYBRID	69	2.9	0.88		
2	HYBRID	70	3.4	0.99		
2	HYBRID	71	3.0	0.84		
2	HYBRID	71	3.1	0.87		
2	HYBRID	74	3.4	0.84		
2	HYBRID	75	3.4	0.81		
2	HYBRID	104	11	0.98		
2	HYBRID	200	73	0.91		
2	HYBRID	210	118	1.27		
2	RBT	259	192	1.11	188.3	102.0
2	RBT	296	260	1.00	282.0	92.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

BKT

	Length	Weight	K	Wr
N:	109	109	109	14
Min:	59	1.7	0.61	89.6
Max:	250	147	8.40	107.5
Mean:	96	16	0.99	96.4

BRN

	Length	Weight	K	Wr
N:	65	65	65	10
Min:	56	1.3	0.66	80.3
Max:	305	274	10.02	99.8
Mean:	102	28	1.08	89.2

CUT

	Length	Weight	K	Wr
N:	5	5	5	5
Min:	165	37	0.82	76.2
Max:	257	145	0.95	88.2
Mean:	196	71	0.88	80.4

HYBRID

	Length	Weight	K	Wr
N:	61	61	61	N/A
Min:	43	0.3	0.33	N/A
Max:	210	118	1.28	N/A
Mean:	69	6	0.88	N/A

RBT

	Length	Weight	K	Wr
N:	41	41	41	41
Min:	201	85	0.91	84.1
Max:	405	745	1.24	113.8
Mean:	288	260	1.05	96.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	79	30	125	± 18.4	0.167	748	± 110	26.4
BRN	55	10	66	± 3.5	0.167	395	± 21	24.4
CUT	5	0	5	± 0	0.167	30	± 0	4.7
HYBRID	32	29	61*	--	0.167	365*	--	4.8*
RBT	39	2	41	± 0.7	0.167	246	± 4	141.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2000

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	79	30	125	± 18.4	0.080	1562	± 230	55.1
BRN	55	10	66	± 3.5	0.080	825	± 44	50.9
CUT	5	0	5	± 0	0.080	62	± 0	9.7
HYBRID	32	29	61*	--	0.080	762*	--	10.1*
RBT	39	2	41	± 0.7	0.080	512	± 9	293.5

* Based on number of fish counted (61)

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/21/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	202	78	0.95	85.1	91.6
1	BRN	56	1.6	0.91		
1	BRN	65	2.4	0.87		
1	BRN	67	2.8	0.93		
1	BRN	70	3.3	0.96		
1	BRN	73	4.0	1.03		
1	BRN	74	4.4	1.09		
1	BRN	75	5.0	1.19		
1	BRN	76	5.1	1.16		
1	BRN	79	4.7	0.95		
1	BRN	80	5.4	1.05		
1	BRN	87	6.3	0.96		
1	BRN	93	6.8	0.85		
1	BRN	126	21	1.05		
1	BRN	167	44	0.94	51.1	86.1
1	BRN	190	68	0.99	74.9	90.7
1	BRN	202	76	0.92	89.8	84.6
1	BRN	218	90	0.87	112.6	79.9
1	BRN	218	100	0.97	112.6	88.8
1	BRN	219	96	0.91	114.1	84.1
1	BRN	227	123	1.05	126.9	96.9
1	BRN	229	124	1.03	130.3	95.2
1	BRN	240	126	0.91	149.7	84.2
1	BRN	242	142	1.00	153.4	92.6
1	BRN	246	123	0.83	161.0	76.4
1	BRN	247	164	1.09	163.0	100.6
1	BRN	273	192	0.94	219.2	87.6
1	RBT	243	156	1.09	155.3	100.5
1	RBT	251	186	1.18	171.2	108.6
1	WS	192	78	1.10		
2	BRN	65	2.6	0.95		
2	BRN	91	7.3	0.97		
2	BRN	94	8.4	1.01		
2	BRN	136	27	1.07		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/21/2000

BKT

	Length	Weight	K	Wr
N:	1	1	1	1
Min:	202	78	0.95	91.6
Max:	202	78	0.95	91.6
Mean:	202	78	0.95	91.6

BRN

	Length	Weight	K	Wr
N:	30	30	30	13
Min:	56	1.6	0.83	76.4
Max:	273	192	1.19	100.6
Mean:	144	53	0.98	88.3

RBT

	Length	Weight	K	Wr
N:	2	2	2	2
Min:	243	156	1.09	100.5
Max:	251	186	1.18	108.6
Mean:	247	171	1.13	104.5

WS

	Length	Weight	K	Wr
N:	1	1	1	N/A
Min:	192	78	1.10	N/A
Max:	192	78	1.10	N/A
Mean:	192	78	1.10	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	1	0	1	± 0	0.12	8	± 0	1.4
BRN	26	4	30	± 1.7	0.12	250	± 14	29.20
RBT	2	0	2	± 0	0.12	17	± 0	6.4
WS	1	0	1	± 0	0.12	8	± 0	1.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	1	0	1	± 0	0.062	16	± 0	2.8
BRN	26	4	30	± 1.7	0.062	484	± 27	56.6
RBT	2	0	2	± 0	0.062	32	± 0	12.1
WS	1	0	1	± 0	0.062	16	± 0	2.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/19/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	70	3.6	1.05		
1	BRN	77	4.2	0.92		
1	BRN	79	5	1.01		
1	BRN	81	5.4	1.02		
1	BRN	82	6	1.09		
1	BRN	91	8.2	1.09		
1	BRN	91	7.5	1.00		
1	BRN	96	9.1	1.03		
1	BRN	97	9.4	1.03		
1	BRN	98	8.4	0.89		
1	BRN	98	9.5	1.01		
1	BRN	100	10	1.00		
1	BRN	100	10	1.00		
1	BRN	105	12.5	1.08		
1	BRN	110	14	1.05		
1	BRN	165	42	0.93	49.3	85.1
1	BRN	168	50	1.05	52.0	96.1
1	BRN	170	50	1.02	53.9	92.8
1	BRN	198	76	0.98	84.7	89.8
1	BRN	200	92	1.15	87.2	105.5
1	BRN	208	85	0.94	98.0	86.8
1	BRN	214	96	0.98	106.6	90.1
1	BRN	214	92	0.94	106.6	86.3
1	BRN	215	92	0.93	108.1	85.1
1	BRN	220	110	1.03	115.7	95.1
1	BRN	222	100	0.91	118.8	84.2
1	BRN	229	130	1.08	130.3	99.8
1	BRN	229	125	1.04	130.3	96.0
1	BRN	230	127	1.04	132.0	96.2
1	BRN	235	128	0.99	140.6	91.0
1	BRN	238	150	1.11	146.0	102.7
1	BRN	241	155	1.11	151.5	102.3
1	BRN	243	135	0.94	155.3	86.9
1	BRN	245	155	1.05	159.1	97.4
1	BRN	253	150	0.93	175.0	85.7
1	BRN	254	164	1.00	177.1	92.6
1	BRN	254	160	0.98	177.1	90.4
1	BRN	257	205	1.21	183.3	111.8
1	BRN	262	193	1.07	194.1	99.4
1	BRN	269	202	1.04	209.9	96.3
1	BRN	269	180	0.92	209.9	85.8
1	BRN	270	205	1.04	212.2	96.6
1	BRN	277	220	1.04	228.9	96.1
1	BRN	282	232	1.03	241.3	96.1
1	BRN	299	250	0.94	287.0	87.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/19/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	300	270	1.00	289.9	93.1
1	BRN	312	310	1.02	325.6	95.2
1	BRN	342	380	0.95	427.4	88.9
1	RBT	251	180	1.14	171.2	105.1
1	RBT	252	185	1.16	173.3	106.7
1	RBT	265	204	1.10	201.8	101.1
1	RBT	278	238	1.11	233.2	102.0
1	WS	52	1.4	1.00		
2	BRN	85	5.4	0.88		
2	BRN	105	12	1.04		
2	BRN	157	37	0.96	42.6	86.9
2	RBT	300	298	1.10	293.6	101.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/19/2000

BRN

	Length	Weight	K	Wr
N:	51	51	51	34
Min:	70	3.6	0.88	84.2
Max:	342	380	1.21	111.8
Mean:	190	104	1.01	93.3

RBT

	Length	Weight	K	Wr
N:	5	5	5	5
Min:	251	180	1.10	101.1
Max:	300	298	1.16	101.1
Mean:	269	221	1.12	103.3

WS

	Length	Weight	K	Wr
N:	1	1	1	N/A
Min:	52	1.4	1.00	N/A
Max:	52	1.4	1.00	N/A
Mean:	52	1.4	1.00	N/A

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	48	3	51	± 0.9	0.122	418	± 7	95.9
RBT	4	1	5	± 1.5	0.122	41	± 12	20
WS	1	0	1	± 0	0.122	8	± 0	<0.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	48	3	51	± 0.9	0.057	895	± 16	205.2
RBT	4	1	5	± 1.5	0.057	88	± 26	42.9
WS	1	0	1	± 0	0.057	18	± 0	<0.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/19/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	RBT	241	181	1.29	151.4	119.5
2	NO FISH	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/19/2000

RBT

	Length	Weight	K	Wr
N:	1	1	1	1
Min:	241	181	1.29	119.5
Max:	241	181	1.29	119.5
Mean:	241	181	1.29	119.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
RBT	1	0	1	± 0	0.115	9	± 0	3.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
RBT	1	0	1	± 0	0.066	15	± 0	6.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/19/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	191	73	1.05	76.1	95.9
1	BRN	205	85	0.99	93.8	90.6
1	BRN	205	84	0.98	93.8	89.5
1	BRN	219	112	1.07	114.1	98.1
1	BRN	223	112	1.01	120.4	93.0
1	BRN	226	116	1.00	125.3	92.6
1	BRN	239	128	0.94	147.8	86.6
1	BRN	240	142	1.03	149.7	94.9
1	BRN	246	152	1.02	161.0	94.4
1	BRN	258	167	0.97	185.4	90.1
1	BRN	260	158	0.90	189.7	83.3
1	BRN	262	170	0.95	194.1	87.6
1	BRN	265	179	0.96	200.7	89.2
1	BRN	273	191	0.94	219.2	87.1
1	BRN	281	215	0.97	238.8	90.0
1	BRN	302	277	1.01	295.7	93.7
1	BRN	305	282	0.99	304.4	92.6
2	BRN	242	126	0.89	153.4	82.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/19/2000

BRN

	Length	Weight	K	Wr
N:	18	18	18	18
Min:	191	73	0.89	82.13
Max:	305	282	1.07	98.13
Mean:	247	154	0.98	90.62

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	17	1	18	± 0.5	0.089	202	± 6	68.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	17	1	18	± 0.5	0.051	353	± 10	119.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/19/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	62	2.5	1.05		
1	BRN	63	2.7	1.08		
1	BRN	66	2.9	1.01		
1	BRN	77	4.3	0.94		
1	BRN	80	4.5	0.88		
1	BRN	82	5.3	0.96		
1	BRN	83	6.1	1.07		
1	BRN	86	6.3	0.99		
1	BRN	87	6.3	0.96		
1	BRN	88	6.4	0.94		
1	BRN	88	6.2	0.91		
1	BRN	101	11	1.07		
1	BRN	130	21	0.96		
1	BRN	138	25	0.95		
1	BRN	143	27	0.92	32.3	83.6
1	BRN	146	31	1.00	34.3	90.3
1	BRN	155	34	0.91	41.0	82.9
1	BRN	170	45	0.92	53.9	83.5
1	BRN	185	66	1.04	69.2	95.3
1	BRN	187	72	1.10	71.5	100.7
1	BRN	190	67	0.98	74.9	89.4
1	BRN	191	66	0.95	76.1	86.7
1	BRN	192	71	1.00	77.3	91.9
1	BRN	194	70	0.96	79.7	87.8
1	BRN	195	76	1.02	80.9	93.9
1	BRN	195	77	1.04	80.9	95.1
1	BRN	195	71	0.96	80.9	87.7
1	BRN	196	75	1.00	82.2	91.3
1	BRN	196	75	1.00	82.2	91.3
1	BRN	196	62	0.82	82.2	75.5
1	BRN	207	86	0.97	96.6	89.0
1	BRN	219	109	1.04	114.1	95.5
1	BRN	230	119	0.98	132.0	90.2
1	BRN	231	114	0.92	133.7	85.3
1	BRN	233	126	1.00	137.1	91.9
1	BRN	237	126	0.95	144.2	87.4
1	BRN	266	176	0.94	203.0	86.7
1	BRN	283	198	0.87	243.9	81.2
2	BRN	75	4.2	1.00		
2	BRN	125	19	0.97		
2	BRN	135	24	0.98		
2	BRN	136	25	0.99		
2	BRN	142	27	0.94	31.6	85.4
2	BRN	180	55	0.94	63.8	86.1
2	BRN	191	70	1.00	76.1	92.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/19/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	193	68	0.95	78.5	86.6
2	BRN	197	73	0.95	83.4	87.5
2	BRN	218	99	0.96	112.6	87.9
2	BRN	223	107	0.96	120.4	88.9
2	BRN	264	151	0.82	198.5	76.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/19/2000

BRN

	Length	Weight	K	Wr
N:	50	50	50	32
Min:	62	2.5	0.82	75.5
Max:	283	198	1.10	100.7
Mean:	163	57	0.97	88.3

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	38	12	54	± 7.9	0.188	287	± 42	36.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	38	12	54	± 7.9	0.08	675	± 99	84.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/18/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	68	3	0.95		
1	BRN	73	3.7	0.95		
1	BRN	103	11	1.01		
1	BRN	135	23	0.93		
1	BRN	141	24	0.86	31.0	77.5
1	BRN	144	30	1.00	33.0	91.0
1	BRN	183	56	0.91	67.0	83.5
1	BRN	190	78	1.14	74.9	104.1
1	BRN	193	68	0.95	78.5	86.6
1	BRN	203	77	0.92	91.2	84.5
1	BRN	207	81	0.91	96.6	83.9
1	BRN	219	104	0.99	114.1	91.1
1	BRN	229	112	0.93	130.3	86.0
1	BRN	234	114	0.89	138.9	82.1
1	BRN	249	149	0.97	166.9	89.3
1	BRN	282	194	0.87	241.3	80.4
2	BRN	79	4.7	0.95		
2	BRN	87	5.9	0.90		
2	BRN	121	16	0.90		
2	BRN	132	21	0.91		
2	BRN	133	21.5	0.91		
2	BRN	170	39	0.79	53.9	72.4
2	BRN	176	51	0.94	59.7	85.4
2	BRN	177	51	0.92	60.7	84.0
2	BRN	203	78	0.93	91.2	85.6
3	BRN	59	1.9	0.93		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/18/2000

BRN

	Length	Weight	K	Wr
N:	26	26	26	16
Min:	59	1.9	0.79	72.4
Max:	282	194	1.14	104.1
Mean:	161	55	0.93	85.4

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	16	9	1	26	± 2.3	0.191	136	± 12	16.5

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	16	9	1	26	± 2.3	0.083	313	± 28	38

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	75	3.4	0.81		
1	BRN	76	3.5	0.80		
1	BRN	76	3.7	0.84		
1	BRN	81	4.7	0.88		
1	BRN	87	4.2	0.64		
1	BRN	88	6.1	0.90		
1	BRN	90	6.3	0.86		
1	BRN	94	8.7	1.05		
1	BRN	95	8.2	0.96		
1	BRN	97	8	0.88		
1	BRN	97	9.1	1.00		
1	BRN	100	9.4	0.94		
1	BRN	100	10	1.00		
1	BRN	103	10	0.92		
1	BRN	111	15	1.10		
1	BRN	165	39	0.87	49.3	79.0
1	BRN	168	49	1.03	52.0	94.2
1	BRN	178	56	0.99	61.8	90.7
1	BRN	180	58	0.99	63.8	90.8
1	BRN	181	57	0.96	64.9	87.8
1	BRN	185	62	0.98	69.2	89.5
1	BRN	190	64	0.93	74.9	85.4
1	BRN	217	101	0.99	111.1	90.9
1	BRN	219	102	0.97	114.1	89.4
1	BRN	231	126	1.02	133.7	94.3
1	BRN	231	130	1.05	133.7	97.3
1	BRN	239	140	1.03	147.8	94.7
1	HYBRID	107	14	1.14		
1	RBT	189	68	1.01		
1	RBT	201	80	0.99		
1	RBT	202	86	1.04		
1	RBT	204	87	1.02		
1	RBT	205	114	1.32		
1	RBT	207	88	0.99		
1	RBT	217	100	0.98		
1	RBT	221	102	0.94		
1	RBT	241	142	1.01		
1	RBT	244	151	1.04		
1	RBT	245	146	0.99		
1	RBT	248	152	1.00		
1	RBT	248	172	1.13		
1	RBT	249	180	1.17		
1	RBT	250	168	1.08		
1	RBT	272	188	0.93		
1	RBT	276	215	1.02		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	RBT	279	231	1.06		
1	RBT	280	219	1.00		
1	RBT	358	540	1.18		
2	BRN	72	3.6	0.96		
2	BRN	85	5.9	0.96		
2	BRN	96	9	1.02		
2	BRN	104	12	1.07		
2	BRN	116	15	0.96		
2	BRN	116	16	1.03		
2	BRN	118	17	1.03		
2	BRN	163	51	1.18	47.6	107.2
2	BRN	180	58	0.99	63.8	90.8
2	BRN	195	66	0.89	80.9	81.6
2	BRN	218	100	0.97	112.6	88.8
2	BRN	234	118	0.92	138.9	85.0
2	BRN	240	135	0.98	149.7	90.2
2	RBT	213	96	0.99	104.2	92.1
2	RBT	235	140	1.08	140.3	99.8
2	RBT	237	154	1.16	144.0	107.0
2	RBT	238	144	1.07	145.8	98.8
2	RBT	242	147	1.04	153.3	95.9
2	RBT	251	170	1.08	171.2	99.3
2	RBT	262	175	0.97	195.0	89.8
2	RBT	291	276	1.12	267.8	103.1
2	RBT	301	274	1.00	296.6	92.4
3	BRN	110	13	0.98		
3	BRN	196	82	1.09	82.2	99.8
3	BRN	217	92	0.90	111.1	82.8
3	RBT	177	50	0.90		
3	RBT	227	124	1.06	126.4	98.1
3	RBT	229	132	1.10	129.8	101.7
3	RBT	261	192	1.08	192.7	99.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/20/2000

BRN

	Length	Weight	K	Wr
N:	43	43	43	20
Min:	72	3.4	0.64	79.0
Max:	240	140	1.18	107.2
Mean:	145	44	0.96	90.5

HYBRID

	Length	Weight	K	Wr
N:	1	1	1	N/A
Min:	107	14	1.14	N/A
Max:	107	14	1.14	N/A
Mean:	107	14	1.14	N/A

RBT

	Length	Weight	K	Wr
N:	33	33	33	12
Min:	177	50	0.90	89.8
Max:	358	540	1.32	107.0
Mean:	242	161	1.05	98.1

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	27	13	3	44	± 3.8	0.142	310	± 27	30.10
HYBRID	1	0	0	1	± 0	0.142	7	± 0	0.2
RBT	20	9	4	35	± 5.2	0.142	246	± 37	87.3

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	27	13	3	44	± 3.8	0.063	698	± 60	67.7
HYBRID	1	0	0	1	± 0	0.063	16	± 0	0.5
RBT	20	9	4	35	± 5.2	0.063	556	± 82	197.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	77	4.5	0.99		
1	BRN	81	4.5	0.85		
1	BRN	82	5.5	1.00		
1	BRN	85	6	0.98		
1	BRN	88	9	1.32		
1	BRN	95	9.1	1.06		
1	BRN	96	9.5	1.07		
1	BRN	100	9	0.90		
1	BRN	100	9.5	0.95		
1	BRN	100	10	1.00		
1	BRN	100	10	1.00		
1	BRN	104	10	0.89		
1	BRN	104	10	0.89		
1	BRN	105	11	0.95		
1	BRN	106	12	1.01		
1	BRN	107	11	0.90		
1	BRN	107	11	0.90		
1	BRN	108	11	0.87		
1	BRN	109	13	1.00		
1	BRN	110	11	0.83		
1	BRN	110	11	0.83		
1	BRN	110	12	0.90		
1	BRN	110	12	0.90		
1	BRN	110	13	0.98		
1	BRN	111	10	0.73		
1	BRN	111	11	0.80		
1	BRN	111	14	1.02		
1	BRN	114	11	0.74		
1	BRN	116	16	1.03		
1	BRN	116	16	1.03		
1	BRN	116	16	1.03		
1	BRN	118	16	0.97		
1	BRN	119	17	1.01		
1	BRN	120	16	0.93		
1	BRN	120	16	0.93		
1	BRN	121	18	1.02		
1	BRN	124	17	0.89		
1	BRN	125	17	0.87		
1	BRN	125	19	0.97		
1	BRN	126	18	0.90		
1	BRN	126	21	1.05		
1	BRN	127	20	0.98		
1	BRN	127	20	0.98		
1	BRN	127	21	1.03		
1	BRN	128	20	0.95		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	128	22	1.05		
1	BRN	132	21	0.91		
1	BRN	132	24	1.04		
1	BRN	133	24	1.02		
1	BRN	133	24	1.02		
1	BRN	134	24	1.00		
1	BRN	135	21	0.85		
1	BRN	135	35	1.42		
1	BRN	137	27	1.05		
1	BRN	138	24	0.91		
1	BRN	139	26	0.97		
1	BRN	141	25	0.89	31.0	80.7
1	BRN	142	25	0.87	31.6	79.0
1	BRN	143	28	0.96	32.3	86.7
1	BRN	145	29	0.95	33.6	86.2
1	BRN	149	36	1.09	36.5	98.7
1	BRN	152	44	1.25	38.7	113.7
1	BRN	153	43	1.20	39.5	109.0
1	BRN	155	39	1.05	41.0	95.1
1	BRN	155	40	1.07	41.0	97.6
1	BRN	157	40	1.03	42.6	93.9
1	BRN	158	43	1.09	43.4	99.1
1	BRN	159	30	0.75	44.2	67.9
1	BRN	159	41	1.02	44.2	92.7
1	BRN	163	49	1.13	47.6	103.0
1	BRN	163	49	1.13	47.6	103.0
1	BRN	165	43	0.96	49.3	87.2
1	BRN	165	44	0.98	49.3	89.2
1	BRN	171	51	1.02	54.8	93.0
1	BRN	174	47	0.89	57.7	81.4
1	BRN	180	65	1.11	63.8	101.8
1	BRN	200	86	1.08	87.2	98.6
1	BRN	215	101	1.02	108.1	93.5
1	BRN	219	98	0.93	114.1	85.9
1	BRN	220	107	1.00	115.7	92.5
1	BRN	223	111	1.00	120.4	92.2
1	BRN	223	119	1.07	120.4	98.8
1	BRN	228	123	1.04	128.6	95.7
1	BRN	229	122	1.02	130.3	93.7
1	BRN	230	131	1.08	132.0	99.3
1	BRN	231	148	1.20	133.7	110.7
1	BRN	233	134	1.06	137.1	97.7
1	BRN	235	138	1.06	140.6	98.1
1	BRN	236	140	1.07	142.4	98.3
1	BRN	236	140	1.07	142.4	98.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	237	142	1.07	144.2	98.5
1	BRN	239	131	0.96	147.8	88.6
1	BRN	239	154	1.13	147.8	104.2
1	BRN	245	162	1.10	159.1	101.8
1	BRN	246	141	0.95	161.0	87.6
1	BRN	249	150	0.97	166.9	89.9
1	BRN	250	159	1.02	168.9	94.1
1	BRN	251	147	0.93	170.9	86.0
1	BRN	251	161	1.02	170.9	94.2
1	BRN	252	176	1.10	173.0	101.8
1	BRN	253	148	0.91	175.0	84.6
1	BRN	253	167	1.03	175.0	95.4
1	BRN	253	170	1.05	175.0	97.1
1	BRN	253	172	1.06	175.0	98.3
1	BRN	254	183	1.12	177.1	103.4
1	BRN	255	159	0.96	179.1	88.8
1	BRN	260	196	1.12	189.7	103.3
1	BRN	261	194	1.09	191.9	101.1
1	BRN	264	183	0.99	198.5	92.2
1	BRN	265	182	0.98	200.7	90.7
1	BRN	265	212	1.14	200.7	105.6
1	BRN	267	199	1.05	205.3	96.9
1	BRN	267	211	1.11	205.3	102.8
1	BRN	275	224	1.08	224.0	100.0
1	BRN	277	231	1.09	228.9	100.9
1	BRN	280	220	1.00	236.3	93.1
1	BRN	282	230	1.03	241.3	95.3
1	BRN	283	258	1.14	243.9	105.8
1	BRN	284	218	0.95	246.5	88.5
1	BRN	285	249	1.08	249.0	100.0
1	BRN	286	272	1.16	251.6	108.1
1	BRN	289	276	1.14	259.5	106.3
1	BRN	292	270	1.08	267.6	100.9
1	BRN	293	232	0.92	270.3	85.8
1	BRN	294	241	0.95	273.1	88.3
1	BRN	294	274	1.08	273.1	100.3
1	BRN	304	269	0.96	301.5	89.2
1	BRN	307	292	1.01	310.4	94.1
1	BRN	308	312	1.07	313.4	99.6
1	BRN	312	309	1.02	325.6	94.9
1	BRN	312	320	1.05	325.6	98.3
1	BRN	314	309	1.00	331.8	93.1
1	BRN	315	318	1.02	335.0	94.9
1	BRN	316	312	0.99	338.1	92.3
1	BRN	319	345	1.06	347.7	99.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	330	340	0.95	384.4	88.4
1	BRN	332	298	0.81	391.4	76.1
1	BRN	333	345	0.93	394.9	87.4
1	BRN	336	412	1.09	405.5	101.6
1	BRN	337	402	1.05	409.1	98.3
1	BRN	339	417	1.07	416.3	100.2
1	BRN	340	408	1.04	420.0	97.1
1	BRN	345	445	1.08	438.6	101.5
1	BRN	358	483	1.05	489.3	98.7
1	BRN	371	575	1.13	543.9	105.7
1	BRN	375	507	0.96	561.4	90.3
1	RBT	158	49	1.24		
1	RBT	193	74	1.03		
1	RBT	203	88	1.05	90.1	97.6
1	RBT	220	98	0.92	114.9	85.3
1	RBT	240	141	1.02	149.5	94.3
1	RBT	242	148	1.04	153.3	96.5
1	RBT	250	144	0.92	169.2	85.1
1	RBT	260	178	1.01	190.5	93.4
2	BRN	91	7.3	0.97		
2	BRN	91	7.5	1.00		
2	BRN	95	9.1	1.06		
2	BRN	98	9	0.96		
2	BRN	107	12	0.98		
2	BRN	107	13	1.06		
2	BRN	109	14	1.08		
2	BRN	119	18	1.07		
2	BRN	121	20	1.13		
2	BRN	122	19	1.05		
2	BRN	126	19	0.95		
2	BRN	126	21	1.05		
2	BRN	127	21	1.03		
2	BRN	128	21	1.00		
2	BRN	130	25	1.14		
2	BRN	131	25	1.11		
2	BRN	137	25	0.97		
2	BRN	137	28	1.09		
2	BRN	138	27	1.03		
2	BRN	141	31	1.11	31.0	100.1
2	BRN	144	32	1.07	33.0	97.1
2	BRN	147	33	1.04	35.0	94.2
2	BRN	153	26	0.73	39.5	65.9
2	BRN	156	41	1.08	41.8	98.1
2	BRN	212	91	0.96	103.7	87.8
2	BRN	219	112	1.07	114.1	98.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/20/2000

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	229	132	1.10	130.3	101.3
2	BRN	241	152	1.09	151.5	100.3
2	BRN	241	152	1.09	151.5	100.3
2	BRN	250	152	0.97	168.9	90.0
2	BRN	252	188	1.17	173.0	108.7
2	BRN	253	163	1.01	175.0	93.1
2	BRN	255	188	1.13	179.1	105.0
2	BRN	261	172	0.97	191.9	89.6
2	BRN	266	182	0.97	203.0	89.7
2	BRN	271	208	1.05	214.5	97.0
2	BRN	277	215	1.01	228.9	93.9
2	BRN	277	215	1.01	228.9	93.9
2	BRN	278	228	1.06	231.3	98.6
2	BRN	299	295	1.10	287.0	102.8
2	BRN	306	300	1.05	307.4	97.6
2	BRN	308	315	1.08	313.4	100.5
2	BRN	310	298	1.00	319.5	93.3
2	BRN	311	273	0.91	322.5	84.6
2	BRN	315	340	1.09	335.0	101.5
2	BRN	320	360	1.10	351.0	102.6
2	BRN	337	420	1.10	409.1	102.7
2	BRN	358	428	0.93	489.3	87.5
2	RBT	184	66	1.06		
2	RBT	207	88	0.99	95.6	92.0
2	RBT	213	98	1.01	104.2	94.0
2	RBT	217	101	0.99	110.3	91.6
2	RBT	248	168	1.10	165.1	101.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/20/2000

BRN

	Length	Weight	K	Wr
N:	194	194	194	119
Min:	77	4.5	0.73	65.9
Max:	375	575	1.42	113.7
Mean:	198	124	1.01	95.5

RBT

	Length	Weight	K	Wr
N:	13	13	13	10
Min:	158	49	0.92	85.1
Max:	260	178	1.24	101.7
Mean:	218	111	1.03	93.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	146	48	216	± 19.2	0.214	1009	± 90	275.9
RBT	8	5	16	± 11.8	0.214	75	± 55	18.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	146	48	216	± 19.2	0.066	3273	± 291	894.9
RBT	8	5	16	± 11.8	0.066	242	± 179	59.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	177	53	0.96	57.0	93.0
1	BKT	143	25	0.85	29.8	84.0
1	BKT	139	24	0.89	27.3	87.9
1	BKT	81	5.2	0.98		
1	BKT	77	4.6	1.01		
1	BKT	75	4.4	1.04		
1	BKT	64	2.2	0.84		
1	BRN	186	59	0.92	70.4	83.9
1	BRN	174	49	0.93	57.7	84.9
1	BRN	159	40	1.00	44.2	90.5
1	BRN	157	34	0.88	42.6	79.8
1	BRN	154	35	0.96	40.2	87.0
1	BRN	145	30	0.98	33.6	89.2
1	BRN	144	32	1.07		
1	BRN	135	24	0.98		
1	BRN	78	4.7	0.99		
1	BRN	75	4.2	1.00		
1	BRN	74	4.9	1.21		
1	BRN	74	3.8	0.94		
1	BRN	72	4.1	1.10		
1	BRN	65	2.7	0.98		
1	HYBRID	219	101	0.96		
1	HYBRID	217	92	0.90		
1	HYBRID	206	78	0.89		
1	HYBRID	200	78	0.98		
1	HYBRID	193	70	0.97		
1	HYBRID	187	66	1.01		
1	HYBRID	185	55	0.87		
1	HYBRID	183	70	1.14		
1	HYBRID	173	54	1.04		
1	HYBRID	170	43	0.88		
1	HYBRID	166	42	0.92		
1	HYBRID	164	49	1.11		
1	HYBRID	162	42	0.99		
1	HYBRID	160	39	0.95		
1	HYBRID	153	37	1.03		
1	HYBRID	150	31	0.92		
1	HYBRID	142	31	1.08		
1	HYBRID	140	32	1.17		
1	HYBRID	140	29	1.06		
1	HYBRID	140	26	0.95		
1	HYBRID	139	29	1.08		
1	HYBRID	137	25	0.97		
1	HYBRID	135	23	0.93		
1	HYBRID	132	23	1.00		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	HYBRID	132	22	0.96		
1	HYBRID	131	23	1.02		
1	HYBRID	131	22	0.98		
1	HYBRID	130	22	1.00		
1	HYBRID	130	21	0.96		
1	HYBRID	129	19	0.89		
1	HYBRID	127	22	1.07		
1	HYBRID	127	18	0.88		
1	HYBRID	124	20	1.05		
1	HYBRID	123	19	1.02		
1	HYBRID	122	17	0.94		
1	HYBRID	121	21	1.19		
1	HYBRID	121	18	1.02		
1	HYBRID	121	17	0.96		
1	HYBRID	120	17	0.98		
1	HYBRID	120	17	0.98		
1	HYBRID	118	16	0.97		
1	HYBRID	117	15	0.94		
1	HYBRID	116	19	1.22		
1	HYBRID	116	18	1.15		
1	HYBRID	115	16	1.05		
1	HYBRID	114	13	0.88		
1	HYBRID	113	15	1.04		
1	HYBRID	110	14	1.05		
1	HYBRID	109	13	1.00		
1	HYBRID	106	12	1.01		
1	HYBRID	104	10	0.89		
1	HYBRID	101	11	1.07		
1	HYBRID	99	11	1.13		
1	HYBRID	97	10	1.10		
1	HYBRID	97	9.2	1.01		
1	HYBRID	95	11	1.28		
1	HYBRID	67	3.1	1.03		
1	HYBRID	65	3.2	1.17		
1	HYBRID	65	2.9	1.06		
1	HYBRID	65	2.9	1.06		
1	HYBRID	64	2.7	1.03		
1	HYBRID	63	2.9	1.16		
1	HYBRID	59	1.9	0.93		
1	HYBRID	58	1.8	0.92		
1	HYBRID	56	1.3	0.74		
1	HYBRID	55	1.6	0.96		
1	HYBRID	55	1.4	0.84		
1	HYBRID	53	1.8	1.21		
1	HYBRID	52	1.3	0.92		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	HYBRID	50	1.4	1.12		
1	HYBRID	50	0.9	0.72		
1	HYBRID	45	0.7	0.77		
1	HYBRID	43	0.8	1.01		
1	HYBRID	40	0.5	0.78		
1	RBT	281	225	1.01	240.9	93.4
1	RBT	257	171	1.01	183.9	93.0
1	RBT	210	93	1.00	99.9	93.1
1	RBT	209	93	1.02	98.4	94.5
2	BKT	170	47	0.96	50.4	93.3
2	BKT	142	24	0.84	29.1	82.4
2	BKT	125	16	0.82		
2	BKT	75	4.3	1.02		
2	BRN	83	5.5	0.96		
2	BRN	81	4.5	0.85		
2	HYBRID	202	83	1.01		
2	HYBRID	155	33	0.89		
2	HYBRID	153	34	0.95		
2	HYBRID	149	40	1.21		
2	HYBRID	126	19	0.95		
2	HYBRID	124	19	1.00		
2	HYBRID	121	16	0.90		
2	HYBRID	120	16	0.93		
2	HYBRID	120	15	0.87		
2	HYBRID	115	13	0.85		
2	HYBRID	64	2.3	0.88		
2	HYBRID	61	1.9	0.84		
2	HYBRID	59	2.6	1.27		
2	HYBRID	59	2.1	1.02		
2	HYBRID	57	1.3	0.70		
2	HYBRID	56	1.4	0.80		
2	HYBRID	54	1.2	0.76		
2	HYBRID	52	1.4	1.00		
2	HYBRID	48	1	0.90		
2	HYBRID	33	0.2	0.56		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
9/17/2001

BKT

	Length	Weight	K	Wr
N:	11	11	11	5
Min:	64	2.2	0.82	82.4
Max:	177	53	1.04	93.3
Mean:	115.3	19.1	0.93	88.1

BRN

	Length	Weight	K	Wr
N:	16	16	16	6
Min:	65	2.7	0.85	79.8
Max:	186	59	1.21	90.5
Mean:	116.0	21.1	0.98	85.9

HYBRID

	Length	Weight	K	Wr
N:	94	94	94	N/A
Min:	33	0.2	0.56	N/A
Max:	219	101	1.28	N/A
Mean:	113.4	21.6	0.98	N/A

RBT

	Length	Weight	K	Wr
N:	4	4	4	4
Min:	209	93	1.00	93.0
Max:	281	225	1.02	94.5
Mean:	239.3	145.5	1.01	93.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	7	4	12	± 6.0	0.073	164	± 82.2	6.91
BRN	14	2	16	± 1.2	0.073	219	± 16.4	10.19
HYBRID	74	20	100	± 8.8	0.073	1370	± 120.5	65.24
RBT	4	0	4	± 0	0.073	55	± 0	17.64

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	7	4	12	± 6.0	0.054	222	± 111.1	9.35
BRN	14	2	16	± 1.2	0.054	296	± 22.2	13.77
HYBRID	74	20	100	± 8.8	0.054	1852	± 163	88.19
RBT	4	0	4	± 0	0.054	74	± 0	23.74

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/17/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	263	164	0.90	196.3	83.5
1	BRN	232	114	0.91	135.4	84.2
1	BRN	225	110	0.97	123.6	89.0
1	BRN	224	118	1.05	122.0	96.7
1	BRN	219	84	0.80	114.1	73.6
1	BRN	218	106	1.02	112.6	94.1
1	BRN	215	88	0.89	108.1	81.4
1	BRN	205	80	0.93	93.8	85.2
1	BRN	194	70	0.96	79.7	87.8
1	BRN	183	56	0.91	67.0	83.5
1	BRN	173	48	0.93	56.8	84.6
1	BRN	166	40	0.87	50.2	79.6
1	BRN	164	38	0.86	48.5	78.4
1	BRN	160	36	0.88	45.0	79.9
1	BRN	157	35	0.90	42.6	82.2
1	BRN	155	32	0.86	41.0	78.1
1	BRN	154	31.5	0.86	40.2	78.3
1	BRN	151	32	0.93	37.9	84.3
1	BRN	146	28	0.90	34.3	81.5
1	BRN	145	28	0.92	33.6	83.2
1	BRN	118	13.5	0.82		
1	BRN	116	13.5	0.86		
1	BRN	115	13	0.85		
1	BRN	115	11	0.72		
1	BRN	114	12.5	0.84		
1	BRN	112	13	0.93		
1	BRN	110	11	0.83		
1	BRN	110	11	0.83		
1	BRN	110	10	0.75		
1	BRN	110	9.5	0.71		
1	BRN	104	10	0.89		
1	BRN	100	8	0.80		
1	BRN	96	8	0.90		
1	BRN	92	7.2	0.92		
1	BRN	86	6.4	1.01		
1	BRN	75	3.8	0.90		
1	BRN	63	2.4	0.96		
1	BRN	63	2.2	0.88		
1	BRN	62	2.2	0.92		
1	BRN	61	2.2	0.97		
1	BRN	56	2	1.14		
1	BRN	56	1.4	0.80		
1	BRN	55	1.4	0.84		
1	BRN	54	1.4	0.89		
1	BRN	52	1.2	0.85		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/17/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	52	1.2	0.85		
1	BRN	52	1.2	0.85		
1	BRN	49	1.2	1.02		
1	BRN	49	1	0.85		
1	BRN	47	1	0.96		
1	BRN	46	1	1.03		
1	BRN	46	1	1.03		
1	BRN	45	1	1.10		
1	BRN	45	0.8	0.88		
1	BRN	41	0.8	1.16		
1	BRN	32	0.4	1.22		
2	BRN	217	90	0.88	111.1	81.0
2	BRN	152	33.5	0.95	38.7	86.6
2	BRN	152	30	0.85	38.7	77.5
2	BRN	151	35	1.02	37.9	92.2
2	BRN	110	11.5	0.86		
2	BRN	108	10.5	0.83		
2	BRN	99	8.8	0.91		
2	BRN	98	9	0.96		
2	BRN	95	9	1.05		
2	BRN	94	8.6	1.04		
2	BRN	52	1	0.71		
2	BRN	51	0.8	0.60		
2	BRN	48	1.2	1.09		
2	BRN	48	0.8	0.72		
2	BRN	45	0.8	0.88		
2	BRN	44	0.6	0.70		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/17/2001

BRN

	Length	Weight	K	Wr
N:	72	72	72	24
Min:	32	0.4	0.60	73.6
Max:	263	164	1.22	96.7
Mean:	111.4	24.7	0.90	83.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	56	16	77	± 8.3	0.151	510	± 55	27.77

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	56	16	77	± 8.3	0.089	865	± 93.3	47.10

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/20/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	245	123	0.84	153.2	80.3
1	BKT	244	131	0.90	151.3	86.6
1	BKT	243	170	1.18	149.4	113.8
1	BKT	229	122	1.02	124.7	97.8
1	BKT	191	78	1.12	71.8	108.6
1	BKT	183	74	1.21	63.0	117.4
1	BKT	183	58	0.95	63.0	92.0
1	BKT	167	47	1.01	47.7	98.5
1	BKT	162	44	1.03	43.5	101.1
1	BKT	136	27	1.07	25.5	105.7
1	BKT	133	24	1.02	23.9	100.5
1	BKT	133	18	0.77	23.9	75.4
1	BKT	132	20	0.87	23.3	85.7
1	BKT	128	20	0.95		
1	BKT	125	17	0.87		
1	BKT	123	16	0.86		
1	BKT	122	17	0.94		
1	BKT	122	9.5	0.52		
1	BKT	121	15	0.85		
1	BKT	117	16	1.00		
1	BKT	115	14	0.92		
1	BKT	115	14	0.92		
1	BKT	115	13	0.85		
1	BKT	114	14	0.94		
1	BKT	113	11	0.76		
1	BKT	112	8.5	0.61		
1	BKT	107	12	0.98		
1	BKT	104	9.5	0.84		
1	BKT	101	9	0.87		
1	BKT	100	10	1.00		
1	BKT	55	1.6	0.96		
1	RBT	253	182	1.12	175.4	103.8
1	RBT	242	172	1.21	153.3	112.2
1	RBT	235	146	1.12	140.3	104.1
1	RBT	208	90	1.00	97.0	92.8
2	BKT	190	78	1.14	70.7	110.4
2	BKT	139	25	0.93	27.3	91.6
2	BKT	130	18	0.82	22.3	80.8
2	BKT	110	12	0.90		
2	BKT	52	1.4	1.00		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/20/2001

BKT

	Length	Weight	K	Wr
N:	36	36	36	16
Min:	52	1.4	0.52	75.4
Max:	245	170	1.21	117.4
Mean:	139.2	36.0	0.93	96.6

RBT

	Length	Weight	K	Wr
N:	4	4	4	4
Min:	208	90	1.00	92.8
Max:	253	182	1.21	112.2
Mean:	234.5	147.5	1.12	103.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	31	5	36	± 1.9	0.054	667	± 26	52.95
RBT	4	0	4	± 0	0.054	74	± 0	24.07

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	31	5	36	± 1.9	0.051	706	± 31.1	56.04
RBT	4	0	4	± 0	0.051	78	± 0	25.37

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BKT	216	112	1.11	104.4	107.3
1	BKT	215	94	0.95	102.9	91.3
1	BKT	200	82	1.03	82.6	99.3
1	BKT	195	81	1.09	76.5	105.9
1	BKT	186	67	1.04	66.2	101.1
1	BKT	169	51	1.06	49.5	103.1
1	BKT	160	42	1.03	41.9	100.3
1	BKT	156	32	0.84	38.8	82.5
1	BKT	150	32	0.95	34.4	93.0
1	BKT	150	30	0.89	34.4	87.2
1	BKT	149	25	0.76	33.7	74.1
1	BKT	146	27	0.87	31.7	85.2
1	BKT	144	24	0.80	30.4	78.9
1	BKT	141	24	0.86	28.5	84.2
1	BKT	136	26	1.03	25.5	101.8
1	BKT	136	23	0.91		
1	BKT	127	18	0.88		
1	BKT	122	14	0.77		
1	BKT	94	6.6	0.79		
1	BKT	75	4.8	1.14		
1	BRN	302	253	0.92	295.7	85.6
1	BRN	275	218	1.05	225.7	96.6
1	BRN	253	166	1.03	175.0	94.9
1	BRN	232	132	1.06	135.4	97.5
1	BRN	186	56	0.87	70.4	79.6
1	BRN	180	48	0.82	63.8	75.2
1	BRN	155	31	0.83	41.0	75.6
1	BRN	149	28	0.85	36.5	76.8
1	BRN	144	29	0.97	33.0	88.0
1	BRN	136	19	0.76		
1	BRN	133	22	0.94		
1	BRN	122	16	0.88		
1	BRN	121	15	0.85		
1	BRN	56	1.8	1.02		
1	CUT	217	100	0.98	112.6	88.8
1	CUT	196	71	0.94	82.2	86.4
1	HYBRID	165	44	0.98		
1	HYBRID	47	1	0.96		
1	HYBRID	47	0.9	0.87		
1	HYBRID	44	0.8	0.94		
1	HYBRID	43	0.7	0.88		
1	HYBRID	42	0.6	0.81		
1	HYBRID	41	0.6	0.87		
1	HYBRID	41	0.6	0.87		
1	HYBRID	23	0.1	0.82		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	RBT	347	510	1.22	456.0	111.8
1	RBT	322	360	1.08	363.7	99.0
1	RBT	322	355	1.06	363.7	97.6
1	RBT	318	330	1.03	350.2	94.2
1	RBT	309	360	1.22	321.1	112.1
1	RBT	306	335	1.17	311.8	107.5
1	RBT	303	285	1.02	302.6	94.2
1	RBT	300	292	1.08	293.6	99.4
1	RBT	294	254	1.00	276.2	91.9
1	RBT	290	305	1.25	265.0	115.1
1	RBT	285	279	1.21	251.4	111.0
1	RBT	285	238	1.03	251.4	94.7
1	RBT	272	264	1.31	218.3	120.9
1	RBT	250	154	0.99	169.2	91.0
1	RBT	233	113	0.89	136.7	82.6
2	BKT	229	138	1.15	124.7	110.6
2	BKT	192	73	1.03	73.0	100.1
2	BKT	173	46	0.89	53.1	86.6
2	BKT	172	46	0.90	52.2	88.1
2	BKT	151	30	0.87	35.1	85.4
2	BKT	146	25	0.80	31.7	78.9
2	BKT	69	3.8	1.16		
2	BKT	67	3.2	1.06		
2	BRN	269	191	0.98	209.9	91.0
2	BRN	251	146	0.92	170.9	85.4
2	BRN	217	102	1.00	111.1	91.8
2	BRN	148	32	0.99	35.8	89.5
2	BRN	140	24	0.87	30.3	79.1
2	BRN	138	28	1.07		
2	BRN	131	22	0.98		
2	CUT	208	94	1.04	98.8	95.2
2	CUT	206	88	1.01	95.9	91.8
2	HYBRID	139	25	0.93		
2	HYBRID	107	13	1.06		
2	HYBRID	40	0.4	0.63		
2	HYBRID	20	0.1	1.25		
2	RBT	329	395	1.11	388.2	101.8
2	RBT	327	360	1.03	381.1	94.5
2	RBT	315	380	1.22	340.3	111.7
2	RBT	293	370	1.47	273.4	135.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2001

BKT

	Length	Weight	K	Wr
N:	28	28	28	21
Min:	67	3.2	0.76	74.1
Max:	229	138	1.16	110.6
Mean:	152.4	42.2	0.95	92.6

BRN

	Length	Weight	K	Wr
N:	21	21	21	14
Min:	56	1.8	0.76	75.2
Max:	302	253	1.07	97.5
Mean:	178.0	75.2	0.94	86.2

CUT

	Length	Weight	K	Wr
N:	4	4	4	4
Min:	196	71	0.94	86.4
Max:	217	100	1.04	95.2
Mean:	206.8	88.3	0.99	90.5

HYBRID

	Length	Weight	K	Wr
N:	13	13	13	N/A
Min:	20	0.1	0.63	N/A
Max:	165	44	1.25	N/A
Mean:	61.5	6.8	0.91	N/A

RBT

	Length	Weight	K	Wr
N:	19	19	19	19
Min:	233	113	0.89	82.6
Max:	347	510	1.47	135.3
Mean:	300.0	312.6	1.13	103.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BKT	20	8	30	± 8.3	0.180	167	± 46.1	15.54
BRN	14	7	24	± 9.4	0.180	133	± 52.2	22.05
CUT	2	2	4	--	0.180	22	--	4.28
HYBRID	9	4	14	± 5.2	0.180	78	± 28.9	1.17
RBT	15	4	20	± 2.2	0.180	111	± 12.2	76.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
9/21/2001

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BKT	20	8	30	± 8.3	0.082	366	± 101.2	34.05
BRN	14	7	24	± 9.4	0.082	293	± 114.6	48.58
CUT	2	2	4	--	0.082	49	--	9.54
HYBRID	9	4	14	± 5.2	0.082	171	± 63.4	2.56
RBT	15	4	20	± 2.2	0.082	244	± 26.8	168.15

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/18/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	261	174	0.98	191.9	90.7
1	BRN	245	146	0.99	159.1	91.8
1	BRN	190	68	0.99	74.9	90.7
1	BRN	190	82	1.20	74.9	109.4
1	BRN	166	43	0.94	50.2	85.6
1	BRN	164	43	0.97	48.5	88.7
1	BRN	158	35	0.89	43.4	80.7
1	BRN	156	33	0.87	41.8	79.0
1	BRN	152	30.5	0.87	38.7	78.8
1	BRN	152	34	0.97	38.7	87.9
1	BRN	145	26.5	0.87	33.6	78.8
1	BRN	145	33	1.08	33.6	98.1
1	BRN	140	25	0.91	30.3	82.4
1	BRN	137	23	0.89		
1	BRN	105	11	0.95		
1	BRN	74	4.2	1.04		
1	WS	205	98	1.14	100.9	97.1
2	BRN	265	198	1.06	200.7	98.6
2	BRN	161	37.5	0.90	45.9	81.7
2	BRN	142	25	0.87	31.6	79.0
2	BRN	131	19.5	0.87		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
9/18/2001

BRN

	Length	Weight	K	Wr
N:	20	20	20	16
Min:	74	4.2	0.87	78.8
Max:	265	198	1.20	109.4
Mean:	164.0	54.6	0.96	87.6

WS

	Length	Weight	K	Wr
N:	1	1	1	1
Min:	205	98	1.14	97.1
Max:	205	98	1.14	97.1
Mean:	205.0	98.0	1.14	97.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	16	4	20	± 2.2	0.129	155	± 17.1	18.66
WS	1	0	1	± 0	0.129	8	± 0	1.73

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	16	4	20	± 2.2	0.063	317	± 34.9	38.16
WS	1	0	1	± 0	0.063	16	± 0	3.46

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/18/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	272	196	0.97	216.9	90.4
1	BRN	264	194	1.05	198.5	97.7
1	BRN	258	184	1.07	185.4	99.2
1	BRN	194	78	1.07	79.7	97.9
1	BRN	188	68	1.02	72.6	93.6
1	RBT	318	370	1.15	350.2	105.6
2	NO FISH	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
9/18/2001

BRN

	Length	Weight	K	Wr
N:	5	5	5	5
Min:	188	68	0.97	90.4
Max:	272	196	1.07	99.2
Mean:	235.2	144.0	1.04	95.8

RBT

	Length	Weight	K	Wr
N:	1	1	1	1
Min:	318	370	1.15	105.6
Max:	318	370	1.15	105.6
Mean:	318.0	370.0	1.15	105.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	5	0	5	± 0	0.137	36	± 0	11.43
RBT	1	0	1	± 0	0.137	7	± 0	5.71

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	5	0	5	± 0	0.057	88	± 0	27.94
RBT	1	0	1	± 0	0.057	18	± 0	14.68

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/18/2001

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
9/18/2001

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/20/2001

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
9/20/2001

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/20/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	268	162	0.84	207.6	78.1
1	BRN	256	140	0.83	181.2	77.3
1	BRN	241	135	0.96	151.5	89.1
1	BRN	238	100	0.74	146.0	68.5
1	BRN	234	115	0.90	138.9	82.8
1	BRN	219	92	0.88	114.1	80.6
1	BRN	218	98	0.95	112.6	87.0
1	BRN	217	100	0.98	111.1	90.0
1	BRN	208	82	0.91	98.0	83.7
1	BRN	205	74	0.86	93.8	78.9
1	BRN	205	90	1.04	93.8	95.9
1	BRN	192	69	0.97	77.3	89.3
1	BRN	190	64	0.93	74.9	85.4
1	BRN	181	58	0.98	64.9	89.4
1	BRN	179	50	0.87	62.8	79.6
1	BRN	174	45	0.85	57.7	77.9
1	BRN	173	50	0.97	56.8	88.1
1	BRN	161	35	0.84	45.9	76.3
1	BRN	160	39	0.95	45.0	86.6
1	BRN	155	37	0.99	41.0	90.2
1	BRN	152	31	0.88	38.7	80.1
1	BRN	151	31	0.90	37.9	81.7
1	BRN	147	26	0.82	35.0	74.2
1	BRN	145	25	0.82	33.6	74.3
1	BRN	140	26	0.95	30.3	85.7
1	BRN	138	26	0.99		
1	BRN	134	21	0.87		
1	BRN	133	20	0.85		
1	BRN	127	18	0.88		
1	BRN	126	18	0.90		
1	BRN	107	11	0.90		
1	BRN	105	9	0.78		
2	BRN	231	100	0.81	133.7	74.8
2	BRN	223	85	0.77	120.4	70.6
2	BRN	178	49	0.87	61.8	79.3
2	BRN	175	48	0.90	58.7	81.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
9/20/2001

BRN

	Length	Weight	K	Wr
N:	36	36	36	29
Min:	105	9	0.74	68.5
Max:	268	162	1.04	95.9
Mean:	180.2	60.5	0.89	82.0

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	32	4	36	± 1.5	0.210	171	± 7.1	22.81

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	32	4	36	± 1.5	0.089	404	± 16.9	53.88

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/18/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	276	192	0.91	226.5	84.8
1	BRN	239	130	0.95	147.8	87.9
1	BRN	238	134	0.99	146.0	91.8
1	BRN	236	114	0.87	142.4	80.0
1	BRN	230	100	0.82	132.0	75.8
1	BRN	220	106	1.00	115.7	91.6
1	BRN	210	88	0.95	100.8	87.3
1	BRN	208	86	0.96	98.0	87.8
1	BRN	201	70	0.86	88.5	79.1
1	BRN	190	58	0.85	74.9	77.4
1	BRN	189	60	0.89	73.8	81.3
1	BRN	172	42	0.83	55.8	75.3
2	BRN	252	158	0.99	173.0	91.4
2	BRN	225	108	0.95	123.6	87.3

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
9/18/2001

BRN

	Length	Weight	K	Wr
N:	14	14	14	14
Min:	172	42	0.82	75.3
Max:	276	192	1.00	91.8
Mean:	220.4	103.3	0.91	84.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	12	2	14	± 1.3	0.198	71	± 6.6	16.17

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	12	2	14	± 1.3	0.078	179	± 16.7	40.76

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/19/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	366	470	0.96	522.4	90.0
1	BRN	265	152	0.82	200.7	75.7
1	BRN	259	157	0.90	187.6	83.7
1	BRN	258	162	0.94	185.4	87.4
1	BRN	235	127	0.98	140.6	90.3
1	BRN	226	117	1.01	125.3	93.4
1	BRN	199	84	1.07	85.9	97.7
1	BRN	198	76	0.98	84.7	89.8
1	BRN	194	67	0.92	79.7	84.1
1	BRN	181	57	0.96	64.9	87.8
1	BRN	180	53	0.91	63.8	83.0
1	BRN	177	54	0.97	60.7	88.9
1	BRN	174	49	0.93	57.7	84.9
1	BRN	173	48	0.93	56.8	84.6
1	BRN	170	47	0.96	53.9	87.2
1	BRN	168	40	0.84	52.0	76.9
1	BRN	167	44	0.94	51.1	86.1
1	BRN	166	41	0.90	50.2	81.6
1	BRN	165	41	0.91	49.3	83.1
1	BRN	164	43	0.97	48.5	88.7
1	BRN	152	32	0.91	38.7	82.7
1	BRN	106	11	0.92		
1	BRN	97	9	0.99		
1	BRN	88	6.6	0.97		
1	BRN	76	4.8	1.09		
1	RBT	241	127	0.91	151.4	83.9
1	RBT	240	150	1.09	149.5	100.3
1	RBT	237	159	1.19	144.0	110.4
1	RBT	230	141	1.16	131.5	107.2
1	RBT	228	109	0.92	128.1	85.1
1	RBT	224	123	1.09	121.4	101.3
1	RBT	214	115	1.17	105.7	108.8
1	RBT	210	102	1.10	99.9	102.1
1	RBT	201	104	1.28	87.5	118.9
1	RBT	200	96	1.20	86.2	111.4
1	RBT	196	76	1.01		
2	BRN	182	59	0.98	66.0	89.4
2	BRN	169	47	0.97	53.0	88.7
2	RBT	214	127	1.30	105.7	120.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
9/19/2001

BRN

	Length	Weight	K	Wr
N:	27	27	27	23
Min:	76	4.8	0.82	75.7
Max:	366	470	1.09	97.7
Mean:	183.5	77.7	0.95	86.3

RBT

	Length	Weight	K	Wr
N:	12	12	12	11
Min:	196	76	0.91	83.9
Max:	241	159	1.30	120.1
Mean:	219.6	119.1	1.12	104.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	25	2	27	± 0.8	0.174	155	± 4.6	26.55
RBT	11	1	12	± 0.7	0.174	69	± 4.0	18.12

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	25	2	27	± 0.8	0.066	409	± 12.1	70.06
RBT	11	1	12	± 0.7	0.066	182	± 10.6	47.79

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/19/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	514	1550	1.14	1428.5	108.5
1	BRN	381	520	0.94	588.4	88.4
1	BRN	375	530	1.01	561.4	94.4
1	BRN	365	410	0.84	518.2	79.1
1	BRN	348	350	0.83	449.9	77.8
1	BRN	329	320	0.90	381.0	84.0
1	BRN	319	254	0.78	347.7	73.0
1	BRN	316	320	1.01	338.1	94.6
1	BRN	315	280	0.90	335.0	83.6
1	BRN	308	290	0.99	313.4	92.5
1	BRN	307	262	0.91	310.4	84.4
1	BRN	300	270	1.00	289.9	93.1
1	BRN	300	242	0.90	289.9	83.5
1	BRN	296	244	0.94	278.6	87.6
1	BRN	291	256	1.04	264.9	96.6
1	BRN	289	190	0.79	259.5	73.2
1	BRN	288	216	0.90	256.9	84.1
1	BRN	279	208	0.96	233.8	89.0
1	BRN	278	206	0.96	231.3	89.0
1	BRN	274	220	1.07	221.6	99.3
1	BRN	272	260	1.29	216.9	119.9
1	BRN	271	190	0.95	214.5	88.6
1	BRN	270	182	0.92	212.2	85.8
1	BRN	268	210	1.09	207.6	101.2
1	BRN	266	200	1.06	203.0	98.5
1	BRN	265	200	1.07	200.7	99.6
1	BRN	263	168	0.92	196.3	85.6
1	BRN	261	140	0.79	191.9	73.0
1	BRN	258	160	0.93	185.4	86.3
1	BRN	253	150	0.93	175.0	85.7
1	BRN	250	168	1.08	168.9	99.5
1	BRN	250	150	0.96	168.9	88.8
1	BRN	247	144	0.96	163.0	88.3
1	BRN	245	152	1.03	159.1	95.5
1	BRN	241	134	0.96	151.5	88.4
1	BRN	241	132	0.94	151.5	87.1
1	BRN	240	130	0.94	149.7	86.8
1	BRN	240	122	0.88	149.7	81.5
1	BRN	234	134	1.05	138.9	96.5
1	BRN	233	136	1.08	137.1	99.2
1	BRN	231	128	1.04	133.7	95.8
1	BRN	229	120	1.00	130.3	92.1
1	BRN	228	120	1.01	128.6	93.3
1	BRN	227	122	1.04	126.9	96.1
1	BRN	226	116	1.00	125.3	92.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/19/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	226	112	0.97	125.3	89.4
1	BRN	225	115	1.01	123.6	93.0
1	BRN	225	112	0.98	123.6	90.6
1	BRN	225	108	0.95	123.6	87.3
1	BRN	222	100	0.91	118.8	84.2
1	BRN	220	112	1.05	115.7	96.8
1	BRN	220	110	1.03	115.7	95.1
1	BRN	220	105	0.99	115.7	90.8
1	BRN	217	106	1.04	111.1	95.4
1	BRN	217	100	0.98	111.1	90.0
1	BRN	215	98	0.99	108.1	90.7
1	BRN	213	98	1.01	105.1	93.2
1	BRN	213	96	0.99	105.1	91.3
1	BRN	210	88	0.95	100.8	87.3
1	BRN	209	92	1.01	99.4	92.6
1	BRN	209	90	0.99	99.4	90.6
1	BRN	209	84	0.92	99.4	84.5
1	BRN	207	90	1.01	96.6	93.2
1	BRN	206	88	1.01	95.2	92.4
1	BRN	205	98	1.14	93.8	104.4
1	BRN	205	88	1.02	93.8	93.8
1	BRN	204	80	0.94	92.5	86.5
1	BRN	202	92	1.12	89.8	102.4
1	BRN	201	82	1.01	88.5	92.6
1	BRN	200	82	1.03	87.2	94.0
1	BRN	200	78	0.98	87.2	89.4
1	BRN	198	78	1.00	84.7	92.1
1	BRN	192	72	1.02	77.3	93.2
1	BRN	190	70	1.02	74.9	93.4
1	BRN	189	64	0.95	73.8	86.8
1	BRN	187	72	1.10	71.5	100.7
1	BRN	187	68	1.04	71.5	95.1
1	BRN	187	66	1.01	71.5	92.3
1	BRN	186	62	0.96	70.4	88.1
1	BRN	185	64	1.01	69.2	92.4
1	BRN	185	60	0.95	69.2	86.7
1	BRN	184	64	1.03	68.1	93.9
1	BRN	183	62	1.01	67.0	92.5
1	BRN	182	58	0.96	66.0	87.9
1	BRN	182	54	0.90	66.0	81.9
1	BRN	180	54	0.93	63.8	84.6
1	BRN	179	60	1.05	62.8	95.5
1	BRN	172	54	1.06	55.8	96.8
1	BRN	167	42	0.90	51.1	82.1
1	BRN	165	45	1.00	49.3	91.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/19/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	142	29	1.01	31.6	91.7
1	BRN	142	28	0.98	31.6	88.5
1	BRN	135	27	1.10		
1	BRN	135	25	1.02		
1	BRN	134	27	1.12		
1	BRN	132	24	1.04		
1	BRN	126	22	1.10		
1	BRN	124	17	0.89		
1	BRN	123	19	1.02		
1	BRN	123	19	1.02		
1	BRN	123	18	0.97		
1	BRN	121	17	0.96		
1	BRN	119	16	0.95		
1	BRN	118	15	0.91		
1	BRN	118	14	0.85		
1	BRN	117	15	0.94		
1	BRN	115	14	0.92		
1	BRN	112	13	0.93		
1	BRN	110	13	0.98		
1	BRN	110	12	0.90		
1	BRN	110	11	0.83		
1	BRN	108	12	0.95		
1	BRN	107	12	0.98		
1	BRN	107	10	0.82		
1	BRN	106	12	1.01		
1	BRN	105	11	0.95		
1	BRN	105	10	0.86		
1	BRN	104	10	0.89		
1	BRN	103	11	1.01		
1	BRN	103	10	0.92		
1	BRN	102	10	0.94		
1	BRN	102	9	0.85		
1	BRN	101	10	0.97		
1	BRN	101	10	0.97		
1	BRN	101	9	0.87		
1	BRN	98	9.8	1.04		
1	BRN	95	8.5	0.99		
1	BRN	93	7.9	0.98		
1	BRN	92	9.8	1.26		
1	BRN	92	9	1.16		
1	BRN	92	8.2	1.05		
1	BRN	90	7	0.96		
1	BRN	89	7.8	1.11		
1	BRN	88	7.1	1.04		
1	BRN	88	7	1.03		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/19/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	87	7.3	1.11		
1	BRN	86	7.2	1.13		
1	BRN	86	6	0.94		
1	BRN	83	6.1	1.07		
1	BRN	83	5.4	0.94		
1	BRN	82	5.4	0.98		
1	BRN	82	4.4	0.80		
1	BRN	81	5.8	1.09		
1	BRN	81	4.2	0.79		
1	BRN	80	5.2	1.02		
1	BRN	76	4.2	0.96		
1	BRN	71	3.6	1.01		
1	BRN	66	3	1.04		
1	RBT	412	950	1.36	766.4	124.0
1	RBT	391	760	1.27	654.2	116.2
1	RBT	190	64	0.93		
1	RBT	182	58	0.96		
1	RBT	178	58	1.03		
1	RBT	160	44	1.07		
1	RBT	158	30	0.76		
1	RBT	156	42	1.11		
1	RBT	145	48	1.57		
1	RBT	45	0.2	0.22		
2	BRN	343	380	0.94	431.1	88.2
2	BRN	342	310	0.77	427.4	72.5
2	BRN	302	264	0.96	295.7	89.3
2	BRN	280	209	0.95	236.3	88.4
2	BRN	268	198	1.03	207.6	95.4
2	BRN	266	182	0.97	203.0	89.7
2	BRN	260	142	0.81	189.7	74.8
2	BRN	255	156	0.94	179.1	87.1
2	BRN	241	146	1.04	151.5	96.3
2	BRN	236	140	1.07	142.4	98.3
2	BRN	227	120	1.03	126.9	94.5
2	BRN	226	120	1.04	125.3	95.8
2	BRN	225	120	1.05	123.6	97.1
2	BRN	223	118	1.06	120.4	98.0
2	BRN	208	78	0.87	98.0	79.6
2	BRN	202	82	0.99	89.8	91.3
2	BRN	198	78	1.00	84.7	92.1
2	BRN	195	90	1.21	80.9	111.2
2	BRN	155	39	1.05	41.0	95.1
2	BRN	133	22	0.94		
2	BRN	121	17	0.96		
2	BRN	121	16	0.90		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/19/2001

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	115	14	0.92		
2	BRN	106	10	0.84		
2	BRN	105	10	0.86		
2	BRN	103	11	1.01		
2	BRN	100	10	1.00		
2	BRN	100	10	1.00		
2	BRN	92	7.4	0.95		
2	BRN	90	7.1	0.97		
2	BRN	86	9.4	1.48		
2	BRN	86	6.7	1.05		
2	BRN	76	4	0.91		
2	RBT	397	850	1.36	685.1	124.1
2	RBT	198	88	1.13		
2	RBT	141	29	1.03		
2	RBT	137	26	1.01		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/19/2001

BRN

	Length	Weight	K	Wr
N:	181	181	181	111
Min:	66	3	0.77	72.5
Max:	514	1550	1.48	119.9
Mean:	186.6	102.2	0.98	90.9

RBT

	Length	Weight	K	Wr
N:	14	14	14	3
Min:	45	0.2	0.22	116.2
Max:	412	950	1.57	124.1
Mean:	206.4	217.7	1.06	121.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	148	33	189	± 9.1	0.247	765	± 36.8	172.36
RBT	10	4	15	± 4.9	0.247	61	± 19.8	29.28

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	148	33	189	± 9.1	0.074	2554	± 123	575.44
RBT	10	4	15	± 4.9	0.074	203	± 66.2	97.43

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	242	108	0.76	153.4	70.4
1	BRN	232	102	0.82	135.4	75.3
1	BRN	220	84	0.79	115.7	72.6
1	BRN	218	77	0.74	112.6	68.4
1	BRN	205	80	0.93	93.8	85.2
1	BRN	192	70	0.99	77.3	90.6
1	BRN	190	61	0.89	74.9	81.4
1	BRN	189	59	0.87	73.8	80.0
1	BRN	181	52	0.88	64.9	80.1
1	BRN	180	52	0.89	63.8	81.4
1	BRN	178	52	0.92	61.8	84.2
1	BRN	176	46	0.84	59.7	77.0
1	BRN	168	42	0.89	52.0	80.7
1	BRN	168	41	0.86	52.0	78.8
1	BRN	153	29	0.81	39.5	73.5
1	BRN	150	31	0.92	37.2	83.3
1	BRN	148	26	0.80	35.8	72.7
1	BRN	144	26	0.87	33.0	78.9
1	BRN	126	14	0.70		
1	BRN	115	13	0.85		
1	BRN	112	13	0.93		
1	BRN	110	13	0.98		
1	BRN	110	12	0.90		
1	BRN	110	12	0.90		
1	BRN	110	11	0.83		
1	BRN	109	12	0.93		
1	BRN	106	11	0.92		
1	BRN	106	11	0.92		
1	BRN	101	9.2	0.89		
1	BRN	100	9.1	0.91		
1	BRN	100	7.8	0.78		
1	BRN	98	8.7	0.92		
1	BRN	98	7.8	0.83		
1	BRN	97	7.8	0.85		
1	BRN	97	7.3	0.80		
1	BRN	94	8.2	0.99		
1	BRN	88	5	0.73		
1	BRN	68	3	0.95		
1	BRN	67	2.9	0.96		
1	BRN	66	2.8	0.97		
1	BRN	65	2.8	1.02		
1	BRN	65	2.7	0.98		
1	BRN	65	2.5	0.91		
1	BRN	65	2.5	0.91		
1	BRN	65	2.3	0.84		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	64	3.1	1.18		
1	BRN	64	2.6	0.99		
1	BRN	64	2.6	0.99		
1	BRN	64	2.5	0.95		
1	BRN	63	2.8	1.12		
1	BRN	63	2.7	1.08		
1	BRN	63	2.5	1.00		
1	BRN	63	2.3	0.92		
1	BRN	62	2.6	1.09		
1	BRN	62	2.3	0.97		
1	BRN	62	2.2	0.92		
1	BRN	62	2.2	0.92		
1	BRN	62	2.1	0.88		
1	BRN	62	2	0.84		
1	BRN	61	2.4	1.06		
1	BRN	61	1.9	0.84		
1	BRN	60	2.3	1.06		
1	BRN	60	2.1	0.97		
1	BRN	60	2.1	0.97		
1	BRN	60	1.9	0.88		
1	BRN	60	1.7	0.79		
1	BRN	58	2.4	1.23		
1	BRN	58	1.7	0.87		
1	BRN	57	2.1	1.13		
1	BRN	57	1.9	1.03		
1	BRN	57	1.9	1.03		
1	BRN	57	1.9	1.03		
1	BRN	57	1.9	1.03		
1	BRN	57	1.8	0.97		
1	BRN	57	1.7	0.92		
1	BRN	57	1.7	0.92		
1	BRN	57	1.6	0.86		
1	BRN	56	1.6	0.91		
1	BRN	56	1.6	0.91		
1	BRN	55	1.7	1.02		
1	BRN	55	1.6	0.96		
1	BRN	55	1.6	0.96		
1	BRN	55	1.5	0.90		
1	BRN	55	1.4	0.84		
1	BRN	55	1.4	0.84		
1	BRN	54	1.9	1.21		
1	BRN	54	1.7	1.08		
1	BRN	54	1.5	0.95		
1	BRN	54	1.4	0.89		
1	BRN	54	1.3	0.83		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	54	1.2	0.76		
1	BRN	53	1.5	1.01		
1	BRN	50	1.4	1.12		
1	BRN	48	1	0.90		
2	BRN	229	114	0.95	130.3	87.5
2	BRN	155	31	0.83	41.0	75.6
2	BRN	148	33	1.02	35.8	92.3
2	BRN	145	28	0.92	33.6	83.2
2	BRN	144	23	0.77	33.0	69.8
2	BRN	138	27	1.03		
2	BRN	130	18	0.82		
2	BRN	116	14	0.90		
2	BRN	110	13	0.98		
2	BRN	110	11	0.83		
2	BRN	109	11	0.85		
2	BRN	108	12	0.95		
2	BRN	105	12	1.04		
2	BRN	105	10	0.86		
2	BRN	104	13	1.16		
2	BRN	103	11	1.01		
2	BRN	102	10	0.94		
2	BRN	100	9.6	0.96		
2	BRN	98	8.4	0.89		
2	BRN	95	8.8	1.03		
2	BRN	94	7.5	0.90		
2	BRN	93	7.5	0.93		
2	BRN	93	6.8	0.85		
2	BRN	92	7.1	0.91		
2	BRN	88	5.7	0.84		
2	BRN	73	3.7	0.95		
2	BRN	71	3.7	1.03		
2	BRN	70	3.7	1.08		
2	BRN	68	3.2	1.02		
2	BRN	68	3	0.95		
2	BRN	68	2.9	0.92		
2	BRN	67	2.5	0.83		
2	BRN	65	2.4	0.87		
2	BRN	64	2.8	1.07		
2	BRN	63	2.5	1.00		
2	BRN	63	2.5	1.00		
2	BRN	63	2.2	0.88		
2	BRN	63	2.2	0.88		
2	BRN	62	2.5	1.05		
2	BRN	62	2.3	0.97		
2	BRN	62	2.3	0.97		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	61	2.3	1.01		
2	BRN	61	2.2	0.97		
2	BRN	61	2.2	0.97		
2	BRN	60	2.3	1.06		
2	BRN	58	2.1	1.08		
2	BRN	58	2.1	1.08		
2	BRN	58	2	1.03		
2	BRN	58	1.9	0.97		
2	BRN	58	1.8	0.92		
2	BRN	57	1.9	1.03		
2	BRN	57	1.7	0.92		
2	BRN	56	1.9	1.08		
2	BRN	56	1.9	1.08		
2	BRN	55	1.9	1.14		
2	BRN	55	1.7	1.02		
3	BRN	136	21	0.83		
3	BRN	108	11	0.87		
3	BRN	96	7.9	0.89		
3	BRN	78	4.5	0.95		
3	BRN	70	3.2	0.93		
3	BRN	68	2.7	0.86		
3	BRN	66	2.3	0.80		
3	BRN	64	2.3	0.88		
3	BRN	61	2	0.88		
3	BRN	59	2	0.97		
3	BRN	58	1.9	0.97		
3	BRN	58	1.9	0.97		
3	BRN	57	1.9	1.03		
3	BRN	57	1.9	1.03		
3	BRN	57	1.8	0.97		
3	BRN	57	1.8	0.97		
3	BRN	57	1.8	0.97		
3	BRN	55	1.7	1.02		
3	BRN	54	1.3	0.83		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
9/24/2002

BRN

	Length	Weight	K	Wr
N:	169	169	169	23
Min:	48	1	0.70	68.4
Max:	242	114	1.23	92.3
Mean:	87.8	11.5	0.94	79.3

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	94	56	19	189	± 17.4	0.069	2739	± 252.2	69.44

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	94	56	19	189	± 17.4	0.059	3203	± 294.9	81.21

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/23/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRK	207	83	0.94	91.7	90.5
1	BRK	201	63	0.78	83.9	75.1
1	BRK	199	78	0.99	81.4	95.9
1	BRK	195	72	0.97	76.5	94.1
1	BRK	172	51	1.00	52.2	97.7
1	BRK	169	53	1.10	49.5	107.1
1	BRK	162	40	0.94	43.5	91.9
1	BRK	155	31	0.83	38.0	81.5
1	BRK	152	37	1.05	35.8	103.2
1	BRK	152	35	1.00	35.8	97.7
1	BRK	142	31	1.08	29.1	106.4
1	BRK	138	25	0.95	26.7	93.6
1	BRK	133	25	1.06	23.9	104.7
1	BRK	130	22	1.00	22.3	98.8
1	BRK	128	26	1.24		
1	BRK	122	21	1.16		
1	BRK	121	22	1.24		
1	BRK	120	16	0.93		
1	BRK	117	12	0.75		
1	BRK	116	15	0.96		
1	BRK	114	12	0.81		
1	BRK	111	14.5	1.06		
1	BRK	111	13	0.95		
1	BRK	110	11	0.83		
1	BRK	109	12	0.93		
1	BRK	109	11.5	0.89		
1	BRK	108	12	0.95		
1	BRK	105	10.5	0.91		
1	BRK	104	14.5	1.29		
1	BRK	103	13	1.19		
1	BRK	103	11	1.01		
1	BRK	102	12	1.13		
1	BRK	102	12	1.13		
1	BRK	101	11	1.07		
1	BRK	101	10.5	1.02		
1	BRK	101	10.5	1.02		
1	BRK	100	9.3	0.93		
1	BRK	99	11.5	1.19		
1	BRK	98	8.8	0.93		
1	BRK	83	4.8	0.84		
1	BRK	77	3.3	0.72		
1	BRK	76	4.2	0.96		
1	BRK	76	3.2	0.73		
1	BRK	75	4.4	1.04		
1	BRK	75	4.2	1.00		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/23/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRK	75	3.8	0.90		
1	BRK	75	3.6	0.85		
1	BRK	75	3.6	0.85		
1	BRK	75	3.2	0.76		
1	BRK	75	2.9	0.69		
1	BRK	74	2.6	0.64		
1	BRK	73	3.1	0.80		
1	BRK	73	3	0.77		
1	BRK	72	3.2	0.86		
1	BRK	72	3.2	0.86		
1	BRK	72	3.2	0.86		
1	BRK	72	3	0.80		
1	BRK	72	3	0.80		
1	BRK	72	2.7	0.72		
1	BRK	70	3.2	0.93		
1	BRK	70	3.2	0.93		
1	BRK	70	2.8	0.82		
1	BRK	70	2.8	0.82		
1	BRK	70	2.6	0.76		
1	BRK	70	2.3	0.67		
1	BRK	69	3.4	1.03		
1	BRK	69	3.1	0.94		
1	BRK	69	2.8	0.85		
1	BRK	69	2.8	0.85		
1	BRK	68	3	0.95		
1	BRK	68	2.8	0.89		
1	BRK	68	2.4	0.76		
1	BRK	68	2.4	0.76		
1	BRK	68	2	0.64		
1	BRK	67	3.4	1.13		
1	BRK	67	2.9	0.96		
1	BRK	67	2.8	0.93		
1	BRK	67	2.8	0.93		
1	BRK	67	2.4	0.80		
1	BRK	67	2.3	0.76		
1	BRK	66	2.9	1.01		
1	BRK	66	2.8	0.97		
1	BRK	66	2.5	0.87		
1	BRK	66	2.5	0.87		
1	BRK	66	2.3	0.80		
1	BRK	66	2.2	0.77		
1	BRK	66	2	0.70		
1	BRK	65	2.6	0.95		
1	BRK	65	2.6	0.95		
1	BRK	65	2.4	0.87		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/23/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRK	65	2.4	0.87		
1	BRK	65	2.3	0.84		
1	BRK	65	2.3	0.84		
1	BRK	65	2.3	0.84		
1	BRK	65	2.2	0.80		
1	BRK	63	2.8	1.12		
1	BRK	63	2.8	1.12		
1	BRK	63	2.4	0.96		
1	BRK	63	2.3	0.92		
1	BRK	63	2.2	0.88		
1	BRK	63	2.2	0.88		
1	BRK	63	2.2	0.88		
1	BRK	63	2.2	0.88		
1	BRK	63	2	0.80		
1	BRK	63	2	0.80		
1	BRK	62	2.2	0.92		
1	BRK	62	2.2	0.92		
1	BRK	62	2.2	0.92		
1	BRK	62	2	0.84		
1	BRK	62	1.8	0.76		
1	BRK	62	1.8	0.76		
1	BRK	61	2.2	0.97		
1	BRK	61	2	0.88		
1	BRK	61	1.8	0.79		
1	BRK	60	2.2	1.02		
1	BRK	60	2	0.93		
1	BRK	60	1.8	0.83		
1	BRK	59	1.3	0.63		
1	BRK	58	2.1	1.08		
1	BRK	58	2	1.03		
1	BRK	58	1.8	0.92		
1	BRK	58	1.5	0.77		
1	BRK	57	2	1.08		
1	BRK	57	2	1.08		
1	BRK	57	2	1.08		
1	BRK	57	1.8	0.97		
1	BRK	57	1.2	0.65		
1	BRK	55	1.8	1.08		
1	BRK	55	1.6	0.96		
1	BRK	54	1.3	0.83		
1	BRK	52	1	0.71		
1	BRK	38	1.2	2.19		
1	RBT	228	113	0.95	128.1	88.2
2	BRK	92	6.2	0.80		
2	BRK	74	3.4	0.84		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/23/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRK	74	3.1	0.77		
2	BRK	73	2.8	0.72		
2	BRK	71	2.5	0.70		
2	BRK	70	2.4	0.70		
2	BRK	68	2.9	0.92		
2	BRK	68	2.8	0.89		
2	BRK	68	2.4	0.76		
2	BRK	68	2.3	0.73		
2	BRK	68	2.1	0.67		
2	BRK	68	1.9	0.60		
2	BRK	67	2.4	0.80		
2	BRK	66	1.8	0.63		
2	BRK	65	1.8	0.66		
2	BRK	65	1.5	0.55		
2	BRK	64	2	0.76		
2	BRK	62	1.4	0.59		
2	BRK	61	1.6	0.70		
2	BRK	60	1.7	0.79		
2	BRK	59	1.2	0.58		
2	BRK	58	1.2	0.62		
2	BRK	57	1.5	0.81		
2	BRK	56	1.5	0.85		
2	BRK	53	0.8	0.54		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
9/23/2002

BRK

	Length	Weight	K	Wr
N:	157	157	157	14
Min:	38	0.8	0.54	75.1
Max:	207	83	2.19	107.1
Mean:	81.4	8.1	0.89	95.6

RBT

	Length	Weight	K	Wr
N:	1	1	1	1
Min:	228	113	0.95	88.2
Max:	228	113	0.95	88.2
Mean:	228.0	113.0	0.95	88.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	132	25	162	± 6.8	0.042	3857	± 161.9	68.88
RBT	1	0	1	± 0.0	0.042	24	± 0	5.98

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	132	25	162	± 6.8	0.051	3176	± 133.3	56.71
RBT	1	0	1	± 0.0	0.051	20	± 0	4.98

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	408	680	1.00	720.7	94.3
1	BRN	385	550	0.96	606.9	90.6
1	BRN	377	214	0.40	570.3	37.5
1	BRN	370	510	1.01	539.5	94.5
1	BRN	365	460	0.95	518.2	88.8
1	BRN	352	450	1.03	465.4	96.7
1	BRN	333	410	1.11	394.9	103.8
1	BRN	330	390	1.09	384.4	101.4
1	BRN	328	390	1.11	377.6	103.3
1	BRN	328	370	1.05	377.6	98.0
1	BRN	328	370	1.05	377.6	98.0
1	BRN	323	390	1.16	360.8	108.1
1	BRN	322	370	1.11	357.5	103.5
1	BRN	320	380	1.16	351.0	108.3
1	BRN	318	360	1.12	344.5	104.5
1	BRN	318	340	1.06	344.5	98.7
1	BRN	310	330	1.11	319.5	103.3
1	BRN	308	320	1.10	313.4	102.1
1	BRN	308	310	1.06	313.4	98.9
1	BRN	306	282	0.98	307.4	91.7
1	BRN	305	330	1.16	304.4	108.4
1	BRN	304	320	1.14	301.5	106.1
1	BRN	304	310	1.10	301.5	102.8
1	BRN	304	300	1.07	301.5	99.5
1	BRN	302	286	1.04	295.7	96.7
1	BRN	300	259	0.96	289.9	89.3
1	BRN	298	262	0.99	284.2	92.2
1	BRN	297	274	1.05	281.4	97.4
1	BRN	296	286	1.10	278.6	102.7
1	BRN	295	282	1.10	275.8	102.2
1	BRN	295	250	0.97	275.8	90.6
1	BRN	294	246	0.97	273.1	90.1
1	BRN	294	244	0.96	273.1	89.4
1	BRN	292	258	1.04	267.6	96.4
1	BRN	290	228	0.93	262.2	87.0
1	BRN	289	220	0.91	259.5	84.8
1	BRN	285	238	1.03	249.0	95.6
1	BRN	285	226	0.98	249.0	90.8
1	BRN	282	232	1.03	241.3	96.1
1	BRN	279	226	1.04	233.8	96.7
1	BRN	275	220	1.06	224.0	98.2
1	BRN	272	200	0.99	216.9	92.2
1	BRN	272	196	0.97	216.9	90.4
1	BRN	271	200	1.00	214.5	93.2
1	BRN	270	188	0.96	212.2	88.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	269	208	1.07	209.9	99.1
1	BRN	268	204	1.06	207.6	98.3
1	BRN	266	212	1.13	203.0	104.4
1	BRN	266	186	0.99	203.0	91.6
1	BRN	260	184	1.05	189.7	97.0
1	BRN	257	180	1.06	183.3	98.2
1	BRN	257	176	1.04	183.3	96.0
1	BRN	257	174	1.03	183.3	94.9
1	BRN	254	166	1.01	177.1	93.8
1	BRN	252	164	1.02	173.0	94.8
1	BRN	252	154	0.96	173.0	89.0
1	BRN	248	152	1.00	165.0	92.1
1	BRN	248	144	0.94	165.0	87.3
1	BRN	247	178	1.18	163.0	109.2
1	BRN	244	148	1.02	157.2	94.1
1	BRN	242	156	1.10	153.4	101.7
1	BRN	242	126	0.89	153.4	82.1
1	BRN	240	146	1.06	149.7	97.5
1	BRN	239	150	1.10	147.8	101.5
1	BRN	236	116	0.88	142.4	81.5
1	BRN	232	118	0.94	135.4	87.2
1	BRN	230	126	1.04	132.0	95.5
1	BRN	221	120	1.11	117.2	102.4
1	BRN	195	60	0.81	80.9	74.1
1	BRN	157	38	0.98	42.6	89.2
1	BRN	151	38	1.10	37.9	100.2
1	BRN	151	36	1.05	37.9	94.9
1	BRN	150	34	1.01	37.2	91.4
1	BRN	149	36	1.09	36.5	98.7
1	BRN	143	29	0.99	32.3	89.8
1	BRN	140	28	1.02	30.3	92.3
1	BRN	138	27	1.03		
1	BRN	136	24	0.95		
1	BRN	135	24	0.98		
1	BRN	134	26	1.08		
1	BRN	134	25	1.04		
1	BRN	131	23	1.02		
1	BRN	130	24	1.09		
1	BRN	129	20	0.93		
1	BRN	128	22	1.05		
1	BRN	127	21	1.03		
1	BRN	127	20	0.98		
1	BRN	126	20	1.00		
1	BRN	125	18	0.92		
1	BRN	124	20	1.05		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
1	BRN	124	19	1.00		
1	BRN	123	17	0.91		
1	BRN	122	19	1.05		
1	BRN	121	19	1.07		
1	BRN	121	17	0.96		
1	BRN	120	18	1.04		
1	BRN	120	18	1.04		
1	BRN	120	17	0.98		
1	BRN	118	17	1.03		
1	BRN	118	17	1.03		
1	BRN	118	16	0.97		
1	BRN	117	17	1.06		
1	BRN	116	16	1.03		
1	BRN	116	12	0.77		
1	BRN	115	17	1.12		
1	BRN	115	15	0.99		
1	BRN	115	15	0.99		
1	BRN	115	11	0.72		
1	BRN	113	14	0.97		
1	BRN	113	12	0.83		
1	BRN	112	13	0.93		
1	BRN	110	14	1.05		
1	BRN	108	13	1.03		
1	BRN	106	12	1.01		
1	BRN	105	11	0.95		
1	BRN	104	11	0.98		
1	BRN	104	11	0.98		
1	BRN	101	11	1.07		
1	BRN	98	9.6	1.02		
1	BRN	97	7.2	0.79		
1	BRN	95	9.2	1.07		
1	BRN	95	8.5	0.99		
1	BRN	90	8.5	1.17		
1	BRN	90	6.8	0.93		
1	BRN	89	7.6	1.08		
1	BRN	85	6.5	1.06		
1	BRN	85	6.1	0.99		
1	BRN	83	6.5	1.14		
1	BRN	81	4.6	0.87		
1	BRN	78	4.7	0.99		
1	BRN	77	4.8	1.05		
1	BRN	76	4.4	1.00		
1	RBT	290	280	1.15	265.0	105.6
1	RBT	265	168	0.90	201.8	83.3
2	BRN	320	340	1.04	351.0	96.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	318	320	1.00	344.5	92.9
2	BRN	306	310	1.08	307.4	100.8
2	BRN	290	242	0.99	262.2	92.3
2	BRN	289	242	1.00	259.5	93.2
2	BRN	286	214	0.91	251.6	85.0
2	BRN	275	206	0.99	224.0	92.0
2	BRN	274	200	0.97	221.6	90.2
2	BRN	273	180	0.88	219.2	82.1
2	BRN	268	232	1.21	207.6	111.8
2	BRN	267	194	1.02	205.3	94.5
2	BRN	262	180	1.00	194.1	92.7
2	BRN	255	168	1.01	179.1	93.8
2	BRN	244	148	1.02	157.2	94.1
2	BRN	231	122	0.99	133.7	91.3
2	BRN	174	54	1.03	57.7	93.5
2	BRN	160	45	1.10	45.0	99.9
2	BRN	156	38	1.00	41.8	90.9
2	BRN	153	33	0.92	39.5	83.6
2	BRN	150	37	1.10	37.2	99.5
2	BRN	148	34	1.05	35.8	95.1
2	BRN	148	32	0.99	35.8	89.5
2	BRN	147	30	0.94	35.0	85.6
2	BRN	144	34	1.14	33.0	103.1
2	BRN	144	27	0.90	33.0	81.9
2	BRN	140	28	1.02	30.3	92.3
2	BRN	137	25	0.97		
2	BRN	136	26	1.03		
2	BRN	130	23	1.05		
2	BRN	129	22	1.02		
2	BRN	128	19	0.91		
2	BRN	125	21	1.08		
2	BRN	124	19	1.00		
2	BRN	123	20	1.07		
2	BRN	123	18	0.97		
2	BRN	121	20	1.13		
2	BRN	118	18	1.10		
2	BRN	118	17	1.03		
2	BRN	117	18	1.12		
2	BRN	116	16	1.03		
2	BRN	115	16	1.05		
2	BRN	114	11	0.74		
2	BRN	108	13	1.03		
2	BRN	108	13	1.03		
2	BRN	105	13	1.12		
2	BRN	105	12	1.04		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/24/2002

PASS	SPECIES	LENGTH	WEIGHT	K	Ws	Wr
2	BRN	104	11	0.98		
2	BRN	104	11	0.98		
2	BRN	103	11	1.01		
2	BRN	99	10	1.03		
2	BRN	99	9.5	0.98		
2	BRN	96	9	1.02		
2	BRN	93	7.9	0.98		
2	BRN	91	7.7	1.02		
2	BRN	81	6	1.13		
2	RBT	254	174	1.06	177.5	98.0
2	RBT	40	0.6	0.94		
3	BRN	355	490	1.10	477.3	102.7
3	BRN	317	320	1.00	341.3	93.8
3	BRN	298	260	0.98	284.2	91.5
3	BRN	285	232	1.00	249.0	93.2
3	BRN	250	152	0.97	168.9	90.0
3	BRN	246	148	0.99	161.0	91.9
3	BRN	198	70	0.90	84.7	82.7
3	BRN	166	46	1.01	50.2	91.6
3	BRN	164	48	1.09	48.5	99.1
3	BRN	164	42	0.95	48.5	86.7
3	BRN	144	33	1.11	33.0	100.1
3	BRN	134	22	0.91		
3	BRN	132	23	1.00		
3	BRN	128	21	1.00		
3	BRN	123	17	0.91		
3	BRN	118	16	0.97		
3	BRN	116	17	1.09		
3	BRN	113	13	0.90		
3	BRN	109	15	1.16		
3	BRN	108	12	0.95		
3	BRN	107	12	0.98		
3	BRN	105	12	1.04		
3	BRN	101	10	0.97		
3	BRN	100	10	1.00		
3	BRN	93	8.5	1.06		
3	BRN	89	6.3	0.89		
3	BRN	67	3.3	1.10		
3	RBT	285	248	1.07	251.4	98.6
3	RBT	244	134	0.92	157.2	85.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
9/24/2002

BRN

	Length	Weight	K	Wr
N:	214	214	214	113
Min:	67	3.3	0.40	37.5
Max:	408	680	1.21	111.8
Mean:	189.8	117.6	1.01	94.4

RBT

	Length	Weight	K	Wr
N:	6	6	6	5
Min:	40	0.6	0.90	83.3
Max:	290	280	1.15	105.6
Mean:	229.7	167.4	1.01	94.2

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	132	55	27	233	± 15.3	0.214	1089	± 71.5	282.34
RBT	2	2	2	6	*	0.214	28	--	10.33

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (miles)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	132	55	27	233	± 15.3	0.070	3329	± 218.6	863.08
RBT	2	2	2	6	*	0.070	86	--	31.74

* Sum of fish caught in 3 passes

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
09/29/2003

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	235	124	0.96	140.6	88.2
BRN	1	212	84	0.88	103.7	81.0
BRN	1	205	88	1.02	93.8	93.8
BRN	1	200	76	0.95	87.2	87.1
BRN	1	193	62	0.86	78.5	79.0
BRN	1	192	60	0.85	77.3	77.6
BRN	1	191	62	0.89	76.1	81.5
BRN	1	187	62	0.95	71.5	86.7
BRN	1	186	60	0.93	70.4	85.3
BRN	1	179	59	1.03	62.8	94.0
BRN	1	173	47	0.91	56.8	82.8
BRN	1	169	50	1.04	53.0	94.4
BRN	1	145	23	0.75	33.6	68.4
BRN	1	136	21	0.83		
BRN	1	130	20	0.91		
BRN	1	128	18	0.86		
BRN	1	116	13	0.83		
BRN	1	115	13	0.85		
BRN	1	112	14	1.00		
BRN	1	110	12	0.90		
BRN	1	110	11	0.83		
BRN	1	108	12	0.95		
BRN	1	106	11	0.92		
BRN	1	106	11	0.92		
BRN	1	106	10	0.84		
BRN	1	104	10	0.89		
BRN	1	104	9	0.80		
BRN	1	103	10	0.92		
BRN	1	102	10	0.94		
BRN	1	100	9.4	0.94		
BRN	1	98	8.8	0.93		
BRN	1	98	8.6	0.91		
BRN	1	98	8.2	0.87		
BRN	1	58	1.8	0.92		
BRN	1	56	1.6	0.91		
BRN	1	47	1	0.96		
BRN	2	222	88	0.80	118.8	74.1
BRN	2	190	61	0.89	74.9	81.4
BRN	2	176	57	1.05	59.7	95.4
BRN	2	117	14	0.87		
BRN	2	103	10	0.92		
BRN	2	97	8	0.88		
BRN	2	58	1.8	0.92		
BRN	2	57	1.4	0.76		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
09/29/2003

BRN		LENGTH	WEIGHT	K	Wr
	N:	44	44	44	16
	MIN:	47	1	0.75	68.4
	MAX:	235	124	1.05	95.4
	MEAN:	132.7	30.5	0.90	84.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	36	8	45	± 3.7	0.083	542	± 44.6	36.44

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	36	8	45	± 3.7	0.059	763	± 62.7	51.30

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
09/29/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	1	213	118	1.22	100.1	117.9
BRK	1	213	104	1.08	100.1	103.9
BRK	1	189	74	1.10	69.5	106.4
BRK	1	180	56	0.96	60.0	93.4
BRK	1	177	54	0.97	57.0	94.8
BRK	1	167	48	1.03	47.7	100.6
BRK	1	165	43	0.96	46.0	93.5
BRK	1	164	45	1.02	45.2	99.6
BRK	1	163	53	1.22	44.3	119.6
BRK	1	157	37	0.96	39.5	93.6
BRK	1	156	40	1.05	38.8	103.1
BRK	1	145	27	0.89	31.0	87.0
BRK	1	143	28	0.96	29.8	94.1
BRK	1	143	26	0.89	29.8	87.4
BRK	1	143	25	0.85	29.8	84.0
BRK	1	136	22	0.87	25.5	86.1
BRK	1	128	18	0.86		
BRK	1	125	17	0.87		
BRK	1	122	16	0.88		
BRK	1	121	16	0.90		
BRK	1	121	14	0.79		
BRK	1	117	13	0.81		
BRK	1	116	14	0.90		
BRK	1	115	12	0.79		
BRK	1	114	13	0.88		
BRK	1	113	14	0.97		
BRK	1	113	13	0.90		
BRK	1	112	13	0.93		
BRK	1	112	11	0.78		
BRK	1	110	13	0.98		
BRK	1	107	10	0.82		
BRK	1	105	12	1.04		
BRK	1	105	10	0.86		
BRK	1	101	8.5	0.83		
BRK	1	97	8	0.88		
BRK	1	94	8.2	0.99		
BRK	1	64	2.3	0.88		
BRK	1	57	1.6	0.86		
RBT	1	248	140	0.92	165.1	84.8
RBT	1	227	102	0.87	126.4	80.7
RBT	1	226	122	1.06	124.7	97.8
RBT	1	218	110	1.06	111.8	98.4
RBT	1	203	92	1.10	90.1	102.1
BRK	2	158	41	1.04	40.3	101.7
BRK	2	152	29	0.83	35.8	80.9

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
09/29/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	2	135	21	0.85	25.0	84.1
BRK	2	111	11	0.80		
BRK	2	64	2.4	0.92		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Middle Fork
09/29/03

BRK		LENGTH	WEIGHT	K	Wr
	N:	43	43	43	19
	MIN:	57	1.6	0.78	80.9
	MAX:	213	118	1.22	119.6
	MEAN:	131.2	27.0	0.93	96.4

RBT		LENGTH	WEIGHT	K	Wr
	N:	5	5	5	5
	MIN:	203	92	0.87	80.7
	MAX:	248	140	1.10	102.1
	MEAN:	224.4	113.2	1.00	92.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	38	5	43	± 1.7	0.050	860	± 34.0	51.19
RBT	5	0	5	± 0	0.050	100	± 0	24.96

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	38	5	43	± 1.7	0.051	843	± 33.3	50.18
RBT	5	0	5	± 0	0.051	98	± 0	24.46

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/23/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	541	1600	1.01	1662.4	96.2
BRN	1	410	585	0.85	731.2	80.0
BRN	1	350	425	0.99	457.6	92.9
BRN	1	330	295	0.82	384.4	76.7
BRN	1	328	300	0.85	377.6	79.5
BRN	1	327	300	0.86	374.2	80.2
BRN	1	325	320	0.93	367.5	87.1
BRN	1	320	310	0.95	351.0	88.3
BRN	1	313	282	0.92	328.7	85.8
BRN	1	310	252	0.85	319.5	78.9
BRN	1	307	265	0.92	310.4	85.4
BRN	1	301	245	0.90	292.8	83.7
BRN	1	301	240	0.88	292.8	82.0
BRN	1	300	258	0.96	289.9	89.0
BRN	1	297	250	0.95	281.4	88.8
BRN	1	287	214	0.91	254.2	84.2
BRN	1	284	218	0.95	246.5	88.5
BRN	1	278	215	1.00	231.3	92.9
BRN	1	275	188	0.90	224.0	83.9
BRN	1	265	194	1.04	200.7	96.6
BRN	1	262	168	0.93	194.1	86.6
BRN	1	261	175	0.98	191.9	91.2
BRN	1	252	160	1.00	173.0	92.5
BRN	1	251	154	0.97	170.9	90.1
BRN	1	245	146	0.99	159.1	91.8
BRN	1	237	138	1.04	144.2	95.7
BRN	1	237	132	0.99	144.2	91.5
BRN	1	236	128	0.97	142.4	89.9
BRN	1	236	124	0.94	142.4	87.1
BRN	1	236	112	0.85	142.4	78.6
BRN	1	232	137	1.10	135.4	101.2
BRN	1	230	113	0.93	132.0	85.6
BRN	1	228	122	1.03	128.6	94.9
BRN	1	227	123	1.05	126.9	96.9
BRN	1	225	109	0.96	123.6	88.2
BRN	1	223	118	1.06	120.4	98.0
BRN	1	221	105	0.97	117.2	89.6
BRN	1	220	112	1.05	115.7	96.8
BRN	1	220	108	1.01	115.7	93.4
BRN	1	219	95	0.90	114.1	83.2
BRN	1	218	104	1.00	112.6	92.4
BRN	1	217	117	1.15	111.1	105.3
BRN	1	217	103	1.01	111.1	92.7
BRN	1	215	111	1.12	108.1	102.7
BRN	1	214	95	0.97	106.6	89.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/23/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	212	100	1.05	103.7	96.5
BRN	1	210	100	1.08	100.8	99.2
BRN	1	210	98	1.06	100.8	97.2
BRN	1	210	85	0.92	100.8	84.3
BRN	1	208	86	0.96	98.0	87.8
BRN	1	206	90	1.03	95.2	94.5
BRN	1	205	96	1.11	93.8	102.3
BRN	1	203	82	0.98	91.2	90.0
BRN	1	202	78	0.95	89.8	86.8
BRN	1	196	66	0.88	82.2	80.3
BRN	1	195	69	0.93	80.9	85.3
BRN	1	190	72	1.05	74.9	96.1
BRN	1	184	61	0.98	68.1	89.5
BRN	1	171	47	0.94	54.8	85.7
BRN	1	143	33	1.13	32.3	102.2
BRN	1	142	32	1.12	31.6	101.2
BRN	1	139	29	1.08		
BRN	1	136	24.5	0.97		
BRN	1	136	24	0.95		
BRN	1	135	22	0.89		
BRN	1	134	22	0.91		
BRN	1	133	20	0.85		
BRN	1	131	22	0.98		
BRN	1	131	21.5	0.96		
BRN	1	130	24	1.09		
BRN	1	127	22	1.07		
BRN	1	126	21	1.05		
BRN	1	126	19	0.95		
BRN	1	126	17.5	0.87		
BRN	1	125	21	1.08		
BRN	1	125	19	0.97		
BRN	1	123	21	1.13		
BRN	1	123	17.5	0.94		
BRN	1	122	20	1.10		
BRN	1	121	18	1.02		
BRN	1	120	20	1.16		
BRN	1	120	19.5	1.13		
BRN	1	120	19	1.10		
BRN	1	120	19	1.10		
BRN	1	120	18	1.04		
BRN	1	120	16.5	0.95		
BRN	1	119	18	1.07		
BRN	1	118	20	1.22		
BRN	1	117	16	1.00		
BRN	1	116	17.5	1.12		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/23/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	116	15	0.96		
BRN	1	116	15	0.96		
BRN	1	115	16	1.05		
BRN	1	115	15	0.99		
BRN	1	115	14.5	0.95		
BRN	1	115	14	0.92		
BRN	1	114	15	1.01		
BRN	1	113	17	1.18		
BRN	1	112	15	1.07		
BRN	1	112	14	1.00		
BRN	1	112	14	1.00		
BRN	1	112	12.5	0.89		
BRN	1	111	12.5	0.91		
BRN	1	111	12.5	0.91		
BRN	1	111	12	0.88		
BRN	1	110	13	0.98		
BRN	1	109	14	1.08		
BRN	1	107	12	0.98		
BRN	1	106	13	1.09		
BRN	1	105	13	1.12		
BRN	1	105	11	0.95		
BRN	1	102	9.8	0.92		
BRN	1	101	11	1.07		
BRN	1	101	9.5	0.92		
BRN	1	100	9.5	0.95		
BRN	1	100	9.5	0.95		
BRN	1	100	9	0.90		
BRN	1	99	10	1.03		
BRN	1	99	10	1.03		
BRN	1	99	9.8	1.01		
BRN	1	97	9.5	1.04		
BRN	1	96	8.5	0.96		
BRN	1	96	8.1	0.92		
BRN	1	94	8	0.96		
BRN	1	94	7.9	0.95		
BRN	1	93	8.1	1.01		
BRN	1	91	7.6	1.01		
BRN	1	87	7.2	1.09		
BRN	1	87	6.9	1.05		
BRN	1	87	6.6	1.00		
BRN	1	86	7.3	1.15		
BRN	1	85	5.6	0.91		
BRN	1	85	5.5	0.90		
BRN	1	82	5.4	0.98		
BRN	1	80	5.1	1.00		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/23/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	80	4.8	0.94		
BRN	1	78	4.5	0.95		
BRN	1	76	4.4	1.00		
BRN	1	74	4	0.99		
BRN	1	55	1.6	0.96		
BRN	1	54	1.6	1.02		
BRN	1	46	1.2	1.23		
RBT	1	250	148	0.95	169.2	87.5
RBT	1	248	170	1.11	165.1	103.0
RBT	1	238	145	1.08	145.8	99.4
RBT	1	236	128	0.97	142.1	90.1
RBT	1	234	130	1.01	138.5	93.9
RBT	1	224	108	0.96	121.4	89.0
RBT	1	218	102	0.98	111.8	91.2
RBT	1	216	98	0.97	108.7	90.1
RBT	1	199	76	0.96		
BRN	2	335	340	0.90	402.0	84.6
BRN	2	327	330	0.94	374.2	88.2
BRN	2	235	130	1.00	140.6	92.4
BRN	2	225	119	1.04	123.6	96.2
BRN	2	223	115	1.04	120.4	95.5
BRN	2	211	91	0.97	102.2	89.0
BRN	2	206	92	1.05	95.2	96.6
BRN	2	205	84	0.98	93.8	89.5
BRN	2	146	16	0.51	34.3	46.6
BRN	2	137	24	0.93		
BRN	2	136	28	1.11		
BRN	2	134	22.5	0.94		
BRN	2	134	22	0.91		
BRN	2	130	22	1.00		
BRN	2	129	18.5	0.86		
BRN	2	127	22	1.07		
BRN	2	124	21	1.10		
BRN	2	124	18	0.94		
BRN	2	120	19	1.10		
BRN	2	120	18.5	1.07		
BRN	2	115	16	1.05		
BRN	2	114	14.5	0.98		
BRN	2	114	14	0.94		
BRN	2	111	12	0.88		
BRN	2	111	12	0.88		
BRN	2	110	13	0.98		
BRN	2	109	11.5	0.89		
BRN	2	108	12	0.95		
BRN	2	106	13	1.09		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/23/03

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	2	106	11	0.92		
BRN	2	103	11	1.01		
BRN	2	98	9.2	0.98		
BRN	2	95	7.4	0.86		
BRN	2	92	9.9	1.27		
BRN	2	89	6.6	0.94		
BRN	2	84	5.8	0.98		
BRN	2	79	4.8	0.97		
BRN	2	75	4.5	1.07		
BRN	2	75	4.4	1.04		
RBT	2	221	100	0.93	116.5	85.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/23/03

BRN		LENGTH	WEIGHT	K	Wr
	N:	181	181	181	70
	MIN:	46	1.2	0.51	46.6
	MAX:	541	1600	1.27	105.3
	MEAN:	162.6	77.9	0.99	89.8

RBT		LENGTH	WEIGHT	K	Wr
	N:	10	10	10	9
	MIN:	199	76	0.93	85.8
	MAX:	250	170	1.11	103.0
	MEAN:	228.4	120.5	0.99	92.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	142	39	194	± 12.9	0.200	970	± 64.5	166.59
RBT	9	1	10	± 0.8	0.200	50	± 4.0	13.28

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	142	39	194	± 12.9	0.070	2771	± 184.3	475.89
RBT	9	1	10	± 0.8	0.070	143	± 11.4	37.99

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
09/22/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRK	1	195		74	1.00	76.5	96.8
BRN	1	245		124	0.84	159.1	77.9
BRN	1	235		124	0.96	140.6	88.2
BRN	1	217		90	0.88	111.1	81.0
BRN	1	215		102	1.03	108.1	94.4
BRN	1	202		80	0.97	89.8	89.1
BRN	1	142		30	1.05	31.6	94.9
BRN	1	140		29	1.06		
BRN	1	135		25	1.02		
BRN	1	134		24	1.00		
BRN	1	129		20	0.93		
BRN	1	120		18	1.04		
BRN	1	85		7.2	1.17		
BRN	1	84		5.6	0.94		
BRN	1	76		5.4	1.23		
BRN	1	75		5.4	1.28		
BRN	1	73		5.0	1.29		
BRN	1	72		4.2	1.13		
BRN	1	62		2.8	1.17		
BRN	1	55		2.4	1.44		
BRN	1	55		2.0	1.20		
HYB	1	264		170	0.92	206.8	82.2
HYB	1	232		112	0.90	138.6	80.8
HYB	1	205		72	0.84	94.4	76.2
HYB	1	204		88	1.04	93.0	94.6
HYB	1	204		74	0.87	93.0	79.6
HYB	1	191		56	0.80	75.8	73.8
HYB	1	186		58	0.90	69.9	83.0
HYB	1	181		46	0.78	64.2	71.6
HYB	1	179		45	0.78	62.0	72.5
HYB	1	176		52	0.95	58.9	88.3
HYB	1	176		51	0.94	58.9	86.6
HYB	1	175		42	0.78	57.8	72.6
HYB	1	174		44	0.84	56.8	77.4
HYB	1	171		54	1.08	53.8	100.3
HYB	1	171		40	0.80	53.8	74.3
HYB	1	170		38	0.77	52.9	71.9
HYB	1	169		40	0.83	51.9	77.1
HYB	1	167		46	0.99	50.0	92.0
HYB	1	166		40	0.87	49.1	81.5
HYB	1	162		32	0.75	45.5	70.3
HYB	1	159		32	0.80	43.0	74.5
HYB	1	156		36	0.95	40.5	88.9
HYB	1	155		36	0.97	39.7	90.7
HYB	1	155		34	0.91	39.7	85.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
09/22/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
HYB	1	152		31	0.88	37.4	83.0
HYB	1	150		24	0.71	35.9	66.9
HYB	1	150		24	0.71	35.9	66.9
HYB	1	149		31	0.94	35.1	88.2
HYB	1	143		30	1.03	30.9	97.0
HYB	1	139		21	0.78	28.3	74.1
HYB	1	135		20	0.81	25.9	77.3
HYB	1	135		18	0.73	25.9	69.6
HYB	1	131		16	0.71	23.6	67.9
HYB	1	127		16	0.78		
HYB	1	126		25	1.25		
HYB	1	126		18	0.90		
HYB	1	107		6.0	0.49		
HYB	1	97		10	1.10		
HYB	1	61		2.5	1.10		
HYB	1	61		2.4	1.06		
HYB	1	60		2.6	1.20		
HYB	1	57		3.6	1.94		
HYB	1	54		2.0	1.27		
HYB	1	53		1.7	1.14		
HYB	1	52		1.6	1.14		
HYB	1	51		1.6	1.21		
HYB	1	50		1.6	1.28		
HYB	1	48		1.6	1.45		
HYB	1	48		1.0	0.90		
HYB	1	45		1.0	1.10		
RBT	1	272		196	0.97	218.3	89.8
RBT	1	266		158	0.84	204.1	77.4
RBT	1	263		186	1.02	197.2	94.3
RBT	1	262		180	1.00	195.0	92.3
RBT	1	259		143	0.82	188.3	75.9
RBT	1	256		190	1.13	181.8	104.5
RBT	1	253		148	0.91	175.4	84.4
RBT	1	245		126	0.86	159.2	79.2
RBT	1	243		140	0.98	155.3	90.2
RBT	1	239		110	0.81	147.7	74.5
RBT	1	236		126	0.96	142.1	88.7
RBT	1	235		124	0.96	140.3	88.4
RBT	1	235		110	0.85	140.3	78.4
RBT	1	234		110	0.86	138.5	79.4
RBT	1	233		120	0.95	136.7	87.8
RBT	1	233		100	0.79	136.7	73.1
RBT	1	232		141	1.13	135.0	104.5
RBT	1	230		117	0.96	131.5	89.0
RBT	1	230		111	0.91	131.5	84.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
09/22/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
RBT	1	225		94	0.83	123.0	76.4
RBT	1	219		92	0.88	113.4	81.1
RBT	1	218		94	0.91	111.8	84.1
RBT	1	210		80	0.86	99.9	80.1
RBT	1	209		92	1.01	98.4	93.5
RBT	1	185		54	0.85		
BRN	2	197		84	1.10	83.4	100.7
BRN	2	185		52	0.82	69.2	75.1
BRN	2	170		42	0.85	53.9	77.9
BRN	2	140		20	0.73		
BRN	2	126		14	0.70		
BRN	2	74		4.2	1.04		
BRN	2	70		4.2	1.22		
HYB	2	172		48	0.94	54.8	87.6
HYB	2	165		40	0.89	48.2	83.0
HYB	2	163		32	0.74	46.4	69.0
HYB	2	154		24	0.66	38.9	61.7
HYB	2	148		19	0.59	34.4	55.2
HYB	2	145		22	0.72	32.3	68.1
HYB	2	143		23	0.79	30.9	74.4
HYB	2	135		21	0.85	25.9	81.2
HYB	2	131		21	0.93	23.6	89.1
HYB	2	111		12	0.88		
HYB	2	102		8.3	0.78		
HYB	2	63		3.4	1.36		
HYB	2	62		2.6	1.09		
HYB	2	61		2.4	1.06		
HYB	2	58		2.4	1.23		
HYB	2	55		2.0	1.20		
HYB	2	55		1.8	1.08		
HYB	2	54		1.6	1.02		
HYB	2	52		2.0	1.42		
HYB	2	45		1.2	1.32		
HYB	2	45		0.8	0.88		
HYB	2	42		1.0	1.35		
RBT	2	290		232	0.95	265.0	87.5
RBT	2	217		86	0.84	110.3	78.0
RBT	2	183		54	0.88		
RBT	2	180		47	0.81		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Cabresto Creek
09/22/04

BRK		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	195	74	1.00	96.8
	MAX:	195	74	1.00	96.8
	MEAN:	195.0	74.0	1.00	96.8

BRN		LENGTH	WEIGHT	K	Wr
	N:	27	27	27	9
	MIN:	55	2	0.70	75.1
	MAX:	245	124	1.44	100.7
	MEAN:	130.1	34.3	1.00	86.6

HYB		LENGTH	WEIGHT	K	Wr
	N:	72	72	72	42
	MIN:	42	0.8	0.49	55.2
	MAX:	264	170	1.94	100.3
	MEAN:	125.2	27.0	0.96	78.7

RBT		LENGTH	WEIGHT	K	Wr
	N:	29	29	29	26
	MIN:	180	47	0.79	73.1
	MAX:	290	232	1.13	104.5
	MEAN:	234.2	122.8	0.91	85.3

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	1	0	1	± 0.0	0.082	12	± 0.0	1.96
BRN	20	7	29	± 6.1	0.082	354	± 74.4	26.77
HYB	50	22	86	± 19.8	0.082	1049	± 241.5	62.44
RBT	25	4	29	± 1.7	0.082	354	± 20.7	95.84

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRK	1	0	1	± 0.0	0.033	30	± 0.0	2.22
BRN	20	7	29	± 6.1	0.033	879	± 184.8	30.15
HYB	50	22	86	± 19.8	0.033	2606	± 600.0	70.36
RBT	25	4	29	± 1.7	0.033	879	± 51.5	107.94

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	1	0	1	± 0.0	0.062	16	± 0.0	2.61
BRN	20	7	29	± 6.1	0.062	468	± 98.4	35.39
HYB	50	22	86	± 19.8	0.062	1387	± 319.4	82.56
RBT	25	4	29	± 1.7	0.062	468	± 27.4	126.70

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
09/22/2004

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	1	234	128		1.00	138.9	92.2
BRN	1	223	102		0.92	120.4	84.7
BRN	1	223	88		0.79	120.4	73.1
BRN	1	201	74		0.91	88.5	83.6
BRN	1	200	70		0.88	87.2	80.3
BRN	1	187	58		0.89	71.5	81.1
BRN	1	176	57		1.05	59.7	95.4
BRN	1	172	47		0.92	55.8	84.2
BRN	1	168	51		1.08	52.0	98.0
BRN	1	161	38		0.91	45.9	82.8
BRN	1	160	42		1.03	45.0	93.2
BRN	1	160	36		0.88	45.0	79.9
BRN	1	157	43		1.11	42.6	101.0
BRN	1	156	37		0.97	41.8	88.5
BRN	1	154	32		0.88	40.2	79.6
BRN	1	152	37		1.05	38.7	95.6
BRN	1	148	31		0.96	35.8	86.7
BRN	1	146	27		0.87	34.3	78.6
BRN	1	145	28		0.92	33.6	83.2
BRN	1	144	32		1.07	33.0	97.1
BRN	1	143	29		0.99	32.3	89.8
BRN	1	137	21		0.82		
BRN	1	136	21		0.83		
BRN	1	134	20		0.83		
BRN	1	120	14		0.81		
BRN	1	103	10.5		0.96		
BRN	1	100	10.5		1.05		
BRN	1	99	10		1.03		
BRN	1	96	8.6		0.97		
BRN	1	96	8.2		0.93		
BRN	1	96	7.4		0.84		
BRN	1	94	9.0		1.08		
BRN	1	92	6.8		0.87		
BRN	1	91	7.4		0.98		
BRN	1	90	7.2		0.99		
BRN	1	90	6.2		0.85		
BRN	1	89	7.2		1.02		
BRN	1	42	1.6		2.16		
BRN	1	42	1.2		1.62		
BRN	2	241	138		0.99	151.5	91.1
BRN	2	225	125		1.10	123.6	101.1
BRN	2	221	108		1.00	117.2	92.1
BRN	2	202	71		0.86	89.8	79.0
BRN	2	195	61		0.82	80.9	75.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
09/22/2004

SPECIES	PASS	LENGTH	WEIGHT		K	Ws	Wr
BRN	2	164	41		0.93	48.5	84.6
BRN	2	156	39		1.03	41.8	93.3
BRN	2	150	29		0.86	37.2	77.9
BRN	2	142	26.5		0.93	31.6	83.8
BRN	2	138	25		0.95		
BRN	2	136	23.5		0.93		
BRN	2	134	25		1.04		
BRN	2	114	14.5		0.98		
BRN	2	99	9.0		0.93		
BRN	3	164	42		0.95	48.5	86.7
BRN	3	158	44		1.12	43.4	101.4
BRN	3	155	35.5		0.95	41.0	86.6
BRN	3	150	31.5		0.93	37.2	84.7
BRN	3	145	32.5		1.07	33.6	96.6
BRN	3	109	12.5		0.97		
BRN	3	104	11		0.98		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Columbine Creek
09/22/2004

BRN		LENGTH	WEIGHT	K	Wr
	N:	60	60	60	35
	MIN:	42	1.2	0.79	73.1
	MAX:	241	138	2.16	101.4
	MEAN:	144.3	36.8	0.98	87.5

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	39	14	7	63	± 5.8	0.120	525	± 48.3	42.59

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	39	14	7	63	± 5.8	0.049	1286	± 118.4	47.32

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	39	14	7	63	± 5.8	0.074	851	± 78.4	69.04

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
09/20/2004

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRK	1	186	69	1.07	66.2	104.2
BRK	1	123	18	0.97		
BRK	1	78	5.0	1.05		
BRK	1	75	3.7	0.88		
BRK	1	72	3.7	0.99		
BRK	1	72	3.2	0.86		
BRK	1	69	3.0	0.91		
BRK	1	69	2.8	0.85		
BRK	1	68	3.0	0.95		
BRK	1	67	2.9	0.96		
BRK	1	67	2.6	0.86		
BRN	1	303	263	0.95	298.6	88.1
BRN	1	287	238	1.01	254.2	93.6
BRN	1	264	194	1.05	198.5	97.7
BRN	1	257	165	0.97	183.3	90.0
BRN	1	256	138	0.82	181.2	76.2
BRN	1	254	152	0.93	177.1	85.8
BRN	1	253	148	0.91	175.0	84.6
BRN	1	242	134	0.95	153.4	87.3
BRN	1	240	148	1.07	149.7	98.9
BRN	1	226	118	1.02	125.3	94.2
BRN	1	220	103	0.97	115.7	89.0
BRN	1	213	93	0.96	105.1	88.5
BRN	1	209	83	0.91	99.4	83.5
BRN	1	194	66	0.90	79.7	82.8
BRN	1	187	63	0.96	71.5	88.1
BRN	1	183	54	0.88	67.0	80.5
BRN	1	173	52	1.00	56.8	91.6
BRN	1	169	44	0.91	53.0	83.1
BRN	1	164	42	0.95	48.5	86.7
BRN	1	134	23	0.96		
BRN	1	69	3.0	0.91		
BRN	1	59	2.2	1.07		
BRN	1	58	2.1	1.08		
BRN	1	58	2.0	1.03		
BRN	1	58	1.8	0.92		
BRN	1	56	1.6	0.91		
BRN	1	56	1.5	0.85		
BRN	1	56	1.3	0.74		
BRN	1	56	1.3	0.74		
BRN	1	54	1.6	1.02		
BRN	1	53	1.3	0.87		
BRN	1	45	0.6	0.66		
HYB	1	207	104	1.17	97.3	106.9
RBT	1	370	670	1.32	553.7	121.0

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
09/20/2004

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	339	470	1.21	424.9	110.6
RBT	1	338	415	1.07	421.2	98.5
RBT	1	335	415	1.10	410.0	101.2
RBT	1	333	365	0.99	402.6	90.7
RBT	1	327	325	0.93	381.1	85.3
RBT	1	323	325	0.96	367.1	88.5
RBT	1	301	249	0.91	296.6	83.9
RBT	1	298	259	0.98	287.8	90.0
RBT	1	295	238	0.93	279.1	85.3
RBT	1	287	255	1.08	256.8	99.3
RBT	1	286	270	1.15	254.1	106.2
RBT	1	283	252	1.11	246.2	102.4
RBT	1	280	252	1.15	238.3	105.7
RBT	1	280	208	0.95	238.3	87.3
RBT	1	279	244	1.12	235.8	103.5
RBT	1	279	242	1.11	235.8	102.6
RBT	1	276	254	1.21	228.2	111.3
RBT	1	276	211	1.00	228.2	92.5
RBT	1	272	244	1.21	218.3	111.8
RBT	1	272	213	1.06	218.3	97.6
RBT	1	267	208	1.09	206.4	100.8
RBT	1	266	194	1.03	204.1	95.1
RBT	1	266	178	0.95	204.1	87.2
RBT	1	264	206	1.12	199.5	103.3
RBT	1	261	179	1.01	192.7	92.9
RBT	1	256	161	0.96	181.8	88.6
RBT	1	254	190	1.16	177.5	107.0
RBT	1	254	183	1.12	177.5	103.1
RBT	1	254	156	0.95	177.5	87.9
RBT	1	253	167	1.03	175.4	95.2
RBT	1	253	164	1.01	175.4	93.5
RBT	1	248	166	1.09	165.1	100.5
RBT	1	248	163	1.07	165.1	98.7
RBT	1	248	142	0.93	165.1	86.0
RBT	1	246	131	0.88	161.1	81.3
RBT	1	245	168	1.14	159.2	105.6
RBT	1	245	150	1.02	159.2	94.2
RBT	1	244	164	1.13	157.2	104.3
RBT	1	243	158	1.10	155.3	101.8
RBT	1	243	154	1.07	155.3	99.2
RBT	1	242	134	0.95	153.3	87.4
RBT	1	240	133	0.96	149.5	88.9
RBT	1	239	146	1.07	147.7	98.9
RBT	1	239	138	1.01	147.7	93.5
RBT	1	238	119	0.88	145.8	81.6
RBT	1	237	132	0.99	144.0	91.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
09/20/2004

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	237	129	0.97	144.0	89.6
RBT	1	230	126	1.04	131.5	95.8
RBT	1	230	126	1.04	131.5	95.8
RBT	1	226	134	1.16	124.7	107.5
RBT	1	217	89	0.87	110.3	80.7
RBT	1	216	106	1.05	108.7	97.5
RBT	1	216	95	0.94	108.7	87.4
RBT	1	209	86	0.94	98.4	87.4
RBT	1	208	93	1.03	97.0	95.9
BRK	2	187	66	1.01	67.3	98.0
BRK	2	165	38	0.85	46.0	82.6
BRK	2	93	7.4	0.92		
BRK	2	74	3.7	0.91		
BRK	2	62	2.5	1.05		
BRN	2	295	284	1.11	275.8	103.0
BRN	2	265	205	1.10	200.7	102.1
BRN	2	244	137	0.94	157.2	87.2
BRN	2	230	129	1.06	132.0	97.8
BRN	2	228	112	0.94	128.6	87.1
BRN	2	197	76	0.99	83.4	91.1
BRN	2	192	60	0.85	77.3	77.6
BRN	2	156	34	0.90	41.8	81.4
BRN	2	62	2.3	0.97		
BRN	2	59	2.2	1.07		
RBT	2	258	190	1.11	186.1	102.1
RBT	2	251	168	1.06	171.2	98.1
RBT	2	243	175	1.22	155.3	112.7
RBT	2	240	167	1.21	149.5	111.7
RBT	2	239	130	0.95	147.7	88.0
RBT	2	210	92	0.99	99.9	92.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Town
09/20/2004

BRK		LENGTH	WEIGHT	K	Wr
	N:	16	16	16	3
	MIN:	62	2.5	0.85	82.6
	MAX:	187	69	1.07	104.2
	MEAN:	95.4	14.7	0.94	94.9

BRN		LENGTH	WEIGHT	K	Wr
	N:	42	42	42	27
	MIN:	45	0.6	0.66	76.2
	MAX:	303	284	1.11	103.0
	MEAN:	167.5	80.5	0.95	88.8

HYB		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	207	104	1.17	106.9
	MAX:	207	104	1.17	106.9
	MEAN:	207.0	104.0	1.17	106.9

RBT		LENGTH	WEIGHT	K	Wr
	N:	62	62	62	62
	MIN:	208	86	0.87	80.7
	MAX:	370	670	1.32	121.0
	MEAN:	262.1	201.1	1.05	96.5

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRK	11	5	17	± 5.2	0.197	86	± 26.4	2.79
BRN	32	10	45	± 6.8	0.197	228	± 34.5	40.46
HYB	1	0	1	± 0.0	0.197	5	± 0.0	1.15
RBT	56	6	62	± 1.7	0.197	315	± 8.6	139.65

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRK	11	5	17	± 5.2	0.080	213	± 65.0	3.13
BRN	32	10	45	± 6.8	0.080	563	± 85.0	45.32
HYB	1	0	1	± 0.0	0.080	13	± 0.0	1.35
RBT	56	6	62	± 1.7	0.080	775	± 21.3	155.85

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRK	11	5	17	± 5.2	0.086	198	± 60.5	6.42
BRN	32	10	45	± 6.8	0.086	523	± 79.1	92.82
HYB	1	0	1	± 0.0	0.086	12	± 0.0	2.75
RBT	56	6	62	± 1.7	0.086	721	± 19.8	319.65

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
09/23/04

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	223	118	1.06	120.4	98.0
BRN	1	208	86	0.96	98.0	87.8
BRN	1	205	86	1.00	93.8	91.6
BRN	1	204	84	0.99	92.5	90.8
BRN	1	185	60	0.95	69.2	86.7
BRN	1	167	44	0.94	51.1	86.1
BRN	1	151	36	1.05	37.9	94.9
RBT	1	282	256	1.14	243.5	105.1
RBT	1	268	194	1.01	208.8	92.9
RBT	1	266	164	0.87	204.1	80.4
RBT	1	259	198	1.14	188.3	105.2
RBT	1	248	148	0.97	165.1	89.6
RBT	1	243	166	1.16	155.3	106.9
RBT	1	243	150	1.05	155.3	96.6
RBT	1	238	140	1.04	145.8	96.0
RBT	1	238	128	0.95	145.8	87.8
RBT	1	237	140	1.05	144.0	97.2
RBT	1	235	142	1.09	140.3	101.2
RBT	1	233	124	0.98	136.7	90.7
RBT	1	227	114	0.97	126.4	90.2
RBT	1	226	112	0.97	124.7	89.8
RBT	1	218	110	1.06	111.8	98.4
RBT	1	218	100	0.97	111.8	89.4
RBT	1	218	96	0.93	111.8	85.9
RBT	1	217	100	0.98	110.3	90.7
RBT	1	208	94	1.04	97.0	96.9
RBT	1	208	92	1.02	97.0	94.8
RBT	1	207	74	0.83	95.6	77.4
RBT	1	197	66	0.86		
BRN	2	166	46	1.01	50.2	91.6
RBT	2	212	104	1.09	102.8	101.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
June Bug
09/23/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	8	8	8	8
	MIN:	151	36	0.94	86.1
	MAX:	223	118	1.06	98.0
	MEAN:	188.6	70.0	0.99	90.9

RBT		LENGTH	WEIGHT	K	Wr
	N:	23	23	23	22
	MIN:	197	66	0.83	77.4
	MAX:	282	256	1.16	106.9
	MEAN:	232.4	131.0	1.01	93.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	7	1	8	± 0.9	0.126	63	± 7.1	9.72
RBT	22	1	23	± 0.5	0.126	183	± 4.0	52.85

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	7	1	8	± 0.9	0.051	157	± 17.6	10.99
RBT	22	1	23	± 0.5	0.051	451	± 9.8	59.08

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	7	1	8	± 0.9	0.063	127	± 14.3	19.60
RBT	22	1	23	± 0.5	0.063	365	± 7.9	105.41

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
09/23/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	273		224	1.10	219.2	102.2
BRN	1	248		140	0.92	165.0	84.9
BRN	1	205		84	0.98	93.8	89.5
BRN	1	202		82	0.99	89.8	91.3
BRN	1	95		9.2	1.07		
BRN	1	93		8.4	1.04		
BRN	1	83		6.2	1.08		
BRN	1	75		4.6	1.09		
BRN	1	57		2.6	1.40		
RBT	1	287		256	1.08	256.8	99.7
RBT	1	240		130	0.94	149.5	86.9
RBT	1	211		96	1.02	101.3	94.8
RBT	1	174		58	1.10		
BRN	2	244		152	1.05	157.2	96.7
BRN	2	104		13	1.16		
BRN	2	99		9.5	0.98		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Elephant Rock
09/23/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	12	12	12	5
	MIN:	57	2.6	0.92	84.9
	MAX:	273	224	1.40	102.2
	MEAN:	148.2	61.3	1.07	92.9

RBT		LENGTH	WEIGHT	K	Wr
	N:	4	4	4	3
	MIN:	174	58	0.94	86.9
	MAX:	287	256	1.10	99.7
	MEAN:	228.0	135.0	1.04	93.8

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	9	3	12	± 2.3	0.108	111	± 21.3	15.00
RBT	4	0	4	± 0.0	0.108	37	± 0.0	11.01

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	9	3	12	± 2.3	0.044	273	± 52.3	16.73
RBT	4	0	4	± 0.0	0.044	91	± 0.0	12.29

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	9	3	12	± 2.3	0.056	214	± 41.1	28.92
RBT	4	0	4	± 0.0	0.056	71	± 0.0	21.13

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
09/29/04

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	275	242	1.16	225.7	107.2
RBT	1	265	182	0.98	201.8	90.2
RBT	1	264	185	1.01	199.5	92.7
RBT	1	256	180	1.07	181.8	99.0
RBT	1	256	164	0.98	181.8	90.2
NO FISH	2	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hansen
09/29/04

RBT		LENGTH	WEIGHT	K	Wr
	N:	5	5	5	5
	MIN:	256	164	0.98	90.2
	MAX:	275	242	1.16	107.2
	MEAN:	263.2	190.6	1.04	95.9

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
RBT	5	0	5	± 0.0	0.150	33	± 0.0	13.87

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
RBT	5	0	5	± 0.0	0.061	82	± 0.0	15.63

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
RBT	5	0	5	± 0.0	0.081	62	± 0.0	26.05

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Mill
09/29/04

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
RBT	1	276	254	1.21	228.2	111.3
RBT	1	276	243	1.16	228.2	106.5
RBT	1	276	235	1.12	228.2	103.0
RBT	1	270	222	1.13	213.5	104.0
RBT	1	249	157	1.02	167.2	93.9
RBT	1	242	171	1.21	153.3	111.5
RBT	1	225	120	1.05	123.0	97.5
RBT	1	220	108	1.01	114.9	94.0
RBT	1	206	92	1.05	94.2	97.6
NO FISH	2	----------				

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Mill
09/29/04

RBT		LENGTH	WEIGHT	K	Wr
	N:	9	9	9	9
	MIN:	206	92	1.01	93.9
	MAX:	276	254	1.21	111.5
	MEAN:	248.9	178.0	1.11	102.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
RBT	9	0	9	± 0.0	0.137	66	± 0.0	25.90

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
RBT	9	0	9	± 0.0	0.055	164	± 0.0	29.19

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
RBT	9	0	9	± 0.0	0.077	117	± 0.0	45.91

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
09/29/04

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Columbine
09/29/04

NO FISH COLLECTED AT SITE

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Cabin Springs
09/27/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	269		181	0.93	209.9	86.2
BRN	1	264		174	0.95	198.5	87.7
BRN	1	247		140	0.93	163.0	85.9
BRN	1	246		130	0.87	161.0	80.7
BRN	1	231		124	1.01	133.7	92.8
BRN	1	221		98	0.91	117.2	83.6
BRN	1	217		100	0.98	111.1	90.0
BRN	1	201		72	0.89	88.5	81.3
BRN	1	167		48	1.03	51.1	93.9
BRN	1	165		45	1.00	49.3	91.2
BRN	1	162		44	1.03	46.7	94.2
BRN	1	143		27	0.92	32.3	83.6
BRN	1	81		5.2	0.98		
RBT	1	257		180	1.06	183.9	97.9
RBT	1	245		153	1.04	159.2	96.1
RBT	1	244		156	1.07	157.2	99.2
RBT	1	235		118	0.91	140.3	84.1
RBT	1	232		114	0.91	135.0	84.5
RBT	1	229		122	1.02	129.8	94.0
RBT	1	225		120	1.05	123.0	97.5
RBT	1	224		118	1.05	121.4	97.2
RBT	1	210		108	1.17	99.9	108.2
BRN	2	229		117	0.97	130.3	89.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Cabin Springs
09/27/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	14	14	14	13
	MIN:	81	5.2	0.87	80.7
	MAX:	269	181	1.03	94.2
	MEAN:	203.1	93.2	0.96	87.8

RBT		LENGTH	WEIGHT	K	Wr
	N:	9	9	9	9
	MIN:	210	108	0.91	84.1
	MAX:	257	180	1.17	108.2
	MEAN:	233.4	132.1	1.03	95.4

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	13	1	14	± 0.6	0.139	101	± 4.3	20.75
RBT	9	0	9	± 0.0	0.139	65	± 0.0	18.93

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	13	1	14	± 0.6	0.056	250	± 10.7	23.30
RBT	9	0	9	± 0.0	0.056	161	± 0.0	21.27

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	13	1	14	± 0.6	0.085	165	± 7.1	33.90
RBT	9	0	9	± 0.0	0.085	106	± 0.0	30.87

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
09/21/04

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	182	60	1.00	66.0	91.0
BRN	1	171	48	0.96	54.8	87.5
BRN	1	100	8.9	0.89		
BRN	1	94	8.0	0.96		
BRN	1	77	4.4	0.96		
BRN	1	73	4.0	1.03		
RBT	1	255	149	0.90	179.6	82.9
RBT	1	251	146	0.92	171.2	85.3
RBT	1	238	126	0.93	145.8	86.4
RBT	1	224	118	1.05	121.4	97.2
RBT	1	204	74	0.87	91.5	80.9
BRN	2	103	12	1.10		
RBT	2	262	180	1.00	195.0	92.3
RBT	2	251	169	1.07	171.2	98.7

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Goathill
09/21/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	7	7	7	2
	MIN:	73	4	0.89	87.5
	MAX:	182	60	1.10	91.0
	MEAN:	114.3	20.8	0.99	89.2

RBT		LENGTH	WEIGHT	K	Wr
	N:	7	7	7	7
	MIN:	204	74	0.87	80.9
	MAX:	262	180	1.07	98.7
	MEAN:	240.7	137.4	0.96	89.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	6	1	7	± 1.0	0.175	40	± 5.7	1.83
RBT	5	2	7	± 2.3	0.175	40	± 13.1	12.12

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	6	1	7	± 1.0	0.071	99	± 14.1	2.06
RBT	5	2	7	± 2.3	0.071	99	± 32.4	13.60

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	6	1	7	± 1.0	0.075	93	± 13.3	4.26
RBT	5	2	7	± 2.3	0.075	93	± 30.7	28.17

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
09/21/04

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	299	268	1.00	287.0	93.4
BRN	1	250	166	1.06	168.9	98.3
BRN	1	172	51	1.00	55.8	91.4
BRN	1	100	9.9	0.99		
BRN	1	90	7.9	1.08		
BRN	1	71	4.8	1.34		
RBT	1	253	171	1.06	175.4	97.5
RBT	1	216	80	0.79	108.7	73.6
RBT	1	201	75	0.92	87.5	85.7
BRN	2	85	6.1	0.99		
RBT	2	237	125	0.94	144.0	86.8

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Questa Ranger Station
09/21/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	7	7	7	3
	MIN:	71	4.8	0.99	91.4
	MAX:	299	268	1.34	98.3
	MEAN:	152.4	73.4	1.07	94.3

RBT		LENGTH	WEIGHT	K	Wr
	N:	4	4	4	4
	MIN:	201	75	0.79	73.6
	MAX:	253	171	1.06	97.5
	MEAN:	226.8	112.8	0.93	85.9

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	6	1	7	± 1.0	0.203	34	± 4.9	5.50
RBT	3	1	4	± 1.9	0.203	20	± 9.4	4.97

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	6	1	7	± 1.0	0.082	85	± 12.2	6.24
RBT	3	1	4	± 1.9	0.082	49	± 23.2	5.53

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	6	1	7	± 1.0	0.082	85	± 12.2	13.75
RBT	3	1	4	± 1.9	0.082	49	± 23.2	12.19

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Highway 522
09/24/04

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	333	270	0.73	394.9	68.4
BRN	1	275	216	1.04	224.0	96.4
BRN	1	275	188	0.90	224.0	83.9
BRN	1	258	178	1.04	185.4	96.0
BRN	1	250	136	0.87	168.9	80.5
BRN	1	241	144	1.03	151.5	95.0
BRN	1	228	130	1.10	128.6	101.1
BRN	1	200	78	0.98	87.2	89.4
BRN	1	197	76	0.99	83.4	91.1
BRN	1	195	70	0.94	80.9	86.5
BRN	1	185	64	1.01	69.2	92.4
BRN	1	185	62	0.98	69.2	89.5
BRN	1	180	60	1.03	63.8	94.0
RBT	1	302	278	1.01	299.6	92.8
RBT	1	273	242	1.19	220.8	109.6
RBT	1	267	164	0.86	206.4	79.4
RBT	1	264	142	0.77	199.5	71.2
RBT	1	254	152	0.93	177.5	85.6
RBT	1	252	124	0.77	173.3	71.5
RBT	1	248	156	1.02	165.1	94.5
RBT	1	248	136	0.89	165.1	82.4
RBT	1	242	118	0.83	153.3	77.0
RBT	1	240	126	0.91	149.5	84.3
RBT	1	238	126	0.93	145.8	86.4
RBT	1	235	128	0.99	140.3	91.2
RBT	1	234	130	1.01	138.5	93.9
RBT	1	233	110	0.87	136.7	80.4
RBT	1	230	118	0.97	131.5	89.7
RBT	1	227	122	1.04	126.4	96.5
RBT	1	224	122	1.09	121.4	100.5
RBT	1	223	114	1.03	119.7	95.2
RBT	1	203	86	1.03	90.1	95.4
RBT	1	188	68	1.02		
BRN	2	187	60	0.92	71.5	83.9
BRN	2	163	46	1.06	47.6	96.7
BRN	2	108	12	0.95		
BRN	2	100	11	1.10		
RBT	2	237	124	0.93	144.0	86.1

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Highway 522
09/24/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	17	17	17	15
	MIN:	100	11	0.73	68.4
	MAX:	333	270	1.10	101.1
	MEAN:	209.4	105.9	0.98	89.7

RBT		LENGTH	WEIGHT	K	Wr
	N:	21	21	21	20
	MIN:	188	68	0.77	71.2
	MAX:	302	278	1.19	109.6
	MEAN:	241.0	137.4	0.96	88.2

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	13	4	17	± 2.5	0.255	67	± 9.8	15.64
RBT	20	1	21	± 0.5	0.255	82	± 2.0	24.84

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	13	4	17	± 2.5	0.103	165	± 24.3	17.47
RBT	20	1	21	± 0.5	0.103	204	± 4.9	28.03

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	13	4	17	± 2.5	0.097	175	± 25.8	40.86
RBT	20	1	21	± 0.5	0.097	216	± 5.2	65.43

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Highway 522
09/28/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	305		298	1.05	304.4	97.9
BRN	1	271		192	0.96	214.5	89.5
BRN	1	246		150	1.01	161.0	93.1
BRN	1	236		136	1.03	142.4	95.5
BRN	1	233		127	1.00	137.1	92.6
BRN	1	232		120	0.96	135.4	88.6
BRN	1	212		96	1.01	103.7	92.6
BRN	1	199		76	0.96	85.9	88.4
BRN	1	198		73	0.94	84.7	86.2
BRN	1	195		70	0.94	80.9	86.5
BRN	1	195		66	0.89	80.9	81.6
BRN	1	190		63	0.92	74.9	84.1
BRN	1	186		70	1.09	70.4	99.5
BRN	1	186		66	1.03	70.4	93.8
BRN	1	184		58	0.93	68.1	85.1
BRN	1	170		55	1.12	53.9	102.0
BRN	1	164		57	1.29	48.5	117.6
BRN	1	113		13	0.90		
BRN	1	103		11	1.01		
BRN	1	101		11	1.07		
BRN	1	98		9.9	1.05		
BRN	1	98		9.8	1.04		
BRN	1	98		9.2	0.98		
BRN	1	98		8.4	0.89		
BRN	1	97		8.3	0.91		
BRN	1	95		7.4	0.86		
BRN	1	93		7.6	0.94		
BRN	1	91		6.3	0.84		
BRN	1	90		6.7	0.92		
RBT	1	277		180	0.85	230.7	78.0
RBT	1	265		170	0.91	201.8	84.2
RBT	1	259		168	0.97	188.3	89.2
RBT	1	253		138	0.85	175.4	78.7
RBT	1	244		158	1.09	157.2	100.5
RBT	1	238		96	0.71	145.8	65.8
RBT	1	228		118	1.00	128.1	92.1
RBT	1	227		116	0.99	126.4	91.8
RBT	1	226		104	0.90	124.7	83.4
RBT	1	222		108	0.99	118.1	91.4
RBT	1	219		172	1.64	113.4	151.7
RBT	1	217		96	0.94	110.3	87.1
RBT	1	208		97	1.08	97.0	100.0
RBT	1	206		76	0.87	94.2	80.7
WS	1	158		41	1.04	45.5	90.1
BRN	2	297		232	0.89	281.4	82.4

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Highway 522
09/28/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	2	180		51	0.87	63.8	79.9
BRN	2	109		12	0.93		
BRN	2	108		12.5	0.99		
BRN	2	98		8.7	0.92		
BRN	2	92		6.7	0.86		
BRN	2	88		5.9	0.87		
RBT	2	200		73	0.91		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Highway 522
09/28/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	36	36	36	19
	MIN:	88	5.9	0.84	79.9
	MAX:	305	298	1.29	117.6
	MEAN:	159.7	61.4	0.97	91.4

RBT		LENGTH	WEIGHT	K	Wr
	N:	15	15	15	14
	MIN:	200	73	0.71	65.8
	MAX:	277	180	1.64	151.7
	MEAN:	232.6	124.7	0.98	91.1

WS		LENGTH	WEIGHT	K	Wr
	N:	1	1	1	1
	MIN:	158	41	1.04	90.1
	MAX:	158	41	1.04	90.1
	MEAN:	158.0	41.0	1.04	90.1

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	29	7	37	± 3.7	0.151	245	± 24.5	33.16
RBT	14	1	15	± 0.6	0.151	99	± 4.0	27.22
WS	1	0	1	± 0.0	0.151	7	± 0.0	0.63

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	29	7	37	± 3.7	0.061	607	± 60.7	37.27
RBT	14	1	15	± 0.6	0.061	246	± 9.8	30.68
WS	1	0	1	± 0.0	0.061	16	± 0.0	0.66

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	29	7	37	± 3.7	0.071	521	± 52.1	70.52
RBT	14	1	15	± 0.6	0.071	211	± 8.5	58.01
WS	1	0	1	± 0.0	0.071	14	± 0.0	1.27

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Outfall 002
09/28/2004

SPECIES	PASS	LENGTH	WEIGHT	K	Ws	Wr
BRN	1	340	365	0.93	420.0	86.9
BRN	1	322	340	1.02	357.5	95.1
BRN	1	295	240	0.93	275.8	87.0
BRN	1	282	176	0.78	241.3	72.9
BRN	1	270	202	1.03	212.2	95.2
BRN	1	264	174	0.95	198.5	87.7
BRN	1	263	90	0.49	196.3	45.8
BRN	1	249	168	1.09	166.9	100.6
BRN	1	249	160	1.04	166.9	95.8
BRN	1	243	156	1.09	155.3	100.5
BRN	1	242	134	0.95	153.4	87.3
BRN	1	233	138	1.09	137.1	100.6
BRN	1	216	94	0.93	109.6	85.8
BRN	1	207	82	0.92	96.6	84.9
BRN	1	206	90	1.03	95.2	94.5
BRN	1	206	86	0.98	95.2	90.3
BRN	1	206	84	0.96	95.2	88.2
BRN	1	203	86	1.03	91.2	94.3
BRN	1	200	82	1.03	87.2	94.0
BRN	1	200	78	0.98	87.2	89.4
BRN	1	199	70	0.89	85.9	81.5
BRN	1	196	72	0.96	82.2	87.6
BRN	1	193	68	0.95	78.5	86.6
BRN	1	188	60	0.90	72.6	82.6
BRN	1	186	58	0.90	70.4	82.4
BRN	1	186	58	0.90	70.4	82.4
BRN	1	183	56	0.91	67.0	83.5
BRN	1	182	54	0.90	66.0	81.9
BRN	1	177	49	0.88	60.7	80.7
BRN	1	174	48	0.91	57.7	83.1
BRN	1	172	48	0.94	55.8	86.0
BRN	1	172	46	0.90	55.8	82.4
BRN	1	170	46	0.94	53.9	85.3
BRN	1	164	42	0.95	48.5	86.7
BRN	1	118	16	0.97		
BRN	1	113	14.5	1.00		
BRN	1	112	15	1.07		
BRN	1	112	14	1.00		
BRN	1	109	13.5	1.04		
BRN	1	108	12.5	0.99		
BRN	1	106	13	1.09		
BRN	1	105	13	1.12		
BRN	1	104	11	0.98		
BRN	1	102	11.5	1.08		
BRN	1	101	9.5	0.92		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Outfall 002
09/28/2004

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	99		9.5	0.98		
BRN	1	98		7.4	0.79		
BRN	1	95		8.7	1.01		
BRN	1	93		8.3	1.03		
BRN	1	90		7.8	1.07		
BRN	1	90		7.7	1.06		
BRN	1	89		7.8	1.11		
BRN	1	86		6.4	1.01		
BRN	1	85		6.7	1.09		
BRN	1	79		5.3	1.07		
RBT	1	290		248	1.02	265.0	93.6
RBT	1	290		210	0.86	265.0	79.2
RBT	1	281		188	0.85	240.9	78.0
RBT	1	276		218	1.04	228.2	95.5
RBT	1	275		198	0.95	225.7	87.7
RBT	1	273		192	0.94	220.8	87.0
RBT	1	273		158	0.78	220.8	71.6
RBT	1	265		188	1.01	201.8	93.2
RBT	1	261		158	0.89	192.7	82.0
RBT	1	259		192	1.11	188.3	102.0
RBT	1	257		148	0.87	183.9	80.5
RBT	1	256		132	0.79	181.8	72.6
RBT	1	253		182	1.12	175.4	103.8
RBT	1	240		144	1.04	149.5	96.3
RBT	1	238		122	0.90	145.8	83.7
RBT	1	238		116	0.86	145.8	79.6
RBT	1	236		128	0.97	142.1	90.1
RBT	1	236		124	0.94	142.1	87.2
RBT	1	234		138	1.08	138.5	99.6
RBT	1	227		98	0.84	126.4	77.6
RBT	1	214		88	0.90	105.7	83.2
BRN	2	297		216	0.82	281.4	76.8
BRN	2	254		162	0.99	177.1	91.5
BRN	2	214		99	1.01	106.6	92.9
BRN	2	198		78	1.00	84.7	92.1
BRN	2	198		74	0.95	84.7	87.4
BRN	2	187		64	0.98	71.5	89.5
BRN	2	184		58	0.93	68.1	85.1
BRN	2	178		52	0.92	61.8	84.2
BRN	2	177		53	0.96	60.7	87.3
BRN	2	172		47	0.92	55.8	84.2
BRN	2	166		47	1.03	50.2	93.6
BRN	2	110		13	0.98		
BRN	2	108		13	1.03		
BRN	2	106		13	1.09		
BRN	2	106		11	0.92		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Outfall 002
09/28/2004

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	2	102		11	1.04		
BRN	2	100		10	1.00		
BRN	2	98		8.6	0.91		
BRN	2	94		8.4	1.01		
BRN	2	89		7.3	1.04		
BRN	2	80		4.8	0.94		
BRN	2	77		4.5	0.99		
BRN	2	73		3.6	0.93		
RBT	2	265		224	1.20	201.8	111.0
RBT	2	251		129	0.82	171.2	75.3
RBT	2	243		122	0.85	155.3	78.6
RBT	2	235		123	0.95	140.3	87.7
RBT	2	232		105	0.84	135.0	77.8
RBT	2	222		96	0.88	118.1	81.3
RBT	2	219		100	0.95	113.4	88.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Outfall 002
09/28/2004

BRN		LENGTH	WEIGHT	K	Wr
	N:	78	78	78	45
	MIN:	73	3.6	0.49	45.8
	MAX:	340	365	1.12	100.6
	MEAN:	165.4	65.1	0.97	87.0

RBT		LENGTH	WEIGHT	K	Wr
	N:	28	28	28	28
	MIN:	214	88	0.78	71.6
	MAX:	290	248	1.20	111.0
	MEAN:	251.4	152.5	0.90	86.6

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	55	23	92	± 18.9	0.177	520	± 106.8	74.63
RBT	21	7	30	± 5.9	0.177	169	± 33.3	56.82

	1st Pass	2nd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	55	23	92	± 18.9	0.072	1278	± 262.5	83.20
RBT	21	7	30	± 5.9	0.072	417	± 81.9	63.59

	1st Pass	2nd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	55	23	92	± 18.9	0.080	1150	± 236.3	165.05
RBT	21	7	30	± 5.9	0.080	375	± 73.8	126.08

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
09/23/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	255		154	0.93	179.1	86.0
BRN	1	243		144	1.00	155.3	92.7
BRN	1	239		130	0.95	147.8	87.9
BRN	1	235		134	1.03	140.6	95.3
BRN	1	231		124	1.01	133.7	92.8
BRN	1	220		104	0.98	115.7	89.9
BRN	1	215		102	1.03	108.1	94.4
BRN	1	213		96	0.99	105.1	91.3
BRN	1	205		130	1.51	93.8	138.5
BRN	1	205		88	1.02	93.8	93.8
BRN	1	200		74	0.93	87.2	84.8
BRN	1	194		70	0.96	79.7	87.8
BRN	1	185		66	1.04	69.2	95.3
BRN	1	182		60	1.00	66.0	91.0
BRN	1	180		60	1.03	63.8	94.0
BRN	1	180		50	0.86	63.8	78.3
BRN	1	178		56	0.99	61.8	90.7
BRN	1	175		54	1.01	58.7	91.9
BRN	1	174		68	1.29	57.7	117.8
BRN	1	170		53	1.08	53.9	98.3
BRN	1	170		47	0.96	53.9	87.2
BRN	1	165		45	1.00	49.3	91.2
BRN	1	163		45	1.04	47.6	94.6
BRN	1	158		44	1.12	43.4	101.4
BRN	1	154		38	1.04	40.2	94.5
BRN	1	126		20	1.00		
BRN	1	125		20	1.02		
BRN	1	125		20	1.02		
BRN	1	121		19	1.07		
BRN	1	120		18	1.04		
BRN	1	120		17	0.98		
BRN	1	118		20	1.22		
BRN	1	118		18	1.10		
BRN	1	118		17	1.03		
BRN	1	118		13	0.79		
BRN	1	117		16	1.00		
BRN	1	115		14	0.92		
BRN	1	113		15	1.04		
BRN	1	113		15	1.04		
BRN	1	111		15	1.10		
BRN	1	110		16	1.20		
BRN	1	110		16	1.20		
BRN	1	110		14	1.05		
BRN	1	110		14	1.05		
BRN	1	110		13	0.98		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
09/23/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	108		13	1.03		
BRN	1	108		13	1.03		
BRN	1	105		13	1.12		
BRN	1	105		13	1.12		
BRN	1	104		13	1.16		
BRN	1	102		12	1.13		
BRN	1	102		12	1.13		
BRN	1	100		11	1.10		
BRN	1	99		11.0	1.13		
BRN	1	98		10.5	1.12		
BRN	1	98		10.5	1.12		
BRN	1	96		10	1.13		
BRN	1	96		10.0	1.13		
BRN	1	95		9.5	1.11		
BRN	1	95		9.5	1.11		
BRN	1	91		9.4	1.25		
BRN	1	90		9.2	1.26		
BRN	1	90		8.2	1.12		
BRN	1	89		8.5	1.21		
BRN	1	89		7.6	1.08		
BRN	1	87		8.4	1.28		
BRN	1	86		7.6	1.19		
BRN	1	86		7.2	1.13		
BRN	1	86		6.8	1.07		
BRN	1	85		7.4	1.20		
BRN	1	85		6.4	1.04		
BRN	1	82		7.6	1.38		
BRN	1	82		6.4	1.16		
BRN	1	81		5.6	1.05		
BRN	1	80		6.0	1.17		
BRN	1	80		5.8	1.13		
BRN	1	78		5.2	1.10		
BRN	1	77		5.6	1.23		
BRN	1	76		5.4	1.23		
BRN	1	74		4.4	1.09		
BRN	1	73		5.6	1.44		
BRN	1	73		5.4	1.39		
BRN	1	72		4.4	1.18		
BRN	1	69		4.2	1.28		
BRN	1	68		3.8	1.21		
RBT	1	444		950	1.09	960.9	98.9
RBT	1	424		960	1.26	835.9	114.8
RBT	1	404		850	1.29	722.3	117.7
RBT	1	404		760	1.15	722.3	105.2
RBT	1	402		900	1.39	711.5	126.5
RBT	1	401		750	1.16	706.2	106.2

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
09/23/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
RBT	1	390		640	1.08	649.2	98.6
RBT	1	385		660	1.16	624.4	105.7
RBT	1	281		202	0.91	240.9	83.8
RBT	1	266		208	1.11	204.1	101.9
RBT	1	260		194	1.10	190.5	101.8
RBT	1	250		174	1.11	169.2	102.8
RBT	1	241		154	1.10	151.4	101.7
RBT	1	235		162	1.25	140.3	115.5
RBT	1	223		90	0.81	119.7	75.2
RBT	1	214		104	1.06	105.7	98.4
RBT	1	197		76	0.99		
BRN	2	194		72	0.99	79.7	90.3
BRN	2	182		56	0.93	66.0	84.9
BRN	2	176		58	1.06	59.7	97.1
BRN	2	166		44	0.96	50.2	87.6
BRN	2	165		54	1.20	49.3	109.4
BRN	2	156		39	1.03	41.8	93.3
BRN	2	135		27	1.10		
BRN	2	130		24	1.09		
BRN	2	122		19	1.05		
BRN	2	115		18	1.18		
BRN	2	114		15	1.01		
BRN	2	112		14	1.00		
BRN	2	110		14	1.05		
BRN	2	105		13	1.12		
BRN	2	105		12	1.04		
BRN	2	104		12	1.07		
BRN	2	101		11	1.07		
BRN	2	99		10	1.03		
BRN	2	97		10	1.10		
BRN	2	94		9.0	1.08		
BRN	2	94		9.0	1.08		
BRN	2	90		8.4	1.15		
BRN	2	90		8.4	1.15		
BRN	2	90		8.2	1.12		
BRN	2	87		8.4	1.28		
BRN	2	87		7.4	1.12		
BRN	2	86		7.4	1.16		
BRN	2	80		7.6	1.48		
BRN	2	73		5.4	1.39		
RBT	2	380		600	1.09	600.2	100.0
RBT	2	223		106	0.96	119.7	88.5
BRN	3	194		74	1.01	79.7	92.8
BRN	3	155		42	1.13	41.0	102.4
BRN	3	155		39	1.05	41.0	95.1
BRN	3	149		33	1.00	36.5	90.5

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
09/23/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	3	120		19	1.10		
BRN	3	112		14	1.00		
BRN	3	110		14	1.05		
BRN	3	105		12	1.04		
BRN	3	103		12	1.10		
BRN	3	96		9.4	1.06		
BRN	3	89		8.2	1.16		
BRN	3	73		5.3	1.36		
RBT	3	284		246	1.07	248.8	98.9
RBT	3	218		98	0.95	111.8	87.6
RBT	3	187		58	0.89		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Upstream of Hatchery
09/23/04

BRN		LENGTH	WEIGHT	K	Wr
	N:	126	126	126	35
	MIN:	68	3.8	0.79	78.3
	MAX:	255	154	1.51	138.5
	MEAN:	123.6	28.4	1.10	94.4

RBT		LENGTH	WEIGHT	K	Wr
	N:	22	22	22	20
	MIN:	187	58	0.81	75.2
	MAX:	444	960	1.39	126.5
	MEAN:	305.1	406.5	1.09	101.5

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (acre)	Density (#/acre)	95% CI	Biomass (lbs/acre)
BRN	85	29	12	131	± 6.9	0.172	762	± 40.1	47.71
RBT	17	2	3	22	± 1.7	0.172	128	± 9.9	114.71

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Area (ha)	Density (#/ha)	95% CI	Biomass (kg/ha)
BRN	85	29	12	131	± 6.9	0.070	1871	± 98.6	53.14
RBT	17	2	3	22	± 1.7	0.070	314	± 24.3	127.64

	1st Pass	2nd Pass	3rd Pass	Pop Est	95% CI	Site Length (mile)	Density (#/mile)	95% CI	Biomass (lbs/mile)
BRN	85	29	12	131	± 6.9	0.065	2015	± 106.2	126.16
RBT	17	2	3	22	± 1.7	0.065	338	± 26.2	302.91

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/21/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	327		310	0.89	374.2	82.8
BRN	1	312		320	1.05	325.6	98.3
BRN	1	300		278	1.03	289.9	95.9
BRN	1	300		264	0.98	289.9	91.1
BRN	1	294		242	0.95	273.1	88.6
BRN	1	283		246	1.09	243.9	100.9
BRN	1	281		204	0.92	238.8	85.4
BRN	1	277		226	1.06	228.9	98.7
BRN	1	275		192	0.92	224.0	85.7
BRN	1	275		190	0.91	224.0	84.8
BRN	1	273		198	0.97	219.2	90.3
BRN	1	272		232	1.15	216.9	107.0
BRN	1	272		200	0.99	216.9	92.2
BRN	1	268		210	1.09	207.6	101.2
BRN	1	267		198	1.04	205.3	96.5
BRN	1	267		194	1.02	205.3	94.5
BRN	1	263		176	0.97	196.3	89.7
BRN	1	261		186	1.05	191.9	96.9
BRN	1	257		162	0.95	183.3	88.4
BRN	1	257		158	0.93	183.3	86.2
BRN	1	252		162	1.01	173.0	93.7
BRN	1	252		160	1.00	173.0	92.5
BRN	1	252		156	0.97	173.0	90.2
BRN	1	251		158	1.00	170.9	92.4
BRN	1	240		156	1.13	149.7	104.2
BRN	1	238		136	1.01	146.0	93.1
BRN	1	237		134	1.01	144.2	92.9
BRN	1	234		124	0.97	138.9	89.3
BRN	1	231		142	1.15	133.7	106.2
BRN	1	229		120	1.00	130.3	92.1
BRN	1	228		114	0.96	128.6	88.7
BRN	1	228		108	0.91	128.6	84.0
BRN	1	227		116	0.99	126.9	91.4
BRN	1	226		130	1.13	125.3	103.8
BRN	1	220		100	0.94	115.7	86.4
BRN	1	219		108	1.03	114.1	94.6
BRN	1	217		100	0.98	111.1	90.0
BRN	1	217		94	0.92	111.1	84.6
BRN	1	215		102	1.03	108.1	94.4
BRN	1	215		96	0.97	108.1	88.8
BRN	1	214		100	1.02	106.6	93.8
BRN	1	214		92	0.94	106.6	86.3
BRN	1	211		104	1.11	102.2	101.7
BRN	1	210		94	1.02	100.8	93.3
BRN	1	209		98	1.07	99.4	98.6

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/21/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	209		84	0.92	99.4	84.5
BRN	1	209		82	0.90	99.4	82.5
BRN	1	206		86	0.98	95.2	90.3
BRN	1	205		86	1.00	93.8	91.6
BRN	1	203		78	0.93	91.2	85.6
BRN	1	202		84	1.02	89.8	93.5
BRN	1	192		74	1.05	77.3	95.7
BRN	1	154		45.5	1.25	40.2	113.1
BRN	1	147		33.5	1.05	35.0	95.6
BRN	1	143		23.5	0.80	32.3	72.8
BRN	1	142		31	1.08	31.6	98.0
BRN	1	136		29.5	1.17		
BRN	1	135		27.5	1.12		
BRN	1	133		24.5	1.04		
BRN	1	132		27.5	1.20		
BRN	1	131		26	1.16		
BRN	1	131		24.5	1.09		
BRN	1	130		25.5	1.16		
BRN	1	130		25	1.14		
BRN	1	130		21.5	0.98		
BRN	1	129		23.5	1.09		
BRN	1	129		23	1.07		
BRN	1	129		23	1.07		
BRN	1	129		21	0.98		
BRN	1	127		22.5	1.10		
BRN	1	126		21	1.05		
BRN	1	125		20.5	1.05		
BRN	1	124		23	1.21		
BRN	1	124		21.5	1.13		
BRN	1	124		21.5	1.13		
BRN	1	123		20.5	1.10		
BRN	1	123		20	1.07		
BRN	1	123		19.5	1.05		
BRN	1	122		20	1.10		
BRN	1	122		19.9	1.10		
BRN	1	122		19.5	1.07		
BRN	1	121		20.5	1.16		
BRN	1	121		19	1.07		
BRN	1	120		19	1.10		
BRN	1	119		18	1.07		
BRN	1	119		16.5	0.98		
BRN	1	118		17.5	1.07		
BRN	1	118		17.5	1.07		
BRN	1	118		17	1.03		
BRN	1	117		18	1.12		
BRN	1	117		17.5	1.09		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/21/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	117		17	1.06		
BRN	1	116		14	0.90		
BRN	1	114		16	1.08		
BRN	1	113		15.5	1.07		
BRN	1	113		14.5	1.00		
BRN	1	112		14.5	1.03		
BRN	1	112		14.5	1.03		
BRN	1	111		14.5	1.06		
BRN	1	111		13.5	0.99		
BRN	1	109		14	1.08		
BRN	1	108		14	1.11		
BRN	1	108		13.5	1.07		
BRN	1	108		13	1.03		
BRN	1	108		8.9	0.71		
BRN	1	106		14.5	1.22		
BRN	1	106		13	1.09		
BRN	1	105		13	1.12		
BRN	1	105		12.0	1.04		
BRN	1	104		13	1.16		
BRN	1	104		12.5	1.11		
BRN	1	104		11.5	1.02		
BRN	1	103		9.6	0.88		
BRN	1	102		12	1.13		
BRN	1	102		11	1.04		
BRN	1	100		11.5	1.15		
BRN	1	100		10.5	1.05		
BRN	1	100		10.5	1.05		
BRN	1	100		9.6	0.96		
BRN	1	99		10.5	1.08		
BRN	1	99		9.8	1.01		
BRN	1	99		9.2	0.95		
BRN	1	98		11.5	1.22		
BRN	1	98		10.5	1.12		
BRN	1	97		10	1.10		
BRN	1	97		9.8	1.07		
BRN	1	96		10.5	1.19		
BRN	1	95		9.6	1.12		
BRN	1	94		9.6	1.16		
BRN	1	94		8.4	1.01		
BRN	1	94		7.8	0.94		
BRN	1	93		9.5	1.18		
BRN	1	93		8.8	1.09		
BRN	1	91		7.4	0.98		
BRN	1	90		11	1.51		
BRN	1	89		7.2	1.02		
BRN	1	89		6.4	0.91		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/21/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	1	88		7.0	1.03		
BRN	1	88		6.4	0.94		
BRN	1	87		6.0	0.91		
BRN	1	85		8.0	1.30		
BRN	1	85		7.4	1.20		
BRN	1	80		5.2	1.02		
BRN	1	78		5	1.05		
BRN	1	76		4.8	1.09		
RBT	1	480		770	0.70	1216.4	63.3
RBT	1	400		700	1.09	700.9	99.9
RBT	1	385		550	0.96	624.4	88.1
RBT	1	271		208	1.05	215.9	96.3
RBT	1	271		168	0.84	215.9	77.8
RBT	1	266		208	1.11	204.1	101.9
RBT	1	231		124	1.01	133.2	93.1
RBT	1	223		102	0.92	119.7	85.2
RBT	1	197		57	0.75		
BRN	2	355		430	0.96	477.3	90.1
BRN	2	275		238	1.14	224.0	106.2
BRN	2	256		178	1.06	181.2	98.2
BRN	2	255		152	0.92	179.1	84.9
BRN	2	251		164	1.04	170.9	95.9
BRN	2	249		158	1.02	166.9	94.6
BRN	2	235		136	1.05	140.6	96.7
BRN	2	225		112	0.98	123.6	90.6
BRN	2	212		84	0.88	103.7	81.0
BRN	2	212		74	0.78	103.7	71.4
BRN	2	207		90	1.01	96.6	93.2
BRN	2	202		76	0.92	89.8	84.6
BRN	2	198		90	1.16	84.7	106.3
BRN	2	190		84	1.22	74.9	112.1
BRN	2	183		58	0.95	67.0	86.5
BRN	2	151		38	1.10	37.9	100.2
BRN	2	149		35	1.06	36.5	96.0
BRN	2	144		32	1.07	33.0	97.1
BRN	2	143		29	0.99	32.3	89.8
BRN	2	134		28	1.16		
BRN	2	132		27.5	1.20		
BRN	2	131		26	1.16		
BRN	2	130		25.5	1.16		
BRN	2	130		23	1.05		
BRN	2	128		23.4	1.12		
BRN	2	128		23	1.10		
BRN	2	127		24.5	1.20		
BRN	2	125		21	1.08		
BRN	2	124		17	0.89		

Length measurement is in millimeters.
Weight measurement is in grams.

Appendix B-4a
Aquatic Biota - Other Fish Populations
Downstream of Hatchery
09/21/04

SPECIES	PASS	LENGTH		WEIGHT	K	Ws	Wr
BRN	2	120		20.5	1.19		
BRN	2	120		18.5	1.07		
BRN	2	119		19.5	1.16		
BRN	2	117		17.5	1.09		
BRN	2	117		17.5	1.09		
BRN	2	116		19.5	1.25		
BRN	2	116		17	1.09		
BRN	2	115		17	1.12		
BRN	2	112		14	1.00		
BRN	2	112		11.5	0.82		
BRN	2	103		11.5	1.05		
BRN	2	100		10.5	1.05		
BRN	2	100		10.5	1.05		
BRN	2	97		10	1.10		
BRN	2	97		9.8	1.07		
BRN	2	90		8.2	1.12		

Length measurement is in millimeters.
Weight measurement is in grams.

APPENDIX B-4b
OTHER DATA
BENTHIC INVERTEBRATE POPULATION MONITORING RESULTS

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
9/10/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**559**	**559**	**302**	**245**	**535**	**441**
Claassenia sabulosa				12		2
Cultus sp.	140	47	81	58	70	79
Megarcys signata		12	12	12	47	17
Sweltsa sp.	279	477	186	93	395	286
Taeniopterygidae	140	23	23	12		40
Zapada cinctipes					23	5
Zapada haysi				58		12
EPHEMEROPTERA	**2558**	**1303**	**1012**	**1187**	**1117**	**1437**
Baetis tricaudatus	1326	535	407	570	535	675
Cinygmula sp.			12	12	70	19
Drunella doddsi	395	140	93	128	93	170
Drunella grandis	23					5
Ephemerella infrequens	814	616	488	477	419	563
Rhithrogena hageni		12	12			5
TRICHOPTERA	**954**	**454**	**221**	**303**	**745**	**535**
Arctopsyche grandis	23					5
Hydropsyche sp.	23			12		7
Lepidostoma sp.		105	23	23	140	58
Micrasema bactro					47	9
Oligophlebodes sp.	675	140	105	221	465	321
Rhyacophila brunnea gr.		23				5
Rhyacophila harmstoni	233	186	93	35	93	128
Wormaldia sp.				12		2
COLEOPTERA	**395**	**209**	**47**	**128**	**163**	**189**
Heterlimnius corpulentus	372	209	47	128	163	184
Narpus concolor	23					5
DIPTERA	**2093**	**1454**	**372**	**571**	**2117**	**1322**
Chelifera sp.	23					5
Cricotopus tremulus	233	209	58	105	116	144
Dicranota sp.		12				2
Empididae	23					5
Hexatoma sp.	116	128		47	47	68
Mallochohelea sp.	116	23	12		116	53
Micropsectra sp.	1047	605	244	163	570	526
Pagastia sp.	47			58	826	186
Pericoma sp.	488	477	58	198	442	333
TURBELLARIA	**23**	**116**	**35**	**47**	**47**	**54**
Polycelis coronata	23	116	35	47	47	54
NEMATODA	**47**				**23**	**14**
Unid. Nematoda	47				23	14

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
9/10/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**70**	**12**			**47**	**26**
Sperchon/Sperchonopsis	47	12			47	21
Wandesia sp.	23					5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
35682

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**197**	**652**	**197**	**35**	**35**	**222**
Capnia sp.		12				2
Claassenia sabulosa		23			12	7
Sweltsa sp.	81	105	116			60
Taeniopterygidae	81	500	81	35		139
Zapada haysi	35	12			23	14
EPHEMEROPTERA	**465**	**536**	**186**	**594**	**128**	**380**
Baetis tricaudatus	267	302	58	419	81	225
Drunella doddsi	23	47	23	35		26
Drunella grandis	12					2
Epeorus deceptivus	23	12				7
Epeorus longimanus	12	93	35	35	47	44
Ephemerella infrequens			47			9
Rhithrogena hageni	128	70	23	105		65
Rhithrogena robusta		12				2
TRICHOPTERA	**105**	**140**	**151**	**58**	**35**	**97**
Arctopsyche grandis	23	35	35	23		23
Micrasema bactro	12					2
Rhyacophila brunnea gr.		12		12	12	7
Rhyacophila harmstoni	70	93	116	23	23	65
COLEOPTERA	**58**	**70**	**116**		**23**	**53**
Heterlimnius corpulentus	58	70	116		23	53
DIPTERA	**164**	**93**	**141**	**59**	**59**	**101**
Chelifera sp.			47			9
Cricotopus tremulus	105	23	12	12	23	35
Dicranota sp.	12					2
Hemerodromia sp.			12			2
Micropsectra sp.		58	23			16
Pagastia sp.	12		12	23	12	12
Pericoma sp.			35	12	12	12
Rheotanytarsus sp.	35				12	9
Simulium sp.				12		2
Thienemanniella sp.		12				2
TURBELLARIA		**12**				**2**
Polycelis coronata		12				2
ANNELIDA						
OLIGOCHAETA	**12**					**2**
Lumbricidae	12					2
NEMATODA				**12**		**2**
Unid. Nematoda				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
35682

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA			**23**			**5**
Sperchon/Sperchonopsis			23			5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
9/9/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**35**	**70**	**105**	**163**	**35**	**82**
Megarcys signata				23		5
Sweltsa sp.	35	70	105	140	35	77
EPHEMEROPTERA	**187**	**432**	**885**	**837**	**442**	**557**
Baetis tricaudatus		12	12			5
Drunella coloradensis	12	12	12		23	12
Drunella doddsi	163	384	861	837	419	533
Epeorus longimanus	12	12				5
Rhithrogena hageni		12				2
TRICHOPTERA	**12**	**128**	**232**	**256**	**116**	**149**
Brachycentrus americanus	12	23	23	23	23	21
Rhyacophila sibirica gr.		105	209	233	93	128
COLEOPTERA		**81**	**128**	**279**	**128**	**123**
Heterlimnius corpulentus		81	128	279	128	123
DIPTERA	**466**	**827**	**1326**	**975**	**675**	**855**
Bibiocephala grandis		12				2
Cricotopus tremulus	23	105	593	267	198	237
Mallochohelea sp.		35	81	70	12	40
Micropsectra sp.	23	47		23	81	35
Pagastia sp.			47	23		14
Pericoma sp.	105	337	279	209	163	219
Prosimulium sp.	23					5
Rheotanytarsus sp.	12	35	35	116		40
Simulium sp.	163	93	12		23	58
Thienemanniella sp.	105	151	256	267	186	193
Tipula sp.	12	12	23		12	12
ANNELIDA						
OLIGOCHAETA	**23**	**12**		**116**	**47**	**40**
Rhynchelmis sp.	23	12		116	47	40

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
9/11/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA					**35**	**7**
Megarcys signata					12	2
Perlodidae					23	5
EPHEMEROPTERA	**129**	**384**	**267**	**314**	**372**	**292**
Acentrella insignificans	12					2
Baetis tricaudatus	12	70	116	93	93	77
Drunella coloradensis	81	233	128	140	174	151
Drunella doddsi	12	81	23	58	58	46
Epeorus deceptivus	12					2
Rhithrogena hageni				23	47	14
TRICHOPTERA	**82**	**58**	**24**	**47**	**35**	**49**
Arctopsyche grandis	23	35	12	35		21
Brachycentrus americanus	47	23	12	12	35	26
Rhyacophila sibirica gr.	12					2
COLEOPTERA	**23**		**12**			**7**
Heterlimnius corpulentus	23		12			7
DIPTERA	**187**	**188**	**105**	**174**	**397**	**209**
Atherix pachypus		12				2
Cricotopus tremulus	35	12	23	81	233	77
Mallochohelea sp.		12			12	5
Micropsectra sp.	12					2
Pagastia sp.	12	35	70	35	140	58
Pericoma sp.					12	2
Polypedilum sp.		12				2
Simulium sp.				23		5
Thienemanniella sp.	128	105	12	35		56
HYDRACARINA			**140**	**12**	**93**	**49**
Gehypochthoniidae			12			2
Lebertia sp.			128	12	93	47

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
9/11/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**	**12**				**4**
Megarcys signata	12					2
Sweltsa sp.		12				2
EPHEMEROPTERA	**129**	**605**	**1815**	**640**	**733**	**785**
Baetis tricaudatus	35	256	512	279	291	275
Drunella coloradensis	47	291	1256	314	314	444
Drunella doddsi	12	35	47	47	93	47
Rhithrogena hageni	35	23			35	19
TRICHOPTERA	**36**	**82**	**1117**	**70**	**233**	**307**
Arctopsyche grandis			47			9
Brachycentrus americanus	12	47	1070	58	233	284
Lepidostoma sp.	12					2
Rhyacophila sibirica gr.	12	35		12		12
COLEOPTERA	**0**	**23**	**47**	**12**	**12**	**18**
Cleptelmis ornata			47			9
Heterlimnius corpulentus		23		12	12	9
DIPTERA	**151**	**733**	**3443**	**2222**	**2361**	**1782**
Atherix pachypus			93	12		21
Chelifera sp.				93		19
Cricotopus tremulus	105	407	1931	1128	1221	958
Limonia sp.		12				2
Pagastia sp.	23	267	1093	954	1047	677
Parorthocladius sp.		35				7
Pericoma sp.		12	93			21
Simulium sp.	23		233	35	93	77
HYDRACARINA	**116**	**81**	**3070**	**279**	**407**	**791**
Lebertia sp.	116	81	3070	279	407	791

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
9/10/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**			**12**		**4**
Megarcys signata	12					2
Sweltsa sp.				12		2
EPHEMEROPTERA	**1151**	**734**	**350**	**1501**	**2745**	**1295**
Baetis tricaudatus	733	93	128	605	1907	693
Cinygmula sp.					47	9
Drunella coloradensis		12		12		5
Drunella doddsi	23	35	35	23		23
Drunella grandis	395	582	140	849	791	551
Epeorus deceptivus		12	47	12		14
TRICHOPTERA	**35**	**58**	**152**	**70**	**372**	**138**
Arctopsyche grandis	35	23	35	23		23
Brachycentrus americanus		12	105	47	279	89
Hydropsyche sp.			12		93	21
Rhyacophila betteni gr.		23				5
COLEOPTERA		**23**	**12**	**23**		**12**
Heterlimnius corpulentus		23	12	23		12
DIPTERA	**2315**	**1513**	**2246**	**2326**	**6747**	**3029**
Chelifera sp.	35	12				9
Cricotopus tremulus	512	791	1396	337	3908	1389
Dicranota sp.					47	9
Empididae	12					2
Micropsectra sp.					523	105
Pagastia sp.	1686	675	826	1977	2175	1468
Pericoma sp.	58	12			47	23
Rhabdomastix sp.			12	12		5
Simulium sp.	12	23	12		47	19
NEMATODA			**12**			**2**
Unid. Nematoda			12			2
HYDRACARINA	**209**	**384**	**244**	**954**	**419**	**442**
Sperchon/Sperchonopsis	209	384	244	954	419	442

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
9/10/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**	**12**			**12**	**6**
Pteronarcella badia	12					2
Taeniopterygidae					12	2
Zapada frigida		12				2
EPHEMEROPTERA	**1164**	**629**	**860**	**791**	**1036**	**895**
Baetis bicaudatus	93	70	81	70	81	79
Baetis tricaudatus	675	372	407	407	454	463
Drunella doddsi	12	12			12	7
Drunella grandis	314	140	279	233	256	244
Epeorus deceptivus		23	12			7
Rhithrogena hageni	70	12	81	81	233	95
TRICHOPTERA	**350**	**245**	**117**	**81**	**140**	**186**
Arctopsyche grandis	163	174	105	58	116	123
Brachycentrus americanus	140	47		23	12	44
Hydropsyche sp.	47	12				12
Rhyacophila harmstoni		12	12		12	7
DIPTERA	**1502**	**187**	**2071**	**326**	**163**	**848**
Atherix pachypus	12					2
Cricotopus tremulus	233	105	1279	163	70	370
Dicranota sp.			12		12	5
Empididae	12					2
Micropsectra sp.	500	12			23	107
Pagastia sp.	361	35	768	93	23	256
Pericoma sp.	12					2
Rhabdomastix sp.			12			2
Simulium sp.	372	35		70	35	102
HYDRACARINA	**58**			**35**		**19**
Sperchon/Sperchonopsis	58			35		19

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
9/10/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA			**12**			**2**
Taeniopterygidae			12			2
EPHEMEROPTERA	**302**	**291**	**1710**	**570**	**1012**	**776**
Baetis tricaudatus	186	93	826	337	384	365
Drunella coloradensis		23			23	9
Drunella doddsi		12		12	12	7
Drunella grandis	23	35	70	93	35	51
Epeorus deceptivus	23	12	12	12	23	16
Rhithrogena hageni	70	116	802	116	535	328
TRICHOPTERA	**82**	**59**	**187**	**197**	**523**	**209**
Arctopsyche grandis	47	47	105	116	302	123
Brachycentrus americanus	35	12	70	81	221	84
Rhyacophila harmstoni			12			2
COLEOPTERA	**12**	**12**				**5**
Heterlimnius corpulentus	12	12				5
DIPTERA	**244**	**187**	**523**	**257**	**454**	**333**
Atherix pachypus					12	2
Cricotopus tremulus	140	128	430	163	337	240
Dicranota sp.		12		12		5
Micropsectra sp.		12				2
Pagastia sp.	81	35	81	47	70	63
Rhabdomastix sp.			12		12	5
Simulium sp.	23			35	23	16
TURBELLARIA	**12**					**2**
Phagocata sp.	12					2
HYDRACARINA		**35**		**12**		**9**
Sperchon/Sperchonopsis		35		12		9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
9/9/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**70**			**12**	**12**	**19**
Pteronarcella badia	70			12	12	19
EPHEMEROPTERA	**361**	**151**	**314**	**58**	**117**	**200**
Baetis bicaudatus	12					2
Baetis tricaudatus	151	58	151		35	79
Drunella doddsi	12					2
Drunella grandis	23				12	7
Rhithrogena hageni	163	70	116	58	47	91
Serratella micheneri		23	47		23	19
TRICHOPTERA	**128**	**106**	**59**	**128**	**70**	**98**
Arctopsyche grandis	81	47	47	58	58	58
Bracycentrus americanus	35	47	12	70	12	35
Rhyacophila harmstoni	12	12				5
DIPTERA	**570**	**326**	**163**	**174**	**326**	**311**
Atherix pachypus	12			23		7
Chelifera sp.	12					2
Cricotopus tremulus	523	314	163	128	314	288
Pagastia sp.	23	12		23	12	14
HYDRACARINA	**23**		**12**	**12**		**9**
Sperchon/Sperchonopsis	23		12	12		9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
9/9/1997

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**24**	**12**		**12**	**9**
Pteronarcella badia		12				2
Sweltsa sp.			12		12	5
Taeniopterygidae		12				2
EPHEMEROPTERA	**745**	**744**	**1105**	**1408**	**791**	**959**
Baetis tricaudatus	605	628	1035	1396	593	851
Drunella grandis	12		12	12	12	10
Rhithrogena hageni	128	116	58		186	98
TRICHOPTERA	**268**	**198**	**383**	**407**	**256**	**302**
Arctopsyche grandis	12	35	35			16
Brachycentrus americanus		35	174	35	23	53
Hydropsyche sp.	256	128	174	372	233	233
COLEOPTERA				**35**	**12**	**9**
Heterlimnius corpulentus				35	12	9
DIPTERA	**501**	**420**	**512**	**1234**	**269**	**588**
Atherix pachypus	35	47	12	47	47	38
Chelifera sp.				23		5
Cricotopus tremulus		105	291	593	116	221
Empididae	12			12		5
Hexatoma sp.	12			47		12
Mallochohelea sp.		23	23	58	12	23
Micropsectra sp.				35	12	9
Pagastia sp.	12		58	361	23	91
Simulium sp.	430	233	128	58	47	179
Thienemannimyia gr. sp.		12			12	5
HYDRACARINA				**12**		**2**
Sperchon/Sperchonopsis				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
10/9/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1001**	**652**	**629**	**618**	**280**	**637**
Cultus sp.		58	105	12	47	44
Hesperoperla pacifica	47		35	12		19
Megarcys signata		23	35			12
Pteronarcella badia	23					5
Skwala americana	23	12	35	12	12	19
Sweltsa sp.	675	442	279	349	163	382
Taenionema sp.	47	105	140	12	58	72
Zapada cinctipes	186	12		221		84
EPHEMEROPTERA	**2652**	**1139**	**2105**	**1070**	**779**	**1549**
Baetis tricaudatus	256	151	140	47	186	156
Drunella doddsi	1326	709	1314	593	430	874
Ephemerella inermis	861	128	384	407	93	375
Rhithrogena robusta	209	151	267	23	70	144
TRICHOPTERA	**1164**	**418**	**653**	**304**	**256**	**558**
Arctopsyche grandis	70	23	35	35	58	44
Brachycentrus americanus			12			2
Chimarra utahensis	116	23				28
Glossosoma sp.	140	35	128	12	23	68
Hydropsyche sp.			12			2
Lepidostoma sp.	163	151	12	128	47	100
Neothremma sp.	535	35	419	47	35	214
Rhyacophila brunnea gr.	47	35		12	23	23
Rhyacophila pellisa/valuma	93	116	35	70	70	77
COLEOPTERA	**23**	**24**	**326**	**23**	**47**	**89**
Heterlimnius corpulentus	23	12	314	23	47	84
Narpus concolor		12	12			5
DIPTERA	**512**	**222**	**559**	**48**	**94**	**287**
Antocha sp.		12			12	5
Cricotopus sp.	47		93		23	33
Dicranota sp.					12	2
Hemerodromia sp.			12			2
Heterotrissocladius sp.	93	105	174	12	23	81
Hexatoma sp.		12	12	12		7
Pericoma sp.	256	35	233	12	12	110
Probezzia sp.	93	23	35	12	12	35
Simulium sp.	23	35				12
TURBELLARIA			**12**	**12**		**5**
Polycelis coronata			12	12		5
NEMATODA			**12**			**2**
Unid. Nematoda			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
10/9/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**582**	**513**	**176**	**303**	**512**	**416**
Capniidae	47	23		12	58	28
Cultus sp.	35		12	12		12
Despaxia augusta			12			2
Hesperoperla pacifica	93	47	23	23	81	53
Isoperla sp.	12	93	47		70	44
Sweltsa sp.	81	47		186	81	79
Taenionema sp.	151	93	70	12	47	75
Zapada cinctipes	105	163	12	23	128	86
Zapada oregonensis	58	47		35	47	37
EPHEMEROPTERA	**1734**	**3442**	**965**	**989**	**1955**	**1817**
Baetis tricaudatus	465	1814	558	419	814	814
Cinygmula sp.	35		12		35	16
Drunella doddsi	198	419	58	58	163	179
Epeorus longimanus	128	23	23	47	105	65
Ephemerella inermis	12	23			23	12
Rhithrogena hageni	140		35	58	47	56
Rhithrogena robusta	756	1163	279	407	768	675
TRICHOPTERA	**83**	**279**	**94**	**210**	**210**	**176**
Arctopsyche grandis	12	116	35	93	93	70
Brachycentrus americanus	12	93	12	23	23	33
Glossosoma sp.			23	12	12	9
Lepidostoma sp.	35			47	12	19
Neothremma sp.	12		12	23	23	14
Rhyacophila brunnea gr.		70			12	16
Rhyacophila rotunda gr.					23	5
Rhyacophila sibirica gr.	12		12	12	12	10
COLEOPTERA	**128**	**186**	**23**	**186**	**140**	**133**
Heterlimnius corpulentus	128	186	23	186	140	133
DIPTERA	**1292**	**1070**	**1793**	**174**	**1188**	**1104**
Antocha sp.		23	12			7
Chelifera sp.	35	23	23			16
Dicranota sp.	12		12		12	7
Heterotrissocladius sp.		23				5
Mallochohelea sp.		47	12	23	47	26
Micropsectra sp.	47		12	23	116	40
Oreogeton sp.	12				12	5
Pericoma sp.	81	23	12		47	33
Rhabdomastix sp.		70	35	12		23
Simulium sp.	1070	861	1675	116	954	935
Tipula sp.	35					7
TURBELLARIA		**23**				**5**
Polycelis coronata		23				5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
10/9/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**47**	**47**	**46**	**117**	**116**	**75**
Homochaeta naidina			23	12	93	26
Lumbriculidae	47	47	23	105	23	49
NEMATODA	**81**	**70**			**140**	**58**
Unid. Nematoda	81	70			140	58
HYDRACARINA					**23**	**5**
Lebertia sp.					23	5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
10/8/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**93**	**512**	**418**	**140**	**105**	**254**
Cultus sp.					12	2
Megarcys signata			23			5
Sweltsa sp.	23	186	174	47	70	100
Taenionema sp.	70	326	221	93	23	147
EPHEMEROPTERA	**1745**	**3001**	**2129**	**1711**	**1337**	**1984**
Baetis tricaudatus	12		12	12		7
Drunella doddsi	1721	2931	2105	1675	1337	1954
Ephemerella inermis	12		12	12		7
Rhithrogena robusta		70		12		16
TRICHOPTERA	**535**	**977**	**651**	**802**	**628**	**718**
Brachycentrus americanus	244	233	174	93	465	242
Hesperophylax sp.					12	2
Rhyacophila sibirica gr.	291	744	477	709	151	474
COLEOPTERA	**174**	**628**	**267**	**128**	**140**	**267**
Heterlimnius corpulentus	174	628	267	128	140	267
DIPTERA	**188**	**466**	**268**	**257**	**187**	**273**
Atherix pachypus			12			2
Hesperoconopa sp.		23				5
Heterotrissocladius sp.	47	47	47	70		42
Hexatoma sp.			12			2
Mallochohelea sp.		93	23	23		28
Muscidae					12	2
Pagastia sp.	70	70	23	70	35	54
Pericoma sp.	12	163	93	70	140	96
Rhabdomastix			12			2
Simulium sp.	47	47	23	12		26
Tipula sp.	12	23	23	12		14
TURBELLARIA	**140**			**23**	**47**	**42**
Polycelis coronata	140			23	47	42
ANNELIDA						
OLIGOCHAETA		**23**	**58**	**35**		**23**
Homochaeta naidina		23	58	35		23
NEMATODA	**23**		**128**	**35**	**12**	**40**
Unid. Nematoda	23		128	35	12	40
HYDRACARINA	**12**	**70**	**35**	**58**		**35**
Lebertia sp.	12	70	23	58		33
Protzia sp.			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
10/8/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**	**58**		**12**		**16**
Despaxia augusta				12		2
Sweltsa sp.		58				12
Taenionema sp.	12					2
EPHEMEROPTERA	**825**	**1605**	**1443**	**896**	**1001**	**1154**
Baetis tricaudatus	23	81	47	12	12	35
Drunella doddsi	58	326		186	70	128
Drunella grandis	721	1198	1396	698	919	986
Rhithrogena hageni	23					5
TRICHOPTERA	**1280**	**1862**	**18376**	**548**	**756**	**4565**
Arctopsyche grandis		12		12		5
Brachycentrus americanus	1256	1628	18329	454	733	4480
Hydropsyche sp.		35				7
Lepidostoma sp.	12	12				5
Oligophlebodes sp.	12					2
Rhyacophila coloradensis gr.			47	12		12
Rhyacophila rotunda gr.		35				7
Rhyacophila sibirica gr.		140		70	23	47
COLEOPTERA	**47**	**93**	**93**	**59**	**47**	**67**
Heterlimnius corpulentus	47	93	93	47	47	65
Optioservus divergens				12		2
DIPTERA	**71**	**199**	**327**	**221**	**70**	**177**
Atherix pachypus	35	58	47			28
Chelifera sp.		35	140			35
Dicranota sp.		12				2
Heterotrissocladius sp.	12	58	47	198	70	77
Micropsectra sp.		12				2
Pagastia sp.	12	12	93	23		28
Pericoma sp.	12	12				5
ANNELIDA						
OLIGOCHAETA			**47**			**9**
Homochaeta naidina			47			9
HYDRACARINA	**500**	**523**	**884**	**23**	**803**	**546**
Lebertia sp.	500	523	884	23	791	544
Sperchon/Sperchonopsis					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
9/11/97

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**58**	**12**	**47**	**12**		**26**
Sweltsa sp.	58	12	47	12		26
EPHEMEROPTERA	**873**	**1140**	**3675**	**1210**	**3350**	**2049**
Baetis tricaudatus			23	12		7
Drunella doddsi	12	12	233	58	47	72
Drunella grandis	849	1128	3419	1140	3303	1968
Ephemerella inermis	12					2
TRICHOPTERA	**966**	**1279**	**3117**	**896**	**8095**	**2871**
Arctopsyche grandis			70	12	47	26
Brachycentrus americanus	942	1244	3047	872	8048	2831
Lepidostoma sp.	12	12				5
Rhyacophila rotunda gr.	12	23				7
Rhyacophila sibirica gr.				12		2
COLEOPTERA	**47**	**12**	**70**	**35**	**47**	**42**
Heterlimnius corpulentus	47	12	70	35	47	42
DIPTERA	**95**	**118**	**418**	**106**	**47**	**156**
Atherix pachypus	12	47		12		14
Chelifera sp.	12		23	47		16
Dicranota sp.		12				2
Heterotrissocladius sp.	35	47	372	47	47	110
Pagastia sp.	12	12				5
Pericoma sp.	12					2
Rhabdomastix sp.	12		23			7
ANNELIDA						
OLIGOCHAETA	**12**		**511**	**35**	**47**	**121**
Homochaeta naidina	12		209	35		51
Stephensoniana tandyi			302		47	70
HYDRACARINA	**128**	**395**	**2210**	**58**	**3582**	**1275**
Lebertia sp.	128	395	2163	58	3489	1247
Sperchon/Sperchonopsis					93	19
Testudacarus/Torrenticola			47			9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
10/7/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
PLECOPTERA				**12**		**2**
Sweltsa sp.				12		2
EPHEMEROPTERA	**512**	**639**	**698**	**873**	**616**	**668**
Baetis tricaudatus	23	23	23			14
Drunella doddsi	12		12	12		7
Drunella grandis	477	616	651	849	616	642
Rhithrogena hageni			12	12		5
TRICHOPTERA	**1419**	**1884**	**362**	**2570**	**744**	**1395**
Arctopsyche grandis		35	47			16
Brachycentrus americanus	1419	1849	291	2570	744	1375
Hydropsyche sp.			12			2
Rhyacophila coloradensis gr.			12			2
COLEOPTERA		**12**	**12**	**58**		**16**
Heterlimnius corpulentus		12		58		14
Optioservus divergens			12			2
DIPTERA	**174**	**35**	**23**	**83**	**35**	**69**
Atherix pachypus				12		2
Chelifera sp.	58	12		12		16
Dicranota sp.	23					5
Heterotrissocladius sp.	93		23	35	35	37
Mallochohelea sp.		23				5
Pagastia sp.				12		2
Tipula sp.				12		2
ANNELIDA						
OLIGOCHAETA	**35**	**628**			**23**	**137**
Homochaeta naidina	35	628			23	137
NEMATODA		**12**				**2**
Unid. Nematoda		12				2
HYDRACARINA	**70**	**151**		**570**	**47**	**167**
Lebertia sp.	70	151		558	47	165
Sperchon/Sperchonopsis				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
9/10/97

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**				**35**	**9**
Sweltsa sp.	12				35	9
EPHEMEROPTERA	**488**	**442**	**593**	**720**	**1221**	**693**
Baetis tricaudatus	174	163	256	209	395	239
Drunella doddsi					35	7
Drunella grandis	233	256	267	430	547	347
Rhithrogena robusta	81	23	70	81	244	100
TRICHOPTERA	**873**	**233**	**687**	**512**	**710**	**604**
Arctopsyche grandis	395	35	221	151	372	235
Brachycentrus americanus	419	174	419	279	163	291
Hydropsyche sp.	47	12	12	47	105	45
Lepidostoma sp.					12	2
Rhyacophila coloradensis gr.					23	5
Rhyacophila rotunda gr.	12	12	35	35	35	26
COLEOPTERA		**12**		**12**	**70**	**19**
Heterlimnius corpulentus		12			58	14
Optioservus divergens				12	12	5
DIPTERA	**128**	**129**	**59**	**71**	**408**	**159**
Atherix pachypus	23	12	12	35	47	26
Chelifera sp.		12		12		5
Heterotrissocladius sp.	70	105	47	12	361	119
Rhabdomastix sp.	35			12		9
ANNELIDA						
OLIGOCHAETA		**82**				**16**
Homochaeta naidina		47				9
Stephensoniana tandyi		35				7
NEMATODA		**47**				**9**
Unid. Nematoda		47				9
HYDRACARINA	**23**	**35**				**11**
Lebertia sp.	23	23				9
Sperchon/Sperchonopsis		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
10/7/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**47**		**116**		**32**
Pteronarcella badia				81		16
Sweltsa sp.		47		35		16
EPHEMEROPTERA	**1431**	**1966**	**1105**	**2012**	**1396**	**1581**
Baetis tricaudatus	361	861	779	430	861	658
Drunella doddsi			35	12		9
Drunella grandis	151	233	140	140	116	156
Rhithrogena hageni	919	872	151	1430	419	758
TRICHOPTERA	**209**	**558**	**604**	**396**	**244**	**402**
Arctopsyche grandis	209	430	523	337	209	342
Brachycentrus americanus		128	81	47	35	58
Rhyacophila pellisa/valuma				12		2
COLEOPTERA	**12**	**12**				**4**
Optioservus divergens		12				2
Zaitzevia parvula	12					2
DIPTERA	**23**	**629**	**152**	**210**	**198**	**241**
Atherix pachypus	23	47	35	12		23
Heterotrissocladius sp.		570	105	186	198	212
Micropsectra sp.				12		2
Rhabdomastix sp.			12			2
Tipula sp.		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
10/7/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA				**23**		**5**
Sweltsa sp.				23		5
EPHEMEROPTERA	**593**	**372**	**418**	**721**	**326**	**486**
Baetis tricaudatus	116	35	163	233	151	140
Drunella grandis			81	23	12	23
Rhithrogena hageni	477	337	174	465	163	323
TRICHOPTERA	**105**	**175**	**279**	**244**	**128**	**186**
Arctopsyche grandis	93	163	198	209	93	151
Brachycentrus americanus	12	12	81	35	35	35
COLEOPTERA			**12**			**2**
Zaitzevia parvula			12			2
DIPTERA	**47**	**174**	**140**	**1151**	**570**	**416**
Heterotrissocladius sp.	47	174	140	1151	570	416

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
10/6/1998

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**58**	**23**	**186**		**24**	**58**
Pteronarcella badia	58	23	186		12	56
Taenionema sp.					12	2
EPHEMEROPTERA	**512**	**558**	**1768**	**965**	**139**	**788**
Baetis tricaudatus	372	395	1442	849	116	635
Cinygmula sp.	12					2
Drunella grandis	128	140	326	58	23	135
Rhithrogena hageni		23		58		16
TRICHOPTERA	**2256**	**1582**	**10839**	**1733**	**1686**	**3619**
Brachycentrus americanus	244	70	465	58	23	172
Glossosoma sp.				35		7
Hydropsyche sp.	2012	1489	10234	1640	1651	3405
Rhyacophila rotunda gr.		23	140		12	35
COLEOPTERA	**210**	**105**	**1071**	**372**		**351**
Narpus concolor			47			9
Optioservus divergens	198	105	977	267		309
Zaitzevia parvula	12		47	105		33
DIPTERA	**605**	**652**	**3768**	**593**	**186**	**1160**
Atherix pachypus	361	209	1023	512	186	458
Chelifera sp.		12				2
Cricotopus sp.		47	163			42
Heterotrissocladius sp.	163	291	2070			505
Probezzia sp.	81	93	465	81		144
Simulium sp.			47			9
HYDRACARINA			**93**			**19**
Lebertia sp.			93			19

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
9/17/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**2234**	**278**	**373**	**396**	**139**	**685**
Capniidae				23		5
Cultus sp.	140	23	47	47	23	56
Hesperoperla pacifica	186				23	42
Isoperla sp.	93		23	47	23	37
Megarcys sp.	93	23				23
Perlomyia sp.	140	23	47	23	47	56
Sweltsa sp.	419	116	186	209	23	191
Taenionema sp.	47	93	70			42
Zapada cinctipes	1116			47		233
EPHEMEROPTERA	**9351**	**1814**	**1791**	**3140**	**1675**	**3554**
Baetis tricaudatus	1814	442	372	930	326	777
Cinygmula sp.	47					9
Drunella doddsi	4187	814	768	1326	721	1563
Drunella grandis	93				23	23
Rhithrogena hageni	47		23	47	23	28
Seratella tibialis	3163	558	628	837	582	1154
TRICHOPTERA	**8189**	**1326**	**1629**	**2232**	**2954**	**3266**
Arctopsyche grandis	1489	47	256	209	209	442
Brachycentrus americanus	47		70	23	47	37
Dolophilodes sp.	977			70	23	214
Glossosoma sp.	233	47	70	23		75
Lepidostoma sp.	2233	349	186	488	209	693
Oligophlebodes sp.	1256	744	698	1116	2093	1181
Rhyacophila brunnea gr.	186				70	51
Rhyacophila rotunda gr.	279	23	23	47	47	84
Rhyacophila sibirica gr.	1489	116	326	256	256	489
COLEOPTERA	**420**	**93**	**489**	**372**	**302**	**335**
Cleptelmis sp.	47					9
Heterlimnius corpulentus	326	93	442	372	302	307
Narpus concolor	47		47			19
DIPTERA	**9724**	**1559**	**1673**	**1978**	**885**	**3164**
Chelifera/Metachela			23		23	9
Dicranota sp.	140		23		47	42
Heterotrissocladius sp.	1826	35	93	105	93	430
Hexatoma sp.	140			23		33
Mallochohelea sp.	419	70	302	93	93	195
Pagastia sp.	198		35	140	47	84
Pericoma sp.	3489	698	372	861	233	1131
Protanyderus sp.			23			5
Rheotanytarsus sp.	3512	756	802	756	349	1235
TURBELLARIA	**186**	**23**		**93**	**93**	**79**
Polycelis coronata	186	23		93	93	79

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
9/17/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**47**	**23**	**93**		**23**	**37**
Lebertia sp.		23	93		23	28
Sperchon/Sperchonopsis	47					9
MOLLUSCA						
GASTROPODA	**47**					**9**
Gyraulus sp.	47					9
PELECYPODA	**93**					**19**
Sphaerium sp.	93					19

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
9/15/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**594**	**280**	**453**	**187**	**175**	**339**
Hesperoperla pacifica	47	12	35	47	12	31
Sweltsa sp.	407	140	244	105	47	189
Taenionema sp.	105	128	151	35	81	100
Zapada cinctipes	35		23		35	19
EPHEMEROPTERA	**536**	**1130**	**977**	**930**	**687**	**851**
Baetis tricaudatus	198	384	244	302	233	272
Drunella coloradensis		12	23			7
Drunella doddsi	186	93	244	244	198	193
Epeorus deceptivus	12	35	58	23	23	30
Epeorus longimanus	12	47	12		35	21
Heptagenia elegantula		47	47	47		28
Rhithrogena hageni	128	512	349	314	163	293
Serratella micheneri					35	7
TRICHOPTERA	**234**	**222**	**325**	**374**	**501**	**330**
Arctopsyche grandis	12			12		5
Brachycentrus americanus					35	7
Cheumatopsyche sp.	58	58	128	105	221	114
Glossosoma sp.	12		23	47	105	37
Lepidostoma sp.		12				2
Micrasema bactro	12					2
Rhyacophila angelita/tucula		12				2
Rhyacophila brunnea/vao	12			12	12	7
Rhyacophila pellisa/valuma	128	140	174	198	128	154
COLEOPTERA	**802**	**419**	**570**	**244**	**70**	**421**
Heterlimnius corpulentus	802	419	570	244	70	421
DIPTERA	**454**	**94**	**430**	**535**	**165**	**335**
Chelifera/Metachela	93	12	58	116		56
Diamesa sp.		12				2
Dicranota sp.	35	12	23		12	16
Hemerodromia sp.					12	2
Heterotrissocladius sp.	174	23	116	47	47	81
Mallochohelea sp.	12		12	35	12	14
Pagastia sp.		12	105	12		26
Pericoma sp.	105	23	116	174	35	91
Rheotanytarsus sp.	35			151	47	47
ANNELIDA						
OLIGOCHAETA		**23**	**47**	**291**	**47**	**81**
Eiseniella tetraedra			35		47	16
Unid. Immature Tubificidae w/o Capilliform Chaetae		23	12	291		65

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
9/15/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA	**12**		**12**			**5**
Unid. Nematoda	12		12			5
HYDARACARINA		**12**			**23**	**7**
Lebertia sp.		12			23	7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/15/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1559**	**1141**	**1676**	**3909**	**2117**	**2081**
Cultus sp.	35				47	16
Isoperla sp.	35					7
Megarcys signata		23	70	47	23	33
Perlomyia sp.	233	140	47		23	89
Sweltsa sp.	384	419	582	1396	861	728
Taenionema sp.	698	233	628	1675	744	796
Zapada cinctipes	174	326	349	791	419	412
EPHEMEROPTERA	**1339**	**815**	**1255**	**4188**	**1699**	**1859**
Baetis bicaudatus		12				2
Baetis tricaudatus	477	244	209	1442	419	558
Cinygmula sp.	12	105	47	326	140	126
Drunella coloradensis				140	23	33
Drunella doddsi	326	186	302	698	512	405
Epeorus deceptivus	128	47	116	233	70	119
Heptagenia sp.		35	23	93	23	35
Rhithrogena hageni	384	186	558	1256	512	579
Serratella micheneri	12					2
TRICHOPTERA	**524**	**582**	**954**	**1164**	**838**	**813**
Glossosoma sp.	47	12	23	140	47	54
Rhyacophila brunnea gr.	93	105	140	326	116	156
Rhyacophila sibirica gr.	384	465	791	698	675	603
COLEOPTERA	**81**	**151**	**70**	**47**		**70**
Optioservus sp.	81	151	70	47		70
DIPTERA	**478**	**700**	**349**	**979**	**1002**	**702**
Chelifera/Metachela		35		47		16
Cricotopus sp.	23					5
Diamesa sp.		12		47		12
Hemerodromia sp.		47			47	19
Heterotrissocladius sp.	140	419	349	744	500	430
Mallochohelea sp.		93		47	47	37
Pagastia sp.	163	12		47	291	103
Pericoma sp.	12	12		47	47	24
Rheotanytarsus sp.	140	58				40
Simulium sp.		12			70	16
TURBELLARIA	**105**		**23**	**93**	**116**	**67**
Dugesia sp.	105		23	93	116	67
NEMATODA			**70**			**14**
Unid. Nematoda			70			14
HYDRACARINA	**47**		**209**		**233**	**98**
Lebertia sp.	47		209		233	98

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
9/15/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**488**	**977**	**302**	**175**	**350**	**459**
Despaxia augusta	23	47		12	47	26
Podmosta/Prostoia	23			12	47	16
Sweltsa sp.	326	837	279	93	233	354
Taenionema sp.	116	93	23	58	23	63
EPHEMEROPTERA	**2418**	**4328**	**1930**	**1116**	**1535**	**2266**
Baetis tricaudatus	209	233	93	174	395	221
Cinygmula sp.		93	23	12		26
Drunella coloradensis	23	93	140			51
Drunella doddsi	1675	2931	1558	651	814	1526
Drunella grandis	23	47		35	70	35
Epeorus deceptivus	23	47				14
Ephemerella infrequens		93			23	23
Rhithrogena hageni	465	791	116	244	233	370
TRICHOPTERA	**629**	**1070**	**768**	**1036**	**465**	**794**
Arctopsyche grandis	47	47		12		21
Brachycentrus americanus	233	372	326	198	140	254
Hydropsyche sp.					23	5
Lepidostoma sp.	23					5
Rhyacophila sibirica gr.	326	651	442	826	302	509
COLEOPTERA	**325**	**233**	**209**	**47**	**93**	**182**
Heterlimnius corpulentus	302	233	209	47	93	177
Zaitzevia parvula	23					5
DIPTERA	**4070**	**7770**	**2535**	**2058**	**4885**	**4264**
Chelifera/Metachela					23	5
Cricotopus sp.	1140	1547	640	151	2582	1212
Diamesa sp.		465	105	47		123
Dicranota sp.	23	140		12		35
Heterotrissocladius sp.	1070	2442	209	849	605	1035
Mallochohelea sp.	163	326	116	81	163	170
Pagastia sp.			70	151	93	63
Pericoma sp.	1442	2559	1163	430	1372	1393
Rhabdomastix sp.			23		47	14
Rheotanytarsus sp.		151				30
Simulium sp.	209	93	209	337		170
Tipula sp.	23	47				14
TURBELLARIA	**163**	**47**		**12**		**44**
Polycelis coronata	163	47		12		44
ANNELIDA						
OLIGOCHAETA	**209**	**326**	**116**	**151**	**256**	**212**
Eiseniella tetraedra		47			23	14
Homochaeta naidina	209	279	116	151	233	198

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
9/15/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA			**70**	**23**		**19**
Unid. Nematoda			70	23		19
HYDRACARINA	**884**	**419**	**140**	**81**	**465**	**398**
Lebertia sp.	884	419	140	81	465	398

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
9/15/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**23**		**12**	**35**	**14**
Sweltsa sp.		23		12	35	14
EPHEMEROPTERA	**4163**	**2629**	**3606**	**2071**	**651**	**2623**
Baetis tricaudatus	93	140	93	93	58	95
Cinygmula sp.	23			58	23	21
Drunella coloradensis	140	47	23	105	35	70
Drunella doddsi	302	163	233	233	81	202
Drunella grandis	3582	2279	3210	1582	454	2221
Rhithrogena robusta	23		47			14
TRICHOPTERA	**768**	**256**	**419**	**291**	**256**	**398**
Arctopsyche grandis	70	47		12		26
Brachycentrus americanus	698	186	372	221	209	337
Rhyacophila sibirica gr.		23	47	58	47	35
COLEOPTERA	**47**	**116**	**116**	**93**	**23**	**79**
Heterlimnius corpulentus	47	116	116	93	23	79
DIPTERA	**605**	**816**	**933**	**467**	**210**	**605**
Atherix pachypus	70	23	23	12	12	28
Chelifera/Metachela		47	47	81	12	37
Cricotopus sp.	70	93	151	35		70
Diamesa sp.		23				5
Dicranota sp.			23			5
Hemerodromia sp.		47				9
Heterotrissocladius sp.	279	349	384	186	93	258
Hexatoma sp.			47		23	14
Mallochohelea sp.			23	47	12	16
Pagastia sp.	163	93	47	12		63
Pericoma sp.			47	12	23	16
Rhabdomastix sp.		47	47	35		26
Rheotanytarsus sp.		47	47	12		21
Simulium sp.	23	47	47	35	35	37
TURBELLARIA		**47**				**9**
Polycelis coronata		47				9
HYDRACARINA	**1186**	**2186**	**1070**	**802**	**419**	**1133**
Lebertia sp.	1186	2163	1070	802	419	1128
Sperchon sp.		23				5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
9/16/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**47**	**47**	**93**	**12**		**40**
Sweltsa sp.	47	47	70	12		35
Zapada cinctipes			23			5
EPHEMEROPTERA	**3047**	**4700**	**2675**	**1071**	**2582**	**2815**
Baetis tricaudatus	279	512	256	70	70	237
Drunella doddsi	70	140	23	35	47	63
Drunella grandis	814	1396	1210	791	1186	1079
Epeorus albertae			23	12	23	12
Rhithrogena hageni	1884	2652	1163	163	1256	1424
TRICHOPTERA	**163**	**885**	**930**	**163**	**279**	**484**
Arctopsyche grandis	70	140	93	23		65
Brachycentrus americanus	70	698	837	140	279	405
Rhyacophila rotunda gr.	23	47				14
COLEOPTERA		**47**	**70**	**70**		**37**
Heterlimnius corpulentus		47	70	70		37
DIPTERA	**3419**	**7257**	**4395**	**1895**	**3373**	**4068**
Atherix pachypus	70	93	93	81	47	77
Chelifera/Metachela			93	23	23	28
Cricotopus sp.	977	756	930	698	1919	1056
Diamesa sp.					105	21
Dicranota sp.	23		23	23	23	18
Heterotrissocladius sp.	1489	2361	2349	779	1035	1603
Hexatoma sp.			23			5
Lispoides sp.				12		2
Pagastia sp.			256	58	105	84
Pericoma sp.				12		2
Rhabdomastix sp.	23					5
Simulium sp.	837	4047	628	209	116	1167
ANNELIDA						
OLIGOCHAETA			**326**		**47**	**75**
Homochaeta naidina			326		47	75
CRUSTACEA						
AMPHIPODA				**23**		**5**
Hyalella azteca				23		5
HYDRACARINA	**93**	**47**	**395**	**12**	**395**	**188**
Lebertia sp.	93	47	395	12	395	188

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
SITE: Downstream of Hansen
9/16/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**23**	**12**	**12**	**24**		**13**
Cultus sp.				12		2
Megarcys sp.	23	12	12			9
Zapada cinctipes				12		2
EPHEMEROPTERA	**3210**	**2141**	**2071**	**1582**	**2558**	**2311**
Baetis tricaudatus	256	221	221	116	430	249
Drunella doddsi	70	12	35	12	23	30
Drunella grandis	2140	1756	1768	1454	2024	1828
Epeorus albertae			12			2
Rhithrogena hageni	744	140	35		81	200
Serratella tibialis		12				2
TRICHOPTERA	**3023**	**373**	**1000**	**1222**	**512**	**1225**
Arctopsyche grandis	116	35	58	47	23	56
Brachycentrus americanus	2884	256	919	1140	465	1133
Hydropsyche sp.				12		2
Lepidostoma sp.		12				2
Limnephilus/Philarctus					12	2
Rhyacophila rotunda gr.	23	58	23	23	12	28
Rhyacophila sibirica gr.		12				2
COLEOPTERA	**163**		**23**	**23**	**35**	**49**
Heterlimnius corpulentus	140		23	23	35	44
Narpus concolor	23					5
DIPTERA	**697**	**326**	**314**	**536**	**420**	**456**
Atherix pachypus			23	12	23	12
Chelifera/Metachela	23		23	23	23	18
Diamesa sp.			12			2
Dicranota sp.			58	12	12	16
Heterotrissocladius sp.	558	221	116	326	256	295
Monohelea sp.			12			2
Pagastia sp.	23	58	58	140	58	67
Protanyderus sp.			12			2
Rhabdomastix sp.	23	23		23	12	16
Rheotanytarsus sp.	70	12			12	19
Simulium sp.		12			12	5
Tipula sp.					12	2
ANNELIDA						
OLIGOCHAETA				**81**		**16**
Homochaeta naidina				81		16
NEMATODA		**12**	**12**	**12**	**12**	**10**
Unid. Nematoda		12	12	12	12	10

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
SITE: Downstream of Hansen
9/16/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**791**	**12**	**233**	**488**	**279**	**361**
Lebertia sp.	768	12	233	488	279	356
Testudacarus/Torrenticola	23					5
MOLLUSCA						
GASTROPODA			**12**			**2**
Gyraulus sp.			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
9/16/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA			**12**	**46**	**12**	**14**
Cultus sp.			12	23	12	9
Perlomyia sp.				23		5
EPHEMEROPTERA	**1302**	**744**	**1559**	**1756**	**1140**	**1301**
Baetis tricaudatus	744	337	640	686	512	584
Cinygmula sp.	23	12	23	12		14
Drunella doddsi			35	23		12
Drunella grandis	442	337	570	488	616	491
Rhithrogena hageni	93	58	291	547	12	200
TRICHOPTERA	**488**	**256**	**639**	**640**	**617**	**527**
Arctopsyche grandis	23	23	81	23	12	32
Brachycentrus americanus	395	209	337	407	547	379
Hydropsyche sp.			23			5
Lepidostoma sp.				12		2
Rhyacophila rotunda gr.	47	12	198	186	58	100
Rhyacophila sibirica gr.	23	12		12		9
LEPIDOPTERA				**12**		**2**
Cosmopterigidae				12		2
COLEOPTERA		**12**	**12**	**47**	**23**	**19**
Heterlimnius corpulentus		12	12	47		14
Optioservus divergens					23	5
DIPTERA	**767**	**699**	**1326**	**1269**	**1918**	**1196**
Atherix pachypus	23	12		23	23	16
Chelifera/Metachela	47	12	12	35	233	68
Cricotopus sp.	163	151		430	523	253
Culicoides sp.				35		7
Dicranota sp.			23		23	9
Empididae					23	5
Heterotrissocladius sp.	395	442	1047	593	1023	700
Pagastia sp.			35	47	58	28
Pericoma sp.		12		12	12	7
Rhabdomastix sp.	23	23		47		19
Rheotanytarsus sp.	23					5
Simulium sp.	93	47	209	47		79
ANNELIDA						
OLIGOCHAETA			**70**	**35**		**21**
Homochaeta naidina			70	35		21
HYDRACARINA	**140**	**70**	**47**	**233**	**47**	**107**
Lebertia sp.	140	70	47	233	47	107

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
9/13/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**24**	**24**		**23**	**14**
Pteronarcella badia		12	12			5
Sweltsa sp.			12			2
Taenionema sp.		12			23	7
EPHEMEROPTERA	**3221**	**815**	**1862**	**3164**	**1466**	**2106**
Baetis bicaudatus		128	326			91
Baetis tricaudatus	2861	128	291	884	256	884
Drunella coloradensis	174	186	291	163	140	191
Drunella doddsi		47			23	14
Rhithrogena hageni	186	326	954	2117	1047	926
TRICHOPTERA	**35**	**81**	**245**	**163**	**47**	**114**
Arctopsyche grandis		35	35		35	21
Brachycentrus americanus	12	23	186	163	12	79
Cheumatopsyche sp.	23	23	12			12
Rhyacophila sibirica gr.			12			2
COLEOPTERA	**12**		**12**			**4**
Heterlimnius corpulentus	12					2
Narpus concolor			12			2
DIPTERA	**233**	**349**	**1210**	**1954**	**444**	**838**
Atherix pachypus	47		47	23	12	26
Chelifera/Metachela	23	35	35		12	21
Cricotopus sp.	12	12		70	12	21
Dicranota sp.				23		5
Hemerodromia sp.					12	2
Heterotrissocladius sp.	128	244	872	1524	361	626
Pagastia sp.	23	23	163	221		86
Protanyderus margarita		12				2
Rhabdomastix sp.			12	23		7
Rheotanytarsus sp.				70		14
Simulium sp.		23	81		35	28
NEMATODA		**35**				**7**
Unid. Nematoda		35				7
HYDRACARINA	**116**			**302**	**58**	**95**
Lebertia sp.	116			302	58	95

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
9/13/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**24**			**6**
Despaxia augusta	12					2
Pteronarcella badia			12			2
Sweltsa sp.			12			2
EPHEMEROPTERA	**919**	**1116**	**558**	**942**	**1035**	**914**
Baetis tricaudatus	221	395	174	233	395	284
Drunella coloradensis	12	23	12			9
Drunella grandis	23					5
Rhithrogena hageni	663	698	372	709	640	616
TRICHOPTERA	**105**	**465**	**105**	**24**	**164**	**172**
Arctopsyche grandis	35	209	23	12	12	58
Brachycentrus americanus	58	209	70	12	116	93
Hydropsyche sp.	12	35			12	12
Lepidostoma sp.		12			12	5
Rhyacophila rotunda gr.			12			2
Rhyacophila sibirica gr.					12	2
COLEOPTERA	**81**	**12**	**12**		**47**	**30**
Narpus concolor	81		12		47	28
Optioservus divergens		12				2
DIPTERA	**442**	**431**	**186**	**128**	**385**	**315**
Atherix pachypus	23				12	7
Dicranota sp.		12		23		7
Heterotrissocladius sp.	384	384	186	105	349	282
Protanyderus sp.		12			12	5
Rhabdomastix sp.					12	2
Simulium sp.	35	23				12
HYDRACARINA		**12**		**12**		**5**
Lebertia sp.		12		12		5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
9/14/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**116**	**23**	**23**	**12**		**36**
Cultus sp.			23			5
Isogenoides sp.	23					5
Pteronarcella badia	70	23		12		21
Zapada cinctipes	23					5
EPHEMEROPTERA	**2559**	**3839**	**2117**	**2815**	**2094**	**2685**
Baetis tricaudatus	2140	3373	1745	2524	1686	2294
Drunella grandis	70	47	116	12	12	51
Epeorus albertae				12	12	5
Rhithrogena hageni	349	419	256	267	384	335
TRICHOPTERA	**3931**	**3001**	**1187**	**3408**	**338**	**2373**
Arctopsyche grandis				35		7
Brachycentrus americanus	465	23	256	337	12	219
Culoptila sp.				12		2
Hydropsyche sp.	3466	2931	884	3012	326	2124
Lepidostoma sp.			47	12		12
Rhyacophila brunnea gr.		47				9
COLEOPTERA	**395**	**442**	**721**	**326**	**197**	**416**
Narpus concolor		23	23		23	14
Optioservus quadrimaculatus	302	372	698	314	174	372
Zaitzevia parvula	93	47		12		30
DIPTERA	**976**	**792**	**1535**	**919**	**291**	**904**
Atherix pachypus	675	256	535	419	151	407
Chelifera/Metachela			23			5
Cricotopus sp.		23	70	47		28
Heterotrissocladius sp.	116	279	768	337	93	319
Hexatoma sp.	23	47	116		12	40
Mallochohelea sp.	23	140		35		40
Pagastia sp.					35	7
Rheotanytarsus sp.	23					5
Simulium sp.	116	47	23	81		53
HYDRACARINA		**70**	**23**	**12**		**21**
Atractides sp.		47				9
Lebertia sp.		23	23	12		12
MOLLUSCA						
GASTROPODA			**23**		**12**	**7**
Fossaria sp.			23		12	7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
9/14/1999

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**24**	**23**		**12**		**11**
Isoperla sobria		23		12		7
Pteronarcella badia	12					2
Zapada cinctipes	12					2
EPHEMEROPTERA	**722**	**2280**	**1164**	**1570**	**1686**	**1484**
Baetis tricaudatus	651	2163	1047	1477	1465	1361
Drunella doddsi	12					2
Drunella grandis	12		12		12	7
Rhithrogena hageni	12	47	93		58	42
Rhithrogena robusta	35	70	12	93	151	72
TRICHOPTERA	**826**	**2001**	**571**	**989**	**2338**	**1345**
Brachycentrus americanus	81	163	12	35	128	84
Brachycentrus occidentalis	128		58	105	35	65
Cheumatopsyche sp.	570	1768	442	837	2128	1149
Hydropsyche sp.	47	70	47		35	40
Rhyacophila sibirica gr.			12	12	12	7
COLEOPTERA	**47**		**35**	**70**	**152**	**61**
Heterlimnius corpulentus	47		23	58	140	54
Narpus concolor				12	12	5
Zaitzevia parvula			12			2
DIPTERA	**361**	**408**	**210**	**315**	**523**	**363**
Atherix pachypus	12		12	12	23	12
Caloparyphus sp.	23			12		7
Cricotopus sp.			12		58	14
Dicranota sp.			23		23	9
Heterotrissocladius sp.	221	128	128	174	291	188
Hexatoma sp.	12					2
Mallochohelea sp.			35			7
Pagastia sp.	35	47		12	12	21
Rheotanytarsus sp.	23					5
Simulium sp.	35	233		105	116	98
TURBELLARIA		**163**	**81**	**209**	**116**	**114**
Dugesia sp.		163	81	209	116	114
MOLLUSCA						
GASTROPODA		**23**				**5**
Physa sp.		23				5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
4/3/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1371**	**466**	**255**	**1349**	**2188**	**1126**
Cultus aestivalis	93	12	23	47	47	44
Isoperla sp.					47	9
Malenka sp.	23			23		9
Megarcys signata	23					5
Paraleuctra sp.	465	151	116	698	884	463
Prostoia besametsa	186	105		186	186	133
Sweltsa sp.	558	198	116	395	977	449
Taenionema sp.	23				47	14
EPHEMEROPTERA	**1792**	**1070**	**2163**	**1699**	**4281**	**2201**
Ameletus sp.					47	9
Baetis tricaudatus	163	93	93	93	186	126
Cinygmula sp.	140	105	163	140	326	175
Drunella coloradensis	419	221	349	326	1256	514
Drunella doddsi	209	93	140	186	93	144
Epeorus longimanus	70	81	488	93	558	258
Ephemerella infrequens	791	442	907	814	1675	926
Rhithrogena hageni		35	23	47	140	49
TRICHOPTERA	**1256**	**872**	**1930**	**1559**	**4002**	**1923**
Arctopsyche grandis	70	35	70	70	186	86
Brachycentrus americanus	163	12	70		326	114
Hydropsyche sp.	23				93	23
Lepidostoma sp. A	302	279	1256	93	1210	628
Lepidostoma sp. B			23	23		9
Micrasema bactro			23		47	14
Oligophlebodes minutus	372	337	302	1047	1070	626
Rhyacophila brunnea gr.		35			47	16
Rhyacophila sibirica gr.	326	174	163	326	1023	402
Rhyacophila sp. nr. rotunda gr.			23			5
COLEOPTERA	**256**	**186**	**326**	**209**	**465**	**288**
Heterlimnius corpulentus	256	151	279	186	465	267
Optioservus sp.		35	47	23		21
DIPTERA	**3025**	**1235**	**1978**	**768**	**12982**	**3999**
Antocha sp.		12	47		47	21
Atherix pachypus	23					5
Chelifera/Metachela	23	12	47		47	26
Cricotopus sp.	419	140	47		733	268
Dicranota sp.	140	35	23	47	93	68
Dixa sp.					47	9
Heterotrissocladius sp.	140	140	419	140	4082	984
Hexatoma sp.		12	23	23	93	30
Mallochohelea sp.	163	58	93	23	233	114
Micropsectra sp.	1210	430	814	186	4443	1417
Pagastia sp.		35				7
Pericoma sp.	884	361	465	349	2931	998
Prosimulium sp.	23					5
Rhabdomastix sp.					233	47

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
4/3/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA		**93**	**186**	**93**	**140**	**102**
Polycelis coronata		93	186	93	140	102
HYDRACARINA	**23**		**46**	**23**	**47**	**28**
Lebertia sp.	23		23		47	19
Sperchon/Sperchonopsis			23	23		9
MOLLUSCA						
PELECYPODA					**47**	**9**
Sphaerium sp.					47	9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**557**	**256**	**652**	**490**	**455**	**482**
Capniidae			12			2
Cultus aestivalis				12	12	5
Doddsia occidentalis	23		70	35	47	35
Hesperoperla pacifica		58	35	12	23	26
Isoperla sp.	93		12	12	23	28
Megarcys signata					12	2
Paraleuctra sp.	93				12	21
Prostoia besametsa			23	35	23	16
Sweltsa sp.	302	128	419	291	244	277
Taenionema sp.	23	70	81	47	47	54
Zapada cinctipes				23	12	7
Zapada oregonensis gr.	23			23		9
EPHEMEROPTERA	**2118**	**1058**	**1047**	**1360**	**1582**	**1432**
Ameletus sp.			35			7
Baetis bicaudatus		35	12		23	14
Baetis tricaudatus	535	465	174	616	512	460
Cinygmula sp.	233	35	70	128	105	114
Drunella coloradensis	302		12	47	93	91
Drunella doddsi	70	105	93	23	70	72
Epeorus longimanus	605	81	233	209	442	314
Ephemerella infrequens	47	23	186	23	58	67
Rhithrogena hageni	233	209	209	279	256	237
Rhithrogena robusta	93	105	23	35	23	56
TRICHOPTERA	**140**	**198**	**501**	**130**	**304**	**254**
Arctopsyche grandis	47	70	23	47	81	54
Brachycentrus americanus				12		2
Glossosomatidae		93		35	23	30
Lepidostoma sp. A	23		12		12	9
Lepidostoma sp. B			326	12		68
Micrasema bactro					12	2
Neothremma sp.			23			5
Oligophlebodes minutus			47		47	19
Rhyacophila brunnea gr.					12	2
Rhyacophila sibirica gr.	70	35	58	12	105	56
Rhyacophila sp. nr. lieftincki gr.			12			2
Rhyacophila sp. nr. rotunda gr.				12	12	5
COLEOPTERA	**186**	**23**	**302**	**47**	**174**	**146**
Heterlimnius corpulentus	163	23	302	35	174	139
Optioservus quadrimaculatus	23			12		7
DIPTERA	**813**	**71**	**524**	**176**	**212**	**357**
Brillia sp.			12		12	5
Chelifera/Metachela		12	12		12	7
Cricotopus sp.	23	35	23	12	23	23
Dicranota sp.	23		58		35	23
Hexatoma sp.					12	2
Mallochohelea sp.			35		35	14
Micropsectra sp.	651		233	116	47	209

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
Oreogeton sp.			35		12	9
DIPTERA cont.						
Pagastia sp.				12		2
Pericoma sp.	116	12	116	12	12	54
Prosimulium sp.		12		12	12	7
Tipula sp.				12		2
TURBELLARIA	**23**					**5**
Polycelis coronata	23					5
ANNELIDA						
OLIGOCHAETA	**825**	**23**	**279**	**12**	**47**	**237**
Eiseniella tetraedra	23	23	279	12	47	77
Stephansoniana tandyi	802					160
HYDRACARINA	**70**			**12**		**16**
Lebertia sp.	70			12		16

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1070**	**489**	**384**	**1256**	**3163**	**1272**
Cultus aestivalis	70	47	12	419	977	305
Megarcys signata	23					5
Paraleuctra sp.	70		12			16
Prostoia besametsa	70	23		93	233	84
Sweltsa sp.	512	140	267	279	651	370
Taenionema sp.	23	23			186	46
Zapada cinctipes		70	35	93	93	58
Zapada oregonensis gr.	302	186	58	372	1023	388
EPHEMEROPTERA	**4001**	**3326**	**1292**	**3628**	**6793**	**3809**
Ameletus sp.		70				14
Baetis bicaudatus	675	535	267	465	1256	640
Baetis tricaudatus	186		47			47
Cinygmula sp.	2117	1931	698	2279	4559	2317
Drunella doddsi	256	23	12		47	68
Epeorus longimanus	23	23	105		372	105
Ephemerella infrequens	419	488	151	791	512	472
Rhithrogena hageni	23	23				9
Rhithrogena robusta	302	233	12	93	47	137
TRICHOPTERA	**1302**	**1047**	**513**	**653**	**419**	**786**
Brachycentrus americanus	23	23		47		19
Glossosoma sp.				47		9
Neothremma sp.	23					5
Oligophlebodes minutus	47		35	140		44
Rhyacophila brunnea gr.	116	93			93	60
Rhyacophila sibirica gr.	907	675	419	372	186	512
Rhyacophila sp. nr. alberta gr.		140	12			30
Rhyacophila sp. nr. rotunda gr.	186	116	47	47	140	107
COLEOPTERA	**23**	**23**	**12**	**47**	**47**	**30**
Heterlimnius corpulentus	23	23	12	47	47	30
DIPTERA	**1978**	**1513**	**3548**	**7445**	**6141**	**4124**
Chelifera/Metachela	70	23	81	47		44
Dicranota sp.	23		47	233	47	70
Hesperoconopa sp.				93		19
Heterotrissocladius sp.	47	70	140		1198	291
Mallochohelea sp.		47	12	93		30
Micropsectra sp.	1140	1186	3256	6885	4559	3405
Oreogeton sp.	395	93	12			100
Pagastia sp.	47				244	58
Pericoma sp.	47	47				19
Prosimulium sp.	209	47		47	93	79
Tipula sp.				47		9
TURBELLARIA				**326**		**65**
Polycelis coronata				326		65

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**23**		**47**	**233**	**47**	**70**
Eiseniella tetraedra	23			233		51
Unid. Immature Tubificidae w/o Capilliform Chaetae			47		47	19
HYDRACARINA	**186**	**116**	**81**	**279**	**93**	**151**
Lebertia sp.	186	93	81	279	93	146
Sperchon/Sperchonopsis		23				5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1129**	**3210**	**1070**	**7490**	**2699**	**3119**
Cultus aestivalis					47	9
Paraleuctra sp.			23	233	93	70
Prostoia besametsa	1105	3140	861	6466	2373	2789
Sweltsa sp.		70	186	744	186	237
Taenionema sp.	12					2
Zapada oregonensis gr.	12			47		12
EPHEMEROPTERA	**606**	**1163**	**1024**	**3814**	**1026**	**1527**
Baetis tricaudatus	105	326	140	186	186	189
Cinygmula sp.			47			9
Drunella coloradensis	12	93	209	558	233	221
Drunella doddsi	477	628	302	2512	419	868
Drunella grandis	12	70			47	26
Epeorus longimanus			140	279	47	93
Ephemerella infrequens		23	23	93	47	37
Rhithrogena hageni		23	163	186	47	84
TRICHOPTERA	**430**	**605**	**581**	**3118**	**2234**	**1393**
Arctopsyche grandis			23		93	23
Brachycentrus americanus	186	326	349	2140	1954	991
Lepidostoma sp. A					47	9
Lepidostoma sp. B			23	47		14
Oligophlebodes minutus					47	9
Rhyacophila brunnea gr.				93		19
Rhyacophila coloradensis gr.				47		9
Rhyacophila sibirica gr.	244	279	186	791	93	319
COLEOPTERA	**81**	**116**	**116**	**47**	**186**	**110**
Heterlimnius corpulentus	81	116	93	47	186	105
Postelichus sp.			23			5
DIPTERA	**1885**	**1721**	**1046**	**8792**	**5072**	**3702**
Bibiocephala grandis				47		9
Brillia sp.	47					9
Chelifera/Metachela		23				5
Cricotopus sp.	361	407	23	663	1175	526
Diamesa sp.				267		53
Dicranota sp.			23		93	23
Mallochohelea sp.				47	47	19
Micropsectra sp.	419	47	256	395	2105	644
Pagastia sp.	314	616	163	1977	442	702
Pericoma sp.	744	605	558	2977	884	1154
Prosimulium sp.		23		2419	279	544
Rheocricotopus sp.			23			5
Tipula sp.					47	9
TURBELLARIA			**140**			**28**
Polycelis coronata			140			28

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**12**		**1140**	**93**	**93**	**268**
Stephansoniana tandyi	12		1140	93	93	268
NEMATODA	**35**				**47**	**16**
Unid. Nematoda	35				47	16
HYDRACARINA	**244**	**419**	**326**	**884**	**1489**	**672**
Lebertia sp.	244	419	326	837	1442	654
Sperchon/Sperchonopsis					47	9
Testudacarus/Torrenticola				47		9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
4/5/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**24**	**12**	**58**	**47**	**81**	**44**
Prostoia besametsa	12	12	23	35	58	28
Sweltsa sp.	12		35	12	23	16
EPHEMEROPTERA	**386**	**151**	**338**	**571**	**489**	**386**
Baetis tricaudatus	70	116	140	105	105	107
Cinygmula sp.			12		12	5
Drunella doddsi	47					9
Drunella grandis	198		174	326	244	188
Epeorus longimanus	12					2
Ephemerella infrequens	12				23	7
Rhithrogena hageni	47	35	12	140	105	68
TRICHOPTERA	**116**	**93**	**129**	**129**	**385**	**170**
Arctopsyche grandis				12		2
Brachycentrus americanus	23	35	47	23	326	91
Lepidostoma sp. A				12		2
Oligophlebodes minutus	12		12	12	12	10
Rhyacophila coloradensis gr.	58	58	35	12	12	35
Rhyacophila sibirica gr.	23		35	58	35	30
COLEOPTERA			**12**	**81**	**35**	**25**
Heterlimnius corpulentus			12	81	23	23
Narpus concolor					12	2
DIPTERA	**454**	**338**	**280**	**176**	**153**	**279**
Atherix pachypus	12			12	12	7
Ceratopogonidae			12		12	5
Chelifera/Metachela	23		12		23	12
Cricotopus sp.	372	302	221	105	35	207
Diamesa sp.	47	12	35	35	12	28
Dicranota sp.		12		12		5
Hesperoconopa sp.				12		2
Hexatoma sp.		12				2
Orthocladius lignicola					47	9
Pagastia sp.					12	2
HYDRACARINA	**105**	**186**	**35**	**919**	**466**	**341**
Lebertia sp.	105	186	35	907	454	337
Protzia sp.				12		2
Sperchon/Sperchonopsis					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
4/3/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**70**					**14**
Prostoia besametsa	58					12
Taenionema sp.	12					2
EPHEMEROPTERA	**524**	**744**	**965**	**210**	**860**	**661**
Baetis bicaudatus	93					19
Baetis tricaudatus	35		12	12	23	16
Cinygmula sp.	233					47
Drunella doddsi					35	7
Drunella grandis	151	744	872	186	709	532
Rhithrogena hageni	12		81	12	93	40
TRICHOPTERA	**559**	**1303**	**884**	**419**	**710**	**775**
Arctopsyche grandis				12	12	5
Brachycentrus americanus	512	1303	884	407	698	761
Rhyacophila brunnea gr.	12					2
Rhyacophila sibirica gr.	35					7
COLEOPTERA		**93**	**12**			**21**
Optioservus sp.		93	12			21
DIPTERA	**2630**	**5909**	**2117**	**2886**	**1884**	**3085**
Atherix pachypus		186	93	105	116	100
Chelifera/Metachela			12	58		14
Cricotopus sp.	2466	4792	1198	2175	1244	2375
Diamesa sp.	105	651	686	419	407	454
Dicranota sp.	35	186	58	12	23	63
Hesperoconopa sp.		47				9
Hexatoma sp.	12				12	5
Mallochohelea sp.				12		2
Pagastia sp.			70		70	28
Pericoma sp.	12	47			12	14
Rheocricotopus sp.				105		21
ANNELIDA						
OLIGOCHAETA	**244**	**419**		**419**	**23**	**221**
Stephansoniana tandyi	244	419		419	23	221
HYDRACARINA	**454**	**1768**	**256**	**419**	**209**	**621**
Lebertia sp.	454	1768	244	419	209	619
Testudacarus/Torrenticola			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
: 4/5/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**23**	**12**	**47**	**19**
Capniidae			23			5
Prostoia besametsa	12			12		5
Pteronarcella badia					35	7
Sweltsa sp.					12	2
EPHEMEROPTERA	**407**	**570**	**720**	**733**	**652**	**616**
Baetis tricaudatus		23	23	12		12
Drunella grandis	384	500	488	430	454	451
Epeorus longimanus		12				2
Ephemerella infrequens		12				2
Rhithrogena hageni	23	23	209	291	198	149
TRICHOPTERA	**559**	**396**	**2163**	**1350**	**1477**	**1187**
Arctopsyche grandis	58	140	23	12	81	63
Brachycentrus americanus	419	186	2047	1303	1337	1058
Hydropsyche sp.	12					2
Lepidostoma sp. A					12	2
Lepidostoma sp. B					12	2
Oligophlebodes minutus				35		7
Rhyacophila coloradensis gr.	58	70	93		35	51
Rhyacophila sp. nr. rotunda gr.	12					2
COLEOPTERA	**23**		**23**			**10**
Heterlimnius corpulentus	23					5
Optioservus quadrimaculatus			23			5
DIPTERA	**2559**	**1385**	**1374**	**1199**	**2198**	**1742**
Atherix pachypus	12	12	47	12		17
Chelifera/Metachela	12	23	47		12	19
Cricotopus sp.	1105	163	675	535	174	530
Diamesa sp.	1430	1175	558	628	2000	1158
Dicranota sp.				12		2
Dolichopodidae					12	2
Pagastia sp.			47			9
Rhabdomastix sp.		12		12		5
HYDRACARINA	**523**	**93**	**884**	**244**	**477**	**445**
Lebertia sp.	523	93	861	244	477	440
Testadacarus/Torrenticola			23			5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**59**	**35**	**12**	**12**	**47**	**32**
Paraleuctra sp.	12					2
Prostoia besametsa	12	23	12		47	19
Pteronarcella badia	12					2
Sweltsa sp.	23	12		12		9
EPHEMEROPTERA	**1534**	**1035**	**337**	**406**	**605**	**784**
Baetis tricaudatus	267	558	174	174	361	307
Drunella doddsi		12				2
Drunella grandis	244	209	58	58	81	130
Epeorus longimanus		23				5
Ephemerella infrequens		12	12			5
Rhithrogena hageni	1000	221	93	174	163	330
Rhithrogena robusta	23					5
TRICHOPTERA	**558**	**605**	**209**	**152**	**547**	**415**
Arctopsyche grandis	70	58		35	70	47
Brachycentrus americanus	430	384	128	105	291	268
Lepidostoma sp. A		12				2
Oligophlebodes minutus		23				5
Rhyacophila coloradensis gr.	58	105	81		174	84
Rhyacophila sibirica gr.				12		2
Rhyacophila sp. nr. rotunda gr.		23			12	7
COLEOPTERA	**24**	**70**	**35**		**12**	**28**
Heterlimnius corpulentus	12	70	23		12	23
Narpus concolor	12		12			5
DIPTERA	**163**	**583**	**651**	**36**	**140**	**313**
Antocha sp.				12		2
Atherix pachypus	23	23	23	12	58	28
Chelifera/Metachela	12	12			12	7
Cricotopus sp.	23	291	407	12	47	156
Diamesa sp.		233	221		23	95
Dicranota sp.	93	12				21
Hesperoconopa sp.		12				2
Rhabdomastix sp.	12					2
ANNELIDA						
OLIGOCHAETA			**12**			**2**
Enchytraeidae			12			2
HYDRACARINA	**47**	**279**	**58**	**12**		**79**
Lebertia sp.	47	267	58	12		77
Sperchon/Sperchonopsis		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**	**12**	**58**	**24**	**12**	**22**
Paraleuctra sp.					12	2
Prostoia besametsa		12	23	12		9
Pteronarcella badia			23	12		7
Sweltsa sp.			12			2
Zapada oregonensis gr.	12					2
EPHEMEROPTERA	**349**	**372**	**512**	**652**	**245**	**425**
Baetis tricaudatus		35		12		9
Drunella doddsi	35				12	9
Drunella grandis	314	23	47	35	47	93
Rhithrogena hageni		314	465	605	186	314
TRICHOPTERA	**151**	**186**	**419**	**116**	**186**	**211**
Arctopsyche grandis	23	23	23	23	35	25
Brachycentrus americanus	81	140	314	81	81	139
Hydropsyche sp.	12		12	12	12	10
Rhyacophila coloradensis gr.	12	23	58		58	30
Rhyacophila sibirica gr.	23		12			7
COLEOPTERA			**12**			**2**
Heterlimnius corpulentus			12			2
DIPTERA	**12**	**59**	**82**	**12**	**35**	**39**
Antocha sp.			12			2
Atherix pachypus		12	47	12		14
Cricotopus sp.	12	47			23	16
Pericoma sp.			23		12	7
HYDRACARINA	**12**	**12**	**12**		**35**	**14**
Lebertia sp.	12		12		35	12
Sperchon/Sperchonopsis		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
4/4/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**12**	**12**		**6**
Capniidae				12		2
Nemouridae			12			2
Paraleuctra sp.	12					2
EPHEMEROPTERA	**104**	**12**	**12**	**0**	**12**	**28**
Baetis tricaudatus	23				12	7
Ephemerella infrequens	23					5
Heptageniidae			12			2
Rhithrogena hageni	58	12				14
TRICHOPTERA	**128**	**81**	**70**	**116**	**70**	**93**
Arctopsyche grandis	23			23		9
Brachycentrus americanus	70	81	70	93	70	77
Oligophlebodes minutus	12					2
Rhyacophila sibirica gr.	23					5
COLEOPTERA	**23**	**12**			**12**	**9**
Heterlimnius corpulentus	23				12	7
Narpus concolor		12				2
DIPTERA	**222**	**60**	**94**	**71**	**47**	**97**
Antocha sp.		12				2
Atherix pachypus		12	12			5
Brillia sp.			12			2
Ceratopogonidae	12					2
Chelifera/Metachela				12		2
Dicranota sp.	70	12	35	47	35	40
Heterotrissocladius sp.	81		12			19
Micropsectra sp.		12			12	5
Pericoma sp.	12					2
Rhabdomastix sp.	47	12	23			16
Tipula sp.				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
4/3/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**	**0**	**128**	**117**	**23**	**56**
Isoperla sp.	12		93	70		35
Prostoia besametsa				47		9
Pteronarcella badia			35		23	12
EPHEMEROPTERA	**2152**	**1908**	**2571**	**2628**	**2722**	**2395**
Baetis tricaudatus	2128	1826	2338	2419	2466	2235
Drunella grandis		35	81	23	23	32
Epeorus longimanus	12	12		23	70	23
Paraleptophlebia sp.			12		23	7
Rhithrogena hageni	12	35	140	163	140	98
TRICHOPTERA	**117**	**651**	**663**	**279**	**605**	**463**
Brachycentrus americanus	93	337	419	163	256	254
Hydropsyche sp.		314	244	116	326	200
Hydroptila sp.					23	5
Lepidostoma sp. A	12					2
Rhyacophila coloradensis gr.	12					2
ODONATA	**12**					**2**
Argia sp.	12					2
COLEOPTERA	**791**	**547**	**594**	**1070**	**1279**	**857**
Narpus concolor	93	47	12	70	186	82
Optioservus sp.	291	174	221	279	488	291
Zaitzevia parvula	407	326	361	721	605	484
DIPTERA	**1025**	**1536**	**1268**	**1396**	**1978**	**1440**
Atherix pachypus	47	337	640	326	512	372
Chelifera/Metachela		35				7
Cricotopus sp.	919	965	558	1012	1326	956
Mallochohelea sp.	47	47	35	23	140	58
Micropsectra sp.				35		7
Pagastia sp.		140				28
Tipula sp.	12	12	35			12
TURBELLARIA	**267**	**58**			**186**	**102**
Dugesia sp.	267	58			186	102
NEMATODA	**12**	**12**			**70**	**19**
Unid. Nematoda	12	12			70	19
MOLLUSCA						
GASTROPODA	**12**					**2**
Fossaria sp.	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
4/3/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**244**	**372**	**663**	**570**	**372**	**444**
Isoperla sp.	244	372	663	570	372	444
EPHEMEROPTERA	**804**	**1699**	**1455**	**1582**	**2233**	**1554**
Baetis bicaudatus	12	35				9
Baetis tricaudatus	698	1454	1105	1489	1791	1307
Drunella grandis		35	47			16
Epeorus longimanus	12	12	35			12
Paraleptophlebia sp.	35	58	47	12	163	63
Rhithrogena hageni	47	105	221	81	279	147
TRICHOPTERA	**396**	**686**	**1803**	**907**	**581**	**875**
Brachycentrus americanus	93	407	1082	465	326	475
Glossosoma sp.				12		2
Hydropsyche sp.	279	244	663	430	186	360
Lepidostoma sp. A	12	35	58		23	26
Lepidostoma sp. B					23	5
Rhyacophila coloradensis gr.	12				23	7
COLEOPTERA	**128**	**81**	**35**	**128**	**140**	**102**
Optioservus sp.	128	81	35	128	140	102
DIPTERA	**164**	**163**	**174**	**129**	**303**	**188**
Atherix pachypus		23	58		47	26
Caloparyphus sp.					23	5
Chelifera/Metachela	12	12				5
Cricotopus sp.	58	23		47	47	35
Dicranota sp.	47	23	35	35	23	33
Hesperoconopa sp.					23	5
Hexatoma sp.	12	12				5
Mallochohelea sp.		12				2
Micropsectra sp.				12		2
Tipula sp.	35	58	81	35	140	70
TURBELLARIA	**349**	**198**	**186**	**326**	**1442**	**500**
Dugesia sp.	349	198	186	326	1442	500
ANNELIDA						
OLIGOCHAETA		**58**	**35**		**46**	**28**
Eiseniella tetraedra		35	35		23	19
Unid. Immature Tubificidae w/o Capilliform Chaetae		23			23	9
HYDRACARINA		**12**				**2**
Lebertia sp.		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
4/3/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
MOLLUSCA						
GASTROPODA			12			2
Physa sp.			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
9/22/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1396**	**651**	**906**	**418**	**4189**	**1511**
Cultus sp.	93		23		140	51
Hesperoperla pacifica	47		23		47	23
Isoperla sp.	93	70	70	116	233	116
Megarcys signata			23			5
Perlodidae				23		5
Pteronarcella badia					47	9
Sweltsa sp.	465	535	628	279	2605	902
Zapada cinctipes	512	23	116		977	326
Zapada oregonensis gr.	186	23	23		140	74
EPHEMEROPTERA	**3117**	**814**	**2582**	**1372**	**5536**	**2684**
Baetis bicaudatus	605	279	791	349	651	535
Baetis tricaudatus	186		116	93	1628	405
Cinygmula sp.			23			5
Drunella coloradensis			23			5
Drunella doddsi	837	209	1070	395	1675	837
Epeorus longimanus					47	9
Ephemerella infrequens	1396	279	419	535	1256	777
Paraleptophlebia sp.			47			9
Rhithrogena robusta	93	47	93		279	102
TRICHOPTERA	**2932**	**930**	**1653**	**1862**	**2885**	**2054**
Arctopsyche grandis	47	23	70	47	186	75
Brachycentrus sp.	47	70	47			33
Glossosoma sp.			93	140	186	84
Hydropsyche sp.	233		140	116	140	126
Lepidostoma sp.	372		93	116	233	163
Oligophlebodes sp.	1582	837	1163	1163	1210	1191
Rhyacophila brunnea gr.	93		47	47	186	75
Rhyacophila sibirica gr.	558			233	744	307
COLEOPTERA	**465**	**279**	**465**	**256**	**977**	**488**
Heterlimnius corpulentus	465	279	465	256	977	488
DIPTERA	**2373**	**977**	**861**	**2443**	**4001**	**2132**
Antocha sp.			23		47	14
Ceratopogoninae	47	47	70	93	186	89
Corynoneura sp.		23				5
Cricotopus (Nostococladius) nostocicol		23				5
Dicranota sp.			23		93	23
Eukiefferiella sp.	58	23				16
Heleniella sp.	58					12
Hexatoma sp.	47			23		14
Micropsectra sp.	744	465	326	1256	2535	1065
Neoplasta sp.	47	47				19

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
9/22/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA Cont.						
Pagastia sp.	116	47	93	198	116	114
Pericoma sp.	791	233	93	605	744	493
Rheocricotopus sp.		23				5
Rheotanytarsus sp.	349	23		70		88
Simulium sp.		23	140	70		47
Tipula sp.					47	9
Tvetenia sp.	116		93	128	233	114
TURBELLARIA			**47**		**279**	**65**
Polycelis coronata			47		279	65
HYDARCARINA				**117**		**23**
Lebertia sp.				47		9
Sperchon/Sperchonopsis				70		14

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
9/21/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**699**	**559**	**604**	**500**	**653**	**604**
Cultus sp.	35				140	35
Hesperoperla pacifica	35	70	23		47	35
Megarcys signata				35		7
Paraleuctra sp.	128	23	23			35
Prostoia besametsa	12	23				7
Sweltsa sp.	326	256	558	337	419	379
Taenionema sp.	47	47				19
Zapada cinctipes	58	93		47		40
Zapada oregonensis gr.	58	47		81	47	47
EPHEMEROPTERA	**2235**	**2419**	**3256**	**1802**	**3535**	**2650**
Ameletus sp.	12					2
Baetis bicaudatus	1082	1070	1442	337	2093	1205
Drunella coloradensis			23			5
Drunella doddsi	12	116		35	93	51
Epeorus longimanus	12	93	23			26
Ephemerella infrequens	35				93	26
Rhithrogena robusta	1082	1140	1768	1430	1256	1335
TRICHOPTERA	**105**	**163**	**465**	**407**	**606**	**349**
Arctopsyche grandis	35		93	81	140	70
Brachycentrus sp.		23			93	23
Dolophilodes aequalis				35		7
Glossosoma sp.	58	23	70		93	49
Lepidostoma sp.					47	9
Neothremma sp.			23	12	47	16
Rhyacophila angelita gr.		47	209	244	93	119
Rhyacophila brunnea gr.	12	70	70	35	93	56
COLEOPTERA	**93**	**140**	**651**	**140**	**977**	**400**
Heterlimnius corpulentus	93	140	651	140	977	400
DIPTERA	**942**	**1793**	**953**	**398**	**2280**	**1273**
Ceratopogoninae			23		47	14
Dicranota sp.		23	47	12	47	26
Eukiefferiella sp.				35		7
Micropsectra sp.	686	791	488	47	1919	786
Neoplasta sp.		47				9
Oreogeton sp.				12		2
Pagastia sp.		47	23		81	30
Parametriocnemus sp.	23					5
Pericoma sp.	140	47	302	151	186	165
Polypedilum sp.				47		9
Rheocricotopus sp.	23					5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
9/21/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA Cont.						
Simulium sp.	47	744	47	35		175
Tipula sp.				12		2
Tvetenia sp.		47		12		12
Unid. Orthocladiinae	23	47	23	35		26
TURBELLARIA	**12**	**23**				**7**
Polycelis coronata	12	23				7
ANNELIDA						
OLIGOCHAETA	**617**	**279**	**977**	**314**	**2792**	**995**
Enchytraeidae			442	47	1803	458
Lumbriculidae	291	279	535	267	989	472
Nais sp.	326					65
HYDRACARINA			**23**	**35**	**47**	**21**
Lebertia sp.			23	35	47	21

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/21/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1350**	**2280**	**3070**	**885**	**2559**	**2029**
Cultus sp.	47	93	93			47
Isoperla sp.	70	279	372	419		228
Paraleuctra sp.	116	326		93		107
Sweltsa sp.	186	419	744		372	344
Taenionema sp.	675	93	884	186	1814	730
Zapada cinctipes	70	698	651	140	140	340
Zapada oregonensis gr.	186	372	326	47	233	233
EPHEMEROPTERA	**1884**	**2094**	**3443**	**2048**	**1489**	**2192**
Ameletus sp.				93		19
Baetis tricaudatus	116	233	326	47	93	163
Cinygmula sp.				93		19
Drunella coloradensis			47			9
Drunella doddsi	1326	1442	1907	1349	651	1335
Ephemerella infrequens	47	186	326	326	47	186
Rhithrogena robusta	395	233	837	140	698	461
TRICHOPTERA	**1698**	**1954**	**512**	**2606**	**2327**	**1820**
Brachycentrus sp.	70					14
Glossosoma sp.	140		93	47	93	75
Hydropsyche sp.		47				9
Oligophlebodes sp.	395	698		1768	1303	833
Rhyacophila brunnea gr.	302	186	186	233	326	247
Rhyacophila sibirica gr.	791	1023	233	558	605	642
COLEOPTERA	**163**	**140**	**186**	**233**	**140**	**172**
Heterlimnius corpulentus	163	140	186	233	140	172
DIPTERA	**954**	**2838**	**7119**	**4978**	**3583**	**3894**
Ceratopogoninae	93		47	558	233	186
Dicranota sp.					47	9
Eukiefferiella sp.	35					7
Heleniella sp.			582			116
Macropelopia sp.	35					7
Micropsectra sp.	326	221	1465	163	1814	798
Neoplasta sp.	23			93	47	33
Oreogeton sp.	70	140				42
Orthocladius (Symposiocladius) sp.	35					7
Orthocladius/Cricotopus gr.	128	1500	3803	2512		1589
Pagastia sp.	128	977	1175	1349	907	907
Parametriocnemus sp.				163		33
Pericoma sp.	23		47	140	372	116
Polypedilum sp.					116	23
Simulium sp.					47	9
Stempellinella sp.	35					7
Tipula sp.	23					5
TURBELLARIA	**186**	**93**	**140**		**186**	**121**
Polycelis coronata	186	93	140		186	121

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/21/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**70**			**791**	**605**	**293**
Enchytraeidae					47	9
Lumbriculidae				93		19
Nais sp.	70			698	558	265
NEMATODA				**47**		**9**
Unid. Nematoda				47		9
HYDRACARINA		**93**	**47**	**279**		**84**
Lebertia sp.		93	47	279		84

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
9/21/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1093**	**1351**	**629**	**1676**	**512**	**1050**
Cultus sp.			70	140		42
Megarcys signata				47		9
Paraleuctra sp.		47				9
Pteronarcella badia		47				9
Sweltsa sp.	1000	930	419	1163	465	795
Taenionema sp.	93	140	70	140	47	98
Zapada cinctipes		47	47	93		37
Zapada oregonensis gr.		140	23	93		51
EPHEMEROPTERA	**4373**	**4651**	**2465**	**4560**	**4001**	**4010**
Baetis tricaudatus	1163	1349	349	279	744	777
Drunella doddsi	1535	1023	907	1582	1163	1242
Drunella grandis	186	93	70	465	186	200
Epeorus longimanus				47	47	19
Ephemerella infrequens	419	465	302	233	698	423
Heptageniidae	186				93	56
Paraleptophlebia sp.	47					9
Rhithrogena hageni	837	1721	837	1954	1070	1284
TRICHOPTERA	**3258**	**2700**	**2046**	**2419**	**2001**	**2484**
Arctopsyche grandis	419	698	116	186	93	302
Brachycentrus americanus	1582	1163	558	1023	791	1023
Glossosoma sp.			23	93	233	70
Hydropsyche sp.	93		23			23
Lepidostoma sp.	140	419	70	279	186	219
Oligophlebodes sp.	140			47	93	56
Rhyacophila brunnea gr.		47	23			14
Rhyacophila coloradensis gr.		47	279	186		102
Rhyacophila sibirica gr.	698	279	861	512	558	582
Rhyacophila sp. nr. rotunda gr.	186	47	93	93	47	93
COLEOPTERA	**745**	**279**	**791**	**419**	**558**	**558**
Heterlimnius corpulentus	698	279	791	419	558	549
Optioservus quadrimaculatus	47					9
DIPTERA	**3211**	**2003**	**1791**	**2561**	**2932**	**2500**
Ceratopogoninae	140		70	93	93	79
Diamesa sp.		70				14
Dicranota sp.			23			5
Eukiefferiella sp.	186	151	47	140	186	142
Hexatoma sp.	47	47		140	47	56
Micropsectra sp.	58		23	140		44
Oreogeton sp.		47				9
Orthocladius (Euortho.) sp.	58	151	23		58	58
Orthocladius (Symposiocladius) sp.	128					26
Orthocladius/Cricotopus gr.	582	140	535	791	1012	612
Pagastia sp.	58			140	128	65
Pericoma sp.	1814	884	977	1070	1210	1191

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
9/21/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA Cont.						
Simulium sp.	140	326	47		47	112
Tipula sp.		47	23	47	93	42
Tvetenia sp.		70	23			19
Unid. Orthocladiinae		70			58	26
TURBELLARIA	**651**	**186**	**23**	**93**	**47**	**200**
Polycelis coronata	651	186	23	93	47	200
ANNELIDA						
OLIGOCHAETA	**279**				**141**	**83**
Enchytraeidae					47	9
Lumbriculidae					47	9
Nais sp.	279				47	65
NEMATODA		**47**		**47**		**19**
Unid. Nematoda		47		47		19
HYDRACARINA	**977**	**94**	**23**	**1210**	**2233**	**907**
Lebertia sp.	977	47	23	1163	2093	861
Protzia sp.				47		9
Sperchon/Sperchonopsis					140	28
Testudacarus/Torrenticola		47				9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
9/20/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**58**	**104**	**47**	**82**	**0**	**59**
Pteronarcella badia	23	23		12		12
Sweltsa sp.	35	81	47	70		47
EPHEMEROPTERA	**1745**	**1524**	**1756**	**942**	**1651**	**1523**
Baetis tricaudatus	651	837	628	314	733	633
Drunella doddsi	23	12				7
Drunella grandis	198	140	174	93	81	137
Epeorus deceptivus	12					2
Rhithrogena hageni	861	535	954	535	837	744
TRICHOPTERA	**279**	**175**	**512**	**163**	**327**	**290**
Arctopsyche grandis		12	23	12		9
Brachycentrus americanus	244	105	430	81	291	230
Glossosoma sp.			12			2
Hydropsyche sp.	12			12	12	7
Oligophlebodes sp.					12	2
Rhyacophila sibirica gr.		58	47	58		33
Rhyacophila sp. nr. rotunda gr.	23				12	7
COLEOPTERA		**47**	**163**	**23**	**105**	**68**
Heterlimnius corpulentus		47	163	23	105	68
DIPTERA	**200**	**59**	**128**	**174**	**501**	**213**
Atherix pachypus		12		23	23	12
Ceratopogoninae				151	279	86
Conchapelopia/Thienemannimyia gr. s					12	2
Diamesa sp.					12	2
Dicranota sp.	12		47			12
Eukiefferiella sp.	47				47	19
Hexatoma sp.	12		12		12	7
Micropsectra sp.	12					2
Neoplasta sp.		12				2
Orthocladius (Euortho.) sp.					35	7
Orthocladius/Cricotopus gr.	12					2
Parametriocnemus sp.	23					5
Polypedilum sp.					23	5
Simulium sp.	47	35	23		23	26
Tvetenia sp.			23			5
Unid. Orthocladiinae	35		23		35	19
ANNELIDA						
OLIGOCHAETA		**12**				**2**
Lumbriculidae		12				2
NEMATODA		**12**				**2**
Unid. Nematoda		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
9/20/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**12**	**12**	**81**		**12**	**23**
Lebertia sp.	12	12	81		12	23

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
9/19/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**186**	**46**	**70**	**442**	**12**	**151**
Pteronarcella badia	47	23	58	186	12	65
Sweltsa sp.	116	23	12	256		81
Zapada cinctipes	23					5
EPHEMEROPTERA	**4604**	**3047**	**3233**	**3211**	**1768**	**3172**
Baetis tricaudatus	2186	2000	1349	2117	1477	1826
Drunella doddsi	23			47	12	16
Drunella grandis	395	163	198	163	93	202
Rhithrogena hageni	2000	884	1686	884	186	1128
TRICHOPTERA	**861**	**488**	**384**	**651**	**257**	**529**
Arctopsyche grandis	140	47	47	23	12	54
Brachycentrus americanus	651	395	279	582	233	428
Hydropsyche sp.				23		5
Lepidostoma sp.	47	23				14
Rhyacophila sp. nr. rotunda gr.	23	23	58	23	12	28
COLEOPTERA	**163**	**163**	**58**	**233**	**93**	**142**
Heterlimnius corpulentus	163	140	58	233	93	137
Zaitzevia parvula		23				5
DIPTERA	**1000**	**631**	**443**	**1118**	**537**	**744**
Antocha sp.			12			2
Atherix pachypus	140	47	35	186	58	93
Brillia sp.				35		7
Diamesa sp.	151	70		105	12	68
Dicranota sp.	47	47		23		23
Eukiefferiella sp.	47	47	12	35	12	31
Hexatoma sp.	23	23				9
Micropsectra sp.	23		12			7
Neoplasta sp.	93	23	35	23	12	37
Orthocladius/Cricotopus gr.	81	47		35	12	35
Pagastia sp.	105	47		140	105	79
Parametriocnemus sp.	23		35	35		19
Polypedilum sp.				35		7
Simulium sp.	93	140	174	326	314	209
Tipula sp.			12			2
Unid. Orthocladiinae	174	140	116	140	12	116
ANNELIDA						
OLIGOCHAETA	**23**	**46**	**12**	**23**	**12**	**23**
Enchytraeidae	23		12		12	9
Nais bretscheri		23				5
Nais sp.		23		23		9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
9/19/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
HYDRACARINA	**47**	**140**			**58**	**49**
Lebertia sp.	47	140			58	49
MOLLUSCA						
GASTROPODA	**23**					**5**
Physa/Physella	23					5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
9/19/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**	**12**	**128**	**12**	**47**	**42**
Pteronarcella badia	12	12	128	12	47	42
EPHEMEROPTERA	**733**	**442**	**803**	**524**	**1070**	**714**
Baetis tricaudatus	686	442	768	477	1023	679
Drunella grandis	47		35	47	47	35
TRICHOPTERA	**884**	**221**	**1058**	**721**	**465**	**670**
Arctopsyche grandis	23		23	23		14
Brachycentrus americanus	849	209	1035	663	442	640
Lepidostoma sp.		12				2
Oligophlebodes sp.				12		2
Rhyacophila coloradensis gr.	12			23	23	12
COLEOPTERA	**35**	**24**			**140**	**39**
Heterlimnius corpulentus	35	12			140	37
Optioservus sp.		12				2
DIPTERA	**815**	**1513**	**1141**	**1768**	**4745**	**1996**
Antocha sp.			23			5
Atherix pachypus		12	12	35	93	30
Diamesa sp.	35	58			384	95
Empididae	12					2
Eukiefferiella sp.	221	233	512	1023	954	589
Neoplasta sp.				12	93	21
Orthocladius (Euortho.) sp.				70	186	51
Orthocladius/Cricotopus gr.	512	1210	547	628	2663	1112
Pagastia sp.	35		47		186	54
Unid. Orthocladiinae					186	37
ANNELIDA						
OLIGOCHAETA	**24**	**47**		**256**	**186**	**103**
Enchytraeidae	12	12		256	163	89
Nais sp.	12	35			23	14
HYDRACARINA	**12**		**105**	**23**	**140**	**56**
Lebertia sp.	12		105	23	140	56

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
9/19/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**116**	**163**		**70**	**93**	**90**
Capniidae	23					5
Isogenoides sp.					23	5
Pteronarcella badia	70	163		70	70	75
Sweltsa sp.	23					5
EPHEMEROPTERA	**3722**	**4024**	**3780**	**4210**	**3861**	**3920**
Baetis bicaudatus	233	302	221	116	93	193
Baetis tricaudatus	2373	2396	2570	3396	3233	2794
Drunella grandis		23		47	23	19
Rhithrogena hageni	1116	1303	989	651	512	914
TRICHOPTERA	**1395**	**2232**	**745**	**1257**	**2047**	**1535**
Arctopsyche grandis	23	209	47	140	256	135
Brachycentrus americanus	721	395	221	372	698	481
Glossosoma sp.			35			7
Hydropsyche sp.	535	1303	314	628	721	700
Oligophlebodes sp.			12			2
Rhyacophila coloradensis gr.	70	23	58	70	279	100
Rhyacophila sibirica gr.	23					5
Rhyacophila sp. nr. rotunda gr.	23	302	58	47	93	105
COLEOPTERA	**140**	**232**	**94**	**46**	**46**	**112**
Heterlimnius corpulentus		93	35		23	30
Narpus concolor	47	116	47	23		47
Optioservus quadrimaculatus	70	23	12	23	23	30
Zaitzevia parvula	23					5
DIPTERA	**256**	**791**	**198**	**349**	**373**	**395**
Antocha sp.				23		5
Atherix pachypus	47	140	81	47	70	77
Dicranota sp.	47		12	23		16
Eukiefferiella sp.	23	23	12		35	19
Hexatoma sp.				23		5
Neoplasta sp.	23	23			47	19
Orthocladius/Cricotopus gr.					70	14
Pagastia sp.	23	70	35	35		33
Simulium sp.	23	116		47	23	42
Unid. Orthocladiinae	70	419	58	151	128	165
ANNELIDA						
OLIGOCHAETA				**70**	**23**	**19**
Enchytraeidae				70	23	19
NEMATODA			**12**			**2**
Unid. Nematoda			12			2
HYDRACARINA	**23**		**58**	**47**		**26**
Lebertia sp.	23		58	47		26

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
9/18/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**418**	**47**	**12**	**233**	**81**	**158**
Amphinemura sp.	23					5
Pteronarcella badia	395	35	12	198	81	144
Sweltsa sp.		12		35		9
EPHEMEROPTERA	**1443**	**1837**	**2524**	**1640**	**2780**	**2044**
Ameletus sp.				12		2
Baetis bicaudatus	582	872	1710	593	1128	977
Baetis tricaudatus	70	58	233	23	35	84
Drunella doddsi					35	7
Drunella grandis	47	23	58	23	35	37
Rhithrogena robusta	744	884	523	989	1547	937
TRICHOPTERA	**1466**	**488**	**325**	**652**	**1059**	**799**
Arctopsyche grandis	186	35	23	12	151	81
Brachycentrus americanus	791	174	209	186	384	349
Hydropsyche sp.	419	209	81	407	477	319
Rhyacophila sibirica gr.	70	23		35	35	33
Rhyacophila sp. nr. rotunda gr.		47	12	12	12	17
COLEOPTERA		**23**	**23**	**47**	**82**	**35**
Heterlimnius corpulentus					12	2
Narpus concolor		23	23	35	58	28
Zaitzevia parvula				12	12	5
DIPTERA	**1187**	**210**	**257**	**431**	**1024**	**621**
Atherix pachypus	47	12	47	35	35	35
Cladotanytarsus sp.	47					9
Dicranota sp.				12	35	9
Eukiefferiella sp.	128	12	81			44
Hexatoma sp.	23					5
Neoplasta sp.	23	23		12	47	21
Orthocladius/Cricotopus gr.	128		35	186		70
Pagastia sp.			12	35		9
Simulium sp.	23		12			7
Unid. Orthocladiinae	768	163	70	151	907	412
ANNELIDA						
OLIGOCHAETA	**23**	**24**		**12**		**12**
Enchytraeidae		12		12		5
Nais sp.	23					5
Unid. Immature Tubificidae w/ Capilliform Chaetae		12				2
HYDRACARINA			**70**	**35**	**186**	**58**
Lebertia sp.			70	23	186	56
Sperchon/Sperchonopsis				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
9/18/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
COLLEMBOLA				**12**		**2**
Unid. Collembola				12		2
PLECOPTERA		**12**				**2**
Paraleuctra sp.		12				2
EPHEMEROPTERA	**326**	**326**	**372**	**326**	**106**	**291**
Baetis bicaudatus	116	116	81	58	12	77
Baetis tricaudatus	163	198	198	221	35	163
Drunella grandis					12	2
Rhithrogena hageni	47	12	93	47	47	49
TRICHOPTERA	**373**	**94**	**105**	**70**	**59**	**140**
Arctopsyche grandis	12		12	12		7
Brachycentrus americanus	128	47	70		12	51
Hydropsyche sp.	233	47	23	58	47	82
COLEOPTERA	**47**	**47**	**93**	**47**	**58**	**58**
Narpus concolor	47	47	93	47	58	58
DIPTERA	**337**	**466**	**407**	**454**	**326**	**399**
Atherix pachypus		12			12	5
Ceratopogoninae			23			5
Neoplasta sp.					12	2
Orthocladius/Cricotopus gr.	23					5
Simulium sp.	47		12			12
Unid. Orthocladiinae	267	454	372	454	302	370
HYDRACARINA	**12**				**12**	**4**
Lebertia sp.					12	2
Testudacarus/Torrenticola	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
9/20/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
COLLEMBOLA	**47**	**186**				**47**
Unid. Collembola	47	186				47
PLECOPTERA	**512**	**327**	**792**	**838**	**512**	**596**
Isoperla sp.	186	47	47	326	93	140
Perlidae		47				9
Pteronarcella badia	326	233	698	512	372	428
Sweltsa sp.			47		47	19
EPHEMEROPTERA	**1116**	**1582**	**1629**	**1024**	**233**	**1117**
Baetis tricaudatus	1023	1396	1582	884	186	1014
Drunella grandis	93			140		47
Heptageniidae			47			9
Rhithrogena hageni		186			47	47
TRICHOPTERA	**5212**	**3583**	**2233**	**4326**	**4420**	**3955**
Brachycentrus americanus	419	279	93	651	512	391
Culoptila sp.	140	419	233	186	186	233
Hydropsyche sp.	4512	2466	1442	2605	2884	2782
Hydroptila sp.	47					9
Lepidostoma sp.	47	93	186	93	326	149
Ochrotrichia sp.	47	326	279	791	512	391
ODONATA					**93**	**19**
Argia sp.					93	19
COLEOPTERA	**745**	**2258**	**1814**	**2884**	**2000**	**1939**
Narpus concolor		47				9
Optioservus quadrimaculatus	605	2117	1628	2791	1814	1791
Postelichus sp.		47				9
Zaitzevia parvula	140	47	186	93	186	130
DIPTERA	**24656**	**5490**	**12141**	**68664**	**14282**	**25045**
Atherix pachypus	1303	419	791	1442	186	828
Ceratopogoninae				47	93	28
Eukiefferiella sp.	18317	4559	8408	54882	11339	19501
Neoplasta sp.		47				9
Orthocladius/Cricotopus gr.	989		1686	9851	477	2601
Pagastia sp.			419		477	179
Rheocricotopus sp.					477	95
Rheotanytarsus sp.				942		188
Simulium sp.	4047	465	837	558	279	1237
Tvetenia sp.				942	477	284
Unid. Orthocladiinae					477	95

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
9/20/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA	**93**	**279**	**47**		**698**	**223**
Dugesia sp.	93	279	47		698	223
HYDRACARINA		**140**	**93**		**186**	**83**
Lebertia sp.		47				9
Sperchon/Sperchonopsis		93	93		186	74

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
9/20/2000

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA					**93**	**19**
Sweltsa sp.					93	19
EPHEMEROPTERA	**47**	**326**	**0**	**233**	**47**	**131**
Baetis tricaudatus		279		233	47	112
Paraleptophlebia sp.	47	47				19
TRICHOPTERA	**10374**	**21771**	**11073**	**9769**	**10048**	**12606**
Brachycentrus americanus	1907	4140	1768	2140	651	2121
Culoptila	47	93	140	93	279	130
Dolophilodes aequalis		47				9
Hydropsyche sp.	2977	7629	4978	4559	1582	4345
Ochrotrichia sp.	5443	9676	4187	2884	7536	5945
Oecetis avara		186		93		56
COLEOPTERA	**1582**	**4838**	**1210**	**4001**	**1722**	**2671**
Heterlimnius corpulentus	1582	4745	1210	3908	1628	2615
Narpus concolor		93		93	47	47
Zaitzevia parvula					47	9
DIPTERA	**7629**	**19584**	**9630**	**21260**	**3769**	**12373**
Caloparyphus sp.		47				9
Eukiefferiella sp.	5385	13072	8478	13165	2652	8550
Euparyphus sp.				47		9
Hexatoma sp.				47		9
Microtendipes sp.		930			151	216
Orthocladius/Cricotopus gr.	965				291	251
Polypedilum sp.	965	2791	384	3745	291	1635
Rheocricotopus sp.		930		2814		749
Rheotanytarsus sp.		465	768	465	291	398
Simulium sp.		419		47	93	112
Tvetenia sp.	314	930		930		435
TURBELLARIA	**5722**	**1582**	**5024**	**4047**	**1628**	**3601**
Dugesia dorotocephala	5722	1582	5024	4047	1628	3601
HYDRACARINA	**279**	**94**		**465**		**167**
Lebertia sp.	279	47				65
Sperchon/Sperchonopsis		47		465		102
MOLLUSCA						
GASTROPODA	**93**	**47**	**140**	**93**		**75**
Physa/Physella	93	47	140	93		75

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
4/2/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**454**	**839**	**83**	**524**	**488**	**476**
Amphinemura sp.					23	5
Capniidae				35		7
Cultus sp.	128	93	12	81	23	67
Hesperoperla pacifica		93	12	35	47	37
Isoperla sp.	35			47	23	21
Paraleuctra sp.		47	12		23	16
Prostoia besametsa	128	47	12	93	47	65
Pteronarcella badia				12		2
Sweltsa sp.	128	419	23	186	302	212
Zapada cinctipes	35	140	12	35		44
EPHEMEROPTERA	**651**	**2233**	**337**	**931**	**1000**	**1030**
Baetis sp.		93				19
Baetis tricaudatus	279	93	128	81	209	158
Cinygmula sp.		93		58	70	44
Drunella doddsi	58		105	140	23	65
Drunella grandis				12		2
Epeorus longimanus	35	977	23	12	47	219
Ephemerella infrequens	279	977	81	558	628	505
Fallceon quilleri				12		2
Rhithrogena hageni				58	23	16
TRICHOPTERA	**2790**	**10980**	**733**	**2966**	**5512**	**4597**
Arctopsyche grandis				12	23	7
Brachycentrus americanus	837	651	58	337	70	391
Glossosoma sp.			151	535	93	156
Hydropsyche sp.	58	47	23		47	35
Lepidostoma sp. A	279	8327	23	500	3419	2510
Lepidostoma sp. B		140			93	47
Micrasema sp.	744	140	12	407	372	335
Oligophlebodes sp.	779	1163	384	1035	1116	895
Rhyacophila brunnea gr.	93	93	12	12		42
Rhyacophila sibirica gr.		419	70	93	279	172
Rhyacophila sp.				35		7
COLEOPTERA	**686**	**977**	**58**	**58**	**279**	**411**
Cleptelmis sp.	35					7
Heterlimnius corpulentus	558	977	35	58	279	381
Optioservus sp.	93		23			23
DIPTERA	**3071**	**8978**	**546**	**2121**	**2037**	**3349**
Antocha sp.	93	93		12	116	63
Brillia sp.	140					28
Cardiocladius sp.					47	9
Ceratopogoninae	523	47	35	35	70	142
Chaetocladius sp.	70	756	93	47	105	214
Cricotopus (Nostococladius) nostocicol	70		128	105	47	70

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
4/2/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA cont.						
Dicranota sp.	35	233	23	47	47	77
Eukiefferiella sp.	686			151		167
Heleniella sp.			23	47	105	35
Hexatoma sp.				12	23	7
Maruina lanceolata				12		2
Micropsectra sp.	70	2279	58	802	500	742
Neoplasta sp.	186	93		35	23	67
Orthocladius/Cricotopus gr.	802	256		47	558	333
Pagastia sp.	140	500		47	47	147
Pericoma sp.	128	1163	116	407	302	423
Prosimulium sp.	58		58	12		26
Rhabdomastix sp.			12			2
Rheotanytarsus sp.		2279		256		507
Tvetenia sp.		1279		47		265
Unid. Orthocladiinae	70				47	23
TURBELLARIA	**35**	**93**	**47**	**326**	**93**	**119**
Polycelis coronata	35	93	47	326	93	119
ANNELIDA						
OLIGOCHAETA	**128**			**12**	**23**	**33**
Enchytraeidae				12	23	7
Megadrili	128					26
HYDRACARINA	**58**	**419**		**12**	**163**	**131**
Lebertia sp.	58	326		12	163	112
Sperchon/Sperchonopsis		93				19
MOLLUSCA						
PELECYPODA		**233**				**47**
Sphaerium sp.		233				47

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**491**	**302**	**790**	**687**	**152**	**484**
Amphinemura sp.	47	47	23	93		42
Cultus sp.		23			12	7
Hesperoperla pacifica	140	23	23	140	35	72
Isoperla sp.	35					7
Paraleuctra sp.			23			5
Perlomyia sp.			47	12		12
Prostoia besametsa	12	93	23	35		33
Sweltsa sp.	233	116	651	372	105	295
Zapada cinctipes	12					2
Zapada oregonensis gr.	12			35		9
EPHEMEROPTERA	**3524**	**4233**	**3745**	**2560**	**1373**	**3087**
Baetis bicaudatus				47		9
Baetis tricaudatus	523	419	419	733	105	440
Cinygmula sp.	1035	1256	395	547	465	740
Drunella doddsi		23		35		12
Epeorus longimanus	454	465	163	105	105	258
Ephemerella infrequens	663	1303	1163	186	163	696
Rhithrogena hageni	744	744	1582	802	535	881
Rhithrogena robusta	105	23	23	105		51
TRICHOPTERA	**513**	**558**	**488**	**468**	**454**	**496**
Arctopsyche grandis	35	23		47	23	26
Brachycentrus americanus	35	116		93		49
Glossosoma sp.	12		23	12	12	12
Hydropsyche sp.				35		7
Lepidostoma sp. A		23				5
Lepidostoma sp. B	93			12	209	63
Micrasema sp.				12		2
Neothremma sp.	47	93	93	12	47	58
Oligophlebodes sp.	35			47	12	19
Rhyacophila brunnea gr.	93	70	23	58	23	53
Rhyacophila hyalinata gr.				12		2
Rhyacophila sibirica gr.	151	186	349	128	128	188
Rhyacophila sp.	12	47				12
COLEOPTERA	**338**	**372**	**302**	**523**	**233**	**353**
Heterlimnius corpulentus	326	372	302	523	233	351
Postelichus sp.	12					2
DIPTERA	**1745**	**745**	**1514**	**2233**	**779**	**1404**
Brillia sp.			70	58	23	30
Ceratopogoninae			70			14
Chaetocladius sp.	174					35
Dicranota sp.	105	140	47	128		84
Heleniella sp.			70			14
Micropsectra sp.	1047	186	896	1465	465	812
Neoplasta sp.	105	70		12	58	49
Oreogeton sp.				12	23	7
Pagastia sp.	81					16

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA cont.						
Pericoma sp.	233	163	326	186	140	210
Prosimulium sp.		70		128		40
Stempellina sp.					35	7
Tvetenia sp.		116	35	244	35	86
TURBELLARIA	**47**					**9**
Polycelis coronata	47					9
ANNELIDA						
OLIGOCHAETA	**1535**	**1233**	**721**	**535**	**535**	**912**
Eiseniella tetraedra	267	535	372	407	209	358
Enchytraeidae	872	361	116	81	209	328
Megadrili	47	221	140	12	70	98
Nais sp.	349	116	93	35	47	128
NEMATODA			**23**			**5**
Unid. Nematoda			23			5
HYDRACARINA	**35**			**24**		**11**
Lebertia sp.	35			12		9
Testudacarus/Torrenticola				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**791**	**896**	**1118**	**594**	**1279**	**934**
Amphinemura sp.	12	35	47	47		28
Cultus sp.	128	140	163	12	198	128
Paraleuctra sp.	35	70	23	81	81	58
Prostoia besametsa	93	58	93	105	58	81
Sweltsa sp.	395	395	675	151	756	474
Taenionema sp.		12	23	12		9
Zapada cinctipes	70	58	47	81	128	77
Zapada oregonensis gr.	58	128	47	105	58	79
EPHEMEROPTERA	**1024**	**1105**	**2257**	**1002**	**2419**	**1561**
Ameletus sp.		23		12		7
Baetis bicaudatus	12		140	140		58
Baetis tricaudatus	12	81	23	105		44
Cinygmula sp.	814	814	1745	558	2152	1217
Drunella doddsi	23	35				12
Epeorus longimanus	35	35	186	47	81	77
Ephemerella infrequens	47	47	93	93	81	72
Rhithrogena hageni			47			9
Rhithrogena robusta	81	70	23	47	105	65
TRICHOPTERA	**1676**	**1163**	**2418**	**2026**	**2941**	**2046**
Brachycentrus americanus	12	35	23	58	81	42
Glossosoma sp.		12	47	12		14
Lepidostoma sp. B	12	35	209	47	81	77
Neothremma sp.		23		35	12	14
Oligophlebodes sp.	861	523	1465	1210	2000	1212
Rhyacophila alberta gr.	23		23			9
Rhyacophila brunnea gr.	47	128	70	140	128	103
Rhyacophila sibirica gr.	686	384	558	477	558	533
Rhyacophila sp.	35	23	23	47	81	42
COLEOPTERA	**151**	**105**	**139**	**81**	**186**	**133**
Heterlimnius corpulentus	151	105	116	81	186	128
Optioservus quadrimaculatus			23			5
DIPTERA	**1033**	**1351**	**1999**	**1896**	**2779**	**1811**
Antocha sp.					12	2
Brillia sp.	23				81	21
Ceratopogoninae	58	47	116	186	186	119
Chaetocladius sp.	23					5
Dicranota sp.	23	12				7
Heleniella sp.	23			58	81	32
Hexatoma sp.					12	2
Macropelopia sp.	23		58			16
Micropsectra sp.	558	1128	1570	826	2059	1228
Neoplasta sp.	93	70	23	35	58	56
Oreogeton sp.	23	12	23			12
Orthocladius/Cricotopus gr.	23			58		16
Pagastia sp.	105	35	186	663	81	214
Pericoma sp.	58	47	23	12	35	35
Tvetenia sp.				58	174	46

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA	**47**	**47**	**23**		**47**	**33**
Polycelis coronata	47	47	23		47	33
ANNELIDA						
OLIGOCHAETA	**35**	**47**	**139**	**361**	**93**	**135**
Eiseniella tetraedra	23	23	23		58	25
Enchytraeidae	12	12	23	35	23	21
Megadrili		12		93		21
Nais sp.			93	233	12	68
NEMATODA			**47**	**12**		**12**
Unid. Nematoda			47	12		12
HYDRACARINA	**140**	**233**	**70**	**175**	**291**	**181**
Lebertia sp.	140	221	70	151	267	170
Protzia sp.				12		2
Sperchon/Sperchonopsis		12		12	12	7
Stygomomonia sp.					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**664**	**792**	**1094**	**2606**	**1280**	**1286**
Amphinemura sp.					23	5
Cultus sp.		35		47		16
Isoperla sp.					12	2
Megarcys signata	12					2
Prostoia besametsa	512	582	896	2047	896	987
Pteronarcella badia					35	7
Sweltsa sp.	140	163	198	512	302	263
Taenionema sp.		12				2
Zapada oregonensis gr.					12	2
EPHEMEROPTERA	**1628**	**1162**	**1965**	**5351**	**1641**	**2349**
Ameletus sp.				47		9
Baetis tricaudatus	151	93	186	372	233	207
Cinygmula sp.	198	81	151	512	163	221
Drunella doddsi	47	12	174	140	140	103
Drunella grandis	35	81	163	186	70	107
Epeorus longimanus	151	116	128	884	174	291
Ephemerella infrequens	872	302	663	2605	640	1016
Rhithrogena hageni	174	477	488	605	221	393
Rhithrogena robusta			12			2
TRICHOPTERA	**1361**	**1001**	**1176**	**3816**	**977**	**1664**
Arctopsyche grandis	35	58	47	140	221	100
Brachycentrus americanus	500	523	686	2047	535	858
Ecclisomyia sp.		12				2
Glossosoma sp.	47			47	12	21
Hydropsyche sp.					12	2
Lepidostoma sp. A		12				2
Lepidostoma sp. B		23	12	233	35	61
Oligophlebodes sp.	314	105	198	837	81	307
Rhyacophila brunnea gr.			12			2
Rhyacophila coloradensis gr.		12				2
Rhyacophila sibirica gr.	465	256	221	512	81	307
COLEOPTERA	**186**	**314**	**174**	**977**	**116**	**353**
Heterlimnius corpulentus	186	314	174	977	116	353
DIPTERA	**1209**	**813**	**1826**	**4374**	**966**	**1838**
Antocha sp.		23			12	7
Ceratopogoninae		23		47	35	21
Diamesa sp.		12				2
Dicranota sp.		58	23	93		35
Hexatoma sp.	35					7
Hydrobaenus sp.				70		14
Micropsectra sp.	198	174	372	907	500	430
Neoplasta sp.				93		19
Orthocladius/Cricotopus gr.		35				7
Pagastia sp.	302	221	663	1047	128	472
Pericoma sp.	651	267	756	2000	279	791
Tipula sp.			12	47	12	14
Tvetenia sp.	23			70		19

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA	**58**	**12**	**58**	**1070**	**70**	**254**
Polycelis coronata	58	12	58	1070	70	254
ANNELIDA						
OLIGOCHAETA	**47**	**128**	**465**	**279**	**47**	**193**
Enchytraeidae		12				2
Nais sp.	47	116	465	279	47	191
HYDRACARINA	**674**	**361**	**791**	**3629**	**419**	**1175**
Lebertia sp.	616	361	779	3489	419	1133
Sperchon/Sperchonopsis	58		12	140		42

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
4/5/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA			**94**	**339**	**186**	**123**
Amphinemura sp.			12	12	23	9
Capniidae				58		12
Cultus sp.			12			2
Prostoia besametsa			12	12	47	14
Pteronarcella badia			23	198	116	67
Sweltsa sp.			23	47		14
Zapada oregonensis gr.			12	12		5
EPHEMEROPTERA	**140**	**525**	**1000**	**1221**	**651**	**707**
Baetis bicaudatus		47		35		16
Baetis tricaudatus	70	233	279	337	186	221
Drunella grandis	12		23	93	186	63
Epeorus longimanus		12		12		5
Rhithrogena hageni	58	233	698	744	279	402
TRICHOPTERA	**209**	**128**	**641**	**2350**	**6885**	**2042**
Arctopsyche grandis			12	140	23	35
Brachycentrus americanus	209	81	593	2012	6676	1914
Glossosoma sp.			12			2
Lepidostoma sp. A		12		174	93	56
Lepidostoma sp. B				12		2
Oligophlebodes sp.		23	12		93	26
Rhyacophila coloradensis gr.		12				2
Rhyacophila sibirica gr.			12	12		5
COLEOPTERA	**12**		**24**	**326**	**256**	**124**
Heterlimnius corpulentus			12	221	70	61
Narpus concolor			12			2
Optioservus divergens				35	93	26
Optioservus quadrimaculatus				58	93	30
Zaitzevia parvula	12			12		5
DIPTERA	**24**	**12**	**107**	**129**	**92**	**74**
Antocha sp.	12		12			5
Atherix pachypus			35	35		14
Ceratopogoninae				12	23	7
Dicranota sp.			12		23	7
Hesperoconopa sp.			12	12		5
Hexatoma sp.				12		2
Neoplasta sp.	12		12			5
Orthocladius/Cricotopus gr.					23	5
Polypedilum sp.		12	12	35		12
Rhabdomastix sp.					23	5
Unid. Orthocladiinae			12	23		7
TURBELLARIA				**12**	**47**	**12**
Polycelis coronata				12	47	12

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
4/5/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**12**				**23**	**7**
Megadrili	12				23	7
HYDRACARINA	**23**	**128**	**47**	**128**	**4419**	**949**
Atractides sp.					23	5
Aturus/Kongsbergia			12			2
Lebertia sp.	23	128	35	128	4303	923
Protzia sp.					23	5
Sperchon/Sperchonopsis					47	9
Testudacarus/Torrenticola					23	5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
4/5/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**36**	**12**	**12**	**36**	**23**	**24**
Capniidae	12			12		5
Prostoia besametsa		12	12	12	23	12
Pteronarcella badia	12					2
Sweltsa sp.	12			12		5
EPHEMEROPTERA	**453**	**47**	**512**	**303**	**617**	**387**
Baetis tricaudatus	209	12	372	209	419	244
Drunella doddsi					23	5
Drunella grandis	58	12	12	47	70	40
Rhithrogena hageni	186	23	128	47	105	98
TRICHOPTERA	**977**	**361**	**2443**	**733**	**1652**	**1234**
Brachycentrus americanus	896	349	2373	686	1570	1175
Hydropsyche sp.	23		23		12	12
Lepidostoma sp. A	58		35	23	47	33
Lepidostoma sp. B		12			23	7
Oligophlebodes sp.				12		2
Rhyacophila coloradensis gr.			12	12		5
COLEOPTERA	**70**	**24**	**140**		**140**	**74**
Heterlimnius corpulentus	35	12	128		105	56
Optioservus sp.	35		12		35	16
Zaitzevia parvula		12				2
DIPTERA	**953**	**562**	**1211**	**665**	**1153**	**907**
Antocha sp.	35		12	12	12	14
Atherix pachypus	35	12	47	23	105	44
Ceratopogoninae	35	12				9
Diamesa sp.	70	35	70		35	42
Dicranota sp.		70		70	47	37
Diplocladius sp.	23					5
Eukiefferiella sp.	23	23				9
Hesperoconopa sp.			23	12		7
Hexatoma sp.	23	35		47	23	26
Micropsectra sp.	23					5
Neoplasta sp.	105	70	58	93	70	79
Orthocladius (Euortho.) sp.		12			35	9
Orthocladius/Cricotopus gr.	523	233	896	302	779	547
Pagastia sp.			35			7
Parametriocnemus sp.		12	35			9
Pericoma sp.	23	12	35	35		21
Polypedilum sp.		12		47		12
Rhabdomastix sp.	23			12		7
Tanyderidae					12	2
Tipula sp.	12	12				5
Tvetenia sp.				12		2
Unid. Orthocladiinae		12			35	9
TURBELLARIA			**12**			**2**
Polycelis coronata			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
4/5/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**523**	**1931**	**697**	**872**	**222**	**850**
Enchytraeidae	233	1291	395	570	105	519
Nais bretscheri	23					5
Nais sp.	267	582	302	209	105	293
Unid. Immature Tubificidae w/ Capilliform Chaetae		58		93	12	33
NEMATODA		**47**		**23**		**14**
Unid. Nematoda		47		23		14
HYDRACARINA	**233**	**233**	**826**	**605**	**1198**	**619**
Lebertia sp.	233	233	826	605	1198	619

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
COLLEMBOLA			**12**			**2**
Unid. Collembola			12			2
PLECOPTERA		**12**	**47**		**82**	**27**
Prostoia besametsa			12			2
Pteronarcella badia		12	35		70	23
Sweltsa sp.					12	2
EPHEMEROPTERA	**210**	**70**	**186**	**209**	**267**	**189**
Baetis tricaudatus	151	70	174	209	174	156
Drunella grandis	12		12		12	7
Rhithrogena hageni	47				81	26
TRICHOPTERA	**1524**	**198**	**2327**	**1210**	**699**	**1190**
Brachycentrus americanus	1477	186	2210	1186	663	1144
Hydropsyche sp.	23				12	7
Lepidostoma sp. A	12		93			21
Lepidostoma sp. B					12	2
Ochrotrichia sp.			12			2
Oligophlebodes sp.	12					2
Rhyacophila sibirica gr.		12	12	12	12	10
Rhyacophila sp.				12		2
COLEOPTERA	**93**	**105**	**221**	**105**	**128**	**130**
Heterlimnius corpulentus	35	70	174	70	116	93
Narpus concolor				12		2
Optioservus quadrimaculatus	58	23	47	23		30
Zaitzevia parvula		12			12	5
DIPTERA	**349**	**200**	**257**	**244**	**211**	**251**
Antocha sp.	12		12		12	7
Atherix pachypus	23	12	35	23	12	21
Brillia sp.					12	2
Ceratopogoninae	35	12		12	23	16
Diamesa sp.	47	47	47	70	35	49
Dicranota sp.	58		12			14
Eukiefferiella sp.	23	12	23		12	14
Heleniella sp.					23	5
Hesperoconopa sp.		12				2
Hexatoma sp.	23					5
Neoplasta sp.		12		58		14
Orthocladius/Cricotopus gr.	116	93	128	81	70	98
Rhabdomastix sp.	12					2
Smittia sp.					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**24**	**12**			**12**	**9**
Enchytraeidae	12	12				5
Nais sp.					12	2
Unid. Immature Tubificidae w/ Capilliform Chaetae	12					2
NEMATODA		**12**				**2**
Unid. Nematoda		12				2
HYDRACARINA	**512**	**128**	**896**	**58**	**70**	**333**
Lebertia sp.	512	128	896	58	70	333

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**					**2**
Sweltsa sp.	12					2
EPHEMEROPTERA	**687**	**791**	**1233**	**1651**	**1082**	**1090**
Baetis tricaudatus	640	709	605	1058	791	761
Cinygmula sp.			23			5
Drunella grandis		12		23		7
Ephemerella infrequens			23			5
Rhithrogena hageni	47	70	582	570	291	312
TRICHOPTERA	**164**	**395**	**547**	**746**	**454**	**460**
Arctopsyche grandis	12			12		5
Brachycentrus americanus	58	116	395	349	279	239
Hydropsyche sp.	70	174	128	326	81	156
Lepidostoma sp. A					12	2
Oligophlebodes sp.			12			2
Rhyacophila brunnea gr.				12		2
Rhyacophila coloradensis gr.	12	105	12	47	70	49
Rhyacophila sibirica gr.	12				12	5
COLEOPTERA	**12**	**12**	**116**		**81**	**44**
Heterlimnius corpulentus		12	35		23	14
Optioservus sp.	12		81		58	30
DIPTERA	**83**	**58**	**140**	**245**	**59**	**116**
Antocha sp.	12	23		105	12	30
Atherix pachypus	23	23	81	58	35	44
Diamesa sp.	12	12				5
Dicranota sp.				12		2
Eukiefferiella sp.				35		7
Neoplasta sp.	12		12	12		7
Orthocladius/Cricotopus gr.				23		5
Pagastia sp.	12					2
Pericoma sp.	12					2
Rhabdomastix sp.			12		12	5
Tvetenia sp.			35			7
ANNELIDA						
OLIGOCHAETA	**105**		**70**	**174**		**70**
Enchytraeidae	105		70	174		70
HYDRACARINA	**35**		**81**	**47**	**70**	**47**
Lebertia sp.	35		81	47	70	47

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**151**	**47**	**70**	**35**	**140**	**88**
Amphinemura sp.			12			2
Capniidae		12	23	23		12
Prostoia besametsa			35			7
Pteronarcella badia	151	35			140	65
Sweltsa sp.				12		2
EPHEMEROPTERA	**303**	**290**	**511**	**256**	**337**	**340**
Baetis tricaudatus	23	23	23		58	25
Drunella grandis	47	35	151	35	35	61
Epeorus longimanus			23			5
Ephemerella infrequens		23				5
Rhithrogena hageni	233	209	314	221	244	244
TRICHOPTERA	**1431**	**744**	**1477**	**559**	**1105**	**1064**
Arctopsyche grandis	35	23	12		35	21
Brachycentrus americanus	989	535	1279	442	593	768
Hydropsyche sp.	337	174	93	105	430	228
Lepidostoma sp. A	35	12	23			14
Oligophlebodes sp.	12		12			5
Rhyacophila coloradensis gr.	23				35	12
Rhyacophila sibirica gr.			58	12	12	16
COLEOPTERA	**23**	**24**	**82**	**12**	**24**	**33**
Heterlimnius corpulentus	23	12	23	12		14
Narpus concolor		12	12		12	7
Optioservus sp.			47		12	12
DIPTERA	**385**	**59**	**2129**	**281**	**117**	**593**
Atherix pachypus	58		23	23	35	28
Brillia sp.	47	23		12		16
Ceratopogoninae	12		47			12
Diamesa sp.	23	12		23	12	14
Dicranota sp.	12		12			5
Eukiefferiella sp.	23		1082	47		230
Hesperoconopa sp.			12			2
Hexatoma sp.		12				2
Micropsectra sp.	12				12	5
Neoplasta sp.			128	47	23	40
Orthocladius/Cricotopus gr.	116		686	105	23	186
Pagastia sp.			58			12
Polypedilum sp.				12		2
Rhabdomastix sp.	12		23		12	9
Tvetenia sp.		12				2
Unid. Orthocladiinae	70		58	12		28

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
4/3/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA		**24**	**58**			**16**
Eiseniella tetraedra			12			2
Enchytraeidae		12	23			7
Nais bretscheri			23			5
Unid. Immature Tubificidae w/ Capilliform Chaetae		12				2
HYDRACARINA	**70**	**116**	**512**	**12**	**12**	**144**
Lebertia sp.	70	116	488	12	12	140
Sperchon/Sperchonopsis			12			2
Testudacarus/Torrenticola			12			2
MOLLUSCA						
GASTROPODA	**12**					**2**
Fossaria sp.	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**59**	**12**	**12**	**24**	**12**	**23**
Capniidae		12				2
Paraleuctra sp.				12		2
Pteronarcella badia	47		12	12		14
Sweltsa sp.	12				12	5
EPHEMEROPTERA			**24**	**23**	**12**	**11**
Baetis tricaudatus			12	23	12	9
Rhithrogena hageni			12			2
TRICHOPTERA	**23**	**35**	**12**	**47**		**23**
Brachycentrus americanus	23	35	12	35		21
Hydropsyche sp.				12		2
COLEOPTERA	**35**		**35**		**70**	**27**
Narpus concolor	23		35		58	23
Optioservus sp.					12	2
Zaitzevia parvula	12					2
DIPTERA	**58**	**12**	**107**	**59**	**47**	**55**
Atherix pachypus	23		12			7
Eukiefferiella sp.		12	12	12		7
Hexatoma sp.	12		12		23	9
Limnophyes sp.			12			2
Neoplasta sp.			12	35	12	12
Orthocladius/Cricotopus gr.			35	12		9
Rhabdomastix sp.	23					5
Tipula sp.					12	2
Unid. Orthocladiinae			12			2
HYDRACARINA		**12**	**12**		**12**	**7**
Lebertia sp.		12	12		12	7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**163**	**186**	**140**	**23**	**245**	**151**
Isoperla sp.	47	47	70		140	61
Pteronarcella badia	93	116	70	23	105	81
Sweltsa sp.	23	23				9
EPHEMEROPTERA	**722**	**628**	**721**	**418**	**315**	**561**
Baetis bicaudatus	47					9
Baetis tricaudatus	675	628	675	395	291	533
Drunella grandis			23	23	12	12
Epeorus longimanus			23			5
Paraleptophlebia sp.					12	2
TRICHOPTERA	**1582**	**1675**	**1047**	**581**	**652**	**1109**
Brachycentrus americanus	302	70	140	93	93	140
Culoptila sp.		23				5
Hydropsyche sp.	395	233	535	93	221	295
Hydroptila sp.	93	47	23	23		37
Hydroptilidae	70	116		93	35	63
Lepidostoma sp. A	326	70	163	116	198	175
Ochrotrichia sp.	326	1116	163	163	105	375
Oecetis avara/disjuncta	70					14
Oligophlebodes sp.			23			5
ODONATA	**465**	**1070**	**233**	**93**	**93**	**391**
Argia sp.	465	1070	233	93	93	391
COLEOPTERA	**2116**	**1628**	**2047**	**2256**	**1628**	**1935**
Heterlimnius corpulentus		23			35	12
Narpus concolor	23	47			81	30
Optioservus quadrimaculatus	1163	628	814	1186	896	937
Postelichus sp.	23					5
Zaitzevia parvula	907	930	1233	1070	616	951
DIPTERA	**4792**	**6187**	**2954**	**3117**	**2791**	**3970**
Atherix pachypus	256	93	302	70	58	156
Ceratopogoninae	233	372		186	105	179
Dicranota sp.	23					5
Ephydridae	23					5
Eukiefferiella sp.	558	756	616		430	472
Euparyphus sp.		23				5
Neoplasta sp.	47		70		58	35
Orthocladius/Cricotopus gr.	3512	4536	1745	2570	2035	2880
Pagastia sp.	140		174	198	93	121
Polypedilum sp.				93		19
Tipula sp.		23	47		12	16
Unid. Orthocladiinae		384				77
TURBELLARIA	**23**	**70**	**93**	**186**	**93**	**93**
Dugesia sp.	23	70	93	186	93	93

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**23**					**5**
Eiseniella tetraedra	23					5
NEMATODA	**23**				**35**	**12**
Unid. Nematoda	23				35	12
CRUSTACEA						
AMPHIPODA		**23**				**5**
Hyalella azteca cx.		23				5
HYDRACARINA	**23**	**93**		**23**		**28**
Lebertia sp.	23	23		23		14
Sperchon/Sperchonopsis		70				14
MOLLUSCA						
GASTROPODA	**23**	**23**				**10**
Fossaria sp.		23				5
Physa/Physella	23					5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**47**	**70**	**70**	**233**		**84**
Isoperla sp.	47	70	70	233		84
EPHEMEROPTERA	**279**	**93**	**163**	**280**	**23**	**167**
Acentrella insignificans			23			5
Baetis tricaudatus	279	70	140	233		144
Drunella grandis				47		9
Rhithrogena hageni		23			23	9
TRICHOPTERA	**653**	**280**	**582**	**838**	**257**	**522**
Brachycentrus americanus	47	93	70	93	47	70
Culoptila sp.	140	93	47	372	47	140
Hydropsyche sp.	326	47	349	326	140	238
Hydroptilidae			23		23	9
Lepidostoma sp. A	47					9
Ochrotrichia sp.			23			5
Oecetis avara/disjuncta	93	47	70	47		51
COLEOPTERA	**1070**	**209**	**1023**	**419**	**442**	**633**
Optioservus sp.	1070	186	1023	419	442	628
Zaitzevia parvula		23				5
DIPTERA	**10328**	**6024**	**8375**	**10422**	**6581**	**8345**
Caloparyphus sp.			70	93	23	37
Diamesa sp.			535	675		242
Dicranota sp.	93	70	47	93	23	65
Eukiefferiella sp.	337	802	535	1012	651	667
Hexatoma sp.			23			5
Neoplasta sp.	47	47	70	47	23	47
Orthocladius (Euortho.) sp.		186	1035	675	221	423
Orthocladius/Cricotopus gr.	9118	4361	5757	7734	4989	6392
Pagastia sp.	686	186	256		651	356
Polypedilum sp.		186				37
Tipula sp.	47		47	93		37
Unid. Orthocladiinae		186				37
TURBELLARIA	**2140**	**1303**	**2024**	**1721**	**1814**	**1800**
Dugesia sp.	2140	1303	2024	1721	1814	1800
ANNELIDA						
OLIGOCHAETA	**140**	**139**	**210**	**187**	**69**	**148**
Eiseniella tetraedra		23		93		23
Limnodrilus sp.	47		47		23	23
Nais sp.			23		23	9
Unid. Immature Tubificidae w/ Capilliform Chaetae		23	70	47		28
Unid. Immature Tubificidae w/o Capilliform Chaetae	93	93	70	47	23	65

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
4/4/2001

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA	**47**	**93**		**93**		**47**
Unid. Nematoda	47	93		93		47
HYDRACARINA	**140**	**23**		**233**		**79**
Atractides sp.		23		47		14
Sperchon/Sperchonopsis	140			186		65
MOLLUSCA						
GASTROPODA	**47**	**47**	**23**		**70**	**37**
Physa/Physella		47	23		70	28
Radix sp.	47					9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
09/17/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**246**	**1046**	**769**	**652**	**326**	**607**
Capniidae			12			2
Cultus sp.	47	233	105	349	70	161
Hesperoperla pacifies	12	93	35	23	93	51
Isoperla sp.					23	5
Megarcys signata		23	58	70	23	35
Paraleuctra sp.	12	70				16
Pteronarcella badia			12			2
Sweltsa sp.	35	209	47	47	47	77
Taenionema sp.	12	23				7
Zapada cinctipes	128	395	500	163	70	251
EPHEMEROPTERA	**1780**	**3490**	**2652**	**4745**	**4093**	**3353**
Baetis bicaudatus	372	1303	593	1116	1140	905
Baetis tricaudatus	791	675	896	1931	1465	1152
Drunella doddsi	151	442	163	512	465	347
Epeorus deceptivus		23	23	23		14
Epeorus longimanus		23	12			7
Ephemerella infrequens	454	930	965	1163	1023	907
Paraleptophlebia sp.		47				9
Rhithrogena hageni	12	47				12
TRICHOPTERA	**1198**	**1511**	**3001**	**1953**	**1604**	**1853**
Arctopsyche grandis	47	116	81			49
Brachycentrus americanus	58	47	93		23	44
Dolophilodes sp.	23		47	23		19
Glossosoma sp,	105		140	23	209	95
Lepidostoma sp.	302	558	1558	209	233	572
Micrasema bactro	35	302	93	93	23	109
Oligophlebodes minutus	488	116	523	744	442	463
Rhyacophila brunnea gr.		23	12	47		16
Rhyacophila sibirica gr.	105	279	349	744	488	393
Rhyacophila sp.	35	70	105	70	186	93
COLEOPTERA	**326**	**280**	**431**	**1117**	**512**	**534**
Heterlimnius corpulentus	326	186	407	1047	512	496
Narpus concolor		47	12			12
Optioservus sp.		47	12	70		26
DIPTERA	**559**	**907**	**955**	**1256**	**1302**	**996**
Antocha sp.					47	9
Ceratopogoninae	58	70	35	47	70	56
Cricotopus (N.) nostcocicola					23	5
Diamesa sp.					23	5
Dicranota sp.			12	23	23	12
Empididae	12					2
Eukiefferiella sp.		23			23	9
Hexatoma sp.				47		9
Micropsectra sp.	163	279	349	244	256	258
Neoplasta sp.	12					2
Orthocladius/Cricotopus sp.					58	12
Pagastia sp.	12		12	23	58	21

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
09/17/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA cont.						
Parametriocnemus sp.			12	58	23	19
Pericoma sp.	279	349	454	768	628	496
Simulium sp.	23	186	81	23	47	72
Unid. Orthocladiinae				23	23	9
TURBELLARIA	**58**	**93**	**35**	**47**	**70**	**61**
Polycelis coronata	58	93	35	47	70	61
ANNELIDA						
OLIGOCHAETA	**12**					**2**
Enchytraeidae	12					2
NEMATODA	**12**	**47**			**23**	**16**
Unid. Nematoda	12	47			23	16
HYDRACARINA	**59**	**46**	**70**	**46**	**47**	**54**
Lebertia sp.	47	23	70	23	47	42
Sperchon/Sperchonopsis	12			23		7
Testudacarus/Torrenticola		23				5
MOLLUSCA						
PELECYPODA			**12**			**2**
Sphaerium sp.			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
09/17/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**105**	**199**	**47**	**222**	**117**	**138**
Capniidae		12		35	12	12
Hesperoperla pacifica		35	12	23	12	16
Isoperla sp.	12					2
Sweltsa sp.	23	47		105	23	40
Taenionema sp.	12		12	12	23	12
Zapada cinctipes	58	105	23	47	47	56
EPHEMEROPTERA	**325**	**605**	**418**	**548**	**304**	**440**
Ameletus sp.		12				2
Baetis bicaudatus		93	116	163	35	81
Baetis tricaudatus	174	279	174	198	174	200
Cinygmula sp.	35	93	35	70	12	49
Drunella doddsi	23	35	23	35	12	26
Epeorus longimanus		12			12	5
Ephemerella infrequens	81	58	58	47	12	51
Rhithrogena hageni	12	23	12	35	47	26
TRICHOPTERA	**82**	**186**	**82**	**280**	**164**	**157**
Arctopsyche grandis				12		2
Brachycentrus americanus		12				2
Glossosoma sp.	12	12			12	7
Hydropsychidae	12	23	12			9
Micrasema bactro		23				5
Neothremma sp.		12	12	23	12	12
Oligophlebodes minutus				12		2
Rhyacophila brunnea gr.	35	23		12	12	16
Rhyacophila sibirica gr.	23	81	58	221	128	102
COLEOPTERA	**70**	**116**	**70**	**233**		**98**
Heterlimnius corpulentus	70	116	70	233		98
DIPTERA	**59**	**315**	**70**	**141**	**279**	**171**
Ceratopogoninae		23			23	9
Corynoneura sp.		12				2
Dicranota sp.	12	23		12		9
Gonomyia sp.				12		2
Micropsectra sp.		151	23	58	151	77
Neoplasta sp.	12	35				9
Oreogeton sp.				23	12	7
Orthocladius (Euorthocladius) sp.					23	5
Orthocladius/Cricotopus sp.	12	12				5
Pagastia sp.				12		2
Parametriocnemus sp.					23	5
Pericoma sp.				12		2
Rheocricotopus sp.		12				2
Simulium sp.			12		12	5
Tvetenia sp.	23	47	35	12	35	30
TURBELLARIA				**12**		**2**
Polycelis coronata				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
09/17/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**70**	**477**	**186**	**721**	**407**	**372**
Eclipidrilus sp.			12	128	244	77
Eiseniella tetraedra	23	140		93		51
Enchytraeidae	35	314	116	442	70	195
Lumbriculidae			23		70	19
Nais sp.	12	23	35	58	23	30
NEMATODA					**23**	**5**
Unid. Nematoda					23	5
HYDRACARINA					**12**	**2**
Lebertia sp.					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
09/20/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**722**	**953**	**651**	**954**	**489**	**755**
Cultus sp.	93		35	47	70	49
Doddsia occidentalis	23	58	35	70	47	47
Isoperla sp.				23		5
Megarcys signata	12	23	23	23		16
Sweltsa sp.	105	477	291	430	70	275
Taenionema sp.	291	314	209	198	279	258
Zapada cinctipes	163	81	58	140	23	93
Zapada oregonensis gr.	35			23		12
EPHEMEROPTERA	**1128**	**1046**	**560**	**1140**	**1745**	**1123**
Ameletus sp.					23	5
Baetis bicaudatus			12			2
Baetis tricaudatus	221	116	70	81	128	123
Cinygmula sp.	302	244	47	267	291	230
Drunella coloradensis	12		12	12	23	12
Drunella doddsi	326	326	128	419	1163	472
Ephemerellidae	23	23			105	30
Rhithrogena robusta	244	337	291	361	12	249
TRICHOPTERA	**1036**	**1069**	**535**	**1523**	**1035**	**1040**
Brachycentrus americanus	12		12			5
Glossosoma sp.	151	186	81	174	23	123
Hydropsyche sp.	12	23	12		12	12
Oligophlebodes minutus	547	151	209	151	698	351
Rhyacophila brunnea gr.		23		23	23	14
Rhyacophila coloradensis gr.	70	128	58	163	70	98
Rhyacophila sibirica gr.	244	558	163	1012	209	437
LEPIDOPTERA	**12**					**2**
Petrophila sp.	12					2
COLEOPTERA.	**198**	**326**	**93**	**140**	**174**	**186**
Heterlimnius corpulentus	198	326	93	140	174	186
DIPTERA	**478**	**373**	**433**	**816**	**687**	**556**
Brillia sp.			12	12	12	7
Ceratopogoninae	93	70	151	233	12	112
Diamesa sp.		23	12	35		14
Dicranota sp.	12	23				7
Eukiefferiella sp.	58	35	35	58	47	47
Heleniella sp.			12	58	12	16
Hexatoma sp.					12	2
Micropsectra sp.	58	58	70	93	93	74
Neoplasta sp.	12					2
Oreogeton sp.			35	23		12
Orthocladius/Cricotopus sp.	70		12	35	209	65
Pagastia sp.	81	70	47	233	267	140
Parachaetocladius sp.	23			12		7
Pericoma sp.	23	12	47		23	21
Simulium sp.	12	12				5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
09/20/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA cont.						
Stempellinella sp.	12					2
Tipula sp.	12	12		12		7
Tvetenia sp.	12	58				14
Unid. Orthocladiinae				12		2
TURBELLARIA	**12**		**23**			**7**
Polycelis coronata	12		23			7
ANNELIDA						
OLIGOCHAETA	**24**			**12**	**23**	**12**
Eiseniella tetraedra					23	5
Enchytraeidae	12			12		5
Nais sp.	12					2
HYDRACARINA	**82**	**116**	**47**	**257**	**70**	**113**
Hygrobates sp.				47		9
Lebertia sp.	70	81	35	163	47	79
Sperchon/Sperchonopsis	12	23	12	47	23	23
Testudacarus/Torrenticola		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
09/20/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**280**	**268**	**605**	**581**	**420**	**431**
Cultus sp.	47	81		70		40
Megarcys signata				23	47	14
Sweltsa sp.	140	47	535	488	326	307
Taenionema sp.	93	128	70		47	68
Zapada oregonensis gr.		12				2
EPHEMEROPTERA	**3653**	**2536**	**2535**	**3001**	**4839**	**3312**
Ameletus sp.		12				2
Baetis bicaudatus	1768	1361	1419	1628	3210	1877
Baetis tricaudatus	1675	1082	1023	1210	1535	1305
Cinygmula sp.				47		9
Drunella doddsi	47					9
Drunella grandis	140	81	70	116	47	91
Ephemerellidae			23			5
Rhithrogena robusta	23				47	14
TRICHOPTERA	**1349**	**966**	**1652**	**1395**	**1769**	**1422**
Arctopsyche grandis	279	291	93	372	651	337
Brachycentrus americanus	326	58	163	395	326	254
Oligophlebodes minutus	558	326	954	326	605	554
Rhyacophila brunnea gr.		12			47	12
Rhyacophila sibirica gr.	186	279	442	279	140	265
Rhyacophila sp.				23		
COLEOPTERA	**395**	**279**	**1047**	**535**	**1721**	**796**
Heterlimnius corpulentus	372	279	1047	535	1721	791
Postelichus sp.	23					5
DIPTERA	**1789**	**805**	**1466**	**1699**	**4186**	**1988**
Antocha sp.	23	58	23	23		25
Ceratopogoninae		12	163	23	47	49
Conchapelopia/Thienemannimyia gr. sp.					81	16
Dicranota sp.		47		47		19
Eukiefferiella sp.	23	47	35	47	174	65
Heleniella sp.				47		9
Hexatoma sp.	23		163	47	140	75
Micropsectra sp.	23	12	35	81		30
Neoplasta sp.	47	12	23			16
Oreogeton sp.	23			23		9
Orthocladius/Cricotopus sp.	151	12	70			47
Pagastia sp.	151	140		81	81	91
Parachaetocladius sp.			35			7
Pericoma sp.	1186	337	814	1233	3256	1365
Polypedilum cf. fallax gr. sp.		35				7
Simulium sp.	116	93	47		326	116
Tvetenia sp.			58	47	81	37
Unid. Orthocladiinae	23					5
TURBELLARIA		**35**			**47**	**16**
Polycelis coronata		35			47	16

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
09/20/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**1175**	**81**	**581**	**349**	**279**	**493**
Lumbriculidae			23			5
Nais sp.	1175	81	558	349	279	488
NEMATODA	**47**					**9**
Unid. Nematoda	47					9
HYDRACARINA	**419**	**12**	**2721**	**1256**	**93**	**901**
Lebertia sp.	419	12	2721	1210	93	891
Protzia sp.				23		5
Sperchon/Sperchonopsis				23		5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
09/19/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**35**	**24**	**12**	**12**		**16**
Capniidae	12					2
Cultus sp.		12				2
Pteronarcella badia		12		12		5
Sweltsa sp.	23		12			7
EPHEMEROPTERA	**477**	**885**	**733**	**1257**	**896**	**850**
Baetis bicaudatus	23	198	174	233	70	140
Baetis tricaudatus	128	198	291	512	465	319
Drunella doddsi	12		23			7
Drunella grandis	209	442	140	372	361	305
Ephemerella/Serratella				12		2
Rhithrogena hageni	105	47	105	128		77
TRICHOPTERA	**59**	**360**	**141**	**651**	**128**	**268**
Arctopsyche grandis			12	105		23
Brachycentrus americanus	47	337	70	488	81	205
Glossosoma sp.			12		12	5
Rhyacophila coloradensis gr.					35	7
Rhyacophila rotunda gr.		23	35	58		23
Rhyacophila sibirica gr.	12		12			5
COLEOPTERA	**70**	**12**	**12**	**23**	**117**	**46**
Heterlimnius corpulentus	70	12	12	23	93	42
Narpus concolor					12	2
Optioservus sp.					12	2
DIPTERA	**83**	**95**	**117**	**153**	**280**	**144**
Antocha sp.		12	12			5
Atherix pachypus	12		23	12	35	16
Diamesa sp.	23	12		35	12	16
Dicranota sp.	12			47	12	14
Eukiefferiella sp.		47	70	35	93	49
Hexatoma sp.					12	2
Micropsectra sp.	12		12			5
Neoplasta sp.					23	5
Orthocladius (Euorthocladius) sp.					47	9
Orthocladius/Cricotopus sp.	12	12				5
Pagastia sp.		12		12	23	9
Pericoma sp.				12		2
Psilometriocnemus sp.	12				23	7
TURBELLARIA				**12**	**23**	**7**
Polycelis coronata				12	23	7
ANNELIDA						
OLIGOCHAETA				**12**	**12**	**4**
Lumbriculidae					12	2
Nais bretscheri				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
09/19/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA			**12**			**2**
Unid. Nematoda			12			2
HYDRACARINA	**221**	**23**	**81**	**81**	**23**	**86**
Lebertia sp.	221	23	81	81	23	86

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
09/18/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**24**		**24**	**12**	**12**
Capniidae		12		12		5
Pteronarcella badia		12		12	12	7
EPHEMEROPTERA	**884**	**559**	**722**	**1512**	**1711**	**1078**
Baetis bicaudatus		12	12		47	14
Baetis tricaudatus	779	465	593	1163	1175	835
Drunella doddsi		12	12			5
Drunella grandis	35	23	47	47	58	42
Epeorus deceptivus	12				12	5
Rhithrogena hageni	58	47	58	302	419	177
TRICHOPTERA	**82**	**128**	**46**	**140**	**187**	**117**
Arctopsyche grandis	35		23	23	47	26
Brachycentrus americanus	47	128	23	105	128	86
Rhyacophila coloradensis gr.				12	12	5
COLEOPTERA	**82**	**24**	**23**	**47**	**47**	**45**
Heterlimnius corpulentus	47	12		47	47	31
Optioservus sp.	35	12	23			14
DIPTERA	**375**	**106**	**442**	**512**	**584**	**404**
Antocha sp.	35		23			12
Atherix pachypus	12	23	47	35	12	26
Ceratopogoninae					12	2
Dicranota sp.	12		23	35		14
Eukiefferiella sp.	58	12	58	233	12	75
Hexatoma sp.	12					2
Neoplasta sp.	12	12		12		7
Orthocladius (Euorthocladius) sp.	47			58		21
Orthocladius/Cricotopus sp.	47			23	35	21
Pagastia sp.	35	12	58	58	12	35
Psilometriocnemus sp.	105	47	221	23	477	175
Simulium sp.			12	35	12	12
Tipula sp.					12	2
ANNELIDA						
OLIGOCHAETA	**407**	**116**	**35**	**35**	**58**	**131**
Enchytraeidae	23		35	35		19
Nais sp.	384	116			58	112
NEMATODA	**12**		**35**			**9**
Unid. Nematoda	12		35			9
HYDRACARINA		**140**		**12**	**267**	**84**
Lebertia sp.		140		12	267	84

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
09/18/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**116**				**23**	**28**
Pteronarcella badia	116				23	28
EPHEMEROPTERA	**826**	**594**	**825**	**709**	**1640**	**919**
Baetis tricaudatus	419	407	407	430	907	514
Drunella grandis	326	140	302	116	640	305
Rhithrogena hageni	81	47	116	163	93	100
TRICHOPTERA	**1082**	**1082**	**2488**	**128**	**6536**	**2263**
Arctopsyche grandis	35	12	23	12	12	19
Brachycentrus americanus	1000	1058	2442	81	6501	2216
Glossosomatidae	12					2
Hydropsyche sp.		12		12		5
Rhyacophila coloradensis gr.	35		23	23	23	21
COLEOPTERA	**70**	**12**	**47**	**23**	**128**	**56**
Heterlimnius corpulentus	70		35	23	70	40
Optioservus sp.		12	12		58	16
DIPTERA	**106**	**187**	**257**	**35**	**198**	**154**
Antocha sp.				12		2
Atherix pachypus	35	12	47		35	26
Diamesa sp.		12	12		23	9
Dicranota sp,	12					2
Eukiefferiella sp.		23	12		12	9
Orthocladius (Euorthocladius) sp.		12				2
Orthocladius/Cricotopus sp.	23	12				7
Pagastia sp.					70	14
Pericoma sp.	12					2
Psilometriocnemus sp.	12	116	186	23	58	79
Simulium sp.	12					2
ANNELIDA						
OLIGOCHAETA		**23**	**23**	**23**	**186**	**51**
Enchytraeidae		23	23	23	186	51
NEMATODA		**12**			**23**	**7**
Unid. Nematoda		12			23	7
HYDRACARINA		**105**	**279**			**77**
Lebertia sp.		105	279			77

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
09/20/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**12**	**12**		**6**
Doddsia occidentalis			12			2
Pteronarcella badia				12		2
Sweltsa sp.	12					2
EPHEMEROPTERA	**477**	**314**	**371**	**687**	**906**	**551**
Baetis bicaudatus	12	23	58	47		28
Baetis tricaudatus	407	198	209	570	802	437
Drunella doddsi		12				2
Drunella grandis	23	58	23	47	23	35
Rhithrogena hageni	35	23	81	23	81	49
TRICHOPTERA	**233**	**233**	**198**	**210**	**337**	**243**
Arctopsyche grandis	35	151	81	105	116	98
Brachycentrus americanus	116	47	93	35	198	98
Hydropsyche sp.	12		12	23	23	14
Rhyacophila sp.	70	35	12	47		33
COLEOPTERA	**12**	**23**		**12**	**23**	**14**
Heterlimnius corpulentus		23		12	23	12
Narpus concolor	12					2
DIPTERA	**302**	**256**	**129**	**349**	**187**	**244**
Antocha sp.			12			2
Atherix pachypus	12				12	5
Dicranota sp.		12				2
Eukiefferiella sp.	58	58	12		12	28
Neoplasta sp.	23		12			7
Orthocladius (Euorthocladius) sp.	23	23		35		16
Pagastia sp.	23	47	35	23	23	30
Psilometriocnemus sp.	163	116	58	291	140	154
ANNELIDA						
OLIGOCHAETA	**23**	**12**				**7**
Enchytraeidae	23					5
Unid. Immature Tubificidae w/ Capilliform Chaetae		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
09/20/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**35**				**23**	**12**
Pteronarcella badia	35				23	12
EPHEMEROPTERA	**1070**	**361**	**477**	**441**	**860**	**642**
Baetis bicaudatus	209	93	198	116	209	165
Baetis tricaudatus	372	105	151	244	337	242
Drunella coloradensis					12	2
Drunella grandis	47	93			58	40
Rhithrogena hageni	442	70	128	81	244	193
TRICHOPTERA	**209**	**245**	**93**	**117**	**325**	**198**
Arctopsyche grandis	81	35	12	35	58	44
Brachycentrus americanus	93	163	58	47	209	114
Hydropsyche sp.	35	47	23	35	58	40
COLEOPTERA	**58**	**12**		**23**	**23**	**23**
Heterlimnius corpulentus	58	12		23	23	23
DIPTERA	**186**	**244**	**315**	**129**	**1279**	**431**
Atherix pachypus	12	12	12		58	19
Ceratopogoninae				12		2
Dicranota sp.	23	12		12	23	14
Empididae		23				5
Eukiefferiella sp.	23					5
Neoplasta sp.		81	12		47	28
Orthocladius/Cricotopus sp.			12			2
Psilometriocnemus sp.	128	116	279	105	1151	356
ANNELIDA						
OLIGOCHAETA	**23**	**12**	**12**		**35**	**16**
Enchytraeidae	23	12	12		35	16
HYDRACARINA	**47**	**35**			**81**	**33**
Lebertia sp.	47	35			81	33

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
09/19/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**23**		**58**	**12**	**19**
Pteronarcella badia		23		58	12	19
EPHEMEROPTERA	**175**	**279**	**383**	**233**	**477**	**309**
Baetis bicaudatus	47	163	151	47	209	123
Baetis tricaudatus	93	81	128	93	70	93
Drunella grandis			23			5
Rhithrogena hageni	35	35	81	93	198	88
TRICHOPTERA	**477**	**1442**	**2198**	**291**	**489**	**979**
Arctopsyche grandis	47	186	174	47	163	123
Brachycentrus americanus	349	1163	861	163	221	551
Hydropsyche sp.	81	93	1163	81	105	305
COLEOPTERA		**59**	**93**		**12**	**33**
Narpus concolor		47	81		12	28
Optioservus sp.		12	12			5
DIPTERA	**35**	**221**	**558**	**35**	**128**	**196**
Hexatoma sp.		12				2
Orthocladius/Cricotopus sp.	35	23	23		12	19
Protanyderus margarita			23			5
Psilometriocnemus sp.		186	512	35	116	170
ANNELIDA						
OLIGOCHAETA	**12**					**2**
Enchytraeidae	12					2
HYDRACARINA	**81**	**81**	**116**	**23**	**35**	**67**
Lebertia sp.	81	81	116	23	35	67

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
09/19/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**12**	**23**	**93**		**26**
Pteronarcella badia		12	23	70		21
Sweltsa sp.				23		5
EPHEMEROPTERA	**616**	**1802**	**1698**	**2675**	**1315**	**1621**
Baetis tricaudatus	558	1558	1570	2303	1210	1440
Drunella grandis				23	47	14
Rhithrogena hageni	58	244	128	349	58	167
TRICHOPTERA	**1070**	**558**	**1535**	**1861**	**1756**	**1356**
Brachycentrus americanus	430	244	709	698	1221	660
Culoptila sp.		23	35			12
Hydropsyche sp.	640	291	756	1163	523	675
Lepidostoma sp.			23			5
Oligophlebodes minutus					12	2
Rhyacophila coloradensis gr.			12			2
COLEOPTERA	**384**	**302**	**268**	**1372**	**1338**	**733**
Heterlimnius corpulentus	12					2
Narpus concolor			12	116	12	28
Optioservus quadrimaculatus	349	302	244	1070	1268	647
Zaitzevia parvula	23		12	186	58	56
DIPTERA	**245**	**223**	**198**	**745**	**687**	**418**
Atherix pachypus	70	35	35	465	337	188
Ceratopogoninae		23				5
Empididae				23		5
Eukiefferiella sp.	105	12	93	140	186	107
Hexatoma sp.					12	2
Micropsectra sp.	12		12			5
Neoplasta sp.					12	2
Orthocladius/Cricotopus sp.	23	93	23	70	140	70
Pagastia sp.	12		12			5
Parametriocnemus sp.		12				2
Pericoma sp.		12				2
Psilometriocnemus sp.		12				2
Rheotanytarsus sp.		12				2
Simulium sp.	23	12	23	47		21
ANNELIDA						
OLIGOCHAETA	**12**				**47**	**11**
Enchytraeidae	12				35	9
Lumbriculidae					12	2
NEMATODA	**12**					**2**
Unid. Nematoda	12					2
HYDRACARINA		**23**	**12**			**7**
Sperchon/Sperchonopsis		23	12			7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
09/19/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**					**2**
Isoperla sp.	12					2
EPHEMEROPTERA	**2233**	**2884**	**2256**	**4839**	**2280**	**2899**
Baetis tricaudatus	2198	2838	2233	4792	2268	2866
Drunella grandis		23		47		14
Rhithrogena hageni	35	23	23		12	19
TRICHOPTERA	**1512**	**2628**	**3187**	**5769**	**1535**	**2927**
Brachycentrus americanus	582	1535	1396	3629	651	1559
Culoptila sp.	58		23	47	23	30
Hydropsyche sp.	849	1070	1768	2000	837	1305
Lepidostoma sp.				93		19
Rhyacophila coloradensis gr.	23	23			12	12
Rhyacophila sp.					12	2
COLEOPTERA	**128**	**163**	**349**	**280**	**128**	**210**
Narpus concolor			23	47		14
Optioservus sp.	128	163	326	233	128	196
DIPTERA	**1129**	**2325**	**2627**	**3073**	**1105**	**2051**
Atherix pachypus	12			47		12
Caloparyphus sp.		23	23			9
Dicranota sp.	12			93		21
Empididae				47		9
Eukiefferiella sp.	174	209	279	977	244	377
Euparyphus sp.				93		19
Hexatoma sp.				47		9
Micropsectra sp.					12	2
Microtendipes sp.			23			5
Neoplasta sp.					12	2
Orthocladius/Cricotopus sp.	35					7
Pagastia sp.			23			5
Parametriocnemus sp.	12					2
Polypedilum cf. fallax gr. sp.				47		9
Rheotanytarsus sp.				47		9
Simulium sp.	884	2093	2279	1675	837	1554
TURBELLARIA			**558**	**1163**	**407**	**426**
Dugesia sp.			558	1070	407	407
Polycelis coronata				93		19
ANNELIDA						
OLIGOCHAETA		**23**	**23**	**94**		**28**
Limnodrilus sp.		23				5
Pristina sp.				47		9
Unid. Immature Tubificidae w/ Capilliform Chaetae			23			5
Unid. Immature Tubificidae w/o						

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
09/19/01

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
Capilliform Chaetae				47		9
NEMATODA					**23**	**5**
Unid. Nematoda					23	5
HYDRACARINA	**12**				**12**	**5**
Lebertia sp.	12				12	5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
4/3/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**70**	**71**	**58**	**304**	**58**	**111**
Cultus sp.				35		7
Hesperoperla pacifica	12	12		12		7
Isoperla sp.	12	12				5
Megarcys signata				12		2
Paraleuctra sp.		12	23	35		14
Prostoia besametsa	23	23	35	163	58	60
Sweltsa sp.	23			47		14
Zapada cinctipes		12				2
EPHEMEROPTERA	**395**	**605**	**384**	**1360**	**557**	**661**
Baetis bicaudatus	12	12				5
Baetis tricaudatus	174	163	140	465	302	249
Cinygmula sp.	23	58	23	128	23	51
Drunella doddsi				35		7
Epeorus longimanus	105	291	116	267	116	179
Ephemerella infrequens	81	58	105	465	116	165
Fallceon quilleri		23				5
TRICHOPTERA	**363**	**385**	**465**	**1503**	**757**	**693**
Arctopsyche grandis				12		2
Brachycentrus americanus	23	35	23	12	12	21
Glossosoma sp.				12		2
Glossosomatidae	35			12	58	21
Hydropsyche sp.	12		23	47	12	19
Lepidostoma sp. A	35	128	174	198	81	123
Lepidostoma sp. B	12	12		35		12
Micrasema sp.	12		58	12	35	23
Oligophlebodes minutus	140	105	140	942	419	349
Rhyacophila brunnea gr.	12	23	12	35	47	26
Rhyacophila coloradensis gr.		12				2
Rhyacophila sibirica gr.	70	70	23	186	93	88
Rhyacophila sp.	12		12			5
COLEOPTERA	**35**	**24**	**116**	**384**	**198**	**151**
Heterlimnius corpulentus	35	12	116	384	198	149
Optioservus quadrimaculatus		12				2
DIPTERA	**94**	**199**	**118**	**1142**	**373**	**383**
Antocha sp.	12		23	70	93	40
Ceratopogoninae		23		70	23	23
Cricotopus (N.) nostocicola	12	12			70	19
Diamesa sp.			12		23	7
Dicranota sp.	12	12	12			7
Eukiefferiella sp.		12	12		12	7
Heleniella sp.				12		2
Micropsectra sp.		47		221	12	56
Neoplasta sp.		12			23	7
Oreogeton sp.				12		2
Orthocladius/Cricotopus sp.				12		2
Pericoma sp.	58	81	12	698	93	188

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
4/3/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Prosimulium sp.			47	35	12	19
Protanyderus sp.				12		2
Rheotanytarsus sp.					12	2
TURBELLARIA	**12**	**35**	**35**	**151**		**47**
Polycelis coronata	12	35	35	151		47
ANNELIDA						
OLIGOCHAETA			**23**		**23**	**9**
Nais sp.			23		23	9
HYDRACARINA		**23**	**24**			**9**
Lebertia sp.		23	12			7
Sperchon/Sperchonopsis			12			2
MOLLUSCA						
PELECYPODA				**35**		**7**
Sphaerium sp.				35		7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
4/2/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**81**	**71**	**187**	**71**	**105**	**101**
Amphinemura sp.	35	35			35	21
Capniidae					12	2
Cultus sp.		12				2
Doddsia occidentalis			12			2
Isoperla sp.			12			2
Paraleuctra sp.			23	12		7
Prostoia besametsa	23	12	12	47	23	23
Sweltsa sp.	23		116		12	30
Taenionema sp.		12	12	12		7
Zapada cinctipes					23	5
EPHEMEROPTERA	**1222**	**385**	**1047**	**1256**	**746**	**932**
Baetis bicaudatus	221	12	58	256	47	119
Baetis tricaudatus	361	105	291	477	140	275
Cinygmula sp.	47		58		105	42
Drunella doddsi		12	12		35	12
Epeorus longimanus	535	244	442	488	384	419
Ephemerella infrequens			12	23	12	9
Rhithrogena hageni	58	12	151	12	23	51
Rhithrogena robusta			23			5
TRICHOPTERA	**59**	**70**	**141**	**117**	**58**	**88**
Arctopsyche grandis	12		35			9
Brachycentrus americanus	12		35	58	12	23
Micrasema sp.		23		12		7
Rhyacophila brunnea gr.	12	47	12	12	23	21
Rhyacophila coloradensis gr.			12	12		5
Rhyacophila sibirica gr.	23		47	23	23	23
COLEOPTERA		**12**	**12**	**35**	**81**	**28**
Heterlimnius corpulentus		12	12	35	81	28
DIPTERA	**151**	**454**	**257**	**397**	**151**	**283**
Antocha sp.		70		12		16
Brillia sp.			12	12		5
Dicranota sp.					23	5
Micropsectra sp.	23					5
Neoplasta sp.		93	12	47		30
Pericoma sp.					23	5
Prosimulium sp.	128	291	233	326	105	217
ANNELIDA						
OLIGOCHAETA			**58**		**35**	**19**
Eiseniella tetraedra			35		35	14
Enchytraeidae			23			5
HYDRACARINA				**12**		**2**
Lebertia sp.				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
4/1/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**907**	**755**	**3605**	**3176**	**5174**	**2723**
Amphinemura sp.				70		14
Cultus sp.	12	23	93	93	116	67
Doddsia occidentalis	105	174	442	756	930	481
Megarcys signata	23					5
Paraleuctra sp.	105	93	58	93	174	105
Prostoia besametsa	442	372	1721	1582	1570	1137
Sweltsa sp.	174	81	640	349	1977	644
Taenionema sp.			151	105	174	86
Zapada cinctipes	23		326	58	233	128
Zapada oregonensis gr.	23	12	174	70		56
EPHEMEROPTERA	**872**	**686**	**2803**	**2640**	**6046**	**2610**
Baetis bicaudatus	209	116	465	535	116	288
Cinygmula sp.	465	419	1803	1349	4419	1691
Drunella doddsi	105	58	291	593	523	314
Epeorus longimanus	12	35	209	12	58	65
Ephemerella infrequens	23	23		23	465	107
Rhithrogena robusta	35	35	35	128	465	140
Tricorythodes sp.	23					5
TRICHOPTERA	**489**	**453**	**1070**	**1083**	**2442**	**1107**
Brachycentrus americanus			35	23		12
Hydropsyche sp.	12					2
Neothremma sp.				12	58	14
Oligophlebodes minutus	35	23	233	279	233	161
Rhyacophila alberta gr.		35	93	47	291	93
Rhyacophila brunnea gr.	23	12	58	12	116	44
Rhyacophila sibirica gr.	163	116	442	582	814	423
Rhyacophila sp.	256	267	209	128	930	358
COLEOPTERA	**58**	**23**	**35**	**82**		**40**
Heterlimnius corpulentus	35	23	35	70		33
Optioservus sp.	23			12		7
DIPTERA	**456**	**223**	**768**	**862**	**2731**	**1007**
Brillia sp.	23		81	23	81	42
Ceratopogoninae	12					2
Chaetocladius sp.	12					2
Dicranota sp.	12					2
Eukiefferiella sp.	12	12				5
Heleniella sp.	23			23	81	25
Macropelopia sp.		12				2
Micropsectra sp.	116	128	140	244	1745	475
Neoplasta sp.	23					5
Oreogeton sp.	12		35	47	58	30
Orthocladius (Euorthocladius) sp.	12	12	35			12
Orthocladius/Cricotopus sp.		12	35	47	81	35
Unid. Orthocladiinae	12					2
Pagastia sp.	105	35	372	454	314	256
Parachaetocladius sp.	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
4/1/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Pericoma sp.	12			12	116	28
Prosimulium sp.	23					5
Rheocricotopus sp.		12	35		81	26
Tipula sp.				12	174	37
Tvetenia sp.	35		35			14
ANNELIDA						
OLIGOCHAETA	**59**	**12**			**58**	**26**
Enchytraeidae	12	12				5
Nais sp.	47				58	21
HYDRACARINA	**12**	**12**	**116**	**47**		**37**
Lebertia sp.	12	12	116	47		37

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/1/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**1675**	**360**	**1942**	**3373**	**1488**	**1768**
Amphinemura sp.				93		19
Cultus sp.		23		35	23	16
Doddsia occidentalis				35		7
Megarcys signata		23				5
Paraleuctra sp.	35	23	35		23	23
Prostoia besametsa	791	105	1593	3024	1233	1349
Pteronarcella badia		23				5
Sweltsa sp.	849	116	233	93	186	295
Zapada oregonensis gr.		47	81	93	23	49
EPHEMEROPTERA	**2326**	**1605**	**3094**	**4641**	**2234**	**2779**
Baetis bicaudatus	151	140	384	814	70	312
Baetis tricaudatus	326	372	1047	3059	721	1105
Cinygmula sp.	35	140	35		47	51
Drunella doddsi	465	465	116	35	186	253
Drunella grandis	35		81		70	37
Epeorus longimanus	1279	488	1396	733	1140	1007
Fallceon quilleri			35			7
Rhithrogena robusta	35					7
TRICHOPTERA	**1128**	**1722**	**2244**	**1383**	**1069**	**1509**
Arctopsyche grandis	116	233	663	558	302	374
Brachycentrus americanus	349	907	1314	500	465	707
Hydropsyche sp.				35		7
Lepidostoma sp. A	35	23				12
Lepidostoma sp. B			81			16
Oligophlebodes minutus	500	349	151	81	186	253
Rhyacophila brunnea gr.	93	47		151	70	72
Rhyacophila coloradensis gr.		23		58	23	21
Rhyacophila sibirica gr.	35	140	35		23	47
COLEOPTERA	**233**	**605**	**267**	**384**	**302**	**359**
Heterlimnius corpulentus	233	605	267	349	209	333
Optioservus divergens				35	93	26
DIPTERA	**1581**	**1536**	**2059**	**209**	**884**	**1253**
Antocha sp.	58	47		58		33
Dicranota sp.	93				23	23
Heleniella sp.			47			9
Hexatoma sp.		23	35			12
Micropsectra sp.	291	523	744		70	326
Orthocladius (Symposiocladius) sp.		47				9
Orthocladius/Cricotopus sp.	35	47	81	23		37
Pagastia sp.	81	128	279	35		105
Pericoma sp.	907	651	779	58	791	637
Rheocricotopus sp.	81	23	47			30
Rheotanytarsus sp.	35					7
Simulium sp.		47		35		16
Tvetenia sp.			47			9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/1/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA	**35**	**70**	**198**	**58**	**93**	**91**
Polycelis coronata	35	70	198	58	93	91
ANNELIDA						
OLIGOCHAETA	**1257**	**70**	**151**	**0**	**47**	**305**
Nais sp.	1210	47	151		47	291
Unid. Immature Tubificidae w/o Capilliform Chaetae	47	23				14
HYDRACARINA	**558**	**814**	**1279**	**151**	**722**	**705**
Lebertia sp.	523	768	1198	151	675	663
Sperchon/Sperchonopsis		23	81		47	30
Testudacarus/Torrenticola	35	23				12

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
4/2/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**58**	**12**		**24**	**18**
Capniidae		12				2
Doddsia occidentalis					12	2
Prostoia besametsa		23	12			7
Sweltsa sp.		23			12	7
EPHEMEROPTERA	**198**	**361**	**197**	**12**	**186**	**191**
Baetis tricaudatus		23			12	7
Drunella grandis	105	198	174	12	23	102
Epeorus longimanus	23					5
Rhithrogena hageni	70	140	23		151	77
TRICHOPTERA	**233**	**187**	**373**	**59**	**256**	**221**
Arctopsyche grandis	23	12	47	12		19
Brachycentrus americanus	105	70	256	35	163	126
Hydropsyche sp.					12	2
Lepidostoma sp. A		12				2
Oligophlebodes minutus					23	5
Rhyacophila coloradensis gr.	58	35	58			30
Rhyacophila sibirica gr.	47	58	12	12	58	37
COLEOPTERA	**93**	**81**	**24**	**23**	**47**	**54**
Heterlimnius corpulentus	70	81	12	23	12	40
Optioservus sp.	23		12		35	14
DIPTERA	**186**	**163**	**233**	**24**	**82**	**137**
Antocha sp.	23	23	116	12		35
Atherix pachypus	116	35	70		47	54
Dicranota sp.		23				5
Heleniella sp.		12				2
Hexatoma sp.		23			12	7
Micropsectra sp.		12				2
Neoplasta sp.			35	12	23	14
Orthocladius (Euorthocladius) sp.	12					2
Orthocladius (Symposiocladius) sp.	12					2
Orthocladius/Cricotopus sp.	23	35				12
Pagastia sp.			12			2
ANNELIDA						
OLIGOCHAETA	**12**				**46**	**12**
Lumbriculidae					23	5
Rhynchelmis sp.					23	5
Unid. Immature Tubificidae w/o Capilliform Chaetae	12					2
HYDRACARINA	**12**	**12**	**12**		**35**	**14**
Lebertia sp.	12	12			35	12
Sperchon/Sperchonopsis			12			2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
4/2/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**47**	**12**	**12**		**14**
Capniidae		12				2
Prostoia besametsa		23		12		7
Sweltsa sp.		12	12			5
EPHEMEROPTERA	**163**	**117**	**47**	**163**	**70**	**113**
Baetis tricaudatus	70	47	12	35	35	40
Drunella grandis	58	35	35	105	35	54
Rhithrogena hageni	35	35		23		19
TRICHOPTERA	**198**	**291**	**116**	**163**	**46**	**163**
Arctopsyche grandis				12		2
Brachycentrus americanus	198	291	116	116	23	149
Rhyacophila coloradensis gr.				35	23	12
COLEOPTERA	**23**	**47**	**12**	**23**		**21**
Optioservus sp.	23	47	12	23		21
DIPTERA	**1186**	**1258**	**721**	**1129**	**583**	**977**
Antocha sp.	23	35	58	23	70	42
Atherix pachypus		12	12	35		12
Ceratopogoninae				12		2
Diamesa sp.	174	256	23	58	140	130
Dicranota sp.	58	47	47	12		33
Diplocladius sp.			23			5
Eukiefferiella sp.			23			5
Gonomyia sp.	12	12				5
Neoplasta sp.	35	47	12	35	12	28
Orthocladius (Euorthocladius) sp.				35		7
Orthocladius/Cricotopus sp.	802	721	500	919	361	661
Pagastia sp.	70	35				21
Parametriocnemus sp.		35				7
Rhabdomastix sp.	12	23				7
Rheocricotopus sp.		35	23			12
ANNELIDA						
OLIGOCHAETA	**82**	**175**	**663**	**430**	**70**	**284**
Enchytraeidae	47	35	209	81	35	81
Nais sp.	35	140	454	349	35	203
HYDRACARINA	**140**	**709**	**244**	**151**	**58**	**260**
Lebertia sp.	140	709	244	151	58	260

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
4/2/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**12**		**12**	**12**		**7**
Prostoia besametsa	12		12	12		7
EPHEMEROPTERA	**47**	**58**	**24**	**71**	**59**	**51**
Baetis tricaudatus	47	58	12	47	12	35
Drunella grandis			12	12	47	14
Rhithrogena hageni				12		2
TRICHOPTERA	**94**	**302**	**1722**	**767**	**2675**	**1112**
Arctopsyche grandis	12					2
Brachycentrus americanus	47	267	1675	744	2675	1082
Rhyacophila coloradensis gr.	23	35	47	23		26
Rhyacophila sibirica gr.	12					2
COLEOPTERA			**12**	**23**	**35**	**14**
Heterlimnius corpulentus			12	23	35	14
DIPTERA	**12**	**361**	**59**	**338**	**1605**	**473**
Antocha sp.		12		23		7
Atherix pachypus			12	23		7
Dicranota sp.				12	23	7
Eukiefferiella sp.		70			372	88
Hexatoma sp.				12		2
Orthocladius/Cricotopus sp.	12	267	47	256	1163	349
Unid. Orthocladiinae					47	9
Pagastia sp.				12		2
Rheocricotopus sp.		12				2
ANNELIDA						
OLIGOCHAETA			**128**	**81**		**42**
Enchytraeidae			128	81		42
HYDRACARINA	**221**	**454**	**174**	**989**	**477**	**463**
Lebertia sp.	221	454	174	989	465	461
Protzia sp.					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
4/2/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**12**		**35**		**9**
Prostoia besametsa		12		23		7
Pteronarcella badia				12		2
EPHEMEROPTERA	**175**	**256**	**396**	**744**	**303**	**375**
Baetis bicaudatus	23	23	12	35	47	28
Baetis tricaudatus	140	233	372	419	221	277
Drunella grandis	12		12	81		21
Rhithrogena hageni				209	35	49
TRICHOPTERA	**140**	**244**	**267**	**512**	**245**	**282**
Arctopsyche grandis				35	12	9
Brachycentrus americanus	128	186	209	384	163	214
Hydropsyche sp.	12	23	58	93	47	47
Rhyacophila coloradensis gr.		35			23	12
COLEOPTERA		**12**	**12**	**12**	**12**	**10**
Heterlimnius corpulentus		12	12	12	12	10
DIPTERA	**35**	**71**	**81**	**105**	**24**	**63**
Antocha sp.		12	23			7
Atherix pachypus		12			12	5
Diamesa sp.					12	2
Dicranota sp.			12			2
Gonomyia sp.				70		14
Orthocladius (Euorthocladius) sp.			23			5
Orthocladius/Cricotopus sp.	23	47	23	35		26
Rheocricotopus sp.	12					2
HYDRACARINA	**58**	**128**	**93**	**12**		**58**
Lebertia sp.	58	128	93	12		58

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
4/3/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA		**24**	**12**	**35**		**13**
Prostoia besametsa		12				2
Pteronarcella badia			12	35		9
Sweltsa sp.		12				2
EPHEMEROPTERA		**59**	**128**	**489**	**151**	**165**
Baetis tricaudatus			12	12	12	7
Cinygmula sp.		12				2
Drunella grandis		12			23	7
Rhithrogena hageni		35	116	477	116	149
TRICHOPTERA	**47**	**221**	**337**	**233**	**105**	**188**
Arctopsyche grandis			23	35	12	14
Brachycentrus americanus	47	209	267	151	93	153
Hydropsyche sp.		12	47	47		21
COLEOPTERA		**81**	**12**	**58**	**12**	**33**
Narpus concolor				23		5
Optioservus sp.		81	12	35	12	28
DIPTERA	**70**	**47**	**93**	**176**	**58**	**88**
Atherix pachypus		47	70	128		49
Diamesa sp.			23			5
Dicranota sp.	12					2
Heleniella sp.	12					2
Hexatoma sp.				12		2
Neoplasta sp.				12	23	7
Orthocladius (Euorthocladius) sp.	23					5
Orthocladius/Cricotopus sp.	23				35	12
Rheocricotopus sp.				12		2
Tvetenia sp.				12		2
ANNELIDA						
OLIGOCHAETA					**24**	**4**
Haplotaxis sp.					12	2
Pristina sp.					12	2
HYDRACARINA		**12**			**47**	**12**
Lebertia sp.		12			47	12

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
4/3/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA					**23**	**5**
Pteronarcella badia					23	5
EPHEMEROPTERA	**12**			**12**	**23**	**10**
Baetis tricaudatus	12			12		5
Rhithrogena hageni					23	5
TRICHOPTERA	**59**	**12**	**58**		**151**	**56**
Arctopsyche grandis	12	12			35	12
Brachycentrus americanus	47		58		116	44
COLEOPTERA					**47**	**9**
Heterlimnius corpulentus					12	2
Narpus concolor					35	7
DIPTERA			**23**	**23**	**46**	**19**
Hexatoma sp.					23	5
Orthocladius/Cricotopus sp.			23	23	23	14
HYDRACARINA			**23**	**12**		**7**
Lebertia sp.			23	12		7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Highway 522
4/4/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**47**	**71**	**59**	**24**	**70**	**54**
Amphinemura sp.		12				2
Capniidae		23				5
Prostoia besametsa	23	12				7
Pteronarcella badia	12	12	12	12	47	19
Sweltsa sp.	12	12	47	12	23	21
EPHEMEROPTERA	**1221**	**1838**	**815**	**2630**	**2419**	**1785**
Baetis bicaudatus				47		9
Baetis tricaudatus	1058	1489	675	2059	2093	1475
Drunella grandis	35	47	47	70	70	54
Rhithrogena hageni	128	302	93	454	256	247
TRICHOPTERA	**1907**	**2326**	**2292**	**3187**	**5884**	**3119**
Arctopsyche grandis				35		7
Brachycentrus americanus	1570	1884	1896	2559	4582	2498
Hydropsyche sp.	209	256	291	477	1023	451
Lepidostoma sp. A	128	186	105	116	209	149
Lepidostoma sp. B					23	5
Rhyacophila coloradensis gr.					47	9
COLEOPTERA	**186**	**279**	**233**	**256**	**745**	**340**
Narpus concolor	12		12		116	28
Optioservus divergens		12	35	12	47	21
Optioservus quadrimaculatus	174	267	186	244	582	291
DIPTERA	**258**	**246**	**82**	**153**	**187**	**184**
Atherix pachypus		12	12	12	47	17
Ceratopogoninae	12	47		12	23	19
Diamesa sp.		12		35		9
Dicranota sp.				12		2
Eukiefferiella sp.	23	23	23	35	47	30
Hesperoconopa sp.	12					2
Hexatoma sp.	47	35	12		23	23
Neoplasta sp.	12	12				5
Orthocladius/Cricotopus sp.	140	58	35	47	47	65
Pagastia sp.	12	47				12
TURBELLARIA		**12**			**23**	**7**
Dugesia sp.		12			23	7
CRUSTACEA						
AMPHIPODA					**23**	**5**
Hyalella azteca					23	5
HYDRACARINA	**58**	**47**	**23**	**35**		**33**
Lebertia sp.	58	47	23	35		33

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
4/4/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**93**	**58**	**23**	**35**	**116**	**65**
Isoperla sp.	81	58		35	116	58
Pteronarcella badia	12					2
Taenionema sp.			23			5
EPHEMEROPTERA	**1721**	**1570**	**2221**	**977**	**1232**	**1544**
Baetis bicaudatus	174	244	488	128		207
Baetis tricaudatus	1419	1105	1489	814	1128	1191
Drunella grandis			35			7
Epeorus longimanus		12			23	7
Paraleptophlebia sp.		35	35	23	23	23
Rhithrogena hageni	128	174	174	12	58	109
TRICHOPTERA	**1012**	**930**	**1965**	**1896**	**3175**	**1796**
Brachycentrus americanus	372	209	1023	1093	1419	823
Culoptila sp.					23	5
Hydropsyche sp.	616	709	907	779	1710	944
Lepidostoma sp. A	12	12	35	12	23	19
Rhyacophila coloradensis gr.	12			12		5
COLEOPTERA	**477**	**500**	**1198**	**570**	**1163**	**782**
Heterlimnius corpulentus					58	12
Narpus concolor				12		2
Optioservus quadrimaculatus	477	477	1163	535	1082	747
Zaitzevia parvula		23	35	23	23	21
DIPTERA	**268**	**267**	**1675**	**652**	**883**	**750**
Antocha sp.					23	5
Atherix pachypus	140	186	465	337	465	319
Ceratopogoninae	12	23	151			37
Dicranota sp.				12		2
Eukiefferiella sp.	35		105	186	291	123
Hexatoma sp.		23				5
Neoplasta sp.		23				5
Orthocladius (Euorthocladius) sp.			35			7
Orthocladius/Cricotopus sp.	81	12	814	105	81	219
Pagastia sp.			70	12	23	21
Tvetenia sp.			35			7
TURBELLARIA		**12**				**2**
Dugesia sp.		12				2
NEMATODA			**23**			**5**
Unid. Nematoda			23			5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
4/3/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**233**	**372**	**349**	**326**	**558**	**368**
Isoperla sp.	233	372	349	326	558	368
EPHEMEROPTERA	**2628**	**2652**	**2861**	**2908**	**2745**	**2759**
Baetis bicaudatus	291	140	47	140	35	131
Baetis tricaudatus	2268	2419	2628	2605	2675	2519
Drunella grandis			23	23	35	16
Epeorus longimanus	23					5
Paraleptophlebia sp.	23	70	70	47		42
Rhithrogena hageni	23	23	93	93		46
TRICHOPTERA	**3012**	**3722**	**2768**	**3000**	**3710**	**3243**
Brachycentrus americanus	1198	1838	1558	1814	1547	1591
Hydropsyche sp.	1768	1698	1163	1093	2070	1558
Lepidostoma sp. A	23	93		23	35	35
Oecetis avara/disjuncta				23		5
Rhyacophila coloradensis gr.	23	93	47	47	58	54
COLEOPTERA	**233**	**418**	**419**	**512**	**791**	**474**
Heterlimnius corpulentus					35	7
Narpus concolor		116				23
Optioservus quadrimaculatus	233	302	419	512	756	444
DIPTERA	**139**	**418**	**303**	**302**	**767**	**387**
Ceratopogoninae				23		5
Dicranota sp.	35	163	163	140	174	135
Eukiefferiella sp.	23	81	23	23	35	37
Hexatoma sp.					35	7
Orthocladius/Cricotopus sp.			47	70	407	105
Pagastia sp.		58		23	58	28
Pericoma sp.				23		5
Tipula sp.	81	116	70		58	65
TURBELLARIA	**430**	**116**	**698**	**419**	**523**	**437**
Dugesia sp.	430	116	698	419	523	437
ANNELIDA						
OLIGOCHAETA			**23**			**5**
Lumbriculidae			23			5
HYDRACARINA	**23**					**5**
Lebertia sp.	23					5
MOLLUSCA						
GASTROPODA		**23**	**46**		**35**	**21**
Fossaria sp.			23			5
Physa/Physella		23	23		35	16

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
9/24/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**140**	**164**	**442**	**431**	**268**	**288**
Capniidae	12					2
Hesperoperla pacifica	23	12	23	58	58	35
Isoperla sp.				35	35	14
Paraleuctra sp.				12	12	5
Sweltsa sp.	93	140	395	291	128	209
Zapada cinctipes			12	35	35	16
Zapada oregonensis gr.	12	12	12			7
EPHEMEROPTERA	**593**	**407**	**1094**	**1617**	**1477**	**1037**
Ameletus sp.	12					2
Baetis bicaudatus	35	35	140	70	256	107
Baetis tricaudatus	267	209	628	558	733	479
Cinygmula sp.	81		12	116	58	53
Drunella doddsi	12		23			7
Epeorus longimanus	23	12	23	12		14
Ephemerella infrequens	23	23	58	23		25
Rhithrogena hageni	12		47	233	151	89
Rhithrogena robusta	128	128	163	605	279	261
TRICHOPTERA	**304**	**107**	**268**	**547**	**407**	**326**
Arctopsyche grandis	12	12	12		23	12
Brachycentrus americanus		12				2
Glossosoma sp.					12	2
Hydropsyche sp.	12					2
Hydroptilidae	58					12
Lepidostoma sp.	35	12	12	35		19
Micrasema sp.		12	12			5
Neothremma sp.	12		35	12	35	19
Ochrotrichia sp.	116					23
Rhyacophila brunnea gr.	35	47	23	70	70	49
Rhyacophila sibirica gr.	12	12	174	430	267	179
Rhyacophila sp.	12					2
COLEOPTERA	**186**	**245**	**535**	**454**	**198**	**323**
Heterlimnius corpulentus	151	233	535	454	198	314
Optioservus sp.	35	12				9
DIPTERA	**560**	**187**	**199**	**257**	**502**	**339**
Brillia sp.		12		12		5
Ceratopogoninae	12	23	70		12	23
Dicranota sp.	12			12	70	19
Eukiefferiella sp.	23					5
Hexatoma sp.				12		2
Micropsectra sp.	116	35	58	128	105	88
Oreogeton sp.	12					2
Orthocladius/Cricotopus sp.	12					2
Pagastia sp.	23	23		23	47	23
Parametriocnemus sp.	12					2
Pericoma sp.		12	47	35	128	44
Rhabdomastix sp.		12	12			5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
9/24/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Rheocricotopus sp.				12		2
Simulium sp.	326	70	12	23	128	112
Stempellina sp.	12				12	5
TURBELLARIA					**12**	**2**
Polycelis coronata					12	2
ANNELIDA						
OLIGOCHAETA	**70**	**571**	**686**	**1361**	**1326**	**803**
Eiseniella tetraedra		128	349	1070	326	375
Enchytraeidae	23	140	151	128	535	195
Lumbriculidae		291	174	70		107
Nais sp.	47	12	12	93	395	112
Rhynchelmis sp.					70	14
HYDRACARINA	**24**		**12**	**12**	**12**	**11**
Lebertia sp.	12			12	12	7
Protzia sp.			12			2
Sperchon/Sperchonopsis	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/23/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**641**	**2629**	**2232**	**756**	**2395**	**1731**
Amphinemura sp.		70	58		81	42
Capniidae		116	35		35	37
Cultus sp.	116	209	174	151	151	160
Doddsia occidentalis	12	326	151		35	105
Isoperla sp.	12	163	58	116	116	93
Megarcys signata	12				81	19
Paraleuctra sp.				35	35	14
Sweltsa sp.	70	582	209	35	616	302
Taenionema sp.			93			19
Zapada cinctipes	279	814	1221	384	1012	742
Zapada oregonensis gr.	140	349	233	35	233	198
EPHEMEROPTERA	**361**	**1652**	**1442**	**1384**	**1930**	**1354**
Ameletus sp.					35	7
Baetis bicaudatus	35	47	93	35	267	95
Baetis tricaudatus	128	209	523	151	779	358
Cinygmula sp.		140		35		35
Drunella doddsi	116	791	675	349	698	526
Epeorus deceptivus	12		35			9
Ephemerella infrequens	70	442	116	814	151	319
Rhithrogena hageni		23				5
TRICHOPTERA	**384**	**1629**	**1849**	**1349**	**2001**	**1442**
Arctopsyche grandis		47			35	16
Brachycentrus americanus	23	47	174		35	56
Glossosoma sp.			35		151	37
Lepidostoma sp.	12					2
Oligophlebodes minutus	58	116		151	198	105
Rhyacophila alberta gr.	105	465	640	430	814	491
Rhyacophila brunnea gr.		93	326		35	91
Rhyacophila coloradensis gr.					35	7
Rhyacophila sibirica gr.	163	768	523	733	663	570
Rhyacophila sp.	23	93	151	35	35	67
COLEOPTERA	**70**	**116**	**93**	**233**	**35**	**109**
Heterlimnius corpulentus	23	93	93	233	35	95
Optioservus divergens	47	23				14
DIPTERA	**803**	**3513**	**4116**	**9176**	**5304**	**4583**
Ceratopogoninae	12	93	35	151	116	81
Dicranota sp.	23	23			35	16
Eukiefferiella sp.		105	116	302		105
Micropsectra sp.	361	1582	1558	1198	3594	1659
Oreogeton sp.	23					5
Orthocladius/Cricotopus sp.	116	314	361	2396	512	740
Pagastia sp.	244	1163	1430	5094	849	1756
Pericoma sp.	12	233	500	35		156
Polypedilum sp.					163	33
Tipula sp.	12				35	9
Tvetenia sp.			116			23

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/23/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
TURBELLARIA			**151**			**30**
Polycelis coronata			151			30
ANNELIDA						
OLIGOCHAETA	**12**	**23**	**93**	**35**	**116**	**56**
Eiseniella tetraedra	12	23	35			14
Enchytraeidae					35	7
Nais sp.			58	35	81	35
HYDRACARINA	**47**	**279**		**81**		**81**
Hydrovolzia sp.		23				5
Lebertia sp.	23	93		81		39
Protzia sp.	12	23				7
Sperchon/Sperchonopsis	12	140				30

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
9/24/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
PLECOPTERA	**116**	**58**	**233**	**116**	**81**	**121**
Isoperla sp.	116	58	233	116	81	121
EPHEMEROPTERA	**465**	**116**	**233**	**314**	**35**	**232**
Acentrella insignificans				81		16
Baetis tricaudatus	349	116	233	233	35	193
Drunella doddsi	116					23
TRICHOPTERA	**15933**	**10176**	**27448**	**13769**	**14851**	**16435**
Brachycentrus americanus	1047	465	1861	349	314	807
Culoptila sp.	349	698	465	233	81	365
Hydropsyche sp.	1977	465	2559	1244	1198	1489
Hydroptila sp.	698	116	349	267	151	316
Hydroptilidae	5350	4129	13607	6478	9071	7727
Leucotrichia sp.	116	58		81		51
Ochrotrichia sp.	6280	4187	8025	5036	3722	5450
Oecetis avara/disjuncta	116	58	582	81	314	230
LEPIDOPTERA	**349**		**233**	**81**	**116**	**156**
Petrophila sp.	349		233	81	116	156
COLEOPTERA	**6280**	**4884**	**12561**	**4838**	**3164**	**6345**
Microcylloepus sp.					35	7
Narpus concolor	116		116		35	53
Optioservus divergens	3024	2442	6048	2012	1547	3015
Optioservus quadrimaculatus	3140	2442	6397	2826	1547	3270
DIPTERA	**5699**	**2847**	**4536**	**3524**	**2012**	**3724**
Caloparyphus sp.	349	174	233	81		167
Cardiocladius sp.	163					33
Cryptochironomus sp.					58	12
Dicranota sp.			116	35	35	37
Eukiefferiella sp.	3582	1384	1756	2245	1326	2059
Microtendipes sp.	349	337	814	454	58	402
Orthocladius/Cricotopus sp.		337		116	140	119
Parametriocnemus sp.		81	140		58	56
Polypedilum sp.	1023	337	1361	558	337	723
Rheotanytarsus sp.		81				16
Simulium sp.	233	116		35		77
Tipula sp.			116			23
TURBELLARIA	**8955**	**4129**	**6280**	**4733**	**3105**	**5440**
Girardia sp.	8955	4129	6280	4733	3105	5440

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
9/24/2002

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**116**	**174**		**243**	**233**	**153**
Limnodrilus sp.					35	7
Nais sp.					35	7
Pristina sp.		58		81		28
Unid. Immature Tubificidae w/ Capilliform Chaetae	116			81	128	65
Unid. Immature Tubificidae w/o Capilliform Chaetae		116		81	35	46
NEMATODA		**116**				**23**
Unid. Nematoda		116				23
CRUSTACEA						
AMPHIPODA		**23**				**5**
Hyalella azteca		23				5
HYDRACARINA	**116**	**465**	**698**	**151**	**116**	**310**
Hygrobates sp.		349	582	151	81	233
Sperchon/Sperchonopsis	116	116	116		35	77

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
3/18/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**802**	**2118**	**1977**	**1627**	**2233**	**1753**
Baetis bicaudatus	395	535	326	465	407	426
Baetis tricaudatus		326	302	395	326	270
Drunella doddsi	35	70		35	58	40
Epeorus longimanus	93	93	93	23	81	77
Ephemerella infrequens	23	256	116	23	140	112
Heptageniidae		582	442	430	733	437
Rhithrogena hageni	256	256	698	256	488	391
PLECOPTERA	**373**	**1162**	**373**	**466**	**674**	**609**
Amphinemura sp.	221	837	140	221	256	335
Hesperoperla pacifica	12	70		70		30
Isoperla sp.	23		47	35		21
Leuctridae		23		23	23	14
Sweltsa sp.	105	209	186	105	372	195
Taenionema sp.		23		12	23	12
Zapada oregonensis gr.	12					2
COLEOPTERA	**267**	**837**	**512**	**163**	**849**	**526**
Heterlimnius corpulentus	267	837	512	163	849	526
TRICHOPTERA	**152**	**348**	**279**	**211**	**383**	**274**
Arctopsyche grandis		23	23	35		16
Brachycentrus americanus	12	23				7
Glossosoma sp.					23	5
Hydropsyche sp.		23		12		7
Lepidostoma sp. A		70	163		23	51
Micrasema bactro		23		12		7
Neothremma sp.	23		23	12	23	16
Oligophlebodes minutus	12	23		23	23	16
Rhyacophila brunnea gr.		140	23	70	93	65
Rhyacophila sibirica gr.	105	23	47	47	198	84
DIPTERA	**304**	**604**	**534**	**420**	**488**	**469**
Brillia sp.	58	23			35	23
Ceratopogoninae	105	23	116		35	56
Chaetocladius sp.	12		23			7
Dicranota sp.	23	116			35	35
Eukiefferiella sp.			23		23	9
Heleniella sp.				12		2
Hexatoma sp.	12				23	7
Micropsectra sp.		349	186	151	163	170
Oreogeton sp.			23			5
Orthocladius/Cricotopus sp.			47	128	23	40
Unid. Orthocladiinae		47	47	47		28
Pagastia sp.	23	23	23	58	105	46
Pericoma sp.	12				23	7
Prosimulium sp.	35			12		9
Rheocricotopus sp.	12		23			7
Simulium sp.	12					2
Stempellina sp.		23				5
Stempellinella			23		23	9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
3/18/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
Tvetenia sp.				12		2
HYDRACARINA		**23**	**46**			**14**
Lebertia sp.		23	23			9
Protzia sp.			23			5
NEMATODA			**23**			**5**
Unid. Nematoda			23			5
ANNELIDA						
OLIGOCHAETA	**1292**	**1257**	**3128**	**477**	**1687**	**1568**
Eiseniella tetraedra	1210	1210	2233	430	1221	1261
Enchytraeidae	70	47	744	47	256	233
Lumbriculidae	12				35	9
Nais sp.			151		140	58
Rhynchelmis sp.					35	7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
3/17/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**733**	**349**	**1420**	**292**	**2047**	**969**
Baetis bicaudatus		93	349		523	193
Baetis tricaudatus		81	349	47	582	212
Cinygmula sp.		93	233	116	407	170
Drunella doddsi	500	58	128	70	233	198
Epeorus longimanus		12		47		12
Ephemerella infrequens	233	12	361	12	302	184
PLECOPTERA	**2164**	**862**	**4594**	**977**	**4710**	**2662**
Amphinemura sp.	465	419	1279	337	1221	744
Cultus sp.	349	35	616	35	233	254
Doddsia occidentalis	35	12	116	12	58	47
Megarcys signata	35					7
Paraleuctra sp.	35				58	19
Prostoia besametsa	814	349	1745	430	2733	1214
Sweltsa sp.	198		465	116	291	214
Taenionema sp.					58	12
Zapada cinctipes	233	47	361	47	58	149
Zapada oregonensis gr.			12			2
COLEOPTERA	**116**	**105**	**116**	**128**	**70**	**107**
Heterlimnius corpulentus	116	93	116	128	70	105
Optioservus quadrimaculatus		12				2
TRICHOPTERA	**3001**	**339**	**2105**	**1176**	**3443**	**2013**
Brachycentrus americanus	35	23		35	58	30
Glossosoma sp.		23	116			28
Lepidostoma sp. A		47	349	12		82
Micrasema sp.		12				2
Oligophlebodes minutus	35	47	233			63
Rhyacophila alberta gr.	500	70	465	105	233	275
Rhyacophila brunnea gr.	35		12	12	12	14
Rhyacophila sibirica gr.	2361	105	814	896	2966	1428
Rhyacophila sp.	35	12	116	116	174	91
DIPTERA	**11165**	**2650**	**24320**	**3259**	**31018**	**14483**
Antocha sp.				12		2
Brillia sp.	1384		733			423
Ceratopogoninae	35	58	1047	35	58	247
Conchapelopia/Thienemannimyia gr. s				105		21
Diamesa sp.		81		105	5315	1100
Dicranota sp.				12		2
Eukiefferiella sp.		81			582	133
Hexatoma sp.	35				58	19
Macropelopia sp.	698					140
Micropsectra sp.	4175	81	4431	395	2361	2289
Neoplasta sp.			116	12	58	37
Oreogeton sp.	81					16
Orthocladius/Cricotopus sp.	1047	1105	9618	1314	18294	6276
Unid. Orthocladiinae		81				16
Pagastia sp.	3477	849	7397	1012	1768	2901
Parachaetocladius sp.		174		105		56

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
3/17/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Parorthocladius sp.					582	116
Pericoma sp.	198	12		12	58	56
Prosimulium sp.		35	233	35	1861	433
Rheocricotopus sp.			733			147
Simulium sp.		12				2
Tipula sp.	35		12		23	14
Tvetenia sp.		81		105		37
HYDRACARINA		**12**	**464**	**12**		**97**
Aturus/Kongsbergia			116			23
Hygrobates sp.			116			23
Lebertia sp.		12	116	12		28
Sperchon/Sperchonopsis			116			23
TURBELLARIA		**35**			**58**	**19**
Polycelis coronata		35			58	19
NEMATODA		**12**			**58**	**14**
Unid. Nematoda		12			58	14
ANNELIDA						
OLIGOCHAETA	**82**	**23**	**245**	**105**	**303**	**151**
Eiseniella tetraedra			12	12	12	7
Enchytraeidae	47	23				14
Nais sp.			233	93	291	123
Rhynchelmis sp.	35					7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
: 3/18/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**233**	**512**	**1279**	**477**	**1500**	**800**
Baetis tricaudatus	233	512	1279	477	1500	800
PLECOPTERA	**349**		**174**	**105**	**35**	**133**
Isoperla sp.	233		116	105	35	98
Prostoia besametsa	116					23
Zapada cinctipes			58			12
COLEOPTERA	**13142**	**7164**		**2012**	**5350**	**5534**
Optioservus divergens	13142	4745		2012	5350	5050
Optioservus quadrimaculatus		2419				484
LEPIDOPTERA	**349**	**93**	**291**	**35**	**116**	**177**
Petrophila sp.	349	93	291	35	116	177
TRICHOPTERA	**4069**	**2047**	**1918**	**385**	**1011**	**1885**
Brachycentrus americanus	116	93		70	116	79
Culoptila sp.	116		116	12		49
Helicopsyche borealis			58			12
Hydropsyche sp.	2326	1442	872	233	779	1130
Hydroptilidae			116			23
Micrasema sp.	116					23
Neothremma sp.	116					23
Ochrotrichia sp.					35	7
Oecetis avara/disjuncta	1163	512	756	70	81	516
Rhyacophila sp.	116					23
DIPTERA	**10932**	**5630**	**17096**	**2024**	**1944**	**7525**
Caloparyphus sp.	233	93	349	116	233	205
Ceratopogoninae	116		58		35	42
Diamesa sp.				58		12
Dicranota sp.	233	93	814	198	233	314
Eukiefferiella sp.	3791	3594	7885	640	1000	3382
Hemerodromia sp.					35	7
Hexatoma sp.					35	7
Microtendipes sp.	1035	1256			47	468
Neoplasta sp.		47	58	12		23
Orthocladius/Cricotopus sp.	3791	186	5257	651	47	1986
Unid. Orthocladiinae			1047	58		221
Pagastia sp.	1035	361	1047	291	81	563
Polypedilum cf. fallax gr. sp.	698		523		186	281
Tipula sp.			58		12	14
HYDRACARINA			**174**	**24**		**39**
Hygrobates sp.			174	12		37
Lebertia sp.				12		2
TURBELLARIA	**4071**	**1396**	**3140**	**430**	**384**	**1884**
Girardia sp.	4071	1396	3140	430	384	1884

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
: 3/18/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
NEMATODA		**47**	**407**		**430**	**177**
Unid. Nematoda		47	407		430	177
ANNELIDA						
OLIGOCHAETA	**116**	**47**	**814**	**46**	**82**	**221**
Limnodrilus sp.		47	349			79
Pristina sp.					35	7
Unid. Immature Tubificidae w/ Capilliform Chaetae				23		5
Unid. Immature Tubificidae w/o Capilliform Chaetae	116		465	23	47	130
MOLLUSCA						
GASTROPODA				**35**		**7**
Physa/Physella				35		7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
: 9/29/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**954**	**732**	**815**	**1059**	**595**	**831**
Baetis bicaudatus	628	337	454	558	442	484
Baetis tricaudatus	186	151	151	233	47	154
Cinygmula sp.	23	128	58	58	12	56
Drunella doddsi	93	47	35	105	12	58
Epeorus longimanus	12	23	12	35	23	21
Ephemerella infrequens	12	23	93	47	47	44
Rhithrogena hageni		23	12	23	12	14
PLECOPTERA	**269**	**303**	**280**	**421**	**153**	**283**
Amphinemura sp.	12		23	23	12	14
Capniidae	12		12	12	35	14
Cultus sp.			12			2
Hesperoperla pacifica	70		23	12	12	23
Isoperla sp.	12		12	35	12	14
Leuctridae		12	23	12		9
Megarcys signata				12		2
Sweltsa sp.	93	198	151	128	35	121
Taenionema sp.	12	81	12	47	12	33
Zapada cinctipes	58	12	12	140	35	51
COLEOPTERA	**174**	**442**	**349**	**256**	**105**	**265**
Heterlimnius corpulentus	174	430	349	256	105	263
Optioservus sp.		12				2
TRICHOPTERA	**175**	**221**	**302**	**303**	**140**	**228**
Arctopsyche grandis	23	23		35	12	19
Brachycentrus americanus	23	35	23	116	35	46
Culoptila sp.	12					2
Glossosoma sp.	12					2
Lepidostoma sp. A	12		23			7
Lepidostoma sp. B			23	12		7
Micrasema bactro			12	12		5
Neothremma sp.	47	23	81	58		42
Oligophlebodes minutus			12			2
Rhyacophila brunnea gr.	23	47	35	35	23	33
Rhyacophila sibirica gr.		93	93	35	47	54
Rhyacophila sp.	23				23	9
DIPTERA	**129**	**279**	**408**	**256**	**94**	**231**
Antocha sp.			12			2
Ceratopogoninae		12	23			7
Dicranota sp.	23	12		23	12	14
Eukiefferiella sp.	12	23	23			12
Micropsectra sp.		128	198	81		81
Orthocladius (Euorthocladius) sp.	35	58	70	93		51
Orthocladius/Cricotopus sp.					23	5
Pagastia sp.			23	12		7
Pericoma sp.	12	23	23	12	12	16
Simulium sp.	47	23	12	23	35	28
Stempellina sp.				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
: 9/29/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (Continued)						
Stilocladius sp.			12			2
Thienemanniella sp.			12			2
Tvetenia sp.					12	2
HYDRACARINA	**23**		**35**	**23**	**12**	**19**
Lebertia sp.	23		12	23		12
Protzia sp.			23		12	7
TURBELLARIA	**12**					**2**
Girardia sp.	12					2
NEMATODA				**12**		**2**
Unid. Nematoda				12		2
ANNELIDA						
OLIGOCHAETA	**186**	**256**	**222**	**326**	**82**	**214**
Eiseniella tetraedra	186	186	140	233	70	163
Enchytraeidae			12	58	12	16
Lumbriculidae				12		2
Nais sp.		70	70	23		33

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/29/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1780**	**1048**	**2058**	**2208**	**2116**	**1842**
Ameletus sp.	12	12			23	9
Baetis bicaudatus	291	23	582	1023	430	470
Baetis tricaudatus		47	116	140	35	68
Cinygmula sp.	593	384	756	267	1186	637
Drunella doddsi	477	244	267	488	233	342
Epeorus deceptivus	12			23		7
Ephemerella infrequens	93	291	151		35	114
Heptageniidae		12	93			21
Rhithrogena robusta	302	35	93	267	174	174
PLECOPTERA	**536**	**490**	**1848**	**1850**	**1407**	**1226**
Amphinemura sp.	12					2
Capniidae		12	58	35	93	40
Cultus sp.	128	105	209	256	174	174
Isoperla sp.	128	35			23	37
Megarcys signata		12	35	23	35	21
Paraleuctra sp.	12		58			14
Sweltsa sp.	128	140	116	35	349	154
Taenionema sp.		93	1023	1361	675	630
Zapada cinctipes	128	93	349	140	58	154
COLEOPTERA	**395**	**326**	**209**	**116**	**35**	**216**
Heterlimnius corpulentus	395	326	209	116	35	216
TRICHOPTERA	**1117**	**502**	**1813**	**930**	**1011**	**1075**
Arctopsyche grandis	35					7
Brachycentrus americanus	128		58	23	23	46
Dolophilodes sp.					23	5
Ecclisomyia sp.	12					2
Glossosoma sp.	58	47	233	93		86
Hydropsyche sp.		12				2
Lepidostoma sp. B	58	12			23	19
Micrasema bactro	105	47	93			49
Oligophlebodes minutus	291	198	174	58	151	174
Rhyacophila alberta gr.	151	58	151		93	91
Rhyacophila brunnea gr.		12	116	23	35	37
Rhyacophila coloradensis gr.			58			12
Rhyacophila sibirica gr.	279	116	930	733	640	540
Rhyacophila sp.					23	5
DIPTERA	**1385**	**572**	**1907**	**1407**	**1034**	**1263**
Brillia sp.		12			23	7
Ceratopogoninae	116	12	233	58	58	95
Diamesa sp.	23	12	35	58		26
Dicranota sp.	47				23	14
Erioptera sp.	12	12				5
Eukiefferiella sp.	23	12	81	198	23	67
Heleniella sp.		12			23	7
Hexatoma sp.	12					2
Micropsectra sp.	186	93	442		442	233
Neoplasta sp.	12		58	116		37

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Middle Fork
9/29/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Orthocladius (Euorthocladius) sp.					23	5
Orthocladius/Cricotopus sp.	93	163	209	23		98
Unid. Orthocladiinae	23	12	35	23		19
Pagastia sp.	407	81	337	454	105	277
Parachaetocladius sp.	93			81		35
Parorthocladius sp.	70	35				21
Pericoma sp.	47		93	140	35	63
Simulium sp.	186	81	233	256	198	191
Tanytarsus sp.		12	116		81	42
Tipula sp.	23		35			12
Wiedemannia sp.	12	23				7
HYDRACARINA	**233**	**70**	**442**	**35**	**174**	**191**
Lebertia sp.	163	70	384	35	151	161
Protzia sp.	12		58			14
Sperchon/Sperchonopsis	58				23	16
TURBELLARIA		**58**	**58**		**23**	**28**
Polycelis coronata		58	58		23	28
NEMATODA	**12**			**35**		**9**
Unid. Nematoda	12			35		9
ANNELIDA						
OLIGOCHAETA	**454**	**105**	**698**	**58**	**268**	**318**
Eiseniella tetraedra	105	70	58		140	75
Enchytraeidae	70	12	58	35	23	40
Nais sp.	279	23	582		105	198
Rhynchelmis sp.				23		5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
9/23/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**860**	**1477**	**1396**	**663**	**896**	**1058**
Baetis bicaudatus	174	244	279	128	105	186
Baetis tricaudatus	686	1233	1105	535	791	870
Rhithrogena hageni			12			2
COLEOPTERA	**280**	**396**	**720**	**291**	**407**	**418**
Heterlimnius corpulentus	12					2
Narpus concolor			58		12	14
Optioservus divergens	105	163	267	105	151	158
Optioservus quadrimaculatus	163	233	395	186	244	244
LEPIDOPTERA	**12**	**12**		**12**	**23**	**12**
Petrophila sp.	12	12		12	23	12
TRICHOPTERA	**1140**	**1395**	**1849**	**954**	**919**	**1251**
Brachycentrus americanus	291	465	523	174	233	337
Culoptila sp.	419	302	465	523	384	419
Hydropsyche sp.	372	558	616	140	256	388
Hydroptila sp.	58	58	128	93		67
Lepidostoma sp. A		12	47	12		14
Oecetis avara/disjuncta			35		23	12
Rhyacophila coloradensis gr.			35	12	23	14
DIPTERA	**303**	**802**	**1105**	**454**	**338**	**600**
Atherix pachypus			12			2
Caloparyphus sp.	23		35			12
Ceratopogoninae					12	2
Cricotopus sp.				12		2
Dicranota sp.	12		12			5
Eukiefferiella sp.	58	23	23	58	35	39
Hexatoma sp.			12	12		5
Micropsectra sp.		23				5
Orthocladius/Cricotopus sp.			23			5
Parametriocnemus sp.	12		93			21
Polypedilum sp.	23	23	23			14
Rheotanytarsus sp.	12					2
Simulium sp.	163	733	872	372	291	486
HYDRACARINA	**12**		**47**	**12**		**14**
Hygrobates sp.			35			7
Lebertia sp.	12					2
Sperchon/Sperchonopsis			12	12		5
TURBELLARIA	**233**	**535**	**500**	**279**	**605**	**430**
Girardia sp.	233	535	500	279	605	430
NEMATODA			**47**		**267**	**63**
Unid. Nematoda			47		267	63

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
9/23/2003

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**24**		**35**		**756**	**163**
Limnodrilus sp.					23	5
Pristina sp.	12					2
Unid. Immature Tubificidae w/o Capilliform Chaetae	12		35		733	156
MOLLUSCA						
GASTROPODA				**12**		**2**
Physa/Physella				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**815**	**1140**	**606**	**628**	**616**	**760**
Baetis bicaudatus	81	128	12	35	35	58
Baetis tricaudatus	454	651	302	302	267	395
Cinygmula sp.			12		35	9
Drunella doddsi		12		12		5
Epeorus longimanus	105	128	163	186	244	165
Ephemerella infrequens	163	221	47	81	35	109
Fallceon quilleri	12		70	12		19
PLECOPTERA	**24**	**129**	**35**	**36**	**35**	**51**
Cultus sp.		47		12	23	16
Hesperoperla pacifica		35	35			14
Prostoia besametsa	12	35		12	12	14
Sweltsa sp.				12		2
Zapada cinctipes	12	12				5
COLEOPTERA	**408**	**210**	**186**	**245**	**257**	**260**
Cleptelmis sp.			105	12		23
Heterlimnius corpulentus	361	163		209	198	186
Narpus concolor			23	12	12	9
Optioservus quadrimaculatus	47	47	58	12	47	42
TRICHOPTERA	**2606**	**4398**	**1384**	**1490**	**1628**	**2299**
Arctopsyche grandis		81	23	47	23	35
Brachycentrus americanus	267	582	151	198	163	272
Hydropsyche sp.	1082	2373	291	395	326	893
Lepidostoma sp. A	454	151	198	47	93	189
Limnephilidae		12				2
Micrasema bactro	116	314	81	116	47	135
Oligophlebodes minutus	663	814	535	547	872	686
Philopotamidae		12		12	23	9
Rhyacophila brunnea gr.	12	47	12	81		30
Rhyacophila coloradensis gr.			12			2
Rhyacophila sibirica gr.	12	12	81	35	81	44
Rhyacophila sp.				12		2
DIPTERA	**1698**	**1327**	**674**	**746**	**952**	**1078**
Antocha sp.	302	198	116	116	116	170
Ceratopogoninae	35	81	58	47	12	47
Chelifera sp.	47	35	12		23	23
Dicranota sp.	12	35		12		12
Eukiefferiella sp.		128	23	12	23	37
Euryhapsis sp.	81					16
Micropsectra sp.		23	23	12	81	28
Orthocladius/Cricotopus gr.	768	582	209	372	395	465
Unid. Orthocladiinae	35			35		14
Pagastia sp.			12			2
Parametriocnemus sp.					12	2
Pericoma sp.	151	47	116	93	209	123
Prosimulium sp.		12		35		9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Cabresto Creek
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Psectrocladius sp.	81	35	23	12		30
Rheocricotopus sp.	35					7
Rheotanytarsus sp.	151	151	70		81	91
Thienemanniella sp.			12			2
HYDRACARINA	**93**	**12**	**12**		**47**	**33**
Lebertia sp.	81		12		35	26
Protzia sp.	12					2
Sperchon/Sperchonopsis		12			12	5
TURBELLARIA		**35**	**70**			**21**
Polycelis coronata		35	70			21
NEMATODA					**12**	**2**
Unid. Nematoda					12	2
ANNELIDA						
OLIGOCHAETA	**12**	**70**	**59**			**27**
Eiseniella tetraedra			12			2
Enchytraeidae	12	58	47			23
Nais sp.		12				2
MOLLUSCA						
PELECYPODA			**12**		**47**	**12**
Sphaerium sp.			12		47	12

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**3222**	**2931**	**944**	**2977**	**3187**	**2653**
Ameletus sp.			12			2
Baetis bicaudatus	81	116	23		163	77
Baetis tricaudatus	430	616	233	1256	768	661
Cinygmula sp.	896	1349	349	861	1314	954
Drunella doddsi	23	70	12	58	35	40
Epeorus longimanus	1617	628	233	500	744	744
Ephemerella infrequens	105	105	70	267	151	140
Rhithrogena hageni	70	47	12	35	12	35
PLECOPTERA	**350**	**326**	**59**	**582**	**384**	**339**
Amphinemura sp.	105	35	23	128	81	74
Cultus sp.				35	12	9
Hesperoperla pacifica	47			93	35	35
Isoperla sp.	35		12		12	12
Paraleuctra sp.		12		12		5
Prostoia besametsa	12	35	12	70	81	42
Sweltsa sp.	151	244	12	209	151	153
Taenionema sp.				35	12	9
COLEOPTERA	**570**	**395**	**395**	**221**	**349**	**386**
Heterlimnius corpulentus	570	395	395	221	349	386
TRICHOPTERA	**316**	**140**	**186**	**1014**	**536**	**437**
Arctopsyche grandis	47	23		12		16
Brachycentrus americanus	47	35	35	593	302	202
Glossosoma sp.					12	2
Hydropsyche sp.		12		12		5
Lepidostoma sp. B	128		58	35		44
Micrasema bactro	35			35	35	21
Neothremma sp.		35		47	12	19
Oligophlebodes minutus	35		23		12	14
Rhyacophila brunnea gr.	12		23	47	35	23
Rhyacophila sibirica gr.		35	35	221	81	74
Rhyacophila sp.	12		12	12	47	17
DIPTERA	**328**	**223**	**163**	**364**	**210**	**256**
Brillia sp.	35			12	35	16
Ceratopogoninae	12			35		9
Corynoneura sp.	93		23			23
Dicranota sp.		12	23	93	105	47
Eukiefferiella sp.	70	93	12	12		37
Heleniella sp.	12					2
Hexatoma sp.				12		2
Micropsectra sp.	47		81	35	35	40
Oreogeton sp.	12			12		5
Orthocladius (Sympos.) sp.			12			2
Orthocladius/Cricotopus gr.	35	12		12		12
Unid. Orthocladiinae		12		12		5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Columbine Creek
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA cont.						
Parametriocnemus sp.	12	12		35	35	19
Pericoma sp.		12		47		12
Rheotanytarsus sp.		35				7
Simulium sp.				35		7
Stempellinella sp.			12			2
Tanytarsus sp.		35		12		9
HYDRACARINA	**12**		**23**	**12**	**35**	**16**
Lebertia sp.	12		23	12	35	16
ANNELIDA						
OLIGOCHAETA	**1151**	**1280**	**476**	**860**	**1314**	**1016**
Eiseniella tetraedra	1093	779	372	651	698	719
Enchytraeidae	35	256	81	93	407	174
Nais sp.	23	233	23	116	209	121
Rhynchelmis sp.		12				2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/1/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1279**	**1791**	**3454**	**3501**	**1094**	**2224**
Baetis bicaudatus		23	233	198	35	98
Baetis tricaudatus	163	582	779	500	198	444
Cinygmula sp.	116	116	198	198	70	140
Drunella doddsi			81	35		23
Drunella grandis					35	7
Epeorus longimanus	395	419	896	814	221	549
Ephemerella infrequens	279	372	616	663	302	446
Fallceon quilleri	47	23	151	81	12	63
Paraleptophlebia sp.	23		35			12
Rhithrogena hageni	256	256	465	1012	221	442
PLECOPTERA	**500**	**1045**	**1536**	**745**	**466**	**858**
Cultus sp.				35		7
Megarcys signata		23	12			7
Paraleuctra sp.	186	395	849	198	198	365
Prostoia besametsa	93	209	35	384	221	188
Pteronarcella badia		23	93	12		26
Sweltsa sp.	221	395	547	81	47	258
Zapada oregonensis gr.				35		7
COLEOPTERA	**1000**	**814**	**1710**	**849**	**1070**	**1089**
Heterlimnius corpulentus	977	814	1710	849	1058	1082
Optioservus sp.	23				12	7
TRICHOPTERA	**3303**	**5466**	**5396**	**6630**	**1560**	**4472**
Arctopsyche grandis		23		12	12	9
Brachycentrus americanus	116	512	430	384	81	305
Glossosoma sp.			547	349	12	182
Hydropsyche sp.	23		35		12	14
Lepidostoma sp. A		47	35	35		23
Lepidostoma sp. B	70	23			35	26
Limnephilidae					12	2
Oligophlebodes minutus	2884	4536	3722	5548	1035	3545
Rhyacophila brunnea gr.	47	93	116	151	233	128
Rhyacophila coloradensis gr.		23	81	35		28
Rhyacophila sibirica gr.	163	186	430	116	128	205
Rhyacophila sp.		23				5
DIPTERA	**1443**	**1515**	**2213**	**1433**	**612**	**1306**
Antocha sp.	140	47	81	81	12	72
Ceratopogoninae			35	81		23
Chelifera sp.	47	47		116	12	44
Dicranota sp.			81	35	12	26
Eukiefferiella sp.	81	140	209	35	186	130
Hexatoma sp.	47	47	35		47	35
Micropsectra sp.		23	105	454	128	142
Orthocladius (Sympos.) sp.			47			9
Orthocladius/Cricotopus gr.		81	47	81		42
Unid. Orthocladiinae		58	47		12	
Pagastia sp.	81	58		35	105	56
Parametriocnemus sp.		23		81		

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Town
4/1/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
DIPTERA (cont.)						
Pericoma sp.	419	419	430	314	81	333
Prosimulium sp.		47	35	35		23
Rheocricotopus sp.	105	23	209	81	12	
Rheotanytarsus sp.	23	58	47			26
Tanytarsus sp.	454	442	802			340
Thienemanniella sp.	23					
Thienemannimyia gr.	23					5
HYDRACARINA	**116**	**139**	**81**	**116**	**35**	**98**
Lebertia sp.	93	116	81	81	35	81
Protzia sp.	23					5
Sperchon/Sperchonopsis				35		7
Testudacarus/Torrenticola		23				5
TURBELLARIA	**116**	**302**	**267**	**233**		**184**
Polycelis coronata	116	302	267	233		184
ANNELIDA						
OLIGOCHAETA	**1128**	**942**	**2919**	**1127**	**640**	**1351**
Eiseniella tetraedra				81		16
Enchytraeidae				81		16
Nais sp.	1128	942	2919	965	640	1319

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
June Bug
4/1/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**372**	**395**	**256**	**337**	**187**	**309**
Baetis tricaudatus	116	128	58	58	23	77
Drunella doddsi			12			2
Drunella grandis	35	23	23	93	12	37
Ephemerella infrequens	12			12	12	7
Rhithrogena hageni	209	244	163	174	140	186
PLECOPTERA	**58**	**116**	**59**	**82**	**24**	**68**
Capniidae		12		23		7
Paraleuctra sp.			12		12	5
Pteronarcella badia		23		12		7
Sweltsa sp.	58	81	47	47	12	49
COLEOPTERA	**59**		**35**		**23**	**23**
Heterlimnius corpulentus	35		35			14
Narpus concolor	12					2
Optioservus sp.	12				23	7
TRICHOPTERA	**314**	**117**	**93**	**152**	**105**	**156**
Arctopsyche grandis	12	47	23			16
Brachycentrus americanus	267	12	58	128	93	112
Hydropsyche sp.	12	23	12	12	12	14
Oligophlebodes minutus	23	12				7
Rhyacophila sibirica gr.		23		12		7
DIPTERA	**36**	**71**	**12**	**139**	**71**	**63**
Atherix pachypus			12	23	12	9
Chelifera sp.	12	23		93	47	35
Dicranota sp.	12					2
Hesperoconopa sp.		12				2
Muscidae		12				2
Orthocladius/Cricotopus gr.	12			23	12	9
Rhabdomastix sp.		12				2
Thienemannimyia gr.		12				2
HYDRACARINA	**12**	**12**	**23**	**12**	**12**	**14**
Lebertia sp.	12	12	23	12	12	14
ANNELIDA						
OLIGOCHAETA				**58**		**12**
Rhynchelmis sp.				58		12

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**535**	**454**	**768**	**1129**	**303**	**638**
Baetis tricaudatus	500	361	721	1105	279	593
Drunella grandis	23	58		12	12	21
Rhithrogena hageni	12	35	47	12	12	24
PLECOPTERA	**35**	**35**	**70**	**12**		**30**
Capniidae	23	23	58			21
Cultus sp.	12	12		12		7
Sweltsa sp.			12			2
COLEOPTERA	**23**	**47**			**12**	**17**
Heterlimnius corpulentus		12			12	5
Optioservus sp.	23	35				12
TRICHOPTERA	**501**	**1303**	**768**	**570**	**105**	**649**
Brachycentrus americanus	442	1291	756	558	105	630
Hydropsyche sp.	47	12	12	12		17
Lepidostoma sp. A	12					2
DIPTERA	**1596**	**582**	**897**	**571**	**233**	**774**
Antocha sp.				12		2
Atherix pachypus			12			2
Ceratopogoninae	12		23	198	58	58
Chelifera sp.	198	58	140	174	12	116
Dicranota sp.	12	23	35			14
Eukiefferiella sp.				12		2
Gonomyia sp.	12		12			5
Hesperoconopa sp.	12		23			7
Hexatoma sp.	12	23				7
Orthocladius/Cricotopus gr.	791	337	477	105	58	354
Unid. Orthocladiinae	93	12	35	12		30
Pagastia sp.	267	47	35	58	105	102
Parametriocnemus sp.	47		58			21
Pericoma sp.		12				2
Pseudodiamesa sp.		23				5
Rhabdomastix sp.			12			2
Rheocricotopus sp.	128	47	23			40
Tipula sp.	12		12			5
HYDRACARINA	**47**		**35**			**16**
Lebertia sp.	47		35			16
NEMATODA				**12**		**2**
Unid. Nematoda				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Elephant Rock
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**3885**	**895**	**2465**	**372**	**93**	**1542**
Enchytraeidae	1105	58	174	105	58	300
Lumbriculidae			12			2
Nais bretscheri	140					28
Nais sp.	2640	837	2279	267	35	1212

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hansen
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**769**	**733**	**745**	**652**	**361**	**651**
Baetis bicaudatus	12			12	12	7
Baetis tricaudatus	454	372	419	593	174	402
Drunella grandis	12	12	23	12	35	19
Fallceon quilleri			12			2
Rhithrogena hageni	291	349	291	35	140	221
PLECOPTERA	**94**	**186**	**349**	**12**	**12**	**131**
Capniidae	47	81	58	12		40
Prostoia besametsa		12				2
Pteronarcella badia	47	70	291			82
Sweltsa sp.		23			12	7
COLEOPTERA		**58**	**23**	**12**		**19**
Heterlimnius corpulentus		35				7
Optioservus quadrimaculatus		23	23	12		12
TRICHOPTERA	**954**	**2618**	**1245**	**1338**	**198**	**1270**
Arctopsyche grandis	12		12		12	7
Brachycentrus americanus	849	2559	1186	1279	186	1212
Hydropsyche sp.	93	47	35	47		44
Lepidostoma sp. A		12				2
Rhyacophila coloradensis gr.			12	12		5
DIPTERA	**105**	**118**	**70**	**118**	**36**	**87**
Antocha sp.					12	2
Atherix pachypus	70	23	23	12		26
Chelifera sp.	12					2
Corynoneura sp.		12				2
Diamesa sp.				23	12	7
Dicranota sp.			35	12		9
Eukiefferiella sp.		12	12			5
Hesperoconopa sp.		12				2
Orthocladius/Cricotopus gr.	23	47		47		23
Polypedilum sp.				12	12	5
Rheocricotopus sp.		12				2
Unid. Orthocladiinae				12		2
HYDRACARINA	**12**			**12**		**5**
Lebertia sp.	12			12		5
ANNELIDA						
OLIGOCHAETA	**93**		**12**	**12**		**24**
Enchytraeidae	81			12		19
Nais sp.	12		12			5

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Columbine
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**639**	**59**	**605**	**1140**	**757**	**640**
Baetis bicaudatus	58	12			35	21
Baetis tricaudatus	488	35	570	733	384	442
Cinygmula sp.	47	12	23			16
Drunella grandis	23			35		12
Epeorus longimanus					12	2
Rhithrogena hageni	23		12	372	326	147
PLECOPTERA	**12**			**12**	**12**	**6**
Capniidae					12	2
Sweltsa sp.	12					2
Zapada cinctipes				12		2
COLEOPTERA	**12**		**36**	**24**	**12**	**17**
Heterlimnius corpulentus	12		12			5
Narpus concolor			12	12		5
Optioservus sp.			12	12	12	7
TRICHOPTERA	**733**	**82**	**372**	**594**	**419**	**440**
Arctopsyche grandis	12					2
Brachycentrus americanus	198	35	128	198	186	149
Hydropsyche sp.	488	35	244	384	233	277
Rhyacophila coloradensis gr.	35	12		12		12
DIPTERA	**128**	**71**	**70**	**141**	**140**	**109**
Atherix pachypus	35	47	23	12	70	37
Brillia sp.				12		2
Ceratopogoninae					12	2
Chelifera sp.	58	12	12	35	58	35
Diamesa sp.		12		47		12
Hexatoma sp.			12	23		7
Orthocladius/Cricotopus gr.	35		23	12		14
HYDRACARINA			**12**		**12**	**4**
Lebertia sp.					12	2
Sperchon/Sperchonopsis			12			2
ANNELIDA						
OLIGOCHAETA	**105**		**12**			**23**
Enchytraeidae	93		12			21
Lumbriculidae	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Goathill
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**117**		**116**	**187**	**58**	**95**
Baetis tricaudatus	12			35	35	16
Drunella grandis	58		23	47	23	30
Rhithrogena hageni	47		93	105		49
PLECOPTERA			**24**	**349**		**74**
Pteronarcella badia			12	349		72
Sweltsa sp.			12			2
COLEOPTERA	**12**	**12**	**36**	**174**	**12**	**49**
Heterlimnius corpulentus			12	35		9
Narpus concolor	12	12	12	58		19
Optioservus quadrimaculatus			12	81	12	21
TRICHOPTERA	**326**	**663**	**570**	**2327**	**268**	**830**
Arctopsyche grandis				12		2
Brachycentrus americanus	314	651	512	2198	256	786
Hydropsyche sp.	12	12	58	105	12	40
Lepidostoma sp. A				12		2
DIPTERA	**407**	**186**	**174**	**1152**	**291**	**440**
Atherix pachypus	128	93	70	593	58	188
Chelifera sp.			23	151		35
Orthocladius/Cricotopus gr.	279	81	81	349	221	202
Unid. Orthocladiinae				12		2
Parorthocladius sp.				47		9
Rheocricotopus sp.		12				2
Stempellinella sp.					12	2
HYDRACARINA		**23**	**35**	**12**	**12**	**16**
Lebertia sp.		23	35	12	12	16
ANNELIDA						
OLIGOCHAETA	**12**		**12**	**36**		**12**
Enchytraeidae	12			12		5
Nais sp.			12	12		5
Unid. Immature Tubificidae w/ Capilliform Chaetae				12		2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Questa Ranger Station
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**12**	**47**	**12**	**12**		**16**
Baetis bicaudatus		23				5
Baetis tricaudatus	12	12	12			7
Fallceon quilleri				12		2
Rhithrogena hageni		12				2
PLECOPTERA					**24**	**4**
Capniidae					12	2
Pteronarcella badia					12	2
COLEOPTERA	**12**	**12**	**23**	**117**		**33**
Heterlimnius corpulentus	12	12		12		7
Narpus concolor			23	105		26
TRICHOPTERA	**106**	**24**	**12**	**23**	**35**	**39**
Arctopsyche grandis	12					2
Brachycentrus americanus	12	12		23	35	16
Hydropsyche sp.	70	12	12			19
Rhyacophila sibirica gr.	12					2
DIPTERA	**35**	**24**	**12**	**12**	**23**	**20**
Antocha sp.	23	12				7
Ceratopogoninae		12				2
Dicranota sp.					23	5
Eukiefferiella sp.	12					2
Pagastia sp.			12			2
Polypedilum sp.				12		2
TURBELLARIA	**12**					**2**
Polycelis coronata	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Highway 522
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**350**	**454**	**221**	**582**	**372**	**395**
Baetis bicaudatus	12	23	12	35		16
Baetis tricaudatus	291	419	174	465	302	330
Drunella grandis	35	12	12	47	70	35
Fallceon quilleri	12					2
Rhithrogena hageni			23	35		12
PLECOPTERA					**58**	**12**
Pteronarcella badia					58	12
COLEOPTERA	**256**	**82**	**93**	**23**	**197**	**130**
Narpus concolor		12	35		23	14
Optioservus quadrimaculatus	256	70	58	23	174	116
TRICHOPTERA	**477**	**524**	**302**	**628**	**616**	**509**
Brachycentrus americanus	326	361	186	454	523	370
Hydropsyche sp.	151	151	116	174	93	137
Rhyacophila coloradensis gr.		12				2
DIPTERA	**477**	**152**	**59**	**106**	**139**	**186**
Antocha sp.	12					2
Ceratopogoninae	23	12	12	12		12
Chelifera sp.	198	35	35	47	81	79
Orthocladius/Cricotopus gr.	244	105	12	47	58	93
HYDRACARINA	**24**	**12**		**12**		**9**
Lebertia sp.	12	12		12		7
Sperchon/Sperchonopsis	12					2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Highway 522
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**593**	**361**	**838**	**547**	**478**	**564**
Baetis bicaudatus		47	35	47	12	28
Baetis tricaudatus	535	267	698	430	349	456
Drunella grandis		12			12	5
Rhithrogena hageni	58	35	105	70	105	75
PLECOPTERA	**116**	**35**	**384**	**35**	**82**	**131**
Pteronarcella badia	116		326		47	98
Sweltsa sp.		35	58	35	35	33
COLEOPTERA	**430**	**35**	**581**	**337**	**117**	**300**
Narpus concolor	93	35	81	35	35	56
Optioservus divergens	174		267	151	47	128
Optioservus quadrimaculatus	163		233	151	35	116
TRICHOPTERA	**547**	**244**	**1431**	**419**	**117**	**551**
Arctopsyche grandis	12			12	12	7
Brachycentrus americanus	302	116	1210	267	58	391
Culoptila sp.	12					2
Hydropsyche sp.	221	128	186	140	47	144
Lepidostoma sp. A			35			7
DIPTERA	**35**	**141**	**59**	**82**	**82**	**79**
Ceratopogoninae		47			12	12
Chelifera sp.		47	12	35	23	23
Dicranota sp.			12			2
Hexatoma sp.	23	35	23	35	47	33
Muscidae			12			2
Orthocladius/Cricotopus gr.	12	12		12		7
HYDRACARINA	**12**	**23**	**58**	**23**	**23**	**28**
Lebertia sp.	12	23	58	23	23	28
NEMATODA					**12**	**2**
Unid. Nematoda					12	2

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Outfall 002
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1268**	**1372**	**384**	**1547**	**1512**	**1216**
Baetis bicaudatus		35			47	16
Baetis tricaudatus	1198	1279	337	1396	1349	1112
Drunella grandis	35	58	35	151	93	74
Rhithrogena hageni	35		12		23	14
PLECOPTERA		**35**			**23**	**12**
Isoperla sp.					23	5
Sweltsa sp.		35				7
COLEOPTERA	**930**	**500**	**407**	**640**	**698**	**635**
Narpus concolor		35	23		23	16
Optioservus divergens			128			26
Optioservus quadrimaculatus	930	465	256	640	675	593
TRICHOPTERA	**3757**	**9199**	**3629**	**3139**	**5117**	**4967**
Brachycentrus americanus	3175	8001	3222	2407	4512	4263
Culoptila sp.		58			23	16
Hydropsyche sp.	582	1140	372	616	582	658
Hydroptila sp.				35		7
Lepidostoma sp. A			35			7
Oecetis avara/disjuncta				81		16
DIPTERA	**5141**	**2279**	**606**	**9733**	**1606**	**3873**
Ceratopogoninae	267		35	81	47	86
Chelifera sp.		58	35	35	47	35
Diamesa sp.	140			616		151
Dicranota sp.	35	35				14
Eukiefferiella sp.	454	605	105	616	349	426
Hexatoma sp.	267	174	163	233	186	205
Orthocladius/Cricotopus gr.	3001	1349	209	7443	954	2591
Unid. Orthocladiinae			12			2
Pagastia sp.	605		47	314		193
Parametriocnemus sp.	302					60
Parorthocladius sp.				314		63
Rheocricotopus sp.		58				12
Simulium sp.	35					7
Tipula sp.	35			81	23	28
HYDRACARINA		**35**	**12**			**9**
Lebertia sp.			12			2
Sperchon/Sperchonopsis		35				7
CRUSTACEA						
AMPHIPODA	**35**		**23**	**35**	**23**	**23**
Hyalella azteca	35		23	35	23	23
TURBELLARIA	**779**		**12**	**233**		**205**

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Outfall 002
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
Girardia sp.	779		12	233		205
NEMATODA				**35**		**7**
Unid. Nematoda				35		7
ANNELIDA						
OLIGOCHAETA	**104**	**35**	**12**	**383**	**23**	**111**
Enchytraeidae		35				7
Limnodrilus sp.	81		12	81	23	39
Ophidonais serpentina				35		7
Unid. Immature Tubificidae w/o Capilliform Chaetae	23			267		58
MOLLUSCA						
GASTROPODA				**35**		**7**
Physa/Physella				35		7

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**2339**	**3047**	**2606**	**1861**	**2175**	**2404**
Baetis bicaudatus	105	267		70	209	130
Baetis tricaudatus	2140	2710	2559	1768	1954	2226
Drunella grandis			47	23	12	16
Epeorus longimanus	12	35				9
Fallceon quilleri	12					2
Paraleptophlebia sp.	70	35				21
PLECOPTERA	**163**	**419**	**186**	**198**	**128**	**219**
Isoperla sp.	163	326	186	198	128	200
Pteronarcella badia		93				19
COLEOPTERA	**500**	**1396**	**2815**	**1767**	**884**	**1473**
Cleptelmis sp.			23			5
Optioservus divergens		70	1396	872		468
Optioservus quadrimaculatus	500	1210	1396	872	826	961
Zaitzevia parvula		116		23	58	39
TRICHOPTERA	**965**	**2675**	**4070**	**2489**	**2384**	**2518**
Brachycentrus americanus	488	1570	1396	721	558	947
Culoptila sp.				93	35	26
Hydropsyche sp.	442	1047	2628	1675	1791	1517
Lepidostoma sp. A	23	58	23			21
Rhyacophila coloradensis gr.	12		23			7
DIPTERA	**304**	**3034**	**1746**	**1233**	**976**	**1458**
Atherix pachypus	47	209	582	128	570	307
Ceratopogoninae		58	47		23	26
Chelifera sp.			23	70	23	23
Eukiefferiella sp.	140	1605	849	233	267	619
Hexatoma sp.	12	58	47	163	23	61
Orthocladius/Cricotopus gr.	23	721	140	395	58	267
Unid. Orthocladiinae		81		58		28
Pagastia sp.		81	35	174	12	60
Parametriocnemus sp.	12					2
Rheocricotopus sp.	35	186				44
Simulium sp.	35	35	23			19
Tipula sp.				12		2
HYDRACARINA		**70**	**23**	**23**		**23**
Lebertia sp.		35				7
Sperchon/Sperchonopsis		35	23	23		16
TURBELLARIA	**12**	**35**	**47**	**70**		**33**
Girardia sp.	12	35	47	70		33
NEMATODA	**12**	**35**	**47**			**19**
Unid. Nematoda	12	35	47			19

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Upstream of Hatchery
3/30/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**59**	**35**		**47**		**27**
Enchytraeidae				47		9
Ilyodrilus/Tubifex	12					2
Limnodrilus sp.	12					2
Unid. Immature Tubificidae w/o Capilliform Chaetae	35	35				14

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
INSECTA						
EPHEMEROPTERA	**1943**	**1012**	**1524**	**1093**	**1117**	**1338**
Baetis bicaudatus				23	12	7
Baetis tricaudatus	1931	1000	1512	1058	1082	1317
Drunella grandis		12				2
Epeorus longimanus	12				23	7
Paraleptophlebia sp.			12	12		5
PLECOPTERA	**151**	**116**	**198**	**116**	**105**	**137**
Isoperla sp.	151	116	198	116	105	137
COLEOPTERA	**1628**	**384**	**12**	**768**	**279**	**614**
Narpus concolor	12		12	12		7
Optioservus divergens	500	93				119
Optioservus quadrimaculatus	1116	291		756	279	488
LEPIDOPTERA			**12**			**2**
Petrophila sp.			12			2
TRICHOPTERA	**722**	**1524**	**2944**	**803**	**1152**	**1428**
Brachycentrus americanus	384	1000	1617	361	663	805
Culoptila sp.	70	81	47	35	58	58
Dolophilodes sp.		12				2
Hydropsyche sp.	186	419	1268	395	407	535
Lepidostoma sp. A			12			2
Oecetis avara/disjuncta	47				12	12
Rhyacophila coloradensis gr.	35	12		12	12	14
DIPTERA	**246**	**211**	**397**	**303**	**187**	**265**
Atherix pachypus		12				2
Caloparyphus sp.	12		12	35	23	16
Ceratopogoninae					12	2
Chelifera sp.			12			2
Diamesa sp.			35			7
Dicranota sp.	105	12	47	81	47	58
Eukiefferiella sp.		23	93			23
Euparyphus sp.	12					2
Hexatoma sp.					12	2
Orthocladius/Cricotopus gr.	35	128	116	35	35	70
Pagastia sp.	23	12	35	58	23	30
Polypedilum sp.		12		35		9
Prosimulium sp.		12				2
Simulium sp.	12		47	47	12	24
Tipula sp.	47			12	23	16
TURBELLARIA	**93**	**105**	**47**	**151**	**105**	**100**
Girardia sp.	93	105	47	151	105	100
NEMATODA	**35**			**12**		**9**
Unid. Nematoda	35			12		9

Appendix B-4b
Aquatic Biota - Macroinvertebrate Density
Downstream of Hatchery
3/31/2004

TAXA	REP 1	REP 2	REP 3	REP 4	REP 5	COMPOSITE
ANNELIDA						
OLIGOCHAETA	**47**	**36**		**94**	**12**	**37**
Eiseniella tetraedra	12			12	12	7
Limnodrilus sp.		12		12		5
Nais sp.		12				2
Unid. Immature Tubificidae w/o Capilliform Chaetae	35	12		70		23
MOLLUSCA						
GASTROPODA					**12**	**2**
Physa/Physella					12	2

APPENDIX B-4c
BENTHIC INVERTEBRATE TISSUES

Appendix B-4c
Aquatic Biota - Benthic Invertebrate Tissues

Parameter	Site ID / Sample Date / Sample ID / Units	MIDDLE FORK 1-Apr-2002 MIDDLE FORK mg/Kg	UPSTREAM RED RIVER 1-Apr-2002 UPSTREAM RED RIVER mg/Kg	JUNE BUG C.G. 2-Apr-2002 JUNE BUG C.G. mg/Kg	ELEPHANT ROCK 2-Apr-2002 ELEPHANT ROCK mg/Kg	HANSEN CREEK 2-Apr-2002 HANSEN CREEK mg/Kg	COLUMBINE 2-Apr-2002 UPSTREAM COLUMBINE mg/Kg	GOATHILL C.G. 3-Apr-2002 GOATHILL C.G. mg/Kg	QUESTA R.S 3-Apr-2002 QUESTA R.S mg/Kg	DOWNSTREAM HATCHERY 3-Apr-2002 DOWNSTREAM HATCHERY mg/Kg	DOWNSTREAM HWY 522 4-Apr-2002 DOWNSTREAM HWY 522 mg/Kg	UPSTREAM HATCHERY 4-Apr-2002 UPSTREAM HATCHERY mg/Kg
Metals												
Aluminum	mg/Kg	193	82	481	400	770	507	700	1950	986	1510	790
Antimony	mg/Kg	0.12	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Arsenic	mg/Kg	0.5	0.2	0.5	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.5
Barium	mg/Kg	7.5	3.6	15.2	23.7	7.6	14.3	9.8	9.9	13.5	15.9	14.8
Beryllium	mg/Kg	0.09	0.09	0.1	0.1	0.2	0.1	0.2	0.6	0.2	0.4	0.2
Boron	mg/Kg	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5
Cadmium	mg/Kg	0.14	0.07	1.68	1.71	1.17	2.21	1.27	0.51	2.84	2.27	1.62
Calcium	mg/Kg	518	328	340	360	300	450	290	470	580	430	560
Chromium	mg/Kg	1.28	0.61	0.64	0.85	0.47	0.65	0.66	0.47	0.69	0.75	0.75
Cobalt	mg/Kg	0.5	0.5	2.3	3.4	2.2	7.5	1.1	1.2	4.2	3.5	6
Copper	mg/Kg	4.7	3.7	53	26.2	21.7	20.1	18.5	38.4	23.4	33.2	17.5
Iron	mg/Kg	431	160	1030	821	330	377	435	1020	651	718	675
Lead	mg/Kg	2	2	2	3	2	2	2	2	2	2	2
Magnesium	mg/Kg	259	184	230	330	240	300	220	270	400	320	200
Manganese	mg/Kg	128	25.8	78.3	130	67.4	329	53.2	70.9	309	133	370
Mercury	mg/Kg	0.05 J	0.05 J	0.04 J	0.04 J	0.04 J	0.04 J	0.05 J	0.04 J	0.04 J	0.05 J	0.05 J
Molybdenum	mg/Kg	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	3.1	0.8	3.9
Nickel	mg/Kg	0.5	0.5	3.6	4.7	2.7	6.1	3.5	3.3	6.4	4.9	7.1
Potassium	mg/Kg	1490	1460	1340	1320	1290	1630	1380	1510	1400	1510	1530
Selenium	mg/Kg	0.34 J	0.25 J	0.31 J	0.22 J	0.24 J	0.31 J	0.19 J	0.25 J	0.22 J	0.26 J	0.27 J
Silver	mg/Kg	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.02
Sodium	mg/Kg	800	790	810	680	660	1030	760	1000	1150	850	1010
Thallium	mg/Kg	0.04	0.01	0.01	0.05	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Vanadium	mg/Kg	0.6	0.2	0.3	0.4	0.2	0.2	0.2	0.3	0.4	0.2	1
Zinc	mg/Kg	24.3	27.1	132	146	152	235	118	91	306	255	137

J = Qualified as estimated due to matrix interferences

APPENDIX B-4d
OTHER SURFACE WATER BIOASSAYS

Molycorp RI/FS
Bioassay Tests - Surface Water
26 October - 2 November 2000

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* OPERATORS: KP, BP, MC

Start: 10/26/0011:00
End: 11/2/0011:45
Test Substance: Goat Hill Campground Water Column
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# alive/exposed		10/10	9/10
% Survival		100	90
Mean reproduction ± SD		28.9 ± 4.5	11.7 ± 2.9
Dissolved O_2 (mg/L)	max.	6.8	6.9
	min.	6.4	6.6
pH	max.	7.95	7.88
	min.	7.71	7.64
Conductivity (µmho/cm)	max.	403	435
	min.	393	403
Temp. (°C)	max.	24.5	24.5
	min.	24.0	24.0

Statistical Analysis of Endpoints:

Survival:
NOEC (Dunnett's Test) = 100%

Mean Reproduction:
NOEC (T-Test w/Bonferroni Adjustment) = 0%

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* OPERATORS: KP, BP, MC

Start: 10/26/0011:45
End: 11/2/0012:00
Test Substance: Downstream Hansen Creek Water Column
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# alive/exposed		10/10	10/10
% Survival		100	100
Mean reproduction ± SD		26.4 ± 3.2	12.1 ± 3.6
Dissolved O_2 (mg/L)	max.	6.3	6.4
	min.	6.1	6.3
pH	max.	7.75	7.58
	min.	7.72	7.18
Conductivity (µmho/cm)	max.	395	362
	min.	362	344
Temp. (°C)	max.	24.5	24.5
	min.	24.0	24.0

Statistical Analysis of Endpoints:

Survival:
NOEC (Dunnett's Test) = 100%

Mean Reproduction:
NOEC (T-Test w/Bonferroni Adjustment) = 0%

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* OPERATORS: KP, BP, MC

Start: 10/26/0011:15
End: 11/2/0012:00
Test Substance: Junebug Campground Water Column
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# alive/exposed		9/10	10/10
% Survival		90	100
Mean reproduction ± SD		25.8 ± 8.7	23.2 ± 8.6
Dissolved O_2 (mg/L)	max.	6.7	7.0
	min.	6.6	6.6
pH	max.	7.96	7.97
	min.	7.69	7.70
Conductivity (μmho/cm)	max.	403	319
	min.	356	301
Temp. (°C)	max.	24.5	24.5
	min.	24.0	24.0

Statistical Analysis of Endpoints:

Survival:
NOEC (Dunnett's Test) = 100%

Mean Reproduction:
NOEC (T-Test w/Bonferroni Adjustment) = 100%

TABLE 4
SUMMARY RESULTS OF *PIMEPHALES PROMELAS* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Pimephales promelas*OPERATORS: KP, BP, MS

Start:10/26/0011:45
End: 11/2/0011:05
Test Substance: Goat Hill Campground Water Column
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# affected/exposed		3/40	6/40
% Affected		7.5	15
Dissolved O_2 (mg/L)	max.	7.0	6.9
	min.	5.9	5.9
pH	max.	7.91	7.83
	min.	7.42	7.72
Conductivity (µmho/cm)	max.	729	888
	min.	442	522
Temp. (°C)	max.	24.5	24.5
	min.	24.0	24.0

Statistical Analysis of Endpoints:
Number affected: NOEC (Dunnett's Test) = 100%

TABLE 5
SUMMARY RESULTS OF *PIMEPHALES PROMELAS* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Pimephales promelas*OPERATORS: KP, BP, MS

Start:10/26/0012:00
End: 11/2/0011:50
Test Substance: Downstream Hansen Creek Water Column
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# affected/exposed		4/40	2/40
% Affected		10	5
Dissolved O_2 (mg/L)	max.	6.7	6.8
	min.	5.9	5.8
pH	max.	7.62	7.56
	min.	7.40	7.54
Conductivity (µmho/cm)	max.	553	493
	min.	208	395
Temp. (°C)	max.	24.5	24.5
	min.	24.0	24.0

Statistical Analysis of Endpoints:
Number affected: NOEC (Dunnett's Test) = 100%

TABLE 6
SUMMARY RESULTS OF *PIMEPHALES PROMELAS* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Pimephales promelas* OPERATORS: KP, BP, MS

Start: 10/26/0011:45
End: 11/2/0011:25
Test Substance: Junebug Campground Water Column
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# affected/exposed		4/40	11/40
% Affected		10	27.5
Dissolved O_2 (mg/L)	max.	6.7	6.7
	min.	5.9	5.9
pH	max.	7.93	7.84
	min.	7.52	7.73
Conductivity (µmho/cm)	max.	731	452
	min.	452	356
Temp. (°C)	max.	24.5	24.5
	min.	24.0	24.0

Statistical Analysis of Endpoints:
Number affected: NOEC (Dunnett's Test) = 100%

TABLE 7
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR WATER COLUMN CHRONIC TOXICITY TESTS

Wet chemistry on effluent samples:

Measurement	Reconstituted Water	Goat Hill Campground Received 10/26/00	Junebug Campground Received 10/26/00	Below Hansen Received 10/26/00
Analysis Temperature °C	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	100	178	124	142
pH	7.39	6.42	7.48	6.49
Alkalinity (mg $CaCO_3$/L)	72	60	70	66
Conductivity (µmho/cm)	352	403	290	330
Dissolved Oxygen (mg O_2/L)	6.5	7.1	7.2	7.4
Ammonia (mg NH_3/L)	--	0.45	1.30	1.10
Un-ionized Ammonia	--	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	--	0.01	0.02	<0.01

APPENDIX B-4e
OTHER SEDIMENT BIOASSAYS

Molycorp RI/FS
Bioassay Tests - Sediment
31 October - 7 November 2000

TABLE 1
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* OPERATORS: KP, BP, MC

Start: 10/31/0015:15
End: 11/7/0014:15
Test Substance: Goat Hill Campground Sediment
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# alive/exposed		10/10	10/10
% Survival		100	100
Mean reproduction ± SD		19.0 ± 14.4	7.3 ± 5.1
Dissolved O_2 (mg/L)	max.	7.3	7.5
	min.	6.1	6.3
pH	max.	8.03	7.99
	min.	7.88	7.75
Conductivity (µmho/cm)	max.	458	560
	min.	427	525
Temp. (°C)	max.	25.0	25.0
	min.	24.0	24.0

Statistical Analysis of Endpoints:

Survival:
NOEC (Dunnett's Test) = 100%

Mean reproduction:
NOEC (T-Test w/Bonferroni Adjustment) = 0%

TABLE 2
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia*OPERATORS: KP, BP, MC

Start:10/31/0014:45
End: 11/7/0014:00
Test Substance: Downstream Hansen Creek Sediment
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# alive/exposed		9/10	8/10
% Survival		90	80
Mean reproduction ± SD		23.8 ± 5.8	17.1 ± 6.0
Dissolved O_2 (mg/L)	max.	7.5	7.6
	min.	6.0	6.3
pH	max.	7.95	8.05
	min.	7.94	7.90
Conductivity (µmho/cm)	max.	453	464
	min.	443	457
Temp. (°C)	max.	25.0	25.0
	min.	24.0	24.0

Statistical Analysis of Endpoints:

Survival:
NOEC (Dunnett's Test) = 100%

Mean reproduction:
NOEC (T-Test w/Bonferroni Adjustment) = 0%

TABLE 3
SUMMARY RESULTS OF *CERIODAPHNIA DUBIA* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Ceriodaphnia dubia* OPERATORS: KP, BP, MC

Start: 10/31/0016:00
End: 11/7/0015:45
Test Substance: Junebug Campground Sediment
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# alive/exposed		10/10	9/10
% Survival		100	90
Mean reproduction ± SD		23.5 ± 7.8	17.6 ± 5.7
Dissolved O_2 (mg/L)	max.	7.5	7.8
	min.	5.9	6.4
pH	max.	8.07	8.16
	min.	8.02	7.99
Conductivity (µmho/cm)	max.	479	477
	min.	462	448
Temp. (°C)	max.	25.0	25.0
	min.	24.0	24.0

Statistical Analysis of Endpoints:

Survival:
NOEC (Dunnett's Test) = 100%

Mean reproduction:
NOEC (T-Test w/Bonferroni Adjustment) = 0%

TABLE 4
SUMMARY RESULTS OF *PIMEPHALES PROMELAS* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Pimephales promelas* **OPERATORS: KP, BP, MS**

Start:10/31/0015:30
End: 11/7/0014:30
Test Substance:Goat Hill Campground Sediment
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# affected/exposed		9/40	2/40
% Affected		22.5	5
Dissolved O_2 (mg/L)	max.	6.8	6.9
	min.	5.3	5.3
pH	max.	8.05	8.09
	min.	7.74	7.63
Conductivity (µmho/cm)	max.	629	1093
	min.	525	610
Temp. (°C)	max.	25.0	25.0
	min.	24.0	24.0

Statistical Analysis of Endpoints:
Number affected: NOEC (Dunnett's Test) = 100%

TABLE 5
SUMMARY RESULTS OF *PIMEPHALES PROMELAS* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Pimephales promelas* OPERATORS: KP, BP, MS

Start: 10/31/0014:30
End: 11/2/0014:00
Test Substance: Downstream Hansen Creek Sediment
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# affected/exposed		4/40	7/40
% Affected		10	17.5
Dissolved O_2 (mg/L)	max.	6.5	6.7
	min.	5.0	4.9
pH	max.	8.08	8.02
	min.	7.27	6.97
Conductivity (µmho/cm)	max.	707	759
	min.	368	369
Temp. (°C)	max.	25.0	25.0
	min.	24.0	24.0

Statistical Analysis of Endpoints:
Number affected: NOEC (Dunnett's Test) = 100%

TABLE 6
SUMMARY RESULTS OF *PIMEPHALES PROMELAS* CHRONIC TOXICITY TEST

TEST: 7 day chronic with *Pimephales promelas*OPERATORS: KP, BP, MS

Start:10/31/0017:45
End: 11/7/0016:45
Test Substance: Junebug Campground Sediment
Client/Project: Molycorp

Test results:

Treatment % Effluent		0	100
# affected/exposed		3/40	22/40
% Affected		7.5	55
Dissolved O_2 (mg/L)	max.	7.0	6.4
	min.	5.4	3.8
pH	max.	8.13	7.96
	min.	7.40	7.50
Conductivity (µmho/cm)	max.	633	850
	min.	469	532
Temp. (°C)	max.	25.0	25.0
	min.	24.0	24.0

Statistical Analysis of Endpoints:
Number affected: NOEC (Dunnett's Test) = 0%

TABLE 7
WATER CHEMISTRY RESULTS FROM SAMPLES RECEIVED FOR CHRONIC TOXICITY TESTS

Wet chemistry on effluent samples:

Measurement	Reconstituted Water*	Goat Hill Campground Sediment Prepared 10/31/00	Junebug Campground Sediment Prepared 10/31/00	Below Hansen Sediment Prepared 10/31/00
Analysis Temperature °C	25.0	25.0	25.0	25.0
Total Hardness (mg $CaCO_3$/L)	100	190	148	126
pH	7.27	7.82	7.33	6.97
Alkalinity (mg $CaCO_3$/L)	70	114	114	74
Conductivity (µmho/cm)	368	463	391	369
Dissolved Oxygen (mg O_2/L)	6.7	6.8	4.6	2.0**
Ammonia (mg NH_3/L)	--	0.494	0.505	0.810
Un-ionized Ammonia	--	<0.1	<0.1	<0.1
Total Residual Chlorine (mg/L)	--	0.02	0.01	>0.01

***Reconstituted water chemistries are a mean of three reconstituted waters used during the test.**
****Prior to test initiation water was aerated until dissolved oxygen measured above 6.0 mg O_2/L (approximately 10 minutes).**

APPENDIX B-4f
OTHER HABITAT EVALUATION

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Cabresto Creek 9/17/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	SMB	11	12	132	2.1	1.5	11.0	5	2	7	0	0	0	0	70
2	LGR	12	9	108	1.2	0.7	12.0	0	0	3	0	0	0	0	70
3	RUN	22	9	198	1.2	0.7	22.0	2	0	3	0	0	0	0	60
4	RUN	18	9	162	1.0	0.5	26.0	10	0	0	0	0	0	0	70
5	LGR	29	11	319	1.1	0.5	29.0	12	0	0	0	0	0	0	60
6	SLB	15	12	180	1.4	0.6	15.0	0	0	0	0	27	0	0	60
7	LGR	186	14	2604	1.1	0.6	0	2	0	19	0	11	0	0	85

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Columbine Creek 9/15/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	SMB	15	12	180	1.1	0.7	0.0	5	0	0	0	0	0	0	60
2	LGR	15	14	210	0.6	0.4	0.0	0	0	0	0	0	0	0	40
3	RUN	25	13	325	1.1	0.7	0.0	3	0	6	0	0	0	0	80
4	LGR	65	12	780	1.1	0.6	0.0	14	0	6	0	0	0	0	75
5	RUN	13	11	143	0.9	0.6	0.0	0	0	4	0	0	0	0	70
6	LGR	151	11	1661	1.5	0.5	0.0	28	0	12	0	0	20	0	65

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Middle Fork 9/15/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	RUN	35	9	315	0.9	0.4	0.0	0	0	2	0	0	7	3	90
2	LGR	14	9	126	0.6	0.4	0.0	0	0	3	0	0	0	0	70
3	RUN	26	9	234	1.1	0.7	0.0	0	0	0	0	5	0	0	75
4	HGR	30	10	300	0.9	0.5	0.0	0	0	7	0	0	0	0	40
5	RUN	24	8	192	0.9	0.5	0.0	0	0	2	0	0	3	0	90
6	RUN	7	8	56	0.8	0.5	0.0	0	0	3	0	0	0	0	85
7	RUN	16	6	96	1.1	0.6	0	4	0	8	0	0	0	0	60
8	LGR	22	13	286	0.5	0.3	0	0	0	3	0	0	0	0	60
9	SMB	18	12	216	2	1	18	0	0	0	0	30	0	0	5
10	LGR	47	9	423	0.8	0.5	0	0	0	2	0	0	0	0	65
11	SMB	9	8	72	1.2	0.8	0	6	0	24	0	0	0	0	65

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Town 9/15/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	RUN	21	21	441	1.2	0.7	0.0	0	0	0	0	0	0	0	15
2	LGR	55	21	1155	1.0	0.5	0.0	5	0	0	0	0	0	0	10
3	RUN	25	21	525	2.2	1.0	0.0	0	10	12	0	0	0	12	5
4	LGR	40	18	720	1.0	0.5	0.0	0	0	2	0	0	0	0	5
5	RUN	41	18	738	1.2	0.7	0.0	0	0	6	0	20	0	0	15
6	RUN	40	16	640	1.7	1.0	0.0	15	0	10	0	9	0	0	35
7	LGR	20	16	320	1	0.7	0	0	0	4	0	0	0	0	50
8	RUN	21	12	252	1.3	0.8	0	0	0	2	0	0	0	0	20
9	LGR	115	22	2530	1	0.5	0	0	0	12	0	0	0	10	30
10	RUN	43	19	817	1.8	1	0	10	0	0	20	32	0	0	40

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
June Bug Campground 9/15/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	HGR	97	18	1746	1.5	0.7	97.0	0	0	77	0	0	0	0	10
2	SMB	16	18	288	1.4	1.0	16.0	0	0	6	0	0	0	0	5
3	RUN	14	19	266	1.6	0.8	14.0	0	0	0	0	0	0	0	5
4	HGR	95	21	1995	1.1	0.6	30.0	0	0	63	0	4	0	0	10
5	LGR	67	17	1139	1.3	0.8	67.0	85	0	15	0	0	0	0	30
6	RUN	50	12	600	2.5	1.2	30.0	90	18	0	0	0	0	0	--

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Below Elephant Rock Campground 9/16/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	RUN	43	21	903	1.5	0.6	17.0	18	0	0	0	0	0	10	5
2	LGR	64	24	1536	1.1	0.7	22.0	59	0	0	0	0	0	0	10
3	RUN	27	18	486	1.6	0.9	2.0	0	0	2	0	0	0	8	5
4	HGR	54	18	972	1.6	0.8	18.0	0	0	43	0	0	0	0	25
5	RUN	83	15	1245	2.6	1.6	9.0	60	14	0	0	0	15	28	10
6	LGR	21	20	420	1.2	0.6	0.0	0	0	0	0	10	0	0	0

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Below Hansen Creek 9/16/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	RUN	27	17	459	1.6	1.2	0.0	0	0	7	0	0	0	0	30
2	LGR	56	18	1008	1.3	0.8	0.0	0	0	10	0	0	0	0	60
3	RUN	75	14	1050	1.5	1.1	12.0	0	0	7	0	0	0	40	60
4	LGR	170	20	3400	1.6	0.8	50.0	0	0	27	0	0	0	0	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Above Columbine, below Mill 9/16/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	HGR	78	15	1170	1.3	0.8	74.0	0	0	19	0	0	0	0	30
2	RUN	53	19	1007	1.8	1.1	53.0	0	0	2	0	0	0	0	15
3	HGR	46	17	782	1.6	1.0	92.0	0	0	30	14	0	0	0	5
4	RUN	40	16	640	1.8	1.3	40.0	0	0	6	0	5	0	0	5
5	HGR	71	17	1207	1.8	1.1	47.0	0	0	45	0	12	4	0	30

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Goathill Campground 9/13/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	HGR	58	20	1160	1.5	1.1	35.0	0	0	25	0	20	0	0	30
2	RUN	25	16	400	2.0	1.2	10.0	18	0	60	0	0	0	0	20
3	SMB	18	12	216	2.2	1.3	6.0	0	0	24	0	0	0	0	15
4	HGR	41	30	1230	1.2	0.8	10.0	0	0	33	0	0	0	0	15
5	LGR	38	21	798	1.8	1.2	6.0	0	0	42	0	0	0	0	20
6	SMB	15	16	240	1.8	1.2	0.0	0	0	32	0	0	0	0	30
7	LGR	47	18	846	2	1.1	38	0	0	9	0	0	0	0	25
8	HGR	37	25	925	1.8	0.8	69	10	0	12	0	0	0	0	20
9	RUN	63	16	1008	1.8	1.1	68	0	0	37	0	0	0	0	20
10	HGR	90	22	1980	1.4	1	85	0	0	27	0	0	24	0	35

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Above Questa Ranger Station 9/13/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	LGR	90	23	2070	1.4	0.9	0.0	0	0	10	0	0	0	0	35
2	SLB	29	22	638	2.0	1.1	0.0	50	0	0	0	0	0	0	35
3	LGR	61	23	1403	1.4	0.9	0.0	0	0	15	0	0	20	0	20
4	RUN	101	19	1919	1.4	0.9	128.0	0	0	9	0	3	0	0	10
5	LGR	65	19	1235	1.8	0.8	130.0	0	0	7	0	3	0	7	10
6	RUN	53	16	848	1.5	1.0	85.0	0	0	22	0	0	0	0	10
7	SMB	16	15	240	2.3	1.5	26	0	35	8	0	3	0	0	25
8	HGR	12	19	228	1.7	1	0	0	0	37	0	0	0	0	10

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Above Fish Hatchery 9/14/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	HGR	84	21	1764	2.2	1.5	0.0	0	15	28	0	24	0	0	10
2	SMB	15	20	300	3.2	2.0	0.0	0	91	10	0	0	0	0	5
3	RUN	32	20	640	2.2	1.5	0.0	0	8	15	0	0	0	0	10
4	HGR	50	23	1150	2.2	1.5	0.0	0	10	20	0	0	0	0	5
5	SMB	30	18	540	3.5	2.2	0.0	0	120	6	0	0	0	0	0
6	HGR	135	18	2430	3.0	1.6	0.0	0	80	95	0	0	0	0	5

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hatchery 9/14/99

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Average depth (ft)	Eroding Bank (ft)	Undercut Banks	Water >2 ft deep	Pocket Water	Root Wads	Woody Debris	Overhanging Vegetation	Cut Bank	Canopy Cover
1	LGR	37	36	1332	1.4	1.0	0.0	0	0	0	0	125	0	0	15
2	RUN	88	30	2640	2.4	1.5	0.0	0	120	6	0	171	0	0	35
3	HGR	38	21	798	2.5	1.7	0.0	0	50	24	0	0	0	0	50
4	RUN	64	17	1088	2.5	1.7	0.0	0	0	60	0	0	0	0	15
5	LGR	78	20	1560	2.5	1.4	0.0	0	0	45	0	50	0	0	40
6	SLB	42	20	840	3.6	2.0	0.0	0	75	0	0	0	0	35	25
7	HGR	36	27	972	2.5	1.5	0	0	0	20	0	0	0	0	10

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Columbine Creek 09/24/02

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	17	9	153	1.1	0.5	0.5	2	5	3	10
2	RUN	16	10	160	0.8	0.3	0.4	1	5	2	15
3	DMO	12	14	168	1.3	0.9	0.7	2	15	--	20
4	LGR	34	11	374	0.6	--	0.3	2	10	4	5
5	SLB	12	8	96	1.1	0.5	0.6	1	10	3	10
6	SLB	11	10	110	0.8	0.4	0.5	2	5	4	10
7	LGR	52	13	676	1.0	--	0.4	3	3	5	5
8	RUN	17	7	119	0.7	0.2	0.5	1	3	3	10
9	LGR	142	8	1136	1.3	--	0.4	3	3	5	10

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Middle Fork 09/23/02

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	29	6	174	0.5	--	0.2	4	5	1	5
2	RUN	17	5	85	0.8	0.3	0.5	2	10	4	10
3	LGR	15	8	120	0.6	--	0.3	2	3	1	10
4	RUN	20	5	100	0.8	0.3	0.3	3	15	3	25
5	LGR	21	11	231	0.6	--	0.2	2	10	2	10
6	RUN	25	6	150	0.6	0.1	0.3	2	8	5	10
7	LGR	21	6	126	0.5	--	0.3	3	8	1	5
8	SLW	12	5	60	0.8	0.5	0.5	4	20	2	10
9	LGR	36	8	288	0.4	--	0.2	3	15	3	15
10	SMW	14	7	98	1.4	1.0	0.5	4	25	6	15
11	LGR	47	7	329	0.6	--	0.3	4	5	0	5
12	SPW	10	9	90	1.8	1.4	1	5	20	15	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hatchery 09/24/02

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	78	33	2574	2.2	--	1.0	3	8	5	10
2	RUN	88	26	2288	2.4	1.7	1.4	5	15	7	15
3	SLR	57	19	1083	3.1	1.1	2.0	4	30	--	20
4	HGR	18	20	360	1.7	--	0.9	3	5	--	5
5	RUN	24	21	504	2.5	1.4	1.6	3	15	12	20
6	LGR	39	20	780	1.7	--	0.8	2	15	5	10
7	SLR	48	23	1104	3.0	2.3	1.2	5	20	3	35
8	HGR	18	35	630	1.4	--	0.7	2	5	--	10

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Columbine Creek 09/29/03

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	6	13	78	1.0	0.2	0.5	2	12	8	15
2	LGR	22	11	242	0.7	--	0.5	2	2	3	25
3	DMA	17	13	221	1.3	0.7	0.7	2	30	--	40
4	DMA	19	12	228	0.7	0.1	0.5	2	25	--	45
5	LGR	23	11	253	0.9	--	0.4	2	5	6	30
6	RUN	9	11	99	1.0	0.4	0.4	2	5	2	35
7	LGR	53	13	689	0.7	--	0.3	2	2	0	25
8	RUN	18	9	162	0.7	0.1	0.5	2	10	3	25
9	RUN	22	10	220	1.3	0.9	0.6	2	10	2	35
10	LGR	70	9	630	0.8	--	0.4	2	5	3	25
11	DMW	12	19	228	0.9	0.3	0.6	2	20	--	45
12	LGR	40	14	560	0.6	--	0.3	2	12	13	30

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Middle Fork 09/29/03

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	29	7	203	0.7	--	0.4	4	2	0	10
2	RUN	15	6	90	0.8	0.3	0.6	2	10	4	10
3	LGR	17	8	136	0.7	--	0.4	2	2	2	10
4	RUN	18	6	108	0.9	0.4	0.6	3	15	1	15
5	LGR	24	10	240	0.6	--	0.3	2	5	2	5
6	RUN	23	9	207	0.7	0.2	0.5	2	5	1	15
7	RUN	11	9	99	0.7	0.2	0.5	2	10	0	15
8	LGR	13	8	104	0.5	--	0.4	2	2	1	10
9	SLW	14	6	84	1.0	0.5	0.6	4	15	0	15
10	LGR	33	10	330	0.6	--	0.3	3	5	1	10
11	SMW	14	8	112	1.4	0.8	0.6	4	15	1	15
12	LGR	48	8	384	0.6	--	0.3	4	5	2	15
13	SPW	9	9	81	1.5	1	0.8	5	15	11	35

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hatchery 09/23/03

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	22	31	682	--	--	0.7	3	5	9	10
2	RUN	39	31	1209	0.4	0.4	0.8	3	15	8	10
3	LGR	29	27	783	--	--	0.6	3	5	8	10
4	RUN	89	20	1780	1.5	1.5	1.2	5	18	10	20
5	SLR	57	18	1026	1.0	1.0	1.6	4	35	--	35
6	HGR	12	21	252	--	--	1.4	3	20	--	20
7	RUN	37	22	814	0.8	0.8	1.5	4	25	8	35
8	LGR	28	22	616	--	--	1	3	12	8	25
9	SLR	41	23	943	3.3	1.7	1.5	5	25	15	40
10	HGR	16	38	608	1.8	--	1	2	8	--	20

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Cabresto Creek 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	SMW	8	12	96	--	--	--	--	5	8	20
2	LGR	13	9	117	--	--	--	--	3	--	15
3	RUN	20	9	180	--	--	--	--	5	11	20
4	RUN	22	9	198	--	--	--	--	5	4	20
5	LGR	28	10	280	--	--	--	--	3	1	10
6	RUN	12	13	156	--	--	--	--	10	5	15
7	LGR	17	12	204	--	--	--	--	5	4	10
8	RUN	38	12	456	--	--	--	--	15	7	30
9	RUN	13	12	156	--	--	--	--	10	9	20
10	LGR	60	11	660	--	--	--	--	5	6	15
11	SMW	13	14	182	--	--	--	--	35	6	40
12	LGR	67	14	938	--	--	--	--	5	10	15

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Columbine Creek 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	6	12	72	--	--	--	--	10	4	15
2	LGR	21	10	210	--	--	--	--	2	4	25
3	DMA	13	15	195	--	--	--	--	35	--	40
4	DMA	16	13	208	--	--	--	--	20	--	45
5	LGR	23	11	253	--	--	--	--	5	4	30
6	RUN	10	12	120	--	--	--	--	2	1	30
7	LGR	53	14	742	--	--	--	--	2	2	25
8	RUN	18	9	162	--	--	--	--	5	3	25
9	RUN	22	11	242	--	--	--	--	8	1	35
10	LGR	70	11	770	--	--	--	--	5	2	20
11	DMW	12	23	276	--	--	--	--	15	--	40
12	LGR	38	16	608	--	--	--	--	10	4	30

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Town 04/01/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	24	19	456	--	--	--	--	5	1	15
2	LGR	40	20	800	--	--	--	--	5	3	10
3	SLB	34	18	612	--	--	--	--	20	5	35
4	LGR	34	16	544	--	--	--	--	5	1	15
5	RUN	34	15	510	--	--	--	--	25	5	15
6	LGR	23	14	322	--	--	--	--	10	1	20
7	DMB	27	16	432	--	--	--	--	60	--	50
8	LGR	16	16	256	--	--	--	--	15	1	20
9	RUN	22	12	264	--	--	--	--	20	3	25
10	LGR	121	21	2541	--	--	--	--	15	6	20
11	RUN	43	17	731	--	--	--	--	30	6	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
June Bug Campground 04/01/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	121	21	2541	--	--	--	--	15	4	65
2	RUN	12	21	252	--	--	--	--	25	3	70
3	LGR	21	19	399	--	--	--	--	15	5	55
4	RUN	32	19	608	--	--	--	--	20	5	55
5	HGR	30	25	750	--	--	--	--	20	--	55
6	RUN	34	19	646	--	--	--	--	35	4	65
7	LGR	26	16	416	--	--	--	--	20	11	65
8	RUN	54	13	702	--	--	--	--	30	11	65

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Elephant Rock Campground 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	31	22	682	--	--	--	--	35	18	80
2	LGR	13	21	273	--	--	--	--	25	7	80
3	GLD	51	14	714	--	--	--	--	20	17	75
4	SMB	30	17	510	--	--	--	--	40	28	80
5	LGR	52	20	1040	--	--	--	--	35	10	70
6	RUN	34	13	442	--	--	--	--	35	14	75
7	SMW	15	13	195	--	--	--	--	20	19	70
8	LGR	69	14	966	--	--	--	--	15	13	65

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hansen Creek 03/31//04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	67	15	1005	--	--	--	--	15	16	60
2	RUN	20	14	280	--	--	--	--	20	12	70
3	LGR	82	15	1230	--	--	--	--	15	10	65
4	RUN	19	15	285	--	--	--	--	25	29	75
5	LGR	49	14	686	--	--	--	--	15	9	70
6	RUN	27	14	378	--	--	--	--	25	18	75
7	LGR	159	18	2862	--	--	--	--	20	16	65

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Mill 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	56	12	672	--	--	--	--	40	27	70
2	LGR	116	14	1624	--	--	--	--	15	12	70
3	RUN	19	15	285	--	--	--	--	20	8	70
4	LGR	30	16	480	--	--	--	--	20	15	65
5	RUN	23	14	322	--	--	--	--	35	26	75
6	LGR	50	18	900	--	--	--	--	25	15	70
7	RUN	94	10	940	--	--	--	--	25	15	75
8	LGR	25	11	275	--	--	--	--	15	5	55

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Columbine, Downstream of Mill 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	47	13	611	--	--	--	--	20	18	55
2	HGR	54	18	972	--	--	--	--	30	--	45
3	RUN	44	14	616	--	--	--	--	25	11	45
4	LGR	40	19	760	--	--	--	--	20	20	50
5	SMB	9	19	171	--	--	--	--	25	14	60
6	RUN	46	14	644	--	--	--	--	25	20	55
7	LGR	58	18	1044	--	--	--	--	25	5	55
8	RUN	20	17	340	--	--	--	--	35	13	55

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Cabin Springs 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	16	78	1248	--	--	--	--	25	14	50
2	RUN	37	13	481	--	--	--	--	35	17	65
3	LGR	29	17	493	--	--	--	--	20	8	60
4	RUN	64	16	1024	--	--	--	--	75	24	60
5	LGR	41	13	533	--	--	--	--	25	10	70
6	SLR	49	12	588	--	--	--	--	50	16	75
7	SLR	27	11	297	--	--	--	--	25	7	65
8	LGR	32	15	480	--	--	--	--	20	7	60
9	RUN	21	15	315	--	--	--	--	25	15	60
10	LGR	62	15	930	--	--	--	--	30	15	45
11	SLR	38	16	608	--	--	--	--	60	17	55
12	LGR	25	13	325	--	--	--	--	50	47	55

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Goathill Campground 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	70	22	1540	--	--	--	--	10	16	50
2	SLR	33	14	462	--	--	--	--	15	7	55
3	HGR	42	28	1176	--	--	--	--	15	--	45
4	RUN	31	20	620	--	--	--	--	15	6	65
5	RUN	25	14	350	--	--	--	--	15	7	60
6	RUN	43	17	731	--	--	--	--	25	6	50
7	HGR	46	23	1058	--	--	--	--	20	--	45
8	RUN	48	16	768	--	--	--	--	20	8	60
9	HGR	53	15	795	--	--	--	--	15	--	45

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Questa Ranger Station 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	100	19	1900	--	--	--	--	10	6	30
2	RUN	22	21	462	--	--	--	--	20	10	35
3	LGR	88	20	1760	--	--	--	--	12	4	35
4	RUN	79	19	1501	--	--	--	--	15	7	45
5	LGR	78	18	1404	--	--	--	--	10	1	40
6	RUN	40	17	680	--	--	--	--	25	5	40
7	RUN	12	12	144	--	--	--	--	10	10	40
8	LGR	9	17	153	--	--	--	--	5	4	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Highway 522 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	25	19	475	--	--	--	--	10	7	30
2	LGR	34	17	578	--	--	--	--	3	7	30
3	RUN	21	20	420	--	--	--	--	5	5	30
4	LGR	365	25	9125	--	--	--	--	8	2	35
5	RUN	51	15	765	--	--	--	--	15	4	35

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Highway 522, Upstream of Outfall 002 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	44	16	704	--	--	--	--	5	5	25
2	LGR	134	20	2680	--	--	--	--	5	6	30
3	RUN	109	17	1853	--	--	--	--	10	11	35
4	LGR	71	17	1207	--	--	--	--	5	6	30

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of NPDES Outfall 002 03/30/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	76	17	1292	--	--	--	--	5	8	40
2	LGR	71	18	1278	--	--	--	--	5	6	20
3	RUN	23	14	322	--	--	--	--	10	4	25
4	LGR	14	16	224	--	--	--	--	5	7	20
5	RUN	51	14	714	--	--	--	--	8	5	30
6	LGR	31	15	465	--	--	--	--	5	3	25
7	RUN	83	20	1660	--	--	--	--	20	6	55
8	LGR	43	21	903	--	--	--	--	10	4	30

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Hatchery 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	50	23	1150	--	--	--	--	15	1	35
2	SPB	21	20	420	--	--	--	--	15	4	30
3	RUN	31	20	620	--	--	--	--	20	6	40
4	LGR	22	24	528	--	--	--	--	5	1	25
5	RUN	67	21	1407	--	--	--	--	15	4	35
6	HGR	87	20	1740	--	--	--	--	10	--	25
7	RUN	28	22	616	--	--	--	--	10	2	15
8	HGR	29	20	580	--	--	--	--	5	--	15

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hatchery 03/31/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	19	29	551	--	--	--	--	10	7	10
2	RUN	41	33	1353	--	--	--	--	15	3	10
3	LGR	29	31	899	--	--	--	--	8	4	10
4	RUN	91	22	2002	--	--	--	--	15	3	20
5	SLR	55	20	1100	--	--	--	--	30	8	35
6	HGR	12	20	240	--	--	--	--	20	--	20
7	RUN	39	20	780	--	--	--	--	25	8	30
8	LGR	28	23	644	--	--	--	--	12	8	25
9	SLR	41	21	861	--	--	--	--	30	6	40
10	HGR	15	38	570	--	--	--	--	8	--	20

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Cabresto Creek 09/24/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	SMB	11	11	121	1.8	1.0	1.1	4	20	--	35
2	LGR	13	9	117	0.9	--	0.4	3	5	2	15
3	RUN	24	10	240	1.0	0.3	0.6	2	10	4	30
4	LGR	27	10	270	0.9	--	0.4	3	15	7	35
5	RUN	16	10	160	1.1	0.7	0.6	2	5	1	30
6	LGR	13	12	156	0.9	--	0.4	1	5	1	30
7	SMB	10	8	80	1.1	0.3	0.9	3	10	1	30
8	LGR	22	9	198	1.1	--	0.5	2	15	5	30
9	RUN	22	12	264	0.9	0.5	0.6	2	20	8	30
10	LGR	80	11	880	0.9	--	0.4	3	5	10	25
11	RUN	21	11	231	1.3	0.9	0.7	2	30	8	30
12	LGR	67	13	871	0.9	--	0.4	2	10	7	35

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Columbine Creek 09/24/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	DMA	28	17	476	1.1	1.0	0.7	2	3	2	20
2	LGR	43	22	946	0.7	--	0.3	1	3	2	20
3	RUN	27	11	297	0.8	0.3	0.4	1	5	1	15
4	LGR	23	10	230	0.6	--	0.4	2	5	1	25
5	DMA	16	13	208	1.2	0.4	0.6	2	10	0	35
6	GLD	45	11	495	0.7	0.1	0.4	2	12	3	20
7	RUN	13	12	156	0.9	0.4	0.4	2	10	4	30
8	LGR	46	13	598	0.9	--	0.3	2	5	1	25
9	RUN	19	9	171	0.8	0.2	0.5	1	10	5	30
10	RUN	21	11	231	0.9	0.3	0.6	2	10	2	25
11	LGR	110	13	1430	0.6	0.4	0.4	2	10	4	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Town 09/20/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	60	18	1080	1.1	--	0.8	3	3	2	10
2	SLB	37	21	777	2.5	1.6	1.2	4	17	4	20
3	LGR	36	17	612	1.1	--	0.8	3	5	5	15
4	RUN	37	17	629	1.1	0.1	0.8	2	25	15	15
5	LGR	23	17	391	1.0	--	0.7	3	10	6	20
6	DMB	29	19	551	1.9	1.1	1.2	4	50	15	45
7	LGR	16	17	272	1.0	--	0.7	2	15	5	20
8	RUN	22	16	352	1.3	0.2	0.9	2	20	8	25
9	LGR	117	21	2457	1.3	--	0.8	4	15	6	30
10	RUN	44	18	792	1.8	0.8	0.7	3	20	11	30
11	LGR	27	20	540	0.9	--	0.7	2	25	7	35
12	SPW	8	18	144	1.9	0.7	1.2	2	10	--	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
June Bug Campground 09/23/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	90	17	1530	1.1	--	0.8	2	15	6	60
2	RUN	31	14	434	1.7	0.9	1.1	3	15	5	65
3	LGR	32	17	544	1.6	--	0.9	2	10	4	60
4	RUN	32	16	512	1.6	0.8	0.9	2	20	6	70
5	HGR	26	25	650	1.2	--	0.6	2	18	6	60
6	RUN	39	18	702	1.2	0.4	0.7	2	20	10	65
7	GLD	28	16	448	1.1	--	0.7	2	10	4	70
8	RUN	56	12	672	2	1.2	0.8	3	20	10	70

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Elephant Rock Campground 09/23/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	31	18	558	1.0	0.2	0.8	2	8	5	55
2	GLD	37	17	629	1.2	0.1	0.6	1	5	6	50
3	RUN	17	15	255	1.1	0.5	0.6	2	10	4	55
4	GLD	28	14	392	0.9	0.2	0.7	2	5	5	45
5	RUN	33	12	396	1.7	0.9	0.8	2	15	6	55
6	LGR	30	21	630	1.1	--	0.7	2	20	1	65
7	SMB	12	24	288	1.6	0.8	1.0	2	30	2	65
8	RUN	44	14	616	1.4	0.5	0.8	3	20	9	50
9	GLD	66	14	924	1.1	0.2	0.8	2	20	10	55

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hansen Creek 09/29/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	166	16	2656	1.3	--	0.8	2	60	19	70
2	RUN	27	15	405	1.4	0.3	1.0	1	50	22	80
3	LGR	57	12	684	1.3	--	1.0	2	45	22	70
4	RUN	18	12	216	1.5	0.4	1.1	2	55	35	80
5	LGR	161	16	2576	1.3	--	0.9	2	35	27	70

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Mill 09/29/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	51	13	663	2.8	1.5	1.4	2	75	22	85
2	LGR	110	16	1760	1.3	--	0.8	2	25	19	75
3	SLW	26	13	338	1.9	0.9	1.0	2	25	20	75
4	LGR	24	18	432	1.1	--	0.8	2	25	16	70
5	RUN	28	13	364	1.8	0.7	1.1	2	50	16	80
6	LGR	62	19	1178	1.4	--	0.9	2	35	12	70
7	RUN	62	13	806	1.5	0.5	1.1	3	30	11	75
8	LGR	41	10	410	1.9	--	1.0	2	25	6	70

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Columbine, Downstream of Mill 09/29/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	45	13	585	1.5	--	1.0	2	20	22	55
2	HGR	63	17	1071	1.3	--	0.9	2	30	27	50
3	RUN	54	16	864	1.5	0.3	0.9	1	25	16	50
4	LGR	37	20	740	1.2	--	0.8	2	20	16	50
5	SMB	9	17	153	1.5	0.4	1.1	1	30	10	60
6	RUN	45	12	540	1.5	0.4	1.0	2	25	22	70
7	LGR	76	17	1292	1.4	--	0.8	2	30	23	65

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Cabin Springs 09/27/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	14	16	224	0.9	--	0.6	2	40	7	60
2	RUN	31	12	372	1.5	0.7	1.4	2	60	29	80
3	LGR	40	15	600	1.4	--	1.1	2	30	33	65
4	RUN	57	16	912	1.1	0.3	0.9	2	75	32	80
5	LGR	40	13	520	1.3	--	1.0	2	30	20	75
6	SLR	59	12	708	1.8	0.8	1.3	2	60	32	85
7	SLR	32	11	352	2.0	1.0	1.6	3	50	32	80
8	LGR	29	15	435	1.1	--	1.0	2	30	23	60
9	RUN	25	12	300	1.3	1.0	1.1	1	45	29	60
10	LGR	66	13	858	1.4	--	1.0	2	35	21	55
11	SLR	21	15	315	1.4	0.4	0.9	2	60	24	65
12	LGR	37	12	444	1.6	0.5	1	2	40	20	60

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Goathill Campground 09/23/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	72	20	1440	1.5	--	0.9	3	20	6	55
2	SLR	35	14	490	2.0	1.0	1.3	4	15	7	55
3	HGR	41	28	1148	1.1	--	1.0	3	20	6	50
4	RUN	34	22	748	2.2	0.9	1.3	3	15	3	55
5	RUN	27	14	378	1.8	0.7	1.1	3	15	4	55
6	RUN	44	18	792	1.7	0.5	1.1	2	30	3	50
7	HGR	53	24	1272	1.7	--	0.9	3	15	6	45
8	RUN	44	16	704	1.9	0.5	0.8	3	15	4	55
9	HGR	48	14	672	1.6	--	1.1	3	10	2	40

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Questa Ranger Station 09/23/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	LGR	100	20	2000	1.3	--	0.8	3	10	5	30
2	RUN	25	21	525	1.3	0.3	0.8	2	15	3	35
3	LGR	86	26	2236	1.1	--	0.7	3	12	5	40
4	RUN	74	20	1480	1.2	0.4	0.7	2	15	5	45
5	LGR	30	19	570	1.2	--	0.7	2	10	2	35
6	RUN	17	21	357	1.7	0.9	0.8	2	30	2	40
7	LGR	51	16	816	1.3	--	0.7	2	12	2	40
8	RUN	36	17	612	2.0	0.8	1.0	3	25	4	45
9	LGR	13	19	247	1	--	0.7	2	5	--	25

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Highway 522 09/24/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	58	20	1160	1.4	0.3	0.9	2	15	8	35
2	LGR	26	18	468	1.0	--	0.7	2	10	8	35
3	RUN	29	20	580	1.3	0.4	0.8	2	15	13	45
4	LGR	354	23	8142	1.1	--	0.7	3	15	7	40
5	RUN	44	17	748	1.4	0.5	1	2	30	21	50

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Highway 522, Upstream of Outfall 002 09/28/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	44	18	792	1.1	0.3	0.8	2	15	7	35
2	LGR	134	17	2278	1.1	--	0.7	3	10	10	35
3	RUN	104	17	1768	1.1	0.3	0.8	2	15	8	40
4	SLW	23	20	460	2.0	1.2	1.0	3	25	14	40
5	LGR	68	19	1292	0.9	--	0.7	3	10	5	35

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of NPDES Outfall 002 09/28/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	81	17	1377	1.7	1.1	1.3	2	5	4	35
2	LGR	79	18	1422	1.3	--	0.9	3	5	3	20
3	SMW	17	14	238	1.8	0.6	1.2	3	15	4	25
4	LGR	15	15	225	1.2	--	0.9	3	5	7	25
5	RUN	49	15	735	1.5	0.5	1.1	2	5	9	30
6	LGR	24	14	336	1.2	--	0.8	2	5	2	25
7	RUN	57	21	1197	1.8	0.7	1.2	4	20	14	30
8	LGR	103	21	2163	1.4	--	0.8	2	15	6	35

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Upstream of Hatchery 09/23/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	HGR	59	27	1593	2.2	--	1.4	3	30	5	45
2	SPB	15	22	330	3.3	1.5	2.0	5	15	2	30
3	RUN	31	20	620	2.4	0.9	1.4	3	25	10	55
4	LGR	24	24	576	1.0	--	1.1	2	15	13	40
5	RUN	68	19	1292	3.0	1.0	1.7	4	25	8	45
6	HGR	87	20	1740	2.3	--	1.3	4	15	6	35
7	RUN	27	24	648	3.0	2.0	1.5	4	10	4	15
8	HGR	34	20	680	2.5	--	1.6	4	5	--	15

Appendix B-4f
Aquatic Biota - Other Habitat Evaluation
Downstream of Hatchery 09/21/04

Habitat Unit #	Habitat Type	Length (ft)	Wetted Width (ft)	Area (ft^2)	Maximum Depth (ft)	Residual pool depth (ft)	Average Depth (ft)	Quality Rating	% Fines by Area	% Fines by Grid	% Embeddedness
1	RUN	40	33	1320	1.7	0.4	0.9	3	20	7	20
2	LGR	24	31	744	1.5	--	0.7	3	10	9	15
3	RUN	89	25	2225	2.1	1.0	1.3	5	25	10	20
4	SLR	53	22	1166	3.2	1.2	1.7	4	40	0	35
5	HGR	16	18	288	2.1	--	1.5	2	20	--	20
6	RUN	44	22	968	2.9	1.0	1.7	4	30	6	35
7	LGR	26	23	598	1.9	--	1.2	2	15	5	25
8	SLR	46	23	1058	3.3	1.4	1.5	5	20	8	40
9	HGR	16	40	640	1.6	--	1.2	2	5	--	20

APPENDIX B-4g
OTHER DATA - RI ADDENDUM - TRANSECT STUDY
BENTHIC INVERTEBRATE POPULATION

Appendix B-4g
Aquatic Biota - Transect Study
Transect Study - North Bank - September 2004

INSECTA TRANSECTS	101	102	103	104
EPHEMEROPTERA	**407**	**891**	**1139**	**312**
Baetis bicaudatus	141	74	363	43
Baetis tricaudatus	224	669	560	220
Drunella doddsi	0	0	0	0
Drunella grandis	41	147	212	48
Ephemerella dorothea	0	0	0	0
Paraleptophlebia sp.	0	0	0	0
Rhithrogena hageni	1	1	4	1
PLECOPTERA	**2**	**4**	**9**	**2**
Capniidae	0	0	0	0
Isoperla sp.	0	0	0	0
Leuctridae	0	0	0	0
Megarcys signata	0	0	0	0
Pteronarcella badia	0	0	0	0
Sweltsa sp.	2	4	9	2
Zapada cinctipes	0	0	0	0
TRICHOPTERA	**294**	**1988**	**3987**	**325**
Arctopsyche grandis	2	3	4	1
Brachycentrus americanus	275	1957	3943	318
Glossosoma sp.	0	0	0	0
Hydropsyche sp.	17	20	22	5
Lepidostoma sp.	0	0	2	0
Oligophlebodes minutus	0	0	0	0
Rhyacophila coloradensis gr.	0	0	11	0
Rhyacophila sibirica gr.	0	3	5	0
Rhyacophila sp.	0	5	0	1
OTHER	**51**	**617**	**265**	**88**
TOTAL (#/1 min. kick)	754	3500	5400	727
TOTAL EPT TAXA	8	10	11	9
# EPHEMEROPTERA TAXA	4	4	4	4
% EPT (% of Total Density)	93	82	95	88
% EPHEMEROPTERA (% of Total Density)	54	25	21	43
% HEPTAGENIIDAE (% of Total Density)	<1	<1	<1	<1

Appendix B-4g
Aquatic Biota - Transect Study
Transect Study - North Bank - September 2004

TRANSECTS	101	102	103	104
EPHEMEROPTERA	**64**	**603**	**103**	**77**
Baetis bicaudatus	16	144	32	23
Baetis tricaudatus	32	394	60	39
Drunella doddsi	0	0	0	0
Drunella grandis	8	65	9	14
Ephemerella dorothea	0	0	0	0
Paraleptophlebia sp.	0	0	0	0
Rhithrogena hageni	8	0	2	1
PLECOPTERA	**3**	**0**	**2**	**1**
Capniidae	0	0	0	0
Isoperla sp.	0	0	0	0
Leuctridae	1	0	0	0
Megarcys signata	0	0	0	0
Pteronarcella badia	0	0	0	0
Sweltsa sp.	2	0	2	1
Zapada cinctipes	0	0	0	0
TRICHOPTERA	**19**	**786**	**38**	**31**
Arctopsyche grandis	1	2	1	3
Brachycentrus americanus	16	778	33	28
Glossosoma sp.	0	0	0	0
Hydropsyche sp.	2	5	2	0
Lepidostoma sp.	0	0	1	0
Oligophlebodes minutus	0	0	0	0
Rhyacophila coloradensis gr.	0	0	0	0
Rhyacophila sibirica gr.	0	0	0	0
Rhyacophila sp.	0	1	1	0
OTHER	**34**	**154**	**38**	**29**
TOTAL (#/1 min. kick)	120	1543	181	138
TOTAL EPT TAXA	23	23	23	23
#EPHEMEROPTERA TAXA	4	3	4	4
% EPT (% of Total Density)	72%	90%	79%	79%
% EPHEMEROPTERA (% of Total Density)	53%	39%	57%	56%
% HEPTAGENIIDAE (% of Total Density)	7%	0%	1%	1%

Appendix B-4g
Aquatic Biota - Transect Study
Transect Study - North Bank - September 2004

TRANSECTS	101	102	103	104
EPHEMEROPTERA	**343**	**105**	**188**	**278**
Baetis bicaudatus	82	15	98	64
Baetis tricaudatus	203	82	69	99
Drunella doddsi	0	0	0	0
Drunella grandis	50	7	21	114
Ephemerella dorothea	0	0	0	0
Paraleptophlebia sp.	0	0	0	0
Rhithrogena hageni	8	1	0	1
PLECOPTERA	**1**	**1**	**0**	**2**
Capniidae	0	0	0	0
Isoperla sp.	0	0	0	0
Leuctridae	0	0	0	0
Megarcys signata	0	0	0	0
Pteronarcella badia	0	0	0	0
Sweltsa sp.	1	1	0	2
Zapada cinctipes	0	0	0	0
TRICHOPTERA	**414**	**72**	**261**	**2972**
Arctopsyche grandis	5	5	2	3
Brachycentrus americanus	375	63	244	2955
Glossosoma sp.	0	0	0	0
Hydropsyche sp.	33	4	8	8
Lepidostoma sp.	0	0	0	0
Oligophlebodes minutus	0	0	0	0
Rhyacophila coloradensis gr.	0	0	7	1
Rhyacophila sibirica gr.	0	0	0	0
Rhyacophila sp.	1	0	0	5
OTHER	**92**	**34**	**30**	**238**
TOTAL (#/1 min. kick)	850	212	479	3490
TOTAL EPT TAXA	23	23	23	23
# EPHEMEROPTERA TAXA	4	4	3	4
% EPT (% of Total Density)	1	1	1	1
% EPHEMEROPTERA (% of Total Density)	0	0	0	0
% HEPTAGENIIDAE (% of Total Density)	0	0	0	0

APPENDIX B-4h
RI ADDENDUM - TRANSECT STUDY
OTHER HABITAT EVALUATION

Appendix B-4h
Aquatic Biota - Transect Study
Sept. 21-22, 2004

Transect #	101	102	103	104
PARAMETER				
1. Epifaunal Substrate/Available Cover	10	11	8	7
2 Embeddedness	7	8	6	5
3. Velocity/Depth Regime	9	11	7	9
4. Sediment Deposition	12	7	10	8
7. Frequency of Riffles (or Bends)	20	20	15	18
8a. Bank Stability (Left)	7	5	7	6
8b. Bank Stability (Right)	7	4	5	7
SUBSTRATE (% COMPOSITION)				
Bedrock	0	0	0	0
Boulder	15	20	15	15
Cobble	30	35	30	15
Gravel	15	15	10	40
Sand	38	29	45	28
Silt	2	1	0	2
Clay	0	0	0	0