MINISTRY OF ENVIRONMENT
PROVINCE OF BRITISH COLUMBIA

THE ATTAINMENT OF AMBIENT WATER QUALITY OBJECTIVES IN 1989

Water Management Division

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The regional staff of Environmental Protection (previously called Waste Management) carried out most of the monitoring, either directly or through contractors. Zenon Environmental Inc. analysed the samples. Information was also obtained from industries via Environmental Protection, from the Canada-B.C. Water Quality Monitoring Agreement, from regional offices of the Ministry of Health, from the federal departments of Environment and of Fisheries and Oceans, and from the Greater Vancouver Regional District.

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1. SUMMARY

By the end of 1989, the Ministry had set water quality objectives in 24 bodies of water throughout the Province. These objectives represent safe conditions or levels of contaminants which will protect the most sensitive water use in each body of water. This report presents the results of monitoring done to check attainment of the objectives in 1989. The report is for the use of the managers of the water resource and will help guide them in carrying out more detailed assessments of the results. Familiarity with the background reports on water quality objectives for each basin is assumed.

The objectives to protect various water uses were set in water basins where water quality problems due to human activity were expected. The monitoring results indicate how well the quality of water in these basins is being safeguarded and thereby, indirectly, how well problems are being dealt with. Although the report does not describe the state of water quality in the Province as a whole, the information will be useful in state-of-the-environment-type reporting.

Results of monitoring to check water quality objectives are summarized in a series of tables. Overall, the objectives were met more than 90 percent of the time, a result similar to that found in 1988. Although this result falls short of an ideal 100 percent compliance, we must bear in mind that objectives are only set in problem areas. Variables for which objectives were sometimes exceeded included fecal coliforms, suspended solids, turbidity, nutrients, dissolved oxygen, pH, temperature, colour, cyanide, copper, iron, zinc, and chlorophenols. Objectives

for these variables were not, of course, exceeded in all the water basins tested.

Cases of objectives being exceeded should be assessed to determine the cause and the possible need for corrective action. Monitoring in future years will indicate whether the problem is persisting or the situation is improving.

The monitoring in 1989 was the third year for this program which began in 1987. In the future, new basins will be added and monitoring will be discontinued in areas where objectives are being met consistently. This will tend to change the overall results as we focus the program more on only those areas where there are many man-made water quality problems.

2. INTRODUCTION

In 1981, the Auditor General recommended that the Ministry develop a method of measuring its performance in safeguarding water quality. To fulfill this recommendation, the Ministry undertook to set water quality objectives for fresh and marine surface waters of British Columbia.

Water quality objectives are safe conditions or levels of contaminants which will protect the most sensitive water use of a specific body of water. They establish a reference against which the state of water quality at a specific site can be checked, as recommended by the Auditor General. They can also be used to prepare Waste Management Permits and to measure their effectiveness. They are thus a basic tool for use in maintaining a sustainable environment.

Work on water quality objectives began in 1982. By the beginning of 1990, objectives had been set in 24 separate bodies of water. In each water basin considered, some type of water quality problem could be expected due to human activity. Objectives have been set for lakes, rivers, creeks, and marine areas in all six Environmental Regions in the Province.

This report for 1989 is the fourth in a series of annual reports which began in 1986. In 1987, 1988, and 1989 funds were allocated for the ambient monitoring needed to check attainment of the objectives. As a result, a fairly accurate account of the attainment of objectives was obtained in 1987 and 1988 and is again given here for 1989.

The water basins in which water quality objectives are set are usually chosen because of perceived water quality

problems. Thus, results presented here indicate conditions in likely problem areas, but do not reflect the state of water quality in the Province as a whole. This is because there are many bodies of water where water quality is relatively unaffected by man and likely to remain so for the foreseeable future. Nevertheless, reports of this type will provide some of the basic data on water quality needed for "state-of-the-environment reporting" now being considered for British Columbia.

3. METHOD OF PRESENTING AND INTERPRETING THE MONITORING DATA

3.1 REPORTS ON OBJECTIVES

By the end of 1989, the Ministry of Environment had completed 24 reports on water quality objectives for specific bodies of water. The complexity and size of the reports varied considerably, depending upon the body of water considered. These bodies of water were distributed among the Environment Regions as follows:

Vancouver Island	2
Skeena	4
Northern Interior	8
Southern Interior	4
Kootenay	2
Lower Mainland	4

Work is in progress on another 22 reports for different water basins. These reports are now at various stages of completion.

3.2 TABLES OF RESULTS

Data collected in 1989 to check objectives are summarized in Tables 2 to 23, with a separate table for each water basin (the objectives for the 24th basin, namely tributaries to the lower Fraser River along the north shore, were not checked in 1989 because the report was finalized too late in the year).

Each table lists all the objectives that have been set, as they appear in the final reports on objectives. A few of the objectives have been updated to reflect new water quality criteria and procedures. For example, we are now using chlorophyll-a instead of periphyton biomass, and

total ammonia-N instead of un-ionized ammonia-N. The 90th percentile of 400 MPN/ 100 mL for fecal coliforms in bathing waters is used in cases when high fecal coliform values were recorded. The tables summarize the measurements made to check the objectives. These include sites, sampling dates, number of samples taken, and the values obtained. The sites and tributaries are listed in the tables in an upstream to downstream sequence, starting with the upstream site or tributary. Finally, a concluding statement about the results is given.

The conclusion states whether the objective was met or not met. The result is reported as indefinite if there are insufficient data to check the objective, or the data are suspect, or the minimum detectable concentration is too high. If no data were collected, the objective is reported as not checked. We consider these tables to be the most important part of this report since they demonstrate, in a factual way, how well objectives were met in 1989.

3.3 TEXT

The text in this report first gives a provincial overview of the results. We then describe briefly, by Region, the tabulated data for each body of water, mentioning the highlights and drawing some general conclusions. Qualifying statements such as: "The objectives were nearly met, slightly exceeded or probably met" are avoided as being too speculative without the support of further evidence to explain them. Thus, objectives exceeded by a wide margin are categorized equally with apparent borderline cases. While a more detailed interpretation is desirable, the work required to document the significance of results in more detail is beyond the scope of this report.

There is also no attempt to explain what may have caused the results or to comment on the effect of objectives not being met. Such assessments would entail consideration of flows, discharges, whether objectives are long term or short term, the degree to which objectives are exceeded, and many other factors. Assessments of this type are presently carried out by Regional Environmental Protection (previously Waste Management) on an ongoing basis.

The report is written to guide those involved in managing water quality by allowing them to focus on areas of concern where further assessment or inspection may be needed. Since monitoring to check water quality objectives covers only a short time span, usually at most 30 days, we believe that any instance when objectives were not met, however close the result, could be significant and is worth a more detailed look. Further study could show that certain objectives were exceeded due to natural phenomena. On the other hand it could reveal the need for corrective action if the cause of the problem was man-made.

3.4 FIGURES

The 24 water basins where objectives have been set are shown on a location map in Figure 1. The water basins (excluding the lower Fraser River tributaries) are also detailed in separate maps, Figures 2 to 23, on which sampling locations referred to in the tables are shown. Each figure number corresponds to the table of the same number.

4. PROVINCIAL OVERVIEW OF RESULTS

4.1 PRESENTATION OF RESULTS

In the tables summarizing the monitoring data, there are four kinds of concluding statements. These are: objective met, objective not met, objective not checked, and indefinite result.

To get an overview of performance for the Province, the number of occurrences for which objectives were met, not met, not checked, or were indefinite are totalled for each water basin from the summary tables. In compiling these totals, we counted each instance of a maximum (or minimum) objective being met or not met, as well as all average and percentile values.

The results of this compilation are shown in Table 1. The sum of occurrences for each kind of conclusion is given by Region and then totalled for the whole Province. The occurrences are also expressed as a percent of the total of all occurrences, both by Region and for the Province as a whole.

4.2 DISCUSSION OF RESULTS

Although the results apply to specific occurrences, we have assumed in this analysis that they are representative of the whole year. This simplification is justified, in part, by the fact that data were usually collected during worst case conditions.

Table 1 shows that the objectives were met 86% of the time in the Province as a whole. This result varied according to Region over a fairly small range, from 73% to

92%. Objectives were not met from between 3% to 10% of the time, with an overall average of 8%.

The occurrences of objectives not being checked and of indefinite results averaged 2.5% and 3.5%, respectively. If we subtract these relatively minor instances of no result from the total, then the percent of time that objectives were met and not met becomes 92% and 8%, respectively.

We can therefore state that in the Province as a whole the objectives were met over 90% of the time in 1989. This is an approximate statement since the frequency at which objectives are tested can vary among Regions and thus influence this value. For example, in the Middle Quinsam Lake basin of the Vancouver Island Region most of the objectives were not checked because there was no need to do so. This was because the coal mine that could affect the water quality of Middle Quinsam Lake was operating below 5% capacity in 1989.

The overall result for 1989 was virtually the same as for 1988, with only a marginal increase in cases of objectives not being met. As the monitoring program is repeated in future years the general picture could change. New basins will be added and there will be a tendency to cease monitoring in areas where objectives are being met consistently by a wide margin. As a first priority, we will concentrate on areas where man-made water quality problems occur. The goal, of course, is for water quality objectives to be met 100% of the time in such areas. It will be important to see how close we can get to this ideal situation in the future.

5. VANCOUVER ISLAND REGION

5.1 COWICHAN-KOKSILAH RIVERS

Data and site locations are presented in Table 2 and Figure 2, respectively.

The Cowichan River is the most important river on Vancouver Island for recreational and commercial fisheries. The Koksilah River is a major tributary of the Cowichan River near its mouth.

The objectives for microbiological indicators (fecal coliforms, *E. coli*, and enterococci) were generally not met in either river. These objectives are fairly restrictive since they were set to protect drinking-water use after disinfection only. The less restrictive objectives to protect recreation were met. The sources of possible bacteriological contamination need to be established.

Dissolved oxygen levels, measured in late summer and fall, were sometimes below the objective levels in both rivers. Although the levels were still high enough so as to not be an immediate threat to fish, we need to ascertain their cause.

The objectives for turbidity, suspended solids, ammonia, copper, lead, and zinc were met throughout both rivers. Objectives for chlorophyll-*a* and total chlorine residual were not checked in the Cowichan River.

5.2 MIDDLE QUINSAM LAKE

Data and site locations are presented in Table 3 and Figure 3, respectively.

Middle Quinsam Lake drains via the Quinsam River into the Campbell River near its estuary. The Middle Quinsam Lake sub-basin is a valuable habitat for trout and salmon and could be impacted by an open-pit coal mine now being developed in the area.

Not all the objectives needed to be checked because no effects on water quality were expected from the mine which operated at less than 50% capacity in 1989.

None of the objectives tested were exceeded. Objectives met included turbidity, suspended solids, ammonia, nitrate, pH, aluminum, arsenic, copper, iron, lead, manganese, and zinc. The results for cadmium, cobalt, and nickel were indefinite because detection limits were too high.

6. SKEENA REGION

6.1 BULKLEY RIVER

Data and site locations are presented in Table 4 and Figure 4, respectively.

The Bulkley River is a major tributary to the Skeena River. It is an important river for fisheries and has some drinking water use.

The objective for fecal coliforms was met where measured except just upstream from Houston. All other water quality objectives were met. This is the same result as obtained in 1988. Both show an improvement over 1987 when the objectives for chlorophyll-a as well as for fecal coliforms were exceeded.

The Morice River objectives were not checked since the river will not now be affected by Kemano completion.

6.2 KATHLYN, SEYMOUR, ROUND, AND TYHEE LAKES

Data and site locations are presented in Table 5 and Figure 5, respectively.

These four small lakes, in the Smithers area, are used for recreation, domestic water supply, and irrigation.

The fecal coliform objectives were generally met at domestic water intakes and beaches in all four lakes, except at an intake in Kathlyn Lake and one in Seymour Lake. These results suggest a minor deterioration since 1988.

The objectives for turbidity were exceeded at times in all four lakes. The objective for colour was met in Kathlyn and Tyhee lakes but exceeded in Seymour Lake and at times in Round Lake.

The total phosphorus objective could not be checked because spring overturn sampling was missed. The objectives for phosphorus are long-term since the lakes have a history of eutrophication.

6.3 LOWER KITIMAT RIVER AND ARM

Data and site locations are presented in Table 6 and Figure 6, respectively.

The river and arm are a migration route for salmonids, and the water is used for recreation and for industrial and municipal supplies. A kraft pulp mill and an aluminum smelter are located in the water basin.

The objectives for fecal coliform to protect recreation were met in Kitimat Harbour and Kitimat Arm. The stricter fecal coliform objectives to protect shellfish harvesting were met at certain sites in Kitimat Arm, although these sites are presently closed to shellfish harvesting.

The objective for suspended solids was exceeded at times in the Kitimat River and the Harbour, but met in the Arm. The objective for turbidity was met throughout.

The objective for average nitrite-nitrogen was not met in the Kitimat River, even upstream from all discharges, and the maximum objective was not met on occasion. The same situation was encountered in 1988.

There were some instances of objectives being exceeded for total copper and total iron in Kitimat Harbour and Arm, but objectives for other metals were generally met, including those for total aluminum, total cadmium, and total lead. Similar results were reported in 1988. For total aluminum, levels below the minimum detection limit used (0.5 mg/L) were considered to meet the objective.

Objectives for toxic contaminants such as cyanide, fluoride, and ammonia-nitrogen were met generally at all sites tested. Exceptions occurred in the harbour where levels of cyanide and fluoride exceeded the objectives on a few occasions. In the case of cyanide, our criteria document recommends that measurements below the current detection limit of 0.005 mg/L be considered acceptable.

The objective for pulp mill toxicity has yet to be checked in the Kitimat River.

6.4 LAKELSE LAKE

Data and site locations are presented in Table 7 and Figure 7, respectively.

Lakelse Lake drains into the Skeena River and is important for salmon spawning and rearing and for recreation. It is also used as a domestic water supply.

The objective for fecal coliforms was met at all water intakes tested. The same result was obtained in 1988.

All other objectives checked were met, as they had been in 1988 and 1987. These included objectives for turbidity, total phosphorus, and chlorophyll-a.

A measurement to check the dissolved oxygen objective was made for the first time and showed this objective was met.

7. NORTHERN INTERIOR REGION

7.1 CHARLIE LAKE

Data and site locations are presented in Table 8 and Figure 8, respectively.

Charlie Lake is used as a drinking water supply and for recreation.

At the bathing beaches, the geometric mean fecal coliform objective was met and the 90th percentile objective was usually met. There were no beach closures, an improvement over 1988. In the body of the lake, at the Fort St. John intake and Scurry intake, the more stringent fecal coliform objective to protect drinking water was not met. This represents a deterioration over 1988 and 1987 when the objective was met.

The total phosphorus objective was generally not met, except for at times in the centre and the North Arm of the lake. These results indicate that the lake continues to be in a eutrophic state.

7.2 BULLMOOSE CREEK

Data and site locations are presented in Table 9 and Figure 9, respectively.

Bullmoose Creek and its branches (West and South Bullmoose Creek) are adjacent to an open pit coal mine and contain important recreational fish habitat.

The objectives for turbidity and suspended solids were exceeded on occasion downstream from the sedimentation ponds. The problem occurred in May or June, presumably

during the freshet period. The objective for chlorophyll-a, checked in the fall, was often exceeded.

Objectives that were met included fecal coliforms, ammonia-nitrogen, nitrite-nitrogen, nitrite plus nitrate nitrogen, and pH. The dissolved oxygen objective was not checked in 1989.

The substrate sedimentation objective has yet to be checked in this basin.

7.3 NECHAKO RIVER

Data and site locations are presented in Table 10 and Figure 10, respectively.

The Nechako River, a major tributary to the Fraser River at Prince George, has its flow controlled for power generation. The river is an important route for migrating salmon.

The fecal coliform objective was met in the Stuart River, a tributary to the Nechako from the north side, and in the Necoslie River which is a tributary to the Stuart. In the Nechako River, where the objective is less stringent, the objective was met only immediately upstream from Vanderhoof and exceeded elsewhere. The objective was met in the Chilako River, a tributary to the Nechako from the southside, where it was measured for the first time.

Other objectives which were met in the Nechako, Stuart, and Chilako rivers, as applicable, included ammonia-nitrogen, nitrite-nitrogen, dissolved oxygen, and pH. The chlorophyll-a objective was not checked in any of the rivers in 1989.

The temperature objective at a site 8 km downstream from Cheslatta Falls was met during the winter months, from January to nearly the end of June and after mid-September. However, during the summer months the objective was frequently exceeded. A similar result was obtained in 1988 and 1987. A cold water release structure planned for the Kenney Dam will presumably correct the problem.

The objective for total gas pressure was checked for the first time in the Nechako River and was met throughout.

7.4 PINE RIVER

Data and site locations are presented in Table 11 and Figure 11, respectively.

The Pine River, a tributary to the Peace River, supplies water to Chetwynd and supports significant sportfish populations.

All objectives checked were met. These included objectives for fecal coliforms, turbidity, suspended solids, ammonia-nitrogen, nitrite-nitrogen, chlorophyll-a, and dissolved oxygen.

A thermal-mechanical pulp mill is being built near the Pine River, downstream from the Murray River. Although the plan is for zero-discharge, water quality objectives should be updated in the future.

7.5 POUCE COUPE RIVER

Data and site locations are presented in Table 12 and Figure 12, respectively.

The Pouce Coupe River and its tributary, Dawson Creek, run into the Peace River inside the Alberta Border. The waters are affected mainly by municipal discharges.

The fecal coliform objective for the Pouce Coupe River was met, as it was in 1988.

Turbidity and suspended solids objectives were met in the Pouce Coupe River but were often exceeded in Dawson Creek.

The objectives for nitrite-nitrogen were met in both streams. Those for ammonia-nitrogen were sometimes exceeded in both streams, especially in Dawson Creek.

The chlorophyll-a objective was not met in the Pouce Coupe, downstream from the municipal discharge, a result similar to 1988 and 1987, but was not checked in Dawson Creek. The dissolved oxygen objective was not checked in either stream in 1989.

7.6 PEACE RIVER

Data and site locations are presented in Table 13 and Figure 13, respectively.

Objectives were set for the Peace River between the Bennett Dam and the B.C.-Alberta Border. The water is important for aquatic life and irrigation and can be affected by municipal discharges, an oil and gas refinery and a pulp mill built in 1988, after the objectives were set. The objectives were first checked in 1988.

The following objectives were met in both the Peace River and the Beatton River (a tributary), as applicable: fecal coliforms - except immediately downstream from the

pulp mill, fluoride, cyanide, ammonia-nitrogen, nitrite-nitrogen, dissolved oxygen, and pH. The temperature objective was met throughout except for one instance downstream from the pulpmill. The result for sulfide was indefinite because the detection limit was too high.

Turbidity and suspended solids objectives were generally met in the Peace River and also in the Beatton River except downstream from the Fort St. John discharges and from the pulpmill. The objective for chlorophyll-a was not checked in 1989 although it was generally not met in the Peace River in 1988.

Regarding heavy metals, the objectives for total lead and total nickel were met in the Peace River. The objectives for total copper were exceeded immediately downstream from the refinery. The objective for total chromium was exceeded immediately downstream from Fort St. John. The objective for total zinc was met except on one occasion downstream from Fort St. John.

Regarding organics, the results for chlorophenols were strictly indefinite but the objective was considered to be met because of the low detection limits used. The objective for phenols was also met, except immediately downstream from Petro-Canada. The objective for 2,4-D was not checked although it was met at all sites in 1988.

The objective for dissolved gas was checked for the first time and was met throughout the Peace River.

7.7 WILLIAMS LAKE

Data and site locations are presented in Table 14 and Figure 14, respectively.

Williams Lake is important for drinking water, recreation, and aquatic life. The water quality is affected by nutrients from traditional farming practices in the San Jose drainage, the main inlet to the lake.

The objective for fecal coliform to protect bathing beaches was met. The fecal coliform objective to protect drinking water was also met.

The total phosphorus and chlorophyll-a objectives were not met, indicating the continued eutrophic state of the lake.

Objectives for turbidity and dissolved oxygen were not met although water clarity was met on the single occasion it was measured. Such results can be expected in a eutrophic lake until some form of lake restoration is carried out.

7.8 UPPER FINLAY RIVER

This area was the site of a gold and silver mine and mill, now closed. Objectives applied to Jock and Galen creeks which eventually flow into the Upper Finlay River.

The objectives were checked in 1987. Since the area is remote and the operation is closed, no further monitoring was carried out in 1988 and 1989. The mill was reactivated in 1989 and therefore future monitoring may be needed.

8. SOUTHERN INTERIOR REGION

8.1 BONAPARTE RIVER

Data and site locations are presented in Table 15 and Figure 15, respectively.

The Bonaparte River is a tributary to the Thompson River. It is an important trout habitat and is affected by cattle farming and municipal discharges. Its main tributaries are Clinton Creek and Loon Creek.

The fecal coliform objective was met in the upper reaches of the Bonaparte River. In Clinton Creek, the objective was met, a reverse of the 1988 result. The objective was also met near the mouth of the Bonaparte River but exceeded downstream from the Cache Creek sewage treatment plant. The fecal coliform objective was not met in Loon Creek, also a reverse of the 1988 result. The more restrictive objective for Loon Lake was met, however.

The objectives for suspended solids and turbidity were frequently not met during freshet in the Bonaparte River, although they were met in Clinton Creek and in Loon Creek. Since suspended material entered the streams from diffuse sources, only one upstream control site was used to check these objectives.

An objective for dissolved solids, applicable only to Clinton Creek, was not checked in 1989 although the objective was exceeded in 1988.

The objectives for ammonia-nitrogen were met in the Bonaparte River and in Clinton and Loon creeks. The same result was obtained for nitritenitrogen.

The chlorophyll-a objective was not met in the Bonaparte River. A less stringent objective for Clinton Creek was not checked in 1989.

The dissolved oxygen objective was not checked in the Bonaparte River and was not met in the summer in Loon Lake. The pH objective was met in the Bonaparte River and in Loon Creek, but was occasionally exceeded in Clinton Creek, a similar result to 1988. Clinton Creek may have a naturally high pH level.

8.2 OKANAGAN VALLEY LAKES

Data and site locations are presented in Table 16 and Figure 16, respectively.

Objectives have only been set so far for phosphorus, which is the main factor controlling the trophic state of the lakes. The lakes are highly valued for recreation, fisheries, and as a source of drinking and irrigation water.

The total phosphorus objective was met in Kalamalka Lake and in the main body of Okanagan Lake. The results for Armstrong Arm and Vernon Arm were indefinite because sampling was not done at spring overturn. The objective has been exceeded historically in the arms. The objective was not met in Wood Lake, Skaha Lake, or Osoyoos Lake.

These results were similar to those obtained in 1987 and 1988.

8.3 SIMILKAMEEN RIVER

Data and site locations are presented in Table 17 and Figure 17, respectively.

The Similkameen River is important for fisheries, drinking water, and irrigation. Water quality can be affected by mining and municipal discharges. The water quality objectives were updated in 1990 because of an increase in mining activity.

The fecal coliform objective, set to protect the water for drinking after disinfection only, was exceeded at times in the Similkameen River but was met in Allison Creek, a tributary. In the main lakes draining to the Similkameen River (Allison, Osprey, and Missezula lakes), the results were indefinite because of too few samples.

Objectives for ammonia-nitrogen and pH were met in the Similkameen River. The pH objective was also met in Wolfe Creek, a tributary adjacent to a copper mine.

The total phosphorus objective was exceeded in Missezula Lake, measured at the wrong time in Allison Lake, and checked incompletely in Osprey Lake.

Regarding heavy metals, the objectives for dissolved copper and dissolved zinc were met in the Similkameen River and in Wolfe Creek. Other objectives measured in Wolfe Creek were dissolved manganese and iron, which were met and dissolved molybdenum for which the average objective was exceeded downstream from the mine. These results were similar to those of 1988.

8.4 CAHILL CREEK

Data and site locations are presented in Table 18 and Figure 18, respectively.

Cahill Creek, its tributaries (Nickel Plate Mine Creek and Sunset Creek), and a parallel stream (Red Top Gulch Creek) enter the Similkameen River near Hedley. This watershed is the site of a gold mine and mill which started operation in August, 1987.

Many of the objectives were met in 1989, as they had been in 1988 and 1987. They included objectives for suspended solids, turbidity, strong-acid dissociable cyanide and thiocyanate, arsenic, ammonia-nitrogen, nitrite-nitrogen, and nitrate-nitrogen. A major exception was the objective for weak-acid dissociable cyanide, which was not met in Cahill Creek at its mouth, as was the case in 1988. The cyanate objective was also exceeded in 1989, in Red Top Gulch Creek. The objectives for dissolved solids and pH were generally met, except on occasion in Nickel Plate Mine Creek.

Among the metals the following objectives were met: total aluminum, dissolved iron, total lead, total molybdenum, total cadmium, total mercury, and total selenium. The objectives for total copper and total zinc were met, except on occasion in Nickel Plate Mine Creek. The objectives for total mercury in fish and total silver in water were not checked.

9. KOOTENAY REGION

9.1 COLUMBIA AND WINDERMERE LAKES

Data and site locations are presented in Table 19 and Figure 19, respectively.

The two lakes are important to fisheries, recreation, and drinking water.

All objectives set for the lakes were met, except turbidity in Columbia Lake which was not checked. Objectives that were met included those for fecal coliforms at water intakes and bathing beaches, turbidity in Windermere Lake, and total phosphorus in both lakes. The results for total phosphorus were similar to those obtained in 1988.

9.2 TOBY CREEK AND UPPER COLUMBIA RIVER

Data and site locations are presented in Table 20 and Figure 20, respectively.

Toby Creek enters the upper Columbia River just downstream from Windermere Lake. Both streams are important for aquatic life and recreation and can be affected by domestic sewage discharges. Toby Creek can also receive drainage from an abandoned mine.

The fecal coliform objectives were generally exceeded in Toby Creek and in the Upper Columbia River upstream from Radium. At Edgewater, further downstream, the results were indefinite due to insufficient sampling. These results show a deterioration since 1988.

All other objectives, which apply to Toby Creek, were met where checked. These included objectives for turbidity, suspended solids, ammonia-nitrogen, nitrite-nitrogen, chlorophyll-a, dissolved copper, total lead, and total zinc. The objective for barium in Toby Creek was not checked and the result for cadmium was indefinite.

10. LOWER MAINLAND REGION

10.1 FRASER RIVER FROM HOPE TO KANAKA CREEK

Data and site locations are presented in Table 21 and Figure 21, respectively.

Objectives were set for the Fraser River, tributaries entering from the south, and all major water courses between the Fraser River and the International Border. The Fraser River is a major salmon migration route and the tributaries are important spawning areas. The river and many of the tributaries are also used for irrigation.

The fecal coliform objective was met in the Fraser River and in several tributaries including Hope Slough, Elk Creek, Luckakuck Creek, Atchelitz Creek, Chilliwack Creek, and the Salmon River. The objective was also met at Cultus Lake bathing beaches. The objective was exceeded in Bertrand Creek, downstream from the Aldergrove sewage lagoons. Fecal coliform objectives were not checked in Saar Creek, the Sumas River, the Chilliwack River, and at Cultus Lake water intakes.

The ammonia-nitrogen objectives were met in the Fraser River except, at times, immediately downstream from the Chilliwack sewage treatment plant. The objectives were met in all the tributaries checked.

The dissolved oxygen objective was met in the Fraser River at all sites tested. In the tributaries, the dissolved oxygen objective was not met at times in Hope Slough, Elk Creek, and Atchelitz Creek. The dissolved oxygen objective was met in Chilliwack Creek, Luckakuck Creek, Bertrand Creek, and the Salmon River.

The objective for pH was met in the Fraser River and in all the tributaries.

10.2 FRASER RIVER FROM KANAKA CREEK TO THE MOUTH

Data and site locations are presented in Table 22 and Figure 22, respectively.

The river and outer estuary are important for salmon migration and rearing. The water is used for irrigation and certain beaches are important for recreation. Water quality can be affected by major discharges of municipal and industrial effluents.

The fecal coliform objective was met in the Main Stem, the North Arm (except on one occasion off Sea Island), and the Middle Arm. In the Main Arm, it was not met at times downstream from the Annacis sewage treatment plant, downstream from the Lulu sewage treatment plant, and just downstream from Steveston. The objective was met at all points along Iona Beach and along Tsawwassen Beach. These results are similar to those of 1988.

The objective for ammonia-nitrogen was met in the Main Arm, the North Arm, and in the Middle Arm. It was not checked on Sturgeon Bank and Roberts Bank.

The dissolved oxygen objective was met in the Main Stem and in all the river arms except, at times, in certain sloughs. These included Gunderson, Deas, Ladner and MacDonald sloughs. The objective was not checked on the Banks and never has been in the past. Measuring dissolved oxygen in surface waters of the Banks should be an important priority for future monitoring.

The pH objective was met in the Main Stem, the Main Arm, the North Arm (except downstream from Belkin), and the Middle Arm.

The objectives for total copper, total lead, and total zinc were met in the North Arm and the Middle Arm. They were also met in the Main Arm except at the mouth where the maximum copper objective was exceeded on one occasion.

The results for chlorophenols in water were strictly indefinite but the objective was considered to be met in the Main Stem and in the Main Arm because of the low detection limits used. The results were indefinite in the North Arm where some positive measurements for pentachlorophenol were obtained. The objective for chlorophenol in sediment was met in the Main Stem but was exceeded throughout the Main Arm and North Arm.

The objective for PCBs in sediments was met in all points of the Main Stem, the Main Arm, and the North Arm.

The objectives for chlorophenols and PCBs in fish tissue were met in 1988 following extensive testing. No data were collected in 1989.

The objective for suspended solids was met in the North and Middle arms, except for one instance at the Oak Street Bridge.

10.3 BOUNDARY BAY

Data and site locations are presented in Table 23 and Figure 23, respectively.

Boundary Bay sustains a crab and herring fishery and is important for recreation. Its main tributaries, namely the

Little Campbell River, the Serpentine River, and the Nicomekl River, provide important habitat for trout and salmon and are used for irrigation. This is the second year that these objectives have been checked.

The fecal coliform objective to protect water for recreation was generally met at beaches in Boundary Bay except on some occasions. In these cases the maximum objective was exceeded at sites in White Rock on the westside and Centennial Beach on the eastside. In the tributary rivers, the fecal coliform objective to protect irrigation use was met in the main stem of the rivers but exceeded in some of their tributaries. These included Mahood, Latimer, and Hyland creeks, which are all tributaries to the Serpentine River.

The objectives for suspended solids and turbidity were exceeded a number of times in the three tributary rivers and in the creeks which flow into them. The high values occurred in the September to November period. Similar results were obtained in 1988. The objectives were not checked in Boundary Bay.

The objective for substrate sedimentation was checked for the first time in 1989. It was met in the Serpentine River, Latimer Creek, and Mahood Creek. The objective was exceeded near the mouths of the Little Campbell River, Murray Creek, and Hyland Creek.

The objectives for ammonia-nitrogen were met in all the tributaries. However, the objectives for nitrite-nitrogen were often exceeded. Similar results were obtained in 1988. The chlorophyll-a objective was met in Mahood and Hyland Creeks but was not checked elsewhere.

The dissolved oxygen objective was not met on several occasions in the three tributary rivers and in the creeks flowing into them. The dissolved oxygen objective was also not met on a few occasions in Boundary Bay. This situation suggests a deterioration over results reported in 1988.

The pH objective was exceeded at times in the Serpentine River and its tributaries but met elsewhere.

The objectives for total lead in the Nicomekl River were met.

Checking the objective for PCBs in water of the Serpentine River and its tributary creeks gave indefinite results because of the high detection limit used. The objective for PCBs in the sediments was met in all areas of Boundary Bay and in the Serpentine River and its tributaries. The objective for PCBs in fish from the Serpentine River and its tributaries was not checked.

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TABLE 1

PROVINCIAL OVERVIEW OF WATER QUALITY OBJECTIVES - 1989

REGION	NUMBER OF OCCURRENCES				
	OBJECTIVES MET	OBJECTIVES NOT MET	OBJECTIVES NOT CHECKED	INDEFINITE RESULT	TOTAL
Vancouver Island	307 73%	28 7%	66 15%	20 5%	421 100%
Skeena	583 86%	70 10%	4 1%	19 3%	676 100%
Northern Interior	1562 88%	159 9%	20 1%	38 2%	1779 100%
Southern Interior	1207 91%	55 4%	17 1%	49 4%	1328 100%
Kootenay	153 92%	5 3%	2 1%	6 4%	166 100%
Lower Mainland	1795 84%	201 10%	45 2%	86 4%	2127 100%
All Regions	5607 86%	518 8%	154 2.5%	218 3.5%	6497 100%
All Regions less occurrences with no result	5607 92%	518 8%			6125 100%

TABLE 2

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	3 - 15/100 mL np = 11/100 mL	Objective not met
	0120808 u/s Lake Cowichwn STP	Aug 9,14,22, 23,Sep 6	5	12 - 44/100 mL np = 40/100 mL	Objective not met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	9 - 35/100 mL np = 30/100 mL	Objective not met
	0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	10 - 88/100 mL np = 65/100 mL	Objective not met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	3 - 13/100 mL np = 12/100 mL	Objective not met
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	4 - 54/100 mL np = 42/100 mL	Objective not met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	10 - 77/100 mL np = 70/100 mL	Objective not met
E. Coli <10/100 mL 90th perc. (np)	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	3 - 7/100 mL np = 6/100 mL	Objective met
	0120808 u/s Lake Cowichwn STP	Aug 9,14,22, 23,Sep 6	5	13 - 34/100 mL np = 28/100 mL	Objective not met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	8 - 31/100 mL np = 30/100 mL	Objective not met
	0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	6 - 32/100 mL np = 30/100 mL	Objective not met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	5 - 10/100 mL np = 10/100 mL	Objective met
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	8 - 34/100 mL np = 30/100 mL	Objective not met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	16 - 45/100 mL np = 42/100 mL	Objective not met
Enterococci < 3/100 mL 90th perc. (np)	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	<2 - 3/100 mL np = 3/100 mL	Objective met

TABLE 2 continued

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Enterococci < 3/100 mL 90th perc. (np)	Cowichan River: 0120808 u/s Lake Cowichwn STP	Aug 9,14,22, 23,Sep 6	5	<2 - 115/100 mL np = 60/100 mL	Objective not met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	<2 - 15/100 mL np = 14/100 mL	Objective not met
	0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	9 - 37/100 mL np = 31/100 mL	Objective not met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	10 - 61/100 mL np = 47/100 mL	Objective not met
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	6 - 37/100 mL np = 30/100 mL	Objective not met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	9 - 52/100 mL np = 50/100 mL	Objective not met
E. Coli <385/100 mL geometric mean (gm)	Cowichan River: E206106 1 km d/s Duncan STP	Aug 9,14,23, 29,Sep 6	5	16 - 37/100 mL gm = 24/100 mL	Objective met
Enterococci <100/100 mL geometric mean (gm)	Cowichan River: E206106 1 km d/s Duncan STP	Aug 9,14,23, 29,Sep 6	5	6 - 26/100 mL gm = 13/100 mL	Objective met
Turbidity max increase 5 NTU or 10%	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	0.3 - 0.4 NTU	Control site
	0120808 u/s Lake Cowichwn STP	Aug 9,14,23, Sep 6	4	0.4 - 0.5 NTU max inc. = 0.2 NTU	Objective met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	0.3 - 0.4 NTU max inc. = 0 NTU	Objective met
	0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	0.3 - 0.5 NTU max inc. = 0.1 NTU	Objective met
	E206106 1 km d/s Duncan STP	Aug 9,14,23, 29,Sep 6	5	0.4 - 0.8 NTU max inc. = 0.4 NTU	Objective met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, Sep 7	4	0.2 - 0.3 NTU	Control site

TABLE 2 continued

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase 5 NTU or 10%	Koksilah River: E206976 at Koksilah Road	Aug 9,14,23, Sep 7	4	0.4 - 0.6 NTU max inc. = 0.2 NTU	Objective met
	0123981 u/s Highway 1	Aug 9,14,23, Sep 7	4	0.5 - 0.7 NTU max inc. = 0.4 NTU	Objective met
Suspended Solids max increase 10 mg/L or 10%	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,23,29, Sep 6	4	<1 - 3 mg/L	Control site
	0120808 u/s Lake Cowichwn STP	Aug 23,Sep 6 Sep 6	2	<1 - 1 mg/L max inc. = 1 mg/L	Objective met
	E206107 d/s Lake Cowichan STP	Aug 23,29, Sep 6	3	<1 - 1 mg/L max inc. = 0 mg/L	Objective met
	0120802 u/s Highway 1	Aug 9,23,29, Sep 6	4	<1 - 2 mg/L max inc. = 1 mg/L	Objective met
	E206106 1 km d/s Duncan STP	Aug 9,23,29, Sep 6	4	1 - 2 mg/L max inc. = 2 mg/L	Objective met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	<1 - 1 mg/L	Control site
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	1 - 2 mg/L max inc. = 2 mg/L	Objective met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	<1 - 3 mg/L max inc. = 2 mg/L	Objective met
Ammonia-N <1.59 mg/L av 8.25 mg/L max at pH = 7.8 temp = 10 C	Cowichan River: E206108 d/s Cowichan Lake	Jan 4-Apr 4,	4	0.007 mg/L or less	Max obj. met
	E206107 d/s Lake Cowichan STP	Aug 9-Sep 6 May 4-Dec 6	5 11	av = 0.012 mg/L max = 0.056 mg/L	Objectives met
	0120802 u/s Highway 1	Jan 4-Dec 6	4	max = 0.040 mg/L	max obj. met
	E206106 1 km d/s Duncan STP	Aug 9-Sep 6 Jan 4-Dec 6	5 15	av = 0.115 mg/L max = 0.147 mg/L	Objectives met
	Koksilah River: E207425 at Port Renfrew Road	Jan 4-Jan 31 Jan 4-Oct 31	5 14	av = 0.007 mg/L max = 0.012 mg/L	Objectives met

TABLE 2 continued

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.59 mg/L av 8.25 mg/L max at pH = 7.8 temp = 10 C	Koksilah River: E206976 at Koksilah Road	May 4-Oct 31	9	0.009 mg/L or less	Max obj. met
	0123981 u/s Highway 1	Jan 4-Oct 31	13	0.023 mg/L or less	Max obj. met
Chlorophyll-a 50 mg/m2 max	Cowichan River	1989	0	no data collected	Objective not checked
Tot Cl2 Res. 0.002 mg/L max	Cowichan River	1989	0	no data collected	Objective not checked
Dissolved Oxygen 8.0 mg/L min Jun - Sep 11.2 mg/L min Oct - May	Cowichan River: 0120808 u/s Lake Cowichwn STP	Aug 23 Aug 29	1 1	7.6 mg/L 8.6 mg/L	Obj. not met Obj. met
	E206107 d/s Lake Cowichan STP	Aug 23 Aug 29	1 1	7.5 mg/L 8.2 mg/L	Obj. not met Obj. met
	0120802 u/s Highway 1	Aug 23-Aug 29 Oct 3	2 1	8.0 - 8.9 mg/L 10.2 mg/L	Obj. met Obj. not met
	E206106 1 km d/s Duncan STP	Aug 23 Aug 23 Sep 6 Oct 3	1 1 1 1	8.0 mg/L 7.7 mg/L 7.6 mg/L 10.2 mg/L	Obj. met Obj. not met Obj. not met Obj. not met
	Koksilah River: E207425 at Port Renfrew Road	Sep 7 Oct 3	1 1	9.2 mg/L 10.8 mg/L	Obj. met Obj. not met
	E206976 at Koksilah Road	Sep 7 Oct 3	1 1	8.2 mg/L 11.0 mg/L	Obj. met Obj. not met
	0123981 u/s Highway 1	Sep 7 Oct 3	1 1	7.3 mg/L 7.1 mg/L	Obj. not met Obj. not met
Dissolved-Cu <0.002 mg/L av 0.004 mg/L max or 20% increase	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	all <0.001 mg/L	Control site
	0120808 u/s Lake Cowichwn STP	Aug 9,14,23, 29,Sep 6	5	all <0.001 mg/L	Objectives met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	all <0.001 mg/L	Objectives met

TABLE 2 continued

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved-Cu <0.002 mg/L av 0.004 mg/L max or 20% increase	Cowichan River: E206106 1 km d/s Duncan STP	Aug 9,14,23, 29,Sep 6	5	all <0.001 mg/L	Objectives met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	all <0.001 mg/L	Control site
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	all <0.001 mg/L	Objectives met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	0.001 mg/L or less	Objectives met
Dissolved-Pb <0.003 mg/L av 0.008 mg/L max or 20% increase	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	0.001 mg/L or less	Control site
	0120808 u/s Lake Cowichwn STP	Aug 9,14,23, 29,Sep 6	5	0.001 mg/L or less	Objectives met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	0.001 mg/L or less	Objectives met
	0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	0.001 mg/L or less	Objectives met
	E206106 1 km d/s Duncan STP	Aug 9,14,23, 29,Sep 6	5	0.001 mg/L or less	Objectives met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	0.001 mg/L or less	Control site
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	0.001 mg/L or less	Objectives met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	0.001 mg/L or less	Objectives met
Dissolved-Zn <0.030 mg/L av 0.180 mg/L max or 20% increase	Cowichan River: E206108 d/s Cowichan Lake	Aug 9,14,23, 29,Sep 6	5	all <0.005 mg/L	Control site
	0120808 u/s Lake Cowichwn STP	Aug 9,14,23, 29,Sep 6	5	all <0.005 mg/L	Objectives met
	E206107 d/s Lake Cowichan STP	Aug 9,14,23, 29,Sep 6	5	all <0.005 mg/L	Objectives met

TABLE 2 continued

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved-Zn <0.030 mg/L av 0.180 mg/L max or 20% increase	Cowichan River: 0120802 u/s Highway 1	Aug 9,14,23, 29,Sep 6	5	av < 0.008 mg/L max = 0.020 mg/L	Objectives met
	E206106 1 km d/s Duncan STP	Aug 9,14,23, 29,Sep 6	5	all <0.005 mg/L	Objectives met
	Koksilah River: E207425 at Port Renfrew Road	Aug 9,14,23, 29,Sep 7	5	all <0.005 mg/L	Control site
	E206976 at Koksilah Road	Aug 9,14,23, 29,Sep 7	5	all <0.005 mg/L	Objectives met
	0123981 u/s Highway 1	Aug 9,14,23, 29,Sep 7	5	0.006 mg/L or less	Objectives met
Copper-8 Quinolinolate 0.0005mg/L max	Cowichan River	1989	0	no data collected	Objective not checked

TABLE 3

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total-P <0.007 mg/L av	Long Lake	1989	0	no data collected	Objective not checked*
Total-P <0.006 mg/L av	Middle Quinsam Lake	1989	0	no data collected	Objective not checked*
Chlorophyll-a <50 mg/m2 av	Quinsam River d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*
Turbidity <1.0 NTU av 5.0 NTU max	Quinsam River: 0900504 d/s Middle Quinsam L.	Nov 20,27 Dec 4,11,18	5	av = 0.6 NTU max = 0.7 NTU	Objectives met
Suspended Solids <5 mg/L av 25 mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Aug 16	1	<1 mg/L	Control site
	0900504 d/s Middle Quinsam L.	Aug 16	1	3 mg/L	Max obj. met Av not chkd*
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Ammonia-N <1.85 mg/L av 12.7 mg/L max at pH = 7.5 temp = 10 C	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	0.009 mg/L	Max obj. met Av not chkd*
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	av = 0.008 mg/L max = 0.012 mg/L	Objectives met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Nitrate-N <40 mg/L av 200 mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	0.05 mg/L	Max obj. met Av not chkd*
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Nitrate-N 10 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	0.02 - 0.06 mg/L	Objective met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Quinsam River Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Diss. Oxygen 3 mg/L min Jun - Aug	Long & Middle Q. Lks. (hypolimnion)	1989	0	no data collected	Objective not checked*

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH >6.5 90th perc (np) >6.9 median (med)	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	7.4	Indefinite result
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	np = 7.4 med = 7.4	Objectives met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Dissolved Al <0.05 mg/L av 0.1 mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	<0.01 mg/L	Max obj. met Av not chkd*
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	all <0.01 mg/L	Objectives met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Total As 0.05 mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	<0.001 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	all <0.001 mg/L	Objective met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*
Total Cd <0.0002mg/L av 0.0003mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	<0.0005 mg/L	Indefinite result
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	all <0.0005 mg/L	Indefinite result
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Total Co 0.05 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	all <0.1 mg/L	Indefinite result
Total Cu <0.002 mg/L av	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	0.014 mg/L	Indefinite result

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.002 mg/L av	Quinsam River: 0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	0.001 - 0.003 mg/L av = 0.002 mg/L	Objective met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*
Total Fe <0.3 mg/L av	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	0.36 mg/L	Indefinite result
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	0.04 - 0.14 mg/L av = 0.10 mg/L	Objective met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*
Total Pb <0.003 mg/L av 0.005 mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	0.001 mg/L	Max obj. met Av not chkd*
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	0.001 mg/L or less	Objectives met
Total Pb <0.003 mg/L av 0.005 mg/L max	Quinsam River: Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Total Mn 0.05 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	<0.01 - 0.05 mg/L	Objective met
Total Hg 0.0001mg/L max 0.5 mg/kg max in fish,wet wt	Quinsam River Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objectives not checked*
Total Ni 0.025 mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	<0.05 mg/L	Indefinite result
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	all <0.05 mg/L	Indefinite result
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*
Total Ag 0.0001mg/L max	Quinsam River Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn 0.03 mg/L max	Quinsam River: E206901 into Middle Quins. L.	Nov 20	1	<0.01 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 4,11,18	5	all <0.01 mg/L	Objective met
	Long & Middle Q. Lks. d/s Flume & Long Lks.	1989	0	no data collected	Objective not checked*

*Not all objectives needed to be checked because the mine development was operating at less than 5% capacity.

TABLE 4

BULKLEY RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	0400297 u/s Houston	July 24,31, Aug 8,14,21	5	7 - 310/100 mL np = 120/100 mL	Objective not met
	0400434 u/s Smithers	July 24,31, Aug 8,14,21	5	5 - 12/100 mL np = 10/100 mL	Objective met
Fecal Coliforms <200/100 mL geometric mean (gm)	0400295 100m d/s Houston	July 24,31, Aug 8,14,21	5	14 - 50/100 mL gm = 25/100 mL	Objective met
	0400435 d/s Smithers in initial dilution zone	July 24,31, Aug 8,14,21	5	3 - 16/100 mL gm = 8/100 mL	Objective met
Turbidity max increase: 5 NTU or 10%	0400297 u/s Houston	July 24,31, Aug 8,14,21	5	0.2 - 3.1 NTU	Control site
	0400295 100m d/s Houston	July 24,31, Aug 8,14,21	5	0.8 - 3.4 NTU max inc.=0.7 NTU	Objective met
	0400434 u/s Smithers	July 24,31, Aug 8,14,21	5	2.5 - 3.7 NTU	Control site
	0400435 d/s Smithers in initial dilution zone	July 24,31, Aug 8,14,21	5	2.6 - 3.7 NTU max inc.=0.3 NTU	Objective met
Susp. Solids max increase: 10 mg/L or 10%	0400297 u/s Houston	July 24,31, Aug 8,14,21	5	1 - 8 mg/L	Control site
	0400295 100m d/s Houston	July 24,31, Aug 8,14,21	5	2 - 5 mg/L max inc. = 1 mg/L	Objective met
	0400434 u/s Smithers	July 24,31, Aug 8,14,21	5	5 - 12 mg/L	Control site
	0400435 d/s Smithers in initial dilution zone	July 24,31, Aug 8,14,21	5	6 - 15 mg/L max inc. = 8 mg/L	Objective met
Tot. Cl2 Res. 0.002 mg/L max	d/s Houston d/s Smithers	1989	0	no data collected	Objective not checked
Chlorophyll-a <50 mg/m2 av	0400434 u/s Smithers	August 21	6	5.5 - 33.1 mg/m2 av = 12.1 mg/m2	Objective met
	0400435 d/s Smithers in initial dilution zone	August 21	6	4.7 - 32.1 mg/m2 av = 13.5 mg/m2	Objective met

TABLE 4 continued

BULKLEY RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.90 mg/L av 4.67 mg/L max at pH = 8.1 temp = 10 C	0400297 u/s Houston	July 24,31, Aug 8,14,21	5	av = 0.007 mg/L max = 0.014 mg/L	Objectives met
	0400295 100m d/s Houston	July 24,31, Aug 8,14,21	5	av = 0.026 mg/L max = 0.080 mg/L	Objectives met
	0400434 u/s Smithers	July 24,31, Aug 8,14,21	5	av = 0.005 mg/L max = 0.007 mg/L	Objectives met
	0400435 d/s Smithers in initial dilution zone	July 24,31, Aug 8,14,21	5	av = 0.005 mg/L max = 0.007 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	0400297 u/s Houston	July 24,31, Aug 8,14,21	5	all < 0.005 mg/L	Objectives met
	0400295 100m d/s Houston	July 24,31, Aug 8,14,21	5	all < 0.005 mg/L	Objectives met
	0400434 u/s Smithers	July 24,31, Aug 8,14,21	5	all < 0.005 mg/L	Objectives met
	0400435 d/s Smithers in initial dilution zone	July 24,31, Aug 8,14,21	5	all < 0.005 mg/L	Objectives met
Dissolved Oxygen 7.8 mg/L min	Bulkley River	1989	0	no data collected	Objective not checked

TABLE 5

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms: <10/100 mL 90th perc. (np) at water intakes <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) at beaches	Kathlyn Lake: E207548 beach	July 17,24,31 August 8,14	5	gm = 29/100 mL np = 80/100 mL	Objectives met
	E207549 intake #2	July 17,24,31 August 8,14	5	np = 3/100 mL	Objective met
	E207550 intake #3	July 17,24,31 August 8,14	5	np = 100/100 mL	Objective not met
	E207551 intake #4	July 17,24,31 August 8,14	5	np < 2/100 mL	Objective met
	Seymour Lake: E207552 intake #1	July 17,24,31 August 8,14	5	np = 5/100 mL	Objective met
	E207553 intake #2	July 17,24,31 August 8,14	5	np = 90/100 mL	Objective not met
	E207554 intake #3	July 17,24,31 August 8,14	5	np = 7/100 mL	Objective met
	Round Lake: E207555 beach	July 17,24,31 August 8,14	5	gm = 3/100 mL np = 3/100 mL	Objectives met
	E207556 intake #2	July 17,24,31 August 8,14	5	np < 2/100 mL	Objective met
	E207557 intake #3	July 17,24,31 August 8,14	5	np = 1/100 mL	Objective met
	E207558 intake #4	July 17,24,31 August 8,14	5	np < 2/100 mL	Objective met
	Tyhee Lake: E207559 beach	July 17,24,31 Augusy 8,14	5	gm = 4/100 mL np = 13/100 mL	Objectives met
	E207560 intake #2	July 17,24,31 August 8,14	5	np = 3/100 mL	Objective met
	E207561 intake #3	July 17,24,31 Aug 8,14	5	np < 2/100 mL	Objective met
	E207562 intake #4	July 17,24,31 August 8,14	5	np = 1/100 mL	Objective met

TABLE 5 continued

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity <1 NTU av 5 NTU max	Kathlyn Lake: E207549 intake #2	July 17,24, August 8,14	4	av = 0.7 NTU max = 0.8 NTU	Objectives met
	E207550 intake #3	July 17,24,31 August 8,14	5	av = 1.4 NTU max = 2.0 NTU	Av not met Max obj. met
	E207551 intake #4	July 17,24,31 August 8,14	5	av = 1.1 NTU max = 1.3 NTU	Av not met Max obj. met
	Seymour Lake: E207552 intake #1	July 17,24,31 August 8,14	5	av = 6.4 NTU	Av not met
		July 17	1	max = 4.7 NTU	Max obj. met
		Jul 24-Aug 14	4	max = 5.1-8.7 NTU	Max not met
	E207553 intake #2	July 17,24,31 August 8,14	5	av = 2.6 NTU max = 4.4 NTU	Av not met Max obj. met
	E207554 intake #3	July 17,24,31 August 8,14	5	av = 1.4 NTU max = 2.4 NTU	Av not met Max obj. met
	Round Lake: E207556 intake #2	July 17,24,31 August 8,14	5	av = 1.2 NTU max = 2.0 NTU	Av not met Max obj. met
	E207557 intake #3	July 17,24,31 August 8,14	5	av = 1.5 NTU max = 2.5 NTU	Av not met Max obj. met
	E207558 intake #4	July 17,24,31 August 8,14	5	av = 0.9 NTU max = 3.0 NTU	Objectives met
	Tyhee Lake: E207560 intake #2	July 17,24,31 August 8,14	5	av = 1.1 NTU max = 1.5 NTU	Av not met Max obj. met
	E207561 intake #3	July 17,24,31 Aug 8,14	5	av = 2.0 NTU max = 3.6 NTU	Av not met Max obj. met
	E207562 intake #4	July 17,24,31 August 8,14	5	av = 0.8 NTU max = 1.3 NTU	Objectives met
Total P <0.015 mg/L av at spring overturn	Kathlyn Lake 1131007 North Basin	May 1	3	0.5 m: 0.028 mg/L 4.0 m: 0.051 mg/L 8.0 m: 0.194 mg/L	Indefinite result
	Round Lake 1131008 mid-lake	May 2	3	0.5 m: 0.070 mg/L 3.5 m: 0.075 mg/L 17 m: 0.334 mg/L	Indefinite result

TABLE 5 continued

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total P <0.015 mg/L av at spring overturn	Tyhee Lake 1131009 North Basin	May 2	3	0.5 m: 0.018 mg/L 6.0 m: 0.040 mg/L 15 m: 0.074 mg/L	Indefinite result
Colour 15 TCU max near water intakes	Kathlyn Lake: E207549 intake #2	July 17,24, August 8,14	4	all = 5 TCU	Objective met
	E207550 intake #3	July 17,24,31 August 8,14	5	5 - 15 TCU	Objective met
	E207551 intake #4	July 17,24,31 August 8,14	5	<5 - 10 TCU	Objective met
	Seymour Lake: E207552 intake #1	July 17,24,31 August 8,14	5	50 - 60 TCU	Objective not met
	E207553 intake #2	July 17,24,31 August 8,14	5	40 - 70 TCU	Objective not met
	E207554 intake #3	July 17,24,31 August 8,14	5	20 - 40 TCU	Objective not met
	Round Lake: E207556 intake #2	July 17,24,31 August 8,14	5	5 - 15 TCU	Objective met
	E207557 intake #3	July 17,31, August 8,14	4	10 - 15 TCU	Objective met
		July 24	1	20 TCU	Obj. not met
	E207558 intake #4	July 24,31, August 8,14	4	10 - 15 TCU	Objective met
		July 17	1	30 TCU	Obj. not met
	Tyhee Lake: E207560 intake #2	July 17,24,31 August 8,14	5	5 - 10 TCU	Objective met
	E207561 intake #3	July 17,24,31 Aug 8,14	5	<5 - 10 TCU	Objective met
	E207562 intake #4	July 17,24,31 August 8,14	5	<5 - 10 TCU	Objective met

TABLE 6

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms shellfish: <14/100 mL median (med) <43/100 mL 90th perc. (np) recreation: <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np)	Kitimat Harbour: (shellfish closure) 0400510 Ocelot Dock, N end	June 28,July 5,12,19,26	5	med = 4/100 mL gm = 4/100 mL np = 10/100 mL	Shellfish & recreational objectvs met
	0400512 Ocelot Dock, S end	June 28,July 5,12,19,26	5	med = 2/100 mL gm = 4/100 mL np = 8/100 mL	Shellfish & recreational objectvs met
	Kitimat Arm: (shellfish closure) E207571 Bish Cove	June 28,July 5,12,19,26	5	med = 2/100 mL gm = 2/100 mL np = 3/100 mL	Shellfish & recreational objectvs met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	med = 4/100 mL gm = 5/100 mL np = 12/100 mL	Shellfish & recreational objectvs met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	med = 2/100 mL gm = 3/100 mL np = 6/100 mL	Shellfish & recreational objectvs met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	med = 2/100 mL gm = 3/100 mL np = 4/100 mL	Shellfish & recreational objectvs met
Suspended Solids max increase: 10 mg/L or 10%	Kitimat River: 0430025 at Highway Bridge	July 19,26, Aug 1,10,15	5	6 - 9 mg/L	Control site
		October 3	8	3 - 4 mg/L	
	E207569 u/s STP & Eurocan	July 19,26, Aug 1,10 15	5	increase = 0 - 4 mg/L	Objective met
	E207570 100m d/s Eurocan	July 19,26, Aug 1,10,15	5	increase = 0 - 7 mg/L	Objective met
		October 3	3 5	inc. = 5 - 6 mg/L inc. = 12-81 mg/L	Obj. met Obj. not met
	Kitimat Harbour & Arm E207571 Bish Cove	June 28,July 5,12,19,26	5	2 - 8 mg/L	Control site
	0400510 Ocelot Dock, N end	June 28,July 5,19,26	4	increase = 0 - 6 mg/L	Objective met
		July 12	1	inc. = 11 mg/L	Obj. not met

TABLE 6 continued

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids max increase: 10 mg/L or 10%	Kitimat Harbour & Arm 0400512 Ocelot Dock, S end	June 28,July 5,12,19,26	5	increase = 0 - 9 mg/L	Objective met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	increase = 0 - 8 mg/L	Objective met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	increase = 0 mg/L	Objective met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	increase = 0 - 2 mg/L	Objective met
Turbidity max increase: 5 NTU or 10%	Kitimat River: 0430025 at Highway Bridge	July 19,26, Aug 1,10,15	5	3.1 - 4.7 NTU	Control site
	E207569 u/s STP & Eurocan	July 19,26, Aug 1,10 15	5	increase = 0 - 1.1 NTU	Objective met
	E207570 100m d/s Eurocan	July 19,26, Aug 1,10,15	5	increase = 0.4 - 2.8 NTU	Objective met
	Kitimat Harbour & Arm E207571 Bish Cove	June 28,July 5,12,19,26	5	0.6 - 0.9 NTU	Control site
	0400510 Ocelot Dock, N end	June 28,July 5,12,19,26	5	increase = 0.7 - 3.2 NTU	Objective met
	0400512 Ocelot Dock, S end	June 28,July 5,12,19,26	5	increase = 1.3 - 2.6 NTU	Objective met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	increase = 1.5 - 3.7 NTU	Objective met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	increase = 0.1 - 1.2 NTU	Objective met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	increase = 1.2 - 4.2 NTU	Objective met
WAD Cyanide 0.001 mg/L max or min detection level of 0.005 mg/L	Kitimat Harbour & Arm 0400510 Ocelot Dock, N end	Jun 28-Jul 26	11	all <0.005 mg/L	Objective met
		July 12	1	0.009 mg/L	Obj. not met
	0400512 Ocelot Dock, S end	Jun 28-Jul 26	7	all <0.005 mg/L	Objective met

TABLE 6 continued

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD Cyanide 0.001 mg/L max or min detection level of 0.005 mg/L	Kitimat Harbour & Arm E207571 Bish Cove	June 28,July 5,12,19,26	5	all <0.005 mg/L	Objective met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	all <0.005 mg/L	Objective met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	all <0.005 mg/L	Objective met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	all <0.005 mg/L	Objective met
Fluoride 1.5 mg/L max	Kitimat Harbour & Arm 0400510 Ocelot Dock, N end	June 28, July 5,12	3	0.23 - 0.99 mg/L	Objective met
		July 19,26	2	1.85 - 6.90 mg/L	Obj. not met
	0400512 Ocelot Dock, S end	June 28, July 5,12,19,26	5	0.17 - 1.18 mg/L	Objective met
	E207571 Bish Cove	June 28,July 5,12,19,26	5	0.30 - 0.40 mg/L	Objective met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	0.21 - 1.29 mg/L	Objective met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	0.19 - 0.28 mg/L	Objective met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	0.17 - 0.25 mg/L	Objective met
H2S 0.002 mg/L max or about 0.008 mg/L max diss sulfide pH = 7.4 temp = 13 C cond = 35uS/cm	Kitimat River: 0430025 at Highway Bridge	July 19,26, Aug 1,10,15	15	all <0.5 mg/L	Indefinite result at each site
	E207569 u/s STP & Eurocan				
	E207570 100m d/s Eurocan				
Chlorophyll-a <50 mg/m2 av	Kitimat River 0430025 at Highway Bridge	August 15	6	13.9 - 36.5 mg/m2 av = 29.8 mg/m2	Objective met

TABLE 6 continued

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.8 mg/L av 14.0 mg/L max at pH = 7.4 temp = 13 C	Kitimat River: 0430025 at Highway Bridge	July 19,26, Aug 1,10,15	5	av = 0.010 mg/L max = 0.025 mg/L	Objectives met
	E207569 u/s STP & Eurocan	July 19,26, Aug 1,10,15	5	av = 0.028 mg/L max = 0.041 mg/L	Objectives met
	E207570 100m d/s Eurocan	July 19,26, Aug 1,10,15	5	av = 0.018 mg/L max = 0.034 mg/L	Objectives met
Ammonia-N <1.0 mg/L av 2.5 mg/L max	Kitimat Harbour & Arm 0400510 Ocelot Dock, N end	June 28, July 5,12,19,26	5	av = 0.018 mg/L max = 0.035 mg/L	Objectives met
	0400512 Ocelot Dock, S end	June 28, July 5,12,19,26	5	av = 0.011 mg/L max = 0.015 mg/L	Objectives met
	E207571 Bish Cove	June 28,July 5,12,19,26	5	av = 0.010 mg/L max = 0.028 mg/L	Objectives met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	av = 0.011 mg/L max = 0.022 mg/L	Objectives met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	av = 0.009 mg/L max = 0.017 mg/L	Objectives met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	av = 0.011 mg/L max = 0.027 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Kitimat River: 0430025 at Highway Bridge	July 19,26, Aug 1,10,15	5	av = 0.03 mg/L max = 0.04 mg/L	Av not met Max obj. met
		October 3	8	0.07 - 0.08 mg/L	Max not met
	E207569 u/s STP & Eurocan	July 19,26, Aug 1,10,15	5	av = 0.03 mg/L max = 0.04 mg/L	Av not met Max obj. met
	E207570 100m d/s Eurocan	July 19,26, Aug 1,10,15	5	av = 0.03 mg/L max = 0.04 mg/L	Av not met Max obj. met
		October 3	8	all = 0.08 mg/L	Max not met
Dissolved Oxygen 7.8 mg/L min	Kitimat River: 0430025 at Highway Bridge	August 10 August 15	1 1	10.1 mg/L 10.3 mg/L	Obj. met Obj. met
	E207569 u/s STP & Eurocan	August 10 August 15	1 1	10.3 mg/L 10.4 mg/L	Obj. met Obj. met

TABLE 6 continued

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.8 mg/L min	Kitimat River E207570 100m d/s Eurocan	August 10 August 15	1 1	10.2 mg/L 10.5 mg/L	Obj. met Obj. met
pH 6.5 - 9.0	Kitimat River: 0430025 at Highway Bridge	July 19,26, Aug 1,10,15	5	6.6 - 7.5	Objective met
	E207569 u/s STP & Eurocan	July 19,26, Aug 1,10,15	5	6.9 - 8.0	Objective met
	E207570 100m d/s Eurocan	July 19,26, Aug 1,10,15	5	7.0 - 7.9	Objective met
Total Al 20% increase	Kitimat Harbour & Arm E207571 Bish Cove	1989	0	no data collected	Control site
	0400510 Ocelot Dock, N end	July 21	1	<0.5mg/L dissolved (below detection)	Objective met
	0400512 Ocelot Dock, S end	July 21	1	<0.5mg/L dissolved (below detection)	Objective met
Total Cd <0.012 mg/L av 0.038 mg/L max	Kitimat Harbour & Arm 0400510 Ocelot Dock, N end	June 28, July 5,12,19,26	5	all <0.0005 mg/L	Objectives met
	0400512 Ocelot Dock, S end	June 28, July 5,12,19,26	5	all <0.0005 mg/L	Objectives met
	E207571 Bish Cove	June 28,July 5,12,19,26	5	<0.0005-0.0005mg/L	Objectives met
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	all <0.0005 mg/L	Objectives met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	<0.0005-0.0005mg/L	Objectives met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	<0.0005-0.0005mg/L	Objectives met
Total Cu <0.002 mg/L av 0.003 mg/L max or 20% increase	Kitimat Harbour & Arm E207571 Bish Cove	June 28, July 5,12,19,26	5	<0.001 - 0.005mg/L	Control site
	0400510 Ocelot Dock, N end	June 28, July 5,12,19,26	5	av = 0.002 mg/L max = 0.006 mg/L = 20% inc.	Objectives met

TABLE 6 continued

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.002 mg/L av 0.003 mg/L max or 20% increase	Kitimat Harbour & Arm 0400512 Ocelot Dock, S end	June 28, July 5,12,19,26	5	av = 0.004 mg/L max = 0.011 mg/L on July 5	Av not met Max not met July 5
	E207572 Hospital Beach	June 28,July 5,12,19,26	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	av = 0.002 mg/L max = 0.004 mg/L >20% inc. July 26	Av obj. met Max not met July 26
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	av = 0.001 mg/L max = 0.001 mg/L	Objectives met
Total Fe 0.3 mg/L max	Kitimat Harbour & Arm 0400510 Ocelot Dock, N end	June 28, July 5,12,26	4	0.055 - 0.099 mg/L	Objective met
		July 19	1	0.528 mg/L	Obj. not met
	0400512 Ocelot Dock, S end	June 28, July 5,12	3	0.055 - 0.160 mg/L	Objective met
		July 19,26	2	0.394 - 0.405 mg/L	Obj. not met
	E207571 Bish Cove	June 28,July 5,12,19,26	5	0.036 - 0.089 mg/L	Objective met
	E207572 Hospital Beach	June 28,July 5,12,26	4	0.035 - 0.223 mg/L	Objective met
		July 19	1	0.737 mg/L	Obj. not met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	0.056 - 0.292 mg/L	Objective met
	E207574 Henderson's Beach	June 28,July 5,19,26	4	0.009 - 0.248 mg/L	Objective met
		July 12	1	0.952 mg/L	Obj. not met
Total Pb <0.009 mg/L av 0.22 mg/L max or 20% increase	Kitimat Harbour & Arm E207571 Bish Cove	June 28, July 5,12,19,26	5	av = 0.001 mg/L max = 0.002 mg/L	Control site
	0400510 Ocelot Dock, N end	June 28, July 5,12,19,26	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	0400512 Ocelot Dock, S end	June 28, July 5,12,19,26	5	av = 0.001 mg/L max = 0.001 mg/L	Objectives met

TABLE 6 continued

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <0.009 mg/L av 0.22 mg/L max or 20% increase	Kitimat Harbour & Arm E207572 Hospital Beach	June 28,July 5,12,19,26	5	av = 0.001 mg/L max = 0.001 mg/L	Objectives met
	E207573 Mission Beach	June 28,July 5,12,19,26	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	E207574 Henderson's Beach	June 28,July 5,12,19,26	5	av = 0.002 mg/L max = 0.003 mg/L	Objectives met
Toxicity % mill effl. in river: <0.05 of the 96-h LC50	Kitimat River d/s Eurocan	1989	0	no data collected	Objective not checked

TABLE 7

LAKELSE LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms: <10/100 mL 90th perc. (np) at water intakes	E207580 intake, lake NW	June 28, July 5,11,19,24	5	np < 2/100 mL	Objective met
	E207581 intake, Gainey Point	June 28, July 5,11,19,24	5	np < 2/100 mL	Objective met
	E207582 intake, lake NE	June 28, July 5,11,19,24	5	np = 2/100 mL	Objective met
<200/100 mL geometric mean (gm) at beaches	E207583 Furlong Beach	June 28, July 5,11,24	4	<2 - 23/100 mL	Indefinite result
Turbidity 1 NTU av 5 NTU max	E207580 intake, lake NW	June 28, July 5,11,19,24	5	av = 0.4 NTU max = 0.7 NTU	Objectives met
	E207581 intake, Gainey Point	June 28, July 5,11,19,24	5	av = 0.5 NTU max = 0.8 NTU	Objectives met
	E207582 intake, lake NE	June 28, July 5,11,24	4	0.3 - 0.6 NTU	Max obj. met
Total-P <0.010 mg/L av May - August	E206616 N end, deepest point	May 23,Jun 21 Jul 2,Aug 20	12	<0.003 - 0.011mg/L av = 0.006 mg/L	Objective met
Chlorophyll-a <0.003 mg/L av May - August	E206616 N end, deepest point	May 23,Jun 21 Jul 2,Aug 20	12	0.001 - 0.005 mg/L av = 0.0025 mg/L	Objective met
Diss. Oxygen 6 mg/L min 5m above sed.	E206616 N end, deepest point	July 2	1	6.6 mg/L 5 m above sediment	Objective met

TABLE 8

CHARLIE LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np) near water intakes	Fort St. John intake	June 23, July 7,14,21,29	5	10 - 306/100 mL np = 100/100 mL	Objective not met
		July 4,11,18, August 8,14	5	20 - 500/100 mL np = 380/100 mL	Objective not met
		August 22,29, Sep 6,13,19	5	0 - 520/100 mL np = 520/100 mL	Objective not met
	Scurry intake	July 4,11,18, 24,31	5	<5 - 460/100 mL np = 100/100 mL	Objective not met
Fecal Coliforms <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) at beaches	Beatton Park Beach north	May 31,June 7 14,20,28	5	<5 - 235/100 mL gm = 11/100 mL np = 60/100 mL	Objectives met
		July 4,11,18, 24,31	5	<5 - 30/100 mL gm = 10/100 mL np = 25/100 mL	Objectives met
		July 24,31, Aug 8,14,21	5	<5 - 5/100 mL gm = 5/100 mL np = 5/100 mL	Objectives met
	Beatton Park Beach centre	May 31, June 7,14,20,28	5	<5 - 375/100 mL gm = 16/100 mL np = 60/100 mL	Objectives met
		July 4,11,18, 24,31	5	<5 - 43/100 mL gm = 13/100 mL np = 35/100 mL	Objectives met
		July 24,31, Aug 8,14,21	5	<5 - 100/100 mL gm = 14/100 mL np = 70/100 mL	Objectives met
	Beatton Park Beach south	May 31, June 7,14,20,28	5	<5 - 420/100 mL gm = 19/100 mL np = 140/100 mL	Objectives met
		July 4,11,18, 24,31	5	<3 - 25/100 mL gm = 8/100 mL np = 18/100 mL	Objectives met
		July 24,31, Aug 8,14,21	5	<3 - 450/100 mL gm = 11/100 mL np = 100/100 mL	Objectives met
	Montney Park	July 4,11,18, 24,31	5	4 - 850/100 mL gm = 24/100 mL np = 460/100 mL	gm obj. met np not met

TABLE 8 continued

CHARLIE LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total-P <0.050 mg/L av at spring overturn <0.075 mg/L av at all other times	0400390 Charlie L. centre	May 16 (spring overturn)	1 1 1	1 m : 0.054 mg/L 4 m : 0.053 mg/L 7 m : 0.054 mg/L av = 0.054 mg/L	Objective not met
		June 7	3	0.042-0.046 mg/L	Objective met
		June 27	1 1 1	1 m : 0.055 mg/L 4 m : 0.061 mg/L 7 m : 0.094 mg/L	Obj. met Obj. met Obj. not met
		September 28	1 1 1	1 m : 0.091 mg/L 4 m : 0.075 mg/L 7 m : 0.080 mg/L	Obj. not met Obj. met Obj. not met
	E207459 Charlie L. north arm	March 15	1 1 1	1 m : 0.052 mg/L 4 m : 0.037 mg/L 7 m : 0.045 mg/L	Obj. met Obj. met Obj. met
		May 16 (spring overturn)	1 1 1	1 m : 0.057 mg/L 3 m : 0.059 mg/L 6 m : 0.066 mg/L av = 0.060 mg/L	Objective not met
		June 7	1 1 1	1 m : 0.041 mg/L 6 m : 0.056 mg/L 8 m : 0.076 mg/L	Obj. met Obj. met Obj. not met
		June 27	3	0.050-0.063 mg/L	Obj. met
		August 17	3	0.135-0.212 mg/L	Obj. not met
		September 28	3	0.083-0.100 mg/L	Obj. not met

TABLE 9

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	West Bullmoose Creek: E206225 u/s sediment ponds	April 24,30, May 7	3	all <2/100 mL	Indefinite result
	E206226 d/s sediment pond 3	April 9,16,24 30, May 7	5	all <2/100 mL	Objective met
	E206227 d/s sed. ponds 1 & 2	April 9,16,24 30, May 7	5	all <2/100 mL	Objective met
	South Bullmoose Cr.: E206228 u/s plant	April 9,16,24 May 7	4	<2 - 2/100 mL	Indefinite result
	E206229 d/s plant	April 9,16,24 30, May 7	5	all <2/100 mL	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	April 16,24, 30, May 7	4	all <2/100 mL	Indefinite result
	E206232 20km d/s tailing pond	April 9,16,24 30, May 7	5	<2 - 8/100 mL	Objective met
Turbidity max increase: 5 NTU or 10%	West Bullmoose Creek: E206225 u/s sediment ponds	May 17,23,29, June 5,12	5	0.5 - 2 NTU	Control site
	E206226 d/s sediment pond 3	May 17,23,29, June 5,12	5	max increase = 2 NTU	Objective met
	E206227 d/s sed. ponds 1 & 2	May 17,23,29, June 12	4	max increase = 3 NTU	Objective met
		June 5	1	max inc. = 7 NTU	Obj. not met
	South Bullmoose Cr.: E206228 u/s plant	May 10,17,23, 29, June 5,12	6	0.3 - 6 NTU	Control site
	E206229 d/s plant	May 10,17,23, 29, June 5,12	6	max increase = 2 NTU	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	May 17,23,29, June 5,12	5	max increase = 3 NTU	Objective met
	E206232 20km d/s tailing pond	May 23,29	2	max inc = 2.6 NTU	Obj. met
		May 17,June 5,12	3	increase = 7.5 - 17 NTU	Objective not met

TABLE 9 continued

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Susp. Solids max increase: 10 mg/L or 10%	West Bullmoose Creek: E206225 u/s sediment ponds	May 17,23,29, June 5,12	5	1 - 11 mg/L	Control site
	E206226 d/s sediment pond 3	May 17,23,29, June 5,12	5	max increase = 3 mg/L	Objective met
	E206227 d/s sed. ponds 1 & 2	May 17,23,29, June 12	4	max increase = 5 mg/L	Objective met
		June 5	1	max inc. = 39 mg/L	Obj. not met
	South Bullmoose Cr.: E206228 u/s plant	May 10,17,23, 29, June 5,12	6	1 - 24 mg/L	Control site
	E206229 d/s plant	May 10,17,23, 29, June 5,12	6	max increase = 8 mg/L	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	May 17,23,29, June 5	4	max increase = 9 mg/L	Objective met
		June 12	1	max inc. = 11 mg/L	Obj. not met
	E206232 20km d/s tailing pond	May 17,23,29, June 5,12	5	increase = 11 - 53 mg/L	Objective not met
Substrate Sedimentation: no increase in particulate < 3 mm dia.	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1989	0	no data collected	Objective not checked
Chlorophyll-a av <50 mg/m2	West Bullmoose Creek E206227 d/s sed. ponds 1 & 2	September 29	6	71.5 - 283 mg/m2 av = 154 mg/m2	Objective not met
	South Bullmoose Cr.: E206228 u/s plant	September 27	6	2.4 - 25.5 mg/m2 av = 12.4 mg/m2	Objective met
	E206229 d/s plant	September 27	6	301 - 463 mg/m2 av = 357 mg/m2	Objective not met
	Bullmoose Creek: 0410094 d/s tailing pond	September 27	6	1.2 - 29.5 mg/m2 av = 9.00 mg.m2	Objective met
	E206232 20km d/s tailing pond	September 27	6	6.2 - 40.9 mg/m2 av = 20.0 mg/m2	Objective met

TABLE 9 continued

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.751 mg/L av 3.90 mg/L max at pH = 8.2 temp = 5 C	West Bullmoose Creek: E206225 u/s sediment ponds	April 24,30, May 7	3	all <0.005 mg/L	Max obj. met
	E206226 d/s sediment pond 3	April 9,16,24 30, May 7	5	<0.005-0.014 mg/L	Objectives met
	E206227 d/s sed. ponds 1 & 2	April 9,16,24 30, May 7	5	<0.005-0.016 mg/L	Objectives met
	South Bullmoose Cr.: E206228 u/s plant	April 9,16,24 May 7	4	<0.005-0.007 mg/L	Max obj. met
	E206229 d/s plant	April 9,16,24 30, May 7	5	<0.005-0.007 mg/L	Objectives met
	Bullmoose Creek: 0410094 d/s tailing pond	April 16,24, 30, May 7	4	<0.005-0.005 mg/L	Max obj. met
	E206232 20km d/s tailing pond	April 9,16,24 30, May 7	5	all <0.005 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	West Bullmoose Creek: E206225 u/s sediment ponds	April 24,30, May 7	3	all <0.005 mg/L	Max obj. met
	E206226 d/s sediment pond 3	April 9,16,24 30, May 7	5	all <0.005 mg/L	Objectives met
	E206227 d/s sed. ponds 1 & 2	April 9,16,24 30, May 7	5	all <0.005 mg/L	Objectives met
	South Bullmoose Cr.: E206228 u/s plant	April 9,16,24 May 7	4	all <0.005 mg/L	Max obj. met
	E206229 d/s plant	April 9,16,24 30, May 7	5	all <0.005 mg/L	Objectives met
	Bullmoose Creek: 0410094 d/s tailing pond	April 16,24, 30, May 7	4	<0.005-0.007 mg/L	Max obj. met
	E206232 20km d/s tailing pond	April 9,16,24 30, May 7	5	all <0.005 mg/L	Objectives met

TABLE 9 continued

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite + Nitrate-N 10 mg/L max	West Bullmoose Creek: E206225 u/s sediment ponds	April 24,30, May 7	3	0.03 - 0.07 mg/L	Objective met
	E206226 d/s sediment pond 3	April 9,24,30 May 7	4	0.99 - 9.40 mg/L	Objective met
		April 16	1	14.60 mg/L	Obj. not met
	E206227 d/s sed. ponds 1 & 2	April 9,16,24 30, May 7	5	1.13 - 8.80 mg/L	Objective met
	South Bullmoose Cr.: E206228 u/s plant	April 9,16,24 May 7	4	0.02 - 0.04 mg/L	Objective met
	E206229 d/s plant	April 9,16,24 30, May 7	5	0.16 - 1.62 mg/L	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	April 16,24, 30, May 7	4	0.69 - 6.55 mg/L	Objective met
	E206232 20km d/s tailing pond	April 9,16,24 30, May 7	5	0.35 - 0.58 mg/L	Objective met
Diss. Oxygen 7.75 mg/L min	West Bullmoose Creek: E206225 u/s sediment ponds	May 11,17,23, 29, June 5,12	6	8.6 - 16.4 mg/L	Objective met
	E206226 d/s sediment pond 3	May 17,23,29, June 5,12	5	9.0 - 13.9 mg/L	Objective met
	E206227 d/s sed. ponds 1 & 2	May 10,17,23, 29, June 5,12	6	8.0 - 14.2 mg/L	Objective met
	South Bullmoose Cr.: E206228 u/s plant	May 10,17,23, 29, June 5,12	6	8.8 - 13.2 mg/L	Objective met
	E206229 d/s plant	May 10,17,23, 29, June 5,12	6	8.9 - 15.0 mg/L	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	May 11,17,23, 29, June 5,12	6	8.1 - 17.1 mg/L	Objective met
	E206232 20km d/s tailing pond	May 11,17,23, 29, June 5,12	6	7.8 - 16.2 mg/L	Objective met

TABLE 9 continued

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 min	West Bullmoose Creek: E206225 u/s sediment ponds	April 24,30, May 7	3	8.1 - 8.3	Objective met
	E206226 d/s sediment pond 3	April 9,16,24 30, May 7	5	8.0 - 8.4	Objective met
	E206227 d/s sed. ponds 1 & 2	April 9,16,24 30, May 7	5	8.1 - 8.4	Objective met
	South Bullmoose Cr.: E206228 u/s plant	April 9,16,24 May 7	4	7.9 - 8.4	Objective met
	E206229 d/s plant	April 9,16,24 30, May 7	5	8.1 - 8.5	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	April 16,24, 30, May 7	4	8.1 - 8.4	Objective met
	E206232 20km d/s tailing pond	April 9,16,24 30, May 7	5	8.0 - 8.4	Objective met

TABLE 10

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Nechako River: 0400629 200 m u/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	<2 - 2000/100 mL np = 1000/100 mL	Objective not met
		Nov 1,6,9,13, 16	5	<2 - 6/100 mL	Indefinite result
	0400631 200 m d/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	<2 - 350/100 mL np = 100/100 mL	Objective not met
		Nov 1,6,9,13, 16	5	2 - 9/100 mL	Indefinite result
	0400449 u/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	<2 - 14/100 mL np = 12/100 mL	Objective met
		Nov 1,6,9,13, 16	5	4 - 24/100 mL	Indefinite result
	0400450 100 m d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	<2 - 2000/100 mL np = 2000/100 mL	Objective not met
		Nov 1,6,9,13, 16	5	9 - 213/100 mL	Indefinite result
	E207450 0.5 km d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	220 - 2000/100 mL np = 1000/100 mL	Objective not met
		Nov 1,6,9,13, 16	5	2 - 18/100 mL	Indefinite result
	E207451 2 km d/s Vanderhoof	Jan17,23, Feb 6,13	4	<2 - 2000/100 mL	Objective not met
		Nov 1,6,9,13, 16	5	4 - 22/100 mL	Indefinite result
	Chilako River: 0400039 ~ 30 km from mouth	Oct 10,12,19, 26,31	5	5 - 31/100 mL np = 24/100 mL	Objective met
Fecal Coliforms <10/100 mL 90th perc. (np)	Stuart River: 0920101 W bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	<2 - 2/100 mL np < 2/100 mL	Objective met

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geom. mean (gm)	Necoslie River: 0400801 d/s Fort St. James 20 m u/s Highway 27	Oct 31,Nov 8, 15,20,23	5	<2 - 9/100 mL gm = 3/100 mL	Objective met
Total Cl2 Res. 0.002 mg/L max	Nechako & Stuart rivers	1989	0	no data collected	Objective not checked
Ammonia-N <2.03 mg/L av 10.5 mg/L max at pH = 7.7 temp = 2 C	Nechako River: 0400629 200 m u/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
		Nov 1,6,9,13, 16	5	max = 0.008 mg/L	Max obj. met
	0400631 200 m d/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	av < 0.005 mg/L max < 0.005 mg/L	Objectives met
		Nov 1,6,9,13, 16	5	max = 0.008 mg/L	Max obj. met
	0400449 u/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	av = 0.011 mg/L max = 0.023 mg/L	Objectives met
		Nov 1,6,9,13, 16	5	max = 0.009 mg/L	Max obj. met
	0400450 100 m d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	av = 0.807 mg/L max = 1.730 mg/L	Objectives met
		Nov 1,6,9,13, 16	5	max = 0.693 mg/L	Max obj. met
	E207450 0.5 km d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	av = 0.021 mg/L max = 0.027 mg/L	Objectives met
		Nov 1,6,9,13, 16	5	max = 0.023 mg/L	Max obj. met
	E207451 2 km d/s Vanderhoof	Jan17,23, Feb 6,13	4	max = 0.028 mg/L	Max obj. met
		Nov 6,9,13,16	4	max = 0.012 mg/L	Max obj. met
Ammonia-N <0.62 mg/L av 3.22 mg/L max at pH = 8.3 temp = 2 C	Chilako River: 0400039 ~ 30 km from mouth	Oct 10,12,19, 26,31	5	av = 0.013 mg/L max = 0.031 mg/L	Objectives met

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.23 mg/L av 6.83 mg/L max at pH = 8.0 temp = 2 C	Stuart River: 0400488 E bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	av = 0.068 mg/L max = 0.098 mg/L	Objectives met
	0920101 W bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	av = 0.006 mg/L max = 0.008 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Nechako River: 0400629 200 m u/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	all < 0.005 mg/L	Objectives met
	0400631 200 m d/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	all < 0.005 mg/L	Objectives met
	0400449 u/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	all < 0.005 mg/L	Objectives met
	0400450 100 m d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	all < 0.005 mg/L	Objectives met
		Nov 1,6,16	3	max = 0.009 mg/L	Max obj. met
	E207450 0.5 km d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	all < 0.005 mg/L	Objectives met
	E207451 2 km d/s Vanderhoof	Jan17,23, Feb 6,13	4	all < 0.005 mg/L	Max obj. met
	Chilako River: 0400039 ~ 30 km from mouth	Oct 10,12,19, 26,31	5	all < 0.005 mg/L	Objectives met
	Stuart River: 0400488 E bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	all < 0.005 mg/L	Objectives met
	0920101 W bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	all < 0.005 mg/L	Objectives met
Chlorophyll-a <50 mg/m2 av	Nechako & Stuart rivers	1989	0	no data collected	Objective not checked
Chlorophyll-a <100 mg/m2 av	Chilako River	1989	0	no data collected	Objective not checked

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.75-11.2 mg/L min, depending on fish egg stage	Nechako River: 0400629 200 m u/s Fort Fraser	Nov 1,6,9,13, 16	5	11 - 14 mg/L	Objective met
	0400631 200 m d/s Fort Fraser	Nov 1,6,9,13, 16	5	11 - 15 mg/L	Objective met
	0400449 u/s Vanderhoof	Nov 1,6,9,13, 16	5	12 - 14 mg/L	Objective met
	0400450 100 m d/s Vanderhoof	Nov 1,6,9,13, 16	5	11 - 14 mg/L	Objective met
	E207450 0.5 km d/s Vanderhoof	Nov 1,6,9,13, 16	5	11 - 14 mg/L	Objective met
	E207451 2 km d/s Vanderhoof	Nov 1,6,9,13, 16	5	10 - 14 mg/L	Objective met
	Chilako River: 0400039 ~ 30 km from mouth	Oct 17,26,31	3	12 - 14 mg/L	Objective met
	Stuart River: 0400488 E bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	11 - 15 mg/L	Objective met
	0920101 W bank at Highway 27	Oct 31,Nov 8, 15,20,23	5	12 - 14 mg/L	Objective met
pH 6.5 - 8.5	Nechako River: 0400629 200 m u/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	7.2 - 7.7	Objective met
		Nov 1,6,9,13, 16	5	7.5 - 7.9	Objective met
	0400631 200 m d/s Fort Fraser	Jan 17,23,30, Feb 6,13	5	7.4 - 7.7	Objective met
		Nov 1,6,9,13, 16	5	7.6 - 7.9	Objective met
	0400449 u/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	7.5 - 7.7	Objective met
		Nov 1,6,9,13, 16	5	7.6 - 7.9	Objective met

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	Nechako River: 0400450 100 m d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	7.5 - 7.7	Objective met
		Nov 1,6,9,13, 16	5	7.4 - 7.9	Objective met
	E207450 0.5 km d/s Vanderhoof	Jan 17,23,30, Feb 6,13	5	7.5 - 7.8	Objective met
		Nov 1,6,9,13, 16	5	7.7 - 8.0	Objective met
	E207451 2 km d/s Vanderhoof	Jan17,23, Feb 6,13	4	7.5 - 7.8	Objective met
		Nov 6,9,13,16	4	7.8 - 7.9	Obj. met
	Chilako River: 0400039 ~ 30 km from mouth	Oct 10,12,19, 26,31	5	8.2 - 8.3	Objective met
	Stuart River: 0400488 E bank at Highway 27	Oct 31,Nov 8, 15,20	4	8.0 - 8.1	Objective met
	0920101 W bank at Highway 27	Oct 31,Nov 8, 15,20	4	7.9 - 8.0	Objective met
Temperature <15 C av ~ 100m d/s Cheslatta Falls	Nechako River: 10 km d/s Cheslatta Falls* (DFO's B. Irvine site)	Jan 1-Jun 22 Jun 23-Jun 26 Jun 27-Jul 1 Jul 2-Sep 14 Sep 15-Dec 31	173 4 5 75 108	0 - 15 C 15.3 - 16.3 C 14.1 - 14.8 C 15.1 - 17.9 C 0.4 - 14.9 C	Obj. met Obj. not met Obj. met Obj. not met Obj. met
<20 C Jul-Aug <18 C Sep-Jun ~ 100m u/s Stuart River	E207451* 2 km d/s Vanderhoof ~ 40 km u/s Stuart R.	Nov 1,6,9,13, 16	5	1.0 - 4.0 C	Obj. met
Total Gas Pressure 109% max	Nechako River: 0400629 200 m u/s Fort Fraser	Nov 1,6,9,13, 16	5	103 - 107%	Objective met
	0400631 200 m d/s Fort Fraser	Nov 1,6,9,13, 16	5	103 - 108%	Objective met
	0400449 u/s Vanderhoof	Nov 1,6,9,13	4	105 - 107%	Objective met

*These sites are nearest to the ideal locations and assumed to be representative

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Gas Pressure 109% max	Nechako River: 0400450 100 m d/s Vanderhoof	Nov 1,6,9,13	4	104 - 106%	Objective met
	E207450 0.5 km d/s Vanderhoof	Nov 1,6,9,13	4	104 - 107%	Objective met
	E207451 2 km d/s Vanderhoof	Nov 1,6,9,13	4	105 - 107%	Objective met

TABLE 11

PINE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	E206235 100 m u/s Chetwynd	Sep 25, Oct 10,12	3	<2 - 2/100 mL	Indefinite result
Fecal Coliforms <200/100 mL geometric mean (gm)	0400561 5 km d/s Chetwynd (Twidwell Bend)	Sep 25, Oct 10,12,23,25	5	<2 - 3/100 mL gm = 2/100 mL	Objective met
	E207956 d/s Murray R confl.,E	Sep 13,19,26, Oct 2,10	5	<2 - 7/100 mL gm = 4/100 mL	Objective met
	E207957 d/s Murray R confl.,W	Sep 13,19,26, Oct 2,10	5	2 - 10/100 mL gm = 4/100 mL	Objective met
Turbidity max increase: 5 NTU or 10%	E206235 100 m u/s Chetwynd	Sep 25, Oct 10,12	3	2.5 - 3.0 NTU	Control site
	0400561 5 km d/s Chetwynd (Twidwell Bend)	Sep 25, Oct 10,12	3	1.9 - 2.4 NTU max inc. = 0 NTU	Objective met
Susp. Solids max increase: 10 mg/L or 10%	E206235 100 m u/s Chetwynd	Sep 25, Oct 10,12	3	2 - 5 mg/L	Control site
	0400561 5 km d/s Chetwynd (Twidwell Bend)	Sep 25, Oct 10,12	3	3 - 4 mg/L max inc. = 1 mg/L	Objective met
Total CL2 res. 0.002 mg/L max	d/s Chetwynd	1989	0	chlorination not occurring	no need to check obj.
Chlorophyll-a <50 mg/m2 av	E206235 100 m u/s Chetwynd	September 25	6	3.2 - 33.3 mg/m2 av = 18.4 mg/m2	Objective met
	0400561 5 km d/s Chetwynd (Twidwell Bend)	September 25	6	18.3 - 33.9 mg/m2 av = 26.0 mg/m2	Objective met
	E207956 d/s Murray R confl.,E	September 26	6	7.9 - 14.0 mg/m2 av = 9.8 mg/m2	Objective met
Ammonia-N <0.467 mg/L av 2.43 mg/L max at pH = 8.4 temp = 8 C	E206235 100 m u/s Chetwynd	Sep 25, Oct 10,12	3	<0.005 - 0.009mg/L	Max obj. met
	0400561 5 km d/s Chetwynd (Twidwell Bend)	Sep 25, Oct 10,12,23,25	5	<0.005 - 0.024mg/L av = 0.009mg/L	Objectives met

TABLE 11 continued

PINE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.467 mg/L av 2.43 mg/L max at pH = 8.4 temp = 8 C	E207956 d/s Murray R confl.,E	Sep 13,19,26, Oct 2,10	5	<0.005 - 0.006mg/L av = 0.006mg/L	Objectives met
	E207957 d/s Murray R confl.,W	Sep 13,19,26, Oct 2,10	5	<0.005 - 0.008mg/L av = 0.006mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	E206235 100 m u/s Chetwynd	Sep 25, Oct 10,12	3	all <0.005 mg/L	Max obj. met
	0400561 5 km d/s Chetwynd (Twidwell Bend)	Sep 25, Oct 10,12,23,25	5	all <0.005 mg/L	Objectives met
Dissolved Oxygen 7.75 mg/L min	0400561 5 km d/s Chetwynd (Twidwell Bay)	1989	0	no data collected	Objective not checked
	E207956 d/s Murray R confl.,E	Jul 25-Dec 6	10	9.1 - 13.7 mg/L	Objective met
	E207957 d/s Murray R confl.,W	Jul 25-Dec 6	9	9.1 - 14.1 mg/L	Objective met

TABLE 12

POUCE COUPE RIVER AND DAWSON CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm)	Pouce Coupe River: E206705 u/s mun. discharge	April 3,11,17 18,24	5	7 - 146/100 mL gm = 31/100 mL	Objective met
	E206959 1.7km d/s D.Cr confl.	April 3,11,17 18,24	5	5 - 80/100 mL gm = 11/100 mL	Objective met
		Oct 4,18,19, 26, Nov 2	5	14 - 88/100 mL gm = 30/100 mL	Objective met
Turbidity max increase: 5 NTU or 10%	Pouce Coupe River: E206705 u/s mun. discharge	May 3 - 24	5	11 - 100 NTU	Control site
	E206959 1.7km d/s D.Cr confl.	May 3 - 24	5	increase = 0 - 2 NTU	Objective met
	Dawson Creek: 0410034 u/s mun. discharge	Jan 29,Oct 4, 18,19,26,Nov2	6	6.9 - 72 NTU	Control site
	0410039 2.5km d/s mun. dis.	Jan 29,Oct 4, 18,19,26	5	increase = 9 - 48 NTU	Objective not met
		November 2	1	increase = 0 NTU	Obj. met
Susp. Solids max increase: 10 mg/L or 10%	Pouce Coupe River: E206705 u/s mun. discharge	May 3 - 24	5	14 - 196 mg/L	Control site
	E206959 1.7km d/s D.Cr confl.	May 3 - 24	5	increase = 0 - 3 mg/L	Objective met
	Dawson Creek: 0410034 u/s mun. discharge	Jan 29,Oct 4, 18,19,26,Nov2	6	9 - 73 mg/L	Control site
	0410039 2.5km d/s mun. dis.	Jan 29,Oct 4, 18,19,26	5	increase = 18 - 49 mg/L	Objective not met
		November 2	1	increase = 0 mg/L	Obj. met
Tot. Cl2 Res. <0.01 mg/L max	Pouce Coupe River & Dawson Creek	1989	0	no chlorination occurring	no need to check obj.
Chlorophyll-a <50 mg/m2 av	Pouce Coupe River: E206705 u/s mun. discharge	Sep 29	4	36.7 - 65.2 mg/m2 av = 49.6 mg/m2	Objective met

TABLE 12 continued

POUCE COUPE RIVER AND DAWSON CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll-a <50 mg/m2 av	Pouce Coupe River: E206959 1.7km d/s D.Cc confl.	Sep 29	4	193 - 332 mg/m2 av = 265 mg/m2	Objective not met
Ammonia-N <0.89 mg/L av 4.61 mg/L max at pH = 8.1 temp = 12 C	Pouce Coupe River: E206705 u/s mun. discharge	May 3,11,17, 18,24	5	av = 0.090 mg/L max = 0.308 mg/L	Objectives met
	E206959 1.7km d/s D.Cr confl.	May 3,11,17, 18,24	5	av = 0.012 mg/L max = 0.024 mg/L	Objectives met
		Jan25,29,Feb8	3	6.8 - 14.9 mg/L	Max not met
		Oct 4,18,19, 26,Nov 2	5	av = 0.013 mg/L max = 0.020 mg/L	Objectives met
	Dawson Creek: 0410034 u/s mun. discharge	Oct 4,18,19, 26,Nov 2	5	av = 0.244 mg/L max = 0.945 mg/L	Objectives met
		January 29	1	<0.005 mg/L	Max obj. met
	0410039 2.5km d/s mun. dis.	May 3 May 11 May 17 May 18 May 24	1 1 1 1 1	4.700 mg/L 4.260 mg/L 0.017 mg/L 0.029 mg/L 0.980 mg/L av = 1.997 mg/L	Max not met Max obj. met Max obj. met Max obj. met Max obj. met Av not met
		Oct 4,18,19 26,Nov 2	5	av = 0.295 mg/L max = 0.915 mg/L	Objectives met
		Jan 29,Feb 8	2	5.1 - 33.1 mg/L	Max not met
Nitrite-N 0.06 mg/L max	Pouce Coupe River: E206705 u/s mun. discharge	May 3 - 24	5	0.005 - 0.007 mg/L	Objective met
	E206959 1.7km d/s D.Cr confl.	Jan 25-May 24	8	<0.005-0.019 mg/L	Objective met
	Dawson Creek: 0410034 u/s mun. discharge	January 29	1	0.027 mg/L	Objective met
	0410039 2.5km d/s mun. dis.	Feb 8,May 11, 17,18,24	5	0.098 - 0.245 mg/L	Objective not met
		Jan 29,May 3	2	0.008 - 0.027 mg/L	Objective met

TABLE 12 continued

POUCE COUPE RIVER AND DAWSON CREEK WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 5.5 mg/L min	Pouce Coupe River: E206705 u/s mun. discharge	May 3 - 24	5	10.0 - 18.0 mg/L	Objective met
	E206706 d/s mun. discharge	May 3 - 24	5	15.0 - 11.0 mg/L	Objective met
	E206959 1.7km d/s D.Cr confl.	May 3 - 24	5	11.0 - 13.0 mg/L	Objective met
	Dawson Creek: 0410039 2.5km d/s mun. dis.	May 3 - 24	5	11.0 - 18.0 mg/L	Objective met

TABLE 13

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	2 - 21/100 mL np = 11/100 mL	Objective met
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	2 - 7/100 mL np = 7/100 mL	Objective met
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	<2 - 31/100 mL np = 21/100 mL	Objective met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	<2 - 32/100 mL np = 23/100 mL	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	2 - 26/100 mL np = 21/100 mL	Objective met
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	4 - 19/100 mL np = 15/100 mL	Objective met
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	2 - 10/100 mL np = 9/100 mL	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	6 - 276/100 mL np = 120/100 mL	Objective not met
	E207965 1 km d/s Fibreco	Aug 28, Sep 6,11	3	5 - 270/100 mL	Indefinite result
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	3 - 31/100 mL np = 29/100 mL	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	5 - 596/100 mL np = 260/100 mL	Objective not met
Fecal Coliforms <200/100 mL geometric mean (gm)	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	17 - 97/100 mL gm = 32/100 mL	Objective met
	E207449 d/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	19 - 97/100 mL gm = 39/100 mL	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase: 5 NTU or 10%	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	1.1 - 15 NTU	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	2.1 - 5.5 NTU	Control site
	0400492 100 m d/s Ft. St John	Aug 16,28 Sep 6,11	4	1.2 - 9.2 NTU max inc = 0.1 NTU	Objective met
		August 22	1	21 NTU max inc = 6 NTU	Objective not met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	1.4 - 14 NTU max inc = 0.3 NTU	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	1.1 - 18 NTU	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	1.1 - 15 NTU	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	1.1 - 15 NTU max inc = 3.1 NTU	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22, Sep 6,11	4	1.6 - 17 NTU max inc = 1 NTU	Objective met
		August 28	1	20 NTU max inc = 11.1 NTU	Objective not met
	E207965 1 km d/s Fibreco	September 6, 11	2	1.4 - 2 NTU max inc = 0.3 NTU	Objective met
		August 28	1	14 NTU max inc = 5.1 NTU	Objective not met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	1.1 - 16 NTU max inc = 0.6 NTU	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	1.1 - 8.4 NTU max inc = 2.3 NTU	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase: 5 NTU or 10%	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	68 - 210 NTU	Control site
	E207449 d/s Ft St Jn dischge.	May 18,31, June 8,15	4	68 - 180 NTU max inc = 10%	Objective met
		May 24	1	250 NTU max inc = 19%	Objective not met
Suspended Solids max increase: 10 mg/L or 10%	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	<1 - 31 mg/L	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	5 - 20 mg/L	Control site
	0400492 100 m d/s Ft. St John	Aug 16,28, Sep 6,11	4	<1 - 21 mg/L max inc = 0 mg/L	Objective met
		August 22	1	51 mg/L max inc = 20 mg/L	Objective not met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	3 - 33 mg/L max inc = 2 mg/L	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	3 - 43 mg/L	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	2 - 37 mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	2 - 37 mg/L max inc = 4 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22, Sep 6,11	4	4 - 45 mg/L max inc = 2 mg/L	Objective met
		August 28	1	38 mg/L max inc = 20 mg/L	Objective not met
	E207965 1 km d/s Fibreco	Aug 28, Sep 6,11	3	3 - 25 mg/L max inc = 7 mg/L	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids max increase: 10 mg/L or 10%	Peace River: 0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	3 - 36 mg/L max inc = 3 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	3 - 23 mg/L max inc = 4 mg/L	Objective met
	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	76 - 692 mg/L	Control site
	E207449 d/s Ft St Jn dischge.	May 18,24, June 8,15	4	67 - 727 mg/L max inc = 9%	Objective met
		May 31	1	625 mg/L max inc = 39%	Objective not met
Tot Cl2 Res. 0.002 mg/L max	Peace River	1989	0	no data collected	Objective not checked
Dissolved Fluoride 1.0 mg/L max	Peace River: 0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	all <0.1 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	all <0.1 mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 28, Sep 6,11	3	all <0.1 mg/L	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all <0.1 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6	4	all <0.1 mg/L	Objective met
WAD - CN <0.005 mg/L av 0.01 mg/L max	Peace River: 0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	all <0.005 mg/L	Objectives met
	E207631 200 m d/s Fibreco	Aug 16,22,28 Sep 6,11	5	all <0.005 mg/L	Objectives met
	E207965 1 km d/s Fibreco (midstream)	Aug 28, Sep 6,11	3	all <0.005 mg/L	Max obj. met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD - CN <0.005 mg/L av 0.01 mg/L max	Peace River: 0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all <0.005 mg/L	Objectives met
	0400143 5 km d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	all <0.005 mg/L	Objectives met
Chlorophyll-a < 50 mg/m2 av	Peace & Beatton Rivers	1989	0	no data collected	Objective not checked
Ammonia-N <0.568 mg/L av at pH = 8.3 temp = 12 C	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	<0.005-0.008 mg/L av = 0.006 mg/L	Objective met
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005-0.009 mg/L av = 0.006 mg/L	Objective met
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	<0.005-0.006 mg/L av = 0.005 mg/L	Objective met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	<0.005-0.007 mg/L av = 0.005 mg/L	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.005-0.012 mg/L av = 0.007 mg/L	Objective met
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005-0.008 mg/L av = 0.006 mg/L	Objective met
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	<0.005-0.010 mg/L av = 0.007 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	<0.005-0.006 mg/L av = 0.005 mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 28, Sep 6,11	3	<0.005 - 0.007mg/L	Indefinite result
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.005-0.006 mg/L av = 0.005 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005-0.007 mg/L av = 0.005 mg/L	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.8 mg/L av at pH = 7.6 temp = 14 C	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	0.005 - 0.018 mg/L av = 0.012 mg/L	Objective met
	E207449 d/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	0.013 - 0.042 mg/L av = 0.026 mg/L	Objective met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.006 mg/L	Objectives met
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	av = 0.007 mg/L max = 0.010 mg/L	Objectives met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.006 mg/L	Objectives met
	E207965 1 km d/s Fibreco	Aug 28, Sep 6,11	3	all < 0.005 mg/L	Max obj. met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.006 mg/L	Objectives met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	av = 0.005 mg/L max = 0.005 mg/L	Objectives met
	E207449 d/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	av = 0.005 mg/L max = 0.006 mg/L	Objectives met
Dissolved Oxygen 7.25 mg/L min	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	8.8 - 12.8 mg/L	Objective met
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	8.9 - 13.0 mg/L	Objective met
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	8.5 - 12.8 mg/L	Objective met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	8.6 - 12.9 mg/L	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	8.5 - 13.2 mg/L	Objective met
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	8.4 - 13.2 mg/L	Objective met
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	8.6 - 13.1 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	8.4 - 13.0 mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 16,28, Sep 6,11	4	8.5 - 12.4 mg/L	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	8.7 - 13.4 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	8.8 - 12.4 mg/L	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.25 mg/L min	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	9.0 - 11.0 mg/L	Objective met
	E207449 d/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	8.0 - 11.0 mg/L	Objective met
Total Dissolved Gas 110% max	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Sep 6,11	2	103 %	Objective met
	0400135 3.2km u/s Ft. St John (midstream)	Sep 6,11	2	103 %	Objective met
	0400492 100 m d/s Ft. St John	Sep 6,11	2	103 %	Objective met
	0410018 500 m d/s Ft. St John	Sep 6,11	2	103 %	Objective met
	0400138 u/s Petro-Canada (N side)	Sep 6,11	2	103 %	Objective met
	0400139 u/s Petro-Canada (midstream)	Sep 6,11	2	103 %	Objective met
	0410054 100m d/s Petro-Canada	Sep 6,11	2	104 %	Objective met
	E207631 200 m d/s Fibreco	Sep 6,11	2	104 - 105 %	Objective met
	E207965 1 km d/s Fibreco	Sep 6,11	2	104 - 105 %	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Sep 6,11	2	104 - 106 %	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Sep 6,11	2	104 - 106 %	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 9.0	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	8.1 - 8.3	Objective met
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	8.2 - 8.3	Objective met
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	8.2 - 8.3	Objective met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	8.2 - 8.3	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	8.2 - 8.4	Objective met
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	8.2 - 8.4	Objective met
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	8.2 - 8.4	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	8.2 - 8.4	Objective met
	E207965 1 km d/s Fibreco	Aug 28 Sep 6,11	3	8.3 - 8.4	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	8.2 - 8.3	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	8.2 - 8.3	Objective met
	Beatton River: E207448 u/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	7.4 - 7.9	Objective met
	E207449 d/s Ft St Jn dischge.	May 18,24,31, June 8,15	5	7.3 - 8.0	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Temperature max increase: 1 C	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	9.8 - 11.8 C	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	10.2 - 11.3 C	Control site
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	10.4 - 11.7 C max inc = 0.6 C	Objective met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	10.4 - 11.7 C max inc = 0.7 C	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	10.5 - 12.1 C	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	10.7 - 12.2 C	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	10.5 - 12.8 C max inc = 1.0 C	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	11.0 - 12.7 C max inc = 0.9 C	Objective met
	E207965 1 km d/s Fibreco	Aug 16,28 Sep 6	3	10.8 - 12.2 C max inc = 0.1 C	Objective met
		September 11	1	12.9 C max inc = 1.1 C	Objective not met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	10.8 - 12.2 C max inc = 0.5 C	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	10.6 - 12.2 C max inc = 0.8 C	Objective met
Tot Copper <0.004 mg/L av 0.011 mg/L max at hardness 100 mg/L or 20% increase	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.002mg/L	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.003mg/L	Control site

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Tot Copper <0.004 mg/L av 0.011 mg/L max at hardness 100 mg/L or 20% increase	Peace River: 0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	av < 0.002 mg/L max = 0.004 mg/L	Objectives met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.002mg/L	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.001mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	av = 0.012 mg/L max = 0.050 mg/L	Av not met Max not met on Sep 11
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	av < 0.002 mg/L max = 0.003 mg/L	Objectives met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	<0.001 - 0.001mg/L	Max obj. met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	av = 0.001 mg/L max = 0.003 mg/L	Objectives met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
Chlorophenols (tri + tetra + penta) 0.0002mg/L max	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	all < 0.0001 mg/L for each homologue	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	all < 0.0001 mg/L for each homologue	Objective met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	all < 0.0001 mg/L for each homologue	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all < 0.0001 mg/L for each homologue	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	all < 0.0001 mg/L for each homologue	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Tot Chromium 0.002 mg/L max or 20% increase	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.030mg/L	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	all < 0.005 mg/L	Control site
	0400492 100 m d/s Ft. St John	Aug 16,22, Sep 6,11	4	all < 0.005 mg/L	Objective met
		August 28	1	0.040 mg/L	Obj. not met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.030mg/L max inc. = 0 %	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.030mg/L	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.030mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	all < 0.005 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.030mg/L max inc. = 0 %	Objective met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	all < 0.005 mg/L	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all < 0.005 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	all < 0.005 mg/L	Objective met
Total Lead <0.006 mg/L av 0.082 mg/L max at hardness 100 mg/L or 20% increase	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.002mg/L	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.001mg/L	Control site

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Lead <0.006 mg/L av 0.082 mg/L max at hardness 100 mg/L or 20% increase	Peace River: 0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.001mg/L	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.001 - 0.001mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	<0.001 - 0.006mg/L	Max obj. met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
Total Nickel 0.065 mg/L max at hardness 100 mg/L	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	0.003 - 0.030 mg/L	Objective met
	0400492 100 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Nickel 0.065 mg/L max at hardness 100 mg/L	Peace River: 0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	0.003 - 0.015 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	0.003 - 0.005 mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	all = 0.003 mg/L	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	all = 0.003 mg/L	Objective met
Total Zinc 0.03 mg/L max or 20% increase	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.006mg/L	Control site
	0400135 3.2km u/s Ft. St John (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.008mg/L	Control site
	0400492 100 m d/s Ft. St John	Aug 22,28, Sep 6,11	4	<0.005 - 0.005mg/L	Objective met
		August 16	1	0.035 mg/L	Obj. not met
	0410018 500 m d/s Ft. St John	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.013mg/L	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all < 0.005 mg/L	Control site
	0400139 u/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.016mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.005mg/L	Objective met

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zinc 0.03 mg/L max or 20% increase	Peace River: E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.025mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	<0.005 - 0.010mg/L	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.030mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.005 - 0.006mg/L	Objective met
Phenol 0.002 mg/L av or 20% increase	Peace River: 0410053 100m u/s Petro-Canada	Aug 16,22,28 Sep 6,11	5	<0.002 - 0.003mg/L av = 0.0024 mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	<0.002 - 0.007mg/L av = 0.0034 mg/L	Objective not met
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	<0.002 - 0.003mg/L av = 0.0022 mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	<0.002 - 0.005mg/L	Indefinite result
	0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	<0.002 - 0.002mg/L av = 0.002 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	<0.002 - 0.003mg/L av = 0.0022 mg/L	Objective met
Sulfide 0.002 mg/L max or 20% increase	Peace River: 0410053 100m u/s Petro-Canada	Aug 16,22,28 Sep 6,11	5	all < 0.5 mg/L	Control site
	0410054 100m d/s Petro-Canada	Aug 16,22,28, Sep 6,11	5	all < 0.5 mg/L	Indefinite result
	E207631 200 m d/s Fibreco	Aug 16,22,28, Sep 6,11	5	all < 0.5 mg/L	Indefinite result
	E207965 1 km d/s Fibreco	Aug 28,Sep 6, 11	3	all < 0.5 mg/L	Indefinite result

TABLE 13 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Sulfide 0.002 mg/L max or 20% increase	Peace River: 0400142 5 km d/s Petro-Canada (N side)	Aug 16,22,28, Sep 6,11	5	all < 0.5 mg/L	Indefinite result
	0400143 5 km d/s Petro-Canada (midstream)	Aug 16,22,28, Sep 6,11	5	all < 0.5 mg/L	Indefinite result
2,4-D (ester) 0.004 mg/L max	Peace River	1989	0	no data collected	Objective not checked

TABLE 14

WILLIAMS LAKE WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform <10/100 mL 90th perc. (np) at water intakes	North shore near centre (before chlorination)	Aug 9,17,21, 24,28	5	<2 - 2/100 mL np < 2/100 mL	Objective met
Fecal Coliform <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) at beaches	Scout Island beach	Jun 5,14,21, Jul 10,17	5	<5 - 15/100 mL gm = 6/100 mL	Objective met
Turbidity <1 NTU av 5 NTU max	0603019 at lake centre	June 19,Oct 3	2	2.4 - 3.9 NTU	Max obj. met
		July 28	1	5.5 NTU	Max not met av not chkd.
Total P <0.020 mg/L av at spring overturn	0603019 at lake centre	May 8	3	5m : 0.037 mg/L 10m : 0.024 mg/L 15m : 0.035 mg/L av = 0.032 mg/L	Objective not met
Chlorophyll-a <0.005 mg/L av May - August	0603019 at lake centre	June 19, Jul 28,Aug 25	3	0.0148-0.0186 mg/L av = 0.017 mg/L	Objective not met
Diss. Oxygen 4 mg/L min 5m above sed.	0603019 at lake centre	October 3	1	0.15 mg/L at 13m (bottom at 18.75m)	Objective not met
Water Clarity 1.2m min Secchi reading	0603019 at lake centre	October 3	1	1.75 m	Objective met

TABLE 15

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Bonaparte River: 0600017 u/s Clinton Creek	Apr 24,May 1, 8,15	4	7.9 - 8.3/100 mL	Indefinite result
	E206646 d/s Clinton Creek	Apr 24,May 1, 8,15	4	12 - 39/100 mL	Indefinite result
	E207296 u/s Loon Creek	Apr 24,May 1, 8,15,23	5	15 - 71/100 mL np = 45/100 mL	Objective met
	E207297 d/s Loon Creek	Apr 24,May 1, 8,15,23	5	18 - 111/100 mL np = 55/100 mL	Objective met
	0600506 u/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	64 - 84/100 mL np = 82/100 mL	Objective met
	0600508 d/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	84 - 144/100 mL np = 130/100 mL	Objective not met
	0600329 at the mouth	Apr 10,24, May 1,8,15	5	3 - 106/100 mL np = 97/100 mL	Objective met
	Clinton Creek: 0600503 u/s Clinton STP	Apr 24,May 8, 15,23	4	2 - 34/100 mL	Indefinite result
	0600258 d/s Clinton STP	Apr 24,May 1, 8,15,23	5	2 - 72/100 mL np = 25/100 mL	Objective met
	0600009 at the mouth	Apr 24,May 1, 15,23	4	2 - 10/100 mL	Indefinite result
	Loon Creek: 0600297 u/s trout hatchery	Apr 24,May 1, 8,15,23	5	23 - 175/100 mL np = 140/100 mL	Objective not met
	E206110 d/s trout hatchery	Apr 24,May 1, 8,15,23	5	16 - 144/100 mL np = 130/100 mL	Objective not met
	0600336 at the mouth	Apr 24,May 1, 8,15,23	5	57 - 172/100 mL np = 130/100 mL	Objective not met
Fecal Coliforms <10/100 mL 90th perc. at water intakes	Loon Lake 0603050 above deepest point	Aug 8,14,21, 28,31	5	all < 2/100 mL	Objective met
Fecal Coliform <200/100 mL gm at beaches	Loon Lake	1989	0	no data collected	Objective not checked

TABLE 15 continued

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids max increase: 10 mg/L or 10%	Bonaparte River: 0600017 u/s Clinton Creek	Apr 24,May 1, 8,15,23	5	6 - 23 mg/L	Control site
	E206646 d/s Clinton Creek	Apr 24,May 1, 8,15,23	5	increase=0-10 mg/L	Objective met
	E207296 u/s Loon Creek	Apr 24,May 1, 8,15,23	5	increase=0-7 mg/L	Objective met
	E207297 d/s Loon Creek	Apr 24,May 1, 8,15,23	5	increase=0-7 mg/L	Objective met
	0600506 u/s Cache Creek STP	Apr 24 May 1,8,15,23	1 4	increase = 9 mg/L inc. = 23-53 mg/L	Obj. met Obj. not met
	0600508 d/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	inc. = 16-52 mg/L	Objective not met
	0600329 at the mouth	Apr 24,May 1, 8,15,23	5	inc. = 20-73 mg/L	Objective not met
	Clinton Creek: 0600503 u/s Clinton STP	Apr 24,May 8, 15,23	4	2 - 16 mg/L	Control site
	0600258 d/s Clinton STP	Apr 24,May 8, 15,23	4	increase=0-6 mg/L	Objective met
	0600009 at the mouth	Apr 24, May 15,23	3	increase = 0 mg/L	Objective met
	Loon Creek: 0600297 u/s trout hatchery	Apr 24,May 1, 8,15,23	5	2 - 18 mg/L	Control site
	E206110 d/s trout hatchery	Apr 24,May 1, 8,15,23	5	increase=0-6 mg/L	Objective met
	0600336 at the mouth	Apr 24,May 1, 8,15,23	5	increase=0-3 mg/L	Objective met
Turbidity max increase: 5 NTU or 10%	Bonaparte River: 0600017 u/s Clinton Creek	Apr 24,May 1, 8,15,23	5	0.6 - 3.0 NTU	Control site
	E206646 d/s Clinton Creek	Apr 24,May 1, 8,15,23	5	increase=0-1.0 NTU	Objective met
	E207296 u/s Loon Creek	Apr 24,May 1, 8,15,23	5	increase=0-2.0 NTU	Objective met

TABLE 15 continued

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase: 5 NTU or 10%	Bonaparte River: E207297 d/s Loon Creek	Apr 24,May 1, 8,15,23	5	increase=0-1.1 NTU	Objective met
	0600506 u/s Cache Creek STP	Apr24,May1,15 May 8,23	3 2	inc. = 4.1-5.0 NTU inc. = 6.1-11 NTU	Obj. met Obj. not met
	0600508 d/s Cache Creek STP	Apr 24,May 1 May 8,15,23	2 3	inc. = 4.4-4.9 NTU inc. = 6.0-8.1 NTU	Obj. met Obj. not met
	0600329 at the mouth	Apr 24,May 1, 8,15,23	5	inc. = 5.1-13.1NTU	Objective not met
	Clinton Creek: 0600503 u/s Clinton STP	Apr 24,May 8, 15,23	4	0.7 - 2.0 NTU	Control site
	0600258 d/s Clinton STP	Apr 24,May 8, 15,23	4	increase=0-1.0 NTU	Objective met
	0600009 at the mouth	Apr 24, May 15,23	3	increase = 0 NTU	Objective met
	Loon Creek: 0600297 u/s trout hatchery	Apr 24,May 1, 8,15,23	5	0.5 - 2.0 NTU	Control site
	E206110 d/s trout hatchery	Apr 24,May 1, 8,15,23	5	increase=0-0.4 NTU	Objective met
	0600336 at the mouth	Apr 24,May 1, 8,15,23	5	increase=0-1.0 NTU	Objective met
Diss. Solids 500 mg/L max	Clinton Creek	1989	0	no data collected	Objective not checked
Tot Cl2 Res. 0.002 mg/L max	Bonaparte River Clinton Creek	1989	0	chlorination not occurring	no need to check obj.
Ammonia-N <0.37 mg/L av 1.93 mg/L max at pH = 8.5 Temp = 10 C	Bonaparte River: 0600017 u/s Clinton Creek	Apr 24,May 1, 8,15,23	5	0.005 mg/L or less	Objectives met
	E206646 d/s Clinton Creek	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	E207296 u/s Loon Creek	Apr 24,May 1, 8,15,23	5	0.006 mg/L or less	Objectives met
	E207297 d/s Loon Creek	Apr 24,May 1, 8,15,23	5	0.005 mg/L or less	Objectives met

TABLE 15 continued

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.37 mg/L av 1.93 mg/L max at pH = 8.5 temp = 10 C	Bonaparte River: 0600506 u/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	0.008 mg/L or less	Objectives met
	0600508 d/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	av = 0.011 mg/L max = 0.017 mg/L	Objectives met
	0600329 at the mouth	Apr 24,May 1, 8,15,23	5	0.008 mg/L or less	Objectives met
	Clinton Creek: 0600503 u/s Clinton STP	Apr 24,May 8, 15,23	4	<0.005 - 0.014mg/L	Max obj. met av not chkd.
	0600258 d/s Clinton STP	Apr 24,May 1, 8,15,23	5	av = 0.061 mg/L max = 0.098 mg/L	Objectives met
	0600009 at the mouth	Apr 24,May 1, 15,23	4	<0.005 - 0.012mg/L	Max obj. met av not chkd.
	Loon Creek: 0600297 u/s trout hatchery	Apr 24,May 1, 8,15,23	5	av = 0.017 mg/L max = 0.065 mg/L	Objectives met
	E206110 d/s trout hatchery	Apr 24,May 1, 8,15,23	5	av = 0.016 mg/L max = 0.032 mg/L	Objectives met
	0600336 at the mouth	Apr 24,May 1, 8,15,23	5	av = 0.008 mg/L max = 0.017 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Bonaparte River: 0600017 u/s Clinton Creek	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	E206646 d/s Clinton Creek	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	E207296 u/s Loon Creek	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	E207297 d/s Loon Creek	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	0600506 u/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	0600508 d/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met
	0600329 at the mouth	Apr 24,May 1, 8,15,23	5	all < 0.005 mg/L	Objectives met

TABLE 15 continued

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Clinton Creek: 0600503 u/s Clinton STP	Apr 24,May 8, 15,23	4	all < 0.005 mg/L	Max obj. met
	0600258 d/s Clinton STP	Apr 24,May 1, 8,15,23	5	av = 0.007 mg/L max = 0.011 mg/L	Objectives met
	0600009 at the mouth	Apr 24,May 1, 15,23	4	all < 0.005 mg/L	Max obj. met
Chlorophyll-a <50 mg/m2 av	Bonaparte River: 0600508 d/s Cache Creek STP	September 14	6	31.9 - 223 mg/m2 av = 152 mg/m2	Objective not met
	0600329 at the mouth	September 14	6	78.3 - 193 mg/m2 av = 128 mg/m2	Objective not met
Chlorophyll-a <100 mg/m2 av or 20% increase	Clinton Creek	1989	0	no data collected	Objective not checked
Diss. Oxygen 7.75-11.2 mg/L min depending on fish egg stage	Bonaparte River Clinton Creek Loon Creek	1989	0	no data collected	Objective not checked
Diss. Oxygen 5 mg/L min, 5m above bottom	Loon Lake 0603050 above deepest point	Aug 8-Aug 29	4	0.9 - 1.5 mg/L 5 m above bottom	Objective not met
pH 6.5 - 8.5	Bonaparte River: 0600017 u/s Clinton Creek	Apr 24,May 1, 8,15,23	5	7.9 - 8.3	Objective met
	E206646 d/s Clinton Creek	Apr 24,May 1, 8,15,23	5	8.1 - 8.4	Objective met
	E207296 u/s Loon Creek	Apr 24,May 1, 8,15,23	5	8.2 - 8.5	Objective met
	E207297 d/s Loon Creek	Apr 24,May 1, 8,15,23	5	8.2 - 8.5	Objective met
	0600506 u/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	8.3 - 8.4	Objective met
	Clinton Creek: 0600503 u/s Clinton STP	Apr 24,May 8, 15,23	4	8.4 - 8.5	Objective met

TABLE 15 continued

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	Clinton Creek: 0600258 d/s Clinton STP	Apr 24,May 1, 8,15,23	5	8.2 - 8.4	Objective met
	0600009 at the mouth	May 1,15 Apr 24,May23	2 2	8.4 - 8.5 8.6	Obj. met Obj. not met
pH 6.5 - 9.0	Bonaparte River: 0600508 d/s Cache Creek STP	Apr 24,May 1, 8,15,23	5	8.2 - 8.4	Objective met
	0600329 at the mouth	Jan 16-Dec 18	15	8.3 - 8.7	Objective met
	Loon Creek: 0600297 u/s trout hatchery	Apr 24,May 1, 8,15,23	5	8.3 - 8.5	Objective met
	E206110 d/s trout hatchery	Apr 24,May 1, 8,15,23	5	8.4 - 8.5	Objective met
	0600336 at the mouth	Apr 24,May 1, 8,15,23	5	8.5 - 8.6	Objective met

TABLE 16

OKANAGAN VALLEY LAKES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total-P <0.040 mg/L av at spring overturn (short-term)	Wood Lake 0500848 lake centre	April 4	1 1	0-10m: 0.044 mg/L 20-30m: 0.045 mg/L	Objective not met
Total-P <0.008 mg/L av at spring overturn	Kalamalka Lake: 0500246 south end	April 4	1 1	0-10m: 0.006 mg/L 20-44m: 0.006 mg/L	Objective met
	0500461 north end	April 13	1 1	0-10m: 0.009 mg/L 20-34m: 0.006 mg/L av = 0.0075 mg/L	Objective met
Total-P <0.010 mg/L av at spring overturn	Okanagan Lake: 0500239 Armstrong Arm	April 5	1 1 1	0-10m: 0.014 mg/L 15m: 0.004 mg/L 20-45m: 0.020 mg/L	Indefinite result
	0500238 Vernon Arm	April 5	1 1 1	0-10m: 0.005 mg/L 15m: 0.015 mg/L 18m: 0.005 mg/L	Indefinite result
	0500730 north basin	April 13	1 1 1	0-10m: 0.005 mg/L 0m: 0.006 mg/L 20-45m: 0.006 mg/L	Objective met
	0500236 central basin	March 15	1 1 1	0-10m: 0.005 mg/L 15m: 0.006 mg/L 20-45m: 0.007 mg/L	Objective met
	0500729 south basin	March 14	1 1 1	0-10m: 0.005 mg/L 15m: 0.005 mg/L 20-45m: 0.005 mg/L	Objective met
Total-P <0.015 mg/L av at spring overturn	Skaha Lake 0500615 lake centre	March 22	2 1	0-10m: 0.020 mg/L 20-44m: 0.020 mg/L	Objective not met
	Osoyoos Lake 0500249 north end	March 28	1 1	0-10m: 0.030 mg/L 20-32m: 0.028 mg/L	Objective not met

TABLE 17

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	Similkameen River: 0500075 Falls u/s Newmont	Sep 13,21,27, Oct 5,11	5	<2 - 2/100 mL np < 2/100 mL	Objective met
	0500629 d/s Newmont	Sep 13,21.27, Oct 5,11	5	<2 - 2/100 mL np < 2/100 mL	Objective met
	0500724 u/s Princeton STP	Sep 13,21,27, Oct 5,11	5	<2 - 37/100 mL np = 23/100 mL	Objective not met
	0500725 d/s Princeton STP	Sep 13,21,27, Oct 5,11	5	<2 - 18/100 mL np = 7/100 mL	Objective met
	0500692 u/s Keremeos STP	Sep 14,20,26, Oct 4,12	5	2 - 8/100 mL np = 5/100 mL	Objective met
	0500693 d/s Keremeos STP	Sep 14,20,26, Oct 4,12	5	<2 - 5/100 mL np = 4/100 mL	Objective met
	0500073 near U.S. border	Sep 26,Oct 4, 10,12,24	5	2 - 15/100 mL np = 14/100 mL	Objective not met
		Sep 12,14,20, 26,Oct 4	5	2 - 9/100 mL np = 7/100 mL	Objective met
	Allison Creek: 0500003 at the mouth	Sep 13,21,27, Oct 5,11	5	2 - 8/100 mL np = 4/100 mL	Objective met
	Allison Lake, N end 1131013	May 3,Aug 17	2	< 2/100 mL	Indefinite result
	Missezula Lake 0500928	May 10,Aug 17	2	< 2/100 mL	Indefinite result
	Osprey Lake at centre E206818	May 9,Aug 15	2	<2 - 2/100 mL	Indefinite result
Diss. Solids <500 mg/L av	Wolfe Creek	1989	0	no data collected	Objective not checked
Tot. Cl2 Res. 0.002 mg/L max	Similkameen River : Princeton to border	1989	0	no data collected	Objective not checked
Ammonia-N <0.874 mg/L av 4.54 mg/L max at pH = 8.1 temp = 15 C	Similkameen River: 0500724 u/s Princeton STP	Sep 13,21,27, Oct 5,11	5	av = 0.008 mg/L max = 0.020 mg/L	Objectives met
	0500725 d/s Princeton STP	Sep 13,21,27, Oct 5,11	5	av = 0.008 mg/L max = 0.021 mg/L	Objectives met

TABLE 17 continued

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.874 mg/L av 4.54 mg/L max at pH = 8.1 temp = 15 C	Similkameen River: 0500692 u/s Keremeos STP	Sep 20,26, Oct 4,12	4	0.006 - 0.037 mg/L	Max obj. met
	0500693 d/s Keremeos STP	Sep 20,26, Oct 4,12	4	0.005 - 0.058 mg/L	Max obj. met
	0500073 near U.S. border	Sep 26,Oct 4, 10,12,24	5	<0.005 - 0.030mg/L	Objectives met
Total-P <0.020 mg/L av at spring overturn	Allison Lake, N end 1131013	May 3	3	0-6 m: 0.008 mg/L 16 m: 0.014 mg/L 20-32m: 0.056 mg/L	Indefinite result
	Missezula Lake 0500928	May 10	3	0-10m: 0.021 mg/L 15-? m: 0.030 mg/L 20-45m: 0.030 mg/L av = 0.027 mg/L	Objective not met
	Osprey Lake at centre E206818	May 9	1	0-3 m: 0.011 mg/L	Indefinite result
Diss. Oxygen 5.25 mg/L min Apr - Sep	Allison Creek	1989	0	no data collected	Objective not checked
pH 6.5 - 8.5	Similkameen River: 0500724 u/s Princeton STP	May 5-Oct 11	6	7.8 - 8.3	Objective met
	0500725 d/s Princeton STP	May 9-Oct 11	6	7.4 - 8.3	Objective met
	0500692 u/s Keremeos STP	Sep 20-Oct 12	4	8.1 - 8.3	Objective met
	0500693 d/s Keremeos STP	Sep 20-Oct 12	4	8.2 - 8.3	Objective met
	0500073 near U.S. border	Jan 3-Nov 21	20	7.7 8.3	Objective met
	Wolfe Creek: 0500397 u/s Newmont	Sep 13-Oct 11	5	8.3 - 8.4	Objective met
	0500101 d/s Newmont	Sep 13-Nov 11	5	8.1 - 8.3	Objective met

TABLE 17 continued

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Cu <0.006 mg/L av 0.008 mg/L max hardness = 78 or 20% increase	Similkameen River: 0500075 Falls u/s Newmont	Sep 13,21,27, Oct 5,11	5	<0.001 - 0.002mg/L	Control site
	0500629 d/s Newmont	Sep 13,21.27, Oct 5,11	5	av = 0.0014 mg/L max = 0.002 mg/L	Objectives met
Dissolved Cu <0.010 mg/L av 0.015 mg/L max hardness=116 or 20% increase	Wolfe Creek: 0500397 u/s Newmont	Sep 13,21,27, Oct 5,11	5	0.003 - 0.006 mg/L	Control site
	0500101 d/s Newmont	Sep 13,21,27, Oct 5,11	5	all = 0.002 mg/L	Objectives met
Dissolved Fe 0.3 mg/L max or 20% increase	Wolfe Creek: 0500397 u/s Newmont	Sep 13,21,27, Oct 5,11	5	0.007 - 0.060 mg/L	Control site
	0500101 d/s Newmont	Sep 13,21,27, Oct 5,11	5	0.024 - 0.070 mg/L	Objective met
Dissolved Mn 0.2 mg/L max or 20% increase	Wolfe Creek: 0500397 u/s Newmont	Sep 13,21,27, Oct 5,11	5	<0.001 - 0.001mg/L	Control site
	0500101 d/s Newmont	Sep 13,21,27, Oct 5,11	5	0.020 - 0.050 mg/L	Objective met
Dissolved Mo <0.020 mg/L av 0.050 mg/L max or 20% increase May - Sep	Wolfe Creek: 0500397 u/s Newmont	Sep 13,21,27, Oct 5,11	5	0.003 - 0.005 mg/L	Control site
	0500101 d/s Newmont	Sep 13,21,27, Oct 5,11	5	all = 0.04 mg/L	Max obj. met Av not met
Dissolved Zn <0.050 mg/L av 0.180 mg/L max hardness = 78 or 20% increase	Similkameen River: 0500075 Falls u/s Newmont	Sep 13,21,27, Oct 5,11	5	<0.005 - 0.005mg/L	Control site
	0500629 d/s Newmont	Sep 13,21.27, Oct 5,11	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
Dissolved Zn <0.050 mg/L av 0.320 mg/L max hardness=116 or 20% increase	Wolfe Creek: 0500397 u/s Newmont	Sep 13,21,27, Oct 5,11	5	<0.005 - 0.005mg/L	Control site
	0500101 d/s Newmont	Sep 13,21,27, Oct 5,11	5	all < 0.005 mg/L	Objectives met

TABLE 18

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Susp. Solids max increase: 10 mg/L or 10%	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	1 - 8 mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	<1 - 9 mg/L	Objective met
Susp. solids max increase: 20 mg/L or 10%	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	1 - 6 mg/L	Objective met
	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	<1 - 6 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	9	<1 - 4 mg/L	Objective met
	Sunset Cr at confl. E206634	1989	0	no data collected	Objective not checked
Turbidity max increase: 5 NTU or 10%	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	0.2 - 2.4 NTU	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	0.2 - 2.4 NTU	Objective met
Turbidity max increase: 10 NTU or 20%	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	0.2 - 2.3 NTU	Objective met
	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	0.1 - 0.5 NTU	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	9	0.1 - 0.4 NTU	Objective met
	Sunset Cr at confl. E206634	1989	0	no data collected	Objective not checked
Diss. Solids 500 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	134 - 246 mg/L	Objective met
	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	104 - 190 mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	140 - 194 mg/L	Objective met
	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	72 - 118 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27,May 4, Jul12,18,Aug2	5	390 - 492 mg/L	Objective met

TABLE 18 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Diss. Solids 500 mg/L max	Nickel Plate Mine,d/s E206633	May 18,25, Jun 6,26	4	502 - 518 mg/L	Objective not met
Sulphate < 50 mg/L av 150 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27,May 4, 11,18,25	5	av = 30.4 mg/L max = 34.5 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Apr 27,May 4, 11,18,25	5	av = 34.6 mg/L max = 48.2 mg/L	Objectives met
	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	2.9 - 4.0 mg/L	Max obj. met
	Nickel Plate Mine,d/s E206633	Jul 6,12,18, 26, Aug 2	5	av = 96.0 mg/L max = 99.0 mg/L	Av not met Max obj. met
WAD-CN <0.005 mg/L av 0.010 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27,May 4, 11,18,25	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Apr 27-May 25 Apr 27 May 4-May 25	5 1 4	av = 0.008 mg/L 0.018 mg/L <0.005 - 0.009mg/L	Av. not met Max not met Max obj. met
SAD-CN + Thiocyanate as CN 0.20 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	11	<0.030 - 0.116mg/L	Objective met
	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	11	<0.030 - 0.102mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	14	all <0.055 mg/L	Objective met
Cyanate as CN 0.45 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-May 11 Jul 12-Aug 2	7	<0.050 - 0.410mg/L	Objective met
		May 18,25	2	0.460 - 0.520 mg/L	Obj. not met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	<0.050 - 0.340mg/L	Objective met
Total As 0.05 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	0.002 - 0.013 mg/L	Objective met
	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	<0.001 - 0.012mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	<0.001 - 0.011mg/L	Objective met
Total As 0.5 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	<0.001 - 0.003mg/L	Objective met

TABLE 18 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total As 0.5 mg/L max	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	<0.001 - 0.020mg/L	Objective met
Ammonia-N <0.718 mg/L av 3.74 mg/L max at pH = 8.2 temp = 10 C	Red Top Gulch at Hwy. E206638	Apr 27,May 4, 11,18,25	5	av = 0.053 mg/L max = 0.138 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Apr 27,May 4, 11,18,25	5	av = 0.093 mg/L max = 0.278 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27,May 4, 11,18,25	5	av = 0.009 mg/L max = 0.011 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Apr 27,May 4, 11,18,25	5	av = 0.010 mg/L max = 0.017 mg/L	Objectives met
Nitrite-N 1 mg/L max	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	<0.005 - 0.012mg/L	Objective met
Nitrite-N 10 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	all <0.005 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	all <0.005 mg/L	Objective met
Nitrate-N 10 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	0.06 - 1.23 mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	0.51 - 1.77 mg/L	Objective met
Nitrate-N 100 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	<0.02 - 0.10 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	7.65 - 17.9 mg/L	Objective met
pH 6.5 - 8.5	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	19	7.6 - 8.5	Objective met
	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	20	7.4 - 8.5	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	18	7.8 - 8.3	Objective met
	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	19	7.3 - 8.1	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2 May 25	19 1	7.6 - 8.5 8.6	Obj. met Obj. not met

TABLE 18 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Al 0.3 mg/L max or 20% increase at pH > 7	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	0.02 - 0.12 mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2 July 18	9 1	0.02 - 0.24 mg/L 0.31 mg/L	Obj. met Indef result
Total Cd 0.0002 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	all <0.0005 mg/L	Indefinite result
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	all <0.0005 mg/L	Indefinite result
Total Cd 0.005 mg/L max	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	all < or equal to 0.0005 mg/L	Objective met
Total Cd 0.02 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	all <0.0005 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	all <0.0005 mg/L	Objective met
Total Cu <0.005 mg/L av 0.007 mg/L max or 20% increase	Red Top Gulch at Hwy. E206638	Apr 27-May 25 May 4-May 25	5 4	av = 0.004 mg/L <0.001 - 0.002mg/L	Obj. met Max obj. met
		April 27	1	0.012 mg/L or 200% increase	Max not met
	Cahill Cr. at Highway E206637	Apr 27-May 25	5	av = 0.003 mg/L max = 0.004 mg/L	Objectives met
Total Cu 0.2 mg/L max	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	max = 0.004 mg/L	Objective met
Total Cu 0.3 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	max = 0.004 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	max = 0.003 mg/L	Objective met
Dissolved Fe 0.3 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	8	<0.005 - 0.091mg/L	Objective met
	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	9	<0.005 - 0.070mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	9	0.007 - 0.053 mg/L	Objective met
	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	<0.005 - 0.005mg/L	Objective met

TABLE 18 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Fe 0.3 mg/L max	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	9	<0.005 - 0.005mg/L	Objective met
Total Pb <0.005 mg/L av 0.007 mg/L max or 20% increase	Red Top Gulch at Hwy. E206638	Apr 27-May 25	5	av = 0.002 mg/L max = 0.004 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Apr 27-May 25	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
Total Pb 0.05 mg/L max	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	max = 0.004 mg/L	Objective met
Total Pb 0.3 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	10	max = 0.009 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	max = 0.002 mg/L	Objective met
Total Hg 0.0001mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	10	all < 0.00005 mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	all < 0.00005 mg/L	Objective met
Total Hg 0.001 mg/L max	Cahill Cr d/s tailing E206636	May 18-Aug 2	7	all < 0.00005 mg/L	Objective met
Total Hg 0.003 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	10	all < 0.00005 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	all < 0.00005 mg/L	Objective met
Total Hg in fish 0.5 ug/g wet wt. (muscle) max	Red Top Gulch at Hwy. and Cahill Cr. at Highway	1989	0	no data collected	Objective not checked
Total Mo <0.01 mg/L av 0.05 mg/L max or 20% increase (May-Sep)	Red Top Gulch at Hwy. E206638	Jul 6,12,18, 26, Aug 2	5	av = 0.01 mg/L max = 0.02 mg/L	Objectives met
	Cahill Cr d/s tailing E206636	Jul 6,12,18, 26, Aug 2	5	all < 0.01 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Jul 6,12,18, 26, Aug 2	5	all < 0.01 mg/L	Objectives met
Total Mo 0.05 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	10	all < 0.01 mg/L	Objective met

TABLE 18 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Mo 0.05 mg/L max	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	all < 0.01 mg/L	Objective met
Total Se 0.001 mg/L max or 20% increase	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	9	all < 0.005 mg/L	Indefinite result
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	9	all < 0.005 mg/L	Indefinite result
Total Se 0.01 mg/L max	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	9	all < 0.005 mg/L	Objective met
Total Se 0.05 mg/L max	Nickel Plate Mine,u/s E206632	Apr 27-Aug 2	9	all < 0.005 mg/L	Objective met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	9	all < 0.005 mg/L	Objective met
Total Ag 0.0001mg/L max or 20% increase	Red Top Gulch at Hwy. and Cahill Cr. at Highway	1989	0	no data collected	Objective not checked
Total Ag 0.05 mg/L max or 20% increase	Cahill Cr d/s tailing and Nickel Plate Mine Cr.	1989	0	no data collected	Objective not checked
Total Zn 0.05 mg/L max	Red Top Gulch at Hwy. E206638	Apr 27-Aug 2	10	all < 0.01 mg/L	Objective met
	Cahill Cr d/s tailing E206636	Apr 27-Aug 2	10	all < 0.01 mg/L	Objective met
	Cahill Cr. at Highway E206637	Apr 27-Aug 2	10	all < 0.01 mg/L	Objective met
	Nickel Plate Mine,u/s E206632	May 4-Aug 2	9	all < 0.01 mg/L	Obj. met
		Apr 27	1	0.12 mg/L	Obj. not met
	Nickel Plate Mine,d/s E206633	Apr 27-Aug 2	10	all < 0.01 mg/L	Objective met

TABLE 19

COLUMBIA AND WINDERMERE LAKES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np) near water intakes	Windermere Lake: E207044 Windermere	Jul 19,25, Aug 1,9,15	5	<2 - 2/100 mL np = 2/100 mL	Objective met
	E207045 Akiskinook	Jul 19,25, Aug 1,9,15	5	all < 2/100 mL	Objective met
	E207046 Terravista	Jul 19,25, Aug 1,9,15	5	all < 2/100 mL	Objective met
	E207047 Windermere Holdings	Jul 19,25, Aug 1,9,15	5	<2 - 2/100 mL np < 2/100 mL	Objective met
	E207048 Parr Utilities	Jul 19,25, Aug 1,9,15	5	<2 - 2/100 mL np < 2/100 mL	Objective met
	E207049 Timber Ridge	Jul 19,25, Aug 1,9,15	5	<2 - 2/100 mL np < 2/100 mL	Objective met
	Columbia Lake E207486 Columere	Jul 19,25, Aug 1,9,15	5	all < 2/100 mL	Objective met
Fecal Coliforms <200/100 mL geometric mean (gm) at beaches	Windermere Lake: E207055 Tretheway	Jul 19,25, Aug 1,9,15	5	2 - 4/100 mL gm = 3/100 mL	Objective met
	E205053 Terravista	Jul 19,25, Aug 1,9,15	5	<2 - 2/100 mL gm < 2/100 mL	Objective met
	E207052 Timber Ridge	Jul 19,25, Aug 1,9,15	5	2 - 6/100 mL gm = 4/100 mL	Objective met
	E207050 Invermere	Jul 19,25, Aug 1,9,15	5	2 - 153/100 mL gm = 13/100 mL	Objective met
	E207051 Athalmer	Jul 19,25, Aug 1,9,15	5	<2 - 62/100 mL gm = 4/100 mL	Objective met
	Columbia Lake E207487 Columere	Jul 19,25, Aug 1,9,15	5	<2 - 23/100 mL gm = 4/100 mL	Objective met
Turbidity <1 NTU av 5 NTU max during non-freshet	Windermere Lake water intake sites E207044 Windermere	Jul 19,25, Aug 1,9,15	5	av = 0.4 NTU max = 0.6 NTU	Objectives met
	E207045 Akiskinook	Jul 19,25, Aug 1,9,15	5	av = 0.4 NTU max = 0.4 NTU	Objectives met

TABLE 19 continued

COLUMBIA AND WINDERMERE LAKES WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity <1 NTU av 5 NTU max during non-freshet	Windermere Lake water intake sites E207046 Terravista	Jul 19,25, Aug 1,9,15	5	av = 0.4 NTU max = 0.4 NTU	Objectives met
	E207047 Windermere Holdings	Jul 19,25, Aug 1,9,15	5	av = 0.4 NTU max = 0.4 NTU	Objectives met
	E207048 Parr Utilities	Jul 19,25, Aug 1,9,15	5	av = 0.4 NTU max = 0.5 NTU	Objectives met
	E207049 Timber Ridge	Jul 19,25, Aug 1,9,15	5	av = 0.4 NTU max = 0.5 NTU	Objectives met
	Columbia Lake	1989	0	no data collected	Objectives not checked
Total-P <0.010 mg/L av at spring overturn	Windermere Lake: 0200051 centre	April 26	1 1	0.5 m : 0.009 mg/L 3.5 m : 0.009 mg/L av = 0.009 mg/L	Objective met
	0200052 north	April 26	1 1	0.5 m : 0.007 mg/L 4.0 m : 0.008 mg/L av = 0.007 mg/L	Objective met
Total-P <0.008 mg/L av at spring overturn	Columbia Lake: 0200433 south	April 26	1 1	0.5 m : 0.006 mg/L 3.0 m : 0.005 mg/L av = 0.005 mg/L	Objective met
	0200434 north	April 26	1	0.5 m : 0.006 mg/L 4.0 m : 0.005 mg/L av = 0.005 mg/L	Objective met

TABLE 20

TOBY CREEK AND UPPER COLUMBIA RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	Toby Creek: 0200333 u/s Panorama	Jul 5,10,17, 27, Aug 3	5	3 - 44/100 mL np = 38/100 mL	Objective not met
	0200334 d/s Panorama	Jul 5,10,17, 27, Aug 3	5	3 - 97/100 mL np = 90/100 mL	Objective not met
	0200223 u/s Invermere	Jul 5,10,17, 27, Aug 3	5	4 - 11/100 mL np = 10/100 mL	Objective met
	0200224 d/s Invermere	Jul 5,10,17, 27, Aug 3	5	2 - 16/100 mL np = 15/100 mL	Objective not met
	Columbia River: 0200232 u/s Radium	Jul 5,12,18, 24, Aug 2	5	2 - 201/100 mL np = 70/100 mL	Objective not met
Fecal Coliforms <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np)	Columbia River: 0200233 d/s Radium	Jul 5,12.18, 24, Aug 2	5	gm = 20/100 mL np = 80/100 mL	Objectives met
	E207529 u/s Edgewater	Oct 17,25	2	2 - 7/100 mL	Indefinite result
	E207530 d/s Edgewater	Oct 17,25	2	2 - 12/100 mL	Indefinite result
Turbidity max increase: 5 NTU or 10%	Toby Creek: 0200333 u/s Panorama	Jul 5,10,17, 27, Aug 3	5	2.5 - 26.0 NTU	Control site
	0200334 d/s Panorama	Jul 5,10,17, 27, Aug 3	5	2.4 - 20.0 NTU max inc.= 0 NTU	Objective met
	0200223 u/s Invermere	Jul 5,10,17, 27, Aug 3	5	3.3 - 22.0 NTU max inc.= 2 NTU	Objective met
	0200224 d/s Invermere	Jul 5,10,17, 27, Aug 3	5	2 - 16 NTU max inc.= 3 NTU	Objective met
Suspended Solids max increase: 10 mg/L or 10%	Toby Creek: 0200333 u/s Panorama	Jul 5,10,17, 27, Aug 3	5	9 - 93 mg/L	Control site
	0200334 d/s Panorama	Jul 5,10,17, 27, Aug 3	5	9 - 91 mg/L max inc.= 10 mg/L	Objective met
	0200223 u/s Invermere	Jul 5,10,17, 27, Aug 3	5	11 - 100 mg/L max inc.= 9 mg/L	Objective met

TABLE 20 continued

TOBY CREEK AND UPPER COLUMBIA RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Susp. Solids max increase: 10 mg/L or 10%	Toby Creek 0200224 d/s Invermere	Jul 5,10,17, 27, Aug 3	5	8 - 60 mg/L max inc.= 4 mg/L	Objective met
Chlorophyll-a <50 mg/m2 av	Toby Creek: 0200223 u/s Invermere	September 20	6	<0.3 - 5.0 mg/m2 av = 1.7 mg/m2	Objective met
	0200224 d/s Invermere	September 20	6	<0.3 - 2.7 mg/m2 av = 1.2 mg/m2	Objective met
Ammonia-N <0.611 mg/L av 4.49 mg/L max at pH = 8.1 temp = 20 C	Toby Creek: 0200333 u/s Panorama	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
	0200334 d/s Panorama	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
	0200223 u/s Invermere	Jul 5,10,17, 27, Aug 3	5	<0.005 - 0.005mg/L	Objectives met
	0200224 d/s Invermere	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Toby Creek: 0200333 u/s Panorama	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
	0200334 d/s Panorama	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
	0200223 u/s Invermere	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
	0200224 d/s Invermere	Jul 5,10,17, 27, Aug 3	5	all < 0.005 mg/L	Objectives met
Total Ba 1.0 mg/L max	Toby Creek	1989	0	no data collected	Objective not checked
Total Cd 0.0002mg/L max	Toby Creek E206170 d/s Mountain Minerals	July 5,17 27	3	all < 0.0005 mg/L	Indefinite result
Dissolved Cu 0.002 mg/L max	Toby Creek E206170 d/s Mountain Minerals	July 5,17	2	0.001 - 0.002 mg/L Total Cu	Objective met
		July 27	1	0.008 mg/L Total Cu	Indefinite result

TABLE 20 continued

TOBY CREEK AND UPPER COLUMBIA RIVER WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb 0.005 mg/L max hardness <95	Toby Creek E206170 d/s Mountain Minerals	July 5,17,27	3	0.001 - 0.004 mg/L hardness = 63 mg/L	Objective met
Total Zn 0.050 mg/L max	Toby Creek E206170 d/s Mountain Minerals	July 5,17,27	3	<0.005 - 0.020mg/L	Objective met

TABLE 21

FRASER RIVER (HOPE TO KANAKA CREEK) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <1000/100 mL geometric mean (gm) April-October	Fraser River: E207393 u/s Kent STP	Aug 1,8,15, 22,31	5	111 - 1260/100 mL gm = 326/100 mL	Objective met
	E207603 100 m d/s Kent STP	Aug 1,8 15, 22,31	5	125 - 4200/100 mL gm = 442/100 mL	Objective met
	0301506 75m u/s Chillwk. STP	Aug 1,8,15, 22,31	5	21 - 225/100 mL gm = 103/100 mL	Objective met
	0301507 100m d/s Chillwk. STP	Aug 1,8,15, 22,31	5	105 - 41000/100 mL gm = 9799/100 mL	Objective not met
	E207391 u/s MSA STP	Aug 8,15,22, 31, Sep 7	5	72 - 700/100 mL gm = 215/100 mL	Objective met
	E207602 100 m d/s MSA STP	Aug 8,15,22, 31, Sep 7	5	144 - 275/100 mL gm = 191/10 mL	Objective met
	0301548 50 m u/s Aldgve. STP	Aug 8,15,22, 31, Sep 7	5	72 - 1790/100 mL gm = 534/100 mL	Objective met
	0301550 100 m d/s Aldgve. STP	Aug 8,15,22, 31, Sep 7	5	140 - 2100/100 mL gm = 525/100 mL	Objective met
	Elk Creek 0300046 at Yale Road	July 5,9,18, 23,30	5	188 - 2640/100 mL gm = 914/100 mL	Objective met
	Chilliwack Creek 0300040 at Wolfe Road	July 5,9,18, 23,30	5	23 - 91/100 mL gm = 52/100 mL	Objective met
	Luckakuck Creek 0300036 at Yale Road	July 5,9,18, 23,30	5	245 - 357/100 mL gm = 310/100 mL	Objective met
	Atchelitz Creek E207623 near mouth	July 5,9,18, 23,30	5	134 - 575/100 mL gm = 214/100 mL	Objective met
	Hope Slough 0300141 at Young Road	July 5,9,18, 23,30	5	23 - 83/100 mL gm = 45/100 mL	Objective met
	Salmon River E207612 d/s Trinity	July 5,9,18, 23,30	5	77 - 350/100 mL gm = 136/100 mL	Objective met

TABLE 21 continued

FRASER RIVER (HOPE TO KANAKA CREEK) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Col. <1000/100 mL geometric mean (gm) April-October	Bertrand Creek E207092 d/s Aldergrove	July 5,9,18, 23,30	5	467 - 3550/100 mL gm = 1216/100 mL	Objective not met
	Sumas River Saar Creek	1989	0	no data collected	Objective not checked
Fecal Col. <100/100 mL 90th perc.	Chilliwack River	1989	0	no data collected	Objective not checked
Fecal Col. <200/100 mL geometric mean (gm) at beaches	Cultus Lake: E207095 N end	July 5,9,18, 23	4	2 - 36/100 mL	Indefinite result
	E207096 E side	July 5,9,18, 23,30	5	<2 - 8/100 mL gm = 3/100 mL	Objective met
	E207098 S end	July 5,9,18, 23,30	5	<2 - 600/100 mL gm = 7/100 mL	Objective met
Fecal Col. <10/100 mL 90th perc. water intakes	Cultus Lake	1989	0	no data collected	Objective not checked
Tot. Cl2 Res. 0.002 mg/L max	Fraser River	1989	0	no data collected	Objective not checked
Ammonia-N <1.04 mg/L av 6.67 mg/L max at pH = 7.9 temp = 18 C	Fraser River: E207393 u/s Kent STP	Aug 1,8,15, 22,31	5	av = 0.007 mg/L max = 0.010 mg/L	Objectives met
	E207603 100 m d/s Kent STP	Aug 1,8 15, 22,31	5	av = 0.007 mg/L max = 0.010 mg/L	Objectives met
	0301506 75m u/s Chillwk. STP	Aug 1,8,15, 22,31	5	av = 0.036 mg/L max = 0.136 mg/L	Objectives met
	0301507 100m d/s Chillwk. STP	Aug 1,8,15, 22,31	5	av = 0.243 mg/L max = 0.296 mg/L	Objectives met
	E207391 u/s MSA STP	Aug 8,15,22, 31, Sep 7	5	av = 0.008 mg/L max = 0.016 mg/L	Objectives met
	E207602 100 m d/s MSA STP	Aug 8,15,22, 31, Sep 7	5	av = 0.009 mg/L max = 0.014 mg/L	Objectives met
	0301548 50 m u/s Aldgve. STP	Aug 8,15,22, 31, Sep 7	5	av = 0.037 mg/L max = 0.138 mg/L	Objectives met

TABLE 21 continued

FRASER RIVER (HOPE TO KANAKA CREEK) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.04 mg/L av 6.67 mg/L max at pH = 7.9 temp = 18 C	Fraser River: 0301550 100 m d/s Aldgve. STP	Aug 8,15,22, 31, Sep 7	5	av = 0.009 mg/L max = 0.016 mg/L	Objectives met
Ammonia-N <1.23 mg/L av 13.5 mg/L max at pH = 7.4 temp = 20 C	Elk Creek 0300046 at Yale Road	July 5,9,18, 23,30	5	av = 1.019 mg/L max = 2.240 mg/L	Objectives met
	Chilliwack Creek 0300040 at Wolfe Road	July 5,9,18, 23,30	5	av = 0.028 mg/L max = 0.048 mg/L	Objectives met
	Luckakuck Creek 0300036 at Yale Road	July 5,9,18, 23,30	5	av = 0.024 mg/L max = 0.049 mg/L	Objectives met
	Atchelitz Creek E207623 near mouth	July 5,9,18, 23,30	5	av = 0.034 mg/L max = 0.051 mg/L	Objectives met
	Hope Slough 0300141 at Young Road	July 5,9,18, 23,30	5	av = 0.038 mg/L max = 0.060 mg/L	Objectives met
	Salmon River E207612 d/s Trinity	July 5,9,18, 23,30	5	av = 0.035 mg/L max = 0.048 mg/L	Objectives met
	Bertrand Creek E207092 d/s Aldergrove	July 5,9,18, 23,30	5	av = 0.036 mg/L max = 0.110 mg/L	Objectives met
Total-P <0.01 mg/L av at spring overturn	Cultus Lake: 0300037 at lake centre	April 27	3	0m 0.004 mg/L 15m 0.006 mg/L 30m 0.024 mg/L	Indefinite result
Dissolved Oxygen 7.75 mg/L min	Fraser River: E207393 u/s Kent STP	Aug 1,15,22, 31	4	8.3 - 12.6 mg/L	Objective met
	E207603 100 m d/s Kent STP	Aug 1,15,22, 31	4	8.4 - 10.2 mg/L	Objective met
	0301506 75m u/s Chillwk. STP	Aug 1,15,22, 31	4	7.9 - 10 4 mg/L	Objective met

TABLE 21 continued

FRASER RIVER (HOPE TO KANAKA CREEK) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.75 mg/L min	Fraser River: 0301507 100m d/s Chillwk. STP	Aug 1,15,22, 31	4	8.4 - 9.9 mg/L	Objective met
	E207391 u/s MSA STP	Aug 15,31	2	8.6 - 10.4 mg/L	Objective met
	E207602 100 m d/s MSA STP	Aug 15,31	2	8.5 - 9.6 mg/L	Objective met
	0301548 50 m u/s Aldgve. STP	Aug 15,31	2	8.0 - 10.0 mg/L	Objective met
	0301550 100 m d/s Aldgve. STP	Aug 15,31	2	8.3 - 10.0 mg/L	Objective met
Dissolved Oxygen 8.0-11.2 mg/L min depending on fish egg stage 6.0 mg/L min at other times (7.75 mg/L min in Chillwk. R)	Elk Creek 0300046 at Yale Road	July 18,23,30	3	1.2 - 4.7 mg/L	Objective not met
	Chilliwack Creek 0300040 at Wolfe Road	July 18,23,30	3	8.0 - 12.2 mg/L	Objective met
	Luckakuck Creek 0300036 at Yale Road	July 18,23,30	3	7.8 - 9.5 mg/L	Objective met
	Atchelitz Creek E207623 near mouth	July 18 & 23 July 30	2 1	6.1 & 9.5 mg/L 4.5 mg/L	Obj. met Obj. not met
	Hope Slough 0300141 at Young Road	July 18 & 30 July 23	2 1	5.5 & 5.6 mg/L 8.8 mg/L	Obj. not met Obj. met
	Salmon River E207612 d/s Trinity	July 18,23,30	3	6.5 - 7.4 mg/L	Objective met
	Bertrand Creek E207092 d/s Aldergrove	July 18,23,30	3	7.2 - 10.8 mg/L	Objective met
	Sumas River Saar Creek Chilliwack River	1989	0	no data collected	Objective not checked

TABLE 21 continued

FRASER RIVER (HOPE TO KANAKA CREEK) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Diss. Oxygen 5.0 mg/L min in hypolimnion	Cultus Lake	1989	0	no data collected	Objective not checked
pH 6.5 - 8.5	Fraser River: E207393 u/s Kent STP	Aug 1,15,22, 31	4	7.7 - 8.2	Objective met
	E207603 100 m d/s Kent STP	Aug 1,15,22, 31	4	7.8 - 8.2	Objective met
	0301506 75m u/s Chillwk. STP	Aug 1,15,22, 31	4	7.7 - 8.1	Objective met
	0301507 100m d/s Chillwk. STP	Aug 1,15,22, 31	4	7.7 - 8.0	Objective met
	E207391 u/s MSA STP	Aug 15,31	2	7.7 - 8.1	Objective met
	E207602 100 m d/s MSA STP	Aug 15,31	2	7.7 - 8.1	Objective met
	0301548 50 m u/s Aldgve. STP	Aug 15,31	2	7.5 - 8.1	Objective met
	0301550 100 m d/s Aldgve. STP	Aug 15,31	2	7.7 - 8.1	Objective met
	Elk Creek 0300046 at Yale Road	July 18,23,30	3	7.2 - 7.4	Objective met
	Chilliwack Creek 0300040 at Wolfe Road	July 18,23,30	3	7.5 - 8.0	Objective met
	Luckakuck Creek 0300036 at Yale Road	July 18,23,30	3	7.5 - 7.8	Objective met
	Atchelitz Creek E207623 near mouth	July 18,23,30	3	7.6 - 7.8	Objective met
	Hope Slough 0300141 at Young Road	July 18,23,30	3	7.6 - 7.8	Objective met

TABLE 21 continued

FRASER RIVER (HOPE TO KANAKA CREEK) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	Salmon River E207612 d/s Trinity	July 18,23,30	3	7.6 - 7.8	Objective met
	Bertrand Creek E207092 d/s Aldergrove	July 18,23,30	3	7.8 - 7.9	Objective met

TABLE *22*

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <1000/100 mL geometric mean (gm) 4000/100 mL max Apr - Oct	Main Stem: GVRD 15 Sapperton Channel	May 16-Sep 19	9	20 - 800/100 mL	Max obj. met
	GVRD 14 nr. Brunette R confl.	May 16-Sep 19	9	<20 - 210/100 mL	Max obj. met
	GVRD 13 u/s Pattullo Bridge	May 16-Sep 19	9	40 - 800/100 mL	Max obj. met
	0300005 at Pattullo Bridge	Aug 7,14,20, 30,31	5	191 - 480/100 mL gm = 270/100 mL	Objectives met
	GVRD 12 d/s Pattullo Bridge	May 16-Sep 19	9	20 - 130/100 mL	Max obj. met
	Main Arm: GVRD 1 u/s Annacis	Apr 19-Oct 25	4	70 - 1100/100 mL	Max obj. met
	0301308 u/s Annacis	Aug 7,14,20, 30,31 Aug 7-Aug 30 Aug 31	5 4 1	gm = 437/100 mL 67 - 830/100 mL 4160/100 mL	Av obj. met Max obj. met Max not met
	GVRD 2 d/s Annacis	Apr 19,Oct 25 Jun 14,Aug 24	2 2	8000/100 mL 130 - 300/100 mL	Max not met Max obj. met
	0301311 d/s Annacis	Aug 7,14,20, 30,31	5	210 - 395/100 mL gm = 286/100 mL	Objectives met
	GVRD 3 12 km d/s Annacis	Apr 19-Aug 24 Oct 25	3 1	130 - 3000/100 mL 11000/100 mL	Max obj. met Max not met
	E105892 u/s Lulu	Aug 7,14,20, 30,31	5	83 - 800/100 mL gm = 205/100 mL	Objectives met
	E105893 d/s Lulu	Aug 7,14,30, 31	4	71 - 3600/100 mL	Max obj. met
	GVRD 4 d/s Lulu	Apr 19,Oct 25 Jun 14,Aug 24	2 2	13000-30000/100 mL 80 - 700/100 mL	Max not met Max obj. met
	GVRD 5 d/s Steveston	Apr 19,Oct 25 Jun 14,Aug 24	2 2	8000 - 22000/100mL 40 - 300/100 mL	Max not met Max obj. met
	North Arm: E207398 u/s Scott Paper	Aug 31	1	155/100 mL	Max obj. met Av not chkd.

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <1000/100 mL geometric mean (gm) 4000/100mL max Apr - Oct	North Arm: E207399 d/s Scott Paper	Aug 31	1	81/100 mL	Max obj. met
	GVRD 11 Queensborough Bridge	May 16-Sep 19	9	20 - 500/100 mL	Max obj. met
	E207396 u/s Belkin	Aug 31	1	89/100 mL	Max obj. met
	E207397 d/s Belkin	Aug 31	1	93/100 mL	Max obj. met
	GVRD 10 ~5 km d/s Belkin	May 16-Sep 19	9	20 - 500/100 mL	Max obj. met
	GVRD 9 Mitchell Island	May 16-Sep 19	9	20 - 170/100 mL	Max obj. met
	GVRD 7 Oak Street Bridge	May 16-Sep 19	9	80 - 500/100 mL	Max obj. met
	0300002 Oak Street Bridge	Aug 31	1	83/100 mL	Max obj. met
	GVRD 6 Sea Island-east	May 16-Sep 19 Jun 16	8 1	80 - 1300/100 mL 5000/100 mL	Max obj. met Max not met
	GVRD 5 Sea Island-west	May 16-Sep 19	9	40 - 1100/100 mL	Max obj. met
	GVRD 1,2,3,4 North Arm jetty	May 16-Sep 19	36	<20 - 2400/100 mL	Max obj. met
	Middle Arm: GVRD 8 at North Arm entrance	May 16-Sep 19	9	20 - 800/100 mL	Max obj. met
	E207601 100 m d/s North Arm	Jul 31,Aug 7, 14,20,30	5	68 - 380/100 mL gm = 187/100 mL	Objectives met
	E207600 at Dinsmore Bridge	Jul 31,Aug 7, 14,20,30	5	105 - 545/100 mL gm = 183/100 mL	Objectives met
Fecal Coliforms <200/100 mL geometric mean (gm) Jun - Aug at beaches	Iona Beach: every 1.5 km along jetty, east to west GVRD 4	Jun 5-Jul 4 Jul 28-Aug 24	6 5	gm = 25/100 mL gm = 32/100 mL	Obj. met Obj. met
	GVRD 6	Jun 5-Jul 4 Jul 11-Aug 8	6 6	gm = 25/100 mL gm = 43/100 mL	Obj. met Obj. met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm) Jun - Aug at beaches	Iona Beach: every 1.5 km along jetty, east to west GVRD 8	Jun 5-Jul 4 Jul 25-Aug 24	6 6	gm = 22/100 mL gm = 22/100 mL	Obj. met Obj. met
	GVRD 10	Jun 5-Jul 4 Jul 25-Aug 24	6 6	gm = 29/100 mL gm = 22/100 mL	Obj. met Obj. met
	GVRD 12	Jun 5-Jul 4 Jul 25-Aug 24	6 6	gm < 20/100 mL gm < 20/100 mL	Obj. met Obj. met
	GVRD 14	Jun 5-Jul 4 Jul 25-Aug 24	6 6	gm < 20/100 mL gm = 25/100 mL	Obj. met Obj. met
	Tsawwassen Beach: MOH 11 3rd Avenue	Jun 8-Jul 3 Jul 9-Aug 7	5 5	gm = 22/100 mL gm = 48/100 mL	Obj. met Obj. met
	MOH 12 Causeway-east	Jun 25-Jul 24 Jul 31-Aug 28	5 5	gm = 24/100 mL gm = 165/100 mL	Obj. met Obj. met
	MOH 13 Causeway-west	Jun 8-Jul 3 Jul 9-Aug 7	5 5	gm = 7/100 mL gm = 22/100 mL	Obj. met Obj. met
Suspended Solids max increase: 10 mg/L or 10%	North Arm: E207398 u/s Scott Paper	Jan, Feb, Aug, Dec	9	5 - 20 mg/L	Control site
	E207399 d/s Scott Paper	Jan, Feb, Aug, Dec	9	increase = 0-2mg/L	Objective met
	E207396 u/s Belkin	Jan, Feb, Aug, Dec	9	increase = 0-3mg/L	Objective met
	E207397 d/s Belkin	Jan, Feb, Aug, Dec	9	increase = 0-3mg/L	Objective met
	0300002 Oak Street Bridge	Jan 23,Feb 27 Dec 10	3	increase = 0-1mg/L	Objective met
		Jan 10	1	22 mg/L increase = 13 mg/L	Objective not met
	Middle Arm: E207601 100 m d/s North Arm	Jul 31,Aug 7, 14,20,30	5	18 - 52 mg/L	Control site
	E207600 at Dinsmore Bridge	Jul 31,Aug 7, 14,20,30	5	17 - 38 mg/L increase=0-10 mg/L	Objective met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cl2 Res. 0.002 mg/L max	Main Arm: at Annacis at Lulu	 Sep 29 Sep 29	 1 1	from STP data: 0.0003 mg/L 0.00004 mg/L	 Obj. met Obj. met
Ammonia-N <0.76 mg/L av 5.6 mg/L max at pH = 8.0 temp = 20 C	Main Arm: GVRD 1 u/s Annacis	Feb 24-Dec 5	6	0.02 - 0.08 mg/L	Max obj. met Av not chkd.
	0301308 u/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.005 - 0.196mg/L	Max obj. met
	GVRD 2 d/s Annacis	Feb 24-Dec 5	6	0.03 - 0.11 mg/L	Max obj. met
	0301311 d/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.005 - 0.099mg/L	Max obj. met
	GVRD 3 12 km d/s Annacis	Feb 24-Dec 5	6	0.04 - 0.12 mg/L	Max obj. met
	E207624 Deas Slough	Dec 10	1	0.029 mg/L	Max obj. met
	E105892 u/s Lulu	Jan 4-23,Feb 27,Dec 10	6	0.043 - 0.077 mg/L	Max obj. met
	E105893 d/s Lulu	Jan 4-23,Feb 27,Dec 10-27	6	0.047 - 0.082 mg/L	Max obj. met
	GVRD 4 d/s Lulu	Feb 24-Dec 5	6	0.05 - 0.09 mg/L	Max obj. met
	GVRD 5 d/s Steveston	Feb 24-Dec 5	6	0.04 - 0.09 mg/L	Max obj. met
	North Arm: E207398 u/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	9	<0.005 - 0.104mg/L	Max obj. met Av not chkd.
	E207399 d/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	9	<0.005 - 0.099mg/L	Max obj. met
	E207396 u/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	0.006 - 0.056 mg/L	Max obj. met
	E207397 d/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	0.007 - 0.050 mg/L	Max obj. met
	0300002 Oak Street Bridge	Jan 10,23,Feb 27,Dec 10	4	0.031 - 0.039 mg/L	Max obj. met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.76 mg/L av 5.6 mg/L max at pH = 8.0 temp = 20 C	Middle Arm: E207601 100 m d/s North Arm	Jul 31,Aug 7, 14,20,30	5	av = 0.006 mg/L max = 0.007 mg/L	Objectives met
	E207600 at Dinsmore Bridge	Jul 31,Aug 7, 14,20,30	5	av = 0.007 mg/L max = 0.012 mg/L	Objectives met
	Sturgeon Bank Roberts Bank	1989	0	no data collected	Objectives not checked
Dissolved Oxygen 7.75 mg/L min	Main Stem: GVRD 15 Sapperton Channel	May 16-Aug 29	5	9.0 - 11.5 mg/L	Objective met
	GVRD 14 nr. Brunette R confl.	May 26-Jul 25	3	9.4 - 11.4 mg/L	Objective met
	GVRD 13 u/s Pattullo Bridge	May 16-Aug 29	4	8.4 - 10.9 mg/L	Objective met
	0300005 at Pattullo Bridge	Jan 10,17, Aug 14,31	4	8.5 - 13.6 mg/L	Objective met
	GVRD 12 d/s Pattullo Bridge	May 26-Jul 25	3	9.4 - 11.2 mg/L	Objective met
	Main Arm: Gunderson Slough	Jul 9 Jul 9 Nov 9 Dec 29	5 1 6 9	0-4m:8.3-10.6 mg/L 5m: 7.7 mg/L 0-5m: 7.9-8.7 mg/L 0-8m:9.4-11.7 mg/L	Obj. met Obj. not met Obj. met Obj. met
	GVRD 1 u/s Annacis	Feb 24-Dec 5	6	9.2 - 12.3 mg/L	Objective met
	0301308 u/s Annacis	Jan 10,17,23, Aug 14,31	5	8.5 - 13.2 mg/L	Objective met
	GVRD 2 d/s Annacis	Apr 19-Dec 5	5	9.1 - 12.3 mg/L	Objective met
	0301311 d/s Annacis	Jan 10,17,23, Aug 14	4	9.0 - 13.2 mg/L	Objective met
	Deas Slough	Jul 9 Nov 5 Nov 5 Dec 29	5 6 1 11	0-4m:9.3-10.2 mg/L 0-5m:8.0-10.2 mg/L 6m: 7.5 mg/L 0-10m:9.4-12.0mg/L	Obj. met Obj. met Obj. not met Obj. met
	GVRD 3 12 km d/s Annacis	Feb 24-Dec 5	6	9.2 - 12.9 mg/L	Objective met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.75 mg/L min	Main Arm: Ladner Slough	Jul 9 Nov 5 Nov 5 Nov 9	5 6 2 12	0-4m: 8.6-9.0 mg/L 0-5m:8.1-10.4 mg/L 6-7m: 5.5-6.5 mg/L 0-11m:9.1-11.7mg/L	Obj. met Obj. met Obj. not met Obj. met
	E105892 u/s Lulu	Jan 10,17,23, Aug 14	4	8.6 - 12.2 mg/L	Objective met
	E105893 d/s Lulu	Jan 17,23, Aug 14,31	4	8.7 - 12.2 mg/L	Objective met
	GVRD 4 d/s Lulu	Feb 24-Dec 5	6	9.0 - 12.5 mg/L	Objective met
	GVRD 5 d/s Steveston	Feb 24-Dec 5	6	8.9 - 12.7 mg/L	Objective met
	North Arm: E207398 u/s Scott Paper	Jan 10,17,23, Aug 14,31	5	8.4 - 13.2 mg/L	Objective met
	E207399 d/s Scott Paper	Jan 10,17,23, Aug 14,31	5	8.6 - 13.2 mg/L	Objective met
	GVRD 11 Queensborough Bridge	May 16-Aug 29	5	9.0 - 11.6 mg/L	Objective met
	Tree Island Slough	Nov 9 Dec 29	3 7	0-3m: 8.7-9.0 mg/L 0-6m:10.0-10.9mg/L	Obj. met Obj. met
	E207396 u/s Belkin	Jan 10,17,23, Aug 14,31	5	8.5 - 13.0 mg/L	Objective met
	E207397 d/s Belkin	Jan 10,17,23, Aug 14,31	5	8.6 - 13.0 mg/L	Objective met
	GVRD 10 ~5 km d/s Belkin	May 26-Jul 25	3	9.4 - 11.4 mg/L	Objective met
	GVRD 9 Mitchell Island	May 16-Aug 29	5	8.9 - 11.0 mg/L	Objective met
	GVRD 7 Oak Street Bridge	Jul 4-Aug 2	3	8.7 - 9.6 mg/L	Objective met
	0300002 Oak Street Bridge	Jan 10,17,23, Aug 14,31	5	8.5 - 11.8 mg/L	Objective met
	Eburne Slough	Jul 9 Nov 5 Nov 9	5 5 7	0-4m: 8.6-9.5 mg/L 0-4m: 8.5-9.7 mg/L 0-6m:8.5-11.1 mg/L	Obj. met Obj. met Obj. met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.75 mg/L min	North Arm: GVRD 6 Sea Island-east	May 26-Jul 25	3	9.2 - 11.2 mg/L	Objective met
	GVRD 5 Sea Island-west	May 16-Aug 29	5	8.8 - 11.2 mg/L	Objective met
	MacDonald Slough	Jul 9 Jul 9 Nov 5 Nov 5 Nov 9 Nov 9	6 1 7 2 12 1	0-6m: 7.8-9.4 mg/L 7m: 1.5 mg/L 0-7m: 7.8-9.3 mg/L 6-8m: 5.6-7.7 mg/L 0-11m:7.9-10.0mg/L 12m: 7.5 mg/L	Obj. met Obj. not met Obj. met Obj. not met Obj. met Obj. not met
	Middle Arm: GVRD 8 at North Arm entrance	May 26-Aug 29	4	9.0 - 11.0 mg/L	Objective met
	E207601 100 m d/s North Arm	August 14	1	8.5 mg/L	Objective met
	E207600 at Dinsmore Bridge	August 14	1	8.6 mg/L	Objective met
Diss. Oxygen 9.0 mg/L min	Sturgeon Bank Roberts Bank	1989	0	no data collected	Objective not checked
pH 6.5 - 8.5	Main Stem: 0300005 at Pattullo Bridge	Jan 10,17, Aug 14,31	4	7.9 - 8.5	Objective met
	Main Arm: GVRD 1 u/s Annacis	Feb 24-Dec 5	6	7.2 - 7.8	Objective met
	0301308 u/s Annacis	Jan 10,17,23, Aug 14,31	5	7.6 - 8.3	Objective met
	0301311 d/s Annacis	Jan 10,17,23, Aug 14	4	8.0 - 8.2	Objective met
	GVRD 2 d/s Annacis	Feb 24-Dec 5	6	7.3 - 7.9	Objective met
	GVRD 3 12 km d/s Annacis	Feb 24-Dec 5	6	7.3 - 7.8	Objective met
	E105892 u/s Lulu	Jan 10,17,23,	3	7.4 - 8.0	Objective met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	Main Arm: E105893 d/s Lulu	Jan 17,23, Aug 14,31	4	7.9 - 8.0	Objective met
	GVRD 4 d/s Lulu	Feb 24-Dec 5	6	7.3 - 7.8	Objective met
	GVRD 5 d/s Steveston	Feb 24-Dec 5	6	7.4 - 7.8	Objective met
	North Arm: E207398 u/s Scott Paper	Jan 10,17,23, Aug 14,31	5	7.8 - 8.4	Objective met
	E207399 d/s Scott Paper	Jan 10,17,23, Aug 14,31	5	7.8 - 8.3	Objective met
	E207396 u/s Belkin	Jan 10,17,23, Aug 14,31	5	7.8 - 8.3	Objective met
	E207397 d/s Belkin	Jan 17,23 Aug 14,31	4	7.8 - 8.1	Objective met
		Jan 10	1	8.6	Obj. not met
	0300002 Oak Street Bridge	Jan 10,17,23, Aug 14,31	5	7.6 - 8.0	Objective met
	Middle Arm: E207601 100 m d/s North Arm	August 14	1	8.0	Objective met
	E207600 at Dinsmore Bridge	August 14	1	8.0	Objective met
Total Cu <0.004 mg/L av 0.006 mg/L max at hardness > 35 or 20% increase	Main Arm: GVRD 1 u/s Annacis	Feb 24-Dec 5	6	<0.001-0.001 mg/L (Dissolved Cu)	Control site
	0301308 u/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.009 mg/L	Control site
	GVRD 2 d/s Annacis	Feb 24-Dec 5	6	<0.001-0.001 mg/L (Dissolved Cu)	Indefinite result
	0301311 d/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.003 mg/L	Max obj. met Av not chkd.
	GVRD 3 12 km d/s Annacis	Feb 24-Dec 5	6	<0.001-0.001 mg/L (Dissolved Cu)	Indefinite result

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.004 mg/L av 0.006 mg/L max at hardness >35 or 20% increase	Main Arm: E207624	Dec 10	1	0.002 mg/L	Max obj. met
	Deas Slough E105892 u/s Lulu	Jan 4-23,Feb 27,Dec 10	6	<0.001-0.006 mg/L	Max obj. met
	E105893 d/s Lulu	Jan 4-23,Feb 27,Dec 10-27	6	<0.001-0.004 mg/L	Max obj. met
	GVRD 4 d/s Lulu	Feb 24-Dec 5	6	<0.001-0.004 mg/L (Dissolved Cu)	Indefinite result
	GVRD 5 d/s Steveston	Feb 24-Oct 25	5	<0.001-0.004 mg/L (Dissolved Cu)	Indefinite result
		Dec 5	1	0.008mg/L Diss. Cu	Max not met
	North Arm: E207398 u/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	8	<0.001-0.005 mg/L	Control site
	E207399 d/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	8	<0.001-0.003 mg/L	Max obj. met Av not chkd.
	E207396 u/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.002 mg/L	Max obj. met
	E207397 d/s Belkin	Jan 4-23,Feb 27,Dec 3-27	8	<0.001-0.005 mg/L	Max obj. met
	0300002 Oak Street Bridge	Jan 10-Dec 10	5	<0.001-0.003 mg/L	Max obj. met
		Mar 17	1	0.050 mg/L	Max not met
	Middle Arm: E207601 100 m d/s North Arm	Jul 31,Aug 7, 14,20,30	5	av = 0.003 mg/L max = 0.005 mg/L	Objectives met
	E207600 at Dinsmore Bridge	Jul 31,Aug 7, 14,20,30	5	av = 0.002 mg/L max = 0.003 mg/L	Objectives met
Total Pb <0.003 mg/L av 0.010 mg/L max	Main Arm: GVRD 1 u/s Annacis	Feb 24-Dec 5	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite result
	0301308 u/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.005 mg/L	Max obj. met Av not chkd.

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <0.003 mg/L av 0.010 mg/L max	Main Arm: GVRD 2 d/s Annacis	Feb 24-Dec 5	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite result
	0301311 d/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.002 mg/L	Max obj. met
	GVRD 3 12 km d/s Annacis	Feb 24-Dec 5	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite result
	E207624 Deas Slough	Dec 10	1	0.002 mg/L	Max obj. met
	E105892 u/s Lulu	Jan 4-23,Feb 27,Dec 10	6	0.001-0.003 mg/L	Max obj. met
	E105893 d/s Lulu	Jan 4-23,Feb 27,Dec 10-27	6	<0.001-0.002 mg/L	Max obj. met
	GVRD 4 d/s Lulu	Feb 24-Dec 5	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite result
	GVRD 5 d/s Steveston	Feb 24-Dec 5	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite result
	North Arm: E207398 u/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.003 mg/L	Max obj. met Av not chkd.
	E207399 d/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.002 mg/L	Max obj. met
	E207396 u/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.002 mg/L	Max obj. met
	E207397 d/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	<0.001-0.007 mg/L	Max obj. met
	0300002 Oak Street Bridge	Jan 10-Dec 10	7	<0.001-0.004 mg/L	Max obj. met
	Middle Arm: E207601 100 m d/s North Arm	Jul 31,Aug 7, 14,20,30	5	av = 0.002 mg/L max = 0.004 mg/L	Objectives met
	E207600 at Dinsmore Bridge	Jul 31,Aug 7, 14,20,30	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
Total-Zn <0.050 mg/L av 0.100 mg/L max	Main Arm: GVRD 1 u/s Annacis	Feb 24-Dec 5	6	<0.001-0.002 mg/L (Dissolved Zn)	Indefinite result

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn <0.050 mg/L av 0.100 mg/L max	Main Arm: 0301308 u/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.005-0.020 mg/L	Max obj. met Av not chkd.
	GVRD 2 d/s Annacis	Feb 24-Dec 5	6	<0.001-0.001 mg/L (Dissolved Zn)	Indefinite result
	0301311 d/s Annacis	Jan 4-23,Feb 27,Dec 3-27	9	<0.005-0.010 mg/L	Max obj. met
	GVRD 3 12 km d/s Annacis	Feb 24-Dec 5	6	<0.001-0.002 mg/L (Dissolved Zn)	Indefinite result
	E207624 Deas Slough	Dec 10	1	0.006 mg/L	Max obj. met
	E105892 u/s Lulu	Jan 4-23,Feb 27,Dec 10	6	<0.005-0.040 mg/L	Max obj. met
	E105893 d/s Lulu	Jan 4-23,Feb 27,Dec 10-27	6	<0.005-0.009 mg/L	Max obj. met
	GVRD 4 d/s Lulu	Feb 24-Dec 5	6	<0.001-0.002 mg/L (Dissolved Zn)	Indefinite result
	GVRD 5 d/s Steveston	Feb 24-Dec 5	6	all < 0.001 mg/L (Dissolved Zn)	Indefinite result
	North Arm: E207398 u/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	9	<0.005-0.030 mg/L	Max obj. met Av not chkd.
	E207399 d/s Scott Paper	Jan 4-23,Feb 27,Dec 3-27	9	<0.005-0.009 mg/L	Max obj. met
	E207396 u/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	<0.005-0.010 mg/L	Max obj. met
	E207397 d/s Belkin	Jan 4-23,Feb 27,Dec 3-27	9	<0.005-0.012 mg/L	Max obj. met
	0300002 Oak Street Bridge	Jan 10-Dec 10	7	<0.005-0.030 mg/L	Max obj. met
	Middle Arm: E207601 100 m d/s North Arm	Jul 31,Aug 7, 14,20,30	5	av = 0.005 mg/L max = 0.007 mg/L	Objectives met
	E207600 at Dinsmore Bridge	Jul 31,Aug 7, 14,20,30	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophenols (tri + tetra + penta) in water 0.0002mg/L max	Main Stem: E206965 d/s Barnston Island	Dec 17	1	< 0.0001 mg/L for each homologue	Objective met
	E206966 Sapperton Channel	Dec 17	1	< 0.0001 mg/L for each homologue	Objective met
	Main Arm 0301311 d/s Annacis	Dec 17	1	< 0.0001 mg/L for each homologue	Objective met
	North Arm: E207399 d/s Scott	Dec 17	1	penta: 0.0001 mg/L tetra & tri: each < 0.0001 mg/L	Indefinite result
	E207397 d/s Belkin	Dec 17	1	penta: 0.0001 mg/L tetra & tri: each < 0.0001 mg/L	Indefinite result
	Middle Arm	1989	0	no data collected	Objective not checked
Chlorophenols (tri + tetra + penta) in sediments 0.01 ug/g max (dry weight)	Main Stem: E206965 d/s Barnston Island	Mar 7,Aug 30	7	< 0.005 ug/g for each homologue	Objective met
	E206966 Sapperton Channel	Mar 7	3	< 0.005 ug/g for each homologue	Objective met
	Main Arm: 0301308 u/s Annacis	Jan 29	3	penta: 0.029-0.051 ug/g tri & tetra each: < 0.005 ug/g	Objective not met
	0301311 d/s Annacis	Jan 29	3	penta: 0.016-0.064 ug/g tetra:<0.005-0.006 ug/g tri:all <0.005ug/g	Objective not met
	E207624 Deas Slough	Jan 29	3	penta: 0.008-0.014 ug/g tetra:<0.005-0.011 ug/g tri:all <0.005ug/g	Objective not met

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophenols (tri + tetra + penta) in sediments 0.01 ug/g max (dry weight)	Main Arm: E105892 u/s Lulu	Mar 13	3	penta: 0.007-0.031 ug/g tri & tetra each: < 0.005 ug/g	Objective not met
	E105893 d/s Lulu	Mar 13	3	penta:<0.005-0.007 ug/g tetra:<0.005-0.012 ug/g tri:all <0.005ug/g	Objective not met
	North Arm: E207399 d/s Scott	Jan 29	3	penta:<0.005-0.130 ug/g tetra:<0.005-0.018 ug/g tri:all <0.005ug/g	Objective not met
	E207396 u/s Belkin	Jan 29,Mar 7	3	penta:<0.005-0.005 ug/g tetra:<0.005-0.005 ug/g tri:all <0.005ug/g	Indefinite result
	E207397 d/s Belkin	Mar 7	3	penta:<0.005-0.066 ug/g tetra:<0.005-0.016 ug/g tri:all <0.005ug/g	Objective not met
	E207401 d/s Mitchell Island	Jan 29	3	penta:<0.005-0.008 ug/g tetra:<0.005-0.006 ug/g tri:all <0.005ug/g	Objective not met
	Middle Arm Sturgeon Bank Roberts Bank	1989	0	no data collected	Objective not checked
Chlorophenols (tri + tetra + penta) in fish 0.10 ug/g max (wet weight)	Main Stem Main Arm North Arm Middle Arm	1989	0	no data collected	Objective not checked

TABLE 22 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
PCBs in sediments 0.03 ug/g max (dry weight)	Main Stem: E206965 Barnston Island	Mar 7	3	all <0.02 ug/g	Objective met
	E206966 Sapperton Channel	Mar 7	3	all <0.02 ug/g	Objective met
	Main Arm: 0301308 u/s Annacis	Jan 29	3	all <0.02 ug/g	Objective met
	0301311 d/s Annacis	Jan 29	3	all <0.02 ug/g	Objective met
	E207624 Deas Slough	Jan 29	3	all <0.02 ug/g	Objective met
	E105892 u/s Lulu	Mar 13	3	all <0.02 ug/g	Objective met
	E105893 d/s Lulu	Mar 13	3	all <0.02 ug/g	Objective met
	North Arm: E207399 d/s Scott	Jan 29	3	all <0.02 ug/g	Objective met
	E207396 u/s Belkin	Jan 29,Mar 7	3	all <0.02 ug/g	Objective met
	E207397 d/s Belkin	Mar 7	3	all <0.02 ug/g	Objective met
	E207401 d/s Mitchell Island	Jan 29	3	all <0.02 ug/g	Objective met
	Middle Arm	1989	0	no data collected	Objective not checked
PCBs in fish 0.50 ug/g max (wet weight)	Main Stem Main Arm North Arm Middle Arm	1989	0	no data collected	Objective not checked

TABLE 23

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) April-October	Boundary Bay: GVRD 27 Balsam Street White Rock	May 31,Jun 9, 16,23,27	5	20 - 130/100 mL gm = 62/100 mL np = 120/100 mL	Objectives met
		Jul 14,21,28, Aug 1,9	5	20 - 230/100 mL gm = 49/100 mL np = 120/100 mL	Objectives met
	MOH 4 Vidal Street White Rock	June 8,12,19, 25, July 3	5	5 - 190/100 mL gm = 42/100 mL np = 120/100 mL	Objectives met
		July 9,17,24, 31, August 7	5	145 - 2300/100 mL gm = 543/100 mL np = 1100/100 mL	Objectives not met
		Aug 20,28, Sep 7,12,19	5	5 - 245/100 mL gm = 24/100 mL np = 80/100 mL	Objectives met
	GVRD 29 Oxford Street White Rock	Jun 9,16,23, 27,Jul 14	5	40 - 300/100 mL gm = 113/100 mL np = 230/100 mL	Objectives met
		Jul 21,28, Aug 1,9,25	5	80 - 1100/100 mL gm = 382/100 mL np = 900/100 mL	Objectives not met
	MOH 5 High Street White Rock	June 8,12,19, 25, July 3	5	5 - 1250/100 mL gm = 112/100 mL np = 450/100 mL	Av obj. met Max not met
		July 17,24, 31, Aug 7,13	5	85 - 3950/100 mL gm = 542/100 mL np = 3200/100 mL	Objectives not met
		Aug 20,28, Sep 7,12,19	5	5 - 1400/100 mL gm = 47/100 mL np = 850/100 mL	Av obj. met Max not met
	GVRD 30 High Street White Rock	Jun 9,16,23, 27,Jul 14	5	40 - 800/100 mL gm = 168/100 mL np = 450/100 mL	Av obj. met Max not met
		Jul 21,28, Aug 1,9,25	5	70 - 300/100 mL gm = 172/100 mL np = 300/100 m	Objectives met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) April-October	Boundary Bay: MOH 8 Centennial Beach concession	June 8,12,19, 25, July 3	5	5 - 2250/100 mL gm = 45/100 mL np = 800/100 mL	Av obj. met Max not met
		July 24,31, Aug 7,13,20	5	25 - 3500/100 mL gm = 350/100 mL np = 2100/100 mL	Objectives not met
	MOH 9 Centennial Beach 3rd Avenue	June 8,12,19, 25, July 3	5	5 - 995/100 mL gm = 34/100 mL np = 300/100 mL	Objectives met
		July 31, Aug 7,13,20,27	5	75 - 3700/100 mL gm = 952/100 mL np = 3000/100 mL	Objectives not met
		Aug 28, Sep 7,12,19,25	5	5 - 95/100 mL gm = 14/100 mL np = 60/100 mL	Objectives met
	MOH 10 Centennial Beach 1st Avenue	June 8,12,19, 25, July 3	5	5 - 345/100 mL gm = 29/100 mL np = 110/100 mL	Objectives met
		July 3,9,17, 24,31	5	10 - 655/100 mL gm = 134/100 mL np = 450/100 mL	Av obj. met Max not met
		Aug 7,13,20, 27, Sep 7	5	5 - 2500/100 mL gm = 38/100 mL np = 800/100 mL	Av obj. met Max not met
	Little Campbell R.: 0300066 near source	Oct 4,10,18, 23,30	5	8 - 146/100 mL gm = 58/100 mL np = 120/100 mL	Objectives met
	0300065 near mouth	Oct 4,10,18, 23,30	5	73 - 695/100 mL gm = 256/100 mL np = 560/100 mL	Objectives not met
Fecal Coliforms <1000/100 mL geometric mean (gm) <4000/100 mL max April-October	Nicomekl River: 0300062 near source	Oct 4,10,18, 23,30	5	71 - 875/100 mL gm = 338/100 mL	Objectives met
	0300060 near mouth	Oct 4,10,18, 23,30	5	2 - 425/100 mL gm = 74/100 mL	Objectives met
	Murray Creek: E207031 near source	Oct 23,30	2	735 & 435/100 mL	Max obj. met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <1000/100 mL geometric mean (gm) <4000/100 mL max April-October	Murray Creek: 0300064 near mouth	Oct 4,10,18, 23,30	5	55 - 485/100 mL gm = 115/100 mL	Objectives met
	Anderson Creek: E207028 near source	Oct 30	1	166/100 mL	Max obj. met
	0300063 near mouth	Oct 4,10,18, 23,30	5	115 - 575/100 mL gm = 199/100 mL	Objectives met
	Serpentine River: 0300059 near source	Oct 4,10,18, 23,30	5	6 - 707/100 mL gm = 84/100 mL	Objectives met
	0300057 near mouth	Oct 4,10,18, 23,30	5	9 - 1380/100 mL gm = 114/100 mL	Objectives met
	Latimer Creek: E207720 near source	Oct 18,23,30, Nov 6,14	5	81 - 2600/100 mL gm = 787/100 mL	Objectives met
	E207716 near mouth	October 23 Oct4,10,18,30 Oct 4-Oct 30	1 4 5	56900/100 mL 625 - 1450/100 mL gm = 2149/100 mL	Max not met Max obj. met Av not met
	Mahood Creek: E207717 near source	Oct 4,10,18, 23,30	5	209 - 3050/100 mL gm = 814/100 mL	Objectives met
	0300056 near mouth	October 18,23 Oct 4,10,30 Oct 4-Oct 30	2 3 5	4160 - 4400/100 mL 223 - 580/100 mL gm = 1040/100 mL	Max not met Max obj. met Av not met
	Hyland Creek: E207718 near source	October 18 Oct4,10,23,30 Oct 4-Oct 30	1 4 5	11500/100 mL 480 - 1220/100 mL gm = 1319/100 mL	Max not met Max obj. met Av not met
	E207719 near mouth	October 18 Oct4,10,23,30 Oct 4-Oct 30	1 4 5	6400/100 mL 580 - 1340/100 mL gm = 1303/100 mL	Max not met Max obj. met Av not met
Suspended Solids	Boundary Bay	1989	0	no data collected near discharges	Objective not checked
max increase: 10 mg/L or 10%	Little Campbell R.: 0300066 near source	Sep 25-Nov 27	10	1 - 201 mg/L	Control site

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids max increase: 10 mg/L or 10%	Little Campbell R.: 0300065 near mouth	Sep 25,Oct 4, 10,18,30	5	3 - 27 mg/L inc.= 0 - 7 mg/L	Objective met
		Oct 23,Nov 6, 14,21,27	5	13 - 77 mg/L inc.= 11 - 67 mg/L	Objective not met
	Nicomekl River: 0300062 near source	Sep 25-Nov 27	10	3 - 48 mg/L	Control site
	0300060 near mouth	Oct 10,Nov 6, 14,21,27	5	13 - 26 mg/L inc.= 0 - 10 mg/L	Objective met
		Sep 25,Oct 4, 18,23,30	5	13 - 36 mg/L inc.= 11 - 33 mg/L	Objective not met
	Murray Creek: E207031 near source	Sep 25-Nov27	7	3 - 23 mg/L	Control site
	0300064 near mouth	Sep 25, Oct 23,30, Nov 27	4	1 - 17 mg/L inc.= 0 - 2 mg/L	Objective met
		Nov 6,14,21	3	16 - 90 mg/L inc.= 11 - 84 mg/L	Objective not met
	Anderson Creek: E207028 near source	Oct 30, Nov 6,14,21,27	5	2 - 11 mg/L	Control site
	0300063 near mouth	Oct 4,10,18, 23,30	5	1 - 15 mg/L inc.= 0 - 8 mg/L	Objective met
	Serpentine River: 0300059 near source	Sep 25-Nov 27	10	7 - 44 mg/L	Control site
	0300057 near mouth	Oct 10,18,23, 30, Nov 14,27	6	8 - 31 mg/L inc.= 0 - 9 mg/L	Objective met
		Sep 25, Oct 4 Nov 6,21	4	20 - 54 mg/L inc.= 11 - 31 mg/L	Objective not met
	Latimer Creek: E207720 near source	Oct 18,23,30, Nov6,14,21,27	7	7 - 122 mg/L	Control site
	E207716 near mouth	Oct 18,23,30, Nov 6,21,27,	6	7 - 18 mg/L inc.= 0 - 3 mg/L	Objective met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids max increase: 10 mg/L or 10%	Latimer Creek: E207716 near mouth	November 14	1	14 mg/L inc. = 12 mg/L	Objective not met
	Mahood Creek: E207717 near source	Sep 25-Nov 27	10	1 - 56 mg/L	Control site
	0300056 near mouth	Sep 25,Oct 4, 10,23,30, Nov 14,21	7	1 - 8 mg/L inc.= 0 - 4 mg/L	Objective met
		Oct 18,Nov 6, 11	3	15 - 162 mg/L inc.= 11 - 137mg/L	Objective not met
	Hyland Creek: E207718 near source	Sep 25-Nov 27	10	3 - 51 mg/L	Control site
	E207719 near mouth	Oct 4,10,18, 30, Nov 14,21	6	4 - 37 mg/L inc.= 0 - 8 mg/L	Objective met
		Nov 6,21	2	30 - 120 mg/L inc.= 19 - 89 mg/L	Objective not met
Turbidity max increase 5 NTU or 10%	Boundary Bay	1989	0	no data collected near discharges	Objective not checked
	Little Campbell R.: 0300066 near source	Sep 25-Nov 27	10	1.0 - 24.0 NTU	Control site
	0300065 near mouth	Sep 25,Oct 4, 10,18,30	5	1.3 - 16.0 NTU inc.= 0 - 5 NTU	Objective met
		Oct 23,Nov 6, 14,21,27	5	7.0 - 22.0 NTU inc.= 6.7-12.5 NTU	Objective not met
	Nicomekl River: 0300062 near source	Sep 25-Nov 27	10	1.8 - 15.0 NTU	Control site
	0300060 near mouth	Oct 10,Nov 23 21	3	5.0 - 17.0 NTU inc.= 2 - 4 NTU	Objective met
		Sep25,Oct4,18 30,Nov6,14,27	7	8.7 - 24.0 NTU inc.= 6 - 16 NTU	Objective not met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase 5 NTU or 10%	Murray Creek: E207031 near source	Sep 25-Nov27	7	2.2 - 19.0 NTU	Control site
	0300064 near mouth	Sep 25,Oct 23 30,Nov 6,27	5	1 - 5 NTU inc.= 0 - 2.9 NTU	Objective met
		Nov 14,21	2	10 - 15 NTU inc.= 5.3 - 11 NTU	Objective not met
	Anderson Creek: E207028 near source	Oct 30, Nov 6,14,21,27	5	3.0 - 5.3 NTU	Control site
	0300063 near mouth	Oct 4,10,18, 23,30	5	0.8 - 6.5 NTU inc.= 0 - 1.2 NTU	Objective met
	Serpentine River: 0300059 near source	Sep 25-Nov 27	10	3 - 20 NTU	Control site
	0300057 near mouth	Oct 10,18,23, 30, Nov 6	5	8.0 - 20.0 NTU inc.= 0 - 3 NTU	Objective met
		Sep 25, Oct 4 Nov 14,21,27	5	15 - 30 NTU inc.= 6.7-20.9 NTU	Objective not met
	Latimer Creek: E207720 near source	Oct 18,23,30, Nov6,14,21,27	7	5.3 - 120 NTU	Control site
	E207716 near mouth	Oct 18,23,30, Nov6,14,21,27	7	4.7 - 9.0 NTU inc.= 0 - 1.2 NTU	Objective met
	Mahood Creek: E207717 near source	Sep 25-Nov 27	10	0.9 - 30 NTU	Control site
	0300056 near mouth	Sep25,Oct4,10 30,Nov14,21	6	1.3 - 7.4 NTU inc.= 0 - 4.5 NTU	Objective met
		Oct 18,23, Nov 6,27	4	12 - 45 NTU inc.= 6 - 32 NTU	Objective not met
	Hyland Creek: E207718 near source	Sep 25-Nov 27	10	2.3 - 26.0 NTU	Control site
	E207719 near mouth	Oct4,10,18,30 Nov 14,21,27	7	2.2 - 27.0 NTU inc.= 0 - 4.0 NTU	Objective met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase 5 NTU or 10%	Hyland Creek: E207719 near source	November 6	1	56.0 NTU inc. = 32.0 NTU	Objective not met
Substrate Sedimentation no increase in weight of particles <3 mm dia	Little Campbell R.: 0300066 near source	Sep 25-Nov 8 Nov 24-Dec 22	2 1	av = 13.0 g <3 mm av = 11.7 g <3 mm	Control site
	0300065 near mouth	Sep 25-Nov 8 Nov 24-Dec 22	2 3	av = 72.9 g <3 mm av = 642.4 g <3 mm	Obj. not met Obj. not met
	Murray Creek: E207031 near source	Sep 25-Nov 8 Nov 24-Dec 22	3 1	av = 729 g <3 mm 1v = 87 g <3 mm	Control site
	0300064 near mouth	Sep 25-Nov 8 Nov 24-Dec 22	3 2	av = 14.5 g <3 mm av = 1100 g <3 mm	Obj. met Obj. not met
	Serpentine River: Tynehead, near source	Sep 25-Nov 8 Nov 24-Dec 22	3 1	av = 996.2 g <3 mm av = 1917 g <3 mm	Control site
	154th Av, near mouth	Sep 25-Nov 8 Nov 24-Dec 22	3 2	av = 780.7 g <3 mm av = 890.7 g <3 mm	Obj. met Obj. met
	Latimer Creek: E207720 near source	Nov 24-Dec 22	2	av = 708.1 g <3 mm	Control site
	E207716 near mouth	Nov 24-Dec 22	3	av = 68.4 g <3 mm	Objective met
	Mahood Creek: E207717 near source	Sep 25-Nov 8 Nov 24-Dec 22	2 1	av = 1005.4 g <3mm av = 1159.8 g <3mm	Control site
	0300056 near mouth	Sep 25-Nov 8 Nov 24-Dec 22	2 3	av = 866.6 g <3 mm av = 851.1 g <3 mm	Obj. met Obj. met
	Hyland Creek: E207718 near source	Sep 25-Nov 8 Nov 24-Dec 22	3 3	av = 456.9 g <3 mm av = 583.0 g <3 mm	Control site
	E207719 near mouth	Sep 25-Nov 8 Nov 24-Dec 22	3 3	av = 592.4 g <3 mm av = 1210 g <3 mm	Obj. not met Obj. not met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.23 mg/L av 13.5 mg/L max at pH = 7.4 temp = 20 C	Little Campbell R.: 0300066 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.028 mg/L max = 0.039 mg/L	Objectives met
	0300065 near mouth	Oct 10,18,23, 30, Nov 6	5	av = 0.081 mg/L max = 0.131 mg/L	Objectives met
	Nicomekl River: 0300062 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.062 mg/L max = 0.089 mg/L	Objectives met
	0300060 near mouth	Oct 18,23,30, Nov 6,14	5	av = 0.234 mg/L max = 0.446 mg/L	Objectives met
	Murray Creek: E207031 near source	Oct 23,30, Nov 6,14,21	5	av = 0.201 mg/L max = 0.320 mg/L	Objectives met
	0300064 near mouth	Oct 30,Nov 6, 14,21,27	5	av = 0.104 mg/L max = 0.262 mg/L	Objectives met
	Anderson Creek: E207028 near source	Oct 30, Nov 6,14,21,27	5	av = 0.067 mg/L max = 0.122 mg/L	Objectives met
	0300063 near mouth	Oct 30,Nov 6, 14,21,27	5	av = 0.043 mg/L max = 0.068 mg/L	Objectives met
	Serpentine River: 0300059 near source	Oct 18,23,30, Nov 6,14	5	av = 0.318 mg/L max = 0.495 mg/L	Objectives met
	0300057 near mouth	Oct 10,18,23, 30, Nov 6	5	av = 0.528 mg/L max = 0.960 mg/L	Objectives met
	Latimer Creek: E207720 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.026 mg/L max = 0.035 mg/L	Objectives met
	Latimer Creek: E207716 near mouth	Oct 10,18,23, 30, Nov 6	5	av = 0.890 mg/L max = 1.500 mg/L	Objectives met
	Mahood Creek: E207717 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.057 mg/L max = 0.153 mg/L	Objectives met
	0300056 near mouth	Oct 30,Nov 6, 14,21,27	5	av = 0.052 mg/L max = 0.082 mg/L	Objectives met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.23 mg/L av 13.5 mg/L max at pH = 7.4 temp = 20 C	Hyland Creek: E207718 near source	Sep 25,Oct 4, 10,18,23	5	av = 0.185 mg/L max = 0.865 mg/L	Objectives met
	E207719 near mouth	Oct 30,Nov 6, 14,21,27	5	av = 0.025 mg/L max = 0.038 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Little Campbell R.: 0300066 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.006 mg/L max = 0.009 mg/L	Objectives met
	0300065 near mouth	Oct 10,18,23, 30, Nov 6	5	av = 0.025 mg/L max = 0.042 mg/L	Av not met Max obj. met
	Nicomekl River: 0300062 near source	Oct 18,23,30, Nov 6,14	5	av = 0.023 mg/L max = 0.027 mg/L	Av not met Max obj. met
	0300060 near mouth	Oct 18,23,30, Nov 6,14	5	av = 0.044 mg/L max = 0.048 mg/L	Av not met Max obj. met
	Murray Creek: E207031 near source	Oct 23,30, Nov 6,14,21	5	av = 0.020 mg/L max = 0.026 mg/L	Objectives met
	0300064 near mouth	Oct 30,Nov 6, 14,21,27	5	av = 0.014 mg/L max = 0.015 mg/L	Objectives met
	Anderson Creek: E207028 near source	Oct 30, Nov 6,14,21,27	5	av = 0.016 mg/L max = 0.021 mg/L	Objectives met
	0300063 near mouth	Oct 30,Nov 6, 14,21,27	5	av = 0.012 mg/L max = 0.015 mg/L	Objectives met
	Serpentine River: 0300059 near source	September 25 Oct4,10,18,23 Sep 25-Oct 23	1 4 5	0.179 mg/L 0.023 - 0.052 mg/L av = 0.065 mg/L	Max not met Max obj. met Av not met
		November 14 Oct 30-Nov 27 Oct 30-Nov 27	1 4 5	0.095 mg/L 0.019 - 0.046 mg/L av = 0.044 mg/L	Max not met Max obj. met Av not met
	0300057 near mouth	Oct 18,23,30, Nov 6,14	5	av = 0.042 mg/L max = 0.049 mg/L	Av not met Max obj. met
	Latimer Creek: E207720 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.008 mg/L max = 0.013 mg/L	Objectives met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Latimer Creek: E207716 near mouth	September 25 Oct4,10,18,23 Sep 25-Oct 23	1 4 5	0.165 mg/L <0.005 - 0.054mg/L av = 0.059 mg/L	Max not met Max obj. met Av not met
	Mahood Creek: E207717 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.018 mg/L max = 0.038 mg/L	Objectives met
	0300056 near mouth	Oct 18,23,30, Nov 6,14	5	av = 0.011 mg/L max = 0.020 mg/L	Objectives met
	Hyland Creek: E207718 near source	Oct 30,Nov 6, 14,21,27	5	av = 0.013 mg/L max = 0.032 mg/L	Objectives met
	E207719 near mouth	Oct 10,18,23, 30, Nov 6	5	av = 0.013 mg/L max = 0.026 mg/L	Objectives met
Chlorophyll-a 50 mg/m2 av	Little Campbell River	1989	0	no data collected	Objective not checked
Chlorophyll-a 100 mg/m2 av	Mahood Creek E207717 near source	September 26	3	1.0 - 3.6 mg/m2 av = 1.9 mg/m2	Objective met
	Hyland Creek E207718 near source	September 26	2	1.3 - 6.1 mg/m2 av = 3.7 mg/m2	Objective met
	Nicomekl River Murray Creek Anderson Creek Serpentine River Latimer Creek	1989	0	no data collected	Objective not checked
Dissolved Oxygen 6.5 mg/L min	Boundary Bay: 0300070 East	Sep 10 Sep 17 Sep 24 Sep 24 Oct 1 Oct 19	4 4 3 1 4 4	0-7m:8.5-10.7 mg/L 0-9m:6.6- 8.8 mg/L 0-6m:7.8- 9.8 mg/L 8m: 6.1 mg/L 0-9m:11.8-12.2mg/L 0-9m:6.9- 8.0 mg/L	Obj. met Obj. met Obj. met Obj. not met Obj. met Obj. met
	0300071 West	Sep 10 Sep 17 Sep 17 Sep 24 Sep 24 Sep 24	5 4 1 1 3 1	0-11m:8.6-11.8mg/L 0-9m:6.6-11.2 mg/L 12m: 6.2 mg/L 0m: 7.2 mg/L 3-9m:4.5-6.2 mg/L 12m: 7.0 mg/L	Obj. met Obj. met Obj. not met Obj. met Obj. not met Obj. met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 6.0 mg/L min Jun - Oct 11.0 mg/L min Nov - May	Little Campbell River 0300066 near source	Sep 25-Oct 30 Nov 6 - 27	6 4	1.3 - 5.0 mg/L 4.0 - 6.5 mg/L	Obj. not met Obj. not met
	0300065 near mouth	Sep 25-Oct 30 Nov 6 - 27 Nov 14	6 3 1	6.1 - 9.7 mg/L 9.7 - 10.6 mg/L 11.4 mg/L	Obj. met Obj. not met Obj. met
	Nicomekl River: 0300062 near source	Sep 25-Oct 30 Nov 14,27 Nov 6,21	6 2 2	8.8 - 10.6 mg/L 11.0 - 11.1 mg/L 9.2 - 10.2 mg/L	Obj. met Obj. met Obj. not met
	0300060 near mouth	Sep 25-Oct 30 Oct 18 Nov 6 - 27	5 1 4	6.3 - 8.2 mg/L 4.3 mg/L 7.0 - 7.9 mg/L	Obj. met Obj. not met Obj. not met
	Serpentine River: 0300059 near source	Oct 10,30 Sep 25-Oct 23 Nov 6 - 27	2 4 4	6.4 - 6.8 mg/L 1.4 - 5.7 mg/L 5.8 - 7.2 mg/L	Obj. met Obj. not met Obj. not met
	0300057 near mouth	Sep 25-Oct 23 Oct 18,30 Nov 6 - 27	4 2 4	6.8 - 10.0 mg/L 4.1 - 5.7 mg/L 5.9 - 7.0 mg/L	Obj. met Obj. not met Obj. not met
Dissolved Oxygen 8.0 mg/L min Jun - Oct 11.0 mg/L min Nov - May	Murray Creek E207031 near source	Oct 18 - 30 Nov 14 - 27 Nov 6	3 3 1	8.7 - 11.4 mg/L 11.0 - 12.1 mg/L 10.8 mg/L	Obj. met Obj. met Obj. not met
	0300064 near mouth	Sep 25-Oct 30 Nov 14 - 27 Nov 6	6 3 1	9.5 - 11.6 mg/L 11.3 - 12.4 mg/L 10.9 mg/L	Obj. met Obj. met Obj. not met
	Anderson Creek: E207028 near source	Oct 30 Nov 6 - 27	1 4	10.2 mg/L 10.0 - 10.4 mg/L	Obj. met Obj. not met
	0300063 near mouth	Sep 25-Oct 30 Nov 6 - 27	5 4	9.6 - 11.2 mg/L 11.0 - 12.0 mg/L	Obj. met Obj. met
	Latimer Creek: E207720 near source	Oct 18 - 30 Nov 14 - 27 Nov 6	3 3 1	9.2 - 11.4 mg/L 11.6 - 12.5 mg/L 10.8 mg/L	Obj. met Obj. met Obj. not met
	E207716 near mouth	Sep 25-Oct 30 Oct 10,18,23 Nov 6 - 27	3 3 4	10.0 - 10.4 mg/L 4.3 - 7.3 mg/L 6.1 - 10.2 mg/L	Obj. met Obj. not met Obj. not met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 8.0 mg/L min Jun - Oct 11.0 mg/L min Nov - May	Mahood Creek: E207717 near source	Sep 25-Oct 30 Nov 14,27 Nov 6,21	6 2 2	8.9 - 10.5 mg/L 11.1 - 11.5 mg/L 10.7 - 10.8 mg/L	Obj. met Obj. met Obj. not met
	0300056 near mouth	Sep 25-Oct 30 Nov 14,27 Nov 6,21	6 2 2	8.6 - 10.9 mg/L 11.2 -11.5 mg/L 10.2 - 10.9 mg/L	Obj. met Obj. met Obj. not met
	Hyland Creek: E207718 near source	Sep 25-Oct 30 Nov 14,27 Nov 6,21	6 2 2	8.1 - 10.8 mg/L 11.2 - 11.4 mg/L 10.4 - 10.9 mg/L	Obj. met Obj. met Obj. not met
	E207719 near mouth	Oct 4 - 30 Sep 25,Oct 10 Nov 6 - 27 Nov 21	4 2 3 1	8.5 - 9.7 mg/L 5.2 - 7.9 mg/L 11.2 - 11.8 mg/L 10.6 mg/L	Obj. met Obj. not met Obj. met Obj. not met
pH 6.5 - 8.5	Little Campbell River 0300066 near source	Sep 25-Nov 27	10	6.7 - 8.4	Objective met
	0300065 near mouth	Sep 25-Nov 27	10	6.8 - 8.3	Objective met
pH 6.5 - 8.5 or 0.2 max increase	Nicomekl River 0300062 near source	Sep 25-Nov 27	10	6.9 - 8.4	Objective met
	0300060 near mouth	Sep 25-Nov 27	10	6.8 - 8.5	Objective met
	Murray Creek: E207031 near source	Oct 18-Nov 27	7	7.0 - 8.3	Objective met
	0300064 near mouth	Sep 25-Nov 27	10	6.9 - 8.5	Objective met
	Anderson Creek: E207028 near source	Oct 30-Nov 27	5	6.9 - 8.2	Objective met
	0300063 near mouth	Sep 25-Nov 27	9	6.9 - 8.4	Objective met
	Serpentine River: 0300059 near source	Sep 25-Nov 27	10	6.6 - 8.3	Objective met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5 or 0.2 max increase	Serpentine River: 0300057 near mouth	Oct 10-Nov 27	9	6.8 - 8.4	Obj. met
		Sep 25	1	9.2	Obj. not met
	Latimer Creek: E207720 near source	Oct 18-N0v 21	6	7.1 - 8.5	Obj. met
		Nov 27	1	4.6	Obj. not met
	Latimer Creek: E207716 near mouth	Sep 25-Nov 27	10	6.8 - 8.2	Objective met
	Mahood Creek: E207717 near source	Sep 25-Nov 27	8	6.8 - 8.4	Obj. met
		Oct 18,30	2	8.6 - 8.7	Obj. not met
	0300056 near mouth	Sep 25-Nov 27	10	7.2 - 8.4	Objective met
	Hyland Creek: E207718 near source	Sep 25-Nov 27	10	7.1 - 8.5	Objective met
	E207719 near mouth	Sep 25-Nov 27	9	6.9 - 8.5	Obj. met
		Oct 10	1	6.0	Obj. not met
Total Lead <0.005 mg/L av 0.010 mg/L max	Nicomekl River: 0300062 near source	Sep 25,Oct 4, 10,18,23	5	all < 0.001 mg/L	Objectives met
	0300060 near mouth	Sep 25,Oct 4, 10,18,23	5	av = 0.002 mg/L max = 0.003 mg/L	Objectives met
PCBs in water 0.001 ug/L max	Serpentine River 0300057 near mouth	October 30	1	<0.4 ug/L	Indefinite result
	Latimer Creek E207716 near mouth	October 30	1	<0.4 ug/L	Indefinite result
	Mahood Creek 0300056 near mouth	October 30	1	<0.4 ug/L	Indefinite result

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

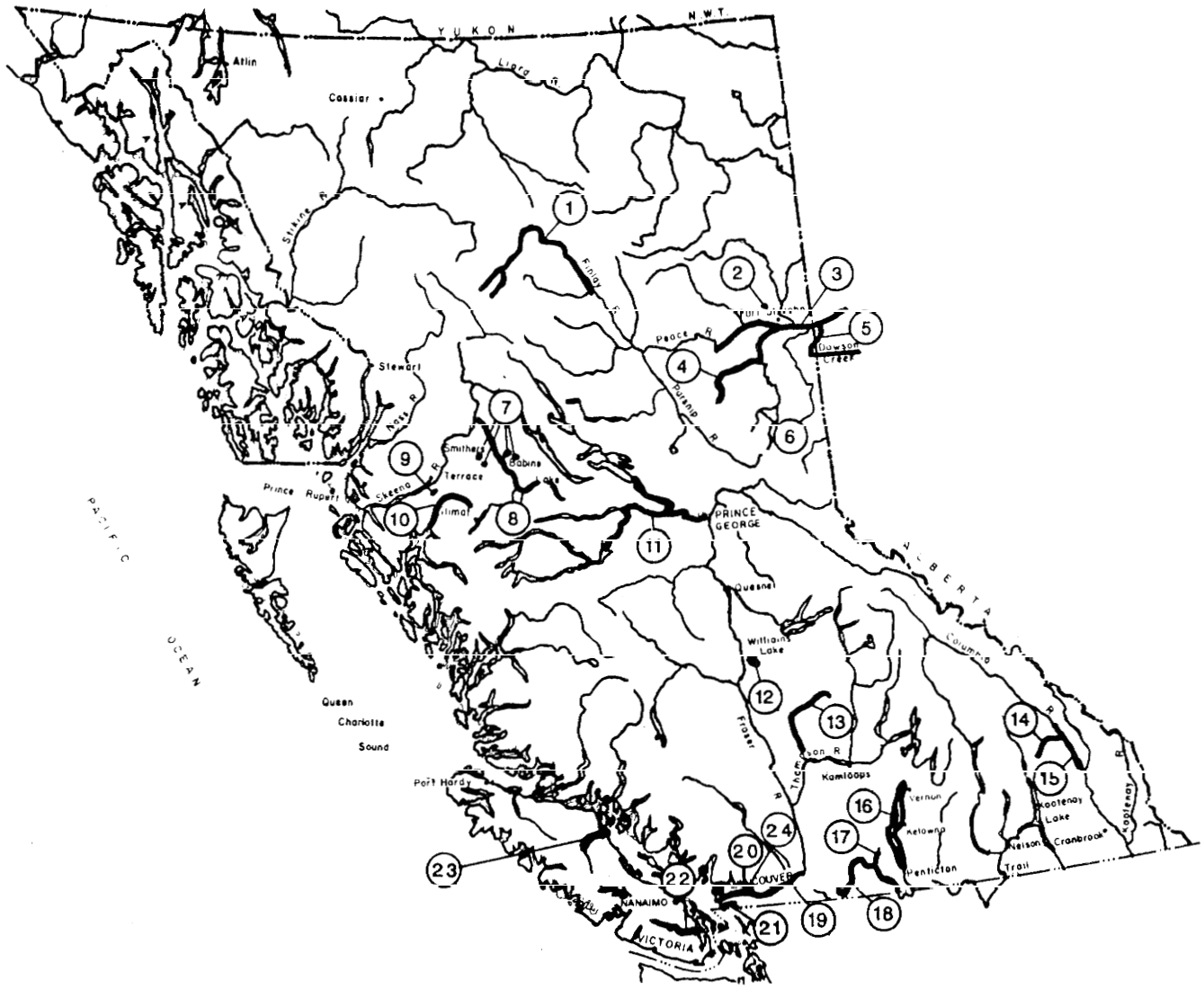
VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
PCBs in water 0.001 ug/L max	Hyland Creek E207719 near mouth	October 30	1	<0.4 ug/L	Indefinite result
PCBs in sediments <0.03 ug/g dry weight	Boundary Bay: 0300070 East	September 24	3	all <0.02 ug/g	Objective met
	0300071 West	September 24	3	all <0.02 ug/g	Objective met
	E207863 West near U.S. border	June 15	6	all <0.010 ug/g	Objective met
	E207864 Beach Grove	June 15	6	all <0.010 ug/g	Objective met
	E207865 East of Grauer Beach	June 15	5	all <0.010 ug/g	Objective met
	E207866 West Delta Airfield	June 15	6	all <0.010 ug/g	Objective met
	E207867 East Delta Airfield	June 14	5	all <0.010 ug/g	Objective met
	E207868 off Serpentine River	June 21	6	all <0.010 ug/g	Objective met
	E207869 North Crescent Beach	June 21	5	all <0.010 ug/g	Objective met
	E207870 Semiahmoo Bay	June 29	6	all <0.010 ug/g	Objective met
	Serpentine River 0300057 near mouth	Mar 3, Nov 16	6	all <0.02 ug/g	Objective met
	Latimer Creek E207716 near mouth	November 27	3	all <0.02 ug/g	Objective met
	Mahood Creek 0300056 near mouth	Mar 16,Nov 14	6	all <0.02 ug/g	Objective met
	Hyland Creek: E207718 near source	March 16	3	all <0.02 ug/g	Objective met

TABLE 23 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1989

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
PCBs in seds. <0.03 ug/g dry weight	Hyland Creek: E207719 near mouth	November 14	3	all <0.02 ug/g	Objective met
PCBs in fish <0.1 - 0.5ug/g wet weight	Serpentine River Latimer Creek Mahood Creek Hyland Creek	1989	0	no data collected	Objective not checked

FIGURE 1
Water Basins Where Water Quality Objectives Have Been Set



1. Upper Finlay R.
2. Charlie L.
3. Peace R.
4. Pine R.
5. Pouce Coupe R.
6. Bullmoose Cr.
7. Kathlyn, Seymour, Round, and Tyhee L's.
8. Bulkley R.
9. Lakelse L.
10. Lower Kitimat R. and Arm
11. Nechako R.
12. Williams L.
13. Bonaparte R.
14. Toby Cr.
15. Columbia and Windermere L.
16. Okanagan Valley L.
17. Cahill Cr.
18. Similkameen R.
19. Lower Fraser R.
20. Lower Fraser R.
21. Boundary Bay
22. Cowichan - Koksilah R.
23. Quinsam R.
24. Lower Fraser R. tributaries

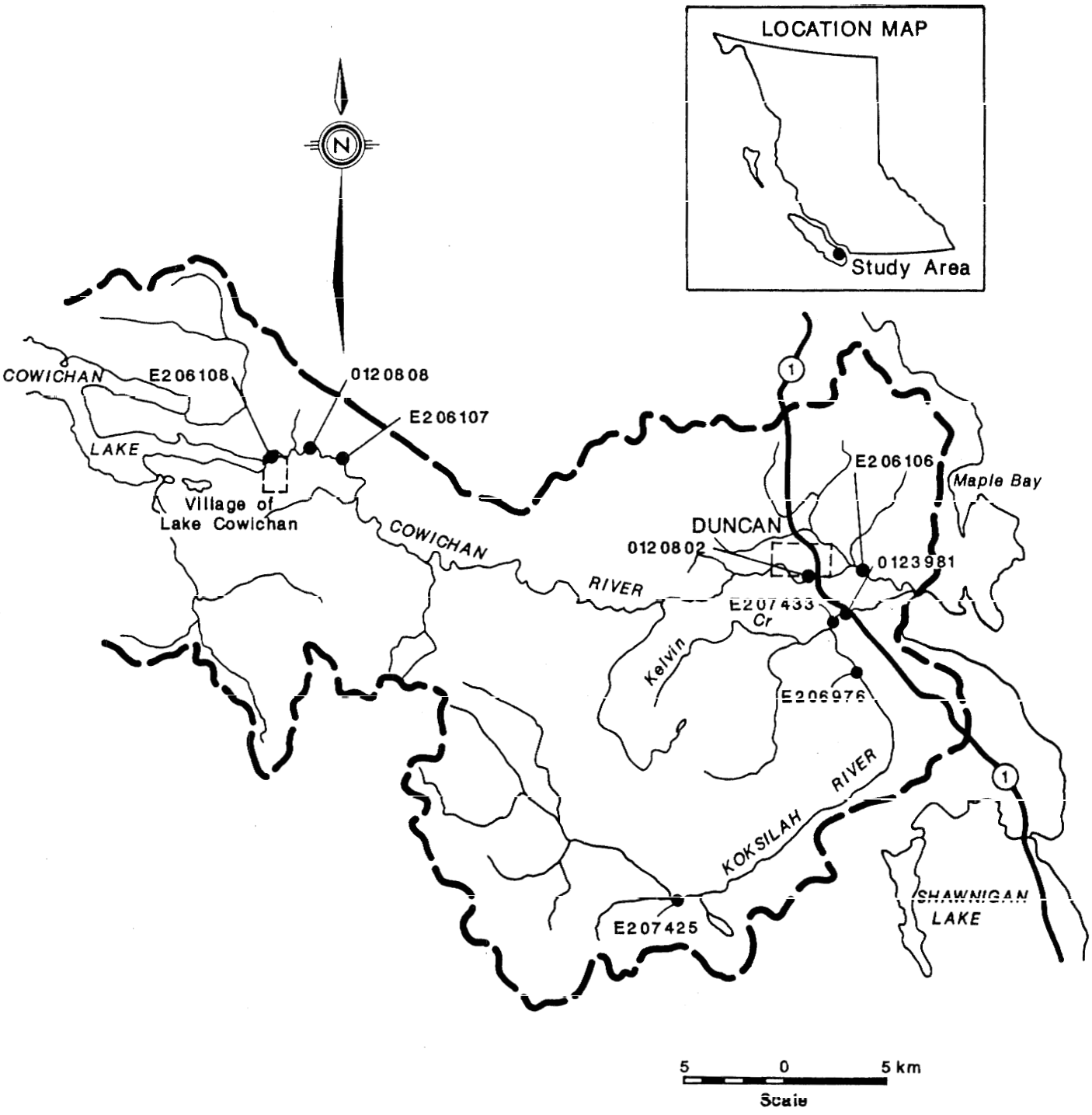


FIGURE 2 Cowichan – Koksilah Rivers

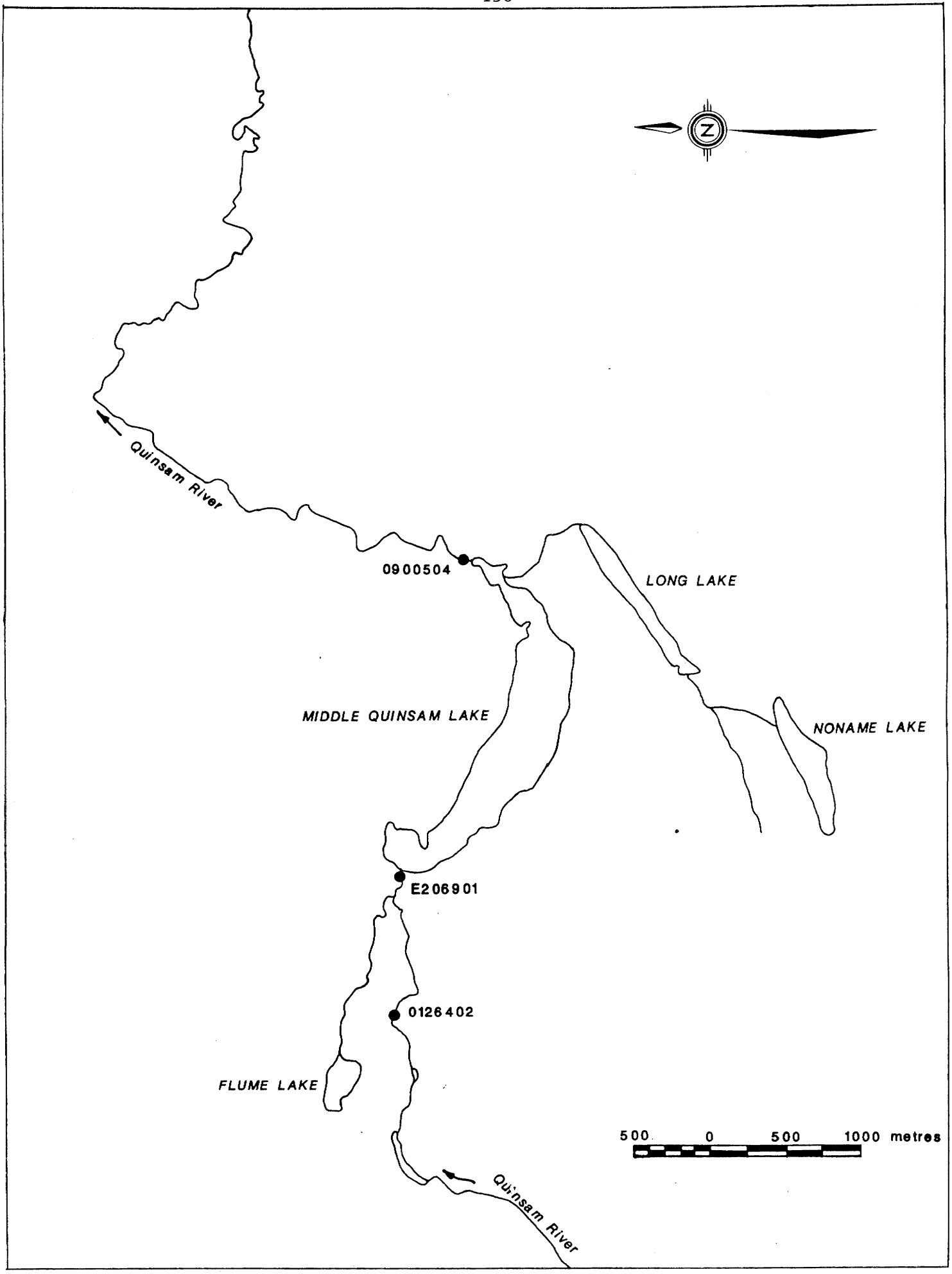


FIGURE 3 Middle Quinsam Lake

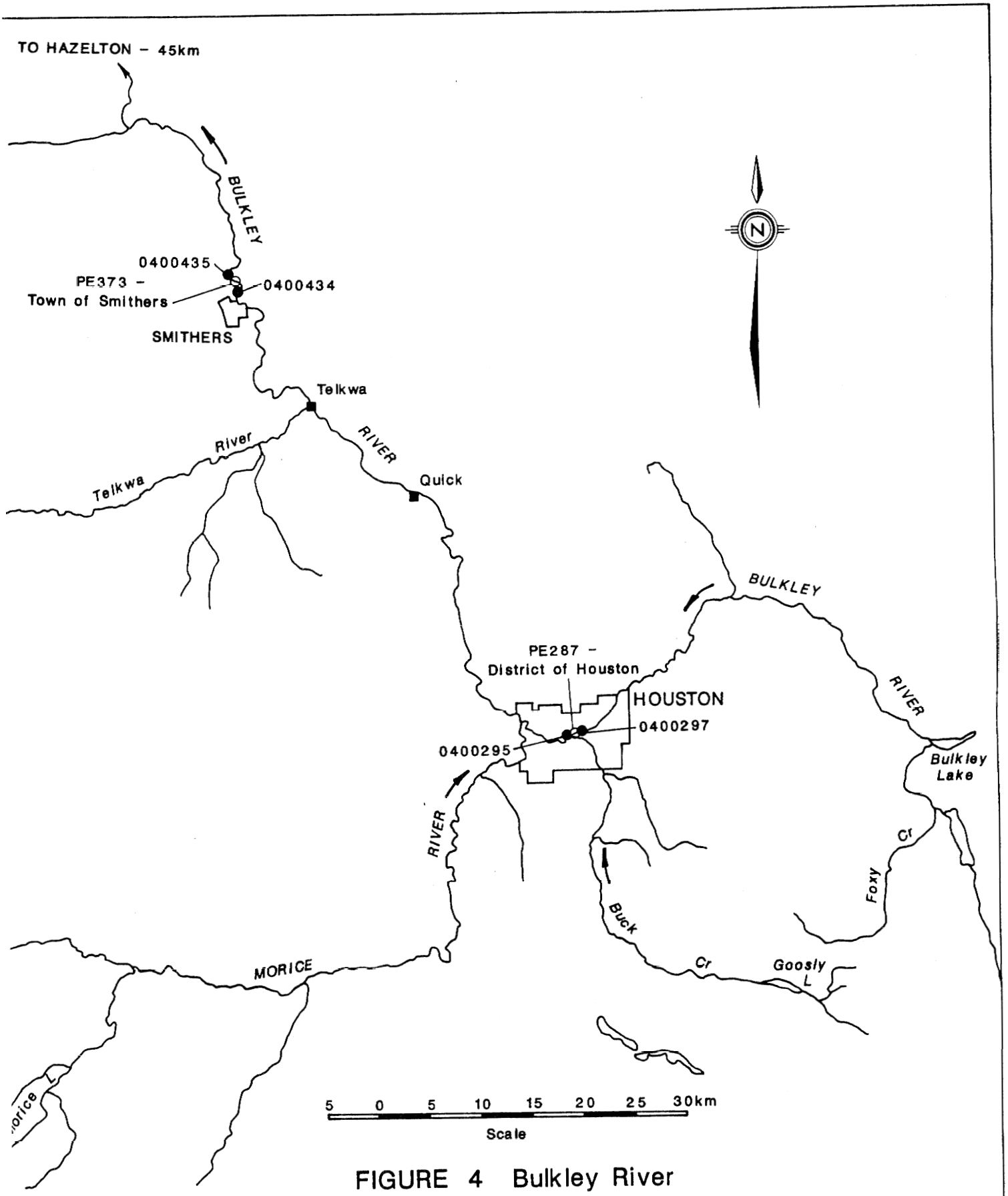


FIGURE 4 Bulkley River

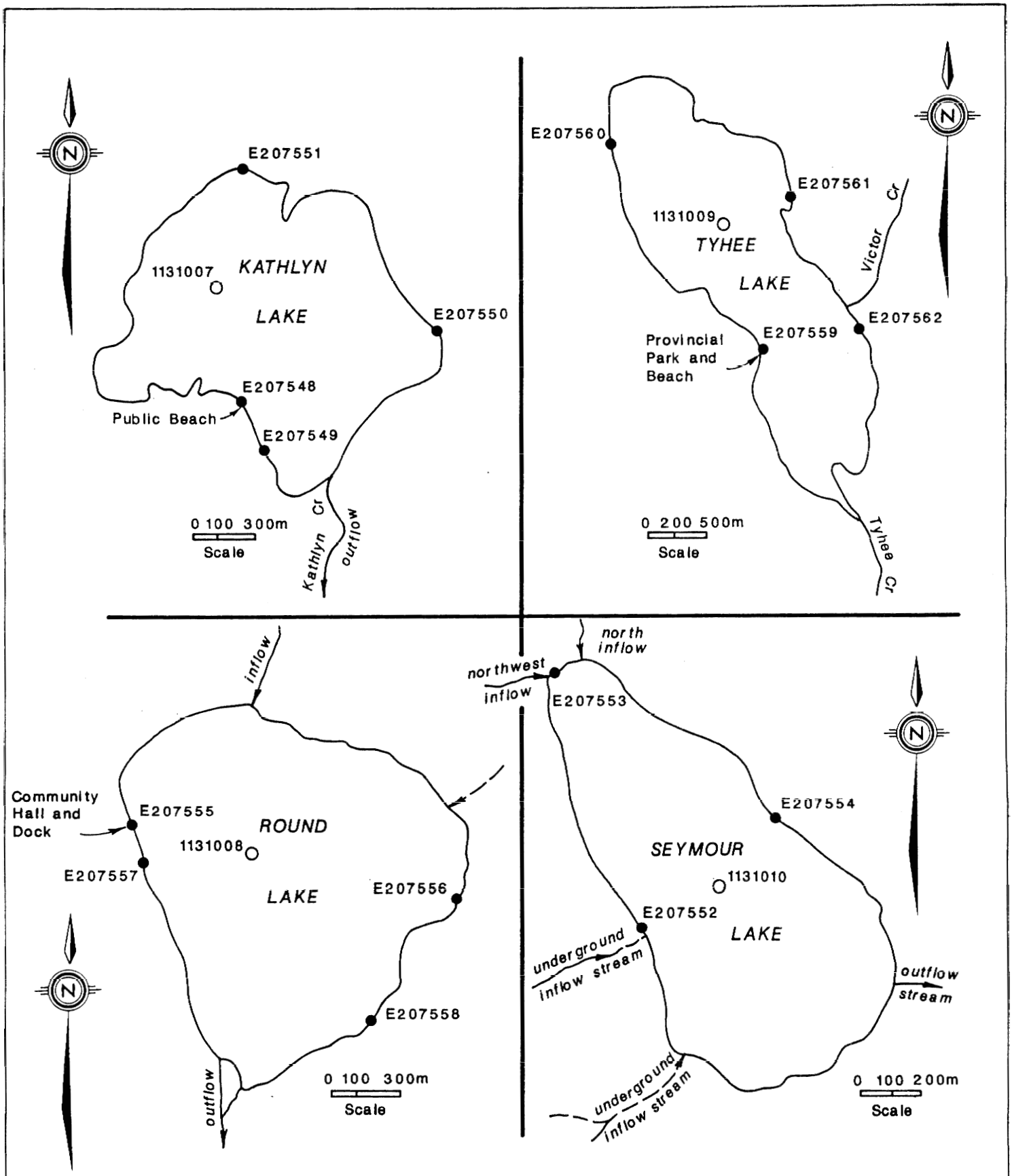


FIGURE 5 Kathlyn, Seymour, Round and Tyhee Lakes

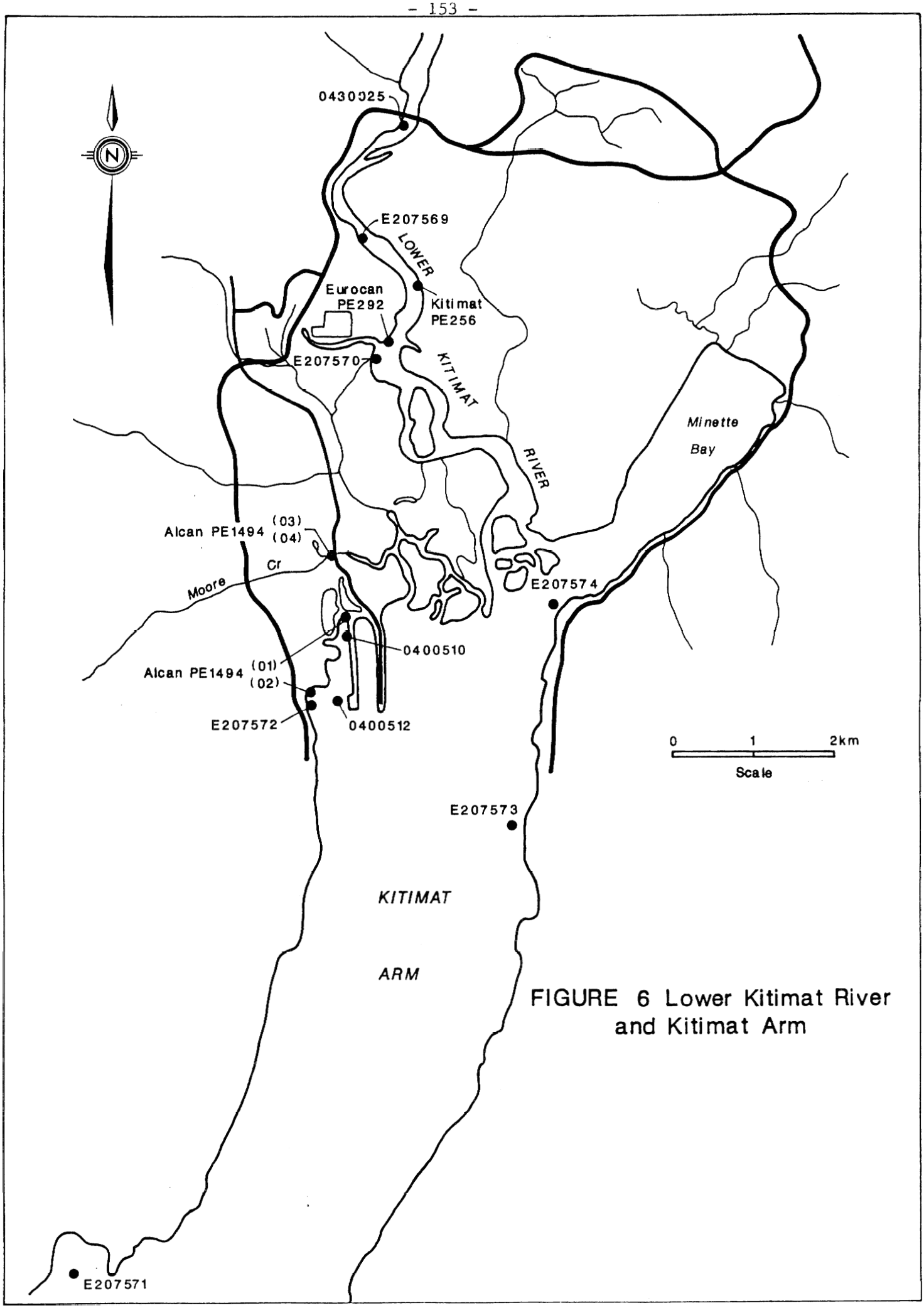


FIGURE 6 Lower Kitimat River and Kitimat Arm

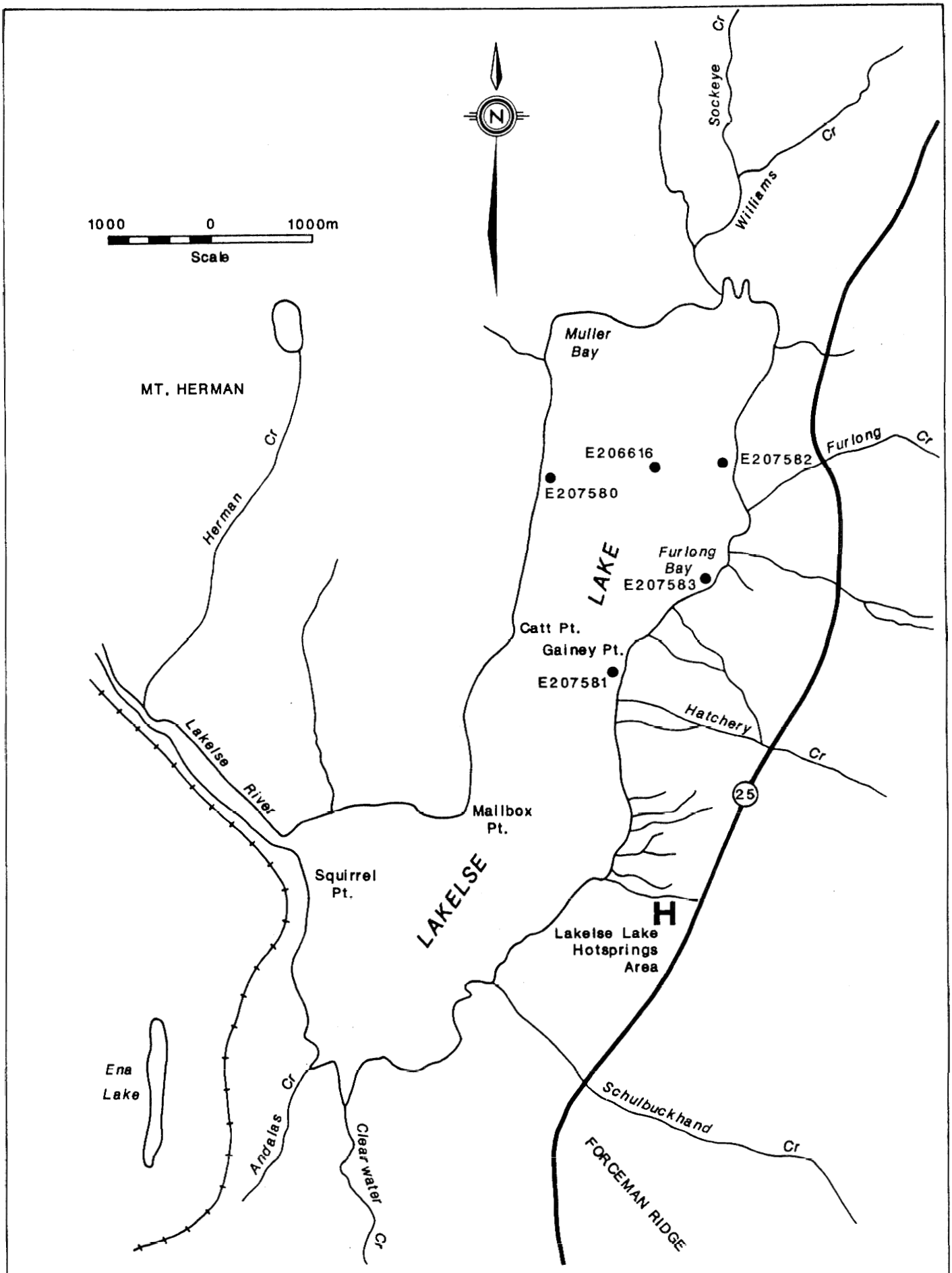


FIGURE 7 Lakelse Lake

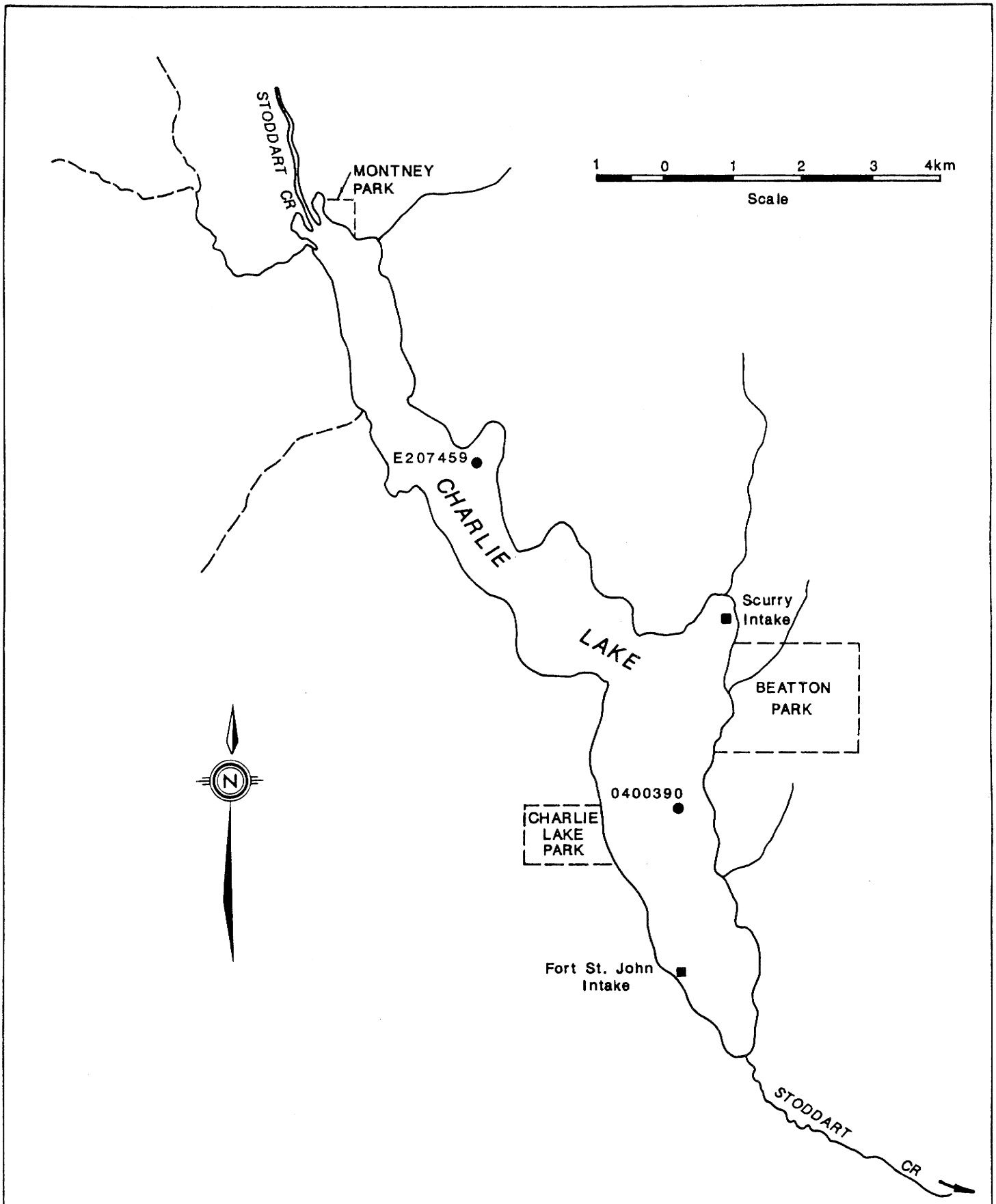


FIGURE 8 Charlie Lake

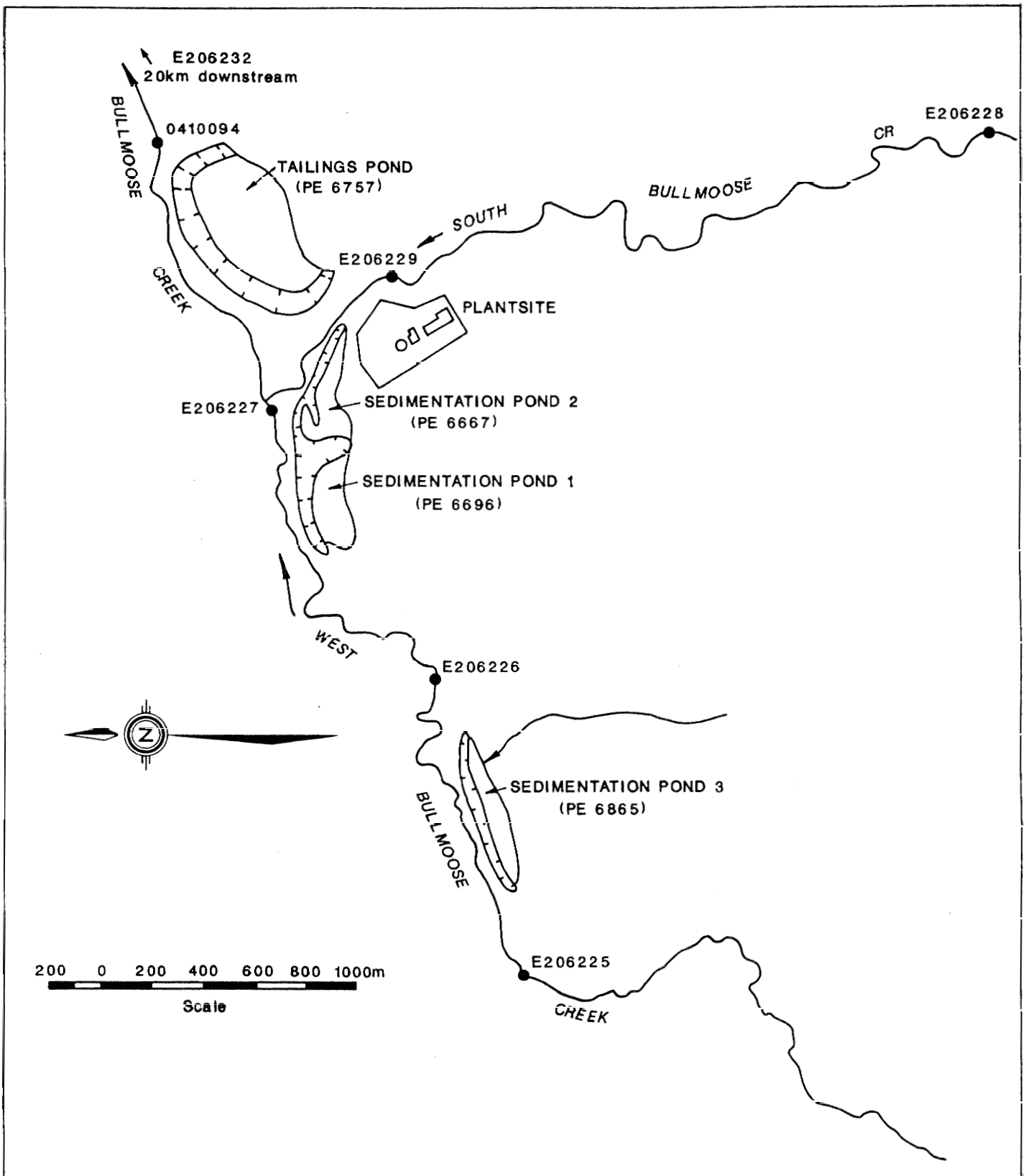


FIGURE 9 Bullmoose Creek

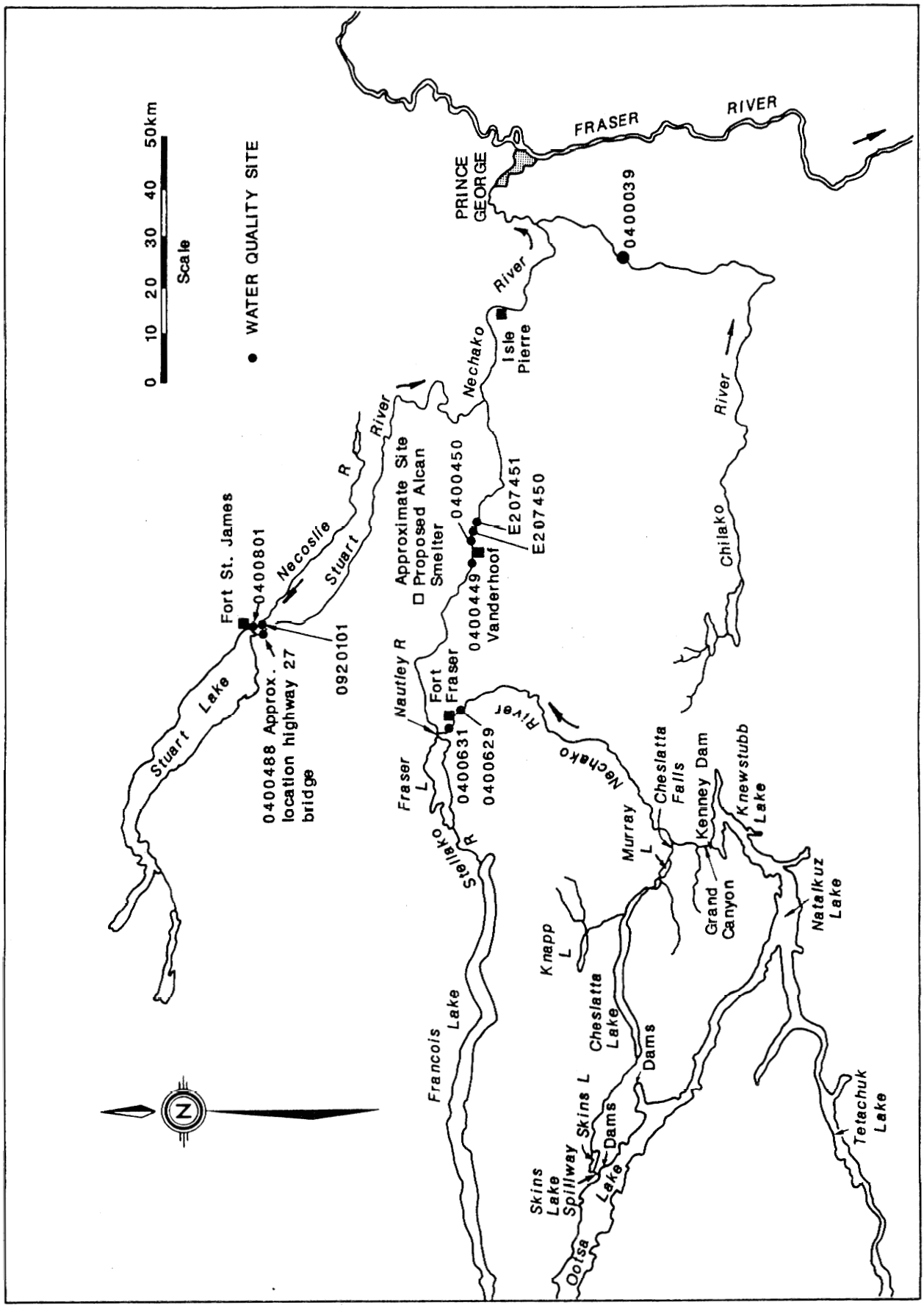


FIGURE 10 Nechako River

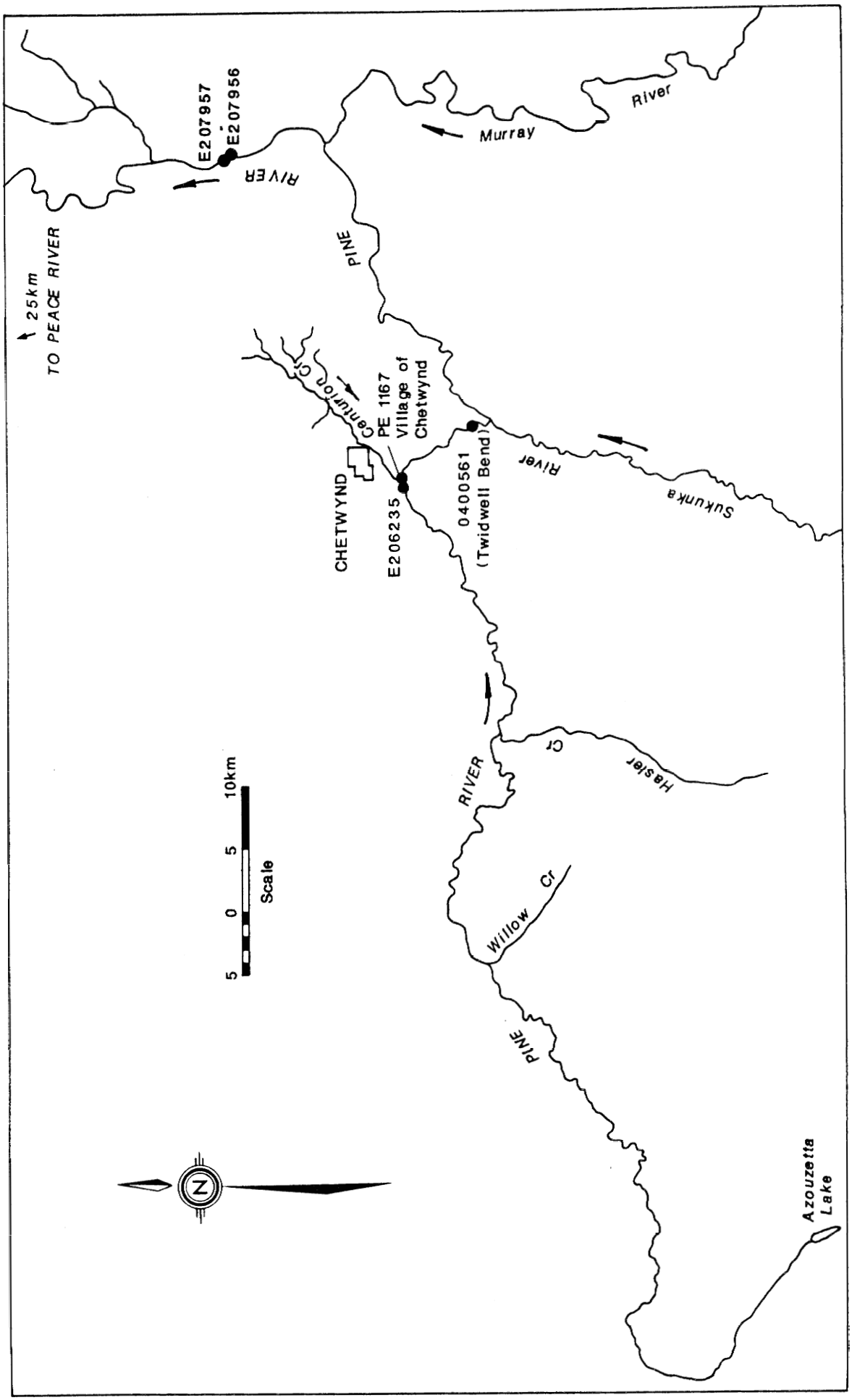


FIGURE 11 Pine River

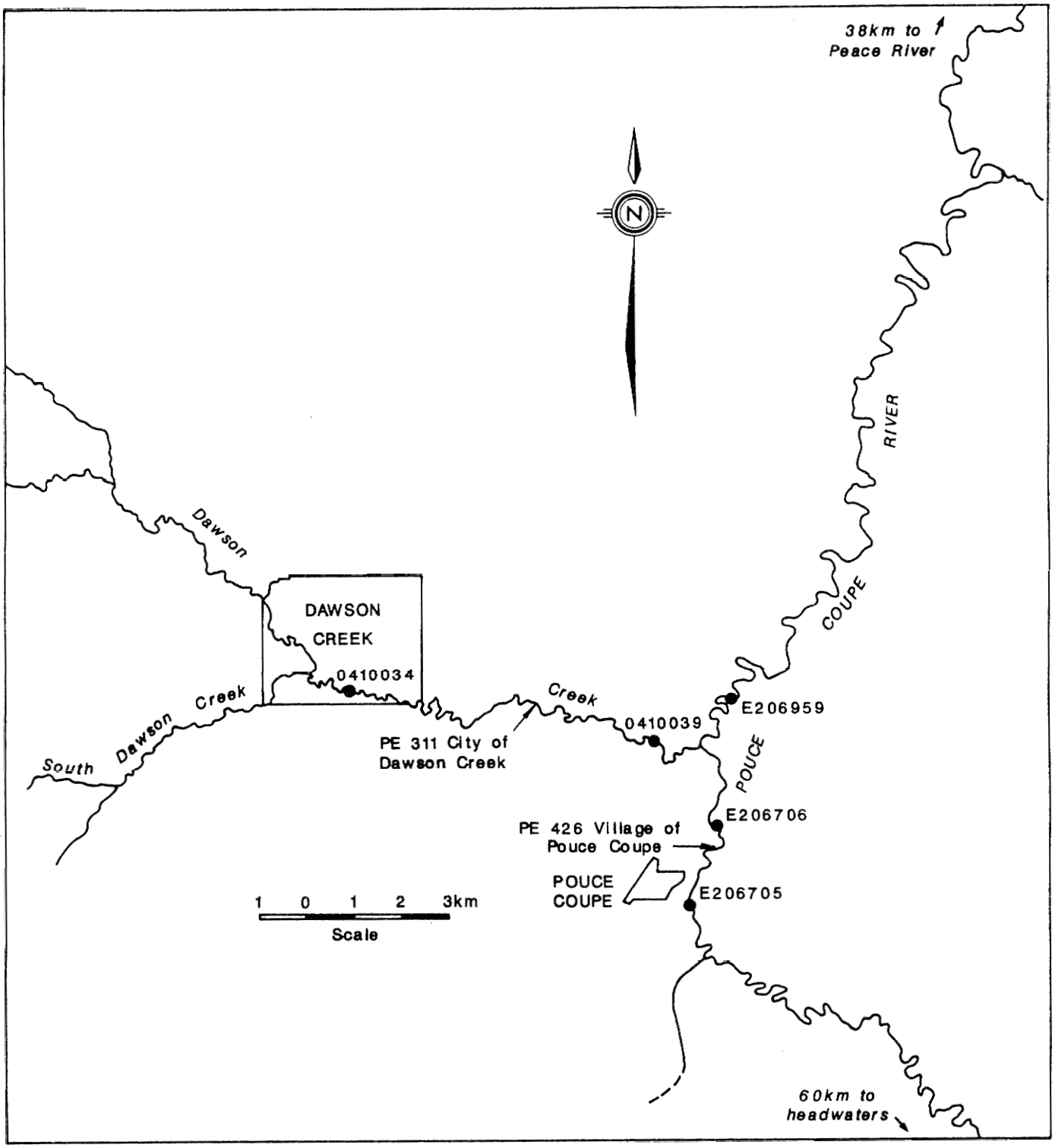


FIGURE 12 Pouce Coupe River

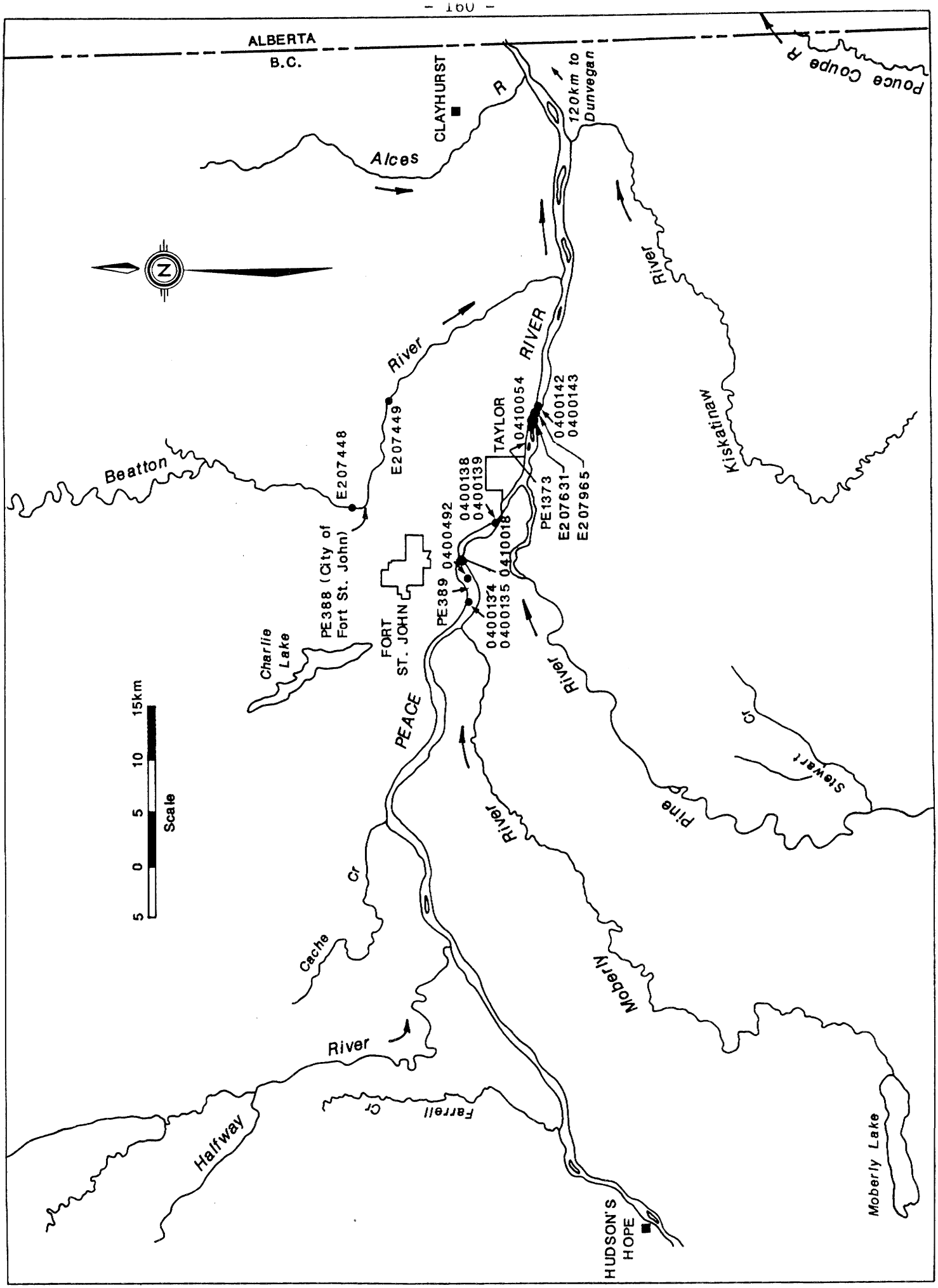


FIGURE 13 Peace River Mainstem

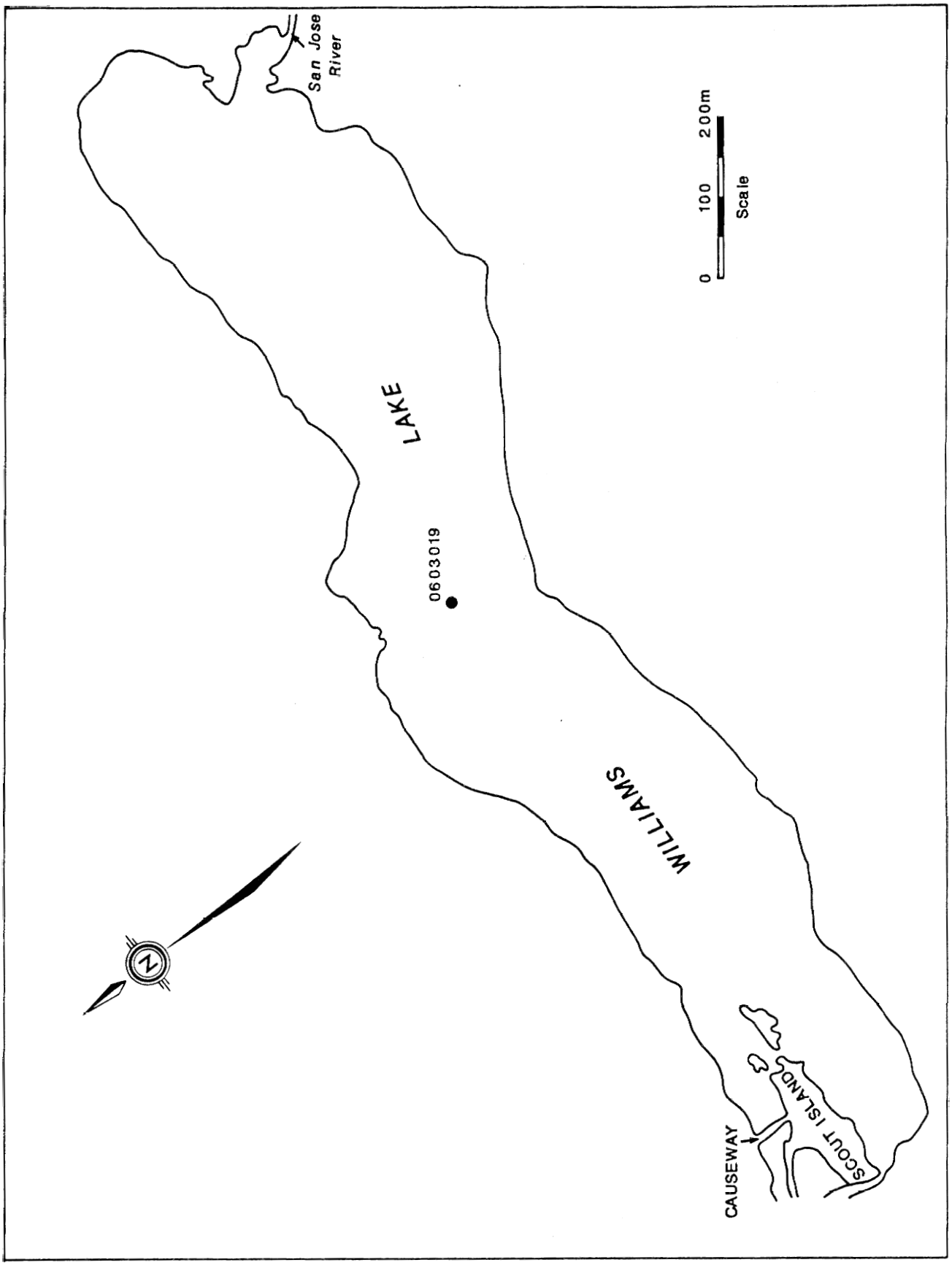


FIGURE 14 Williams Lake

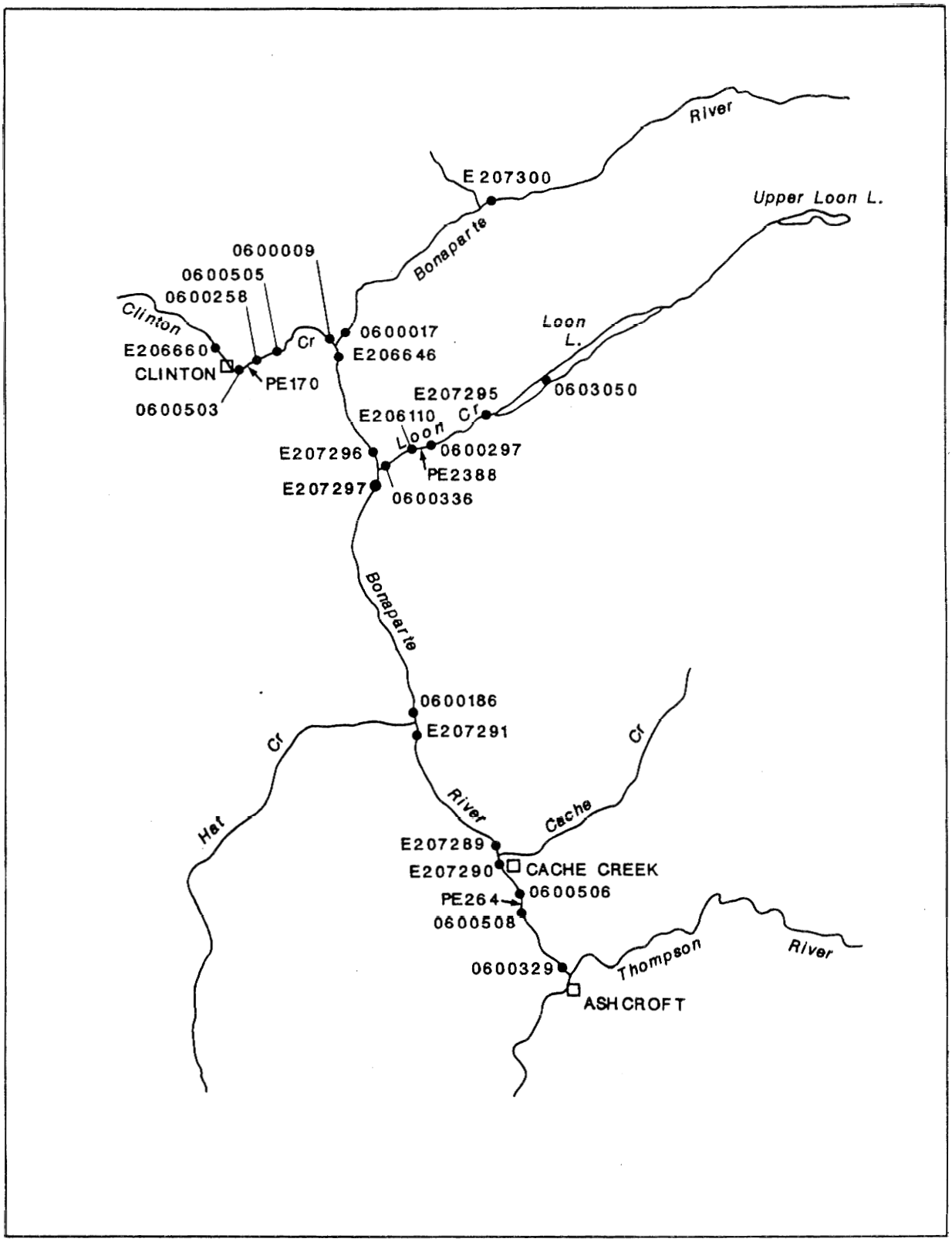


FIGURE 15 Bonaparte River

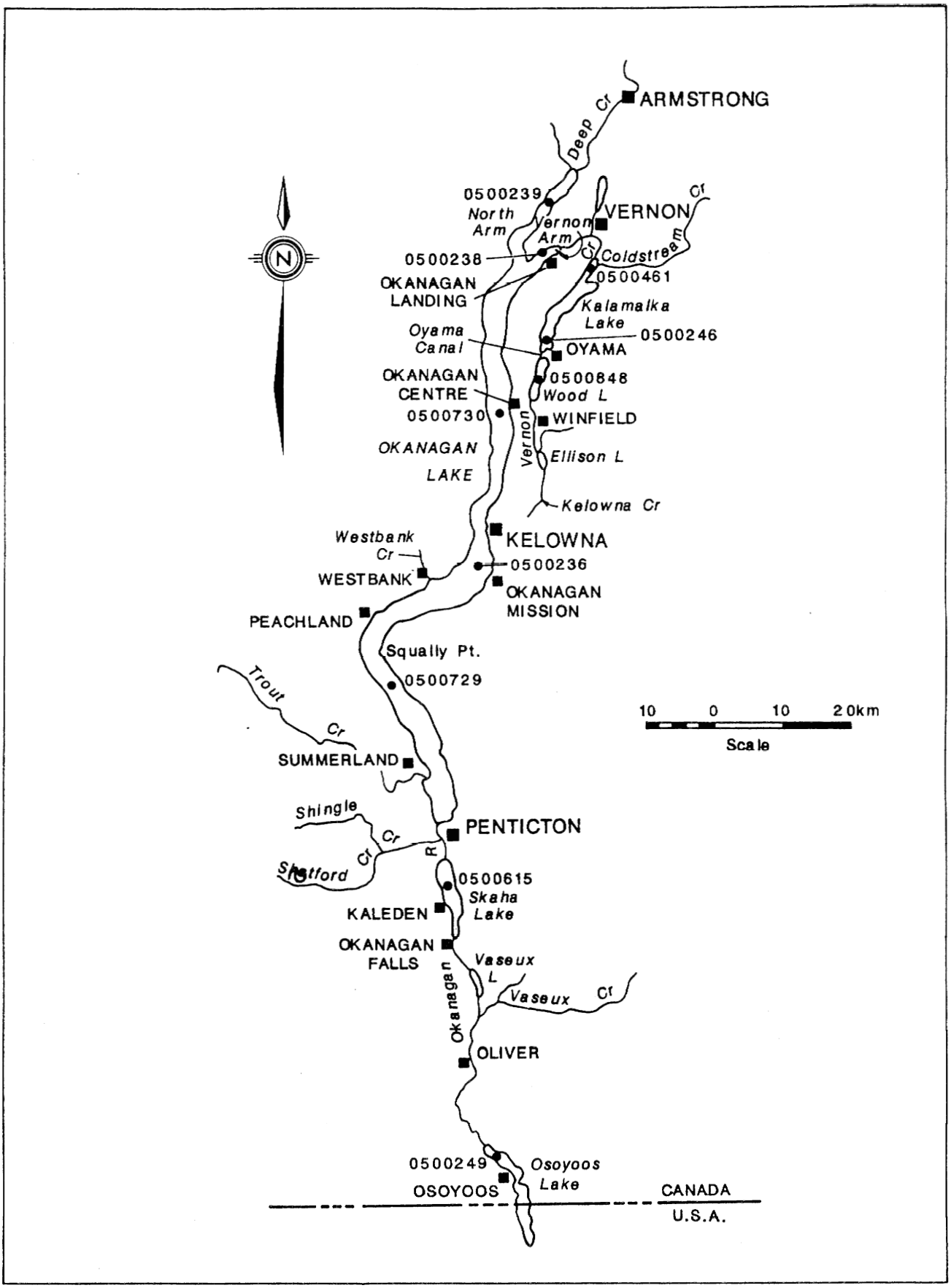


FIGURE 16 Okanagan Valley Lakes

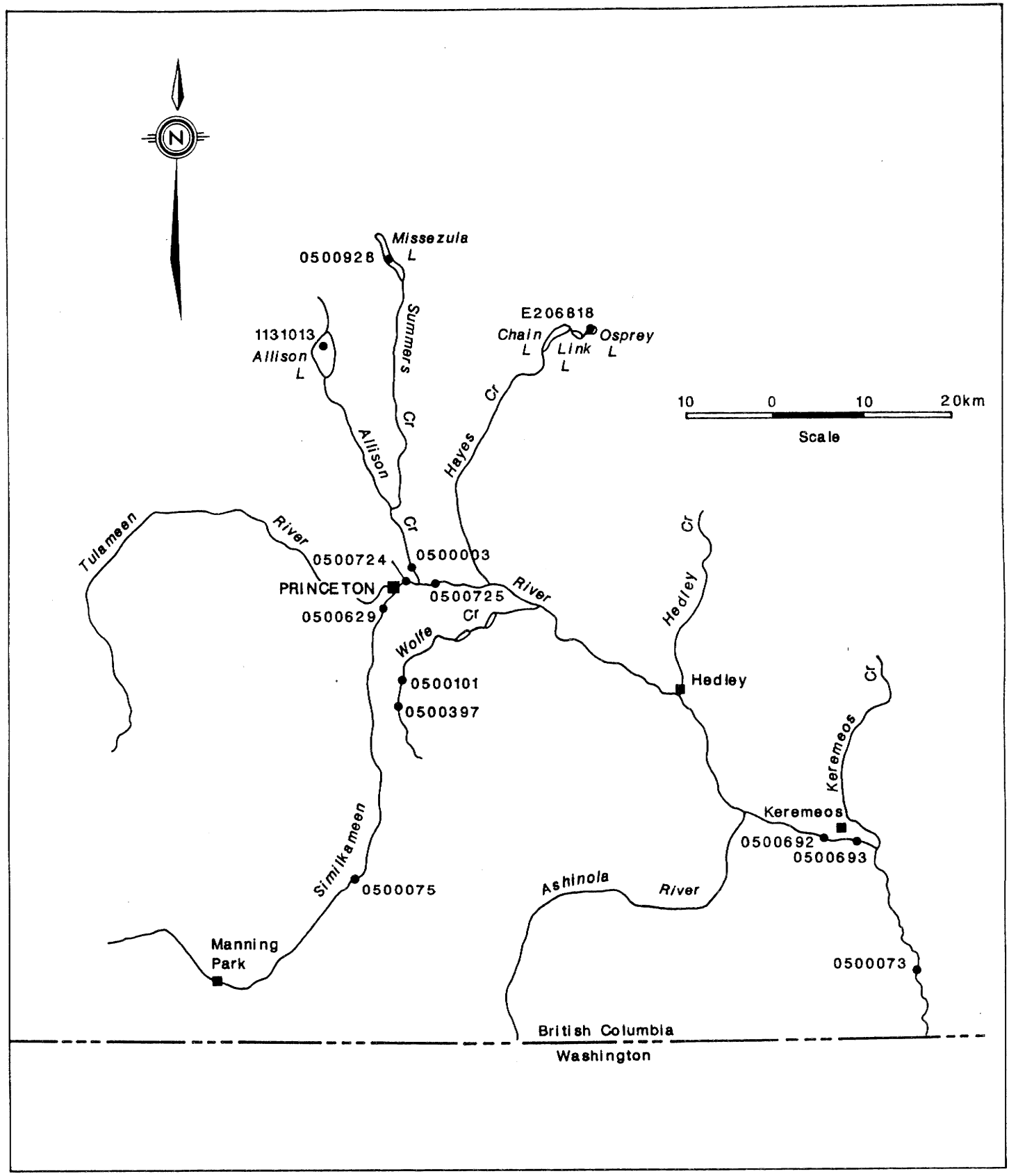


FIGURE 17 Similkameen River

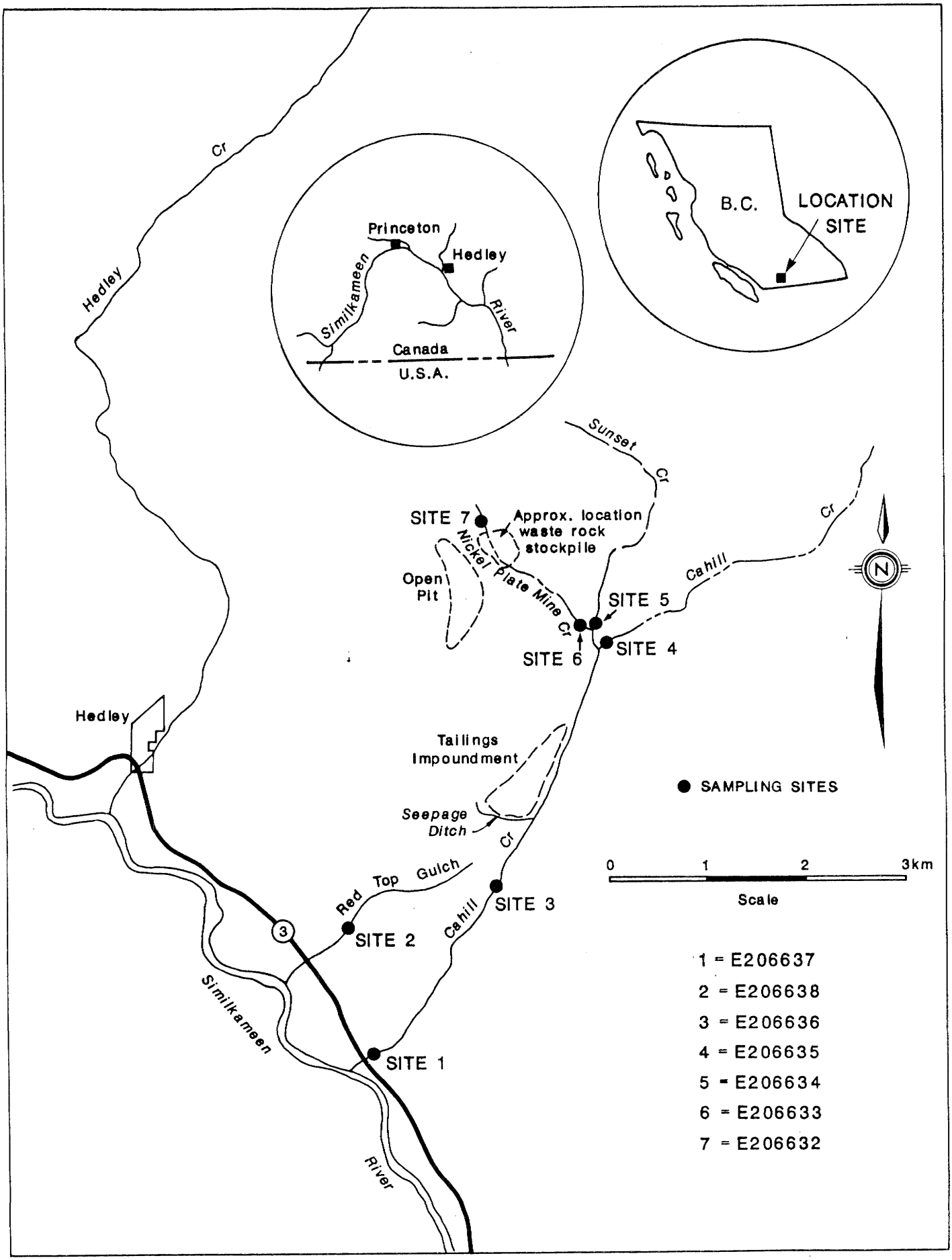


FIGURE 18 Cahill Creek

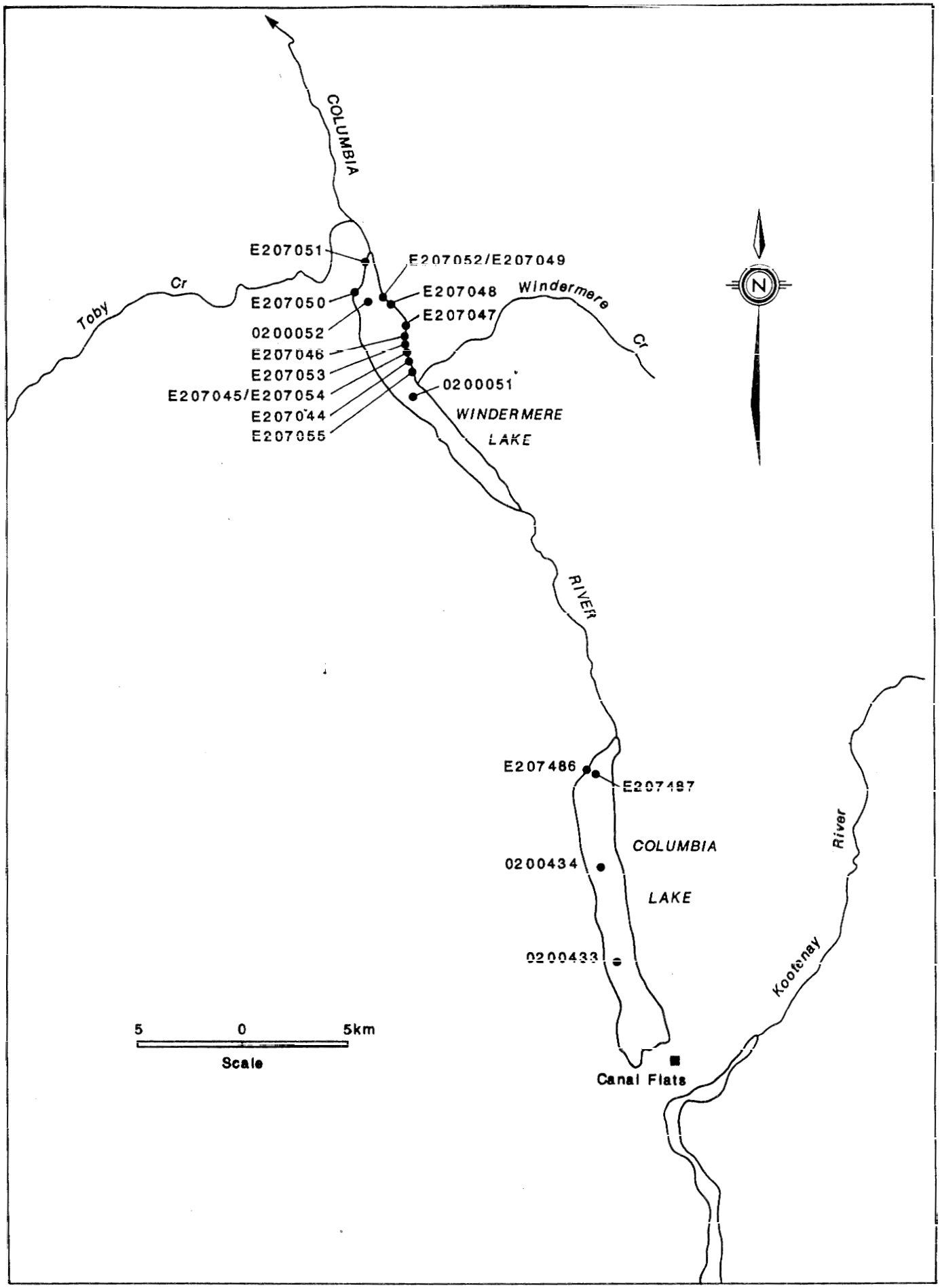


FIGURE 19 Columbia and Windermere Lakes

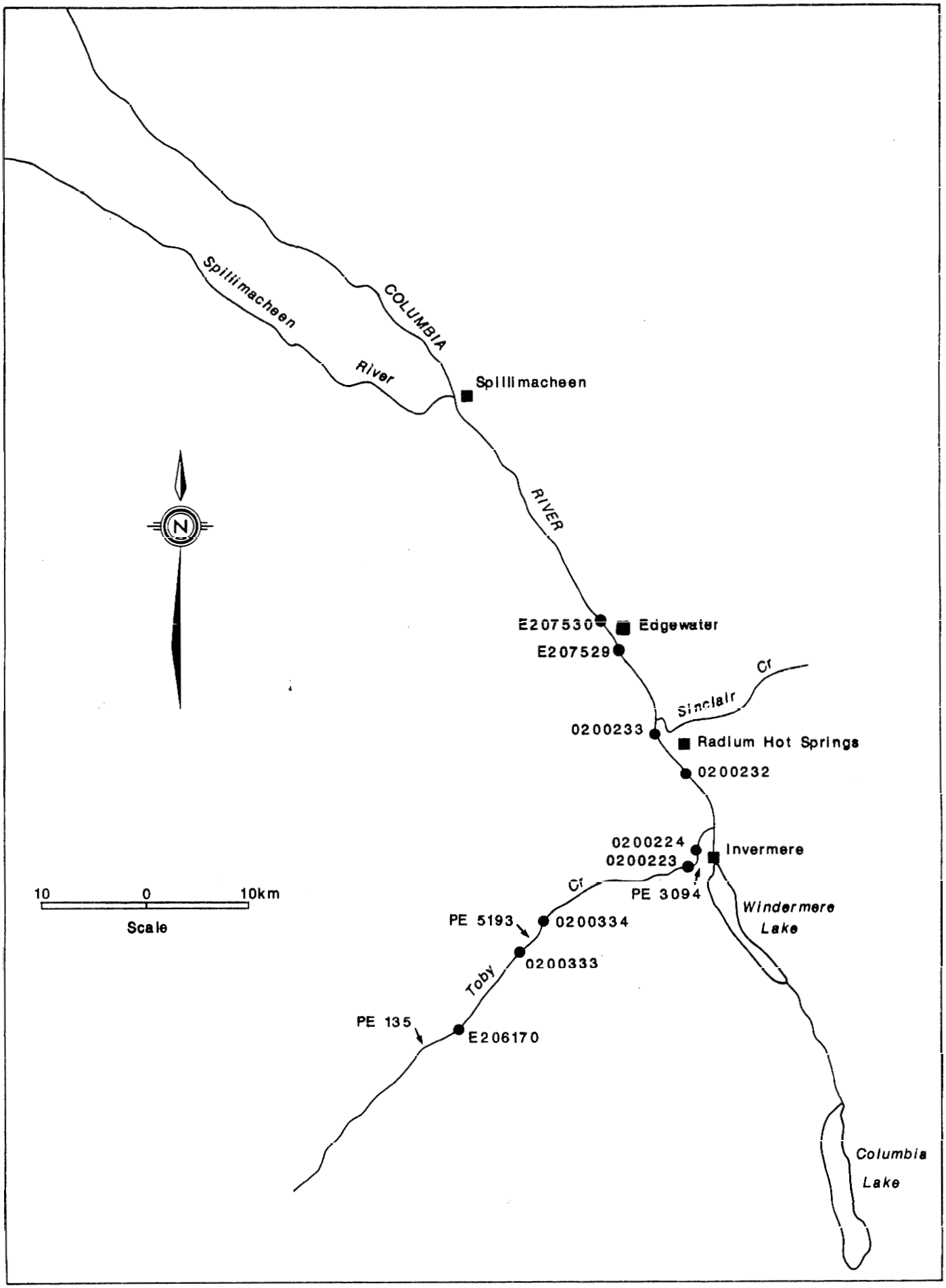


FIGURE 20 Toby Creek and the Upper Columbia River

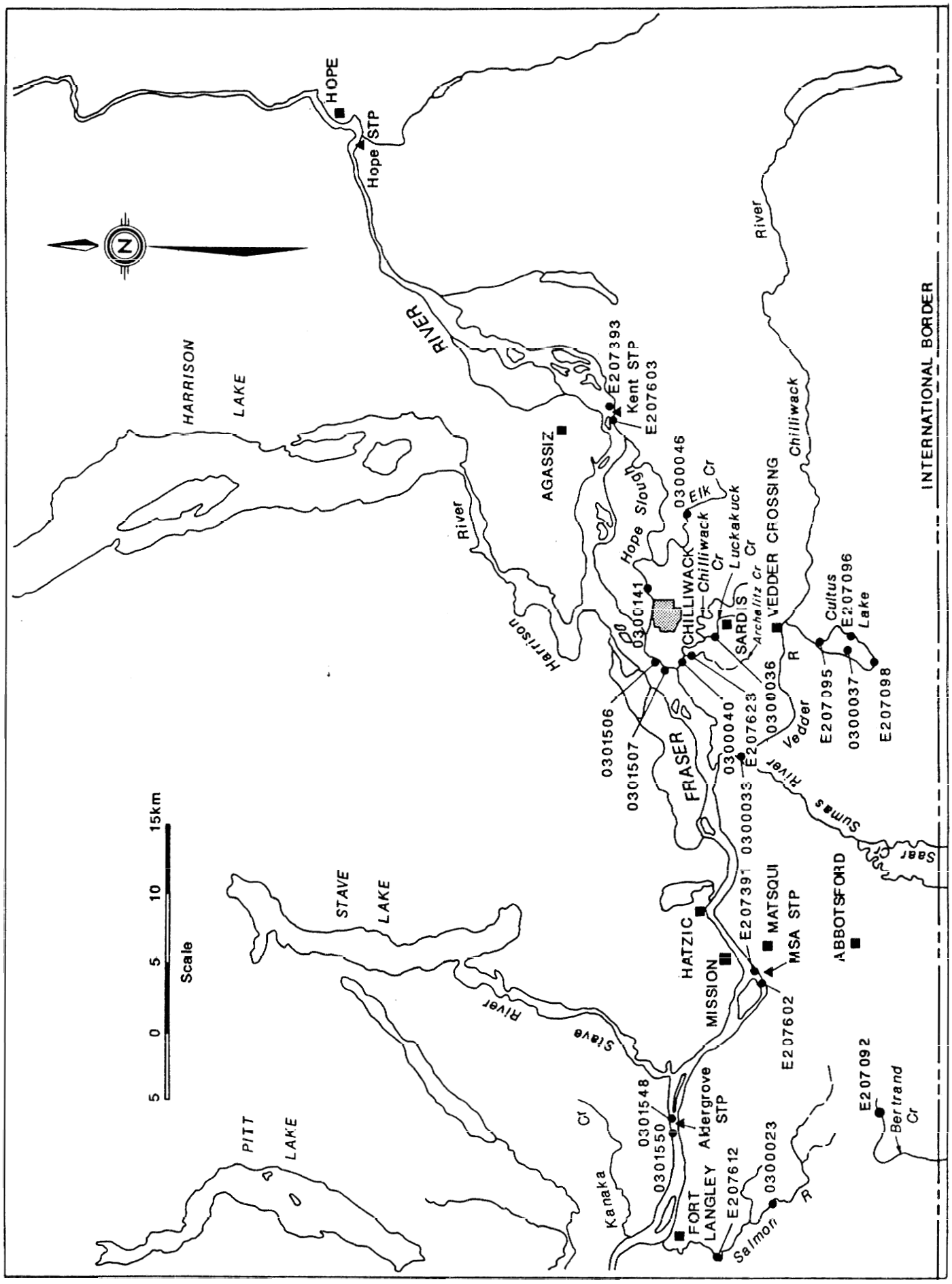


FIGURE 21 Fraser River from Hope to Kanaka Creek

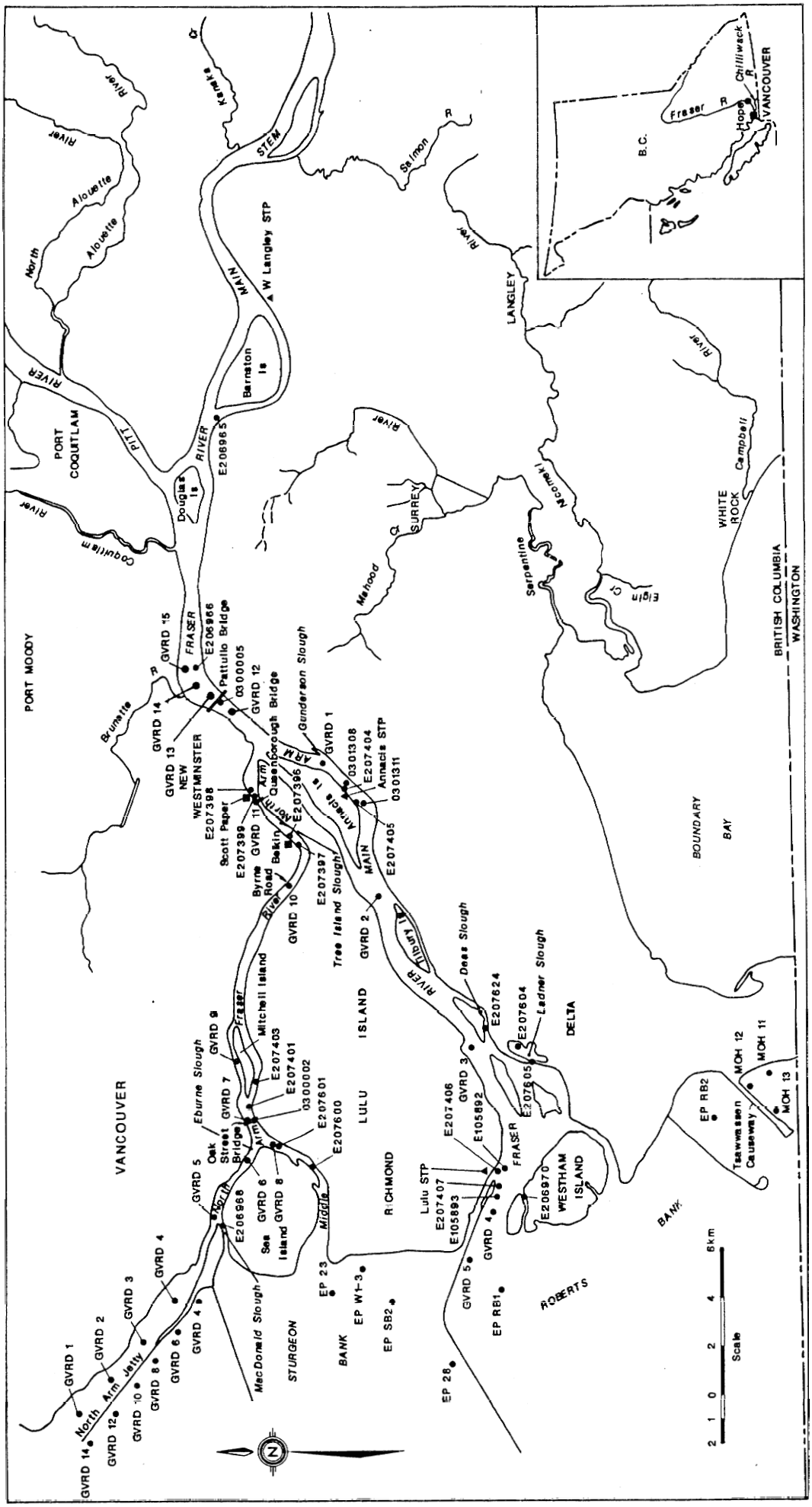


FIGURE 22 Fraser River from Kanaka Creek to the mouth

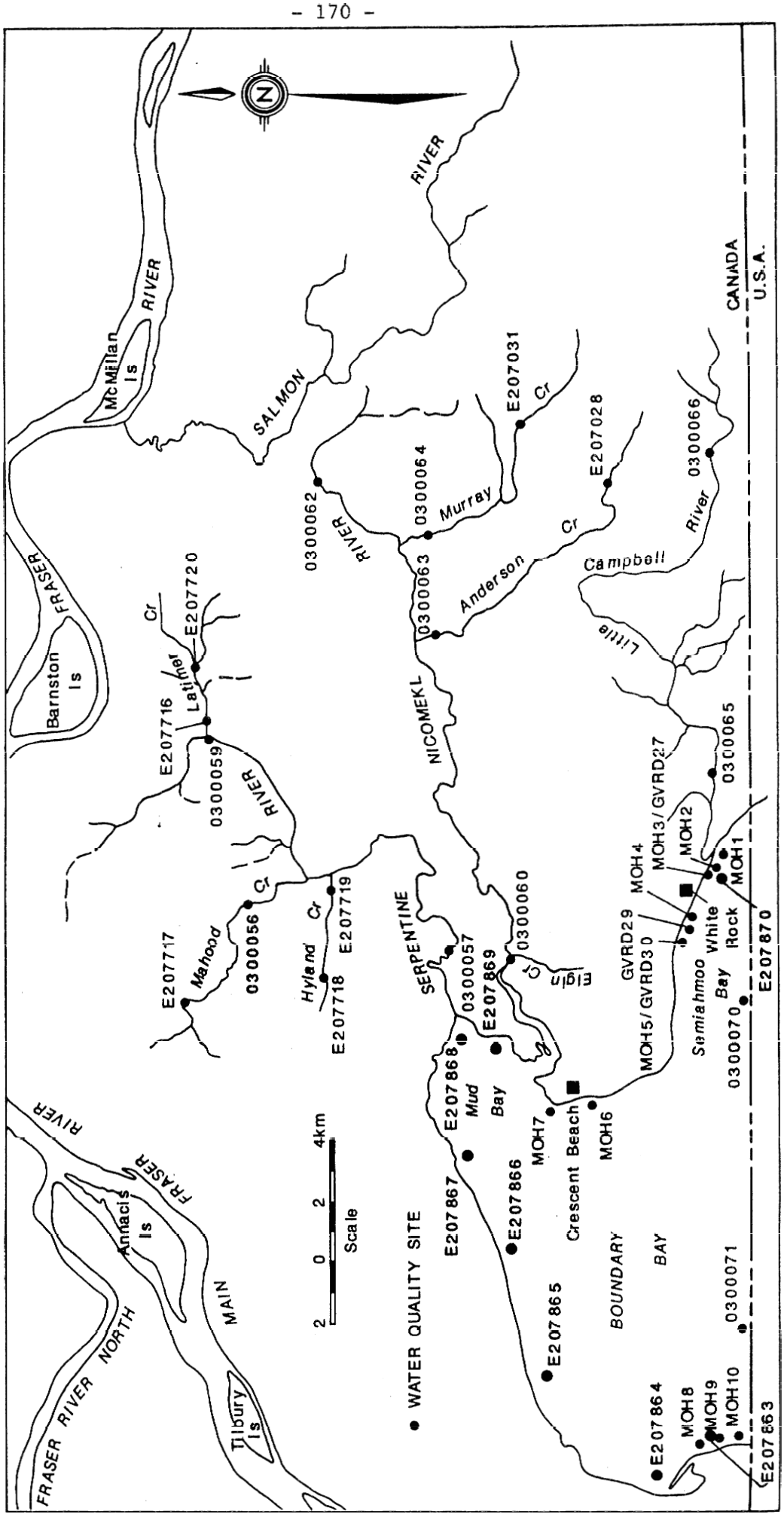


FIGURE 23 Boundary Bay