MINISTRY OF ENVIRONMENT, LANDS AND PARKS

PROVINCE OF BRITISH COLUMBIA

THE ATTAINMENT OF AMBIENT WATER QUALITY OBJECTIVES IN 1991

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1. SUMMARY

The task of setting water quality objectives in priority basins in British Columbia began in mid 1982. By the end of 1991, the Ministry had set water quality objectives in 34 bodies of water throughout the Province. Monitoring to check the attainment of objectives started, on an annual basis, in 1987. This report presents the results of monitoring done in 1991 to check the attainment of objectives in certain selected basins.

The results are summarized in a series of tables. Overall, the objectives were met about 90 percent of the time, an outcome similar to those of 1988 to 1990. Although this result falls short of an ideal 100 percent compliance, it generally applies only to objectives that were set in problem areas. Thus, while the monitoring results describe indirectly how well problems are being dealt with, they do not describe the state of water quality in the Province as a whole. Variables for which objectives were sometimes exceeded in more than one basin included the following: fecal coliforms, E. coli, enterococci, suspended solids, turbidity, phosphorus, chlorophyll-a, pH, dissolved oxygen, temperature, cyanide, copper in water and sediments, iron, lead in water and sediments, mercury, zinc in sediments, and PCBs in sediments.

Cases of objectives being exceeded need investigation to determine the cause and the possible need for corrective action. Monitoring in future years will indicate whether problems are persisting or being solved. Monitoring also shows how close water quality conditions are to ideal and results are thus one measure of the state of the environment in B.C.

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 or Plans and to measure their effectiveness. They are thus a basic tool for use in maintaining a healthy aquatic environment.

Work on water quality objectives began in 1982. By the beginning of 1992, objectives had been set in 34 separate bodies of water and updated in one. In each basin considered, some type of water quality problem was expected due to human activity. Objectives have been set for lakes, rivers, creeks, and marine areas and cover all six Environmental Regions of the Province.

This report for 1991 is the sixth in a series of annual reports which began in 1986. Since 1987, funds have been allocated for the minimum ambient monitoring needed to check the attainment of the objectives. As a result, a picture of how well objectives are met was obtained from 1987 to 1990 and is again given here for 1991. The report is for the use of the managers of the water resource. It shows where conditions are acceptable and where further evaluation is needed to solve water quality problems. It can also be used by anyone interested in the present state of water quality in a given basin although, to keep this report to a

reasonable length, familiarity with the background reports on water quality objectives for each basin is assumed. Copies of the background reports on objectives can be obtained from the Water Quality Branch of the Ministry in Victoria.

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. There are many bodies of water where water quality is relatively unaffected by humans and likely to remain so for the foreseeable future. Nevertheless, reports in this series are one measure of the state of the environment regarding water quality in British Columbia.

3. METHODS OF PRESENTING AND INTERPRETING THE DATA

3.1 Reports on Objectives

By the end of 1991, the Ministry of Environment had completed 34 reports on water quality objectives for specific water basins. The complexity and size of the reports varied considerably, depending upon the basin considered. These water basins were distributed among the Environment Regions as follows:

Vancouver Island	4
Skeena	4
Northern Interior	8
Southern Interior	9
Kootenay	3
Lower Mainland	6
Total	34

Work is in progress on another 16 reports for different water basins. These reports are now at various stages of completion.

3.2 Tables of Results

Data collected in 1991 to check objectives are summarized in Tables 2 to 28, with a separate table for each of the 27 water basins monitored. Seven basins were not monitored in 1991, due either to low priority or late completion of the objectives during 1991. Decisions on which basins to monitor and on the details of monitoring and funding were reached early in the year after close consultation with the Regions. The work to be done was described in monitoring schedules and the progress of the work was followed during the year.

Each table lists all the objectives that have been set, as they appear in the summary table of each objectives reports. 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 is used when high fecal coliform values are recorded at bathing beaches.

The tables summarize the measurements made to check the objectives. These include sites, sampling dates, number of samples taken, and the values obtained. For each objective checked, 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.

Five different concluding statements are used: objective met, objective not met, indefinite result, objective not checked, and omitted 1991. The result is reported as indefinite if there were insufficient data to check the objective, or the data were suspect, or the mimimum detectable concentration was too high. The objective is reported as not checked if, for some reason, planned data collection did not take place. The objective is reported as omitted if there was a deliberate plan to not monitor because of low priority, taking into account past results. We consider these tables to be the most important part of this report since they show where and when objectives were met in 1991.

3.3 Text

The text in this report first gives a provincial overview of the results. The tabulated data for each body of water are then described briefly, by Region, 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 presentation of data that would be required to document the significance of results in more detail is beyond the scope of a province-wide 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 river flows, effluent discharges, whether objectives are long-term or short-term, the degree to which objectives are exceeded, quality assurance, and other factors. In the past, assessments of this type were left to Regions to carry out on an ongoing basis. In the future, we may present information collected over a period of time in short state- of-environment type of reports for specific basins. A quality assurance program to test the accuracy and precision of laboratory data was introduced in 1991 and the results are presented in the following chapter 4.

The report is written to guide those involved in managing water quality by focusing 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 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 there were human causes to the problem.

3.4 Figures

The 34 basins where objectives have been set are shown on a location map in Figure 1. The 27 water basins monitored in 1991

are detailed in separate maps, Figures 2 to 28, on which sampling sites referred to in the tables are shown. Each figure number corresponds to the table of the same number.

3.5 Guide to Ranking Future Monitoring

Due to limited funds, we cannot monitor all basins where objectives have been set each year. Monitoring is therefore ranked as follows:

1st priority: any basin with less than three years of complete monitoring and any basin considered provincially or internationally significant. Examples of significant basins are the Fraser River due to fisheries, the Okanagan Valley lakes due to recreation, the lower Columbia River due to transboundary effects, and Burrard Inlet due to a federal-provincial plan.

2nd priority: any basin in which, after at least three years monitoring, a number of objectives are not regularly attained and there is either a local expression of concern or a plan for short-term action.

3rd priority: any basin as for the 2nd priority above, but where the concern and the plan of action are undefined.

4th priority: any basin in which, after at least three years monitoring, most objectives are either being met or the corrective plan of action is long term.

4. QUALITY ASSURANCE PROGRAM

4.1 Introduction

A quality assurance program, describing the accuracy and precision of test results, was begun in 1991. The program was limited in scope due both to scarce resources and the fact that it was the first of its type to be undertaken. Details on procedures and results are in a separate Water Quality Branch report issued in April, 1992.

Eight variables were chosen for testing in the program. These were mercury, total copper, total iron, total lead, total zinc, cyanide, ammonia nitrogen, and nitrite nitrogen. These were chosen on the basis of important objectives most frequently exceeded. Fecal coliforms was not included due to the lack of standard references.

In an ideal situation one would aim to measure the accuracy and precision of the total monitoring process. This would include sample collection, handling in the field, shipping, storage, and laboratory analysis. Only the accuracy and precision of the laboratory analyses were measured in the 1991 program (except for mercury) and, strictly speaking, the results apply to just a short operating period of the laboratory, not year-round operation.

4.2 Procedure

Standard reference solutions were prepared by a commercial laboratory using clean-room techniques. The concentrations chosen for these solutions were close to the maximum criterion level to protect aquatic life for each substance. Results would thus indicate the confidence one may have in laboratory data at levels where sensitive objectives may be exceeded.

For mercury, a reference solution containing 90 ng/L Hg was prepared. The procedure used for mercury differed from that used for the other substances because the literature indicates that, due to contamination problems, clean-room techniques are essential to ensure reliable analytical results. The reference solution was therefore sent to three laboratories for comparative testing. The laboratory with the best results being ASL (Analytical Service Laboratories Ltd.) of Vancouver, it was subsequently chosen to perform all 1991 mercury analyses to check objectives.

In measuring mercury, travel blanks were used to monitor the effect that sampling in the field might have on sample contamination. Travel blanks are sample bottles containing pre-acidified, mercury-free distilled water. These are opened in the field, subjected to the same handling as normal sample bottles (except they are not filled with sample or preservative), capped and sent to the laboratory for mercury analysis along with the true samples. Any mercury found in the travel blanks, together with a knowledge of laboratory accuracy, gives a measure of contamination from the field.

For the other metals, a reference solution containing copper, iron, lead, and zinc was prepared at the following nominal concentrations: 5 ug/L Cu, 300 ug/L Fe, 10 ug/L Pb, and 50 ug/L Zn. The precise concentrations were determined by the National Research Council of Canada laboratory in Ottawa. A total of 25 samples of this solution were sent to Zenon Environmental Inc. of Vancouver, which is the laboratory generally used for objectives work. These samples were sent blind, that is to say the laboratory was not aware that they were reference samples.

Separate reference solutions were prepared for cyanide, ammonia nitrogen, and nitrite nitrogen, at the following nominal concentrations: 0.200 mg/L CN measured as strong-acid dissociable cyanide (similar to total cyanide), 10 mg/L NH3-N, and 0.060 mg/L

NO2-N. The precise concentrations were determined by CB Research International laboratory in Victoria. Twenty four samples of each of these reference solutions were sent to Zenon, again as blind samples.

4.3 Results

The results are given in terms of the accuracy and the precision of the laboratory measurements. The accuracy is a measure of how the analytical result differs from the true value. It is expressed as a percent by dividing the analytical result by the true concentration of the reference solution. The precision is a measure of the repeatability of the analysis. It is also expressed as a percent by dividing the standard deviation of the analytical results by their mean.

a) mercury

ASL achieved an accuracy of 100 - 104% and a precision of 2%. This means that mercury results, at the 90 ng/L level, are expected to be within 4% of the true value and can be replicated within 2% as far as laboratory measurements are concerned.

The problem of mercury contamination in the field during sampling was partly addressed by the results from travel blanks. Field data were received from the lower Fraser area, the lower Columbia River, Howe Sound, and Burrard Inlet. Out of 25 travel blanks, 5 showed the presence of mercury. All 5 were from Burrard Inlet and gave an average mercury level of 11 ng/L. These results indicate that, in Burrard Inlet, mercury contamination may account for about 50% of the average water quality objective but for less than 1% of the maximum objective.

b) copper

Zenon gave an average accuracy of 210% and a precision of 12% at the 5 ug/L level. Copper results are therefore expected to be

about 110% higher than the true value and can be replicated within 12% by the laboratory. A possible outlier was noted in the data set which, when eliminated, gave an average accuracy of 146% In this case, confidence in the results is improved to an expected 46% above the true value.

c) iron

The Zenon accuracy averaged 100% and the precision 14% at the 300 ug/L level. Iron results are therefore expected to be equal to the true value, on average, and can be replicated within 14% in the laboratory. However, while the average accuracy was high the range varied between 73% and 112%.

d) lead

The Zenon accuracy averaged 129% and the precision 11% at the 10 ug/L level. Lead results are therefore likely to be 29% higher than the true value and can be replicated within 11%.

e) zinc

The Zenon accuracy averaged 85% and the precision 5% at the 50 ug/L level. Thus zinc results are expected to be 15% below the true value and can be replicated within 5% in the laboratory. Excluding outliers, the accuracy becomes 122% and results would likely be 22% above the true value.

f) cyanide (strong-acid dissociable)

On average the Zenon accuracy was 82% and the precision was 38% at the 0.200 mg/L level. This means that cyanide measurements are expected to be 18% below the true value and can be replicated within 38%. These relatively poor results may have been due to deterioration of the reference samples during storage before analysis, although this possibility will need to be verified.

g) ammonia nitrogen

Zenon accuracy averaged 106% and the precision was 11% at the 10 mg/L level. This means that ammonia nitrogen analyses will average 6% higher than the true value and can be replicated within 11%.

h) nitrite nitrogen

Zenon accuracy averaged 121% and the precision was 6% at the 0.060 mg/L level. The accuracy was poor considering that the target value (0.060 mg/L) was well above the detection limit. The result indicates that nitrite nitrogen analyses will average 21% higher than the true value. Analytical replication would be within 6% which is considered to be a good degree of precision.

5. PROVINCIAL OVERVIEW OF RESULTS

5.1 Presentation of Results

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

To get an overview of performance for the Province, the number of occurrences of each conclusion were totalled for each water basin from the summary tables. In compiling these totals, each instance of a maximum (or minimum) objective being met or not met was counted together with 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.

5.2 Discussion of Results

Although the results apply to specific occurrences, we will assume in this analysis that they are representative of the whole year. This simplification is a conservative approach to describing the state of water quality since data were usually collected during worst case conditions.

Table 1 shows that the objectives were met 78% of the time in the Province as a whole in 1991. This result varied according to Region from 63% to 88%. Objectives were not met from between 0% to 17% of the time, with an overall average of 9%.

The occurrence of objectives not checked, objectives omitted, or indefinite results averaged 3%, 6%, and 4%, respectively. If we subtract these relatively minor instances of no result from the total, then the number of instances (or percent of time) that objectives were met becomes 90% and the number not met 10%.

We can therefore state that in the Province as a whole the objectives were met about 90% of the time in 1991. This is an approximate statement since it can be influenced by several monitoring factors. For example, the frequency at which particular objectives in any Region are monitored can change the final result. The inclusion or omission of water basins with either serious or minor water quality problems will obviously also affect the outcome.

The overall result for 1991 was a shade lower than results for previous years (1987 to 1990). As the monitoring program is repeated in future years the general picture could change even further. New basins will be added and, with a fixed monitoring budget, there will be a tendency to cease monitoring in areas where objectives are being met consistently by a wide margin (as described in section 3.5). As a first priority, we will probably concentrate on areas where the worst man-made water quality problems occur. This strategy could, at first, produce a more negative general result. We would expect the situation to improve in subsequent years as corrective action is taken. The goal, of course, is for water quality objectives to be met 100% of the time in all such areas. Monitoring in future years, followed by corrective action where required, will show how close we can get to this ideal situation.

6. VANCOUVER ISLAND REGION

6.1 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. Data were collected only on the Cowichan River in 1991.

The objective for fecal coliforms was not met in the Cowichan River towards the mouth, as has been the case since monitoring started in 1989. This objective is fairly restrictive since it was set to protect drinking-water use after disinfection only. Monitoring for other microbiological indicators and in other parts of the basin was not carried out in 1991. As recommended in the 1989 report, the sources of possible bacteriological contamination need to be established before the situation can be corrected.

Dissolved oxygen levels, measured in early summer, met the objective in the Cowichan River. In 1989 and 1990, values measured in late summer were at times below objective levels in both rivers, especially in the lower reaches.

The objectives for turbidity, suspended solids, and ammonia were generally met throughout the Cowichan River as has usually been the case in the past. No data were collected on chlorophyll-a copper, lead, zinc, and copper-8 quinolinolate. While the objectives for heavy metals have been met in the past, those for chlorophyll-a and copper-8 have never been checked.

6.2 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 in 1991 because the mine was operating at about 50 percent of full-scale capacity and there was no mining in the Long Lake area. Thus some measurements were deliberately omitted, as shown in Table 3.

Most of the objectives tested were met. The only exceptions were results for cadmium, cobalt, and lead which were indefinite due to high detection limits. Objectives met included those for phosphorus in Long and Middle Quinsam lakes, suspended solids, ammonia, nitrate, nitrite, dissolved oxygen, aluminum, arsenic, copper, iron, manganese, mercury, nickel, silver, and zinc. The results for pH were indefinite because insufficient samples were collected in 30 days to calculate medians and 90th percentiles. All these results were similar to those obtained in 1989 and 1990, except for the zinc objective which was exceeded in 1990.

6.3 Oyster River

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

The Oyster River flows from the Forbidden Plateau area into the Strait of Georgia, south of Campbell River. The river and its tributaries are important habitat for several species of trout and salmon. The main threats to water quality are logging and mine

exploration. The latter is expected to lead to active mining in the future, especially for coal.

Most of the objectives were checked in 1991 in contrast to 1990, the first year of monitoring, when many measurements were omitted. The only objective exceeded was for chromium in the Oyster River upstream from Adrian Creek near the headwaters. Since all other chromium values were indefinite due to high detection limits, further testing is recommended. Objectives met included those for turbidity, suspended solids, ammonia, nitrite, nitrate, pH, aluminum, arsenic, cobalt, lead, manganese, nickel, and zinc. The results for cadmium, copper, and iron were indefinite because the detection limits were too high and there were insufficient data to confirm the coliform objective. Overall, the results mirrored those obtained in 1990.

7. SKEENA REGION

7.1 Bulkley River

Data and site locations are presented in Table 5 and Figure 5, 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 main influences on water quality are treated municipal effluent from Houston and Smithers and possible contamination in the headwaters from mining.

The objective for fecal coliforms was not met upstream from Houston although it was met upstream from Smithers. The objective is fairly restrictive in these locations since it was set to protect drinking water use. Elsewhere, the objective was met as were all other objectives checked. These included objectives for turbidity, suspended solids, ammonia, nitrite, and dissolved oxygen. Similar results have been obtained from 1987 to 1990. The source of the relatively higher fecal coliform counts upstream from Houston needs to be established if the problem is to be corrected.

7.2 Kathlyn Seymour, Round, and Tyhee Lakes

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

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

The fecal coliform objectives were met at all domestic water intakes and beaches where measured in all four lakes. Water at intakes in Kathlyn, Seymour, and Tyhee lakes have occasionally

exceeded the objective in the past (1988-1990). The objectives for turbidity and colour were exceeded at times in all the lakes except Tyhee Lake.

The total phosphorus objective was exceeded in Kathlyn Lake but could not be checked in Round Lake because stratification had occurred at sampling time. The objective was not checked in Tyhee Lake. All the objective results reflect the tendency for the lakes to be eutrophic. Long-term measures outlined in the assessment report setting the objectives need to be implemented to reverse this trend.

7.3 Lower Kitimat River and Arm

The river and arm are an important migration route for salmonids, and the water is also 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 were monitored for three years from 1988 to 1990. The data obtained were fairly consistent and most objectives were met, except at times those for cyanide and certain metals. No monitoring was carried out in 1991 and an assessment to update the existing objectives was started in 1992.

7.4 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.

All the objectives checked were met in 1991, except that for

chlorophyll-a which was exceeded. The fecal coliform objective was indefinite due to insufficient samples. Objectives met included those for turbidity, phosphorus, and dissolved oxygen. Similar results were obtained from 1987 to 1990, when all objectives were met (except chlorophyll-a in 1990), and indicate that the lake is in good condition.

8. NORTHERN INTERIOR REGION

8.1 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. Agriculture and development around the lake are factors affecting water quality.

At the Charlie Lake Park bathing beach, the geometric mean and 90th percentile fecal coliform objectives were met. As in 1989 and 1990, there were no beach closures. At the Fort St. John intake, the more stringent fecal coliform objective to protect drinking water was met from January to May but was exceeded from May to November. In the past, this objective has sometimes been met (1987,1988, 1990) and sometimes been exceeded (1989).

The phosphorus objective at spring overturn was met for the first time since 1987. The objective for other times of the year was usually met until late July after which time it was exceeded. These results show that the lake was not as eutrophic in 1991 as it has been in the past.

8.2 Bullmoose Creek

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

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

The objectives for turbidity and suspended solids were not

checked in 1991. In the past, these objectives have sometimes been exceeded during the freshet period. The objective for chlorophyll-a, which was often exceeded in 1989, was met at all sites checked in 1991. Measurements for substrate sedimentation were indefinite due to use of improper particle size.

No other objectives were checked in 1991 although they have usually been met in past years. They included those for fecal coliforms, ammonia, nitrite, nitrate, dissolved oxygen, and pH.

8.3 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 Nechako River at all sites checked in 1991. Such a result has not been obtained since 1987. In major tributaries (Stuart River, Necoslie River, and Chilako River), the objective was either not checked or the results were indefinite due to insufficient sampling. The objective has been met in these tributaries in the past.

Other objectives which were met in the Nechako River (and the Stuart River as applicable) were those for ammonia, nitrite, dissolved oxygen, and pH. Total gas pressure was not measured although the objective was met in 1989 and 1990. Chlorophyll-a was also omitted. In 1988, the only year it was checked, the objective was met in the Nechako River but exceeded in the Stuart River. No measurements were made in the Chilako River in 1991.

The temperature objective at a site downstream from Cheslatta

Falls was met during the winter months, from January to June and after late September. However, during the summer months (June to September) the objective was frequently exceeded. Similar results have been obtained since 1987. Further downstream, just below Vanderhoof, a less stringent temperature objective was met all year except for the last week in June.

8.4 Pine River

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

The objectives were monitored for four years from 1987 to 1990. The results showed that objectives were being met fairly consistently. No monitoring was carried out in 1991 and the priority for future monitoring is low at this time.

8.5 Pouce Coupe River and Dawson Creek

The Pouce Coupe River runs into the Peace River inside the Alberta Border. Dawson Creek is its major tributary. The waters are affected mainly by municipal discharges.

The objectives were checked for four years, from 1987 to 1990, although complete data were not obtained in any one year. In the Pouce Coupr River, the fecal coliform objective was met but most other objectives (nutrients, turbidity) were exceeded at one time or another. In Dawson Creek, fecal coliform objectives do not apply but most of the other objectives were also exceeded on several occasions.

No monitoring was carried out in 1991. The municipal treatment plants need to be upgraded if the objectives are to be met.

8.6 Peace River

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

Objectives have been 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.

Objectives in the Peace River were checked for three years from 1988 to 1990 and thus only partial testing was carried out in 1991. Among the objectives omitted or not checked in 1991 but exceeded at times in the past were fecal coliforms, suspended solids, turbidity, copper, and chromium. Other objectives which have been met in the past but were also not checked in 1991 included fluoride, cyanide, ammonia, total dissolved gases, phenol, chlorophenols, lead, nickel, and zinc.

Those objectives measured in 1991 were all met. They included dissolved oxygen, pH, temperature, and nickel. Considering the importance of the Peace River, both in B.C. and in Alberta, we recommend that all objectives be checked regularly in the future as monitoring funds permit.

8.7 Williams Lake

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

Williams Lake drains to the Fraser River and is important for drinking water, recreation, and aquatic life. The water quality is affected by nutrients from traditional farming practices in the San

Jose River drainage, the main inlet to the lake.

Monitoring to check objectives has been carried since 1987. The objective for fecal coliforms to protect bathing beaches was met in 1991 as it has been in the past. The objective to protect drinking water was not checked. It was met in 1989, the only year it was measured.

The objective for turbidity was met but the objectives for phosphorus, chlorophyll-a, dissolved oxygen, and water clarity were all exceeded. These results were similar to those obtained in the past and reflect the current eutrophic state of the lake.

8.8 Upper Finlay River

The Finlay River, located in the north east part of the Province, drains into the north end of Williston Lake. The area of the upper Finlay was the site of a gold and silver mine and mill, now closed. Objectives apply 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 has been carried out since. Future monitoring may be needed if the mill is reactivated on a full-time basis.

9. SOUTHERN INTERIOR REGION

9.1 Bonaparte River

Data and site locations are presented in Table 13 and Figure 13, 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 objectives have been monitored since 1987 with varying degrees of completion. As a result, only limited monitoring was carried out in 1991. Objectives which have been exceeded consistently at times include suspended solids, turbidity, and chlorophyll-a. The fecal coliform objective was usually met in the upper reaches but exceeded near the mouth. Objectives which are usually met include those for ammonia, nitrite, pH, and dissolved oxygen. In Loon Lake, the dissolved oxygen objective was not met in 1991, duplicating past results.

The water quality situation in the Bonaparte River basin seems to be fairly stable and well defined. Unless there are new developments or changes, future monitoring to check objectives will be a low priority at this time.

9.2 Okanagan Valley Lakes

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

To date, objectives have only been set in the five main lakes 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 short-term phosphorus objective was met in Wood Lake, as it was in 1990. This new trend is a change from previous results obtained in 1987, 1988, and 1989 when the objective was not met. The phosphorus objectives for Kalamalka and Okanagan lakes were met, including in the Vernon Arm of Okanagan Lake where the objective had been exceeded in previous years until 1990. The objective was also met in Skaha Lake for the first time since 1987, but was exceeded in Osoyoos Lake as it has been in the past.

9.3 Similkameen River

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

The Similkameen River flows from Manning Park, through the south Okanagan, then south across the U.S. border. It 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 in the Hedley Creek area.

Objectives were not checked in the Similkameen River from Manning Park to Princeton, in Allison Creek, and in Wolfe Creek in either 1990 or 1991. Taking into account past results, these areas were considered a low priority for monitoring.

Fewer objectives were checked in the Similkameen River in 1991 and none were checked in Hedley Creek. Objectives met included those for cyanide (weak-acid dissociable), arsenic, ammonia, pH, chromium, copper, iron, lead, manganese, molybdenum, nickel, and zinc. Objectives for iron and zinc had been exceeded in 1990. The fecal coliform objective, set to protect the water

for drinking after disinfection only, was not met at times in the Similkameen River. A similar result was obtained in 1989 and 1990.

Since there are less than three years of complete monitoring to check the updated objectives, future monitoring of these objectives should be a high priority.

9.4 Cahill Creek

Data and site locations are presented in Table 16 and Figure 16, 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 began operating in 1987. Monitoring to check objectives began the same year.

The objectives-checking program was scaled down in 1991 in the same way as in 1990. Whereas most of the objectives had been met in 1990 as they had been in previous years, there were some instances of objectives being exceeded in 1991. These included objectives for suspended solids, turbidity, dissolved solids, sulphate, cyanide in various forms (cyanide, in the weak-acid dissociable form, was not met in 1988 and 1989 at Cahill Creek at the mouth), nitrate, pH, and zinc. The objectives that were met at all times in 1991 included those for nitrite, aluminum, cadmium, and molybdenum. Due to the relatively large number of objectives that were exceeded in 1991, future monitoring should be a fairly high priority.

9.5 Bessette Creek

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

Bessette Creek, which flows into the Shuswap River, is formed by the joining of Harris and Duteau creeks near the town of Lumby. Lawson Creek, and its tributary Spider Creek, flow into Duteau Creek. These creeks provide spawning habitat for trout and four species of salmon. Activities that can affect water quality include a telephone pole treatment plant near Harris Creek, a woodwaste landfill along Duteau Creek, and agricultural operations generally.

While partial monitoring was carried out last year, 1991 is the first year most of the objectives were checked. Fecal coliform, E. coli, and enterococci objectives to protect the water for drinking after partial treatment were generally not met in Bessette, Lawson, and Spider creeks. Other objectives exceeded at times were suspended solids and turbidity in Lawson Creek, pH in Spider Creek, and dissolved oxygen in Lawson and Spider creeks.

Objectives that were met included those for suspended solids and turbidity in Bessette and Spider creeks, ammonia, nitrite, and nitrate in all creeks, colour in Lawson and Spider creeks, temperature in Duteau Creek, pH in Bessette, Lawson, and Harris creeks, dissolved oxygen in Bessette and Harris creeks, and resin acids in Lawson and Spider creeks.

In Harris Creek, the important chlorophenol objectives were met in the sediments. In the water column, mono and dichlorophenol could not be analysed by the laboratory, tri and pentachlorophenol were below detection limits, and tetrachlorophenol met the objective.

Continued monitoring to check objectives will be a high priority in this basin for the next few years.

9.6 Tributaries to Okanagan Lake near Westbank

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

Objectives were set for Peachland, Trepanier, and Westbank creeks which flow into Okanagan Lake in the Peachland-Westbank area. Peachland and Trepanier creeks support spawning populations of kokanee or trout, and all three creeks are used for irrigation and domestic water supplies. Peachland and Trepanier creeks can be affected by seepage from a molybdenum mine which closed recently. Treated sewage effluent is discharged to Westbank Creek.

While partial monitoring was carried out last year, 1991 was the first year that most of the objectives were checked. Fecal coliform and enterococci objectives, set to protect bathing beaches, were not met in Westbank Creek. Other objectives that were exceeded included those for dissolved aluminum in Peachland, Trepanier, and Westbank creeks, molybdenum in Peachland Creek, and iron at the mouth of Westbank Creek.

Objectives met included those for dissolved solids, sodium, and pH in Peachland and Trepanier creeks; ammonia, nitrate, and nitrite in Peachland and Westbank creeks; chlorophyll-*a* in Peachland Creek; dissolved oxygen and copper in Westbank Creek; and molybdenum in Trepanier creek.

Continued monitoring to check objectives will be a high priority in this basin for the next few years.

9.7 Tributaries to Okanagan Lake near Kelowna

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

Mission, Kelowna, and Brandt's creeks are tributaries to Okanagan Lake on its east shore near Kelowna. Mission and Kelowna creeks support salmonids and the water is also used for irrigation and domestic supply. Brandt's Creek is used mainly for just irrigation. The creeks can be affected by urban stormwater runoff in their lower reaches and by logging or agriculture further upstream. Treated wastewater is discharged to Brandt's Creek.

As for the tributaries near Westbank (section 8.6), 1991 was the first year of relatively complete monitoring to check objectives. The objectives for fecal coliforms, E. coli, and enterococci were generally not met met in Mission and Kelowna creeks (a similar result to 1990). Other objectives exceeded included those for specific conductivity in Brandt's Creek (met in 1990) and for chlorophyll-a in Mission Creek.

All other objectives checked were met. These included ammonia, nitrite, and dissolved oxygen in Kelowna and Mission creeks; chlorophyll-a in Kelowna Creek; and metals (aluminum, copper, lead, and zinc) also in Kelowna Creek.

9.8 Hydraulic Creek

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

Hydraulic Creek flows into Okanagan Lake via Mission Creek about 10 km upstream from the lake. Hydraulic Creek is an important source of drinking water relying on disinfection only. The creek also supports recreational fish and is used for irrigation. Commercial logging in the watershed can affect these water uses.

In 1991, objectives were checked for the first time and fairly complete measurements were obtained. The only objective to be

exceeded was the one for temperature at the outlet of Hydraulic Lake for one week. All other objectives were met. These included objectives for turbidity, suspended solids, temperature for virtually all of the summer, and fecal coliforms. Objectives for E. coli and enterococci were not checked in 1991.

Monitoring to check objectives in Hydraulic Creek will remain a priority for the next few years to establish a reasonable data base.

10. KOOTENAY REGION

10.1 Columbia and Windermere Lakes

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

The two lakes are important for fisheries, recreation, and as a source of drinking water. Housing development around the lakes is the main potential influence on water quality.

The pattern in the past has been for all objectives set in the lakes to be met. In 1991, the only objectives checked were those for fecal coliforms at Windermere Lake beaches and they were met. Objectives not checked included those for fecal coliforms at water intakes, phosphorus at spring overturn, and turbidity.

Monitoring to check objectives has been carried out since 1987, although not all objectives were checked each year. Since the objectives have been met fairly consistently, future monitoring is a low priority at this time.

10.2 Toby Creek and Upper Columbia River

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

Toby Creek enters the Upper Columbia River just downstream from Windermere Lake. Both streams are important for aquatic life and recreation. Toby Creek can be affected by indirect discharges of domestic sewage and by drainage from an abandoned mine. The Upper Columbia River receives a discharge of treated sewage from Radium Hot Springs.

In the Upper Columbia River, the fecal coliform objective to protect drinking water upstream from Radium was not met, whereas the objective to protect recreation downstream from Radium was met. These results are similar to results obtained intermittently in the past since 1987. In Toby Creek, the objectives were last checked in 1988 and 1989. All objectives were met except, on one occasion, those for fecal coliforms. Objectives met included those for suspended solids, nutrients, and certain metals.

Although objectives have not been strictly checked completely over three years, future monitoring is considered a fairly low priority considering results obtained so far.

10.3 Columbia River from Keenleyside to Birchbank

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

The Columbia River is one of the major rivers in British Columbia and further downstream in the United States. In B.C., the river is important for aquatic life, sport fishing, recreation and, to a lesser extent, as a drinking water supply. In the U.S., it supports a food fishery, major salmon runs, and irrigation and drinking water supplies. In the section of river from the Hugh Keenleyside Dam to Birchbank, the main influence is a kraft pulp mill discharging effluent about 3 km downstream from the dam. The mill is being expanded and modernized and the effluent treatment upgraded to secondary. There are also small discharges of secondary-treated municipal effluent.

Objectives were checked for the first time in 1991 and monitoring was reasonably complete. Objectives met included those for pH, colour, suspended solids, turbidity, pulp mill toxicity in the river, chlorophenols, resin acids, and chlorinated resin acids.

The objective for dioxins and furans in fish were not met. A public notice advising against consumption of mountain whitefish from the river was issued in 1990. This situation is expected to improve after modernization of the pulp mill. The objective for total dissolved gases was exceeded for well over half the year. Changes in the way the Hugh Keenleyside dam is operated will be required in order to meet the objective at all times. The objective for dissolved oxygen was exceeded on a few occasions, although all recorded values were greater than 9.4 mg/L.

There were insufficient data to check fecal coliform and E. Coli objectives and the results for dioxins and furans in water were indefinite due to high detection limits. Objectives for total organic carbon in sediment, dioxins and furans in sediments, and for chlorophyll-a were not checked in 1991.

11. LOWER MAINLAND REGION

11.1 Fraser River from Hope to Kanaka Creek

Objectives have been set for the Fraser River, for tributaries entering from the south, and for 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 major discharges to the Fraser River in this section are of treated sewage.

Monitoring to check objectives was carried out in 1987,1988, and 1990 and discontinued in 1991. The results showed that the fecal coliform objective was met in the Fraser River and in some tributaries, but exceeded in certain other tributaries. Objectives for dissolved oxygen and ammonia were usually met in the river, except at times immediately downstream from the Chilliwack sewage treatment plant.

Considering the importance of the Fraser River, past results, and the intermittent nature of the monitoring, at least one more year of complete monitoring should be carried out.

11.2 Fraser River from Kanaka Creek to the Mouth

Data and site locations are presented in Table 24 and Figure 24, 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.

Monitoring to check objectives has been carried out annually

since 1987. Due to the provincial importance attached to the river and the threats to water quality that exist in this section, such monitoring will be continued.

The fecal coliform objective, set to protect irrigation, was met in the Main Stem, the North Arm, and the Middle Arm. In the Main Arm, it was not met at times downstream from Annacis. The objective to protect swimming was met at all points along Iona beach and Tsawwassen beach. All coliform results were similar to those obtained in 1988, 1989, and 1990.

The maximum ammonia objective was met in the Main Arm, the North Arm, and the Middle Arm. The dissolved oxygen objective was met in the Main Stem and in all the river arms. It was not checked in the sloughs (although in 1989 it was exceeded at times in Gunderson, Deas, Ladner, and MacDonald sloughs) or on Sturgeon Bank and Roberts Bank.

The pH objective was occasionally exceeded in the Main Stem and in the river arms when slightly lower values were recorded. Only a few data on total metals were collected in 1991. The maximum objective for copper was exceeded in the Main Arm downstream from Annacis. Such higher copper values have occurred at times in the past in the Main Arm. The maximum objectives for lead and zinc were met in all the river arms.

The objective for chlorophenols in sediments was met in Gunderson Slough and Tilbury Slough in the Main Arm and at sites downstream from Belkin in the North Arm. This result confirms those of 1990 which showed a definite improvement over 1989 when the objective was exceeded in the Main and North arms. The objective for PCBs in sediments was met in the Main and North arms, as it was in 1990 and 1989.

11.3 Boundary Bay

Data and site locations are presented in Table 25 and Figure 25, respectively.

Boundary Bay sustains a crab and herring fishery and is important for recreation. The little Campbell River, the Serpentine River, and the Nicomekl River are tributaries to Boundary Bay on the east side. They provide important habitat for trout and salmon and are used for irrigation.

The fecal coliform objectives to protect bathing beaches were met in Boundary Bay in 1991, including at sites in White Rock where the objectives have been exceeded at times in the past. In the tributary rivers, the objective to protect irrigation use was not checked. In the past, the objective was usually met in the main stem of the rivers and exceeded at times in their tributaries.

The objective for suspended solids was exceeded the one time it was measured in Boundary Bay near a pump station. The objective for turbidity was met at the same site. These objectives were not checked in the tributary rivers although they have beeen exceeded at times in the past, in the September to October period.

The substrate sedimentation objective was not checked, although it had been in 1990 and 1989. The objective was met in some streams and exceeded in others, usually near the mouths.

The maximum objective for ammonia was met in the tributary streams as it generally has been in the past. The dissolved oxygen objective was exceeded on one occasion in Boundary Bay, the only place it was measured. In the past, the objective has been frequently exceeded both in Boundary Bay and in certain of the tributaries due, presumably, to agricultural runoff. No other objectives were checked in 1991. Objectives for toxic substances

such as those for lead in the Nicomekl River and PCBs in the sediments of Boundary Bay and the tributaries have been met in the past.

Monitoring to check objectives has been carried out from 1988 to 1991, although not completely every year. Considering the length of record and the consistency of results, further monitoring is a low priority at this time.

11.4 Burrard Inlet

Data and site locations are presented in Table 26 and Figure 26, respectively.

Burrard Inlet includes Port Moody Arm, Indian Arm, Vancouver Harbour, False Creek, and English Bay. The water is designated for aquatic life and wildlife in all areas and for primary-contact recreation in most areas, except in False Creek. There are several municipal and industrial discharges to Burrard Inlet which can affect water quality. These include primary-treated sewage, combined sewer overflows, stormwater, bulk-loading terminals, a sugar refinery, a sodium chlorate plant, a chlor-alkali plant, and oil refineries.

This is the second year that objectives for Burrard Inlet have been checked and monitoring was fairly complete in comparison to 1990.

Extensive data were collected for fecal coliforms at bathing beaches. Samples of the data are given in Table 26. The objective was exceeded at times at Brockton Point but met at other beaches. These included beaches in Port Moody Arm, Indian Arm (sometimes exceeded in 1990), near 2nd. Narrows, in West Vancouver, around English Bay, and at the mouth of False Creek. The enterococci objective, which was not tested as extensively, was exceeded at

times in Indian Arm and at Ambleside Beach but met elsewhere.

The objectives for suspended solids and turbidity were tested using Indian Arm as a control site. The objectives were generally met except occasionally near a chlor-alkali plant and near a major combined sewer overflow.

The ammonia objectives were met throughout Burrard Inlet. The objective for dissolved oxygen was frequently not met at all sites tested, although the minimum value rarely dropped below 5 mg/L. These measurements were made in the summer thereby presenting a worst case for dissolved oxygen values. The cyanide objective, applicable only to Port Moody Arm, was generally considered met except on one occasion near a bulk-loading terminal. The pH objective, applicable between 2nd. Narrows and Roche Point, was met.

The objective for arsenic was met at all sites tested, both in the water and in the sediments. Objectives for a number of heavy metals in water and sediments were set for various locations. Results can be summarized as follows:

-in water, objectives for barium, cadmium, chromium, nickel, and zinc were met. Objectives for lead and iron were exceeded occasionally while those for copper and mercury were exceeded at most sites.

-in sediments, objectives for chromium, and nickel were met while those for cadmium, copper, lead, mercury, and zinc were often not met. High values occurred near oil refineries and combined sewer overflows. In general, there is a trend for heavy metals to exceed objectives more in the sediments than in the water column. Although the mercury objectives in water and sediments were exceeded, the mercury objective for fish was met in English sole from False Creek and off Locarno Park.

Objectives have been set for a number of organic compounds,

none of which were checked in 1990. In 1991, the objective for PCBs was exceeded in sediments from Vancouver Harbour and False Creek and in fish from False Creek. The objective for phenols was not met on several occasions in the Harbour and in Port Moody Arm. For PAHs, objectives are set for individual PAHs in sediments and are grouped as either low molecular weight (L-PAH) or high molecular weight (H-PAH) compounds. At the two ends of Burrard Inlet, namely Port Moody Arm and Outer Burrard, all the objectives were met in the sediments except for a few high molecular weight compounds. At the other extreme, in False Creek, all the objectives were exceeded. In the remaining waters of Burrard Inlet there were mixed results with more objectives for high molecular weight compounds being exceeded in Vancouver Harbour. Results for tributyl tin were indefinite due to high detection limits and objectives for chlorophenols, ethylene dichloride and styrene were not checked.

11.5 Burrard Inlet Tributaries

Data and site locations are presented in Table 27 and Figure 27, respectively.

Objectives were set for three tributaries to Burrard Inlet. School House Brook discharges to Port Moody Arm and could be influenced by a chemical polymer plant. Lynn Creek discharges to Vancouver Harbour and could be affected by a municipal landfill. The Capilano River discharges to outer Burrard Inlet and may also be affected by a municipal landfill. The main uses of these tributaries are recreation, aquatic life, and wildlife.

The objectives were checked for the first time in 1991 but the results are very incomplete. The objective for fecal coliforms was met in Lynn Creek. The results for the Capilano River, where the objective also applies, were indefinite. The objectives for ammonia and nitrite were met in Lynn Creek and the Capilano River.

Regarding heavy metals, only two objectives were checked. Those for copper were exceeded on one occasion in School House Brook and the Capilano River but met in Lynn Creek. Those for mercury were met in Lynn Creek and the Capilano River.

Objectives not checked included those for chlorophyll-a, dissolved oxygen, phenols, temperature, pH, cadmium, chromium, cobalt, iron, lead, zinc, mercury in fish, chlorophenols in water and sediments, and PCBs in water, sediments, and fish.

11.6 North Shore Lower Fraser Tributaries

Data and site locations are presented in Table 28 and Figure 28, respectively.

Objectives have been set for the following four tributaries to the north shore of the lower Fraser River in the Lower Mainland: Kanaka Creek, the Pitt River, the Coquitlam River, and the Brunette River. All these streams, and their tributary streams and lakes, support salmon and trout fisheries to varying degrees. Most are important for recreation and some are sources of drinking water requiring treatment. Discharges which can affect water quality include stormwater, agricultural runoff, treated sewage, landfill leachates, wastewaters from gravel operations, and a wood preservation plant.

Fecal coliform, E. coli, and enterococci objectives were exceeded in most streams. These included Kanaka Creek, the Pitt River, the Alouette River, the North Alouette River, the Coquitlam River, and Or Creek (a tributary to the Coquitlam River). In Scott Creek (another tributary to the Coquitlam) and Hoy Creek (a tributary to Scott), the fecal coliform objective was met but those for E. coli and enterococci were exceeded. Only in Pitt Lake were the objectives for all three microbiological objectives met. In Alouette Lake, the objective for enterococci was exceeded but those

for fecal coliforms and E. coli were met. These results are in contrast to those of 1990 when the objectives were generally met in the Pitt River, the Alouette River, the North Alouette River, the Coquitlam River, and Or Creek.

The objective for suspended solids was exceeded at times in Kanaka Creek, the Pitt River, and the Coquitlam River. It was met in the other streams and lakes, although there were a number of indefinite results due to a lack of control sites. The turbidity objective was also exceeded in Kanaka Creek, the Pitt River, and the Coquitlam River as well as in the Alouette and North Alouette rivers. There were a similar number of indefinite results due to a lack of control sites. The substrate sedimentation objective was not checked in 1991. It was exceeded last year in the Brunette River, the only location where it was checked.

The objectives for ammonia and nitrite were met in all streams and lakes. The objective for chlorophyll-a was not checked, although it was met in all areas checked in 1990. The dissolved oxygen objective was generally met, except at times in Kanaka Creek, the Alouette and North Alouette rivers, the Coquitlam River, Scott Creek, Hoy Creek, Burnaby Lake, and Deer Lake. Despite these results, the dissolved oxygen level was not recorded below 6.7 mg/L in the streams. The pH objective was met throughout, except a few times in Kanaka Creek when slightly lower values were recorded.

Some heavy metal objectives were exceeded at times in the Brunette River drainage. Among objectives not met were those for copper in Still Creek, Burnaby Lake, the Brunette River, and Deer Lake; lead in Burnaby and Deer lakes; and zinc in Still Creek and Burnaby Lake. The objectives for chromium and mercury were met throughout the system. In sediments, the objectives for copper, lead, and zinc were exceeded in Stil Creek and the Brunette River. In addition, the sediment lead objective was exceeded in Burnaby Lake and Deer Lake and the sediment zinc objective was exceeded in

Burnaby Lake. The mercury sediment objective was not checked nor were the objectives for lead and mercury in fish from the Brunette River drainage.

The objectives for chlorophenols in water and sediments were met in the Pitt River, an improvement over 1990 when the objective for chlorophenols in sediments was exceeded. The objective for chlorophenols in fish was not checked in 1990 or 1991.

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TABLE 1

PROVINCIAL OVERVIEW OF WATER QUALITY OBJECTIVES - 1991

REGION	NUMBER OF OCCURRENCES					
	OBJECTIVES MET	OBJECTIVES NOT MET	OBJECTIVES NOT CHECKED	OBJECTIVES OMITTED	INDEFINITE RESULT	TOTALS
Vancouver Island	421	1	39	100	111	672
	63%	0%	6%	15%	16%	100%
Skeena	167	13	5	0	4	189
	88%	7%	3%	0%	2%	100%
Northern Interior	982	110	11	70	14	1187
	83%	9%	1%	6%	1%	100%
Southern Interior	1077	119	19	134	62	1411
	76%	9%	1%	10%	4%	100%
Kootenay	322	71	3	7	12	415
	77%	17%	1%	2%	3%	100%
Lower Mainland	2923	372	159	163	111	3728
	79%	10%	4%	4%	3%	100%
All Regions	5892	686	236	474	314	7602
	78%	9%	3%	6%	4%	100%
All Regions less occurrences with no result	5892	686				6578
	90%	10%				100%

TABLE 2

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	Cowichan River: 0120802 u/s Highway 1	Jul 22,29, Aug 7,15,22	5	5 - 47/100 mL np = 25/100 mL	Objective not met
	Koksilah River	1991	0	no data collected	Omitted 1991
E. Coli <10/100 mL 90th perc. (np)	Cowichan River u/s Highway 1	1991	0	no data collected	Objective not checked
	Koksilah River	1991	0	no data collected	Omitted 1991
E. Coli <385/100 mL geometric mean (gm)	Cowichan River d/s Highway 1	1991	0	no data collected	Objective not checked
Enterococci <3/100 mL. 90th perc. (np)	Cowichan River u/s Highway 1 Koksilah River	1991	0	no data collected	Omitted 1991
Enterococci <100/100 mL geometric mean (gm)	Cowichan River d/s Highway 1	1991	0	no data collected	Omitted 1991
Turbidity max increase 5 NTU or 10%	Cowichan River: 0120802 u/s Highway 1	Jul 22,29, Aug 7,15,22	5	0.3 - 2.0 NTU	Objective met
	E206106 1 km d/s Duncan STP	Jul 22,Aug 7, 15,22	4	0.4 - 0.6 NTU	Objective met
	Koksilah River	1991	0	no data collected	Omitted 1991
Suspended Solids max increase 10 mg/L or 10%	Cowichan River: 0120802 u/s Highway 1	Jul 22,29, Aug 7,15,22	5	<1 - 6 mg/L	Objective met
	E206106 1 km d/s Duncan STP	Jul 22,Aug 7, 15,22	4	1 - 2 mg/L	Objective met
	Koksilah River	1991	0	no data collected	Omitted 1991

TABLE 2 continued

COWICHAN - KOKSILAH RIVERS WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.30 mg/L av 6.75 mg/L max at pH = 7.9 temp = 15 C	Cowichan River: 0120802 u/s Highway 1	Jul 29,Aug 7, 15,22	4	<0.005 - 0.008mg/L	Max obj. met Av not chkd.
	E206106 1 km d/s Duncan STP	Aug 7,15,22	3	0.066 - 0.171 mg/L	Max obj. met
Chlorophyll-a 50 mg/m2 max	Cowichan River	1991	0	no data collected	Objective not checked
Tot Cl2 Res. 0.002 mg/L max	Cowichan River	1991	0	no data collected	Omitted 1991
Dissolved Oxygen 8.0 mg/L min Jun - Sep 11.2 mg/L min Oct - May	Cowichan River: 0120802 u/s Highway 1	Jul 22,29	2	9.5 - 9.6 mg/L	Objective met
	E206106 1 km d/s Duncan STP	Jul 22	1	9.9 mg/L	Objective met
	Koksilah River	1991	0	no data collected	Omitted 1991
Dissolved Cu <0.002 mg/L av 0.004 mg/L max or 20% increase	Cowichan River Koksilah River	1991	0	no data collected	Omitted 1991
Dissolved Pb <0.003 mg/L av 0.008 mg/L max or 20% increase	Cowichan River Koksilah River	1991	0	no data collected	Omitted 1991
Dissolved Zn <0.030 mg/L av 0.180 mg/L max	Cowichan River Koksilah River	1991	0	no data collected	Omitted 1991
Copper-8 Quinolinolate 0.0005mg/L max	Cowichan River	1991	0	no data collected	Omitted 1991

TABLE 3

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total-P <0.007 mg/L av (May - Sep)	Long Lake: E206619 over deepest point	Jun 19 & Jul 16	8	<0.003 - 0.007mg/L (1 - 9 m) av = 0.005 mg/L	Objective met
Total-P <0.006 mg/L av (May - Sep)	Middle Quinsam Lake: E206618 over deepest point	May 23-Sep 10	20	<0.003 - 0.006mg/L (1 - 9 m) av = 0.004 mg/L	Objective met
Chlorophyll-a <50 mg/m2 av	Quinsam River d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Turbidity <1.0 NTU av 5.0 NTU max	Quinsam River: d/s Middle Quinsam L.	1991	0	no data collected	Omitted 1991
Suspended Solids <5 mg/L av 25 mg/L max or max increase 10 mg/L	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 16-Dec 17	9	<1.0 - 2.0 mg/L	Control site
	E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	av < 1.0 mg/L max = 1.0 mg/L	Objectives met
	0900504 d/s Middle Quinsam L.	Jul 16-Dec 17 Dec 3,10,17	9	<1.0 - 7.0 mg/L	Max obj. met Av not chkd.
	Middle Quinsam Lake: E206618 over deepest point	Jun 19	4	<1.0 - 3.0 mg/L (1 - 9 m)	Max obj. met Av not chkd.
	d/s Flume L & Long L Long Lake	1991	0	no data collected	Omitted 1991
Ammonia-N <1.85 mg/L av 12.7 mg/L max at pH = 7.5 temp = 10 C	Long Lake: E206619 over deepest point	Jun 19 & Jul 16	8	<0.005 - 0.008mg/L (1 - 9 m)	Max obj. met Av not chkd.
	Middle Quinsam Lake: E206618 over deepest point	Aug 12 & Sep 10	8	<0.005 - 0.018mg/L (1 - 9 m)	Max obj. met Av not chkd.
	Quinsam River d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Nitrate-N <40 mg/L av 200 mg/L max	Quinsam River: E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	av = 0.03 mg/L max = 0.03 mg/L	Objectives met
	Long lake: E206619 over deepest point	Jun 19 & Jul 16	8	all < 0.02 mg/L	Max obj. met Av not chkd.

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrate-N <40 mg/L av 200 mg/L max	Middle Quinsam Lake: E206618 over deepest point	Jun 19-Sep 10	12	<0.02 - 0.02 mg/L (1 - 9 m)	Max obj. met Av not chkd.
	d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Nitrate-N 10 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Jun 16-Dec 17	10	<0.02 - 0.04 mg/L	Objective met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 16-Dec 17	9	<0.005 - 0.006mg/L	Max obj. met
	E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	all < 0.005 mg/L	Objectives met
	Middle Quinsam Lake	1991	0	no data collected	Obj not chkd
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Diss. Oxygen 3 mg/L min 1m above seds. Jun - Aug	Middle Quinsam Lake: E206618 over deepest point	Jun 19,Jul 16 Aug 12	10	8.6 - 14.5 mg/L (9 - 12 m)	Objective met
	Long Lake	1991	0	no data collected	Omitted 1991
pH >6.5 90th perc (np) >6.9 median (med)	Quinsam River: 0126402 u/s Middle Quinsam L.	Aug 8-Dec 17	8	6.9 - 9.8	Indefinite result
	E206901 into Mid. Quinsam Lk.	Jul 30,Aug 8, 12	4	7.2 - 13.0	Indefinite result
	0900504 d/s Middle Quinsam L.	Jul 30-Dec 17	9	7.2 - 11.9	Indefinite result
	Long Lake: E206619 over deepest point	Jun 19 & Jul 16	8	6.7 - 7.3 (1 - 9 m)	Indefinite result
	Middle Quinsam Lake: E206618 over deepest point	May 23 Jun 19 Jul 16 Aug 12 Sep 10	13 16 12 13 13	0-12m: 7.3 - 7.9 0-11m: 7.1 - 7.9 0-11m: 7.3 - 7.8 0-12m: 7.0 - 7.9 0-11m: 7.1 - 7.8	Indefinite result
	d/s Flume L & Long L	1991	0	no data collected	Omitted 1991

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Al <0.05 mg/L av 0.1 mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Nov 20,27, Dec 3,10,17	5	av < 0.08 mg/L max < 0.10 mg/L	Max obj. met Av indef.
	E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	av < 0.07 mg/L max < 0.10 mg/L	Max obj. met Av indef.
	0900504 d/s Middle Quinsam L.	Jul 16,24,30, Aug 8,12	5	av < 0.07 mg/L max < 0.10 mg/L	Max obj. met Av indef.
		Nov 20,27, Dec 3,10,17	5	av < 0.08 mg/L max < 0.10 mg/L	Max obj. met Av indef.
	Middle Quinsam Lake: E206618 over deepest point	Jul 16 & Aug 12	8	all = 0.05 mg/L (1 - 9 m)	Max obj. met Av not chkd.
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total As <0.05 mg/L av	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 16-Dec 17	8	all < 0.001 mg/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	all < 0.001 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Jul 16-Dec 17	10	all < 0.001 mg/L	Objective met
	Middle Quinsam Lake: E206618 over deepest point	Jun 19-Aug 12 Aug 12	12	all < 0.001 mg/L (1 - 9 m)	Objective met
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Cd <0.0002mg/L av 0.0003mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Nov 27-Dec 10	2	all < 0.01 mg/L	Max indef. Av not chkd.
	E206901 into Mid. Quinsam Lk.	Jul 16-Aug 12	4	all < 0.01 mg/L (diss)	Max indef. Av not chkd.
	0900504 d/s Middle Quinsam L.	Jul 16-Aug 12	4	all < 0.01 mg/L (diss)	Max indef. Av not chkd.
	Middle Quinsam Lake: E206618 over deepest point	Jun 19	4	all < 0.0005 mg/L (1 - 9 m)	Max indef. Av not chkd.

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cd <0.0002mg/L av 0.0003mg/L max	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Co 0.05 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Jul 16-Dec 17	10	all < 0.1 mg/L	Indefinite result
Total Cu <0.002 mg/L av	Quinsam River: 0126402 u/s Middle Quinsam L.	Nov 20,27, Dec 3,10,17	5	av = 0.0012 mg/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	all < 0.01 mg/L	Indefinite result
	0900504 d/s Middle Quinsam L.	Nov 20,27, Dec 3,10,17	5	av = 0.0016 mg/L	Objective met
	Middle Quinsam Lake: E206618 over deepest point	Jul 16 & Aug 12	8	<0.001 - 0.003mg/L (1 - 9 m)	Indefinite result
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Fe <0.3 mg/L av	Quinsam River: 0126402 u/s Middle Quinsam L.	Nov 20,27, Dec 3,10,17	5	av = 0.09 mg/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 16,24,30, Aug 8,12	5	av = 0.15 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Jul 16,24,30, Aug 8,12	5	av = 0.09 mg/L	Objective met
		Nov 20,27, Dec 3,10,17	5	av = 0.17 mg/L	Objective met
	Middle Quinsam Lake: E206618 over deepest point	Jun 19-Aug 12	12	0.04 - 0.08 mg/L (1 - 9 m)	Indefinite result
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Pb <0.003 mg/L av 0.005 mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Nov 20,27, Dec 3,10,17	5	all < 0.1 mg/L	Indefinite results
	E206901 into Mid. Quinsam Lk.	Jul 16-Aug 12	4	all < 0.1 mg/L	Max indef. Av not chkd.

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <0.003 mg/L av 0.005 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Jul 16-Dec 17 Dec 3,10,17	10	all < 0.1 mg/L	Indefinite results
	Middle Quinsam Lake: E206618 over deepest point	Jun 19-Aug 12	12	all < 0.1 mg/L (1 - 9 m)	Max indef. Av not chkd.
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Mn 0.05 mg/L max	Quinsam River: 0900504 d/s Middle Quinsam L.	Jul 16-Dec 17	10	max = 0.02 mg/L	Objective met
Total Hg 0.1 ug/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 24,30, Aug 8,12	4	all < 0.005 ug/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 24,30, Aug 8,12	4	all < 0.005 ug/L	Objective met
	0900504 d/s Middle Quinsam L.	Jul 24,30, Aug 8,12	4	<0.005 - 0.005ug/L	Objective met
	Middle Quinsam Lake	1991	0	no data collected	Obj not chkd
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Hg 0.5 mg/kg max in fish,wet wt	Quinsam River Long & Middle Q. Lks. d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Ni 0.025 mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 16-Dec 17	9	all = 0.002 mg/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 16-Aug 12	5	all = 0.002 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Jul 16-Dec 17	10	all = 0.002 mg/L	Objective met
	Middle Quinsam Lake: E206618 over deepest point	Jun 19-Aug 12	12	all = 0.002 mg/L (1 - 9 m)	Objective met
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991

TABLE 3 continued

MIDDLE QUINSAM LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Ag 0.0001mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 16-Dec 17	9	all < 0.0005 mg/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 16-Aug 12	5	all < 0.0005 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Jul 16-Dec 17	10	all < 0.0005 mg/L	Objective met
	Middle Quinsam Lake: E206618 over deepest point	Jul 16-Aug 12	8	all < 0.0005 mg/L (1 - 9 m)	Objective met
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991
Total Zn 0.03 mg/L max	Quinsam River: 0126402 u/s Middle Quinsam L.	Jul 16-Dec 17	9	max = 0.01 mg/L	Objective met
	E206901 into Mid. Quinsam Lk.	Jul 16-Aug 12	5	all < 0.01 mg/L	Objective met
	0900504 d/s Middle Quinsam L.	Jul 16-Dec 17	10	all < 0.01 mg/L	Objective met
	Middle Quinsam Lake: E206618 over deepest point	Jun 19-Aug 12	12	max = 0.10 mg/L (1 - 9 m)	Objective met
	Long Lake d/s Flume L & Long L	1991	0	no data collected	Omitted 1991

TABLE 4

OYSTER RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Oyster River: E208377 u/s Adrian Creek	May 14,Jun 4	2	all <2/100 mL	Indefinite result
Turbidity 5 NTU max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	<0.1 - 0.2 NTU	Objective met
Turbidity <7 NTU 90th perc.	Oyster River: 0125580 near the mouth	May 14,21,30, June 4	4	0.3 - 0.7 NTU	Indefinite result
Susp. Solids 12 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	<1 - 1 mg/L	Objective met
Susp. Solids <15 mg/L 90th perc.	Oyster River: 0125580 near the mouth	May 14,21,30, June 4	4	<1 - 2 mg/L	Indefinite result
Ammonia-N <1.85 mg/L av 12.7 mg/L max at pH = 7.5 temp = 10 C	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, Jun 4	4	<0.005 - 0.008mg/L	Max obj. met Av not chkd.
	0125580 near the mouth	May 14,21,30, Jun 4	4	<0.005 - 0.006mg/L	Max obj. met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	<0.005 - 0.007mg/L	Max obj. met Av not chkd.
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	0.008 - 0.018 mg/L	Max obj. met Av not chkd.
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 21,30, Jun 4	3	all <0.005 mg/L	Max obj. met Av not chkd.
	0125580 near the mouth	May 21,30, Jun 4	3	all <0.005 mg/L	Max obj. met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 21,30	2	all <0.005 mg/L	Max obj. met Av not chkd.
	Little Oyster River: E207430 near the mouth	May 21,30	2	all <0.005 mg/L	Max obj. met Av not chkd.

TABLE 4 continued

OYSTER RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrate-N 10 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, Jun 4	4	0.02 - 0.03 mg/L	Objective met
	0125580 near the mouth	May 14,21,30, Jun 4	4	<0.02 - 0.02 mg/L	Objective met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	0.04 - 0.05 mg/L	Objective met
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	0.05 - 0.06 mg/L	Objective met
pH 6.5 - 8.5	Oyster River: E208377 u/s Adrian Creek	May 14-Jun 4	7	7.2 - 7.7	Objective met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	7.5 - 7.6	Objective met
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	7.4 - 7.6	Objective met
pH >6.5 90th perc 8.5 max	Oyster River: 0125580 near the mouth	May 14,21,30, June 4	4	7.3 - 7.7	Max obj. met np not chkd.
Dissolved Al <0.05 mg/L av 0.1 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	all = 0.05 mg/L	Max obj. met Av not chkd.
	0125580 near the mouth	May 14,21,30, June 4	4	all = 0.05 mg/L	Max obj. met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	all = 0.05 mg/L	Max obj. met Av not chkd.
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	all = 0.05 mg/L	Max obj. met Av not chkd.
Total As 0.05 mg/L max	Oyster River	1991	0	no data collected	Omitted 1991
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14	1	<0.001 mg/L	Objective met

TABLE 4 continued

OYSTER RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total As 0.05 mg/L max	Little Oyster River: E207430 near the mouth	May 14	1	<0.001 mg/L	Objective met
Total Cd 0.2 ug/L max	Oyster River: E208377 u/s Adrian Creek	May 21 & 30	2	<0.5 - <10.0 ug/L	Indefinite result
	Woodhus Creek Little Oyster River	1991	0	no data collected	Objective not checked
Total Cr 0.002 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14-Jun 4 May 30	3 1	<0.005-<0.010 mg/L 0.020 mg/L	Indef result Obj. not met
	0125580 near the mouth	May 14,21,30, June 4	4	<0.005-<0.010 mg/L	Indefinite result
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	<0.005-<0.010 mg/L	Indefinite result
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	all <0.005 mg/L	Indefinite result
Total Co 0.002 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	all <0.1 mg/L	Indefinite result
	0125580 near the mouth	May 14,21,30, June 4	4	all <0.1 mg/L	Indefinite result
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14 May 21 & 30	1 2	<0.001 mg/L <0.1 mg/L	Obj. met Indef result
	Little Oyster River: E207430 near the mouth	May 14 May 21 & 30	1 2	<0.001 mg/L <0.1 mg/L	Obj. met Indef result
Total Cu <0.003 mg/L av <0.005 mg/L 90th perc. (np)	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	<0.001 - 0.001mg/L	Indefinite results
	0125580 near the mouth	May 14,21,30, June 4	4	<0.001 - 0.002mg/L	Indefinite results
Total Cu <0.010 mg/L 90th perc.	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	<0.001 - 0.001mg/L	Indefinite results

TABLE 4 continued

OYSTER RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.010 mg/L 90th perc.	Little Oyster River: E207430 near the mouth	May 14,21,30	3	all = 0.002 mg/L	Indefinite result
Dissolved Fe <0.3 mg/L 90th perc. (np)	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	0.01 - 0.23 mg/L	Indefinite result
	0125580 near the mouth	May 14,21,30, June 4	4	0.05 - 0.10 mg/L	Indefinite result
Total Pb <3.5 ug/L av 5.9 ug/L max at hardness 12.7 mg/L	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	<1 - 1 ug/L	Max obj. met Av not chkd.
	0125580 near the mouth	May 14,21,30, June 4	4	<1 - 1 ug/L	Max obj. met
Total Pb <3.9 ug/L av 14.9 ug/L max at hardness 26.2 mg/L	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	<1 - 1 ug/L	Max obj. met Av not chkd.
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	all = 2 ug/L	Max obj. met Av not chkd.
Total Pb 0.8 ug/g max in fish muscle	Oyster River Woodhus Creek Little Oyster River	1991	0	no data collected	Omitted 1991
Total Mn 0.05 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	all <0.01 mg/L	Objective met
	0125580 near the mouth	May 14,21,30, June 4	4	all <0.01 mg/L	Objective met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	<0.010-<0.006 mg/L	Objective met
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	0.02 - 0.03 mg/L	Objective met
Total Hg <0.02 ug/L av 0.1 ug/L max	Oyster River	1991	0	no data collected	Omitted 1991
	Woodhus Creek Little Oyster River	1991	0	no data collected	Objectives not checked

TABLE 4 continued

OYSTER RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Hg 0.5 ug/g max in fish muscle	Oyster River Woodhus Creek Little Oyster River	1991	0	no data collected	Omitted 1991
Total Ni 0.025 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	all = 0.002 mg/L	Objective met
	0125580 near the mouth	May 14,21,30, June 4	4	all = 0.002 mg/L	Objective met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	all = 0.002 mg/L	Objective met
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	all = 0.002 mg/L	Objective met
Total Zn <0.01 mg/L av 0.03 mg/L max	Oyster River: E208377 u/s Adrian Creek	May 14,21,30, June 4	4	all <0.01 mg/L	Max obj. met Av not chkd.
	0125580 near the mouth	May 14,21,30, June 4	4	all <0.01 mg/L	Max obj. met
	Woodhus Creek: E207431 ~ 5 km from mouth	May 14,21,30	3	<0.005 - 0.010mg/L	Max obj. met Av not chkd.
	Little Oyster River: E207430 near the mouth	May 14,21,30	3	<0.005-<0.010 mg/L	Max obj. met Av not chkd.

TABLE 5

BULKLEY RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	0400297 u/s Houston	Jul 16,22,31, Aug 6,15	5	3 - 17/100 mL np = 14/100 mL	Objective not met
	0400434 u/s Smithers	Jul 16,22,31, Aug 6,15	5	1 - 7/100 mL np = 6/100 mL	Objective met
Fecal Coliforms <200/100 mL geometric mean (gm)	0400295 100m d/s Houston	Jul 16,22,31, Aug 6,15	5	5 - 18/100 mL gm = 10/100 mL	Objective met
	0400435 d/s Smithers in initial dilution zone	Jul 16,22,31, Aug 6,15	5	1 - 9/100 mL gm = 3/100 mL	Objective met
Turbidity max increase: 5 NTU or 10%	0400297 u/s Houston	Jul 16,22,31, Aug 6,15	5	0.6 - 2.0 NTU	Control site
	0400295 100m d/s Houston	Jul 16,22,31, Aug 6,15	5	0.5 - 2.5 NTU max inc. = 0.5 NTU	Objective met
	0400434 u/s Smithers	Jul 16,22,31, Aug 6,15	5	1.6 - 4.4 NTU	Control site
	0400435 d/s Smithers in initial dilution zone	Jul 16,22,31, Aug 6,15	5	1.5 - 4.1 NTU max inc. = 0.3 NTU	Objective met
Susp. Solids max increase: 10 mg/L or 10%	0400297 u/s Houston	Jul 16,22,31, Aug 6,15	5	1 - 5 mg/L	Control site
	0400295 100m d/s Houston	Jul 16,22,31, Aug 6,15	5	1 - 6 mg/L max inc. = 2 mg/L	Objective met
	0400434 u/s Smithers	Jul 16,22,31, Aug 6,15	5	4 - 12 mg/L	Control site
	0400435 d/s Smithers in initial dilution zone	Jul 16,22,31, Aug 6,15	5	4 - 11 mg/L max inc. = 1 mg/L	Objective met
Tot. Cl2 Res. 0.002 mg/L max	d/s Houston d/s Smithers	1991	0	chlorination not occurring	no need to check obj.
Chlorophyll-a <50 mg/m2 av	d/s Houston d/s Smithers	1991	0	no data collected	Objective not checked

TABLE 5 continued

BULKLEY RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.86 mg/L av 9.65 mg/L max at pH = 7.7 temp = 10 C	0400297 u/s Houston	Jul 16,22,31, Aug 6,15	5	av = 0.005 mg/L max = 0.007 mg/L	Objectives met
	0400295 100m d/s Houston	Jul 16,22,31, Aug 6,15	5	av = 0.020 mg/L max = 0.054 mg/L	Objectives met
	0400434 u/s Smithers	Jun 16,22,31, Aug 6,15	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	0400435 d/s Smithers in initial dilution zone	Jun 16,22,31, Aug 6,15	5	all < 0.005 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	0400297 u/s Houston	Jun 16,22,31, Aug 6,15	5	all < 0.005 mg/L	Objectives met
	0400295 100m d/s Houston	Jun 16,22,31, Aug 6,15	5	all < 0.005 mg/L	Objectives met
	0400434 u/s Smithers	Jun 16,22,31, Aug 6,15	5	all < 0.005 mg/L	Objectives met
	0400435 d/s Smithers in initial dilution zone	Jun 16,22,31, Aug 6,15	5	all < 0.005 mg/L	Objectives met
Dissolved Oxygen 7.8 mg/L min	0400297 u/s Houston	Jun 16,22,31, Aug 6,15	5	9.2 - 10.6 mg/L	Objective met
	0400295 100m d/s Houston	Jun 16,22,31, Aug 6,15	5	8.9 - 11.1 mg/L	Objective met
	0400434 u/s Smithers	Jun 16,22,31, Aug 6,15	5	9.1 - 11.0 mg/L	Objective met
	0400435 d/s Smithers in initial dilution zone	Jun 16,22,31, Aug 6,15	5	9.4 - 11.4 mg/L	Objective met

TABLE 6

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1991

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 11,17,23 Aug 2,8	5	gm = 3/100 mL np = 4/100 mL	Objectives met
	E207549 intake #2	July 11,17,23 Aug 2,8	5	np < 2/100 mL	Objective met
	E207550 intake #3	July 11,17,23 Aug 2,8	5	np < 2/100 mL	Objective met
	Seymour Lake: E207552 intake #1	July 11,23,27 Aug 2,8	5	np < 2/100 mL	Objective met
	E207553 intake #2	July 11,17,23 Aug 2,8	5	np = 2/100 mL	Objective met
	Round Lake: E207555 beach	July 11,17,23 Aug 2,8	5	gm = 4/100 mL np = 10/100 mL	Objectives met
	E207556 intake #2	July 11,17,23 Aug 2,8	5	np < 2/100 mL	Objective met
	E207557 intake #3	July 11,17,23 Aug 2,8	5	np = 2/100 mL	Objective met
	Tyhee Lake: E207559 beach	July 11,17,23 Aug 2,8	5	gm = 1/100 mL np = 1/100 mL	Objectives met
	E207560 intake #2	July 11,17,23 Aug 2,8	5	np = 2/100 mL	Objective met
	E207561 intake #3	July 11,17,23 Aug 2,8	5	np < 2/100 mL	Objective met
Turbidity <1 NTU av 5 NTU max	Kathlyn Lake: E207549 intake #2	July 11,17,23 Aug 2,8	5	av = 1.2 NTU max = 2.0 NTU	Av not met Max obj. met
	E207550 intake #3	July 11,17,23 Aug 2,8	5	av = 1.6 NTU max = 4.5 NTU	Av not met Max obj. met
	Seymour Lake: E207552 intake #1	July 11,17,23 Aug 2,8	5	av = 4.2 NTU	Av not met
		Aug 8	1	max = 5.2 NTU	Max not met
		Jul 11-Aug 2	4	max = 5.0 NTU	Max obj. met

TABLE 6 continued

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity <1 NTU av 5 NTU max	Seymour Lake: E207553 intake #2	July 11,17,23 Aug 2,8	5	av = 7.2.NTU	Av not met
		Jul 17, Aug 8	2	max = 5.4-23 NTU	Max not met
		Jul11,23,Aug2	3	max = 4.5 NTU	Max obj. met
	Round Lake: E207556 intake #2	July 11,17,23 Aug 2,8	5	av = 1.2 NTU max = 1.7 NTU	Av not met Max obj. met
	E207557 intake #3	July 11,17,23 Aug 2,8	5	av = 2.2 NTU max = 4.5 NTU	Av not met Max obj. met
	Tyhee Lake: E207560 intake #2	July 11,17,23 Aug 2,8	5	av = 1.0 NTU max = 1.5 NTU	Objectives met
	E207561 intake #3	July 11,17,23 Aug 2,8	5	av = 0.6 NTU max = 0.9 NTU	Objectives met
Total P <0.015 mg/L av at spring overturn	Kathlyn Lake 1131007 North Basin	April 23	3	0.5 m: 0.019 mg/L 4.0 m: 0.021 mg/L 8.0 m: 0.019 mg/L av = 0.020 mg/L	Objective not met
	Round Lake 1131008 mid-lake	April 30	3	0.5 m: 0.056 mg/L 5.0 m: 0.056 mg/L 17 m: 0.130 mg/L	Indefinite result
	Tyhee Lake 1131009 North Basin	1991	0	no data collected	Objective not checked
Colour 15 TCU max near water intakes	Kathlyn Lake: E207549 intake #2	July 11,17,23 Aug 2,8	5	all = 10 TCU	Objective met
	E207550 intake #3	July 11,23, Aug 2,8	4	10 - 15 TCU	Objective met
		July 17	1	20 TCU	Obj. not met
	Seymour Lake	1991	0	no data collected	Objective not checked
	Round Lake: E207556 intake #2	July 11,17,23 Aug 2,8	5	10 - 15 TCU	Objective met

TABLE 6 continued

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Colour 15 TCU max near water intakes	Round Lake: E207557 intake #3	July 17,23, Oct 8	3	20 - 50 TCU	Objective not met
		Jul 11, Oct 2	2	15 TCU	Obj. met
	Tyhee Lake: E207560 intake #2	July 11,17,23 Oct 2,8	5	5 - 10 TCU	Objective met
	E207561 intake #3	July 11,17,23 Oct 2,8	5	5 - 10 TCU	Objective met

TABLE 7

LAKELSE LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc (np) at water intakes	E207582 intake, lake NE	Aug 7,13	2	< 2/100 mL	Indefinite result
	E207581 intake, Gainey Point	Aug 7,13	2	< 2/100 mL	Indefinite result
Fecal Coliforms <200/100 mL geometric mean (gm) at beaches	E207583 Furlong Beach	Aug 7,13	2	< 2 - 7/100 mL	Indefinite result
Turbidity <1 NTU av 5 NTU max	E207582 intake, lake NE	Aug 7,13	2	0.3 - 0.4 NTU	Max obj. met Av not chkd.
	E207581 intake, Gainey Point	Aug 7,13	2	0.3 - 0.4 NTU	Max obj. met
Total-P <0.010 mg/L av May - August (0 - 30 m)	E206616 N end, deepest point	Jun 11-Aug 21	9	<0.003 - 0.008mg/L (0.5 - 29 m) av = 0.004 mg/L	Objective met
Chlorophyll-a <3 ug/L av May - August (0 - 6 m)	E206616 N end, deepest point	May 8-Aug 21	8	1.5 - 7.8 ug/L (0 - 6 m) av = 4.2 ug/L	Objective not met
Dissolved Oxygen 6 mg/L min 5m above sed.	E206616 N end, deepest point (sediments at 30 m)	May 8 Jun 11 Jul 15 Aug 21	1 1 1 1	10.8 mg/L at 25 m 11.0 mg/L at 25 m 8.1 mg/L at 25 m 8.5 mg/L at 25 m	Objective met

TABLE 8

CHARLIE LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np) near water intakes	Fort St. John intake	Jan 2,9,16,23 30	5	<2 - 4/100 mL np = 4/100 mL	Objective met
		Feb 6,13,27, Mar 6,13	5	<2 - 10/100 mL np = 4/100 mL	Objective met
		Mar 20,26, Apr 3,10,17	5	<2 - 10/100 mL np = 8/100 mL	Objective met
		Apr 24, May 1 8,15,22	5	<2 - 14/100 mL np = 9/100 mL	Objective met
		May 28, Jun 5 12,19,26	5	2 - 22/100 mL np = 18/100 mL	Objective not met
		Jul 3,10,17, 24,31	5	10 - 240/100 mL np = 140/100 mL	Objective not met
		Aug 7,14,21, 28, Sep 4	5	40 - 220/100 mL np = 200/100 mL	Objective not met
		Sep 11,18,25, Oct 2,9	5	52 - 310/100 mL np = 240/100 mL	Objective not met
		Oct 16,23,30, Nov 6,13	5	4 - 60/100 mL np = 50/100 mL	Objective not met
Fecal Coliforms <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) at beaches	Beatton Park Beach south	May 28-Aug 20	5	<5 - 200/100 mL	Indefinite results
	Charlie Lake Park boat launch	Jul 10,29, Aug 12,20,26	5	<5 - 200/100 mL gm = 10/100 mL np = 80/100 mL	Objectives met
Total-P <0.050 mg/L av at spring overturn <0.075 mg/L av at all other times	0400390 Charlie Lake deep station	March 27 (spring overturn)	1 1 1	1 m : 0.039 mg/L 5 m : 0.033 mg/L 8.2m : 0.132 mg/L	Indefinite result
		March 27 (spring overturn)	1 1 1 1	3 m : 0.036 mg/L 4 m : 0.032 mg/L 6 m : 0.035 mg/L 7 m : 0.053 mg/L av = 0.039 mg/L	Objective met

TABLE 8 continued

CHARLIE LAKE WATER QUALITY OBJECTIVES - 1991

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 Lake deep station	May 8	1 1 1	1 m : 0.056 mg/L 6 m : 0.057 mg/L 11 m : 0.092 mg/L av = 0.068 mg/L	Objective met
		May 30	1 1 1	1 m : 0.036 mg/L 6 m : 0.049 mg/L 12 m : 0.075 mg/L av = 0.053 mg/L	Objective met
		June 20	1 1 1	1 m : 0.047 mg/L 6 m : 0.052 mg/L 12 m : 0.087 mg/L av = 0.062 mg/L	Objective met
		July 23	1 1 1	1 m : 0.091 mg/L 6 m : 0.043 mg/L 12 m : 0.336 mg/L av = 0.157 mg/L	Objective not met
		August 22	9	0.080 - 0.448 mg/L	Obj. not met
		September 10	1 1 1	1 m : 0.113 mg/L 5 m : 0.098 mg/L 12 m : 0.125 mg/L av = 0.112 mg/L	Objective not met
		October 24	1 1 1	1 m : 0.091 mg/L 6 m : 0.062 mg/L 12 m : 0.077 mg/L av = 0.077 mg/L	Objective not met
	0400391 Charlie Lake centre	March 27 (spring overturn)	1 1 1	1 m : 0.040 mg/L 4 m : 0.036 mg/L 7 m : 0.066 mg/L av = 0.047 mg/L	Objective met
		May 8 (spring overturn)	1 1 1	1 m : 0.089 mg/L 4.5m : 0.083 mg/L 7.5m : 0.084 mg/L av = 0.085 mg/L	Objective not met
		May 30	1 1 1	1 m : 0.033 mg/L 4.5m : 0.051 mg/L 7.5m : 0.074 mg/L av = 0.053 mg/L	Objective met
		June 20	1 1 1	1 m : 0.048 mg/L 5 m : 0.047 mg/L 9 m : 0.066 mg/L av = 0.054 mg/L	Objective met

TABLE 8 continued

CHARLIE LAKE WATER QUALITY OBJECTIVES - 1991

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	0400391 Charlie Lake centre	July 23	1 1 1	1 m : 0.085 mg/L 5 m : 0.044 mg/L 8.5m : 0.068 mg/L av = 0.066 mg/L	Objective met
		September 10	1 1 1	1 m : 0.153 mg/L 5 m : 0.099 mg/L 9 m : 0.076 mg/L av = 0.109 mg/L	Objective not met
		October 24	1 1 1	1 m : 0.071 mg/L 4.5m : 0.066 mg/L 9 m : 0.066 mg/L av = 0.068 mg/L	Objective met
	0400388 Charlie Lake South	March 27 (spring overturn)	1 1 1	1 m : 0.043 mg/L 3 m : 0.037 mg/L 5.7m : 0.035 mg/L av = 0.038 mg/L	Objective met
		May 30 (spring overturn)	1 1 1	1 m : 0.035 mg/L 3 m : 0.037 mg/L 5.5m : 0.034 mg/L av = 0.035 mg/L	Objective met
		June 20	1 1 1	1 m : 0.037 mg/L 3.5m : 0.047 mg/L 6 m : 0.045 mg/L av = 0.043 mg/L	Objective met
		July 23	1 1	1 m : 0.066 mg/L 3.5m : 0.051 mg/L 6 m : 0.050 mg/L av = 0.056 mg/L	Objective met
		August 22	1 1 1	1 m : 0.120 mg/L 3.5m : 0.102 mg/L 6 m : 0.091 mg/L av = 0.104 mg/L	Objective not met
		September 10	1 1 1	1 m : 0.099 mg/L 3.5m : 0.104 mg/L 6 m : 0.097 mg/L av = 0.100 mg/L	Objective not met
		October 24	1 1 1	1 m : 0.048 mg/L 3 m : 0.065 mg/L 6 m : 0.074 mg/L av = 0.062 mg/L	Objective met

TABLE 9

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Turbidity max increase: 5 NTU or 10%	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Susp. Solids max increase: 10 mg/L or 10%	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Substrate Sedimentation: no increase in particulate < 3 mm dia.	South Bullmoose Cr. E206228 u/s plant	May 5	5	89.5% - 99.9% w/w < 1.19 mm av = 97% w/w < 1.19 mm	Control site
	West Bullmoose Creek E206227 d/s sed. ponds 1 & 2	May 5	4	91.8% - 95.2% w/w <1.19 mm av = 93% w/w < 1.19 mm	Indefinite result
	South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Chlorophyll-a av <50 mg/m2	West Bullmoose Creek E206277 d/s sed. ponds 1 & 2	Sep 13	6	2.5 - 81.5 mg/m2 av = 36.0 mg/m2	Objective met
	South Bullmoosr Cr.: E206228 u/s plant	Sep 13	6	0.5 - 11.0 mg/m2 av = 3.53 mg/m2	Objective met
	E206229 d/s plant	Sep 13	6	1.3 - 62.8 mg/m2 av = 13.5 mg/m2	Objective met
	Bullmoose Creek: 0410094 d/s tailing pond	Sep 13	6	3.4 - 6.8 mg/m2 av = 4.6 mg/m2	Objective met
	E206232 20km d/s tailing pond	Sep 13	6	1.7 - 15.0 mg/m2 av = 6.75 mg/m2	Objective met

TABLE 9 continued

BULLMOOSE CREEK WATER QUALITY OBJECTIVES - 1991

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 South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Nitrite-N <0.02 mg/L av 0.06 mg/L max	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Nitrite + Nitrate-N 10 mg/L max	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
Diss. Oxygen 7.75 mg/L min	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991
pH 6.5 min	West Bullmoose Creek South Bullmoose Cr. Bullmoose Creek	1991	0	no data collected	Omitted 1991

TABLE 10

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1991

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	Sep 30,Oct 9, 17,24,31	5	2 - 10/100 mL np = 9/100 mL	Objective met
	0400631 200 m d/s Fort Fraser	Sep 30,Oct 9, 17,24,31	5	8 - 27/100 mL np = 22/100 mL	Objective met
	0400449 u/s Vanderhoof	Jan 29,Feb 5, 11,18,25	5	2 - 4/100 mL np = 3/100 mL	Objective met
		Sep 30, Oct 9,17,24	4	10 - 27/100 mL	Indefinite result
	0400450 100 m d/s Vanderhoof	Sep 30,Oct 9, 17,24,31	5	20 - 57/100 mL np = 44/100 mL	Objective met
		Jan 28	1	3630/100 mL	Indefinite result
	E207450 0.5 km d/s Vanderhoof	Jan 29 Sep 30-Oct 17	1 3	116/100 mL 14 - 38/100 mL	Indefinite result
	Stuart River: 0400488 E bank at Highway 27	Oct 3,8,16,29	4	2 - 24/100 mL	Indefinite result
	Chilako River	1991	0	no data collected	Omitted 1991
Fecal Coliforms <10/100 mL 90th perc. (np)	Stuart River: 0920101 W bank at Highway 27	Oct 3,8,16,29	4	1 - 8/100 mL	Indefinite result
Fecal Coliforms <200/100 mL geom. mean (gm)	Necoslie River: 0400801 d/s Fort St. James 20 m u/s Highway 27	Oct 3,8,16,29	4	4 - 110/100 mL	Indefinite result
Total Cl2 Res. 0.002 mg/L max	Nechako & Stuart rivers	1991	0	no data collected	Omitted 1991
Ammonia-N <1.83 mg/L av 9.50 mg/L max at pH = 7.7 temp = 12 C	Nechako River: 0400629 200 m u/s Fort Fraser	Sep 30,Oct 9, 17,24,31	5	av = 0.007 mg/L max = 0.010 mg/L	Objectives met
	0400631 200 m d/s Fort Fraser	Sep 30,Oct 9, 17,24,31	5	av = 0.007 mg/L max = 0.011 mg/L	Objectives met

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.83 mg/L av 9.50 mg/L max at pH = 7.7 temp = 12 C	Nechako River: 0400449 u/s Vanderhoof	Jan 29,Feb 5, 11,18,25	5	av = 0.024 mg/L max = 0.079 mg/L	Objectives met
		Sep 30,Oct 9, 17,24,31	5	av = 0.007 mg/L max = 0.011 mg/L	Objectives met
	0400450 100 m d/s Vanderhoof	Sep 30,Oct 9, 17,24,31	5	av = 0.160 mg/L max = 0.380 mg/L	Objectives met
		Jan 28	1	0.430 mg/L	Max obj. met
	E207450 0.5 km d/s Vanderhoof	Jan 29 Sep 30-Oct 17	1 3	0.018 mg/L max < 0.005 mg/L	Max obj. met Max obj. met
Ammonia-N <0.887 mg/L av 4.61 mg/L max at pH = 8.1 temp = 12 C	Stuart River: 0400488 E bank at Highway 27	Oct 3,8,16,29	4	<0.005 - 0.025mg/L	Max obj. met Av not chkd.
	0920101 W bank at Highway 27	Oct 3,8,16,29	4	<0.005 - 0.007mg/L	Max obj. met
	Chilako River	1991	0	no data collected	Omitted 1991
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Nechako River: 0400629 200 m u/s Fort Fraser	Sep 30,Oct 9, 17,24,31	5	av = 0.008 mg/L max = 0.014 mg/L	Objectives met
	0400631 200 m d/s Fort Fraser	Sep 30,Oct 9, 17,24,31	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	0400449 u/s Vanderhoof	Jan 29,Feb 5, 11,18,25	5	av = 0.002 mg/L max = 0.002 mg/L	Objectives met
		Sep 30,Oct 9, 17,24,31	5	av = 0.005 mg/L max = 0.010 mg/L	Objectives met
	0400450 100 m d/s Vanderhoof	Sep 30,Oct 9, 17,24,31	5	av = 0.011 mg/L max = 0.021 mg/L	Objectives met
	E207450 0.5 km d/s Vanderhoof	Jan 29-Oct 17	4	max = 0.009 mg/L	Max obj. met
	Stuart River: 0400488 E bank at Highway 27	Oct 3,8,16,29	4	all < 0.005 mg/L	Max obj. met Av not chkd.
	0920101 W bank at Highway 27	Oct 3,8,16,29	4	max = 0.005 mg/L	Max obj. met
	Chilako River	1991	0	no data collected	Omitted 1991

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll-a	Nechako River	1991	0	no data collected	Obj not chkd
<50 mg/m2 av	Stuart River	1991	0	no data collected	Omitted 1991
Chlorophyll-a <100 mg/m2 av	Chilako River	1991	0	no data collected	Omitted 1991
Dissolved Oxygen 7.75-11.2 mg/L min, depending on fish egg stage	Nechako River: 0400629 200 m u/s Fort Fraser	Jan 30-Oct 31	10	10.2 - 12.2 mg/L (min in Sep)	Objective met
	0400631 200 m d/s Fort Fraser	Jan 30-Oct 31	10	10.2 - 11.9 mg/L (min in Sep)	Objective met
	0400449 u/s Vanderhoof	Jan 29-Oct 31	10	9.8 - 12.0 mg/L (min in Sep)	Objective met
	0400450 100 m d/s Vanderhoof	Jan 26-Oct 31	5	8.5 - 11.5 mg/L (min in Feb & Sep)	Objective met
	E207450 0.5 km d/s Vanderhoof	Jan 29-Oct 31	10	8.9 - 12.4 mg/L (min in Jan & Sep)	Objective met
	E207451 2 km d/s Vanderhoof	Jan 29-Oct 31	10	9.9 - 12.6 mg/L	Objective met
	Stuart River: 0400488 E bank at Highway 27	Oct 3-Oct 29	5	10.6 - 11.4 mg/L	Objective met
	0920101 W bank at Highway 27	Oct 3-Oct 29	5	10.1 - 11.2 mg/L	Objective met
	Chilako River	1991	0	no data collected	Omitted 1991
pH 6.5 - 8.5	Nechako River: 0400629 200 m u/s Fort Fraser	Jan 30-Oct 31	6	7.2 - 7.7	Objective met
	0400631 200 m d/s Fort Fraser	Jan 30-Oct 31	6	7.1 - 7.6	Objective met
	0400449 u/s Vanderhoof	Jan 29-Oct 31	10	7.0 - 7.7	Objective met
	0400450 100 m d/s Vanderhoof	Jan 28-Oct 31	6	7.1 - 7.8	Objective met
	E207450 0.5 km d/s Vanderhoof	Jan 29-Oct 17	4	7.5 - 7.7	Objective met

TABLE 10 continued

NECHAKO RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	Stuart River: 0400488 E bank at Highway 27	Oct 3-Oct 29	4	7.7 - 8.1	Objective met
	0920101 W bank at Highway 27	Oct 3-Oct 29	4	7.5 - 8.1	Objective met
	Chilako River	1991	0	no data collected	Omitted 1991
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-Sep 8 Sep 9-Sep 10 Sep 11-Sep 12 Sep 13-Sep 17 Sep 18 Sep 19-Dec 31	173 77 2 2 5 1 104	0.5 - 14.3 C 15.1 - 18.2 C 14.8 - 15.0 C 15.4 - 15.6 C 14.3 - 14.6 C 15.3 C 14.2 - 1.0 C	Obj. met Obj. not met Obj. met Obj. not met Obj. met Obj. not met Obj. met
Temperature <20 C Jul-Aug <18 C Sep-Jun ~ 100m u/s Stuart River	Nechako River: at Vanderhoof* ~ 40 km u/s Stuart R.	Jan 1-Jun 23 Jun 24-Jun 30 Jul 1-Aug 31 Sep 1-Dec 31	174 7 62 69	0 - 17.2 C 18.2 - 19.0 C 14.6 - 19.3 C 0 - 16.0 C	Obj. met Obj. not met Obj. met Obj. met
Total Gas Pressure 109 % max	Nechako River	1991	0	no data collected	Objective not checked

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

TABLE 11

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Peace River	1991	0	no data collected	Omitted 1991
Fecal Coliforms <200/100 mL geometric mean	Beatton River	1991	0	no data collected	Omitted 1991
Turbidity max increase: 5 NTU or 10%	Peace River Beatton River	1991	0	no data collected	Omitted 1991
Suspended Solids max increase: 10 mg/L or 10%	Peace River Beatton River	1991	0	no data collected	Omitted 1991
Tot Cl2 Res. 0.002 mg/L max	Peace River	1991	0	no data collected	Omitted 1991
Dissolved Fluoride 1.0 mg/L max	Peace River	1991	0	no data collected	Omitted 1991
WAD - CN <0.005 mg/L av 0.01 mg/L max	Peace River	1991	0	no data collected	Omitted 1991
Chlorophyll-a < 50 mg/m2 av	Peace River Beatton River	1991	0	no data collected	Omitted 1991
Ammonia-N <0.709 mg/L av at pH = 8.2 temp = 12 C	Peace River Beatton River	1991	0	no data collected	Omitted 1991

TABLE 11 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Peace River Beatton River	1991	0	no data collected	Omitted 1991
Dissolved Oxygen 7.25 mg/L min	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 8,15,21, Sep 3,5	5	9.5 - 10.8 mg/L	Objective met
	0400492 100 m d/s Ft. St John	Aug 8,15,21, Sep 3,5	5	9.2 - 10.6 mg/L	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 8,15,21, Sep 3,5	5	9.0 - 10.6 mg/L	Objective met
	0410054 100m d/s Petro-Canada	Aug 8,15,21, Sep 3,5	5	9.3 - 10.6 mg/L	Objective met
	E207631 200 m d/s Fibreco	Aug 8,15, Sep 3,5	4	9.0 - 10.4 mg/L	Objective met
	E207965 1 km d/s Fibreco	Aug 8,15,21, Sep 3	4	9.2 - 10.6 mg/L	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 8,15,21, Sep 3,5	5	9.4 - 10.6 mg/L	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 8,15,21, Sep 3,5	5	9.5 - 10.8 mg/L	Objective met
	Beatton River	1991	0	no data collected	Omitted 1991
Total Dissolved Gas 110% max	Peace River	1991	0	no data collected	Omitted 1991
pH 6.5 - 9.0	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 8,15,21, Sep 3,5	5	8.2 - 8.3	Objective met
	0400492 100 m d/s Ft. St John	Aug 8,15,21, Sep 3,5	5	8.2 - 8.3	Objective met

TABLE 11 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 9.0	Peace River: 0400138 u/s Petro-Canada (N side)	Aug 8,15,21, Sep 3,5	5	8.2 - 8.4	Objective met
	0410054 100m d/s Petro-Canada	Aug 8,15,21, Sep 3,5	5	8.2 - 8.4	Objective met
	E207631 200 m d/s Fibreco	Aug 8,15,21, Sep 3,5	5	8.1 - 8.3	Objective met
	E207965 1 km d/s Fibreco	Aug 8,15,21, Sep 3,5	5	8.2 - 8.4	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 8,15,21, Sep 3,5	6	8.1 - 8.4	Objective met
	0400143 5 km d/s Petro-Canada (midstream)	Aug 8,21, Sep 3,5	4	8.2 - 8.3	Objective met
	Beatton River	1991	0	no data collected	Omitted 1991
Temperature max increase: 1 C	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 8,15,21, Sep 3,5	5	11.0 - 14.0 C	Control site
	0400492 100 m d/s Ft. St John	Aug 8,15,21, Sep 3,5	5	11.0 - 15.0 C max inc = 1.0 C	Objective met
	0400138 u/s Petro-Canada (N side)	Aug 8,15,21, Sep 3,5	5	11.0 - 14.0 C	Control site
	0410054 100m d/s Petro-Canada	Aug 8,15,21, Sep 3,5	5	11.5 - 14.5 C max inc = 0.5 C	Objective met
	E207631 200 m d/s Fibreco	Aug 8,15, Sep 3,5	4	11.5 - 14.3 C max inc = 0.5 C	Objective met
	E207965 1 km d/s Fibreco	Aug 8,15,21, Sep 3	4	11.5 - 14.5 C max inc = 0.5 C	Objective met
	0400142 5 km d/s Petro-Canada (N side)	Aug 8,15,21, Sep 3,5	5	11.3 - 14.5 C max inc = 1.0 C	Objective met

TABLE 11 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Temperature max increase: 1 C	Peace River: 0400143 5 km d/s Petro-Canada (midstream)	Aug 8,15,21, Sep 3,5	5	11.0 - 14.5 C max inc = 1.0 C	Objective met
Total 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 8,15,21, Sep 3,5	15	<0.001 - 0.003mg/L av = 0.001mg/L	Control site
	d/s sites	1991	0	no data collected	Objectives not checked
Chlorophenols (tri + tetra + penta) 0.0002mg/L max	Peace River	1991	0	no data collected	Omitted 1991
Total Chromium 0.002 mg/L max or 20% increase	Peace River: 0400134 3.2km u/s Ft. St John (N side)	Aug 8,15,21, Sep 3,5	15	all < 0.005 mg/L	Control site
	d/s sites	1991	0	no data collected	Objective not checked
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 8,15,21, Sep 3,5	15	<0.001 - 0.002mg/L av = 0.001mg/L	Control site
	d/s sites	1991	0	no data collected	Objectives not checked
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 8,15,21, Sep 3,5	15	all = 0.002 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 8,15,21, Sep 3,5	15	<0.005 - 0.050mg/L	Control site
	d/s sites	1991	0	no data collected	Objective not checked

TABLE 11 continued

PEACE RIVER MAINSTEM WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Phenol <0.002 mg/L av or 20% increase	Peace River	1991	0	no data collected	Omitted 1991
Sulfide 0.002 mg/L max or 20% increase	Peace River	1991	0	no data collected	Omitted 1991
2,4-D (ester) 0.004 mg/L max	Peace River	1991	0	no data collected	Omitted 1991

TABLE 12

WILLIAMS LAKE WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform <10/100 mL 90th perc. at water intakes	Williams Lake water intake sites	1991	0	no data collected	Omitted 1991
Fecal Coliform <200/100 mL geometric mean (gm) <400/100 mL 90th perc. (np) at beaches	Scout Island beach	Jun 24,Jul 4, 8,24,29	5	gm = 18/100 mL np = 30/100 mL	Objectives met
	Russet Bluff beach	Jun 11-Aug 12	5	<5 - 135/100 mL	Indefinite result
	Rotary beach	Jun 13-Jul 8	2	15 - >99/100 mL	Indefinite result
Turbidity <1 NTU av 5 NTU max	0603019 at lake centre	Apr 22-Nov 4	19	0.3 - 4.2 NTU (0.5 - 18 m)	Max obj. met Av not chkd.
Total P <0.020 mg/L av at spring overturn	0603019 at lake centre	Apr 22	1 1 1 1	0.5m : 0.079 mg/L 5 m : 0.065 mg/L 10 m : 0.071 mg/L 15 m : 0.072 mg/L av = 0.072 mg/L	Objective not met
Chlorophyll-a <5 ug/L av May - August	0603019 at lake centre	May 23,Jun 11 Aug 15	3	15.2 - 18.8 ug/L av = 17.5 ug/L	Objective not met
Diss. Oxygen 4 mg/L min 5m above sed.	0603019 at lake centre (sediments at 20 m)	Feb 25,Apr 22 Oct 17,Nov 4	4	5.6 - 9.3 mg/L at 14 m	Objective met
		Jun 11,Jul 24 Aug 15,Sep 25	4	0.15 - 3.9 mg/L at 14 m	Objective not met
Water Clarity 1.2m min Secchi reading	0603019 at lake centre	Apr 28-Nov 11	29	1.25 - 2.5 m	Objective met
		Apr 22,Jun 30 Aug 4,Sep 23	4	1 m	Objective not met

TABLE 13

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Bonaparte River: 0600508 d/s Cache Creek STP	Jan 9-Dec 18	6	25 - 330/100 mL	Indefinite result
	0600329 near mouth	Jan 15-Dec 18	14	2 - 525/100 mL	Indefinite result
	Clinton Creek Loon Creek	1991	0	no data collected	Omitted 1991
Fecal Coliforms <10/100 mL 90th perc. at water intakes	Loon Lake	1991	0	no data collected	Omitted 1991
Fecal Coliform <200/100 mL gm at beaches	Loon Lake	1991	0	no data collected	Omitted 1991
Suspended Solids max increase: 10 mg/L or 10%	Bonaparte River: 0600329 near mouth	Jan 15-Aug 7	10	12 - 210 mg/L	Indefinite result
		Sep 17-Dec 18	5	2 - 10 mg/L	Objective met
	Clinton Creek Loon Creek	1991	0	no data collected	Omitted 1991
Turbidity max increase: 5 NTU or 10%	Bonaparte River Clinton Creek Loon Creek	1991	0	no data collected	Omitted 1991
Diss. Solids 500 mg/L max	Clinton Creek	1991	0	no data collected	Omitted 1991
Tot Cl2 Res. 0.002 mg/L max	Bonaparte River Clinton Creek	1991	0	chlorination not occurring	no need to check obj.
Ammonia-N <0.365 mg/L av 1.90 mg/L max at pH = 8.5 temp = 15 C	Bonaparte River: 0600329 near mouth	Jan 15-Dec 18	14	<0.005 - 0.161mg/L	Max obj. met Av not chkd.
	Clinton Creek Loon Creek	1991	0	no data collected	Omitted 1991

TABLE 13 continued

BONAPARTE RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Bonaparte River: 0600329 near mouth	Jan 15-Dec 18	14	<0.005 - 0.013mg/L	Max obj. met Av not chkd.
	Clinton Creek:	1991	0	no data collected	Omitted 1991
Chlorophyll-a <50 mg/m2 av	Bonaparte River	1991	0	no data collected	Objective not checked
Chlorophyll-a <100 mg/m2 av or 20% increase	Clinton Creek	1991	0	no data collected	Omitted 1991
Diss. Oxygen 7.75-11.2 mg/L min depending on fish egg stage	Bonaparte River Clinton Creek Loon Creek	1991	0	no data collected	Omitted 1991
Diss. Oxygen 5 mg/L min, 5m above bottom	Loon Lake 0603050 above deepest point (30 m)	May 14	2	4.3 - 4.7 mg/L at 25 m	Objective not met
		Jun 19	2	2.8 - 4.5 mg/L at 25 m	Objective not met
pH 6.5 - 8.5	Bonaparte River Clinton Creek	1991	0	no data collected	Omitted 1991
pH 6.5 - 9.0	Bonaparte River: 0600329 near mouth	Jan 15-Dec 18	14	8.0 - 8.7	Objective met
	Loon Creek	1991	0	no data collected	Omitted 1991

TABLE 14

OKANAGAN VALLEY LAKES WATER QUALITY OBJECTIVES - 1991

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 25	1 1	15m: 0.029 mg/L 20-30m: 0.028 mg/L av = 0.028 mg/L	Objective met
Total-P <0.008 mg/L av at spring overturn	Kalamalka Lake: 0500246 south end	March 19	1 1 1	1-10m: 0.007 mg/L 15m: 0.006 mg/L 20-45m: 0.008 mg/L av = 0.007 mg/L	Objective met
	0500461 north end	March 19	1 1 1	1-10m: 0.008 mg/L 15m: 0.009 mg/L 20-30m: 0.007 mg/L av = 0.008 mg/L	Objective met
Total-P <0.010 mg/L av at spring overturn	Okanagan Lake: 500239 Armstrong Arm	April 10	1 1 1	0m: 0.014 mg/L 15m: 0.015 mg/L 20-45m: 0.024 mg/L av = 0.018 mg/L	Objective not met
	0500238 Vernon Arm	April 10	1 1	0 m : 0.007 mg/L 20 m : 0.006 mg/L av = 0.007 mg/L	Objective met
	0500730 north basin	March 13	1 1 1	1m: 0.005 mg/L 10-15m: 0.004 mg/L 20-45m: 0.005 mg/L av = 0.005 mg/L	Objective met
	0500236 central basin	March 20	1 1 1 1	0m: 0.005 mg/L 1-10m: 0.006 mg/L 15m: 0.007 mg/L 20-45m: 0.006 mg/L av = 0.006 mg/L	Objective met
	0500729 south basin	March 6	1 1 1	1m: 0.005 mg/L 10-15m: 0.004 mg/L 20-45m: 0.006 mg/L av = 0.005 mg/L	Objective met
Total-P <0.015 mg/L av at spring overturn	Skaha Lake 0500615 lake centre	March 7	1 1 1	1-10m: 0.013 mg/L 15m: 0.014 mg/L 20-45m: 0.017 mg/L av = 0.015 mg/L	Objective met
	Osoyoos Lake 0500249 north end	March 19	1 1	1-10m: 0.020 mg/L 20-32m: 0.021 mg/L av = 0.021 mg/L	Objective not met

TABLE 15

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10 /100 mL 90th perc. (np)	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	4 - 14/100 mL np = 12/100 mL	Objective not met
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	4 - 9/100 mL np = 6/100 mL	Objective met
	0500073 near U.S. border	Jan 2-Dec 31	26	<2 - 84/100 mL	Indefinite result
	Allison, Missezula & Osprey lakes	1991	0	no data collected	Omitted 1991
E. Coli <10/100 mL 90th perc.	Similkameen River: Princeton to border	1991	0	no data collected	Omitted 1991
Enterococci <3/100 mL 90th perc.	Similkameen River: Princeton to border	1991	0	no data collected	Omitted 1991
Suspended Solids max increase: 10 mg/L or 10%	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Substrate Sedimentation: no increase in weight of particles <3 mm dia	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Turbidity max increase: 1-5 NTU or 10%	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Tot. Cl2 Res. 0.002 mg/L max	Similkameen River : Princeton to border	1991	0	no data collected	Omitted 1991
WAD-CN <0.005 mg/L av 0.010 mg/L max	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	all <0.005 mg/L	Objectives met
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	all <0.005 mg/L	Objectives met
	0500073 near U.S. border	October 29	11	all <0.005 mg/L	Max obj. met

TABLE 15 continued

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD-CN <0.005 mg/L av 0.010 mg/L max or 20% increase	Hedley Creek	1991	0	no data collected	Omitted 1991
SAD-CN + Thiocyanate as CN 0.20 mg/L max	Similkameen River: Princeton to border	1991	0	no data collected	Omitted 1991
SAD-CN + Thiocyanate as CN 0.20 mg/L max or 20% inc.	Hedley Creek	1991	0	no data collected	Omitted 1991
Cyanate as CN 0.45 mg/L max	Similkameen River: Princeton to border	1991	0	no data collected	Omitted 1991
Cyanate as CN 0.45 mg/L max or 20% inc.	Hedley Creek	1991	0	no data collected	Omitted 1991
Total Arsenic 0.05 mg/L max or 20% increase	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	all < 0.001 mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	all < 0.001 mg/L	Objective met
Total Arsenic 0.05 mg/L max	Hedley Creek	1991	0	no data collected	Omitted 1991
Ammonia-N <1.09 mg/L av 5.68 mg/L max at pH = 8.0 temp = 15 C	Similkameen River: 0500073 near U.S. border	Jan 2-Dec 31	26	<0.005 - 0.010mg/L	Max obj. met Av not chkd.
	Hedley Creek	1991	0	no data collected	Omitted 1991
Total-P <0.020 mg/L av at spring overturn	Missezula Lake Allison Lake Osprey Lake	1991	0	no data collected	Omitted 1991
Chlorophyll-a <50 mg/m2 av	Similkameen River: Princeton to border	1991	0	no data collected	Omitted 1991

TABLE 15 continued

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll-a <100 mg/m2 av	Hedley Creek	1991	0	no data collected	Omitted 1991
Diss. Oxygen 8-11 mg/L min	Similkameen River: Princeton to border	1991	0	no data collected	Omitted 1991
pH 6.5 - 8.5	Similkameen River: 0500073 near U.S. border	Jan 2-Dec 31	26	7.6 - 8.1	Objective met
	Hedley Creek	1991	0	no data collected	Omitted 1991
Dissolved Al <0.05 mg/L av 0.10 mg/L max or 20% inc.	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Total Cr <0.002 mg/L av 0.02 mg/L max or 20% increase	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	all <0.01 mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	all < 0.01 mg/L	Max obj. met Av indef.
	Hedley Creek	1991	0	no data collected	Omitted 1991
Total Cu <0.002 mg/L av 0.005 mg/L max or 20% increase hardness = 36	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	av = 0.002 mg/L max = 0.003 mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	av = 0.002 mg/L max = 0.003 mg/L	Objectives met
Total Cu <0.002 mg/L av 0.003 mg/L max or 20% inc. hardness = 15	Hedley Creek	1991	0	no data collected	Omitted 1991
Total Fe 0.3 mg/L max or 20% increase	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	0.19 - 1.90 mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	0.20 - 1.56 mg/L max increase = 5%	Objective met
	Hedley Creek	1991	0	no data collected	Omitted 1991

TABLE 15 continued

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <0.004 mg/L av 0.022 mg/L max or 20% increase hardness = 36	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	<0.001 - 0.002mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	<0.001 - 0.001mg/L	Objectives met
Total Pb <0.004 mg/L av 0.007 mg/L max or 20% increase hardness = 15	Hedley Creek	1991	0	no data collected	Omitted 1991
Total Pb 0.8ug/g wet wt max in fish muscle	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Total Mn 0.05 mg/L max or 20% increase	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	<0.01 - 0.05 mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	<0.01 - 0.05 mg/L	Objective met
	Hedley Creek	1991	0	no data collected	Omitted 1991
Total Hg <0.02 ug/L av 0.1 ug/L max	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Total Hg 0.5ug/g wet wt max in fish muscle	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Total Mo <0.01 mg/L av 0.05 mg/L max May - Sep	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	all <0.01 mg/L	Objectives met
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	all <0.01 mg/L	Objectives met
	Hedley Creek:	1991	0	no data collected	Omitted 1991

TABLE 15 continued

SIMILKAMEEN RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Ni 0.025 mg/L max or 20% increase hardness <65	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	all <0.05 mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	all <0.05 mg/L	Objective met
	Hedley Creek	1991	0	no data collected	Omitted 1991
Total U <0.01 mg/L av 0.10 mg/L max or 20% inc.	Similkameen River: Princeton to border & Hedley Creek	1991	0	no data collected	Omitted 1991
Total Zn <0.01 mg/L av 0.03 mg/L max or 20% increase	Similkameen River: E207461 u/s Hedley	Jun 25,Jul 2, 9,16,23	5	<0.005 - 0.012mg/L	Control site
	E207463 d/s Candorado	Jun 25,Jul 2, 9,16,23	5	<0.005 - 0.010mg/L	Objectives met
	Hedley Creek	1991	0	no data collected	Omitted 1991

TABLE 16

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Susp. Solids max increase: 10 mg/L or 10%	Red Top Gulch at Hwy. Cahill Cr. at Highway	1991	0	no data collected	Omitted 1991
Susp. solids max increase: 20 mg/L or 10%	Sunset Creek: E215954 u/s Canty Pit	Jun 25,Jul 2, 9,16,23	5	1 - 15 mg/L	Control site
	E215955 d/s Canty Pit	Jun 25	1	max inc. = 13 mg/L	Obj. met
		Jul 2,9,16,23	4	inc. = 29-512 mg/L	Obj. not met
	Cahill Cr d/s tailing Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Turbidity max increase: 5 NTU or 10%	Red Top Gulch at Hwy. Cahill Cr. at Highway	1991	0	no data collected	Omitted 1991
Turbidity max increase: 10 NTU or 20%	Sunset Creek: E215954 u/s Canty Pit	Jun 25,Jul 2, 9,16,23	5	0.4 - 1.5 NTU	Control site
	E215955 d/s Canty Pit	Jun 25,Jul 16	2	inc. = 1.9-9.9 NTU	Obj. met
		Jul 2,9,23	3	inc.=17.4-49.6 NTU	Obj. not met
	Cahill Cr d/s tailing Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Diss. Solids 500 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25-Jul 9	3	504 - 560 mg/L	Obj. not met
		Jul 16,23	2	478 - 488 mg/L	Obj. met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	120 - 248 mg/L	Objective met
	Cahill Cr d/s tailing Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Sulphate < 50 mg/L av 150 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	159 - 177 mg/L av = 164 mg/L	Objectives not met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	av = 25.5 mg/L max = 36.4 mg/L	Objectives met
	Cahill Cr d/s tailing Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991

TABLE 16 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD-CN <0.005 mg/L av 0.010 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	all < 0.005 mg/L	Objectives met
		Oct 4-Dec 18	9	<0.005 - 0.006mg/L	Max obj. met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	av = 0.005 mg/L max = 0.006 mg/L	Objectives met
		Oct 24	1	0.014 mg/L	Max not met
		Oct 4-Dec 18	9	<0.005 - 0.007mg/L	Max obj. met
SAD-CN + Thiocyanate as CN 0.20 mg/L max	Red Top Gulch at Hwy. E206638	Jul 9 - Dec 4	9	<0.030-<0.036 mg/L	Objective met
	Cahill Cr. at Highway E206637	Jun 25-Dec 4	9	<0.031-<0.044 mg/L	Obj. met
		Nov 6	1	0.555 mg/L	Obj. not met
Cyanate as CN 0.45 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25-Dec 18	10	<0.05 - 0.19 mg/L	Objective met
	Cahill Cr. at Highway E206637	Jun 25-Dec 18	7	<0.05 - 0.42 mg/L	Obj. met
		Nov13 & Dec 4	2	0.75 & 0.53 mg/L	Obj. not met
Total As 0.05 mg/L max	Red Top Gulch Creek Cahill Creek	1991	0	no data collected	Omitted 1991
Total As 0.5 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Ammonia-N (dependent on pH & temp.)	Red Top Gulch at Hwy. Cahill Cr. at Highway	1991	0	no data collected	Omitted 1991
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	av = 0.008 mg/L max = 0.018 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	av = 0.010 mg/L max = 0.016 mg/L	Objectives met
Nitrite-N 1 mg/L max	Cahill Cr d/s tailing	1991	0	no data collected	Omitted 1991
Nitrite-N 10 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Nitrate-N 10 mg/L max	Red Top Gulch at Hwy. E206638	Jul 2-Jul 23	4	5.32 - 6.33 mg/L	Obj. met
		Jun 25	1	11.38 mg/L	Obj. not met

TABLE 16 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrate-N 10 mg/L max	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	2.02 - 6.64 mg/L	Objective met
Nitrate-N 100 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
pH 6.5 - 8.5	Cahill Cr. at Highway E206637	July 2	1	8.3	Obj. met
		July 9	1	9.2	Obj. not met
	Nickel Plate Mine Cr. Red Top Gulch Creek	1991	0	no data collected	Omitted 1991
Total Al 0.3 mg/L max or 20% increase at pH > 7	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	<0.01 - 0.12 mg/L	Objective met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	0.46 - 11.10 mg/L	Indef result (no control)
Total Cd 0.0002 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	all <0.0005 mg/L	Objective met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	all <0.0005 mg/L	Objective met
Total Cd 0.005 mg/L max	Cahill Cr d/s tailing	1991	0	no data collected	Omitted 1991
Total Cd 0.02 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Total Cu <0.005 mg/L av 0.007 mg/L max or 20% increase	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	all < 0.01 mg/L	Indefinite result
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	<0.01 - 0.03 mg/L	Indef result (no control)
Total Cu 0.2 mg/L max	Cahill Cr d/s tailing	1991	0	no data collected	Omitted 1991
Total Cu 0.3 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Dissolved Fe 0.3 mg/L max	Red Top Gulch at Hwy. Cahill Cr. at Highway Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991

TABLE 16 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <0.005 mg/L av 0.007 mg/L max or 20% increase	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	all < 0.1 mg/L	Indefinite result
	Cahill Cr. at Highway E206637	Jun 25,Jul 2. 9,16,23	5	all < 0.1 mg/L	Indefinite result
Total Pb 0.05 mg/L max	Cahill Cr d/s tailing	1991	0	no data collected	Omitted 1991
Total Pb 0.3 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Total Hg 0.0001mg/L max	Red Top Gulch at Hwy. Cahill Cr. at Highway	1991	0	no data collected	Omitted 1991
Total Hg 0.001 mg/L max	Cahill Cr d/s tailing	1991	0	no data collected	Omitted 1991
Total Hg 0.003 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Total Hg in fish 0.5 ug/g wet wt. (muscle) max	Red Top Gulch at Hwy. and Cahill Cr. at Highway	1991	0	no data collected	Omitted 1991
Total Mo <0.01 mg/L av 0.05 mg/L max or 20% increase (May-Sep)	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	all < 0.01 mg/L	Objectives met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 9,16,23	5	all < 0.01 mg/L	Objectives met
Total Mo 0.05 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Total Se 0.001 mg/L max or 20% inc.	Red Top Gulch at Hwy. Cahill Cr. at Highway	Jun 25,Jul 4	2	both < 0.005 mg/L	Indefinite result
Total Se 0.01 mg/L max	Cahill Cr d/s tailing	1991	0	no data collected	Omitted 1991
Total Se 0.05 mg/L max	Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Total Ag 0.0001mg/L max or 20% inc.	Red Top Gulch at Hwy. Cahill Cr. at Highway	1991	0	no data collected	Omitted 1991

TABLE 16 continued

CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Ag 0.05 mg/L max or 20% inc.	Cahill Cr d/s tailing and Nickel Plate Mine Cr.	1991	0	no data collected	Omitted 1991
Total Zn 0.05 mg/L max	Red Top Gulch at Hwy. E206638	Jun 25,Jul 2, 9,16,23	5	all < 0.01 mg/L	Objective met
	Cahill Cr. at Highway E206637	Jun 25,Jul 2, 16,23	4	<0.01 - 0.01 mg/L	Objective met
		Jul 9	1	0.07 mg/L	Obj. not met
	Nickel Plate Mine Cr.	1990	0	no data collected	Omitted 1990

TABLE 17

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np) 200/100 mL max	Bessette Creek: 0500293 u/s Lumby	Jul 11-Aug 6 Jul 11 & 25 Jul 18-Aug 6	5 2 3	np = 340/100 mL 365 & 309/100 mL 116 - 134/100 mL	np not met Max not met Max obj. met
	0500697 d/s Lumby	Jul 11-Aug 6 Jul 18-Aug 6 Jul 11	5 4 1	np = 200/100 mL 57 - 199/100 mL 202/100 mL	np not met Max obj. met Max not met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	np = 80/100 mL max = 105/100 mL	Objectives met
	0500646 d/s Riverside mill	Jul 11-Aug 6 Jul11,25,Aug6 Jul18 & Jul31	5 3 2	np = 440/100 mL 203 - 520/100 mL 12 & 155/100 mL	np not met Max not met Max obj. met
	Spider Creek 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	750 - 11200/100 mL np = 6500/100 mL	Objectives not met
E. Coli <100/100 mL 90th perc. 200/100 mL max	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,31, Aug 6	4	102 - 164/100 mL	Max obj. met Av not chkd.
	0500697 d/s Lumby	Jul 11,18,31, Aug 6	4	74 - 132/100 mL	Max obj. met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,31, Aug 6	4	32 - 69/100 mL	Max obj. met Av not chkd.
	0500646 d/s Riverside mill	Jul 11 & 18 Jul31 & Aug 6	2 2	105 & 19/100 mL 210 & 345/100 mL	Max obj. met Max not met
	Spider Creek 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	465 - 12000/100 mL np = 8000/100 mL	Objectives not met
Enterococci <25/100 mL 90th perc. 50/100 mL max	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,25, 31, Aug 6	5	91 - 705/100 mL np = 450/100 mL	Objectives not met
	0500697 d/s Lumby	Jul 11-Aug 6 Jul 31 Jul 11-Aug 6	5 1 4	np = 350/100 mL 22/100 mL 77 - 460/100 mL	np not met Max obj. met Max not met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11-Aug 6 Jul 11 & 31 Jul18,25,Aug6	5 2 3	np = 150/100 mL 22 & 43/100 mL 58 - 310/100 mL	np not met Max obj. met Max not met

TABLE 17 continued

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Enterococci <25/100 mL 90th perc. 50/100 mL max	Lawson Creek: 0500646 d/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	58 - 530/100 mL np = 400/100 mL	Objectives not met
	Spider Creek 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	220 - 8500/100 mL np = 2500/100 mL	Objectives not met
Diss. Solids 500 mg/L max or 20% increase	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	2 - 3 mg/L	Control site
	0500646 d/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	4 - 50 mg/L	Objective met
	Spider Creek: 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	6 - 10/mg/L	Objective met
Susp. Solids 10 mg/L or 10% max increase	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,25, 31, Aug 6	5	1 - 4 mg/L	Control site
	0500697 d/s Lumby	Jul 11,18,25, 31, Aug 6	5	1 - 6 mg/L	Objective met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	2 - 3 mg/L	Control site
	0500646 d/s Riverside mill	Jul18 & Aug 6 Jul 11,25,31	2 3	max inc.= 7 mg/L inc. = 11 - 48mg/L	Obj. met Obj. not met
	Spider Creek: 0500644 near mouth	Jul 11,18,25, 31 Aug 6	5	6 - 10 mg/L	Objective met
	Harris Creek: E209072 u/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	<1 - 3 mg/L	Control site
	E210219 at Bell Pole	Jul 11,18,25, 31, Aug 6	5	<1 - 6 mg/L	Objective met
Substrate Sedimentation: no increase in weight of particles <3 mm dia	Bessette Creek Lawson Creek Spider Creek Harris Creek	1991	0	no data collected collected	Objective not checked

TABLE 17 continued

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity 5 NTU or 10% max increase	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,25, 31, Aug 6	5	0.6 - 0.9 NTU	Control site
	0500697 d/s Lumby	Jul 11,18,25, 31, Aug 6	5	0.7 - 1.5 NTU	Objective met
	Lawson Creek 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	0.8 - 1.2 NTU	Control site
	0500646 d/s Riverside mill	Jul 11 Jul 18-Aug 6	1 4	13.0 NTU 1.2 - 3.6 NTU	Obj. not met Obj. met
	Spider Creek: 0500644 near mouth	Jul 18,25,31, Aug 6	4	1.2 - 2.1 NTU	Objective met
	Harris Creek: E209072 u/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	0.3 - 1.0 NTU	Control site
	E210219 at Bell Pole	Jul 11,18,25, 31, Aug 6	5	0.3 - 0.8 NTU	Objective met
Ammonia-N <1.09 mg/L av 5.68 mg/L max at pH = 8.0 temp = 15 C	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,25, 31, Aug 6	5	av = 0.011 mg/L max = 0.028 mg/L	Objectives met
	0500697 d/s Lumby	Jul 11,18,25, 31, Aug 6	5	av = 0.012 mg/L max = 0.020 mg/L	Objectives met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	av = 0.035 mg/L max = 0.042 mg/L	Objectives met
	0500646 d/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	av = 0.036 mg/L max = 0.060 mg/L	Objectives met
	Spider Creek: 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	av = 0.042 mg/L max = 0.086 mg/L	Objectives met
	Harris Creek: E209072 u/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	av < 0.007 mg/L max = 0.014 mg/L	Objectives met
	E210219 at Bell Pole	Jul 11,18,25, 31, Aug 6	5	av < 0.006 mg/L max = 0.012 mg/L	Objectives met

TABLE 17 continued

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.04 mg/L av 0.12 mg/L max Cl = 2-4 mg/L	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,25, 31, Aug 6	5	all < 0.005 mg/L	Objectives met
	0500697 d/s Lumby	Jul 11,18,25, 31, Aug 6	4	<0.005 - 0.005mg/L	Objectives met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	av = 0.014 mg/L max = 0.020 mg/L	Objectives met
	0500646 d/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	av = 0.015 mg/L max = 0.022 mg/L	Objectives met
	Spider Creek: 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	av < 0.005 mg/L max = 0.006 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max Cl < 2 mg/L	Harris Creek: E209072 u/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	all < 0.005 mg/L	Objectives met
	E210219 at Bell Pole	Jul 11,18,25, 31, Aug 6	5	all < 0.005 mg/L	Objectives met
Nitrate-N 10 mg/L max	Bessette Creek: 0500293 u/s Lumby	Jul 11,18,25, 31, Aug 6	5	<0.02 - 0.05 mg/L	Objective met
	0500697 d/s Lumby	Jul 11,18,25, 31, Aug 6	5	0.04 - 0.08 mg/L	Objective met
	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	0.58 - 0.64 mg/L	Objective met
	0500646 d/s Riverside mill	Jul 11,18,25, 31, Aug 6	5	<0.02 - 0.31 mg/L	Objective met
	Spider Creek: 0500644 near mouth	Jul 11,18,25, 31, Aug 6	5	<0.02 - 0.05 mg/L	Objective met
	Harris Creek: E209072 u/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	all < 0.02 mg/L	Objective met
	E210219 at Bell Pole	Jul 11,18,25, 31, Aug 6	5	all < 0.02 mg/L max = 0.012 mg/L	Objective met

TABLE 17 continued

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll-a 100 mg/m2 max	Bessette Creek Lawson Creek Spider Creek Harris Creek	1991	0	no data collected	Objective not checked
Colour 15 TCU max or 20% increase	Lawson Creek: 0500645 u/s Riverside mill	Aug 6	1	5 TCU	Objective met
	0500646 d/s Riverside mill	Jul25,31Aug 6 Jul 11 & 18	3 2	all = 15 TCU 20 & 50 TCU	Obj. met Indef result
	Spider Creek: 0500644 near mouth	Jul 11.18,25, 31, Aug 6	5	5 - 10 TCU	Objective met
Temperature 1 C max increase	Duteau Creek E216026 u/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	16 - 18 C	Control site
	E208041 d/s Bell Pole	Jul 11,18,25, 31, Aug 6	5	15 - 16.8 C max increase = 0 C	Objective met
pH 6.5 - 8.5 or 0.2 max increase at pH >8.5	Bessette Creek: 0500293 u/s Lumby	Jul 11	1	7.4	Objective met
	0500697 d/s Lumby	Jul 11	1	7.1	Objective met
pH 6.5 - 8.5	Lawson Creek: 0500645 u/s Riverside mill	Jul 11	1	7.4	Objective met
	Spider Creek 0500644 near mouth	Jul 11	1	5.3	Objective not met
	Harris Creek E209072 u/s Bell Pole	Jul 11	1	7.3	Objective met
Diss. Oxygen 8-11 mg/L min	Bessette Creek: 0500293 u/s Lumby	Jul 11,25, Aug 6	3	10.5 - 11.1 mg/L	Objective met
	0500697 d/s Lumby	Jul 11,25, Aug 6	3	11.0 - 12.2 mg/L	Objective met

TABLE 17 continued

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Diss. Oxygen 8-11 mg/L min	Lawson Creek: 0500645 u/s Riverside mill	Jul 11,25, Aug 6	3	3.9 - 7.5 mg/L	Objective not met
	0500646 d/s Riverside mill	Jul 25 Jul 11 & Aug6	1 2	8.0 mg/L 7.7 & 6.8 mg/L	Obj. met Obj. not met
	Spider Creek: 0500644 near mouth	Jul 11 & 25 Aug 6	2 1	9.8 & 8.9 mg/L 7.2 mg/L	Obj. met Obj. not met
	Harris Creek: E209072 u/s Bell Pole	Jul 11,Aug 6	2	11.0 - 11.2 mg/L	Objective met
	E210219 at Bell Pole	Jul 11	1	11.2 mg/L	Objective met
Resin Acids DHA: 0.013 mg/L max Total: 0.052 mg/L max at pH = 8.0	Lawson Creek: 0500645 u/s Riverside mill	Jul 25 & Aug 6	2	all <0.001mg/L DHA all <0.007mg/L Tot	Objectives met
	0500646 d/s Riverside mill	Jul 25 & Aug 6	2	all <0.001mg/L DHA all <0.007mg/L Tot	Objectives met
	Spider Creek: 0500644 near mouth	Jul 25 & Aug 6	2	all <0.001mg/L DHA all <0.007mg/L Tot	Objectives met
	Harris Creek	1991	0	no data collected	Obj not chkd
Total Chlorophenols in sediments: 0.005 ug/g max dry weight	Harris Creek: E209072 u/s Bell Pole	Aug 20	1	< 0.005 ug/g each homologue	Objective met
	E210219 at Bell Pole	Aug 20	1	< 0.005 ug/g each homologue	Objective met
Total Chlorophenols in fish: 0.1 ug/g max wet weight	Harris Creek	1991	0	no data collected	Omitted 1991
Mono-CP 0.5 ug/L max	Harris Creek	1991	0	no data collected	Omitted 1991
Di-CP 0.1 ug/L max	Harris Creek	1991	0	no data collected	Omitted 1991

TABLE 17 continued

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Tri-CP 0.05 ug/L max	Harris Creek: E209072 u/s Bell Pole	Jan 30	1	<0.1 ug/L	Indefinite result
	E210219 at Bell Pole	Jan 30	1	<0.1 ug/L	Indefinite result
Tetra-CP 0.1 ug/L max	Harris Creek: E209072 u/s Bell Pole	Jan 30	1	<0.1 ug/L	Objective met
	E210219 at Bell Pole	Jan 30	1	<0.1 ug/L	Objective met
Penta-CP 0.05 ug/L max	Harris Creek: E209072 u/s Bell Pole	Jan 30	1	<0.1 ug/L	Indefinite result
	E210219 at Bell Pole	Jan 30	1	<0.1 ug/L	Indefinite result

TABLE 18

TRIBUTARIES TO OKANAGAN LAKE NEAR WESTBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE		MEASUREMENT			CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm)	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	310 - 955/100 mL gm = 491/100 mL	Objective not met
E. Coli <77/100 mL geometric mean (gm)	Westbank Creek 0500096 at the mouth	Jul 15,24,29	3	415 - 665/100 mL	Indefinite result
Enterococci <20/100 mL geometric mean (gm)	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	314 - 1090/100 mL gm = 553/100 mL	Objective not met
Pseudomonas aeruginosa <2/100mL 75th perc (sp)	Westbank Creek	1991	0	no data collected	Objective not checked
Residual Chlorine 0.002mg/L max	Westbank Creek	1991	0	no data collected	Omitted 1991
Suspended Solids 10 mg/L or 10% max increase	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	11 - 40 mg/L	Indefinite result
Substrate Sedimentation no increase in weight of particles <3 mm dia	Westbank Creek	1991	0	no data collected	Objective not checked
Turbidity 1-5 NTU or 10% max increase	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	3.8 - 12 NTU	Indefinite result
Diss. Solids 500 mg/L max	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	94 - 116 mg/L	Objective met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	130 - 148 mg/L	Objective met
	Trepanier Creek: 0500362 near source	Jul 4,10,15, 24,29	5	84 - 104 mg/L	Objective met

TABLE 18 continued

TRIBUTARIES TO OKANAGAN LAKE NEAR WESTBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Diss. Solids 500 mg/L max	Trepanier Creek: 0500078 at the mouth	Jul 4,10,15, 24,29	5	98 - 124 mg/L	Objective met
Sodium 39 mg/L max at creek mouths May - Sep hard. = 72mg/L 270 mg/L max at other times and elsewhere at all times	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	3.0 - 4.1 mg/L	Objective met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	4.2 - 4.6 mg/L	Objective met
	Trepanier Creek: 0500362 near source	Jul 4,10,15, 24,29	5	2.2 - 2.9 mg/L	Objective met
	0500078 at the mouth	Jul 4,10,15, 24,29	5	3.2 - 4.5 mg/L	Objective met
Ammonia-N <0.700 mg/L av 3.64 mg/L max at pH = 8.2 temp = 15 C	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	<0.005 - 0.008mg/L	Objectives met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	<0.005 - 0.007mg/L	Objectives met
	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	<0.005 - 0.037mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	all <0.005 mg/L	Objectives met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	all <0.005 mg/L	Objectives met
	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	av = 0.012 mg/L max = 0.012 mg/L	Objectives met
Nitrate-N 10 mg/L max	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,28	5	all < 0.02 mg/L	Objective met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	<0.02 - 0.17 mg/L	Objective met
	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	0.83 - 2.15 mg/L	Objective met

TABLE 18 continued

TRIBUTARIES TO OKANAGAN LAKE NEAR WESTBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll-a <100 mg/m2 av	Peachland Creek 0500056 at the mouth	Aug 7	1	1.3 mg/m2	Objective met
	Westbank Creek	1991	0	no data collected	Omitted 1991
Diss. Oxygen 8-11 mg/L min	Westbank Creek 0500096 at the mouth	Jul 3,10,15, 24,29	5	9.9 - 10.8	Objective met
pH 6.5 - 9.0	Peachland Creek: 0500355 d/s Brenda Mine	Jul 2 & 9	2	7.9	Objective met
	0500056 at the mouth	Jul 3 & 10	2	8.0 & 7.4	Objective met
pH 6.5 - 8.5	Trepanier Creek: 0500362 near source	Jun 18, Jul 4 10,15,24,29	6	7.7 - 8.1	Objective met
	0500078 at the mouth	Jun 18, Jul 4 10,15,24,29	6	7.8 - 8.3	Objective met
Diss. Al <0.05 mg/L av 0.1 mg/L max or 20% increase	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	all = 0.05 mg/L	Objectives met
	0500056 at the mouth	Jul 4 - 29 Jul 4 Jul 10 - 29	5 1 4	av = 0.07 mg/L 0.14 mg/L max = 0.05 mg/L	Av not met Max not met Max obj. met
Diss. Al <0.05 mg/L av 0.1 mg/L max	Trepanier Creek: 0500362 near source	Jul 4,10,15, 24,29	5	all = 0.05 mg/L	Objectives met
	0500078 at the mouth	Jul 4 - 29 Jul 4 Jul 10 - 29	5 1 4	av = 0.06 mg/L 0.11 mg/L max = 0.05 mg/L	Av not met Max not met Max obj. met
	Westbank Creek 0500096 at the mouth	Jul 4 - 29 Jul 4 Jul 10 - 29	5 1 4	av = 0.14 mg/L 0.49 mg/L max = 0.05 mg/L	Av not met Max not met Max obj. met
Total Cu <0.003 mg/L av 0.010 mg/L max hard. = 81mg/L or 20% increase	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	<0.001 - 0.002mg/L	Objectives met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	<0.001 - 0.003mg/L	Objectives met

TABLE 18 continued

TRIBUTARIES TO OKANAGAN LAKE NEAR WESTBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.016 mg/L av 0.040 mg/L max hard.=408 mg/L	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	all < 0.01 mg/L	Objectives met
Total Mo <0.01 mg/L av 0.05 mg/L max or 20% increase (May - Sep)	Peachland Creek: 0500355 d/s Brenda Mine	Jul 4,10,15, 24,29	5	av = 0.02 mg/L max = 0.02 mg/L	Av not met Max obj. met
	0500056 at the mouth	Jul 4,10,15, 24,29	5	av = 0.02 mg/L max = 0.02 mg/L	Av not met Max obj. met
Total Mo 0.25 mg/L max	Trepanier Creek: 0500362 near source	Jul 4,10,15, 24,29	5	all <0.01 mg/L	Objective met
Total Mo <0.01 mg/L av 0.05 mg/L max (May - Sep)	Trepanier Creek: 0500078 at the mouth	Jul 4,10,15 24,29	5	all <0.01 mg/L	Objectives met
Total Fe 0.3 mg/L max	Westbank Creek 0500096 at the mouth	Jul 4 - 24 Jul 29	4 1	0.33 - 1.28 mg/L 0.27 mg/L	Obj. not met Obj. met
Total Zn 0.03 mg/L max	Westbank Creek 0500096 at the mouth	Jul 4,10,15, 24,29	5	<0.01 - 0.01 mg/L	Objective met

TABLE 19

TRIBUTARIES TO OKANAGAN LAKE NEAR KELOWNA WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100/100 mL 90th perc. (np)	Mission Creek: E209637 at E Kelowna Bridge	Jul 30, Aug 7 14,21,29	5	28 - 135/100 mL np = 80/100 mL	Objective met
	0500046 at the mouth	Jul 30, Aug 7 14,21,29	5	35 - 199/100 mL np = 120/100 mL	Objective not met
	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	190 - 725/100 mL np = 550/100 mL	Objective not met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	260 - 2000/100 mL np = 1950/100 mL	Objective not met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	270 - 910/100 mL np = 650/100 mL	Objective not met
E. Coli <100/100 mL 90th perc. (np)	Mission Creek: E209637 at E Kelowna Bridge	Jul 30, Aug 7 14,21,29	5	35 - 155/100 mL np = 95/100 mL	Objective met
	0500046 at the mouth	Jul 30, Aug 7 14,21,29	5	31 - 205/100 mL np = 130/100 mL	Objective not met
	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	120 - 735/100 mL np = 550/100 mL	Objective not met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	255 - 2350/100 mL np = 2100/100 mL	Objective not met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	265 - 915/100 mL np = 550/100 mL	Objective not met
Enterococci <25/100 mL 90th perc. (np)	Mission Creek E209637 at E Kelowna Bridge	Jul 30, Aug 7 14,21,29	5	31 - 2450/100 mL np = 800/100 mL	Objective not met
	0500046 at the mouth	Jul 30, Aug 7 14,21,29	5	76 - 885/100 mL np = 450/100 mL	Objective not met
	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	120 - 845/100 mL np = 830/100 mL	Objective not met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	196 - 1650/100 mL np = 1400/100 mL	Objective not met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	52 - 1160/100 mL np = 700/100 mL	Objective not met

TABLE 19 continued

TRIBUTARIES TO OKANAGAN LAKE NEAR KELOWNA WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Specific Conductivity 1200 uS/cm max (May - Sep)	Brandt's Creek: E208958	Jul 30, Aug 7 14,21,29	5	2190 - 2720 uS/cm	Objective not met
	0500009 at the mouth	Feb 27,Jul 30 Aug7,14,21,29	6	1260 - 2300 uS/cm	Objective not met
Ammonia-N <0.700 mg/L av 3.64 mg/L max at pH = 8.2 temp = 15 C	Mission Creek: E209637 at E Kelowna Bridge	Jul 30, Aug 7 14,21,29	5	all < 0.005 mg/L	Objectives met
	0500046 at the mouth	Jul 30, Aug 7 14,21,29	5	<0.005 - 0.008mg/L	Objectives met
	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	av = 0.014 mg/L max = 0.023 mg/L	Objectives met
		Feb 6 & Apr 1	2	0.380 & 0.011 mg/L	Max obj. met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	av = 0.026 mg/L max = 0.051 mg/L	Objectives met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	av = 0.015 mg/L max = 0.027 mg/L	Objectives met
		Feb 6 & 13	2	0.303 & 0.038 mg/L	Max obj. met
Nitrite-N <0.02 mg/L av 0.06 mg/L max Cl < 2 mg/L	Mission Creek: E209637 at E Kelowna Bridge	Jul 30, Aug 7 14,21,29	5	<0.005 - 0.006mg/L	Objectives met
	0500046 at the mouth	Jul 30, Aug 7 14,21,29	5	all < 0.005 mg/L	Objectives met
Nitrite-N <0.20 mg/L av 0.60 mg/L max Cl > 10 mg/L	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	<0.005 - 0.006mg/L	Objectives met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	av = 0.022 mg/L max = 0.027 mg/L	Objectives met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	av = 0.017 mg/L max = 0.022 mg/L	Objectives met
Chlorophyll-a <100 mg/m2 av	Mission Creek: E209637 at E Kelowna Bridge	Aug 7	2	32.4 - 227 mg/m2 av = 130 mg/m2	Objective not met

TABLE 19 continued

TRIBUTARIES TO OKANAGAN LAKE NEAR KELOWNA WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll-a <100 mg/m2 av	Mission Creek 0500046 at the mouth	Aug 7	2	47.3 - 2.3 mg/m2 av = 25 mg/m2	Objective met
	Kelowna Creek 0500039 at the mouth	Aug 7	1	7.0 mg/m2	Objective met
Diss. Oxygen 8-11 mg/L min	Mission Creek: E209637 at E Kelowna Bridge	Jul 30, Aug 7 14,21,29	5	11.9 - 13.0 mg/L	Objective met
	0500046 at the mouth	Jul 30, Aug 7 14,21,29	5	10.9 - 13.1 mg/L	Objective met
	Kelowna Creek: E209638 at Hereron Road	Feb 6,Jul 30, Aug7,14,21,29	6	10.3 - 14.0 mg/L	Objective met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	11.0 - 12.2 mg/L	Objective met
	0500039 at the mouth	Feb 6,Jul 30, Aug7,14,21,29	6	9.2 - 10.6 mg/L	Objective met
pH 6.5 - 9.0	Mission Creek	1991	0	no data collected	Objective not checked
pH 6.5 - 8.5	Kelowna Creek: E209638 at Hereron Road	Feb 6	1	7.5	Objective met
	0500039 at the mouth	Feb 6	1	7.8	Objective met
Diss. Al 0.1 mg/L max or 20% increase	Kelowna Creek: E209638 at Hereron Road	Feb 6,Jul 30, Aug7,14,21,29	6	0.04 - 0.05 mg/L	Objective met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	all = 0.05 mg/L	Objective met
	0500039 at the mouth	Feb 6,Jul 30, Aug7,14,21,29	6	0.03 - 0.05 mg/L	Objective met

TABLE 19 continued

TRIBUTARIES TO OKANAGAN LAKE NEAR KELOWNA WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.009 mg/L av 0.024 mg/L max or 20% increase hard.= 234mg/L	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	av = 0.002 mg/L max = 0.003 mg/L	Objectives met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	av = 0.002 mg/L max = 0.005 mg/L	Objectives met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	av = 0.002 mg/L max = 0.003 mg/L	Objectives met
Total Pb <0.013 mg/L av 0.241 mg/L max or 20% increase hard.= 234mg/L	Kelowna Creek: E209638 at Hereron Road	Jul 30, Aug 7 14,21,29	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	av < 0.001 mg/L max = 0.001 mg/L	Objectives met
	0500039 at the mouth	Jul 30, Aug 7 14,21,29	5	av = 0.001 mg/L max = 0.002 mg/L	Objectives met
Total Pb 0.8ug/g wet wt max in fish muscle	Kelowna Creek	1991	0	no data collected	Omitted 1991
Total Zn 0.1 mg/L max or 20% increase	Kelowna Creek: E209638 at Hereron Road	Feb 6,Jul 30, Aug7,14,21,29	6	0.005 - 0.060 mg/L	Objective met
	E215986 d/s feedlot	Jul 30, Aug 7 14,21,29	5	<0.005 - 0.090mg/L	Objective met
	0500039 at the mouth	Feb 6-Aug 29	7	<0.005 - 0.070mg/L	Objective met

TABLE 20

HYDRAULIC CREEK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity 5 NTU max	0500658 Hydraulic Lake outlet	May 28-Oct 8	17	0.8 - 2.8 NTU	Objective met
	E215840 at SEKID intake	May 28-Oct 8	17	0.8 - 2.9 NTU	Objective met
Turbidity 10 NTU max	E215842 near headwaters	May 28-Sep 24	15	0.3 - 3.8 NTU	Objective met
	E215841 u/s Hydraulic Lake	May 28-Oct 8	17	1.5 - 6.1 NTU	Objective met
Suspended Solids 20 mg/L max	E215841 u/s Hydraulic Lake	May 28-Oct 8	17	2 - 18 mg/L	Objective met
	E215840 at SEKID intake	May 28-Oct 8	17	4 - 13 mg/L	Objective met
Temperature 18 C max	E215842 near headwaters	Jun 25-Oct 15	14	4.4 - 16.7 C	Objective met
	E215841 u/s Hydraulic Lake	Jun 25-Oct 15	16	5.5 - 15.5 C	Objective met
	0500658 Hydraulic Lake outlet	Jun 25-Oct 15 Aug 13 - 20	14 2	10.0 - 17.8 C 18.3 - 18.9 C	Obj. met Obj. not met
	E215840 at SEKID intake	May 28-Sep 3	10	9 - 16 C	Objective met
Fecal Coliforms 10/100 mL 90th perc. (np)	E215840 at SEKID intake	Jun 4,11,25, Jul 2,9	5	1 - 9/100 mL np = 7/100 mL	Objective met
		Jul 9,15,22, 30, Aug 13	5	2 - 11/100 mL np = 9/100 mL	Objective met
		Aug 27, Sep 3 10,17,24	5	<2 - 14/100 mL np = 6/100 mL	Objective met
E. Coli 10/100 mL 90th perc.	Hydraulic Creek	1991	0	no data collected	Omitted 1991
Enterococci 3/100 mL 90th perc.	Hydraulic Creek	1991	0	no data collected	Omitted 1991

TABLE 21

COLUMBIA AND WINDERMERE LAKES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc (np) near water intakes	Windermere Lake water intake sites	1991	0	no data collected	Omitted 1991
	Columbia Lake water intake sites	1991	0	no data collected	Omitted 1991
Fecal Coliforms <200/100 mL geometric mean (gm) at beaches	Windermere Lake: E216027 Holland Creek mouth	Jul 17,23,30, Aug 8,12	5	1 - 24/100 mL gm = 3/100 mL	Objective met
	E216064 Timber Ridge	Jul 17,23,30, Aug 8,12	5	1 - 3/100 mL gm = 2/100 mL	Objective met
	Columbia Lake beaches	1991	0	no data collected	Omitted 1991
Turbidity <1 NTU av 5 NTU max during non-freshet	Windermere Lake Columbia Lake water intake sites	1991	0	no data collected	Omitted 1991
Total-P <0.010 mg/L av at spring overturn	Windermere Lake	1991		no data collected	Objective not checked
Total-P <0.008 mg/L av at spring overturn	Columbia Lake	1991	0	no data collected	Objective not checked

TABLE 22

UPPER COLUMBIA RIVER WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <10/100 mL 90th perc. (np)	Columbia River: 0200232 u/s Radium	Jul 17,23,30, Aug 8,12	5	2 - 231/100 mL np = 100/100 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 17,23,30, Aug 8,12	5	2 - 9/100 mL gm = 4/100 mL np = 6/100 mL	Objectives met

TABLE 23

COLUMBIA RIVER FROM KEENLEYSIDE TO BIRCHBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 10 mg/L min	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17 Oct 1	4 1	11.6 - 15.4 mg/L 9.4 mg/L	Obj. met Obj. not met
	E216155 400 m d/s Celgar	Oct 29-Nov 26	2	13.5 - 13.0 mg/L	Objective met
	0200200 400 m u/s Kootenay	Sep 3-Dec 17 Oct 1	4 1	11.6 - 13.3 mg/L 9.5 mg/L	Obj. met Obj. not met
	0200003 at Birchbank	Sep 17-Dec 17 Sep 3-Oct 1	9 2	11.5 - 13.1 mg/L 9.4 - 9.8 mg/L	Obj. met Obj. not met
pH 6.5 - 8.5	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	5	7.1 - 8.0	Objective met
	E216155 400 m d/s Celgar	Sep 3-Dec 17	5	7.1 - 7.7	Objective met
	0200200 400 m u/s Kootenay	Sep 3-Dec 17	5	7.3 - 8.1	Objective met
	0200003 at Birchbank	Sep 3-Dec 17	26	7.1 - 8.1	Objective met
Colour 15 TCU max	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	5	all = 5 TCU	Objective met
	E216155 400 m d/s Celgar	Sep 3-Dec 17	5	all = 5 TCU	Objective met
	0200200 400 m u/s Kootenay	Sep 3-Dec 17	5	all = 5 TCU	Objective met
	0200003 at Birchbank	Sep 3-Nov 26	6	all = 5 TCU	Objective met
Suspended Solids 10 mg/L max increase	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	5	1 - 2 mg/L	Control site
	E216155 400 m d/s Celgar	Sep 3-Dec 17	5	1 - 2 mg/L	Objective met
	0200200 400 m u/s Kootenay	Sep 3-Dec 17	5	1 - 2 mg/L	Objective met
	0200003 at Birchbank	Sep 3-Dec 17	14	1 - 2 mg/L	Objective met

TABLE 23 continued

COLUMBIA RIVER FROM KEENLEYSIDE TO BIRCHBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity 5 NTU max increase	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	5	0.3 - 0.5 NTU	Control site
	E216155 400 m d/s Celgar	Sep 3-Dec 17	5	0.4 - 1.3 NTU	Objective met
	0200200 400 m u/s Kootenay	Sep 3-Dec 17	5	0.3 - 0.8 NTU	Objective met
	0200003 at Birchbank	Sep 3-Nov 26	15	0.3 - 1.7 NTU	Objective met
Sediment TOC no increase u/s to d/s at 95% confidence	Columbia River	1991	0	no data collected	Objective not checked
Dissolved Gas < 110% max	Columbia River at Robson 3.5 km d/s Celgar	Jan 27-Apr 30	32	98.1 - 103.7 %	Objective met
		Jan 1-Jan 23 Sep 10-Oct 31	11 49	115.0 - 117.5 % 113.9 - 132.5 %	Objective not met
Fecal Coliforms <100/100 mL 90th perc. (np)	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	5	all < 2/100 mL	Indefinite result
	E216155 400 m d/s Celgar	Sep 3-Dec 17	5	<2 - 4/100 mL	Indefinite result
	0200200 400 m u/s Kootenay	Sep 3-Dec 17	5	<2 - 4/100 mL	Indefinite result
	0200003 at Birchbank	Sep 3-Dec 17	13	<2 - 4/100 mL	Indefinite result
E. Coli <100/100 mL 90th perc. (np)	Columbia River: 0200183 3 km u/s Celgar	Oct 29-Dec 17	3	all < 2/100 mL	Indefinite result
	E216155 400 m d/s Celgar	Oct 29-Dec 17	3	all < 2/100 mL	Indefinite result
	0200200 400 m u/s Kootenay	Oct 29-Dec 17	3	1 - 3/100 mL	Indefinite result
	0200003 at Birchbank	Oct 29-Dec 17	3	<2 - 4/100 mL	Indefinite result

TABLE 23 continued

COLUMBIA RIVER FROM KEENLEYSIDE TO BIRCHBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Toxicity %mill effluent in river <0.05*96-hLC50 = 0.28 - 3.30%	Columbia River d/s Celgar	Jan 22-Dec 17	18	% mill effluent in river = 0.04 - 0.38 %	Objective met
Chlorophenols <50 ng/L tri <100ng/L tetra <50 ng/L penta	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	4 4 4	tri 1.1-2.8 ng/L tetra 1.5-0.6 ng/L penta 0.2-1.0 ng/L	Objectives met
	E216155 400 m d/s Celgar	Sep 3-Dec 17	9 9 9	tri 1.4-15.2 ng/L tetra 0.8-3.5 ng/L penta 0.2-4.0 ng/L	Objectives met
	0200200 400 m u/s Kootenay	Sep 3-Dec 17	5 5 5	tri 1.4-14.2 ng/L tetra 0.6-5.1 ng/L penta 0.2-4.0 ng/L	Objectives met
	0200003 at Birchbank	Sep 3-Dec 17	4 4 4	tri 2.2-9.0 ng/L tetra 0.9-2.5 ng/L penta 0.2-0.5 ng/L	Objectives met
Dioxins/Furans 1pg/g TCDD TEQ max in fish (wet weight)	Columbia River Genelle 2 km u/s Birchbank	January	6	20 - 77 pg/g (mountain whitefish)	Objective not met
Dioxins/Furans 0.2 pg/L TCDD TEQ max in water	Columbia River: 0200183 3 km u/s Celgar	Oct 1	1	< 1.7 pg/L	Indefinite result
	E216155 400 m d/s Celgar	Oct 1	1	< 1.5 pg/L	Indefinite result
	0200200 400 m u/s Kootenay	Oct 1	1	< 1.7 pg/L	Indefinite result
	0200003 at Birchbank	Oct 1	1	< 1.9 pg/L	Indefinite result
Dioxins/Furans 0.7 pg/g TCDD TEQ max in seds	Columbia River	1991	0	no data collected	Omitted 1991

TABLE 23 continued

COLUMBIA RIVER FROM KEENLEYSIDE TO BIRCHBANK WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Resin Acids 12 ug/L abiet 45 ug/L total max at pH = 7.5	Columbia River: 0200183 3 km u/s Celgar	Sep 3-Dec 17	5 5	abiet:all < 1 ug/L total:all < 7 ug/L	Objectives met
	E216155 400 m d/s Celgar	Sep 3-Dec 17	5 5	abiet:all < 1 ug/L total:all < 7 ug/L	Objectives met
	0200200 400 m u/s Kootenay	Oct 1-Dec 17	4 4	abiet:all < 1 ug/L total:all < 7 ug/L	Objectives met
	0200003 at Birchbank	Sep 3-Dec 17	6 6	abiet:all < 1 ug/L total:all < 7 ug/L	Objectives met
Chlorinated Resin Acids 6 ug/L max of mono Cl-DHA & di CL-DHA	Columbia River: 0200183 3 km u/s Celgar	Oct 1-Dec 17	4 4	Cl-DHA all<1 ug/L Cl2-DHA all<1 ug/L	Objectives met
	E216155 400 m d/s Celgar	Oct 1-Dec 17	4 4	Cl-DHA all<1 ug/L Cl2-DHA all<1 ug/L	Objectives met
	0200200 400 m u/s Kootenay	Oct 1-Dec 17	4 4	Cl-DHA all<1 ug/L Cl2-DHA all<1 ug/L	Objectives met
	0200003 at Birchbank	Oct 1-Nov 26	4 4	Cl-DHA all<1 ug/L Cl2-DHA all<1 ug/L	Objectives met
Chlorophyll-a <50 mg/m2 av	Columbia River	1991	0	no data collected	Omitted 1991

TABLE 24

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

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 14-Sep 10	9	20 - 140/100 mL	Max obj. met
	GVRD 14 nr. Brunette R confl.	May 14-Sep 10	9	20 - 170/100 mL	Max obj. met
	GVRD 13 u/s Pattullo Bridge	May 14-Sep 10	9	<20 - 230/100 mL	Max obj. met
	0300005 at Pattullo Bridge	Sep 17,24, Oct 1,9,14	5	24 - 1610/100 mL gm = 81/100 mL	Objectives met
	GVRD 12 d/s Pattullo Bridge	May 14-Sep 10	9	20 - 300/100 mL	Max obj. met
	Main Arm: GVRD 1 u/s Annacis	Apr 25-Aug 9	3	40 - 230/100 mL	Max obj. met
	0301308 u/s Annacis	Sep 17-Oct 14 Oct 14 Sep 17-Oct 9	5 1 4	gm = 555/100 mL 9050/100 mL 41 - 855/100 mL	gm obj. met Max not met Max obj. met
	GVRD 2 d/s Annacis	Jun 7 - Aug 9 Apr 25	2 1	20 - 40/100 mL 13000/100 mL	Max obj. met Max not met
	0301311 d/s Annacis	Sep 17-Oct 14 Sep24 & Oct14 Sep 17-Oct 9	5 2 3	gm = 1330/100 mL 6160 - 15000/100mL 46 - 2150/100 mL	gm not met max not met Max obj. met
	GVRD 3 12 km d/s Annacis	Apr 25-Aug 9	3	300 - 1700/100 mL	Max obj. met
	GVRD 4 d/s Lulu	Apr 25-Aug 9	3	80 - 2200/100 mL	Max obj. met
	GVRD 5 d/s Steveston	Apr 25-Aug 9	3	110 - 3000/100 mL	Max obj. met
	North Arm: E207398 u/s Scott Paper	Sep 17,24, Oct 1,9,14	5	42 - 2900/100 mL gm = 261/100 mL	Objectives met
	GVRD 11 Queensborough Bridge	May 14-Sep 10	9	<20 - 170/100 mL	Max obj. met
	GVRD 10 ~5 km d/s Belkin	May 14-Sep 10	9	70 - 170/100 mL	Max obj. met

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <1000/100 mL geometric mean (gm) 4000/100mL max Apr - Oct	North Arm: GVRD 9 Mitchell Island	May 14-Sep 10	10	<20 - 300/100 mL	Max obj. met
	GVRD 7 Oak Street Bridge	May 14-Sep 10	8	20 - 220/100 mL	Max obj. met
	0300002 Oak Street Bridge	Sep 17,24, Oct 1,9,14	5	169 - 765/100 mL gm = 468/100 mL	Objectives met
	GVRD 6 Wood Island east	May 14-Sep 10	8	40 - 500/100 mL	Max obj. met
	GVRD 5 Wood Island west	May 14-Sep 10	8	40 - 500/100 mL	Max obj. met
	GVRD 1,2,3,4 North Arm jetty	May 14-Sep 10	36	<20 - 230/100 mL	Max obj. met
	Middle Arm: GVRD 8 at North Arm entrance	May 14-Sep 10	8	<20 - 140/100 mL	Max obj. met
	E207601 100 m d/s North Arm	Sep 17,24, Oct 1,9,14	5	43 - 610/100 mL gm = 229/100 mL	Objectives met
	E207600 at Dinsmore Bridge	Sep 17,24, Oct 1,9,14	5	208 - 640/100 mL gm = 385/100 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 11-Jul 16 Jul 26-Aug 28	 6 6	 gm = 28/100 mL gm = 68/100 mL	 Obj. met Obj. met
	GVRD 6	Jun 5-Jul 5 Jul 26-Aug 28	6 6	gm = 36/100 mL gm = 68/100 mL	Obj. met Obj. met
	GVRD 8	Jun 5-Jul 5 Jul 26-Aug 28	6 6	gm = 25/100 mL gm = 53/100 mL	Obj. met Obj. met
	GVRD 10	Jun 5-Jul 5 Jul 16-Aug 13	6 6	gm = 28/100 mL gm = 66/100 mL	Obj. met Obj. met
	GVRD 12	Jun 5-Jul 5 Jul 26-Aug 28	6 6	gm = 25/100 mL gm = 129/100 mL	Obj. met Obj. met
	GVRD 14	Jun 5-Jul 5 Jul 26-Aug 28	6 6	gm = 25/100 mL gm = 40/100 mL	Obj. met Obj. met

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm) Jun - Aug at beaches	Tsawwassen Beach: GVRD 1 Causeway-north, 0 km	Jun 24,28, Jul 5,19,26	5	gm = 26/100 mL	Objective met
	GVRD 2 Causeway-north, 2 km	Jun 24,28, Jul 5,19,26	5	gm = 43/100 mL	Objective met
	GVRD 3 Causeway-north, 3 km	Jun 24,28, Jul 5,19,26	5	gm < 20/100 mL	Objective met
Susp. Solids max increase: 10 mg/L or 10%	North Arm 0300002 Oak Street Bridge	Mar 10	1	10 mg/L	Objective met
	Middle Arm E207601 100 m d/s North Arm	Mar 3	1	61 mg/L	Indefinite result
Total Cl2 Res. 0.002 mg/L max	Main Arm	1991	0	no data collected	Omitted 1991
Ammonia-N <1.09 mg/L av 5.7 mg/L max at pH = 8.0 temp = 15 C	Main Arm: GVRD 1 u/s Annacis	Feb 27-Dec 23	6	0.02 - 0.11 mg/L	Max obj. met Av not chkd.
	0301308 u/s Annacis	Mar 10	1	0.051 mg/L	Max obj. met
	0301311 d/s Annacis	Mar 10	1	0.046 mg/L	Max obj. met
	GVRD 2 d/s Annacis	Feb 27-Dec 23	6	0.04 - 0.11 mg/L	Max obj. met
	GVRD 3 12 km d/s Annacis	Feb 27-Dec 23	6	0.05 - 0.12 mg/L	Max obj. met
	GVRD 4 d/s Lulu	Feb 27-Dec 23	6	0.06 - 0.12 mg/L	Max obj. met
	GVRD 5 d/s Steveston	Feb 27-Dec 23	6	0.06 - 0.14 mg/L	Max obj. met
	North Arm 0300002 Oak Street Bridge	Mar 10	1	0.038 mg/L	Max obj. met Av not chkd.
	Middle Arm E207601 100 m d/s North Arm	Mar 3	1	0.049 mg/L	Max obj. met Av not chkd.

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.09 mg/L av 5.7 mg/L max	Sturgeon Bank Roberts Bank	1991	0	no data collected	Omitted 1991
Dissolved Oxygen 7.75 mg/L min	Main Stem: GVRD 15 Sapperton Channel	May 14,Jun 5	2	11.0 - 11.3 mg/L	Objective met
	GVRD 14 nr. Brunette R confl.	May 28,Jun 28	2	10.7 - 11.1 mg/L	Objective met
	GVRD 13 u/s Pattullo Bridge	May 1,Jun 5	2	11.1 - 11.2 mg/L	Objective met
	0300005 d/s Pattullo Bridge	Mar 3-Mar 27	5	12.4 - 13.8 mg/L	Objective met
	GVRD 12 d/s Pattullo Bridge	May 28,Jun 28	2	10.5 - 11.5 mg/L	Objective met
	Main Arm: GVRD 1 u/s Annacis	Feb 27-Dec 23	6	9.2 - 13.0 mg/L	Objective met
	0301308 u/s Annacis	Mar 3-Mar 27	5	12.6 - 13.6 mg/L	Objective met
	0301311 d/s Annacis	Mar 3-Mar 27	5	12.5 - 13.4 mg/L	Objective met
	GVRD 2 d/s Annacis	Feb 27-Dec 23	6	9.3 - 13.0 mg/L	Objective met
	GVRD 3 12 km d/s Annacis	Feb 27-Dec 23	6	9.0 - 12.4 mg/L	Objective met
	GVRD 4 d/s Lulu	Feb 27-Dec 23	6	9.0 - 12.0 mg/L	Objective met
	GVRD 5 d/s Steveston	Feb 27-Dec 23	6	9.2 - 11.7 mg/L	Objective met
	North Arm: GVRD 11 Queensborough Bridge	May 14-Jun 5	2	10.7 - 10.9 mg/L	Objective met
	E207398 u/s Scott Paper	Mar 3-Mar 27	5	12.3 - 13.2 mg/L	Objective met
	GVRD 10 ~5 km d/s Belkin	May 28,Jun 28	2	10.5 - 11.2 mg/L	Objective met

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 7.75 mg/L min	North Arm: GVRD 9 Mitchell Island	May 14,Jun 5	2	10.9 - 11.0 mg/L	Objective met
	GVRD 7 Oak Street Bridge	May 14-Jun 5	2	10.8 - 11.0 mg/L	Objective met
	0300002 Oak Street Bridge	Mar 3-Mar 27	5	12.2 - 13.2 mg/L	Objective met
	GVRD 6 Sea Island-east	May 28,Jun 28	2	10.4 - 10.8 mg/L	Objective met
	GVRD 5 Sea Island-west	May 14,Jun 5	2	10.7 mg/L	Objective met
	Middle Arm: GVRD 8 at North Arm entrance	May 28,Jun 28	2	10.5 - 11.1 mg/L	Objective met
	E207601 100 m d/s North Arm	Mar 3-Mar 27	5	12.2 - 12.8 mg/L	Objective met
	E207600 at Dinsmore Bridge	Mar 3-Mar 27	5	12.0 - 12.6 mg/L	Objective met
Diss. Oxygen 9.0 mg/L min	Sturgeon Bank Roberts Bank	1991	0	no data collected	Objective not checked
pH 6.5 - 8.5	Main Stem: 0300005 d/s Pattullo Bridge	Mar 3-Mar 21	3	6.6 - 7.0	Obj. met
		Mar 27	1	6.4	Obj. not met
	Main Arm: GVRD 1 u/s Annacis	Feb 27-Dec 23	6	7.1 - 7.9	Objective met
	0301308 u/s Annacis	Mar 3-Mar 27	4	6.6 - 7.1	Objective met
	0301311 d/s Annacis	Mar 3-Mar 27	3	6.7 - 6.8	Obj. met
		Mar 21	1	6.4	Obj. not met
	GVRD 2 d/s Annacis	Feb 27-Dec 23	6	7.2 - 7.9	Objective met
	GVRD 3 12 km d/s Annacis	Feb 27-Dec 23	6	7.3 - 7.9	Objective met

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	Main Arm: GVRD 4 d/s Lulu	Feb 27-Dec 23	6	7.3 - 7.9	Objective met
	GVRD 5 d/s Steveston	Feb 27-Dec 23	6	7.5 - 7.9	Objective met
	North Arm: E207398 u/s Scott Paper	Mar 3-Mar 21	3	6.6 - 7.0	Obj. met
		Mar 27	1	6.4	Obj. not met
	0300002 Oak Street Bridge	Mar 3-Mar 21	3	6.8 - 7.3	Obj. met
		Mar 27	1	6.3	Obj. not met
	Middle Arm: E207601 100 m d/s North Arm	Mar 3-Mar 21	3	6.6 - 7.2	Obj. met
		Mar 27	1	6.4	Obj. not met
	E207600 at Dinsmore Bridge	Mar 3-Mar 27	5	6.5 - 7.1	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 27-Dec 23	6	<0.001 - 0.002mg/L (Dissolved Cu)	Control site
	0301308 u/s Annacis	Mar 10	1	0.003 mg/L (Total Cu)	Control site
	0301311 d/s Annacis	Mar 10	1	0.01 mg/L (Total Cu)	Max not met
	GVRD 2 d/s Annacis	Feb 27-Dec 23	6	<0.001 - 0.004mg/L (Dissolved Cu)	Indefinite results
	GVRD 3 12 km d/s Annacis	Feb 27-Dec 23	6	<0.001 - 0.002mg/L (Dissolved Cu)	Indefinite results
	GVRD 4 d/s Lulu	Feb 27-Dec 23	6	<0.001 - 0.002mg/L (Dissolved Cu)	Indefinite results
	GVRD 5 d/s Steveston	Feb 27-Dec 23	6	0.001 - 0.004 mg/L (Dissolved Cu)	Indefinite results
	North Arm: 0300002 Oak Street Bridge	Mar 10	1	0.002 mg/L (Total Cu)	Max obj. met Av not chkd.

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.004 mg/L av 0.006 mg/L max	Middle Arm E207601 100 m d/s North Arm	Mar 3	1	0.005 mg/L (Total Cu)	Max obj. met Av not chkd.
Total Pb <0.003 mg/L av 0.010 mg/L max	Main Arm: GVRD 1 u/s Annacis	Feb 27-Dec 23	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite results
	0301308 u/s Annacis	Mar 10	1	<0.001 mg/L (Total Pb)	Max obj. met Av not chkd.
	0301311 d/s Annacis	Mar 10	1	0.002 mg/L (Total Pb)	Max obj. met
	GVRD 2 d/s Annacis	Feb 2&-Dec 23	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite results
	GVRD 3 12 km d/s Annacis	Feb 27-Dec 23	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite results
	GVRD 4 d/s Lulu	Feb 27-Dec 23	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite results
	GVRD 5 d/s Steveston	Feb 27-Dec 23	6	all < 0.001 mg/L (Dissolved Pb)	Indefinite results
	North Arm 0300002 Oak Street Bridge	Mar 10	1	<0.001 mg/L (Total Pb)	Max obj. met Av not chkd.
	Middle Arm E207601 100 m d/s North Arm	Mar 3	1	<0.001 mg/L (Total Pb)	Max obj. met Av not chkd.
Total-Zn <0.050 mg/L av 0.100 mg/L max	Main Arm: GVRD 1 u/s Annacis	Feb 27-Dec 23	6	<0.001 - 0.002mg/L (Dissolved Zn)	Indefinite results
	0301308 u/s Annacis	Mar 10	1	<0.005 mg/L (Total Zn)	Max obj. met Av not chkd.
	0301311 d/s Annacis	Mar 10	1	<0.005 mg/L (Total Zn)	Max obj. met
	GVRD 2 d/s Annacis	Feb 27-Dec 23	6	<0.001 - 0.003mg/L (Dissolved Zn)	Indefinite results
	GVRD 3 12 km d/s Annacis	Feb 27-Dec 23	6	<0.001 - 0.002mg/L (Dissolved Zn)	Indefinite results

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn <0.050 mg/L av 0.100 mg/L max	Main Arm: GVRD 4 d/s Lulu	Feb 27-Dec 23	6	all < 0.001 mg/L (Dissolved Zn)	Indefinite results
	GVRD 5 d/s Steveston	Feb 27-Nov 14	5	all < 0.001 mg/L (Dissolved Zn)	Indefinite results
	North Arm 0300002 Oak Street Bridge	Mar 10	1	<0.005 mg/L (Total Zn)	Max obj. met Av not chkd.
	Middle Arm E207601 100 m d/s North Arm	Mar 3	1	0.015 mg/L (Total Zn)	Max obj. met Av not chkd.
Chlorophenols (tri + tetra + penta) in water 0.0002mg/L max	Main Stem Main Arm North Arm Middle Arm	1991	0	no data collected	Omitted 1991
Chlorophenols (tri + tetra + penta) in sediments 0.01 ug/g max (dry weight)	Main Arm: Gunderson Slough (FHC sites 4,5,6,7,8)	Jul 16	5	all < 0.005 ug/g for each homologue except sites 4 & 5 tetra = 0.005 ug/g	Objective met
	N end Tilbury Island E206970 (FHC sites 4,5,6 u/s 1,2,3 d/s Chatterton)	Jul 16	7	all < 0.005 ug/g for each homologue except site 2 tetra = 0.007 ug/g	Objective met
	Tilbury Slough FHC site 7 at centre	Jul 16	1	all < 0.005 ug/g for each homologue	Objective met
	North Arm (FHC sites 1,3 u/s, 4 across, 2 d/s Belkin)	Jul 16	4	all < 0.005 ug/g for each homologue	Objective met
	Main Stem Middle Arm Sturgeon Bank Roberts Bank	1991	0	no data collected	Omitted 1991
Chlorophenols (tri + tetra + penta) in fish 0.10 ug/g max (wet weight)	Main Stem Main Arm North Arm	1991	0	no data collected	Omitted 1991

TABLE 24 continued

FRASER RIVER (KANAKA CREEK TO THE MOUTH) WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
PCBs in sediments 0.03 ug/g max (dry weight)	Main Arm: Gunderson Slough FHC sites 4,5	Jul 16	2	0.064 - 0.081 ug/g	Objective not met
	Gunderson Slough FHC sites 6,7,8	Jul 16	3	<0.01 - 0.024 ug/g	Objective met
	N end Tilbury Island E206970 (FHC sites 4,5,6 u/s 1,2,3 d/s Chatterton)	Jul 16	7	all < 0.010 ug/g	Objective met
	Tilbury Slough FHC site 7 at centre	Jul 16	1	< 0.010 ug/g	Objective met
	North Arm (FHC sites 1,3 u/s, 4 across, 2 d/s Belkin)	Jul 16	4	all < 0.010 ug/g	Objective met
	Main Stem Middle Arm	1991	0	no data collected	Omitted 1991
PCBs in fish 0.50 ug/g max (wet weight)	Main Stem Main Arm North Arm Middle Arm	1991	0	no data collected	Omitted 1991

TABLE 25

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1991

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	Apr 12,19,26, May 3,10	5	<20 - 5000/100 mL gm = 235/100 mL np = 800/100 mL	Objectives not met
		Jun 24,28, Jul 4,19,26	5	<20 - 500/100 mL gm = 85/100 mL np = 350/100 mL	Objectives met
	MOH 4 Vidal Street White Rock	Jul 15,29, Aug 6,12,18	5	<5 - 130/100 mL gm = 31/100 mL np = 95/100 mL	Objectives met
	GVRD 29 Oxford Street White Rock	Apr 19,26, May 3,10,17	5	40 - 800/100 mL gm = 92/100 mL np = 350/100 mL	Objectives met
		Jun 24,28, Jul 4,19,26	5	<20 - 130/100 mL gm = 41/100 mL np = 120/100 mL	Objectives met
	MOH 5 High Street White Rock	Jul 8,15,29, Aug 6,12	5	65 - 108/100 mL gm = 85/100 mL np = 105/100 mL	Objectives met
	GVRD 30 High Street White Rock	May 3,10,17, 31, Jun 7	5	20 - 230/100 mL gm = 47/100 mL np = 180/100 mL	Objectives met
		Jun 24,28, Jul 4,19,26	5	<20 - 80/100 mL gm = 26/100 mL np = 50/100 mL	Objectives met
	MOH 8 Centennial Beach concession	Jun 5,10,17, 24, Jul 2	5	5 - 175/100 mL gm = 17/100 mL np = 90/100 mL	Objectives met
		Jul 29,Aug 6, 12,18,25	5	5 - 245/100 mL gm = 29/100 mL np = 140/100 mL	Objectives met
	MOH 9 Centennial Beach 3rd Avenue	Jun 10,17,24, Jul 2,8	5	15 - 80/100 mL gm = 35/100 mL np = 70/100 mL	Objectives met
		Jul 29,Aug 6, 12,18,25	5	5 - 475/100 mL gm = 14/100 mL np = 100/100 mL	Objectives met

TABLE 25 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1991

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 10 Centennial Beach 1st Avenue	Jun 10,17,24, Jul 2,8	5	5 - 165/100 mL gm = 22/100 mL np = 60/100 mL	Objectives met
		Jul 29,Aug 6, 12,18,25	5	9 - 420/100 mL gm = 49/100 mL np = 230/100 mL	Objectives met
	Little Campbell R.	1991	0	no data collected	Omitted 1991
Fecal Coliforms <1000/100 mL geometric mean (gm) <4000/100 mL max April-October	Nicomekl River Murray Creek Anderson Creek Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
Suspended Solids max increase: 10 mg/L or 10%	Boundary Bay: 0300070 East	Aug 13	1	7 mg/L	Control site
	E207867 East Delta Airfield (Oliver St pump stn.)	Aug 14	1	18 mg/L	Objective not met
	Little Campbell R. Nicomekl River Murray Creek Anderson Creek Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
Turbidity max increase: 5 NTU or 10%	Boundary Bay: 0300070 East	Aug 13	1	0.8 NTU	Control site
	E207867 East Delta Airfield (Oliver St pump stn.)	Aug 14	1	5.3 NTU	Objective met
	Little Campbell R. Nicomekl River Murray Creek Anderson Creek Serpentine River	1991	0	no data collected	Omitted 1991

TABLE 25 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase: 5 NTU or 10%	Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
Substrate Sedimentation no increase in weight of particles <3 mm dia	Little Campbell River Nicomekl River Murray Creek Anderson Creek Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Objective not checked
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	Jun 12,13,18	3	0.024 - 0.042 mg/L	Max obj. met Av not chkd.
	0300065 near mouth	Jun 12,13,18	3	0.010 - 0.020 mg/L	Max obj. met
	Nicomekl River: 0300060 near mouth	Jun 12,13,18	3	<0.005 - 0.065mg/L	Max obj. met Av not chkd.
	Serpentine River: 0300059 near source	Jun 11,13,18, 25	4	0.046 - 0.267 mg/L	Max obj. met Av not chkd.
	0300057 near mouth	Jun 11,13,18, 25	4	0.026 - 0.150 mg/L	Max obj. met Av not chkd.
	Latimer Creek: E207716 near mouth	Jun 11,13,18, 25	4	0.286 - 0.970 mg/L	Max obj. met Av not chkd.
	Mahood Creek: 0300056 near mouth	Jun 11,13,18, 25	4	<0.005 - 0.105mg/L	Max obj. met Av not chkd.
	Hyland Creek: E207718 near source	Jun 11,13,18, 25	4	0.007 - 0.045 mg/L	Max obj. met Av not chkd.
	Murray Creek Anderson Creek	1991	0	no data collected	Omitted 1991
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Little Campbell R. Nicomekl River Murray Creek Anderson Creek	1991	0	no data collected	Omitted 1991

TABLE 25 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
Chlorophyll-a 50 mg/m2 av	Little Campbell R.	1991	0	no data collected	Omitted 1991
Chlorophyll-a 100 mg/m2 av	Nicomekl River Murray Creek Anderson Creek	1991	0	no data collected	Omitted 1991
Chlorophyll-a 100 mg/m2 av (long term)	Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
Dissolved Oxygen 6.5 mg/L min 9.0 mg/L min (long-term)	Boundary Bay: 0300070 East	Aug 13	1	13.4 mg/L	Objective met
	E207867 East Delta Airfield (Oliver St pump stn.)	Aug 14	1	5.7 mg/L	Objective not met
Dissolved Oxygen 6.0 mg/L min Jun - Oct 11.0 mg/L min Nov - May	Little Campbell R. Nicomekl River Serpentine River	1991	0	no data collected	Omitted 1991
Dissolved Oxygen 8.0 mg/L min Jun - Oct 11.0 mg/L min Nov - May	Murray Creek Anderson Creek Latimer Creek Mahood Creek Hyland Creek near mouth	1991	0	no data collected	Omitted 1991
pH	Little Campbell R. Nicomekl River Murray Creek Anderson Creek Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991

TABLE 25 continued

BOUNDARY BAY WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Lead <0.005 mg/L av 0.010 mg/L max	Nicomekl River	1991	0	no data collected	Omitted 1991
PCBs in water 0.001 ug/L max	Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
PCBs in sediments <0.03 ug/g av	Boundary Bay Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991
PCBs in fish <0.1 - 0.5ug/g wet weight	Serpentine River Latimer Creek Mahood Creek Hyland Creek	1991	0	no data collected	Omitted 1991

TABLE 26

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm) May - Oct	Port Moody Arm: GVRD 1 Barnett Pk.,E of pier	May 3 - Jun 7	5	<20 - 500/100 mL gm = 44/100 mL	Objective met
		Jun 14-Jul 15	5	<20 - 220/100 mL gm = 37/100 mL	Objective met
	GVRD 2 Barnett Pk.,Sandy Bch	May 3 - Jun 7	5	<20 - 2400/100 mL gm = 80/100 mL	Objective met
		Jun 14-Jul 15	5	20 - 800/100 mL gm = 129/100 mL	Objective met
	Indian Arm: GVRD 35 Deep Cove Beach, N	Jul 4 - Aug 1	9	40 - 800/100 mL gm = 187/100 mL	Objective met
		Aug 8 - Sep 9	9	20 - 3000/100 mL gm = 138/100 mL	Objective met
	GVRD 39 Deep Cove Beach, S	Jun 13-Jul 13	9	<20 - 800/100 mL gm = 50/100 mL	Objective met
		Jul 8 - Aug 8	9	40 - 800/100 mL gm = 181/100 mL	Objective met
	2nd Narrows-Roche Pt. GVRD 36 Cates Park Beach	Jun 17-Jul 18	9	<20 - 70/100 mL gm = 27/100 mL	Objective met
		Jul 29-Aug 29	8	<20 - 170/100 mL gm = 31/100 mL	Objective met
	GVRD 29 Cates Park, boat ramp	Jun 6 - Jul 8	9	<20 - 80/100 mL gm = 31/100 mL	Objective met
		Jul 29-Aug 29	8	<20 - 2400/100 mL gm = 50/100 mL	Objective met
	1st-2nd Narrows: GVRD 5 1 km W Brockton Pt.	May 6 - Jun 5	8	<20 - 140/100 mL gm = 38/100 mL	Objective met
		Aug 6 - Sep 4	6	<20 - 1100/100 mL gm = 85/100 mL	Objective met
	GVRD 1 1.5 km W Brockton Pt.	May 6 - Jun 6	8	<20 - 5000/100 mL gm = 79/100 mL	Objective met
		Aug 6 - Sep 4	6	<20 - 9000/100 mL gm = 200/100 mL	Objective not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm) May - Oct	Outer Burrard: GVRD 14 Ambleside Beach	Jul 31-Aug 30	7	<20 - 1300/100 mL gm = 44/100 mL	Objective met
		Sep 30-Oct 29	9	<20 - 230/100 mL gm = 36/100 mL	Objective met
	GVRD 101 3rd Beach	Jul 31-Aug 30	8	<20 - 300/100 mL gm = 39/100 mL	Objective met
		Sep 30-Oct 29	9	<20 - 500/100 mL gm = 69/100 mL	Objective met
	GVRD 200 2nd Beach	Jun 17-Jul 17	10	<20 - 170/100 mL gm = 42/100 mL	Objective met
		Aug 8 - Sep 9	9	20 - 800/100 mL gm = 105/100 mL	Objective met
	GVRD 304 English Bay Beach	May 27-Jun 25	9	<20 - 300/100 mL gm = 62/100 mL	Objective met
		Aug 19-Sep 19	9	<20 - 300/100 mL gm = 49/100 mL	Objective met
	GVRD 703 Locarno Beach	Jun 11-Jul 11	9	<20 - 3000/100 mL gm = 59/100 mL	Objective met
		Aug 28-Sep 28	10	<20 - 170/100 mL gm = 47/100 mL	Objective met
	False Creek: GVRD 16 at the mouth	Jun 5 - Jul 4	7	<20 - 110/100 mL gm = 45/100 mL	Objective met
		Jul 24-Aug 26	5	<20 - 130/100 mL gm = 38/100 mL	Objective met
Enterococci <20/100 mL geometric mean (gm) May - Oct	Indian Arm: GVRD 35 Deep Cove Beach, N	May 16-Jun 17	9	1 - 350/100 mL gm = 13/100 mL	Objective met
		Jul 4 - Aug 1	9	<1 - 370/100 mL gm = 32/100 mL	Objective not met
	2nd Narrows-Roche Pt. GVRD 36 Cates Park Beach	Jul 15-Aug 15	8	<1 - 190/100 mL gm = 6/100 mL	Objective met
		Aug 29-Sep 27	5	<1 - 73/100 mL gm = 6/100 mL	Objective met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Enterococci <20/100 mL geometric mean (gm) May - Oct	Outer Burrard: GVRD 14 Ambleside Beach	May 27-Jun 26	7	8 - 60/100 mL gm = 22/100 mL	Objective not met
		Aug 22-Sep 23	9	<1 - 270/100 mL gm = 11/100 mL	Objective met
	GVRD 101 3rd Beach	Jun 25-Jul 24	9	4 - 57/100 mL gm = 14/100 mL	Objective met
		Jul 31- Aug30	9	<1 - 530/100 mL gm = 14/100 mL	Objective met
	GVRD 200 2nd Beach	Jun 17-Jul 17	10	<1 - 110/100 mL gm = 16/100 mL	Objective met
		Jul 31-Aug 30	9	2 - 280/100 mL gm = 20/100 mL	Objective not met
	GVRD 304 English Bay Beach	May 21-Jun 19	10	4 - 51/100 mL gm = 11/100 mL	Objective met
		Aug 19-Sep 18	10	4 - 310/100 mL gm = 17/100 mL	Objective met
	GVRD 703 Locarno Beach	May 22-Jun 21	10	1 - 120/100 mL gm = 11/100 mL	Objective met
		Aug 7 - Sep 5	10	4 - 130/100 mL gm = 14/100 mL	Objective met
	Port Moody Arm 1st-2nd Narrows False Creek	1991	0	no data collected	Omitted 1991
Suspended Solids 10 mg/L max increase	Indian Arm 0300080 3 km E of Deep Cove	Feb 27 Mar 7 Mar 14 Mar 21	2 2 2 2	2,3 mg/L at 0,15 m 3,2 mg/L at 0,15 m 2,4 mg/L at 0,15 m 5,4 mg/L at 0,15 m	Control Site
	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 25-Mar 21	8	2 - 11 mg/L max inc. = 6 mg/L	Objective met
	E207823 100m off Ioco disch.	Feb 25-Mar 21	8	2 - 8 mg/L max inc. = 3 mg/L	Objective met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 21	1 1	6 mg/L at 0 m 5 mg/L at 22.8m	Objective met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids 10 mg/L max increase	2nd Narrows-Roche Pt: E207821 50m off Chevron disch	Feb 27-Mar 21	8	1 - 6 mg/L max inc. = 3 mg/L	Objective met
	E207820 100m S Can-Occ. disch	Feb 27-Mar 21 Mar 21	7 1	max inc.= 3 mg/L (12m)inc.= 13 mg/L	Obj. met Obj. not met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21	10	2 - 6 mg/L max inc. < 5 mg/L	Objective met
	E207818 off Clark Drive CSO	Feb 21-Mar 21 Feb 14 & 21	8 2	max inc. < 8 mg/L (0m)inc.=19-22mg/L	Obj. met Obj. not met
	E207816 100-500m E Vn Wharves	Feb 21-Mar 21 Feb 14 & 21	10 2	3 - 8 mg/L max inc. = 7 mg/L	Objective met
	E207813 100m off Coal Hbr CSO	Feb 27-Mar 21	8	3 - 10 mg/L max inc. = 6 mg/L	Objective met
	Outer Burrard: E207812 off Locarno Park CSO	Feb 25-Mar 20	8	2 - 7 mg/L max inc. < 7 mg/L	Objective met
	0300076 English Bay	Feb 25-Mar 20	8	3 - 7 mf/L max inc. < 7 mg/L	Objective met
	False Creek: E207814 100m E Science World	Feb 25-Mar 20	8	4 - 6 mg/L max inc. < 6 mg/L	Objective met
	E207815 at mid-point	Feb 25-Mar 20	8	2 - 7 mg/L max inc. < 7 mg/L	Objective met
Turbidity 5 NTU max increase	Indian Arm 0300080 3 km E of Deep Cove	Feb 27 Mar 7 Mar 14 Mar 21	2 2 2 2	0.7-0.6 NTU,0-15 m 0.3-0.2 NTU,0-15 m 0.5 NTU at 0-15 m 0.6 NTU at 0-15 m	Control Site
	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 25-Mar 21	8	0.4 - 2.0 NTU max inc. = 1.4 NTU	Objective met
	E207823 100m off Ioco disch.	Feb 25-Mar 21 Aug 28	8 1	0.3 - 0.9 NTU max inc. < 0.9 NTU	Objective met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 21	1 1	0.7 NTU at 0 m 0.8 NTU at 22.8m	Objective met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity 5 NTU max increase	2nd Narrows-Roche Pt: E207821 50m off Chevron disch	Feb 27-Mar 21	8	0.3 - 0.9 NTU max inc. = 0.2 NTU	Objective met
	E207820 100m S Can-Occ. disch	Feb 27-Mar 21	8	0.3 - 4.0 NTU max inc. = 3.4 NTU	Objective met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21	10	0.3 - 1.0 NTU max inc. < 1.0 NTU	Objective met
	E207818 off Clark Drive CSO	Feb 21-Mar 21 Mar 21	9 1	max inc. = 2.0 NTU (0m)inc. = 6.4 NTU	Obj. met Obj. not met
	E207816 100-500m E Vn Wharves	Feb 21-Mar 21	10	0.3 - 2.0 NTU max inc. < 2.0 NTU	Objective met
	E207813 100m off Coal Hbr CSO	Feb 27-Mar 21	8	0.2 - 1.0 NTU max inc. = 0.5 NTU	Objective met
	Outer Burrard: E207812 off Locarno Park CSO	Feb 25-Mar 20	8	0.8 - 2.5 NTU max inc. < 2.5 NTU	Objective met
	0300076 English Bay	Feb 25-Mar 20	8	0.4 - 1.5 NTU max inc. < 1.5 NTU	Objective met
	False Creek: E207814 100m E Science World	Feb 25-Mar 20	8	0.5 - 1.0 NTU max inc. < 1.0 NTU	Objective met
	E207815 at mid-point	Feb 25-Mar 20	8	0.5 - 1.5 NTU max inc. < 1.5 NTU	Objective met
Cl2-Produced Oxidants 3 ug/L av	Port Moody Arm 2nd Narrows-Roche Pt.	1991 1991	0 0	no data collected no data collected	Obj not chkd Omitted 1991
Ammonia-N <1.0 mg/L av 2.5 mg/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 25-Mar 21 Aug 7 - Sep 3	16	<0.005 - 0.210mg/L (0 - 17.2 m)	Max obj. met Av not chkd.
	E207823 100m off Ioco disch.	Feb 25-Mar 21 Aug 7 - Sep 3	16	<0.005 - 0.265mg/L (0 - 11.3 m)	Max obj. met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7 - Sep 3 (0 - 22.8 m)	10	av = 0.052 mg/L max = 0.127 mg/L	Objectives met
	E207821 50m off Chevron disch	Aug 7 - Sep 3 (0 - 10.7 m)	10	av = 0.071 mg/L max = 0.220 mg/L	Objectives met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.0 mg/L av 2.5 mg/L max	2nd Narrows-Roche Pt: E207820 100m S Can-Occ. disch	Aug 7 - Sep 3 (0 - 15 m)	10	av = 0.046 mg/L max = 0.121 mg/L	Objectives met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Aug 7 - Sep 3 (0 - 20.2 m)	10	av = 0.047 mg/L max = 0.114 mg/L	Objectives met
	E207818 off Clark Drive CSO	Feb 21-Mar 21 (0 - 14 m)	10	av = 0.215 mg/L max = 1.290 mg/L	Objectives met
	E207816 100-500m E Vn Wharves	Aug 7 - Sep 3 (0 - 11.3 m)	10	av = 0.061 mg/L max = 0.242 mg/L	Objectives met
	E207813 100m off Coal Hbr CSO	Aug 7 - Sep 3 (0 - 8.6 m)	10	av = 0.076 mg/L max = 0.233 mg/L	Objectives met
	False Creek: E207814 100m E Science World	Feb 25-Mar 20 Aug 7 - Sep 3	16	0.007 - 0.231 mg/L (0 - 8 m)	Max obj. met Av not chkd.
	E207815 at mid-point	Feb 25-Mar 20 Aug 7 - Sep 3	16	<0.005 - 0.129mg/L (0 - 8 m)	Max obj. met
Dissolved Oxygen 6.5 mg/L min	Indian Arm 0300080 3 km E of Deep Cove	Aug 7 - Sep 3 Sep 3 Aug 7 - 27	5 1 4	0m: 7.8 - 9.6mg/L 25m: 7.2 mg/L 25m: 5.4 - 6.0mg/L	Obj. met Obj. met Obj. not met
	Outer Burrard: E207812 off Locarno Park CSO	Aug 7 - Sep 3 Aug 7,27,Sep3 Aug 14 - 21	5 3 2	0m: 6.7 - 9.8mg/L 9m: 7.4 - 8.1mg/L 8m: 6.0 - 6.2mg/L	Obj. met Obj. met Obj. not met
	0300076 English Bay	Aug 7 - Sep 3 Aug 27-Sep 3 Aug 7 - 21	5 2 3	0m: 7.2 - 9.8mg/L 20m: 6.6 - 7.6mg/L 18m: 5.4 - 5.7mg/L	Obj. met Obj. met Obj. not met
	False Creek: E207814 100m E Science World	Aug 7 - Sep 3 Sep 3 Aug 7 - 27	5 1 4	0m:6.9 - 11.6mg/L 8m: 8.4 mg/L 8m: 4.8 - 6.3mg/L	Obj. met Obj. met Obj. not met
	E207815 at mid-point	Aug 7 - Sep 3 Aug 27-Sep 3 Aug 27 Aug 7 - 27	4 2 1 3	0m:8.0 - 11.3mg/L 8m: 6.5 - 8.1mg/L 0m: 6.4 mg/L 8m: 5.8 - 6.2mg/L	Obj. met Obj. met Obj. not met Obj. not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 6.5 mg/L min (long-term)	Port Moody Arm: E207698 50 m E Pacific Coast	Aug 7 - Sep 3	3	0m:8.8 - 10.2mg/L	Obj. met
		Aug 14 - 27	2	0m: 5.2 - 6.1mg/L	Obj. not met
		Aug 7 - Sep 3	5	16m: 3.2 - 5.6mg/L	Obj. not met
	E207823 100m off Ioco disch.	Aug 7 - Sep 3	4	0m:7.3 - 10.0mg/L	Obj. met
		Aug 14	1	0m: 6.0 mg/L	Obj. not met
		Aug 7 - Sep 3	5	11m: 4.0 - 6.0mg/L	Obj. not met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7 - Sep 3	4	0m: 6.6 - 9.2mg/L	Obj. met
		Sep 3	1	20m: 7.6 mg/L	Obj. met
		Aug 7 - 27	4	20m: 5.8 - 6.3mg/L	Obj. not met
		Aug 14	1	18m: 6.3 mg/L	Obj. not met
	E207821 50m off Chevron disch	Aug 21-Sep 3	3	0m: 6.6 - 8.8mg/L	Obj. met
		Aug 27-Sep 3	2	8m: 6.6 - 7.9mg/L	Obj. met
		Aug 7 - 14	2	0m: 5.6 - 6.4mg/L	Obj. not met
		Aug 7 - 21	3	9m: 6.2 - 6.4mg/L	Obj. not met
	E207820 100m S Can-Occ. disch	Aug 7 - Sep 3	4	0m: 6.6 - 9.0mg/L	Obj. met
		Aug 27-Sep 3	2	14m: 6.6 - 7.9mg/L	Obj. met
		Aug 14	1	0m: 6.2 mg/L	Obj. not met
		Aug 7 - 21	3	14m: 5.2 - 6.0mg/L	Obj. not met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Aug 14-Sep 3	3	0m: 6.6 - 8.6mg/L	Obj. met
		Sep 3	1	19m: 8.0 mg/L	Obj. met
		Aug 7 - 27	2	0m: 6.3 - 6.4mg/L	Obj. not met
		Aug 7 - 27	4	19m: 5.5 - 6.3mg/L	Obj. not met
	E207818 off Clark Drive CSO	Aug 7 - Sep 3	4	0m: 6.8 - 7.2mg/L	Obj. met
		Aug 14-Sep 3	2	12m: 7.0 - 7.4mg/L	Obj. met
		Aug 27	1	0m: 6.2 mg/L	Obj. not met
		Aug 14 - 27	3	13m: 6.2 - 6.4mg/L	Obj. not met
	E207816 100-500m E Vn Wharves	Aug 7 - Sep 3	4	0m: 6.6 - 8.4mg/L	Obj. met
		Sep 3	1	11m: 7.4 mg/L	Obj. met
		Aug 27	1	0m: 6.4 mg/L	Obj. not met
		Aug 7 - 27	4	10m: 5.9 - 6.2mg/L	Obj. not met
	E207813 100m off Coal Hbr CSO	Aug 7 - Sep 3	3	0m: 7.8 - 8.4mg/L	Obj. met
		Sep 3	1	8m: 7.8 mg/L	Obj. met
		Aug 21 - 27	2	0m: 6.3 - 6.4mg/L	Obj. not met
		Aug 7 - 27	4	8m: 5.0 - 5.6mg/L	Obj. not met
WAD-CN 0.001 mg/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 25,Mar 7, 14,21, Aug 21	9	all <0.005 mg/L (0 - 13 m)	Objective met
		Mar 21	1	0.006 mg/L (0 m)	Obj. not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD-CN 0.001 mg/L max	Port Moody Arm: E207823 100m off Ioco disch.	Feb 25,Mar 7, 14,21, Aug 21	10	all <0.005 mg/L (0 - 12 m)	Objective met
H2S 0.002 mg/L max	Port Moody Arm 1st-2nd Narrows	1991	0	no data collected	Objective not checked
pH 6.5 - 8.5	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7 - Sep 3	10	7.3 - 7.9 (0 - 20 m)	Objective met
	E207821 50m off Chevron disch	Feb 27-Mar 21 Aug 7 - Sep 3	8 10	0-9 m: 7.6 - 7.7 0-8 m: 7.4 - 8.0	Obj. met Obj. met
	E207820 100m S Can-Occ. disch	Feb 27-Mar 21 Aug 7 - Sep 3	8 10	0-12 m: 7.5 - 7.7 0-14 m: 7.3 - 8.0	Obj. met Obj. met
Total As 0.010 mg/L max	2nd Narrows-Roche Pt. E207822 50m off Shellburn dis	Aug 21	2	<0.001 - 0.001mg/L (0 - 23 m)	Objective met
	E207821 50m off Chevron disch	Aug 21	2	0.001 mg/L (0 - 9 m)	Objective met
	E207820 100m S Can-Occ. disch	Aug 21	2	0.001 mg/L (0 - 15 m)	Objective met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Aug 21	2	0.001 mg/L (0 - 20 m)	Objective met
	E207818 off Clark Drive CSO	Aug 21	2	0.001 mg/L (0 - 10 m)	Objective met
	E207816 100-500m E Vn Wharves	Aug 21	2	<0.001 - 0.001mg/L (0 - 10 m)	Objective met
	E207813 100m off Coal Hbr CSO	Aug 21	2	0.001 mg/L (0 - 9 m)	Objective met
Total As <20 ug/g av in sediment (long-term)	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	all <10 ug/g	Objective met
	E207816 100-500m E Vn Wharves	Sep 5	3	11 - 24 ug/g av = 19 ug/g	Objective met
	E207813 100m off Coal Hbr CSO	Sep 5	3	11 - 16 ug/g av = 14 ug/g	Objective met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total As <20 ug/g av in sediment (long-term)	False Creek: E207814 100m E Science World	Sep 5	3	12 - 14 ug/g av = 13 ug/g	Objective met
	Port Moody Arm	1991	0	no data collected	Omitted 1991
Total As <20 ug/g av in sediment	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	all <10 ug/g	Objective met
	2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
Total Ba 0.5 mg/L max	2nd Narrows-Roche Pt: E207821 50m off Chevron disch	Feb 27,Mar 7, 21	6	all <0.5 mg/L (0 - 9 m)	Objective met
	E207820 100m S Can-Occ. disch	Feb 27,Mar 7, 21	6	all <0.5 mg/L (0 - 12 m)	Objective met
Total Cd <0.009 mg/L av 0.043 mg/L max	Indian Arm 0300080 3 km E of Deep Cove	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 25 m)	Objectives met
	Port Moody Arm: E207698 50 m E Pacific Coast	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 17 m)	Objectives met
	E207823 100m off Ioco disch.	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 12 m)	Objectives met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7,14,21, 27, Sep 3	10	<0.0005-0.0013mg/L (0 - 23 m)	Objectives met
	E207821 50m off Chevron disch	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 11 m)	Objectives met
	E207820 100m S Can-Occ. disch	Aug 7,14,21, 27, Sep 3	10	<0.0005-0.0013mg/L (0 - 15 m)	Objectives met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 20 m)	Objectives met
	E207818 off Clark Drive CSO	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 14 m)	Objectives met
	E207816 100-500m E Vn Wharves	Aug 7,14,21, 27, Sep 3	10	<0.0005-0.0005mg/L (0 - 11 m)	Objectives met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cd <0.009 mg/L av 0.043 mg/L max	1st-2nd Narrows: E207813 100m off Coal Hbr CSO	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 9 m)	Objectives met
	False Creek: E207814 100m E Science World	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 8 m)	Objectives met
	E207815 at mid-point	Aug 7,14,21, 27, Sep 3	10	all <0.0005 mg/L (0 - 9 m)	Objectives met
Total Cd <1.0 ug/g av in sediment (long-term)	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	2 - 3 ug/g av = 3 ug/g	Objective not met
	E207816 100-500m E Vn Wharves	Sep 5	3	2 - 5 ug/g av = 5 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	all = 1 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	all = 3 ug/g	Objective not met
	Port Moody Arm	1991	0	no data collected	Omitted 1991
Total Cd <1.0 ug/g av in sediment	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	all < 1 ug/g	Objective met
	2nd Narrows-Roche Pt.	Sep 5	0	no data collected	Omitted 1991
Total Cr 0.050 mg/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 21-Mar 21 Aug 21	11	all <0.005 mg/L (0 - 13 m)	Objective met
	E207823 100m off Ioco disch.	Feb 21-Mar 21 Aug 21	11	all <0.005 mg/L (0 - 9 m)	Objective met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 21	1	<0.005 mg/L (0 m)	Objective met
	E207821 50m off Chevron disch	Feb 21-Mar 21 Aug 21	12	all <0.005 mg/L (0 - 9 m)	Objective met
	E207820 100m S Can-Occ. disch	Feb 21-Aug 21 Aug 21	12	all <0.005 mg/L (0 - 12 m)	Objective met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cr 0.050 mg/L max	False Creek: E207814 100m E Science World	Feb 21-Mar 21	10	all <0.005 mg/L (0 - 6 m)	Objective met
Total Cr <60 ug/g av in sediment	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	48 - 68 ug/g av = 50 ug/g	Objective met
	E207816 100-500m E Vn Wharves	Sep 5	3	29 - 45 ug/g av = 36 ug/g	Objective met
	E207813 100m off Coal Hbr CSO	Sep 5	3	35 - 52 ug/g av = 46 ug/g	Objective met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	34 - 40 ug/g av = 37 ug/g	Objective met
	Port Moody Arm 2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
Total Cr <60 ug/g av in sediment (long-term)	False Creek: E207814 100m E Science World	Sep 5	3	43 - 64 ug/g av = 54 ug/g	Objective met
Total Cu <2 ug/L av 3 ug/L max (long-term)	Port Moody Arm: E207698 50 m E Pacific Coast	Aug 7-Sep 3 Aug 14,21 Aug 7-Sep 3	10 2 8	0-17m: av =2.2ug/L 0-13m:max = 4 ug/L 0-17m:max = 3 ug/L	Av not met Max not met Max obj. met
	E207823 100m off Ioco disch.	Aug 7-Sep 3 Aug14,27,Sep3 Aug 7-Sep 3	10 3 7	0-12m: av =2.6ug/L 0-10m:max =4-8ug/L 0-12m:max = 2 ug/L	Av not met Max not met Max obj. met
	Indian Arm 0300080 3 km E of Deep Cove	Aug 7,14,21, 27, Sep 3	10	0-26m: av =1.4ug/L 0-26m:max = 3 ug/L	Objectives met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7-Sep 3 Aug 7,14,21 Aug 7-Sep 3	10 4 6	0-23m: av = 3 ug/L 0-23m:max =4-7ug/L 0-20m:max = 3 ug/L	Av not met Max not met Max obj. met
	E207821 50m off Chevron disch	Aug 7-Sep 3 Aug 7,21 Aug 7-Sep 3	10 3 7	0-11m: av =2.3ug/L 0-11m:max =4-6ug/L 0-9m: max = 2 ug/L	Av not met Max not met Max obj. met
	E207820 100m S Can-Occ. disch	Aug 7-Sep 3 Aug 7,21 Aug 7-Sep 3	10 2 8	0-15m: av =2.5ug/L 15m:max = 4 ug/L 0-15m:max = 3 ug/L	Av not met Max not met Max obj. met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <2 ug/L av 3 ug/L max (long-term)	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21 Mar 14,21 Feb 21-mar 21	10 2 8	0-15m: av =2.1ug/L 15m:max = 5 ug/L 0-15m:max = 2 ug/L	Av not met Max not met Max obj. met
	E207818 off Clark Drive CSO	Feb 21-Mar 21 Feb 21-Mar 21 Feb 21-Mar21	10 6 4	0-14m: av = 7 ug/L 0-14m:max=5-23ug/L 0-9m: max = 2 ug/L	Av not met Max not met Max obj. met
	E207816 100-500m E Vn Wharves	Feb 21-Mar 21 Feb 27-Mar 21 Feb 21-Mar 21	10 4 6	0-12m: av =4.6ug/L 0-12m:max=4-18ug/L 0-9m; max = 3 ug/L	Av not met Max not met Max obj. met
	E207813 100m off Coal Hbr CSO	Aug 7-Sep 3 Aug 7,21,27 Aug 14-Sep 3	10 3 7	0-9m: av = 6.5ug/L 0-9m:max =4-40ug/L 0-9m:max = 3 ug/L	Av not met Max not met Max obj. met
	Outer Burrard: E207812 off Locarno Park CSO	Aug 7-Sep 3 Aug 7,Sep 3 Aug 7-Sep 3	10 2 8	0-9m: av = 2.4ug/L 8-9m:max = 6-7ug/L 0-9m:max = 3 ug/L	Av not met Max not met Max obj. met
	0300076 English Bay	Aug 7-Sep 3 Aug 14 Aug 7-Sep 3	10 1 9	0-20m: av =1.9ug/L 19m:max = 7 ug/L 0-20m:max = 3 ug/L	Av obj. met Max not met Max obj. met
	False Creek: E207814 100m E Science World	Aug 7-Sep 3 Aug 7,Sep 3 Aug 14-Sep 3	10 3 7	0-9m: av = 3 ug/L 0-8m:max =4-11ug/L 0-9m:max = 3 ug/L	Av not met Max not met Max obj. met
	E207815 at mid-point	Aug 7-Sep 3 Aug 27,Sep 3 Aug 7-Sep 3	10 2 8	0-9m: av = 2 ug/L 0-8m:max =4-6 ug/L 0-9m:max = 3 ug/L	Av obj. met Max not met Max obj. met
Total Cu <100 ug/g av in sediment	Port Moody Arm	1991	0	no data collected	Omitted 1991
Total Cu <100 ug/g av in sediment (long-term)	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	360 - 455 ug/g av = 418 ug/g	Objective not met
	E207816 100-500m E Vn Wharves	Sep 5	3	2790 - 5550 ug/g av = 4930 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	262 - 273 ug/g av = 268 ug/g	Objective not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <100 ug/g av in sediment (long-term)	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	39 - 42 ug/g av = 40 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	162 - 166 ug/g av = 164 ug/g	Objective not met
	2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
Total Fe 0.3 mg/L max (long-term)	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 25-Aug 21 Mar 21	9 1	0-13m:max=0.27mg/L 0m: 0.42 mg/L	Obj. met Obj. not met
	E207823 100m off Ioco disch.	Feb 25-Aug 21	10	<0.005 - 0.250mg/L (0 - 12 m)	Objective met
	False Creek: E207814 100m E Science World	Feb 25-Aug 21	10	<0.005 - 0.260mg/L (0 - 7 m)	Objective met
	E207815 at mid-point	Feb 25-Aug 21	10	<0.005 - 0.170mg/L (0 - 7 m)	Objective met
Total Fe 0.3 mg/L max	Indian Arm 0300080 3 km E of Deep Cove	Feb 27-Aug 21	10	<0.005 - 0.048mg/L (0 - 25 m)	Objective met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Aug 21	12	0.011 - 0.073 mg/L (0 - 20 m)	Objective met
	E207818 off Clark Drive CSO	Feb 21-Aug 21 Mar 21	11 1	0-14m:max=0.19mg/L 0m: 0.40 mg/L	Obj. met Obj. not met
	E207816 100-500m E Vn Wharves	Feb 21-Aug 21 Mar 14	11 1	0-12m:max=0.27mg/L 9m: 0.43 mg/L	Obj. met Obj. not met
	E207813 100m off Coal Hbr CSO	Feb 27-Aug 21 Mar 21	9 1	0-9m:max=0.12 mg/L 6m: 0.33 mg/L	Obj. met Obj. not met
	Outer Burrard: E207812 off Locarno Park CSO	Feb 25-Aug 21	10	<0.005 - 0.150mg/L (0 - 8 m)	Objective met
	0300076 English Bay	Feb 25-Aug 21	10	<0.005 - 0.050mg/L (0 - 17 m)	Objective met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <2 ug/L av (long-term) 140 ug/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Aug 7-Sep 3	10 10	0-17m: av =3.3ug/L 0-17m:max = 13ug/L	Av not met Max obj. met
	E207823 100m off Ioco disch.	Aug 7-Sep 3	10 10	0-12m: av =1.3ug/L 0-12m:max = 3 ug/L	Objectives met
	Indian Arm 0300080 3 km E of Deep Cove	Aug 7-Sep 3	10 10	0-25m: av =1.9ug/L 0-25m:max = 5 ug/L	Objectives met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7-Sep 3	10 10	0-23m: av =1.6ug/L 0-23m:max = 5 ug/L	Objectives met
	E207821 50m off Chevron disch	Aug 7-Sep 3	10 10	0-11m: av =1.3ug/L 0-11m:max = 3 ug/L	Objectives met
	E207820 100m S Can-Occ. disch	Aug 7-Sep 3	10 10	0-15m: av =4.5ug/L 0-15m:max = 19ug/L	Av not met Max obj. met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21	10 10	0-15m: av =1.9ug/L 0-15m:max = 7 ug/L	Objectives met
	E207818 off Clark Drive CSO	Feb 21-Mar 21	10 10	0-14m: av =1.9ug/L 0-14m:max = 5 ug/L	Objectives met
	E207816 100-500m E Vn Wharves	Feb 21-mar 21	10 10	0-12m: av =3.2ug/L 0-12m:max = 10ug/L	Objectives met
	E207813 100m off Coal Hbr CSO	Feb 27-Aug 27	15	0-9m:max = 12 ug/L	Max obj. met
	Outer Burrard: E207812 off Locarno Park CSO	Feb 25-Aug 27	16	0-9m:max = 10 ug/L	Max obj. met Av not chkd.
	0300076 English Bay	Feb 25-Aug 27	15	0-19m:max = 9 ug/L	Max obj. met
	False Creek: E207814 100m E Science World	Feb 25-Aug 27	16	0-9m: max = 7 ug/L	Max obj. met Av not chkd.
	E207815 at mid-point	Feb 25-Aug 27	16	0-9m:max = 14 ug/L	Max obj. met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <30 ug/g av in sediment (long-term)	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	217 - 321 ug/g av = 271 ug/g	Objective not met
	E207816 100-500m E Vn Wharves	Sep 5	3	289 - 715 ug/g av = 532 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	93 - 112 ug/g av = 102 ug/g	Objective not met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	all < 10 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	162 - 178 ug/g av = 173 ug/g	Objective not met
	Port Moody Arm 2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
Total Pb 0.8 ug/g max wet weight in fish tissue	Indian Arm: 0300080 3 km E of Deep Cove	Sep 25	5	all < 0.2 ug/g (English sole)	Objective met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 25	5	all < 0.2 ug/g (English sole)	Objective met
	False Creek: E207814 100m E Science World	Sep 25	5	all < 0.2 ug/g (English sole)	Objective met
	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows	1991	0	no data collected	Omitted 1991
Total Hg <0.02 ug/L av 2.0 ug/L max	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21	10	all <0.05 ug/L (0 - 15 m)	Av not met Max obj. met
	E207818 off Clark Drive CSO	Feb 21-Mar 21	10 10	0-14m:av <0.09ug/L 0-14m:max=0.20ug/L	Av not met Max obj. met
	E207816 100-500m E Vn Wharves	Feb 21-mar 21	10 10	0-12m:av <0.06ug/L 0-12m:max=0.12ug/L	Av not met Max obj. met
	E207813 100m off Coal Hbr CSO	Feb 21-Mar 21	10 10	0-7m: av <0.07ug/L 0-7m:max =0.13ug/L	Av not met Max obj. met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Hg <0.02 ug/L av 2.0 ug/l max	Outer Burrard: E207812 off Locarno Park CSO	Feb 20-Mar 21	10 10	0-8m: av <0.05ug/L 0-8m:max =0.07ug/L	Av not met Max obj. met
		Aug 7-Sep 3	10 10	0-9m: av <0.07ug/L 0-9m:max =0.11ug/L	Av not met Max obj. met
	0300076 English Bay	Feb 20-Mar 21	10 10	0-15m:av <0.05ug/L 0-15m:max<0.05ug/L	Av not met Max obj. met
	False Creek: E207814 100m E Science World	Feb 20-Mar 21	10 10	0-6m: av <0.05ug/L 0-6m:max <0.05ug/L	Av not met Max obj. met
	E207815 at mid-point	Feb 20-Mar 21	10 10	0-6m: av <0.05ug/L 0-6m:max <0.05ug/L	Av not met Max obj. met
	2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1990
Total Hg 0.5 ug/g max wet weight in fish tissue	Outer Burrard: E207812 off Locarno Park CSO	Sep 25	5	all < 0.05 ug/g (English sole)	Objective met
	False Creek: E207814 100m E Science World	Sep 25	5	all < 0.05 ug/g (English sole)	Objective met
	2nd Narrows-Roche Pt. 1st-2nd Narrows	1991	0	no data collected	Omitted 1991
Total Hg <0.15 ug/g av in sediment	Port Moody Arm 2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
Total Hg <0.15 ug/g av in sediment (long-term)	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	1.55 - 2.69 ug/g av = 2.23 ug/g	Objective not met
	E207816 100-500m E Vn Wharves	Sep 5	3	0.04 - 0.51 ug/g av = 0.31 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	0.81 - 1.00 ug/g av = 0.90 ug/g	Objective not met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	0.01 - 0.30 ug/g av = 0.14 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	0.60 - 0.63 ug/g av = 0.61 ug/g	Objective not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Ni <8 ug/L av 75 ug/L max	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7-Sep 3	10	0-23m:all <10 ug/L	Objectives met
	E207821 50m off Chevron disch	Feb 21-Mar 21 Aug 7-Sep 3	10 10	0-9m: all <10 ug/L 0-11m:all <10 ug/L	Objs. met Objs. met
	E207820 100m S Can-Occ. disch	Feb 21-Mar 21 Aug 7-Sep 3	10 10	0-12m:all <10 ug/L 0-15m:all <10 ug/L	Objs. met Objs. met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21 Aug 7-Sep 3	10 10	0-15m:all <10 ug/L 0-20m:all <10 ug/L	Objs. met Objs. met
	E207818 off Clark Drive CSO	Feb 21-Mar 21 Aug 7-Sep 3	10 10	0-14m:all <10 ug/L 0-14m:all <10 ug/L	Objs. met Objs. met
	E207816 100-500m E Vn Wharves	Feb 21-Mar 21 Aug 7-Sep 3	10 10	0-9m: all <10 ug/L 0-11m:all <10 ug/L	Objs. met Objs. met
	E207813 100m off Coal Hbr CSO	Feb 21-Mar 21 Aug 7-Sep 3	10 10	0-7m: all <10 ug/L 0-9m: all <10 ug/L	Objs. met Objs. met
	False Creek: E207814 100m E Science World	Feb 20-Mar 21 Aug 7-Sep 3	10 10	0-6m: all <10 ug/L 0-8m: all <10 ug/L	Objs. met Objs. met
	E207815 at mid-point	Feb 20-Mar 21 Aug 7-Sep 3	9 10	0-6m: all <10 ug/L 0-9m: all <10 ug/L	Objs. met Objs. met
Total Ni <45 ug/g av in sediment	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	40 - 45 ug/g av = 43 ug/g	Objective met
	E207816 100-500m E Vn Wharves	Sep 5	3	52 - 91 ug/g av = 75 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	all = 36 ug/g av = 36 ug/g	Objective met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	37 - 38 ug/g av = 37 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	33 - 36 ug/g av = 35 ug/g	Objective met
	Port Moody Arm 2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn <86 ug/L av 95 ug/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Feb 21-Mar 21	10 10	0-10m: av <10 ug/L 0-10m:max =41 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-17m: av < 5 ug/L 0-17m:max = 6 ug/L	Objectives met
	E207823 100m off Ioco disch.	Feb 21-Mar 21	10 10	0-9m: av < 7 ug/L 0-9m: max =30 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-12m: av < 6 ug/L 0-12m:max =13 ug/L	Objectives met
	Indian Arm 0300080 3 km E of Deep Cove	Feb 21-Mar 21	10 10	0-15m: av < 5 ug/L 0-15m:max = 8 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-26m: av < 7 ug/L 0-26m:max =16 ug/L	Objectives met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 7-Sep 3	10 10	0-23m: av < 7 ug/L 0-23m:max =20 ug/L	Objectives met
	E207821 50m off Chevron disch	Feb 21-Mar 21	10	0-9m: all < 5 ug/L	Objs. met
		Aug 7-Sep 3	10 10	0-11m: av < 7 ug/L 0-11m:max =19 ug/L	Objectives met
	E207820 100m S Can-Occ. disch	Feb 21-Mar 21	10 10	0-12m: av < 6 ug/L 0-12m:max =11 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-15m: av < 5 ug/L 0-15m:max = 9 ug/L	Objectives met
	1st-2nd Narrows: E207819 mid-harbour(L-K bank)	Feb 21-Mar 21	10	0-15m:all < 5 ug/L	Objs. met
		Aug 7-Sep 3	10 10	0-20m: av < 9 ug/L 0-20m:max =24 ug/L	Objectives met
	E207818 off Clark Drive CSO	Feb 21-Mar 21	10 10	0-14m: av <10 ug/L 0-14m:max =36 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-14m: av <10 ug/ 0-14m:max =25 ug/L	Objectives met
	E207816 100-500m E Vn Wharves	Feb 21-Mar 21	10 10	0-12m: av < 8 ug/L 0-12m:max =33 ug/L	Objectives met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn <86 ug/L av 95 ug/L max	1st-2nd Narrows: E207816 100-500m E Vn Wharves	Aug 7-Sep 3	10 10	0-11m: av <12 ug/L 0-11m:max =42 ug/L	Objectives met
	E207813 100m off Coal Hbr CSO	Feb 21-Mar 21	10 10	0-7m: av < 6 ug/L 0-7m: max =15 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-9m: av <18 ug/L 0-9m: max =57 ug/L	Objectives met
	Outer Burrard: E207812 off Locarno Park CSO	Feb 20-Mar 21	10	0-8m: all < 5 ug/L	Objs. met
		Aug 7-Sep 3	10 10	0-9m: av < 7 ug/L 0-9m: max =15 ug/L	Objectives met
	0300076 English Bay	Feb 20-Mar 21	10 10	0-15m: av < 6 ug/L 0-15m:max =20 ug/L	Objectives met
		Aug 7-Sep 3	10 10	0-20m: av < 7 ug/L 0-20m:max =19 ug/L	Objectives met
	False Creek: E207814 100m E Science World	Feb 20-Mar 21	10	0-6m: all < 5 ug/L	Objs. met
		Aug 7-Sep 3	10 10	0-9m: av < 7 ug/L 0-9m: max =20 ug/L	Objectives met
	E207815 at mid-point	Feb 20-Mar 21	9	0-6m: all < 5 ug/L	Objs. met
		Aug 7-Sep 3	10 10	0-9m: av < 5 ug/L 0-9m: max = 8 ug/L	Objectives met
Total Zn <150ug/g av in sediment	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	326 - 439 ug/g av = 378 ug/g	Objective not met
	E207816 100-500m E Vn Wharves	Sep 5	3	789 - 1130 ug/g av = 983 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	194 - 203 ug/g av = 197 ug/g	Objective not met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	85 - 88 ug/g av = 86 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	395 - 426 ug/g av = 413 ug/g	Objective not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn <150ug/g av in sediment	Port Moody Arm 2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
Chlorophenols (tri + tetra + penta) 0.2 ug/L max <0.1 ug/g av in sediment 0.1 ug/g max wet weight in fish	1st-2nd Narrows	1991	0	no data collected	Omitted 1991
PCBs <0.03 ug/g av in sediment	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	3	<0.02 - 0.24 ug/g av < 0.09 ug/g	Objective not met
	E207816 100-500m E Vn Wharves	Sep 5	3	<0.02 - 3.00 ug/g av < 1.01 ug/g	Objective not met
	E207813 100m off Coal Hbr CSO	Sep 5	3	0.09 - 0.11 ug/g av = 0.10 ug/g	Objective not met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	3	all < 0.02 ug/g	Objective met
	False Creek: E207814 100m E Science World	Sep 5	3	0.05 - 0.10 ug/g av = 0.08 ug/g	Objective not met
	Port Moody Arm 2nd Narrows-Roche Pt.	1991	0	no data collected	Omitted 1991
PCBs 0.5 ug/g max wet weight in fish	Outer Burrard: E207812 off Locarno Park CSO	Sep 25	5	<0.1 - 0.2 ug/g (English sole)	Objective met
	False Creek: E207814 100m E Science World	Sep 25 Sep 25	4 1	0.2 - 0.5 ug/g 0.9 ug/g (English sole)	Obj. met Obj. not met
	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows	1991	0	no data collected	Omitted 1991
TBT 10 ng/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Aug 21	2	0-13m: <0.50 ug/L	Indefinite result

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
TBT 10 ng/L max	Port Moody Arm: E207823 100m off Ioco disch.	Aug 21	2	0-12m: <0.50 ug/L	Indefinite result
	Indian Arm 0300080 3 km E of Deep Cove	Aug 21	1	25m: <0.50 ug/L	Indefinite result
	False Creek: E207814 100m E Science World	Aug 21	1	0-7.5m:<0.50 ug/L	Indefinite result
	E207815 at mid-point	Aug 21	1	0-7m: <0.50 ug/L	Indefinite result
	1st-2nd Narrows	1991	0	no data collected	Obj not chkd
	Outer Burrard	1991	0	no data collected	Omitted 1991
Ethylene Dichloride <0.2 mg/L av 2.0 mg/L max	1st-2nd Narrows	1991	0	no data collected	Omitted 1991
Phenols 1 ug/L max	Port Moody Arm: E207698 50 m E Pacific Coast	Aug 21	2	0-13m: 2 - 4 ug/L	Objective not met
	E207823 100m off Ioco disch.	Feb 25 Aug 21	1 2	9m: 6 ug/L 0-12m: 3 - 4 ug/L	Obj. not met Obj. not met
	2nd Narrows-Roche Pt: E207822 50m off Shellburn dis	Aug 21	1 1	0m: <2 ug/L 23m: 2 ug/L	Obj. met Obj. not met
	E207821 50m off Chevron disch	Feb 21-Mar 21 Mar 7	9 1	0-9m: all < 2 ug/L 7m: 4 ug/L	Obj. met Obj. not met
		Aug 21	2	0-9m: 3 ug/L	Obj. not met
	E207820 100m S Can-Occ. disch	Feb 21-Mar 21 Mar 7	8 2	0-12m:all < 2 ug/L 0-12m: 2 - 4 ug/L	Obj. met Obj. not met
		Aug 21	1 1	0m: <2 ug/L 12m: 2 ug/L	Obj. met Obj. not met
Styrene 0.05 mg/L max	Port Moody Arm	1991	0	no data collected	Objective not checked

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
L-PAH in sediment: (max) total 0.5 ug/g naph 0.20 ug/g acyl 0.06 ug/g acph 0.05 ug/g fluo 0.05 ug/g phen 0.15 ug/g anth 0.10 ug/g (long-term)	Port Moody Arm: E207823 100m Off Ioco disch.	Mar 26	3	total 0.265 ug/g	Obj. met
			3	naph 0.064 ug/g	Obj. met
			3	acyl 0.025 ug/g	Obj. met
			3	acph 0.006 ug/g	Obj. met
			3	fluo 0.017 ug/g	Obj. met
			3	phen 0.117 ug/g	Obj. met
			3	anth 0.035 ug/g	Obj. met
	2nd Narrows-Roche Pt: E207821 50m off Chevron disch	Mar 26	3	total 0.125 ug/g	Obj. met
			3	naph 0.005 ug/g	Obj. met
			3	acyl 0.004 ug/g	Obj. met
			3	acph 0.008 ug/g	Obj. met
			3	fluo 0.028 ug/g	Obj. met
			3	phen 0.127 ug/g	Obj. met
			3	anth 0.064 ug/g	Obj. met
		Sep 5	3	total 1.212 ug/g	Obj. not met
			3	naph 0.054 ug/g	Obj. met
			3	acyl 0.015 ug/g	Obj. met
			3	acph 0.068 ug/g	Obj. not met
			3	fluo 0.106 ug/g	Obj. not met
			3	phen 0.817 ug/g	Obj. not met
			3	anth 0.151 ug/g	Obj. not met
	1st-2nd Narrows: E207818 off Clark Drive CSO	Sep 5	1	total 0.754 ug/g	Obj. not met
			1	naph 0.100 ug/g	Obj. met
			1	acyl <0.001 ug/g	Obj. met
			1	acph 0.047 ug/g	Obj. met
			1	fluo 0.069 ug/g	Obj. not met
			1	phen 0.440 ug/g	Obj. not met
			1	anth 0.097 ug/g	Obj. met
	E207813 100m off Coal Hbr CSO	Sep 5	1	total 0.808 ug/g	Obj. not met
			1	naph 0.073 ug/g	Obj. met
			1	acyl 0.022 ug/g	Obj. met
			1	acph 0.046 ug/g	Obj. met
			1	fluo 0.077 ug/g	Obj. not met
			1	phen 0.440 ug/g	Obj. not met
			1	anth 0.150 ug/g	Obj. not met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	1	total 0.284 ug/g	Obj. met
			1	naph 0.040 ug/g	Obj. met
			1	acyl 0.020 ug/g	Obj. met
			1	acph 0.023 ug/g	Obj. met
			1	fluo 0.027 ug/g	Obj. met
			1	phen 0.130 ug/g	Obj. met
			1	anth 0.044 ug/g	Obj. met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
L-PAH in sediment (max) total 0.5 ug/g naph 0.20 ug/g acyl 0.06 ug/g acph 0.05 ug/g fluo 0.05 ug/g phen 0.15 ug/g anth 0.10 ug/g (long-term)	False Creek: E207814 100m E Science World	Sep 5	1	total 1.446 ug/g	Obj. not met
			1	naph 0.210 ug/g	Obj. not met
			1	acyl 0.140 ug/g	Obj. not met
			1	acph 0.066 ug/g	Obj. not met
			1	fluo 0.120 ug/g	Obj. not met
			1	phen 0.610 ug/g	Obj. not met
			1	anth 0.300 ug/g	Obj. not met
H-PAH in sediment: (max) total 1.2 ug/g flth 0.17 ug/g pyre 0.26 ug/g bz-a 0.13 ug/g chry 0.14 ug/g bz-f 0.14 ug/g bz-p 0.32 ug/g in-p 0.06 ug/g di-a 0.06 ug/g b-pe 0.07 ug/g (long-term)	Port Moody Arm: E207823 100m Off Ioco disch.	Mar 26	3	total 0.946 ug/g	Obj. met
			3	flth 0.136 ug/g	Obj. met
			3	pyre 0.237 ug/g	Obj. met
			3	bz-a 0.047 ug/g	Obj. met
			3	chry 0.091 ug/g	Obj. met
			3	bz-f 0.111 ug/g	Obj. met
			3	bz-p 0.098 ug/g	Obj. met
			3	in-p 0.053 ug/g	Obj. met
			3	di-a 0.050 ug/g	Obj. met
			3	b-pe 0.147 ug/g	Obj. not met
	2nd Narrows-Roche Pt: E207821 50m off Chevron disch	Mar 26	3	total 0.606 ug/g	Obj. met
			3	flth 0.180 ug/g	Obj. not met
			3	pyre 0.130 ug/g	Obj. met
			3	bz-a 0.062 ug/g	Obj. met
			3	chry 0.092 ug/g	Obj. met
			3	bz-f 0.022 ug/g	Obj. met
			3	bz-p 0.060 ug/g	Obj. met
			3	in-p 0.019 ug/g	Obj. met
			3	di-a 0.050 ug/g	Obj. met
			3	b-pe 0.033 ug/g	Obj. met
	1st-2nd Narrows: E207818 50m off Chevron disch	Sep 5	1	total 2.721 ug/g	Obj. not met
			1	flth 0.570 ug/g	Obj. not met
			1	pyre 0.540 ug/g	Obj. not met
			1	bz-a 0.170 ug/g	Obj. not met
			1	chry 0.510 ug/g	Obj. not met
			1	bz-f 0.430 ug/g	Obj. not met
			1	bz-p 0.220 ug/g	Obj. not met
			1	in-p 0.120 ug/g	Obj. not met
			1	di-a <0.001 ug/g	Obj. met
			1	b-pe 0.160 ug/g	Obj. not met

TABLE 26 continued

BURRARD INLET WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
H-PAH in sediment (max) total 1.2 ug/g flth 0.17 ug/g pyre 0.26 ug/g bz-a 0.13 ug/g chry 0.14 ug/g bz-f 0.14 ug/g bz-p 0.32 ug/g in-p 0.06 ug/g di-a 0.06 ug/g b-pe 0.07 ug/g (long-term)	1st-2nd Narrows: E207813 100m off Coal Hbr CSO	Sep 5	1	total 3.119 ug/g	Obj. not met
			1	flth 0.540 ug/g	Obj. not met
			1	pyre 0.620 ug/g	Obj. not met
			1	bz-a 0.230 ug/g	Obj. not met
			1	chry 0.330 ug/g	Obj. not met
			1	bz-f 0.610 ug/g	Obj. not met
			1	bz-p 0.300 ug/g	Obj. not met
			1	in-p 0.200 ug/g	Obj. not met
			1	di-a 0.069 ug/g	Obj. not met
			1	b-pe 0.220 ug/g	Obj. not met
	Outer Burrard: E207812 off Locarno Park CSO	Sep 5	1	total 1.841 ug/g	Obj. not met
			1	flth 0.210 ug/g	Obj. not met
			1	pyre 0.230 ug/g	Obj. met
			1	bz-a 0.079 ug/g	Obj. met
			1	chry 0.110 ug/g	Obj. met
			1	bz-f 0.170 ug/g	Obj. met
			1	bz-p 0.930 ug/g	Obj. not met
			1	in-p 0.040 ug/g	Obj. met
			1	di-a 0.011 ug/g	Obj. met
			1	b-pe 0.061 ug/g	Obj. met
	False Creek: E207814 100m E Science World	Sep 5	1	total 7.880 ug/g	Obj. not met
			1	flth 1.100 ug/g	Obj. not met
			1	pyre 1.800 ug/g	Obj. not met
			1	bz-a 0.600 ug/g	Obj. not met
			1	chry 0.710 ug/g	Obj. not met
			1	bz-f 1.600 ug/g	Obj. not met
			1	bz-p 0.870 ug/g	Obj. not met
			1	in-p 0.500 ug/g	Obj. not met
			1	di-a 0.140 ug/g	Obj. not met
			1	b-pe 0.560 ug/g	Obj. not met

TABLE 27

BURRARD INLET TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200 /100 mL geometric mean (gm)	Lynn Creek: 0300085 2 km from mouth	Jun 11,19,26, Jul 4,10	5	27 - 224/100 mL gm = 51/100 mL	Objective met
	Capilano River: 0300083 near mouth	Jun 19,26, Jul 4,10	4	2 - 38/100 mL	Indefinite result
E. Coli <77/100 mL geometric mean (gm)	Lynn Creek Capilano River	1991	0	no data collected	Omitted 1991
Enterococci < 20/100 mL geometric mean (gm)	Lynn Creek Capilano River	1991	0	no data collected	Omitted 1991
Ammonia-N <1.84 mg/L av 20.5 mg/L max at pH = 7.0 temp = 10 C	Lynn Creek: 0300085 2 km from mouth	Jun 11,19,26, Jul 4,10	5	av = 0.020 mg/L max = 0.028 mg/L	Objectives met
	Capilano River: 0300083 near mouth	Jun 19,26, Jul 4,10	4	all < 0.005 mg/L	Max obj. met Av not chkd.
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Lynn Creek: 0300085 2 km from mouth	Jun 11,19,26, Jul 4,10	5	all < 0.005 mg/L	Objectives met
	Capilano River: 0300083 near mouth	Jun 19,26, Jul 4,10	4	all < 0.005 mg/L	Max obj. met Av not chkd.
Chlorophyll-a 50 mg/m2 max	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Diss. Oxygen 8-11 mg/L min	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Phenols 1 ug/L max	Lynn Creek Capilano River School House Brook	1991	0	no data collected	Objective not checked
Temperature max increase: 1 C	School House Brook	1991	0	no data collected	Objective not checked

TABLE 27 continued

BURRARD INLET TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 9.0	School house Brook	1991	0	no data collected	Objective not checked
Total Cd 0.2 ug/L max	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Total Cr 2 ug/L max	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
	School House Brook	1991	0	no data collected	Omitted 1991
Total Co 50 ug/L max	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Total Cu <2 ug/L av 3 ug/L max (assume hard.= 10 mg/L)	School House Brook: 0301566 u/s Reichold	Jul 4,10	2	all < 1 ug/L	Max obj. met Av not chkd.
	0301578 d/s Reichold	Jun 11 Jul 4	1 1	70 ug/L 1 ug/L	Max not met Max obj. met
	Lynn Creek: 0300085 2 km from mouth	Jun 11,19,26, Jul 4,10	5	all < 1 ug/L	Objectives met
	Capilano River: 0300083 near mouth	Jun19,Jul4,10 Jun 26	3 1	all < 1 ug/L 4 ug/L	Max obj. met Max not met Av not chkd.
Total Fe 0.3 mg/L max	School House Brook Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Total Pb <3.5 ug/L av 4.3 ug/L max (assume hard.= 10 mg/L)	School House Brook	1991	0	no data collected	Objectives not checked
Total Hg 0.02 ug/L av 0.1 ug/L max (long term for Lynn Creek)	Lynn Creek: 0300085 2 km from mouth	Jun 11,19,26, Jul 4,10	5	av < 0.014 ug/L max = 0.050 ug/L	Objectives met
	Capilano River: 0300083 near mouth	Jun 26,Jul 4, 10	3	all < 0.005 ug/L	Max obj. met Av not chkd.

TABLE 27 continued

BURRARD INLET TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Hg 0.5 ug/g max wet weight in fish	Lynn Creek Capilano River	1991	0	no data collected	Omitted 1991
Total Zn 0.015 mg/L max	School House Brook Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Chlorophenols 0.2 ug/L max	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Chlorophenols 0.01 ug/g max in sediment	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
Chlorophenols 0.1 ug/g max wet wt,in fish	Lynn Creek Capilano River	1991	0	no data collected	Omitted 1991
PCBs 1 ng/L max	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
PCBs 0.03 ug/g max in sediment	Lynn Creek Capilano River	1991	0	no data collected	Objective not checked
PCBs 0.1 ug/g max wet wt,in fish	Lynn Creek Capilano River	1991	0	no data collected	Omitted 1991

TABLE 28

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms 200/100 mL max (short-term) <100/100 mL 90th perc (np) (long-term)	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28,Nov 4,14,20	5	16 - 2950/100 mL np = 600/100 mL	np not met
		Nov 4	1	2950/100 mL	Max not met
		Oct 22-Nov 20	4	16 - 163/100 mL	Max obj. met
	0300024 near mouth	Oct 22,28,Nov 4,14,20	5	27 - 10000/100 mL np = 2000/100 mL	np not met
		Nov 4	1	10000/100 mL	Max not met
		Oct 22-Nov 20	4	27 - 153/100 mL	Max obj. met
	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	5 - 90/100 mL np = 60/100 mL	Max obj. met np obj. met
	0300012 near mouth	Jul 30,Aug 8, 14,19,29	5	19 - 178/100 mL np = 110/100 mL	Max obj. met np not met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	27 - 660/100 mL np = 350/100 mL	np not met
		Aug 29	1	660/100 mL	Max not met
		Jul 30-Aug 19	4	27 - 195/100 mL	Max obj. met
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	52 - 1650/100 mL np = 650/100 mL	np not met
		Aug 8-29	2	257 - 1650/100 mL	Max not met
		Jul 30-Aug 19	3	52 - 96/100 mL	Max obj. met
Fecal Coliforms <10/100 mL 90th perc. (np)	Pitt Lake 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	<2 - 7/100 mL np = 3/100 mL	Objective met
	Alouette Lake 0300016 near outlet	Jul 30,Aug 8, 14,19,29	5	1 - 7/100 mL np = 3/100 mL	Objective met
	Or Creek 1189002 near mouth	Oct 22,28, Nov 4,14,20	5	1 - 109/100 mL np = 20/100 mL	Objective not met
Fecal Coliforms <100/100 mL 90th perc. (np)	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	1 - 117/100 mL np = 100/100 mL	Objective not met
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	7 - 127/100 mL np = 75/100 mL	Objective met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	1 - 218/100 mL np = 140/100 mL	Objective not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <200/100 mL geometric mean (gm)	Hoy Creek E216030 near mouth	Oct 22,28, Nov 4,14,20	5	27 - 1120/100 mL gm = 118/100 mL	Objective met
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28, Nov 4,14,20	5	22 - 1270/100 mL gm = 163/100 mL	Objective met
	Coquitlam River 0300010 near mouth	Oct 22,28, Nov 4,14,20	5	24 - 710/100 mL gm = 115/100 mL	Objective met
Fecal Coliforms <200/100 mL geometric mean (gm) <400/100 mL 90th perc (np)	Burnaby Lake 0300009 near outlet	Aug 8,14,19, 30	4	41 - 1700/100 mL	Indefinite results
	Deer Lake E216032 at mid-lake	Aug 8,14,19, 30	4	1 - 512/100 mL	Indefinite results
<u>E. Coli</u> 200/100 mL max (short-term) <100/100 mL 90th perc (np) (long-term)	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20 Nov 4 Oct 22-Nov 20	5 1 4	18 - 3000/100 mL np = 600/100 mL 3000/100 mL 18 - 95/100 mL	np not met Max not met Max obj. met
	0300024 near mouth	Oct 22,28, Nov 4,14,20 Nov 4 Oct 22-Nov 20	5 1 4	48 - 8650/100 mL np = 2400/100 mL 8650/100 mL 48 - 100/100 mL	np not met Max not met Max obj. met
<u>E. Coli</u> <77/100 mL geometric mean (gm) (short-term) <100/100 mL 90th perc. (np) (long-term)	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	gm = 22/100 mL np = 60/100 mL	Objectives met
	0300012 near mouth	Jul 30,Aug 8, 14,19,29	5	gm = 51/100 mL np = 130/100 mL	gm met np not met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	gm = 102/100 mL np = 350/100 mL	Objectives not met
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	gm = 195/100 mL np = 800/100 mL	Objectives not met
<u>E. Coli</u> <10/100 mL 90th perc (np)	Pitt Lake 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	1 - <2/100 mL	Objective met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
E. Coli <10/100 mL 90th perc. (np)	Alouette Lake 0300016 near outlet	Jul 5,11,16, 24,31	5	<2 - 8/100 mL np = 3/100 mL	Objective met
	Or Creek 1189002 near mouth	Oct 22,28, Nov 4,14,20	5	1 - 94/100 mL np = 10/100 mL	Objective not met
E. Coli <100/100 mL 90th perc. (np)	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	2 - 135/100 mL np = 100/100 mL	Objective not met
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	5 - 123/100 mL np = 80/100 mL	Objective met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	1 - 164/100 mL np = 100/100 mL	Objective not met
E. Coli <77/100 mL geometric mean (gm)	Hoy Creek E216030 near mouth	Oct 22,28, Nov 4,14,20	5	29 - 1120/100 mL gm = 130/100 mL	Objective not met
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28, Nov 4,14,20	5	22 - 1400/100 mL gm = 156/100 mL	Objective not met
	Coquitlam River 0300010 near mouth	Oct 22,28, Nov 4,14,20	5	42 - 650/100 mL gm = 120/100 mL	Objective not met
E. Coli <77/100 mL geometric mean (gm) (long-term)	Burnaby Lake 0300009 near outlet	Aug 8,14,19, 30	4	41 - 1700/100 mL gm = 208/100 mL	Indefinite result
	Deer Lake E216032 at mid-lake	Aug 8,14,19, 30	4	3 - 399/100 mL	Indefinite result
Enterococci 50/100 mL max (short-term) <25/100 mL 90th perc (np) (long-term)	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20 Oct 22-Nov 20 Oct 28-Nov 14	5 3 2	15 - 5100/100 mL np = 750/100 mL 80 - 1500/100 mL 15 - 36/100 mL	np not met Max not met Max obj. met
	0300024 near mouth	Oct 22,28, Nov 4,14,20 Oct 22-Nov 20 Oct 28	5 4 1	24 - 12600/100 mL np = 2000/100 mL 57 - 12600/100 mL 24/100 mL	np not met Max not met Max obj. met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Enterococci <200/100 mL geometric mean (gm) (short-term) <25/100 mL 90th perc (np) (long-term)	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	gm = 7/100 mL np = 40/100 mL	gm obj. met np not met
	0300012 near mouth	Jul 30,Aug 8, 14,19,29	5	gm = 12/100 mL np = 25/100 mL	gm obj. met np not met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	gm = 81/100 mL np = 400/100 mL	Objectives not met
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	gm = 55/100 mL np = 300/100 mL	gm obj. met np not met
Enterococci <3/100 mL 90th perc (np)	Pitt Lake 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	all < 2/100 mL	Objective met
	Alouette Lake 0300016 near outlet	Jul 30,Aug 8, 14,19,29	5	<2 - 8/100 mL np = 3/100 mL	Objective not met
Enterococci <25/100 mL 90th perc. (np)	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	9 - 119/100 mL np = 100/100 mL	Objective not met
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	2 - 42/100 mL np = 30/100 mL	Objective not met
	Or Creek 1189002 near mouth	Oct 22,28, Nov 4,14,20	5	1 - 233/100 mL np = 80/100 mL	Objective not met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	1 - 431/100 mL np = 150/100 mL	Objective not met
Enterococci <20/100 mL geometric meam (gm)	Hoy Creek E216030 near mouth	Oct 22,28, Nov 4,14,20	5	33 - 940/100 mL gm = 169/100 mL	Objective not met
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28, Nov 4,14,20	5	18 - 1340/100 mL gm = 149/100 mL	Objective not met
	Coquitlam River 0300010 near mouth	Oct 22,28, Nov 4,14,20	5	19 - 2600/100 mL gm = 164/100 mL	Objective not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Enterococci <20/100 mL geometric mean (gm) (long-term)	Burnaby Lake 0300009 near outlet	Jul 31,Aug 8, 14,19,30	5	5 - 804/100 mL gm = 31/100 mL	Objective not met
	Deer Lake E216032 at mid-lake	Aug 8,14,19, 30	4	1 - 555/100 mL	Indefinite result
Pseudomonas aeruginosa <2/100 mL 75th perc.	Coquitlam R. d/s Park Scott Creek Hoy Creek Burnaby Lake Deer Lake	1991	0	no data collected	Objective not checked
Suspended Solids max increase: 10 mg/L	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20	5	1 - 136 mg/L	Control site
	0300024 near mouth	Oct 22,Nov 14 Oct28,Nov4,20	2 3	inc. = 7 - 10 mg/L inc. = 16-221 mg/L	Obj. met Obj. not met
	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	4 - 154 mg/L	Control site
	0300012 near mouth	Jul 30 Aug 8,14,19	1 3	inc. = 0 mg/L inc. = 11-18 mg/L	Obj. met Obj. not met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	1 - 17 mg/L	Control site
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	inc. = 0 - 5 mg/L	Objective met
	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	<1 - 5 mg/L	Control site
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	inc. = 0 - 6 mg/L	Objective met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	6 - 88 mg/L	Control site
	0300010 near mouth	Oct 22-Nov 20 Nov 4	4 1	inc. = 0 - 6 mg/L inc. = 119 mg/L	Obj. met Obj. not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids max increase: 10 mg/L or 10%	Or Creek 1189002 near mouth	Oct 22-Nov 14 Nov 4,20	3 2	<1 - 6 mg/L 12 - 40 mg/L	Obj. met Indef result
	Scott Creek 1189007 d/s Hoy Creek	Oct 28,Nov 14 Oct 22-Nov 20	2 3	<1 - 6 mg/L 16 - 63 mg/L	Obj. met Indef result
	Hoy Creek E216030 near mouth	Oct 28 Oct 22-Nov 20	1 4	<1 mg/L 11 - 62/100 mL	Obj. met Indef result
	Still Creek 0300008 near Burnaby L. inlet	Oct 28-Nov 20 Oct 21,Nov 4	3 2	3 - 8 mg/L 18 - 27 mg/L	Obj. met Indef result
	Burnaby Lake 0300009 near outlet	Oct 28 Oct 21-Nov 20	1 4	8 mg/L 13 - 45 mg/L	Obj. met Indef result
	Brunette River 0300111 near mouth	Oct 28 Oct 21-Nov 20	1 4	10 mg/L 11 - 32 mg/L	Obj. met Indef result
Suspended Solids max increase: 10 mg/L	Pitt Lake: 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	2 - 7 mg/L	Objective met
	Alouette Lake: 0300016 near outlet	Jul 30,Aug 8, 14,19,29	5	<1 - 1 mg/L	Objective met
	Deer Lake E216032 at mid-lake	Oct 28-Nov 4 Oct 21,Nov 20	3 2	4 - 9 mg/L 12 - 20 mg/L	Obj. met Indef result
Turbidity max increase: 1NTU, u/s <5 5NTU, u/s <50 or 10%	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20	5	1.0 - 136 NTU	Control site
	0300024 near mouth	Oct 22,28, Nov 4,14,20	5	inc. = 5.6-110 NTU	Objective not met
	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	4.3 - 30.0 NTU	Control site
	0300012 near mouth	Jul 30,Aug 8 Aug 14,19	2 2	inc. = 0 - 5 NTU inc. = 10 - 17 NTU	Obj. met Obj. not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity Max increase: 1NTU, u/s <5 5NTU, u/s <50 or 10%	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	0.3 - 8.4 NTU	Control site
	0300014 208 St (d/s Haney)	Aug 14,29 Jul 30-Aug 19	2 3	inc. = 0 - 0.8 NTU inc. = 1.3-1.9 NTU	Obj. met Obj. not met
	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	<0.1 - 0.7 NTU	Control site
	0300017 near mouth	Aug 29 Jul 30-Aug 19	1 4	inc. = 0.7 NTU inc. = 1.4-3.1 NTU	Obj. met Obj. not met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	13 - 48 NTU	Control site
	0300010 near mouth	Nov 4 Oct 22-Nov 20	1 4	inc. = 10 NTU inc. = 0 NTU	Obj. not met Obj. met
	Or Creek 1189002 near mouth	Oct 22,28 Nov 4,14,20	2 3	0.3 - 0.5 NTU 1.2 - 9.4 NTU	Obj. met Indef result
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28,Oct Nov 4,14,20	5	1.5 - 32.0 NTU	Indef result (no control)
	Hoy Creek E219030 near mouth	Oct 28 Oct 22-Nov 20	1 4	0.7 NTU 4.7 - 50.0 NTU	Obj. met Indef result
	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	3.7 - 18.0 NTU	Indef result (no control)
	Burnaby Lake 0300009 near outlet	Oct 21,28, Nov 4,14,20	5	3.9 - 26.0 NTU	Indef result (no control)
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	6.0 - 13.0 NTU	Indef result (no control)
	Pitt Lake: 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	1.6 - 6.2 NTU	Indef result (no control)

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity max increase: 1NTU, u/s <5 5NTU, u/s <50 or 10%	Alouette Lake: 0300016 near outlet	Jul 30,Aug 8, 14,19,29	5	0.2 - 0.6 NTU	Objective met
	Deer Lake E216032 at mid-lake	Oct 21,28, Nov 4,14,20	5	4.0 - 20.0 NTU	Indef result (no control)
Substrate Sedimentation 10% max increase in weight of particles <3 mm dia	Brunette River Kanaka Creek Pitt River Alouette River North Alouette River Coquitlam River Or Creek Scott Creek Hoy Creek Pitt Lake Alouette Lake	1991	0	no data collected	Objective not checked
Ammonia-N <1.79 mg/L av 9.31 mg/L max at pH = 7.7 temp = 15 C	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	0300024 near mouth	Oct 22,28, Nov 4,14,20	5	av < 0.024 mg/L max = 0.070 mg/L	Objectives met
	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	av = 0.007 mg/L max = 0.009 mg/L	Objectives met
	0300012 near mouth	Jul 30,Aug 8, 14,19,29	5	av < 0.005 mg/L max = 0.006 mg/L	Objectives met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	av = 0.021 mg/L max = 0.054 mg/L	Objectives met
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	av = 0.040 mg/L max = 0.110 mg/L	Objectives met
	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	all < 0.005 mg/L	Objectives met
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	av < 0.010 mg/L max = 0.020 mg/L	Objectives met
	Coquitlam River: 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	all < 0.005 mg/L	Objectives met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <1.79 mg/L av 9.31 mg/L max at pH = 7.7 temp = 15 C	Coquitlam River: 0300010 near mouth	Oct 22,28, Nov 4,14,20	5	av = 0.009 mg/L max = 0.017 mg/L	Objectives met
	Or Creek 1189002 near mouth	Oct 22,28, Nov 4,14,20	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28, Nov 4,14,20	5	av = 0.016 mg/L max = 0.044 mg/L	Objectives met
	Hoy Creek E216030 near mouth	Oct 22,28, Nov 4,14,20	5	av = 0.009 mg/L max = 0.022 mg/L	Objectives met
	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	av = 0.172 mg/L max = 0.287 mg/L	Objectives met
	Burnaby Lake 0300009 near outlet	Oct 21,28, Nov 4,14,20	5	av = 0.055 mg/L max = 0.100 mg/L	Objectives met
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	av = 0.046 mg/L max = 0.124 mg/L	Objectives met
	Pitt Lake 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	av < 0.013 mg/L max = 0.043 mg/L	Objectives met
	Alouette Lake 0300016 near outlet	Jul 30,Aug 8, 14,19,29	5	av < 0.008 mg/L max = 0.018 mg/L	Objectives met
	Deer Lake E216032 at mid-lake	Oct 21,28 Nov 4,14,20	5	av = 0.126 mg/L max = 0.200 mg/L	Objectives met
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20	5	av = 0.005 mg/L max = 0.007 mg/L	Objectives met
	0300024 near mouth	Oct 22,28, Nov 4,14,20	5	av = 0.007 mg/L max = 0.010 mg/L	Objectives met
	Pitt River E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	all < 0.005 mg/L	Objectives met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Pitt River 0300012 near mouth	Jul 30,Aug 8, 14,19,29	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	av < 0.005 mg/L max = 0.006 mg/L	Objectives met
	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	all < 0.005 mg/L	Objectives met
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	av < 0.005 mg/L max = 0.007 mg/L	Objectives met
	0300010 near mouth	Oct 22,28, Nov 4,14,20	5	av = 0.009 mg/L max = 0.017 mg/L	Objectives met
	Or Creek 1189002 near mouth	Oct 22,28, Nov 4,14,20	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28, Nov 4,14,20	5	av = 0.005 mg/L max = 0.008 mg/L	Objectives met
	Hoy Creek E216030 near mouth	Oct 22,28, Nov 4,14,20	5	av < 0.006 mg/L max = 0.008 mg/L	Objectives met
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	av = 0.009 mg/L max = 0.013 mg/L	Objectives met
	Pitt Lake 0300013 near outlet	Jul 30,Aug 8, 14,19,30	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met
	Alouette Lake 0300016 near outlet	Jul 30,Aug 8, 14,19,29	5	av < 0.005 mg/L max = 0.005 mg/L	Objectives met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N <0.02 mg/L av 0.06 mg/L max	Deer Lake E216032 at mid-lake	Oct 21,28, Nov 4,14,20	5	av < 0.011 mg/L max = 0.021 mg/L	Objectives met
Nitrite-N <0.20 mg/L av 0.60 mg/L max at Cl > 10 mg/L	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, 4,14,20	5	av = 0.018 mg/L max = 0.035 mg/L	Objectives met
	Burnaby Lake 0300009 near outlet	Oct 21,28, 4,14,20	5	av = 0.010 mg/L max = 0.012 mg/L	Objectives met
Chlorophyll-a <50 mg/m2 av	Kanaka Creek Or Creek Scott Creek Hoy Creek Coquitlam River	1991	0	no data collected	Objective not checked
Chlorophyll-a <100 mg/m2 av	Alouette River: North Alouette River Pitt River Brunette River Still Creek	1991	0	no data collected	Objective not checked
Total-P <0.015 mg/L av Apr - Oct (long-term)	Burnaby Lake 0300009 near outlet	Nov 20	3	0.361 - 0.517 mg/L av = 0.460 mg/L	Indefinite result
Dissolved Oxygen 11.0 mg/L min Nov - Mar 8.0 mg/L min Apr - Oct	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22,28, Nov 4,14,20	5	12.0 - 13.5 mg/L	Objective met
	0300024 near mouth	Oct 22,28 Nov 4 Nov 14,20	2 1 2	9.4 - 10.6 mg/L 11.6 mg/L 10.4 - 10.1 mg/L	Obj. met Obj. met Obj. not met
	Pitt River: E216028 u/s Alouette River	Jul 30,Aug 8, 14,19,30	5	9.2 - 10.9 mg/L	Objective met
	0300012 near mouth	Jul 30,Aug 8, 14,19,29	5	9.2 - 10.1 mg/L	Objective met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,29	5	9.5 - 10.3 mg/L	Objective met
	0300014 208 St (d/s Haney)	Jul 30,Aug 19 Aug 8,14,29	2 3	6.7 - 7.4 mg/L 8.2 - 10.7 mg/L	Obj. not met Obj. met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 11.0 mg/L min Nov - Mar 8.0 mg/L min Apr - Oct	North Alouette River: 0300018 u/s Haney	Jul 30 Aug 8-Aug 29	1 4	7.9 mg/L 9.5 - 12.5 mg/L	Obj. not met Obj. met
	0300017 near mouth	Jul 30,Aug 8 Aug 14,19,29	2 3	7.5 mg/L 8.4 - 11.0 mg/L	Obj. not met Obj. met
	Coquitlam River 0300019 d/s Or Creek	Oct 22,28, Nov 4,14,20	5	11.7 - 13.4 mg/L	Objective met
	0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	11.7 - 13.3 mg/L	Objective met
	0300010 near mouth	Oct 22,28 Nov 14 Nov 4,20	2 1 2	8.6 - 9.3 mg/L 7.8 mg/L 11.6 - 12.4 mg/L	Obj. met Obj. not met Obj. met
	Or Creek 1189002 near mouth	Oct 22,28, Nov 4,14,20	5	12.1 - 13.3 mg/L	Objective met
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28 Nov 14 Nov 4,20	2 1 2	10.6 - 11.6 mg/L 10.6 mg/L 11.7 - 12.1 mg/L	Obj. met Obj. not met Obj. met
	Hoy Creek E216030 near mouth	Oct 21,28 Nov 14 Nov 4,20	2 1 2	10.6 - 11.2 mg/L 10.5 mg/L 11.1 - 12.2 mg/L	Obj. met Obj. not met Obj. met
Dissolved Oxygen 6.0 mg/L min (short-term) 8.0 mg/L min (long-term) 11.0 mg/L min Nov - Mar (long-term)	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	7.1 - 10.2 mg/L	Objective met
	Burnaby Lake 0300009 near outlet	Jul 31 Aug 14,19	3	2.8 - 4.1 mg/L	Objective not met
		Aug 7-Nov 20	7	6.6 - 11.2 mg/L	Objective met
	Deer Lake E216032 at mid-lake	Jul 31,Aug 7 Jul 31,Aug 7 Aug 14-Nov 20	2 2 8	4m: 2.1 - 2.4 mg/L 0m: 7.5 - 8.7 mg/L 6.0 - 9.6 mg/L	Obj. not met Obj. met Obj. met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Diss. Oxygen 8.0 mg/L min 11.0 mg/L min Nov - Mar (long-term)	Brunette River E208821 Hume Park	Oct 21,28, 4,14,20	5	9.6 - 12.1 mg/L	Objective met
	0300111 near mouth	Oct 21,28, 4,14,20	5	10.0 - 11.6 mg/L	Objective met
pH 6.5 - 8.5 (long-term)	Kanaka Creek: 0300025 112 Ave (mid-length)	Oct 22-Nov 14 Nov 4,20	3 2	6.5 - 7.3 6.4	Obj. met Obj. not met
	0300024 near mouth	Oct 22-Nov 14 Nov 4,20	3 2	6.8 - 7.3 6.4	Obj. met Obj. not met
pH 6.5 - 8.5 or max change 0.2 if u/s pH <6.5	Pitt River 0300012 near mouth	Jul 30,Aug 8, 19,29	4	7.4 - 8.0	Objective met
	Alouette River: 0300015 232 St (u/s Haney)	Jul 30,Aug 8, 14,19,20	5	7.1 - 7.5	Objective met
	0300014 208 St (d/s Haney)	Jul 30,Aug 8, 14,19,29	5	6.8 - 7.4	Objective met
	North Alouette River: 0300018 u/s Haney	Jul 30,Aug 8, 14,19,29	5	6.7 - 7.5	Objective met
	0300017 near mouth	Jul 30,Aug 8, 14,19,29	5	6.5 - 7.0	Objective met
	Coquitlam River 0300011 u/s Coquitlam R. Park	Oct 22,28, Nov 4,14,20	5	6.2 - 7.4	Control site
	0300010 near mouth	Oct 22,28, Nov 4,14,20	5	6.9 - 7.4	Objective met
	Or Creek 1189002 near mouth	Oct 22-Nov 14 Oct 28,Nov 20	3 2	6.7 - 7.1 6.1 - 6.4	Obj. met Indef result
	Scott Creek 1189007 d/s Hoy Creek	Oct 22,28, Nov 4,14,20	5	6.9 - 7.4	Objective met
	Hoy Creek E216030 near mouth	Oct 22,28, Nov 4,14,20	5	6.7 - 7.1	Objective met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5 or max change 0.2 if u/s pH <6.5	Pitt Lake 0300013 near mouth	Jul 30,Aug 8, 14,19,30	5	6.6 - 7.6	Objective met
	Alouette Lake 0300016 near mouth	Jul 30,Aug 8, 14,19,29	5	6.6 - 7.2	Objective met
pH 6.5 - 8.5	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	7.0 - 7.2	Objective met
	Burnaby Lake 0300009 near outlet	Oct 21,28, Nov 4,14,20	5	6.8 - 7.4	Objective met
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	7.0 - 7.7	Objective met
	Deer Lake E216032 at mid-lake	Oct 21,28, Nov 4,14,20	5	7.1 - 7.4	Objective met
Total Cr 0.020 mg/L max (long-term)	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	all <0.005 mg/L	Objective met
	Burnaby Lake 0300009 near outlet	Oct 21,28, Nov 4,14,20	5	<0.005 - 0.006mg/L	Objective met
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	<0.005 - 0.005mg/L	Objective met
	Deer Lake E216032 at mid-lake	Oct 21,28, Nov 4,14,20	5	<0.005 - 0.009mg/L	Objective met
Total Cu <0.002 mg/L av 0.005 mg/L max at hard. >30 mg/L (long-term)	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	0.011 - 0.016 mg/L av = 0.014 mg/L	Objectives not met
	Burnaby Lake 0300009 near outlet	Oct 21,28, Nov 4,14,20	5	0.002 - 0.004 mg/L av = 0.003 mg/L	Max obj. met Av not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu <0.002 mg/L av 0.005 mg/L max at hard. >30 mg/L (long-term)	Brunette River 0300111 near mouth	Oct 21-Nov 20 Oct 21-Nov 20 Nov 4,14	5 3 2	av = 0.004 mg/L 0.002 - 0.003 mg/L 0.007 mg/L	Av not met Max obj. met Max not met
	Deer Lake E216032 at mid-lake	Oct 21,28, Nov 5,14,20	5	av = 0.003 mg/L 0.001 - 0.004 mg/L	Av not met Max obj. met
Total Cu <30 ug/g av in sediments (long-term)	Still Creek 0300008 near Burnaby L. inlet	Nov 20	3	165 - 334 ug/g av = 222 ug/g	Objective not met
	Burnaby Lake 0300009 near outlet	Nov 20	3	19 - 31 ug/g av = 22 ug/g	Objective met
	Brunette River 0300111 near mouth	Nov 20	3	35 - 39 ug/g av = 37 ug/g	Objective not met
	Deer Lake E216032 at mid-lake	Nov 20	3	13 - 17 ug/g av = 15 ug/g	Objective met
Total Pb <0.004 mg/L av 0.018 mg/L max (long-term)	Still Creek 0300008 near Burnaby L. inlet	Oct 21,28, Nov 4,14,20	5	0.002 - 0.006 mg/L av = 0.004 mg/L	Objectives met
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	0.001 - 0.007 mg/L av = 0.003 mg/L	Objectives met
Total Pb <0.004 mg/L av 0.012 mg/L max (long-term)	Burnaby Lake 0300009 near outlet	Oct 21,28, Nov 4,14,20	5	av = 0.004 mg/L 0.002 - 0.007 mg/L	Av not met Max obj. met
	Deer Lake E216032 at mid-lake	Oct 21-Nov 20 Oct 21-Nov 20 Oct 28	5 4 1	av = 0.008 mg/L 0.004 - 0.007 mg/L 0.016 mg/L	Av not met Max obj. met Max not met
Total Pb <5 ug/g av in sediments (long-term)	Still Creek 0300008 near Burnaby L. inlet	Nov 20	3	151 - 193 ug/g av = 175 ug/g	Objective not met
	Burnaby Lake 0300009 near outlet	Nov 20	3	20 - 36 ug/g av = 29 ug/g	Objective not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

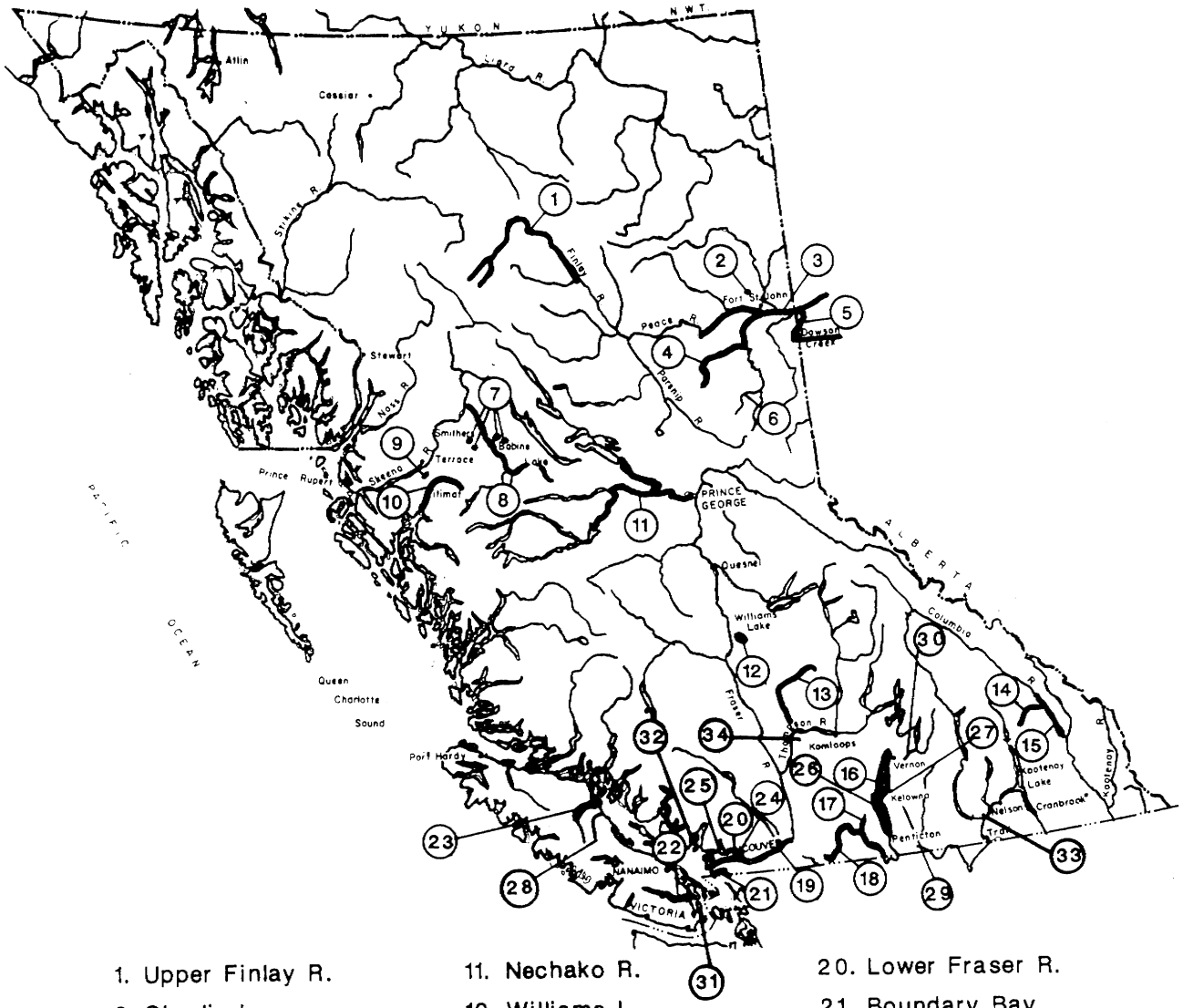
VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb <5 ug/g av in sediments (long-term)	Brunette River 0300111 near mouth	Nov 20	3	48 - 63 ug/g av = 56 ug/g	Objective not met
	Deer Lake E216032 at mid-lake	Nov 20	3	10 - 15 ug/g av = 12 ug/g	Objective not met
Total Pb 0.8 ug/g wet weight in fish muscle	Still Creek Deer Lake Brunette River	1991	0	no data collected	Omitted 1991
	Burnaby Lake	1991	0	no data collected	Obj not chkd
Total Hg <0.02 ug/L av 0.1 ug/L max (long-term)	Still Creek 0300008 near Burnaby L. inlet	Oct 21	1	< 0.005 ug/L	Max obj. met Av not chkd.
	Burnaby Lake 0300009 near outlet	Oct 21	1	< 0.005 ug/L	Max obj. met Av not chkd.
	Brunette River E208821 Hume Park	Oct 21	1	< 0.005 ug/L	Max obj. met Av not chkd.
	0300111 near mouth	Oct 21	1	< 0.005 ug/L	Max obj. met
	Deer Lake E216032 at mid-lake	Oct 21	1	< 0.005 ug/L	Max obj. met Av not chkd.
Total Hg <0.07 ug/g av in sediments (long-term)	Still Creek Burnaby Lake Brunette River Deer Lake	1991	0	no data collected	Objective not checked
Total Hg 0.05 ug/g wet weight in fish muscle	Still Creek Deer Lake Brunette River	1991	0	no data collected	Omitted 1991
	Burnaby Lake	1991	0	no data collected	Obj not chkd
Total Zn 0.03 mg/L max (long-term)	Still Creek 0300008 near Burnaby L. inlet	Oct 28,Nov 14 Oct 21-Nov 20	2 3	0.03 mg/L 0.04 - 0.05 mg/L	Obj. met Obj. not met

TABLE 28 continued

NORTH SHORE LOWER FRASER TRIBUTARIES WATER QUALITY OBJECTIVES - 1991

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn 0.03 mg/L max (long-term)	Burnaby Lake 0300009 near outlet	Oct 28-Nov 20 Oct 21	4 1	0.009 - 0.030 mg/L 0.470 mg/L	Obj. met Obj. not met
	Brunette River 0300111 near mouth	Oct 21,28, Nov 4,14,20	5	<0.005 - 0.030mg/L	Objective met
	Deer Lake E216032 at mid-lake	Oct 21,28, Nov 4,14,20	5	<0.005 - 0.030mg/L	Objective met
Total Zn <70 ug/g av in sediments (long-term)	Still Creek 0300008 near Burnaby L. inlet	Nov 20	3	293 - 415 ug/g av = 374 ug/g	Objective not met
	Burnaby Lake 0300009 near outlet	Nov 20	3	66 - 101 ug/g av = 86 ug/g	Objective not met
	Brunette River 0300111 near mouth	Nov 20	3	211 - 232 ug/g av = 222 ug/g	Objective not met
	Deer Lake E216032 at mid-lake	Nov 20	3	42 - 48 ug/g av = 45 ug/g	Objective met
Chlorophenols (tri + tetra + penta) in water 0.0002mg/L max	Pitt River 0300012 near mouth	Aug 19	1	< 0.0001 mg/L for each homologue	Objective met
Chlorophenols (tri + tetra + penta) in sediments <0.01 ug/g av	Pitt River 0300012 near mouth	Aug 19	3	penta: 0.02-<0.005 ug/g tetra: all <0.005 ug/g tri: all <0.005 ug/g av sum=0.007 ug/g	Objective met
Chlorophenols (tri + tetra + penta) in fish 0.10 ug/g max (wet weight)	Pitt River	1991	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 Lakes
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
25. Burrard Inlet
26. Okanagan Tribs., Westbank
27. Okanagan Tribs., Kelowna
28. Oyster River
29. Hydraulic Creek
30. Bessette Creek
31. Elk Lake
32. Pender Harbour
33. Columbia R. (to Birchbank)
34. Thompson River

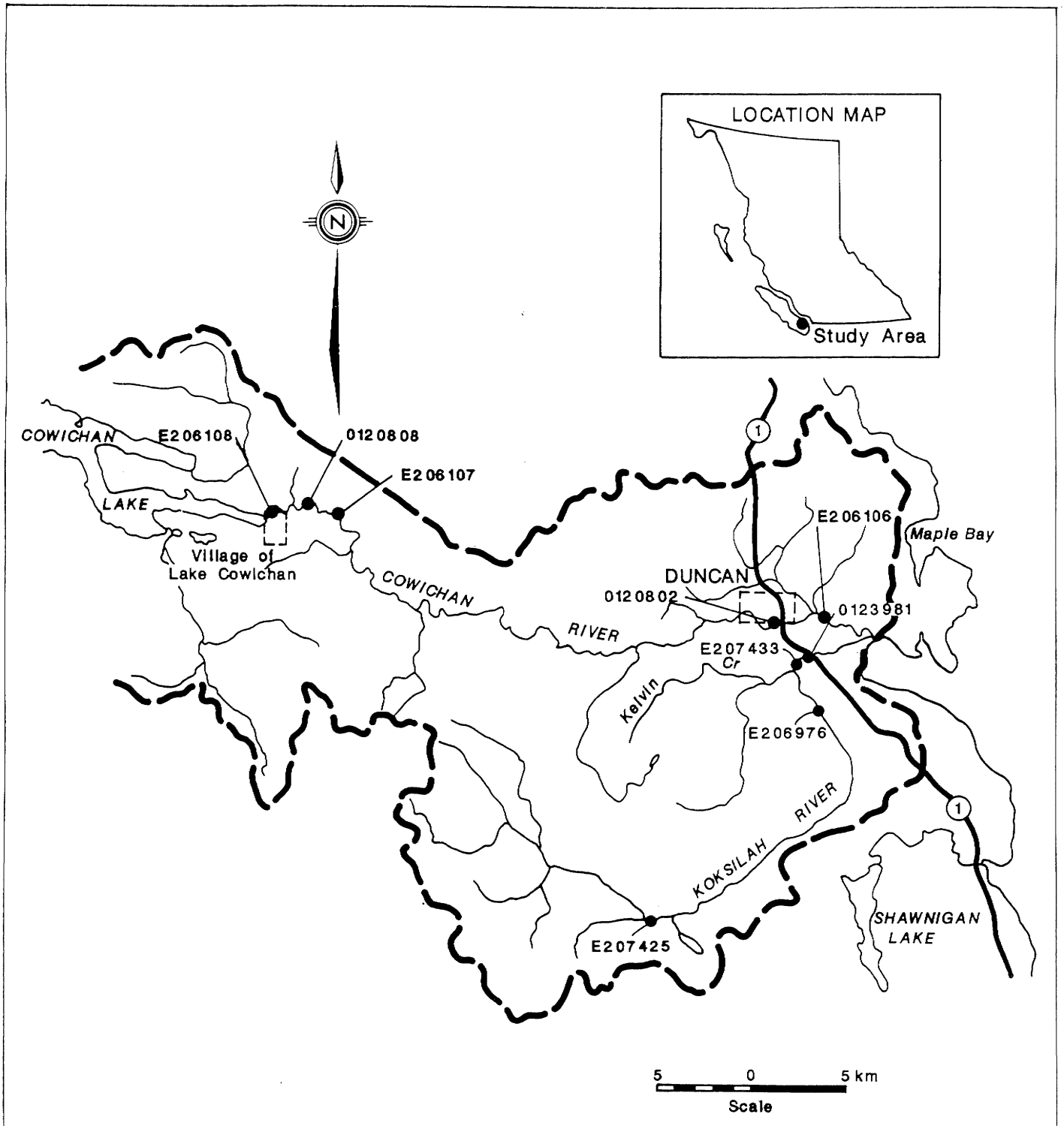


FIGURE 2 Cowichan – Koksilah Rivers

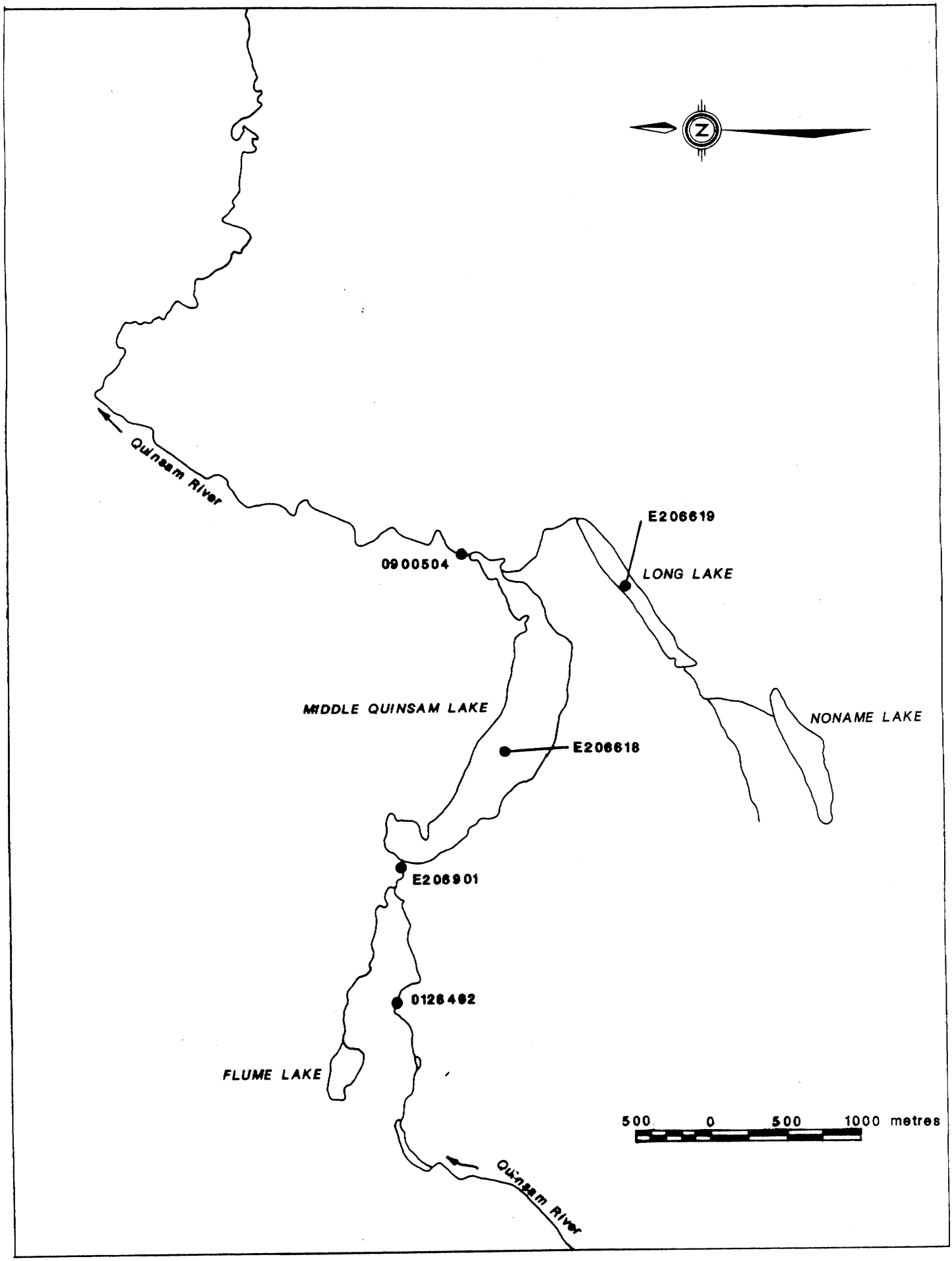


FIGURE 3 Middle Quinsam Lake

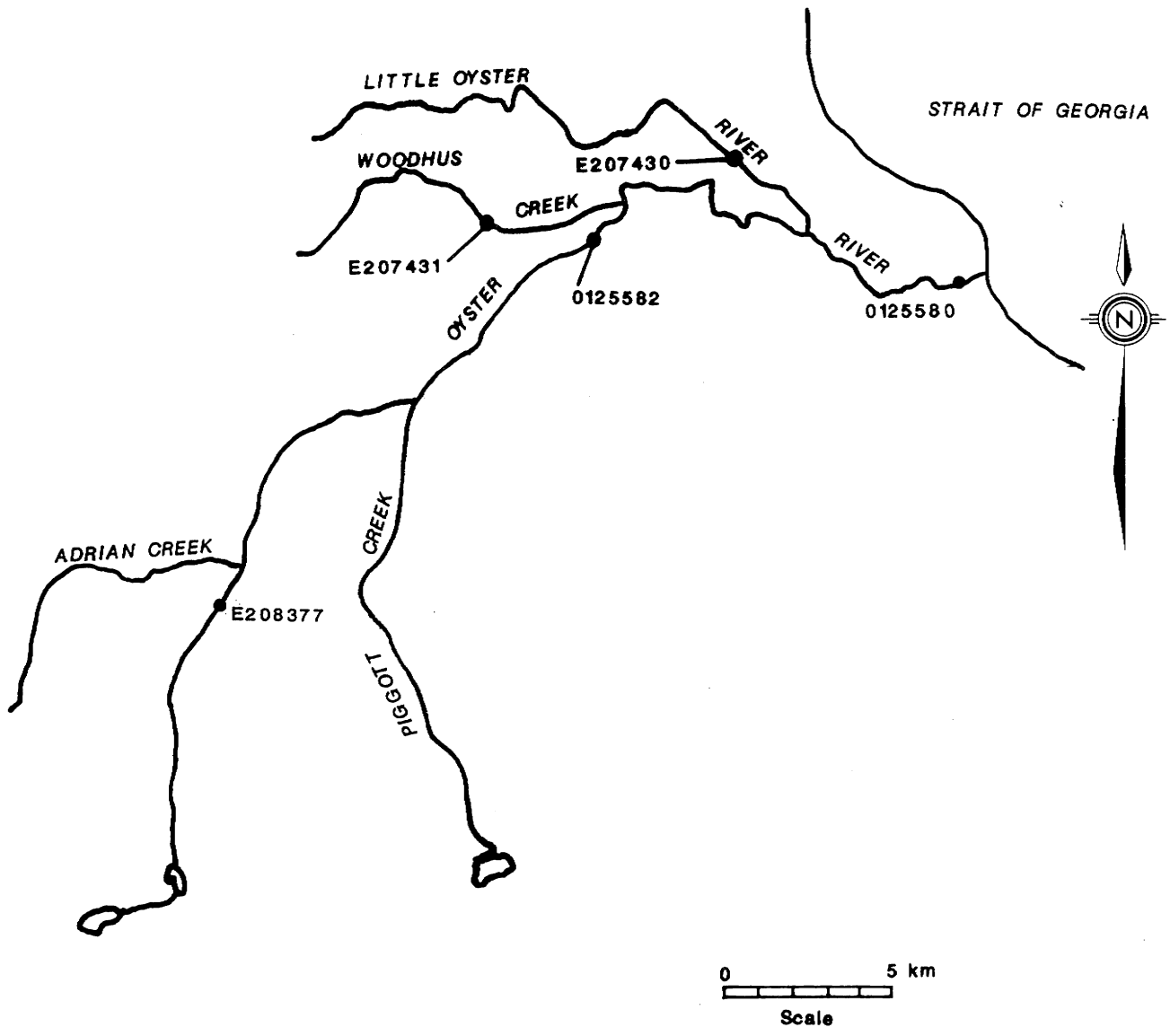


FIGURE 4 Oyster River

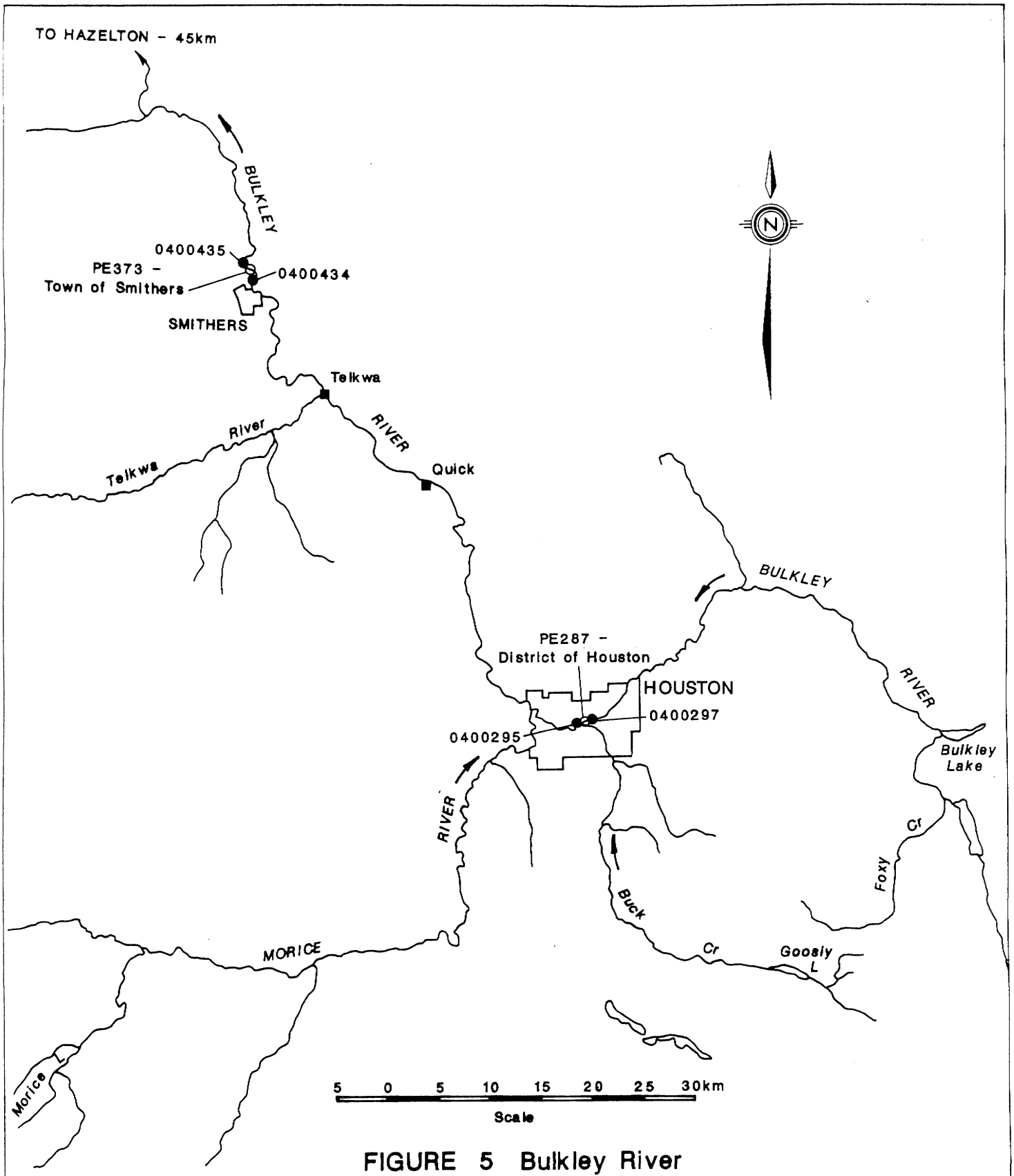


FIGURE 5 Bulkley River

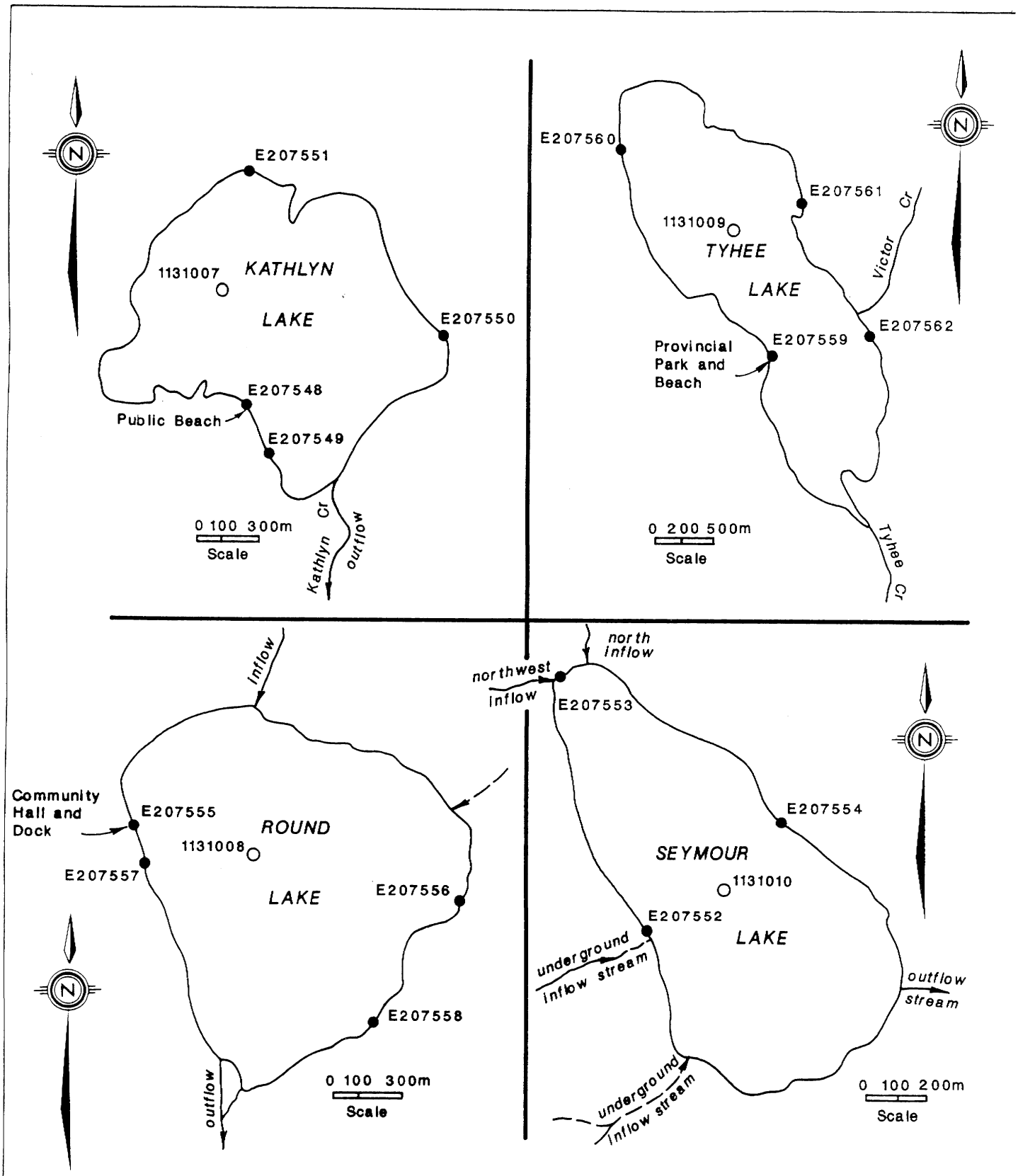


FIGURE 6 Kathlyn, Seymour, Round and Tyhee Lakes

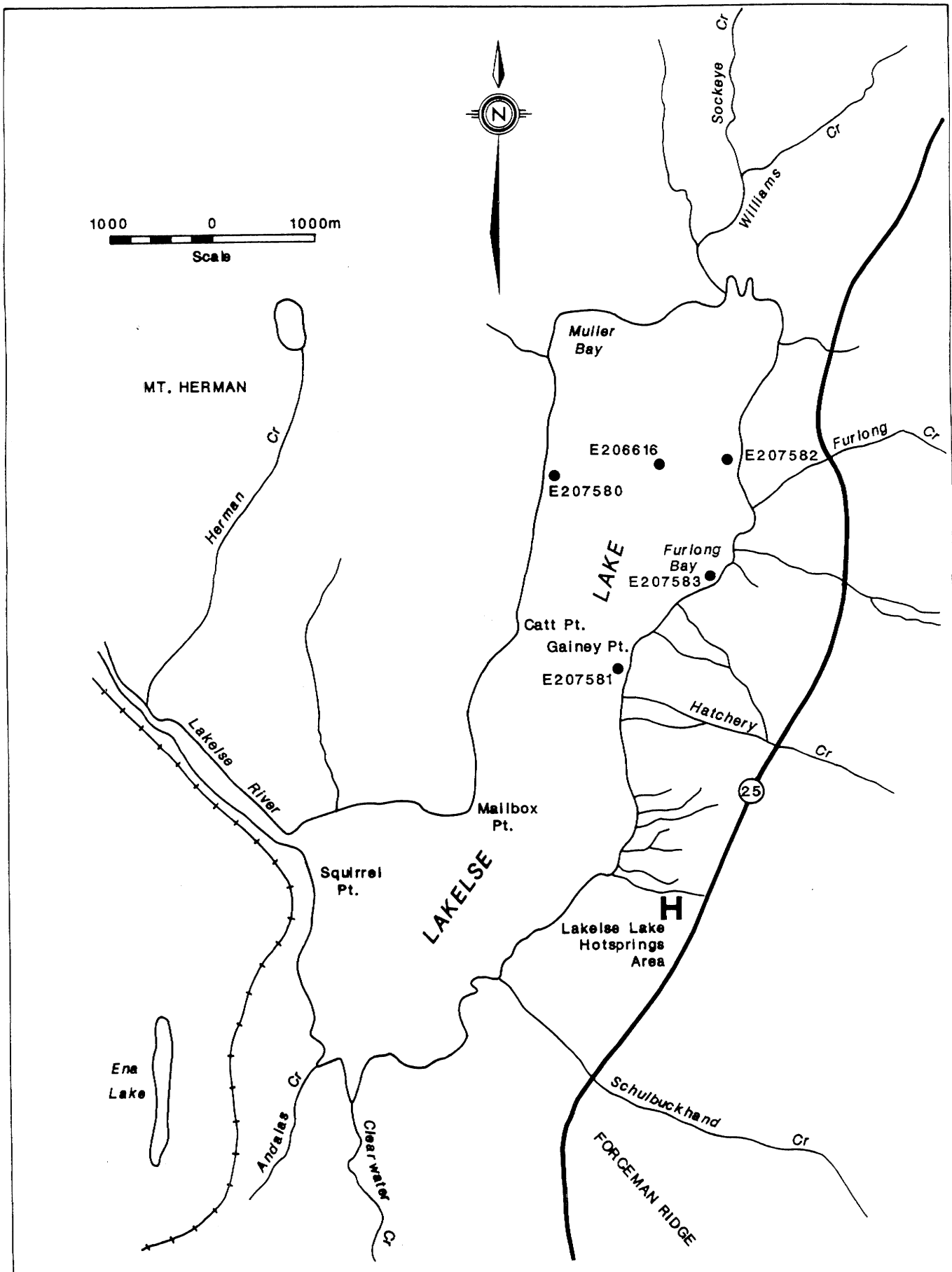


FIGURE 7 Lakelse Lake

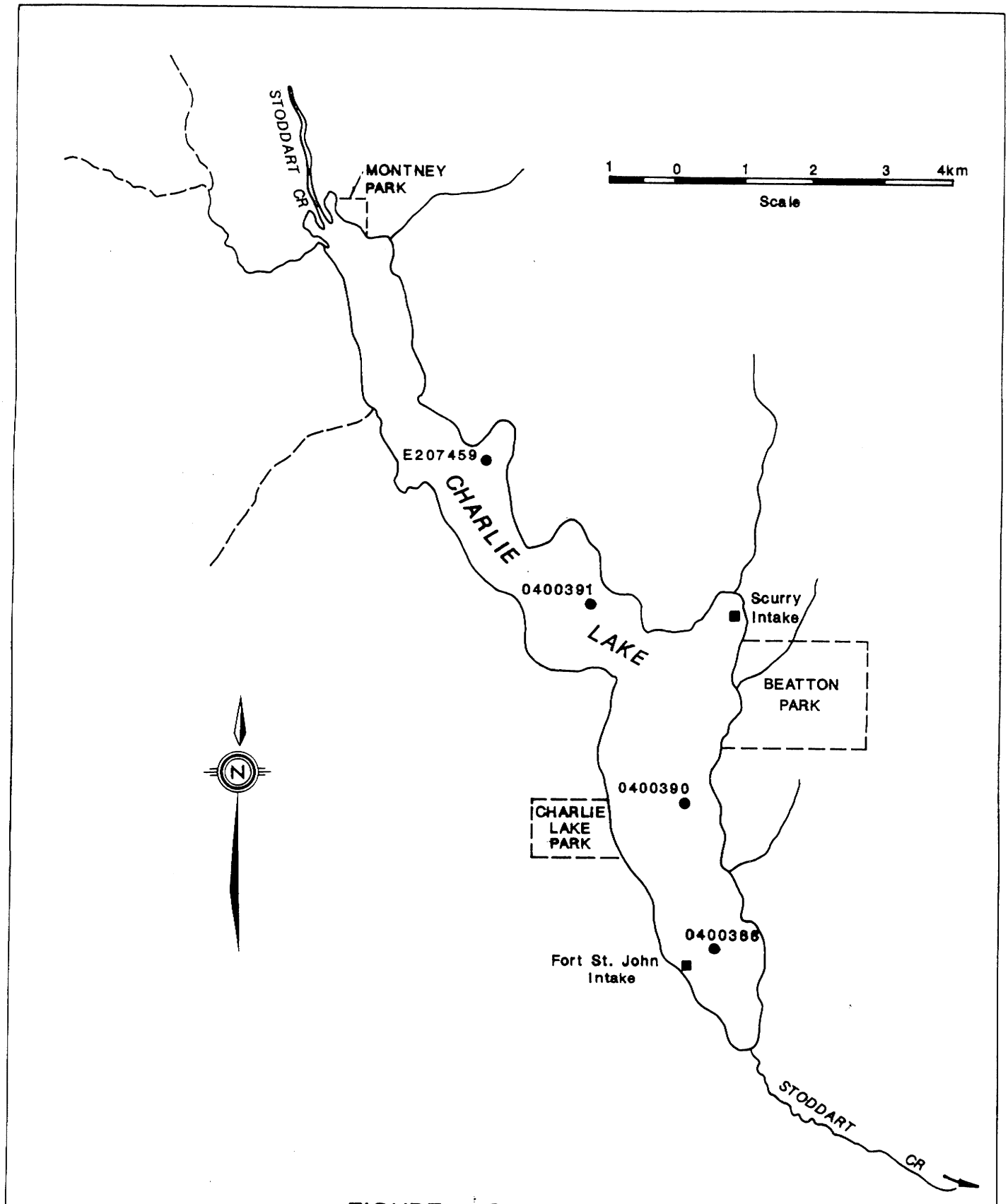


FIGURE 8 Charlie Lake

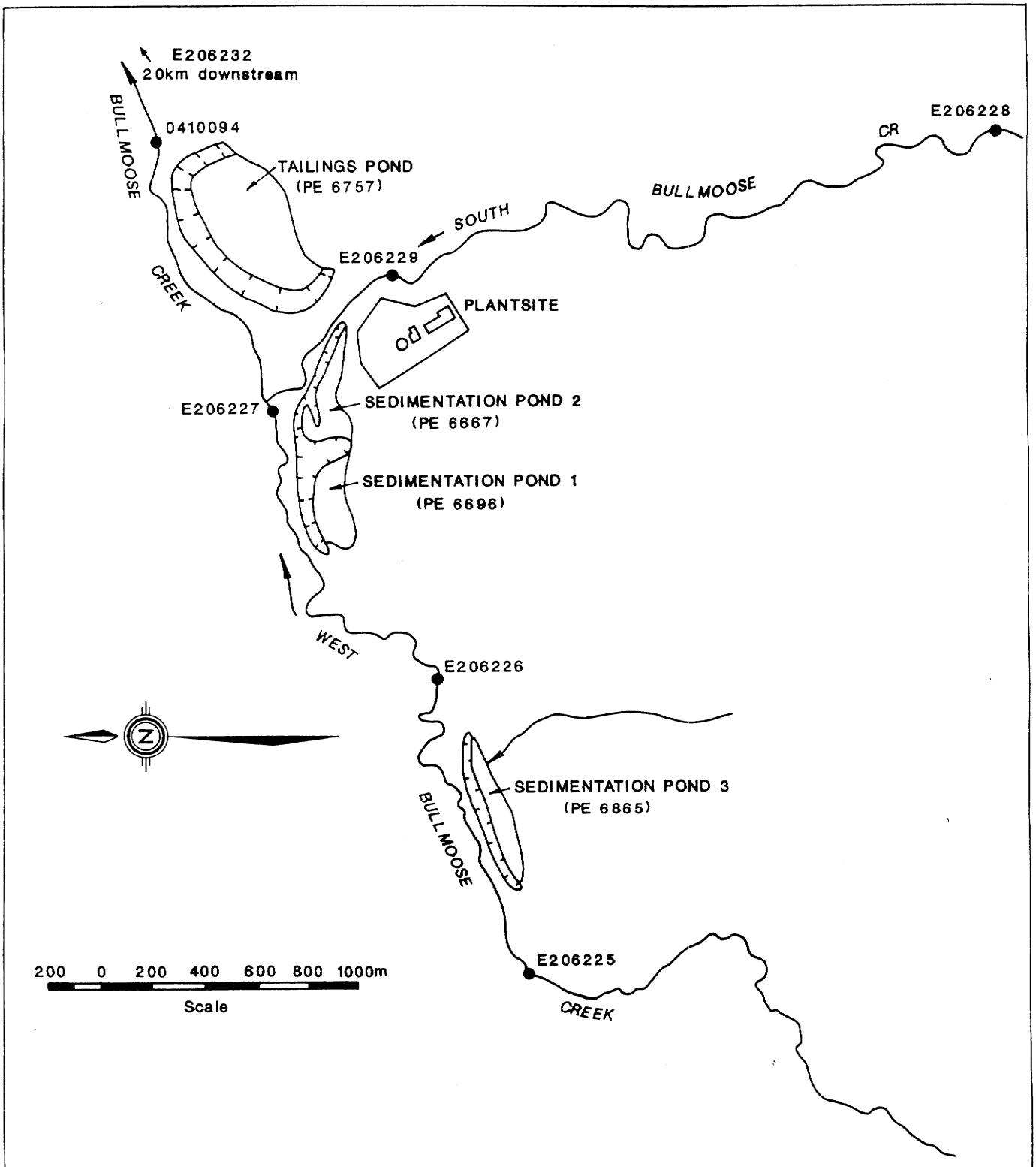


FIGURE 9 Bullmoose Creek

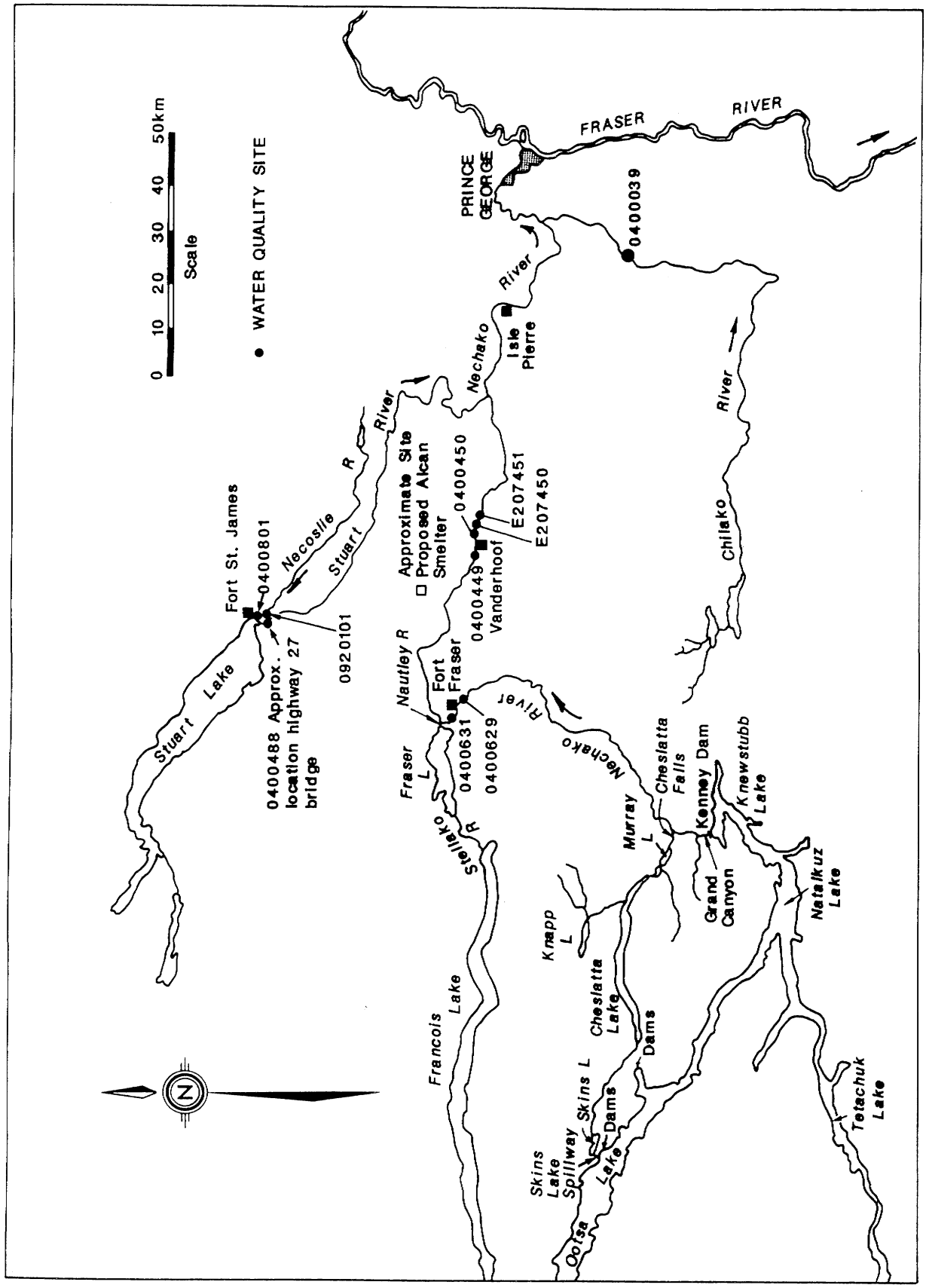


FIGURE 10 Nechako River

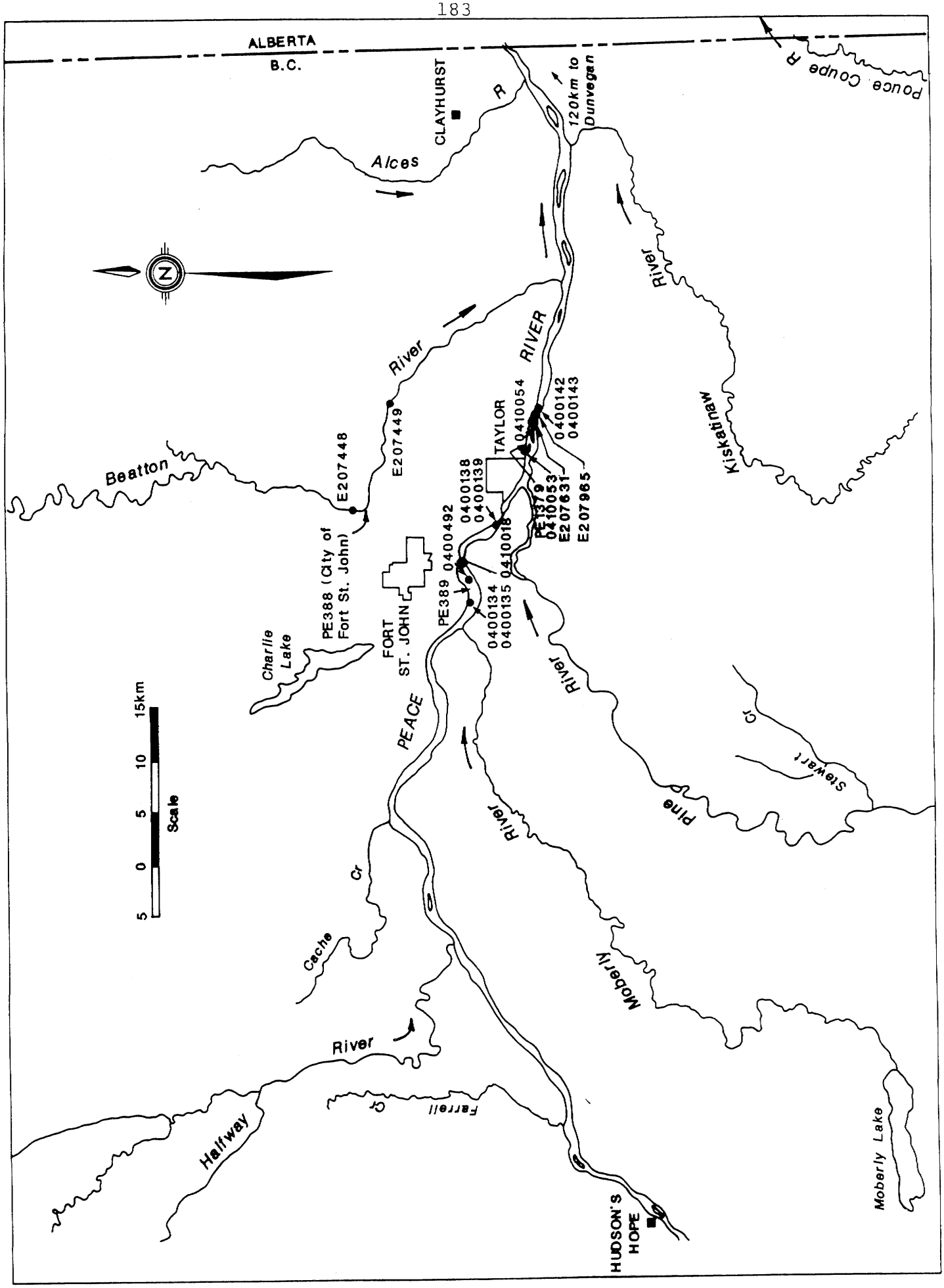


FIGURE 11 Peace River Mainstem

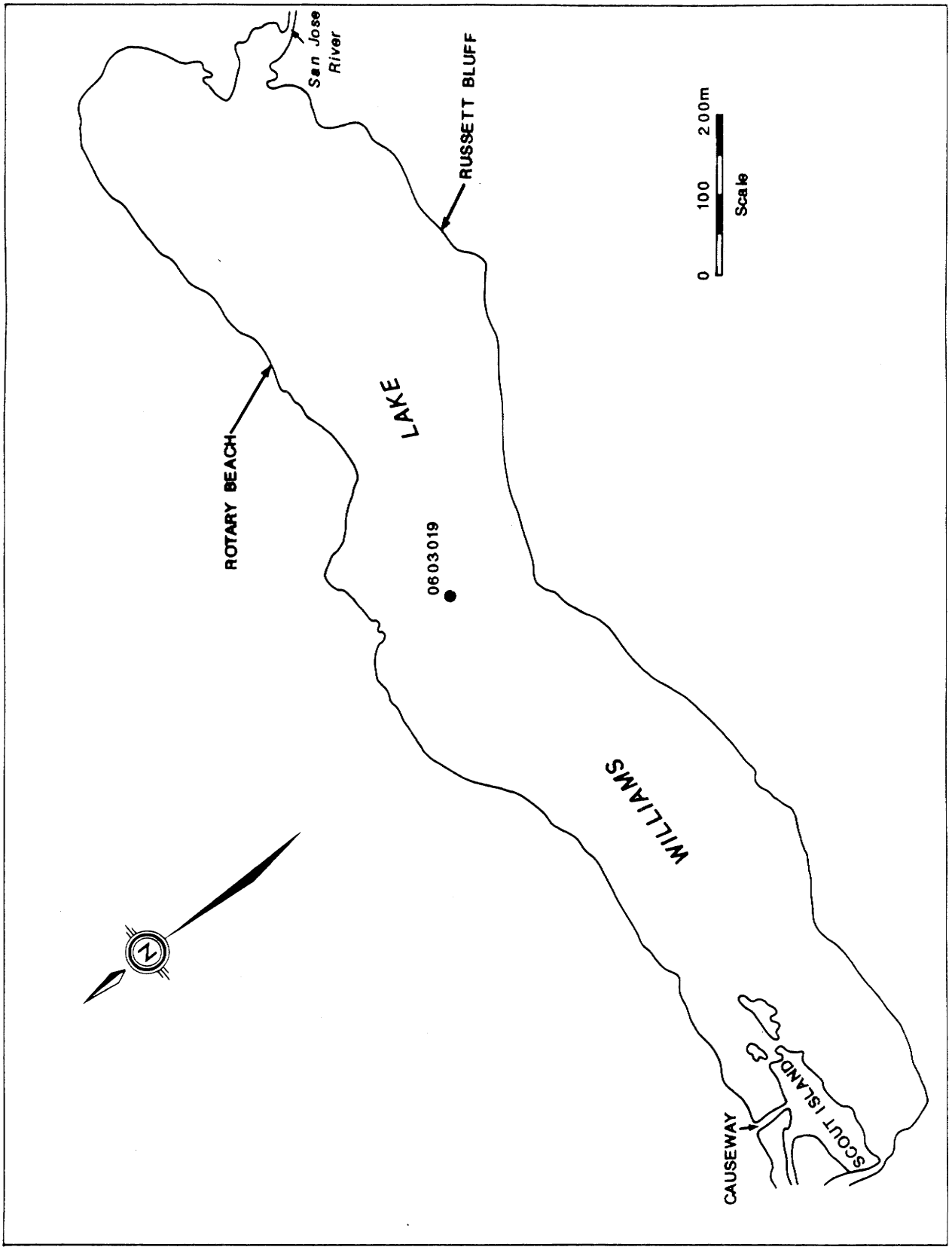


FIGURE 12 Williams Lake

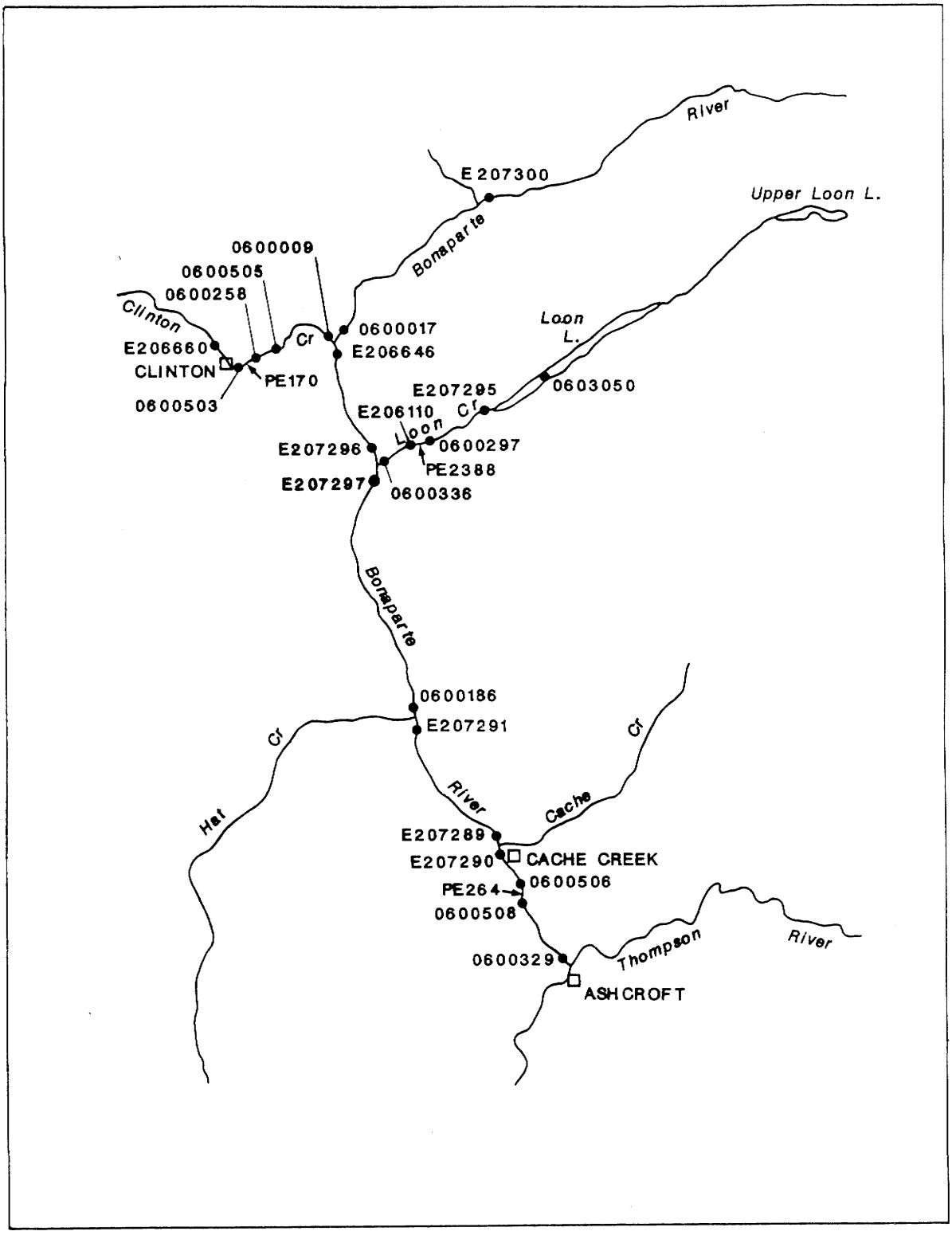


FIGURE 13 Bonaparte River

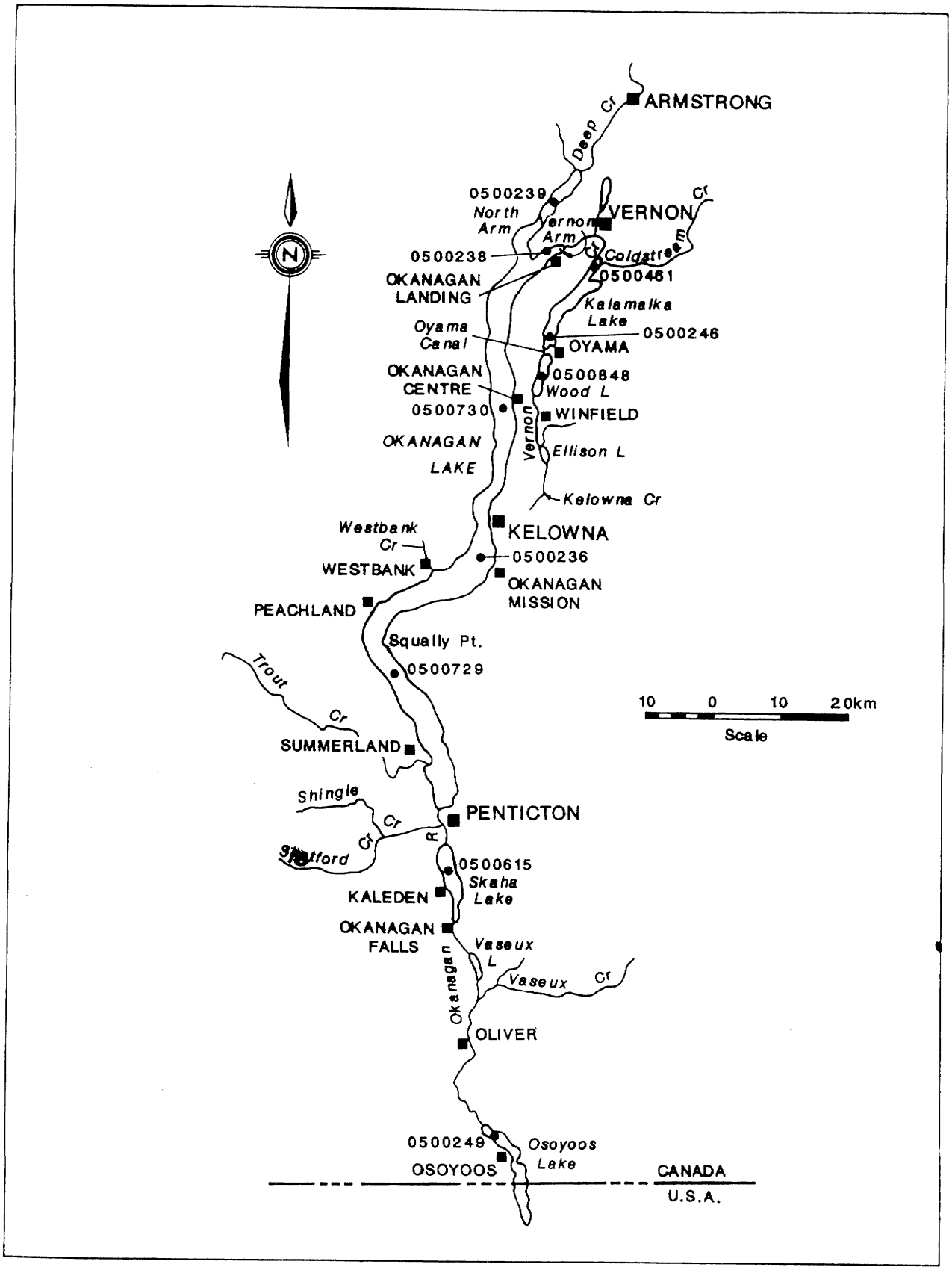


FIGURE 14 Okanagan Valley Lakes

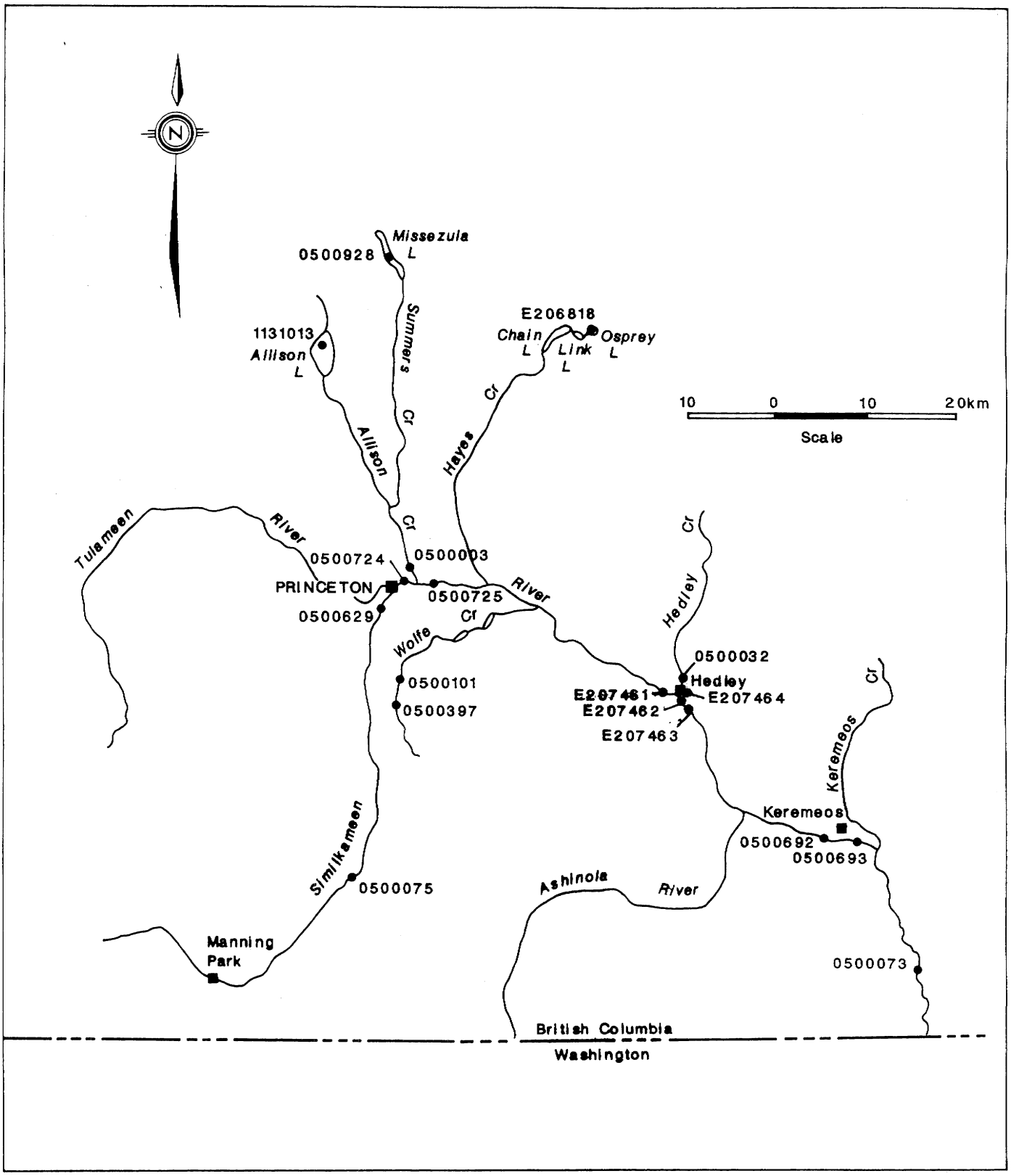


FIGURE 15 Similkameen River

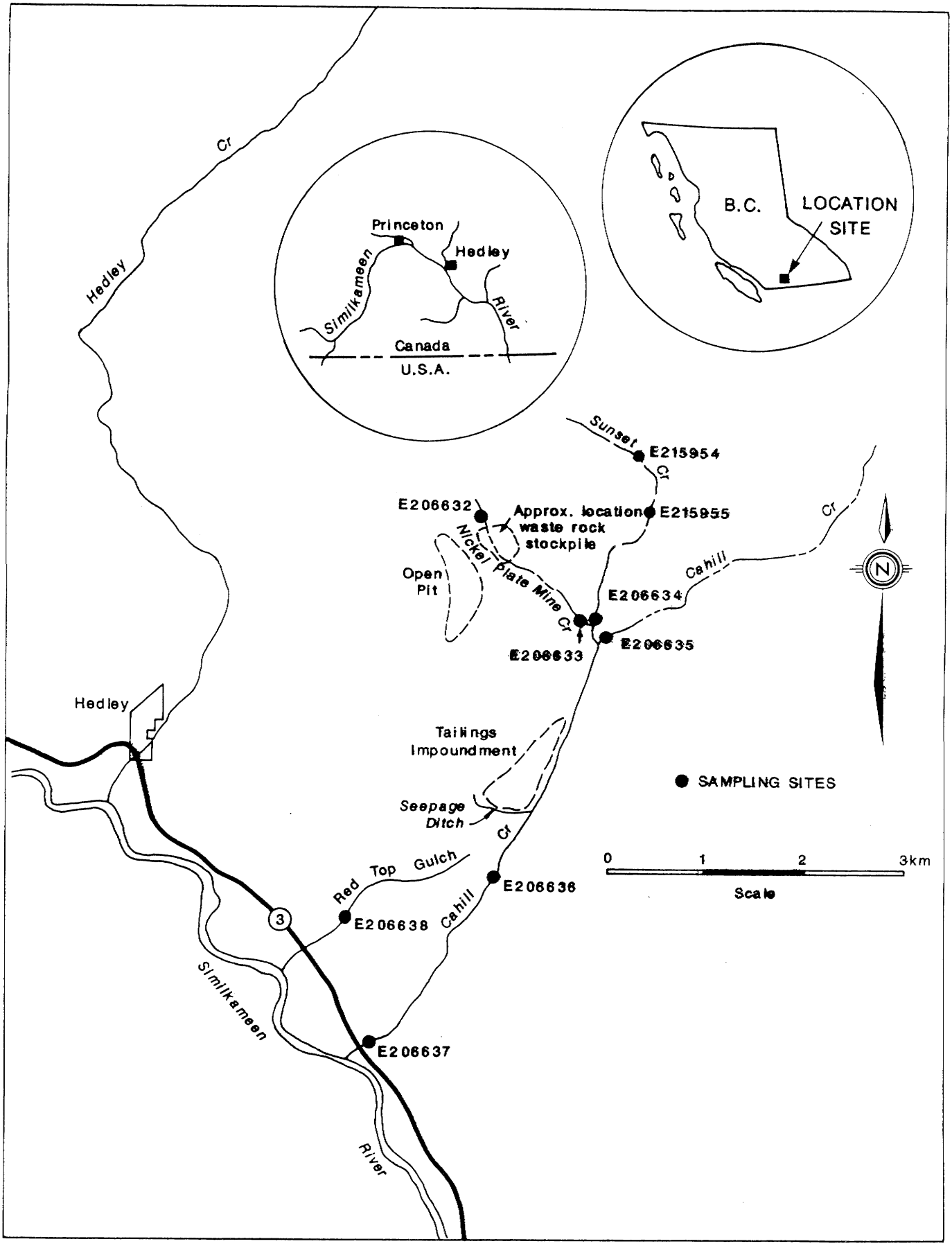


FIGURE 16 Cahill Creek

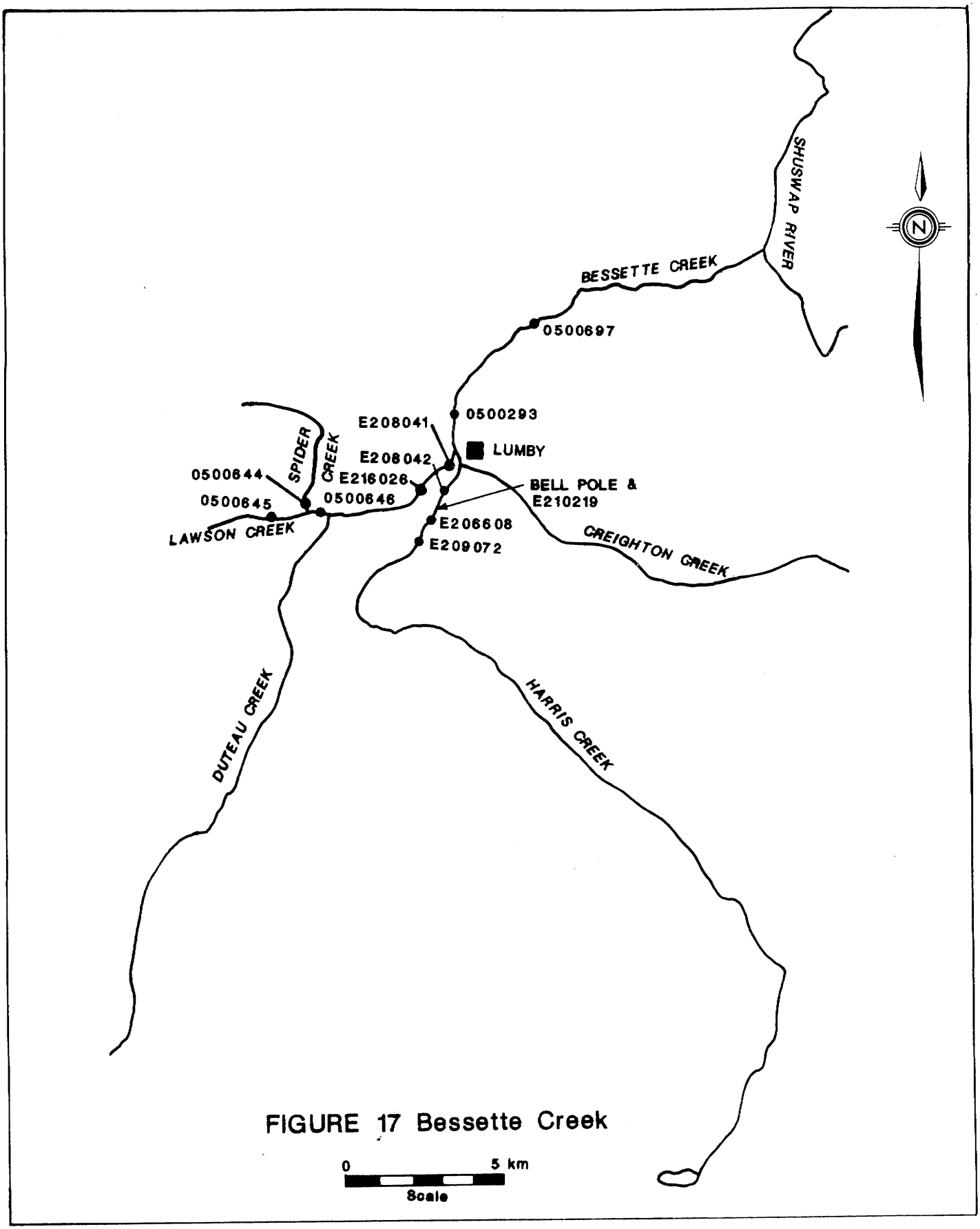


FIGURE 17 Bessette Creek

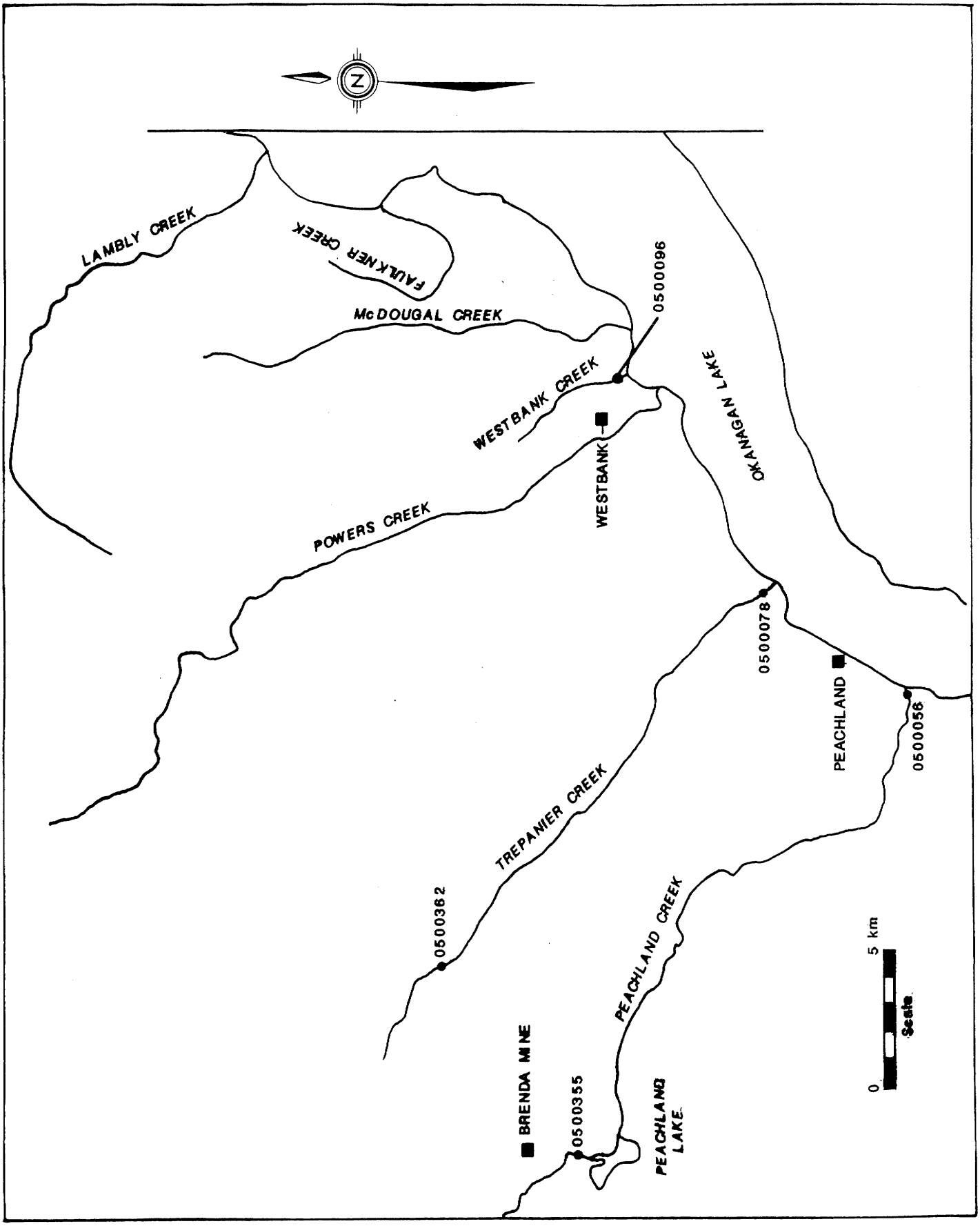


FIGURE 18 Tributaries to Okanagan Lake Near Westbank

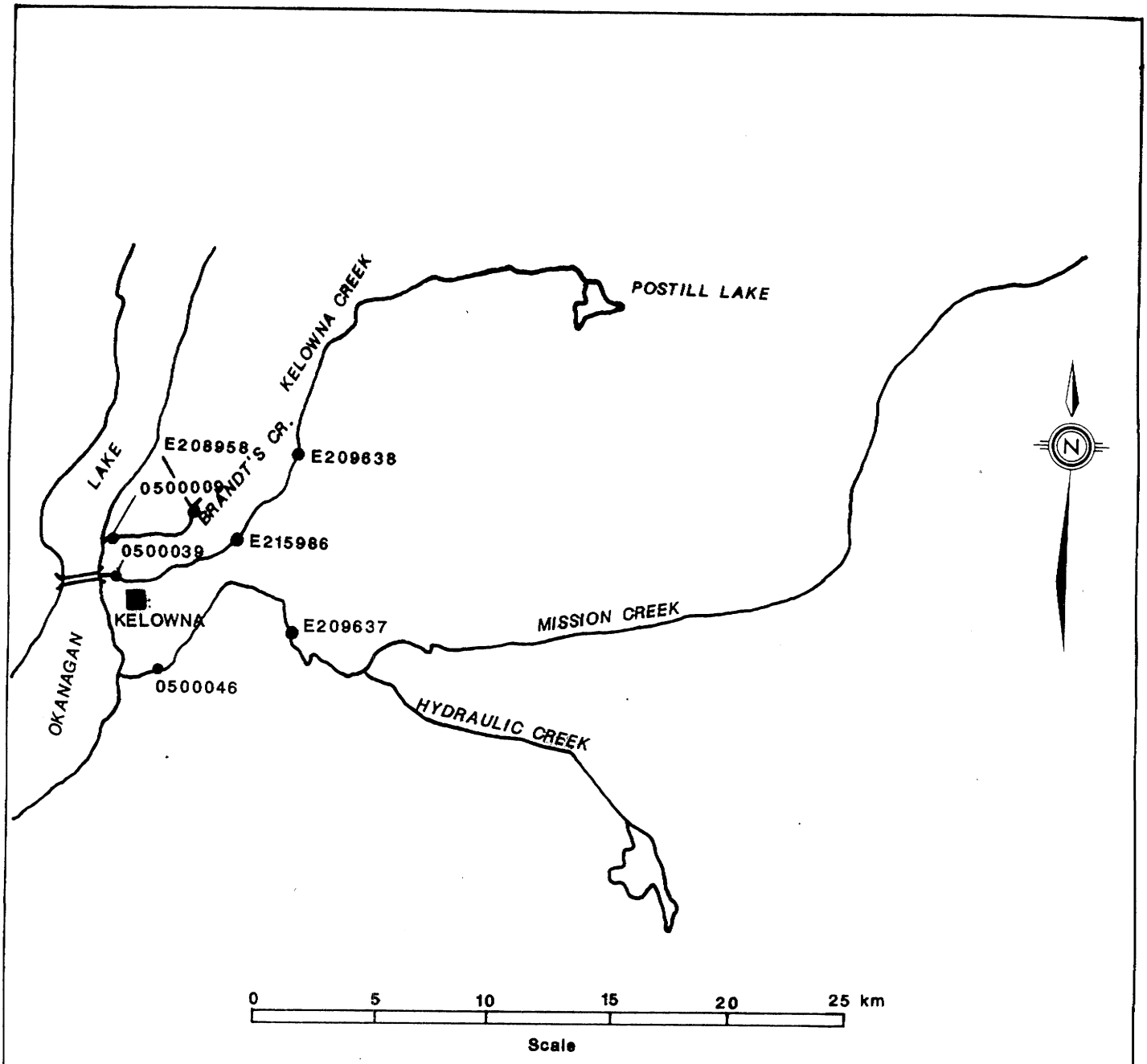


FIGURE 19 Tributaries to Okanagan Lake Near Kelowna

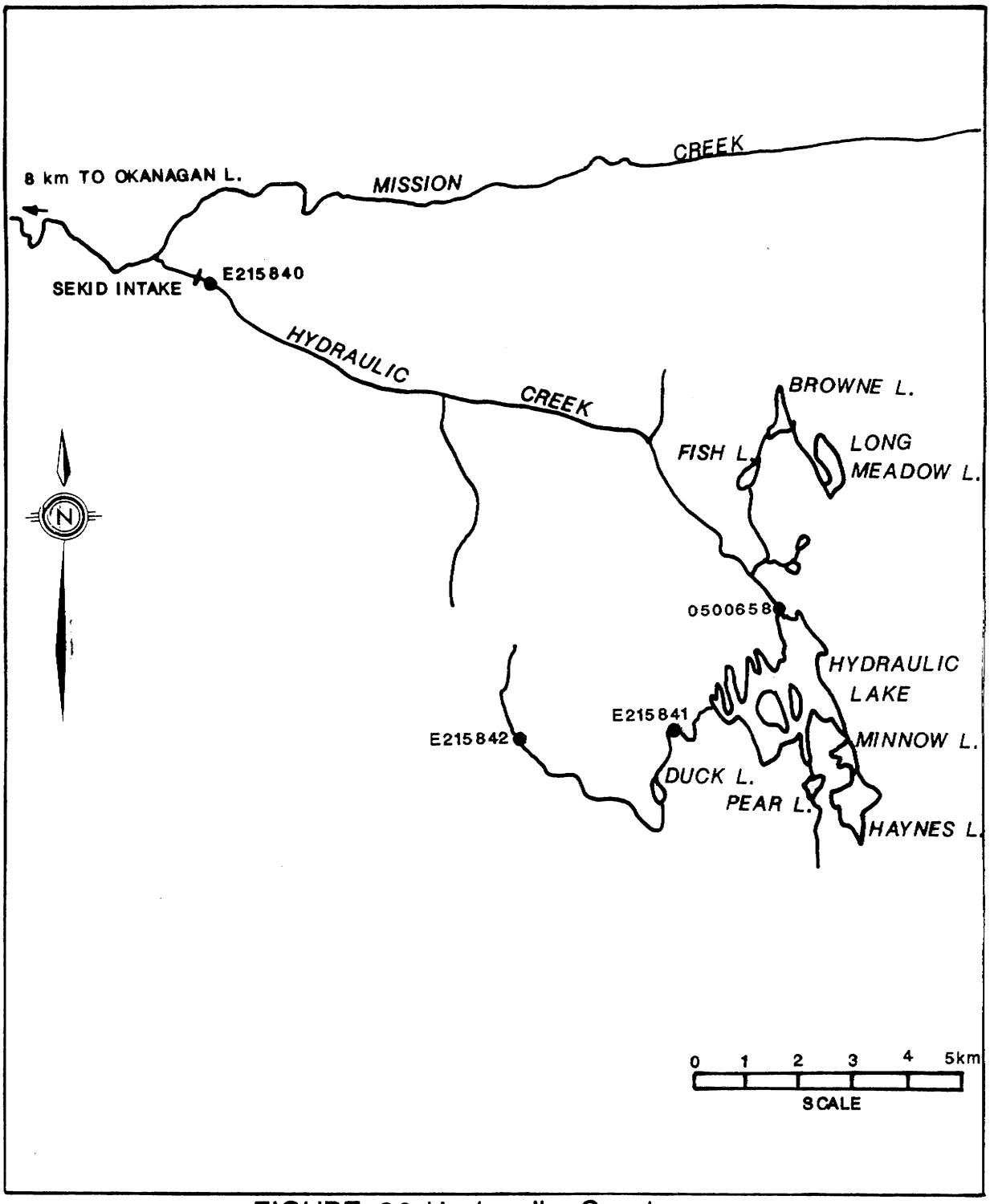


FIGURE 20 Hydraulic Creek

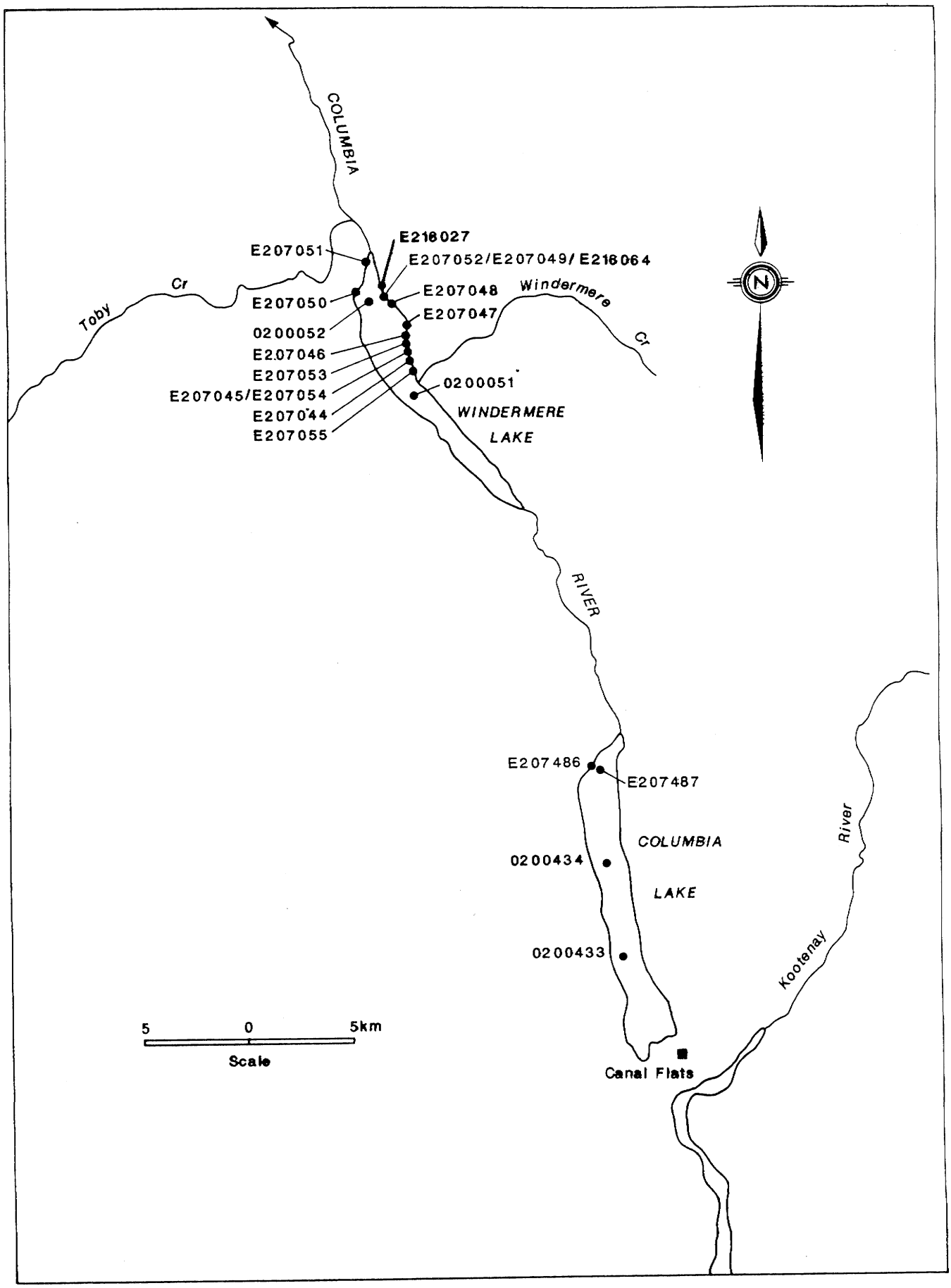


FIGURE 21 Columbia and Windermere Lakes

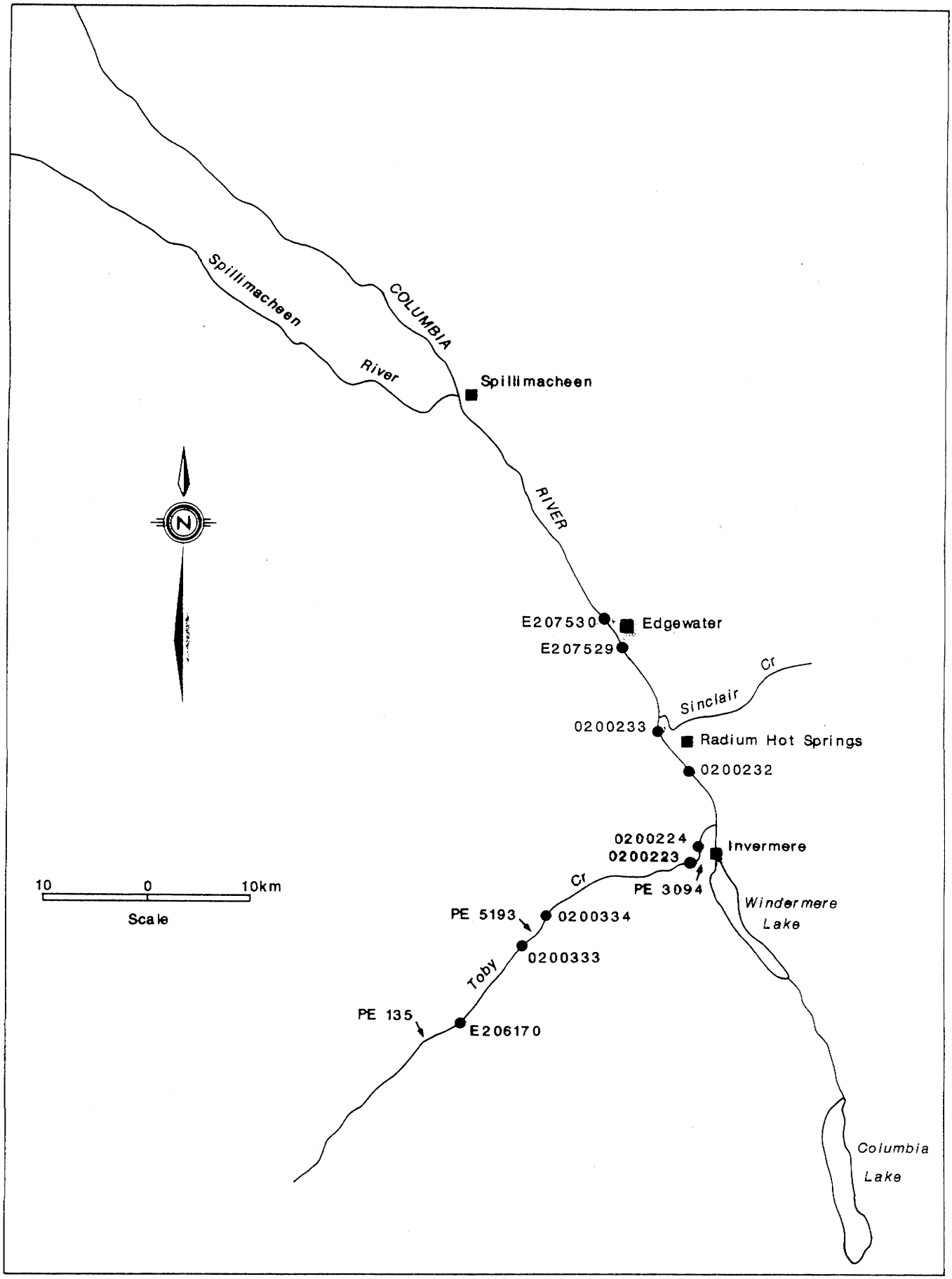


FIGURE 22 Toby Creek and the Upper Columbia River

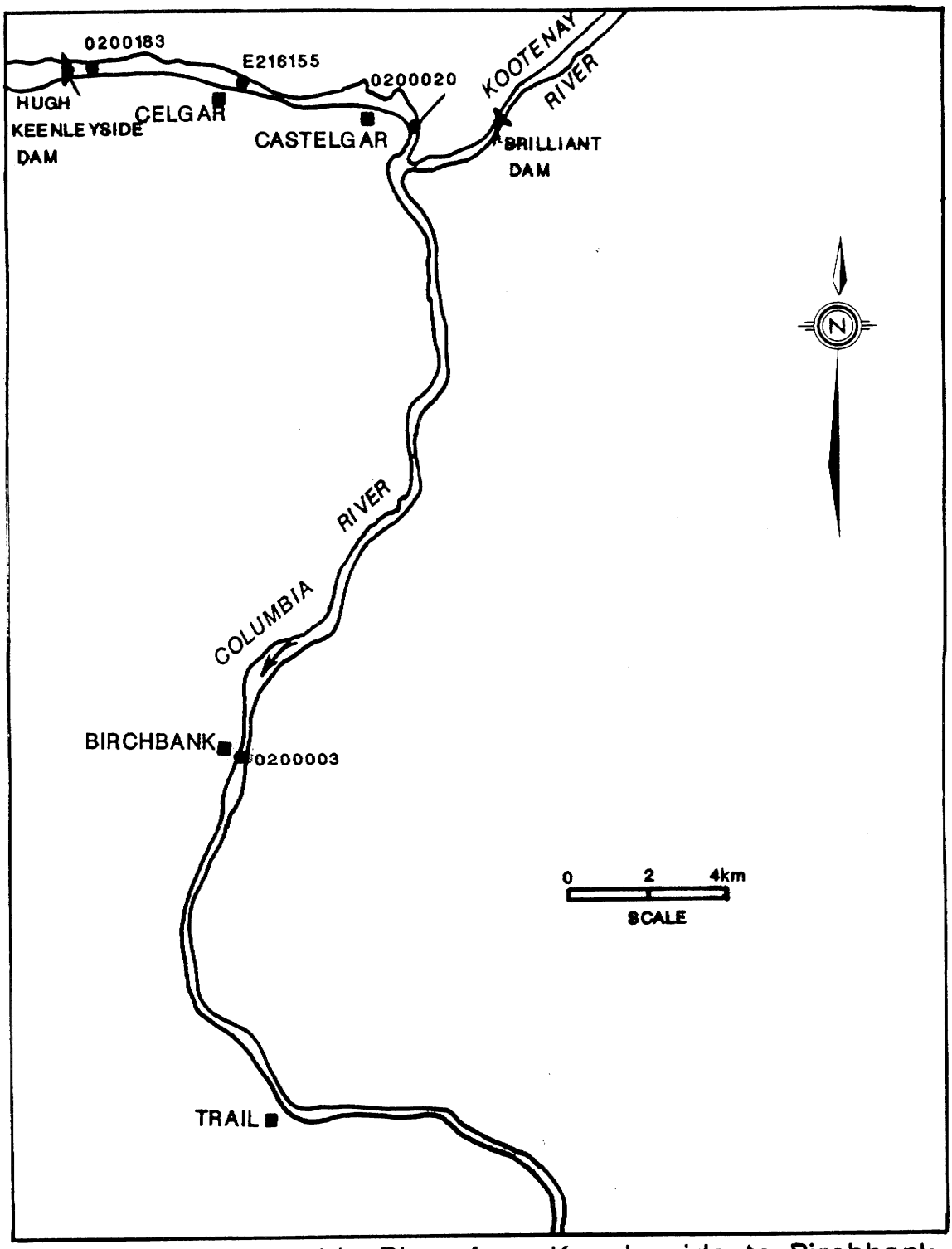


FIGURE 23 Columbia River from Keenleyside to Birchbank

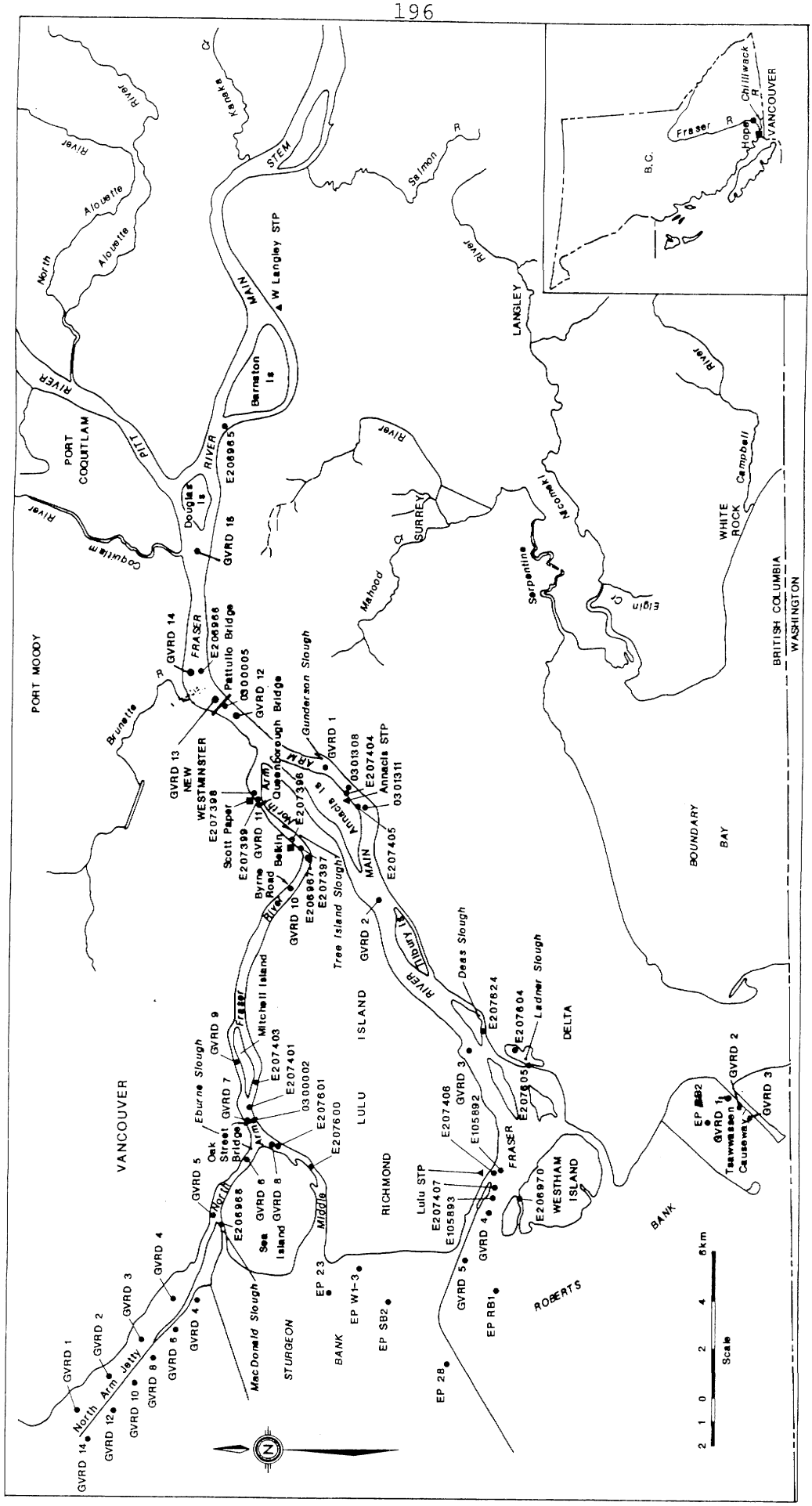


FIGURE 24 Fraser River From Kanaka Creek to the Mouth

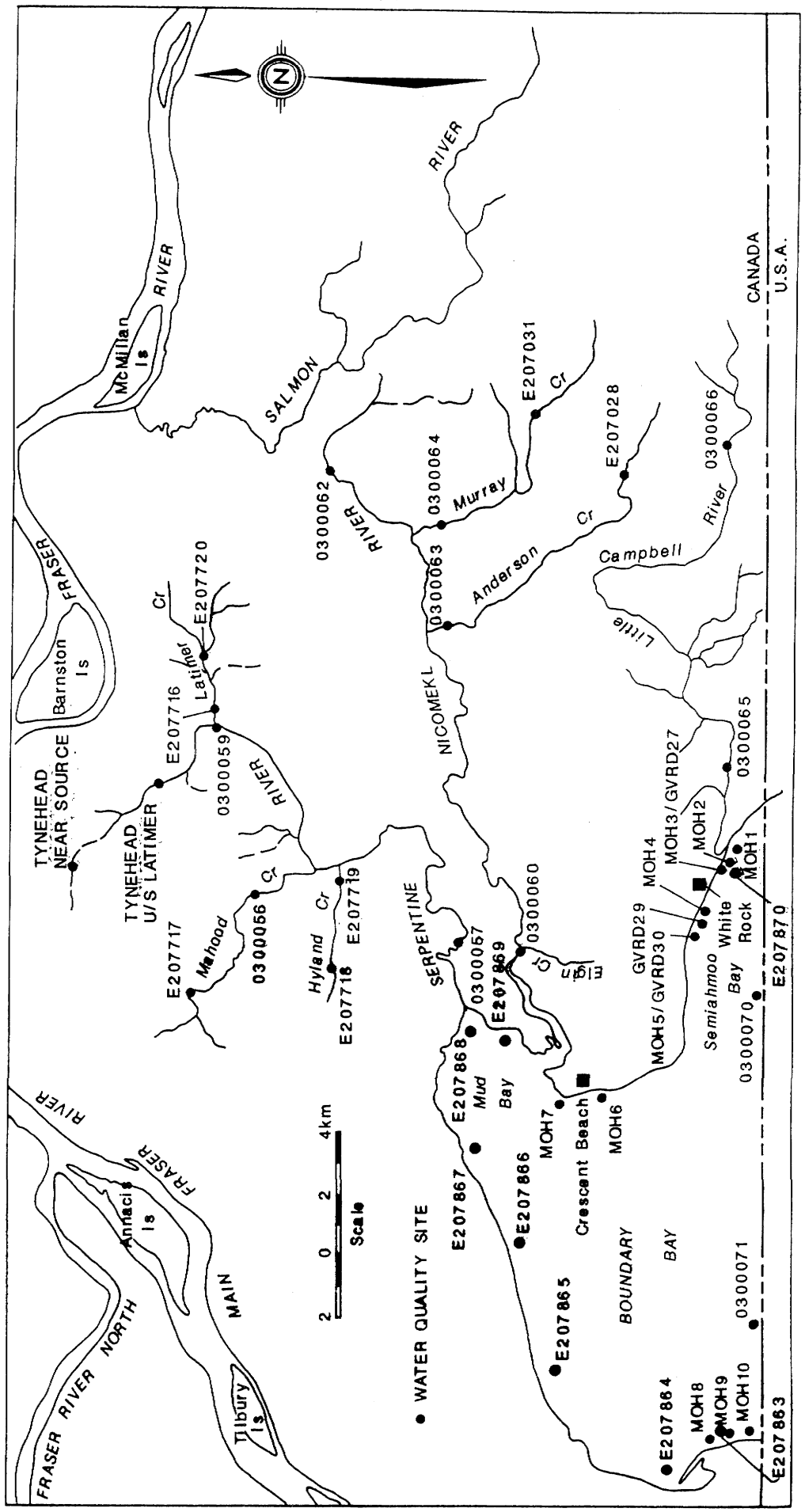


FIGURE 25 Boundary Bay

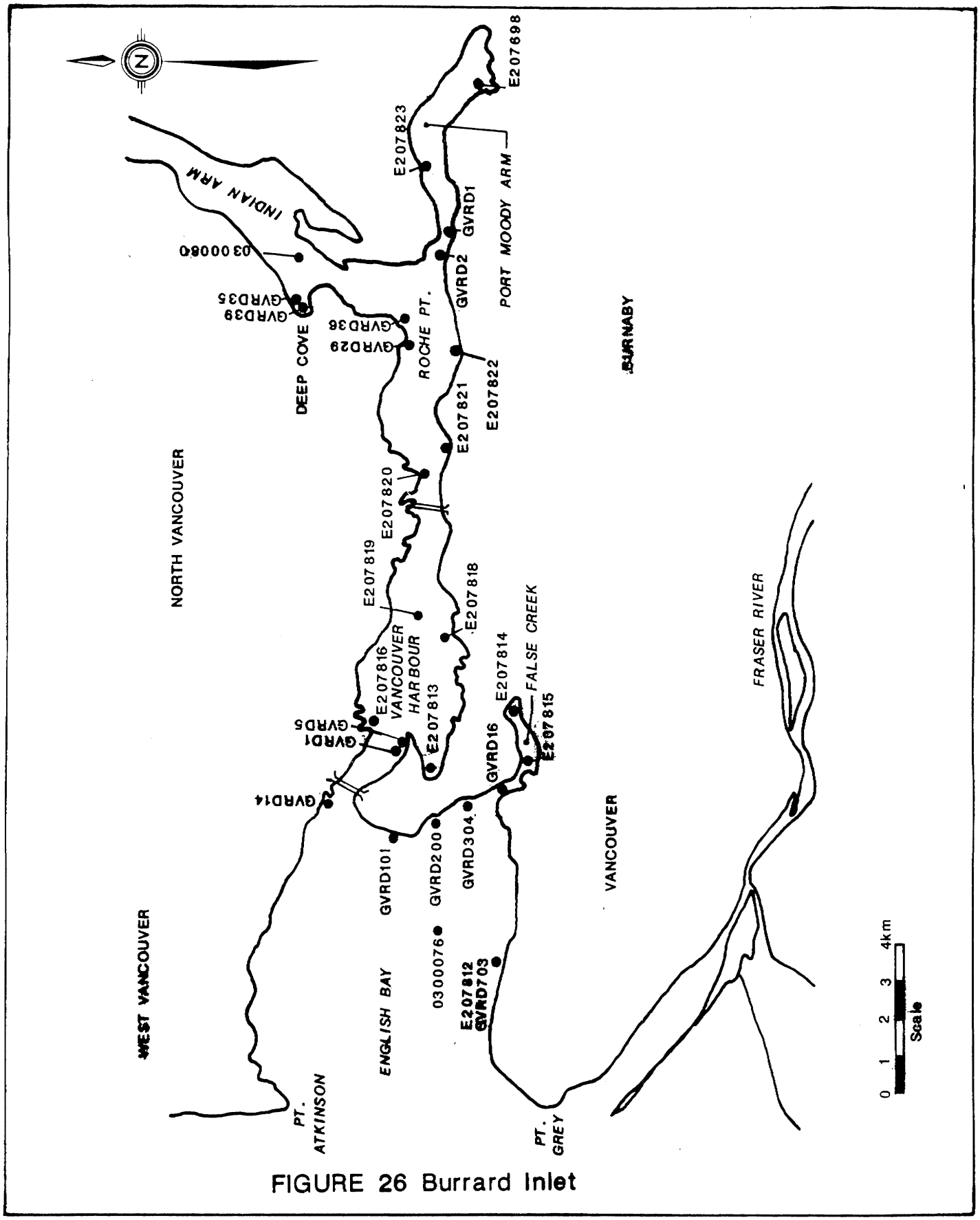


FIGURE 26 Burrard Inlet

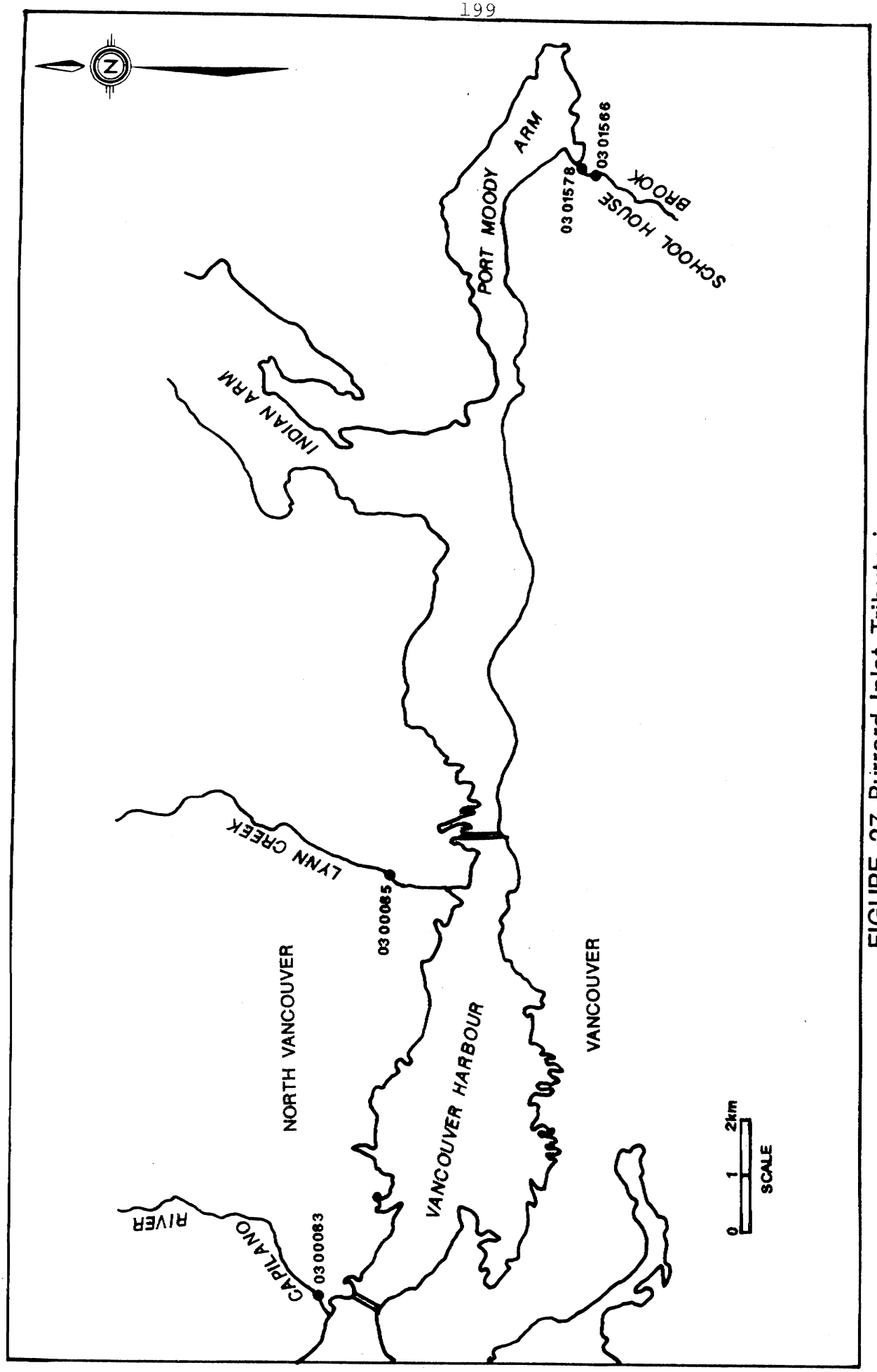


FIGURE 27 Burrard Inlet Tributaries

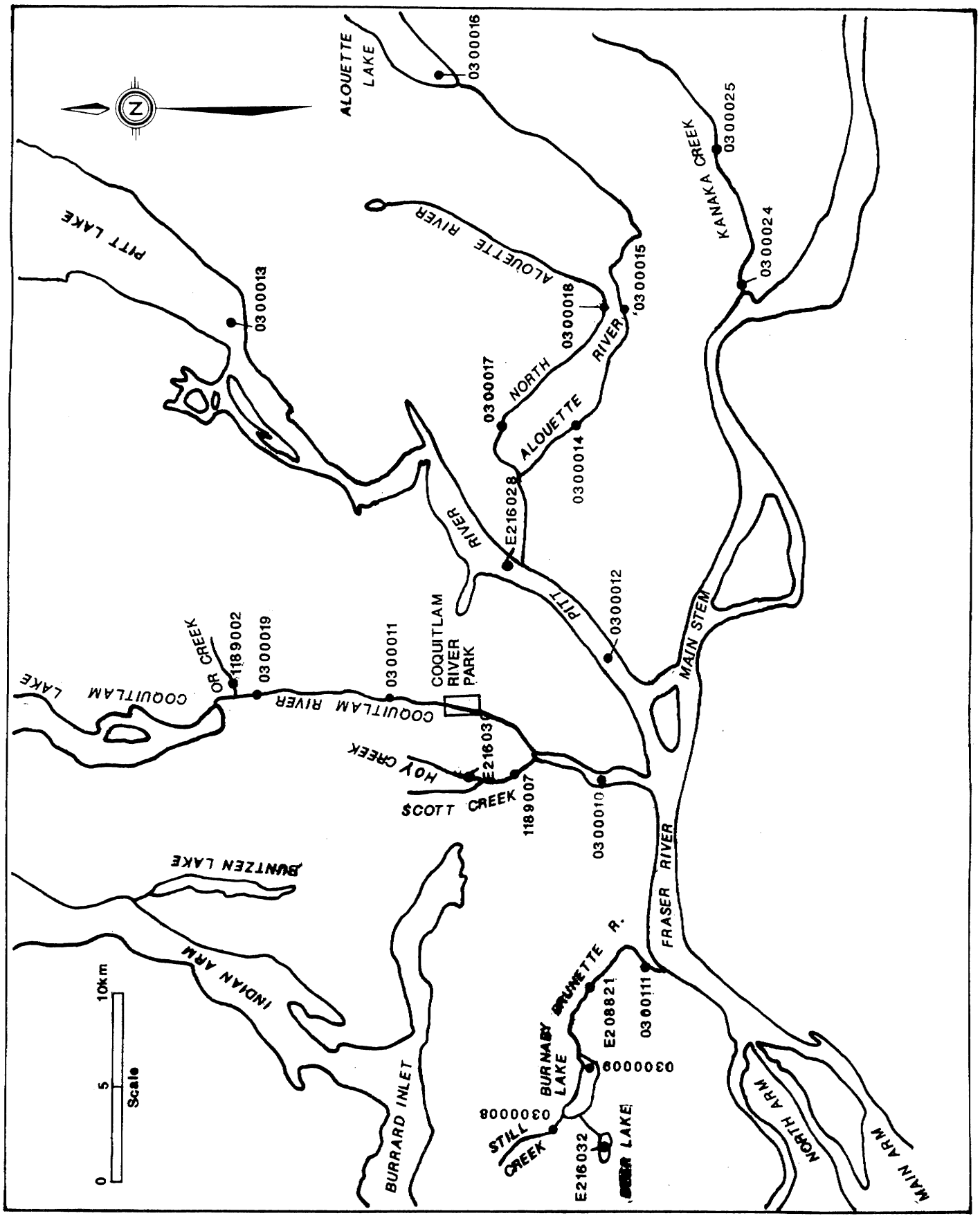


FIGURE 28 North Shore Tributaries to the Lower Fraser River