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Shellfish Growing Water Sanitary Survey of Gabriola Island and Outlying Areas, British Columbia, 1975

**Surveillance Report
EPS 5-PR-75-12**

**Pacific Region
December 1975**

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SHELLFISH-GROWING WATER SANITARY SURVEY
OF
GABRIOLA ISLAND AND OUTLYING AREAS
BRITISH COLUMBIA, 1975

by

D.B. Arney and B. Kay

Pollution Abatement Branch
Environmental Protection Service
Pacific Region

Report Number EPS 5-PR-75-12

December, 1975

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ABSTRACT

A sanitary survey of Gabriola Island and outlying areas was conducted between July 21 and August 27, 1975, by personnel of the Environmental Protection Service, Pacific Region.

The purpose of the survey was to fully evaluate the quality of the growing water in the area since no previous studies had been performed and thereby to classify the waters as contaminated or uncontaminated with respect to the health hazard associated with the consumption of molluscan shellfish harvested from the waters.

A total of 307 marine samples was bacteriologically examined during the survey. Thirteen of the 64 marine sample stations did not meet the acceptable shellfish growing water fecal coliform standard. Contributing factors were untreated domestic sewage ocean discharges, seepage from faulty residential and commercial septic-tank absorption-field systems, raw sewage from boats, and landwash during periods of high rainfall.

A recommendation is made to amend the existing B.C. Fishery Regulations' contaminated area Schedule J closure, and to close 4 additional locations to the direct harvesting of shellfish until such time as the identified pollution sources are removed.

RÉSUMÉ

Le personnel du Service de protection de l'environnement de la région du Pacifique a effectué entre le 21 juillet et le 27 août 1975 une étude sanitaire des eaux côtières entourant l'île Gabriola.

Le but de cette étude était d'évaluer l'état des eaux de cette zone, qui n'avaient fait l'objet d'aucune étude antérieure, afin de les classer en eaux polluées et en eaux non polluées en fonction des risques pour la santé résultant de la consommation des mollusques provenant de ces eaux.

Au total, on a analysé 307 échantillons d'eau de mer au cours de cette étude. Treize des 64 stations-témoins ne répondaient pas aux normes concernant les coliformes fécaux dans les eaux à crustacés. Les facteurs de pollution étaient: l'écoulement direct des eaux d'égouts ménagères, les infiltrations dues aux défectuosités des systèmes à absorption des fosses septiques des bâtiments résidentiels et commerciaux, les déchets jetés par les bateaux et les écoulements provenant de la terre au moment des pluies torrentielles.

On recommande de modifier les règlements actuels régissant la pêche en Colombie-Britannique (Annexe J Fermeture de la région polluée) et d'interdire la pêche directe des mollusques à 4 autres endroits jusqu'à ce que les causes de pollution susmentionnées aient disparu.

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1 INTRODUCTION

Gabriola Island is a popular recreational area and has a considerable summer population. The 1974 census lists the permanent population at 825. The island and adjacent islands have many natural moorage areas used by boaters. There are numerous summer and year-round residences along the Gabriola Island shoreline plus three marinas and six resorts. In addition, a shipyard is found at Silva Bay, a government wharf and moorage at Degnen Bay, and a government ferry terminal at Descanso Bay.

There are commercial oyster leases in Degnen Bay and clams are dug commercially at False Narrows. Many other beaches on the island and surrounding areas are utilized for recreational shellfish harvesting.

Because no previous studies had been performed, a comprehensive study was needed to fully evaluate the quality of the growing water. Consequently, personnel of the Shellfish Water Quality Program of the Environmental Protection Service, Pacific Region, conducted a bacteriological water quality survey of Gabriola Island, Ruxton Island, DeCourcy Island, and Nanaimo harbour from July 21 to August 27, 1975. The Nanaimo harbour portion of the survey was in support of a biological study undertaken by the Marine Studies Group of the Environmental Protection Service. A sanitary inspection of sewage disposal facilities on land was carried out to identify and evaluate sources of pollution entering the growing waters.

2 SAMPLE STATION LOCATIONS

The object of the survey was to examine and classify the shellfish growing water quality of utilizable resource areas that could be subject to contamination from a variety of sources, including boat discharges, sewage outfalls, and septic tank seepage.

Both Ruxton Island and DeCourcy Island are popular moorage spots, the latter having a Provincial Marine Park (Pirate's Cove) at its southern end covering 76 acres. Ten sample stations were positioned

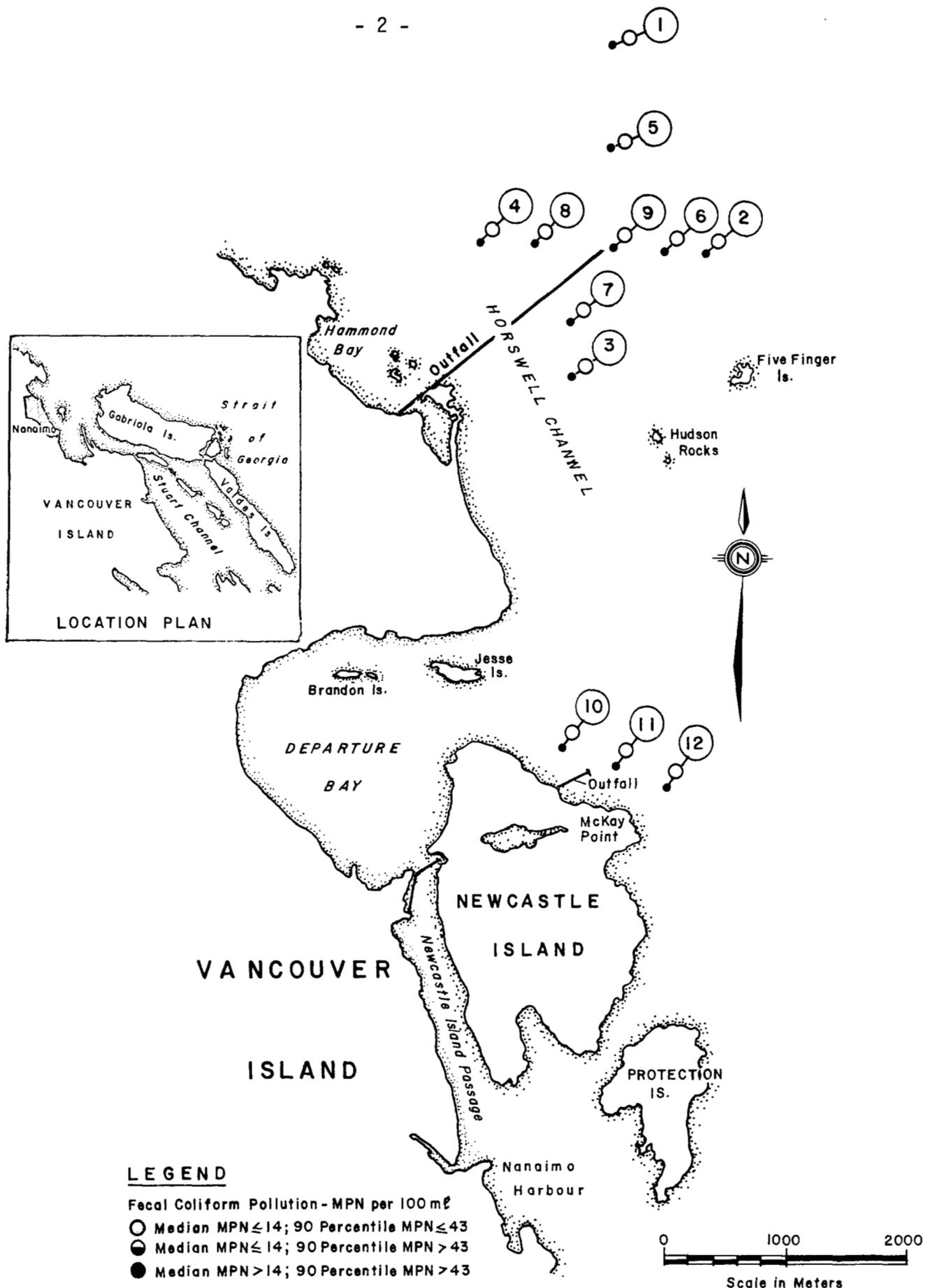


FIGURE I FIVE FINGER OUTFALL AND NEWCASTLE ISLAND SAMPLE STATION LOCATIONS

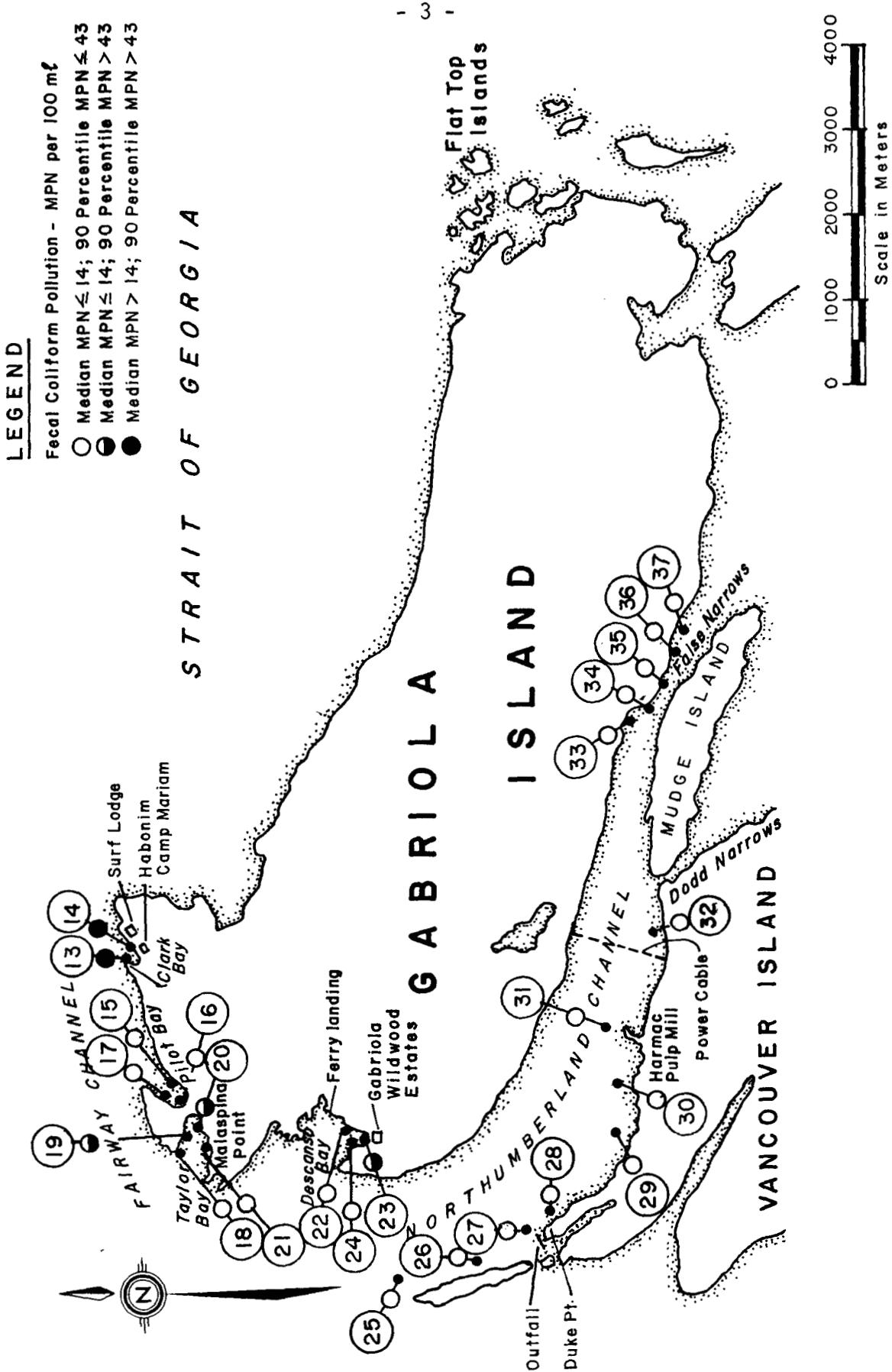


FIGURE 2 WEST GABRIOLA ISLAND, NORTHUMBERLAND CHANNEL AND FALSE NARROWS SAMPLE STATION LOCATIONS

FIGURE 2

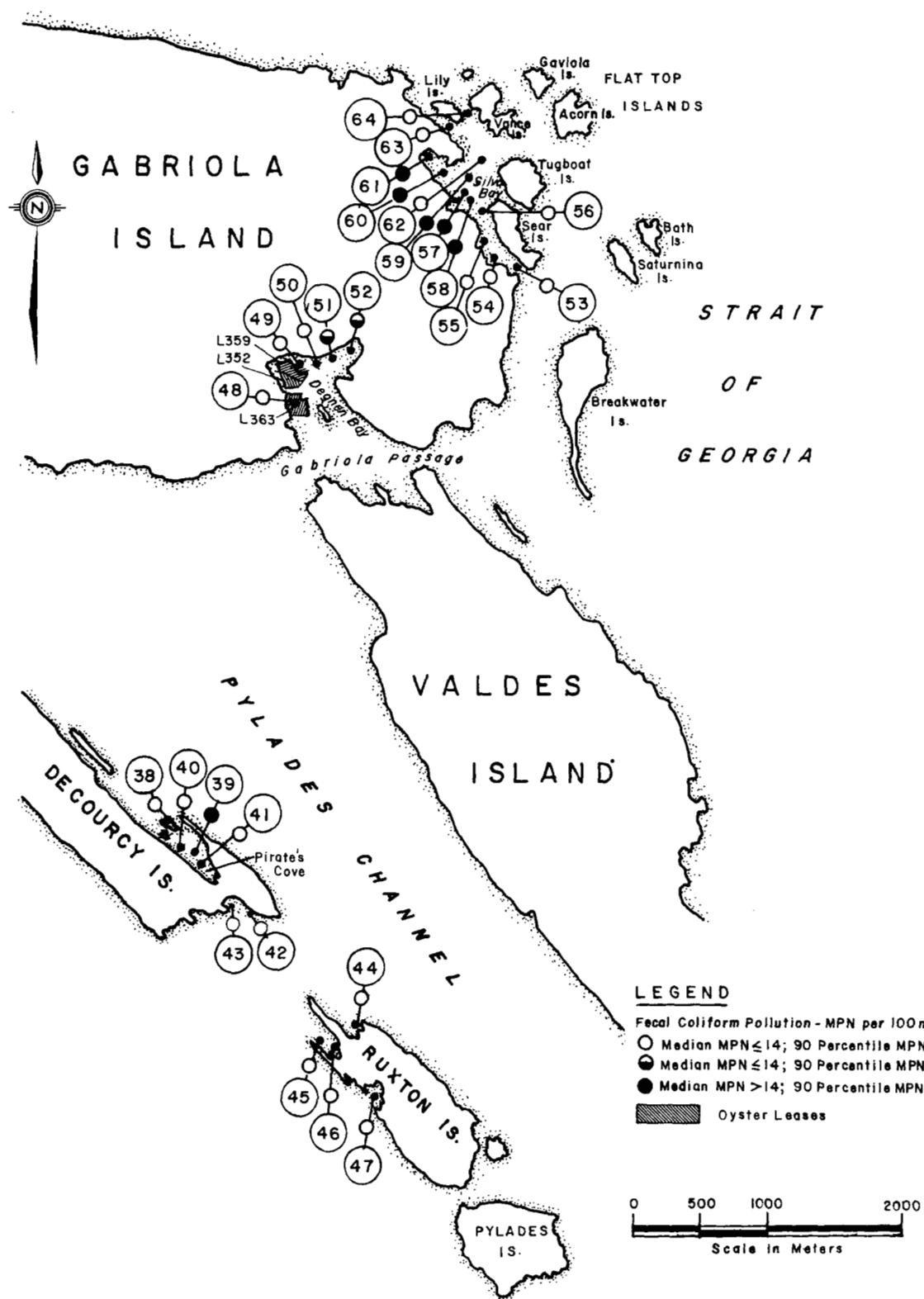


FIGURE 3 EAST GABRIOLA ISLAND, PIRATE'S COVE MARINE PARK AND RUXTON ISLAND SAMPLE STATION LOCATIONS

in these areas to determine the impact of boat discharges on surrounding oyster beds.

The primary areas of concern on Gabriola Island include Degnen Bay, Silva Bay, Pilot Bay, Taylor Bay, Descanso Bay, and False Narrows. Degnen Bay and Silva Bay are the most popular boat moorage locations and were sampled extensively. Sampling at 34 locations around the island was necessary to adequately determine the growing water quality of molluscan shellfish resource areas.

Two registered commercial oyster leases located in Degnen Bay could be subject to some degree of sewage pollution from boat discharges and faulty residential disposal systems. Samples were taken at five locations to assess the extent of pollution from the aforementioned sources.

Silva Bay has a concentration of commercial establishments and provides services to recreational boaters and tourists during the summer months. Moorage is extensive and although shore toilet facilities are provided for the boaters, boat sewage disposal practices are not controlled, and raw sewage is discharged into the receiving waters. This pollution source, combined with sources such as outfalls and seepage from commercial and residential disposal systems, necessitated 12 sample stations being assigned to this area.

The other sample stations on Gabriola Island were devoted to those areas subject to contamination from possible faulty residential disposal systems. The increased summer population of the island puts an additional load on these systems and can significantly decrease intertidal zone water quality during the summer months.

In addition to the local sources of pollution on Gabriola Island, it was conceivable that discharges from the City of Nanaimo sewage outfall and the Harmac Pulp Mill industrial and domestic sewage outfalls could contaminate the surrounding shoreline of the

island. Twenty sample stations were positioned from the Nanaimo Five Finger Island sewage outfall southward to the Harmac Mill in Northumberland Channel to assess the degree and extent of influence of these pollution sources.

Sample station locations are shown in Figures 1, 2, and 3, and geographically defined in Table 4 (Appendix III).

3 FIELD PROCEDURES AND METHODS

Sampling stations were selected and a bacteriological and physical water-testing program was developed to assess the shellfish growing water quality and the source of pollutants.

3.1 Bacteriological Sampling and Analysis

All water samples for bacteriological analyses were collected in sterile 170 cc wide-mouth bottles approximately 15 to 30 cm below the water surface. The water depth at collection points over the shellfish beds did not exceed 1.2 metres. Samples were collected by boat or by wading and stored in coolers at temperatures not exceeding 10°C until processed. Analyses were carried out in the Environmental Protection Service mobile laboratory located at the sampling area and were performed within three hours of collection.

The fecal coliform MPN per 100 ml was determined using the multiple tube fermentation technique (at least 3 decimal dilutions of 5 tubes each) as described in Part 407C of the 13th edition of Standard Methods for the Examination of Water and Wastewater(1).

Incubation was for 24 ± 2 hours in a water bath equipped with a circulation device, and maintained at $44.5 \pm 0.2^\circ\text{C}$. Presumptive culture media used was Bacto-Lauryl Tryptose Broth; fecal coliform determinations were made using Bacto-EC medium.

3.2 Physical and Chemical Testing Equipment and Analyses

Temperature and salinity measurements at marine sample stations were made at a depth of 15 to 30 cm below the water surface using a

Beckman Model RB 3-349 Solubridge Electrolytic Conductivity meter and a YSI Model 33 Salinity-Conductivity-Temperature Meter. Wind speeds were determined with a Telcor Series 210 electronic wind speed/direction indicator.

Tide data obtained is that for Point Atkinson and the rainfall data was obtained from the Atmospheric Environment Service station located at Vancouver International Airport.

4 DISCUSSION OF RESULTS

Daily bacteriological and elemental data for each sample station is presented in Table 3 (Appendix II). Fecal coliform MPN results for marine sample stations are summarized in Table 2 (Appendix I).

The results have been interpreted and the growing waters classified using the fecal coliform standard recommended at the Eighth National Shellfish Sanitation Workshop. In order that an area can be considered bacteriologically safe for the harvesting of shellfish, the fecal coliform median MPN of the water must not exceed 14/100 ml and not more than 10% of the samples normally exceed 43/100 ml for a 5 tube decimal dilution test in those portions of the area most probably exposed to fecal contamination during the most unfavourable hydrographic and pollution conditions (2).

A total of 307 marine samples were collected for bacteriological analysis during the survey period. A minimum of 6 samples was collected for each marine station.

The bacteriological results presented in Table 2 show that 51 of the marine sample stations met the approved growing water standard. Of the remaining 13 sample stations which were classified as unacceptable, 8 exceeded the standard at the median level and 5 exceeded the standard at the 90 percentile level.

Biochemical identification (IMViC) of 48 bacterial isolates from selected stations showed that 73% of the isolates were E. Coli Var. I. It is important to note that while not all isolates were E. Coli Var. I, this species was detected at all stations subjected to IMViC analysis.

The intensity of rainfall during the survey period was greater than the rainfall for the same period in the past three years (Table 1). During the survey period 90.2 millimetres of rain fell compared to a trace in 1974, 18.0 millimetres in 1973, and 29.7 millimetres in 1972. Moreover, 70% of the precipitation during the survey fell during the last week in August.

4.1 Five Finger Island Area and Newcastle Island

Sample stations 1 to 9 were established by the Marine Studies Group to evaluate the dispersion characteristics of the new Nanaimo Regional Sewer Authority Five Finger Island treated sewage outfall which became operational in October, 1974. Raw sewage from the City of Nanaimo was formerly discharged through two 45.8 centimetre diameter outfalls; one northwest of McKay Point on Newcastle Island and the other just north of Duke Point at the south end of Nanaimo harbour.

Fifty-four samples collected for bacteriological analysis from the Five Finger Island area during the survey period did not exhibit significant fecal coliform levels. Sample stations 10, 11, and 12 off Newcastle Island also proved to be of acceptable water quality.

4.2 Northumberland Channel

Sample stations 25 to 32 satisfied the shellfish growing water quality standard. However, during the period of the survey, the Harmac Pulp Mill was shut down due to a labour dispute with a consequent 90% reduction in domestic sewage discharge. Presently, all domestic sewage generated within the mill is discharged raw via the alkaline sewer system. The raw sewage from the laboratory building and the main office both have separate outfalls and the No. 3 woodroom discharges

TABLE 1 TOTAL PRECIPITATION (mm) FOR GABRIOLA ISLAND 1972 - 1975

Date	1972	1973	1974	1975
July 23	Nil	Nil	Nil	0.8
July 24	Nil	Nil	Nil	1.0
August 6	Nil	Nil	Nil	27.9
August 7	Nil	Nil	Nil	25.4
August 14	1.3	Nil	Nil	Nil
August 15	21.1	Nil	Nil	1.8
August 16	5.3	9.9	Nil	7.9
August 17	1.0	5.8	Nil	Nil
August 20	1.0	Nil	Nil	Nil
August 22	Nil	Nil	Nil	40.6
August 25	Nil	Nil	Nil	17.8
August 26	Nil	Nil	Nil	3.3
August 27	Nil	2.3	Nil	3.3
August 28	Nil	Nil	Nil	8.4

via a septic tank outfall to Northumberland Channel. It is understood that the mill is currently working towards segregating all domestic sewage which will be treated in a secondary treatment plant.

4.3 Western Gabriola Island

Station 23 in Descanso Bay had a high 90 percentile MPN level. The only identified source of pollution in this area was a culvert which carries drainage from the local area to the beach, and also passes under the septic tank absorption field serving the 11 trailer homes presently located on the Wildwood Estates property. There was a significant increase in fecal coliform numbers between the entrance and exit of this culvert. On August 20 the fecal coliform MPN counts observed at the entrance and exit were 130/100 ml and 2×10^4 /100 ml, respectively; on August 24 the figures were 1.1×10^3 /100 ml and 7.9×10^5 /100 ml, respectively. The source of contamination would seem to be septic seepage into the culvert from the absorption field.

Stations 19 and 20 in Taylor Bay had 90 percentile MPN levels of 49/100 ml and 79/100 ml, respectively. The specific sources of pollution were not found but seepage from septic tank absorption fields is the most likely source.

The highest counts of the survey were obtained at sample stations 13 and 14 in Clark Bay with fecal coliform median MPN's of 1600/100 ml and 130/100 ml, respectively. Serious problems exist at both Surf Lodge and Habonim Camp Miriam. A sample of seepage on the beach in front of the lodge and a sample of effluent from a leaking septic tank outfall pipe (which serves the lodge) gave fecal counts of $> 1.6 \times 10^6$ /100 ml and 4.9×10^4 /100 ml, respectively. Seepage entering the head of the bay from the Habonim Camp Miriam septic-tank absorption field had a fecal count of 1.6×10^6 /100 ml. The seepage flow increased significantly during heavy rainfall. No other pollution sources were observed in this area but considering the extensive and shallow bedrock in this area, septic seepage could be expected.

The fecal coliform median MPN at sample station 13 exceeded the provincial swimming water standard of 200/100 ml.

4.4 Eastern Gabriola Island

Of the twelve sample stations established in Silva Bay, five did not meet the standard. These were stations 57 through 61, inclusive, with fecal coliform median MPN's/100 ml of 40.5, 33, 14.5, 30, and 33, respectively.

Boats moored at the Silva Bay Resort marina (capacity - 75 boats) are major contributors of fecal contamination to Silva Bay. Boaters are encouraged to use shore toilets but the habitual use of on-board facilities prevails.

At the Silva Bay Resort, sewage treatment is provided by a 45.5 cubic metre Imhoff tank; the effluent is chlorinated and passes through a chlorine contact chamber to discharge through a 7.6 cm diameter outfall to a depth of 7.3 metres at low water. Chlorination of the sewage is accomplished by slowly dissolving chlorine tablets in the contact chamber. Bacteriological samples of the effluent demonstrated fecal coliform MPN's of 1.6×10^6 /100 ml, 1.1×10^6 /100 ml, and 1.3×10^6 /100 ml, indicating that chlorination is ineffective. At the time of the survey, sewage from the laundry, washroom facilities, and the pub was being discharged into Silva Bay through a septic tank with an outfall pipe which was broken at the low water level. In addition, it was discovered by a dye test that some raw sewage was spilling out of an opening in the sewer pipe beneath the pub onto the rocks and water below.

The store immediately north of the Silva Bay Resort discharges septic-tank effluent directly into the water. In addition, the residence at Pages' Resort near Sear Island in Silva Bay also has a direct sewage discharge into the water.

The Royal Vancouver Yacht Club floats at Tugboat Island have a docking capacity for approximately 80 boats. On shore, there is a clubhouse equipped with 2 propane incinerating toilets, and a caretaker's

house serviced by a septic tank with a direct discharge to the water. While the use of on-shore facilities is encouraged, boaters may still use their own shipboard facilities.

In Degnen Bay, sample stations 51 and 52 proved unacceptable with 90 percentile MPN levels of 139.3/100 ml and 51.6/100 ml, respectively. A source of contamination at this location would be discharges from boats moored at the government and private floats. Fecal coliform counts were noticeably higher during periods of heavy rain although no obvious on-shore problems were determined at this location.

The water quality at sample station 39 in Pirate's Cove at DeCourcy Island was unacceptable with a fecal coliform median MPN of 23/100 ml. Bacterial isolates taken from all stations in the cove were subjected to IMViC analysis and demonstrated the presence of E. coli Var. I. The fecal contamination was the result of boat discharges and landwash. The detection of E. coli at all stations in Pirate's Cove indicates a potential health hazard exists with respect to shellfish consumption during the boating season in this area.

5 CONCLUSIONS

(i) Sample station 23 in Descanso Bay does not meet the shellfish growing water standard. The contamination appears to emanate from the Gabriola Wildwood Estates' mobile-home park sewage-disposal system.

(ii) Two stations at Taylor Bay proved to be unacceptable with the probable cause being seepage from septic-tank absorption fields fronting the bay.

(iii) The counts recorded at sample stations 13 and 14 in Clark Bay were the highest obtained during the survey with seepage and discharge of sewage from Surf Lodge and absorption-field seepage from Habonim Camp Miriam being the only identified sources of contamination.

(iv) Five sample stations in Silva Bay did not meet the standard. The identified sources were sewage discharges from the Silva

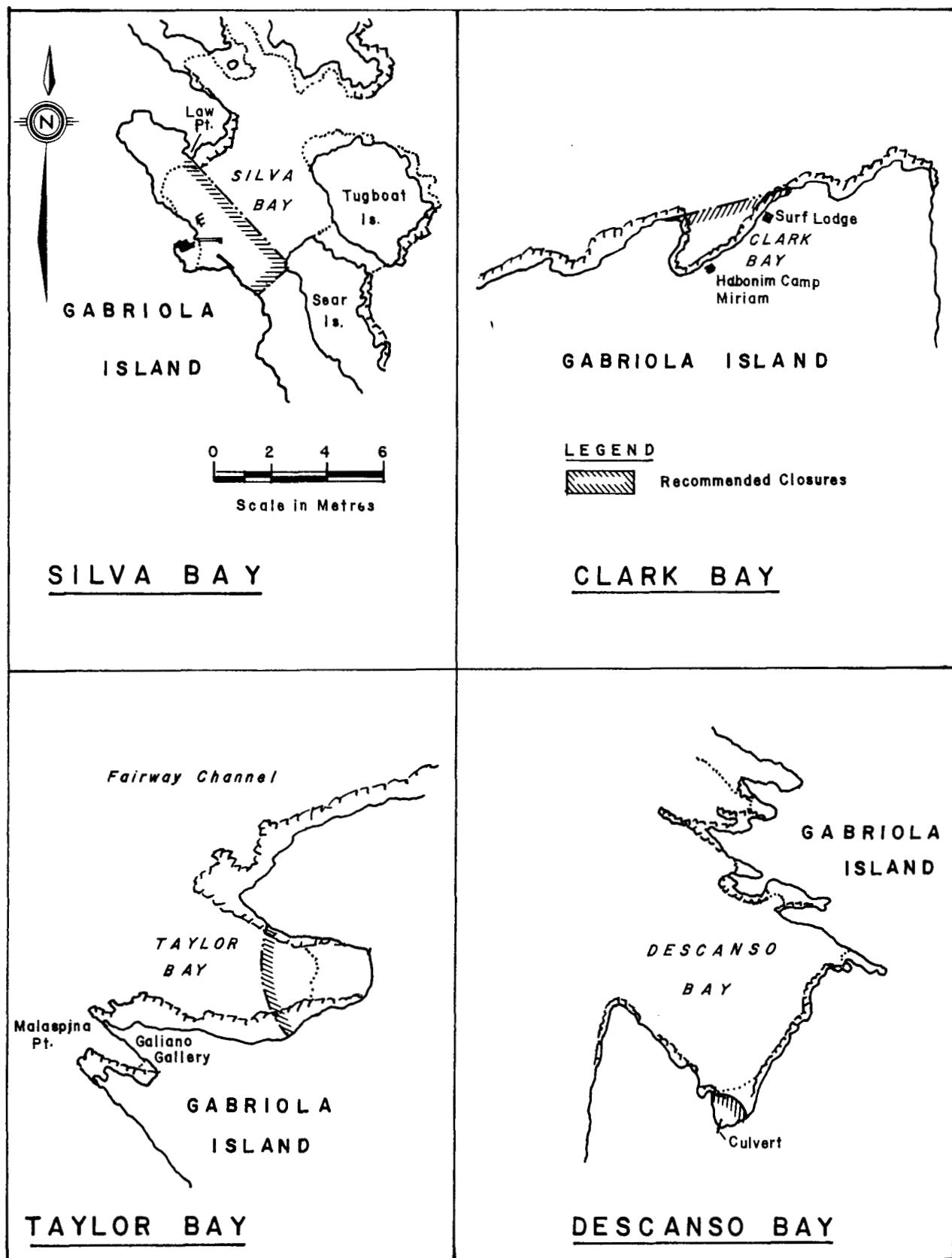


FIGURE 4 RECOMMENDED CLOSURES ON GABRIOLA ISLAND

Bay Resort, 2 shore-based residences, and from boats.

(v) Discharges from moored boats and landwash produced an unacceptable fecal coliform median MPN of 23/100 ml at one sample station in Pirate's Cove.

(vi) Discharges from moored boats plus landwash during heavy rain resulted in unacceptable water quality at sample stations 51 and 52 in Degnen Bay.

(vii) The City of Nanaimo sewage outfall does not appear to effect the quality of the water surrounding the northwestern shoreline of Gabriola Island.

6 RECOMMENDATIONS

(a) The present contaminated area 17-6 Schedule J closure of Silva Bay, Gabriola Island, should be amended to read, "The waters and tidal foreshore of Silva Bay, Gabriola Island, Area 17, lying within a line drawn from the southerly tip of Law Point to the northwest tip of Sear Island and from the latter to the most northerly point of Gabriola Island opposite the northwest tip of Sear Island."

(b) The following should be added to Schedule J of the British Columbia Fishery Regulations:

- (1) Area 17-16. "The waters of Clark Bay lying within a line drawn from the northeast to the northwest tips of land enclosing the bay."
- (2) Area 17-17. "The waters and tidal foreshore of Taylor Bay lying within a 400-metre radius of the most northeasterly point of Taylor Bay."
- (3) Area 17-18. "The waters and tidal foreshore of Descanso Bay lying within a 70-metre radius of the culvert entering the southern end of the bay."
- (4) Area 17-19. "The waters and tidal foreshore of Pirate's Cove, DeCourcy Island."

(c) Letters be written to the responsible provincial authorities concerning the various pollution sources listed in Table 5 (Appendix IV) requesting their investigation and remedial action where possible.

(d) Conduct a survey in winter of False Narrows and Northumberland Channel to assess the effect of the Harmac Mill on the shellfish growing waters.

(e) Conduct a winter survey of Nanaimo Harbour to determine if the present Schedule J closure can be modified.

7 REFERENCES

1. Standard Methods for the Examination of Water and Wastewater, 1971, 13th ed. Amer. Public Health Assoc., New York.
2. Preliminary Report on a Comparison of Total Coliform and Fecal Coliform Values in Shellfish Growing Area Waters and a Proposal for a Fecal Coliform Growing Area Standard, 1974, D.A. Hunt and J. Springer, U.S. Food and Drug Administration, Washington, D.C.

ACKNOWLEDGEMENTS

B. Kay, Bacteriologist, R. Schroeder, Bacteriological Technician, and M. Nider, Bacteriological Technician, conducted the bacteriological analyses in the Environmental Protection Service mobile laboratory located at Taylor Bay. Mr. Kay compiled the bacteriological data.

D. Arney, Biological Technician, and K. Cooper, Engineering Technician, conducted the sanitary survey and carried out the sampling program.

T. Tevendale, Senior Protect Engineer, directed the survey planning and contributed substantially to the final narrative.

APPENDIX I

TABLE 2 SUMMARY OF FECAL COLIFORM MPN DATA FOR SHELLFISH-GROWING
WATER SAMPLES

TABLE 2 SUMMARY OF FECAL COLIFORM MPN DATA FOR SHELLFISH GROWING
WATER SAMPLES

Sample Station	Number of Samples	MPN Range	Fecal Coliform MPN per 100 ml	
			Median	90 Percentile
1	6	<2 - <2	<2	<2
2	6	<2 - 2	<2	2
3	6	<2 - 4	2	2.8
4	6	<2 - 2	<2	2
5	6	<2 - 2	<2	2
6	6	<2 - 2	<2	2
7	6	<2 - 5	2	5
8	6	<2 - 5	<2	5
9	6	<2 - 2	<2	2
10	6	<2 - 8	3.5	6.2
11	6	<2 - 5	2	3.2
12	6	<2 - 5	<2	3.2
13	7	<2 - 5400	1600	2740
14	7	11 - 920	130	444
15	6	<2 - 22	2	13.6
16	6	<2 - 14	3	8.6
17	6	<2 - 79	3.5	38.2
18	7	<2 - 13	2	7.4
19	10	<2 - 350	6	49
20	10	<2 - 140	6	79
21	7	<2 - 18	4	9.5
22	4	<2 - 5	2	3.8
23	10	<2 - >1600	8.5	920
24	5	<2 - 7	4	6
25	6	<2 - <2	<2	<2
26	6	<2 - 2	2	2
27	6	<2 - 2	2	2
28	6	<2 - 2	<2	2
29	6	<2 - 5	<2	4.4
30	6	<2 - 2	<2	2
31	6	<2 - 2	<2	2
32	6	<2 - 5	2	5
33	7	<2 - 8	5	5.9
34	7	<2 - 8	2	5.9
35	7	<2 - 13	7	13
36	7	<2 - 2	<2	2
37	7	<2 - 5	2	2.9
38	8	<2 - 79	3	22.2
39	8	2 - 350	23	96.4
40	8	2 - 79	5	34.2

continued...

Sample Station	Number of Samples	MPN Range	Fecal Coliform MPN per 100 ml	
			Median	90 Percentile
41	8	< 2 - 110	9.5	35.6
42	6	< 2 - 8	3.5	6.2
43	6	< 2 - 17	3	11.6
44	6	< 2 - 2	< 2	2
45	6	< 2 - 5	2	5
46	6	< 2 - 5	< 2	3.2
47	6	< 2 - 2	< 2	2
48	6	< 2 - 2	< 2	2
49	6	< 2 - 5	< 2	3.2
50	7	< 2 - 49	7	26.6
51	7	< 2 - 350	11	139.3
52	8	< 2 - 170	< 2	51.6
53	6	< 2 - 8	2	6.2
54	6	< 2 - 9	2	4.8
55	6	< 2 - 5	2	3.2
56	11	< 2 - 33	4	32
57	6	2 - 540	40.5	294
58	6	2 - 1600	33	696.4
59	6	< 2 - 49	14.5	39.4
60	6	2 - 110	30	63.8
61	6	< 2 - 170	33	110
62	6	< 2 - 6	3	5.4
63	6	< 2 - 8	2	5.6
64	6	< 2 - 5	2	3.2

APPENDIX II

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR
MARINE SAMPLES

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 1 Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1130	1010 1540	3.4 2.4	-	Ni1	NW @ 14	-
Aug. 1	1020	0710 1445	1.6 3.6	17.0	Ni1	NE @ 8	25.0
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	2.5	-	<2
Aug. 8	-	-	-	-	Ni1	-	<2

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
TABLE 3 **Location:** FIVE FINGERS OUTFALL
Sample Station: 2

Date (1975)	Sample Time	Tide Time	Conditions Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1145	1010 1540	3.4 2.4	-	Ni1	NW @ 16	-	<2
Aug. 1	1035	0710 1445	1.6 3.6	17.0	Ni1	N @ 7	25.0	<2
Aug. 5	-	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	-	2.5	-	<2
Aug. 8	-	-	-	-	Ni1	-	-	<2

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TABLE 3
Sample Station: 3
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1105	1010 3.4	-	Ni1	NW @ 10	-	2
		1540 2.4					
		0710 1.6	17.5	Ni1	N @ 10	24.0	4
		1445 3.6					
Aug. 5	-	- -	-	Ni1	-	-	<2
Aug. 6	-	- -	-	2.8	-	-	2
Aug. 7	-	- -	-	2.5	-	-	2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 4 Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1135	1010 1540	3.4 2.4	-	Ni1	NW @ 2	<2
Aug. 1	1030	0710 1445	1.6 3.6	17.0	Ni1	N @ 8	25.0
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	2.5	-	<2
Aug. 8	-	-	-	-	Ni1	-	2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 5 Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1120	1010 1540	3.4 2.4	-	Ni1	NW @ 13	-
Aug. 1	1015	0710 1445	1.6 3.6	17.0	Ni1	N @ 11	25.0
							<2
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	2.5	-	<2
Aug. 8	-	-	-	-	Ni1	-	2

TABLE 3
Sample Station: 6

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1140	1010 1540	3.4 2.4	-	Ni1	NW @ 19	-
Aug. 1	1035	0710 1445	1.6 3.6	17.0	Ni1	NE @ 6	25.0
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	2.5	-	2
Aug. 8	-	-	-	-	Ni1	-	<2

TABLE 3
Sample Station: 7
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1110	1010 1540	3.4 2.4	-	Ni1	NW @ 16	-
Aug. 1	1010	0710 1445	1.6 3.6	17.5	Ni1	N @ 12	24.0
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	2.8	-	5.0
Aug. 7	-	-	-	-	2.5	-	5
Aug. 8	-	-	-	-	Ni1	-	<2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 8 Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Time	Condi-tions Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1135	1010 1540	3.4 2.4	-	Ni1	N @ 15	-	<2
Aug. 1	1030	0710 1445	1.6 3.6	17.0	Ni1	N @ 5	25.0	<2
Aug. 5	-	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	-	2.8	-	-	<2
Aug. 7	-	-	-	-	2.5	-	-	5
Aug. 8	-	-	-	-	Ni1	-	-	<2

TABLE 3
Sample Station: 9
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: FIVE FINGERS OUTFALL

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1115	1010 3.4 1540 2.4	-	Ni1	NW @ 10	-	<2
Aug. 1	1015	0710 1.6 1445 3.6	17.0	Ni1	N @ 10	25.0	<2
Aug. 5	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	2.5	-	2
Aug. 8	-	-	-	-	Ni1	-	2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 10
 Location: OFF NORTH END NEWCASTLE ISLAND

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
		Time Height (m)					
July 28	-	-	-	Ni1	-	-	8
July 29	1055	1010 1540	3.4 2.4	18.0	Ni1	NW 2 14	21.2
Aug. 1	1045	0710 1445	1.6 3.6	17.5	Ni1	E @ 3	<2
Aug. 6	-	-	-	-	2.8	-	<2
Aug. 7	-	-	-	-	2.5	-	5

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 11 Location: OFF NORTH END NEWCASTLE ISLAND

Date (1975)	Sample Time	Tide Conditions Time	Tide Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Ni1	-	-	2
July 29	1050	1010 1540	3.4 2.4	18.2	Ni1	NW @ 12	21.2	2
Aug. 1	1045	0710 1445	1.6 3.6	18.0	Ni1	NE @ 6	24.0	<2
Aug. 5	-	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	-	2.8	-	-	<2
Aug. 7	-	-	-	-	2.5	-	-	5

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 12 Location: OFF MCKAY POINT, NEWCASTLE ISLAND

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	Nil	-	-	<2
July 29	1045	1010 1540	3.4 2.4	18.0	Nil	NW @ 12	21.7
Aug. 1	1050	0710 1445	1.6 3.6	18.0	Nil	NE @ 5	24.0
Aug. 5	-	-	-	Nil	-	-	<2
Aug. 6	-	-	-	2.8	-	-	<2
Aug. 7	-	-	-	2.5	-	-	2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 13 Location: ACROSS BAY FROM CAMP MIRIAM

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 19	-	-	-	Ni1	-	-	<2
Aug. 20	1030	0440 1130	4.0 1.2	-	Ni1	-	110
Aug. 20	-	-	-	-	Ni1	-	920
Aug. 21	1030	0520 1210	4.0 1.3	13.5	Ni1	-	>1600
Aug. 21	1500	1210 1910	1.3 4.3	-	Ni1	-	1600
Aug. 22	0940	0600 1240	4.0 1.4	16.0	40.6	-	23.0
Aug. 23	1530	1310 1940	1.6 4.3	-	Ni1	-	5400

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Date (1975)	Sample Time	Tide Time	Conditions Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 19	-	-	-	-	Ni1	-	-	33
Aug. 20	1045	0440 1130	4.0 1.2	-	Ni1	-	-	130
Aug. 20	-	-	-	-	Ni1	-	-	111
Aug. 21	1045	0520 1210	4.0 1.3	13.5	Ni1	-	29.0	240
Aug. 21	1515	1210 1910	1.3 4.3	-	Ni1	-	-	240
Aug. 22	0950	0600 1240	4.0 1.4	16.0	40.6	-	23.0	920
Aug. 22	1545	1310 1940	1.6 4.3	-	Ni1	-	-	110

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 15 Location: SE SIDE PILOT BAY FRONTING HOUSES

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 20	1100	0440 1130	4.0 1.2	-	Ni1	-	<2
Aug. 20	-	-	-	-	Ni1	-	2
Aug. 21	1045	0520 1210	4.0 1.3	14.5	Ni1	-	28.5
Aug. 21	1530	1210 1910	1.3 4.3	-	Ni1	-	<2
Aug. 22	1000	0600 1240	4.0 1.4	16.0	40.6	-	22
Aug. 22	1600	1310 1940	1.6 4.3	-	40.6	-	<2
						-	8

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 17
 Location: NW END OF BEACH AT PILOT BAY,
 FRONTING HOUSES.

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 20	1130	0440 1130	4.0 1.2	-	Nil	-	-
Aug. 20	-	-	-	-	Nil	-	-
Aug. 21	1130	0520 1210	4.0 1.3	15.5	Nil	-	79
Aug. 21	1600	1210 1910	1.3 4.3	-	Nil	-	-
Aug. 22	1030	0600 1240	4.0 1.4	16.0	40.6	-	22.5
Aug. 22	1630	1310 1940	1.6 4.3	-	40.6	-	<2
							2

TABLE 3
Sample Station: 18

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: PUBLIC ACCESS ACROSS FROM TAYLOR BAY LODGE

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1610	1250 1935	.8 4.8	17.5	Ni1	-	25.0
Aug. 14	1455	1315 1305	3.9 3.1	20.5	Ni1	-	22.0
Aug. 15	1630	1440 1935	4.0 3.3	18.0	1.8	-	<2
Aug. 18	1200	1010 1745	1.2 4.3	15.0	Ni1	-	26.0

TABLE 3
Sample Station: 19

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: TAYLOR BAY ACROSS FROM 20 -
AT CREAM HOUSE

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1600	1250 1935	18.1 4.8	Ni1	-	26.0	<2
Aug. 11	-	-	-	Ni1	-	-	2
Aug. 12	-	-	-	Ni1	-	-	49
Aug. 13	1340	1140 1655	3.9 2.8	Ni1	-	-	4
Aug. 14	1550	1315 1705	3.9 3.1	20.9	Ni1	22.0	13
Aug. 15	1630	1440 1935	4.0 3.3	18.0	1.8	-	26.0
Aug. 18	1155	1010 1745	1.2 4.3	16.0	Ni1	-	27.0
Aug. 19	1620	1045 1810	1.2 4.3	-	Ni1	-	2
Aug. 20	1155	1130 1840	1.2 4.3	-	Ni1	-	8
Aug. 21	-	-	-	-	Ni1	-	7

TABLE 3
Sample Station: 20

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: TAYLOR BAY - IN FRONT OF RED
AND WHITE TRIM HOUSE

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1550	1250 1935	8 4.8	16.0	Ni1	-	27.0 <2
Aug. 14	1520	1315 1805	3.9 3.1	20.7	Ni1	-	22.5 79
Aug. 15	1440	1440 1935	4.0 3.3	18.0	1.8	-	25.0 17
Aug. 18	1145	1010 1145	1.2 4.3	16.0	Ni1	-	28.0 140
Aug. 19	1655	1045 1810	1.2 4.3	-	Ni1	-	- 33
Aug. 20	1145	1130 1840	1.2 4.3	-	Ni1	-	- <2
Aug. 21	-	-	-	-	Ni1	-	- 8

TABLE 3
Sample Station: 21

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: IN FRONT OF TAYLOR BAY LODGE

Date (1975)	Sample Time	Conditions Time	Tide Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1535	1250 1935	.8 4.8	17.2	Ni1	-	26	2
Aug. 11	1120	0905 1455	3.9 3.1	18.0	Ni1	-	20.5	4
Aug. 12	-	-	-	-	Ni1	-	-	<2
Aug. 13	1420	1140 1655	3.9 2.8	19.5	Ni1	-	-	<2
Aug. 14	1535	1315 1805	3.9 3.1	21.5	Ni1	-	23.0	13
Aug. 15	1445	1440 1935	4.1 3.3	18.5	1.8	-	25.0	4
Aug. 18	1315	1010 1745	1.2 4.3	15.0	Ni1	-	28.5	8

TABLE 3
Sample Station: 22

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: ACROSS FROM WHITE HOUSE IN DESCANSO BAY

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 19	1520	104.5 1810	18.4 4.3	Ni1	26.5	-	<2
Aug. 20	-	- -	- -	Ni1	-	-	<2
Aug. 21	0955	0520 1210	4.0 1.3	14.0	Ni1	30.0	-
Aug. 22	-	- -	- -	-	40.6	-	<2

TABLE 3
Sample Station: 23

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: DESCANSO BAY OFF
WILDLWOOD ESTATES TRAILER PARK.

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1340	1250 1935	16.8 4.8	Ni1	-	25.0	4
Aug. 11	-	-	-	Ni1	-	-	2
Aug. 12	-	-	-	Ni1	-	-	33
Aug. 13	-	-	-	Ni1	-	-	2
Aug. 14	1345	0710 1440	1.3 4.1	23.7	Ni1	-	21.5
Aug. 15	1615	1440 1935	4.1 3.3	18.0	1.8	-	> 1600
Aug. 18	1130	1010 1745	1.2 4.3	21.1	Ni1	-	130
Aug. 19	1525	1045 1810	1.2 4.3	21.1	Ni1	-	26.0
Aug. 20	-	-	-	-	Ni1	-	<2
Aug. 21	0940	0520 1210	4.0 1.3	14.0	Ni1	-	30.0
							2

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 18	1140	1010 1745	1.2 4.3	-	Ni1	-	-
Aug. 19	1530	1045 1810	1.2 4.3	17.4	Ni1	-	26.0
Aug. 20	-	-	-	-	Ni1	-	-
Aug. 21	-	-	-	-	Ni1	-	-
Aug. 21	0945	0520 1210	4.0 1.3	14.0	40.6	-	30.0

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Sample Station: 25 Location: NORTHUMBERLAND CHANNEL OFF JACK POINT

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Ni1	-	<2
July 29	1030	1010 3.4 1540 2.4	18.2	Ni1	NW @ 14	20.0	<2
Aug. 1	1105	0710 1.6 1445 3.6	17.8	Ni1	NW @ 7	23.7	<2
Aug. 5	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	27.9	-	-	<2
Aug. 7	-	-	-	25.4	-	-	<2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 26
 Location: NORTHUMBERLAND CHANNEL BETWEEN
 JACK POINT AND DUKE POINT

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Ni1	-	-
July 29	1020	1010 1540	3.4 2.4	18.1	Ni1	NW @ 16	20.0
Aug. 1	1110	0710 1445	1.6 3.6	17.9	Ni1	NW @ 8	23.6
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	27.9	-	<2
Aug. 7	-	-	-	-	25.4	-	<2

TABLE 3
Sample Station: 27
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: NORTHUMBERLAND CHANNEL
WESTERLY OF DUKE POINT

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Ni1	-	<2
July 29	1015	1010 3.4 1540 2.4	18.3	Ni1	NW @ 11	20.0	2
Aug. 1	1115	0710 1.6 1445 3.6	18.0	Ni1	N @ 6	23.5	2
Aug. 5	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	27.9	-	-	<2
Aug. 7	-	-	-	25.4	-	-	2

TABLE 3
Sample Station: 28
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: NORTHUMBERLAND CHANNEL
EASTERLY OF DUKE POINT.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	Ni1	-	-	<2
July 29	1010	0435 2.2 1010 3.4	18.2	Ni1	NW @ 12	20.0	<2
Aug. 1	1115	07.0 1.6 1445 3.6	17.0	Ni1	NW @ 5	24.0	<2
Aug. 5	-	-	-	Ni1	-	-	<2
Aug. 6	-	-	-	27.9	-	-	<2
Aug. 7	-	-	-	25.4	-	-	2

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 29
 Location: NORTHUMBERLAND CHANNEL OFF
 HOOKER CHEMICAL CONVEYOR DOCK.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Ni1	-	-
July 29	1005	0435 1010	2.2 3.4	18.2	Ni1	NW @ 16	19.8
Aug. 1	1120	0710 1445	1.6 3.6	18.0	Ni1	NE @ 3	23.5
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	27.9	-	<2
Aug. 7	-	-	-	-	25.4	-	<2

TABLE 3
Sample Station: 30

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: NORTHUMBERLAND CHANNEL OFF HARMAC PULP MILL WEST DOCK.

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Ni1	-	-
July 29	1000	0435 1010	2.2 3.4	18.4	Ni1	N @ 15	19.3
Aug. 1	1125	0710 1445	1.6 3.6	18.0	Ni1	E @ 10	24.0
Aug. 5	-	-	-	-	Ni1	-	<2
Aug. 6	-	-	-	-	27.9	-	<2
Aug. 7	-	-	-	-	25.4	-	2

TABLE 3
Sample Station: 31
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: NORTHUMBERLAND CHANNEL OFF
HARMAC PULP MILL EAST DOCK.

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	-	-	-	-	Nil	-	-
July 29	1000	0435	2.2	18.4	Nil	W @ 19	19.0
	1010	1010	3.4				5
Aug. 1	0710	0710	1.6	17.8	Nil	E to 20	23.7
	1445	1445	3.6				<2
Aug. 5	-	-	-	Nil	-	-	5
Aug. 6	-	-	-	-	27.9	-	<2
Aug. 7	-	-	-	-	25.4	-	2

TABLE 3
Sample Station: 32

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: SE END OF NORTHUMBERLAND
CHANNEL OFF POWER CABLE SIGN.

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	0950	0435 1010	2.2 3.4	18.3	Ni1	W 0 9	19.0
		0710 1445	1.6 3.6	16.9	Ni1	SE 0 12	23.0
Aug. 1	1135	-	-	-	Ni1	-	<2
Aug. 5	-	-	-	-	Ni1	-	-
Aug. 6	-	-	-	-	27.9	-	2
Aug. 7	-	-	-	-	25.4	-	<2
						-	2

TABLE 3
Sample Station: 33
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: FALSE NARROWS OFF MOST
WESTERLY MARKER

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1410	1250 1935	.8 4.8	15.5	Nil	-	27.0 < 2
Aug. 11	1010	0905 1455	4.0 1.9	14.9	Nil	-	26.0 2
Aug. 12	-	-	-	-	Nil	-	- 5
Aug. 13	-	-	-	-	Nil	-	- 5
Aug. 14	1410	0710 1440	1.6 3.6	19.0	Nil	-	23.0 5
Aug. 15	1540	1440 1935	4.1 3.3	16.0	1.8	-	25.0 8
Aug. 18	1125	1010 1745	1.2 4.3	13.0	Nil	-	27.0 < 2

TABLE 3
Sample Station: 34

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: MOST EASTERLY NAVIGATION MARKER
FALSE NARROWS

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1420	1250 1935	.8 4.8	15.5	Nil	-	27.0
Aug. 11	1005	0905 1455	4.0 1.9	14.5	Nil	-	26.0
Aug. 12	-	-	-	-	Nil	-	-
Aug. 13	-	-	-	-	Nil	-	<2
Aug. 14	1415	0710 1440	1.6 3.6	19.0	Nil	-	23.0
Aug. 15	1545	1440 1935	4.1 3.3	16.0	1.8	-	25.0
Aug. 18	1120	1010 1745	1.2 4.3	13.0	Nil	-	27.0
						<2	<2

TABLE 3
Sample Station: 35

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES

Sample Station: 35

Location: FALSE NARROWS - ACROSS FROM
WHITE HOUSE ON MUDGE IS. - DOWN
FROM WALKWAY

FROM WALKWAY.							
Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1425	1250 1935	15.0 4.8	Ni1	-	27.0	5
Aug. 11	1000	0905 1455	14.5 1.9	Ni1	-	26.0	8
Aug. 12	-	-	-	Ni1	-	-	2
Aug. 13	-	-	-	Ni1	-	-	7
Aug. 14	1425	0710 1440	19.0 3.6	Ni1	-	23.0	13
Aug. 15	1545	1440 1935	18.0 3.3	1.8	-	26.0	13
Aug. 18	1115	1010 1745	12.5 4.3	Ni1	-	27.0	<2

TABLE 3
Sample Station: 36

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: FALSE NARROWS - OFF NORTH-EAST
NANAIMO HARBOUR BOUNDARY MARKER.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1435	1250 1935	.8 4.8	18.0	Nil	-	28.0
Aug. 11	1025	0905 1455	4.0 1.9	15.5	Nil	-	24.5
Aug. 12	-	-	-	-	Nil	-	-
Aug. 13	-	-	-	-	Nil	-	-
Aug. 14	1425	0710 1440	1.6 3.6	19.0	Nil	-	-
Aug. 15	1550	1440 1935	4.1 3.3	18.0	1.8	-	26.0

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
 Sample Station: 37 Location: OFF WHITE HOUSE AT SOUTH END OF
 FALSE NARROWS

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1455	1250 1935	.8 4.8	17.0	Ni1	-	28.0
Aug. 11	1030	0905 1455	4.0 1.9	15.5	Ni1	-	24.5
Aug. 12	-	-	-	-	Ni1	-	-
Aug. 13	-	-	-	-	Ni1	-	-
Aug. 14	1430	0710 1440	1.6 3.6	19.0	Ni1	-	23.0
Aug. 15	1555	1440 1935	4.1 3.3	18.0	1.8	-	26.0
							5

TABLE 3
Sample Station: 38
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: ENTRANCE TO PIRATE'S COVE

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1545	1455 2125	1.9 4.7	-	Ni1	NW @ 11	- < 2
Aug. 12	1055	1015 1555	3.9 2.3	-	Ni1	NW @ 11	- 5
Aug. 13	1050	0500 1140	1.4 3.9	15.8	Ni1	NW @ 8	23.5 < 2
Aug. 14	1030	0600 1315	1.3 3.9	17.0	Ni1	N @ 3	23.0 < 2
Aug. 15	1115	0710 1440	0.3 4.1	15.9	1.8	E @ 5	25.0 4
Aug. 18	1055	1010 1745	1.2 3.5	15.0	Ni1	NW @ 10	- < 2
Aug. 23	1145	0645 1310	3.9 1.6	13.0	Ni1	W @ 15	26.5 79
Aug. 24	1115	0725 1330	3.9 1.9	13.5	Ni1	E @ 4	25.5 8

TABLE 3
Sample Station: 39

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: MIDDLE OF PIRATE'S COVE

Date (1975)	Sample Time	Tide Time	Conditions Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1540	1455 2125	1.9 4.7	-	Ni1	NW @ 8	-	4
Aug. 12	1050	1015 1555	3.9 2.3	-	Ni1	NW @ 11	-	23
Aug. 13	1045	0500 1140	1.4 3.9	15.8	Ni1	NW @ 8	24.0	14 17 boats
Aug. 14	1025	0600 1315	1.3 3.9	16.0	Ni1	N @ 3	24.0	23
Aug. 15	1115	0710 1440	1.3 4.1	16.0	1.8	E @ 10	25.0	350
Aug. 18	1050	1010 1715	1.2 3.5	15.0	Ni1	NW @ 10	-	23
Aug. 23	1140	0645 1310	3.9 1.6	13.0	Ni1	NW @ 10	26.5	33
Aug. 24	1115	0725 1330	3.9 1.9	13.4	Ni1	SE @ 7	25.5	2

TABLE 3
Sample Station: 40

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: OFF PRIVATE FLOAT AT PIRATE'S COVE.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1535	1455 2125	1.9 4.7	-	Ni1	N @ 10	-
Aug. 12	1045	1015 1555	3.9 2.3	-	Ni1	NW @ 6	-
Aug. 13	1035	0500 1140	1.4 3.9	15.6	Ni1	SE @ 3	24.0
Aug. 14	1015	0600 1315	1.3 3.9	16.5	Ni1	NE @ 5	23.0
Aug. 15	1105	0700 1440	1.3 4.1	16.0	1.8	SE @ 7	24.5
Aug. 18	1040	1010 1745	1.2 3.5	15.0	Ni1	NW @ 4	-
Aug. 23	1135	0645 1310	3.9 1.6	13.0	Ni1	N @ 6	26.5
Aug. 24	1105	0725 1330	3.9 1.9	13.5	Ni1	SE @ 4	25.5
						< 2	12

TABLE 3
Sample Station: 41

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: OFF SOUTHERLY HEXAGONAL FLOAT
IN PIRATE'S COVE.

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1540	1455 2125	1.9 4.1	-	Ni1	W @ 7	- <2
Aug. 12	1050	1015 1555	3.9 2.3	-	Ni1	NW @ 12	- 13
Aug. 13	1040	0500 1140	1.4 1.3	15.8	Ni1	NW @ 9	- 8
Aug. 14	1020	0600 1315	1.3 3.9	16.0	Ni1	E @ 4	24.0 5
Aug. 15	1110	0710 1440	1.3 4.1	15.6	1.8	E @ 6	25.0 11
Aug. 18	1045	1010 1745	1.2 3.5	15.5	Ni1	NW @ 9	- 17
Aug. 23	1140	0645 1310	3.9 1.6	13.0	Ni1	NW @ 14	26.0 110
Aug. 24	1110	0725 1330	3.9 1.9	13.4	Ni1	SE @ 6	25.5 7

TABLE 3
Sample Station: 42

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: BAY AT SE END DECOURCY ISLAND

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1520	1455 2125	1.9 4.7	-	Ni1	S @ 6	-
Aug. 12	1035	1015 1555	3.9 2.3	-	Ni1	W @ 4	-
Aug. 13	1020	0500 1140	1.4 3.9	15.0	Ni1	SW @ 5	3
Aug. 14	1005	0600 1315	1.3 3.9	15.5	Ni1	SE @ 6	24.0
Aug. 15	1050	0710 1440	1.3 4.1	16.1	1.8	SE @ 8	5
Aug. 18	1030	1010 1745	1.2 3.5	14.5	Ni1	S @ 2	2
							< 2

TABLE 3
Sample Station: 43

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: BAY AT SE END DECOURCY ISLAND

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1515	1455 2125	1.9 4.7	-	Ni1	W @ 6	-
Aug. 12	1030	1015 1555	3.9 2.3	-	Ni1	E @ 3	-
Aug. 13	1015	0500 1140	1.4 3.9	15.0	Ni1	NW @ 8	24.0
Aug. 14	1000	0600 1315	1.3 3.9	15.5	Ni1	SE @ 5	25.0
Aug. 15	1045	0710 1440	1.3 4.1	16.5	1.8	SE @ 7	25.0
Aug. 18	1030	1010 1745	1.2 3.5	14.5	Ni1	N @ 7	-
							17 1 boat

TABLE 3
Sample Station: 44

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: MOORAGE ON EAST SIDE RUXTON
ISLAND NEAR RED HOUSE WITH
YELLOW TRIM.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1525	1455 2125	1.9 4.7	-	Ni1	N @ 10	-
Aug. 12	1035	1015 1555	3.9 2.3	-	Ni1	NW @ 7	<2
Aug. 13	1025	0500 1140	1.4 3.9	15.5	Ni1	N @ 6	24.5
Aug. 14	1010	0600 1315	1.3 3.9	15.5	Ni1	N @ 3	<2
Aug. 15	1055	0710 1440	1.3 4.1	15.0	1.8	W @ 3	25.5
Aug. 18	1035	1010 1745	1.2 3.5	15.5	Ni1	NW @ 10	<2
							2

TABLE 3
Sample Station: 45

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: MOORAGE AT NORTH END OF RUXTON
ISLAND - WEST SIDE OF COVE.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1500	1455 2125	1.9 4.7	-	Nil	W @ 10	-
Aug. 12	1020	1015 1555	3.9 2.3	-	Nil	NW @ 11	-
Aug. 13	1000	0500 1140	1.4 3.9	15.2	Nil	N @ 7	24.5
Aug. 14	0945	0600 1315	1.3 3.9	16.0	Nil	SE @ 2	25.0
Aug. 15	1035	0710 1440	1.3 4.1	15.9	1.8	E @ 4	25.0
Aug. 18	1020	1010 1745	1.2 3.5	16.5	Nil	NW @ 10	20.0

TABLE 3
Sample Station: 46

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
MOORAGE AT NORTH END OF RUXTON
Location: ISLAND - WEST SIDE OF COVE.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1505	1455 2125	1.9 4.7	-	Ni1	SW @ 7	- < 2
Aug. 12	1025	1015 1555	3.9 2.3	-	Ni1	W @ 7	- < 2
Aug. 13	1005	0500 1140	1.4 3.9	15.0	Ni1	NW @ 3	24.5 < 2
Aug. 14	0950	0600 1315	1.3 3.9	15.5	Ni1	NW @ 2	25.0 5
Aug. 15	1040	0710 1440	1.3 4.1	16.7	1.8	NW @ 2	25.0 < 2
Aug. 18	1020	1010 1745	1.2 3.5	16.5	Ni1	NW @ 9	- < 2

TABLE 3
Sample Station: 47

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: COVE ON WEST SIDE OF RUXTON ISLAND.

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 11	1450	0905 1455	4.0 1.9	-	Ni1	E @ 6	-
Aug. 12	-	-	-	-	Ni1	SE @ 8	-
Aug. 13	0955	0500 1140	1.4 3.9	15.2	Ni1	E @ 3	24.5
Aug. 14	0925	0600 1315	1.3 3.9	16.0	Ni1	SE @ 3	24.5
Aug. 15	1030	0710 1440	1.3 4.1	16.9	1.8	SE @ 6	<2
Aug. 18	1015	1010 1745	1.2 3.5	15.5	Ni1	@ 4	24.5
							2

TABLE 3
Sample Station: 48

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: OFF GREEN HOUSE IN DEGENEN BAY

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 28	1630	-	-	Ni1	-	-	8
July 29	1420	1010 1540	11.1 8.0	17.7	Ni1	W @ 21	21.8
Aug. 1	1205	0710 1445	5.3 11.9	16.9	Ni1	E @ 8	25.0
Aug. 5	1445	1040 1815	2.4 14.5	16.8	Ni1	SE @ 8	< 2
Aug. 6	1425	1125 1830	2.0 15.0	16.8	27.9	E @ 6 - 11	22.7
Aug. 7	1455	1205 1900	2.0 15.4	15.0	25.4	SE @ 8	2
						24.1	5

TABLE 3
Sample Station: 49
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: OFF PINK HOUSE BY PILINGS
IN DEGENEN BAY.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1415	1010 1540	11.1 8.0	17.8	Ni1	W @ 10	21.4
Aug. 1	1200	0710 1445	5.3 11.9	17.0	Ni1	NE @ 10	24.6
Aug. 5	1445	1040 1815	2.4 14.5	16.4	27.9	E @ 6	< 2
Aug. 6	1425	1125 1830	2.0 15.0	17.0	25.4	SE @ 11	22.0
Aug. 7	1455	1205 1900	2.0 15.4	15.0	Ni1	SE @ 6	24.8
Aug. 8	-	-	-	-	-	-	2

TABLE 3
Sample Station: 50

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: OFF GARAGE OF HOUSE BY WHARF
IN DEGNEN BAY.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 18	1100	1010 1745	15.0 4.3	Ni1	S @ 2	-	< 2
Aug. 19	1410	1045 1810	16.4	Ni1	-	26.5	7
Aug. 20	1020	0440 1130	14.3	Ni1	-	27.0	8
Aug. 21	-	-	-	Ni1	-	-	5
Aug. 21	-	-	-	Ni1	-	-	17
Aug. 23	1205	0645 1310	13.0 1.6	Ni1	E @ 7	29.0	49
Aug. 24	1135	0725 1330	13.5 1.8	Ni1	SE @ 3	25.5	4

TABLE -3
Sample Station: 51

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: 3rd WHARF EAST OF GOVERNMENT FLOAT

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 18	1105	1010 1745	1.2 4.3	15.0	Ni1	SE @ 5	-
Aug. 19	1425	1045 1810	1.2 4.3	15.0	Ni1	-	28.0
Aug. 20	1025	0440 1130	4.0 1.2	14.0	Ni1	-	27.5
Aug. 21	-	-	-	-	Ni1	-	5
Aug. 22	-	-	-	-	40.6	-	13
Aug. 23	1210	0645 1310	3.9 1.6	13.0	Ni1	SW @ 7	-
Aug. 24	1135	0725 1330	3.8 1.8	13.5	Ni1	NE @ 2	11
							350
							49

TABLE 3
Sample Station: 52

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: HEAD OF DEGENEN BAY.

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1410	1010 1540	3.4 2.4	18.0	Ni1	SE @ 6	21.9 <2
Aug. 1	1200	0710 1445	1.6 3.6	17.1	Ni1	S @ 6	24.4 <2
Aug. 5	1440	1040 1815	.7 4.4	16.1	27.9	E @ 4	26.0 <2
Aug. 6	1420	1125 1830	.6 4.6	16.0	25.4	N @ 3	23.0 <20
Aug. 7	1450	1205 1900	.6 4.7	14.5	Ni1	SE @ 3 - 6	25.5 5
Aug. 8	-	-	-	-	Ni1	-	- <2
Aug. 23	1210	0645 1310	1.2 .5	13.0	Ni1	E @ 7	26.0 170
Aug. 24	1130	0725 1330	1.2 .5	13.7	Ni1	SE @ 2	26.0 22
							10 boats 12 boats

TABLE 3
Sample Station: 53

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Sample station: 53

Location: ENTRANCE TO CHANNEL BETWEEN
SEAR ISLAND AND GABRIOLA ISLAND.

SEASIDE ISLAND AND GABRIOLA						
Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Fecal coliform MPN/100 ml
		Height (m)		(ppt)		
July 29	1425	1010 1540	3.4 2.4	19.0	NW @ 18	20.0
Aug. 1	1215	0710 1445	1.6 3.6	16.2	NW @ 11	25.0
Aug. 5	1455	1040 1815	.7 4.4	16.5	NW @ 10	24.6
Aug. 6	1605	1125 1830	.6 4.6	18.0	27.9 E @ 13	14.8 50
Aug. 7	1440	1205 1900	.6 4.7	14.0	25.4 E @ 13	26.0 5
Aug. 8	-	-	-	-	NW	-

TABLE 3
Sample Station: 54

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: OFF CABLE SIGN IN CHANNEL BETWEEN
SEAR ISLAND AND GABRIOLA ISLAND

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1435	1010 1540	3.4 2.4	18.8	Ni1	W @ 12	20.1
Aug. 1	1220	0710 1445	1.6 3.6	16.0	Ni1	E @ 12	25.0
Aug. 5	1500	1040 1815	.7 4.4	17.8	Ni1	NW @ 9	< 2
Aug. 6	1605	1125 1830	.6 4.6	18.7	27.9	E @ 11	23.4
Aug. 7	1435	1205 1900	.6 4.7	14.0	25.4	SE @ 7-10	< 2
Aug. 8	-	-	-	-	Ni1	-	16.0
					-	-	2
					-	-	< 2

TABLE 3
Sample Station: 55

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: OVER REEF OFF WHARF IN CHANNEL
BETWEEN SEAR ISLAND AND GABRIOLA ISLAND

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1430	1010 1540	3.4 2.4	19.0	Ni1	N @ 15	20.0
					-	-	2
Aug. 1	1220	0710 1445	1.6 3.6	16.2	Ni1	SE @ 9	24.0
					-	-	<2
Aug. 5	1500	1040 1815	1. 4.4	17.0	Ni1	N @ 9	24.0
					-	-	<2
Aug. 6	1600	1125 1830	.6 4.7	18.2	27.9	SE @ 9	15.9
					-	-	<2
Aug. 7	1435	1250 1935	.8 4.8	14.0	25.4	SE @ 10-15	25.0
					-	-	2
Aug. 8	-	-	-	-	Ni1	-	<2

TABLE 3
Sample Station: 56

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: BETWEEN SEAR ISLAND AND GABRIOLA
ISLAND OFF OLD WHITE SHACK.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1440	1010 1540	3.4 2.4	18.9	Ni1	W @ 15	20.1
Aug. 1	1225	0710 1445	1.6 3.6	17.5	Ni1	SE @ 6	23.5
Aug. 5	1505	1040 1815	4.7 4.4	17.0	Ni1	NW @ 7	24.0
Aug. 6	1400	1125 1830	.6 4.6	18.3	27.9	SE @ 14	16.0
Aug. 7	1430	1205 1900	.6 4.7	14.5	25.4	SE @ 9-14	25.0
Aug. 8	1000	0555 1250	4.4 .8	13.5	Ni1	W @ 8	26.5
Aug. 11	1430	0905 1455	4.0 1.9	-	Ni1	NW @ 11	-
Aug. 12	1000	0405 1015	1.6 3.9	-	Ni1	NW @ 13	-
Aug. 13	0935	0500 1140	1.4 3.9	16.6	Ni1	NW @ 11	21.5
Aug. 15	1010	0710 1440	1.3 4.1	16.4	1.8	S @ 11	23.0
							8

TABLE 3
Sample Station: 57

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: OFF GAS FLOAT AT SILVA BAY MARINA.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1025	0555 4.4 1250 .8	13.3	Ni1	-	21.0	540
Aug. 11	-	-	-	Ni1	-	-	2
Aug. 12	-	-	-	Ni1	-	-	130
Aug. 13	-	-	-	Ni1	-	-	32
Aug. 14	1055	0710 1.3 1440 4.1	17.3	Ni1	NE @ 4	22.0	49
Aug. 18	0940	0250 4.0 1010 1.2	13.7	Ni1	NW @ 14	21.8	13

TABLE 3
Sample Station: 58

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: OFF SOUTH FLOAT AT SILVA BAY MARINA.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	1030	0555 1250	4.4 .8	13.5	Ni1	-	27.0
Aug. 11	-	- -	-	-	Ni1	-	-
Aug. 12	-	- -	-	-	Ni1	-	2
Aug. 13	-	- -	-	-	Ni1	-	33
Aug. 14	1050	0710 1440	1.3 4.1	17.5	Ni1	E @ 8	94
Aug. 18	0955	0250 1010	4.0 1.2	13.7	Ni1	NW @ 8	22.0
						21.0	33
						1600	

TABLE 3
Sample Station: 59
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: BETWEEN R.V.Y.C. AND SILVA BAY MARINA

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	0955	0555 4.4 1250 .8	14.5	Ni1	NW @ 10	25.5	<2
Aug. 11	1425	0905 4.0 1455 1.9	-	Ni1	NW @ 8	-	<2
Aug. 12	0955	0405 1.6 1015 3.9	-	Ni1	NW @ 6	-	2
Aug. 13	0930	0500 1.4 1140 3.9	16.6	Ni1	NW @ 11	22.0	49
Aug. 14	0905	0600 1.3 1315 3.9	17.0	Ni1	E @ 8	22.0	2
Aug. 15	1005	0710 1.3 1440 4.1	16.9	1.8	NE @ 11	23.0	33

TABLE 3
Sample Station: 60

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: OFF CORNER OF FLOAT AT BOATE
IN SILVA BAY.

Date (1975)	Sample Time	Tide Time	Conditions Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
Aug. 8	0955	0555 1250	4.4 .8	14.2	Ni1	W @ 7	26.0	33
Aug. 11	1420	0905 1455	4.0 1.9	-	Ni1	W @ 9	-	2
Aug. 12	0950	0405 1015	1.6 3.9	-	Ni1	NW @ 12	-	110
Aug. 13	0930	0500 1140	1.4 3.9	16.6	Ni1	W @ 13	22.0	27
Aug. 14	0900	0600 1315	1.3 3.9	17.0	Ni1	E @ 7	22.0	33
Aug. 15	1005	0710 1440	1.3 4.1	17.0	1.8	E @ 9	22.5	17

TABLE 3 BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES

Sample Station: 61

Location: Cove at western end of Silva Bay

Date (1975)	Sample Time	Tide Conditions	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
		Time Height (m)					
August 8	-	-	-	Ni1	-	-	17
August 11	-	-	-	Ni1	-	-	49
August 12	-	-	-	Ni1	-	-	170
August 13	-	-	-	Ni1	-	-	11
August 14	-	-	-	Ni1	-	-	70
August 19	1500	1045 1810	1.2 4.3	19.4	Ni1	-	< 2
							25.0

TABLE 3
Sample Station: 62

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: BETWEEN TUGBOAT ISLAND AND
LAW POINT

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1445	1010 1540	3.4 2.4	18.8	Nil	W @ 7	20.5
Aug. 1	1230	0710 1445	1.6 3.6	18.0	Nil	SE @ 16	23.2
Aug. 5	1510	1040 1815	17 4.4	17.0	Nil	NW @ 7	24.0
Aug. 6	1355	1125 1830	.6 4.6	18.2	27.9	E @ 11	<2
Aug. 7	1425	1205 1900	.6 4.7	15.0	25.4	SE @ 12-17	16.7
Aug. 8	-	-	-	-	Nil	-	20
						-	2

TABLE 3
Sample Station: 63
BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.
Location: CHANNEL BETWEEN EAST END LILY ISLAND
AND LAW POINT

Date (1975)	Sample Time	Tide Conditions Time	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1450	1010 1540	3.4 2.4	18.8	Ni1	W @ 20	21.0 <2
Aug. 1	1235	0710 1445	1.6 3.6	17.5	Ni1	SE @ 8	23.4 <2
Aug. 5	1510	1040 1815	.7 4.4	17.0	Ni1	W @ 8	24.0 <2
Aug. 6	1350	1125 1830	.6 4.6	18.2	27.9	SE @ 5	16.3 2
Aug. 7	1420	1205 1900	.6 4.7	15.0	25.4	E @ 16	24.0 <2
Aug. 8	-	-	-	-	Ni1	-	-

TABLE 3
Sample Station: 64

BACTERIOLOGICAL ANALYSES RESULTS AND SAMPLING CONDITIONS FOR MARINE SAMPLES.

Location: CHANNEL BETWEEN EAST TIP LILY ISLAND
AND VANCE ISLAND.

Date (1975)	Sample Time	Tide Conditions Time Height (m)	Water Temp. (°C)	Total Precip. (mm)	Wind (knots)	Salinity (ppt)	Fecal coliform MPN/100 ml
July 29	1445	1010 1540	3.4 2.4	18.7	Ni1	W @ 21	21.1
Aug. 1	1230	0710 1445	1.6 3.6	17.0	Ni1	E @ 8	24.0
Aug. 5	1515	1040 1815	.7 4.4	17.0	Ni1	W @ 7	25.0
Aug. 6	1350	1125 1830	.6 4.6	18.3	27.9	SE @ 6	16.6
Aug. 7	1426	1205 1900	.6 4.7	15.2	25.4	SE @ 9-14	23.5
Aug. 8	-	-	-	-	Ni1	-	<2

APPENDIX III

TABLE 4 MARINE SAMPLE STATION LOCATIONS

TABLE 4

MARINE SAMPLE STATION LOCATIONS

Sample Station	Latitude	Longitude	Location		
1	49° 15'03.5"N	123° 55'55.0"W	Five Finger	outfall	
2	49° 14'14.0"N	123° 55'10.0"W	"	"	"
3	49° 13'38.0"N	123° 56'00.0"W	"	"	"
4	49° 14'52.0"N	123° 56'43.0"W	"	"	"
5	49° 14'40.0"N	123° 55'56.0"W	"	"	"
6	49° 14'18.0"N	123° 55'30.0"W	"	"	"
7	49° 14'19.0"N	123° 56'25.0"W	"	"	"
8	49° 14'19.0"N	123° 56'25.0"W	"	"	"
9	49° 14'22.5"N	123° 55'57.0"W	"	"	"
10	49° 12'10.5"N	123° 55'56.0"W	Off north end of Newcastle Island		
11	49° 12'16.1"N	123° 55'34.0"W	Off north end of Newcastle Island		
12	49° 11'58.0"N	123° 55'20.0"W	Off McKay Point, Newcastle Island		
13	49° 12'02.0"N	123° 49'48.0"W	Across bay from Camp Miriam		
14	49° 11'59.0"N	123° 49'24.5"W	Fronting Camp Miriam		
15	49° 11'38.8"N	123° 51'17.2"W	SE side Pilot Bay fronting houses		
16	49° 11'41.5"N	123° 51'22.4"W	Middle of beach Pilot Bay		
17	49° 11'48.5"N	123° 51'20.8"W	NW end of beach Pilot Bay fronting houses.		
18	49° 11'40.0"N	123° 51'54.0"W	Public access across from Taylor Bay Lodge.		
19	49° 11'39.5"N	123° 51'44.8"W	Across from 20 at Taylor Bay at cream house.		
20	49° 11'34.0"N	123° 51'45.6"W	Taylor Bay - in front of red house with white trim.		
21	49° 11'30.8"N	123° 51'55.2"W	In front of the Taylor Bay Lodge.		
22	49° 10'22.2"N	123° 51'48.0"W	Across from white house in Descanso Bay.		
23	49° 10'21.3"N	123° 51'52.6"W	Off culvert from Wildwood Estates in Descanso Bay.		

Sample Station	Latitude	Longitude	Location
24	49° 10'07.0"N	123° 51'52.6"W	Off house at east end of Descanso Bay.
25	49° 10'07.0"N	123° 53'24.8"W	Northumberland Channel off Jack Point.
26	49° 09'28.7"N	123° 53'10.8"W	Northumberland Channel between Jack Point and Duke Point.
27	49° 09'11.0"N	123° 52'15.6"W	Northumberland Channel westerly of Duke Point.
28	49° 09'06.0"N	123° 52'45.6"W	Northumberland Channel easterly of Duke Point.
29	49° 08'35.5"N	123° 52'40.0"W	Northumberland channel off Hooker Chemical Conveyer Dock.
30	49° 08'32.6"N	123° 51'53.2"W	Northumberland Channel off Harmac Pulp Mill West Dock.
31	49° 08'31.1"N	123° 50'37.3"W	Northumberland Channel off Harmac Pulp Mill East Dock.
32	49° 08'13.6"N	123° 49'46.3"W	SE end of Northumberland Channel off power cable sign.
33	49° 08'12.0"N	123° 47'02.6"W	False Narrows off most westerly marker.
34	49° 08'06.0"N	123° 46'44.6"W	False Narrows off most easterly navigation marker.
35	49° 08'06.7"N	123° 46'46.3"W	False Narrows across from white house on Mudge Island.
36	49° 08'04.1"N	123° 46'38.6"W	False Narrows -NE Nanaimo Harbour Boundary Marker.
37	49° 46'26.6"N	123° 46'26.6"W	Off white house at South end of False Narrows.
38	49° 06'00.0"N	123° 43'39.0"W	Entrance to Pirate's Cove.
39	49° 06'45.8"N	123° 43'43.3"W	Middle of Pirate's Cove.
40	49° 06'45.7"N	123° 43'51.8"W	Off private float at Pirate's Cove.
41	49° 06'36.0"N	123° 43'38.6"W	Off southerly hexagonal float at Pirate's Cove.
42	49° 05'38.5"N	123° 43'24.0"W	Bay at SE end DeCourcy Island.
43	49° 05'37.4"N	123° 43'29.2"W	Bay at SE end DeCourcy Island.
44	49° 05'00.0"N	123° 42'32.6"W	Moorage East side Ruxton Island near red house with yellow trim.
45	49° 04'58.9"N	123° 42'49.7"W	Moorage at North end of Ruxton Island - west side of cove.
46	49° 04'57.8"N	123° 42'42.8"W	Moorage at North end of Ruxton Island east side of cove.
47	49° 04'42.0"N	123° 42'24.0"W	Cove on west side of Ruxton Island.

Sample Station	Latitude	Longitude	Location
48	49° 08'03.3"N	123° 43'00.0"W	Off green house in Degnen Bay.
49	49° 08'09.0"N	123° 42'49.7"W	Off pink house by pilings in Degnen Bay.
50	49° 08'16.1"N	123° 42'36.0"W	Off garage next to house by wharf in Degnen Bay.
51	49° 08'16.1"N	123° 42'36.0"W	Third wharf east of government float in Degnen Bay.
52	49° 08'18.0"N	123° 42'32.6"W	Head of Degnen Bay.
53	49° 08'38.0"N	123° 41'18.0"W	Entrance to channel between Sear Island and Gabriola Island.
54	49° 08'42.4"N	123° 41'32.0"W	Off cable sign in channel between Sear and Gabriola islands.
55	49° 08'44.9"N	123° 41'37.0"W	Over reef off wharf in channel between Sear Island and Gabriola Island.
56	49° 08'55.5"N	123° 41'38.0"W	Between Sear Island and Gabriola Island off old white shack.
57	49° 09'01.5"N	123° 41'50.6"W	Off gas float at Silva Bay Marina.
58	49° 09'00.0"N	123° 41'48.3"W	Off south float at Silva Bay Marina.
59	49° 09'03.0"N	123° 41'40.1"W	Between R.V.Y.C. and Silva Bay Marina.
60	49° 09'06.0"N	123° 41'56.0"W	Off corner of float at Boatel in Silva Bay.
61	49° 09'10.3"N	123° 42'01.0"W	Cove at western end of Silva Bay.
62	49° 09'07.8"N	123° 41'37.0"W	Between Tugboat Island and Law Point in Silva Bay.
63	49° 09'14.7"N	123° 41'15.3"W	Channel between East end Lily Island and Law Point, Silva Bay.
64	49° 09'19.5"N	123° 41'40.0"W	Channel between East tip Lily Is. and Vance Island, Silva Bay.

APPENDIX IV

TABLE 5 POSITIVELY-IDENTIFIED AND SUSPECTED SOURCES OF POLLUTION

TABLE 5 POSITIVELY-IDENTIFIED AND SUSPECTED SOURCES OF POLLUTION

Sample Station	Source	Problem
13	Habonim Camp Miriam	Faulty septic-tank absorption field.
14	Surf Lodge	Direct discharge to the receiving waters. Pipe is broken above the low-water mark.
19	Taylor Bay residences	Seepage from septic-tank absorption fields.
20	Taylor Bay residences	As above.
23	Wildwood Estates	Culvert to the beach runs under trailer-park septic-tank absorption field.
39	Pirate's Cove	Boat discharges and landwash.
51	Degnen Bay	Boat discharges and landwash.
52	Degnen Bay	Boat discharges and landwash.
57	Silva Bay Resort	Ineffective and defective sewage-disposal facilities at the Silva Bay Resort.
57,58	Silva Bay Resort marina, Page's Store and residence	Boat discharges. Direct sewage discharge.
59,60,61	Marinas and anchored boats	Boat discharges.
60,61	Leloup's Store	Direct septic tank discharge.
-	Royal Vancouver Yacht Club caretaker's residence at Tugboat Island	Direct sewage discharge.