Appendices

Appendix I

Criteria to be considered for assessing eutrophication in esturial and coastal waters (DoE 1993).

Appendix I

Criteria to be considered for assessing eutrophication in esturial and coastal waters (DoE 1993).

(a) Nitrate Concentrations

Winter (February) nitrate nitrogen concentrations significantly enhanced relative to a background concentration for a defined geographical area based on salinity.

(b) Occurrence of exceptional algal blooms

Attention should be given to the occurrence of unusual blooms of phytoplanktonic species or blooms of unusual scale or blooms with unusual toxicity characteristics.

In considering abundance it can be taken that blooms of algae in coastal waters normally reach densities of at least $5x10^5$ cells per litre and chlorophyll-a concentrations of around $10mg/m^3$.

(Note: Numeric values are given only as indicators of possible current or future problems. They are neither above nor below which a state of eutrophication will have been demonstrated to be present or absent.)

(c) Duration of algal blooms

It could be considered exceptional if the normal spring bloom algal densities persisted through the summer until the autumn bloom without the typical nutrient-limited decline in the summer.

(d) Oxygen deficiency

Attention should be given to decreased oxygen concentration at the surface, as well as in deeper layers, including in areas where sedimentation and/or stratification may occur.

Care must be taken under this heading to ensure that consideration is given to oxygen deficiency which is due to the decay of plant material and not caused by organic discharges to the local area.

(e) Changes in fauna

Substantial increases or decreases in benthic biomass, shifts in species composition and mortality of benthos and fish.

(f) Changes in macrophyte growth

These can be relatively minor, such as the disappearance of red algal species, or a reduction in depth of the photic zone, or more significant, for example dense and widespread growth of *Enteromorpha* spp.

(g) Occurrence and magnitude of Paralytic Shellfish Poisoning (PSP).

The occurrence of PSP-causing species (e.g. *Alexandrium* sp) is endemic in areas around the UK coast even where there is no nutrient enrichment and blooms of varying significance occur each year. However, their scale may be enhanced by nutrient enrichment, extending the duration and geographic area of effect of the present chronic phenomenon. Such an extension could indicate eutrophication but could also be due to a variety of natural causes.

(h) Formation of algal scums on beaches and offshore

Dense blooms of colonial or chain-forming species (e.g. *Phaeocystis, Chaetoceros*) can result in drifts of cells on the sea surface or on the strand line, or slimy deposits on fish nets or drogues. The significance of these phenomena should be placed in a historical perspective as such phenomena have been regularly recorded in some UK coastal waters for over 100 years.

Appendix II

Results from the sea surveys.

Survey 1 - 27th February 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
					℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
1	B	49 09.81 N	2 08.17 W	9:40	8.50	93	7.77	2.19	2.84	0.18	12.89	13.06	2.41	15.47	0.50
2	B	49 09.87 N	2 08.60 W	9:46	8.00	84	7.90	2.16	2.63	0.16	10.41	10.57	1.72	12.29	0.44
3	C	49 09.65 N	2 08.53 W	9:52	8.00	82	7.93	2.11	2.57	0.16	10.62	10.78	1.06	11.84	0.53
4	B	49 09.83 N	2 08.93 W	9:55	8.00	82	7.95	1.90	2.55	0.15	10.56	10.71	0.82	11.53	0.55
5	B	49 10.43 N	2 08.65 W	10:06	8.30	87	7.98	1.86	2.63	0.24	11.39	11.64	9.00	20.63	0.45
6	B	49 10.55 N	2 08.62 W	10:10	8.00	89	7.99	2.81	2.63	0.31	11.68	11.99	3.48	15.48	0.24
7	B	49 10.76 N	2 08.62 W	10:13	8.10	92	8.00	1.79	2.49	0.14	10.35	10.49	1.06	11.55	0.46
8	B	49 10.83 N	2 08.46 W	10:17	8.10	89	8.00	1.58	2.39	0.15	10.13	10.28	0.49	10.77	0.47
9	B	49 10.96 N	2 08.38 W	10:21	8.00	85	7.98	1.98	2.72	0.14	11.72	11.85	0.59	12.44	0.45
10	B	49 11.02 N	2 08.32 W	10:27	8.00	86	7.98	1.73	2.56	0.16	10.76	10.92	1.00	11.92	0.48
11	B	49 11.09 N	2 08.28 W	10:30	8.00	87	7.98	1.79	2.58	0.15	10.84	10.99	1.17	12.16	0.52
12	B	49 11.19 N	2 08.23 W	10:34	8.00	86	7.99	1.98	2.60	0.16	12.61	12.78	0.71	13.49	0.49
13	B	49 11.29 N	2 08.07 W	10:36	8.10	90	7.99	1.80	2.56	0.14	10.99	11.14	0.50	11.64	0.49
14	B	49 11.37 N	2 07.99 W	10:39	8.10	83	8.00	1.94	2.42	0.14	10.43	10.57	0.96	11.53	0.75
15	B	49 11.46 N	2 07.84 W	10:42	8.20	89	8.01	2.03	2.36	0.14	10.14	10.28	0.98	11.26	0.42
16	B	49 11.44 N	2 07.97 W	10:48	8.02	94	8.02	2.05	2.36	0.14	10.14	10.28	0.60	10.88	0.43
17	B	49 11.45 N	2 08.21 W	10:51	8.20	82	8.02	1.83	2.35	0.13	12.86	12.99	0.39	13.39	0.45
18	B	49 11.44 N	2 08.37 W	10:54	8.32	93	8.02	2.00	2.33	0.14	10.29	10.42	0.52	10.94	0.44
19	B	49 11.44 N	2 08.51 W	10:57	8.30	86	8.02	1.93	2.35	0.13	10.51	10.64	0.76	11.40	0.43
20	B	49 11.34 N	2 08.57 W	11:00	8.40	80	8.04	1.89	2.32	0.12	10.37	10.49	0.61	11.10	0.46
21	B	49 11.21 N	2 08.61 W	11:06	8.30	79	8.04	1.74	2.43	0.14	10.85	10.99	0.71	11.71	0.50
22	B	49 11.12 N	2 08.72 W	11:10	8.20	85	8.05	1.93	2.32	0.14	10.49	10.64	1.22	11.86	0.42
23	B	49 10.99 N	2 08.77 W	11:12	8.30	91	8.05	2.42	2.53	0.14	11.21	11.35	1.01	12.36	0.46
24	B	49 10.82 N	2 08.82 W	11:15	8.20	84	8.04	1.54	2.33	0.14	10.36	10.49	1.19	11.68	0.47
25	B	49 10.66 N	2 08.92 W	11:19	8.20	82	8.03	1.93	2.33	0.12	10.23	10.35	0.63	10.98	0.39
26	B	49 10.65 N	2 08.93 W	11:23	8.10	88	8.03	2.18	2.22	0.14	10.93	11.07	0.74	11.81	0.38
27	B	49 10.49 N	2 08.98 W	11:28	8.20	91	8.03	2.28	2.35	0.21	11.43	11.64	0.71	12.34	0.42
28	B	49 10.38 N	2 09.00 W	11:30	8.10	87	8.01	2.13	2.39	0.11	11.59	11.71	0.92	12.63	0.41
29	B	49 10.25 N	2 08.97 W	11:33	8.10	82	8.01	2.23	2.37	0.11	11.82	11.92	0.81	12.74	0.40
30	B	49 10.11 N	2 09.04 W	11:38	8.10	90	8.00	2.40	2.74	0.23	13.98	14.21	3.21	17.42	0.44
31	C	49 08.78 N	2 08.11 W	11:52	8.20	86	7.96	2.23	2.31	0.11	11.82	11.92	0.81	12.74	0.43
32	C	49 08.85 N	2 07.87 W	11:57	8.20	83	8.02	2.16	2.47	0.11	12.96	13.06	0.96	14.02	0.44
33	C	49 09.11 N	2 07.81 W	12:00	8.10	85	7.99	2.20	2.29	0.09	11.19	11.28	0.46	11.74	0.43
34	C	49 09.59 N	2 07.61 W	12:05	8.30	90	7.98	2.33	2.31	0.11	10.59	10.71	0.68	11.39	0.44
35	B	49 09.82 N	2 07.78 W	12:11	8.30	78	8.00	2.12	2.26	0.10	11.61	11.71	0.54	12.24	0.40
36	B	49 10.00 N	2 07.95 W	12:14	8.30	87	8.00	1.88	2.41	0.11	12.09	12.21	0.93	13.14	0.42
37	B	49 10.19 N	2 08.13 W	12:18	8.30	85	8.00	2.02	2.33	0.12	11.59	11.71	0.61	12.32	0.45
38	B	49 10.33 N	2 08.33 W	12:20	8.40	84	8.03	1.63	2.25	0.11	11.03	11.14	0.53	11.67	0.46
39	B	49 10.47 N	2 08.21 W	12:24	8.40	88	8.04	2.18	2.37	0.14	11.57	11.71	0.58	12.29	0.47
Mean Zone B					8.18	86	8.00	2.00	2.45	0.14	11.14	11.29	0.92	12.43	0.45
Mean Zone C					8.20	86	7.99	2.23	2.35	0.11	11.61	11.71	0.70	12.43	0.43

Survey 2 - 2nd April 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature ℃	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
1	C	49 06.74 N	2 06.58 W		10.20	124	8.10	1.87	0.52	0.19	10.23	10.42	0.98	11.40	0.05
2	C	49 04.56 N	2 06.79 W		10.40	110	8.30	0.94	0.66	0.18	11.89	12.06	1.48	13.55	0.55
3	C	49 02.43 N	2 07.15 W		10.70	110	8.20	1.34	0.60	0.15	10.70	10.85	0.33	11.18	0.31
4	C	49 02.51 N	2 11.10 W		10.90	124	8.20	0.94	0.43	0.15	10.13	10.28	0.55	10.83	0.31
5	C	49 02.70 N	2 15.49 W		10.80	105	8.17	1.09	0.62	0.21	11.07	11.28	0.76	12.04	0.39
6	C	49 02.93 N	2 19.96 W		11.10	107	8.14	0.49	0.84	0.18	10.74	10.92	1.02	11.94	0.38
7	C	49 03.60 N	2 24.20 W		10.70	96	8.18	0.71	1.25	0.32	12.60	12.92	2.68	15.60	0.47
8	C	49 04.26 N	2 28.29 W		10.30	96	8.16	1.83	1.17	0.21	10.64	10.85	0.66	11.52	0.37
9	C	49 04.91 N	2 32.50 W		10.60	95	8.17	0.89	1.26	0.21	11.00	11.21	2.56	13.76	0.44
10	C	49 05.65 N	2 36.67 W		10.30	94	8.13	0.89	1.45	0.21	10.29	10.49	0.94	11.43	0.40
11	C	49 06.47 N	2 31.34 W		10.10	90	8.13	1.04			Sample container broken in transit to laboratory				
12	C	49 07.20 N	2 26.26 W		10.20	90	8.21	1.54	1.29	0.23	10.55	10.78	1.38	12.16	0.41
13	C	49 07.85 N	2 21.29 W		10.20	84	8.20	0.94	1.41	0.34	12.59	12.92	6.09	19.01	0.55
14	C	49 08.82 N	2 16.56 W		10.20	93	8.25	1.24	0.97	0.19	10.38	10.57	1.11	11.67	0.32
15	C	49 09.61 N	2 12.24 W		9.80	96	8.10	1.19	0.87	0.16	10.19	10.35	0.73	11.08	0.30
16	B	49 09.91 N	2 09.53 W		10.80	102	8.10	1.09	1.32	0.49	13.44	13.92	1.82	15.74	0.72
17	B	49 09.98 N	2 08.97 W		10.60	100	8.61	1.20	0.70	0.24	8.25	8.50	2.15	10.64	0.54
18	B	49 10.35 N	2 08.53 W		10.10	86	8.39	1.29	0.85	0.21	10.79	10.99	1.55	12.54	0.46
19	B	49 10.49 N	2 08.47 W		10.80	99	8.30	1.07	1.31	0.54	13.67	14.21	3.11	17.32	1.15
20	B	49 10.62 N	2 08.41 W		10.40	106	8.70	1.19	2.90	1.19	30.29	31.48	12.56	44.05	2.21
21	B	49 10.72 N	2 08.35 W		10.00	95	8.63	1.20	0.91	0.30	8.98	9.28	2.36	11.64	0.36
22	B	49 11.01 N	2 08.18 W		10.70	107	8.32	0.98	0.83	0.27	9.15	9.42	4.97	14.39	0.68
23	B	49 11.12 N	2 08.09 W		10.50	97	8.33	0.99	0.74	0.23	8.48	8.71	1.61	10.32	0.48
24	B	49 11.23 N	2 08.03 W		10.60	105	8.62	0.80			Sample container broken in transit to laboratory				
25	B	49 11.40 N	2 07.93 W		10.70	104	8.38	1.16	0.69	0.24	8.76	9.00	1.47	10.47	0.50
26	A	49 11.48 N	2 07.83 W		11.70	90	8.36	1.14	19.40	6.66	130.34	137.00	47.12	184.11	20.60
27	B	49 11.44 N	2 08.33 W		11.00	105	8.29	1.24	0.91	0.23	9.41	9.64	1.91	11.54	0.57
28	B	49 11.41 N	2 08.47 W		10.70	86	8.27	1.20	0.68	0.23	9.69	9.92	0.96	10.89	0.50
29	B	49 11.14 N	2 08.59 W		10.40	95	8.70	0.85	0.83	0.40	10.38	10.78	1.55	12.33	0.62
30	B	49 10.97 N	2 08.73 W		10.20	90	8.44	1.09	0.55	0.19	7.37	7.57	0.73	8.30	0.31
31	B	49 10.48 N	2 08.26 W		10.20	95	8.32	1.43	0.53	0.21	8.15	8.35	0.95	9.30	0.38
Mean Zone B					10.52	98	8.41	1.11	0.84	0.27	9.57	9.85	1.70	11.72	0.53
Mean Zone C					10.43	101	8.18	1.13	0.95	0.20	10.90	11.11	1.13	12.50	0.34

Survey 3 - 30th April 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
					℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
6	C	49 05.95 N	2 06.30 W	10:48	12.50	99	8.97	2.60	0.19	0.04	1.04	1.07	1.81	2.88	0.14
7	C	49 05.91 N	2 07.66 W	11:01	12.40	91	8.13	2.81	0.16	0.04	0.86	0.91	1.63	2.53	0.12
8	C	49 05.90 N	2 09.00 W	11:11	12.40	94	8.16	2.78	0.14	0.04	0.72	0.76	1.21	1.98	0.12
9	C	49 05.91 N	2 10.41 W	11:17	12.30	97	8.16	2.52	0.16	0.04	0.68	0.72	1.43	2.16	0.19
10	C	49 05.89 N	2 11.84 W	11:22	12.50	94	8.16	2.77	0.15	0.05	0.54	0.59	1.36	1.96	0.16
11	C	49 05.87 N	2 13.25 W	11:29	12.60	92	8.17	2.52	0.14	0.06	0.56	0.61	1.07	1.68	0.07
12	C	49 05.85 N	2 14.69 W	11:35	12.40	97	8.16	2.63	0.30	0.07	0.90	0.97	1.22	2.19	0.09
13	C	49 06.84 N	2 14.84 W	11:35	12.50	96	8.16	3.21	0.23	0.07	1.20	1.27	1.41	2.68	0.18
14	C	49 06.99 N	2 13.24 W	11:46	12.10	95	8.17	2.70			Sample container broken in transit to laboratory				
15	C	49 07.10 N	2 11.61 W	11:51	12.00	98	8.17	1.82	0.21	0.07	1.09	1.16	1.39	2.56	0.18
16	C	49 07.26 N	2 09.98 W	11:57	11.90	99	8.18	2.83	0.16	0.06	0.83	0.89	1.01	1.90	0.09
17	C	49 07.36 N	2 08.33 W	12:02	11.90	100	8.17	2.16	0.20	0.05	0.54	0.59	0.93	1.51	0.10
18	C	49 07.42 N	2 06.71 W	12:07	12.20	97	8.17	2.07	0.16	0.06	0.64	0.69	1.19	1.88	0.12
19	C	49 08.47 N	2 08.17 W	12:18	12.60	94	8.18	1.96	0.13	0.05	0.58	0.63	1.04	1.67	0.08
20	C	49 09.20 N	2 08.41 W	12:25	13.00	93	8.18	1.83	0.25	0.04	0.41	0.46	0.96	1.42	0.10
21	B	49 09.87 N	2 08.48 W	12:30	12.80	96	8.18	1.67	0.20	0.05	1.35	1.40	1.06	2.46	0.13
22	B	49 10.22 N	2 08.86 W	12:35	13.10	91	8.18	1.59	0.20	0.06	0.72	0.79	1.09	1.88	0.07
23	B	49 10.31 N	2 08.62 W	12:39	13.20	96	8.18	1.28	0.51	0.06	0.39	0.45	0.84	1.29	0.10
24	B	49 10.48 N	2 08.60 W	12:44	13.40	89	8.17	1.16	0.25	0.05	0.36	0.41	1.03	1.43	0.09
25	B	49 10.61 N	2 08.68 W	12:47	13.20	87	8.17	1.41	0.20	0.06	0.56	0.62	1.00	1.62	0.10
26	B	49 10.87 N	2 08.58 W	12:51	12.90	89	8.18	1.38	0.19	0.06	0.54	0.59	0.92	1.51	0.08
27	B	49 11.05 N	2 08.45 W	12:55	13.20	93	8.17	1.57	0.16	0.05	0.45	0.50	0.76	1.26	0.07
28	B	49 11.23 N	2 08.22 W	13:00	13.60	88	8.18	1.65	0.32	0.08	0.79	0.86	0.81	1.68	0.14
29	B	49 11.41 N	2 07.95 W	13:06	13.70	89	8.17	1.56	0.48	0.09	3.33	3.41	1.10	4.51	0.46
30	A	49 11.54 N	2 07.54 W	13:12	14.40	82	7.83	1.16	56.11	14.35	389.72	404.07	59.54	463.61	62.67
31	B	49 11.40 N	2 08.32 W	13:23	13.00	88	8.17	1.57	0.63	0.04	1.14	1.18	0.51	1.68	0.19
32	B	49 11.21 N	2 08.87 W	13:28	13.00	86	8.17	2.16	0.42	0.06	0.59	0.65	0.94	1.59	0.14
33	B	49 10.87 N	2 08.99 W	13:37	13.00	81	8.18	1.61	0.30	0.06	0.61	0.67	0.99	1.66	0.14
34	B	49 10.74 N	2 09.02 W	13:40	13.20	82	8.17	2.01	0.25	0.06	0.39	0.46	0.98	1.43	0.10
35	B	49 10.53 N	2 09.05 W	13:44	13.00	79	8.17	1.96	0.25	0.06	0.55	0.61	1.09	1.71	0.10
36	B	49 10.29 N	2 09.07 W	13:48	12.90	84	8.16	1.87	0.25	0.06	0.38	0.44	0.99	1.42	0.09
37	B	49 10.05 N	2 09.19 W	13:55	13.40	82	8.17	2.11	0.19	0.05	0.40	0.45	0.66	1.11	0.08
38	B	49 09.84 N	2 09.01 W	14:01	13.00	89	8.18	2.59	0.21	0.05	0.51	0.56	0.99	1.56	0.14
39	B	49 09.93 N	2 08.00 W	14:09	13.50	83	8.18	2.10	0.20	0.06	0.37	0.43	0.07	0.50	0.09
40	Harbour	49 10.37 N	2 07.02 W	14:17	14.10	85	8.16	1.97	0.45	0.09	1.03	1.11	1.24	2.35	0.19
Mean Zone B					13.17	87	8.17	1.74	0.29	0.06	0.61	0.67	0.79	1.55	0.11
Mean Zone C					12.35	96	8.22	2.48	0.18	0.05	0.72	0.78	1.24	2.03	0.12

Survey 4 - 3rd June 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature ℃	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
6	A	49 11.42 N	2 08.06 W	10:21	15.00	98	6.98	1.20	3.27	0.49	6.65	7.14	28.56	35.70	0.49
7	B	49 11.17 N	2 08.09 W	10:25	14.60	98	8.18	1.16	1.15	0.09	2.54	2.63	1.04	3.67	0.62
8	B	49 10.97 N	2 08.17 W	10:28	14.20	99	8.19	1.39	1.19	0.08	1.45	1.53	0.59	2.11	0.39
9	B	49 10.78 N	2 08.23 W	10:32	14.10	99	8.28	1.14	1.16	0.09	1.27	1.36	2.45	3.81	0.31
10	B	49 10.63 N	2 08.28 W	10:36	14.20	100	8.21	1.07	1.02	0.09	0.71	0.80	1.26	2.06	0.23
11	B	49 10.45 N	2 08.35 W	10:39	14.10	100	8.21	0.94	0.96	0.06	0.48	0.54	1.25	1.78	0.16
12	B	49 10.24 N	2 08.38 W	10:43	14.10	99	8.21	0.85	0.89	0.04	0.28	0.31	0.84	1.16	0.12
13	B	49 10.07 N	2 08.47 W	10:48	14.10	98	8.21	0.84	0.95	0.05	0.26	0.31	0.84	1.16	0.15
14	B	49 09.84 N	2 08.59 W	10:51	14.00	99	8.21	0.89	0.99	0.22	0.41	0.63	6.00	6.63	0.25
15	B	49 09.81 N	2 09.35 W	10:55	14.10	100	8.22	1.74	0.96	0.05	0.24	0.29	0.82	1.11	0.11
16	B	49 09.92 N	2 09.30 W	10:58	14.00	99	8.21	1.14	0.95	0.05	0.47	0.52	3.64	4.16	0.12
17	B	49 10.08 N	2 09.12 W	11:00	14.10	98	8.22	1.24	Sample container broken in transit to laboratory						
18	B	49 10.30 N	2 09.09 W	11:04	14.10	98	8.22	0.89	0.94	0.06	0.46	0.52	0.95	1.47	0.18
19	B	49 10.54 N	2 09.06 W	11:06	14.20	99	8.22	1.03	0.94	0.06	0.26	0.33	0.67	1.00	0.21
20	B	49 10.77 N	2 09.00 W	11:10	14.60	98	8.22	1.20	0.85	0.07	0.24	0.31	0.29	0.61	0.19
21	B	49 10.99 N	2 08.95 W	11:13	14.80	100	8.24	1.38	Sample container broken in transit to laboratory						
22	B	49 11.13 N	2 08.77 W	11:18	14.60	100	8.23	1.38	0.90	0.06	0.54	0.60	0.59	1.19	0.22
23	B	49 11.23 N	2 08.45 W	11:21	14.80	100	8.22	1.47	6.48	0.40	41.36	41.76	1.18	42.94	8.43
24	B	49 10.95 N	2 08.15 W	11:24	14.30	100	8.23	1.17	0.98	0.06	1.31	1.37	0.33	1.70	0.36
25	B	49 10.47 N	2 08.12 W	11:27	14.20	100	8.24	1.74	0.93	0.07	0.41	0.49	0.64	1.13	0.15
26	B	49 09.99 N	2 07.75 W	11:30	14.30	99	8.24	1.79	1.09	0.09	0.34	0.42	0.23	0.65	0.16
27	C	49 05.93 N	2 06.27 W	11:52	14.60	100	8.24	0.49	Sample container broken in transit to laboratory						
28	C	49 05.93 N	2 08.05 W	12:00	14.60	98	8.24	0.58	1.01	0.05	0.39	0.44	0.52	0.96	0.13
29	C	49 05.95 N	2 09.82 W	12:07	14.60	97	8.24	1.13	0.93	0.05	0.26	0.31	0.62	0.94	0.15
30	C	49 05.97 N	2 11.52 W	12:14	14.40	98	8.24	0.98	0.74	0.06	0.29	0.36	0.27	0.63	0.09
31	C	49 06.06 N	2 13.21 W	12:20	14.20	99	8.24	1.96	0.67	0.26	0.56	0.83	0.79	1.62	0.10
32	C	49 06.07 N	2 14.09 W	12:28	14.10	99	8.24	1.92	Sample container broken in transit to laboratory						
33	C	49 07.17 N	2 15.20 W	12:34	14.20	99	8.23	1.52	0.77	0.09	0.35	0.44	0.86	1.29	0.07
34	C	49 07.40 N	2 13.78 W	12:42	14.20	98	8.24	1.12	0.73	0.04	0.18	0.22	0.79	1.01	0.08
35	C	49 07.54 N	2 12.04 W	12:49	14.20	100	8.23	1.16	0.75	0.06	0.29	0.36	0.76	1.12	0.09
36	C	49 07.74 N	2 10.80 W	12:56	14.20	100	8.24	1.20	1.09	5.25	29.87	35.12	21.42	56.54	0.12
37	C	49 07.96 N	2 09.29 W	13:05	14.30	100	8.24	1.29	1.06	4.04	16.45	20.49	11.35	31.84	0.08
38	C	49 08.14 N	2 07.95 W	13:11	14.30	100	8.24	1.61	0.62	0.06	0.26	0.31	0.36	0.67	0.06
39	C	49 09.40 N	2 07.21 W	13:18	15.20	105	8.26	0.76	0.69	0.04	0.32	0.36	0.44	0.80	0.11
40	C	49 08.87 N	2 08.49 W	13:24	14.80	103	8.23	1.20	0.92	0.04	1.19	1.23	0.48	1.71	0.09
41	C	49 08.91 N	2 09.41 W	13:33	14.40	102	8.22	1.12	0.80	0.07	0.32	0.39	0.39	0.79	0.18
Mean Zone B					14.28	99	8.22	1.23	0.99	0.07	0.53	0.61	0.72	1.43	0.21
Mean Zone C					14.45	100	8.24	1.20	0.79	0.06	0.35	0.42	0.54	1.00	0.10

Survey 5 - 1st July 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature ℃	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
6	C	49 06.00 N	2 06.00 W	11:15	15.70	88	7.93	1.20	1.61	0.06	0.35	0.41	0.86	1.27	0.05
7	C	49 04.94 N	2 06.54 W	11:25	15.70	90	7.94	1.13	1.51	0.06	0.61	0.67	1.68	2.35	0.60
8*	C	49 04.83 N	2 08.17 W	11:34	15.70	86	7.81	1.34	1.44	0.06	0.44	0.51	1.42	1.93	0.21
9	C	49 04.66 N	2 09.75 W	11:52	15.30	87	7.84	1.42	1.39	0.06	0.30	0.36	0.36	0.72	0.17
10	C	49 04.59 N	2 10.66 W	12:00	15.20	87	7.76	0.96	1.41	0.05	0.32	0.37	0.35	0.72	0.12
11	C	49 04.29 N	2 13.20 W	12:09	17.00	88	7.87	0.71	1.46	0.09	0.68	0.77	0.41	1.18	0.28
12	C	49 04.13 N	2 14.86 W	12:18	17.60	85	7.79	1.29	1.45	0.10	0.71	0.81	0.51	1.32	0.16
13	C	49 05.22 N	2 14.54 W	12:27	17.40	84	7.81	0.93	1.44	0.09	0.70	0.79	0.45	1.24	0.14
14	C	49 05.65 N	2 12.80 W	12:36	16.30	88	7.99	0.95	1.40	0.11	2.16	2.28	0.65	2.93	0.15
15	C	49 05.96 N	2 11.04 W	12:49	16.10	86	7.76	0.85	1.43	0.09	0.66	0.76	0.69	1.44	0.14
16	C	49 06.13 N	2 09.45 W	13:02	16.40	86	7.92	0.88	1.41	0.09	0.61	0.70	0.59	1.29	0.13
17*	C	49 07.19 N	2 07.09 W	13:15	16.70	88	7.93	0.80	1.46	0.09	0.67	0.76	0.67	1.43	0.14
18*	C	49 08.00 N	2 06.62 W	13:33	17.20	86	7.96	0.98	1.40	0.09	0.71	0.81	0.50	1.31	0.13
19	C	49 08.00 N	2 09.12 W	13:58	16.20	87	7.92	1.20	1.42	0.08	0.50	0.58	0.46	1.04	0.12
20*	C	49 08.50 N	2 08.46 W	14:07	18.30	84	7.93	0.93	1.42	0.06	0.55	0.61	0.38	0.99	0.13
21*	B	49 09.84 N	2 08.59 W	14:28	16.70	90	7.95	1.23	1.46	0.07	0.49	0.56	0.45	1.01	0.12
22	B	49 09.90 N	2 08.55 W	14:38	16.10	85	8.00	1.29	1.50	0.07	0.51	0.58	0.57	1.15	0.13
23*	B	49 10.18 N	2 08.50 W	14:41	16.00	83	7.93	1.18	1.53	0.07	0.46	0.53	0.65	1.18	0.16
24	B	49 10.34 N	2 08.36 W	14:49	16.50	90	8.01	1.17	1.49	0.06	0.50	0.56	0.61	1.18	0.14
25*	B	49 10.48 N	2 08.15 W	14:52	16.80	86	7.89	1.43	1.47	0.09	1.83	1.93	0.64	2.57	0.14
26	B	49 10.66 N	2 08.07 W	14:58	15.50	86	7.99	1.29	1.47	0.07	0.46	0.53	0.54	1.06	0.13
27*	B	49 10.87 N	2 08.15 W	15:02	16.00	89	7.99	1.25	1.48	0.06	0.44	0.50	0.49	0.99	0.13
28	B	49 11.10 N	2 08.05 W	15:11	16.70	90	7.89	1.19	1.52	0.07	0.39	0.46	0.53	0.99	0.12
29*	B	49 11.25 N	2 07.97 W	15:14	16.00	91	7.88	1.25	1.57	0.06	0.39	0.46	0.77	1.23	0.13
30*	B	49 11.48 N	2 07.94 W	15:25	16.70	95	7.90	1.74	1.40	0.04	0.45	0.49	0.54	1.03	0.15
31	A	49 11.51 N	2 07.80 W	15:31	16.90	94	7.93	1.20	10.43	1.56	105.16	106.73	16.56	123.29	19.60
32	B	49 11.19 N	2 08.41 W	15:36	15.80	102	7.97	1.21	1.57	0.08	0.85	0.93	0.84	1.77	0.17
33	B	49 11.08 N	2 08.65 W	15:41	15.60	93	7.98	1.39	1.48	0.08	0.46	0.54	0.84	1.37	0.14
34	B	49 10.82 N	2 08.91 W	15:44	15.30	94	7.95	1.19	1.51	0.07	0.41	0.49	0.07	0.56	0.13
35	B	49 10.51 N	2 08.95 W	15:49	15.40	93	7.85	0.79	1.55	0.07	0.40	0.47	0.19	0.66	0.13
36	B	49 10.23 N	2 08.96 W	15:52	15.20	71	7.95	1.19	1.48	0.07	0.37	0.44	0.09	0.53	0.13
37	B	49 10.07 N	2 08.73 W	15:56	15.20	74	7.99	0.85	1.52	0.08	0.34	0.42	0.07	0.49	0.16
Mean Zone B					15.97	88	7.95	1.23	1.50	0.07	0.49	0.56	0.38	1.01	0.14
Mean Zone C					16.45	87	7.88	1.04	1.44	0.08	0.59	0.67	0.59	1.31	0.15

* Depth profile sites

Survey 6 - 29th July 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature ℃	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
6	C	49 07.00 N	2 06.50 W	10:15	18.20	93	7.88	1.65	1.46	0.04	1.46	1.50	1.73	3.23	0.02
7	C	49 06.00 N	2 06.50 W	10:27	18.20	97	7.81	1.29	1.42	0.04	0.34	0.38	1.12	1.50	0.14
8*	C	49 06.00 N	2 08.00 W	10:35	18.20	92	7.79	1.38	1.51	0.04	1.30	1.33	0.97	2.31	0.04
9	C	49 06.00 N	2 09.50 W	10:50	18.10	90	7.79	1.52	1.53	0.04	1.38	1.43	0.76	2.19	0.11
10	C	49 06.00 N	2 10.50 W	10:56	–	90	–	1.16	1.49	0.06	0.71	0.76	0.86	1.63	0.08
11	C	49 06.00 N	2 12.50 W	11:08	18.40	86	–	1.25	1.50	0.05	0.95	1.00	0.85	1.85	0.09
12	C	49 06.00 N	2 14.00 W	11:20	18.20	91	–	1.47	1.48	0.04	1.00	1.04	0.77	1.81	0.11
13	C	49 07.00 N	2 14.00 W	11:28	18.20	89	–	1.43	1.46	0.04	1.16	1.20	0.54	1.74	0.03
14	C	49 07.00 N	2 12.50 W	11:37	18.20	95	–	1.61	1.50	0.04	1.24	1.28	0.95	2.23	0.10
15	C	49 07.00 N	2 11.00 W	11:50	18.40	100	–	0.89	1.56	0.04	1.20	1.24	0.76	2.00	0.06
16	C	49 07.00 N	2 09.50 W	11:55	18.40	103	–	1.12	1.50	0.05	1.09	1.14	0.54	1.67	0.14
17*	C	49 07.00 N	2 08.00 W	12:05	18.20	102	–	0.89	1.56	0.04	1.10	1.14	0.36	1.50	0.04
18*	C	49 08.00 N	2 08.00 W	12:23	17.90	91	–	1.07	1.50	0.05	4.33	4.38	0.44	4.82	0.11
19	C	49 08.00 N	2 09.50 W	12:40	18.00	89	–	1.03	1.50	0.04	0.96	1.00	0.81	1.81	0.05
20*	C	49 06.30 N	2 06.30 W	12:50	18.30	93	–	1.03	1.59	0.04	1.41	1.44	0.74	2.18	0.07
21*	B	49 10.00 N	2 08.12 W	13:08	18.30	90	–	1.07	1.62	0.04	1.06	1.10	0.52	1.62	0.04
22	B	49 10.03 N	2 08.53 W	13:17	18.50	91	–	1.12	1.64	0.04	1.06	1.10	1.11	2.21	0.03
23*	B	49 10.18 N	2 08.52 W	13:20	19.20	95	–	0.98	1.61	0.04	0.83	0.86	0.41	1.27	0.04
24	B	49 10.34 N	2 08.41 W	13:27	19.40	99	–	0.85	1.64	0.04	1.02	1.06	1.01	2.06	0.13
25*	B	49 10.53 N	2 08.31 W	13:30	19.00	93	–	0.71	1.61	0.04	0.94	0.97	0.68	1.65	0.05
26	B	49 10.85 N	2 08.18 W	13:40	18.50	92	–	0.98	1.66	0.04	0.96	0.99	1.02	2.01	0.03
27*	B	49 11.07 N	2 07.90 W	13:45	19.70	102	–	0.98	1.76	0.04	1.24	1.27	0.56	1.83	0.05
28	B	49 11.34 N	2 07.83 W	13:53	18.80	91	–	1.12	1.73	0.04	0.88	0.91	0.73	1.64	0.07
29*	A	49 11.54 N	2 07.54 W	13:55	19.80	96	–	1.12	17.19	2.71	121.87	124.58	10.06	134.63	21.76
30	A	49 11.47 N	2 07.97 W	14:05	19.80	95	–	1.34	20.40	5.75	182.57	188.33	17.49	205.82	31.97
31	B	49 11.40 N	2 08.40 W	14:10	19.30	102	–	0.98	1.93	0.39	0.24	0.63	0.91	1.54	0.11
32	B	49 11.22 N	2 08.64 W	14:12	19.30	100	–	0.76	1.93	0.04	0.61	0.64	0.56	1.21	0.15
33	B	49 10.91 N	2 08.91 W	14:16	19.10	101	–	0.80	1.91	0.04	0.86	0.89	0.70	1.59	0.07
34	B	49 10.69 N	2 09.10 W	14:20	18.80	100	–	1.38	1.81	0.04	1.15	1.19	1.09	2.27	0.07
35	B	49 10.50 N	2 09.18 W	14:26	19.00	100	–	0.85	1.94	0.04	0.91	0.94	0.69	1.63	0.14
36	B	49 10.34 N	2 09.14 W	14:28	18.60	98	–	1.20	2.00	0.04	1.50	1.53	0.68	2.21	0.06
37	B	49 10.22 N	2 09.10 W	14:30	20.20	102	–	0.76	1.73	0.04	0.77	0.81	0.89	1.70	0.13
38	B	49 10.07 N	2 09.06 W	14:32	19.70	100	–	0.89	1.80	0.04	1.09	1.12	0.66	1.78	0.14
39	B	49 10.03 N	2 08.90 W	14:35	19.00	98	–	0.85	1.76	0.04	1.14	1.17	0.51	1.68	0.12
40	B	49 10.16 N	2 08.05 W	14:39	18.30	94	–	1.16	1.68	0.05	1.63	1.68	0.64	2.33	0.13
Mean Zone B					19.04	97	–	0.97	1.76	0.06	0.93	1.02	0.71	1.76	0.08
Mean Zone C					18.21	93	7.82	1.25	1.50	0.04	1.14	1.19	0.76	2.06	0.07

* Depth profile sites

Survey 7 - 9th September 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature °C	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
6	C	49 07.00 N	2 06.50 W	12:07	18.60	83	7.89	1.70	2.17	0.13	0.66	0.79	0.98	1.76	0.30
7	C	49 06.00 N	2 06.50 W	12:16	18.60	82	7.84	1.47	2.08	0.13	0.64	0.76	1.24	2.00	0.26
8*	C	49 06.00 N	2 08.00 W	12:23	18.60	76	7.85	1.47	2.06	0.12	0.47	0.59	0.77	1.36	0.31
9	C	49 06.00 N	2 09.50 W	12:42	18.70	78	7.78	1.70	2.04	0.13	0.59	0.71	1.01	1.72	0.25
10	C	49 06.00 N	2 10.50 W	12:45	19.00	77	7.85	1.20	2.03	0.14	0.83	0.97	1.61	2.58	0.24
11	C	49 06.00 N	2 12.50 W	12:57	18.70	79	7.86	1.38	2.01	0.13	0.59	0.71	0.87	1.58	0.22
12	C	49 06.00 N	2 14.00 W	13:00	18.50	80	7.86	1.87	2.01	0.13	0.58	0.71	1.04	1.74	0.22
13	C	49 07.00 N	2 14.00 W	13:07	18.60	77	7.86	1.65	2.03	0.13	0.71	0.84	1.07	1.91	0.22
14	C	49 07.00 N	2 12.50 W	13:15	18.50	76	7.84	1.47	2.06	0.13	0.67	0.80	0.79	1.59	0.24
15	C	49 07.00 N	2 11.00 W	13:23	18.60	73	7.84	1.79	2.06	0.12	0.86	0.98	0.92	1.90	0.42
16	C	49 07.00 N	2 09.50 W	13:30	18.80	73	7.84	2.08	2.02	0.12	0.71	0.84	0.74	1.58	0.21
17*	C	49 07.00 N	2 08.00 W	13:38	18.70	71	7.84	1.43	2.08	0.12	0.59	0.71	0.77	1.48	0.55
18*	C	49 08.00 N	2 08.00 W	13:54	18.70	69	7.86	2.01	2.11	0.11	0.42	0.54	1.24	1.77	0.45
19	C	49 09.00 N	2 09.00 W	14:20	18.80	68	7.81	1.52	2.09	0.12	0.29	0.41	0.85	1.26	0.42
20*	C	49 09.00 N	2 08.30 W	14:26	18.50	68	7.86	1.79	2.10	0.13	0.54	0.66	0.87	1.53	0.26
21*	B	49 09.83 N	2 08.54 W	9:44	18.30	83	7.72	2.10	2.06	0.16	2.01	2.16	2.29	4.45	0.28
22	B	49 10.00 N	2 08.48 W	10:00	18.30	81	6.80	1.79	2.26	0.14	0.64	0.78	1.27	2.05	0.30
23*	B	49 10.22 N	2 08.56 W	10:15	18.20	84	7.67	2.01	2.23	0.13	0.53	0.66	0.95	1.61	0.30
24	B	49 10.38 N	2 08.48 W	10:30	18.70	79	7.79	2.28	2.24	0.12	0.44	0.56	1.07	1.63	0.30
25*	B	49 10.55 N	2 08.22 W	10:35	18.40	81	7.82	1.87	2.10	0.11	0.47	0.59	0.94	1.52	0.22
26	B	49 10.91 N	2 08.16 W	10:45	18.80	82	7.83	2.72	2.27	0.14	0.95	1.09	1.10	2.19	0.34
27*	B	49 11.21 N	2 07.98 W	10:50	18.50	82	7.62	2.45	2.22	0.12	0.24	0.36	0.71	1.07	0.29
28*	A	49 11.33 N	2 07.89 W	11:00	18.70	85	7.84	2.45	4.24	0.19	30.44	30.63	1.33	31.95	4.49
29	A	49 11.52 N	2 07.81 W	11:10	18.60	83	7.65	2.19	13.78	0.39	164.09	164.48	1.46	165.95	22.05
30	B	49 11.49 N	2 08.07 W	11:15	18.40	82	7.81	1.79	2.11	0.14	0.50	0.64	0.89	1.52	0.27
31	B	49 11.45 N	2 08.42 W	11:18	18.50	82	7.82	2.01	2.11	0.14	0.47	0.61	0.99	1.59	0.22
32	B	49 11.32 N	2 08.67 W	11:20	18.30	82	7.78	1.92	2.14	0.13	0.44	0.56	0.93	1.49	0.22
33	B	49 11.11 N	2 08.82 W	11:23	18.30	83	7.82	2.01	2.08	0.11	0.29	0.40	0.68	1.08	0.19
34	B	49 10.89 N	2 09.00 W	11:25	18.30	81	7.39	1.70	2.06	0.13	0.38	0.51	0.97	1.48	0.21
35	B	49 10.69 N	2 09.14 W	11:27	18.30	81	7.82	1.74	2.04	0.13	0.53	0.66	1.26	1.91	0.22
36	B	49 10.45 N	2 09.20 W	11:30	18.40	81	7.84	1.89	2.01	0.12	0.42	0.54	1.16	1.71	0.23
37	B	49 10.29 N	2 09.20 W	11:32	18.30	82	7.84	1.96	2.20	0.14	0.35	0.49	1.32	1.81	0.24
38	B	49 10.12 N	2 09.20 W	11:35	18.30	83	7.84	2.10	2.15	0.14	0.39	0.53	1.15	1.68	0.26
39	B	49 09.92 N	2 09.06 W	11:37	18.40	83	7.85	2.68	2.09	0.11	0.42	0.54	1.11	1.64	0.26
40	B	49 09.73 N	2 08.88 W	11:40	18.40	83	7.85	2.10	1.95	0.14	0.42	0.56	1.06	1.61	0.22
Mean Zone B					18.39	82	7.72	2.06	2.13	0.13	0.48	0.62	1.06	1.69	0.25
Mean Zone C					18.66	75	7.85	1.64	2.06	0.13	0.59	0.72	0.96	1.69	0.29

* Depth profile sites

Survey 8 - 30th September 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
					℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
6	C	49 07.00 N	2 06.50 W	13:05	18.20	86	7.90	1.36	2.81	0.23	2.01	2.24	0.36	2.60	0.35
7	C	49 06.00 N	2 06.50 W	13:35	18.40	87	7.88	1.34	2.71	0.19	1.63	1.82	0.69	2.51	0.39
8	C	49 06.00 N	2 08.00 W	13:40	18.55	88	7.94	1.74	2.73	0.21	1.98	2.19	0.62	2.81	0.24
9	C	49 06.00 N	2 09.50 W	13:45	18.50	88	7.98	–	2.66	0.20	1.78	1.98	0.26	2.24	0.30
10	C	49 06.00 N	2 11.00 W	13:51	18.85	87	7.95	1.12	2.75	0.24	1.91	2.15	0.59	2.73	0.29
11	C	49 06.00 N	2 12.50 W	13:58	18.65	87	8.16	0.40	2.88	0.24	1.26	1.50	0.19	1.69	0.27
12	C	49 06.00 N	2 14.00 W	14:03	18.35	87	7.98	0.80	2.88	0.24	2.11	2.35	0.33	2.68	0.28
13	C	49 07.00 N	2 14.00 W	14:10	18.65	86	7.97	0.89	2.94	0.24	1.80	2.03	0.83	2.86	0.30
14	C	49 07.00 N	2 12.50 W	14:15	18.70	86	8.00	0.71	2.93	0.24	1.77	2.01	0.48	2.48	0.29
15	C	49 07.00 N	2 11.00 W	14:20	18.75	84	8.00	0.85	2.93	0.24	1.93	2.17	0.51	2.68	0.30
16	C	49 07.00 N	2 09.50 W	14:25	18.70	87	8.00	0.89	2.94	0.25	1.98	2.23	0.14	2.38	0.28
17	C	49 07.00 N	2 08.00 W	14:30	18.60	84	8.02	1.29	2.87	0.26	1.92	2.18	0.52	2.70	0.33
18	C	49 08.00 N	2 08.00 W	14:35	18.70	86	8.00	0.80	2.96	0.24	1.79	2.03	0.21	2.23	0.29
19	C	49 08.00 N	2 09.50 W	14:42	18.35	82	8.01	1.07	2.89	0.20	1.83	2.03	0.09	2.12	0.28
20	C	49 09.00 N	2 08.50 W	14:47	18.45	85	8.04	1.65	3.09	0.24	1.86	2.09	0.13	2.22	0.31
21	B	49 09.80 N	2 08.50 W	14:53	18.45	84	8.03	1.38	3.19	0.22	1.82	2.04	0.11	2.15	0.29
22	B	49 10.00 N	2 08.20 W	14:58	18.35	86	8.05	1.38	3.18	0.24	1.79	2.03	0.14	2.16	0.25
23	B	49 10.20 N	2 08.50 W	15:00	18.20	87	8.04	1.61	3.13	0.23	1.73	1.96	0.11	2.06	0.28
24	B	49 10.40 N	2 08.50 W	15:30	18.65	84	8.05	1.38	3.21	0.22	1.97	2.19	0.11	2.30	0.31
25	B	49 10.60 N	2 08.40 W	15:05	18.55	87	8.05	1.52	3.21	0.22	1.71	1.93	0.12	2.05	0.30
26	B	49 11.00 N	2 08.00 W	15:08	18.90	88	8.07	1.20	3.00	0.21	1.76	1.98	0.11	2.08	0.35
27	B	49 11.30 N	2 08.00 W	15:11	19.05	88	8.07	2.14	2.98	0.21	6.56	6.77	0.15	6.92	1.44
28	B	49 11.30 N	2 08.30 W	15:15	18.70	93	8.10	3.08	2.88	0.20	8.58	8.78	0.11	8.89	1.80
29	B	49 11.10 N	2 08.50 W	15:18	18.55	89	8.10	1.29	2.97	0.19	1.71	1.90	0.10	2.00	0.40
30	B	49 10.80 N	2 08.70 W	15:20	18.15	86	8.11	2.23	3.78	0.21	1.78	1.99	0.09	2.08	0.33
31	B	49 10.50 N	2 08.90 W	15:23	18.05	85	8.10	1.38	3.25	0.24	1.67	1.91	0.12	2.03	0.31
32	B	49 10.10 N	2 09.00 W	15:25	17.95	84	8.12	1.65	3.18	0.22	1.59	1.81	0.09	1.91	0.31
33	B	49 09.80 N	2 09.20 W	15:30	17.85	83	8.13	1.43	3.08	0.25	1.73	1.98	0.12	2.10	0.32
34	B	49 09.60 N	2 09.50 W	15:36	17.85	85	8.12	1.52	3.01	0.23	1.71	1.94	0.10	2.04	0.32
35	B	49 09.90 N	2 07.90 W	15:38	18.35	87	8.10	1.61	3.13	0.23	1.74	1.97	0.09	2.06	0.33
36	B	49 10.10 N	2 07.80 W	15:40	18.05	85	8.11	1.65	3.20	0.23	1.77	2.00	0.07	2.07	0.32
37	B	49 10.40 N	2 08.00 W	15:43	17.95	87	8.10	2.23	3.15	0.23	1.71	1.93	0.07	2.01	0.32
38	B	49 10.60 N	2 08.20 W	15:46	17.95	87	8.10	2.77	3.19	0.23	1.68	1.91	0.07	1.98	0.31
Mean Zone B					18.31	86	8.09	1.75	3.15	0.22	2.05	2.29	0.10	2.40	0.38
Mean Zone C					18.56	86	7.99	1.07	2.86	0.23	1.83	2.06	0.33	2.44	0.30

Survey 9 - 29th October 1997

Site No.	Zone	Latitude	Longitude	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
					℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
6	C	49 07.00 N	2 06.50 W	9:42	14.30	82	7.69	1.34	3.92	0.74	3.18	3.92	1.11	5.03	0.51
7	C	49 06.00 N	2 06.50 W	9:50	14.10	87	7.79	1.29	4.20	0.63	4.22	4.85	0.54	5.38	0.44
8	C	49 06.00 N	2 08.00 W	9:58	14.60	87	7.78	2.50	3.81	0.65	3.77	4.42	0.64	5.06	0.44
9	C	49 06.00 N	2 09.50 W	10:05	15.00	84	7.76	1.29	3.81	0.69	4.24	4.93	0.81	5.75	0.45
10	C	49 06.00 N	2 11.00 W	10:11	14.80	85	7.78	1.56	3.88	0.71	3.82	4.53	0.85	5.38	0.45
11	C	49 06.00 N	2 12.50 W	10:18	14.70	83	7.79	1.16	3.88	0.70	2.99	3.69	0.84	4.53	0.44
12	C	49 06.00 N	2 14.00 W	10:25	15.00	83	7.81	1.25	3.84	0.74	3.80	4.54	0.71	5.25	0.44
13	C	49 07.00 N	2 14.00 W	10:34	14.60	82	7.80	1.07	3.84	0.71	3.65	4.35	0.69	5.05	0.41
14	C	49 07.00 N	2 12.50 W	10:45	14.00	85	7.80	1.16	4.02	0.72	3.96	4.68	0.66	5.34	0.45
15	C	49 07.00 N	2 11.00 W	10:53	14.40	84	7.80	2.81	3.84	0.74	2.82	3.56	0.72	4.28	0.44
16	C	49 07.00 N	2 09.50 W	11:02	14.20	85	7.80	1.25	3.92	0.73	4.06	4.79	0.74	5.53	0.45
17	C	49 07.00 N	2 08.00 W	11:11	14.60	86	7.81	1.47	3.81	0.69	4.13	4.82	0.69	5.51	0.45
18	C	49 08.00 N	2 08.00 W	11:20	14.40	85	7.82	1.29	3.92	0.75	4.05	4.80	0.66	5.46	0.46
19	C	49 08.00 N	2 09.50 W	11:34	14.00	87	7.82	1.38	3.95	0.67	3.58	4.25	0.52	4.77	0.46
20	C	49 09.00 N	2 08.50 W	11:40	14.10	86	7.82	1.52	4.38	0.69	2.65	3.33	0.59	3.93	0.44
21	B	49 10.00 N	2 08.58 W	11:48	13.60	87	7.79	1.52	4.13	0.69	2.44	3.13	0.56	3.68	0.46
22	B	49 10.24 N	2 08.56 W	11:54	13.60	86	7.83	1.47	4.09	0.64	3.99	4.63	0.58	5.21	0.47
23	B	49 10.36 N	2 08.49 W	11:56	13.50	85	7.81	1.61	4.38	0.61	2.51	3.13	0.66	3.78	0.47
24	B	49 10.49 N	2 08.34 W	11:59	13.70	86	7.82	1.56	4.24	0.64	2.43	3.07	0.83	3.90	0.47
25	B	49 10.64 N	2 08.23 W	12:00	13.70	86	7.85	2.01	4.24	0.65	3.46	4.11	0.56	4.67	0.46
26	B	49 10.83 N	2 08.17 W	12:04	13.50	86	7.86	1.61	4.17	0.66	3.99	4.65	0.70	5.35	0.56
27	B	49 10.97 N	2 08.17 W	12:07	13.10	87	7.87	1.61	4.38	0.66	4.45	5.11	0.64	5.75	0.71
28	B	49 11.04 N	2 08.40 W	12:10	13.40	87	7.88	1.83	4.52	0.64	4.44	5.08	0.66	5.74	0.54
29	B	49 10.95 N	2 08.51 W	12:12	13.30	86	7.88	1.83	4.20	0.64	3.96	4.60	0.61	5.21	0.49
30	B	49 10.75 N	2 08.69 W	12:15	13.50	87	7.88	1.92	4.66	0.68	3.99	4.67	0.68	5.35	0.48
31	B	49 10.60 N	2 08.82 W	12:17	13.50	88	7.88	3.35	3.99	0.66	3.97	4.63	0.87	5.50	0.50
32	B	49 10.38 N	2 08.85 W	12:20	13.50	87	7.88	1.79	4.66	0.69	4.02	4.71	0.69	5.40	0.46
33	B	49 10.15 N	2 08.93 W	12:23	13.60	86	7.88	1.65	4.27	0.69	3.95	4.63	0.73	5.36	0.50
34	B	49 10.00 N	2 09.00 W	12:26	13.60	86	7.87	1.47	4.20	0.67	3.01	3.68	0.71	4.39	0.51
35	C	49 09.79 N	2 08.95 W	12:30	13.60	85	7.87	1.65	4.20	0.68	4.11	4.79	1.19	5.98	0.46
36	C	49 09.68 N	2 09.27 W	12:37	13.60	86	7.88	1.38	4.20	0.68	4.20	4.88	0.91	5.79	0.46
37	C	49 09.58 N	2 09.87 W	12:42	13.50	88	7.89	1.52	4.49	0.67	3.94	4.61	0.89	5.50	0.46
38	B	49 09.89 N	2 09.49 W	12:49	13.80	86	7.89	1.52	4.31	0.68	4.21	4.89	0.89	5.78	0.47
39	B	49 09.89 N	2 08.23 W	12:56	13.60	87	7.89	1.34	4.49	0.68	4.16	4.84	0.60	5.44	0.47
40	B	49 09.97 N	2 07.59 W	13:00	13.60	87	7.89	1.56	4.31	0.66	3.96	4.61	0.66	5.28	0.39
Mean Zone B					13.54	86	7.86	1.74	4.30	0.66	3.64	4.31	0.68	5.00	0.49
Mean Zone C					14.45	85	7.79	1.49	3.99	0.70	3.70	4.40	0.75	5.17	0.45

Appendix III

Results from the beach surveys (including beach surveys carried out in conjunction with sea surveys).

Survey 1 - 27th February 1997

Site	Grid Reference	Time	Temperature °C	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	14:00	–	81	–	4.57	5.21	0.50	27.06	27.56	3.83	31.38	1.32
B2 Sea at PSD Outfall	631 487	14:40	11.60	–	7.93	3.72	8.26	0.64	48.05	48.69	2.92	51.61	3.44
B3 Sea at Beach Rock	627 489	15:22	10.40	89	8.32	4.76	5.98	0.56	30.07	30.63	7.30	37.92	0.56
Zone A - Mixing Zone													
PSD outfall	634 494	13:23	12.30	86	7.38	2.49	164.54	25.49	1091.84	1117.32	104.94	1222.27	105.49
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	16:20	9.70	78	7.73	2.77	208.97	3.28	1039.01	1042.29	4.28	1046.58	2.65
La Haule A Outfall	608 494	16:05	9.50	90	8.00	–	235.32	1.71	997.75	999.46	9.28	1008.74	6.78
La Haule B Outfall	613 496	16:55	9.30	77	7.80	–	254.18	2.14	1668.38	1670.53	3.57	1674.10	150.79
St. Peter's Valley	617 497	17:05	9.40	76	7.53	4.61	222.14	0.93	1205.56	1206.49	3.57	1210.06	2.65
Waterworks Valley	629 497	17:10	9.30	70	7.35	15.17	140.26	1.07	1091.20	1092.27	3.57	1095.84	3.16
Weighbridge Outfall	648 484	17:37	9.00	65	7.85	–	110.36	1.00	9.71	10.71	6.43	17.13	0.29
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		12:00	–	–	–	0.74	211.11	32.84	923.79	956.63	321.26	1277.88	339.05
Effluent from PSD outfall	634 494	14:50	14.20	85	7.17	1.79	264.15	53.47	1552.80	1606.28	307.69	1913.97	0.13

Survey 2 - 2nd April 1997

Site	Grid Reference	Time	Temperature °C	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	16:32	11.90	92	8.34	5.67	2.53	0.45	21.18	21.63	1.16	22.79	1.65
B2 Sea at PSD Outfall	631 487	–	–	–	–	–	–	–	–	–	–	–	–
B3 Sea at Beach Rock	627 489	16:57	12.70	94	8.17	3.44	5.55	0.44	69.52	69.96	0.68	70.64	0.53
Zone A - Mixing Zone													
PSD outfall	634 494	16:44	16.20	79	7.45	1.65			Sample container broken in transit to laboratory				
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	17:53	11.40	98	8.04	12.81	205.77	1.43	1012.31	1013.74	3.57	1017.31	1.94
La Haule A Outfall	608 494	17:36	11.00	105	8.63	1.98	224.28	1.71	1047.72	1049.43	2.86	1052.29	1.65
La Haule B Outfall	613 496	17:18	10.80	98	8.01	4.55	260.66	1.86	1524.60	1526.46	0.54	1527.00	2.78
St. Peter's Valley	617 497	17:07	12.20	103	8.71	10.80	217.44	1.05	1220.93	1221.98	1.61	1223.60	1.81
Waterworks Valley	629 497	16:58	13.90	85	8.73	16.56	77.25	2.50	882.74	885.24	4.28	889.52	0.19
Bellozanne Stream	639 507	12:10	–	–	–	4.06	267.00	2.21	1204.28	1206.49	7.14	1213.63	2.29
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		12:00	–	–	–	0.62	282.66	44.98	1354.27	1399.24	149.92	1549.16	316.44
Effluent from PSD outfall	634 494						Not sampled – outfall submerged						

Survey 3 - 30th April 1997

Site		Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
				°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples														
B1	Sea at Victoria Pool	636 483	15:30	14.90	83	8.23	3.15	0.45	0.12	1.52	1.64	1.88	3.53	0.55
B2	Sea at PSD Outfall	631 487	15:45	15.20	81	8.06	3.01	1.62	0.26	15.80	16.06	1.29	17.35	2.20
B3	Sea at Beach Rock	627 489	16:00	15.00	84	8.05	3.48	1.46	0.25	17.74	17.99	2.03	20.02	1.85
B4	Sea at Second Tower	619 489	16:20	13.50	89	8.09	3.77	0.48	0.11	1.78	1.89	1.09	2.98	0.25
B5	Sea at St. Aubin	606 488	16:55	14.70	90	7.96	6.56	0.96	0.11	1.51	1.63	0.66	2.29	0.35
Zone A - Mixing Zone														
PSD outfall		634 494						Not sampled – outfall submerged						
Inputs - Catchment outfalls														
St. Aubin's Outfall		606 488	17:05	15.10	63	7.80	4.79	102.53	1.71	1069.14	1070.85	8.57	1079.42	2.03
La Haule A Outfall		608 494	16:45	14.70	81	7.91	3.89	38.80	6.00	1136.24	1142.24	4.28	1146.52	2.65
La Haule B Outfall		613 496	16:30	15.10	82	7.57	4.52	73.69	3.57	1581.29	1584.86	3.57	1588.43	4.52
St. Peter's Valley		617 497	16:10	15.30	79	7.81	5.89	42.36	2.00	1247.33	1249.33	2.86	1252.18	2.97
Waterworks Valley		629 497	16:15	13.80	84	7.80	17.45	16.02	3.57	1288.59	1292.16	9.28	1301.44	1.23
Bellozanne Stream		639 507	15:12	–	–	–	5.35	61.23	4.57	1751.63	1756.19	4.28	1760.48	1.61
Input of Interest - Bellozanne STW Effluent														
STW - final effluent from UV plant							0.69	119.97	117.08	1860.42	1977.50	616.10	2593.60	16.15
Effluent from PSD outfall		634 494	14:56					Not sampled – outfall submerged						

Survey 3B - 15th May 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	9:15	15.40	159	8.16	1.74	1.47	0.06	0.50	0.56	0.34	0.90	0.19
B2 Sea at PSD Outfall	631 487	9:23	13.50	105	7.97	4.17	0.63	0.05	0.20	0.25	0.07	0.32	0.66
B3 Sea at Beach Rock	627 489	9:42	14.90	104	7.87	1.65	3.86	0.49	23.42	23.92	0.83	24.74	5.83
B4 Sea at Second Tower	619 489	9:55	15.60	109	7.96	3.39	0.60	0.05	0.44	0.49	0.37	0.86	0.29
B5 Sea at St. Aubin	606 488	10:14	15.50	101	7.92	5.83	0.74	0.14	2.49	2.63	0.21	2.83	0.33
Zone A - Mixing Zone													
PSD outfall	634 494	9:29	17.80	82	6.81	7.94	229.98	20.63	1481.41	1502.05	73.75	1575.79	299.01
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	10:28	15.00	97	7.70	5.78	212.53	7.78	779.65	787.43	1.43	788.86	0.39
La Haule A Outfall	608 494	10:08	14.80	97	7.78	2.49	209.33	8.85	773.58	782.43	5.71	788.15	3.29
La Haule B Outfall	613 496	10:01	13.80	94	7.44	1.22	260.24	2.43	1211.20	1213.63	2.14	1215.77	3.52
St. Peter's Valley	617 497	9:47	13.90	90	7.49	6.01	201.85	2.21	897.30	899.51	2.14	901.66	2.62
Waterworks Valley	629 497	9:38	14.20	91	7.37	11.40	56.25	4.35	687.41	691.77	12.14	703.91	0.52
Bellozanne Stream	639 507	11:23	15.40	89	7.20	2.96	258.81	3.57	1210.06	1213.63	0.71	1214.34	0.55
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		11:12	19.50	51	6.62	2.40	306.52	28.56	1270.74	1299.30	149.92	1449.22	129.16
Effluent from PSD outfall	634 494						Not sampled – outfall submerged						

Survey 4 - 3rd June 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	15:57	21.60	151	8.24	1.56	2.21	0.04	0.17	0.21	0.21	0.42	0.29
B2 Sea at PSD Outfall	631 487	15:49	22.20	111	8.14	1.87	97.62	15.49	629.16	644.65	43.83	688.49	116.92
B3 Sea at Beach Rock	627 489	15:42	20.30	120	8.28	2.19	7.19	0.54	44.79	45.33	0.64	45.98	9.23
B4 Sea at Second Tower	619 489	15:36	21.30	123	8.24	2.99	1.90	0.34	7.80	8.14	0.51	8.65	1.65
B5 Sea at St. Aubin	606 488	15:29	18.20	119	8.13	1.56	1.04	0.06	0.60	0.66	0.60	1.26	0.31
Zone A - Mixing Zone													
PSD outfall	634 494						Not sampled - tide below level of outfall						
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	15:18	16.40	103	7.97	2.59	189.04	2.78	932.42	935.21	1.43	936.64	3.55
La Haule A Outfall	608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall	613 496	15:05	16.90	99	7.89	8.52	260.95	3.21	1274.67	1277.88	2.86	1280.74	3.78
St. Peter's Valley	617 497	14:58	18.40	105	7.96	2.10	189.75	4.43	923.64	928.07	2.86	930.93	4.20
Waterworks Valley	629 497	14:52	17.30	93	7.93	5.21	74.76	10.42	682.06	692.48	17.13	709.62	1.36
Bellozanne Stream	639 507	12:15	–	–	–	0.79	237.45	6.57	900.09	906.65	0.71	907.37	0.36
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		12:00	–	–	–	3.57	279.10	52.83	1596.28	1649.11	291.99	1941.09	300.30
Effluent from PSD outfall	634 494	14:38	21.80	82	7.96	1.79	271.98	65.54	1704.94	1770.47	239.16	2009.63	306.76

Survey 4B - 17th June 1997

Site		Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
				°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples														
B1	Sea at Victoria Pool	636 483	9:55	15.70	106	7.56	4.07	0.64	0.04	0.04	0.07	0.16	0.23	0.36
B2	Sea at PSD Outfall	631 487	12:10	17.30	100	7.67	5.62	39.16	0.53	286.24	286.77	2.19	288.97	48.08
B3	Sea at Beach Rock	627 489	12:25	16.90	106	7.81	4.41	0.79	0.04	0.44	0.49	0.31	0.80	0.62
B4	Sea at Second Tower	619 489	12:30	17.80	105	7.84	5.16	0.63	0.05	0.36	0.41	0.26	0.68	0.47
B5	Sea at St. Aubin	606 488	12:40	18.20	106	7.57	6.20	0.76	0.05	0.19	0.24	0.35	0.59	0.59
Zone A - Mixing Zone														
PSD outfall		634 494						Not sampled - tide below level of outfall						
Inputs - Catchment outfalls														
St. Aubin's Outfall		606 488	10:45	15.50	69	7.46	3.80	88.29	2.28	832.98	835.26	0.71	835.98	3.16
La Haule A Outfall		608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall		613 496	10:32	15.30	91	7.31	5.50	127.09	4.71	1194.64	1199.35	7.14	1206.49	5.81
St. Peter's Valley		617 497	10:25	15.20	93	7.27	2.78	82.95	3.71	831.55	835.26	1.43	836.69	4.20
Waterworks Valley		629 497	10:15	15.60	91	7.50	2.34	51.98	5.64	708.26	713.90	2.86	716.76	3.39
Bellozanne Stream		639 507	11:35	14.60	81.00	7.01	0.51	110.00	5.93	1050.65	1056.57	7.85	1064.42	0.19
Input of Interest - Bellozanne STW Effluent														
STW - final effluent from UV plant			11:25	22.80	56.00	6.65	1.58	155.93	3.57	1838.29	1841.86	<35.695	<1877.557	329.36
Effluent from PSD outfall		634 494	10:04	22.50	86	6.98	1.34	155.22	2.71	336.39	339.10	2.14	341.24	303.53

Survey 5 - 1st July 1997

Site		Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
				℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples														
B1	Sea at Victoria Pool	636 483	16:32	19.50	110	8.07	6.64	5.27	0.61	59.50	60.11	0.11	60.22	12.14
B2	Sea at PSD Outfall	631 487	16:44	18.80	98	8.04	5.89	0.72	0.05	0.36	0.41	0.16	0.56	0.20
B3	Sea at Beach Rock	627 489	17:00	17.40	96	7.82	2.41	1.35	0.07	0.71	0.78	0.39	1.17	3.13
B4	Sea at Second Tower	619 489	17:18	15.50	98	7.85	2.23	2.42	0.09	4.97	5.06	0.43	5.49	0.22
B5	Sea at St. Aubin	606 488	17:31	16.00	100	7.91	2.63	1.35	0.06	0.38	0.44	0.13	0.57	0.17
Zone A - Mixing Zone														
PSD outfall		634 494						Not sampled – outfall submerged						
Inputs - Catchment outfalls														
St. Aubin's Outfall		606 488	17:52	15.20	92	8.04	1.79	81.52	<3.57	681.77	685.34	<35.67	<721.04	<16.14
La Haule A Outfall		608 494	17:23	15.20	87.00	7.96	12.64	89.36	5.71	629.66	635.37	<35.67	<671.07	<16.14
La Haule B Outfall		613 496	17:11	15.10	94	7.67	2.21	118.55	<3.57	1102.98	1106.55	<35.67	<1142.24	<16.14
St. Peter's Valley		617 497	17:06	16.10	84	7.60	1.52	84.02	<3.57	703.19	706.76	<35.67	<742.46	<16.14
Waterworks Valley		629 497	16:53	17.10	88	7.76	2.05	55.89	12.14	844.54	856.68	121.36	978.04	<16.14
Bellozanne Stream		639 507	12:15	–	–	–	3.17	99.68	12.85	822.41	835.26	<35.67	<870.96	<16.14
Input of Interest - Bellozanne STW Effluent														
STW - final effluent from UV plant			12:00	–	–	–	1.03	75.47	22.13	1527.03	1549.16	207.03	1756.19	277.69
Effluent from PSD outfall		634 494						Not sampled – outfall submerged						

Survey 5B - 14th July 1997

Site	Grid Reference	Time	Temperature °C	Dissolved Oxygen % Saturation	pH	Chlorophyll a mg/m3	Dis. reactive silicon mmol/m3 Si	Nitrite nitrogen mmol/m3 N	Nitrate nitrogen mmol/m3 N	Total oxidised nitrogen mmol/m3 N	Ammoniacal nitrogen mmol/m3 N	DAIN mmol/m3 N	DAIP mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	14:10	20.40	111	8.00	8.97	2.82	0.71	30.92	31.63	0.50	32.13	7.04
B2 Sea at PSD Outfall	631 487	15:37	22.50	101	7.99	4.09	0.11	0.06	0.55	0.61	0.36	0.98	0.44
B3 Sea at Beach Rock	627 489	14:26	19.90	110	7.91	1.83	0.52	0.06	0.26	0.33	0.26	0.59	0.21
B4 Sea at Second Tower	619 489	14:48	19.10	122	7.91	1.96	0.94	0.07	0.42	0.49	0.33	0.82	0.11
B5 Sea at St. Aubin	606 488	15:06	20.00	112	7.92	2.23	0.78	0.06	0.26	0.31	0.21	0.52	0.21
Zone A - Mixing Zone													
PSD outfall	634 494						Not sampled – outfall submerged						
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	15:18	18.70	98	7.94	3.00	196.16	1.86	682.77	684.63	0.71	685.3	2.71
La Haule A Outfall	608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall	613 496	14:53	18.80	98	7.96	2.54	284.80	4.57	1123.39	1127.96	6.43	1134.39	4.55
St. Peter's Valley	617 497	14:41	19.70	123	8.00	2.10	136.70	2.64	671.28	673.92	2.14	676.06	4.23
Waterworks Valley	629 497	14:35	18.80	85	7.74	2.01	135.28	7.35	329.61	336.96	0.71	337.67	8.14
Bellozanne Stream	639 507	13:49	15.80	92.00	7.50	31.10	255.61	12.42	994.18	1006.60	5.00	1011.60	0.48
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		13:38	24.00	58.00	6.72	1.61	300.11	52.11	1711.22	1763.33	514.01	2277.34	272.20
Effluent from PSD outfall	634 494						Not sampled – outfall submerged						

Survey 6 - 29th July 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	15:58	22.90	108	7.99	5.09	1.61	0.04	0.83	0.87	0.07	0.94	0.43
B2 Sea at PSD Outfall	631 487	16:10	22.50	118	7.06	1.29	5.09	0.29	10.63	10.92	0.07	10.99	<3.229
B3 Sea at Beach Rock	627 489	16:27	22.50	112	7.89	0.40	1.48	0.04	0.93	0.96	0.99	1.96	0.17
B4 Sea at Second Tower	619 489	16:45	22.00	113	7.85	2.23	2.41	0.06	5.87	5.93	1.25	7.18	0.06
B5 Sea at St. Aubin	606 488	17:02	22.30	111	7.92	3.66	1.47	0.04	0.79	0.82	0.07	0.89	0.05
Zone A - Mixing Zone													
PSD outfall	634 494						Not sampled – outfall submerged						
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	17:19	20.20	94	7.75	7.50	205.41	1.57	687.34	688.91	1.43	690.3	2.62
La Haule A Outfall	608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall	613 496	16:53	17.50	92	7.74	3.88	269.85	4.21	1088.05	1092.27	4.28	1096.55	6.17
St. Peter's Valley	617 497	16:39	19.90	7.35	62.00		117.84	8.85	446.62	455.47	0.71	456.18	5.10
Waterworks Valley	629 497	16:18	18.50	84	7.62	1.03	105.02	27.13	743.88	771.01	0.71	771.73	10.14
Bellozanne Stream	639 507	15:31	17.10	66.00	7.14	0.62	215.38	9.35	768.80	778.15	3.57	781.72	0.48
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		15:42	26.30	55.00	6.64	1.70	298.33	78.53	1791.89	1870.42	235.59	2106.01	339.05
Effluent from PSD outfall	634 494						Not sampled – outfall submerged						

Survey 6B - 11th August 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	14:40	23.90	109	8.30	9.14	0.93	0.04	0.04	0.07	3.77	3.84	1.32
B2 Sea at PSD Outfall	631 487	14:50	24.20	109	8.1	9.1	1.38	0.04	0.11	0.14	0.74	0.89	0.23
B3 Sea at Beach Rock	627 489	15:05	24.40	109	8.16	14.59	1.65	0.04	0.39	0.43	0.52	0.95	0.32
B4 Sea at Second Tower	619 489	15:25	22.50	109	8.30	12.76	1.98	0.08	0.07	0.15	0.77	0.92	0.23
B5 Sea at St. Aubin	606 488	15:45	22.50	109	8.50	21.92	1.46	0.04	0.10	0.14	0.61	0.75	0.25
Zone A - Mixing Zone													
PSD outfall	634 494		–	–	–	–	–	–	–	–	–	–	–
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	15:55	20.00	–	8.78	7.27	225.35	1.36	719.68	721.04	1.43	722.5	3.87
La Haule A Outfall	608 494	15:35	21.60	–	8.86	4.37	198.65	0.71	506.16	506.87	0.71	507.58	5.39
La Haule B Outfall	613 496	15:30	23.30	–	8.46	2.90	280.53	2.28	1104.26	1106.55	3.57	1110.11	5.10
St. Peter's Valley	617 497	15:15	22.60	–	8.16	6.52	170.52	3.86	330.25	334.11	7.14	341.24	8.40
Waterworks Valley	629 497	15:00	23.00	–	7.91	0.98	155.93	9.42	661.64	671.07	2.14	673.21	8.07
Bellozanne Stream	639 507	16:25	19.10	–	8.42	0.62	260.95	1.85	517.91	519.76	1.42	521.18	0.53
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		16:35	25.20	–	7.76	0.77	285.87	35.70	1556.30	1592.00	257.72	1849.71	280.92
Effluent from PSD outfall	634 494	17:05	25.20	78	8.08	2.30	284.80	38.34	1596.49	1634.83	230.59	1865.42	368.11

Survey 7 - 9th September 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	16:07	19.70	121	7.31	12.72	0.83	0.06	0.21	0.26	1.93	2.20	0.96
B2 Sea at PSD Outfall	631 487	16:16	18.80	77	7.02	6.65	1.78	0.06	0.17	0.24	1.33	1.57	3.00
B3 Sea at Beach Rock	627 489	16:42	19.00	81	7.92	5.62	1.37	0.04	0.06	0.10	0.62	0.72	0.71
B4 Sea at Second Tower	619 489	16:57	18.70	88	7.82	8.57	1.09	0.04	0.04	0.07	0.78	0.85	0.52
B5 Sea at St. Aubin	606 488	17:00	19.20	85	7.92	8.66	1.26	0.04	0.04	0.07	0.66	0.73	0.35
Zone A - Mixing Zone													
PSD outfall	634 494						Not sampled - tide below level of outfall						
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	17:10	16.60	73	7.82	4.19	163.05	0.64	734.67	735.32	0.71	736.0	2.65
La Haule A Outfall	608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall	613 496	16:51	17.10	66	7.78	4.56	241.37	3.28	1053.29	1056.57	2.14	1058.71	6.36
St. Peter's Valley	617 497		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Waterworks Valley	629 497	16:36	18.40	64	7.72	2.05	95.41	2.57	511.44	514.01	2.86	516.86	8.75
Bellozanne Stream	639 507	17:44	15.60	48		10.44	257.74	5.57	1022.45	1028.02	2.14	1030.16	0.84
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		17:35	22.40	40.00	6.36	1.27	253.83	29.27	2355.16	2384.43	292.70	2677.13	358.42
Effluent from PSD outfall	634 494	16:22	22.10	64	6.62	1.69	231.04	36.98	2397.42	2434.40	441.90	2876.30	335.82

Survey 7B - 27th August 1997

Site		Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
				℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples														
B1	Sea at Victoria Pool	636 483	15:56	20.40	118	7.93	9.06	5.70	0.45	19.90	20.35	0.29	20.64	7.30
B2	Sea at PSD Outfall	631 487	16:07	21.20	121	7.96	16.18	4.95	0.26	8.38	8.64	0.07	8.71	3.97
B3	Sea at Beach Rock	627 489	16:25	20.50	131	7.96	7.90	0.75	0.10	0.52	0.62	0.84	1.46	0.94
B4	Sea at Second Tower	619 489	16:40	19.60	124	7.91	10.10	1.66	0.11	0.85	0.96	0.56	1.53	0.47
B5	Sea at St. Aubin	606 488	16:57	20.20	126	7.89	9.17	1.91	0.05	0.24	0.29	1.11	1.41	0.60
Zone A - Mixing Zone														
PSD outfall		634 494						Not sampled – outfall submerged						
Inputs - Catchment outfalls														
St. Aubin's Outfall		606 488	17:14	19.00	118	7.85	9.15	211.82	1.21	497.80	499.02	1.43	500.4	3.97
La Haule A Outfall		608 494						0.00	0.00	0.00	0.00	0.00	0.00	0.00
La Haule B Outfall		613 496	16:48	19.00	113	7.73	3.48	259.17	2.50	954.13	956.63	5.71	962.34	5.88
St. Peter's Valley		617 497	16:31	19.20	106	7.78	8.93	93.27	1.64	278.92	280.56	2.14	282.70	7.78
Waterworks Valley		629 497	16:14	19.50	140	7.71	2.86	85.80	5.35	551.49	556.84	2.14	558.98	2.58
Bellozanne Stream		639 507	15:15	16.60	76	7.24	8.65	17.87	628.09	663.93	663.93	2.86	666.78	3.87
Input of Interest - Bellozanne STW Effluent														
STW - final effluent from UV plant			15:28	23.40	74.00	6.68	1.95	244.22	24.27	1553.45	1577.72	157.06	1734.78	290.61
Effluent from PSD outfall		634 494						Not sampled – outfall submerged						

Survey 8 - 30th September 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	16:15	20.15	107	8.12	10.98	1.99	0.09	0.59	0.68	0.10	0.78	0.77
B2 Sea at PSD Outfall	631 487	10:20	17.55	94	8.07	11.31	1.53	0.14	1.01	1.15	0.09	1.24	0.88
B3 Sea at Beach Rock	627 489	10:50	18.10	95	7.81	8.48	2.51	0.17	1.44	1.61	0.26	1.87	0.77
B4 Sea at Second Tower	619 489	11:10	18.30	98	7.86	11.07	2.23	0.11	0.71	0.81	0.24	1.06	0.66
B5 Sea at St. Aubin	606 488	11:20	18.30	79	7.93	60.24	2.00	0.17	0.96	1.13	0.09	1.22	0.67
Zone A - Mixing Zone													
PSD outfall	634 494	10:30	20.75	89.00	7.01	2.68	135.42	3.29	1976.14	1979.43	1.01	1980.44	288.67
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	11:25	15.80	96	8.31	3.21	244.22	2.00	740.46	742.46	0.71	743.2	4.84
La Haule A Outfall	608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall	613 496	11:03	16.50	90	8.35	3.03	235.32	4.00	1031.16	1035.16	2.14	1037.30	4.52
St. Peter's Valley	617 497	11:00	16.20	85	8.29		230.69	5.35	119.58	124.93	20.70	145.64	7.75
Waterworks Valley	629 497	10:40	16.60	88	7.99		78.32	1.71	433.05	434.77	14.28	449.04	7.43
Bellozanne Stream	639 507	9:25	13.80	–	7.35	13.57	251.34	2.57	954.06	956.63	2.86	959.48	0.61
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		9:50	21.85	38.00	6.87	1.52	260.24	5.57	11924.41	11929.98	5.00	11934.98	374.56
Effluent from PSD outfall	634 494						Not sampled – outfall submerged						

Survey 8B - 14th October 1997

Site		Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
				°C	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples														
B1	Sea at Victoria Pool	636 483	10:00	15.10	–	8.82	5.18	4.70	0.61	10.17	10.78	0.64	11.42	0.96
B2	Sea at PSD Outfall *	631 487	10:07	15.90	–	7.92	2.32	13.96	0.80	105.00	105.80	2.20	108.00	13.79
B3	Sea at Beach Rock	627 489	10:34	15.00	–	7.94	4.46	3.77	0.41	4.35	4.77	0.07	4.84	0.40
B4	Sea at Second Tower	619 489	10:45	14.90	–	7.94	3.61	4.70	0.39	6.13	6.52	0.07	6.59	0.27
B5	Sea at St. Aubin	606 488	10:55	15.00	–	8.06	2.10	3.92	0.26	2.31	2.57	0.07	2.64	0.22
Zone A - Mixing Zone														
PSD outfall *		634 494												
Inputs - Catchment outfalls														
St. Aubin's Outfall		606 488	11:33	12.80	–	8.08	3.35	187.97	1.50	588.90	590.40	5.00	595.4	2.20
La Haule A Outfall		608 494	no flow	no flow	no flow	no flow	no flow	no flow	no flow	no flow	no flow	no flow	no flow	no flow
La Haule B Outfall		613 496	11:18	13.10	–	8.25	1.29	229.62	2.36	847.19	849.54	2.14	851.68	3.62
St. Peter's Valley		617 497	11:12	11.50	–	8.70	16:04	163.05	2.36	537.35	539.71	3.57	543.28	4.13
Waterworks Valley		629 497	10:25	12.00	–	8.08	0.30	158.06	6.00	650.79	656.79	12.85	669.64	2.91
Bellozanne Stream		639 507	9:32	12.00	–	7.72	9.20	215.02	2.78	417.30	842.40	7.14	849.54	0.55
Input of Interest - Bellozanne STW Effluent														
STW - final effluent from UV plant*			9:25	19.10	–	6.64	2.81	203.99	3.57	1631.26	1634.83	35.70	1670.53	232.49
Effluent from PSD outfall		634 494	10:20	19.00	–	7.17	4.69	190.10	2.78	1810.52	1813.31	5.00	1818.30	229.26

* Due to construction activities, the effluent from Bellozanne STW was being discharged via the short storm outfall at First Tower. Thus, B2 may be representative of Zone A.

Survey 9 - 29th October 1997

Site	Grid Reference	Time	Temperature	Dissolved Oxygen	pH	Chlorophyll a	Dis. reactive silicon	Nitrite nitrogen	Nitrate nitrogen	Total oxidised nitrogen	Ammoniacal nitrogen	DAIN	DAIP
			℃	% Saturation		mg/m3	mmol/m3 Si	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 N	mmol/m3 P
Beach Samples													
B1 Sea at Victoria Pool	636 483	13:50	12.70	97	7.95	2.01	4.45	0.57	2.52	3.09	1.16	4.25	0.58
B2 Sea at PSD Outfall	631 487	15:22	12.60	89	7.84	3.75	7.80	1.09	47.10	48.19	2.13	50.32	5.91
B3 Sea at Beach Rock	627 489	15:31	12.30	90	7.92	3.03	8.51	0.82	58.50	59.33	1.18	60.50	6.17
B4 Sea at Second Tower	619 489	15:10	13.00	98	7.91	4.37	4.17	0.91	16.22	17.13	1.02	18.15	1.86
B5 Sea at St. Aubin	606 488	14:50	12.50	103	7.95	3.79	5.98	1.29	36.69	37.98	1.58	39.56	3.12
Zone A - Mixing Zone													
PSD outfall	634 494						Not sampled – outfall submerged						
Inputs - Catchment outfalls													
St. Aubin's Outfall	606 488	14:25	8.90	86	7.79	2.86	111.43	1.00	355.24	356.24	0.71	357.0	1.78
La Haule A Outfall	608 494		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
La Haule B Outfall	613 496	15:06	8.50	86	7.75	2.95	143.47	1.14	984.04	985.18	0.71	985.90	3.62
St. Peter's Valley	617 497	15:15	7.50	86	8.46	19:12	117.12	1.14	320.83	321.97	0.71	322.68	3.91
Waterworks Valley	629 497	15:27	8.40	81	7.64	3.53	49.84	3.36	539.21	542.56	3.57	546.13	1.61
Bellozanne Stream	639 507	16:04	9.70	74	7.41	1.02	122.11	6.14	907.65	913.79	13.56	927.36	0.61
Input of Interest - Bellozanne STW Effluent													
STW - final effluent from UV plant		16:18	17.7	44	6.56	0.40	265.22	47.12	2087.44	2134.56	464.04	2598.60	309.98
Effluent from PSD outfall	634 494						Not sampled – outfall submerged						