

APPENDIX B1
(See Section 5)
EPA Water Quality Data
Bandon Estuary and Kinsale Harbour 1993-1997

Station No.	Survey Date	Time (Hr)	Time (Tidal)	Sample Depth	Salinity (‰)	Temp. (°C)	pH	D.O. (%)	BOD-5 (mg/l)	TON (mg/l)	NH ₃ (mg/l)	Free NH ₃ (mg/l)	PO ₄ (µg/l)
CO25	12.10.93	15.03	HW+0.43	S	24.2	12.2	7.83	92		0.92			55
CO25	12.10.93	15.03	HW+0.43	1									
CO25	12.10.93	15.03	HW+0.43	2	28.3								
CO25	12.10.93	15.03	HW+0.43	3	31.5	12.6		85					
CO25	12.10.93	12.11	HW-3.09	S	25.7	11.9	7.88	97		1.21			45
CO25	12.10.93	12.11	HW-3.09	1									
CO25	12.10.93	12.11	HW-3.09	2	27.9								
CO25	12.10.93	12.11	HW-3.09	4	31.0	12.7		89					
CO24	12.10.93	12.00	HW-3.20	S	21.8	12.1	7.87	91		1.04			43
CO24	12.10.93	12.00	HW-3.20	1	24.0	12.3							
CO24	12.10.93	12.00	HW-3.20	2	27.8	12.4							
CO24	12.10.93	12.00	HW-3.20	4	32.3	12.7		89					
CO24	12.10.93	16.20	HW+1.00	S	28.3	12.5	7.92	93		0.62			45
CO24	12.10.93	16.20	HW+1.00	1									
CO24	12.10.93	16.20	HW+1.00	2	31.8								
CO24	12.10.93	16.20	HW+1.00	3	33.0	12.6							
CO23	12.10.93	16.33	HW+1.13	S	29.9	12.7	7.92	92		0.62			45
CO23	12.10.93	16.33	HW+1.13	1									
CO23	12.10.93	16.33	HW+1.13	2	30.6								
CO23	12.10.93	16.33	HW+1.13	3	33.4	12.4		87					
CO23	12.10.93	11.43	HW-3.37	S	24.4	12.4	7.89	89		1.02			43
CO23	12.10.93	11.43	HW-3.37	1	26.2								
CO23	12.10.93	11.43	HW-3.37	2	30.6	12.5		80					
CO23	12.10.93	11.43	HW-3.37	5	31.8								
CO22	12.10.93	11.27	HW-3.53	S	28.0	12.5	7.88	92		0.66			43
CO22	12.10.93	11.27	HW-3.53	1	30.7								
CO22	12.10.93	11.27	HW-3.53	2	34.4								
CO22	12.10.93	11.27	HW-3.53	3	34.4	12.4		85					

B1.1

2328/MH&P

Station No.	Survey Date	Time (Hr)	Time (Tidal)	Sample Depth	Salinity (‰)	Temp. (° C)	pH	D.O. (%)	BOD-5 (mg/l)	TON (mg/l)	NH ₃ (mg/l)	Free NH ₃ (mg/l)	PO ₄ (µg/l)
CO25	24.01.95	10.22	HW+0.07	S	17.9	6.5	7.94	84		1.443	0.063	0.0009	19
CO25	24.01.95	10.22	HW+0.07	1	27.2	7.7							
CO25	24.01.95	10.24	HW+0.09	2	30.1	8.2	8	85		0.610	0.033	0.0006	15
CO25	24.01.95	10.24	HW+0.09	3	32.3	8.4							
CO25	24.01.95	13.40	HW+3.25	S	9.6	5.9	7.67	82	1.5	2.416	0.092	0.0007	20
CO25	24.01.95	13.40	HW+3.25	1	11.1	6.0							
CO25	24.01.95	13.40	HW+3.25	2	19.5	6.8							
CO25	24.01.95	13.40	HW+3.25	3	20.6	7.0							
CO24	24.01.95	10.04	HW-0.11	S	23.0	6.9	7.81	82		1.515	0.066	0.0007	18
CO24	24.01.95	10.04	HW-0.11	1	25.1	7.2							
CO24	24.01.95	10.04	HW-0.11	2	33.6	8.6							
CO24	24.01.95	14.00	HW+3.45	S	20.6	7.0	7.92	84		1.528	0.073	0.0011	20
CO24	24.01.95	14.00	HW+3.45	1	22.3	7.1							
CO24	24.01.95	14.00	HW+3.45	2	28.7	8.0							
CO24	24.01.95	14.00	HW+3.45	3	31.5	8.3	7.95	66		0.874	0.052	0.0009	16
CO24	24.01.95	14.00	HW+3.45	4	32.4	8.3							
CO23	24.01.95	09.53	HW-0.22	S	21.0	6.5	7.89	81		1.056	0.048	0.0006	17
CO23	24.01.95	09.53	HW-0.22	1	24.6	7.1							
CO23	24.01.95	09.53	HW-0.22	2	30.3	8.1							
CO23	24.01.95	14.10	HW+3.55	S	22.4	7.1	7.95	83		1.337	0.060	0.0009	18
CO23	24.01.95	14.10	HW+3.55	1	23.9	7.3							
CO23	24.01.95	14.10	HW+3.55	2	28.9	7.9							
CO23	24.01.95	14.10	HW+3.55	3	31.1	8.2	7.93	45		0.866	0.044	0.0007	16
CO23	24.01.95	14.10	HW+3.55	4	33.3	8.6							
CO22	24.01.95	09.39	HW-0.36	S	27.9	7.5	7.95	84		0.754	0.038	0.0006	16
CO22	24.01.95	09.39	HW-0.36	1	28.0	7.6							
CO22	24.01.95	09.39	HW-0.36	2	33.0	8.6							
CO22	24.01.95	09.39	HW-0.36	3	35.0	8.8							
CO22	24.01.95	14.25	HW+4.10	S	23.9	7.3	7.64	83		1.212	0.055	0.0004	17
CO22	24.01.95	14.25	HW+4.10	1	29.0	7.9							
CO22	24.01.95	14.25	HW+4.10	2	32.0	8.4							
CO22	24.01.95	14.25	HW+4.10	3	32.4	8.5							
CO25	11.05.95	10.28	-04.42	S	28.3	12.2	8.28	102		0.310	0.035	0.0017	23
CO25R	11.05.95	10.28	-04.42	2	30.1	11.9	8.28	99		0.215	0.039	0.0019	22

Station No.	Survey Date	Time (Hr)	Time (Tidal)	Sample Depth	Salinity (‰)	Temp. (°C)	pH	D.O. (%)	BOD-5 (mg/l)	TON (mg/l)	NH3 (mg/l)	Free NH3 (mg/l)	PO4 (µg/l)
CO25	11.05.95	13.08	-02.02	S	32.0	11.6	8.17	100		0.065	0.035	0.0013	22
CO24	11.05.95	10.06	-05.04	S	31.7	11.7	8.25	103		0.080	0.037	0.0016	21
CO24R	11.05.95	13.19	-01.51	S	32.9	11.4	8.23	83		0.043	0.022	0.0009	2
CO23	11.05.95	10.02	-05.08	S	31.9	11.7	8.19	102		0.070	0.030	0.0012	2
CO23R	11.05.95	13.37	-01.33	S	33.4	11.2	8.23	87		0.025	0.012	0.0005	20
CO22	11.05.95	09.50	-05.20	S	33.2	11.4		101		0.030	0.017	0.0007	23
CO22R	11.05.95	13.50	-01.20	S	34.0	11.2	8.20	98		0.006	0.007	0.0003	33
CO25	08.06.95	10.22	03.03	S	28.2	13.0	8.33	124		0.163	0.002	0.0001	7
CO25	08.06.95	13.43	00.18	S	32.2	12.6	8.25	113		0.052	0.002	0.0001	5
CO24	08.06.95	10.12	03.13	S	31.4	12.4	8.25	116		0.069	0.002	0.0001	8
CO24	08.06.95	13.52	00.27	S	33.1	12.0	8.21	111		0.034	0.002	0.0001	26
CO23	08.06.95	10.02	03.23	S	32.1	12.0	8.23	116		0.042	0.002	0.0001	4
CO23	08.06.95	14.02	00.37	S	33.3	12.1	8.18	114		0.028	0.002	0.0001	3
CO22	08.06.95	09.50	03.35	S	33.7	11.2	8.16	104		0.013	0.002	0.0001	6
CO22	08.06.95	14.12	00.47	S	34.2	11.3	8.16	113		0.004	0.002	0.0001	7
CO25	6.06.96	09.33	00.03	S	28.0	13.1	7.91	87		0.585	0.035	0.0008	35
CO25	6.06.96	09.33	00.03	I	29.1	12.8							
CO25	6.06.96	09.33	00.03	2	30.3	12.4							
CO25	6.06.96	12.35	03.05	S	22.4	14.7	8.86	89		1.021	0.079	0.0018	43
CO25	6.06.96	12.35	03.05	I	23.3	14.5							
CO25	6.06.96	12.35	03.05	2	27.5	13.3							
CO25	6.06.96	12.35	03.05	3.7	29.0	13.0							
CO24	6.06.96	09.19	-00.11	S	28.0	13.0	7.86	88		0.779	0.050	0.0010	36
CO24	6.06.96	09.19	-00.11	I	29.1	12.2							
CO24	6.06.96	09.19	-00.11	2	32.8	11.4							
CO24	6.06.96	12.45	03.15	S	28.5	13.2	7.94	91		0.557	0.044	0.0011	35
CO24	6.06.96	12.45	03.15	I	28.7	13.1							
CO24	6.06.96	12.45	03.15	2	28.9	13.4							
CO24	6.06.96	12.45	03.15	8.5	32.7	11.5							
CO23	6.06.96	12.55	03.25	S	29.9	13.0	7.96	93		0.439	0.032	0.0008	30
CO23	6.06.96	12.55	03.25	I	30.0	12.8							
CO23	6.06.96	12.55	03.25	2	31.2	12.2							
CO23	6.06.96	12.55	03.25	9	33.4	11.2							
CO23	6.06.96	14.03	04.33	S	28.2	13.8	7.99	90	1.3	0.560	0.042	0.0012	35

B1.3

2328A/11/6/P

Station No.	Survey Date	Time (Hr)	Time (Tidal)	Sample Depth	Salinity (‰)	Temp. (°C)	pH	D.O. (%)	BOD-5 (mg/l)	TON (mg/l)	NH ₃ (mg/l)	Free NH ₃ (mg/l)	PO ₄ (µg/l)
C023	6.06.96	14.03	04.33	1	29.0	13.1							
C023	6.06.96	14.03	04.33	2	29.5	12.9							
C023	6.06.96	14.03	04.33	10	32.7	11.0	4.05			1.849	0.025	0.0000	58
C022	6.06.96	13.05	03.35	S	32.2	11.8	7.99	98		0.321	0.027	0.0007	27
C022	6.06.96	13.05	03.35	1	32.3	11.8							
C022	6.06.96	13.05	03.35	2	33.5	11.1							
C022	6.06.96	13.05	03.35	6	34.8	10.6							
C022	6.06.96	13.52	04.22	S	31.0	12.8	7.31	89		0.362	0.034	0.0002	27
C022	6.06.96	13.52	04.22	1	31.9	12.2							
C022	6.06.96	13.52	04.22	2	33.3	11.8							
C022	6.06.96	13.52	04.22	5	34.6	10.8							
C025	24.07.96	11.16		Surface	31.3	16.7	8.06	107		0.112	0.009	0.0004	10
C025	24.07.96	11.16		1	31.8	16.6							
C025	24.07.96	11.16		2	33.5	15.6							
C025	24.07.96	11.16		3	33.8	15.2							
C025R	24.07.96	14.03		Surface	29.7	17.4	7.45	106		0.220	0.008	0.0001	12
C025R	24.07.96	14.03		1	29.7	17.4							
C025R	24.07.96	14.03		2	29.9	17.4							
C025R	24.07.96	14.03		3	30.2	17.3							
C024	24.07.96	11.06		Surface	30.7	16.7	8.28	111		0.114	0.007	0.0005	11
C024	24.07.96	11.06		1	31.8	16.3							
C024	24.07.96	11.06		2	33.5	15.5							
C024	24.07.96	11.06		3	33.8	15.1							
C024R	24.07.96	14.10		Surface	30.6	17.1	7.18	108		0.171	0.007	0.0000	13
C024R	24.07.96	14.10		1	30.6	17.1							
C024R	24.07.96	14.10		2	31.4	16.7							
C024R	24.07.96	14.10		3	31.5	16.6							
C023.5	24.07.96	10.55		Surface	32.8	15.1	8.26	107		0.032	0.003	0.0002	9
C023.5	24.07.96	10.55		1	33.0	15.9							
C023.5	24.07.96	10.55		2	33.3	15.6							
C023.5	24.07.96	10.55		3	34.4	14.4							
C023.5R	24.07.96	14.17		Surface	31.8	16.5	7.75	106		0.105	0.009	0.0002	12
C023.5R	24.07.96	14.17		1	32.2	16.4							
C023.5R	24.07.96	14.17		2	32.2	16.4							

Station No.	Survey Date	Time (Hr)	Time (Tidal)	Sample Depth	Salinity (‰)	Temp. (°C)	pH	D.O. (%)	BOD-5 (mg/l)	TON (mg/l)	NH ₃ (mg/l)	Free NH ₃ (mg/l)	PO ₄ (µg/l)
C023.5R	24.07.96	14.17		3	32.9	15.9							
C023	24.07.96	10.47		Surface	32.5	16.0	8.25	98		0.049	0.005	0.0003	9
C023	24.07.96	10.47		1	32.7	16.0							
C023	24.07.96	10.47		2	33.0	15.7							
C023R	24.07.96	10.47		3	33.2	15.6							
C023R	24.07.96	14.25		Surface	32.4	16.2	8.10	106		0.088	0.005	0.0002	11
C023R	24.07.96	14.25		1	32.9	15.9							
C023R	24.07.96	14.25		2	33.0	15.6							
C023R	24.07.96	14.25		3	33.9	15.0							
C022	24.07.96	10.37		Surface	33.7	15.4	8.03	94		0.021	0.003	0.0001	9
C022	24.07.96	10.37		1	33.7	15.4							
C022	24.07.96	10.37		2	33.8	15.3							
C022R	24.07.96	10.37		3	33.8	15.0							
C022R	24.07.96	14.35		Surface	33.2	15.7	8.10	105		0.044	0.007	0.0003	10
C022R	24.07.96	14.35		1	33.6	15.6							
C022R	24.07.96	14.35		2	33.9	15.2							
C022R	24.07.96	14.35		3	34.3	15.2							
C025	30.04.97	12.40	00.50	S	29.9	12.5	8.09	99.4		0.418	0.003	0.0001	21
C025	30.04.97	12.40	00.50	1	30.4	12.4							
C025	30.04.97	12.40	00.50	2	31.3	12.1		98.6					
C025	30.04.97	12.40	00.50	5.9	33.6	10.9							
C024	30.04.97	12.50	01.00	S	31.8	12.0	8.09	100.1		0.315	0.003	0.0001	23
C024	30.04.97	12.50	01.00	1	32.0	12.0							
C024	30.04.97	12.50	01.00	2	32.6	11.5		98					
C024	30.04.97	12.50	01.00	4	33.5	11.0							
C023	30.04.97	13.00	01.50	S	32.5	11.7	8.11	102		0.324	0.003	0.0001	26
C023	30.04.97	13.00	01.50	1	32.7	11.5							
C023	30.04.97	13.00	01.50	2	33.2	11.3		102					
C022	30.04.97	13.00	01.50	11	35.2	9.8							
C022	30.04.97	13.35	01.45	S	32.7	11.6	8.11	98.5		0.245	0.003	0.0001	17
C022	30.04.97	13.35	01.45	1	32.7	11.6							
C022	30.04.97	13.35	01.45	2	34.4	10.3							
C022	30.04.97	13.35	01.45	6.8	35.4	9.6							
C025	10.06.97	12.06	02.36	S	33.2	15.6	8.2	85.7		0.096	0.028	0.0015	18

Station No.	Survey Date	Time (Hr)	Time (Tidal)	Sample Depth	Salinity (%)	Temp. (°C)	pH	D.O. (%)	BOD-5 (mg/l)	TON (mg/l)	NH ₃ (mg/l)	Free NH ₃ (mg/l)	PO ₄ (µg/l)
CO25	10.06.97	12.06	02.36	1	33.2	15.6							
CO25	10.06.97	12.06	02.36	2	33.2	15.6							
CO25	10.06.97	12.06	02.36	4.1	33.3	15.6							
CO24	10.06.97	12.19	02.49	S	33.9	15.4	8.2	95.6		0.071	0.027	0.0014	14
CO24	10.06.97	12.19	02.49	1	34	15.3							
CO24	10.06.97	12.19	02.49	2	34	15.3							
CO24	10.06.97	12.19	02.49	12	34.4	15.1							
CO23	10.06.97	12.35	03.05	S	34.8	14.7	8.2	95.8		0.037	0.023	0.0011	10
CO23	10.06.97	12.35	03.05	1	34.8	14.7							
CO23	10.06.97	12.35	03.05	2	34.9	14.6							
CO23	10.06.97	12.35	03.05	6	35.1	14.4							
CO22	10.06.97	12.47	03.17	S	35.2	14.4	7.33	97.8		0.024	0.024	0.0002	12
CO22	10.06.97	12.47	03.17	1	35.2	14.4							
CO22	10.06.97	12.47	03.17	2	35.3	14.4							
CO22	10.06.97	12.47	03.17	12	35.5	14.4				0.4824	0.0258		21.25806

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APPENDIX B2

(See Section 5)

Shellfish Flesh Results

Liquid and flesh samples have been tested from February 1996. The results from April 1997 to the present are shellfish flesh levels. There is no accepted scientific correlation between the faecal coliform levels found in flesh and the level in surrounding waters. However, in order to attempt to compare the faecal coliform levels in the surrounding waters, a notional factor of 25 is used on the flesh results. (Ref. Test sample results for September 1996 to April 1997). In general, these notional figures correspond to the simulated results for the existing regime. Bold figures are actual results, italicised figures are factored as above.

Date of Sample	Site	Liquid Result	Flesh Result	Liquid/Flesh Ratio
14/07/94	Kinsale Estuary	b		
14/07/94	Kinsale Estuary	500		
16/02/96	Kinsale Seafoods Ltd	225	9	
26/02/96	Kinsale Seafoods Ltd		0	
29/02/96	Kinsale Seafoods Ltd		0	
06/09/96	Kinsale Seafoods Ltd	12	0	
16/09/96	Kinsale Seafoods Ltd	300	6	50
30/01/97	Kinsale Seafoods Ltd	132	16	8.25
25/03/97	Kinsale Seafoods Ltd	52	2	26
22/04/97	Kinsale Seafoods Ltd	186	4	46.5
22/04/97	Kinsale Shellfish Ltd	118	5	23.6
29/04/97	Kinsale Seafoods Ltd	25	1	
13/05/97	Kinsale Seafoods Ltd	75	3	
20/05/97	Kinsale Seafoods Ltd	300	12	
27/05/97	Kinsale Seafoods Ltd	0	0	
03/06/97	Kinsale Seafoods Ltd	900	36	
03/06/97	Kinsale Shellfish Ltd	900	36	
10/06/97	Kinsale Seafoods Ltd	100	4	
17/06/97	Kinsale Seafoods Ltd	200	8	
01/07/97	Kinsale Seafoods Ltd	50	2	
08/07/97	Kinsale Estuary	175	7	
22/07/97	Kinsale Seafoods Ltd	275	11	
30/07/97	Kinsale Seafoods Ltd	100	4	
05/08/97	Kinsale Seafoods Ltd	150	6	
12/08/97	Kinsale Seafoods Ltd	175	7	
19/08/97	Kinsale Seafoods Ltd	50	2	
26/08/97	Kinsale Seafoods Ltd	250	10	
02/09/97	Kinsale Seafoods Ltd	650	26	
08/09/97	Kinsale Seafoods Ltd	275	11	
15/09/97	Kinsale Seafoods Ltd	700	28	
23/09/97	Kinsale Seafoods Ltd	275	11	
30/09/97	Kinsale Seafoods Ltd	50	2	
07/10/97	Kinsale Seafoods Ltd		0	
14/10/97	Kinsale Seafoods Ltd	400	16	
21/10/97	Kinsale Seafoods Ltd	100	4	
21/10/97	Kinsale Shellfish Ltd	425	17	
24/03/98	Kinsale Shellfish Ltd	325	13	
24/03/98	Kinsale Seafoods Ltd	25	1	
07/04/98	Kinsale Shellfish Ltd	1,575	63	
07/04/98	Kinsale Seafoods Ltd	1,400	56	
07/07/98	Kinsale Shellfish Ltd	50	2	
07/07/98	Kinsale Seafoods Ltd	25	1	
04/08/98	Kinsale Shellfish Ltd	75	3	
04/08/98	Kinsale Seafoods Ltd	75	3	

APPENDIX C1

(See section 7)

Water Quality

This appendix provides water quality data for Kinsale Marsh from RPS Cairns (1996). Two water quality samples were taken on 5 December 1996. One was taken from the main lagoon of the marsh and one was taken from the stream entering the southeast corner of the marsh.

Parameters	Units	Sites	
		Main Lagoon	Stream
Time	-	17:07	17:20
Temperature	°C	5.5	-
pH	-	7.90	6.55
Ammonia	mg N/l	0.038	0.009
Orthophosphate	mg P/l	0.010	0.010
Total Oxidised Nitrogen	mg N/l	1.50	7.10
Suspended Solids	mg/l	1.8	0.4
Conductivity	µS cm ⁻¹	15,570	346
Salinity	ppt	9.0	0.1
Colour	Hazen	33	3

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APPENDIX C2

(see section 7)

Vegetation

This appendix includes lists of species recorded in the distinct broad habitat zones. Nomenclature follows Stace (1991).

TABLE 1. Western compartment of marsh plant list based on survey in June 1998. (M = marginal species, in the line of the outfall pipeline; H = halophytes; HK = western hedgebank; W = weed introductions.)

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i> HK
American Willowherb	<i>Epilobium ciliatum</i> W
Ash	<i>Fraxinus excelsior</i> HK
Blackthorn	<i>Prunus spinosa</i> HK
Bramble	<i>Rubus fruticosus</i> agg. M/HK
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Celery-leaved Buttercup	<i>Ranunculus sceleratus</i> H
Clustered Dock	<i>Rumex conglomeratus</i> M
Common Couch	<i>Elytrigia reopens</i> M
Common Nettle	<i>Urtica dioica</i> M
Common Sorrel	<i>Rumex acetosa</i> M
Common Spike-rush	<i>Eleocharis palustris</i> M
Creeping Bent	<i>Agrostis stolonifera</i> M
Creeping Buttercup	<i>Ranunculus repens</i>
Cuckoo Flower	<i>Cardamine pratensis</i> M
Elm	<i>Ulmus</i> genus HK
False Fox-Sedge	<i>Carex otrubae</i> M
False Oat-grass	<i>Arrhenatherum elatius</i>
Fool's Water-cress	<i>Apium nodiflorum</i>
Gipsywort	<i>Lycopus europaeus</i>
Glaucous Sedge	<i>Carex flacca</i> M
Great Willowherb	<i>Epilobium hirsutum</i> M
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i> M
Grey Club-rush	<i>Schoenoplectus tabernaemontani</i> H
Hard Rush	<i>Juncus inflexus</i> M
Hawthorn	<i>Crataegus monogyna</i> HK
Hedge Bindweed	<i>Calystegia sepium</i> ssp. <i>sepium</i> M
Hogweed	<i>Heracleum sphondylium</i> M
Hybrid Creeping Cinquefoil	<i>Potentilla x mixta</i> (<i>P. anglica</i> x <i>P. reptans</i>) M
Lesser Spearwort	<i>Ranunculus flammula</i>
Marsh Bedstraw	<i>Galium palustre</i> M
Marsh Cinquefoil	<i>Potentilla palustris</i>
Marsh Orchid	<i>Dactylorhiza</i> genus
Marsh Thistle	<i>Cirsium palustre</i> M
Marsh Willowherb	<i>Epilobium palustre</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Meadowsweet	<i>Filipendula ulmaria</i> M
Navelwort	<i>Umbilicus rupestris</i> HK
Oval Sedge	<i>Carex ovalis</i> M
Ragged Robin	<i>Lychnis flos-cuculi</i>
Red Fescue	<i>Festuca rubra</i> M
Remote Sedge	<i>Carex remota</i>
Rough Meadow-grass	<i>Poa trivialis</i> M

Common Name	Scientific Name
Rusty Willow	<i>Salix cinerea</i> asp. <i>oleifolia</i> HK
Saltmarsh Rush	<i>Juncus gerardii</i> H
Sea Mayweed	<i>Tripleurospermum maritimum</i> H
Sharp-flowered Rush	<i>Juncus acutiflorus</i> M
Silverweed	<i>Potentilla anserina</i>
Soft Rush	<i>Juncus effusus</i> M
Spear-leaved Orache	<i>Atriplex prostrata</i> H
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i> M
Toad Rush	<i>Juncus bufonius</i> s.s
Tufted Water Forget-me-not	<i>Myosotis laxa</i>
Water Figwort	<i>Scrophularia auriculata</i> M
Water Mint	<i>Mentha aquatica</i> M
Water-cress	<i>Rorippa masturtium-aquaticum</i> M
Wood Dock	<i>Rumex sanguineus</i> MHK
Yellow Iris	<i>Iris pseudacorus</i> M
Yorkshire Fog	<i>Holcus lantus</i> M

TABLE 2. Central embankment plant list based on survey in June 1998. (H = halophyte.)

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i> saplings
Blackthorn	<i>Prunus spinosa</i>
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>
Common Couch	<i>Elytrigia repens</i> ssp. <i>repens</i>
Common Mouse-ear	<i>Cerastium fontanum</i>
Common Vetch	<i>Vicia sativa</i> ssp. <i>nigra</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Curled Dock	<i>Rumex crispus</i>
Danish Scurvy-grass	<i>Cochlearia danica</i> H
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>
Greater Sea-spurrey	<i>Spergularia media</i> H
Ivy	<i>Hedera helix</i> ssp. <i>helix</i>
Long-bracted Sedge	<i>Carex entensa</i> H
Meadow Buttercup	<i>Ranunculus acris</i>
Perennial Rye-grass	<i>Lolium perenne</i>
Perennial Sow-thistle	<i>Sonchus arvensis</i>
Red Clover	<i>Trifolium pratense</i>
Red Fescue	<i>Festuca rubra</i>
Rough Meadow-grass	<i>Poa trivialis</i>
Saltmarsh Rush	<i>Juncus gerardii</i> H
Sea Arrowgrass	<i>Troglodchin maritima</i> H
Sea Aster	<i>Aster tripolium</i> H
Sea Mayweed	<i>Tripleurospermum maritimum</i> H
Sea-milkwort	<i>Glaux maritima</i>
Toad Rush	<i>Juncus ambiguus</i> H
Tufted Vetch	<i>Vicia cracca</i>
White Clover	<i>Trifolium repens</i>
Wild Carrot	<i>Daucus carota</i> ssp. <i>carota</i>
Yorkshire Fog	<i>Holcus lanatus</i>

TABLE 3. School Meadow plant list, based on survey in June 1998. (Code: HK = hedgebank:)

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i> HK
Blackthorn	<i>Prunus spinosa</i> HK
Bracken	<i>Pteridium aquilinum</i>
Bristle Club-rush	<i>Isolepis setacea</i>
Bush Vetch	<i>Vicia sepium</i>
Carnation Sedge	<i>Carex panicea</i>
Clustered Dock	<i>Rumex conglomeratus</i>
Cock's-foot	<i>Dactylis glomerata</i>
Common Knapweed	<i>Centaurea nigra</i>
Common Sedge	<i>Carex nigra</i>
Common Sorrel	<i>Rumex acetosa</i>
Compact Rush	<i>Juncus conglomeratus</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Curled Dock	<i>Rumex crispus</i>
Elder	<i>Sambucus nigra</i>
Germander Speedwell	<i>Veronica chamaedrys</i>
Glaucous Sedge	<i>Carex flacca</i>
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>
Greater Tussock Sedge	<i>Carex paniculata</i>
Hairy Dog Rose	<i>Rosa corymbifera</i>
Hard Rush	<i>Juncus inflexus</i>
Hemlock Water-dropwort	<i>Oenanthe crocata</i>
Hybrid Creeping Cinquefoil	<i>Potentilla x mixta</i> (<i>P. anglica</i> x <i>P. reptans</i>)
Lesser Spearwort	<i>Ranunculus flammula</i>
Lesser Stitchwort	<i>Stellaria graminea</i>
Lesser Sweetbriar	<i>Rosa micrantha</i> HK
Marsh Bedstraw	<i>Galium palustre</i>
Marsh Foxtail	<i>Alopecurus geniculatus</i>
Marsh Orchid	<i>Dactylorhiza</i> genus
Marsh Thistle	<i>Cirsium palustre</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Meadow Foxtail	<i>Alopecurus pratensis</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Oval Sedge	<i>Carex ovalis</i>
Privet	<i>Ligustrum vulgare</i> HK
Ragged Robin	<i>Lychmis flos-cuculi</i>
Red Clover	<i>Trifolium pratense</i>
Red Fescue	<i>Festuca rubra</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Rough Meadow-grass	<i>Poa trivialis</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i>
Silverweed	<i>Potentilla anserina</i>
Soft Rush	<i>Juncus effusus</i>
Soft Shield-fern	<i>Polystichum setiferum</i>
Square-stalked St John's Wort	<i>Hypericum texrapterum</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>
Water Mint	<i>Mentha aquatica</i>
White Clover	<i>Trifolium repens</i>
Yellow Iris	<i>Iris pseudacorus</i>
Yorkshire Fog	<i>Holcus lanatus</i>

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TABLE 4. Alder wood zone plant list based on surveys in December 1997 and June 1998.

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i>
Beech	<i>Fagus sylvatica</i>
Bramble	<i>Rubus fruticosus</i> agg.
Broad Buckler-fern	<i>Dryopteris dilatata</i>
Brooklime	<i>Veronica beccabunga</i>
Clustered Dock	<i>Rumex conglomeratus</i>
Common Knapweed	<i>Centaurea nigra</i>
Common Nettle	<i>Urtica dioica</i>
Common Sorrel	<i>Rumex acetosa</i>
Common Spike-rush	<i>Eleocharis palustris</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Cuckoo Flower	<i>Cardamine pratensis</i>
Fool's Water-cress	<i>Apium nodiflorum</i>
Gorse	<i>Ulex europaeus</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>
Hard Fern	<i>Blechnum spicant</i>
Hard Rush	<i>Juncus inflexus</i>
Hedge Bindweed	<i>Calystegia sepium</i> ssp. <i>sepium</i>
Hedge Woundwort	<i>Stachys sylvatica</i>
Hemlock Water-dropwort	<i>Oenanthe crocata</i> (rare)
Honeysuckle	<i>Lonicera perelymenum</i>
Ivy	<i>Hedera helix</i> ssp. <i>helix</i>
Jointed-rush	<i>Juncus articulatus</i>
Marsh Bedstraw	<i>Galium palustre</i>
Marsh Thistle	<i>Cirsium palustre</i>
Marsh Woundwort	<i>Stachys palustris</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Privet	<i>Ligustrum vulgare</i>
Ragged Robin	<i>Lychnis flos-cuculi</i>
Red Fescue	<i>Festuca rubra</i>
Remote Sedge	<i>Carex remota</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Rusty Willow	<i>Salix cinerea</i> ssp. <i>oleifolia</i>
Self-heal	<i>Prunella vulgaris</i>
Soft Rush	<i>Juncus effusus</i>
Soft Shield-fern	<i>Polystichum setiferum</i>
Water Mint	<i>Mentha aquatica</i>
Wood Dock	<i>Rumex sanguineus</i>
Yellow Iris	<i>Iris pseudacorus</i>
Yorkshire Fog	<i>Holcus lanatus</i>

TABLE 5. South-east corner of marsh plant list based on August 1997 survey (RPS Cairns, 1997c). (UM = upper marsh, BS = backing scrubwood, W = weed introductions, S = stream, N = naturalised; * = additional species recorded June 1998.)

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i> BS
Autumn Hawkbit	<i>Leontodon autumnalis</i>
Bristle Club-rush	<i>Isolepis setacea</i>
Brookweed	<i>Samolus valerandii</i>
Cat's-ear	<i>Hypochaeris radicata</i>
Chaffweed	<i>Anagallis minima</i> *
Clustered Dock	<i>Rumex conglomeratus</i>

Common Name	Scientific Name
Clustered Rush	<i>Juncus conglomeratus</i> UM
Common Couch	<i>Elytrigia repens</i>
Common Sedge	<i>Carex nigra</i> *
Common Sorrel	<i>Rumex acetosa</i>
Common Spike-rush	<i>Eleocharis palustris</i>
Common Yellow Sedge	<i>Carex viridula</i> ssp. <i>oedocarpa</i> *
Corn Mint	<i>Mentha arvensis</i> UM
Creeping Bent	<i>Agrostis stolonifera</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Creeping Thistle	<i>Cirsium arvense</i> W
Curled Dock	<i>Rumex crispus</i> UM
Dotted Sedge	<i>Carex punctata</i>
False Fox-sedge	<i>Carex otrubae</i>
False Oat-grass	<i>Arrhenatherum elatius</i> UM
Floating Sweet-grass	<i>Glyceria fluitans</i> S
Fool's Water-cress	<i>Apium nodiflorum</i> S
Frog Rush	<i>Juncus ambiguus</i> *
Glaucous Sedge	<i>Carex flacca</i> *
Gorse	<i>Ulex europaeus</i> BS
Great Willowherb	<i>Epilobium hirsutum</i> UM
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>
Greater Reedmace	<i>Typha latifolia</i> S
Grey Club-rush	<i>Schoenus tabernaemontani</i>
Gypsywort	<i>Lycopus europaeus</i> UM
Hard Rush	<i>Juncus inflexus</i> UM
Hemlock Water-dropwort	<i>Oenanthe crocata</i> S
Hemp-agrimony	<i>Eupatorium cannabinum</i> UM
Hoary Willowherb	<i>Epilobium parviflorum</i>
Honeysuckle	<i>Conoclinium periclymenum</i> BS
Hybrid Creeping Cinquefoil	<i>Potentilla x mixta</i> (= <i>P. anglica</i> x <i>P. reptans</i>)
Jointed Rush	<i>Juncus articulatus</i>
Lesser Hawkbit	<i>Leontodon saxatile</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Marsh Bedstraw	<i>Galium palustre</i>
Marsh Pennywort	<i>Hydrocotyle vulgaris</i>
Marsh Thistle	<i>Cirsium palustre</i> UM
Marsh Willowherb	<i>Epilobium palustre</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Meadowsweet	<i>Filipendula ulmaria</i> UM
Montbretia	<i>Crocsmia x crocosmiiflora</i> N/UM
Oval Sedge	<i>Carex ovalis</i>
Perennial Sow-thistle	<i>Sonchus arvensis</i> UM
Red Bartsia	<i>Odontites verna</i>
Red Fescue	<i>Festuca rubra</i>
Remote Sedge	<i>Carex remota</i>
Rusty Willow	<i>Salix cinerea</i> ssp. <i>oleifolia</i> BS
Sea Aster	<i>Aster tripolium</i>
Sea Club-rush	<i>Bolboschoenus maritimus</i>
Sea Mayweed	<i>Tripleurospermum maritimum</i>
Self-heal	<i>Prunella vulgaris</i>
Sharp-flowered Rush	<i>Juncus acutiflorus</i> UM
Short-fruited Willowherb	<i>Epilobium obscurum</i>
Silverweed	<i>Potentilla anserina</i>
Slender Club-rush	<i>Isolepis cernua</i> *
Soft Rush	<i>Juncus effusus</i> UM
Spear-leaved Orache	<i>Atriplex prostrata</i>
Square-stalked St. John's Wort	<i>Hypericum tetrapterum</i>
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i> UM
Tufted Forget-me-not	<i>Myosotis laxa</i>

Common Name	Scientific Name
Tufted Vetch	<i>Vicia cracca</i> UM
Water Figwort	<i>Scrophularia auriculata</i> UM/S
Water Mint	<i>Mentha aquatica</i>
Water-cress	<i>Rorippa nasturtium-aquaticum</i> agg. S
Wild Carrot	<i>Daucus carota</i>
Yellow Bartsia	<i>Parantucellia viscosa</i>
Yellow Iris	<i>Iris pseudacorus</i> UM
Yorkshire Fog	<i>Holcus lanatus</i>

TABLE 6. Scientific names of plant species mentioned in the text, not listed in Tables 1-5.

Common Name	Scientific Name
Borrer's Saltmarsh-grass	<i>Puccinellia fasciculata</i>
Pink-Flowered Hedge Bindweed	<i>Calystegia sepium</i> ssp. <i>roseata</i>

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APPENDIX C3

(see section 7)

Birds

This Appendix lists the available waterfowl counts for the Bandon Estuary and Kinsale Marsh. Counts marked with an asterisk exceed the levels for national importance. Lists of species recorded within the treatment works site and along the pipeline routes are also provided.

1984/85 to 1986/87

Sheppard (1993) lists mean annual peak counts (based on eight counts over two seasons) for the winters 1984/85 to 1986/87. These counts are for the whole Bandon Estuary and are shown in Table 1.

TABLE 1. Mean annual peak counts for the Bandon Estuary 1984/85 to 1986/87.

Species	Count
Cormorant	57
Grey Heron	21
Shelduck	70
Wigeon	47
Teal	50
Mallard	259
Oystercatcher	256
Golden Plover	81
Lapwing	665
Dunlin	198
Black-tailed Godwit	*88
Curlew	591
Redshank	*264

1991/1992

Collins (1992) lists monthly maximum counts (based on 134 counts) for Kinsale Marsh. These are shown in Table 2 and Table 3.

1996

Three counts of Kinsale Marsh were carried out as part of a previous study (RPS Cairns, 1996). These are shown in Table 4. On 18 November, the water level was low with small amounts of mud remaining exposed at high tide. On 27 November, the water level was high, and the entire marsh was flooded even at low tide.

On 27 November, 63 Snipe were flushed from the northern compartment and from the eastern shore (only part of the former section was walked). Therefore, given the extent of suitable habitat which was not covered, a total population of at least 100 birds seems a reasonable estimate.

TABLE 2. Monthly maxima figures for main species of waders and waterfowl utilising Kinsale Marsh.

Bird Species	1992												
	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Grey Heron	10	17	8	14	8	5	2	2	0	3	5	9	4
Shelduck	7	2	0	0	9	5	23	24	30	28	77	28	8
Wigeon	0	0	6	16	121	24	2	1	4	11	0	0	0
Teal	0	26	110	64	95	31	34	33	25	17	9	4	4
Mallard	10	7	50	5	26	16	5	0	1	2	1	1	13
Oystercatcher	215	456	*725	300	300	160	110	114	135	78	102	65	118
Lapwing	7	5	61	335	800	1,000	1,500	1,600	0	0	0	5	2
Dunlin	1	38	287	225	200	440	280	345	3	6	5	1	3
Black-tailed Godwit	*134	*410	*450	*350	*375	25	*116	0	*100	*181	*206	*133	*80
Bar-tailed Godwit	2	4	15	15	5	50	40	51	0	3	2	1	3
Curlew	179	381	*1,000	*1,000	300	*1,000	*1,000	444	108	69	28	75	64
Redshank	131	150	200	*275	100	70	10	12	55	32	2	121	148
Greenshank	19	28	34	44	7	4	3	3	6	5	5	11	29
Black-headed Gull	400	550	200	220	140	75	60	37	1	17	177	129	186
Lesser Black-backed Gull	2	20	2	0	7	0	0	15	1	11	2	3	2
Herring Gull	6	3	5	1	3	0	0	9	0	23	9	10	5
Great Black-backed Gull	49	59	42	0	3	1	2	7	1	6	14	26	31

From Collins (1992).

TABLE 3. Other waterfowl recorded at Kinsale Marsh in 1991/1992.

Species	No. Recorded	Month Recorded
Little Grebe	Max. 5	October-December
Ringed Plover	Max. 9	September-October
Pacific Golden Plover	Single	October
Golden Plover	Max. 122	January-February
Grey Plover	Max. 4	September-November, April, July
Knot	Max. 4	August-October
Little Stint	Singles	August-October
Curlew Sandpiper	Max. 6	September-October
Ruff	Max. 3	Occasional throughout winter
Snipe	Max. 18	September-April
Whimbrel	Max. 27	Autumn and Spring
Spotted Redshank	Max. 6	July-December, February, April
Lesser Yellowlegs	Singles	October and May
Wood Sandpiper	Single	August
Common Sandpiper	Max. 7	July-August
Ring-billed Gull	Singles	August-October
Kittiwake	Singles	July and February
Sandwich Tern	Max. 9	July-September, April
Common Tern	Max. 2	July-August

From Collins (1992).

TABLE 4. Waterfowl counts in Kinsale Marsh, November 1996. The low tide count is divided into birds on the marsh and birds on the adjacent mudflat south of the road causeway.

Species	18 November		27 November		27 November
	High Tide	Low Tide		High Tide	
		Marsh	Mudflat		
Little Grebe	3	4	0	4	
Cormorant	0	1	0	0	
Grey Heron	6	12	1	0	
Mute Swan	2	2	4	11	
Mallard	20	30	0	2	
Teal	28	10	0	34	
Oystercatcher	4	0	6	72	
Lapwing	14	240	240	21	
Dunlin	560	1	24	320	
Black-tailed Godwit	*110	0	0	3	
Curlew	4	0	4	28	
Redshank	8	0	11	210	
Greenshank	2	0	1	17	
Black-headed Gull	450	8	8	1	
Common Gull	5	0	0	63	
Herring Gull	0	0	0	0	
Great Black-backed Gull	0	0	1	0	
Kingfisher	0	1	2	0	
		1	0	0	

From RPS Cairns (1996).

1997

A low tide count of Kinsale Marsh and the adjoining mudflat south of the road causeway was made on 12 December 1997. This is shown in Table 5. An annotated list of species recorded in the treatment works site and along the pipeline routes is provided in Table 6.

TABLE 5. Low tide waterfowl count of Kinsale Marsh, 12 December 1997.

Species	Kinsale Marsh				Total
	Western Lagoon	Eastern Lagoon	Swamp/Fields	Bandon Mudflat	
Little Grebe	0	2	0	0	2
Grey Heron	1	1	7	1	10
Shelduck	0	3	0	4	7
Teal	0	15	2	0	17
Mallard	3	16	0	8	27
Water Rail	0	0	2	0	2
Moorhen	1	0	3	0	4
Oystercatcher	2	10	83	4	99
Lapwing	440	22	0	28	490
Dunlin	610	0	0	0	610
Ruff	0	1	0	0	1
Snipe	NA	NA	12	0	NA
Woodcock	0	0	1	0	1
Black-tailed Godwit	44	39	0	2	85*
Curlew	42	12	36	2	92
Greenshank	3	0	0	0	3
Redshank	28	13	0	6	47
Black-headed Gull	32	80	0	15	127
Common Gull	1	0	0	0	1
Herring Gull	0	7	0	0	7
Great Black-backed Gull	0	1	5	0	6

TABLE 6. Bird species recorded in the treatment works site and along the pipeline routes on 6 June 1998.

Species	Treatment Works	Outfall pipeline	Storm and foul sewer pipeline
Grey Heron	0	*	1
Mallard	0	0	8
Moorhen	0	*	0
Woodpigeon	0	*	*
Skylark	*	0	0
Meadow Pipit	*	*	*
Pied Wagtail	0	0	*
Duncock	*	0	*
Robin	*	*	*
Wren	0	*	*
Stonechat	0	0	*
Blackbird	*	*	*
Song Thrush	0	0	*
Sedge Warbler	0	*	*
Blue Tit	*	*	*
Great Tit	*	0	*
Hooded Crow	*	0	*
Chaffinch	*	0	*
Greenfinch	0	0	*
Linnet	*	0	0
Reed Bunting	0	*	0
Yellowhammer	0	0	*

TABLE 7. Scientific names of bird species.

Common Name	Scientific Name
American Golden Plover	<i>Pluvialis dominica</i>
Blackbird	<i>Turdus merula</i>
Black-headed Gull	<i>Larus ridibundus</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Blue Tit	<i>Parus caeruleus</i>
Blue-winged Teal	<i>Anas discors</i>
Chaffinch	<i>Fringilla coelebs</i>
Common Gull	<i>Larus canus</i>
Common Sandpiper	<i>Actitis hypoleucos</i>
Common Tern	<i>Sterna hirundo</i>
Cormorant	<i>Phalacrocorax carbo</i>
Curlew	<i>Numenius arquata</i>
Curlew Sandpiper	<i>Calidris ferruginea</i>
Dunlin	<i>Calidris alpina</i>
Dunnock	<i>Prunella modularis</i>
Golden Plover	<i>Pluvialis apricaria</i>
Grasshopper Warbler	<i>Locustella naevia</i>
Great Black-backed Gull	<i>Larus major</i>
Greenshank	<i>Tringa nebularia</i>
Grey Heron	<i>Ardea cinerea</i>
Grey Plover	<i>Pluvialis squatarola</i>
Herring Gull	<i>Larus argentatus</i>
Hooded Crow	<i>Corvus corone</i>
Kingfisher	<i>Alcedo atthis</i>
Kittiwake	<i>Rissa tridactyla</i>
Knot	<i>Calidris canutus</i>
Lapwing	<i>Vanellus vanellus</i>
Least Sandpiper	<i>Calidris minutilla</i>
Lesser Black-backed Gull	<i>Larus fuscus</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Little Grebe	<i>Tachybaptus ruficollis</i>
Little Stint	<i>Calidris minuta</i>
Mallard	<i>Anas platyrhynchos</i>
Meadow Pipit	<i>Anthus pratensis</i>
Moorhen	<i>Gallinula chloropus</i>
Mute Swan	<i>Cygnus olor</i>
Oystercatcher	<i>Haematopus ostralegus</i>
Pacific Golden Plover	<i>Pluvialis fulva</i>
Pied Wagtail	<i>Motacilla alba</i>
Raven	<i>Corvus frugilegus</i>
Redpoll	<i>Carduelis flammea</i>
Redshank	<i>Tringa totanus</i>
Reed Bunting	<i>Emberiza schoenbaenus</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Ringed Plover	<i>Charadrius hiaticula</i>
Robin	<i>Erithacus rubecula</i>
Ruff	<i>Philomachus pugnax</i>
Sandwich Tern	<i>Sterna sandvicensis</i>
Sedge Warbler	<i>Acrocephalus choenbaenus</i>
Shelduck	<i>Tadorna tadorna</i>
Siskin	<i>Carduelis spinus</i>
Skylark	<i>Alauda arvensis</i>
Snipe	<i>Gallinago gallinago</i>
Spotted Redshank	<i>Tringa erythropus</i>
Teal	<i>Anas crecca</i>
Water Rail	<i>Rallus aquaticus</i>
Whimbrel	<i>Numenius phaeopus</i>
Wigeon	<i>Anas penelope</i>

Common Name	Scientific Name
Wilson's Phalarope	<i>Phalaropus tricolor</i>
Woodcock	<i>Scolopax rusticola</i>
Woodpigeon	<i>Columba palumbus</i>
Wood Sandpiper	<i>Tringa glareola</i>
Wren	<i>Troglodytes troglodytes</i>
Yellowhammer	<i>Emberiza citrinella</i>

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APPENDIX C4
(see section 7)

Scientific Names of Mammals Mentioned in the Text

Common Name	Scientific Name
Badger	<i>Meles meles</i>
Fox	<i>Vulpes vulpes</i>
Hedgehog	<i>Erinaceus europaeus</i>
Otter	<i>Lutra lutra</i>
Pygmy Shrew	<i>Sorex minutus</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Brown Rat	<i>Rattus norvegicus</i>
Woodmouse	<i>Apodemus sylvaticus</i>

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APPENDIX C5

(see section 7)

Definitions of Impact Terminology

The following terminology is used to describe impacts:

Type of Impact

- Positive impact: A change to the ecology of the affected site which enhances the ecological value of the area.
- Negative impact: A change to the ecology of the affected site which reduces the ecological value of the area.

Magnitude of Impact

- No change: No discernible change in the ecology of the affected site.
- Imperceptible Impact: A change in the ecology of the affected site which affects the ecological value of the affected site but without noticeable consequences to the ecological value of the wider area.
- Slight Impact: A change in the ecology of the affected site which has noticeable consequences to the ecological value of the wider area, but these consequences are not considered to significantly affect species or habitats of conservation importance.
- Moderate Impact: A change in the ecology of the affected site which has noticeable consequences to the ecological value of the wider area and these consequences are considered to significantly affect species or habitats of conservation importance.
- Substantial Impact: A change in the ecology of the affected site which has noticeable consequences to the ecological value of the wider area. These consequences are considered to significantly affect species or habitats of high conservation importance and to potentially affect the overall viability of those species or habitats in the wider area.
- Profound Impact: A change in the ecology of the affected site which has noticeable consequences to the ecological value of the wider area. These consequences are considered to be such that the overall viability of species or habitats of high conservation importance in the wider area is under a very high degree of threat (negative impact) or is likely to increase markedly (positive impact).

APPENDIX D

(See Section 9)

Noise

Instrumentation

Modular Precision Sound Level Meter:
Bruel & Kjaer Type 2231 (serial no. 1657394)

Application Module Statistical Analyser:
Bruel & Kjaer Type 4155 (1 off).

The Sound Level Meter with Application Module BZ 7115 and Microphone Type 4155 fulfils the following:

IEC 651 - 1979 Type 1
IEC 804 - 1985 Type 1
ANSI S1.4 - 1983 Type 1

Acoustic Calibrator:
Bruel & Kjaer Type 4230 (serial no. 635320)

Calibration was carried out in accordance with the manufacturer's instructions both before and after the sampling period to ensure accuracy of results.

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Measurements

SET-UP

Module #: 15 (BZ 7115)

Mic. Corr: +0.4 dB

Pr. Time: 00:15:00

Tone W.: F

Frequency W.: A

Rg. (dB) 20.4-93.4

Record	Date	Time	MAXP	MACL	L(01)	L(10)	L(50)	L(90)	L(99)	MINL	LEQ	SEL
Causeway Adjacent to Proposed Site, Kinsale												
0004	15.11.93	22:54:03	95.0	73.2	55.9	47.9	41.4	38.9	37.4	36.7	46.3	75.7
0005	15.11.93	23:09:03	78.4	59.3	51.4	45.4	41.4	39.4	38.4	37.3	43.1	72.5
Harbour Heights, Kinsale												
0006	15.11.93	23:50:40	87.6	68.5	58.9	50.4	44.9	41.9	39.9	38.4	48.2	77.7
0007	16.11.93	00:05:40	77.7	64.5	54.9	49.9	44.4	40.9	38.9	36.7	46.7	76.2
16 m From Source, Bandon Sewage Works												
0008	16.11.93	00:41:16	66.6	53.4	54.4	52.4	51.4	50.9	50.4	50.2	51.5	64.9
0009	16.11.93	00:42:53	65.8	54.3	53.9	52.9	51.4	50.9	50.4	49.9	51.7	66.8
35 mm From Source, Bandon Sewage Works Downwind												
0010	16.11.93	00:44:12	66.0	54.0	53.9	52.9	51.9	51.4	50.4	50.3	52.2	64.2
0011	16.11.93	00:46:02	67.8	53.7	53.9	52.9	51.4	50.4	49.9	50.0	51.5	59.3
0012	16.11.93	00:53:43	73.1	56.2	55.9	54.4	53.4	52.4	51.4	51.2	53.4	67.5
0013	16.11.93	00:55:30	70.8	54.5	54.4	53.9	53.4	52.9	52.4	52.2	53.3	62.8
0014	16.11.93	00:58:09	70.2	55.1	54.9	54.4	53.4	52.4	51.9	51.8	53.4	69.4
38 mm From Source, Bandon Sewage Works Upwind												
0015	16.11.93	01:00:06	66.3	55.0	54.4	49.9	46.4	44.9	44.4	44.3	47.4	60.1
0016	16.11.93	01:00:17	60.6	47.5	47.4	46.9	45.9	45.4	44.9	44.7	45.8	53.6
0017	16.11.93	01:00:25	59.8	46.8	46.9	46.4	45.9	45.4	44.9	44.9	45.8	54.8
0018	16.11.93	01:00:36	62.0	50.8	50.9	47.9	45.9	45.4	44.9	44.5	46.6	57.0
0019	16.11.93	01:01:22	77.0	50.1	48.9	46.9	45.4	44.4	43.9	43.7	45.5	57.3
0020	16.11.93	01:01:32	68.6	51.9	51.4	49.4	45.9	44.9	44.4	44.4	46.8	56.8
Causeway Adjacent to Proposed Site, Kinsale												
0021	16.11.93	11:13:50	92.0	82.9	65.9	49.4	41.4	38.4	36.9	36.1	52.8	82.3
0022	16.11.93	11:28:50	87.9	72.3	67.4	50.4	42.9	40.4	36.4	38.4	52.6	82.0
Harbour Heights, Kinsale												
0023	16.11.93	12:00:54	89.4	69.3	66.9	56.9	48.9	43.4	41.4	39.4	54.3	83.4
0024	16.11.93	12:15:54	85.9	70.6	61.09	54.4	47.4	43.4	41.4	39.8	51.6	81.1
16 mm From Source, Bandon Sewage Works												
0025	16.11.93	14:35:54	71.3	55.6	55.4	54.4	43.9	52.9	52.4	52.0	53.8	62.8
0026	16.11.93	14:37:01	67.7	55.8	55.4	54.9	53.9	52.9	52.4	52.2	53.8	63.8
0027	16.11.93	14:39:19	68.2	56.3	56.4	54.4	52.4	51.9	51.4	51.3	52.7	62.7

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BS 5228 - Prediction of Site Noise to Noise-sensitive Areas

Description of Source Noise	Kinsale WWTP (proposed)
Position of Activity (S)	Carousel Pumps
Dist. Of Meas. Pod. (M)	35 metres
Location of Receiver ®	MP1 Farm West of Proposed Site
Distance from (S) to ®	400 metres
Laeq at (M)	53 (Measured Downwind)
Lw	92
(S) to ® m	400
Dist. Corr.	-60
Laeq	32
Barrier Correction	0*
Refl. If applicable	0
Duration Correction 100%	0
Predicted Laeq @ Receiver ®	32

BS 5228 - Prediction of Site Noise to Noise-sensitive Areas

Description of Source Noise	Kinsale WWTP (proposed)
Position of Activity (S)	Carousel Pumps
Dist. Of Meas. Pod. (M)	35 metres
Location of Receiver ®	MP2 Harbour Heights
Distance from (S) to ®	400 metres
Laeq at (M)	53 (Measured Downwind)
Lw	92
(S) to ® m	400
Dist. Corr.	-60
L _{aeq}	32
Barrier Correction	0*
Refl. If applicable	0
Duration Correction 100%	0
Predicted Laeq @ Receiver ®	32

BS 5228 - Prediction of Site Noise to Noise-sensitive Areas

Description of Source Noise	Kinsale WWTP (proposed)
Position of Activity (S)	Carousel Pumps
Dist. Of Meas. Pod. (M)	35 metres
Location of Receiver ®	MP3 Farm North of Proposed Site
Distance from (S) to ®	125 metres
Laeq at (M)	53 (Measured Downwind)
Lw	92
(S) to ® m	125
Dist. Corr.	-50
Laeq	42
Barrier Correction	0*
Refl. If applicable	0
Duration Correction 100%	0
Predicted Laeq @ Receiver ®	42

APPENDIX E

(See Section 10)

Cultural Heritage - Site Descriptions

Note: All the descriptions given below are from the Archaeological Inventory of County Cork – Volume 2, East and South Cork.(1994) or from the files of the Cork Archaeological Survey.

CO111:72 TISAXON MORE

OS 111:12:4 (0730,0161) Bullán (1939). OD 100-200 16150,5150

Bullaun stone: In pasture on south-facing slope. No visible surface trace due to field clearance. Not shown on 1842 and 1902 OS maps.

CO111:73/01 TISAXON MORE

OS 111:16:1 (0715,0101) fulachta fian (1939). OD 50-100 16132,5079

Fulacht fiadh: In marshy ground on south side of stream. Spread of burnt material now grass covered. Second fulacht fiadh (CO111-07302-) c. 30 m to the east.

CO111:73/02 TISAXON MORE

OS 111:16:1 (0726,098) fulachta fian (1939). OD 50-100 16145,5076

Fulacht fiadh: In marshy ground on south side of stream. Low mound of burnt material, now grass-covered. Second fulacht fiadh (CO111-07302-) c. 30 m to the west.

CO111:74 TISAXON BEG

OS 111:16:1 (0730,098) fulacht fian (1939). OD 0-50 16149,5076

Fulacht fiadh: In tillage, c. 80 m from north bank of Bandon River. Spread of burnt material (18.5 m N-S; 16.3 m E-W).

CO111:75/01 TISAXON BEG

OS 111:16:4 (0763,037) Grave Yd. (1939). OD 0-50 16187,5004

Graveyard: At north side of road, on west side of Whitecastle creek; sub-rectangular graveyard (c. 70 m E-W; c. 40 m N-S) enclosed by stone wall to west and south and elsewhere by stone-faced earthen bank. In occasional use. Earliest inscribed headstone dated 1740 (Henchion 1970, 143-57). Near northwest corner, roofless sub-rectangular ruin (4.35 m E-W; 3.75 m N-S) named 'Watch House' on 1939 OS map; erected between 1792 and 1842 according to Henchion (ibid,156); lintelled door in south wall, windows in south and west wall, fireplace in west wall (see plan and elevations, ibid, 157). No visible surface trace of Tisaxon parish church which was in ruins by 1615 (Brunnicardi 1913, 75).

CO111:75/02 TISAXON BEG

OS 111:16:1 (0764,0105) OD 16188,5084

Cemetery watchman's hut.

CO111:76 CAPPAGH

OS 111:16:1 (0763,0107) Not shown. OD 50-100 16188,5086

Fulacht fiadh: In tillage, on west-facing slope overlooking Whitecastle Creek. Spread of burnt material (16 m N-S; 9 m E-W); stream to south.

CO112:30 RATHBEG

OS 112:9:5 (083,0157) Indicated (1934). OD 100-200 16362,5123

Workhouse: Indicated on 1842 OS map within rectangular enclosure. Gatehouse/warden's house survives on east side, three-bay, one-storey with dormer windows flanked by shallow gabled one-bay, two-storey wings back and front. Adorned with decorative bargeboards and lattice windows. Date stone 1841. Now used as offices. Central accommodation block no longer survives. Infirmary at rear survives as long (23-bay), two-storey gable-ended block; now functions as hospital. Remains of connecting east-west range between accommodation block and infirmary projects from central east elevation of infirmary. Part of enclosing stone wall survives. Burial ground (CO112-03201-) indicated on 1902 OS map to the south.

CO112:32/01 RATHBEG

OS 112:13:1 (076,0144) Burial Gd. (Disused) (1934). OD 200-300 16355,5110

Burial ground: Beside road c. 250 m southwest of Union workhouse (CO112-030---). Not shown

CO112:32/02 RATHBEG

OS 112:13:2 (078,0140) Not shown. OD 200-300 16357,5106

Circular enclosure: In pasture, on level ground, overlooking Kinsale Harbour to the south. Circular area (c. 61 m NE-SW) defined by undulation N-WSW. Penannular soil mark visible in aerial photograph (AP, Dr DDC Pochin Mould).

CO112:33/01 ABBEYLANDS

OS 112:13:1 (070,0100) Abbey Well (1934). OD 100-200 16348,5064

Holy well: In housing estate, short distance north of Carmelite friary (CO-112-03303-) and similarly dedicated to St Mary; possibly supplied water to the friary (Gillan and Hurley 1978, 33). Approached by pathway between houses. Circular well (diam. 0.65 m; H 0.72 m) cut into rock face and enclosed by semi-circular stone wall at rear; concrete step forms front and retains water flow. Thought locally to be associated with early Christian foundation of St Multose (CO11-085---).

CO112:33/02 ABBEYLANDS

OS 112:13:1 (072,096) Graveyard (1934). OD 100-200 16350,5059

Graveyard: Short distance northwest of town walls of Kinsale; surrounding ruins of Carmelite friary (CO112-03303-). In occasional use; many family tombs. Headstones date from 18th century. Holy well nearby (CO112-03301-).

CO112:33/03 ABBEYLANDS

OS 112:13:1 (072,096) Abbey (in ruins) (1934). OD 100-200 16350,5059

Friary: In centre of graveyard (CO112-03302-); St. Mary's Carmelite priory, founded by Robert fitz Richard Balrain in 1334; in 1541 jurors reported the existence of 'church with belfry, cloister, hall and other buildings' (Gwynn and Hadcock 1988, 290). Extensively damaged in 1601 during siege of Kinsale; temporary chapel erected 1633 but abandoned 1653 (Gillan and Hurley 1978, 33); convent 'was existing c. 1737' (Gwynn and Hadcock *ibid*) and the Prior made Town almoner in 1741 (Mulcahy 1968, 12). A 'few fragmentary walls' (Garner 1980, 36) survive.

CO112:34/01 TOWNPLOTS

OS 112:13:2 (0100,086) Kinsale (1934). OD 50-100 16380,5049

Historic town: On or near site of early christian monastery (CO112-085--); established as trading post by Vikings (Jefferies 1986, 34) and settled by Anglo-Normans c. 1200 (Garner 1980, 1). Received first charter relatively late in 1333-4; murage grant to repair town walls in 1348 (CO112-03402-); market grant of 1226 seems to confirm presence of town at that date (Thomas 1992, 138). Town was 'of little importance throughout the medieval period' (Garner *ibid*) but featured in siege during Battle of Kinsale in 1601 (Mulcahy 1968, 54-67). Town's defences strengthened in 17th century by construction of James Fort (CO112-036---) in 1604 and Charles Fort in 1670 (CO125-007---), but taken by Williamite forces in 1690 (Mulcahy *ibid*, 30) when much damage done to town walls. The town continued to grow and prosper to some extent in 18th and 19th centuries, with a heavy reliance on the fishing industry (Gillan and Hurley 1978, 11).

CO112:34/02 TOWNPLOTS /ABBEYLANDS

OS 112:13:1 (076,086) Town Wall (1934). OD 50-100 16355,5049

Town wall: Town of Kinsale given first charter in 1333-4 which states that 'the walls are ruinous, and the burgesses not able to repair them'; possibly walled from mid-13th century; murage grant to repair walls in 1348 (Thomas 1992,138). Walls probably battlemented with internal rampart, external fosse, c.15 towers; four gates and internal gate Upper town, two in Base town (Thomas *ibid*). Damaged during Battle of Kinsale in 1601 (Mulcahy 1968, 17); according to Lewis (1837, vol. 2, 234), town walls largely destroyed during siege of 1690, though subject to some repairs in 18th century (McSwiney 1938, 82-5 & 92-3). Three remaining gates removed by 1805 (Lewis *ibid*). McSwiney (*ibid*, 81) traces layout of walls which enclosed what Bradley (1985, 452) describes as 'forked-linear' street pattern. Thomas (*ibid*) suggests that walling of Base town, which continues linear pattern to southeast, may be later, possibly late 16th century. At most, only fragmentary remains of town's defences survive above ground level (McSwiney *ibid*, 92); according to Thomas (*ibid*, 137) 'much of N wall survives in reduced form as a field boundary ... no other remains'.

CO112:34/03 TOWNPLOTS

OS 112:13:1 (076,096) St. John's Catholic Church (1934). OD 50 16355,5059

Roman Catholic Church: Church of St. John the Baptist. T-plan barn-church with wide nave and transepts dating from 1830s. Well-composed classical facade of ashlar limestone; superb tripartite Corinthian reredos in interior (Garner 1980, 7-9).

CO112:34/04 TOWNPLOTS

OS 112:13:2 (088,080) G. Yd. (1934). OD 50-100 16367,5042

Graveyard: Roughly oval graveyard (c. 80 m E-W; c. 60 m N-S) surrounding St. Multose Church (CO112-03405-), enclosed by high stone wall; however 1842 OS map shows graveyard largely unenclosed. Gate has 'fine piers of channelled ashlar' (Garner 1980, 13) of late 18th century date with 'particularly handsome' wrought-iron gates. Contains many 'dog-kennel' mausoleums; one large early 18th century mausoleum with 'cornice, cemented walls and slated roof' (*ibid*). Grave slab on Webb vault near south wall dated 1582 (Darling 1895, 29); altar tomb against south wall dated 1670 (*ibid*, 41); numerous other vaults, chest tombs and uninscribed headstones. In occasional use.

CO112:34/05 TOWNPLOTS

OS 112:13:2 (092,081) Church (1842). OD 50-100 16371,5043

Church: In Kinsale; Church of Ireland parish church of St. Multose, 'one of the few medieval parish churches in Ireland still in use' (Leask 1966, vol. 2, 149-50). Rectangular

nave and chancel, once separated by a chancel arch taken down in 1730 (Darling 1895, 16). Nave aisled; north aisle continues to near end of chancel; transept to north in line with easternmost bay of nave. Tower rises over west end of north aisle. On south side of nave aisle, fragmentary remains of 16th century 'Galway Chapel'. Though much altered, church remains, according to Leask (ibid) 'in extent and plan, as when first built in the early thirteenth century'. He dates this early phase 'on the evidence of one transitional pointed window-head' (ibid), rebuilt over door in north wall of tower. However, group of three lancets in west wall are 'apparently of mid-century (i.e. 13th) date', otherwise the windows are 'less certainly dateable'. Church much altered 1730 and again 1759-60, but major renovations, including replacing north nave and chancel arcade and complete re-roofing, took place 1835-7; 'sweeping alterations' again made 1856-8 (Darling ibid, 16-9). Chancel given new ceiling in 1951 (Garner 1980, 11).

During re-flooring of nave in 1858 many 'stone coffins' were found 'made of two flags placed parallel, with one at head and another at feet; a series of thin slabs over all for a cover'; burials were thought to be 'ecclesiastics' from the 'ornaments found with some of them' (Darling ibid, 19-20).

Other items of interest include rectangular font with spiral shaft; statue of cleric with pastoral staff in niche over west door. Church also contains an interesting collection of 16th, 17th and 18th century grave slabs, memorials and plaques (Darling ibid, 27-43; Garner ibid, 12); including tombstone of Jacobus Galwey dated 1627 (rubbing Caulfield & Darling 1895-7, facing 47); tombstone of William Galwey dated 1628 (rubbing ibid, facing 46); and monuments to Katherine Percival (dated 1682) and Robert and Helena Southwell (dated 1679), this latter has 'an unusual sarcophagus surmounted by an urn' (Potterton 1975, 90).

CO112:34/06 TOWNPLOTS

OS 112:13:2 (097,096) Gaol (1842). OD 50-100 16376,5059

Urban tower house: On northwest side of Cork Street, three-storey tower house built as town residence by Fitzgerald family, whose arms are over the door, hence sometimes known as 'Desmond Castle' (Healy 1988, 247; Gillan and Hurley 1978, 29). Apparently owned by a William Baines in 1581 (Coleman 1912, 133), but functioned as magazine in 1601 (Gillan and Hurley ibid); subsequently used as prison for foreign captives (hence sometimes known as the 'French Prison'), many of whom died in fire of 1747 (O'Sullivan 1905, 10); borough jail 1791-1846; declared national monument in 1938 and restored by OPW. Photograph (Coleman 1912, opp. p 133) shows gable over second floor facing street, now replaced by battlements; other recent repairs include removal of rendering and replacement of missing mullions as well as blocking of ground floor windows. Central ground floor door with pointed arch, hood moulding with floriated stops; door may be an insertion (Harbison 1977, 58). Two central first floor windows with ogee heads (cusped to left) divided by mullion and transome; similar windows, but with rounded arches, set at corner angles. Single central window at second floor level, rectangular light divided by mullion and transome. All lights have hood mouldings overhead. String course between ground and first floors.

CO112:34/07 TOWNPLOTS

OS 112:13:2 (0101,086) Court House (1934). OD 0-50 16381,5048

Market House: Built c. 1600 as market house, originally accessible by water (Bence-Jones 1970, 295). Altered in 1706 for use as court house; five-bay, two-storey with attic; ground floor arcading with outer arches blocked; weather-slatted first floor with central

venetian window; attic storey of three weather-slatted curvilinear gables (Garner 1980, 16). Similar to the Exchange in Youghal, as depicted by Dineley in 1681 (Beharrel 1977, 181). Now Kinsale Museum.

CO112:34/08 DROMDERRIG

OS 112:13:5 (0112,050) Almshouses. OD 100-200 16392,5011

Almshouse: Known as Southwell Gift Houses. Built 1682 by Sir Robert Southwell for eight old people. A three-bay, two-storey gable-ended house flanked by rows of single-storey houses with dormer windows. Restored in recent years (Garner 1980, 69).

CO112:35 WATERS-LAND SOUTH

OS 112:13:3 (0165,0110) Indicated (1842). OD 100 16448,5073

Enclosure: In garden, on south-facing slope. Depicted as semi-circular enclosure on 1842 OS map. No visible surface trace.

CO112:36 OLD-FORT

OS 112:13:6 (0180,06) James's Fort (in ruins) (1934). OD 50-100 16463,4963

Star-Shaped Fort: On highest part of promontory which projects on west side of Kinsale harbour. Map of 1587 (Hayes-McCoy 1964, 25) shows tower named 'Castle Parks' here which was 'a small structure of no great strength' (ibid); this was occupied and further strengthened by Spanish in 1601 (O'Sullivan 1916, 47). After Battle of Kinsale work began, in February 1602, on 'pentagonal bastioned work designed by Paul Ives' (Kerrigan 1980, 15) but not completed until October 1604 (Hayes-McCoy 1964, 33) at cost of £675 (O'Sullivan 1916, 99). In need of repairs by 1611 when defences improved and inner fort built (Gowen 1979, 257); repaired again in 1677 (ibid, 257-9). Besieged by Williamite forces in 1690 but easily overcome (Kerrigan 1980, 15; Gowen 1979, 259). Defences described in detail by Gowen (ibid, 259-63): five earthen bastions on angles of a pentagon, linked by straight curtain walls, enclose an area c. 100 m x c. 120 m. External ditch evident on west, north and east sides (max. width 15 m). Landward bastions (to southwest) larger than other three; part of stone facing survives on this side. Mid-way along south curtain are remains of gate-house and revetment for drawbridge. Centrally placed within is square fort, enclosing area c. 30 m x c. 40 m, with demi-bastions on each corner. Wall pierced by gun loops and backed by earthen banks. Inside are two diametrically opposed towers with gun loops, between which are three gabled buildings forming a quadrangle. From ditch at northeast corner of inner fort, covered way leads to vaulted sally port beside northeast bastion of outer fort, then northeast to blockhouse (CO112-083—) on shoreline. Fort is a national monument (no. 525) in state guardianship.

CO112:58 DROMDERRIG

OS 112:13:5 (0135,033) Indicated (1934). OD 50-100 16457,5006

Custom House: Built in early 18th century as Custom House. House of L-shaped plan with five bay, two-storey front; central three bays form shallow breakfront. Gibbs surround to round-headed front doorcase. Two bays added to left with archway at ground level. Interior has 'good eighteenth-century, raised fielded-panel shutters', shouldered architraves and panelling (Garner 1980, 60-1).

CO112:60 CAPPAGH

OS 112:13:4 (023,051) OD 16298,5012

Potential site - documentation.

CO112:61 SCILLY

OS 112:13:5 (0137,065) Not shown. OD 0-50 16419,5026

Fish Palace: Went (1946, 140) records site of pilchard press at Scilly in Kinsale. No visible surface trace. 1842 OS map shows two parallel rectangular structures (long axes NE-SW) in area known locally as "the palace"; ruined residential structure may be remains of these. Immediately to southwest, ruined rectangular two-storey, 11-bay structure (long axis N-S) to SW, date plaque inscribed "1840", is known locally as "fish factory".

CO112:77 CAPPAGH

OS 112:13:4 (016,055) Not shown. OD 50-100 16337,5029

Bee Boles: In east-facing stone wall to southwest of two-storey, 19th century house. Twelve identical bee boles arranged in groups of four, each group separated by pilaster. Arched recess; straight ingoings with rounded back (H 0.59 m; Wth 0.62 m; D 0.44 m), 0.55 m above present ground level; prominent voussoirs. Tower (CO112-083---) to the east.

CO112:78 TOWNPLOTS

OS 112:13:2 (086,081) Not shown. OD 50-100 16366,5044

Possible Early Ecclesiastical Enclosure: Moastery founded in Kinsale by St. M'Eilte Oge (Multose) in 6th century (Gwynn and Hadcock 1988, 396). No standing early christian remains survive but roughly oval plan of St. Multose graveyard (CO112-03404-) and circular surrounding streets suggest possible fossilisation of monastic precinct. See also CO112-085---.

CO112:79 OLD-FORT

OS 112:0: (00,00) Not shown. OD 0-50 0,0

Shell Midden: Recorded by Coleman (1916, 182-3) as 'on the north side of the promontory on which stands the Old Spanish fort (Jamesfort) (CO112-036---). No visible surface trace.

CO112:82 BALLYNACUBBY URBAN

OS 112:13:4 (077,071) Not shown. OD 50-100 16399,5045

Burial Ground: Uncovered c. 1978 during building of housing estate on southwest side of Kinsale, just outside, and to west of, town walls (CO112-034---). Excavation revealed c. 40 skeletons laid out in single interments in separate grave pits c. 0.4 m-0.6 m below ground level; orientation east-west; clear rows observed. No coffins used. Arms extended, hands crossed over the genital region. No signs of church or associated structures located. Ring on finger of one skeleton dates site to 16th-17th century (personal communication, J. Barber).

CO112:83 OLD-FORT

OS 112:13:6 (0205,021) Blockhouse (in ruins) (1934). OD 0-50 16527,4994

Block House: At northeast tip of Castlepark promontory in Kinsale harbour; approached from west by covered way from James' Fort (CO112-036---). Built on rock outcrop just above high-tide mark. Roofless ruin, modified in recent times when used as 'store for fish boxes' (O'Sullivan 1916, 100). Covered way leads to downward sloping ramp passing between two rectangular structures and through wide doorway onto level platform (17.8 m E-W; 17 m N-S), enclosed by straight walls to north, south and west and by three-sided wall to east. Ground floor wall pierced by series of double splayed opes, all modified recently to take window frames; first floor wall added in recent times. Double splayed opes probably gun ports. In northwest corner passage leads to domed magazine (6.1 m E-W; 4.6 m N-S), approached through small ante chamber. In north wall of passage splayed and lintelled ope with narrow vertical slit, according to O'Neil (1940, 112) 'probable that this opening is for

cannon' and dated by him to 16th century. In southwest corner rock-cut passage with rock-cut stairs rises to platform (c. 4 m E-W; c. 3.5 m N-S) overlooking buildings. On north side of ramp two-storey structure (int. 3.45 m N-S; 3.6 m E-W) with fireplace in west wall on both floors; gun loops in north and south walls at first floor level. To south of ramp similar structure with one floor, at higher level; also fireplace in west wall. According to O'Neil (1940, 113), earliest part of structure 16th century, but O'Sullivan (1916, 99) gives 1604 account for construction of James Fort which includes £50 for 'Blockhouse at the point of the land'. Shown on 1625 map (Hayes-McCoy 1964, 33) and clearly depicted in Phillips's 'prospect' of 1685 (Kerrigan 1977-9). Whatever its date, structure appears to be remains of shore-level battery of at least eight guns, with a magazine and accommodation as part of complex.

Overlooking blockhouse, c. 80 m to WSW, rectangular gable-ended structure (7.3 m N-S; 10.5 m E-W), roofless but walls stand to full height and partially ivy-clad. Central door in east wall, approached through round-arched porch; flanked by windows with attic window overhead. Side walls blank. Central fireplace in west wall covered by segmental brick arch; rectangular stack overhead, unusually, four angled flues feed into stack but features from which they fed gone or ruined. Kerrigan (1980, 15) suggests may be remains of tower built 1654-6 and shown on Phillips's 'prospect' of 1685, however, depicted on prospect as tall square tower unlike present structure. Arrangement of flues suggests some system for smoking fish; according to local information used for curing fish (personal communication, Eugene Gillen).

CO112:84 CAPPAGH

OS 112:13:4 (031,067) 'Tower' (1934). OD 50-100 16352,5041

Ornamental Tower: Overgrown two-storey tower, to southeast of 19th century house. Rectangular in plan with pointed door on north side. Bee boles (CO112-077---) to west.

CO112:85 ABBEYLANDS

OS 112:13:1 (074,088) Not shown. OD 50-100 16396,5062

Possible Early Ecclesiastical Enclosure: In pasture, on southeast-facing slope. Located directly outside site of west wall of medieval town of Kinsale (CO112-03402- and CO112-03401-). According to local information (personal communication, E. Gillen) site of early ecclesiastical settlement of St. Multose founded in the 6th century (Gwynn and Hadcock 1988, 396). No visible surface trace. It is also possible that site is that now occupied by St Multose' Church (CO112-03404-).

CO112:87 WATERS-LAND NORTH

OS 112:0: (00,00) Not shown. OD 0,0

Possible Leper Hospital: According to Lee (1966, 19) 'Tobar na Lobhar (the well of the Lepers)' is traditionally believed to be the place where lepers lived, 'using the water of the well'. Exact location not known.

CO112:88 CAMPHILL

OS 112:0: (00,00) Not shown. OD 0,0

Leper Hospital: According to O'Donoghue (1986, 165) townland also known as 'Spital Hills' since here was a leper hospital'. On plan of Battle of Kinsale, hill to north of town, called 'The Spittle Hill' (Lee 1966, 19). Exact location not known.

CO112:89 DROMDERRIG

OS 112:13:5 (0102,022) Not shown. OD 200-300 16424,4995

Mound: In pasture, atop east-west ridge known as Compass Hill, overlooking Kinsale to northeast. Low, roughly circular mound (15 m N-S; 16 m E-W; H 0.5 m); very faint depression on northeast side (with c. 15 m; running c. 40 m to field fence). Marked as 'the mound upon the Hill' on 1601 map (O'Neil 1940, facing 111); used as observation post and firing platform by Spanish during siege of Kinsale in 1601. O'Neil (ibid) suggests this 'appears to be a round barrow' but current visible form too eroded to identify original form.

CO112:90 CAPPAGH

OS 112:13:1 (06,096) Not shown. OD 200-300 16327,5070

Military Fortification: On 2 October 1601, Spanish force occupied Kinsale town; by 4 November English force occupying high ground around town to begin siege which lasted to 12 January 1602; Irish force defeated by English at Battle of Kinsale on 3 January (Mulcahy 1968, 54-67). Contemporary plans (O'Neil 1940, plate 8; Hayes-McCoy 1964, plate 13) show siege works and batteries erected by English on high ground around town; these appear to have taken the form of rectangular earthwork entrenchments with corner bastions. O'Neil's (ibid, 114) survey of these siege works found traces only of 'Sr. Jaratt's Horseis' Sconce ... some 210 yards WSW of Cappagh House ... most of its outline is just traceable as a hollow in the fields on each side of the road and its eastern bastion exists as a formless lump in the field. It seems to have been 90 to 100 yards square.' This area now in pasture with no visible trace of features described by O'Neil, some c. 250 m further west on north side of road is field known as 'Camp Field' but again no visible trace of fortifications. On high ground to north of town small townland of Camphill location of main English camp; again no visible trace of fortifications.

CO112:91 TOWNPLOTS

OS 112:13:2 (093,093) OD 16372,5056

Market Cross: Site included in Urban Archaeological Survey of County Cork (1995).

CO112:92 TOWNPLOTS

OS 112:13:2 (094,086) OD 16374,5049

Market Cross: Site included in Urban Archaeological Survey of County Cork (1995).

CO112:93 DROMDERRIG

OS 112:13:5 (0118,046) OD 16399,5007

Armorial Stone: Site included in Urban Archaeological Survey of County Cork (1995). Located on rear wall of Town Hall.

CO112:94 RATHMORE

OS 112:13:2 (093,0108) OD 16373,5072

Church: Site included in Urban Archaeological Survey of County Cork (1995).

CO124:19 KILNACLOONA

OS 124:4:2 (0821,0540) Hachured (1902). OD 200-300 16164,4890

Ringfort: In pasture, on north-facing slope, overlooking Bandon River. Shown as circular enclosure on 1842 OS map; indicated as semi-circular enclosure SSE->NNW on later ed. Site interior (38.6 m N-S; 33.9 m E-W) defined by denuded earth and stone bank (ext. H 1.9 m), very low to east. Slight trace of fosse. Interior slopes gently to east. According to local information, second bank (H c. 1 m) and intervening fosse (D c. 3 m) removed c. 1978-9. No visible surface trace.

CO125:1 CASTLELANDS

OS 125:1:5 (082,0519) Ringrone Castle (in ruins) (1935). OD 100-200 16348,4868
Tower House: On slight eminence, overlooking Bandon River to north. Only west wall (L 7.5 m) and short return of north wall (L c. 1.5 m) stand, to second floor level. Skewbacks visible for vaults (on N-S axis) over ground and second floor levels. Indications of ground floor door at west end of north wall; central flat-headed window ope in west wall at first floor level; wall press at north end of west wall at second floor level. In Grose's (Stalley 1991, 46) early 19th century depiction, castle shown as ruinous; pointed arch doorway on ground floor of north wall; three storeys with central opes above this, one a slit window, other two broken. Built by de Courcey family (Healy 1988, 286-7).

CO125:2/01 CASTLELANDS

OS 125:1:5 (088,0514) Church (in ruins) (1935). OD 100-200 16355,4862
Church of Ireland Church: Near north end of graveyard (CO125-00202-), roofless ruins of rectangular church (17.4 m E-W; 8.3 m N-S); missing points of gables, side walls in poor repair (Coleman 1912, facing p. 82). Entered by central door in west gable, ope now covered by segmental arch but original (wooden?) lintel gone. Lit by two windows each in north and south walls and central window in east gable. Very plain gabled building depicted here by Grose (Stalley 1991, 46) in early 19th century; according to Brady (1863, vol. 1, 244) 'built about 1780'. Ruins appear to date from this time; abandoned 1844 when new church built nearby. On site of ancient parish church of Ringrone of which there is no visible surface trace.

CO125:2/02 CASTLELANDS

OS 125:1:5 (087,0516) Indicated (1935). OD 100-200 16354,4864
Graveyard: On north side of road, overlooking estuary of Bandon River to north. Rectangular graveyard (c. 70 m NW-SE; c. 60 m NE-SW) enclosed by stonewall; still in use. 'There are two or three large built-up tombs here, including that of the De Courceys, Lords Kinsale' (Coleman 1913-16e, 437); also memorial erected by Bullen family in 1726 consisting of 'Coat-of-Arms above an incised inscription, in a frame over a box tomb' (Westropp 1913-16, 242 & facing photo); earliest headstones date from late 18th century. Near north end ruins of Church of Ireland church (CO125-00201-) on site of ancient parish church of Ringrone.

CO125:3 CASTLELANDS

OS 125:1:2 (094,0531) Lady's Well (1935). OD 0-100 16362,4881
Holy Well: In pasture, on north-facing slope. Enclosed by brick wall; used as cattle trough. Ringrone castle (in ruins) (CO125-001---) nearby.

CO125:4 CASTLE-PARK

OS 125:1:6 (0194,0488) Knockroe (1935). OD 100-200 16467,4836
Settlement Cluster: Named 'Knockroe' on 1842 OS map, now abandoned. Only three out of approximately seven houses remain, one in ruins. All are one-storey, mud built, gable-ended, with single end chimney of brick. Top of wall, gable with chimney and ope surrounds are stone built. One has slate roof, other of corrugated iron.

CO125:5 CASTLE-PARK

OS 125:1:3 (0166,0591) Not shown. OD 0-50 16437,4945

Fulacht Fiadh: According to local information, stone lined trough of fulacht fiadh uncovered during construction of housing estate. No visible surface trace.

CO125:6 OLD-FORT

OS 125:1:3 (0180,0604) OD 16451,4959

Star-Shaped Fort: Same site as 112:28.

CO125:7 FORTHILL

OS 125:2:1 (0266,0588) Charles Fort (in ruins) (1935). OD 0-100 16542,4942

Star-Shaped Fort: On east shore of Kinsale Harbour, facing James Fort (CO112-036---); bastioned star-shaped fort, about 10 acres in extent. Built on site of Ringcurran Castle 1678-83; designed by architect William Robinson. Overlooked to landward; weakness exposed by besieging Williamite forces in 1690 when garrison surrendered after 13 day siege. Irregular polygon in plan; three bastions face inland (Cockpit, Flagstaff and North); two demi-bastions on shoreline. Bastions linked by massive masonry ramparts (H c. 14 m); along shoreline outer ramparts form second tier of gun batteries; Orrery's battery to south forms a third tier. Outside ramparts to landward dry moat, covered way and sloping glacis of which little survives. Central landward bastion largest and once served as citadel of fort. Most of the gun embrasures survive though many have been altered or enlarged. Entrance gateway between Flagstaff and North bastions erected in 18th century - original destroyed in 1690 siege. Bastions and ramparts are basically unchanged since 17th century; interior much altered as fort functioned as military barracks throughout 18th and 19th centuries when officers' quarters, soldiers' quarters, governor's house, guard house etc built inside fort. Seventeenth century vaulted magazine and diagonal blast wall survive, as well as part of inward-facing ramparts of citadel. Since 1973 OPW have carried out repairs; fort now a National Monument (No.), open to the public. (Kerrigan 1977-9, 323-8; Gowen 1979, 237-46; Anon 1988)