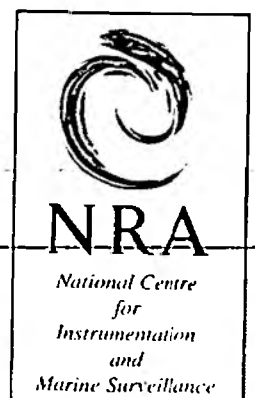


Market Testing Of Coastal Survey Vessels

Final Report to Project Board

16 November 1995



MARKET TESTING OF COASTAL SURVEY VESSELS

1. Introduction

1.1 The NRA timetabled the market testing of its coastal survey vessels in 1994/95 and a paper to EG and the Board in October 1994 concluded that there was no reason to discontinue the market testing exercise. However, the paper did identify further work that needed to be undertaken before a business risk analysis and the preferred option for the vessels could be completed. This project aims to address these further issues and present the business case for the preferred market testing option to EG and the Board.

1.2 It must be emphasised that it is the work being carried out by the Coastal Survey Vessels that is being reviewed, not the complete range of coastal monitoring activities undertaken by the NRA. While a formal Marine Monitoring Strategy addressing the Authority's business needs has been produced and agreed by the regions, it was accepted that there were some issues which remained unresolved and which required further work. Amongst these was how the national marine baseline survey and other estuary and coastal water monitoring could be merged to provide optimal delivery of the Authority's requirements.

1.3 Accordingly, a contract was let to carry out a review of the data from the baseline surveys of 1993 and 1994. This reviewed both the quality of the data from the various sources (spot sampling, on board analysis, continuous on track monitoring and remote sensing) and how they meet the business needs defined in the Marine Monitoring Strategy. The contractors (Smith Associates) were briefed by HQ staff, given access to all the data held by the National Centre for Instrumentation and Marine Surveillance in the South Western Region and reported in July 1995. The report was presented to the Water Quality Monitoring Group and the recommendations are being incorporated into the national marine monitoring and surveillance programme.

2. Profile of Current Service

2.1 Current Work Programme

2.1.1 In the NRA marine monitoring and surveillance activities are carried out in a variety of ways. Some of the work is carried out by Coastal Survey Vessels, some by smaller boats, some by helicopter and some by using contracted vessels. At present there is a lack of consistency between one region and another.

2.1.2 An exercise was therefore carried out to compile a national workplan of all of the NRA's coastal and marine monitoring activities. This involved all of the NRA regions and the work was collated as follows:

- i) by boat type
- ii) by region
- iii) by need.



2.1.6 Workplan Analysis

Criteria

The workplan was analysed to determine the suitability of vessel type for any given survey/survey area.

It was assumed that Regions with ready access to a full range of NRA boats make a sensible choice according to work type, location, manpower availability and qualifications etc. Interest was concentrated on the Regions without Coastal Survey Vessels to determine the extent to which such vessels might be used for the existing monitoring workplan were they readily available.

The circumstances which may favour use of Coastal Survey Vessels are the following:

- Coastal water work
- Work in exposed estuaries eg Thames, Severn
- Benthic work
- Work that could be incorporated into baseline runs/coastal passages
- Any of the above work currently undertaken by contracted in vessels.

In addition to the Marine Monitoring workplan, support information was gained from telephone conversations with Operational Scientist/Survey Officers. The following represents a synopsis of relevant observations:

This analysis revealed that there is a scope for growth of the Coastal Survey Vessels workload by integrating some of the monitoring for the EU Dangerous Substances Directive into the surveillance work, particularly in the Southern and Thames regions. If the NRA wished to maximise the use of its vessels then there is also scope for some of the work presently being carried out by chartered vessels to be incorporated into the Coastal Survey Vessels work programme, given that it is economical to do so.

There is bias in workload of the vessels towards those regions who operate them. There is also a perception that the vessels are not readily available other than to the regions that control them.

Although regional priorities are well established there is little prioritising between the national work and regional investigations, consequently there are times when because of conflict in these priorities nationally co-ordinated work has not been carried out due to competing regional priorities.

Scope exists in obtaining greater consistency by prioritising the National and Regional work on a national basis, but this may well lead to a decrease in regional commitment to the use of the vessels if those regions currently operating the vessels sense a lack of ownership.

3.4 Cost of Capital

There are significant differences in the calculation of historic cost depreciation charged against the Coastal Survey Vessels by Regions.

The first mainly impacts on the Water Guardian costs and is due to the use of different rates of depreciation by Regions, as follows:

	Vessel (%)	Equipment (%)
North/Yorks (Water Guardian)	8.33	20
Other Regions	5.00	10-20 (depending on type)

The second disparity relates to the treatment of many items of equipment as revenue instead of capital by South Western Region. As this equipment was purchased in prior years, there is no depreciation in the current (or any future) year.

The effect of the above is set out in the following table:

DEPRECIATION	Anglian	North/Yorks	North West	South West	Total
	£'000	£'000	£'000	£'000	£'000
Current Cost	28.1	45.0	23.5	18.5	115.1
Revised Cost					
1. Standardisation of rate	34.5	31.7	23.8	23.5	113.5
2. Capitalisation of revenue items				1.5	1.5
Variance	6.4	(13.3)	0.3	6.5	(0.1)

3.5 Cost of Current Service by Key Result Area

BOAT NAME	REGION	MANDATORY	OPERATIONAL	TOTAL
		£'000	£'000	£'000
Vigilance	South Western	122.6	14.8	137.4
Coastal Guardian	North West	54.1	81.5	135.6
Water Guardian	North/Yorks	78.1	22.8	100.9
Sea Vigil	Anglian	58.2	47.0	105.2
TOTAL		313.0	166.1	479.1

Although some of these sites are in shallow estuaries many of these samples could easily be incorporated into a modified national baseline survey discussed under Surveillance Monitoring.

Detailed specification for the UK National (Marine) Monitoring Plan are set out in Appendix 5.

4.3 Surveillance Monitoring

4.3.1 Surveillance monitoring covers those activities undertaken to report on the status of the marine environment. The category of surveillance monitoring covers monitoring undertaken for national purposes whereby the NRA reports on the general status of water quality and the changes which have occurred with time. This is in accordance with the NRA Water Quality Strategy (1993) which states that the NRA will 'publish reports on all aspects of water quality on a regular basis'.

The Environment Act (1995) Section 5 (2) requires the Environment Agency to compile information enabling it to form an opinion of the general state of pollution of the environment. For the marine environment, this would be facilitated by the national marine baseline survey and the consistency of approach which would result from national prescription of monitoring and surveillance.

4.3.2 There is no coastal waters classification scheme at present. However, the NRA has undertaken national baseline coastal surveys to assess coastal water quality. These surveys provided information on coastal water quality collected by a combination of water sampling, continual on-boat measurement using the coastal survey vessels and aerial reconnaissance using a hired light aircraft.

Data derived from these activities have been reviewed by external consultants (Smith Associates) to confirm the quality of the data and make recommendations on their application to the business needs of the NRA. In addition, the data has been subject to statistical analysis to further refine the design of the survey by optimising the number and location of sampling points.

4.4 Regional Operational Requirements

This category covers all samples for the regions' local needs. The regions specify, prioritise and carry out the work directly within their own line management, within their own budget and in line with the guidelines in the Regional NRA Programme for the Monitoring of Water Quality Part 3 - "Management and Design of Regional Operational Monitoring Programmes".

5.2 The KRA's for the Coastal Survey Vessels can be summarised as:

- i) Deliver to the appropriate quality standards the statutory monitoring identified in the workplan of the Coastal Survey Vessels.
- ii) Provide information to describe the state of the coastal environment from a water quality perspective.
- iii) Obtain sufficient information to be able to describe water quality trends both seasonally and on a year to year basis.
- iv) Deliver the regional operational requirements for marine monitoring and benthic sampling according to an agreed annual programme.

5.3 These will need to be modified when the national marine monitoring and surveillance programme has been drafted and any changes brought about by the Environment Agency are known.

6. Assessment of Options

6.1 The following market testing options have been identified:

- i) Do nothing option: ie stop work and do not carry out any of the work currently being undertaken by the survey vessels. We would need to ensure that all of the essential statutory work continues using alternative boats.
- ii) No change option: ie reflects the status quo, carrying out the present workload or that later identified in the national marine monitoring and surveillance programme. This option would be based upon the current regionally based management of the vessels.
- iii) Efficiency review option: this option examines the possible efficiency improvements that might result by bringing the vessels together and operated as an integrated fleet with central management. This would involve separation of client and contractor at the national level with customers at Head Office, Regions and Areas.
- iv) Franchising option: based upon the workload identified in option ii) above, the NRA could retain control of assets but franchise out the operation of the vessels. This option could look at franchising the vessels both individually and as one fleet. However, to obtain some consistency in both service and operation it is recommended to review franchising the vessels as one fleet. This option would only address the operation, service and maintenance of the vessels and would not look at franchising arrangements for scientific staff.

7.2 Each option was assessed in this manner and is summarised in the matrix below:

Factor ()	Do nothing	No change	Regional	National	Franchise	Market Test
Business Needs (5)	5 (25)	2 (10)	1 (5)	1 (5)	2 (10)	2 (10)
Value for Money (5)	5 (25)	5 (25)	3 (15)	2 (10)	2 (10)	1 (5)
Improved Quality (3)	5 (15)	5 (15)	2 (6)	1 (3)	3 (9)	3 (9)
Propriety (3)	1 (3)	1 (3)	1 (3)	1 (3)	2 (6)	2 (6)
Staff Employment (2)	5 (10)	1 (2)	2 (4)	3 (6)	5 (10)	5 (10)
H&S (5)	1 (5)	2 (10)	2 (10)	1 (5)	2 (10)	2 (10)
TOTALS	83	65	43	32	55	50
Index	259	203	134	100	172	156
Ranking	6	5	2	1	4	3

There has been much discussion of the matrix with different opinions on the weighting of the various factors. However, each opinion favours overall the efficiency review.

8. The External Market

8.1 Coastal Survey Vessel Sampling capability

The coastal survey vessels have been designed to collect a full range of samples from the marine environment and are capable of collecting all the samples currently required for NRA marine monitoring activities. The vessels are all equipped to the same standard and the sampling capability of the Coastal Survey Vessels is summarised below:

- i) Spot chemical and sediment grab samples for laboratory analysis;
- ii) Grab samples for benthic community analysis;
- iii) Trawl samples for fish population analysis;

9.3 The no change option would mean continuation of the unequal availability and perceived unequal use of the CSVs across different regions and little central control of their activities. Improved inter-regional liaison could reduce these difficulties but the non boat operating regions would still not perceive themselves to be equal participants. There would be no development of a user/supplier relationship.

9.4 Several factors lead to reservations over franchising or market testing the marine monitoring activities of the coastal survey vessels at the present time. These are:

- i) The business risk analysis favours an efficiency review.
- ii) Uncertainty as to the future workload. The national marine monitoring and surveillance plan which is being derived from the Marine Monitoring Strategy, the review of existing programmes and the available data is not complete and therefore its full effect cannot yet be assessed.
- iii) The precise requirements of the Environment Agency for data from the marine environment is not yet known. The duty under Section 5 of the Environment Act 1995 may result in its requirements being different to those of the NRA.
- iv) The external market is fragmented and unable to meet all the perceived future needs for marine monitoring and surveillance.

9.5 The business risk analysis favours an efficiency review of the operation of the CSVs. Those presently operating the vessels favour an efficiency review considering the vessels under regional control. It is an option with a number of advantages :

- i) Minimum operational disturbance - no change in reporting, line management and support systems therefore no need to set up new systems.
- ii) Regional operation of the CSVs would retain direct links with specialist regional staff thus the use of staff on board only when required and on other duties at other times.
- iii) It facilitates effective liaison with regional users such as staff in Areas and thus maintains utilisation of the vessels.
- iv) The efficiency review shows that it might be possible to make savings of the order of £38,000 with this option.

The option also has some disadvantages:

- i) It is difficult to introduce clear client/provider splits.

equipment on board and the equipment would be unlikely to remain fully functional and reliable with a succession of different users. Therefore staff would have to be identified for each vessel. Because they may only spend a fraction of their time on board the vessels at present, it may be difficult to achieve a corresponding saving in the regions.

- iii) National control of the CSV fleet is likely to lead to loss of regional identity which might result in a loss of regional commitment to their use. This would need to be addressed by means of SLAs with the regions which would underpin commitment to the use of the vessels.
- iv) Because of the additional staff requirements for management and a permanent crew member, this option would be likely to result in an increase of costs of about £40,000 per annum.

9.7 The advantages and disadvantages of the efficiency reviews of regional and national operation lead to consideration of an additional option which attempts to maximise the advantages and minimise the disadvantages of the options above.

This hybrid efficiency review has advantages i to iii of the regional option and i to iii of the national fleet option.

Importantly, it minimises the impact on staff numbers by restricting the size of the national unit and seeking to avoid duplication between the national unit and the regional units.

9.8 In the hybrid review, the following national role in the management of the CSVs is provided by the National Centre:

- i) Direction, control, prioritising and programming of national mandatory work derived from the present review of the Marine Monitoring Strategy. The budget for this work being held by the National Centre.
- ii) Prioritising and coordination of regional bids for marine work so as to produce a single coordinated national programme with pre-costed contracts between clients and the boat operators.
- iii) Drawing up SLAs between users and the whole fleet as a National Service.
- iv) Quality assurance of the all the activities of the vessels.
- v) Setting targets for marine work.
- vi) Auditing marine work in relation to NRA Codes of Practice, the MSA and the NRA guidelines (Management and Design of Regional Operational Programmes).

Appendix 1

Work Type and Vessel Type Totals for each Region

TOTALS							
WORK ACTIVITY				BOAT TYPE			
Region	Mandatory	Reg Ops	Other	I	II	III	C
Southern	442	27	515	15	342	398	252
North/York	189	35	80	275	9	61	0
Welsh	96	243	856	0	284	850	61
Anglian	136	194	108	212	20	177	33
Thames	111	61.6	131	146	94	64	0
S/Trent	12	24	36	0	0	72	0
South West	770	24	1199	166	294	1527	85
North West	221	133	138	219	86	161	30
Totals	1979	741	3063	1033	1129	3310	461

Region		Mandatory	Reg Ops	Total
South West	Vigilance	149	18	167
	Contract	0	6	6
North West	Coastal Guardian	81	122	203
	Contract	0	26	26
Southern	Sea Ranger	77	62	13
	Contract	239	5	243
North/York	Water Guardian	46	121	167
	Northumbrian Rivers	0	82	82
Anglian	Sea Vigil	55	143	198
	Contract	0	24	24
Thames	Thames Guardian	13	135	148

Summary of Utilisation all Coastal Survey Vessels 1995 (to date)

Surveys included

1995	1	2	3	4	5	6	7	8	9	10	11								
Month	Stat- utory	Surveil- lance	Regional Operational Requirements	Income Generating Work	PR	Survey Preparation/ Calibration	Bad Weather	Anchor/ Passage/ Standby	Essential Maint- enance	General & Other Duties	Leave etc	Total Hours	Monthly Hours	Total Survey	Unpro- ductive Survey	% Util excl bad weather)	% Util (Incl bad weather)	% Util (excl bad weather & AP/S)	% Util (incl bad weather excl AP/S)
Jan-95	21	99	121	30	8	80	38	23	114	156	75	760	504	415	38	74.8	82.4	70.3	77.8
Feb-95	71	227	54	16	29	41	171	83	81	72	0	808	456	655	171	106.1	143.7	88.0	125.6
Mar-95	84	136	204	99	0	31	180	26	109	93	4	966	504	760	180	115.0	150.7	109.8	145.5
Apr-95	62	98	108	46	0	59	0	22	137	159	90	776	488	391	0	80.0	80.0	75.6	75.6
May-95	16	266	75	86	7	68	23	57	123	204	68	891	504	597	23	114.0	118.5	102.8	107.2
Jun-95	73	149	226	65	22	54	45	68	88	118	96	1002	488	700	45	134.2	143.4	120.4	129.6
Jul-95	100	337	107	94	43	108	74	101	109	75	0	1136	504	952	74	174.3	188.9	154.3	168.9
Aug-95	0	0	0	0	0	0	0	0	0	0	0	0	504	0	0	0.0	0.0	0.0	0.0
Sep-95	0	0	0	0	0	0	0	0	0	0	0	0	488	0	0	0.0	0.0	0.0	0.0
Oct-95	0	0	0	0	0	0	0	0	0	0	0	0	504	0	0	0.0	0.0	0.0	0.0
Nov-95	0	0	0	0	0	0	0	0	0	0	0	0	488	0	0	0.0	0.0	0.0	0.0
Dec-95	0	0	0	0	0	0	0	0	0	0	0	0	504	0	0	0.0	0.0	0.0	0.0

Total Hours	426	1310	895	435	109	439	530	378	761	875	333	6438	5936	4470	530				
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Total Survey Time 4469.6 hrs (groups 1 to 8)
 Unproductive Survey Time 530.4 hrs (group 7)
 Productive Survey Time 3939.2 hrs (Total - Unproductive)

Monthly Mean To Date	60.8	187.2	127.9	62.2	15.6	62.8	75.8	54.0	108.7	125.0	47.6	919.7	848.0	638.5	75.8	114.1	129.7	103.0	118.6
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Values are as decimal hours

	Anglian	Northumbria & Yorkshire	North West	South Western	
	SEA VIGIL	WATER GUARDIAN	COASTAL GUARDIAN	VIGILANCE	TOTAL
FTEs	1.5	1.5	1.5	1.5	6.0
COSTS	£	£	£	£	£
SALARIES					
Direct	46,236	35,395	34,639	35,427	151,697
Superannuation & NI	5,356	4,601	3,655	4,630	18,242
Travelling & Subsistence	6,264	3,015	3,677	6,349	19,305
	57,856	43,011	41,971	46,406	189,244
EQUIPMENT, TOOLS & MATERIALS					
Vessel & navigation equipment	1,164	8,000		2,100	11,264
Safety equipment				500	500
Other equipment	2,548		4,993		7,541
Fuel	3,416	5,000	4,500	6,000	18,916
Other	1,372		750	1,250	3,372
	8,500	13,000	10,243	9,850	41,593
HIRED & CONTRACTED SERVICES					
Vessel & navigation equipt. - annual refit		7,000			7,000
Vessel & navigaton equipt. - routine main	7,612	7,000	9,045	5,000	28,657
Contract vessel and/or crew	7,524			1,500	9,024
Vehicle hire	1,876				1,876
Dock dues	5,424	5,000	800	5,000	16,224
	22,436	19,000	9,845	11,500	62,781
INSURANCES					
Actual	288				288
Notional	13,052	13,483	13,733	13,500	53,768
	13,340	13,483	13,733	13,500	54,056
OTHER COSTS					
DoT inspection fees & assoc. costs	120	150	450	725	1,445
Telephone	1,952	270	250	611	3,083
Electricity	768	60		60	888
Training					0
Other	1,148		50	385	1,583
	3,988	480	750	1,781	6,999
TOTAL DIRECT COSTS	106,120	88,974	76,542	83,037	354,673
SUPPORT COSTS					
Finance	1,576	500	734	400	3,210
Administration	800	250			1,050
Personnel	336	800	202	800	2,138
Procurement	280			400	680
IT / Communications	200	60		2,000	2,260
	3,192	1,610	936	3,600	9,338
COST OF CAPITAL					
historic cost depreciation	28,064	45,003	23,469	18,557	115,093
	28,064	45,003	23,469	18,557	115,093
TOTAL COSTS	137,376	135,587	100,947	105,194	479,104

Appendix 4 Statutory Monitoring

Appendix 4.1 Bathing Water Quality Directive Sampling is undertaken by regions from shore based locations. Data from the survey vessels is potentially of use in support of water quality investigations of failure of samples to meet the Directive.

Bathing Water Quality Directive SI 1991/1597 Bathing Waters (Classification) Regulations 1991 (arising from 76/160/ECU on Bathing Water Quality)		
Mandatory determinands to be measured	Sampling location	Sampling frequency
Total Coliforms-Confirmed, Faecal Coliforms -Confirmed Salmonella., Enteroviruses, pH, Colour, Mineral Oils, Surface Active Substances reacting with Methylene Blue. Total Phenols (Phenol, 2 methyl phenol, 3 methyl phenol, 2 chloro phenol, 2,5 dichlorophenol). Transparency. Faecal Streptococci	Identified bathing waters at a point at which the daily average density of bathers is highest.	Minimum of fortnightly between 1 May and 30 September (20 samples to be taken throughout season)

Appendix 4.2 The Quality of Shellfish Waters Directive requires sampling of the water column above designated shellfish sites. The parameters measured are summarised below:

Quality of Shellfish Waters Directive 79/923/ECU Quality Required for Shellfish Waters		
Mandatory determinands to be measured	Sampling location	Sampling frequency
a) Salinity, Dissolved Oxygen Saturation b) pH, Colouration (after filtration) Suspended Solids, Petroleum Hydrocarbons c) Organohalogenated Substances (DDT, Lindane, Parathion and Dieldrin), Silver, Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc d) Substances affecting the taste of shellfish	Designated shellfish waters	a) Monthly b) Quarterly c) Once every six months d) Where presence is presumed

Some sample sites are monitored on a quarterly basis and naturally fall into the coastal surveillance programme. This might link the data set from some of the more sensitive harbours and estuaries.

Appendix 4.4 The Titanium Dioxide Directive requires that the quality of the waters receiving titanium dioxide waste be measured. Samples are required to be taken in the immediate vicinity of the discharge point and in a neighbouring zone deemed to be unaffected by the discharge

Titanium Dioxide Directive 78/176/ECU Waste from the Titanium Dioxide Industry		
82/883/ECU Procedures for Surveillance and Monitoring of Environment /concerned by Waste from the Titanium Dioxide Industry		
Mandatory determinands to be measured	Sampling locations	Sampling frequency
Water: Iron (total dissolved, hydrated oxides and hydroxides)	At the same location and depth and under the same conditions each time. One near the discharge and another in a neighbouring area deemed to be unaffected by the discharge	Once every 4 months for water samples, annually for sediments and biota
Sediment: Titanium, Iron (total hydrated oxides and hydroxides)		
Living organisms: Titanium, Chromium, Iron, Nickel, Zinc, Lead		
Diversity and relative abundance of benthic fauna; presence of morbid anatomical lesions in fish		

It is worth noting that at present only three relevant factories exist and the limited work undertaken in support of this Directive is carried out in a satisfactory manner. This has a limited impact upon this project.

Appendix 4.5 The Urban Waste Water Treatment Directive concerns the consenting and monitoring of discharges from urban waste water plants and the concomitant identification of Sensitive Areas and High Natural Dispersion Areas. Parameters to be measured and the sampling details are summarised below.

Urban Waste Water Directive 91/71/ECU Concerning Urban Waste Water Treatment		
Mandatory determinands to be measured	Sampling location	Sampling frequency
Winter nutrients: including TON, NH ³ , NO ² . Data of use in assessment of eutrophication. Percentage cover of algal growth (for areas > 10 hectares), chlorophyll-a concentration, cell counts, summer nutrients.	Sampling to be undertaken at existing points, notably those for bathing waters and shellfish waters.	In general weekly between May and September. winter nutrients: three times between December and February. Algal growth: June-August

Appendix 5 / Other Monitoring Duties

UK National (Marine) Monitoring Plan Marine Pollution Management Group (MPMMG) - UK National Monitoring Plan		
Mandatory determinands to be measured	Sampling, location	Sampling frequency
<p>Unfiltered Water: γ and α-Hexachlorocyclohexane, *β-Hexachlorocyclohexane, *Dieldrin, *Aldrin, *Endrin, *Isodrin, Hexachlorobenzene, *Hexachlorobutadiene, Pentachlorophenol, *DDT (op DDT), *Priority Hazardous Substances (Carbon Tetrachloride, Chloroform, Trifluralin, Endosulfan, Simazine, Atrazine, Azinphos-ethyl, Azinphos-methyl, Dichlorvos, Fenitrothion, Fenthion, Malathion, Parathion, Parathion-methyl, Trichloroethylene, Tetrachloroethylene, Trichlorobenzene, 1, 2-Dichloroethane, Trichloroethane) Dissolved Oxygen, Suspended Solids, Chlorophyll a, Secchi-depth, Salinity, Temperature, Oyster Embryo Bioassay</p> <p>Filtered Water Sample: Mercury, Cadmium, Copper, Lead, Nickel, Zinc, Chromium, Ammoniacal Nitrogen, Nitrate as N, Nitrite as N, Orthophosphate as P, Silicate as Si</p> <p>Total Surficial Sediment: Aluminium, Mercury Cadmium, Copper, Lead, Nickel, Arsenic, Chromium, Tributyl Tin, Polychlorinated Biphenyls, *Dieldrin, *Aldrin, *Endrin, Hexachlorobenzene, DDT (pp TDE, pp DDE, pp DDT), Oyster Embryo Bioassay</p> <p>Shellfish: Mercury, Cadmium, Lead, Zinc, Tributyl Tin. Polychlorinated Biphenyls, γ and α-Hexachlorocyclohexane, *Dieldrin, *Aldrin, *Endrin, Hexachlorobenzene, Pentachlorophenol, DDT (pp TDE, pp DDE, pp DDT), *Hexachlorobutadiene</p> <p>Fish Muscle: Mercury, Arsenic</p> <p>Fish Liver: Cadmium Lead, Polychlorinated Biphenyls, *Dieldrin, *Aldrin, Endrin, DDT (pp TDE pp DDT)</p>	<p>Sites in agreed estuaries representative of the 0-10 ppt, 10-20 ppt, 20-30 ppt, salinity ranges; agreed intermediate coastal water sites. To be decided for sediment, biological tissue and analysis and benthos after analysis of the spatial surveys</p> <p>* Estuarine sites only</p>	<p>Quarterly for water quality at estuarine sites, annually for water quality at intermediate sites; annually for sediment samples; twice per year (Winter and Summer) for oyster embryo bioassay at estuarine sites, once per year at intermediate sites; to be decided for sediment, biological after analysis and benthos after analysis of the spatial survey.</p>

Appendix 6 Review of Responses to Market Survey

Criteria used in assessing vessels suitability:

- 1) The NRA is responsible for monitoring the Coastal waters of England and Wales. For this we need an integrated monitoring system. A system capable for collecting all types of samples, water, sediment, fish, trawl, dredge and electronic data. All these have to be preserved and analysed or processed according to good analytical practice.
- 2) The NRA is responsible for the safety of all its staff. It must ensure that contractors working for it are suitably qualified, experienced and equipped to protect both themselves and NRA staff working with them.
- 3) National work will be specified in some detail in the national marine monitoring and surveillance programme. However, it would not be practicable to be prescriptive at national level in specifying regional operational work.
- 4) The vessels have to work within the law and in accordance with the NRA Marine Code of Practice. It appears that vessels which do not comply with either the law or the NRA Code of Practice have been used in some regions. There will therefore be a need to review all vessels used by the NRA to ensure their compliance. Any vessel considered in comparison to the CSVs or for use by the NRA MUST fully comply with both the law and NRA Code of Practice and be fully insured or the NRA may be open to prosecution and civil claims.
- 5) The deterrent effect. The fact that the polluters know the NRA is capable of monitoring every area under its control has had a marked effect on their activities.
- 6) The image of the NRA. The NRA has to demonstrate it carries out its duties in a manner which is both technically and professionally sound.

Review

Looking at the available survey craft, it can clearly be seen that there are a number of vessels available but none are capable of doing the whole range of tasks expected of our Coastal Survey Vessels. The NRA with its four vessels is the only organisation with a unified fleet capable of covering the whole sea area. None of the other vessels can be described as "a mature market involved in marine pollution monitoring".

The external market consists of the MOTOR VESSELS ROAGAN, PROUD SEAHORSE, GRASSHOLM and MILLBROOK SURVEYOR backed up by a selection of less suitable craft.

Individual Vessels

Vessel: Algier Rose

This is a very well found vessel built to service diving operations. The owner has covered all aspects of safety and law. The vessel would be an ideal candidate to do some of the local work now undertaken by small NRA boats (for example whalers).

Main Problems

- 1) Master not qualified to NRA code of practice levels for CSV's.
- 2) No independent generators.
- 3) Single screw.
- 4) No information on toilet discharge.
- 5) Survey cabin too small for all coastal survey work.
- 6) Fixed "A" frame extra staff required to ensure safe operation.
- 7) Wet exhaust system.
- 8) No Qubit Navigation System.
- 9) Not set up for trawl work.
- 10) No accommodation.
- 11) No piped sea water.

Vessel: Hydrotech

This vessel is typical of contract vessels of opportunity. Set up for some other task, mainly hydrographic surveys.

Main Problems

- 1) Stern deck area not suitable for grab or trawl work.
- 2) Stern deck too exposed for most jobs other than in ideal conditions.
- 3) No accommodation.
- 4) Single Screw.
- 5) No trawl winch.
- 6) Limited storage for samples.
- 7) Very small generator should be at least 20 KVA.
- 8) Direct discharge toilet.
- 9) No Qubit Navigation System.
- 10) No piped sea water.

Agua Fact

Some nice ideas we could employ or hire. They do not run any vessels of their own.

Andrews Hydrographic

Vessel: Millbrook Surveyor

A very nice vessel which has potential for coastal work.

Main Problems

- 1) Single screw.
- 2) No "A" frame aft. Only a crane which is not ideal for grab work.
- 3) Qualifications of Master not given.
- 4) Draft no good for inshore work.
- 5) Not capable of trawling.
- 6) Mess rates are three times that of the NRA vessels.
- 7) No piped sea water.

Vessel: Proud Seashore

This vessel would be ideal for coastal survey work with some modifications.

Main Problems

- 1) May have some high positioning costs.
- 2) May have delays due to bad weather on delivery.
- 3) No information on direct discharges from engines (toilets OK).
- 4) Air draft would cause some problems on east coast.
- 5) Not a shallow water vessel.
- 6) No piped sea water.

Vessel: M V Mariner

This would be too small for coastal survey work.

Main Problems

- 1) Qualifications of crew do not conform with NRA Code of Practice.
- 2) Single screw.
- 3) No information on discharges, but I have heard of a vessel of this size with dry exhausts and internal sewage systems.
- 4) No accommodation.
- 5) Very small survey cabin.
- 6) No piped sea water.

