Commercial-in-Confidence
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LYMINGTON - YARMOUTH PROPOSED NEW FERRIES

ENVIRONMENTAL APPRAISAL

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Commercial-in-Confidence

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CONTROLLED DOCUMENT

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C O N T E N T S

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1. INTRODUCTION

1.1.1 Gifford have been commissioned by Wightlink Limited to undertake an Environmental Appraisal of the potential environmental effects which could arise from the proposed introduction of new ferries on the Lymington-Yarmouth car/ passenger ferry route.

1.1.2 A press release has been issued (dated 16 October 2006) by Wightlink ferries regarding the proposed replacement of the existing ferries which are approaching the end of their working life and is included in Appendix 1. In addition commuters using the existing ferries have been briefed and meetings between the Solent Protection and Yacht clubs have been undertaken by Wightlink. In general the proposals have been well received with only minimal negative feedback to the suggested new ferries being raised by some members of the yacht clubs.

1.1.3 This report is based upon works undertaken by Gifford in 1992 for the then proposed replacement of the existing ferries. The 1992 fleet renewal did not take place but Wightlink has now advanced plans to replace the existing C Class ferries (which were operating in 1992) with new ferries, referred to throughout this report as R Class ferries.

1.1.4 A bibliography of reports and other documents used in the preparation of this report is given in Appendix 2.

2. OBJECTIVES AND SCOPE

2.1.1 The purpose of this report is to consider environmental affects associated with the ferry operation. The approach is based upon the issues identified during the 1992 Scoping Study Report (Wightlink New Ferries, Lymington to Yarmouth Route, Environmental Impact Assessment Scoping Study Report, 1992, Report Number 4771.01) relating to the introduction of larger ferries. Issues which may require more detailed study have also been highlighted.

2.1.2 The 1992 Scoping Study Report identified five issues as being of potential importance. These were:

- Ecological issues
- Dredging and navigation issues
- Planning matters
- Road traffic concerns
- Specific issues pertaining to Yarmouth

2.1.3 These issues have been reassessed and reaffirmed as the main points of importance for this study.

3. STANDARDS AND LIMITATIONS

3.1.1 This report has been prepared solely for use by Wightlink Limited. It shall not be relied upon by, or transferred to, any other party without the prior written authorisation of Gifford.

3.1.2 The findings and opinions expressed within the report are based upon information derived from a variety of different sources. Gifford believe these information sources to be reliable, however, we do not accept any liability for the accuracy or otherwise of information received from third parties.

3.1.3 It should be noted that some of the aspects considered in this study are subject to change with time. Therefore, if the proposals are delayed or postponed consideration should be given to reviewing such issues to confirm that no changes have taken place to the base data used or to relevant legislation.

4. BACKGROUND

4.1 Uses of the Lymington Estuary

4.1.1 There has been a ferry service between Lymington and the Isle of Wight since the 1830's. The present ferries have been in use since 1973 and are approaching the end of their working lives. At present the service provides approximately 22,250 sailings annually and these form part of the shipping traffic within the estuary. The ferries are considered by the Islanders to be a valued asset for the economy of West Wight, bringing tourists direct to the area, taking commuters to and from the mainland and allowing both the import and export of goods.

4.1.2 Lymington has two marinas with a total of approximately 1200 marina berths plus 240 boats ashore. In addition the Lymington Harbour Commissioners have around 700 residential boat moorings. Of these approximately 12-15 are used by active fishing boats, mostly for shellfish. Rowing and canoeing are both represented by Lymington clubs with approximately 50 members each and the Lymington, Keyhaven and District Wildfowlers and Marsh Users Association has approximately 80 members. These figures set the minimum numbers of water users along the river to which are added visting and touring vessels. There is some tension between water users and nature conservation, and between the ferries and recreational users, although the safety record is very good. There is a need to understand the competing interests if these are to exist harmoniously alongside each other.

4.1.3 The pressures for recreational use of the estuary are increasing. In recreational sailing terms the report of the Working Party of the third Solent Sailing Conference 1983 stated that the Harbour Commissioners considered the Lymington harbour to be at its capacity. There has since been a small increase in capacity and the harbour is now considered by the Harbour Master to be very close to full capacity (2007). The only opportunity to increase moorings in the future will be by reorganising existing moorings and any further increase is likely to be small. Clearly any effects of ferries on recreational craft activity will be increased if the number of smaller craft is increased.

4.1.4 Ferries operate to a speed limit of 6 knots below Harper's Post and 4 knots north of Harper's Post.

4.2 Boundary of the Study Area

4.2.1 It is important to determine the limits of the study area. This includes the area of impact both within the river environment and, in the light of the transport and environmental designation issues, to address the wider New Forest environment. The Yarmouth end of the route is not considered in detail within this report other than in section 11.

4.2.2 In the case of the littoral environment, it has been assumed that the maximum impact may be felt at low tide, although certain impacts may be felt at high water. On the basis of subjective assessment, the study has been concentrated to the lower Lymington River, south of the ferry terminal. The lower extent of the river, where any effects of the new ferries might be felt in terms of wash or drawdown, is very hard to determine and would of course be affected by the state of the tide. It would seem prudent to extend the study therefore to the limits of the mouth of the River at Lymington Bank, at which point it is considered that the effects are likely to be negligible.

4.2.3 For the purposes of this exercise the seaward limits of the study have been drawn at 50 44'.35 N. This is indicated on the Admiralty Chart 2021 of the Lymington River and shows the expansion of the sublitoral slope from the Long Reach main channel to the marsh edge. This is over 25m away from the main channel where it is thought that any effects of the proposed new ferries would be negligible. Any significant effects may be expected to occur higher up the estuary where the channel is more restricted and where there are greater numbers of moorings.

4.2.4 A copy of the chart of the estuary is provided in Figure 1 showing the study area on the Lymington side of the ferry.

5. PROPOSALS

5.1.1 It is proposed to replace the existing C class ferries, which are nearing the end of their usable life, with new R class ferries. The size and dimensions of the C and R class ferries are very similar, as outlined in Table 1, below:

Detail	Existing C Class Ferries	Proposed R Class Ferries	Difference Between Ferries
Length Over All (LOA)	58.0m	62.4m	plus 7.6%
Length At Waterline (LBP)	55.0m	56.1m	plus 2.0%
Moulded Breadth	15.2m	16.0m	plus 5.3%
Breadth At Waterline	12.2m	14.4m	plus 18.0%
Length / Beam Ration At Waterline	4.5	3.9	minus 13.3%
Draft	2.28m	2.30m	plus 0.88%
Load Displacement	850 tonnes	1500 tonnes	plus 76.5%
Displacement / Length^3 Ratio	0.00511	0.00850	plus 66.29%
Block Coefficient (CB)	0.517	0.650	plus 25.73%
Voith Schneider Propellers	2 x 16E	2 x 21G	
Combined h.p.	800hp (a)	2360hp (b)	see notes
Power / Weight Ratio (h.p. / displ.)	0.94	1.57	see notes
Maximum thrust available (tonnes) (c)	8.0	23.6	see notes
(Thrust / Displacement Ratio) x 100	0.94	1.73	see notes
Longitudinal Distanced Between Thrusters	34.5m	49.9m	plus 44.64%
Above Water Lateral Area (at loaded draft)	295m^2	544m^2	plus 84.41%
Below Water Lateral Area (at loaded draft)	125m^2	129m2	plus 3.2%
Above / Below Water Ratio	2.36	4.22	plus 78.8%
Maximum Speed	10.0kts	12.0kts	plus 20%

Table 1 – Comparison table of the existing and proposed ferry dimensions

5.1.2 Notes referred to in the table are contained in the Eagle Lyon Pope (2006) report.

5.1.3 The capacities of the ferries in terms of vehicles are similar; the new ferries would carry fewer vehicles than the existing ferries were originally designed for and approximately half the number of foot passengers, as outlined in Table 2, below:

	Capacity per vessel	
	Existing C class vessel	**Proposed R class vessel**
Passenger	700 (500 in practice)	350
Car units	72-76 (48 in practice)	65

Table 2 – Comparison of the capacity of the C and R class ferries

5.1.4 A scale diagram showing the existing and proposed vessels is contained in Figure 2.

5.1.5 It is understood that no changes are needed to the ferry terminal and dock at either Lymington or Yarmouth in order to service the proposed R class ferry other than minor works to the link span and passenger access to facilitate integration of shore infrastructure and the improved safety requirements of the new vessels.

6. STUDY METHODOLOGY

6.0.1 As indicated in Section 4.1 the ferry service is well established and has a long history. The issues therefore have to be considered in terms of comparison between measurable effects of the present operation and those that could occur following the replacement of the existing ferries. Some general and background information has been given to set the scene with regard to the current situation.

6.1 Consultees

6.1.1 Consultation has been undertaken with the following people and bodies:

- Wightlink management and ferry masters
- The Lymington Harbour Master on behalf of the Lymington Harbour Commissioners
- Mr Chris Hill of the Geodata Institute to obtain an up to date scientific opinion on the state of saltmarsh and mudflat recession across the Solent.

6.1.2 Further literature and information searches have been conducted using internet resources:

- Natural England
- The Solent Forum
- Hampshire and Isle of Wight Naturalists Trust
- Hampshire and Isle of Wight Wildlife Trust
- Magic Maps

7. SALTMARSH AND ECOLOGICAL ISSUES

7.1 Introduction

7.1.1 This environmental appraisal has considered the existing environment and the proposals as currently defined in order to provide an assessment of the potential implications on the estuarine system within the Lymington Estuary. Consultation was undertaken with the Nature Conservancy Council (now Natural England) and the Hampshire and Isle of Wight Naturalists Trust as part of the 1992 study. This has been augmented by further research into the existing designations and policies, which are currently present in the area.

7.2 Overview of the Lymington Estuary

7.2.1 The Lymington Estuary is approximately three kilometres long from the Toll bridge below the Lymington reed beds to the mouth of the estuary. The main river can be dredged although it has been indicated (Lymington Harbour Master) that the main channel is no longer dredged on a regular basis as the wash of the ferries maintains it at a suitable depth. However, other areas are dredged; the Berthon Marina and Lymington Yacht Haven have been dredged annually since 2002. A joint licence exists between the two marinas and Lymington Harbour Commissioners allowing 30,000m^3 per year to be dredged in total. It is understood that the only capital dredging to have taken place near the channel since the 1992 studies has been upstream of Harpers Post. This was undertaken to provide more channel space for the ferries and more yacht pontoons to the river side of the Yacht Haven wave screen. The navigation channels can therefore be regarded as being the same for both this, and the 1992, studies.

7.2.2 The dredging requirements for Lymington are approximately 30,000m^3 per annum. This material is all deposited by tidal action therefore there is no alluvial deposit. LHC has a view that the dredging requirement is partly due to agitation of the river banks by speeding vessels, including the Wightlink ferries. LHC have further noted that the increased water prism above Harpers Post has helped reduce the wash effect of ferries, which navigate at the 4 knot speed limit.

7.2.3 The socio-economic character of the estuary is a mixture of recreational boating, the upper western end is urban and the lower estuarine area is rural. Additional to the intensive recreational boating activity there is a small fishing fleet of around 15 boats which is reported to dredge for shellfish, largely *Mercenaria mercenaria* clams outside the Lymington Estuary. Certain traditional activities, such as wildfowl shooting, are conducted along the marsh edges and creeks, which may conflict with the nature conservation interests in causing disturbance. These activities are however closely managed and regulated and the unofficial access to the marshes appears to be of greater concern. The extent of bait digging in the area is not known but it is likely that this occurs and produces at least local disturbance, even if the reduction in the infaunal populations is considered insignificant.

7.2.4 Only below the ferry quay are the banks substantially natural or semi-natural, with the upper estuary being largely embanked or walled. South of the ferry terminal and, excluding the area of the marinas, the boundary is largely composed of mudflats backed by saltmarsh vegetation with transition to terrestrial communities beyond the upper marsh. Many of the seaward edges of the marsh have ridges of shell, sand and shingle.

7.3 Existing Marsh Quality and Geomorphology

7.3.1 The marsh would appear to have an eroding edge with a cliffed frontage over much of the area. The typical profile of such marsh edges consists of a more or less gently sloping subtidal to lower intertidal slope backed by steep and variable slope of up to 1 metre. The top of the marsh

is usually dominated by algae or has seasonal growth of glasswort, especially where *Spartina* has been lost or shows poor growth. Generally, in areas which are experiencing erosion the *Spartina* is only established further back on marshes. The marsh and associated mudflats are dissected by a number of creeks systems and the surface of the marsh is extensively broken by pan areas where the vegetation cover has been broken. Additionally some of the marsh edge has accumulated mixed shingle, shell and sand ridges.

7.3.2 Changes in the extent of the marsh are widely accepted as being, at least in part, due to natural changes in the ability of the mud flats to support the primary species that promoted sedimentation. Such successional changes are typical of natural communities though the factors of forcing such changes are uncertain. A number of theories have been advanced for the considerable die-back witnessed along this and similar coastlines and may be related to the changes in the marsh levels in relation to the tidal levels, the soil aerobic status, plant vigour and quality of sediment supply. The reduction in sediment supply induced by coastal protection measures along adjacent coastlines may also limit the sedimentation rates and hence the ability of the marsh to sustain itself. It is unlikely to be possible to establish definitively the reason for "die-back".

7.3.3 Determination of the historic rates of change is best shown by aerial photographs and a photograph showing the outline areas of saltmarsh and mudflat at various time is shown in Figure 3.

7.3.4 It is noted in the Solent Forum review of nature conservation in the area that Spartina dieback is reducing the extent of saltmarshes, but this appears to be the result of a natural process. The opinion stated within this document is that the habitat is more seriously threatened throughout the area by coastal squeeze and erosion as a result of a relative rise in sea level. (http://www.solentforum.hants.org.uk/natconsv/summinfonatconsv.htm). In addition a report by the New Forest Council Coastal Protection Group in 2001 discusses the fact that, despite trials of various saltmarsh defences, such as fibre rolls, to reduce wave and wash impact, the saltmarsh still continued to recede behind the defences.

7.3.5 It is reported by Mr Chris Hill of the Geodata Institute, who has many years experience of saltmarsh and mudflat research within the estuary, that the recession of saltmarsh in the area is a synchronous loss from the area as a whole, and is not considered to be due to single wave attack from the ferries. As demonstrated by the aerial photograph in Figure 3 the greatest areas of loss are along the coast to the east and west of the mouth of the estuary, not within the estuary itself. Also noted is the loss of saltmarsh within the Pylewell Lake area, which is used only by small craft, and not by the ferries. This therefore supports the fact that the saltmarsh is receding from both natural reasons and vessel movements, including smaller vessels.

7.3.6 In addition Mr Chris Hill notes that there is a historical movement of the Needles channel towards Lymington. Therefore there is a history of channel movement for many years prior to the introduction of ferries within the estuary.

7.4 Effect of Sea Level Rise

7.4.1 There is now scientific consensus that the sea level along the south coast is rising and that this will vary considerably in its impact due to a number of factors. Any eustatic (sea level) change must be considered in combination with isostatic changes (crustal movement) along the south coast and also in relation to the wind, wave and surge characteristic predictions. These changes are relevant to the physical and biological processes operating within the coastal zone.

7.4.2 It is reported in the Solent Forum review of nature conservation that a relative rise in sea level is already beginning to have a serious effect on intertidal and adjacent maritime habitats in the Sensitive Marine Area of the Solent. This is now occurring at a rate of 5-8mm/year, with up to 90% loss of intertidal having occurred in some areas of the Solent during the 20th century. The intertidal zone is steepening and decreasing in area as the low water mark moves inland, but in most cases an equivalent landward movement of the upper shore transition is not possible because of the presence of landward defences protecting arable, urban and industrial land. The result is the coastal 'squeeze' of saltmarshes and other upper shore habitats and a reduction in the extent of these important features. A similar problem is caused by cliff erosion when there is only a narrow fringe of maritime vegetation between the cliff edge and adjacent managed land (whether in agricultural, recreational or urban use). Erosion of this narrow belt of vegetation can result in its complete loss where there is no possible means of retreat of this habitat inland. (http://www.solentforum.hants.org.uk/natconsv/summinfonatconsv.htm)

7.4.3 A deeper Solent would produce a larger tidal prism to be moved in and out of the river system at each tidal cycle. This may be expected to have both beneficial and detrimental effects. There would be greater dilution of the estuary with the increased flushing which may have beneficial effects on the benthic populations. The rates of scour might be expected to be increased due to translation of the force with shoaling closer to the marsh, and thus there is potential for an increased tidal scour and erosion of the marsh edge and the mud lands.

7.4.4 When set against the background of these predicted changes any impact which the proposed ferries would have as compared to the existing ferries is thought to be negligible.

7.5 Existing Jurisdiction

7.5.1 Areas within the harbour limits and the east and west the saltmarsh are owned by the Crown Estate Commissioners and leased to the Lymington Harbour Commissioners on a regulatory licence.

7.5.2 The conservation interests of these areas and additional saltmarshes adjacent to them are currently managed and wardened by the Hampshire and Isle of Wight Naturalist's Trust (HIWNT) and Hampshire County Council Recreation Department. The ownership and leasing and subleasing provide a considerable level of control over the marsh areas. On those areas not leased to the HIWNT the Trust has informal agreements to warden the marshes, especially during the waterfowl breeding season.

7.5.3 The River management is regulated by the Lymington Harbour Commissioners. The Lymington Coastal Area Advisory Panel, representing a wide range of organisations with specific interest or control over the wider area of the Lymington-Keyhaven Coast offer advice on control and policy for the coastal zone.

7.6 Conservation Status and Nature Conservation Policies

7.6.1 The main change in the conservation status of the area since the production of the 1991 report has been the designation of the New Forest as a National Park in March 2005. The designation includes the upper and lower sections of the Lymington River and parts of the eastern bank in the central section. The designation outline is shown in Figure 4. The ferry terminal and slipway falls just outside the designated National Park area.

7.6.2 As in 1992 the estuary carries a number of statutory conservation designations in addition to being a National Park, forming part of the South Hampshire Coast Area of Outstanding Natural Beauty. The Lymington River is designated under the Hurst Castle and Lymington River Estuary SSSI and is contiguous with the North Solent SSSI and North Solent Marshes NNR and the Lymington River Reedbeds SSSI to the north of the Toll bridge, as shown in Figure 5.

7.6.3 This designation excludes the area of the north western sector of the estuary from the marina at Waterford, which reflects the loss of interest in this area following the development of the marinas in the 1970's. These developments are reported to have been undertaken without environmental assessments (thus there is no known background environmental quality data available from this source) and occupied areas formerly of saltmarsh and mudflats, though these would appear to have degraded prior to the marina construction. The location of the existing statutory and non-statutory designations are shown in Figures 5 and 6.

7.6.4 The particular conservation value of the marshlands and mudflats lies in the provision of a resource for wintering feeding and roosting and breeding birds. The upper part of the estuary north of Bridge Road is now entirely fresh water due to the action of a one-way tide flap installed in the nineteenth century. It supports dense reed beds which themselves grade upstream into wet, unimproved meadows. Together, these form the Lymington River Reedbeds Site of Special Scientific Interest (SSSI), which is now included in a Wetland of International Importance (Ramsar site) and a Special Protection Area (SPA) under the EC Birds Directive. The salt marshes adjoining the ferry terminal and the Yacht Haven are within the Hurst Castle and Lymington River Estuary SSSI, which is in the Solent and Southampton Water Ramsar Site and SPA; parts are also in the Solent Maritime candidate Special Area of Conservation (cSAC). The river itself is included in a SSSI.

7.6.5 Conservation status has been considered on a site basis initially though it is clear from the recent reports from the statutory and non-statutory bodies that estuarine systems are considered holistically as part of an estuarine conservation resource, which has been under increasing threat, and requires international conservation measures.

7.7 Ornithological Data

7.7.1 The main use of the area by birds is concentrated at the mudflat, creek and marsh edge and although the *Spartina* marsh is productive in botanical terms it is of relatively less ecological value as a bird feeding resource.

7.7.2 The colonisation of exposed mudflats by typical saltmarsh infaunal species may be considered to keep pace with the rate of erosion, thus the actual food resource to the birds may not be greatly reduced by limited erosion. Clearly this effect is threshold dependent and beyond a certain stage there will be gross loss of feeding and roosting areas in the marsh.

7.7.3 The marsh edge, where this is composed of shell and shingle ridges, is of particular note for the large breeding populations of black-headed gulls and the numbers of breeding terns (common, little and sandwich terns). The breeding success is very variable from year to year, due to the potential for washout of the nesting bird by high tides, which may lead to relaying.

7.8 Summary

7.8.1 The impact of larger ferries on birds is likely to be negligible, the ferries will operate within the existing channel and it has not been established that the natural retreat of the marshes due to successional changes has had a marked effect on the breeding success of the bird populations,

nor on the feeding bird carrying capacity of the marshes. In addition the retreat of the saltmarsh appears to be a natural process which would be minimally impacted by the proposals.

8. NAVIGATION CHANNELS

8.1 Introduction

8.1.1 This section deals with the possible effects of larger ferries on the use of the river as a navigable waterway, the possible requirement for dredging and the associated consequential effects, and the effects the passage of slightly larger vessels along the river might have upon the river regime, particularly the stability of the mudbanks and saltings.

8.1.2 Other enquiries have been made to establish the current status of studies, which have been mentioned during consultations. Since the introduction of larger ferries was first suggested by Wightlink there have been a number of studies commissioned by the Lymington Harbour Commissioners which provide helpful background information regarding the influence ferry movements have on the shape and stability of the main navigation channel provides sound analyses on which to develop a strategy for assessing the potential impacts of larger ferries on the estuary.

8.2 Comparison of Bathymetric Surveys

Long Term Changes

8.2.1 Admiralty Charts for the Lymington cover the period 1882 to the most recent chart dated 2006, with amendments dated 2007. These show how the estuary has developed and how natural processes have influenced its morphology. Earlier information dating from 1810 shows the estuary with a substantially different alignment to its present course.

8.2.2 The data from 1810 shows the main channel with an essentially straight path to the Solent cutting through what is now salt marsh to the west of the present channel in Short Reach. The situation had changed by 1867 with the alignment of the channel adopting the route now seen. The Admiralty charts for the period 1882 to the present show the bend at Cocked Hat gradually deepening and moving slightly southward. The 1991 ELP report refers to the possibility of the curve of Short Reach developing further; implying that this may be the continuation of what is essentially a natural process. A comparison of the 1987 and 2006 charts is contained in Figure 7.

8.2.3 However compared with the radical change that appears to have occurred between 1810 and 1867, the channel has had a reasonably stable configuration over the last 125 years.

8.2.4 The present salt marshes offer a degree of coastal protection and are an important part of the flood defences of the area. The Environment Agency is concerned with regard to flood risk and the degree of protection offered by present sea defences in the estuary. It is therefore important to recognize the influence changes in the extent of salt marshes would have on flood risk. However it is thought that the scale of effects that could be directly related to ferry movements is likely to be negligible in relation to the substantial salt marsh changes that would be necessary to have an impact on these perceived flood risks.

Local Bathymetric Surveys

8.2.5 It is our understanding that over the period between surveys dredging of the channel has been limited to the clearing of identified "high spots" and what can best be termed "maintenance dredging". The LRDC (Lymington Rural District Council – now part of the New Forest District Council) report suggests that the channel "probably represents the equilibrium between deposition and erosion caused by the ferries operating in a confined waterway". This may, in

part, be true. However, it is important to consider the whole of the estuary when trying to assess the causal effect for the changes observed. The present ferries have been in operation since 1973. Schedules have changed over this period and there are now approximately 22,250 sailings per year. This number has remained reasonably constant over the last 5 (2001-2006) years. Over the same period the number of moorings on the river has increased to a point where the Harbour is now almost at full capacity and general river traffic has grown. It is most probable that the changes in the channel are the result of a complex, interdependent range of effects; natural and man-made. The role of the ferries in this process may be contributory but needs to be evaluated against those other factors.

8.3 Bank and Bed Erosion

8.3.1 The ELP report (2006) indicates that the proposed R class ferries will be capable of navigating within the existing Lymington Waterways as the overall dimensions are similar, but that their effect will be different to the existing ferries because of increased effects of squat, wash and drawdown. Table 3, below shows the maximum sinkage values undertaken by ELP for their 2006 report.

Vessel Class	Speed (knots)	Single Channel	
		Mid tide	Chart datum
C	4	0.055	0.105
C	6	0.155	0.417
R	4	0.084	0.189
R	6	0.255	0.823

Table 3 – Maximum sinkage values from the ELP (2006) report

8.3.2 The values shown in Table 3 may be used to demonstrate squat and drawdown of the existing and proposed vessels as these are indicated by the sinkage values. It can be seen that the R class vessels demonstrate greater values than the C class vessels for both squat and drawdown, as would be expected from their greater block coefficient.

8.3.3 The ELP report concludes that the R-class ferries could have an adverse impact on channel erosion due to this increased displacement, drawdown and backflow when compared to the existing C-class.

8.3.4 Should the proposed new ferries operate at speeds at or near 8 knots at low water they would be more likely to ground than the existing C class ferries. Wash from the free waves of the R-class may cause a greater nuisance (due to greater height) than that from the present C-class, although the extent of the increase cannot be determined without further more detailed study.

8.4 Material Movement

8.4.1 At low water on slack tide, the estuary might well be thought of as a natural freshwater river in which the passage of any vessel, including the ferries, could be analyzed for wave propagation, drawdown, transverse and reverse currents and this has been reviewed in the ELP report. However, movement of material between bed and bank, and in and out of the estuary is also related to the tidal cycle and additional natural disturbances of material caused by wind induced waves, storm surges, and significant fluvial flows. Processes that will be significant in the long term are global warming and sea level rise, both of which have been referred to in Section 7. To these must be added the artificial removal of material by dredging. It is clear therefore that the process of morphological change of the navigable channel of the Lymington estuary is complex.

8.4.2 The Lymington estuary is most at risk from the hydraulic effects of the passage of the ferry when freshwater flows are low and at low states of the tide. Under these conditions it is reasonable to use the analogy of an inland waterway, under which conditions the hydraulic effects of the ferry are most active.

8.5 Wash Effects and Drawdown

8.5.1 The present class "C" vessels are of 850 tonnes displacement and 58m overall length, have a water line length of 55m, are 12.2m in the beam at water line and draw 2.3m when fully loaded. The proposed R-class vessels are of a similar design to the C-class ferries. The currently proposed R-class ferries are 62.4m long, with a 56.1m water line length, are 14.4 in the beam at waterline and draw 2.3m.

8.5.2 The thrusters on the proposed new ferries will both be mounted on the centreline fore and aft, rather than being offset, as is the case with the C-class ferries. This will have two positive effects:

- The fact that both thrusters will be on the centreline will reduce the erosion effect when compared to the C-class ferries with their offset thrusters.
- The R-class will have improved directional stability, which will make them better able to navigate clear of the bank slopes.

8.5.3 These centre mounted thrusters will be more efficient and will therefore require less thrust to be applied than the existing offset units on the C class vessels. Application of leeway offset on both units will assist in reducing leeway at lower power outputs, and therefore assist in keeping the vessel away from the estuary banks.

8.5.4 Although the sizes of the existing C-class ferries and the proposed R-class ferries is similar the R-class ferries have a greater displacement, block co-efficient and thrust, all of which have the potential to increase the hydrodynamic effects of squat, wash and drawdown.

8.6 Bank Erosion

8.6.1 Vessel speed is clearly a critical factor in determining the magnitude of the front wave and drawdown. In turn this affects the magnitude of transverse and reverse currents that contribute to bank erosion. Since the blockage ratio of the vessel in the channel is dependent on the cross-section at any point it is possible to identify the locations of potentially damaging effects. However this is influenced by the state of the tide, which determines the number of occasions when particular wash effects might occur and when the vessel might approach limiting speed.

8.6.2 It is also important to consider the damaging effects on unprotected banks of wash. This is a particular problem with small craft since such craft are of shallow draught and can steer much closer to the banks. Under high power these craft tend to travel stern down in the water producing waves of large amplitude. Damage to the bank at waters edge can be substantial and with tidal movement can lead to progressive failure and erosion of the bank. It is therefore considered that the effect of such vessels on the estuary is likely to pose a much greater risk to the banks than the continuation of the ferry service.

8.6.3 The actual mode of failure of the banks and the loss of salt marsh in the Lymington estuary is uncertain. However the situation that creates the greatest damage may be more dependent on a combination of tide height, wave energy and other factors than on any single parameter such as drawdown. However in reality the speed of either class of vessel at critical states of the tide is more significant than the differences in their respective block co-efficient.

8.7 Operational Vessel Speed

8.7.1 Any change in the potential impacts on bank stability and saltmarsh erosion could be mitigated by operating speeds. Wightlink have confirmed that, based on the advice of ELP, a structured programme of live trials would be carried out once the new vessels are delivered in order to establish optimum operational speeds. This would allow the optimal speed for various tidal states to be established which would then be published in the Route Operating Manuals to ensure all Masters were fully aware of the restrictions. The best estimate of the likely speeds are given in the ELP report and summarised below in Table 4.

Tide	Area	Speed	Area	Speed
Existing speed limits				
All conditions	Above Harpers	4 knots	Below Harpers	6 knots
Anticipated future speed limits				
Above half tide	Above Harpers	4 knots	Below Harpers	6 knots
Below half tide	Above Harpers	3 knots	Below Harpers	5 knots

Table 4 – Estimate of speeds which may be implemented following live trials

8.7.2 The interaction between the ferries and leisure craft is a key concern. The safety record has been shown to be good and any reduction in ferry operating speeds will further support safety at critical times.

8.8 Summary

8.8.1 The following points can be derived from the foregoing discussion:

a) The passage of any vessel, large or small, has the potential to contribute to the erosion of banks in the estuary;

b) The larger displacement and blockage co-efficient of the proposed new ferry will influence the magnitude of the wash, drawdown and associated effects such as local currents;

c) The dynamics of the silt regime in the estuary is not well understood;

d) Dredging will not be required for the proposed new ferries as they are similar in dimensions to the existing ferries. However any widening or deepening of the channel, should this be thought worthwhile for manoeuvrability reasons, would be likely to reduce wash effects;

e) Bank erosion is a complex problem related to state of tide, wind induced waves, exposure, bank material, mooring practices and the existing profile in addition to wash effects from vessels;

Various mitigating measures can be adopted to minimise the damage to banks should this be needed in the future. These include physical bank protection measures and operational controls related to vessel speed and loading, and the state of tide and wind.

9. PLANNING ISSUES

9.1 Introduction

9.1.1 The purpose of this Section of the report is to consider which particular planning issues could either require specific consent from the Local Planning Authorities (LPA), or which could with advantage be addressed by Wightlink in relation to the introduction of larger ferries on the Lymington - Yarmouth route. It is believed that the statutory powers that Wightlink hold at Lymington should obviate the need for seeking such consents from the LPA.

9.2 Scope of Work

9.2.1 The relevant statutory strategic and local planning policy documents for Hampshire and the Isle of Wight, together with special non-statutory policies for the coastal areas and New Forest have been examined.

9.2.2 During these investigations, consideration was given to two aspects; firstly those aspects of the proposals which could run counter to any specific planning policies, whether for the local area or for the protection of aspects of the wider environment such as designated areas; and secondly, the broader issues which the planning authorities may wish to see covered in any submission by Wightlink Ltd, recognising that the planning authorities may have no legal jurisdiction over them.

9.3 Matters Requiring Consent under the Town and Country Planning Acts

9.3.1 An initial examination of the proposals of the Company for the use of larger vessels on the Lymington - Yarmouth route, gave consideration to which aspects of them may require consent under the Town and Country Planning Acts. To fall within the scope of the Planning Acts, it must be proposed to change the use of land or to carry out certain engineering operations in, on, or under the land. It is therefore not considered that any of the current proposals fall within the scope of this Act.

9.4 Scope of Planning Policies Delivered

9.4.1 There are two different types of planning policy, which could, in principle, be impacted by the Company's proposals.

9.4.2 The first is the local planning policies for the control of changes within the immediate area of the ferry terminal. These are fairly clear cut and relatively easy to identify from the Local Plan documents, described below.

9.4.3 The second type are the policies related to the wider area, and includes such aspects as the possible effects on the New Forest National Park, the South Hampshire Coast Area of Outstanding Natural Beauty and other statutory designations. It is much more difficult both to identify which of these wider policies is relevant, and also to determine whether the proposals are in fact likely to have any specific impact on them.

9.4.4 Both types of policy stem from the strategic planning policies for the area, and in particular from the Structure Plans.

9.5 Policies Considered

9.5.1 The following policies were reviewed in terms of their potential scope for covering the proposals:

- Hampshire County Structure Plan 2000-2011
- Unitary Development Plan for the Isle of Wight 2001
- Hampshire Full Local Transport Plan 2006 (Chapter 4, Long Term Transport Strategy)
- County Structure Plan (1994) and its subsequent Review (2000)
- New Forest Area Transport Strategy 2006

9.5.2 From these preliminary investigations of the planning policies and the Wightlink proposals it appears that the proposed works do not fall directly within the scope of any of these policies.

10. ROAD TRAFFIC CONCERNS

10.1 Introduction

10.1.1 The proposed new ferries would carry fewer vehicles than the C class ferries were originally designed to carry. In addition the number of sailings over the past seven years has decreased slightly as some “shoulder period” sailings have been removed. As a result there is not considered to be a likely increase in traffic flows as a result of the new ferries.

10.1.2 If more sailings per day became necessary then this would need to be assessed in terms of increased traffic flows, in particular through the New Forest National Park. However there are no current plans to increase the number of sailings per annum at present.

10.2 Ferry traffic and capacities

10.2.1 Table 5 provides a comparison of the existing ferry and proposed ferry capacities

	Capacity per vessel	
	Existing C class vessel	**Proposed R class vessel**
Passenger units	700 (500 in practice)	350
Car units	72-76 (48 in practice)	65

Table 5 – Comparison of existing and proposed vessel capacity

10.2.2 The number of sailings per year is not expected to rise and has been stable since 2000.

10.2.3 The number of sailings per year is outlined in Table 6.

Year	**Number of sailings**
2000	23 141
2001	23 356
2002	23 774
2003	23 564
2004	23 119
2005	23 436
2006	22 256
2007	22 366 planned

Table 6: Comparison of the number of sailings for the past 7 years

10.3 Potential increase in daily vehicle flows

10.3.1 There is a decrease of 350 people per sailing in terms of the passenger capacity of the new ferries when compared to the as-designed capacity of the existing ferries, therefore it is reasonable to assume that there will be an associated decrease in vehicle flows associated with the delivery of 'foot passengers' to Lymington.

10.4 Road traffic

10.4.1 Although there is an increase in vehicle capacity compared to the current C Class vessel, the proposed capacity in terms of vehicle numbers is less than the capacity of the C Class when they were first introduced in 1973. However in the intervening period the total number of vehicles carried has increased as a result of the increased number of sailings, but as the road connections have improved this is unlikely to be cause for concern.

10.4.2 The full LTP for the New Forest area dated March 2006 has been reviewed and the impact of ferry traffic on the town of Lymington is not mentioned.

11. ISSUES PERTAINING TO YARMOUTH

11.1.1 There should be little physical difficulty in accommodating the slightly larger ferry in the harbour at Yarmouth. No dredging or engineering works are needed.

11.1.2 It is also fair to say that few objectors to the introduction of the new ferries have come forward from island residents or organizations. To the contrary, there has been general support for the new ferries. The service is recognised as an important factor in maintaining and further developing the economy of West Wight, an area with high unemployment in relation to the rest of the Island which is itself suffering higher unemployment than the rest of the region.

11.1.3 There are no planning issues related to strategic policies for the Island, or specifically for Yarmouth, that would discourage the development of the ferry service.

11.1.4 The most recent Isle of Wight Local Transport Plan produced in 2006 acknowledges the importance of improving interchange and accessibility between the Island and the mainland, stating, “The Council recognises the importance of maintaining and improving cross-Solent links and the necessity to improve and update key cross Solent interchanges”. The first LTP identified the need to improve facilities at Yarmouth, Cowes, East Cowes and Ryde and planning permission was recently given for a new interchange at Ryde to facilitate connections between on-Island journeys and cross-Solent journeys made by the Fast Cat and Hovercraft.

11.1.5 It is difficult to see how the increase in ferry size would affect the ecology of the environment of Yarmouth harbour, although the designations existing for the harbour and surrounding area, e.g. SSSI, SAC, SPA, may require further consideration. Dredging is not required and noise and visual impacts should be improved by the provision of the more modern ferry. Both emissions and noise from the new ferries will be significantly lower than the existing ferries due to the improved performance of modern engines. In addition it is proposed to turn off the engines whilst the ferries are in berth, a practise which cannot be employed with the existing vessels.

11.1.6 The capacity in terms of vehicles is smaller than the original capacity of the existing ferries (65 compared to 76) therefore there should be no change in the marshalling and loading of vehicles onto the proposed ferries.

12. CONCLUSIONS

12.1.1 It is considered that there will be little or no increased impact on ecology when comparing the proposed ferry to the existing ferry.

12.1.2 It is considered that any potential negative impacts which could affect erosion and bank stability could be mitigated by the control of operational vessel speeds.

12.1.3 It is not considered that any increase in traffic as a result of the proposals would have a negative impact on the local area as the proposed ferry would carry fewer vehicles than the existing ferry was originally designed for, and in addition the local road connections have improved since the original ferries were introduced.

12.1.4 It is not considered that there are any planning issues relating to the proposals as only minor on-shore works are proposed relating to improvements in ship-to-shore integration.

13. POTENTIAL MITIGATING MEASURES IN THE ESTUARY

13.1.1 It is considered that only under low water conditions will the impact of the proposed ferries be potentially greater than the existing ferries. It is considered that this impact can be mitigated by reducing the operating speed of the ferries during such conditions.

APPENDICES

Appendix 1

Press release Issued by Wightlink Ferries

16th October 2006

Wightlink Announces Details of New Ferries

Over the last few months Wightlink has been working up plans for two new vessels to replace two of its ferries on the Lymington/Yarmouth route. These plans are the result of a working party which was made up of staff from the route, various managers and representatives from Hart Fenton Naval Architects.

Staff Open Days were held in Lymington and Portsmouth recently where copies of the plans for the new ferries were displayed, together with models of the proposed new design and the existing ships. The models clearly demonstrated the flexibility of the new vessels to carry a greater and more varied traffic load within a footprint that is only marginally larger than the current vessels, and with the same draft.

The principal characteristics of the new vessels are:

- Length 62.40 Metres
- Beam 16.00 Metres
- Draft 2.30 Metres
- Service Speed 10-12 Knots
- Passenger Capacity 360
- Vehicle Capacity 65 Cars

Throughout August tenders were sought from a number of European shipyards which have the capacity to build the new ships and were able to offer delivery in the first half of 2008.

Following visits to certain yards made throughout September and, as a result of further technical discussions, it is expected that an order will be placed with a Croatian yard. Further information on the specific yard will be released once Letters of Intent have been signed.

ENDS

Notes to Editors

• Wightlink is the largest independent ferry and port operator in the UK
• The company operates 8 car ferries and 3 FastCats
• 5.7 million passengers were carried in 2005
• 1.2 million cars, 160,000 trucks and 19,000 coaches were carried in 2005
• The company employs some 600 staff

For further information, please contact:-
Kerry Jackson, Marketing Manager Wightlink Isle of Wight Ferries
Tel. 023 9285 5427, e-mail kerryjackson@wightlink.co.uk

Appendix 2
Information sources

The following information sources were used in the production of this report.

- Durnell, P., (2006) Hampshire and Isle of Wight Breeding Waterbird Survey, Lymington-Keyhaven Marshes
- Eagle Lyon Pope (2006), Wightlink Ferries Lymington Harbour Navigational Review Report number ELP-55272-1206-57219-Rev1
- Gifford (2003), Wightlink – Assessment of Ferry Emissions, Phase 1 summary. Report number 10889. RO3
- Gifford (1992) Wightlink, Proposed New Ferries on Lymington-Yarmouth Route Environmental Impact Assessment, Ecological and Morphological Study. Report Number 4771.05
- Gifford (1992), Wightlink Ltd. Lymington-Yarmouth Route Proposed New Ferries, Environmental Impact Assessment, River Traffic Study
- Gifford (1992), Wightlink New Ferries, Lymington-Yarmouth Route, Environmental Impact Assessment Scoping Study Report. Report number 4771.01
- Hamill *et al.,* (1996) The calibration of a computational fluid dynamics model of the velocity distribution in the wash of a marine propeller. Hydrodynamics, Chwang, Lee and Luang (eds.), Balkerna, Rotterdam
- Hampshire County Structure Plan (1996-2011)
- Hampshire Full Local Transport Plan (2006)
- Hillman, Tricklebank and Hill (1995), The Need for an Integrated Estuary Plan as a Management Tool. ICE Conference on Coastal Management, 1995.
- Im Sande, D., *et al.* (2000), Influence of Propeller and Ship's Rudder on Scouring Action and Erosion on Inland Waterways – Physical Model Tests Determining Propeller Induced Flow Velocities and ADV. Joint Conference on Water Resource Engineering and Water Resources Planning and Management 2000, Hotchkiss, and Glade (eds.)
- New Forest District Local Plan (2005)
- Verhey, H.J. (1983), The Stability of Bottom and Banks subjected to the Velocities in the Propeller Jet behind Ships, Delft Hydraulics Laboratory Publication No. 303

FIGURES

FIGURE 1

2007 CHART OF THE LYMINGTON ESTUARY

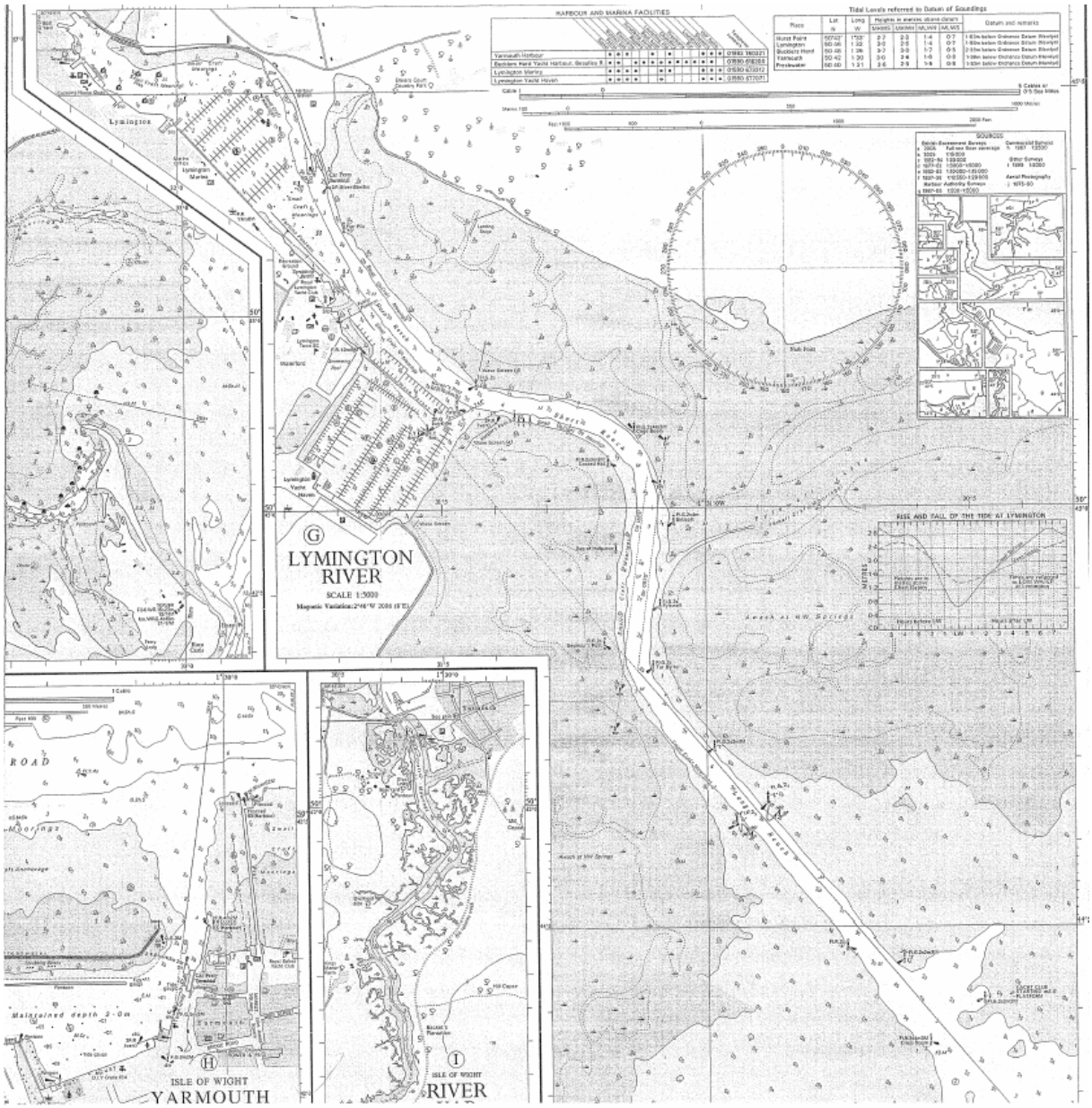
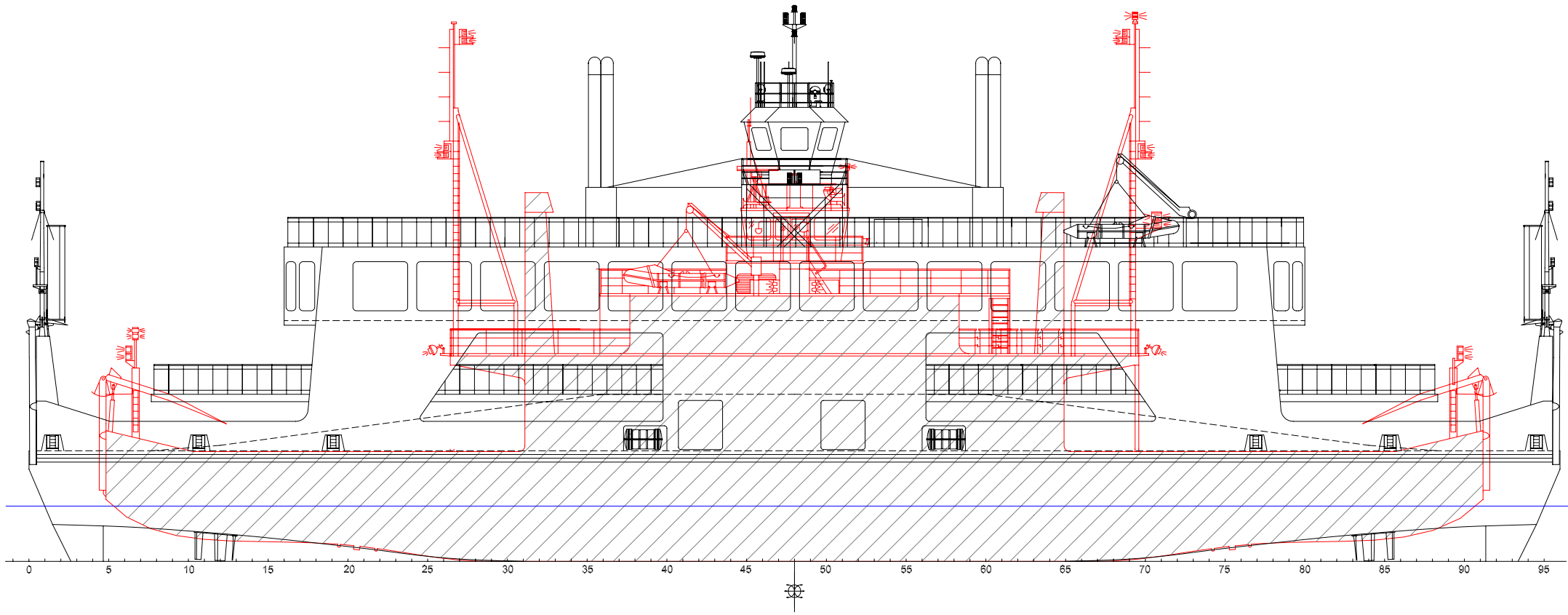
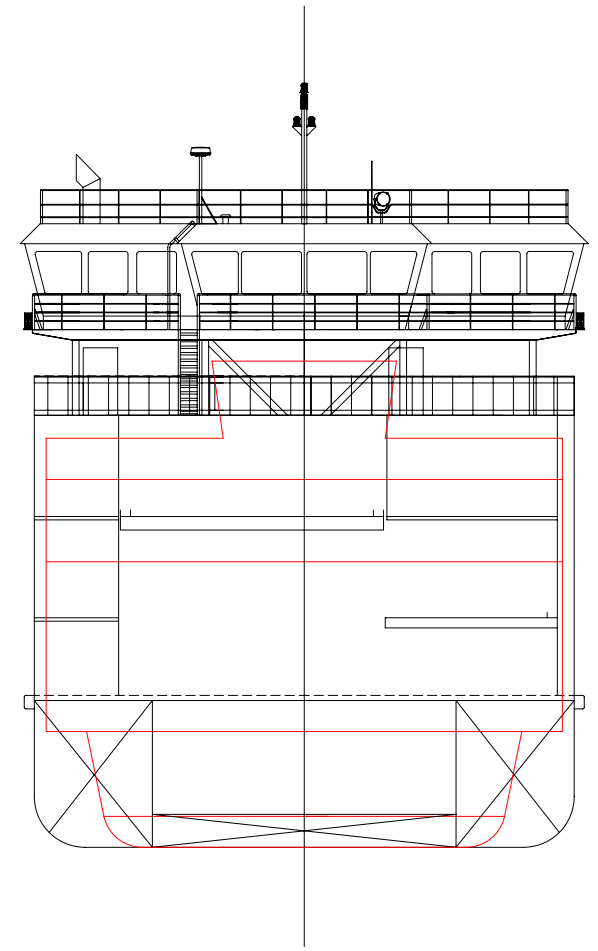
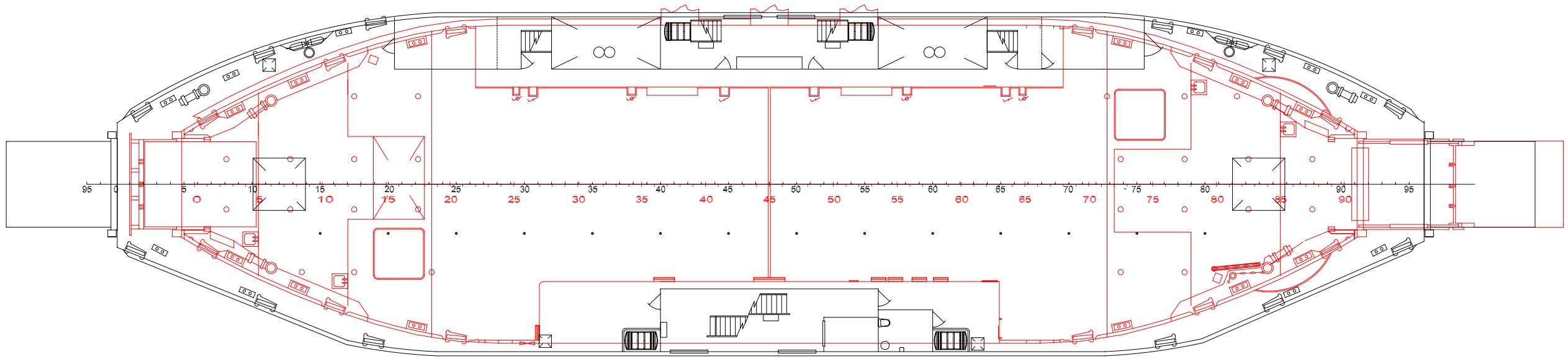

HARBOUR AND MARINA FACILITIES
Tidal Levels referred to Datum of Soundings
LYMINGTON
RIVER
SCALE 1:5000
RISE AND FALL OF THE TIDE AT LYMINGTON
ISLE OF WIGHT
YARMOUTH
ISLE OF WIGHT
RIVER

FIGURE 2

OVERLAID COMPARISON OF THE EXISTING AND PROPOSED VESSELS







REVISION	DESCRIPTION	REVISED BY INITIALS	DATE	CHECKED BY INITIALS	DATE
A	TO REFLECT CHANGES TO GA	MA	15/09/06	TMS	15/09/06

Hart, Fenton & Co Ltd
Norman House, Kettering Terrace,
Portsmouth, Hampshire, PO2 7AE, UK
Tel: 023 92875277 Fax: 023 92875280
e-mail: ht@hart-fenton.demon.co.uk

PROJECT : LYMINGTON~YARMOUTH

TITLE : PROFILE COMPARISON

ISSUED DATE : 12/09/06

DWG CHKD BY: TMS 12/09/06

PROJECT NO.:	HF633
DRAWING BY:	MA
DRAWING DATE :	08/09/06
DRAWING NO.:	633A011A
SHEET :	1of1
SCALE :	NTS
STATUS:	Issued

FIGURE 3

AERIAL PHOTOGRAPH SHOWING SALTMARSH RECESSION

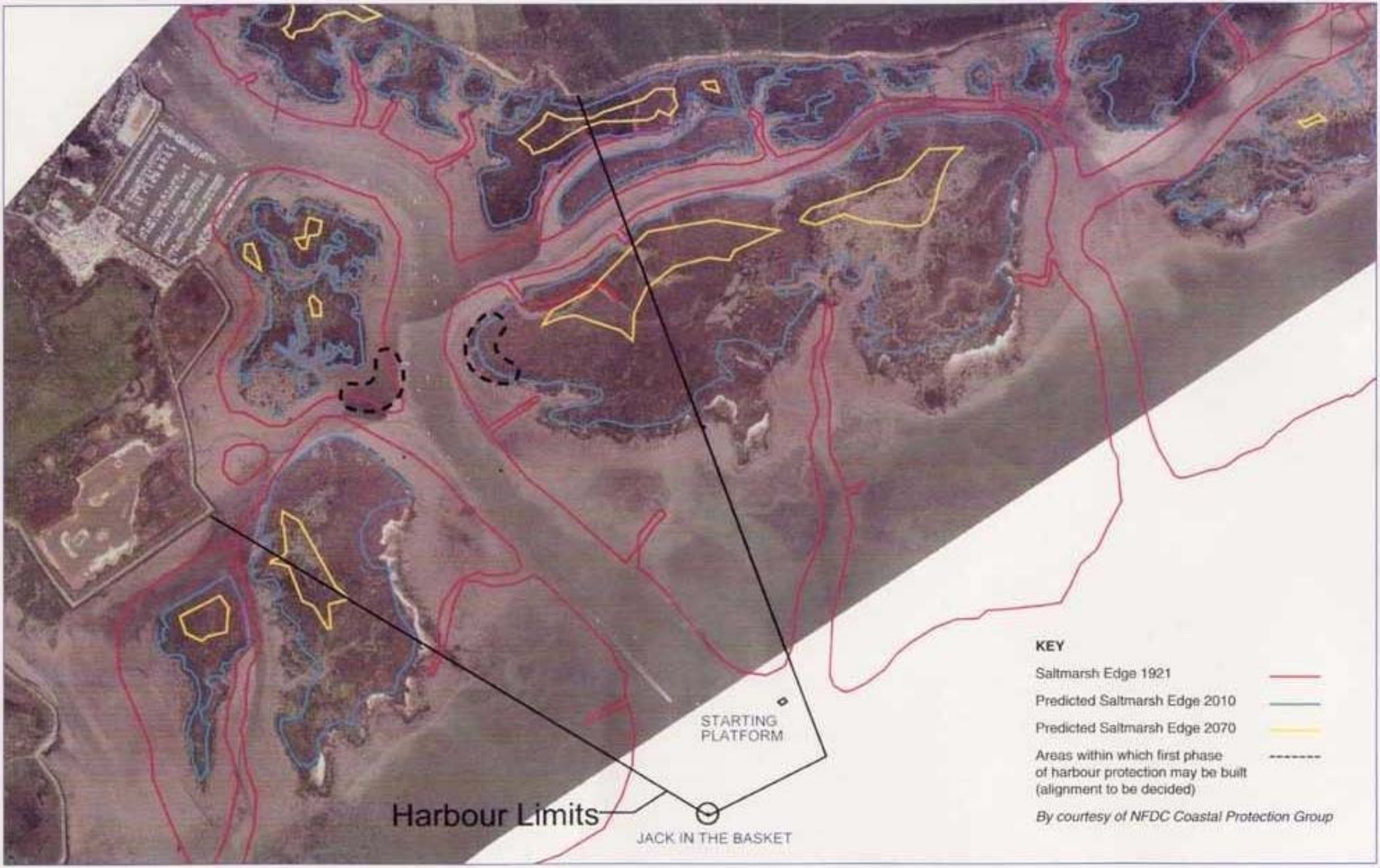

STARTING
PLATFORM
Harbour Limits
JACK IN THE BASKET
KEY
Saltmarsh Edge 1921
Predicted Saltmarsh Edge 2010
Predicted Saltmarsh Edge 2070
Areas within which first phase of harbour protection may be built (alignment to be decided)
By courtesy of NFDC Coastal Protection Group

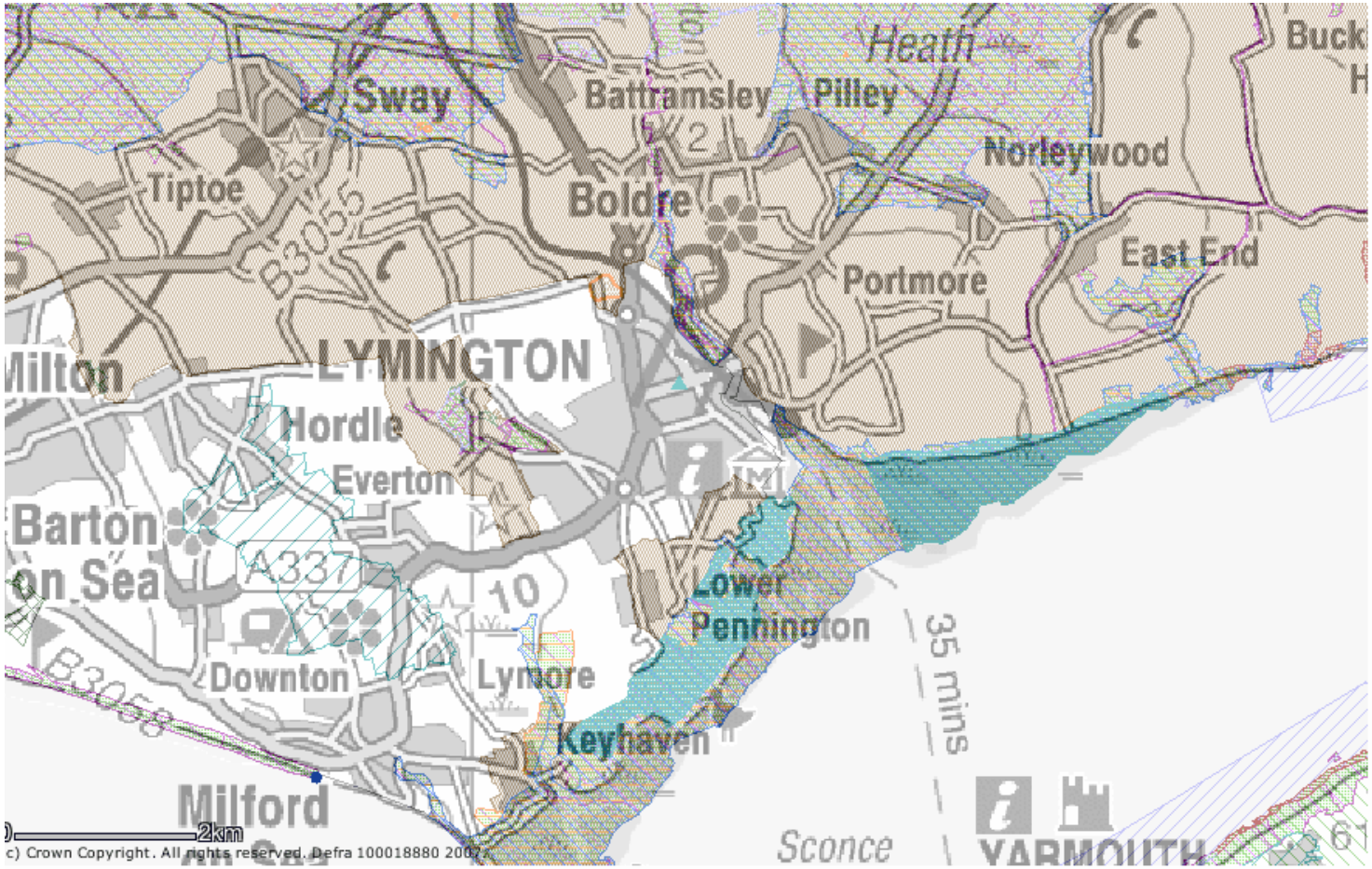
FIGURE 4

NEW FOREST NATIONAL PARK DESIGNATION BOUNDARY


THE NEW FOREST NATIONAL PARK
National Park Boundary
Perambulation Boundary
District Boundaries
Land subject to legal challenge
© Crown Copyright. All rights reserved
New Forest National Park Authority.
Licence no. 1000114703 2006
Land subject to legal challenge
NEW FOREST NATIONAL PARK AUTHORITY
(Headquarters)

FIGURE 5

STATUTORY DESIGNATION MAP

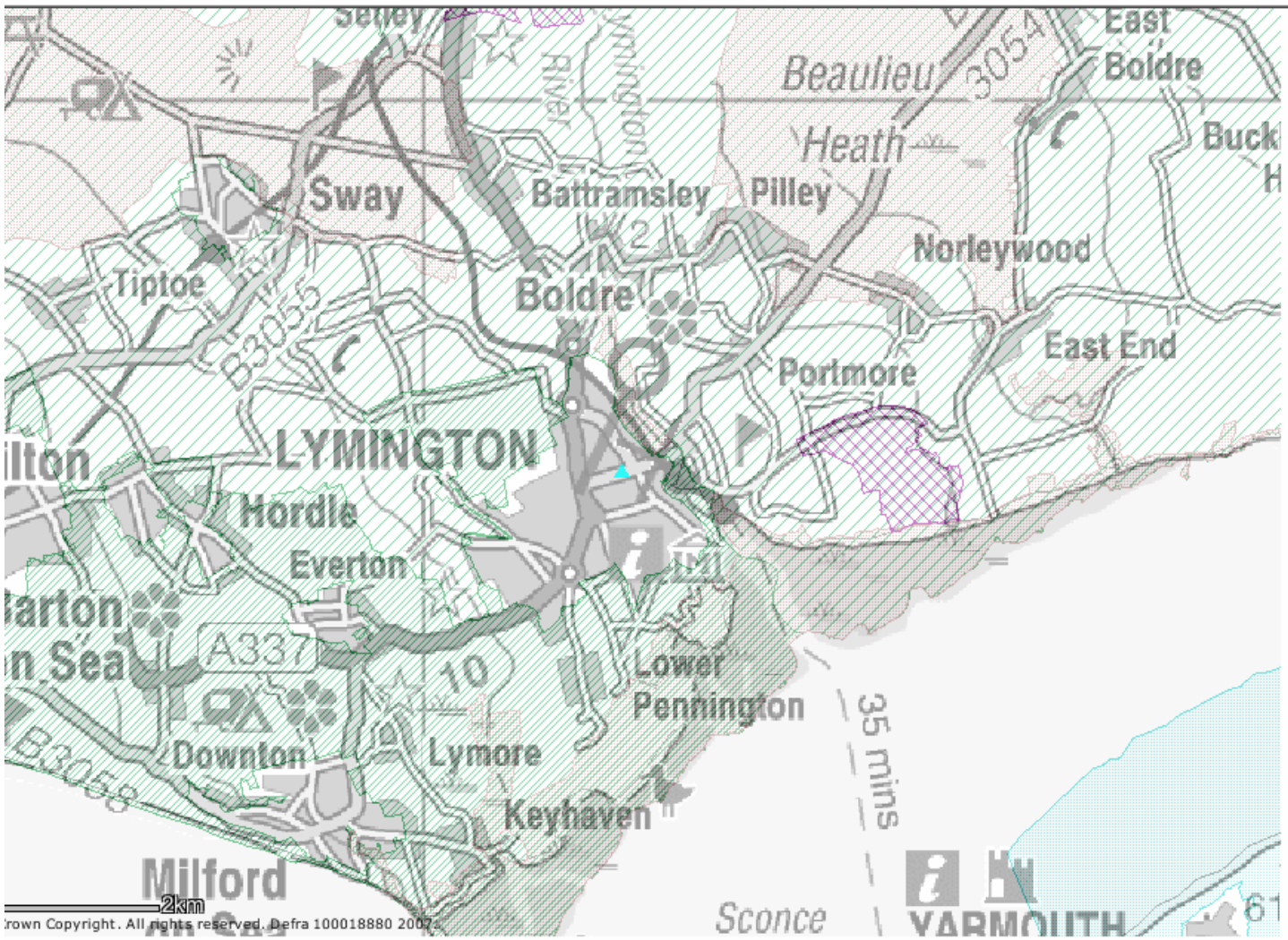


(England)
Protected Wreck Sites (England)
Nitrate Vulnerable Zones (England)
Local Nature Reserves (England)
Biosphere Reserves (England)
National Nature Reserves (England)
Ramsar Sites (England)
Special Protection Areas (England)
Special Areas of Conservation (England)
Sites of Special Scientific Interest Units (England)
Sites of Special Scientific Interest (England)
Registered Common Land (England)
World Heritage Sites (England)
Nitrate Sensitive Areas (England)
Areas of Outstanding Natural Beauty (England)
Environmentally Sensitive Areas (England)
National Parks - proposed (England)
National Parks (England)
Moorland Line (England)
Less Favoured Areas (England)

Scale: 1: 64528 Go

FIGURE 6

NON-STATUTORY DESIGNATION MAP

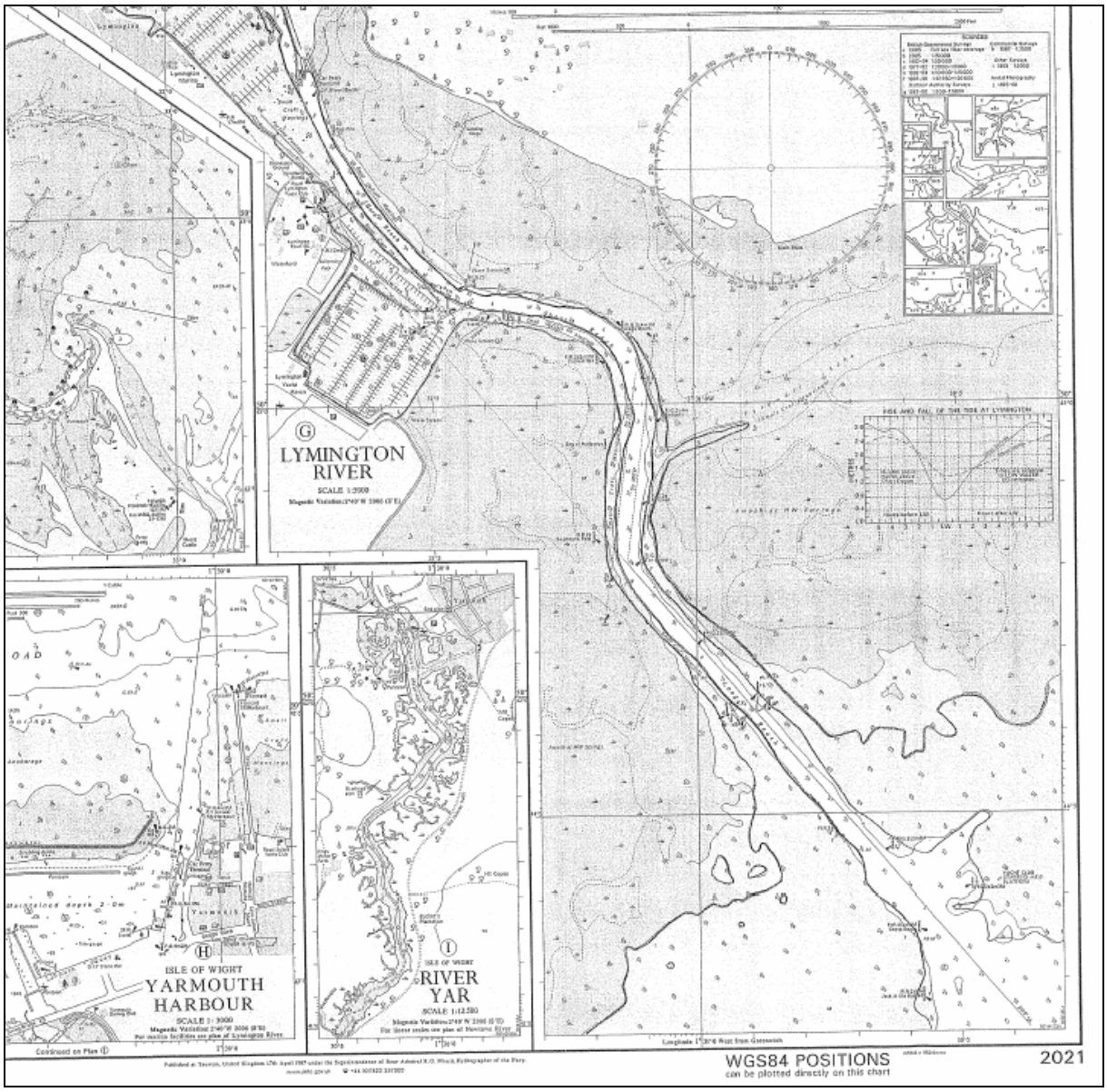


List of Layers

- Highlighted Feature
- Doorstep Greens (England
- Millennium Greens (England)
- Walking The Way To Healt Initiative (England)
- National Trails (England)
- Registered Battlefields (England)
- Registered Parks and Gardens (England)
- Land Management Initiatives (England)
- Catchment Sensitive Farmi Delivery Initiative 2006-2008: Priority Catchments (England)
- Upland Experiment Areas (England)
- Important Bird Areas (England)
- Heritage Coasts (England)
- Objective 1 Areas (England)
- Objective 2 Areas (England)
- National Forest (England)
- Green Belt (England)
- Community Forests (England)

FIGURE 7

CHART SHOWING THE CHANNEL ALIGNMENT IN 1987 AND 2007


LYMINGTON RIVER
SCALE 1:2500
ISLE OF WIGHT
YARMOUTH HARBOUR
SCALE 1:3000
ISLE OF WIGHT
RIVER YAR
SCALE 1:12,500
WGS84 POSITIONS
can be plotted directly on this chart
2021