

25 IN-COMBINATION EFFECTS

1. FSR ES Volume II *Development in the Haven: In-combination Effects* assesses the potential in-combination effects predicted to arise as a result of HPUK's proposed Felixstowe South Reconfiguration and Bathside Bay development (including its ancillary developments) in the Harwich Haven. The potential environmental impacts of the latter were identified and assessed in Posford Haskoning (2003a).
2. In addition, where appropriate, it describes the potential in-combination effects associated with other activities and developments within the estuarine system. This is of particular relevance with respect to potential effects on the hydrodynamic and sedimentary regime.
3. The report assumes a 'worst case' scenario where the reconfiguration of Felixstowe South and the development of Bathside Bay are undertaken simultaneously, as would be desirable to provide needed deepwater quay capacity as quickly as possible, although this is unlikely to occur. Unless otherwise indicated, the assessment of in-combination effects is undertaken based on the predicted *mitigated* impacts of the proposed developments.
4. With respect to potential in-combination effects on the hydrodynamic and sedimentary regime, as well as the intertidal habitat of the Stour and Orwell estuaries, 18 projects and activities either implemented, in-going or proposed within the Haven are considered.
5. The additive changes in tidal range associated with different developments were predicted to be up to -42mm/year (as a worst case). However, the studies found that if all projects were to occur, a reduction in the rate of ongoing intertidal erosion would arise. Where the combined effect of Bathside Bay and FSR is to cause a slight reduction in the tidal range effect, by 0.7ha, but a significant reduction in the requirement for maintenance dredging and hence a reduction, by 0.8ha/year, in the year-on-year increase in the erosion of intertidal.
6. For all of the past, ongoing and planned projects examined the main in-combination effect is one of a loss of intertidal area within the SPA, compensated for by an increase in intertidal area outside the SPA.
7. Table 25.1.1 summarises the predicted effects of reconfiguring Felixstowe South, in-combination with the development of Bathside Bay, on all relevant features of the biological, physical, human and built environment.

Table 25.1.1 Summary of predicted in-combination effects associated with the development of Bathside Bay and reconfiguration of Felixstowe South

| Parameter / Predicted effect ^{1 2} | Bathside Bay | Felixstowe South | interaction | In-combination |
|---|----------------------------|-------------------|-------------|----------------------------|
| MARINE ECOLOGY | | | | |
| Loss of intertidal due to reclamation | MAJOR ADVERSE ³ | NEGLIGIBLE | ADDITIVE | MAJOR ADVERSE ³ |
| Loss of subtidal habitat | MODERATE ADVERSE | MINOR TO MODERATE | ADDITIVE | MODERATE ADVERSE |
| Effect on tidal range | NEGLIGIBLE | NEGLIGIBLE | CUMULATIVE | NEGLIGIBLE |
| On-going erosion of intertidal | NO EFFECT | MINOR BENEFIT | CUMULATIVE | MODERATE BENEFIT |
| Effects of wave action | NEGLIGIBLE | NEGLIGIBLE | ADDITIVE | NEGLIGIBLE |
| ORNITHOLOGY | | | | |
| Disturbance | MINOR ADVERSE | NEGLIGIBLE | ADDITIVE | MINOR ADVERSE |
| Loss of intertidal | MAJOR ADVERSE ³ | NEGLIGIBLE | ADDITIVE | MAJOR ADVERSE ³ |
| Effect on tidal range | MINOR ADVERSE | NEGLIGIBLE | CUMULATIVE | MINOR ADVERSE |
| On-going erosion of intertidal | NO CHANGE | MINOR BENEFIT | CUMULATIVE | MODERATE BENEFIT |
| COASTAL AND TERRESTRIAL ECOLOGY | | | | |
| Direct loss of habitat | MODERATE ADVERSE | NEGLIGIBLE | NONE | NONE |
| WATER AND SEDIMENT QUALITY | | | | |
| Accidental pollution | RISK REMOTE | RISK REMOTE | ADDITIVE | RISK MORE REMOTE |
| Release of contaminants | NEGLIGIBLE | NEGLIGIBLE | ADDITIVE | NEGLIGIBLE |
| Dispersion of coliforms | NO IMPACT | NEGLIGIBLE | CUMULATIVE | NEGLIGIBLE |
| Surface water run-off | NEGLIGIBLE | NEGLIGIBLE | ADDITIVE | NEGLIGIBLE |
| Maintenance dredging | NEGLIGIBLE | MINOR BENEFIT | CUMULATIVE | MINOR BENEFIT |
| FISHERIES AND FISHING ACTIVITY | | | | |
| Suspended sediment | MINOR ADVERSE | MINOR ADVERSE | ADDITIVE | MINOR TO MODERATE |

¹ Where no combined impact is predicted, the effect is not reported

² Inclusive of mitigation, but assumes that the construction phases coincide (i.e. worst case)

³ Compensated for by managed realignment at Little Oakley, Hamford Water

| Parameter / Predicted effect ¹ | Bathside Bay | Felixstowe South | Nature of interaction | |
|---|---------------------|---------------------|-----------------------|------------------------|
| Direct uptake of fish | MINOR ADVERSE | MINOR ADVERSE | ADDITIVE | MINOR ADVERSE |
| Restriction of access to fishing grounds | MODERATE ADVERSE | MINOR ADVERSE | ADDITIVE | MODERATE ADVERSE |
| TRAFFIC AND TRANSPORTATION | | | | |
| Construction traffic | MINOR ADVERSE | NEGLIGIBLE | NONE | NONE |
| Operational traffic | NO IMPACT | NO IMPACT | ADDITIVE | NEGLIGIBLE |
| Rail network capacity | NEGLIGIBLE | NEGLIGIBLE | ADDITIVE | NEGLIGIBLE |
| NOISE AND VIBRATION | | | | |
| Construction noise | MINOR TO MODERATE | MINOR TO MODERATE | CUMULATIVE | MINOR ADVERSE |
| Operational port noise | MINOR TO MODERATE | NEGLIGIBLE TO MINOR | CUMULATIVE | NEGLIGIBLE |
| Traffic noise | NO IMPACT | NO IMPACT | NONE | NONE |
| Shipping noise | NEGLIGIBLE TO MINOR | NEGLIGIBLE TO MINOR | CUMULATIVE | MINOR ADVERSE |
| AIR QUALITY | | | | |
| Construction | MINOR ADVERSE | MINOR ADVERSE | NONE | NONE |
| Operation | MINOR ADVERSE | MINOR ADVERSE | CUMULATIVE | NEGLIGIBLE |
| LANDSCAPE AND VISUAL | | | | |
| Construction phase | MINOR ADVERSE | MINOR ADVERSE | CUMULATIVE | MINOR ADVERSE |
| Land cover | MINOR ADVERSE | MODERATE BENEFICIAL | CUMULATIVE | MODERATE ADVERSE |
| Topography | MAJOR ADVERSE | MODERATE BENEFICIAL | CUMULATIVE | MODERATE ADVERSE |
| Landscape character | MINOR TO MAJOR | MINOR TO MODERATE | CUMULATIVE | MINOR TO MAJOR ADVERSE |
| Lighting | MINOR TO MAJOR | MODERATE BENEFIT | CUMULATIVE | MODERATE TO MAJOR |
| Setting of settlements | MINOR TO MAJOR | NEG TO MODERATE | CUMULATIVE | NO EFFECT TO MAJOR |
| ARCHAEOLOGY AND HERITAGE | | | | |
| Removal of land-based features | NO IMPACT | NEG TO MODERATE | NONE | NONE |
| Removal of marine archaeology | NEGLIGIBLE | MINOR ADVERSE | ADDITIVE | MINOR ADVERSE |
| Removal of potential marine archaeology | NEGLIGIBLE | MINOR ADVERSE | ADDITIVE | MINOR ADVERSE |
| Effects on setting of listed buildings | MAJOR ADVERSE | MODERATE ADVERSE | ADDITIVE | MODERATE TO MAJOR |

¹ Inclusive of mitigation

| Parameter / Predicted effect ¹ | Bathside Bay | Felixstowe South | Nature of interaction | In-combination |
|---|------------------|------------------|-----------------------|------------------|
| LAND DRAINAGE AND COASTAL DEFENCE | | | | |
| Land drainage | NO IMPACT | NO IMPACT | NONE | NONE |
| Coastal defence (Shotley) | NEGLIGIBLE | MINOR ADVERSE | ADDITIVE | NEGLIGIBLE |
| NAVIGATION | | | | |
| Navigational safety | NEGLIGIBLE | NEGLIGIBLE | ADDITIVE | NEGLIGIBLE |
| SOCIO-ECONOMICS | | | | |
| Construction jobs | MINOR BENEFIT | MINOR BENEFIT | ADDITIVE | MINOR BENEFIT |
| Construction effects on the economy | MODERATE BENEFIT | MODERATE BENEFIT | ADDITIVE | MODERATE BENEFIT |
| Operational job creation / economic growth | MODERATE BENEFIT | MODERATE BENEFIT | ADDITIVE | MODERATE BENEFIT |
| Tourism | MINOR BENEFIT | MINOR BENEFIT | ADDITIVE | NONE |
| Investment | ENHANCEMENT | MODERATE BENEFIT | CUMULATIVE | MODERATE BENEFIT |

¹ Inclusive of mitigation

PART III:

ASSESSMENT OF POTENTIAL EFFECTS AND ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE DISPOSAL OF DREDGED MATERIAL

This Part comprises the following:

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| Section 26 | Hydrodynamic and sedimentary regime |
| Section 27 | Subtidal marine communities |
| Section 28 | Water and sediment quality |
| Section 29 | Commercial navigation |
| Section 30 | Fisheries resource and commercial fishing activity |
| Section 31 | Mineral resources |
| Section 32 | Summary of potential impact associated with the disposal of dredged material and mitigation measures |
| Section 33 | Monitoring proposals |
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PART III ASSESSMENT OF POTENTIAL EFFECTS AND ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE DISPOSAL OF DREDGED MATERIAL

1. This Part describes the potential impacts on a range of parameters predicted to arise as a result of the proposed disposal of dredged material at Inner Gabbard (East). As described in Section 2.1 of this Environmental Statement, it is proposed that a total of 2,960,000m³ of material would be disposed at this site; this material would comprise primarily stiff clay with a mixture, sand, gravel and rock.

2. Two scenarios have been assessed, namely:

- A 4m high deposit of clay estimated to result from the placement of clay arising from the deepening and widening of the approach channel; and,
- An 8m high deposit of clay that is intended to represent clay deposited from potential future schemes (i.e. a volume in the order of 40Mm³ has been assumed for this purpose).

3. These two scenarios were used as a basis for considering the potential for impact on future disposal of material arising from maintenance dredging. It should be noted that all maintenance dredgings from the berths and approaches to the Port of Felixstowe will continue to be disposed of at the existing Inner Gabbard dispersive site. The proposed capital disposal site at Inner Gabbard (East) would not receive any maintenance dredgings and, therefore, it is not necessary to consider the above two scenarios with respect to effect on dispersion of maintenance dredgings.

4. This Part considers the potential impacts of the disposal of capital dredged material arising from the proposed dredging for the Felixstowe South Reconfiguration on the following parameters:

- Hydrodynamic and sedimentary regime;
- Subtidal marine communities;
- Water and sediment quality;
- Navigation;
- Fisheries resource and commercial fishing activity; and,
- Mineral resources.

5. The approach to the assessment of potential environmental impacts is as described in the introduction to Part II of this ES. In summary, the effects of the disposal on the hydrodynamic and sedimentary regime are described as 'changes' as it is not appropriate to assess the effects in terms of significance. The potential impacts of the disposal of dredged material on the other environmental parameters are assessed using the same methodology as adopted for the assessment of potential environmental impacts of the proposed development (and as described in Section 1.5.1).