

Harvey's Towans Sand Replenishment Site
Preliminary management recommendations

1.0 Background

1.1 Under 6.1 of the Hayle Licence to Dredge 2008-2010 it was agreed that a minimum of 20% of the dredged materials must be retained within the St Ives Bay sand cell for the 2 year licence period.

1.2 In the absence of a FEPA licence, a terrestrial site was selected as a replenishment zone. Site availability was limited to land in ING ownership; Harvey's Towans was proposed by Buro-Happold and HHAL and agreed (with additional advice) by Natural England (NE).

1.3 Over the licence period a total of 51 836 tonnes was dredged from the harbour and channel. Of this, 10 700t was deposited on Harvey's Towans constituting 20.6% of the total amount dredged between 2008 and 2010. This satisfies condition 6.1 and no further deposition on Harvey's Towans is expected under the expired Licence.

1.4 During quarterly meetings under the 2008-2010 Hayle Licence to Dredge, the requirement for management measures of the replenishment zone was accepted by ING. A management plan for the replenishment zone was requested by the Environmental Consultees; details were expected to be set out within the Dredging Protocol (required under condition 4.4 of the Hayle Licence to Dredge).

2.0 Current condition and issues

2.1 In January 2011 a visual estimation of the replenishment zone suggests an area of approx. 80 x 80m (to be verified).

2.2 The initial deposition in the replenishment zone in December 2008 of 6,700t contained unscreened material. This oversight was rectified for the second (and final) deposition of 4,000t in October 2010 when particles >20mm were removed. However, it was evident from the most recent site visit in January 2011 that surface sand remains mixed with stones (commonly 1-3cm in diameter),

larger rocks and anthropogenic debris such as metal to a depth of approx. 5-10cm. It is not clear whether the screened sand from October 2010 has already blown away to expose the underlying stones and rocks, or whether the screening in October was not effective in removing larger particles. Whilst material immediately beneath the top 5-10 cm appears to comprise of well sorted particles it is not known whether this remains true across the whole site or to what depth it extends. The current situation of poorly sorted surface material will have a negative impact on colonisation through impeding the transportation of wind blown sand across the face of the replenishment zone.

2.3 In addition to changes in chemical and physical sediment composition, photographic records suggest that the height and profile of the site have been dramatically altered as the result of replenishment work. This is likely to have a number of implications for the speed and success of site recovery. In terms of slope, the current profile to the north east of the site (adjacent to the path) is too steep, and therefore unstable, for the natural recolonisation of dune flora to occur. Loose dry sand rests at an angle of 30-35°; therefore the slope needs to be below the angle of repose before natural stabilization can occur. Whilst vegetation can allow stability of slope up to 43° it would require additional measures, such as thatching, for plants to establish in the first place.

2.4 As to the increase in height caused by deposition of dredged material in the replenishment zone, photos from 2008 suggest that survival of existing marram would have been compromised by such significant additions of overlying material. Whilst marram can tolerate deposition rates of 1m of new sediment per year, this figure was exceeded during the operations of 2008 and 2010.

2.5 Prior to operations in 2008, the advice from NE was to remove existing marram and retain for use on top of dredged material. This advice does not appear to have been followed.

2.6 From the visit in January 2011 there is continued evidence of pedestrian and vehicular access across the replenishment site. Whilst boulders have recently been placed adjacent to the car park to discourage access by dune buggies and other vehicles, it is likely that trampling will persist. If allowed to continue it is unlikely that marram (transplanted or naturally occurring) will survive within the replenishment zone. Without recolonisation the substrate will remain unstable; sediment will continue to be lost to the car park and surrounding areas. Currently the replenishment area is unsightly so there is much to be gained, in terms of public relations, in returning the area to a state more congruent with the

surrounding dunes. Furthermore, as a UK BAP (Biodiversity Action Plan) priority habitat, management measures must ensure that the dune area, currently degraded as a result of replenishment activity, is restored to its former status.

2.7 Photographs from 2008, 2009 and 2010 are available on CD from HHAL on request.

3.0 Management measures

The detailed protocol behind each management measure set out below must be agreed by the Environmental Consultees before activity commences. Measures should be drawn together within a comprehensive site management plan. Adequate supervision of operations must be ensured and records of activity maintained.

3.1 Short term (within 4 months)

- i. Remove rocks and other large debris from site
- ii. Screen (mesh size 10mm) or remove top 5-10cm of poorly sorted material
- iii. Reprofile to ensure slope does not exceed 30^o
- iv. Erect and maintain perimeter fencing to prevent vehicular and pedestrian access
- v. Undertake marram planting or transplantation across replenishment site
- vi. Erect and maintain information notices
- vii. Monitor site using quarterly fixed point photography
- viii. Produce a comprehensive site management plan

3.2 Intermediate term (within 1 year)

A review of the site should be undertaken by HHAL after one year. On the advice of the Environmental Consultees, should the short term measures be deemed insufficient in promoting adequate recovery, then additional measures outlined below should be implemented.

3.3 Management measures (> 1 year)

- i. Screen and remove materials >10mm (if appropriate)
- ii. Reprofile to ensure slope does not exceed 30^o (if appropriate)
- iii. Undertake thatching of site to stabilize sand and protect vegetation
- iv. Re-plant/transplant marram (if appropriate)
- v. Maintain perimeter fencing and information notices
- vi. Continue monitoring using quarterly fixed point photography