ArupTransport

Tyne and Wear Passenger Transport Authority

New Tyne Crossing

Summary of Proof of Evidence on Spoil & Waste Management

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1. STRUCTURE OF EVIDENCE

1.1 My evidence identifies the regulatory framework within which the operations would be undertaken. I describe the history of the area and the processes involved in establishing the nature and quantity of the materials.

1.2 I describe the methodology used to establish and assess the options for disposal of the surplus materials.

1.3 I identify the potential environmental impacts, the mitigation to be applied and the mechanisms for ensuring delivery.

2. EXISTING CONDITIONS

2.1 The majority of the site is made ground overlying glacial and alluvial deposits. The made ground ranges from domestic/industrial wastes to ash, colliery spoils and ships ballast.

2.2 The industrial history of the banks of the River Tyne dates back to 17th Century and includes mineral extraction and processing, metal works, ship yards, and ballast hills.

2.3 Activity peaked between the mid 19th and 20th Century with quays, land reclamation and dredging occurring alongside industrial expansion. However, by the late 1950's substantial industrial and residential clearance had occurred. Re-development then took place in the mid 1980's. To the north several industrial and domestic landfill sites were operated between 1940 and the 1970's.

2.4 A desk-based study and the results of the Preliminary Ground Investigation were used to establish the baseline ground conditions.

2.5 Soils test and leachate analysis results showed that a number of determinants in the made ground were elevated and to a lesser extent in the natural ground. The determinants and degree of elevation varied across the site and included heavy and phytotoxic metals, inorganic and organic compounds.

2.6 The results of sediment contamination leaching and toxicity surveys established the levels of contamination likely to be encountered within the river. This was also found to be variable.

3. ASSESSMENT METHOD

3.1 The assessment for Chapter 19 of the Environmental Statement – Waste Arisings and Disposal, was a desktop exercise utilising the studies behind Chapter 12 – Water Quality and River Impacts and Chapter 16 – Geology, Soils and Contaminated Land. It examined the opportunities for disposal, the potential environmental impacts and the appropriate mitigation.

3.2 The review of the Chapter 19 assessment and the more detailed analysis of the volumes to be handled and the implications of the disposal options is contained in a report entitled 'Analysis of Tunnel Construction Spoil Generation and Disposal 2003 (2003 Report). (Appendix A).

3.3 The significance criteria adopted in the Environmental Statement Chapter 19 (ILfig.3 - Environmental Statement Table 19.1) was also used in the 2003 Report.

3.4 My proof notes differences (para 5.4 and ILfig.1) between the quantities referred to in the Environmental Statement and the 2003 Report due to design refinements. I do not consider that these revisions alter the Environmental Statement conclusions.

3.5 The opportunities for using the materials on-site were examined with a view to maximizing the quantities and thereby minimizing the environmental impacts of off-site disposal.

3.6 A hierarchy of sustainability for the disposal options was developed. This is to be used to direct the Concessionaire in the development of the surplus material disposal elements of the Waste Management Plan as required by the Construction Code of Practice.

3.7 An overview of the current state of the construction market, the availability of appropriate landfill sites and the likelihood of securing a dedicated disposal site(s) was undertaken.

3.8 The potential for disposal at sea has been examined considering the suitability of materials and the regulatory procedures.

4. FINDINGS

4.1 The project involves considerable quantities of dredged, excavated, and other potentially surplus natural and manmade materials of different origins and conditions.

4.2 The total quantity is estimated at 693,400 m^3, generated over 24 months. The on-site material requirement is estimated at 340,500 m^3 leaving a surplus of 352,900 m^3.

4.3 There are a number of options for the disposal of the surplus materials. Each option has been considered in terms of environmental sustainability. A hierarchy that reflects this and the project circumstances has been compiled, referred to as the 'Hierarchy of Sustainability' (ILfig.4 – Appendix B).

4.4 A proportion of the surplus material is affected by contamination that occurs in 'hotspots' at a level that could pose a risk to humans and the environment. The contamination is associated with made ground, the surface layers of the natural ground and the silt. Materials from the riverbed have the disadvantage of being saturated.

4.5 The majority of the relatively uncontaminated dredged materials would be suitable for sea disposal subject to obtaining an appropriate FEPA licence from DEFRA.

4.6 The Hierarchy of Sustainability identified five basic options for disposing of the materials:

- On-site re-use/Onsite process and use
- Off-site re-use/existing recycling facility
- Offsite Dedicated recycling facility
- Landfill
- Sea Disposal

5. ASSESSMENT OF OPTIONS

5.1 Land Disposal

The Environmental Statement (CD5 – para 19.8.3) identified the worst case scenario of all surplus material going to landfill in one year and assessed the impact on the regions landfill void space, 55% of the annual input, as moderate adverse. ('Tyne and Wear' Unitary Development Authorities (DETR Municipal Waste Management Survey 1998-99).

5.2 The 2003 Report analysis examined a potential optimum position. In other words estimating the likely quantities of material that would be re-used or recycled off-site over a two year period, having taken a pessimistic view of the level of unusable material. The apportionment was based on informal consultation with members of the construction and waste disposal industries and a review of research findings. 'Survey of Arisings and Use of Construction and Demolition Waste in England and Wales 2001' (2001 Survey).

5.3 The average distance travelled from source to recycler is 25km and then 25km to the end-user. (BRE – Centre for Sustainable Construction: Sustainable Construction – the Data; March 2000). This implies a market area including the largest conurbations in the northeast.

5.4 The 2003 Report established that offsite re-use/recycling for each year would equate to 2.22% and 1.88% of the estimate for such uses (2001 Survey).

5.5 The landfill requirement equates to 3.4% and 9.0% of the annual inputs for the two years. If year 2 was apportioned equally between the 14 sites this equates to 3,770 m^3 per site. The Waste Management Licences typically allow 50-75,000 m^3 of construction & demolition and/or 'difficult' wastes.

5.6 The 2003 Report volumes and percentages are considered achievable levels in the context of a properly formulated and implemented Waste Management Plan.

5.7 **Sea Disposal**

The likelihood of securing sea disposal has been assessed by comparison of the proposed activity with existing dredging and disposal operations on the Tyne.

5.8 The levels of contamination are similar or less than those from navigation dredging. Consequently, the majority of the material should therefore be suitable for at sea disposal.

5.9 Dredging and disposal from the Tyne during the 1990's is understood to have varied between 80,000 and 280,000m^3. The 2003 Report sea disposal requirement for each year is 20,100m^3 and 93,600m^3. In this context the volumes should not rule out sea disposal.

5.10 There are 7 Marine Disposal Sites in the vicinity of the mouth of the Tyne (included on ILfig.4 Appendix B). The selection of a site and the volume rests with DEFRA.

6. IMPACTS ASSOCIATED WITH THE OPTIONS

6.1 **Land Disposal**

There are four issues that have potentially significant environmental impacts on land:

6.2 Release/Escape of Contaminants

The excavation and transportation of contaminated material have the potential for escape of contaminants into the environment. This could be from spillage, dust, run off and discharges to surface water particularly from the dewatering of dredged materials.

6.3 Transportation

Transportation of the surplus materials offsite to landfill or beneficial use has the potential to cause moderate adverse impacts (traffic congestion, noise and vibration) at various times.

6.4 'Loss' of Void Space

The availability of void space is a major issue for local authorities. The worst-case (see para 8.1) is the equivalent of 55% of the annual landfill inputs for the 'Tyne & Wear' Authorities. In the environmental Statement this was judged to be a moderate adverse impact. The 2003 Report presents a more realistic scenario and reflects a reasonable view of the success of diverting surplus materials away from landfill.

6.5 Natural Resources

The re-use and recycling of surplus materials would have a minor beneficial impact in respect of substitution for primary aggregate production.

6.6 Sea Disposal

The potential impacts of disposal of dredged material at sea are the effects of contamination and burial at the point of disposal.

6.7 Contamination and effect of burial has been the subject of recent research consisting of laboratory experiments using sediments from the Mersey and Tees. The research concluded that the effects were mainly determined by the deposition frequency rather than the type or degree of contamination.

6.8 I therefore conclude that the potential impacts from the New Tyne Crossing materials at the deposition site will not be the key determining factor in the issuing of a licence, rather it will be a function of the overall quantities and frequency of deposition at the disposal site at the time of the licence application.

7. MITIGATION

7.1 The mechanisms for the delivery of satisfactory mitigation are contained in the Code of Construction Practice. Specifically the Management Plans:

- General Environmental
- Traffic
- Noise and Vibration
- Dust and Air Pollution
- Contaminated Land
- Surface and Groundwater
- Spoil and Waste

7.2 Release/Escape of Contaminants

Contaminated material would be carefully managed in accordance with environmental and health and safety requirements. It will have priority for disposal or re-use to minimise the time during which contaminants could escape.

7.3 Measures for control of dust emissions would include wheel cleaning, road sweeping and maintenance and damping down of haul roads.

7.4 Areas identified for the temporary containment of contaminated material would be bunded and surface water runoff collected for appropriate disposal. This would include the dredged material storage area and particularly any area required for dewatering of contaminated material destined for landfill.

7.5 Transportation

The potential for transport impacts will vary proportionally with the rate of material generation. Traffic management measures would include restrictions on operating hours, rate of despatch and use of temporary surge piles to smooth out the production peaks.

7.6 Sea Disposal

Mitigation for potential effects of contamination would involve the identification and separate disposal of unacceptably contaminated material to landfill. Mitigation for the effects of burial would be the formulation of a disposal regime involving smaller quantities at frequent intervals co-ordinated with existing activity at the disposal site.

8. CONCLUSION

8.1 The Environmental Statement and 2003 Report analysis identified potential impacts associated with the issues of contamination, volume of material, the use and disposal of it.

8.2 None of these issues are of such significance that they will not be capable of satisfactory mitigation by the implementation of the Management Plans envisaged by the Code of Construction Practice.

8.3 I therefore conclude that the residual effects of the environmental impacts associated with the above issues will be no more than minor adverse.