APPENDIX 5

CONTAMINATED SILT DISPOSAL – REGULATORY OPTIONS

Royal HaskoningDHV
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YORKPOTASH
A **Sirius Minerals** Project

York Potash Project: Contaminated silt disposal

Contaminated silt – Regulatory Options Note

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1 INTRODUCTION

1.1 Purpose of the report

1.1.1 The proposed development of a new Harbour Facility on the River Tees at Bran Sands forms part of the York Potash Project (YPP). There are proposed dredging works as part of the construction of the Harbour Facilities (see section 1.2 below). The layers of sediment to be dredged include contaminated silt; sands and gravels; and geological material (Mercia mudstone). This document is concerned with the management of the contaminated silt layer.

1.1.2 The levels of contamination in the silt mean that it would be prohibited from disposal to sea. Therefore, the silt must be brought to land for disposal or recovery.

1.1.3 As part of the feasibility assessment for the management of contaminated silt as waste on land, there is a requirement for York Potash Limited (YPL) to understand the associated regulatory constraints and controls required to do this.

1.1.4 This document will inform YPL and any sub-contractors commissioned by them as to what their regulatory obligations are in relation to the management of contaminated silt on land.

1.1.5 This report expands upon these obligations and provides a review of environmental permitting considerations; regulatory requirements for off-site disposal, treatment or recovery of the contaminated silt; and a review of the appropriate protocols, codes of practice or criteria, which would allow the material to be reused outside of the waste regulatory framework as a construction material. This report concentrates on the regulatory constraints.

1.1.6 A summary of waste regulatory constraints is provided in **Section 2**.

1.1.7 Recommendations for the next steps in the feasibility assessment are provided in **Section 3**.

1.1.8 **Annex 1** provides a detailed review of the regulatory constraints associated with managing the contaminated silt on land.

1.2 Background

1.2.1 YPL proposes to develop Harbour facilities on Teesside for the export of up to 13 million tonnes per annum (mtpa) of polyhalite bulk fertiliser. The proposed Harbour facilities would include a port terminal on the southern bank of the Tees estuary.

1.2.2 Two options are being considered for the quay construction – an open quay structure and a solid quay structure. In both cases, the development of the port terminal would be undertaken in two phases to provide the necessary export facilities that mirror the predicted increase in production from an initial 6.5mtpa to 13mtpa of product.

1.2.3 Capital dredging of the berth pocket (and approaches to the pocket) would be required in order to allow the maximum design vessels proposed access to the port terminal. This dredging would be undertaken in two phases and is linked to the phased construction of the quay.

1.2.4 In the downstream section of the proposed dredge area, existing borehole logs indicate that the required dredging would be entirely within the silts, sands, gravels and clays. In the upstream section, the dredging would generally require the removal of bedrock (marl). Consequently, the majority of the Phase 1 dredging would be undertaken in the silts, sands, gravels and clays (as show in **Table 1**).

Table 1 Summary of capital dredged material quantities and material types for Phases 1 and 2 (open quay configuration)

Material type	Capital dredge volume (m^3)				Total
Phase 1					
Silts	155,000				
Sands and Gravels		300,000			
Clays			180,000		
Mercia Mudstone				115,000	
Total (Phase 1)					**750,000**
Phase 2					
Silts	26,000				
Sands and Gravels		26,000			
Clays			50,000		
Mercia Mudstone				270,000	
Total (Phase 2)					**372,000**
Total (Phase 1 + Phase 2)	**181,000**	**325,000**	**230,000**	**375,000**	**1,122,000**

1.2.5 **Table 2** shows the proposed quantity of each type of dredged material for both quay options.

Table 2 Summary of dredged material volumes for the open quay and closed (reclamation) quay options

Material type	Open quay (m^3)	Solid quay (m^3)
Silts	181,000	66,000
Sands and Gravels	326,000	196,000
Clays	230,000	194,000
Mercia Mudstone	375,000	358,000
TOTAL	**1,122,000**	**814,000**

1.2.6 In order to identify the chemical and geotechnical properties of the silt layer, it has been subject to sampling and testing. An assessment of the chemical analysis data has been carried out[1] and confirms that the level of contamination exceeds the hazardous waste thresholds. This is briefly summarised below.

1.2.7 Vibracore samples of the contaminated silt were taken from nine sampling points. Seven sampling points were in the proposed berth area. Two sampling points were in the main navigation channel and outside of the proposed dredged area. The sample locations are identified in the hazardous waste assessment report.

1.2.8 The data were assessed to determine the waste classification of the contaminated silt. This has an important bearing on potential disposal or recovery options on land.

1.2.9 None of the samples from the sampling points in the main navigation channel (outside of the proposed dredged area) were observed to be hazardous.

1.2.10 Approximately half of the samples taken from within the proposed dredge area exceeded the hazardous waste thresholds; and all of the sampling points from the proposed dredged area included one or more samples that exceeded the hazardous waste thresholds

1.2.11 Therefore the contaminated silt as a whole should be dealt with as a hazardous waste when dredged. This classification only applies to the silt.

1.2.12 The underlying sands and gravels below the silt layer represent the geological horizon and as such are unlikely to be contaminated as a consequence of anthropogenic influence. They are not hazardous waste.

1.2.13 For Phases 1 and 2, it is proposed that dredging of the silts would be undertaken using enclosed grabs, due to the elevated concentrations of contaminants present within the silt. **Table 1** shows that 181,000m^3 of contaminated silt would require dredging by this method for the open quay configuration, and 66,000m^3 for the closed configuration. However, a precautionary approach has been taken because of the hazardous waste classification of the silt layer to allow 181,000m^3 silt + the top 15% of the material below the silts (i.e. a total of 208,150m^3) for the open quay configuration; and 66,000m^3 + the top 15% of the material below the silts (i.e. a total of 75,900m^3) for the closed quay configuration, to be dealt with on land as contaminated silt.

1.3 Site constraints

1.3.1 There is no opportunity in the proposed development for the storage or management of the contaminated silt on land within the proposed Harbour development site. Therefore, all waste treatment options would require an off-site solution.

[1] Royal HaskoningDHV, 'York Potash Project - Sediment disposal – Hazardous Waste Assessment', 9Y0989-109-101/303852/Sed_Haz_assessment/PBoro (2014)

1.3.2 It is proposed that some of the capital dredged sands, gravels, clay and mudstone would be used as part of the habitat enhancement proposals in Bran Sands lagoon.

1.3.3 Should the solid (closed) quay configuration option be progressed, the balance of sands and gravels that are not used within the habitat enhancement proposals in Bran Sands lagoon could be used within the construction of the port terminal.

1.3.4 However, the open quay structure option does not feature use of sands and gravels for construction purposes. Therefore, given that no other known uses for this material currently exist, the use of sands and gravels in the construction phase cannot be guaranteed. Consequently, it has been assumed (for the purposes of 'worst case' assessment) that offshore disposal of sands and gravels would be necessary.

1.3.5 None of the contaminated silt would be suitable for use in the habitat enhancement proposals; or as fill in the open quay option; or for offshore disposal. However, if the closed quay option is required, it could be used as part of the backfilling requirements for the construction of the closed quay, if the contaminated sediment has been treated to a specification that meets the requirements for this use.

2 SUMMARY OF THE REGULATORY CONSTRAINTS

The following represents a summary of the regulatory constraints or conditions that would be applicable to YPL (and / or the dredging contractor that would be commissioned by YPL to carry out the dredging operation) for the management of the contaminated silt on land. A more detailed examination of the regulatory principles is provided in **Annex 1**.

2.1 Removal from Site and the Waste Duty of Care

2.1.1 The contaminated silt would be considered waste when it is dredged; and would be subject to regulatory control in accordance with the waste regulatory framework. The waste duty of care starts with the person who produced the waste. This would be the dredging contractor.

2.1.2 There is no scope within the development proposals to dewater and/or treat the contaminated silt within the Harbour development footprint; therefore, the contaminated silt would be removed 'as dredged' (i.e. wet). It is proposed that the contaminated silt would be removed by barge to an off-site waste treatment facility.

2.1.3 The removal of the contaminated silt from the dredged area by barge must be by a person or company who is authorised to carry waste, i.e. is a registered waste carrier; or who can prove that they are exempt or excluded. This would apply regardless of the means of transport used to transport the waste.

2.1.4 The facility that receives the contaminated silt must hold an environmental permit that authorises the receipt of wet contaminated silt. There is a legal obligation under the waste duty of care to ensure that all parties involved in the transfer of waste hold the appropriate authorisation.

2.1.5 Every barge movement of the contaminated silt from the dredge area must be accompanied by appropriate waste transfer documentation, which must be completed and signed by all relevant parties. The producer or current holder of the waste is responsible for ensuring that the written information is accurate and contains all of the information necessary for the safe handling, disposal, treatment or recovery by all subsequent holders.

2.2 Hazardous Waste

2.2.1 The hazardous waste classification assessment carried out[2] has confirmed that the contaminated silt would be hazardous waste when dredged. Therefore, the appropriate European Waste Catalogue (EWC) code for it would be *17 05 05** - '*dredging spoil containing dangerous substances*'. The EWC code must be provided on waste transfer documentation.

2.2.2 Prior to the commencement of dredging, and throughout all phases of the dredging programme, the site must be registered as a hazardous waste producer with the Environment Agency.

[2] Royal HaskoningDHV, 'York Potash Project - Sediment disposal – Hazardous Waste Assessment', 9Y0989-109-101/303852/Sed_Haz_assessment/PBoro (2014)

2.2.3 Hazardous waste consignment notes must be prepared by (or on behalf of) the dredging contractor before the contaminated silt is removed from the dredging area for each movement of the contaminated silt to an off-site treatment, recovery or disposal facility. These provide a chain of custody for the transfer and must be signed by the original holder (the dredging contractor); the person who removes the contaminated silt from the dredge area; and an authorised representative of the facility that receives the wet contaminated silt.

2.2.4 It is illegal to mix the contaminated silt with other hazardous wastes; or non-hazardous wastes; or with substances that are not waste, unless the mixing is authorised by an environmental permit.

2.3 Waste Hierarchy

2.3.1 It is a legal requirement for waste producers/holders to follow the waste hierarchy when making decisions about waste management options for waste. Waste holders have to choose the highest possible hierarchical option for their wastes. Lower hierarchical options cannot be justified by cost alone. They require environmental justification over available higher options.

2.3.2 The appropriate waste hierarchical options for the management of contaminated silt are:

- Removal and off site treatment (the treatment must include dewatering as a minimum) followed by recovery; or
- Removal and off site treatment (the treatment must include dewatering as a minimum) followed by disposal.

2.3.3 It is a legal requirement that waste transfer documentation must include a declaration from the producer / holder that the waste hierarchy has been followed when determining the waste management options for the contaminated sediment.

2.4 Treatment of the Contaminated Silt (including Dewatering)

2.4.1 The contaminated silt would be too wet to be directly recovered or disposed after dredging and would require dewatering. Dewatering is a waste treatment operation.

2.4.2 Dewatering must be carried out at a facility which holds an environmental permit that authorises the dewatering of the contaminated silt. YPL and the dredging contractor would have the responsibility for ensuring that an appropriate authorisation is held by the facility that receives the contaminated silt and that the contaminated silt is allowed under the relevant conditions of the authorisation.

2.4.3 Any land-based storage of the material after removal from site pending dewatering (or any other treatment) must be on an impermeable surface or within a sealed drainage system because the contaminated silt is classified as hazardous.

2.4.4 Water that has drained from hazardous contaminated silt is not allowed to be discharged back into a watercourse (including the one from which the contaminated silt was dredged), unless the discharge complies with the conditions of an environmental permit.

2.4.5 Stockpiles of the contaminated silt must be kept separate from any other material which is hazardous; and from non-hazardous waste; and from materials that are not waste.

2.4.6 It is not possible at this stage to ascertain whether the contaminated silt would be directly suitable for any use option or disposal directly after it is dewatered. Given that chemical contamination exists, it could mean the material would pose an unacceptable risk to human health or the environment in the context of any proposed use. A detailed quantitative risk assessment would be required at the site of the proposed use. Further treatment, such as chemical stabilisation may be required to remove or reduce the risk to an acceptable level that would allow the treated silt to be used.

2.4.7 Any further treatment of the contaminated silt for recovery or disposal purposes would also be a waste operation and requires an environmental permit, whether it is carried out at a fixed facility or using mobile treatment plant.

2.4.8 If treatment can be provided using mobile plant equipment, it would be the responsibility of the mobile plant operator to obtain the mobile plant permit for the treatment operation. The operator would also need to obtain a deployment form authorised by the Environment Agency to carry out the activity at the proposed location. It would be the responsibility of YPL and the dredging contractor to ensure that a mobile plant operator had the required authorisations in place before any contaminated silt could be sent to them; and that the contaminated silt is allowed under the relevant conditions of the authorisation.

2.4.9 Where the proposed treatment is intended to produce a construction material to a defined specification for use, a method statement is required to provide a framework to ensure that the material can meet the defined specification. This will enable it to be 'suitable for use'. The method statement must provide:

- Acceptance criteria to define the wastes which are suitable for the treatment process and a method for rejecting unacceptable wastes.
- An engineering specification that the treated material must meet.
- A sampling and testing methodology to assess the treated material against the specification.
- Procedures to reject out-of-specification treated material.

2.4.10 It would be the responsibility of YPL and the dredging contractor to supply all relevant information about the contaminated silt to inform the method statement. The dredging contractor would be responsible for ensuring that the contaminated silt met the acceptance criteria.

2.5 Definition of disposal or recovery

2.5.1 If the treated contaminated silt is to be used for construction purposes, the type of activity or use is subject to criteria that define whether the activity is disposal or recovery. This is significant, because disposal operations are subject to a more stringent set of regulatory controls and represent a lower hierarchical option (in the waste hierarchy).

2.5.2 For the proposed activity to be considered a recovery process, evidence must be provided to demonstrate that the following criteria are achieved, in accordance with Environment Agency guidance[3] EA, Regulatory Guidance Series No. EPR13, v1.0 ('RGN13'):

- Is there a clear benefit from the activity?
- Is the waste material suitable for its intended use?
- Is the minimum amount of waste being used to achieve the intended benefit?
- Is the waste being used as a substitute for non-waste material?
- Will the proposal be completed to an appropriate standard?

2.5.3 If the proposed activity does not meet these criteria, it will be considered a disposal operation. A permit for the disposal of waste on land would be required (i.e. a landfill permit).

2.6 Regulatory Positions for the use of Treated Contaminated Sediment in Construction

2.6.1 There are no suitable exemptions from permitting or simple Standard Rules environmental permits that would be applicable for the use of contaminated silt in construction.

2.6.2 A bespoke permit would be required to use the treated contaminated silt in a construction project as waste. A bespoke permit would require a comprehensive application bundle, including a detailed environmental risk assessment; and a management system that would provide a control system to ensure that the proposed activities would not cause unacceptable harm to human health or the environment.

2.6.3 This approach is not recommended, due to the bureaucratic and administrative requirements associated with applying for and managing an environmental permit. There is an alternative approach, without the need for environmental permitting, which is described below.

2.6.4 The CL:AIRE Code of Practice[4] (CoP) could apply to the use of treated contaminated silt in the closed quay configuration or in another local development scheme, where there is a need for the material. For this option to be feasible the scheme must require the use of the appropriate volume of material; AND an appropriate treatment regime must be in place to ensure that the contaminated silt would be suitable for use within the scheme.

[3] https://www.gov.uk/government/publications/rgn-13-defining-waste-recovery-permanent-deposit-of-waste-on-land
[4] http://www.claire.co.uk/index.php?option=com_content&view=category&id=977&Itemid=330

2.6.5 Regular liaison with the regulatory authorities should be maintained throughout the process to ensure that all parties are aware of the application of the CoP on the chosen development and that the appropriate lines of evidence are provided to ensure that the CoP principles can be met. If the principles are followed, the treated contaminated silt would not be considered waste when used and, therefore, an environmental permit would not be required for the use.

2.6.6 The principles are as follows:

- The proposed use of the material must not cause any harm to human health or the environment.
- The excavated material is suitable for its proposed use, without further treatment.
- The use of the material is certain.
- Only a sufficient quantity of material will be used.

2.6.7 As set out above, the contaminated silt would not be suitable for use immediately after being dredged because it would be wet. However, the CoP allows for the treatment of material at a waste treatment facility. The principles of the CoP would be applied to the use of the treated material at the proposed receiver site after it has been treated at the waste treatment facility.

2.6.8 Where the intention is to use the treated sediment at another site, the treatment of hazardous contaminated silt must reduce the levels of contaminants to below the hazardous waste thresholds; AND to levels that are below levels of contamination at the intended receiver site. This applies irrespective of whether the site-specific circumstances mean that the material could be successfully used.

2.6.9 There must be evidence in place (i.e. via the detailed design) for the chosen site to be able to demonstrate that the treated contaminated silt would be used with defined quantities provided prior to use. This requires a Materials Management Plan (MMP) to be prepared by the contractor to show how and where all materials on the ground are to be dealt with; a tracking system to monitor any waste/material movements; and also contingency measures must be defined, i.e. contractual requirements to define who takes responsibility and what happens in the event that the material is not suitable for use.

2.6.10 The CoP requires that the MMP is independently reviewed by a Qualified Person. The Qualified Person must provide a Declaration that the principles of the CoP have been complied with before the treated silt can be used in the proposed construction works.

2.7 Landfill Disposal

2.7.1 Landfill disposal is a potential option for on-shore management where there are no feasible options available to recover part, or all, of the contaminated silt on land; or where the concentrations of hazardous substances in the contaminated silt mean that it is unsuitable for use.

2.7.2 The key aspects of landfill requirements for disposal of the contaminated silt would be pre-treatment (which as a minimum must include dewatering) and compliance with the Hazardous Waste Acceptance Criteria[5] (hazardous WAC).

2.7.3 Appropriate treatment could vary from simple dewatering, to chemical treatment to lower the concentration of hazardous substances, or irreversibly bind contaminants into a solid matrix to prevent long-term release to the environment.

2.7.4 Prior to landfilling, the waste would require testing in accordance with the WAC requirements. This would determine whether the material meets the criteria for disposal in a hazardous class of landfill. The contaminated silt would not be allowed to be landfilled in a hazardous class of landfill if it fails the hazardous WAC.

2.8 Landfill Tax

2.8.1 HMRC was contacted to provide clarity on which rate of landfill tax would apply to the landfilling of contaminated silt from the proposed Harbour facilities. Their response clearly stated that the criteria provided in section 4.1 of HMRC guidance LFT1[6] would define whether the silt is exempt from any form of landfill tax, regardless of contamination.

2.8.2 The conditions of LFT1 Section 4.1 are met for the proposed dredging programme for the proposed Harbour facilities. Therefore, the disposal of the contaminated silt to landfill would not incur landfill tax.

2.8.3 LFT1 identifies that this exemption would apply to silt that has been dewatered; or where additives have been mixed with the contaminated silt to ensure that it is not liquid waste.

2.9 Export for Management Overseas

2.9.1 Facilities for the management of contaminated silt exist across Europe and there is an active European Sediment Network[7] that has a focus on the management of sediment.

2.9.2 The contaminated silt could only be exported for 'recovery' within the EU or to an OECD Country outside of the EU. Export for disposal is banned.

2.9.3 The shipment of this material would need to follow the Waste Shipment Regulation procedure of prior written notification and consent. This would include providing of financial provision and insurance to cover potential repatriation and treatment in the UK.

[5] The Waste Acceptance Criteria ('WAC') are defined in Council Decision 2003/33/EC established criteria and procedures for the acceptance of waste at landfills, pursuant to Article 16 of and Annex II to Directive 1999/31/EC (the Landfill Directive)

[6] https://www.gov.uk/government/publications/excise-notice-lft1-a-general-guide-to-landfill-tax/excise-notice-lft1-a-general-guide-to-landfill-tax

[7] http://www.sednet.org

2.9.4 There is considerable bureaucracy and costs involved with sending waste overseas. Although disposal is lower than recovery in the waste hierarchy, the environmental considerations of shipping the waste a considerable distance to an overseas recovery facility are likely to be more significantly adverse than disposal in a UK-based facility. Therefore, this option should only be pursued if there are no technically or economically feasible options for recovery or disposal of the contaminated silt in the UK.

3 RECOMMENDATIONS

3.1.1 Section 2 (and Annex 1) describe the regulatory obligations that YPL and their appointed dredging contractor would have to comply with to manage the contaminated silt that would arise due to the dredging associated with the Harbour facilities on land.

3.1.2 The assessment of the regulatory constraints provided in Annex 1 has effectively ruled out any suitable waste hierarchical options that:

- prevent the production of the contaminated silt;
- allow the preparation for reuse (within the strict definition of 'reuse' in the waste hierarchy); or
- recycle the contaminated silt.

3.1.3 The potential to recycle the material at a facility overseas is also ruled out.

3.1.4 There are facilities in the UK that treat contaminated silt and an investigation into the available treatment and subsequent recovery or disposal options should form the next step of the feasibility assessment process.

3.1.5 However, the practical availability of appropriate facilities is likely to be significantly constrained by the fact that the material would be removed from the dredge area as dredged, i.e. wet, by barge. Therefore, any facility that receives the silt must be at the 'water's edge'.

3.1.6 The preferred option in line with the waste hierarchy would be to recover the contaminated silt after it has been dewatered by using it in the construction of the closed quay configuration, should this option be chosen. However, if this option is not chosen, the best hierarchical option would be to dewater and treat the contaminated silt so it can be put to beneficial use elsewhere (for example a construction project at another development site; or preparation into a landfill restoration material).

3.1.7 These options are likely to require further treatment to make the silt suitable for use, given its levels of contamination and fine nature. It is recommended that further physico-chemical treatment options, such as stabilisation or solidification, are investigated.

3.1.8 Mobile treatment operations are constrained by their rate of treatment. The overall volume of the silt and the rate of dredging may mean that physico-chemical treatment for the purposes of recovery may not be feasible at a mobile plant facility in a location that does not provide adequate storage and containment. This must be factored into any feasible treatment operations.

3.1.9 It is recommended that discussions are held with relevant local authorities to identify whether there are any suitable 'water's-edge' development schemes in the planning process that could receive the contaminated silt after treatment for use in construction.

3.1.10 A Materials Management Plan would be required to implement the relevant processes needed to treat the contaminated silt to a required specification and use the treated contaminated silt in accordance with the principles of the CL:AIRE CoP at the relevant site(s).

3.1.11 It is also recommended that discussions are held with local or regional waste management facilities at 'water's edge' locations to identify appropriate treatment regimes for recovery and disposal; and outline costs for treatment. This process has been initiated and water's edge facilities have been identified. This will be progressed as part of the final stage of the feasibility assessment

3.1.12 Where suitable waste facilities are found, it is recommended that their environmental permit credentials are audited to fulfil part of YPL's waste duty of care requirements. Suitable sites should also be assessed to identify any constraints for managing the wet contaminated silt. Any site that has constraints that would create a risk to the dredging programme would be ruled out.

4 ANNEX 1 – DETAILED WASTE REGULATORY CONSTRAINTS

4.1 Duty of Care

4.1.1 The waste duty of care is a legal requirement implemented by Section 34 of the Environmental Protection Act 1990, to ensure that producers and holders handle their waste safely and in compliance with the appropriate regulations. The duty of care involves making sure that the waste has been described properly and that all of the properties associated with the waste are known; and to ensure that persons involved in the transfer of waste hold the necessary authorisation to do so.

4.1.2 Duty of care provisions are provided in the Waste (England & Wales) Regulations 2011, SI 2011 No. 988.

4.1.3 The waste duty of care starts with the person who produces the waste. This will be the dredging contractor.

4.1.4 There are mandatory duty of care requirements for waste producers and holders of waste. These requirements include:

- The waste producer or current holder is responsible for ensuring that where wastes are stored pending collection, they are stored securely and in a safe place.
- The waste producer or current holder is responsible for ensuring that the written description of the waste is accurate and contains all the information necessary for safe handling, disposal, treatment or recovery by all subsequent holders.
- The waste producer or current holder is responsible for ensuring that the subsequent holder of the waste has the necessary authorisation to accept it.
- If the waste producer or current holder selects a final disposal, treatment or recovery destination then they share with the manager of that waste management facility the responsibility for ensuring that the waste falls within the conditions of any permit or exemption relevant to that facility.

4.1.5 A producer/holder is responsible according to what he knows or should have foreseen (e.g. the responsibility to ensure the waste is loaded securely for transport, and responsibility for taking action should he come to learn or suspect that it is not ending up at a legitimate destination). A producer/holder should act on knowledge to stop the illegal handling of waste. If the holder does not do this and their waste is subsequently found to have been illegally disposed, the original holder could be held responsible and may face prosecution.

4.1.6 When it is removed for disposal or recovery, there is a duty to:

- Check that the waste is collected or transferred by someone who is authorised to remove it. Transfer by barge is included in this requirement. This will mean that they must be registered as a carrier of waste, unless they are exempt or excluded from needing to be registered.
- Ensure the waste goes to a site which has an environmental permit or waste exemption which authorises the receipt of the contaminated silt.

- Give the waste carrier a completed hazardous waste consignment note - this must include a written description of the waste and be signed by both parties. Copies of hazardous waste consignment notes must be kept for three years.
- Ensure that a declaration is signed on the transfer documentation to indicate that the waste management hierarchy of options has been considered and applied.

4.1.7 The description of the waste on the waste transfer documentation must include the European Waste Catalogue (EWC) code and a full description of the waste. The EWC provides an associated description with the EWC code for the waste. The EWC identifies that there are two potential codes for dredged sediment:

- '17 05 05* dredging spoil containing dangerous substances.'
- '17 05 06 dredging spoil other than those mentioned in 17 05 05*'.

4.1.8 Code 17 05 05* must be used for hazardous silt, while code 17 05 06 must be used for non-hazardous silt. The hazardous waste classification assessment carried out[8] has confirmed that the silt is hazardous, therefore, EWC code 17 05 05* applies. This code must be included on every hazardous waste consignment note.

4.2 Hazardous waste requirements

4.2.1 The Hazardous Waste (England & Wales) Regulations 2005 (as amended) ('HWR') are in place to ensure that hazardous wastes are managed safely from the point of production, until they are ultimately disposed or recovered.

4.2.2 A hazardous waste assessment has been carried out (as described above) and the silt would be classified as hazardous waste when dredged. Therefore, this must be taken into account for any proposed recovery or disposal operations.

4.2.3 It is illegal to mix hazardous waste with non-hazardous wastes; and also mix hazardous waste with materials that are not waste, unless the activity is authorised by an environmental permit

4.2.4 The HWR require that any site or premises must be registered with the Environment Agency where 500kg or more hazardous waste is produced over a 12 month period. Therefore, the proposed development site must be registered throughout both phases of dredging the contaminated silt. A hazardous waste registration number will be provided by the Environment Agency upon registration. This must be used on all hazardous waste consignment notes.

4.2.5 The contaminated silt would be removed from the dredge area by barge to another site for storage, treatment, recovery or disposal directly after dredging. The HWR require that every single movement of hazardous wastes must be accompanied by a hazardous waste consignment note that has a unique

[8] Royal HaskoningDHV, 'York Potash Project - Sediment disposal – Hazardous Waste Assessment', 9Y0989-109-101/303852/Sed_Haz_assessment/PBoro (2014)

consignment note code. Guidance on the consignment of hazardous waste and consignment note codes is provided on the Environment Agency's website[9].

4.2.6 It is the responsibility of the holder of the waste silt (i.e. the dredging contractor) to complete the hazardous waste consignment note. A third party, e.g. a consultant or waste management contractor, can be used to complete it on the holders' behalf, however, the legal responsibility for completing the consignment note still remains with the holder.

4.3 The Waste Hierarchy

4.3.1 The Waste (England and Wales) Regulations 2011 SI 2011 No. 988 implements the Revised Waste Framework Directive[10] ('rWFD') in England and Wales. The waste hierarchy is set out at Article 4 of the rWFD. The waste hierarchy requires the producer/holder of a waste to demonstrate that the priorities identified in **Table 3** have been considered in order to determine the most suitable waste management option for all wastes prior to removal from site.

Table 3 The waste hierarchy

Waste Hierarchy	Relevant activity
Prevention	Using less material in design and manufacture, keeping products for longer, re-use, using less hazardous materials
Preparing for re-use	Repairing; reconditioning; or recycling without requiring adaptation; repairing a discarded broken product to make it operational
Recycling	Turning waste into a new substance or product, includes composting if it meets quality protocols
Other recovery	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste, some backfilling / use of material for construction
Disposal	Landfill and incineration without energy recovery

Table reproduced from Defra website: https://www.gov.uk/waste-legislation-and-regulations

4.3.2 It is a legal requirement for waste producers/holders to follow the waste hierarchy when making decisions about waste management options. Waste holders have to demonstrate the highest possible hierarchical option for their wastes. Lower hierarchical options cannot be justified by cost alone. They require environmental justification over available higher options, for example the location of a site may

[9] https://www.gov.uk/dispose-hazardous-waste/consignment-notes
[10] 2008/98/EC

justify sending waste to a lower hierarchical option (e.g. local landfill), rather than sending it hundreds of miles to the nearest facility that could provide a higher option.

Assessment against the hierarchical options

'Prevention' and 'Preparing for re-use'

4.3.3 The creation of the dredged contaminated silt cannot be prevented, because has to be removed as a consequence of the works; and given the nature of the material, it cannot meet the definition of 'prepared for reuse'.

'Recycling'

4.3.4 There are no Quality Protocols specifically for contaminated silt. However, it is noted that the Waste & Resources Action Programme (WRAP) Aggregates Quality Protocol[11] includes non-hazardous contaminated silt in the list of acceptable wastes, as long as it can be demonstrated that the contaminated silt is inert and does not include any fines. This Quality Protocol requires that the contaminated silt is subjected to treatment at a waste management facility, where it is processed into a secondary aggregate product using factory-control-procedures. This process would generate a marketable secondary aggregate that is suitable for use in any location that requires the specified product. Given that the silt contains contamination that exceeds the hazardous waste thresholds, it will not meet the definition of 'inert'. Therefore, there are no recycling options available.

'Other recovery'

4.3.5 The contaminated silt could be reused for construction purposes, e.g. as low grade fill; or as a defined-specification engineering material, after appropriate treatment, for example as backfill in the closed quay configuration (if this is preferred) or at another suitable development if one is available. However, the silt must be deemed 'suitable for use' according to several criteria, which are described later in this report. The contaminated silt will need to be dewatered before it is suitable for recovery.

4.3.6 There is no proposed option to provide a dedicated dewatering or treatment facility as part of the construction phase of the proposed Harbour facilities, however, if the closed quay configuration is preferred, there could be scope to use treated contaminated sediment as backfill material where it has been treated so that it meets the required technical specification. Therefore, any treatment would be at an off-site location.

4.3.7 Where the contaminated silt is used in construction, this is technically considered 'other recovery' and would be a lower hierarchical option than recycling. However, it does have advantages, particularly if the silt is recovered for use on site or within another proposed local development scheme:

[11] http://aggregain.wrap.org.uk/quality/quality_protocols/

- It is the best possible option when considering the proximity principle, i.e. managing the material at or close to the site.
- Reuse of the material would prevent the need for using similar quantities of virgin aggregate that would be used for the same purpose, thus saving natural resources.

Disposal

4.3.8 The lowest hierarchical option for the silt would be to dispose of it. It is contrary to the waste hierarchy to justify landfilling by means of convenience or cost.

4.3.9 Landfill would be a justifiable alternative if there are no available local development projects that could accept the silt after it had been treated. It could also be justified if the treatment required to make the contaminated sediment suitable for use gave rise to unacceptable emissions, or was technically unfeasible (e.g. the rate of treatment could not match the rate of dredging, which would give rise to problems associated with storage).

Appropriate options

4.3.10 The appropriate waste hierarchical options for the management of the silt are removal and off site treatment followed by recovery (reuse in construction); or Disposal.

- Removal and off site treatment followed by recovery; or
- Removal and off site treatment followed by disposal.

4.4 Recovery or Disposal

4.4.1 The term 'recovery' has been debated across EU Member States and has been the subject of case law at a European level. In ruling on the Abfall case (Abfall Service AG ASA) C-6/00), the European Court stated that " *the essential characteristic of a waste recovery operation is that its principal objective is that the waste serve a useful purpose in replacing other materials which would have been used for that purpose, thereby conserving natural resources*".

4.4.2 The Environment Agency has provided guidance[12] to define when the deposit on land is considered to be recovery - EA, Regulatory Guidance Series No. EPR13, v1.0 ('RGN13').

4.4.3 For the proposed activity to be considered a recovery process, evidence must be provided to demonstrate that the following criteria are achieved:

- Is there a clear benefit from the activity?
- Is the waste material suitable for its intended use?
- Is the minimum amount of waste being used to achieve the intended benefit?
- Is the waste being used as a substitute for non-waste material?

[12] https://www.gov.uk/government/publications/rgn-13-defining-waste-recovery-permanent-deposit-of-waste-on-land

- Will the proposal be completed to an appropriate standard?

4.4.4 These principles must be demonstrated either via the environmental permit application for the proposed activity for using the contaminated silt in construction after treatment as a waste (see **section 4.8**); or using a Materials Management Plan if the CL:AIRE Code of Practice is the preferred route for use of the treated contaminated silt as a non-waste (see **section 4.9** for further details).

4.4.5 If the proposed activity does not meet all of these criteria as part of the proposed use, it will be considered a disposal operation and an environmental permit for landfill would be required to deposit the contaminated silt on land.

4.5 Storage

4.5.1 There is no proposed option to store the contaminated silt on-site as part of the construction phase of the proposed Harbour facilities. Therefore, the operator of off-site waste management facilities would bear the responsibility of adhering to the legislative requirements for storage.

4.5.2 The silt is classified as hazardous waste, therefore, any land-based storage of the material pending treatment or disposal must ensure that any water discharge arising from natural surcharge as a consequence of storing the contaminated silt whilst wet is contained. Storage must be on an impermeable surface; or within a sealed drainage system and away from open drains, bare ground, soakaways and other sensitive areas.

4.5.3 The containment system must be secure, free from damage; and be of sufficient capacity to prevent overflows, for example during periods of heavy rain. The containment system must be regularly inspected and maintained to prevent leaks.

4.6 Dewatering

4.6.1 The contaminated silt will need to be dewatered before it can be recovered or disposed on land. Dewatering is a physical treatment process, which is considered to be a waste management activity. Therefore, an environmental permit is required in accordance with the Environmental Permitting (England & Wales) Regulations 2010 (as amended), to ensure that there are appropriate controls in place to prevent unacceptable risks to human health or the environment when carrying out the activity. Water that has drained from hazardous silt is not allowed to be discharged back into the watercourse from which the silt was dredged, or any other watercourse, unless the discharge complies with the conditions of an environmental permit.

4.6.2 The option to provide a dedicated dewatering or treatment facility for the contaminated sediment on-site does not form part of the proposed scheme and dewatering will not take place within the proposed development site. Therefore, there is no requirement for YPL to obtain an environmental permit to dewater the silt. The permit would be the responsibility of the operator of the off-site dewatering facility.

4.6.3 There is an exemption that is applicable for the storage and dewatering of small quantities of un-contaminated silt from inland waters[13]. This is 'D1 Deposit of waste from dredging of inland waters'. However, the exemption does not cover contaminated silt that is classified as hazardous waste and therefore is not appropriate in this case.

4.6.4 It is not possible at this stage to ascertain whether the silt will be directly suitable for use or disposal directly after it is dewatered. Given that chemical contamination is present in the silt, it could mean the material would pose an unacceptable risk to human health or the environment in the context of any proposed use. A detailed quantitative risk assessment would be required at the site of the proposed use. Further treatment, such as chemical stabilisation may be required to remove or reduce the risk to an acceptable level.

4.6.5 Furthermore, for disposal, the level of contamination after dewatering may exceed Waste Acceptance Criteria (WAC) limits (see **section 4.10**). If so, require further treatment would be required to reduce levels of contamination to an acceptable lever prior to landfill.

4.7 Treatment

4.7.1 Any further treatment of the silt would be a waste operation and would require an environmental permit that authorises the receipt of hazardous dredged contaminated silt for treatment whether it is carried out at a fixed facility; or using Mobile Plant.

Treatment on the site of a suitable development

4.7.2 Where the contaminated silt requires treatment at another development site prior to make it suitable for use, this would require a mobile treatment plant to operate the treatment process at the chosen development site.

4.7.3 If treatment can be provided using mobile plant equipment, it will be the responsibility of the mobile plant operator to obtain the mobile plant permit for the operation, and in addition, they will need to obtain a deployment form authorised by the Environment Agency to carry out the activity at the proposed location.

4.7.4 Prior to the commencement of the treatment operation using mobile plant, the Environment Agency must be notified about the proposed activity by the contractor via a 'Deployment Form[14]', which contains the details about treatment methodology, site supervision, pollution control, emission monitoring plans, acceptance and rejection procedures, and a conceptual site model and risk assessment for carrying the treatment procedure(s) out at the site. The Environment Agency requires 25 days to review the deployment form following receipt of a complete application. The treatment activity must not be carried out before the deployment form has been approved by the Environment Agency. It is the responsibility of the contractor to gain these approvals.

[13] https://www.gov.uk/waste-exemptions-disposing-of-waste
[14] https://www.gov.uk/government/publications/deployment-form-for-land-and-groundwater-remediation

4.7.5 It would be the responsibility of the holder of the contaminated silt (i.e. the Dredging Contractor) to ensure that the mobile plant operator had the required environmental mobile plant permit and authorised deployment form; and that the authorisation allowed contaminated silt.

Treatment to a defined construction specification

4.7.6 Where the proposed treatment is intended to produce a construction material to a defined specification for use as backfill material (if the closed quay option is preferred) or at a chosen development site, a method statement is required to provide a framework to ensure that the material meets the defined specification. This will enable it to be 'suitable for use' at the chosen site.

4.7.7 It would be the responsibility of YPL and the Dredging Contractor to supply all relevant information about the contaminated silt to enable appropriate treatment prior to use at the chosen development site.

4.7.8 The method statement must provide each of the following:

- Acceptance criteria to define which wastes are suitable for the treatment process and a method for rejecting unacceptable wastes.

4.7.9 Unacceptable material would include any other waste material (e.g. shopping trolleys, wood, wreckage etc.) that must be prevented from entering the treatment process. The site plan should allocate an area and suitable storage facilities to store rejected wastes not suitable for the treatment process.

- An engineering specification that the treated material must meet.

4.7.10 There will need to be contractual provisions, which identify the appropriate geotechnical specification that the treated dredged material must meet to allow it to be used as engineering fill at the chosen site. These are related to specific technical standards for aggregate material currently on the market, for example the Highways Agency Specification for Highway Works: Series 600[15], for general fill material. Other specifications are available according to the proposed use.

4.7.11 The appropriate standards will be used to benchmark the quality of the treated contaminated silt. When the required specification is achieved the treated contaminated silt would cease to be waste because they are 'suitable for use'.

- A sampling and testing methodology to assess the treated material against the specification.

4.7.12 A testing plan with sampling frequencies must be established. The tests must comply with the standards/specifications for equivalent natural aggregates. These would be set by the Design

[15] http://www.dft.gov.uk/ha/standards/mchw/vol1/pdfs/series_0600.pdf

Engineers dependent upon required strengths of the material according to their designated use. Testing must be carried out by UKAS[16] accredited laboratories.

- Procedures to reject out-of-specification treated material.

4.7.13 If the treated material cannot meet the required specification, then it is not suitable for use at the chosen site. The method statement should identify what procedures would be followed for material that is not suitable for use, e.g. material would be put back through the treatment process; or rejected and set aside for off-site disposal.

Treatment at a dedicated waste facility

4.7.14 There are a number of treatment technologies available that could treat the contaminated silt, according to a specified purpose, i.e. treatment to a specification pending use in the closed quay configuration if this is the preferred option; or treatment pending use as restoration material. In terms of treatment pending use, the principles identified above in sections 4.7.6 to 4.7.13 would also apply to a fixed facility

4.7.15 If the proposed treatment is pre-treatment pending disposal (see **Section 4.10**), the output must be tested to ensure that it complies with the hazardous WAC prior to disposal.

4.8 Use in Construction as a Waste

4.8.1 If the contaminated silt is to be reused in construction, then the proposed activity must meet the criteria for a beneficial recovery operation (see section 4.4).

Waste Exemption

4.8.2 The use of waste for the purposes of construction is considered to be a waste operation and will require an environmental permit, unless it can be demonstrated that an appropriate exemption applies; or evidence can be provided to demonstrate that the material is not a waste when it is used (see **section 4.9**).

4.8.3 A waste exemption is a waste operation that is exempt from needing an environmental permit in accordance with the Environmental Permitting (England & Wales) Regulations 2010 ('EPR 2010') (as amended). Waste exemptions can involve the use, treatment, disposal or storage of waste.

4.8.4 The waste exemption 'U1 – Use of waste in construction'[17] allows for the use of up to 1,000 tonnes of waste in small scale construction instead of using raw materials. The operator of the exemption has to be able to demonstrate that the waste will be used beneficially as part of a defined construction project (i.e. a recovery operation). Waste is not allowed to be disposed under this exemption. The use of the

[16] http://www.ukas.com/services/accreditation-services/Accreditation-Services.asp
[17] https://www.gov.uk/waste-exemptions-using-waste

contaminated silt from the proposed harbour development under this exemption would be prohibited because the criteria does not allow the use of hazardous waste. Furthermore, the quantity that is allowed is too small.

Environmental Permits for Using Waste in Construction

4.8.5 An environmental permit is required where a waste operation does not meet the requirements of an exemption. The permit sets the conditions that must be followed by the operator to prevent the operation from causing harm to human health or the environment.

4.8.6 There are two tiers of environmental permit available in England and Wales. The first tier is a Standard-Rules permit. This is an 'off-the-shelf' permit that is not site specific and contains a standard set of rules that are applicable to particular waste management operations regardless of location. The rules cannot be varied and exclude waste operations in sensitive locations.

4.8.7 If it is not possible to carry out the waste management operation according to the Standard Rules, then the second tier of permitting is required. This is a bespoke permit. A bespoke permit is site specific and involves a much more rigorous application process and compliance conditions.

4.8.8 Regardless of the tier of permit required, the use of the waste for construction purposes must be demonstrated as being a recovery operation, and must meet the requirements identified in section 4.4.

4.8.9 The Standard Rules have general restrictions. The activities shall not be within:

- A groundwater Source Protection Zones 1 or 2; or
- 50 metres of any spring or well, or of any borehole not used to supply water for domestic or food production purposes, or
- 250 metres of any borehole used to supply water for domestic or food production; or
- 500 metres of a European Site (for example a candidate or Special Area of Conservation (cSAC or SAC) and Proposed or Special Protection Area (pSPA or SPA) in England and Wales), Ramsar site or a Site of Special Scientific Interest (SSSI).

4.8.10 A Standard Rules permit does not allow the discharge of any emissions into surface waters or groundwater.

4.8.11 There are currently two standard permits that allow the use of waste excavated material for construction purposes; one for up to 50,000 tonnes and the other for up to 100,000 tonnes (SR2010No7 and SR2010No8, respectively). *"Construction work"* means the carrying out of any building, civil engineering or engineering work and includes the building, alteration, conversion, repair, upkeep or other maintenance of a structure and the preparation of a site for an intended structure. It includes drainage works. This does not include land restoration or reclamation.

4.8.12 Both permits are subject to similar criteria. The main points are that waste shall only be accepted if:

- it is of a type listed in a table within the standard rules;
- it has been identified as a suitable waste type in the approved waste recovery plan;
- it conforms to the description in the documentation supplied by the producer and holder;
- its chemical, physical and biological characteristics make it suitable for its intended use on the site;
- any excavated soil from potentially contaminated sites has been shown by prior chemical analysis and assessment to be suitable for the intended use without significant risk of pollution; and
- it is visually inspected on arrival and at the point of deposit to ensure that it complies with these standard rules

4.8.13 There are two other Standard Rules permits that also cover the use of waste excavated material on land, where the specific purpose is to use waste for reclamation, restoration or improvement of land, which has previously been subject to industrial or other man made development. These are SR2010No9 and SR2010No10, for up to 50,000 tonnes and up to 100,000 tonnes respectively. These have the same criteria as described above, but also have the restriction that waste cannot be spread more than 2m deep; and that the reclamation, restoration or improvement of land must provide agricultural or ecological benefit.

4.8.14 The Standard Rules permits for using waste in construction do not allow the use of hazardous wastes. Therefore, a bespoke permit would be required to use the dredged contaminated silt as waste in a construction project; unless the contaminated silt was first subject to treatment that removed all hazardous properties caused by contamination.

Bespoke Permits

4.8.15 A bespoke permit would be required for any waste operation that is not covered by a waste exemption or standard permit activity. A bespoke permit application requires a dedicated and thorough risk assessment in accordance with the Environment Agency's H1 requirements[18]. The activities must be operated in accordance with procedures written in an environmental management system, which must provide a control system to ensure that the proposed activities will not cause unacceptable harm to human health or the environment. This means higher fees associated with application, subsistence and surrender, because the Environment Agency applies a greater amount of resource in order to determine the application.

4.8.16 The subsistence fees are calculated according to the level of risk, according to the Environment Agency's OPRA (Operational Risk Appraisal) scheme and are bespoke to each application.

4.8.17 Given that the contaminated silt is hazardous, if it has been determined that a suitable option would be to use it as waste in a construction project (for example use in the construction of the oper quay configuration), it would be the responsibility of YPL and the Dredging Contractor to ensure that the site holds a bespoke permit that authorises the use (unless an alternative regulatory position has been approved for the use).

[18] https://www.gov.uk/government/publications/h1-environmental-risk-assessment-for-permits-overview

4.8.18 This approach is not recommended, due to the bureaucratic and administrative requirements associated with applying for; and managing an environmental permit. There is an alternative approach, without the need for environmental permitting that is described below.

4.9 Use in Construction as a Non-waste

The CL:AIRE Code of Practice (CoP)

4.9.1 The Environment Agency has a view that excavated contaminated silt is waste when it is dredged. Waste management control would apply to using such material for construction as described in section 4.8.

4.9.2 However, in the interests of sustainability and pragmatism, the Environment Agency has recognised the value of using excavated material in developments. The organisation Contaminated Land: Applications In Real Environments (CL:AIRE) has written a Code of Practice[19] (CoP) for using excavated material, which has the support of the Environment Agency.

4.9.3 The CoP could apply to the use of the silt on land, either at the site in the open quay configuration if this is the preferred option; or in another local development scheme, as long as all of the principles in the CoP can be met. For this option to be feasible, there would need to be a suitable scheme that requires the use of the appropriate volume of material; AND an appropriate treatment regime to ensure that the contaminated silt would be suitable for use within the scheme.

4.9.4 The CoP is subject to self-regulation via the use of an independent assessment by a Qualified Person, who is a person that fulfils the required experience, qualifications and professional membership criteria set by CL:AIRE. It sets out the principles for achieving a non-waste status through a risk-based approach. If these principles are followed, the treated silt would not be considered to be waste when used, therefore, waste regulatory controls would not apply at the point of use.

4.9.5 YPL would be responsible for ensuring that all relevant information about the silt is made available to the appropriate stakeholders of the proposed development where the CoP would be applied. YPL and the dredging contractor would be responsible for ensuring that the use of the CoP would be valid prior to transferring the treated silt to the point of use.

4.9.6 Regular liaison with the regulatory authorities should be maintained throughout the process to ensure that all parties are aware of the application of the CoP on the development and that the appropriate lines of evidence are provided to ensure that the CoP principles can be met.

4.9.7 The principles are as follows:

[19] http://www.claire.co.uk/index.php?option=com_content&view=category&layout=blog&id=977&Itemid=330

The proposed use of the material must not cause any harm to human health or the environment.

4.9.8 This requires a risk assessment, at the appropriate level, of the development area to demonstrate that the use will not create an unacceptable risk to human health or the environment. A risk assessment for the specific end use should follow the principles defined in Environment Agency Contaminated Land Report 11[20], ('CLR11'). This will find out whether any contaminants from anthropogenic and/or natural sources present an unacceptable level of risk to human health, controlled waters, ecosystems and/or the built environment, based on the available pathways and receptors. If the level of risk is unacceptable after treatment, the CoP cannot apply to the material, therefore, it would be a waste and an environmental permit would be required to allow the use of the treated material.

4.9.9 It is likely that a detailed quantitative risk assessment would be required, given that the contaminated silt is classified as hazardous waste.

4.9.10 The fact that the material is classified as a hazardous waste does not immediately preclude the use of the CoP. However, the principles of the CoP must be followed to demonstrate that the material would be suitable for use by risk assessment; and that the treated material meets the required specification.

4.9.11 YPL would be required to provide the analytical data on the contaminated silt which would help inform the risk assessment process.

The excavated material is suitable for its proposed use.

4.9.12 The chemical and geotechnical properties of the material must be demonstrated to be suitable for the intended use. This means that there must be a specification provided for use as construction material.

4.9.13 The material must be suitable for use in all respects without further treatment. If it requires treatment, it is waste. However, if treatment is required, the material can be used in accordance with the principles of the CoP after this treatment has been carried out.

4.9.14 In this case, the contaminated silt would not be suitable for use immediately after being dredged because it would be too wet. However, the CoP allows for the treatment of material at a permitted facility, as part of a 'simple hub and cluster arrangement'. In this case, the proposed YPL harbour development area would be the 'donor' site; the treatment facility would be the 'hub' facility; and the chosen development site would be the 'receiver' site – so if the material is returned back to the Harbour construction for use in the open quay configuration (if this is the chosen option) the Harbour Development would be the 'receiver' site; or if the treated material is sent to another facility for use, that development site would be the 'receiver' site. The principles of the CoP would be applied to the use of the treated material from the hub site, at the proposed receiver site.

4.9.15 The CoP requires that the Environment Agency must be consulted regarding the proposed hub and cluster arrangement.

[20] https://www.gov.uk/government/publications/managing-land-contamination

4.9.16 The following general restrictions apply to contaminated silt that has been transferred from the proposed YPL harbour development for treatment and use:

- The treatment process must be authorised.
- The hazards to human health and the environment must not be increased beyond the current levels that exist at the receiver site by the importation of the treated material.
- The importation of the treated material must not introduce any new hazards that don't currently exist at the received site.

4.9.17 Therefore, any treatment of the contaminated silt must reduce the levels of contaminants to below the hazardous waste thresholds; and to levels that are below levels of contamination at the intended receiver site prior to reuse at the receiver site.

4.9.18 The CoP requires that there must be a contract in place between the treatment facility and the receiving site where the treated contaminated silt is intended be used. The contract must set out clearly the role of each party, the allocation of responsibility for acceptance and rejection and who pays for additional treatment at the treatment facility (Hub) site, or if necessary for disposal if the required specification cannot be achieved.

The use of the material is certain

4.9.19 The contractor at the receiving facility must be able to demonstrate that the treated contaminated silt would be used in accordance with defined quantities provided in the scheme design prior to use. They must be able to demonstrate that all of the material would be used and that use is a certainty, not a probability. The use of the excavated material must form part of the final design, so it can be clearly identified where in the scheme the material would be used; and how much would be used. This requires a Materials Management Plan (MMP) to be prepared to show: how and where all materials on the ground are to be dealt with; a tracking system to monitor any waste/material movements; and contingency measures (i.e. who takes responsibility and what happens in the event that the material is not suitable for use).

Only a sufficient quantity of material will be used.

4.9.20 The quantity of material required must be known prior to construction. If excess treated contaminated silt is deposited this is taken to be an indication that it is being discarded and it would be considered to be waste.

4.9.21 The CoP outlines the minimum standard for a MMP, which provides the control mechanism to ensure compliance with the CoP principles. In summary the MMP provides:

- Details of the parties that will be involved with the implementation of the MMP.
- A description of the materials in terms of potential use and relative quantities of each category.
- The specification for use of materials against which proposed materials will be assessed, underpinned by an appropriate risk assessment related to the place where they are to be used.

- Details of where and, if appropriate, how these materials will be stored.
- Details of the intended final destination and use of these materials.
- Details of how these materials are to be tracked.
- Contingency arrangements that must be put in place prior to movement of these materials.
- Verification Plan to identify how the placement of materials is to be recorded and the quantity of material to be used relate to the design objectives.

4.9.22 The CoP also requires that the MMP is independently reviewed by a Qualified Person. The Qualified Person must provide a Declaration that the principles of the CoP have been complied with before construction can begin.

4.9.23 There is a fee[21] associated with the use of treated contaminated silt in accordance with the CoP.

4.10 Landfill

4.10.1 The legal provisions associated with landfill are in the Environmental Permitting (England and Wales) Regulations 2010 (as amended) ('EPR'), the Landfill Directive (1999/31/EC) and the Council Decision (2003/33/EC).

4.10.2 The Landfill Directive sets rigorous standards to reduce reliance on landfill and the environmental impact of wastes disposed of by landfill. Tighter operational and infrastructure standards limit the types and nature of waste that can be sent to landfill and place greater restrictions on the location of landfill sites.

4.10.3 The key points are:

- Certain kinds of waste cannot be landfilled.
- Landfills are classified according to whether they can accept hazardous, non-hazardous or inert wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before they can be sent to landfill.
- There are formal processes for identifying and checking wastes before wastes can be accepted at a landfill site.

4.10.4 These provisions have a significant impact on how wastes are managed. Landfill sites should only be used once alternative options for managing waste have been considered and discounted in accordance with the waste hierarchy (see section 4.3).

4.10.5 Contaminated silt is not banned from landfill, unless it is considered to be a liquid.

[21] http://www.claire.co.uk/index.php?option=com_content&view=article&id=795:dow-cop-declaration-fee-payment&catid=979:executing-dowcop-projects&Itemid=330

4.10.6 Waste in liquid form is:

(i) any waste that flows near instantaneously into a hollow in the surface of the waste; or

(ii) any waste load containing a free-draining liquid substance that is more than 250 litres or 10% of the load volume, whichever represents the lesser amount. The term free draining means a liquid as defined in (i), irrespective of whether that liquid is in a container.

4.10.7 If a waste is not liquid (as defined by (i) above) it must be a sludge, or solid. This practical test is most relevant for fine-grained, homogeneous wastes such as filter-cakes, sewage sludge and silts. A waste that flows only slowly, rather than near instantaneously, into a hollow will be a sludge or a fine-grained solid; and it would not be prohibited from landfill.

4.10.8 The key aspects of landfill requirements for disposal of the contaminated silt would be pre-treatment (which as a minimum must include dewatering); and compliance with the hazardous WAC.

Pre-treatment

4.10.9 It is a legal requirement that all wastes going for landfill must be pre-treated, unless treatment is not technically possible (note, this applies to inert wastes only); or if treatment would not reduce the quantity or the hazards that it poses to human health or the environment. The proposed pre-treatment option must comply with the definition of 'treatment'. This involves a 'three-point test':

1. It must be a physical, thermal, chemical or biological process including sorting.
2. It must change the characteristics of the waste. and
3. It must do so in order to:
    a. reduce its volume; or
    b. reduce its hazardous nature; or
    c. facilitate its handling; or
    d. enhance its recovery.

4.10.10 The purpose of this pre-treatment is to reduce the amount of waste going to landfill; and reduce the impact of waste when it is landfilled.

4.10.11 Dewatering is a physical process that changes the physical characteristics of the waste and reduces its volume. It would not reduce the hazardous nature of the material. Therefore, dewatering would satisfy the requirements of pre-treatment.

4.10.12 Further testing would be required to ascertain whether the dewatered contaminated silt would meet the Hazardous Waste Acceptance Criteria (see below).

Waste Acceptance Criteria

4.10.13 It is a legal requirement that a hazardous class of landfill can only accept hazardous waste. YPL would be responsible for ensuring that the dewatered contaminated silt was sent to the appropriate class of landfill and that it meets the Hazardous Waste Acceptance Criteria[22] (hazardous WAC) before it could be sent to landfill.

4.10.14 The silt must be tested after it has been dewatered to demonstrate that the levels of contamination fulfil the hazardous WAC. These are a series of chemical leaching tests that are designed to mimic the behaviour of a waste in a landfill. The silt cannot be landfilled if it fails the hazardous WAC. If this happens, the waste must be subjected to further treatment to lower the relevant concentrations of contaminants to below the hazardous WAC thresholds.

4.10.15 The chemical analysis that was carried out on the contaminated silt was for hazardous waste classification and not for hazardous WAC. These two assessment processes are clearly distinct and are for different purposes. Therefore, prior to any disposal by landfill, further analysis must be carried out on the dewatered contaminated silt in accordance with the required test methods for hazardous WAC. The analysis must be carried out in accordance with the required standard two-stage test method, which is set out in BS EN 12457-3. The samples provided for the WAC assessment should be allowed to dewater prior to analysis to mimic the waste silt that would be disposed.

4.10.16 Further guidance on WAC is provided in Environment Agency technical document: 'Waste Sampling and Testing for Disposal to Landfill, EBPRI 11507B, Final March 2013'[23]. The full WAC suite is provided in Table 5.3, page 20 of the technical document.

Landfill Tax

4.10.17 HMRC has produced guidance on Landfill Tax. The position for uncontaminated silt is clear – no landfill tax is payable for the disposal of uncontaminated silt. However, the available guidance on whether the disposal of contaminated silt would be subject to landfill tax; and if so, what rate of landfill tax, is not clear. A summary of the potentially contradictory positions is described below.

4.10.18 Waste removed from inland waterways and harbours by dredging that is disposed to landfill may qualify as being exempt from landfill tax where it meets the requirements identified in section 4.1 of HMRC Guidance LFT1[24]. Section 4.1 states: "*IF material is removed from the bed of the water (including the banks of canals and rivers) and has been dredged from:*

[22] The Waste Acceptance Criteria ('WAC') are defined in Council Decision 2003/33/EC established criteria and procedures for the acceptance of waste at landfills, pursuant to Article 16 of and Annex II to Directive 1999/31/EC (the Landfill Directive)
[23] 'Waste Sampling and Testing for Disposal to Landfill, EBPRI 11507B, Final March 2013' https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321207/Sampling_and_testing_of_waste_for_landfill.pdf
[24] HMRC Reference: Notice LFT1 (April 2014) https://www.gov.uk/government/publications/excise-notice-lft1-a-general-guide-to-landfill-tax/excise-notice-lft1-a-general-guide-to-landfill-tax

- *a river, canal, watercourse, dock or harbour, or*
- *the approaches to a harbour and removed in the interests of navigation.*

the disposal will qualify for exemption."

4.10.19 This implies that the disposal of silt is from the proposed YPL harbour development is exempt from landfill tax.

4.10.20 However, the Landfill Tax (Qualifying Material) Order 2011[25], SI. 2011 No. 1017 (as amended) identifies that naturally occurring dredged material qualifies for the lower rate of landfill tax (currently £2.60/tonne for 2015/2016), by virtue of being in Group 1 'Rocks and Soils' (Note: *(n) dredgings*). This implies that the contaminated silt could be subject to the lower rate of landfill tax

4.10.21 Furthermore, HMRC has also published[26] 'Landfill tax - draft further guidance on lower rating', which provides further advice on the interpretation of the Qualifying Materials Order 2011. Sections 2.1 and 2.2 provide advice on what constitutes 'Naturally occurring' for the purpose of materials in Group 1 'Rocks and Soils'. Annex III of this guidance provides further examples where a more detailed description of the materials is required in order to establish the landfill tax liability. It provides an example for dredging spoil and states that "*However, dredging spoil can contain other materials such as metal, wood, plastic and chemical contaminants and may therefore be* ***standard rated*** [my emphasis] - *see section 4 about mixed loads*." Section 4.3, bullet point iii) states that "*The standard rated materials in a load of mainly qualifying material must not be of an amount to classify the load as hazardous*."

4.10.22 The paragraph above implies that dredged material that is classified as hazardous waste would not qualify for the exemption or the lower rate of landfill tax because it would be considered to be a standard-rated material due to contamination. Therefore, it would be liable to the standard rate of tax, which is currently £82.60 per tonne for 2015/2016), when disposed in a landfill.

4.10.23 Therefore, depending upon which HMRC guidance document is read, the contaminated silt is either exempt from landfill tax; subject to the lower rate of landfill tax; or the higher rate of landfill tax.

4.10.24 HMRC was contacted[27] to provide clarity on this issue. Their response clearly stated that the position in section 4.1 of LFT1 has priority. If the conditions in LFT1 Section 4.1 can be met, then the silt is exempt from any form of landfill tax, regardless of contamination.

4.10.25 Given the silt would be an excavation from the bed of the River Tees the conditions of LFT1 Section 4.1 exemption are met for the proposed YPL harbour development dredging operation.

[25] http://www.legislation.gov.uk/uksi/2011/1017/contents/made
[26] http://www.hmrc.gov.uk/landfill-tax/lower-rating.pdf
[27] HMRC call reference numbers CPE3107 and CKM31394 27/11/2014

4.10.26 This would mean that no landfill tax would be payable for the disposal of the contaminated silt to landfill. LFT1 identifies that this exemption would apply to silt that has been dewatered; or where additives have been mixed with the contaminated silt to ensure that it is not a liquid waste.

4.10.27 Landfill disposal is a potential option for on-shore management where there are no feasible options available to recover part, or all of the contaminated silt on land; or where the level of contaminants in the contaminated silt means that it is unsuitable for use.

4.11 Disposal Overseas

4.11.1 Facilities for the management of contaminated silt exist across Europe and there is an active European Sediment Network[28] that has a focus on the management of sediment.

4.11.2 The shipment of the silt to an overseas location for disposal or recovery would be subject to international and national policy and legislation. The relevant international policy and legislation are:

- The UN Basel Convention[29] on the Control of Transboundary Movements of Hazardous Waste and their Disposal ('the Basel Convention').
- The Organisation for Economic Co-operation and Development Decision[30] (C(2001)107/FINAL as amended) concerning the Control of Transboundary Movements of Wastes Destined for Recovery Operations (the 'OECD Decision').
- The EU Waste Shipment Regulations ('WSR')[31]
- The Transfrontier Shipment of Waste Regulations 2007[32] (as amended) ('TFS Regulations 2007').
- The UK Plan for Shipments of Waste (the 'UK Plan')[33].

4.11.3 The WSR implement the Basel Convention in the EU. The TFS Regulations 2007 set out the administrative requirements for the enforcement of the WSR within the UK.

4.11.4 The UK Plan prohibits the general export of waste for disposal from the UK. Some exceptions are allowed, but these do not include hazardous contaminated silt. Therefore, the contaminated silt would be prohibited from export for disposal.

4.11.5 The OECD Decision aims to facilitate trade of recyclables in an environmentally sound and economically efficient manner using a risk-based approach to assess the necessary level of control for materials. Wastes exported outside the OECD area, whether for recovery or final disposal, do not benefit from this simplified procedure. Furthermore, the WSR prohibits the export of hazardous waste outside of the EU to countries to which the OECD Decision does not apply. Therefore, the silt could only be exported for recovery within the EU; or to an OECD Country outside of the EU.

[28] http://www.sednet.org
[29] http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx
[30] http://www.oecd.org/env/waste/theoecdcontrolsystemforwasterecovery.htm
[31] Regulation (EC) No 1013/2006 of The European Parliament and of The Council of 14 June 2006 on Shipments Of Waste
[32] http://www.legislation.gov.uk/uksi/2007/1711/pdfs/uksi_20071711_en.pdf
[33] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69546/pb13770-waste-shipments.pdf

4.11.6 The level of controls applied to the transboundary movement of contaminated silt is confirmed according to the assignment of the appropriate description code from the lists provided in the Annexes to the WSR. Silt is not defined by a single entry in the annexes to the WSR and is unassigned. Therefore, the full procedure of prior written notification and consent (see below) would have to be followed. This is further confirmed by the fact that the material is classified as hazardous.

4.11.7 There would have to be evidence provided to the Environment Agency (who are the competent authority responsible for imports to / exports from England) and also the appropriate competent authority for the country where the waste will be sent, that the receiving facility has the appropriate authorisation in place to recover the contaminated silt; and that the recovery process is genuine and legal. This would require negotiation with the international regulators. The competent authorities of destination and dispatch have the legal right to object to any shipment for recovery if they believe that it would not comply with the requirements of WSR.

4.11.8 The written notification and consent procedure requires that consent must be obtained from all relevant competent authorities. There is a comprehensive application process that requires the provision of:

- Notification document – the Environment Agency would supply the notification document with a unique number for the waste shipment application. They will also provide annex templates to ensure that the notification is completed in accordance with the WSR.
- Movement document – this is used as the tracking form for each individual shipment of waste. Each shipment must have a unique number and the content of the tracking form must comply with the requirements of the template provided in WSR.
- A Financial Guarantee – this requires that sufficient money is made available on request for the Environment Agency to deal with the waste if the shipment isn't completed, including the cost of returning the exported waste to a facility in the UK. The approved guarantee or insurance must be sufficient to cover transporting the waste; the subsequent disposal or recovery on repatriation; and storage for up to 90 days.
- A Contract – this must be a legally enforceable, written contract including all stakeholders involved in the shipment, including the business that would be recovering or disposing the waste to ensure that the:
    - business recovering the waste would provide a certificate confirming they have legally recovered or disposed of the waste;
    - notifier would take the waste back if the shipment or the recovery does not go ahead as intended, or if the shipment is found to be illegal; and
    - importer (consignee) must take responsibility for recovering of the waste if it is found to be illegal as a result of the consignee's action.
- Third Party Insurance.
- The appropriate fee for notification and shipment to the Environment Agency. Note also that the other competent authorities involved may also apply a fee.

4.11.9 The competent authorities have 30 days from acknowledging receipt of the notification package to provide their notification decision, which will be one of:

- consent to the notification without conditions.
- consent to the notification with conditions.
- objection.

4.11.10 If consent is provided, it lasts for 12 months.

4.11.11 There is considerable bureaucracy involved with sending waste overseas. Although disposal is lower than recovery in the waste hierarchy, the environmental considerations of shipping the waste considerable distance to an overseas recovery facility may be more significantly adverse than disposal in a UK-based facility.

4.11.12 Therefore, recovery overseas should only be pursued if there are no technically or economically feasible options for recovery or disposal of the waste in the UK.