Construction Environmental Management Plan

PF10-PR10-43-F001

Project: South Bank Wharf Teesside **Site Code: GX21**

GRAHAM is committed to supporting the UN Sustainable Development Goals, a blueprint to achieve a more sustainable future for all.

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***Accepted By**			

*Optional acceptance by client representative

Version History:

The Environmental Manager and Project Manager will work collaboratively to conduct periodic reviews of this document to ensure that the information contained within it, is suitable and sufficient for site operations. It is anticipated that this will be carried out at least every six months.

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SECTION 1.0 Organisational Arrangements

Guidance Notes:

The information contained in this section describes the Environmental Management processes adopted on site.

1.1. Introduction

This document has been prepared by GRAHAM. In preparing this document GRAHAM is demonstrating their commitment to being an environmentally responsible company. This Construction Environmental Management Plan (CEMP) forms part of an overall environmental management system and is to be read in conjunction with the Construction Phase Plan and the Quality Plan for the Project.

This CEMP is intended to satisfy the requirements of the principles set down in the International Environmental Management System Standard ISO 14001:2015. Our policies and procedures described within this document are in compliance with relevant legislation and best practice guidance.

In preparing this document GRAHAM have drawn on information contained in the following documents:

- South Bank Quay Construction Environmental Management Plan – Ref: PC1084-RHD-SB-XX-RP-EV-1117
- South Bank Quay EIA Report – PC1084-RHD-SB-EN-RP-EV-1100
- South Bank Quay Supplementary Environmental Report - PC1084-RHD-ZZ-XX-RP-Z-1115

1.2. Scope of Project

The project involves the construction of a new quay in the Tees estuary. In summary the project is expected to comprise the following activities:

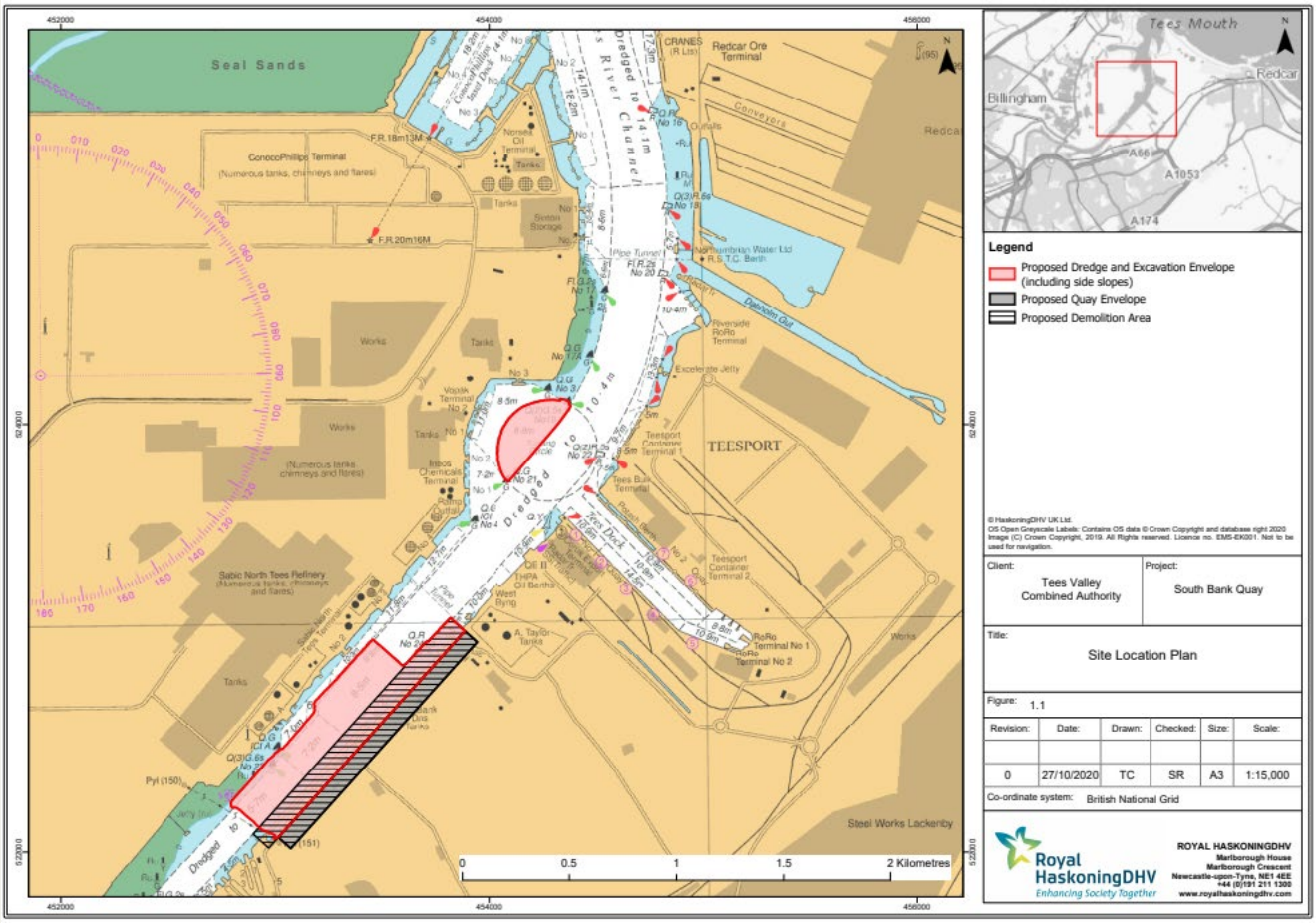
- Demolition of the dilapidated wharf, three jetties downstream of the wharf (including the conveyor at the extreme downstream end jetty), a live electrical substation and pipework which previously abstracted water from the Tees estuary associated with the pumping station.
- Construction of a new solid piled quay structure up to 30m wide and 1,230m in length (with an approximate 1,050m of usable quay for berthing), set back into the riverbank. Although the useable surface of the quay itself would be up to 30m wide, the overall footprint of the quay would be up to 50m wide due to the proposals to construct an anchor structure further inland of the quay deck.
- Excavation and re-use of approximately 275,000m3 of soils behind the proposed quay wall to install tie rods to the anchor wall. Excavation and re-use of a further approximately 1,140,000m3 of soils in front of the proposed quay wall to create the berth pocket.
- Capital dredging of approximately 1,800,000m3 of marine sediments with offshore disposal into the Tees Bay C disposal site.
- Installation of approximately 200,000m3 of rock within the berth pocket to form a rock blanket.

STDC is intending to commence construction in 2021 to enable operation of the facility by 2023 (an approximately three-year construction phase). It is proposed that the quay is constructed in phases, with an initial berth length of approximately 450m proposed in Phase 1 (total quay length of approximately 630m). The quay would be extended to provide a total useable berth length of 1,050m (total quay length of approximately 1,230m) as required in Phase 2, based on market demands.

Construction works are to be undertaken 24 hours a day, seven days per week.

1.3. Site Location and Context

The site is located on the Tees estuary as detailed in figure 1 below:



Given the proposals to utilise land-based plant for the proposed quay construction, access to site for construction plant and personnel will be via Smiths Dock Road.

It is anticipated that there will be a requirement for transport of some construction materials by sea (including steel and rock), with vessels berthing in Tees Dock or at a suitable berth along the river channel. The materials transported by sea would be offloaded onto heavy goods vehicles (HGVs) and transported to site using the existing road network. Rock for the rock blanket is anticipated to be placed directly into position on the riverbed from the vessel.

1.4. Purpose and benefits of the plan

- The plan defines the Environmental Management procedures, work practices and management responsibilities relating to the construction of the project.
- The plan demonstrates how GRAHAM intends to satisfy the requirements of the client

- The Plan defines the scope of environmental issues, together with the requirements for action by GRAHAM that shall be set out to avoid, minimise and mitigate construction effects on the environment, existing surrounding communities and new residents of the local area
- The plan sets out the individual responsibilities of Directors, Managers, Supervisors and Operatives, with their respective roles defined in a clear system of managerial control.
- The plan establishes the structure and content for the procedures to monitor compliance, including specific auditing by GRAHAM.

- The plan establishes a regular procedure for reporting environmental information and ensures that environmental issues are firmly on the agenda of progress review meetings.
- The plan ensures that complete documented records are kept for easy, accessible reference.
- The plan provides a statement of Intent to statutory, regulatory and local authorities to take effective action to work in compliance with all statutory provisions and protect the environment.

The CEMP is a live document which must be updated and developed throughout the course of the project. An update to the CEMP will be carried out every six months as a minimum.

1.5. GRAHAM Environmental Strategy and Climate Action Strategy

As part of the GRAHAM 2021 Environmental Strategy and Climate Action Strategy, this project will seek to adopt solutions and opportunities which will positively impact upon our four key areas of Environmental Sustainability focus (as follows):

- **Protecting the Environment**
- **Environmental Management and Improvement**
- **Conserving Resources**
- **Climate Action**

The GRAHAM overarching commitment to working in support of the UN Sustainable Development goals will also underpin the Project ethos toward "Sustainable Development" and opportunities will be sought to positively influence the SDG's.

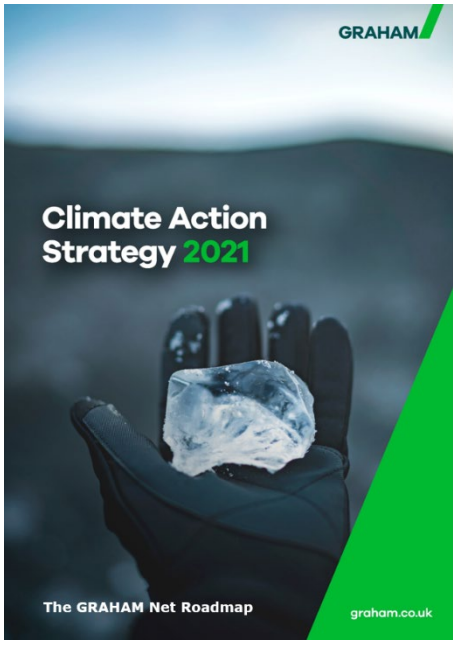


Figure 1 - Climate Action Strategy

Figure 2 - Key Focus Areas

1.6. GRAHAM Environmental Management System

GRAHAM operate an ISO 14001:2015 accredited Environmental Management System. We use this in conjunction with all relevant legal and other requirements for the environmental management of this project.

The environmental performance of the site will be regularly checked by site inspections carried out by our SHE Advisors and Environmental Audits carried out by the Environmental Manager. The implementation of our EMS will be audited both internally by our Systems Audit Manager and externally by NQA Ltd.

1.7. GRAHAM Environmental Policy Statements

The work carried out on the Project will be in compliance with:

- **GRAHAM Environmental Policy Statement**
- **GRAHAM Biodiversity Policy Statement**
- **GRAHAM Climate Action Policy Statement**
- **GRAHAM Green Travel Policy Statement**
- **GRAHAM Waste Management Policy Statement**

1.8. Objectives and Targets

As part of our commitment to continually improve our environmental performance, specific targets and objectives relating to the Project are as follows:

FOCUS AREA	AMBITION	ORGANISATIONAL TARGET	PROJECT TARGET	MEASUREMENT
CLIMATE ACTION	To eliminate carbon from our business and to measure and manage our progress towards a decarbonised economy	Net-zero carbon emissions by 2045 & decrease carbon emissions by 50% by 2030.	Site carbon emissions to remain less than or equal to: **10.25 TCO2e/£1M** *(For 2021/22)*	tCO_2e/£1M
ENVIRONMENTAL MANAGEMENT AND IMPROVEMENT	To manage our business in such a way as to aid improvement in environmental performance in the workplace	Ensure that the GRAHAM Environmental Frequency Rate is maintained at less than 0.02.	Submit at least **one environmental observation per month**	Percentage of sites that have submitted at least one environmental observation each month
CONSERVING RESOURCES	To have a net positive impact on resources and ensure the implementation of the principles of the circular economy by keeping products and materials at their highest utilisation throughout their lifecycle	To: a) reduce the quantity of construction waste generated by 50% by 2030 b) reduce mains water consumption by 50% by 2030	a)Site construction waste to remain less than or equal to: **31T/£1M** b)Site mains water consumption to remain less than or equal to: **56M3/£1M** *(For 2021/22)*	a) Tonnes of construction waste/ £1m b) M3 per £1m
PROTECTING THE ENVIRONMENT	To proactively manage ecological issues and contribute towards the protection and enhancement of natural assets in order to support wellbeing and help climate proof our communities	Increase the number of biodiversity actions by 50% (against a 2019/20 normalised baseline) by 2030	Undertake at least **two biodiversity actions per annum**	Percentage increase from baseline year (measured in actions/£50m)

1.9 Environmental Roles and Responsibilities

- An organisational chart is shown within the Construction Phase Plan
- The table below details the environmental duties and responsibilities for positions identified in the organisation chart
- The environmental qualifications for positions identified are detailed within the relevant CV's included within the Construction Phase Plan

Name	Responsibilities
Contracts Director Paul Scott	• Assign specific environmental duties to competent members of the Project Team • Identify the environmental training needs of personnel under their control and arrange appropriate training programmes and ensure records are being maintained • Ensure that significant environmental aspects identified for the project are managed • Promote the continual improvement of environmental performance
Contracts Manager Thomas Craven	• Ensure that the CEMP is produced, maintained and implemented on the project and distributed to all relevant parties • Ensure that all personnel for whom they are responsible are aware of the CEMP and implement the relevant requirements • Identify the competence of all subcontractors and suppliers and ensure that they are made aware of, and comply with, the Project Plans and any documentation requirements • Establish a consultation and communication system with all relevant interested parties associated with the project, including employees, partners, contractors, clients, designers and third parties, etc., where relevant
Project Manager Jonathan Martin	• Ensure that all personnel undergo suitable and sufficient environmental induction before starting work on the project • Ensure that staff are attending the appropriate environmental courses that are organised by the Environmental Manager. Ensure the Environmental Manager is maintaining records • Monitor the performance of personnel and activities under their control and ensure that arrangements are in place so that all personnel can work in a manner which minimises risks to themselves and to the environment • Undertake a programme of regular project environmental inspections in accordance with procedures • Implement the environmental performance measurement, review and reporting requirements • Assist and support the Environmental Manager when pollution investigations are required • Co-operate with auditors during environmental audits and action any non-conformances
Site Engineers Stephen Godfrey Craig Simpson	• Site Engineers also assume the role of Environmental Team Leaders • Ensure all environmental issues within their designated work area are identified and noted in the method statements if applicable • Liaise with Environmental Manager to ensure any environmental issues are dealt with swiftly and correctly • Issue daily task talks when environmental best practice is not utilised

Name	Responsibilities
	• Liaise with Environmental Manager when approaching subcontractors regarding environmental issues • Ensure environmental mitigation drawings are reviewed prior to works commencing • Ensure any environmental incidents are recorded and the associated procedure is followed • Read the Environmental Management Plan prior to works commencing
Procurement Manager	• Ensure that materials are ordered so that the quantity delivered, the timing of the delivery and the storage does not create unnecessary waste
Environmental Manager Jayne Walker	• Implementation of the CEMP Procedures • Liaise with the Engineering Manager to ensure all environmental aspects and requirements are included in the design • Draw up the CEMP to ensure all aspects, impacts, statutory requirements and Client commitments are reflected in the plan • Maintain and audit the CEMP and the documents which underpin it • Undertake a programme of regular project environmental inspections, monitoring, recording and reporting in accordance with procedures • Liaise with the Project Manager to ensure that the works are constructed in line with the CEMP • Liaise with the employer's environmental advisors, statutory bodies and the local community as required • Attend regular construction meeting to ensure environmental issues are discussed with the appropriate management • Comply with GRAHAM environmental incident investigation and reporting procedures • Chair Review Meetings involving relevant stakeholders and the Project Team • Support and provide training to the workforce with regard to understanding environmental aspects, impacts, regulatory requirements, best practice, constraints and methods of working
Engineering Manager	• Be fully aware of the project environmental aspects in general and of their specialty in particular • Ensure the works are carried out to agreed working methods and procedures and to the required standard of quality • Train and educate the workforce with regard to best practice, constraints and methods of working • Liaise with Environmental Manager to ensure any environmental issues are dealt with swiftly and correctly
Site Staff	• The approach to the environmental management structure aims to ensure that the appropriate environmental performance is delivered by all staff working on site whether from GRAHAM or our Sub-Contractors. • Ultimately, site staff can both be responsible for environmental impacts but also for resolving any incidents quickly and in the correct manner. • All staff working on site will be undergo a Site Induction and a part of the induction delivered must include the environmental sensitivities and requirements of the project.

Name	Responsibilities
	• All staff will, thus, receive an overview of environmental issues and then be provided more detailed guidance from GRAHAM Site Environmental Co-ordinators for specific activities. • All site staff will be empowered to act to prevent any unnecessary impact to the natural environment.
Project Ecological Clerk of Works	• An ECoW will be appointed to ensure the implementation of the CEMP. The ECoW will be responsible for: ➢ Ensuring all site works comply with relevant legislation in relation to protected species and that the CEMP is adhered to throughout the works. ➢ Being the main point of contact should any environmental issues arise during works. ➢ Making the relevant stakeholders and regulators aware of any environmental issues that occur during the works. ➢ Ensuring tool-box talks are undertaken on site. • The ECoW will be present on site for one day per week during the demolition and construction works, with visits scheduled according to when certain key activities are to be undertaken. •
Subcontractors	• Provide evidence during procurement process to demonstrate commitment to the environment • Ensure all staff read the CEMP • Provide environmental mitigation required during their works • Appoint a member of staff responsible for coordinating environmental impacts and aspects • Ensure risk assessments address environmental issues associated with their works
Subcontractors Environmental Representative	• Each Sub-Contractor, appointed by GRAHAM, will be required to appoint an Environmental Representative who will be responsible for: ➢ Ensuring that environmental considerations are included and/or applied with regards to risk assessments, method statements and work instructions including delivery of toolbox talks to their staff. ➢ Carrying-out environmental inspections and house-keeping of (their part of) the site. ➢ Carrying out any corrective actions identified through audit, inspection, or as directed by GRAHAM or PMC Environmental Manager. ➢ Implementation and monitoring of waste minimisation, segregation and safe disposal measures. ➢ Implementation and monitoring of nuisance matters such as noise, dust, light, and conduct on site that may have environmental implications. • These Sub-Contractor Environmental Representatives will meet with Environmental Team Leaders to ensure clarity on environmental issues for the activities they are involved in. All Sub-Contractors will need to demonstrate the ability to comply with any environmental constraints or requirements as part of the procurement process.
	•

Note - GRAHAM will notify the Employers Representative of any intended changes in personnel with core environmental responsibilities.

1.10 Competence, Training and Awareness

- The table below details the Environmental Competency and Training Plan for those personnel that will be employed on the Project
- Records of competency requirements and training will be maintained by the GRAHAM SHE Training department using an advanced training software tool which prompts in advance of refresher training requirements.
- A description of the training that will be delivered is outlined overleaf

ENVIRONMENTAL TRAINING MATRIX

	Company SHE Induction	Site Specific SHE Induction	Site Introductory Environmental Advisory Training	SHE Briefing	Spill Kit Training	Environmental Champion Training	Environmental Advice Notes	Environmental Toolbox Talks	CIRIA / NEBOSH Award / SEATS - one day environmental awareness training	NEBOSH Certificate in Environmental Management (or equivalent)	Leading with Environmental Sustainability (IEMA Certified)	Graduate Environmental Management Training Session	Supply Chain Briefing	Fuel efficient driver training	E-Learning Training courses: Introduction to Biodiversity	The Circular Economy	Introduction to Environmental Management	Introduction to Sustainable Construction	Introduction to Climate Change and Carbon
Perid of Validity (years)	N/A	N/A	N/A	1	3	3		N/A	5	N/A	5	N/A	1	3	N/A	N/A	N/A	N/A	N/A
Regional Director	C	C	N/A	C	N/A	N/A	C	N/A	N/A	N/A	C	N/A	N/A	D	D	D	D	D	D
Contracts Manager / Director	C	C	N/A	C	N/A	N/A	C	N/A	N/A	N/A	C	N/A	N/A	D	D	D	D	D	D
Project Manager	C	C	RS	C	N/A	N/A	C	N/A	RS	N/A	N/A	N/A	N/A	D	D	D	D	D	D
Site Manager / Agent	C	C	C	C	RS	RS	C	N/A	RS	N/A	N/A	N/A	N/A	D	D	D	D	D	D
Site / Section Engineer	C	C	C	C	C	RS	C	N/A	RS	N/A	N/A	N/A	N/A	D	D	D	D	D	D
Graduate Engineer	C	C	C	C	C	RS	C	N/A	RS	N/A	N/A	C	N/A	D	D	D	D	D	D
Foremen/ Supervisor/ Ganger	C	C	RS	C	C	RS	C	C	RS	N/A	N/A	N/A	N/A	D	D	D	D	D	D
Environmental Champion	C	C	C	C	C	C	C	N/A	C	RS	N/A	N/A	N/A	D	D	D	D	D	D
SHE Professional	C	C	C	C	C	RS	C	N/A	RS	C	N/A	N/A	N/A	D	D	D	D	D	D
Plant Operatives/ Labourer	N/A	C	N/A	N/A	RS	N/A	C	C	N/A	N/A	N/A	N/A	N/A	D	D	D	D	D	D
Site Support Staff e.g. commercial, design etc.	C	C	N/A	C	N/A	N/A	C	N/A	N/A	N/A	N/A	N/A	RS	D	D	D	D	D	D
Procurement Officer	C	RS	N/A	C	N/A	N/A	C	N/A	N/A	N/A	N/A	N/A	C	D	D	D	D	D	D
Office Based Employee	C	RS	N/A	C	N/A	RS	C	N/A	N/A	N/A	N/A	N/A	N/A	D	D	D	D	D	D

Key

C - Core Training - always required for this role

RS - Role Specific Training

D - Desirable training course

Figure 3 - GRAHAM Environmental Training Matrix

Description of training

Environmental Training	Description	Delivered by
Company SHE Induction	All members of staff receive a company induction which includes an introduction to the key aspects of the Environmental Management Systems within GRAHAM	HR Team
Site Specific SHE Induction	All site operatives are given site specific environmental information through the induction process	Designated member of the site team
Initial Environmental advisory/ communication training	Appropriate members of the site team receive an initial environmental advisory briefing. Key environmental aspects of the project are communicated at this stage	Environmental Team
SHE Briefing	Members of the site team attend an annual briefing which highlights areas of good practice, legislation changes and any new company initiatives	SHE Team
Spill Kit Training	Site teams are given practical training on the legal requirements regarding fuel storage, potential damage caused by such a spill, GRAHAM's spill procedure, measures to prevent spills occurring and practical training in the use of spill kits	Designated member of the site team / Environmental team
Environmental Champion Training	Specific member(s) of the site team are assigned the environmental champion role. Training is provided to highlight their roles and responsibilities in managing environmental aspects onsite	Environmental Team
Environmental TBTs / Advice Notes	Environmental tool box talks and advice notes are given on a regular basis to reinforce and further emphasize site environmental issues	Designated member of the site team
CIRIA / NEBOSH Award / SEATS - one day environmental awareness training	Environmental Champions attend a one day externally delivered environmental awareness course. This course provides an introduction to environmental issues and outlines mechanisms to improve site environmental performance.	External body
NEBOSH Certificate in Environmental Management (or equivalent)	Relevant SHE team members attain environmental management qualifications which are professionally certified in order to deliver a high level of environmental expertise	External body
Leading with Environmental Sustainability	Senior Management attend training which challenges leaders to formulate a strategic understanding of the risks and opportunities presented by a changing environment on their ability to do business	External body
Graduate Environmental Management Training Session	Graduates attend classroom based training to provide them with an overview of the GRAHAM Environmental Management System	Environmental Team
Supply Chain Briefing	Key suppliers attend a briefing delivered in order to communicate environmental information relevant to their operations	SHE Team
Fuel Efficient Driver Training	High mileage drivers attend a practical driver training course in order to improve fuel efficiency through driving style	External body

Additional E-Learning Training courses

Environmental Training	Description	Delivered by
Introduction to Biodiversity	This training explains the principles and benefits of Biodiversity, and explains the opportunities of enhancing wildlife in the built environment	SCSS e-learning
The Circular Economy	This training introduces the concept of circular rather than linear economies	SCSS e-learning

Introduction to Environmental Management	This training provides an overview of Environmental Management	SCSS e-learning
Introduction to Sustainable Construction	This training introduces the principles of sustainability, sustainable development and sustainable construction	SCSS e-learning
Introduction to Climate Change and Carbon	This training provides an overview of Climate and Carbon	SCSS e-learning

1.11 Internal Communication

All staff and contractors will be informed of the content and location of this CEMP and associated controls. The induction of all new employees and contractors will include the contents of this plan and the Environmental Incident Response Procedure. See 'Site Induction' contained within the Construction Phase Plan (CPP) Method Statements will be used to communicate specific environmental requirements as appropriate.

The Environmental Manager will have responsibility for communicating any changes in policy, procedure or legislation.

The Site Manager will have responsibility for maintaining internal communication, including changes to material on display.

The GRAHAM Environmental Policy (Section 1.7) and other appropriate environmental information will be displayed on all notice boards.

1.12 External Communication and Managing Neighbours

GRAHAM will organise regular progress meetings with the Employer's Representative at agreed frequencies. The meetings will include an update on risk mitigation, progress against targets and a review of any audit/ assurance monitoring findings.

GRAHAM will maintain a record of discussions held with statutory authorities.

The GRAHAM Site Team will agree with the Employer's Representative how those affected by the works will be consulted, informed and mitigated of the consequences of the work. This is likely to include informing local residents and stakeholders (both verbally and in writing) of activities that may cause an impact or nuisance.

A separate Construction Traffic Management Plan (CTMP) will be developed. This will be implemented and adhered to in order to minimise disturbance to the highway network.

In order to manage and minimise any impact to commercial and recreational navigation it is noted that as a matter of course PD Teesport will manage any conflicts with vessels through coordination via the Harbour Master and use of Vessel Traffic System. In addition, notices to Mariners will be issued prior to works commencing informing other operators of proposed works.

1.13 Records and Documents

- Copies of all licences, consents, permits or permissions granted to GRAHAM (as shown in section 1.14) will be retained on site
- Upon completion of the contract, final versions of the CEMP, operational controls and all other documents that record the environmental risks, best practice examples, mitigation measures, commitments, incidents and other relevant information for inclusion in the Health and Safety File/ O&M manuals will be provided to the Employers Representative

1.14 Permissions, Consents and Licences

Consents have been sought from the following governing bodies in relation to the works:

Type of Consent	Governing Body	Consent Required	Responsibility and Timescale For Obtaining	Details of Conditions	Responsibility for Discharging Requirements
Environmental Permit: Discharge to surface water or groundwater	Environment Agency	TBC	Site Management Team – prior to requirement to discharge water	TBC by application response	Site Management Team
Environmental Permit: For flood risk activities *(including work in, on or over a river or within a flood plain)*	Environment Agency	Not Required	N/A	N/A	N/A
Environmental Permit: For mobile plant (MPP) for treatment of waste and land improvement	Environment Agency	Not required	N/A	N/A	N/A
Environmental Permit or Waste Exemption: For using, treating, disposing or storing waste	Environment Agency	Not required	N/A	N/A	N/A
WI Act temporary discharge consent	Local water company	Not required	N/A	N/A	N/A
Planning permission for site compound	LPA (local planning authority)	Not required	N/A	N/A	N/A
Hedgerow removal notice	LPA (local planning authority)	N/A	N/A	N/A	N/A
European Protected Species Licence e.g. bats/ badgers/ great crested newts	Natural England	TBC	Site Management Team	N/A	Site Management Team

Type of Consent	Governing Body	Consent Required	Responsibility and Timescale For Obtaining	Details of Conditions	Responsibility for Discharging Requirements
Scheduled Monument Consent	Historic England	Not required	N/A	N/A	N/A
Marine Licence	MMO (Marine Management Organisation) / Crown Estates	Yes	Applied for by the client prior to GRAHAM instruction	See Appendix 1.8	The licence holder and GRAHAM carrying out the activity
Consent to work in SSI, SAC, SPA, RAMSAR	Natural England	Not Required – Covered by Planning Consent and Marine Licence	N/A	N/A	N/A
Tree Preservation Order Consent	LPA (Local Planning Authority)	Not required	N/A	N/A	N/A
Listed Building consent	LPA (Local Planning Authority)	Not required	N/A	N/A	N/A
Planning permission for "relevant demolition" in conservation areas	LPA (Local Planning Authority)	Not required	N/A	N/A	N/A
Section 61 of the Control of Pollution Act (Noise and Vibration from Construction)	LPA (Local Planning Authority)	Not required	N/A	N/A	N/A
Planning Permission	Redcar and Cleveland Borough Council (RCBC)	Yes	Applied for by the client prior to GRAHAM instruction	See Appendix 1.8	The client and GRAHAM carrying out the activity
River works licence	PD Ports	Yes	Client	See Appendix 1.8	The licence holder and GRAHAM carrying out the activity
Dredging Licence	PD Ports	Yes	Client	See Appendix 1.8	The licence holder and GRAHAM carrying out the activity
The Crown Estate Consent	The Crown Estate	Yes	Client	See Appendix 1.8	The licence holder and GRAHAM carrying out the activity

Harbour Revision Order	MMO (Marine Management Organisation)	Yes	Client	See Appendix 1.8	The licence holder and GRAHAM carrying out the activity

Note: Specific controls as a result of these consents will be implemented by detailing the requirements in the associated Method Statements, together with any specific records to be generated as necessary to show compliance. Regular toolbox talks will be held on these specific controls throughout the execution of the works

1.15 Monitoring of Construction Activities

Environmental performance is monitored through the following activities:

1. Completion of the Weekly Site Supervisors Environmental Report - (IMS Ref: PF10-PR10-46-F016)
2. Inspections carried out by the SHE Team
3. Environmental Audits carried out by the Environmental Manager – (IMS Ref: PF10-PR10-40-F002)
4. Review of Site Waste data, Carbon Impacts, Water Consumption and Biodiversity Actions (on Cora)
5. Noise and vibration monitoring (as necessary)
6. Water quality monitoring (as necessary)

Environmental performance will also be a regular item included on the agenda for Progress meetings

1.16 Auditing of Construction Activities

The methodology for auditing of construction activities includes but is not limited to:

- A review of documentation including the CEMP, environmental risk assessments, method statements, permits and licences
- A site visit which includes inspection of on-site waste skips, stockpiles, fuel storage arrangements and any nearby watercourses
- Discussions with the site team
- A report which includes findings and prioritised recommendations is then drafted by the auditor for actioning by the Site Manager

Details of the nominated personnel to conduct audits, report back and action mechanisms are as follows:

- Lianne Taylor – Head of Environment**
- David O'Hagan – Environmental Manager**
- Rosie Barnett – Environmental Manager**
- Jayne Walker – Environmental Manager (Civils) **
- John McGrory – Environmental Manager (Building North) **
- Keith O'Flynn – Project Environmental Manager**
- Andrew Cooke – SHE Director
- Robin Fleming – Head of Health and Safety (Building South and Interior Fit-Out)
- Chris Murphy – SHE Manager (Civils)
- George Mills – Regional Health and Safety Manager (Building North)

***Main Auditors*

The nominated auditors will ensure any areas of improvement are identified to the Site Manager and will undertake a follow up to ensure that this improvement has taken place. Results of the audits will be made available to the Contracts Manager for information.

1.17 Identification of Aspects and Impacts (Project Environmental Risk and Opportunities Register)

Prior to actual commencement on site, the Environmental Manager in consultation with the Project Manager will complete a site-specific Project Environmental Risk and Opportunities Register in order to identify the relevant environmental aspects and impacts associated with the works. This risk register will outline the controls that must be put in place to manage any significant adverse environmental impacts to acceptable levels. (IMS Ref: PF10-PR10-43-F003)

1.18 Environmental Risk Assessment

As well as including Health, Safety, Welfare and Quality requirements, Work Package Plans shall include environmental risk assessments (IMS Ref: PF10-PR10-01-F003) and give consideration of the following environmental requirements:

- List of significant environmental impacts relevant to the activity
- Assess the risks from these impacts
- Identification of receptors/ resources likely to be affected by the works
- On-site monitoring arrangements
- Environmental controls for statutory nuisance aspects – noise/ dust/ fumes/ lighting
- Refuelling, repair and servicing of mobile plant
- Waste management controls
- Selected mitigation methods to minimise impacts
- A list of relevant consents
- Training and briefing requirements
- Report any unacceptable residual risks to the STDC Project Manager and Project Board with a view to finding solutions that are environmentally acceptable.

Work Package Plans must be completed and filed for inspection by stakeholders, regulators and other interested parties.

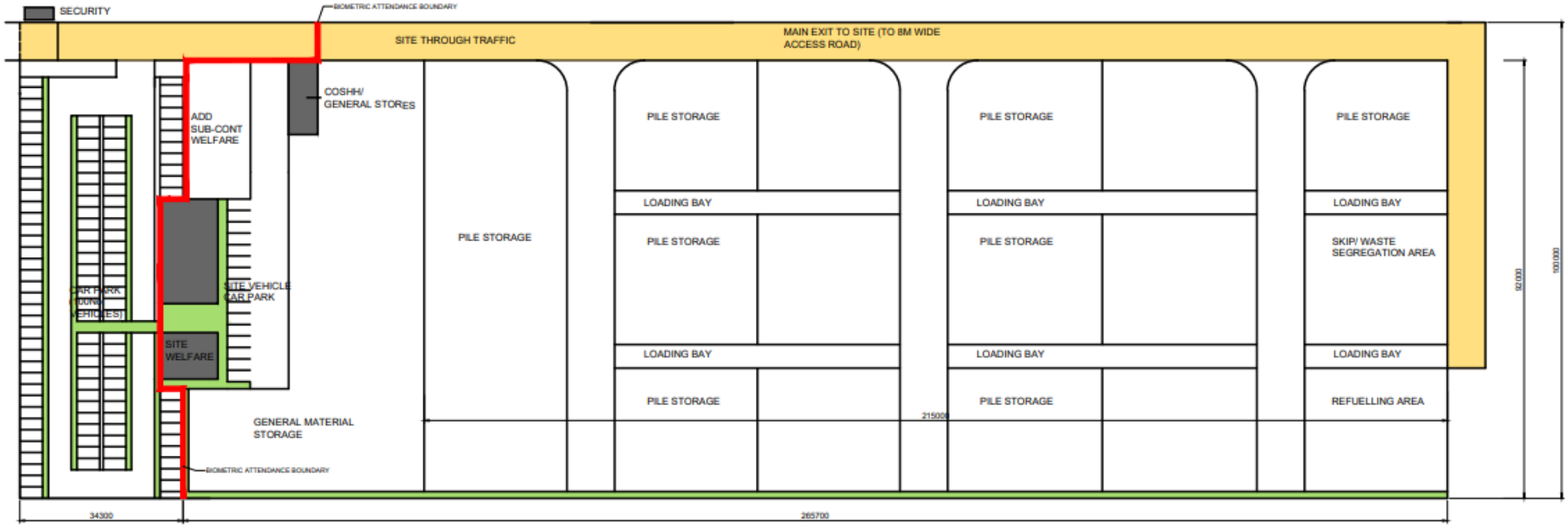
Environmental Risk Assessment is an ongoing process within GRAHAM to ensure that new hazards with changing consequences and likelihoods can be identified

SECTION 2.0 Site Compound Layout

Guidance Notes:

Site compound and site layout drawings are included in this section. These drawings include information on:

- Provision and location of bunded refuelling areas
- Provision and location of fuel and COSHH storage areas
- Materials storage area
- Stock pile locations - TBC
- Concrete washout provision and location – Location will vary as the project develops therefore not shown on plan
- Location of skip segregation area and details of waste segregation strategy
- Surface water and foul drainage locations – No known live services present
- Locations of monitoring for nuisance noise (sensitive receptors) – Not shown on plan, see section 7.0
- Location, configuration and direction of temporary site lighting - See TMP
- Details of enclosure of working areas (hoarding provision) – NB – not currently shown. Heras fencing will be erected around the site perimeter. The exact extent will be confirmed when CDM boundaries are confirmed by the client.
- Construction traffic management proposals - See TMP
  - Parking
  - Delivery routes
  - Plant movements
  - Site access


SECURITY
BIOMETRIC ATTENDANCE BOUNDARY
SITE THROUGH TRAFFIC
MAIN EXIT TO SITE (TO 8M WIDE ACCESS ROAD)
ADD SUB-CONT WELFARE
COSHH/ GENERAL STORES
PILE STORAGE
PILE STORAGE
PILE STORAGE
PILE STORAGE
LOADING BAY
LOADING BAY
LOADING BAY
PILE STORAGE
PILE STORAGE
PILE STORAGE
SKIP/ WASTE SEGREGATION AREA
SITE VEHICLE CAR PARK
SITE WELFARE
LOADING BAY
LOADING BAY
LOADING BAY
PILE STORAGE
PILE STORAGE
REFUELLING AREA
215000
GENERAL MATERIAL STORAGE
BIOMETRIC ATTENDANCE BOUNDARY
92000
101000
34300
265700

SECTION 3.0 Ecology and Biodiversity Management Plan

Guidance Notes:

This section contains details of ecological considerations (such as nesting seasons, protected species etc.) and steps required to safeguard ecology during construction.

3.1 Ecological Issues
3.2 Existing Site Ecological Features
3.3 Species Management Plans
3.4 Habitat Management Plan

3.1 Ecological issues

This section prescribes the mitigation measures which are necessary to be implemented in order to prevent or reduce adverse impacts upon ecological receptors. It also considers the legal requirements associated with statutory protected species and sites. Details of our aspirations and methodologies for the achievement of biodiversity net gain are also included.

3.2 Existing Site Ecological features

Marine ecology

Predicted construction phase impacts are linked to habitat loss from the demolition of existing structures and capital dredging, increased suspended sediment concentrations and increased sediment deposition.

Based on the sensitivity of the benthic communities and habitats present within the scheme footprint and the results of the hydrodynamic and sediment plume modelling, the EIA has predicted an impact of minor adverse significance with regard to habitat loss. No significant impacts are predicted to marine ecological receptors as a result of increased suspended sediment concentrations or sediment deposition during construction.

Marine mammals

Based on the outcome of underwater noise assessment, the potential impact of permanent auditory injury to marine mammals from dredging has been assessed as negligible. The assessment has concluded impacts of negligible significance to all marine mammals with regard to potential for temporary auditory injury from all other activities.

As piling is to take place on land and out of water, underwater noise levels will be below those that could potentially cause temporary threshold shift (short-term adverse effects on hearing) of seals, even under worst case conditions.

Although there will be a small temporary increase in construction-related vessel traffic during dredging and construction, vessel strikes are not anticipated to be significant due to the existing number of vessel movements in the area. A worst-case impact of negligible significance (not significant) is predicted.

Terrestrial ecology

The proposed scheme will result in the permanent loss of a small area of broadleaved woodland; however, the trees within this area are predominately young birch trees and therefore have been assessed as having low ecological value. Invasive non-native species (namely Japanese Rose and Japanese Knotweed) were also recorded within the footprint of the proposed scheme. No other species or habitats of importance were recorded.

The proposed scheme would result in the following environmental impacts to terrestrial ecological receptors:

- disturbance on foraging and commuting bats;
- disturbance (lighting and noise) on commuting/foraging otters;
- disturbance and loss of habitat for breeding birds;
- loss of foraging and breeding habitat for terrestrial invertebrates;
- potential spread of invasive non-native species; and
- disturbance and habitat loss for brown hare and hedgehogs.

With the adoption of mitigation measures, a worst case impact of minor adverse was predicted.

Marine and coastal ornithology

The proposed scheme is located within the Teesmouth and Cleveland Coast Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI), and is adjacent to the Teesmouth and Cleveland

Coast Ramsar site. The Tees estuary provides supporting habitat for wintering waterbirds and breeding terns.

Direct impacts on supporting habitat would only affect areas of relatively low value for foraging waterbirds and terns, notably the depauperate intertidal area and the artificial structures at the South Bank. The footprint of the scheme does not overlap with high value habitat such as intertidal mudflats at North Tees Mudflat or other such areas further downstream. As a result, impacts on foraging / roosting waterbirds as a result of changes to supporting habitat are expected to be minor adverse.

It is predicted that there would be no effects on benthic prey resources at mudflats and other intertidal areas. Impacts on fish resources within the subtidal area, as a result of increased suspended sediment, would only affect a minute portion of the common tern foraging range and would be temporary and short-lived. As such, impacts on prey resources and foraging are predicted to be minor adverse, at worst.

Some noise and visual disturbance is expected during construction particularly as a result of the proposed piling works. Following the implementation of mitigation measures, noise levels at the North Tees Mudflat, Vopak Foreshore and other high-value supporting habitats within the Tees will fall below significant sensitivity thresholds. With mitigation in place, disturbance impacts are predicted to be minor adverse, at worst.

Fish and fisheries

The Tees estuary provides both intertidal and subtidal habitat for a number of resident fish and shellfish species, with plaice, cod, dab, whiting and flounder being the principal species recovered during fish surveys. Migratory fish species regular commute along the Tees, notably salmonids, lampreys and European eel. Most commercial fisheries operate outside of the Tees, but there are small, seasonal fisheries that target lobster and velvet swimming crab.

Adverse impacts may be expected as a result of temporary increases in suspended sediment during the capital dredging works, notably if creating barrier effects that may deter migratory patterns. However, with mitigation measures in place to reduce the magnitude of such effects, any residual impact is predicted to be minor. Other water quality issues, such as a reduction in dissolved oxygen or suspension of contaminants, are not considered to have any significant impact on resident or migratory species.

Based on the expected underwater noise levels associated with capital dredging activities, sound thresholds for causing physical injury will not be exceeded. In terms of behavioural responses, it is expected that fish will already be habituated to regular dredging noises within the estuary and a minor adverse impact is predicted. A review of potential impacts from land-based piling resulted in a conclusion that there will be negligible impacts on both resident and migratory fish.

3.3 Species Management Plans

BATS

LEGISLATION

Bats and their roosts are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981, as amended. Taken together, this legislation makes it an offence to:

- Deliberately capture, injure or kill a bat
- Deliberately disturb a bat in such a way as to be likely:
  - To impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or
  - To impair its ability to hibernate or migrate; or
  - To affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of a bat
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead bat or any part of, or anything derived from a bat

In addition, bats are also a priority species in England as required under Section 41 of the Natural Environment and Rural Communities Act 2006. Consultation with the relevant authority is therefore required before any work is undertaken that might affect bats.

MITIGATION

General

- All site operatives will be made aware of the possibility of finding bats during demolition of buildings, during works at built structures and during tree felling. If bats are found in properties or trees, operatives will stop work immediately and contact the Site Management Team

For confirmed direct impacts

- Confirmed bat roost sites will not be disturbed or obstructed until a European Protected Species licence has been obtained from Natural England. Once obtained, the licence conditions for mitigation and compensation will be fully followed

For confirmed impacts to commuting routes

Noise and Vibration

- Best Practicable Means will be adopted to ensure that noise emissions and vibration is reduced whenever practicable.

Lighting

- All lighting will be task orientated and be kept to the minimum amount required for security/health and safety.
- Lights will be switched off when not in use, where practicable and safe to do so.
- Light spill will be minimised using adjustable column heights and/or cowls/hoods.
- If night-time lighting is required, it will be designed in accordance with the Bats and artificial lighting in the UK (BCT, ILE, 2018) and Guidance Notes for the Reduction of Obtrusive Light (ILE, 2011). This is likely to require:
  - No direct lighting of the water's edge, or nearby scrub habitats and use of dark buffer zones.
  - Consideration of appropriate luminaire specifications, sensitive light configuration, screening, glazing, dimming and part-night lighting.

ENHANCEMENT

The following provisions, although not exhaustive will be considered for implementation (either on or off site) where practicable:

- Provision of additional bat boxes and artificial roosts
- Planting of trees and hedgerows in order to create corridors for bats to safely forage and travel

OTTER

LEGISLATION

Otter are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981, as amended. Taken together, this legislation makes it an offence to:

- Deliberately capture, injure or kill an otter
- Deliberately disturb an otter in such a way as to be likely:
  - To impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or
  - To impair its ability to hibernate or migrate; or
  - To affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of an otter
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead otter, or any part of, or anything derived from an otter

In addition, Otters are also a priority species in England as required under Section 41 of the Natural Environment and Rural Communities Act 2006. Consultation with Natural England is therefore required before any work is undertaken that might affect Otters.

MITIGATION

General

- A pre-construction otter survey will be undertaken eight weeks prior to construction starting (to allow time for a Natural England disturbance licence application, if required) to re-assess otter activity. The survey will be undertaken within the proposed footprint of construction plus a 250m buffer zone, to determine current use at the time of construction (otters may increase their use of the site in the interim period between the current survey and the commencement of construction). The surveys will be undertaken in appropriate weather condition and following guidance in the 'New Rivers and Wildlife Handbook' (Holmes et al, 1994), Chanin (2003) and Strachan & Jefferies (1996). Should an active resting site be found, a European Protected Species licence is likely to be required to undertake work within the area. Consultation will be required with Natural England to discuss the mitigation measures required, which will subsequently form the basis of the otter licence. This is likely to include the following:
  - Construction vehicles and equipment should not be active on, or stored by the riverbank for longer than is essential.
  - The risks can be further reduced by following best practice and guidance produced by Design Manual for Roads and Bridges (DMRB Volume 10 section 4).
  - An Ecological Clerk of Works (ECoW) will be present during the works. Work should stop should an otter holt or resting place be found within 250m, and Natural England consulted, as a licence may be necessary before works can continue.
  - A temporary ramp will be placed in trenches over 0.5 m deep in order to allow a potentially trapped animal to exit the trench.
  - Any open pipes will be capped to prevent animals gaining access.
  - All excavations and pipe systems will be checked at the start of each working day.
- Works will only proceed where it can be demonstrated that Otters will be protected during the construction process and that disturbance will be kept to an acceptable minimum
- All site operatives will be made aware of the possibility of Otter presence on and around the construction site. If an Otter holt or couch is found, operatives will stop work immediately and contact the Site Management Team
- Specific otter tool-box talks will be provided to all construction staff by a suitably qualified ecologist prior to works commencing.
- The working methodology will follow construction industry good practice guidance

For confirmed direct impacts

Licencing

- Where it is impossible to avoid general disturbance to otters, or the destruction of their shelters and habitat, works will only commence where a European Protected Species licence has been obtained from Natural England.
- Once obtained, the licence conditions for mitigation and compensation will be fully followed

General

- An ECoW will be present during construction of the scheme
- The locations of all holts/ couches will be identified in confidence in order to ensure that they are not accidentally disturbed during the construction process. These areas will be fenced with signs to clearly mark that contractors must not enter.
- Work pits will be covered at night or mammal ramps will be positioned to allow any trapped animals to escape
- Otters will be excluded from the site area by erecting temporary otter-proof fencing in such a way that commuting routes are not disrupted
- In order to minimise habitat loss to Otters, work compounds and storage sites will be located at least 30m away from any watercourse and will avoid key areas of woodland, dense scrub and/ or wetland

For confirmed impacts to commuting and foraging routes

Noise and Vibration

- Best Practicable Means (BPM) will be adopted to ensure that noise emissions and vibration is reduced whenever practicable
- Screening will be used (where possible and feasible to do so) against the river edge to reduce the noise and visual impacts from construction on foraging / commuting otters.

Lighting

- All lighting will be task orientated and be kept to the minimum amount required for security/health and safety.
- Lights will be switched off when not in use, where practicable and safe to do so.
- Light spill will be minimised using adjustable column heights and/or cowls/hoods.
- Where artificial light if required, it will be directed away from the river to allow otters to migrate through the area undisturbed.

ENHANCEMENT

The following provisions, although not exhaustive will be considered for implementation (either on or off site) where practicable:

- Restoring or improving suitable habitat for otter (creation of waterbodies and reedbeds; planting of trees along river banks)
- Provision of artificial holts
- Provision of ledges on bridges, culverts etc to enable safe otter passage

BIRDS

LEGISLATION

Wild Birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 such that it is an offence to:

- Deliberately capture, injure or kill any wild bird
- Take damage or destroy the nest of any wild bird while that nest is in use or being built
- Obstruct or prevent any wild bird from using its nest
- Take or destroy an egg or any wild bird

MITIGATION

Vegetation clearance

Any necessary clearance of trees, scrub and tall herbaceous vegetation will occur outside the bird-breeding/nesting season (i.e. vegetation clearance works to be carried out between September and the following February. For reference, the breeding bird season is generally taken as the 1st March until 31st August inclusive. However, it is also noted that birds can nest at any time of the year and are therefore protected when they do.

Should it not be possible, a nesting bird survey will be undertaken by a suitably experienced ecologist immediately prior to works commencing.

Marine and coastal birds

Surveys will be undertaken to check for the presence of potential nesting habitat and nests prior to demolition and other construction-phase works, if undertaken during the breeding season (March to August). In the event that nests are identified, an exclusion zone would be established around the nest and works not permitted within the exclusion zone until the nest is confirmed as no longer in use. This would be overseen by an experienced ornithologist.

In order to minimise noise and visual disturbance to birds the following mitigation measures will be implemented:

- Use of noise reduction shrouding on piling rigs. It is estimated (based on research) that such noise shrouds may provide 14dB noise attenuation.
- The trailing suction hopper dredger (TSHD) and backhoe would be limited to working within one side of the river at a time.
- Dredging operations will be undertaken in long strips along the axis of the estuary rather than dredging across the width of the river.
- Construction lighting will be installed in a manner that reduces (where possible) light spill over the river.

ENHANCEMENT

The following provisions, although not exhaustive will be considered for implementation (either on or off site) where practicable:

- Provision of additional bird boxes

- Creation of new habitat for birds via tree planting to ensure suitable connectivity for breeding and wintering birds

FISH

LEGISLATION

It is an offence to knowingly permit the flow of poisonous matter and polluting effluents into river courses. In addition, the Salmon and Freshwater Fisheries Act 1975 (and 2003) protects fish against water pollution, alteration of stream channels and capture, translocation and release.

MITIGATION

General

- Works which will directly affect or are in close proximity to a watercourse will be subject to a Method Statement which will specify measures to protect fish
- Pollution prevention measures will be implemented when working on or in close vicinity to water environments.
- Best Practicable Means (BPM) will be adopted to ensure that noise emissions and vibration is reduced whenever practicable.
- All lighting will be task orientated and be kept to the minimum amount required for security/health and safety
- Lights will be switched off when not in use, where practicable and safe to do so.
- Light spill will be minimised using adjustable column heights and/or cowls/hoods.

For in-stream working

Dredging

In order to minimise the impacts to fish due to reductions in water quality and under water noise from dredging the following mitigation measures will be implemented:

- The dredging activities will not commence until a water quality monitoring scheme has been submitted to and approved in writing by the MMO. The scheme shall include detail related to:
    - Baseline monitoring prior to commencement.
    - A programme to monitor dissolved oxygen levels and turbidity during dredging.
    - A programme to monitor post completion of the dredge.
- Should a reduction of 1mg/l of dissolved oxygen be observed during dredging, the operations causing that effect should temporarily pause for a period of six hours or until the reading returns to the previously observed level.
- Use of an enclosed grab to dredge material in the vicinity of BH34 (A borehole situated offshore, in the west section of the quay)(exclusion zone as defined by the MMO) given the elevated concentrations of contaminants in sediment at that location.
- The trailing suction hopper dredger (TSHD) and backhoe would be limited to working within one side of the river at a time.
- Dredging operations will be undertaken in long strips along the axis of the estuary rather than dredging across the width of the river.

No dredging not covered under statutory harbour authority powers can be conducted during the period from 1st July to 31st August (inclusive) without permission from the MMO. Permission will only be granted if agreement has been reached that no other dredging will take place on the River Tees during this period.

If permission is granted by the MMO to undertake dredging operation during 1st July to 31st August (inclusive), dissolved oxygen levels will be monitored prior to the dredging activity, as a minimum, monitored every hour during the dredging activity. If a drop of 1m/g of dissolved oxygen is observed, than the dredging activity will temporarily pause for a period of 6 hours (a tidal cycle) or until the

reading returns to the previously observed level. Recorded data will be shared with the Environment Agency upon completion of the licensed activities, no later than 10 working days after their completion. The MMO will be sent a copy within 7 days of the data being issued.

ENHANCEMENT

The following provisions, although not exhaustive will be considered for implementation (either on or off site) where practicable:

- Restoring or improving suitable habitat for fish

MARINE MAMMALS

LEGISLATION

Marine mammals are protected under the Conservation of Offshore Marine Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981, as amended. Taken together, this legislation protects marine species from intentional or deliberate disturbance, taking, harm and killing, and in some cases possession or sale.

In addition, many Marine Mammals are also a priority species in England under Section 41 of the Natural Environment and Rural Communities Act 2006. Consultation with the relevant authority is therefore required before any work is undertaken that might affect marine mammals.

MITIGATION

- As per section 5 of this CEMP no waste concrete slurry or wash water from concrete or cement works will be discharged into the marine environment
- Plant, vehicles and machinery will not be refuelled on the foreshore.
- As per section 5 of this CEMP bunding and storage facilities will be installed to contain and prevent the release of fuel, oils and chemicals associated with the plant, refuelling and construction equipment into the marine environment.
- All relevant requirements of the Marine Licence will be adhered to
- In order to minimise the impacts to marine mammals due to reductions in water quality and under water noise from dredging the following mitigation measures will be implemented:
    - The dredging activities will not commence until a water quality monitoring scheme has been submitted to and approved in writing by the MMO. The scheme shall include detail related to:
        - Baseline monitoring prior to commencement.
        - A programme to monitor dissolved oxygen levels and turbidity during dredging.
        - A programme to monitor post completion of the dredge.
    - Should a reduction of 1mg/l of dissolved oxygen be observed during dredging, the operations causing that effect should temporarily pause for a period of six hours or until the reading returns to the previously observed level.
    - Use of an enclosed grab to dredge material in the vicinity of BH34 (exclusion zone as defined by the MMO) given the elevated concentrations of contaminants in sediment at that location.
    - The trailing suction hopper dredger (TSHD) and backhoe would be limited to working within one side of the river at a time.
    - Dredging operations will be undertaken in long strips along the axis of the estuary rather than dredging across the width of the river.

ENHANCEMENT

The following provisions, although not exhaustive will be considered for implementation (either on or off site) where practicable:

- Restoring or improving suitable habitat for marine mammals

Brown Hare & Hedgehog

LEGISLATION

Brown Hare and hedgehog are species of principal importance in England under Section 41 of the Natural Environment and Rural Communities Act 2006. Consultation with the relevant authority is therefore required before any work is undertaken that might affect these mammals.

MITIGATION

In order to minimise disturbance and loss to brown Hare and hedgehog the following mitigation measures will be implemented:

- Areas of potential habitat containing hedgehogs will be cleared gradually, leaving areas of scrub where possible as these may provide nesting habitat and/or shelter for hedgehogs, if present. If this is not possible, piles of dead wood and/or brash piles will be created in areas outside of working areas to mitigate for the removal of potential habitat.
- Placement of temporary shelters, such as hedgehog house, will be placed where habitat connectivity for hedgehogs may have been removed.
- As a precaution, deep trenches and excavations dug across the proposed scheme footprint will be covered overnight or be left with a plank or similar material with a slope no more than 45°, in order to allow hedgehog and small mammals to exit trenches or excavations if they fall in.
- Any netting to be used during construction will be kept off the ground to avoid any entanglement of hedgehogs (or other animals) and any loose netting will be securely tied.
- All rubbish associated with the site works will be kept in contained and designated areas to avoid animals becoming trapped in litter.
- In the event that a hedgehog is found during the works and/or welfare of an animal is concerning, the ECoW is to be contacted to seek guidance on the next steps to be taken. This may include contacting the Hedgehog Preservation Society.

ENHANCEMENT

The following provisions, although not exhaustive will be considered for implementation (either on or off site) where practicable:

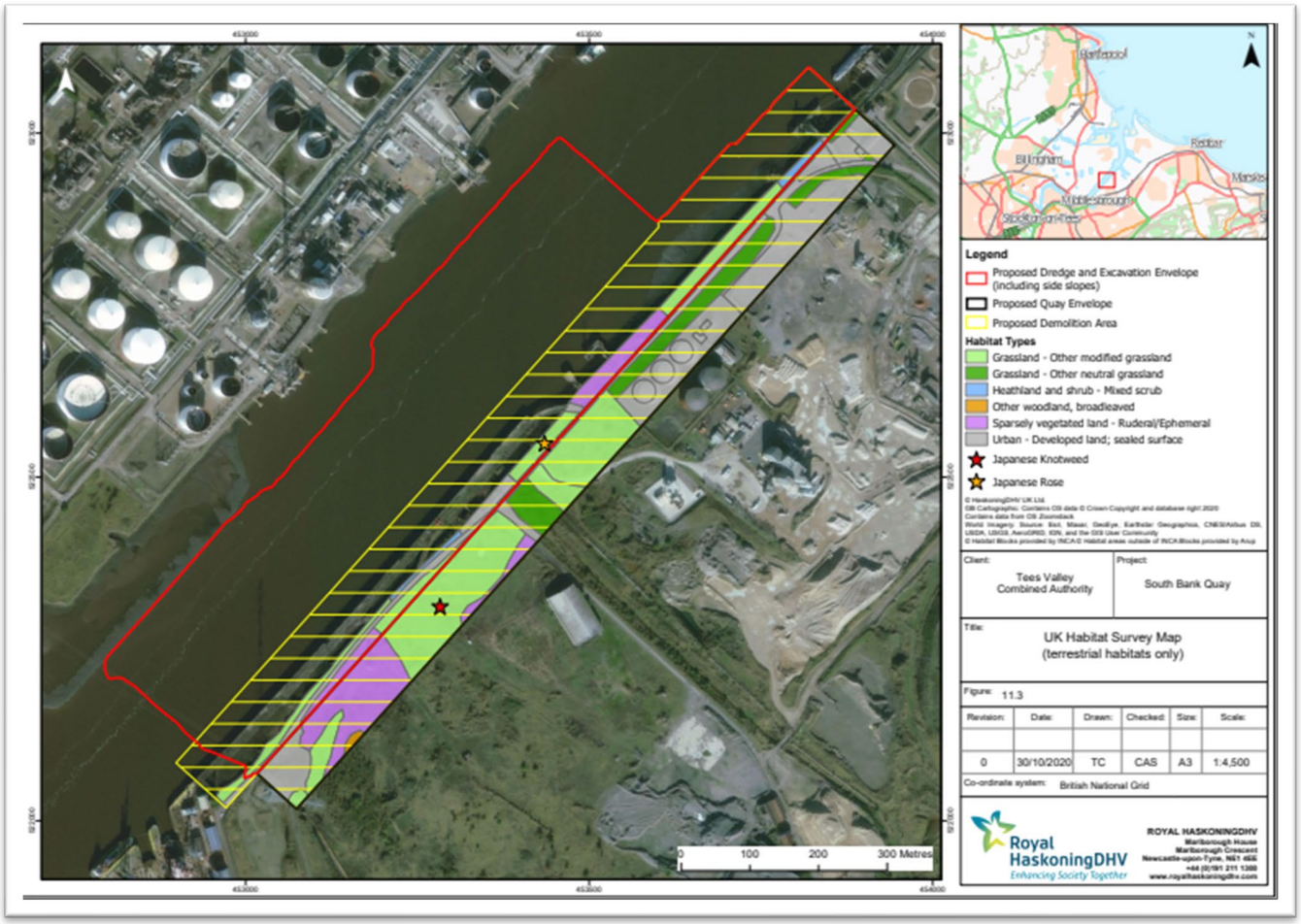
- Restoring or improving suitable habitat for brown hare and / or hedgehog

3.4 Habitat Management Plan

HABITAT MANAGEMENT PLAN

EXISTING FEATURES

Habitats identified on site are shown in the drawing below



The proposed scheme will result in the permanent loss of a small area of broadleaved woodland; however, the trees within this area are predominately young birch trees and therefore have been assessed as having low ecological value. Invasive non-native species (namely Japanese Rose and Japanese Knotweed) were also recorded within the footprint of the proposed scheme. No other species or habitats of importance were recorded within the EIA.

POTENTIAL IMPACTS

Land

- Loss or damage to local habitats.
- Damage or destruction of unrecoverable habitats/landscapes.
- Reduction/loss of both flora and fauna species.
- Impacts on the natural ecology of local species such as bird nesting grounds, badger setts/wildlife corridors.

Water

- Direct loss of habitat
- Changes in water chemistry /biochemistry and water flow

- Introduction of silt into water body
- Reduction in water oxygen levels
- Damage, destruction or accelerated erosion of riverbanks contributing to a change in flow, routes and alteration of the riverbed impacting both flora and fauna species

MITIGATION

Land

- On completion of construction works any areas that were unavoidably impacted will where practicable be replaced and or improved.
- Care will be taken to minimise the impact to existing vegetation and heavy plant will be confined to the site and working areas to avoid damaging soils outside the area. The removal of trees will be avoided where possible.
- A stout fence will be erected around any trees to be retained. As most damage usually occurs to the roots, the fence will enclose at least the area covered by the spread of the branches.

Water

- At all times we will implement pollution prevention measures when working on or in close vicinity to water environments.
- To minimise / offset any direct loss of marine habitat the following mitigation measures will be implemented:
    - Use of verti-pools on the quay face at different heights within the tidal frame.
    - Implementation of measures within the South Tees Regeneration Masterplan Environment and Biodiversity Strategy.
    - Minimising the footprint of the proposed dredge as far as practicable within the constraints of delivering a development that meets the operational need.
- Where realignment works are required these will be designed and executed to ensure minimal sedimentation and erosion.
- If culverts are required these will be kept to a minimum and will be constructed to ensure minimal disturbance to existing environment.

SECTION 4.0 Land Management Plan

Guidance Notes:

This section contains details of the steps required to safeguard the site from negative impacts in respect of Geology/ Ground Conditions/ contaminated land

4.1 Geology and Contaminated Land Issues
4.2 Site Geology and Ground Conditions
4.3 Potential sources of contamination not previously identified
4.4 Potential Pathways
4.5 Potential Receptors
4.6 Mitigation Measures
4.7 Discovery of Contaminated Land Emergency Procedure

4.1 Geology and contaminated Land Issues

Ground contamination may be present on-site as a result of the current and historical land use(s) that have occurred. In order for ground contamination to present a risk to human health or the environment there must be pollution pathway present comprising a source, pathway and receptor.

The CLR-11 document defines the three essential elements to any risk as:

- A contaminant (or hazard) that is in, on or under the land and has the potential to cause harm
- A receptor which in general terms is something that could be adversely affected by a contaminant or hazard, for example human health
- A pathway which is a means by which a receptor can be exposed to, or affected by a contaminant or hazard

Pollution Pathway

4.2 Site Geology and Ground Conditions

Geology

The anticipated geological sequence within the proposed scheme footprint is outlined below.

Stratum	Unit	Depth to base of stratum (m bgl*)	Approximate thickness (m)	Description
Made Ground		Up to 10.00	5.00 – 10.00	Granular deposits comprising silty / sandy ash, clinker with cobbles and boulder sized fragments of grey blast furnace slag. The site and wider area are known to comprise reclaimed mudflat and marshland and therefore Made Ground is likely to have been used to raise site levels and widespread across the site.
Superficial Deposits	Tidal Flat Deposits	10.20	4.00	Post glacial estuarine and marine Alluvium identified as sand, silt and clay. Superficial Deposits formed up to 2 million years ago in the Quaternary Period.
	Glaciolacustrine Deposits	Not recorded		Clay and silt formed 2 million years ago in the Quaternary Period.
	Glacial Till	Not recorded		Glacial Till deposits formed 2 million years ago in the Quaternary Period.
Bedrock	Mercia Mudstone Group	Not recorded		Red mudstone and subordinate siltstone formed approximately 201 to 252 million years ago in the Triassic Period.

*bgl – below ground level

Due to the absence of designated geological sites within the proposed scheme footprint, the geological sensitivity is considered to be negligible.

Hydrogeology

The EIA has concluded that due to the unproductive nature of the aquifer designations of both the superficial deposits and underlying Mercia Mudstone Group, the lack of potable groundwater abstractions, likely saline intrusion and the absence of a SPZ, groundwater within the footprint of the proposed scheme is considered to have a low sensitivity.

Contaminated land

Previous ground investigations and environmental assessments have identified contaminant levels in excess of screening levels for metals, PAH's and TPH.

A contaminated land remediation strategy was developed by Wood in 2019 (Appendix 7.1 Ref:) and this will be implemented as part of the works

The tables below sets out the key sources of contamination which have been identified both within and adjacent to the proposed scheme footprint.

Potential source	Potential associated contaminants
Made Ground across the landward parts of the proposed scheme footprint including demolished buildings, structures, slag and ash associated with the adjacent steel work.	Asbestos, metals and metalloids, polycyclic aromatic hydrocarbons (PAHs), fuel and oil hydrocarbons, aromatic hydrocarbons (SVOCs and VOCs), phenols, cyanides, ammonium, chlorides and sulphates.
Riverside Pumping Station buildings (sterilisation and motors for pumps)	Asbestos, inorganic compounds (chlorine, sodium chloride), fuel and oil hydrocarbons.
Electrical sub-stations and transformers	Asbestos, metals and metalloids, polycyclic aromatic hydrocarbons (PAHs), fuel and oil hydrocarbons, polychlorinated biphenyls (PCBs).
Pipelines	Unknown contents and potentially associated with oil depot and may contain fuel and oil hydrocarbons.
Wharf usage, travelling cranes and railway tracks	Fuel and oil hydrocarbons, metals and metalloid, PAHs, phenols, asbestos, organotins, sulphates and sulphides, chlorinated solvents. Potential leaks and spillages from loading of cargo onto ships. Potential re-fuelling of vessels.
Oil depot tanks and pipelines	Asbestos, metals and metalloids, polycyclic aromatic hydrocarbons (PAHs), fuel and oil hydrocarbons, volatile and semi-volatile organic compounds (VOCs and SVOCs), phenols and PCBs.
Tanks to the east of the pumping station which have now been demolished.	
Benzole plant and associated tanks which have been demolished.	

Potential source	Potential associated contaminants
Slag crushing works (former) Tarmac Teesport Asphalt Plant (Asphalt and Concrete Plant)	Phenols, PAHs, PCBs, bitumen, hydrochloric acid, organic compounds, fuel and oil hydrocarbons, metals and metalloids.
Off-site sources including: • Easton Sheet and Galvanising Works; • Teesport; • Slag crushing works; • Ore crushing plant; • Travelling cranes and railways; • Hanson Ready-mixed concrete; • Landfill sites; • Teesside Works Cleveland; • Made Ground from land reclamation and infilling of reservoirs; and • Dockyards including saw and timber mills.	Asbestos, metals and metalloids, PAHs, fuel and oil hydrocarbons, volatile and semi-volatile organic compounds (VOCs and SVOCs), phenols, cyanides, ammonium, chlorides, sulphates and sulphides. Ground gases.

The EIA has identified that Construction activities will disturb soils and groundwater and may result in the mobilisation of contaminants which have the potential to impact on controlled waters and human health receptors.

It was concluded that the impact during the construction phase would be of negligible significance to groundwater, moderate adverse to the Tees estuary and associated ecological receptors and minor adverse significance to human health. This is on the basis that the mitigation measures set out in this CEMP would be adhered to, and the measures detailed in an outline remediation strategy would be implemented.

An Environmental Site Assessment (ESA) report has been completed. The ESA includes a Generic Quantitative Risk Assessment (GQRA) undertaken by Arcadis. A Ground Investigation and GQRA Report was also undertaken by Royal Haskoning. The conclusions of the GQRA undertaken were that concentrations of arsenic, lead, benzene, dibenzofuran, 1,2 dichloroethane and polycyclic aromatic hydrocarbons (PAHs) were measured exceeding the GAC in soil for the protection of human health. In relation to water resources, several exceedances of WQS were measured on site, primarily relating to those wells screening the Made Ground and the Tidal Flat Deposits.

A Detailed Quantitative Risk Assessment (DQRA) published in September 2021 (Ref: 10035117-AUK-XX-XX-RP-ZZ-0331-01-SB_DQRA) was undertaken to further assess the contaminant of concern (CoC) identified as exceeding the relevant water quality standards (WQS) in the GQRAs undertaken by Arcadis and Royal Haskoning. The DQRA focuses on water resource receptors, specifically, the River Tees is located just beyond the northern border of the site. The scope of the water resource DQRA includes:

- Assessment of the potential risk posed to water resources using a source-pathway-receptor approach to refine the existing conceptual site model (CSM); and,
- Evaluation of the need for remediation works to be undertaken.

Potential sources of contamination exist on site associated with the Made Ground and historical use of the site. Review of the contaminant distribution identified two sources to assess:

- Made Ground source from across the site - considered to comprise a single diffuse soil source associated with Made Ground and slag.
- Groundwater source in the vicinity of SBC_AUK_BH110 - considered to represent contamination associated with the SBCO area and also the location of identified non-aqueous phase liquid (NAPL). NB – This is not located within the works area of this project.

Diffuse groundwater contaminants found throughout the site associated with Made Ground include metals, hydrocarbons including PAH, inorganics including cyanide, ammonia and sulphate and other organic compounds such as phenolics.

Groundwater contaminants associated with SBCO include metals, hydrocarbons (including tars), PAH, inorganics including cyanide, ammonia and sulphate and other volatile and semi-volatile organic compounds.

The findings of the water resource assessment for the Made Ground Source undertaken in this DQRA concludes that the site does not present a significant risk to the River Tees.

Non-aqueous Phase Liquid has been measured on site however, dissolved phase concentrations indicate that NAPL is not presenting a risk to water resources. A potential pathway due to piled foundations was identified under the pollutant linkages. Based on the findings of the contaminant distribution and underlying ground conditions, it is considered unlikely that this pathway could represent a significant risk to water resources. Although contamination may locally be able to enter the underlying natural deposits around piles, lateral migration within the unit is unlikely to be significant.

As part of the enabling works undertaken by others a remediation strategy has been undertaken as per South Bank Quay Area, Former Steelworks, Redcar – Enabling Earthworks and Remediation Strategy (Ref 10035117-AUK-XX-XX-RP-ZZ-0293-02-South Bank Quay Strategy)

4.3 Potential sources of contamination not previously identified

Primary Sources of contaminants include tanks, site processes/operations (including combustion processes), site spillages/leaks, waste storage areas, and drainage lines.

Secondary Sources of contaminants result from the release of substances or deposition of materials from the Primary Sources, including atmospheric deposition and waste disposal.

Made ground/fill deposits and soils containing naturally occurring substances are also considered as a potential source of contaminants.

Site activities have the potential to mobilise any contaminants that exist in the ground by creating pathways or simply by providing environmental conditions that assist their development to a more toxic form.

Contaminants of concern may include a range of organic and/or inorganic substances namely heavy metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, volatile and semi-volatile organic compounds, polychlorinated biphenyls (PCB's), asbestos and other harmful or toxic materials not mentioned above.

4.4 Potential Pathways

- Soils leaching to groundwater
- Groundwater advection
- Surface water run-off
- Migration via services and service ducts
- Migration through strata of a permeable nature
- Dermal, inhalation or ingestion
- Increased dusting levels as a result of weather conditions or construction activities

4.5 Potential Receptors

- Ecological Receptors namely; flora, fauna and the water ecosystem
- Groundwater including Minor and Major Aquifers underlying the site
- Surface Waters (controlled water)
- Buildings, building materials and services (BBMS)
- Human receptors including demolition and construction workers.

4.6 Mitigation Measures

- Works will be completed in line with planning and site investigation mitigation measures
- Measures for storage of chemicals, fuels and hazardous materials will be implemented on site (as per section 5 of this CEMP)
- A watching brief will be provided to identify and segregate potential contaminated soil

- Where any unexpected contamination is discovered, we will liaise with the local authority and experienced consultants and agree a remediation strategy for dealing with contamination
- Known areas of contamination will be managed as per the measures detailed in the Outline Remediation Strategy (Appendix 7.1 Ref:) including:
    - Placement of a capping layer on the surface in order to break pollutant linkages. This technique includes the placement of either hardstanding or chemically 'suitable for use' materials up to 0.3m in thickness over contaminated ground.
    - Clean service runs are recommended to protect both future land users and utility assets.
    - Selective excavation and disposal at the adjacent hazardous waste facility of limited 'hotspots' of contamination to complement the capping layer remediation approach.
    - Testing of soils and materials for re-use within the proposed scheme footprint to determine their suitability.
    - Adherence to Construction (Design and Management) Regulations 2015.
    - Development of a materials management plan (MMP).
- In order to minimise the impacts on groundwater quality during earthworks and piling and to minimise the impacts on surface water quality from the discharge of dissolved phase contaminants in groundwater and surface water runoff the following measures will be implemented, as described in Appendix 7.4 (Environmental Action Plan):

    - Prior to commencement of construction activities/relevant phase, a programme of site characterisation works is to be undertaken and submitted to RCBC to ascertain if contaminants are present in concentrations that could result in pollution to controlled waters. The programme shall include the following components:
        1. A preliminary risk assessment which has identified:
            - all previous uses
            - potential contaminants associated with those uses
            - a conceptual model of the site indicating sources, pathways and receptors
            - potentially unacceptable risks arising from contamination at the site
        2. A site investigation scheme, based on (1 Contaminated Land Remediation Strategy?) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off-site.
        3. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
        4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

           Any changes to these components require the written consent of RCBC. The scheme shall be implemented as approved.

    - A Piling Risk Assessment shall be submitted to and approved in writing by RCBC prior to commencement of piling. Any mitigation measures identified as part of the assessment shall be implemented throughout the construction phase unless agreed in writing.
- In order to minimise the impacts on human health due to construction:
    - Construction works will follow best practice and guidance including compliance with the Health and Safety at Work Act 1974 legislation, Construction (Design and

Management) Regulations 2015 and Control of Substances Hazardous to Health (COSHH) Regulations.

- This will include the production and adoption of site and task specific health and safety plans.
- The plan will outline the use of risk mitigation strategies including appropriate Personal Protective Equipment (PPE), provision of welfare facilities and relevant good working practices applied to avoid potential risk to human health from any potential ground contamination, in line with relevant available guidance.
- Adoption of measures outlined within the air quality section of this CEMP.

4.7 Discovery of Contaminated Land Emergency Procedure

All site personnel will be vigilant during excavating for signs of unexpected contamination. Where contamination is suspected during the works the following action will be taken

- All work must be stopped immediately.
- The Site Manager must notify the discovery to the Environmental Manager
- The area must be sealed off in order to contain the spread of contaminants.
- The site must be cleared to ensure there is nothing that could cause fire or explosion.
- The Site team must seek expert advice to identify, if appropriate and possible, the extent and cause of contamination (e.g. prior land use, spillage on site).
- If asbestos is uncovered, it should be re-covered temporarily to prevent release to atmosphere.
- A specialist contaminated land survey should be undertaken in order to determine the level of contamination and whether disposal or remediation methods are required.
- The Site Manager must complete an Environmental Incident Report on CORA.
- Good practice must be followed to remediate the land.

SECTION 5.0 Water Management Plan

Guidance Notes:

This section contains details of the steps required in order to ensure best practice with regard to the protection of water quality and water efficiency

5.1 Water Management Issues
5.2 Existing Site Conditions
5.3 General Water Management Controls
5.4 Control Measures for Hazardous Substances
5.5 Control Measures for Plant and Equipment
5.6 Control Measures for Concrete, Cement and Grout
5.7 Control Measures for Oil Storage
5.8 Control Measures for Refuelling
5.9 Appointed Persons for Refuelling
5.10 Control Measures for Discharging Water
5.11 Control Measures for Abstracting Water from Excavations
5.12 Control Measures for Drainage
5.13 Control Measures for Flood protection and coastal defences
5.14 Control Measures for Dredging
5.15 Control Measures for Riverbank Excavations
5.16 Control Measures for Demolition
5.17 Control Measures for Landside Excavations
5.18 Water Efficiency

5.1. Water Management Issues

The construction industry presents a major pollution threat to the water environment. Where harm has occurred or deemed likely to occur the regulator can either carry out works to clean up the pollution and recover costs from the Contractor, or can serve a works notice requiring the polluter to clean up the discharge at their own expense. If watercourses are polluted, or unacceptable wastes are disposed of to the sewer system, the regulatory authorities have the powers to prosecute.

GRAHAM will at all times implement working methods to protect the water environment from pollution and other adverse impacts. Our objective is to protect water quality and the ecosystems the water resources support.

5.2. Existing site conditions

Hydrology

The proposed scheme footprint is located in the Tees Lower and Estuary catchment. The landside parts of the proposed scheme footprint are entirely located on the south bank of the River Tees, a designated Environment Agency Main River. The proposed quay is to be located approximately 6km upstream from the river mouth, where the River Tees enters the North Sea.

The River Tees is a tidally influenced transitional waterbody as defined by the Water Framework Directive (WFD). Approximately 10.5km upstream of the proposed scheme footprint, the River Tees is controlled by a tidal barrage. The barrage is operated by the Canal and River Trust and maintains a controlled water level upstream of the structure.

There is one unnamed watercourse that runs through the proposed scheme footprint. This watercourse was the former alignment of the Holme Beck, which has since been diverted along the south eastern boundary of the proposed SIZ landside development also being progressed by STDC. The currently unnamed channel that was formerly the alignment of the Holme Beck flows north through the SIZ landside development site via an open channel, before being culverted underneath the access track present within the proposed scheme footprint and discharging into the River Tees.

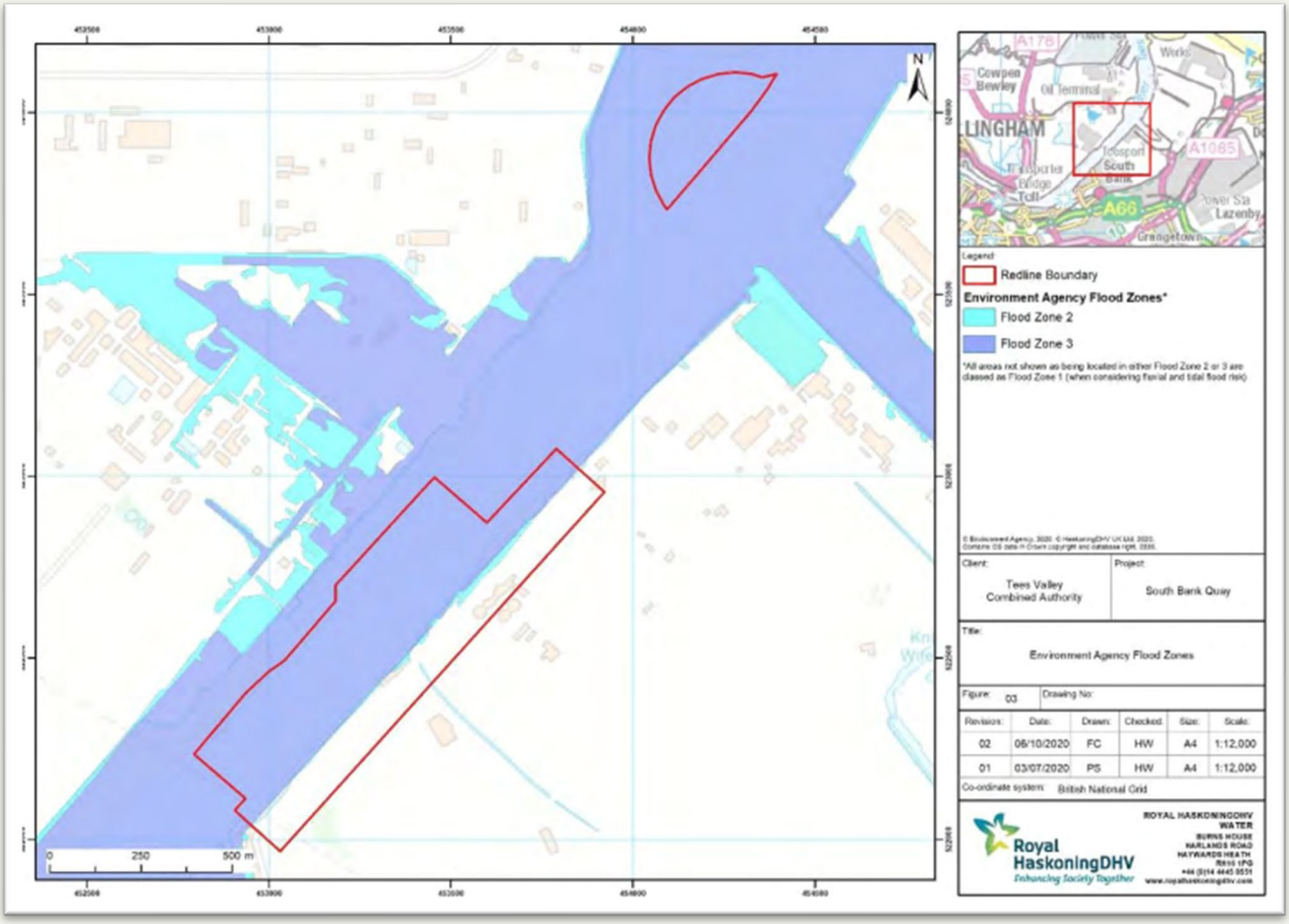
Within the wider area there are a number of small watercourses. The closest to the proposed scheme footprint comprise the Cleveland Channel and Lackenby Channel. The Cleveland Channel flows into the Lackenby Channel approximately 1.4km south-east of the proposed scheme footprint. The Lackenby Channel flows perpendicular to the River Tees in an open channel, before being culverted and draining into the River Tees approximately 300m north-east of the proposed scheme footprint via the Lackenby Outfall

Surface Water Drainage

It is understood that there is no formal drainage system from the existing land adjacent to the Tees estuary. It is understood that surface water runoff and drainage from the land is likely to flow directly into the Tees estuary.

Flood Risk

As shown in the drawing below the proposed scheme footprint spans across EA Flood Zones 1, 2 and 3, whereby the in-channel elements are located in either Flood Zone 2 or Flood Zone 3 and the landside elements (i.e. the quay) are located in Flood Zone 1.



Hydrodynamic and sedimentary regime

The demolition of South Bank Wharf and jetties will have only minor, localised and temporary effects that are not of significant concern. Construction of the new quay (to be set back from the riverbank) will be from land, using predominantly land-based plant, with no construction activity in the river and so will cause no effects on the hydrodynamic and sedimentary regime.

The capital dredging of the river and the offshore disposal of dredged sediments both will cause plumes of sediment to form. The plume effects arising from the river dredging are characterised by a short-lived localised increase in suspended sediment concentrations by the order of a few hundred mg/l at the point of dredging activity, followed by a general dispersion in spatial extent and reduction in concentration over following hours. Since the dredging is a near-continuous operation, the plume effects will be observed throughout much of the approximately four-month period, but at varying extents depending on the dredging activities undertaken at any one time.

Marine sediment and water quality

A potential impact on water quality has been identified due to the resuspension of sediment, principally as a result of the proposed dredge. However, on further consideration of the potential impact, the risk of exceeding water quality standards was deemed to be low. Additionally, sediment plume modelling shows relatively limited areas of high suspended solids concentrations, which only occur for a matter of hours at a time before the suspended sediment concentrations return to baseline values. No significant impacts are therefore predicted.

There is a possibility that some contaminants present in sediment could exceed their respective environmental quality standard (EQS) during capital dredging. However, sediment plume modelling does not predict long term and large scale extends of elevated concentrations of suspended solids; rather, they are predicted to remain in close proximity to the dredging vessel(s). Additionally, time series data extracted for the Smiths Dock water quality monitoring point predicts a set of short-lived

peaks in concentrations which return to baseline concentrations within hours. Consequently, the risk of EQS failure is small scale and temporary. Additionally, a relatively large proportion of the total volume of dredged material comprises geological material (i.e. mudstone) which contains much lower levels of contaminants, therefore the risk to EQS is only during dredging of the finer sediments in the upper layers. Overall, a minor adverse impact is predicted.

Other impacts such as demolition and removal of existing structures and construction of the new quay wall would have small and localised effects on water quality, but the effects of this would be highly localised and temporary only.

5.3. General Water Management controls

Best practice working methods will be adopted during demolition / excavation adjacent to the Tees estuary to ensure that transport of debris into the Tees is minimised as far as possible. Should any debris fall into the river channel during demolition, this would be removed as early as practicable. Task specific Risk Assessment and Method Statements (RAMs) will be developed.

All work will be carried out in line with GPP5 "Works and Maintenance in or near water" in order to ensure best practice with regard to the protection of water quality.

The handling, use and storage of hazardous materials will be undertaken in line with Guidance for Pollution Prevention (e.g., GPP2 Above Ground Oil Storage Tanks).

All vessels will adhere to the requirements of the MARPOL Convention Regulations

All work will be undertaken in accordance with the following CIRIA Guidance

- Coastal and Marine Environmental Site Guide (2nd edition) (C744)
- Guidance note C741 Environmental Good Practice on Site Guide (4th edition)

5.4. Control Measures for Hazardous Substances

Hazardous substances are common pollutants of waterbodies and groundwater supplies which can be used for drinking water. The following control measures will be put in place on site in order to avoid the potential for contaminants from hazardous substances migrating to surface and groundwater.

All containers for hazardous substances (solid and liquid) will be leak-proof. Storage of such substances will be within impermeable, bunded, secure areas, with impervious walls and floor to remove the risk of migration to groundwater or a nearby watercourse. Such storage areas will be located away from sensitive areas of the site and will be covered to prevent ingress of water. Hazardous substance stores will be clearly marked with appropriate warning signs.

Storage areas for hazardous substances will be kept tidy and we will plan deliveries to keep the amount of hazardous materials on site to a minimum

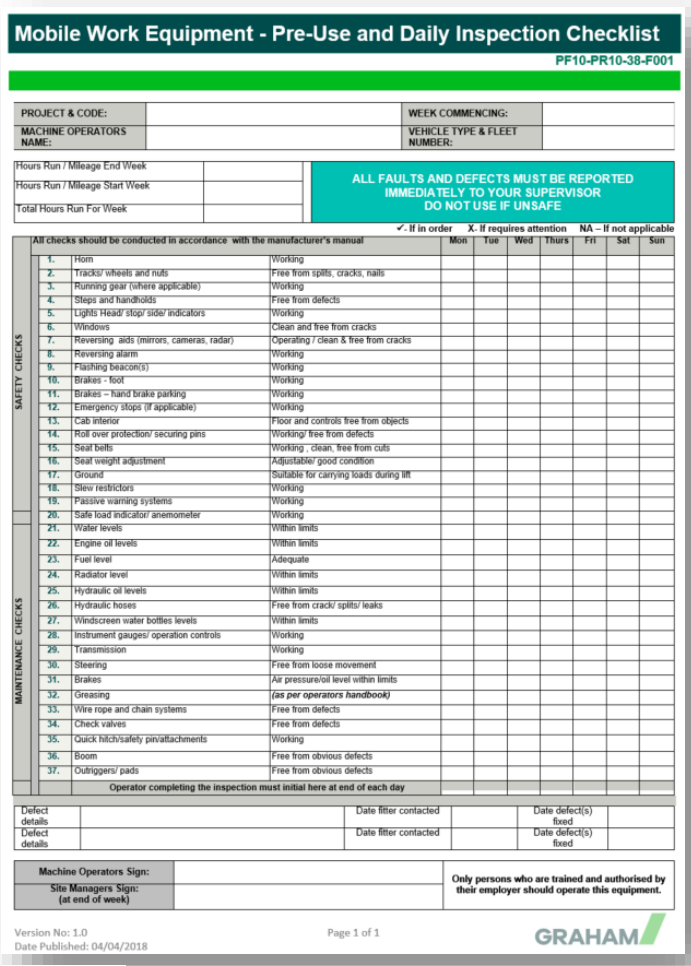
We will ensure that any water that has come into contact with hazardous materials, or is believed to be contaminated, will be stored, tested, classified and appropriately disposed of in accordance with relevant legislation.

The quantity and type of all environmentally hazardous materials will be recorded and updated weekly on the Materials Storage Inventory Form (IMS Ref: PF10-PR10-43-F006)

Figure 4 - Examples of bunded and covered COSHH areas and containers

5.5 Control Measures for Plant and Equipment

Daily plant checks will be completed for all mobile plant and equipment. Particular attention will be made to checking engine fluids and hydraulic hoses. Any leaks or damage to the plant will be recorded and notified to the plant department/ hire company immediately so that the appropriate servicing can be arranged. Any items of plant/ equipment found to have any leaks will be removed from service until the fault is rectified.



Mobile Work Equipment - Pre-Use and Daily Inspection Checklist

PF10-PR10-38-F001

PROJECT & CODE:		WEEK COMMENCING:	
MACHINE OPERATORS NAME:		VEHICLE TYPE & FLEET NUMBER:	

Hours Run / Mileage End Week	
Hours Run / Mileage Start Week	
Total Hours Run For Week	

ALL FAULTS AND DEFECTS MUST BE REPORTED IMMEDIATELY TO YOUR SUPERVISOR DO NOT USE IF UNSAFE

✓- If in order X- If requires attention NA – If not applicable

		All checks should be conducted in accordance with the manufacturer's manual	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
SAFETY CHECKS	1.	Horn	Working						
	2.	Tracks/ wheels and nuts	Free from splits, cracks, nails						
	3.	Running gear (where applicable)	Working						
	4.	Steps and handholds	Free from defects						
	5.	Lights Head/ stop/ side/ indicators	Working						
	6.	Windows	Clean and free from cracks						
	7.	Reversing aids (mirrors, cameras, radar)	Operating / clean & free from cracks						
	8.	Reversing alarm	Working						
	9.	Flashing beacon(s)	Working						
	10.	Brakes - foot	Working						
	11.	Brakes – hand brake parking	Working						
	12.	Emergency stops (if applicable)	Working						
	13.	Cab interior	Floor and controls free from objects						
	14.	Roll over protection/ securing pins	Working/ free from defects						
	15.	Seat belts	Working , clean, free from cuts						
	16.	Seat weight adjustment	Adjustable/ good condition						
	17.	Ground	Suitable for carrying loads during lift						
	18.	Slew restrictors	Working						
	19.	Passive warning systems	Working						
	20.	Safe load indicator/ anemometer	Working						
MAINTENANCE CHECKS	21.	Water levels	Within limits						
	22.	Engine oil levels	Within limits						
	23.	Fuel level	Adequate						
	24.	Radiator level	Within limits						
	25.	Hydraulic oil levels	Within limits						
	26.	Hydraulic hoses	Free from crack/ splits/ leaks						
	27.	Windscreen water bottles levels	Within limits						
	28.	Instrument gauges/ operation controls	Working						
	29.	Transmission	Working						
	30.	Steering	Free from loose movement						
	31.	Brakes	Air pressure/oil level within limits						
	32.	Greasing	*(as per operators handbook)*						
	33.	Wire rope and chain systems	Free from defects						
	34.	Check valves	Free from defects						
	35.	Quick hitch/safety pin/attachments	Working						
	36.	Boom	Free from obvious defects						
	37.	Outriggers/ pads	Free from obvious defects						
		Operator completing the inspection must initial here at end of each day							

Defect details		Date fitter contacted		Date defect(s) fixed	
Defect details		Date fitter contacted		Date defect(s) fixed	

Machine Operators Sign:		Only persons who are trained and authorised by their employer should operate this equipment.
Site Managers Sign: (at end of week)		

Version No: 1.0
Date Published: 04/04/2018

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GRAHAM

Figure 5 - GRAHAM Mobile Plant Daily Inspection Sheet

Figure 6 - Example of GRAHAM Enviropad in use

- Enviropads will be used under diesel pumps and standing plant.
- Effluent from wheels washers and plant washing facilities will be contained for proper treatment and disposal.

5.6 Control Measures for Concrete, Cement and Grout

Concrete, cement and grouts are highly alkaline and corrosive and can have a detrimental impact on watercourses. To minimise any impact:

CONCRETE WASHOUT FROM CONCRETE LORRIES

- Concrete wash water control measures will be planned and implemented before starting the project. A concrete washout risk assessment will be completed to assess the risk to receptors based upon site location and volume of concrete washout generated.
- The amount of wash water produced will be minimised and where possible and practicable, it will be returned to the batching plant
- For washwaters that cannot be returned to the batching plant, the concrete washout system utilised will (as a minimum) securely capture, contain and store the concrete solids and wash water in an impervious container/ bund.
- Washout arrangements will be located 10m away from drainage gullies, surface water drains and watercourses
- The washout area will be conveniently located for washing out equipment and adequately signposted.
- To minimise the amount of washout water generated, excess concrete will be scraped off the equipment before it is washed. These excess solids will be placed in a designated storage container.
- A high pressure, low volume water spray nozzle will be used to reduce water use
- The area will be monitored and maintained to ensure proper use and have adequate storage capacity
- Temporary concrete washouts will be designed with enough volume to contain all liquid and concrete waste.
- Plastic lining material will be a minimum of 10 mm polyethylene sheeting and will be free of holes, tears, or other defects that compromise the integrity of the material

CONCRETE WASHOUT SYSTEMS (EXAMPLES IN ORDER OF PREFERENCE)

A. Wash into geotextile bag, collect the filtered wash out water in separate tank and arrange with concrete supplier to extract tank contents following the last pour of the day. Concrete washout water can be reused at the batching plant making more concrete. **Note: Requires submersible pump, geotextile bags and agreement with concrete supplier**

B. Use integrated pump and waterhose to clean chute into the specific geotextile bag. This segregates the solids, and the collected high pH wash out water is stored for re-use to rinse out the next wagon's chute. **Note: Requires power connection to pump the water, geotextile bags and has capacity for 50 wagons**

C. Combined Concrete Washout and pH adjustment System - separates and dewaters the waste concrete solids and then its on-board automatic carbon dioxide pH adjustment system neutralises the high pH washwater down to (circa pH 6 to 9) limits set by the Environment Agency for discharge. **Requires: Power, consent to discharge, CO_2 gas, and water quality testing**

D. Washout into a holding tank / skip lined with an impermeable sheet to prevent ground contamination. Mixture is allowed to cure / water evaporate **Requires: dry weather / potentially a sacrificial bag of cement**

Figure 7 - Examples of Concrete Washout Systems that may be utilised on site

ON-SITE BATCHING

- Batching and mixing activities will be located well away from watercourses and drains
- Material storage areas for all cementious materials will be protected and covered.
- Surface drainage in the area around the batching plant will be controlled as we are aware that it may be polluted.
- Spills of concrete, cement, grout and similar materials will be contained and ensured that they cannot reach surface water or drains.
- Concrete washout from mixing plant will be carried out in a designated contained impermeable area.

CONCRETE PLACEMENT

- We will discuss arrangements for deliveries to site with suppliers before work starts, agreeing routes, designated washout areas and emergency procedures.
- Bulk and bagged cement and concrete additives will be stored at least 10m away from watercourses, gullies and drains.
- A contingency plan will be put in place for uncontrolled releases.

5.7 Control Measures for Oil Storage

Oil is one of the most common pollutants in the UK and spilt oil can pollute waterbodies and groundwater supplies which can be used for drinking water.

TYPES OF OIL EXPECTED TO BE FOUND ON SITE

- Petrol
- Diesel
- Heating oils
- Biofuels
- Lubricating and hydraulic oils
- Synthetic and mineral oils
- Biodegradable
- Shuttering and cutting
- Waste oils

OIL STORAGE LOCATIONS

In all cases we will avoid storing oil in high risk locations such as:

- Where there is risk of damage by impact or collision e.g. from site traffic
- Within 50M of a spring, well or borehole
- Within 10M of a watercourse, ditch or drainage channel
- Where spilt oil could enter open drains or soak into unmade ground where it could pollute groundwater

OIL STORAGE TANKS AND CONTAINMENT SYSTEMS

When storing more than 200litres of oil, a secondary containment system will be provided. The capacity of the secondary containment system will be either 110% of the largest drum or 25% of the total volume stored (whichever is greater). Additionally all ancillary equipment will be kept contained within the bund.

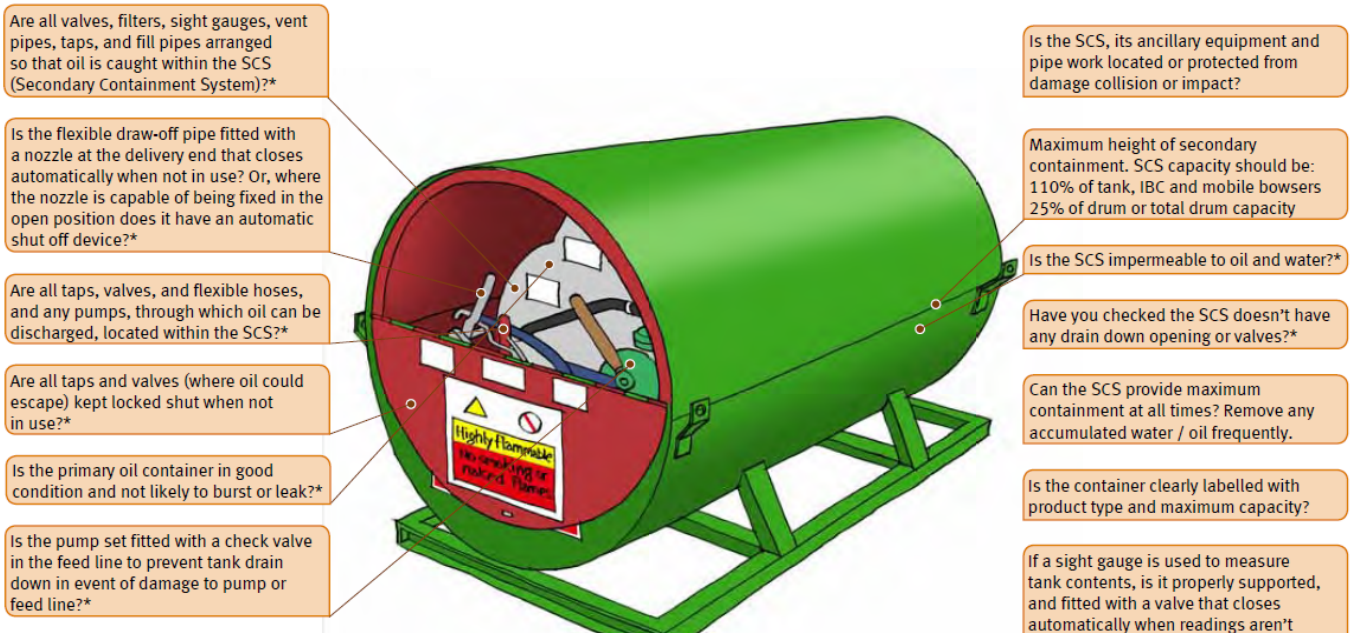


Figure 8 - Illustration of oil storage with a secondary containment system

INSPECTION AND MAINTENANCE

All oil storage areas, containers and secondary containers will be frequently inspected and checked for signs of damage, corrosion, bulging, leaks or unauthorised use and interference. Any required maintenance, defects or faults will be repaired immediately.

5.8 Control Measures for Refuelling

A **designated refuelling** area will be established for the project. This area will consist of an impermeable surface, situated well away from watercourses. Signage (such as that illustrated below) will be erected to indicate the location of the refuelling area and an oil spillage kit will also be at hand at this area. All fuel deliveries to site will be supervised by a designated individual.

Figure 9 - Example of a protected refuelling area on handstand with spill kit

When refuelling has to be carried out away from the designated area, it will be carried out by using a drip tray or other secondary containment solution to prevent oil from spilling onto the ground. Where mobile refuelling is necessary, all bowsers will carry an emergency spill kit. All oil containers (including mobile bowsers) will be returned to the designated storage area after use.

5.9 Appointed Persons for Refuelling

A dedicated person(s) will be appointed and trained for the purpose of refuelling on site.

An "appointed persons" poster such as that shown below will be completed and displayed on site.

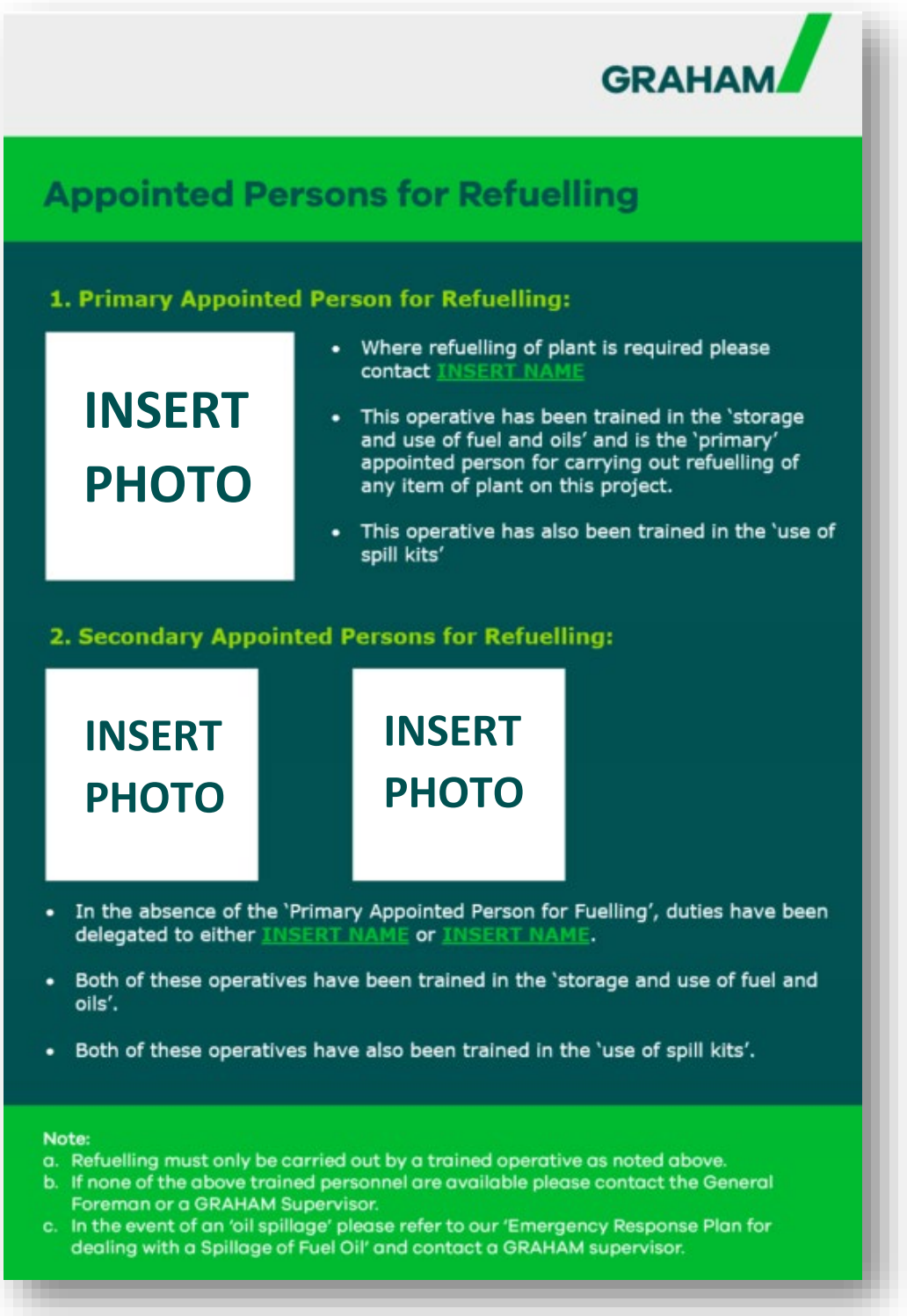


Figure 10 - Poster template (Appointed persons for refuelling)

5.10 Control measures for discharging Water

- We will minimise the amount of waste water which needs to be discharged and find alternative means of disposal where possible.
- Any temporary stockpiling of materials will be prevented from eroding by rain water or surface water runoff.
- Water containing silt, or any other contaminating material will not be released directly to a watercourse of surface water drain. Treatment facilities, such as sediment traps or siltbusters in series will be used as appropriate, before water is discharged. These facilities will be regularly inspected and maintained. A full record will be kept of inspection, maintenance and measures employed to sustain performance.
- All site discharges will be of a quality, by a method and at a location acceptable to the regulator. This will be agreed (via written consent) in advance of works commencing on site.
- Prior to any discharge into a sewer, a Trade Effluent Consent will be obtained from the local Water Company
- A "permit to pump/ discharge" (See Appendix 5.1 - Ref: PF10-PR10-43-F012) will be used to ensure that personnel discharging water are fully aware of the requirements.
- Where applicable, a Water Quality Monitoring Plan will be drawn up prior to construction commencing. This will detail the requirements and frequency of water quality sampling as a result of construction activities and will specify the parameters to be achieved relevant to the water quality objectives at the receiving site.

5.11 Control measures for Abstracting Water from Excavations

- The removal of water from an excavation is a high risk activity.
- Prior to excavation below the water table, including site de-watering, we will inform the regulator and Water Company of the works to be conducted. Any de-watering, groundwater lowering and disposal measures will be agreed in advance with the regulator and if necessary an Abstraction Licence obtained.
- A "permit to pump/ discharge" (See Appendix 5.1- Ref: PF10-PR10-43-F012) will be used for any abstraction activities
- A small sump will be dug in the excavation for the head of the pump. This will be surrounding by a perforate pipe and a suitable grade of clean stone.

5.12 Control measures for Drainage

Drainage systems can act as a pathway to spread pollutants. Drains can also make pollution invisible, so it is important to know where drains are located and where they lead in order to prevent polluting materials entering drains.

- All existing drainage on site (e.g. surface water, foul sewer) will be identified and a "drainage plan" will be made available
- All drain covers and gullies will be clearly marked to identify them (Recommendation is red for foul, blue for surface water)
- If any pollution enters a drain, the site spill response team will immediately stop the pollution with a physical block, stop the activity causing the pollution, then notify the Environmental Manager.

5.13 Control measures for Flood Protection and Coastal defence

The risk of a flood event occurring and its impact on human health can be controlled through the implementation of the following Flood Risk Emergency Plan (FREP):

Flood Risk Emergency Plan (FREP).

- GRAHAM will sign up to flood alerts via the following link: https://www.gov.uk/sign-up-for-flood-warnings. This will ensure that the site management team will have as much advance notice as possible to take action in the event that a flooding event is forecast/predicted.
- Prior to works commencing, all construction workers will undergo site induction training prior to being allowed access to the proposed scheme site. This will include actions required in the event of a flood risk emergency incident, such as those included in the FREP including obtaining flood warnings /alerts, responding to warning sirens and following escape routes in the event of a site evacuation.
- No workers will be allowed on site unless they have undergone a site induction.
- River conditions will also be monitored daily by the site management team.

If a flood event that is going to impact the site is predicted:

- The site management team will brief all staff/operatives immediately on the impeding threat.
- Construction works are to cease and all plant and materials are to be moved to the high ground along the southern boundary of the site.
- Site workers will be evacuated to higher ground
- Arrangements will be identified and made for safe access to and from the site in line with the Emergency Plan, contained within the Construction Phase Plan.
- A continuous coastal defence line will be retained, using the existing, revised or a combined defence line (i.e. quay) such that a continued standard of protection will be provided throughout construction that is comparable with the existing.

5.14 Control Measures for Dredging

Note: at the time of writing the final Marine Licence had not yet been received and therefore the following control measures are subject to change on receipt of the final Marine Licence.

The following control measures will be implemented to minimise reductions in water quality due to resuspension of contaminants during dredging

- The dredging activities may not commence until such a time as a scheme of monitoring has been submitted to, and approved in writing by, the Marine Management Organisation. This must be submitted at least 6 weeks prior to the commencement of activities.
  The scheme shall include:
  - Baseline assessment prior to commencement.
  - Programme to monitor dissolved oxygen levels and turbidity (where appropriate)
  - Disposal programme to ensure previous maximum capacity at the disposal site is not exceeded.
  - Programme of post-implementation monitoring. The scheme must be fully implemented and subsequently adhered to, in accordance with the timing/phasing arrangements embodied within the scheme, or any details as may be subsequently agreed, in writing by, the MMO.
- Two water quality monitoring buoys will be deployed at locations to be agreed with the MMO/ Harbour Master but within 300m of upstream and downstream dredge extents. TBC on receipt of final Marine Licence
- Should a reduction of 1mg/l of dissolved oxygen be observed during dredging, the operations causing that effect should temporarily pause for a period of six hours or until the reading returns to the previously observed level.
- Use of an enclosed grab to dredge material in the vicinity of BH34 (exclusion zone as defined by the MMO) given the elevated concentrations of contaminants in sediment at that location.
- The trailing suction hopper dredger (TSHD) and backhoe would be limited to working within one side of the river at a time.

- Dredging operations will be undertaken in long strips along the axis of the estuary rather than dredging across the width of the river.

5.15 Control Measures for Riverbank Excavations

The following measures will be implemented to minimise the release of sediment during riverbank excavation to create the Berth Pocket:

- Control measures to be put in place to reduce spills as per the control measures previously noted in this section of the CEMP
- use of a backhoe to remove the material.
- Removal of as much material as possible at low water and therefore out of the water.

5.16 Control Measures for Demolition

Best practice working methods will be adopted during demolition adjacent to the Tees estuary to ensure that transport of debris into the Tees is minimised as far as possible This includes Flat top barges being placed under the section of the structures being demolished to capture demolition material. Should any debris fall into the river channel during demolition, this would be removed as early as practicable.

Any risks to water quality (and consequently marine ecological receptors) will therefore be reduced as far as possible.

5.17 Control Measures for Landside Excavations

The following measures will be implemented to minimise the spill of material as result of landside excavations

- A 2 meter buffer will be maintained between the edge of the excavation and the River Tees.
- As the excavation progresses a buffer will be created to prevent the potential for spill of any excavated material into the River.

5.18 Water Efficiency

A practical system will be put in place to minimise use of mains water during the construction process. Mains water consumption from the site offices and operations will be measured and monitored monthly with action for reduction of consumption implemented.

Water efficiency techniques employed on site will include the following actions (where relevant and feasible):

- Daily Visual Inspection for leaking pipes / taps / valves.

An unfixed leak can be the most significant water use on site. Leaks can come from damaged washers in taps, worn valves and corroded or damaged pipework.

- Fit Trigger Guns to Hoses

Hoses left running when not in use waste a lot of water in a short time. Fit robust trigger guns to hoses so that flow can be controlled at the point of use.

- Closed Loop Wheel Wash

A closed loop wheel wash reuses the water for the process. Waterless systems are another innovative option that use angled steel grids to clean debris from tyres.

- Dust Suppression

Most suppression techniques are very water inefficient. A fan misting system is a mains fed electrically powered efficient alternative

- Washing Out Concrete Wagon Chutes

Mains pressure hoses with basic spray patterns are water inefficient. Use a high pressure low volume efficient spray pattern to reduce water use. Wash out water can be re-used at concrete batching plants

- Commissioning Water Use

High volumes of water are used during building services commissioning and testing. Plan for these activities considering water recirculating and minimisation.

- Rainwater Harvesting

Where possible, rainwater will be harvested from the roofs of the site accommodation, to feed boot wash; or used to fill the water bottle of power saws and other similar power tools for dust suppression.

- Low flush toilets

Utilising a low flush toilet uses significantly less water than a full-flush toilet. Single or dual flush models are available.

- Taps of the aerated mixer type with flow restrictors

Tap aerators are water saving devices that control the amount of water that flows through the tap without affecting the water pressure as they mix the water with air.

SECTION 6.0 Dust and Air Quality Management Plan

Guidance Notes:

This section contains details of the steps required in order to ensure best practice with regard to the protection of air quality and dust prevention

6.1 Dust and Air Quality Issues

6.2 Site Conditions

6.3 Monitoring Protocols

6.4 Records of details and action taken in response to exceptional incidents or dust-causing episodes

6.5 Dust and Air Pollution Mitigation Measures

6.1 Dust and Air Quality Issues

Dust and air pollution, including odours, can cause nuisance affecting properties. In addition, there are statutory objectives in relation to nitrogen dioxide (NO2) and fine particulate matter (PM10) which have known health impacts.

Section 79 of the Environmental Protection Act 1990 defines a number of factors relating to dust and air pollution which constitute a statutory nuisance. This includes:

- Smoke emitted from premises so as to be prejudicial to health or a nuisance
- Fumes or gases emitted from premises so as to be prejudicial to health or a nuisance
- Any dust, steam, smell or other effluvia arising on industrial, trade or business premise and being prejudicial to health or a nuisance
- Any accumulation or deposit which is prejudicial to health or a nuisance

Our objective is to carry out the works in such a way that emissions of dust and other air pollutants including odour are limited and to use best practicable means to avoid the creation of nuisance.

6.2 Site conditions

Work activities that may give rise to dust and air pollution

- Demolition, excavation
- Transportation and storage of materials
- Excavations and earthworks
- Operation of the construction site or undertaking construction activities which results in odours being generated from, for example, smoke, fumes or gases

Summary of receptors relevant to the works

- The public adjacent to the construction site
- Site workers
- Watercourses
- Ecological receptors

6.3 Monitoring protocols

The inspection and monitoring procedures to be implemented to monitor the effectiveness of measures to prevent dust and air pollutant emissions and to avoid detrimental effects on the health of workers or nuisance to sensitive receptors due to exposure to dust and air pollution are as follows:

- Daily inspection of areas adjacent to the construction site to monitor any dust and air pollution which may be generated despite the use of best practicable means to prevent dust and air quality emissions.
- Daily inspection of construction vehicles, plant and machinery.
- Daily inspection of the level of trafficking, use and condition of access routes to site.

Should inspections show a nuisance arising, work will be stopped until prevention and remediation measures are implemented.

6.4 Records of details and action taken in response to exceptional incidents or dust-causing episodes

Records will be made within the site diary where action was taken in response to exceptional incidents or dust-causing episodes.

Full details of any complaints in relation to dust will be recorded by the Site Management Team on Cora.The complaints log will be made available to the local authority on request

6.5 Dust and Air pollution mitigation measures

GENERAL

- The GRAHAM Site Management Team will use best practicable means to prevent nuisance as a result of dust through design and different work methods
- Site operatives will receive training as part of site induction, toolbox talks and through communication of relevant environmental risk assessments and method statements
- The site will be laid out such that machinery and dust-causing activities will be located away from sensitive receptors, where reasonably practicable
- Hoardings and other barriers will be erected along the site boundary, to mitigate the spread of dust to any sensitive buildings or other environmental receptors
- GRAHAM Green Travel Policy will form the basis for a Green Travel Plan to be implemented on site – see section 8.7.4 of this CEMP

CONSTRUCTION PLANT AND VEHICLES

- Construction plant will be operated in accordance with the manufacturer's written recommendations
- All vehicles and plant will be switched off when not in use – NO IDLING
- Vehicle and construction plant exhausts will be directed away from the ground where possible and be positioned at a height to facilitate appropriate dispersal of exhaust emissions
- Enclosing, shielding or provision of filters on plant likely to generate excessive quantities of dust beyond the site boundaries will be employed
- The movement of construction traffic around the site will be kept to the minimum reasonable for the effective and efficient operation of the site and construction of the Project
- Construction plant will be located away from site boundaries which are close to sensitive receptors where reasonable and practicable
- We will avoid use of diesel or petrol powered generators by using mains electricity or battery powered equipment where reasonable and practicable
- We will keep vehicle, plant and equipment maintenance records on site and these will be made available to the Employer's Representative upon request
- All NRMM will use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004).
- All NRMM will comply with regulation (EU) 2016/1628 of the European Parliament and of the European Council.
- All NRMM will be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting).
- The ongoing conformity of plant retrofitted with DPF, to a defined performance standard, will be ensured through a programme of onsite checks.

TRAFFIC/ ACCESS ROUTES

- On-site parking will be designated for staff and visitors
- Inspection of vehicle movement area site conditions will be undertaken by the Site Manager
- Delivery drivers will be made aware of site restrictions
- Vehicle speeds will be restricted to 10m/h to prevent high levels of dust being released

- Vehicles either delivering or removing material from Site, which have a dust potential, will be covered with tarpaulin or the like to minimise the release of dust

TRAFFIC IMPACTS ON PUBLIC ROADS

- Vehicle wheel washing facilities will be provided and there will be a road sweeper on hand at the site to clear up any material deposited on the public highway by vehicles accessing/egressing the site and site compounds.
- Public roads outside of the site will be regularly inspected for cleanliness and cleaned as necessary
- Site Management will liaise with relevant authorities regarding any road or lane closures
- Delivery drivers to adhere to public road restrictions.
- Neighbours will be advised of unusual traffic movements (e.g. concrete wagons for continuous large concrete pours/ abnormal loads etc.)

DEMOLITION

- Soft strip inside any buildings or structures before demolition.
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed.
- In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

EARTHWORKS

- Re-vegetate earthworks and exposed areas to stabilise surfaces as soon as practicable, or use hessian, mulches or trackifiers.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- Only remove the cover in small areas during work and not all at once.

CONSTRUCTION

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

TRACKOUT

- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes where practicable, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Install a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where reasonably practicable.
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Locate site access gates at least 10 m from receptors where possible.

SECTION 7.0 Noise and Vibration Management Plan

Guidance Notes:

Details of control measures in respect of noise and vibration are contained within this section.

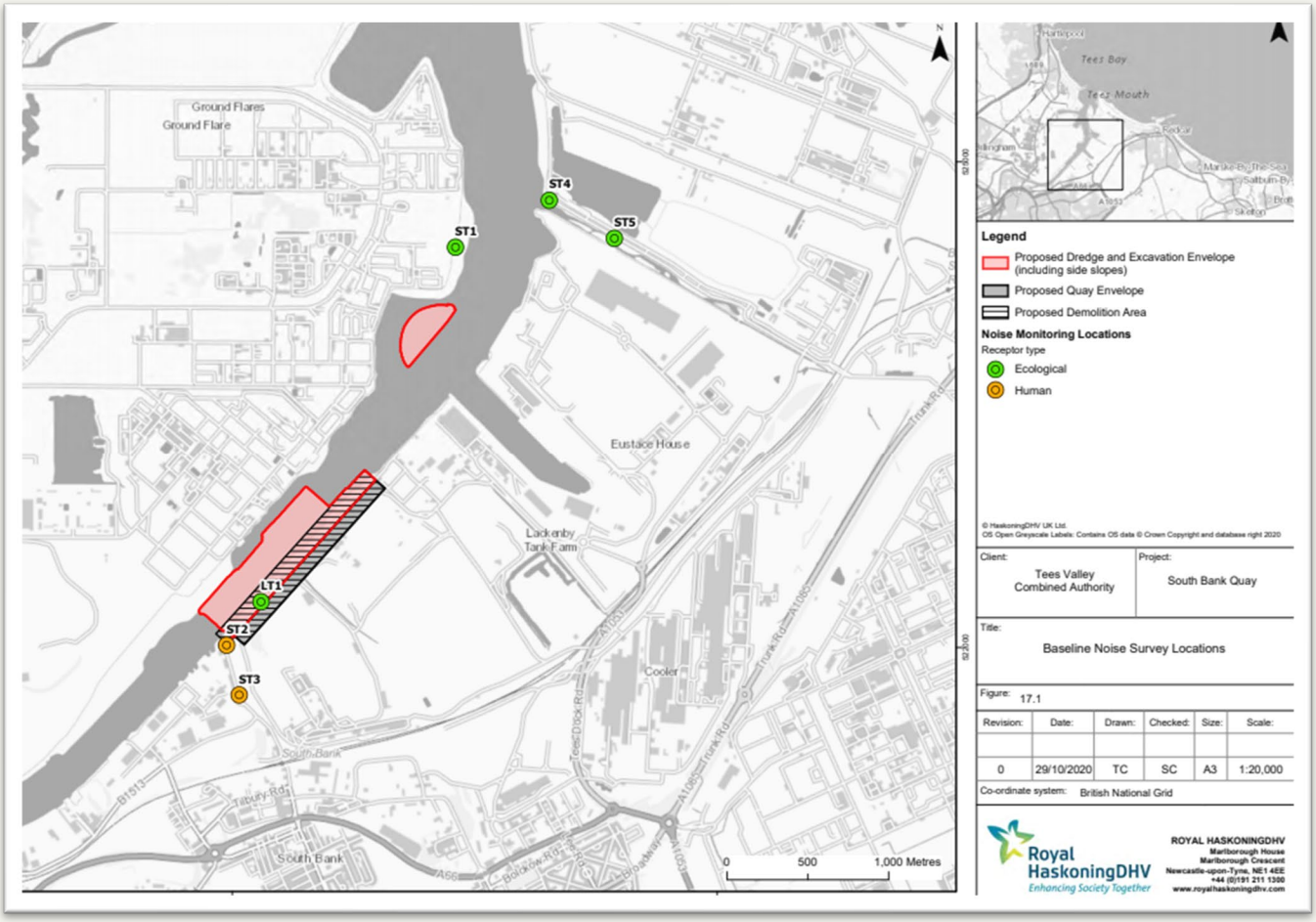
7.1 Noise and Vibration Issues
7.2 Site Conditions
7.3 Noise Control Measures (General)
7.4 Operating Hours
7.5 Establishment of Baseline Conditions
7.6 Noise Monitoring Plan
7.7 Liaison with the Local Community during the Contract
7.8 Establishment of Working Relationship with the Local Authority
7.9 Section 61 of the Control of Pollution Act (COPA), 1974
7.10 Programming of Works
7.11 Distancing from Sensitive Receptors
7.12 Plant and Equipment
7.13 Traffic Noise during Construction
7.14 Noise Screening
7.15 Vibration

7.1. Noise and Vibration Issues

Excessive noise and vibration on site not only represents a major hazard to site workers but it can also annoy neighbours and in some cases disturb adjacent wildlife. Best practice will therefore be implemented in order to minimise noise and vibration and comply with the contents and recommendations of the "Code of Practice for Noise Control on Construction and Open sites" (BS5228-1: 2009+A1:2014).

7.2. Site Conditions

Noise Baseline
A baseline noise survey was undertaken at the locations shown in the drawing below between the 10th and 11th September 2020 to determine the existing noise environment at the site and surrounding area.



- A description of the noise monitoring locations, how they correspond to the NSR's presented below and the dominant noise sources are provided in the following table

Measurement location	X	Y	Description	Dominant noise sources
LT1	453178	522282	Long term monitoring location at the proposed scheme footprint. Representative of receptor ECO1	Noise from nearby industrial sites on both sides of the River Tees.
ST1	454381	524472	Short term monitoring at Vopak foreshore, representative of noise receptor ECO2.	Noise from wildlife and tidal movements. Noise from mechanical plant associated with nearby industrial premises audible and constant.
ST2	452965	522014	Short term monitoring at South Tees Business Parks / Teesport Commerce Park (Smith's Dock Road) representative of noise receptor NSR1.	Noise from adjacent industrial premises dominant. Impulsive noise from crane and material movements highly perceptible.
ST3	453043	521707	Short term monitoring at South Tees Business Parks / Teesport Commerce Park (Smith's Dock Road) representative of noise receptor NSR1.	Noise from adjacent industrial premises dominant. Impulsive noise from crane and material movements highly perceptible. Noise from safety alarms and mechanical plant also clearly audible.
ST4	454961	524762	Short term monitoring at the confluence of Dabholme Gut, representative of noise receptor ECO3.	Noise from mechanical plant associated with the nearby tunnel head house dominant. Impulsive noise from other nearby industrial just perceptible.
ST5	455364	524527	Short term monitoring at the centre of Dabholme Gut, representative of noise receptor ECO3.	Noise from nearby industrial premises dominant; specifically, noise from safety alarms, movement of materials/goods. Noise from wildlife also perceptible.

- The results of the baseline noise measurements are presented below

Measurement Location	Start Date and Time	Duration (hh:mm:ss)	$L_{Aeq,T}$	L_{AFmax}	L_{A10}*	L_{A90}*
LT1	10/09/20 11:09:00	11:51:00	49.3	74.6	49.2	45.8
LT1	10/09/20 23:00:00	03:36:00**	44.1	60.9	44.9	42.4
ST1	10/09/20 12:43:01	00:33:04	44.3	57.7	44.3	42.9
ST2	10/09/20 14:02:52	00:08:12	51.3	63.0	51.8	50.3
ST2	10/09/20 14:42:02	00:15:06	52.5	70.2	52.4	51.2
ST3	10/09/20 14:15:14	00:15:31	50.2	64.8	50.5	48.2
ST3	10/09/20 14:59:15	00:16:02	49.1	63.7	49.4	48.2
ST4	11/09/20 09:57:18	00:16:05	63.3	65.9	63.9	62.8
ST5	11/09/20 10:21:51	00:18:13	49.9	65.8	50.5	49.0

** Displayed as the as the arithmetic mean of the results during the reference period*
*** Measurements affected by prolonged period of adverse weather conditions*

Noise Sensitive Receptors (NSR's)

- The EIA identified the following key NSR's

Receptor ID	Description
NSR1	Offices and other noise sensitive areas within South Tees Business Parks
ECO1	Waterbird and seabird site at North Tees Mudflat
ECO2	Waterbird and seabird site at Vopak foreshore
ECO3	Waterbird and seabird site at Dabholme Gut

Details of construction noise impact criteria

BS 5228-1 describes several methods for assessing noise impacts during construction projects. The assessment approach utilised in this assessment defines fixed noise thresholds for human receptors within the nearby business parks based on the example criteria provided in BS 5228-1. The "5 dBA change" method, described in BS 5228-1 E3.3, specifies a construction noise limit based on the existing ambient noise level and for different periods of the day with respect to the pre-construction ambient noise level. The guidance states:

"Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB LAeq,T from site noise alone, for the daytime, evening and night-time periods, respectively"

Therefore, daytime construction noise levels below the lower cut-off value, 65 dB LAeq.T, are considered very low magnitude at human NSRs within the nearby business park

Summary of EIA Noise Impact Assessment

The Main Noise and Vibration sources relevant to the works are:

- Demolition of the existing South Bank Wharf;
- Installation of tubular king piles and spigots;
- Installation of infill sheet piles;
- Installation of anchor wall;
- Installation of heavy load area piles;
- Heavy load slab; • Filling and compaction;
- Installation of pile plugs and cope beam;
- Installation of quay furniture;
- Lighting and ducts;
- Excavation of front wall;
- Dredging; and
- Vessel deliveries

Predicted noise levels at the identified NSR's are provided in the following table

Receptor ID	Predicted $L_{Aeq,T}$ (dB)	Predicted L_{AFmax} (dB)
NSR1	52.2 - 59.2	71.8 - 81.0
ECO1	46.8 - 59.5	68.8 - 80.0
ECO2	38.5	56.6
ECO3	35.5 - 36.8	53.1 - 56.4

According to the EIA the Noise effects on human receptors (NSR1) during construction are not considered to be significant

In relation to ecological receptors , it is assumed that the greatest noise disturbance to birds using the study area is likely to arise from impulsive sources, such as impact piling works. The EIA has

identified the noise effects on ecological receptors (specifically water birds) to be of moderate adverse significance (pre-mitigation) and minor adverse (post-mitigation).

7.3. Noise Control Measures (General)

No part of the works will be carried out in such a manner as to cause unnecessary noise except in cases of an emergency when the work is absolutely necessary for the saving of life or property or the safety of the works.

All operatives will receive training and advice on noise minimisation and general good site practice through site-specific training and briefings.

7.4. Operating Hours

As defined in the planning permission for the projects works may be undertaken 24 hours a day, 7 days per week.

Working hours and contact details will be displayed on external site hoarding using the environmental noise information poster.

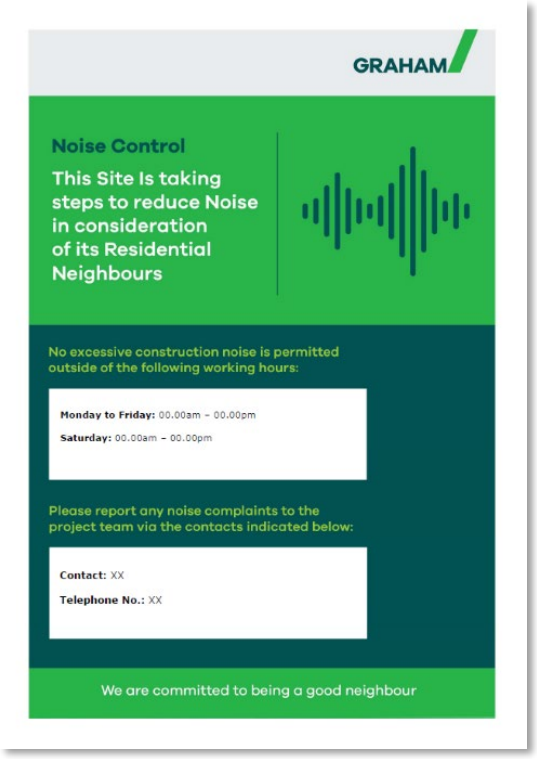


Figure 11 - Noise Control Poster

7.5 Establishment of baseline conditions

Baseline noise measurements as undertaken in the EIA Ref (PC1084-RHD-SB-EN-RP-EV-1100) will be reviewed in order to understand the dominant noise sources and extent in the vicinity of the site area.

7.6 Noise Monitoring Plan

A Noise Monitoring Plan will be drawn up prior to construction commencing. This will detail the predicted noise levels as a result of construction activities and will specify the typical noise levels of construction plant intended for use. This will be set against appropriate construction noise impact criteria. Anticipated noise monitoring positions will also be set out.

Mitigation measures will be undertaken if the results of noise monitoring indicate that excessive noise impacts are arising from the activities associated with the works.

7.7 Liaison with the Local Community during the Contract

The effect of noise and vibration on nearby sensitive receptors will be minimised through a good communication strategy. Prior to works being undertaken, consultation with occupiers of sensitive receptors that may be adversely affected by construction noise and vibration will be undertaken. We will provide information of construction works and notice of when high noise and/or vibration generating activities are taking place. It is intended that this will increase the tolerance of receptors and thus minimising adverse effects. All communications will contain contact details to direct any questions or complaints to.

7.8 Establishment of working relationship with the Local Authority

The site team will make contact with the local authority at the earliest opportunity. Agreement with the local authority will be sought on appropriate controls for undertaking significantly noisy works close to receptors.

7.9 Section 61 of the Control of Pollution Act (COPA), 1974

Consideration will be given to the merit in applying to the local authority for a section 61 prior consent. Section 61 is in effect an agreement between the developer and the local authority which allows a reasonable level of noise to occur. This offers protection from any subsequent action by the local authority under section 60 or 66 of COPA or under the Environmental Protection Act to impose further controls on noise from the site. It also allows the local authority to (a) Attach any conditions (b) Limit or qualify a consent to allow for any change in circumstances (c) Limit the duration of a consent. Any person who knowingly carries out the works, or permits the works to be carried out, in contravention of any conditions attached to the Prior Consent will be guilty of an offence.

7.10 Programming of works

Information will be sought from the community concerning sensitive periods so works can be planned to occur outside these times

7.11 Distancing from Sensitive Receptors

- Noisy work activities will be planned in order to maximise the distance from the noise source to sensitive receptors
- Work compounds will be laid out so that access and loading areas are located as far away from sensitive neighbours as practicably possible
- Shouting and raised voices will be kept to a minimum. The use of tannoys and radios will be prohibited within close proximity of sensitive residential receptors.

7.12 Plant and Equipment

- Modern installation techniques will be adopted that utilise high frequency pile drivers which significantly limit noise and vibration. Pile dampers will also be utilised.
- In order to reduce the impact of piling on waterbirds noise reduction shrouding will be used where appropriate on the piling rigs.
- Selection of equipment will be carried out with the objective of reducing noise and vibration wherever possible. Only equipment conforming to relevant national or international standards, directives and recommendations on noise and vibration emissions will be used
- Plant and equipment will be maintained and operated following manufacturer's instructions to run efficiently generating minimal noise
- Where possible plant producing less noise will be used
- Pneumatic tools will be fitted with silencers or mufflers
- Plant will be switched off when not in use
- Mobile compressors and generators will be fitted with appropriate silencers and/ or proprietary acoustic enclosures
- Plant and equipment supplied with acoustic enclosures will be operated with all panels closed
- Site staff will enforce a policy whereby all plant is shut down when not in use
- All stationary equipment with significant noise outfall will be sited to minimise noise nuisance to local residents
- As far as possible generation of power will be via a permanent power supply as opposed to generators
- Using electrically powered equipment run from the mains supply where available is preferred to using generators to power plant and equipment

- Care will be taken when erecting or striking scaffolds to avoid impact noise from banging steel. Scaffold deliveries will be programmed to arrive during normal working hours only.
- Crane spindles, pulley wheels, telescopic sections and moving parts of mobile working platforms will be adequately lubricated in order to prevent undue screeching.

7.13 Traffic Noise during Construction

- Delivery vehicles will, where reasonably practicable, be fitted with effective exhaust silencers and will be maintained in good working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable
- Time slots will be adopted for deliveries to ensure that convoys of vehicles do not arrive simultaneously and to avoid unnecessary idling on-site
- Strict controls will be implemented to prevent temporary parking on kerbside in the vicinity of noise sensitive receptors near the site
- Sufficient clear signage will be utilised to ensure that demolition and construction vehicles use only designated routes.
- Care will be taken when unloading vehicles to minimise noise

7.14 Noise screening

Where appropriate, screenings will be utilised in order to reduce noise levels between the source and the receiver. Materials used for screening may include earth bunds, existing buildings, site security hoarding or purpose-built noise screens. Holes/ openings in the screen material will be kept to a strict minimum and the density of the material will also be given due consideration in order to be as effective as possible

7.15 Vibration

A Piling risk assessment has been undertaken (Ref SBQ1-GCL-ENV-SBKXX-MS-WM-000001) to ensure that underground utilities, buildings and other protected structures surrounding the works are protected from damage.

Controls will be put in place to avoid risk of physical damage from vibration.

SECTION 8.0 Energy and Carbon: Management and Reduction Plan

Guidance Notes:

This section contains details of company policy on energy management and how energy efficiency is incorporated within site operations.

8.1 Energy & Carbon Issues
8.2 Site Conditions
8.3 Purpose of the Energy and Carbon Management and Reduction Plan
8.4 Climate Action Targets
8.5 Site Energy and Carbon Strategy
8.6 Scope
8.7 Energy Efficiency and Carbon Emission Reduction Activities
8.8 Communication, Campaigning and Training
8.9 Carbon Footprint - Measurement and Reporting
8.10 Carbon Offsetting

8.1 Energy and Carbon Issues

GRAHAM are at the forefront of action on the climate emergency and to demonstrate our commitment we are signatories to the "pledge to net zero" and the BITC "Climate Action Pledge". We recognise that climate change is emerging as one of the most serious environmental challenges currently threatening the global community. We understand that there is a need to minimise Greenhouse gas emissions produced as a result of fossil fuel consumption and we acknowledge that we have a role to play in tackling these issues.

8.2 Site Conditions

We are committed to reducing our energy and carbon impacts and we will ensure that the Project adopts a number of low carbon initiatives from procurement of our plant and equipment through to implementing efficient waste management on site and educating our workforce. The SHE Department's remit will be to evaluate the energy and carbon impact of our activities and to identify solutions aimed at reducing these impacts.

8.3 Purpose of the Energy and Carbon Management and Reduction Plan

This Energy and Carbon Management and Reduction Plan (ECMRP) outlines the GRAHAM targets and strategy for energy and carbon reduction and defines the steps that the Project will take to contribute to these outcomes by specifying key actions. These actions include specific technical interventions leading directly to emissions reduction as well as management, policy and enabling actions. The ECMRP is intended to provide a practical and formal basis for implementing carbon emission reduction throughout the project activities.

The objectives of the ECMRP on a site-specific basis are to:

- Implement practices so that, over the short to medium-term, carbon emissions become one of the issues that are automatically considered in regular decision making across the full scope of site works.
- To undertake a series of interventions that will lead directly to measurable emissions reductions.

Implementing low-carbon initiatives on site is expected to achieve social, economic and environmental benefits.

8.4 Climate Action Targets

The key Climate Action target that GRAHAM have set is as follows:

Carbon emissions to Net zero by 2045 (at the latest) with interim 50% reduction by 2030)

The key GRAHAM Project Specific carbon reduction target 2020/21 is as follows:

Carbon emissions resulting from all project activities must remain below 11TCo2e/£1M

The project carbon footprint target aligns with the GRAHAM Company Target to reduce Carbon emissions to Net zero by 2045 (with interim 50% reduction by 2030)

Through implementing the ECMRP on the Project we intend to:

- Reduce carbon emissions
- Improve energy efficiency in work practices
- Reduce water consumption
- Reduce waste, increase recycling and reduce the volume of waste sent to landfill
- Promote and enable environmentally sound transport and travel practices
- Maximise fuel efficiency and minimise as far as practicable carbon emissions from all plant and ancillary equipment
- Run an energy efficiency programme
- Identify opportunities for using energy derived from renewable resources where practicable
- Promote energy awareness amongst staff, encouraging and enabling good environmental practice

8.5 Site Energy and Carbon Strategy

In order to achieve the targets and objectives the following approach will be adopted:

- Craig Simpson has been named as the individual who will be "Site Environmental Champion" responsible for the monitoring and collection of data
- The Site Environmental Champion will ensure that information regarding the ECMRP, its aims and successes are regularly communicated to all personnel involved in the project
- The Site Environmental Champion will record and display monthly measurements of site energy usage and display graphical analysis of carbon emissions on site noticeboards of how consumption over the project duration compares to the targets
- We will instil the idea that carbon and energy management is the responsibility of every individual and not just that of an interested few
- We will ensure site staff and operatives are fully aware of how to facilitate the success of the plan, as well as to dispel any energy related myths, including through awareness campaigns and competitions

8.6 Scope

The scope of the ECMRP to determine emissions will cover the areas detailed below.

- Utility data covering fuel, electricity and water will be collected for the site compound and all on-site mobile units and recorded on Cora.
- Waste quantities and data will be uploaded to Cora detailing waste streams generated and resultant carbon impacts will be quantified

8.7 Energy Efficiency and Carbon Emission Reduction Activities

8.7.1 Design

- We will work closely with our designers and where appropriate, a whole life Carbon Assessment will be undertaken in order to assist in driving down carbon reductions
- We will prioritise the specification of low carbon or net zero products for use where viable
- We will endeavour to reduce quantities of materials required during construction through efficient design, and use materials with a lower embodied GHG intensity where possible.
- WE will prioritise the use of materials from local sources where feasible

8.7.2 Low Carbon Plant and Equipment

- Telematics will be utilised in order to monitor the performance of machinery and plant in order to ensure that it is effective and efficient in order to maximise productivity and reduce carbon.

- Due consideration will be given to energy efficiency and emissions when plant and vehicles are researched for potential use on site. We will continue to work with plant manufacturers to ensure that we will be at the forefront of trials on the use of available electric, hybrid and hydrogen plant as the technology begins to mature.

- We will explore the viability of alternative sources of energy including fuel cell modules and HVO biofuels which are compatible with existing diesel engines and equipment

- All Plant and vehicles will be serviced at designated intervals, so they run efficiently, thereby reducing carbon emissions. Where subcontracted or hired plant or vehicles are utilised on our sites, evidence of testing, inspection and regular maintenance will be sought prior to any permitted usage on the site.

- Idling of plant will be minimised

8.7.3 Low Carbon Site Compound

- Welfare accommodation will be required to meet the GRAHAM eco specification standard to include energy saving devices and technologies.

- On site renewable energy solutions for site accommodation will be implemented where feasible.

- GRAHAM have partnered with energy management broker Sustainable Advantage to assist sites in procuring electricity/ gas. By operating through a broker we can ensure that sites/ offices utilise green tariffs where all energy is renewable.

- Where feasible we will look to install Electric Vehicle charging infrastructure within site compound areas

8.7.4 Green Transport

We recognise that the travel associated with our business has a direct impact on the environment, particularly through vehicle emissions, fuel consumption and our impact on local congestion. For this reason, we are committed to reducing the need for unnecessary business travel and encouraging the use of more sustainable forms of transport across our operations.

The specific Green travel practices which will be implemented on site are as follows:

- The Carbon Trusts eco driving training will be mandatory training for high mileage drivers.

- Promote the Green travel policy initiatives - Raise awareness on site of the need to reduce transport emissions

- Consider the location of meetings to minimise travel distances and promote the use of video conferencing and tele-conferencing to replace some work trips

- Encourage car sharing and the use of work vans & minibuses to minimise collective distances travelled
- Encourage sub-contractors to use work vans & minibuses to travel to site to minimise collective distances travelled
- Implementation of a CTMP to minimise the number of journeys required during construction

8.7.5 Managing Behaviours

- Energy awareness will be encouraged amongst employees through energy saving posters and training
- Energy usage will be monitored against agreed targets
- Energy Audits will be regularly conducted by the SHE team, with opportunities for improvement implemented
- Subcontractors and suppliers will be encouraged to adopt energy efficient systems of work in their operations
- All staff and subcontractors will be reminded that appliances must be switched off when not in use

8.8 Communication, Campaigning and Training

In order to ensure the success of the ECMRP it is essential that all relevant parties are kept informed as to how they can assist in reaching the emissions reduction targets as well as communicating success stories on what has already been achieved. The table below outlines the proposed communication strategy.

The objective of the Communication Strategy is to promote energy awareness, to encourage a low carbon culture and to disseminate information on the ECMRP and performance against emission targets.

Method	Description	Target	Involvement
Site Induction	Verbal instruction given at Site Induction	Site Operatives, Site Visitors	Site Manager
Posters, Resource Management Summary, Advice Notes	Printed material for distribution on site and displayed on notice boards in site compound and offices.	Site Operatives, Site Visitors	Site/ Project Manager, Environmental Manager/ Advisor and SHE Team members

8.9 Carbon Footprint - Measurement and Reporting

We have invested in and improved the mechanism for monitoring site energy and carbon in order to streamline and improve the visibility of the information for sites and all other interested parties.

Carbon footprint data will uploaded to Cora on a monthly basis. The software will be used to convert the data into TCO2e by applying an appropriate emission factor as determined by UK Government conversion factors.

8.10 Carbon Offsetting

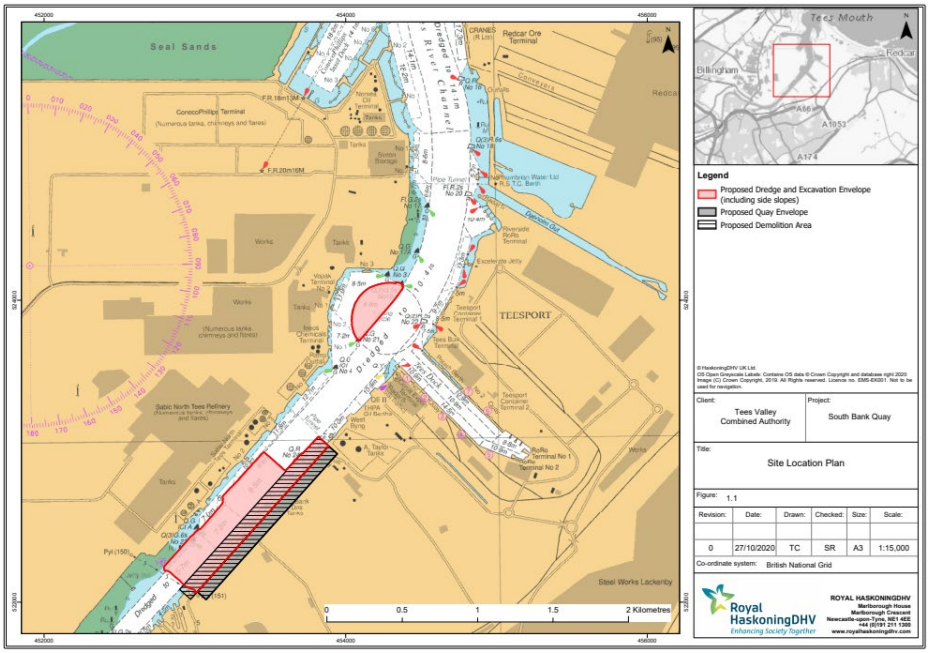
We have engaged with “Natural Capital Partners” to enable sites the opportunity to offset their emissions and become “carbon neutral”

SECTION 9.0 Site Waste and Resource Management Plan

Guidance Notes:

This section contains details of the processes and opportunities to reduce waste, reuse or recycle products, components and buildings, and for materials to move up the waste hierarchy so that material resources can flow around a circular economy.

9.1 Purpose and Description of the Project

Project Name	South Bank Quay		
Project Location	The site is located on the Tees estuary as detailed in figure 1 below: 		
Project Cost (estimated)*	£90,000,000		
Project Start Date	**Date**	**Month**	**Year**
	6th	September	2021
Project End Date	**Date**	**Month**	**Year**
	31st	March	2023
Description of the Project	The project involves the construction of a new quay in the Tees estuary. In summary the project is expected to comprise the following activities: • Demolition of the dilapidated wharf, three jetties downstream of the wharf (including the conveyor at the extreme downstream end jetty), a live electrical substation and pipework. • Construction of a new solid piled quay structure up to 30m wide and 1,230m in length • Excavation and re-use of approximately 275,000m3 of soils behind the proposed quay wall to install tie rods to the anchor wall. Excavation and re-use of a further approximately 1,140,000m3 of soils in front of the proposed quay wall to create the berth pocket.		

	• Capital dredging of approximately 1,800,000m3 of marine sediments with offshore disposal into the Tees Bay C disposal site. • Installation of approximately 200,000m3 of rock within the berth pocket to form a rock blanket.
Project Footprint (Sq/M)	31,500
Client	Tees Valley Combined Authority
Principal Contractor	GRAHAM
Version Number and Date	002 Draft for review

9.2 Responsibilities and Declarations

	Name	Contact details
Who is responsible for drafting the SWMP?	Jayne Walker	Jayne.walker@graham.co.uk
Who is responsible for implementing the SWMP on site?	Darren Baker	Darren.baker@graham.co.uk
Who is the waste champion?	Craig Simpson	Craig.sompson@graham.co.uk
Who is the person in charge of the project?	Jonny Martin	Jonny.martin@graham.co.uk
Where will this SWMP be kept?	On sharepoint and in the site office	

Declaration statement: We the 'Client' and the 'Principal contractor' will take reasonable steps to ensure that all waste from the site is dealt with in accordance with the waste duty of care in section 34 of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) Regulations. All reasonable steps will also be taken to ensure that the waste materials are handled efficiently, and waste managed appropriately.
Client signature:
Signature of Principal Contractor Representative:
Signature of S/C Representative(s):

9.3 Description of Waste Management Roles

Project Manager/ Site Manager:	• Ensure plan meets client's approval and is signed off accordingly • Implementing and managing the plan on site • Arranging for full details of all arising's, movements and treatment of waste to be accurately recorded and reported in a timley manner • Distinguish reusable materials from materials suitable for recycling • Ensure maximum segregation at the source and separate materials for recovery • Appointment of a suitable "Waste Champion" for the site
Environmental Manager:	• Implementing the plan within GRAHAM • Providing training • Providing advice and guidance to the Site Manager and ensure that best practice is transferred across the organisation • Conducting waste audits
Procurement Manager:	• Ensure that materials are ordered so that the quantity delivered, the timing of the delivery and storage of materials does not generate unnecessary waste • Ensure that the waste management requirements within the GRAHAM procurement documents are communicated to our supply chain • To undertake early engagement with our Waste Management Contractor in order to discuss our waste forecasts and to ensure an optimal skip strategy which maximises recycling
Environmental Champion:	• Overseeing management of waste records • Periodic reviews of SWMP • Regular inspection of waste recycling areas on site • Ensuring that regular toolbox talks on waste management and minimisation are carried out • Encourage and motivate site personnel to implement best practices
Appointed Operatives:	• Ensure that discrete operations stated in the SWMP are performed on an on-going basis

9.4 Waste Management Policy

GRAHAM operate an Environmental Management System which is certified by National Quality Assurance (NQA) against the requirements of BS EN ISO 14001:2015. Our EMS will be utilised to assist in the employment of waste reduction techniques on the project

This Site Waste Management Plan has been prepared in accordance with the GRAHAM Environmental Policy, Waste Management Policy and Waste Management Procedure **PF10-PR10-44**

GRAHAM are committed to the Circular Economy, where products and materials are kept in high value use for as long as possible. This includes minimising waste, reducing consumption, and designing for reuse, repair and recycling. This commitment has driven the adoption of an approach which prioritises the reuse of all materials and products.

9.5 Benchmarks for Conserving Resources

GRAHAM WASTE TARGETS

	KPI/Metric	Target
A	Tonnes of Construction waste generated per £1M construction value	**≤31**
B	Diversion of Construction waste from landfill	**≥97%**

SECONDARY WASTE TARGETS

	KPI/Metric	Target
C	Tonnes of Construction and Demolition waste generated per £1M construction value	**≤56**
D	Tonnes of Construction waste per 100m2 GIFA	**≤6.5**

- The site construction waste reduction target has been derived using GRAHAM data relating to construction waste generated on all construction sites during our baseline accounting year (2014/15). This waste reduction target aligns with the GRAHAM Company Target to reduce waste generation by 50% by 2030.
- Projects within the building division also benchmark against BREEAM KPIs for construction and waste demolition and waste diversion (Target D)

9.6 Proposals for Waste Minimisation – TBC prior to Stage 3

REF	INFORMATION REQUIRED	YES/NO/NA	RESPONSE / COMMENTS
1.	Have opportunities been identified to reduce waste through the design process e.g., no-dig techniques, pre-fabrication of materials?	Yes	Anchor wall now located closer to the main quay wall therefore reducing excavation volumes
2.	Can structures be raised out of the ground to reduce excavation volume?	No	
3.	Is excavation material suitable for re-use following suitable testing?	Yes	
4.	Can excavated materials be re-used at another GRAHAM Site (Note - waste exemption required)	No	
5.	Can it be arranged for excavated material to be used at a landfill site for capping or engineering works?	N/A	
6.	Can contaminated material be treated using soil washing, bioremediation or other techniques to render it suitable for re-use?	Yes	Potentially – requires investigation
7.	Is there scope to use a recycled product such as 6F2 or fine fill aggregates, reducing reliance on finite raw materials?	Yes	
8.	Has the site team discussed and identified strategies for reducing waste with subcontractors?	Yes	As part of pre-appointment discussions
9.	Has a "Waste Management Suppliers pre-appointment Assessment" been completed?	Yes	
10.	Will Subcontractors and Site operatives who handle materials and waste receive waste awareness toolbox talks and other training?	Yes	
11.	Is waste data going to be regularly reviewed (e.g. during progress meetings) in order to monitor waste targets for the project?	Yes	
12.	Will the Environmental Champion be briefed on their duties to help facilitate waste prevention during the project?	Yes	
13.	Can redundant equipment be sold for reuse?	N/A	
14.	Can unsuitable material be conditioned to make it useable by following the relevant Waste and Resources Action Programme (WRAP) quality protocol?	N/A	
15.	Are there any other ways in which the project will minimise waste to landfill?	N/A	

9.7 Identification of Waste and Proposals for Waste Reuse and Recycling

With reference to the Drawings and Specification, the following materials have been identified as wastes which could potentially arise on the Project. Quantities of forecast construction wastes have been derived by multiplying the total material quantity by standard wastage rate data provided by the Waste and Resources Action Programme (WRAP).

Waste Type	Waste Stream	Material Type	Suggested LOW Code	Destination	Forecast Quantities (tonnes)
Excavation	Soil and Stones	Soil and stones other than those mentioned in 17 05 03	17 05 04	On-site reuse	300,000
Excavation	Soil and Stones	Soil and stones other than those mentioned in 17 05 04	17 05 03*	Choose an item.	117
Excavation	Bituminous material	Bituminous mixtures other than those mentioned in 17 03 01	17 03 01	Choose an item.	
Excavation	Dredge Material	Dredging spoil other than those mentioned in 17 05 05	17 05 06	Choose an item.	1,000,000
Excavation	Dredge Material	Dredging spoil other than those mentioned in 17 05 06	17 05 05*	Choose an item.	TBC
Demolition	Gypsum (plasterboard)	Gypsum-based construction materials other than those mentioned in 17 08 01	17 08 02	Choose an item.	
Demolition	Inert	Concrete, bricks, tiles and ceramics	17 01 07	On-site reuse	1,000
Demolition	Wood	Timber materials – demolished roof/doors/window frames	17 02 01	Choose an item.	
Demolition	Metals	Mixed metals – building cladding/pipework/cables	17 04 07	Off-site recycling (segregated)	1,500
Demolition	Insulation	Floor/Wall/Roof Insulation	17 06 04	Choose an item.	
Demolition	Plastics	DPC/ Pipework / Coverings	17 02 03	Choose an item.	
Demolition	Glass	Glass/ Windows	17 02 02	Choose an item.	
Construction	Gypsum (Plasterboard)	Gypsum-based construction materials other than those mentioned in 17 08 01	17 08 02	Choose an item.	
Construction	Wood	Timber materials – offcuts/shuttering/wooden packaging	17 02 01	Off-site recycling (segregated)	5
Construction	Metals	Mixed metals – electrical and plumbing waste/pipe offcuts/stud wall cuttings	17 04 07	Off-site recycling (segregated)	20
Construction	Plastics	Hard Plastics/Pipe offcuts/ wrapping protection materials	17 02 03	Off-site recycling (mixed)	1

Construction	Packaging	Mixed Packaging – Cardboard/Paper/Plastic	15 01 06	Off-site recycling (mixed)	10
Construction	Segregated Hazardous Waste	Used Engine Oil/ Batteries/ Waste paints/ Aerosol cans/ Paint thinners	Various	Off-site recycling (segregated)	1
Construction	Office waste	Mixed Municipal Waste from site offices/canteen	20 03 01	Off-site recycling (segregated)	5

9.8 Organisations which may be used to facilitate reuse

- **The National Community Wood Recycling Project**

www.communitywoodrecycling.org.uk

The National Community Wood Recycling Project (NCWRP) is a network of wood recycling social enterprises. The aim of the enterprise is to

- Save resources by rescuing and re-using waste timber that would otherwise by landfilled
- Create sustainable jobs, as well as training and volunteering opportunities, for local people – especially those who might find it difficult to get into or back to employment.

- **Recipro**

www.recipro-uk.com

Suppliers and contractors donate unwanted, surplus building materials to the Recipro social enterprise. The products are then sold on at hugely discounted rates. Customers range from charities to schools, churches to shops as well as the local community

- **Community Repaint**

www.communityrepaint.org.uk

Community Repaint is a network of paint reuse schemes across England, Scotland, Wales and Northern Ireland. The purpose of the scheme is to collect leftover reusable paint and redistribute it to those who need paint but cannot afford it.

- **International Synergies**

www.international-synergies.com

International Synergies can be utilised to identify any wastes which may have a value to other member companies with a view to third party re-use of these materials.

- **Reuse Network**

www.reuse-network.org.uk

Surplus furniture and household items can be donated for reuse through the Reuse Network. This is a national coordinating body for 300 furniture and appliance re-use and recycling organisations which exist across the UK.

Note - this list is non-exhaustive and may be added to as new opportunities are sought and implemented.

9.9 Waste Storage Arrangements

In line with best practice for the recycling of waste, we will segregate waste on site and to facilitate this, an appropriate number of waste handling and segregation areas will be set up. At these areas, waste streams will be segregated into separate skips and then removed to an approved material recycling facility. Each skip will be clearly labelled indicating type of waste contained within.

Figure 12 - Waste Storage Arrangements

The segregation of skip wastes will be of the following types:

- Metal
- Packaging
- Timber
- Gypsum
- Inert
- Mixed (for all other wastes)

Additional skips and bins will also be provided for office derived waste including:

- Paper & Cardboard
- Plastic
- Cardboard
- Food waste

All skips utilised on site will:

- Prevent spillages or leakages
- Be corrosive resistant (to the weather elements)
- Will prevent scavenging from animals
- Prevent materials from being blown away

9.10 Office Waste Arrangements

Site offices and canteens often generate a significant quantity of wastes, many of which are recyclable. Opportunities should be sought to recycle as many of these items as possible and separate waste bins should be available in the site offices to facilitate collection of recyclables such as paper, cardboard, aluminium cans and plastic bottles. Site Operatives should be regularly reminded of the office/ canteen waste recycling procedures and bins should be labelled to assist in their correct usage.

Figure 13 - Office Waste Segregation

9.11 Duty of Care and Waste Transfer Procedures

Throughout construction of the Project, it will be ensured that all site staff, subcontractors and waste management contractors will act in accordance with all environmental legislation in relation to waste management. All movements of waste will be accompanied by waste transfer notes. GRAHAM site staff will ensure that the waste is described as accurately as possible and that the waste transfer note is signed by both the waste producer and the waste carrier. The waste carrier will hand over a copy of the note to a member of GRAHAM site staff prior to leaving the site.

- Waste Transfer Notes will be stored in Appendix 4.1 of this plan
- A log of each waste movement will be completed. This can be done via Cora or by using the GRAHAM waste log (REF:PF10-PR10-44-F009) and storing the log in appendix 4.4 of this plan

Only registered carriers of waste will be employed for transport purposes and copies of all waste management permits, licences and exemptions will also be obtained and held on site prior to any movement of waste taking place. For all waste transfers, GRAHAM will obtain a copy of the receipt, or a copy of the invoice, from the authorised disposal site as proof that the waste reached the proposed destination.

- Details of Waste Management Carriers for Transporting Waste (REF:PF10-PR10-44-F012) will be stored in Appendix 4.3 of this plan
- Details of Permitted, Licenced or Exempt Sites (REF:PF10-PR10-44-F011) will be stored in Appendix 4.2 of this plan

GRAHAM will retain all controlled waste transfer notes for a minimum of two years and hazardous waste transfer notes for a minimum of three years. Waste transfer notes will initially be retained on site and upon project completion will be transferred to a document store in head office. Each consignment of waste taken from the site will be subject to documentation, which will conform to the table below to ensure full traceability of the material to its final destination.

Waste Transfer Note Detail

1. State the name of the waste producer.
2. Signature of the waste producer.
3. Signature of the waste carrier.
4. A combination of:
   (i) a description of the waste (inert, non-hazardous or hazardous) and
   (ii) the relevant the European Waste Catalogue (EWC) code classification.
5. State the quantity of waste in cubic metres (m3).
6. How the waste is stored and any processes the waste has been through
7. State the name of the site where the waste is being created.
8. State the date and time that the waste was taken off site by the waste carrier.
9. State the name and address of the waste carrier.
10. Waste carrier licence number
11. State the name and address of where the waste is being taken to and the site licence/ permit or exemption
    number
12. State whether the waste carrier is the producer or carrier of the waste (in most cases it will be the latter).
13. Highlight on the waste transfer note the certificate number
14. Standard Industry code (SIC) of your business
15. Include a statement that you have applied the waste hierarchy

9.12 Waste Transfer Note Detail

Written Description of the Waste e.g. concrete, timber, mixed construction

European Waste Code (EWC) E.G.

17 09 04 Mixed Construction

The Standard Industry Classification (SIC) Code See list of common GRAHAM SIC Codes (section 9.13 of SWRMP)

Details of the place where the waste is transferred from the transferor (waste producer) to the transferee (carrier) this is the location the waste is being collected from

Date of the waste transfer (date or period the collection was made)

The Waste Carriers Registration Number

Duty of Care – Waste Transfer Note

PF10-PR10-44-F008

Project:

Section A – Description of Waste

1. Description of the waste being transferred: _____
2. European Waste Catalogue/ List of Waste Code [ ] [ ] [ ] e.g. 17 01 01
3. How is the waste contained?
   Loose ☐ Sacks ☐ Skip ☐ Drum ☐ Other ☐ *Please describe*
4. How much waste? For example, number of sacks, weight etc: _____

Section B – Current holder of the waste (Transferor)

By signing in section D below I confirm that I have fulfilled my duty to apply the waste hierarchy

1. Full Name: Graham Construction
2. Company name and address: Ballygowan Road, Hillsborough, BT26 6HX
3. SIC code (2007):
4. Which of the following are you: (*Please tick one or more boxes*)
   Producer of the Waste ☐ Importer of the Waste ☐ Registered Waste Carrier ☐
5. Please state how has the waste been treated:
   Segregation/ separate collection/ screening/ hand picking (*Delete as appropriate*)
6. If treatment has not been carried out please state why this is not considered necessary. (E.g. The waste is inert waste which cannot be treated because it is not technically feasible to do so): _____

Section C – Person collecting the waste (Transferee)

1. Full Name: _____
2. Company name and address: _____
3. Which of the following are you?

	Tick	*Licence/ permit number*	*Expiry date*
Holder of a valid exemption		N/A	N/A
A registered waste carrier/ broker/ dealer			

Section D – The Transfer

1. Address of transfer/collection point (*SITE*): _____
2. Date of transfer: _____
   (For multiple consignments/ "Season Tickets" give "between" dates)
3. Time(s) of transfer: _____
4. Destination of Waste, give address: _____
5. Destination of Waste, give licence/ permit number: _____
6. Name and address of broker who arranged this waste transfer (*if applicable*): _____

Transferor's signature	Transferee's signature
Print Name: _____	Print Name: _____
Representing: _____	Representing: _____

Details of the container and the quantity of waste Skip, size, Volume or weight and whether waste is in bags, drums etc

The Waste Hierarchy Declaration confirming that the waste producer has considered prevention, reuse, recycle, recover and disposal in that order.

Details of the person transferring the waste (transferor) this is usually the waste producer – GRAHAM. If subcontractors are arranging waste disposal it may be named.

Details of the person the waste is being transferred to (the transferee) this is the waste carrier e.g. skip company, haulage contractor, road sweeper.

Destination details including permit or exemption reference for that facility GRAHAM requirement for waste destination to be on the waste transfer note

Signatures of the transferee (waste producer) and the transferor (waste Carrier) both signatures are needed on all WTN

Note: Legible copies of waste transfer notes must be available at all times and must be kept for two years from the date of the waste collection

9.13 UK SIC CODES - Excerpts from UK Standard Industrial Classification of Economic Activities

Section F Construction

41100	Development of building projects

Common SIC CODES for GRAHAM operations

41201	**Construction of commercial buildings**
41202	**Construction of domestic buildings**
42110	**Construction of roads and motorways**
42120	**Construction of railways and underground railways**
42130	**Construction of bridges and tunnels**
42210	**Construction of utility projects for fluids**
42220	Construction of utility projects for electricity and telecommunications
42910	Construction of water projects
42990	Construction of other civil engineering projects
43110	Demolition
43120	Site preparation
43130	Test drilling and boring
43210	Electrical installation
43220	Plumbing, heat and air-conditioning installation
43290	Other construction installation
43310	Plastering
43320	Joinery installation
43330	Floor and wall covering
43341	Painting
43342	Glazing
43390	Other building completion and finishing
43910	Roofing activities
43991	Scaffold erection
43999	Other specialised construction activities

Short Enforcement Guide

- You will be committing an offence, if you give waste to an unregistered waste carrier
- You will be committing an offence, if you do not have valid waste transfer notes and or consignment notes for the movement of waste
- You will be committing an offence, if you transport waste and you are not registered to do so
- You will be committing an offence, if you transport waste and do not have a complete waste transfer note with you
- You will be committing an offence, if you accept waste without holding the relevant waste authorisation
- You will be committing an offence, if you keep, treat or dispose of waste without the relevant waste authorisation

9.14 Minimisation of Hazardous Waste

Hazardous Waste Minimisation

Eliminating the use of hazardous materials will eliminate the generation of hazardous waste from these products. Therefore, it is important that designers and architects are involved in any plan to reduce hazardous waste as they may specify materials which we (as a contractor) are bound by. However, GRAHAM also have an element of choice in the products we purchase, and we also have further opportunities to reduce the amount of hazardous waste produced through better handling, segregation and identification of re-use and recycling options.

The following table is a list of potential opportunities that may be applied to the construction project in order to reduce the generation

Hazardous waste management/ minimisation measures				
	Material	***Measure***	***Indicative Cost***	***Anticipated Benefits***
1.	Solvents	Purchase only low-VOC paints, solvents and adhesives	Low	Reduced VOC emissions to atmospheres, less residual solvent in containers, easier disposal
2.	Various	Brief all site workers on likely hazardous wastes. Identify and clearly mark recovery & disposal storage arrangements	Low	Less cross-contamination, increased hazardous waste segregation, raised levels of awareness, reduced disposal costs
3.	Paints & Solvent	Increase level of accountability for hazardous materials – single point of issue, with nominated person responsible	Low	Less hazardous raw materials used, greater accountability and control/understanding of material usage (benchmarking).
4.	Packaging	Clean and sort packaging to reduce hazardous component prior to disposal	Low - Medium	Reduced volume of packaging being consigned as hazardous (disposal costs reduced)
5.	Treated wood	Reduce disposal of treated waste wood to landfill – minimise off-cuts and increase re-use where applicable.	Low - Medium	Increased level of beneficial wood re-use (or energy recovery), reduced landfill, potential future revenue source
6.	Oils, fuels & lubricants	Ensure all materials are stored in bunded areas and allocate central accountancy for oil wastes	Low - Medium	Reduce the frequency of spills to ground, increase collection of waste oils/rags.
7	Sediment from BH34	Visual assessment will be undertaken on all material excavated from BH34 with all potentially contaminated material stored separately from 'clean' excavated material.	Low	Avoidance of unnecessary contamination of 'clean' excavated material.

9.15 Typical Hazardous Outputs

Storage of Hazardous Wastes

All Hazardous waste streams will be stored separately from other Hazardous wastes and will be stored separately from controlled waste in secure and labelled containers.

Typical Hazardous Waste Streams

Typical hazardous waste streams occurring on site will include

Activities	Hazardous Inputs	Hazardous Outputs
Site clearance and demolition	N/A	Asbestos, treated wood, electrical and electronic items containing hazardous components (including cables and switches); refrigerants and foams; drums of hazardous materials, potentially fly-tipped hazardous materials
Excavation	N/A	Potentially contaminated soils, asphalt containing tar products from paving and driveways
Dredging	N/A	Contaminated sediment
General construction works (including cementing, grouting etc.)	Grout, cement, resins, hardeners, various COSHH materials	Spent resins and hardeners, concrete and grout wash-out, un-set cement/grout, contaminated shuttering, spent COSHH materials and contaminated packaging
Building installation (e.g. electrical wiring and fittings, insulation, plumbing)	Fluorescent tubes/bulbs, electrical and electronic equipment and cabling	Spent fluorescent tubes and bulbs, off-cuts of electrical wiring etc.
Floor and wall covering (including plastering)	Adhesives, solvents, coatings, polishes, varnishes, resins, treated wood, plasterboard	Spent coatings and adhesives, empty containers containing residue, contaminated packaging, spent solvents, asbestos, plasterboard off-cuts, plaster washout
Painting (including paint preparation)	Solvent-based paints, paint thinners, enamels, lacquers, epoxies, primers, acrylics, brush cleaners	Spent solvent-based paints, empty solvent-based paint tins containing residue, spent solvent cleaners
Asphalting (roofing, paving)	Asphalt	Unused asphalt containing tar products, contaminated containers and equipment
General maintenance and power generation	Oils, greases, degreasers, batteries	Oily rags, oil filters etc. from maintenance of plant and machinery; waste oil; spent batteries; greases and lubricants; spent COSHH materials; oil contaminated absorbent spill material; contaminated PPE; oil contaminated water from bunds etc.

9.16 Management of Hazardous Waste

How to determine if waste is Hazardous

To determine whether waste is hazardous or not, the European List of Wastes (LoW) should be consulted. Within the LoW, Hazardous Waste is classified as "Absolute, Mirror or Non-Hazardous". Absolute (A*) is considered hazardous irrespective of the concentration of levels of dangerous substances present. A Mirror entry (*) can be either hazardous or not, depending on whether it contains certain levels of "*dangerous substances*".

Unexpected discovery of Hazardous Waste

Unexpected hazardous waste not previously anticipated will be identified as early as possible into the duration of the project. Appropriate facilities and remediation or disposal arrangements will be made at the earliest possible opportunity. Examples of unexpected hazardous wastes include discovery of contaminated land.

Moving and Transporting Hazardous Waste

Hazardous wastes must be:

- Transported by a registered or exempt waste carrier
- Accompanied by a consignment note
- Transferred to a facility that holds a suitable environmental permit or pollution prevention and control (PPC) permit

Consignment Notes

A consignment note should be completed every time hazardous waste is removed from the site. The consignment note will then accompany the hazardous waste whilst it is being moved or transferred. In line with our legal requirements copies of completed hazardous waste consignment notes should be kept for three years.

Consignment notes can be purchased/ obtained from the relevant statutory authority. The type of consignment note you need to complete depends on how and where the waste is transported. You can use single or multiple collection forms.

Pre-notification/ Premise Registration

ENGLAND

A Consignment Note must accompany all movements of hazardous waste. The CN contains more information than a standard Waste Transfer Note and should be retained for 3 years. There is no requirement to pre-notify the regulator of such waste movements.

9.17 Hazardous Waste Consignment Note Detail

Consignment Note Code Unique code generated by the waste producer

Details of the site the waste is being collected from GRAHAM site / premises address

European Waste Code (EWC) 17 03 01* bituminous mixtures containing coal tar

17 05 03* soil and stones containing hazardous substances 17 06 01* Insulation containing asbestos 17 06 05* construction materials containing asbestos 13 05 03* interceptor sludges 13 05 07* oily water from oil / water separators 13 07 01* fuel oil and diesel 160601*lead batteries 20 01 21* fluorescent tubes 20 01 27* paint, inks, adhesives and

Details of the waste carrier including the carrier registration number and vehicle registration number must be signed and dated by the waste

Details of the waste destination the receiving waste facility must hold a permit that allows it to accept the hazardous

The Standard Industry Classification (SIC) Code Construction: 41.20

Demolition 43.11

The Hazardous Property (HP) code and or indentity of Persistent Organic Pollutant (POP) (COSHH Assessment)

H1 – Explosive

H2 – Oxidising

H3 – Flammable

And / or

Details of the container and the quantity of waste

Details of the person transferring the waste (consignor)

This is usually the waste producer, GRAHAM or a subcontractor if they have arranged the waste collection.

Confirmation that the waste facility has received the waste from the carrier. A copy of the HWCN with this section signed by the waste facility must be obtained within 3 months

Note: A copy of the HWCN must be taken when the waste is removed and a further copy with Part E signed must be obtained. Part E is signed by the waste facility when they receive the waste from the carrier. The final copy with Part E must be obtained from the waste carrier and returned to GRAHAM. Legible copies of hazardous waste consignment notes must be available on site and must be kept for three years from the date of the waste collection.

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PRODUCER'S/HOLDER'S/CONSIGNOR'S COPY (Delete as appropriate)

PART A Notification details

1 Consignment note code: / 3 The waste will be taken to (name, address and postcode):

2 The waste described below is to be removed from (name, address, postcode, telephone, e-mail, facsimile):

4 The waste producer was (if different from 2) (name, address, postcode, telephone, e-mail, facsimile):

PART B Description of the waste If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: 2 SIC (2007) for the process giving rise to the waste: . /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are:		Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
			Component	Concentration (% or mg/kg)			

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are: /

1 Carrier name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

2 Carrier registration no./reason for exemption:

3 Vehicle registration no. (or mode of transport, if not road):

Signature

Date D D M M Y Y Y Y Time H H M M

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

Signature

Date D D M M Y Y Y Y Time H H M M

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)

1 I received this waste at the address given in A3 on: Date D D M M Y Y Y Y Time H H M M

2 Vehicle registration no. (or mode of transport if not road):

3 Where waste is rejected please provide details:

Name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

I certify that waste permit/exempt waste operation number:

authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Signature

Date D D M M Y Y Y Y Time H H M M

9.18 Training

Everyone on site will receive training which will include the following waste and environmental issues:

- The Site Waste and Resource Management Plan
- Roles and responsibilities
- Waste procedures on site – including segregation, recycling, reuse and return methods
- Hazardous waste
- Duty of care/ responsibilities
- Materials storage and handling

Waste and environmental training on site will consist of:

- Induction training will incorporate a section on waste management on site
- Toolbox talks will be carried out on waste issues and all site operatives and subcontractors will be expected to attend
- Various employees attend workshops and seminars delivered by External providers such as WRAP in order to further advance knowledge and best practice in relation to waste issues.
- A training course for the elected "Site Environmental Champion" is delivered in house to relevant operatives by the Environmental Manager.

Communication:

- Communication of the progress of the SWRMP is carried out during monthly progress meetings involving site staff, senior management, and the client
- Posters are displayed throughout the site to ensure that everyone is aware of the importance of the Site Waste and Resource Management Plan and adheres to the site waste management procedures

Figure 14 - Posters

9.19 Subcontractor Requirements

All Subcontractors are required to fulfil the following responsibilities in relation to waste management:

- Provide to the project team a forecast of the key waste streams that you will create and an identification of what actions you plan to take to reduce waste.
- Minimise the use of materials and the production of waste through, efficient design, handling, transportation, stock control, the use of prefabricated / pre-sized materials, minimise packaging and efficient construction techniques.
- Segregate waste, use specific waste containers and waste management areas.
- Fulfil all statutory waste handling requirements such as Duty of Care Regulations
- Manage the collection, storage, segregation and treatment/disposal of the different types of waste you produce

In addition, a small number of subcontract work packages may be **responsible for the disposal of their own waste.** Where this is the case, the Site Team will ensure that these Subcontractors undertake the following responsibilities:

- Complete the "Expectations for removal of Excavated Material from Site by a Sub-Contractor" form (REF: PF10-PR10-44-F007)
- Provide the waste carriers licence (collection permit in ROI) for the haulier removing the waste
- Provide the waste management licence /permit/ exemption certificate or permit for the site receiving the waste
- Provide any other relevant licence / permit / exemption such as that required for reprocessing or waste storage
- Provide a monthly report (using the standard GRAHAM format) with the quantities of the different types of waste removed from site. This must be provided with the split of each different type of waste managed, according to waste management method – re-use, recycling, recovery, landfill and other, and, in the case of re-use, recycling and recovery, whether this has taken place on- or off- site; and the quantity of waste materials sent to landfill.

9.20 Management of Subcontractors

Illustration of Type A and Type B Subcontractors

The nature of Subcontractor work activities will assist in determining whether a Subcontractor should be responsible for their own wastes (as illustrated below). This arrangement can only be finalised following receipt of relevant documentation illustrated below. Where relevant documentation has not been provided, GRAHAM will arrange the waste removal and contra-charge the Subcontractor as appropriate.

<table>
<tr><th>Site Activity/ Sub-contractor Work Package</th><th>Primary Waste Stream</th><th>Waste Management Responsibility</th></tr>
<tr><td>Demolition and site clearance</td><td>Hardcore, spoil, timber, plastics</td><td rowspan="6"><u>Type A Subcontractor</u>
Subcontractor has full responsibility for their own waste and must collect, store, segregate and dispose of all waste materials in accordance with industry best practice and current legislation.

<u>MUST</u> provide the Site Team with copies of the following for all waste leaving the site:

• Waste Carriers Licences
• Waste Management Licences/ permits
• Waste Exemption Certificates
• Waste Transfer Notes
• Hazardous/ Special Waste Consignment Notes
• Monthly figures of all waste removed from site to include type of material, total quantity of waste, waste management option i.e. landfill, reuse, recycling and the percentage of each waste material recycled or reused.</td></tr>
<tr><td>Groundworks</td><td>Spoil</td></tr>
<tr><td>Foundations/piling</td><td>Spoil and hardcore</td></tr>
<tr><td>Structure</td><td>Bulk concrete, miscellaneous hardcore & metal</td></tr>
<tr><td>Drylining</td><td>Plasterboard, metal studwork and insulation off cuts</td></tr>
<tr><td>Brick/ blockwork</td><td>Bricks (crushed and incorporated into works)</td></tr>
<tr><td>Building envelope</td><td>Timber, plastic, cardboard, hardcore/ rubble,
Metal, Hazardous Waste</td><td rowspan="7"><u>Type B Subcontractor</u>
Waste Management Contractor has responsibility for overall waste management and removal of waste from site.

Individual subcontractors have local

responsibility for segregation and distribution of waste on site to the waste compound.</td></tr>
<tr><td>Mechanical & Electrical</td><td>Cables, metal, timber, plastic, cardboard,
plastic packaging, Hazardous waste</td></tr>
<tr><td>Trades (Joinery, Painting, Timber, cardboard, plastic packaging,
Plastering, etc.)</td><td>Timber, paint, renders, cardboard, plastic packaging, Hazardous waste</td></tr>
<tr><td>Landscaping habitat restoration/creation</td><td>Green waste and Topsoil</td></tr>
<tr><td>Site re-instatement, removal of site offices and final clear away</td><td>Timber, hardcore, metal, office waste</td></tr>
<tr><td>Office activities</td><td>Paper, cardboard, plastic packaging,
general office waste</td></tr>
</table>

9.21 Waste Management Supplier Requirements

To actively help achieve the waste reduction, reuse and recycling targets that have been set out for the project, requirements for Waste Management Suppliers are as follows:

- Agreement to work in accordance with GRAHAM Waste Supplier KPIs
- Fulfil all statutory waste handling requirements.
- Work with the project team to plan and implement suitable on-site waste management processes
- Monthly waste analysis reports to be made available to the GRAHAM site team by the 3rd of each month
- The tonnage of each waste material must be recorded within the waste report and the percentage recovery rates for each material illustrated.
- Waste log to be made available to the GRAHAM site team by the 3rd of each month
- Facilitate site visits/ audits by GRAHAM where requested
- GRAHAM are to be informed immediately of any changes to the operator's conditions, licence suspensions or pending prosecutions
- Delivery of at least 99% diversion of non-hazardous waste from landfill
- Contribute to the development and implementation of the Site Waste and Resource Management Plan as required.

GRAHAM Approved/ Preferred List of Waste Management Suppliers

The GRAHAM SHE team maintain a list of approved/ preferred Waste Management Contractors. Suppliers not on the "approved/ preferred and unapproved list" will be asked to complete the "Waste Management Supplier Pre-Appointment Assessment" (Appendix 1.3 – REF: PF10-PR10-44-F0010). The returned information will be forwarded to the SHE Team to review details and ensure that the supplier meets relevant GRAHAM environmental requirements.

Reporting and Documentation

The Waste Management Contractor shall provide the following information:

- Waste Transfer Notes and Hazardous Waste Consignment Notes.
- Copies of the Carriers Licence for all carriers used.
- Copies of the Waste Management Licences / Permits (or exemptions) for all destinations of waste.
- A register of containers logged.

On a monthly basis the Waste Management Contractor will supply the following information:

- The quantity (weight) of waste produced for each waste type together with the destination of that waste (reused, recycled, land filled, etc.).
- Recommendations for improved waste management/minimisation.

9.22 Waste Monitoring and Reporting

Waste quantities and data should be recorded within the waste management section of Cora. Data should be uploaded each month by the 5th of the month.

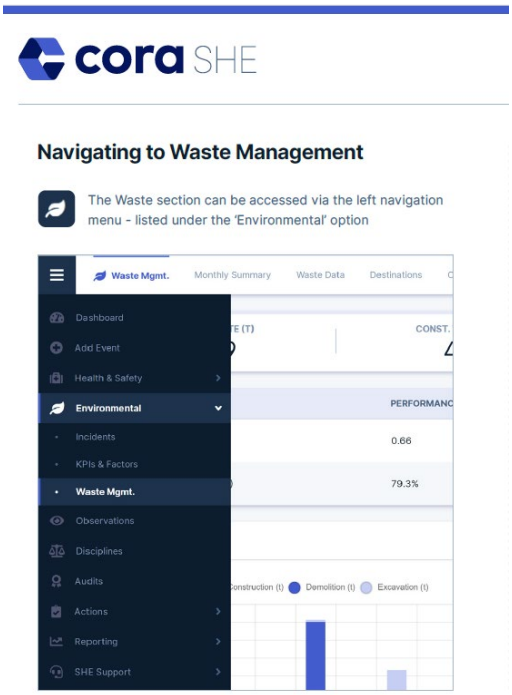


Figure 15 - Cora (waste section)

Use Cora to input project waste data. The software will automatically calculate the total waste and waste to landfill

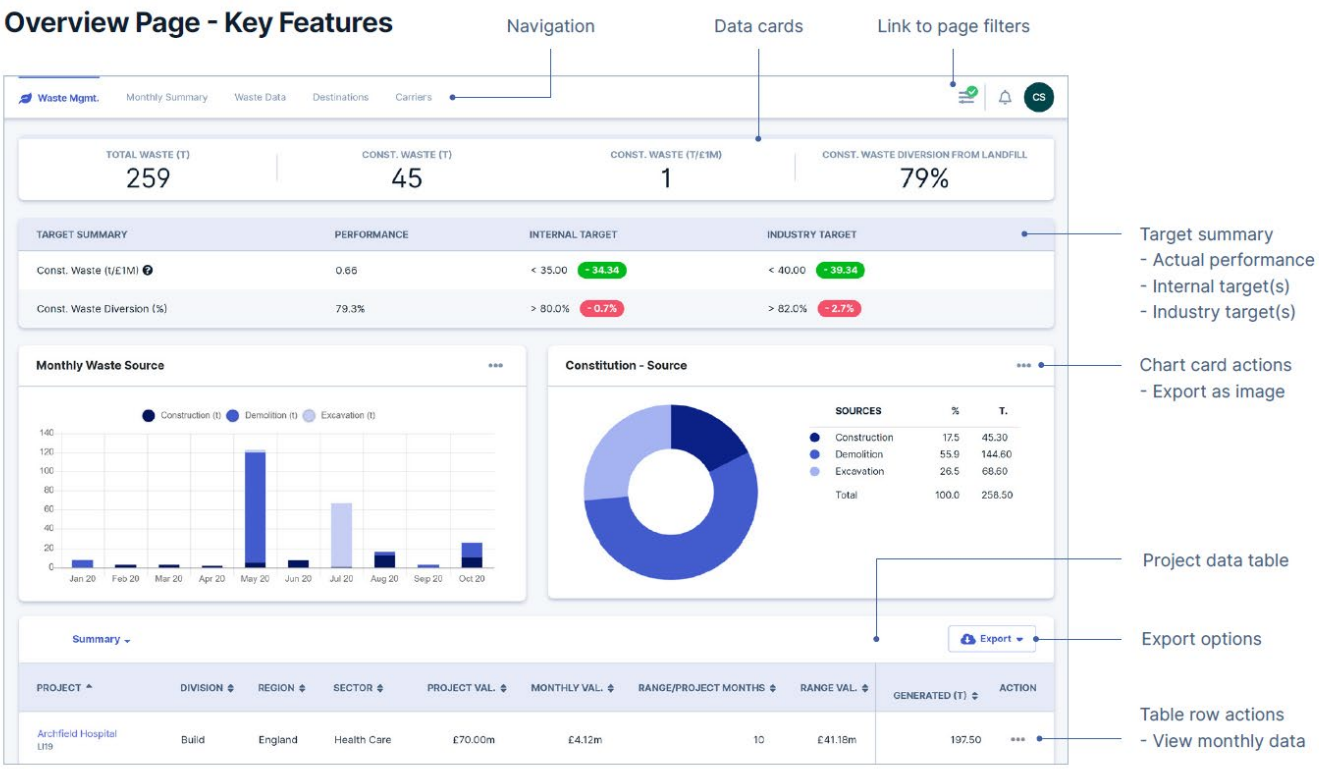


Figure 16 - Cora (overview)

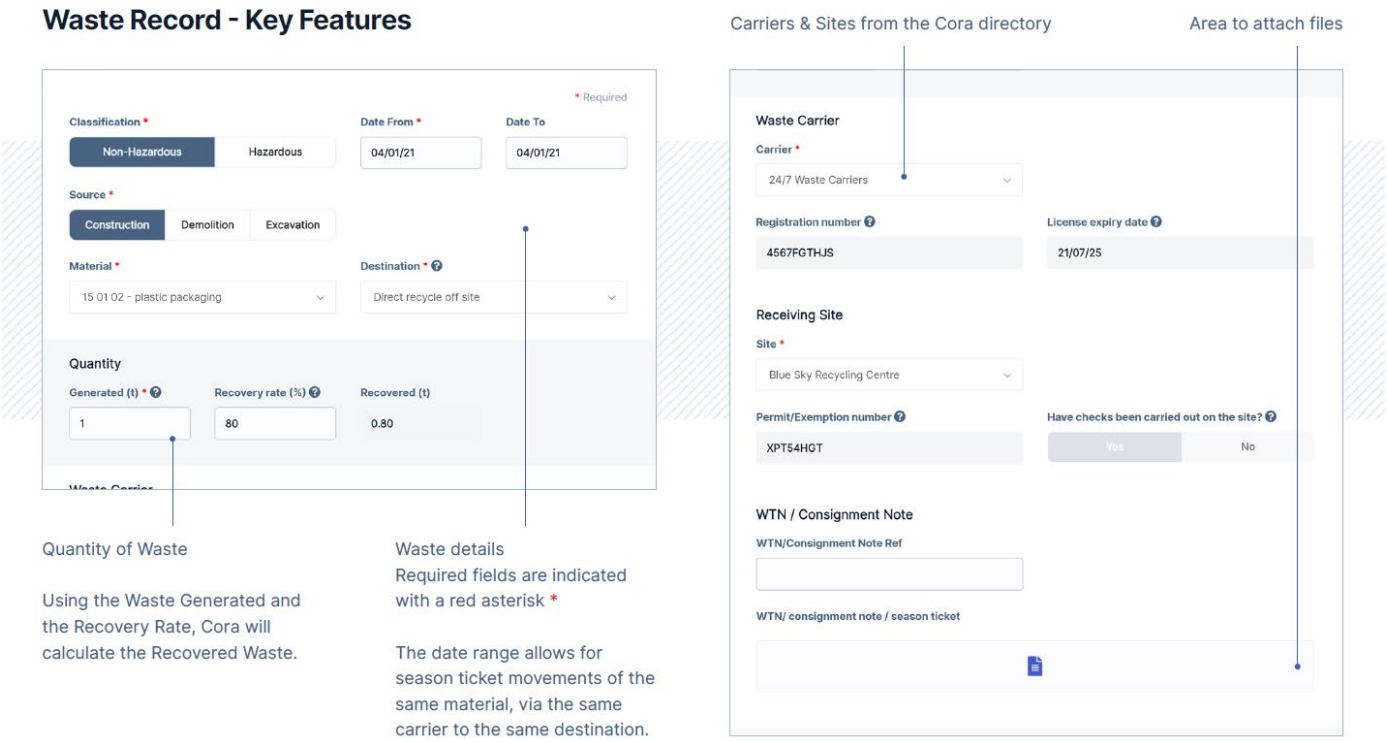


Figure 17 - Cora (Waste Records)

Waste Types Included in the Measurement

- Record ALL construction, demolition and excavation wastes – including that generated by subcontractors (where this is part of the main contact of works)
- Record wastes in Tonnes only. Volumes of waste should be converted using standardised conversion factors
- For skip wastes – find out from your waste management contractor, the total tonnage of waste generated and the percentage that has been recycled and record this within the spreadsheet
- Record ALL reuse of wastes on site e.g. reuse of topsoil in landscaping

Note:

- Guidance from the Department of Communities and Local Government identified that List of Waste **17 05 04 (soil and stones not containing dangerous substances)** is non-exempt and when sent to landfill should be allocated a 50% recovery rate. All sites should therefore ensure that where excavation waste classified under European Waste Code 17 05 04 is taken to landfill, that it is allocated a 50% recovery rate.
- Where EWC 17 05 04 is "beneficially reused" e.g. used as capping as part of a landfill closure or restoration or sent to an "exempt" site, it should be allocated a 100% recovery rate.

SECTION 10 Invasive Species

Guidance Notes:

This section contains details of the steps required to safeguard the site from negative impacts in respect of contaminated land and invasive plants.

10.1 Invasive Species Issues
10.2 Identification and Surveys
10.3 Site Conditions
10.4 Invasive Species Management
10.5 Invasive Species Control and Eradication

10.1 Invasive Species Issues

Non-native, or invasive, species are described as 'organisms introduced by man into places outside of their natural range of distribution, where they become established and disperse, generating a negative impact on the local ecosystem and species' (International Union for Conservation of Nature (IUCN), 2011). The ecological impacts of such 'biological invasions' are considered to be the second largest threat to biodiversity worldwide, after habitat loss and destruction.

The UK is bound by international agreements such as the Convention on Biological Diversity, the United Nations Convention on the Law of the Sea, the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979), the Convention on the Conservation of European Wildlife and Natural Habitat (Bern, 1979) and the Habitats and Birds Directives. All of these include provisions requiring measures to prevent the introduction of, or control of, non-native species, especially those that threaten native or protected species (JNCC, 2004). Additionally, Section 14 of the Wildlife and Countryside Act (WCA) (1981) makes it illegal to release, or allow to escape into the wild, certain plants or animals which may cause ecological, environmental or socio-economic harm. These commitments are expected to be subject to greater international enforcement over time.

10.2 Identification and Survey

All site staff will be provided with INNS identification material similar to the example shown in figure 19 below. The identification material will include all relevant marine and terrestrial INNS.

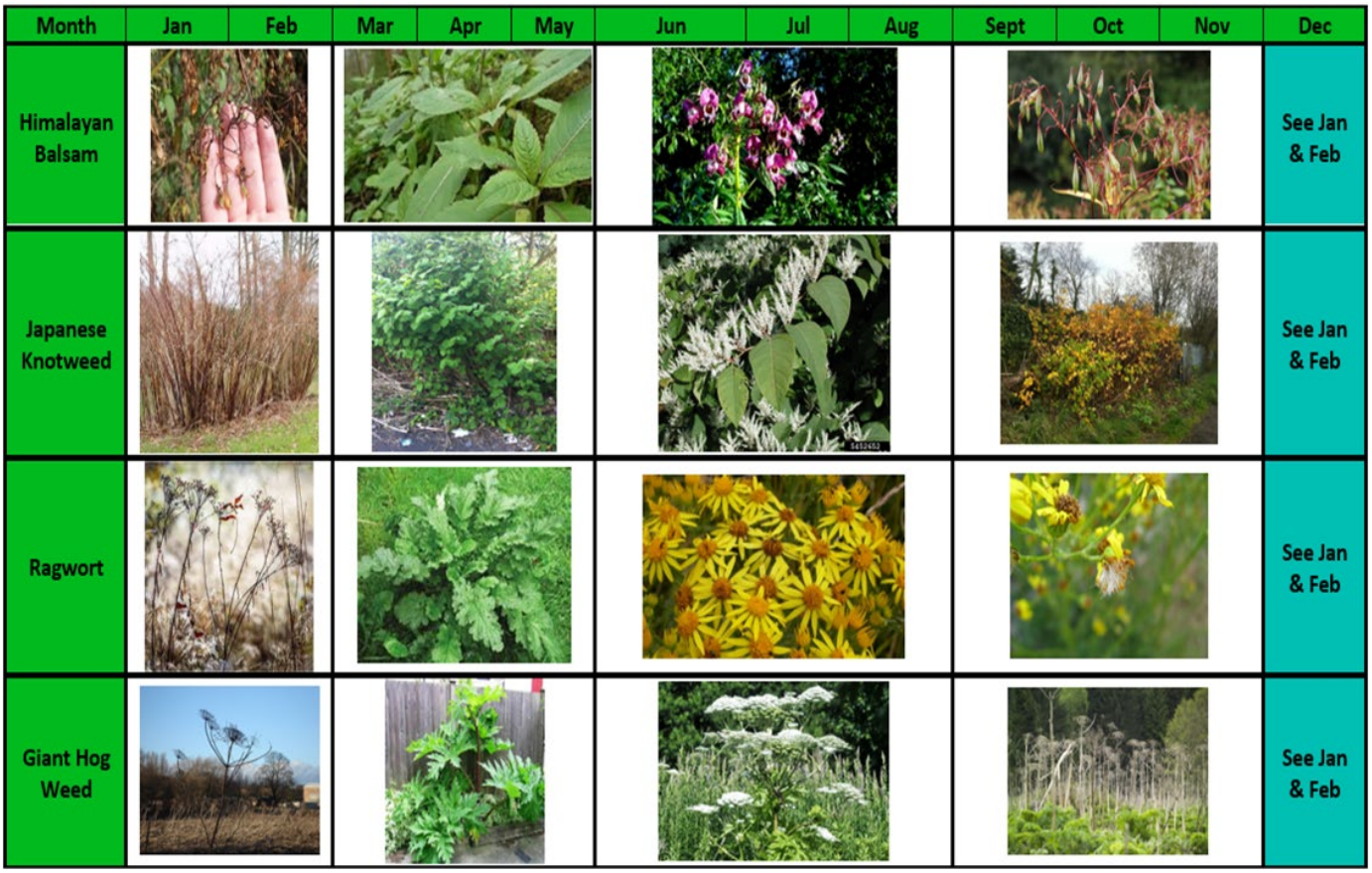


Figure 18 - Invasive Plant Identification

The site surveillance and reporting procedures outlined in section 4 of the INNS Management Plan (Appendix 7.2 Ref: PC1084-RHD-SB-XX-RP-EV-1118) will be implemented throughout the duration of the works

10.3 Site Conditions

The construction phase of the South Bank quay scheme has potential to result in the introduction and spread of marine and terrestrial INNS.

The activities considered to be at greatest risk of introducing and spreading INNS comprise:

- Use of vessels to transport construction materials to site and undertake capital dredging.
- Transport of construction materials, plant and personnel to site by road
- Excavation of landside soils known to contain invasive species (locally).

An Invasive Non-Native Species Management Plan has been developed (Ref: PC1084-RHD-SB-XX-RP-EV-1118)). As per the requirements of the Marine Licence a A biosecurity plan and ballast water management plan are incorporated within the INNS Management Plan. This will be submitted to the MMO 6 weeks prior to the works commencing and will be approved by the MMO and Environment Agency before the works can commence

Providing the control measures detailed in Section 3 of this Management Plan are implemented , the risk of introducing or spreading INNS will be kept to a minimum. Together with implementation of site surveillance actions and the contingency plan (where required), the biosecurity risks associated with the construction phase are considered to be low.

To date terrestrial INNS identified at the site include Japanese Knotweed and Japanese Rose. Marine INNS recorded within the site footprint include:

- (*Euchone limnicola*)
- (*Dipolydora quadrilobata*)
- Whip Mudworm (*Polydora cornuta*)
- Rams Horn Worm (*Streblospio benedicti*)
- Bar-grilled mudworm(*Streblospio gynobranchiata*)
- Acorn Barnacle(*Austrominius modestus*)
- File Yolidia (*Yoldia limatula*)

10.4 Invasive Species Management

- See Invasive Non-Native Species Management Plan in Appendix 7.2

10.5 Invasive Species Control and Eradication

Currently there are various means by which invasive plants can be eradicated from sites. These include:

- Long-term treatment with herbicides.
- Excavation and disposal at a licensed landfill site. (If invasive plants are disposed of offsite, they will be dealt with as waste in accordance with the Duty of Care Requirements)
- Excavation, deep burial and/or bunding on site prior to treatment with herbicide.

Due to site specific variations in soil type, topography, adjacent sensitivities and degree of invasive weed infestations, combinations of various control methods may be used. The procedures detailed in section 4.1 of the INNS Management Plan will be followed. Advice will be sought from the Environment Agency and Natural England on the most appropriate eradication measures and long term control measures.

SECTION 11 Archaeology & Cultural Heritage

Guidance Notes:

This section contains details of archaeological considerations and steps required to safeguard archaeology and cultural heritage during construction.

11.1 Archaeological Monitoring
11.2 Discovery of Unexpected Archaeological Finds
11.3 Loss of Assets Due to Demolition
11.4 Minimising the Risk of Impact to Any Submerged Heritage Assets During Dredging / Excavation

11.1 Archaeological Monitoring

Access will be afforded to the site at all reasonable times to any nominated Archaeologist to observe the operations and to monitor the implementation of archaeological requirements.

11.2 Discovery of Unexpected Archaeological Finds

- STOP work immediately.
- IMMEDIATELY PROTECT the find by fencing/blocking off.
- NOTIFY the discovery to the project team
- Access to the area by machinery and personnel is to be prevented.
- Time is to be allowed for the archaeologist to undertake the appropriate level of recording.
- Archaeological objects and treasure discovered must be reported to the regulator

11.3 Loss of Assets Due to Demolition

The dilapidated remains of the early 20th century South Bank Wharf and three jetties will be demolished as part of the proposed scheme. The EIA has assessed these as being of low heritage significance. However, due to the proposed destruction of these structures, the magnitude of effect is considered to be high resulting in a moderate adverse impact. In order to mitigate this impact, a suitable record of the structures will be prepared prior to demolition, anticipated to comprise a photographic record and drone footage of the wharf and jetties. The suitability of this record will be confirmed in advance of demolition with RCBC and submitted to the RCBC HER.

11.4 Minimising the Risk of Impact to Any Submerged Heritage Assets During Dredging / Excavation

Direct (physical) impacts to potential submerged or buried archaeology may occur as a direct result of construction activities including:

- removal of the piles supporting the jetties and wharf and pipework feeding the pumping station;
- capital dredging (to deepen the northern half of the Tees Dock turning circle, a section of the existing approach channel and to create a berth pocket);
- construction of the new quay (to be set back into the riverbank); and
- placement of jack up feet/vessel anchors.

An archaeological reporting protocol will be adopted to mitigate the potential impact on any as yet unidentified marine archaeological remains arising from construction activities.

The protocol will be formalised in a Written Scheme of Investigation (WSI) which will be produced by a suitably qualified marine archaeological specialist.

- The WSI shall make provision for:
    - Before development commences, and taking into account the evaluation where relevant, an agreed site monitoring strategy that provides for interpretation and recording of areas of expected archaeological sensitivity, and for any unexpected discoveries of archaeologically significant deposits or structures.
    - The systematic recording by photographic and photogrammetric means (including drone survey where appropriate) of structures to be demolished (including old jetties, pumping and custom houses)
    - Reasonable notification to the local planning authority of commencement and completion of archaeological work.
    - Details of staff involvement in carrying out of archaeological work, and their qualifications and responsibilities.
    - The timetable for completing any post-excavation assessment, archiving and report.

SECTION 12 Emergency Response

Guidance Notes:

This section contains details of the procedure to follow in the event of an environmental complaint, spill or incident.

12.1 Emergency Response Equipment and Resources
12.2 Emergency Preparedness and Response
12.3 Environmental Incident Response Plan
12.4 Emergency Response Reporting

12.1 Emergency Response Equipment and Resources

Oil spillage kits will be available on site at all times and a team of operatives will be trained on how to maintain, position and use them properly. Training may be carried out in-house by the Environmental Manager or by the site team.

The trained Emergency Spill Response team will be identified on the site's environmental noticeboard.

Figure 19 - Spill kits

Figure 20 - Spill Response Team Poster

Spill kits should be appropriate and adequate for risk on site

If the nature of the incident necessitates external spill response provision, the Emergency Response Team will be contacted using the contact details below:

Response Team	Phone	Availability
OHES Environmental	0333 3331123	24hr Service

12.2 Emergency preparedness and Response

Planning for responding to incidents and emergencies is an important part of project environmental management. Emergency preparedness and response and contingency plans will be produced by GRAHAM to take account of the location of the local drainage system (and watercourses); any requirement to engage emergency services, location and contents of spill kits, notification process and emergency contacts list in the event of an incident (including external parties such as the Environment Agency and Emergency Services), etc.

Project emergency preparedness and response procedures will be developed and completed by GRAHAM and included in the site induction and allocated persons will be appropriately trained. The procedures will be drilled on a periodic basis to ensure that they are still effective and personnel know how to respond. Each drill will be logged.

12.3 Environmental Incident Response Plan

The Environmental Incident Response Plan describes the actions to take in order to deal with any unexpected environmental incidents and details simple guidance on the immediate action to be taken in order to prevent and minimise pollution resulting from an environmental incident. The response actions are detailed according to the specific pollutant and the receiving receptor.

The Environmental Incident Response Plan also describes environmental incident reporting and investigation processes.

The Environmental Incident Response Plan will be displayed on site and communicated to all operatives. (IMS Ref: PF10-PR10-43-F013)

12.4 Incident response reporting

- All operatives will be made aware that any environmental incident, spillage or compliant must be reported to the GRAHAM site staff as soon as it happens
- Environmental Events as a result of the Works will be recorded by adding an "Environmental Incident", "Environmental Complaint" or "Other" event record on Cora.
- Every effort will be made to establish the cause of the issue leading to a complaint/ spill/ incident. Assuming the issue arose from the failure of a control system, the issue will be put right at the earliest opportunity
- The response action will be recorded on Cora by the Site Manager
- A log of all complaints/ spills/ incidents and follow-up actions will be maintained
- The Environmental Manager will undertake an investigation of all major incidents and will notify relevant agencies as required. Any reference numbers will be recorded and notified to the Employers Representative.

CEMP APPENDICIES (1.1-1.8; 2.1-2.4) *(Retained on site in CEMP Site Folder 1)*	
1.0 RECORDS INITIATED DURING THE PRE-CONSTRUCTION PHASE	
1.1	**Project Environmental Risk and Opportunities Register** *Completed by the Regional/ Project Environment Manager (in co-operation with the Project Manager)*
1.2	**Pre-construction Environmental Information** *Completed by the Project Manager to inform the CEMP*
1.3	**Waste Management Supplier Pre-Appointment Assessment** *Completed by the Regional/ Project Environmental Manager upon receipt of supplier information*
1.4	Expectations for Removal of Excavated Material from site by a Sub-contractor *Completed by the relevant Subcontractor*
1.5	Concrete Washout Risk Assessment
1.6	Noise Monitoring Plan
1.7	Site Drainage plan
1.8	Licences, consents, permits or permissions granted to GRAHAM (as detailed in section 1.14 of the CEMP)
2.0 RECORDS OF ENVIRONMENTAL TRAINING AND COMMUNICATION	
2.1	**Introductory Site Environmental Awareness Training & Environmental Champion Training** *(Delivered by the Project/ Regional Environmental Manager)*
2.2	**Spill Kit Training (Training certificate or communication sheets)** *(Can be delivered by the Project/ Regional Environmental Manager or by the site team (dependant on risk))*
2.3	**Toolbox talks (Communication sheets)**
2.4	**Advice Notes (Communication sheets)**
2.5	**Site Induction**

Records in bold text are those that must be available for each project. Other records are process and site specific

CEMP APPENDICIES (3.1-3.9; 4.1-4.5; 5.1-5.2; 6.1) *(Retained on site in CEMP Site Folder 2)*	
3.0 ENVIRONMENTAL MEASURING AND MONITORING	
3.1	**Weekly Site Supervisors Environmental Report**
3.2	Water Quality: Visual Inspection Record
3.3	Water Quality – Sampling Record
3.4	**Materials Storage Inventory**
3.5	Invasive Plants - Record of Monitoring
3.6	Invasive Plants – Record of Treatment
3.7	NRMM Inventory
3.8	Noise Monitoring Report Form
3.9	Dust and Air Quality Monitoring Plan
4.0 WASTE MANAGEMENT	
4.1	Duty of Care Waste Transfer Notes
4.2	**Details of Permitted, licenced or exempt sites**
4.3	**Details of Waste Management carriers for transporting waste**
4.4	**Waste Log (Only if CORA is not used)**
4.5	Site Waste Management Plan Datasheet (Only if CORA is not used)
5.0 PERMITS	
5.1	Permit to pump and discharge
5.2	Permit to Clear
6.0 AUDITS AND CLOSEOUTS	
6.1	(Only if CORA is not used)
7.0 Supplementary Information	
7.1	Contaminated Land Remediation Strategy

7.2	Invasive Non-Native Species Management Plan
7.3	Drawing B3553F05-3000-DR-0448 Main Contract Environmental Construction Plan (Sh 1 – 7)
7.4	Environmental Action Plan
7.5	Construction Traffic Management Plan
7.6	Materials Management Plan
7.7	Flood Risk Emergency Plan

Records in bold text are those that must be available for each project. Other records are process and site specific

Appendix 1.1: Project Environmental Risk and Opportunities Register

Appendix 1.2: Pre-construction Environmental Information

Appendix 1.3: Waste Management Supplier Pre-Appointment Assessment

Appendix 1.4: Expectations for removal of excavated material from site by a Subcontractor

Appendix 1.5: Concrete Washout Risk Assessment

Appendix 1.6: Noise Monitoring Plan

Appendix 1.7: Site Drainage Plan

Appendix 1.8: Licences, consents, permits or permissions

Appendix 2.1: Introductory Site Environmental Awareness Training & Environmental Champion Training

Appendix 2.2: Spill Kit Training

Appendix 2.3: Toolbox Talks

Appendix 2.4: Environmental Advice Talks

Appendix 2.5: Site Induction

SEE CONSTRUCTION PHASE PLAN

Appendix 3.1: Weekly Site Supervisors Environmental Report

Appendix 3.2: Water Quality - Visual Inspection Record

Appendix 3.3: Water Quality - Sampling Record

Appendix 3.4: Materials Storage Inventory

Appendix 3.5: Invasive Plants - Record of Monitoring

Appendix 3.6: Invasive Plants – Record of Treatment

Appendix 3.7: NRMM Inventory

Appendix 3.8: Noise Monitoring Report Form

Appendix 3.9: Dust and Air Quality Monitoring Plan

Appendix 4.1: Duty of Care Waste Transfer Notes

Appendix 4.2: Details of permitted, licenced or exempt sites

Appendix 4.3: Details of Waste Management Carriers for Transporting Waste

Appendix 4.4: Waste Log

Appendix 4.5: Site Waste Datasheet

Appendix 5.1: Permit to Pump and Discharge

Appendix 5.2: Permit to Clear

Appendix 6.0: Audits and Closeouts

Appendix 7.1: Contaminated Land Remediation Strategy

Appendix 7.2: Invasive Non-Native Species Management Plan

REPORT

South Bank Quay

Invasive Non-Native Species Management Plan

Client: Tees Valley Combined Authority

Reference: PC1084-RHD-SB-XX-RP-EV-1118

Status: S3/P01

Date: 12/07/2021

Royal HaskoningDHV

Enhancing Society Together

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Document title: South Bank Quay

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Reference: PC1084-RHD-SB-XX-RP-EV-1118
Status: P01/S3
Date: 12/07/2021
Project name:
Project number: PC1084
Author(s): Steven Rayner and Claire Smith

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Checked by: Paul Salmon

Date: 12.07.21

Approved by: Jamie Ellis

Date: 12.07.21

Classification
Project related

Table of Contents

1 INTRODUCTION

1.1 Background

South Tees Development Corporation (STDC) is proposing to construct a new quay at South Bank in the Tees estuary (referred to hereafter as the scheme) (see Figure 1.1). The new quay is to be utilised predominantly by the renewable energy industry, as well as supporting more general industrial and storage/distribution activities. In summary, the scheme comprises demolition, capital dredging, offshore disposal of dredged material and construction and operation of a new quay (to be set back into the riverbank). Further detail is presented in Section 2.

The scheme is to be implemented in a phased manner, with two phases of work currently envisaged (see Drawing PC1084-RHD-SB-DN-DR-C-1380). Two planning applications and two marine licence applications were submitted to Redcar and Cleveland Borough Council (RCBC) and the Marine Management Organisation (MMO) respectively in November 2020 (one planning application and one marine licence application per phase), with the planning permissions issued in March 2021 (reference R/2020/0684/ESM for Phase 1 and reference R/2020/0685/ESM for Phase 2). The marine licences from the MMO are outstanding.

1.2 Purpose of this document

Condition 3 of the planning permissions states:

"Prior to the commencement of the development, a Construction Environmental Management Plan (CEMP) for the development shall be submitted to and approved in writing by the Local Planning Authority. The CEMP, or any other subsequent variation approved in writing by the Council, will include measures relating to:

- *Invasive Non-Native Species (INNS) Management Plan.*
- *Construction Traffic Management Plan (CTMP).*
- *Construction Waste Management Plan (CWMP).*
- *Materials Management Plan (MMP).*
- *Construction Phase Flood Risk Emergency Plan (FREP).*
- *Details of the control measures to reduce spills of soils during landside excavation.*
- *Site induction training.*

This INNS management plan has been produced to partly address condition 3 of the planning permission for Phase 1 only (R/2020/0684/ESM). STDC is not seeking to discharge condition 3 of the planning permission for Phase 2 on the basis that Phase 2 is to be implemented at a later date. STDC will submit further documentation to RCBC to fully discharge condition 3 of the Phase 1 planning permission.

INNS are "broadly defined as those species whose introduction or spread threaten biological diversity or have other unforeseen impacts" (Defra, 2015). The purpose of this document is to ensure that the construction activities minimise the risk of introducing and spreading INNS.

Figure 1.1

Drawing PC1084-RHD-SB-DN-DR-C-1380

Although STDC is only seeking to discharge condition 3 of the Phase 1 planning permission at this time, it is understood that the site compound required for Phase 1 is to be positioned within the Phase 2 footprint (see Drawing PC1084-RHD-SB-DN-DR-C-1395). This INNS management plan therefore also takes account of the risk of spreading known terrestrial INNS within the Phase 2 footprint during construction of Phase 1.

1.3 Biosecurity plan and method statement methodology

In lieu of any national (English) guidance in relation to INNS, this management plan has adapted the Marine Biosecurity Planning guidance (Scottish Natural Heritage and Firth of Clyde Forum, 2014) which is considered to constitute best practice, and considers the following issues:

- Understanding of the site characteristics and existing INNS records.
- Understanding how INNS may be introduced to the site.
- Understanding of the site activities which risk introducing INNS.
- Outlining the required control measures to reduce and prevent the identified risks.
- Outlining required monitoring actions and contingency plan if INNS are identified.

Although this guidance is aimed at marine INNS, it is considered that the principles of the guidance are also relevant with regard to terrestrial INNS. In addition to the above, guidance from the GB Non-native Species Secretariat (NNSS) website has been considered and referenced where appropriate to do so.

This INNS management plan should be read in conjunction with the construction and environmental management plan (CEMP) (Royal HaskoningDHV, 2021).

1.4 Key legislation

This INNS management plan will ensure compliance with the following UK and EU legislation:

- Water Framework Directive 2000 (WFD).
- Marine Strategy Framework Directive (2208/56/EC).
- EU Regulation on Invasive Alien Species.
- Wildlife and Countryside Act 1981.
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention).
- The Conservation of Habitats and Species Regulations 2017

Further detail regarding each is provided below.

1.4.1 Water Framework Directive

The EC Water Framework Directive (WFD) (2000/60/EC) came into force in 2000 and is transposed into UK law through The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The WFD aims "to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater". It aims to ensure that all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet good status or potential. The Directive considers the presence of INNS, which can reduce the ecological and overall status of a water body.

Drawing PC1084-RHD-SB-DN-DR-C-1395

1.4.2 Marine Strategy Framework Directive

The Marine Strategy Framework Directive (2008/56/EC) was adopted in 2008. The goal of the Directive is to achieve 'Good Environmental Status' by 2020 across Europe's marine environment. The Directive provides an overarching framework for other key directives and legislation including the WFD. Descriptor 2 requires that "non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem".

The Directive includes targets to reduce the risk of introduction and spread of non-native species through improved management of high risk pathways and vectors and to develop action plans for key high risk marine nonindigenous species by 2020.

1.4.3 EU Regulation on Invasive Alien Species

The EU Regulation on Invasive Alien Species outlines rules to prevent, minimise and mitigate the adverse effects of invasive alien species on biodiversity and related ecosystem services, and on human health and safety as well as to reduce their social and economic impact. The Regulation outlines species of union concern and requires action plans to control the introduction and spread of INNS.

1.4.4 Wildlife and Countryside Act

It is an offence under this Act to release, or allow to escape into the wild any animal or plant species which is not ordinarily resident in the UK and is not a regular visitor to the UK in a wild state or is listed in Schedule 9 to the Act.

1.4.5 Ballast Water Management Convention

The International Convention for the Control and Management of Ships' Ballast Water and Sediments (the Ballast Water Management Convention), adopted in 2004, aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments. Vessels must have ballast water management plans and record books. Regulations include control of where ballast water can be exchanged and volume of exchange.

1.4.6 The Conservation of Habitats and Species Regulations

The Conservation of Species and Habitats Regulations 2017 (the Habitats Regulations) as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 implement the Habitats Directive (92/43/EEC) in England and Wales. The Habitats Regulations also transport elements of the Wild Birds Directive (2009/147/EC) in England and Wales. Within the Habitats Directive (92/43/EEC) it states that 'provision should be made for supplementary measures governing the reintroduction of certain native species of fauna and flora and the possible introduction of non-native species'.

2 SCHEME DESCRIPTION

2.1 Overview

As noted in Section 1, STDC has received planning permission to construct a new quay in the Tees estuary. The planning applications were supported by an Environmental Impact Assessment (EIA) Report (Royal HaskoningDHV, 2020) and a supplementary environmental report (Royal HaskoningDHV, 2021). A detailed description of the scheme can be found in the EIA Report, however, in summary it comprises the following:

- Demolition of the dilapidated wharf, three jetties downstream of the wharf (including the conveyor at the extreme downstream end jetty), a live electrical substation and pipework which previously abstracted water from the Tees estuary associated with the pumping station.
- Construction of a new solid piled quay structure up to 30m wide and 1,230m in length (with an approximate 1,050m of usable quay for berthing), set back into the riverbank. Although the useable surface of the quay itself would be up to 30m wide, the overall footprint of the quay would be up to 50m wide due to the proposals to construct an anchor structure further inland of the quay deck.
- Excavation and re-use of approximately 275,000m^3 of soils behind the proposed quay wall to install tie rods to the anchor wall. Excavation and re-use of a further approximately 1,140,000m^3 of soils in front of the proposed quay wall to create the berth pocket.
- Capital dredging of approximately 1,800,000m^3 of marine sediments with offshore disposal into the Tees Bay C disposal site.
- Installation of approximately 200,000m^3 of rock within the berth pocket to form a rock blanket.

It is understood that value engineering is currently ongoing which may change some of the detail defined above. It is understood that any amendments to the above would not be material changes to the consented scheme. Any material changes that require variation to the planning permission (or marine licence once received) will be addressed via the Contractor.

2.2 Site access

Given the proposals to utilise land-based plant for the proposed quay construction, access to site for construction plant and personnel will be via Smiths Dock Road (see Drawing PC1084-RHD-SB-DN-DR-C-1395).

It is anticipated that there will be a requirement for transport of some construction materials by sea (including steel and rock), with vessels berthing in Tees Dock or at a suitable berth along the river channel. The materials transported by sea would be offloaded onto heavy goods vehicles (HGVs) and transported to site using the existing road network. Rock for the rock blanket is anticipated to be placed directly into position on the riverbed from the vessel.

2.3 Programme

STDC is intending to commence construction in 2021 to enable operation of the facility by 2023 (an approximately three-year construction phase). It is proposed that the quay is constructed in phases, with an initial berth length of approximately 450m proposed in Phase 1 (total quay length of approximately 630m). The quay would be extended to provide a total useable berth length of 1,050m (total quay length of approximately 1,230m) as required in Phase 2, based on market demands.

Construction works are to be undertaken 24 hours a day, seven days per week.

3 INNS management plan

3.1 Understanding the site

3.1.1 Physical environmental within the Tees estuary

The 'site' which is the subject of this report includes an area of land on the southern bank of the Tees estuary, and the adjacent intertidal and subtidal Tees estuary (shown on Figure 1.1). Detail regarding the physical characteristics of the Tees is presented below.

Bathymetry

The present main channel in the Tees has a declared depth of 15.4m below chart datum (bCD) in the approach channel (i.e. in Tees Bay), 14.1m bCD to upstream of Redcar Ore Terminal, 10.4m below CD up to Teesport and then progressively less depth up to 4.5m below CD in Billingham Reach. Parts of the channel now declared at 14.1m below CD were originally dredged to a deeper depth.

Water levels

The tidal curve at the mouth of the Tees estuary is observed to be very close to sinusoidal in shape with ranges of 4.6m and 2.3m for mean spring and neap tides, respectively (UKHO, 2020). The other astronomical tidal parameters of the estuary mouth are presented in Table 3.1.

Table 3.1 Tidal levels for the Tees estuary

Description	Level (m CD)	Level (m ODN)
Highest astronomical tide	6.10	3.25
Mean high water spring tide	5.50	2.65
Mean high water neap tide	4.30	1.45
Mean sea level	3.20	0.35
Mean low water neap tide	2.00	-0.85
Mean low water spring tide	0.90	-1.95
Lowest astronomical tide	0.00	-2.85

Tidal currents

Tees Bay and the Tees estuary attract sediment as the tidal current flows are generally quite low compared to many other coastal areas. This is due to Tees Bay forming a shallow embayment within the general alignment of the north east coastline. The low tidal current flows mean that sands brought into Tees Bay from the North Sea tend to settle on the sea or riverbed below the water surface, gradually building up over time.

Flow discharges and mixing

The River Tees has its source about 160km from the sea on Cross Fell in the Pennines and drains a catchment of 1932km^2. The main freshwater input to the estuary is measured at Low Moor. Before reaching the South Bank quay area, the Tees' fluvial flow is regulated by the Tees Barrage, which is operated to maintain upstream water levels and prevent the upstream penetration of saline water. The regulated flow through the barrage is, therefore, very unlike the natural flow that would otherwise occur, especially as the flows are no longer continuous.

Conductivity, temperature and depth (CTD) surveys undertaken in 2020 illustrated that temperatures in the Tees estuary range from around 14 to 16°C.

3.1.2 Summary of habitats within the landside parts of the scheme footprint

An extended Phase 1 habitat survey (EP1HS) was undertaken within the landside parts of the scheme footprint in 2020. As shown on Figure 3.1, the terrestrial habitat within the Phase 1 boundary was categorised predominantly as 'urban (developed land)', with an area of 'grassland – other modified grassland' at the upstream end. Small patches of 'neutral grassland', 'heathland and scrub' and 'sparsely vegetated land - ruderal/ephemeral' were also present.

3.1.3 Presence of invasive species within the South Bank quay footprint

Table 3.1 and Table 3.2 identify the terrestrial and marine INNS respectively recorded during the site-specific surveys undertaken in 2020. The location of the terrestrial INNS identified during the 2020 survey is shown on Figure 3.1, whilst the location of the marine INNS (by cross referencing to the detail included in Table 3.2) can be found in Figure 3.2.

Table 3.2 categorises marine species as either non-native (i.e. those that have reached the UK by accidental human transport, deliberate human introduction or which have arrived by natural dispersion from a non-native population in Europe), or cryptogenic (i.e. those of unknown origin and are not demonstrably native or introduced).

Table 3.1 Terrestrial INNS recorded within the Phase 1 scheme footprint during site-specific survey

Taxa	Status	Background / origin	Occurrence within the 2020 site specific survey
Japanese rose	Non-native	This is a non-native rose species that is native to the coastal areas of eastern Asia where it is predominantly found in sand dunes, coastal vegetated shingle and free draining acid grassland. It spreads outwards from the main stand quickly by using creeping rhizomes from which suckers will arise (National Trust, undated).	Two stands located at the upstream end of the Phase 1 boundary (on land).
Japanese knotweed	Non-native	This is a fast-growing and strong clump-forming perennial, with tall, dense annual stems. Stem growth is renewed each year from the stout, deeply-penetrating rhizomes (creeping underground stems). Originally introduced to Britain as an ornamental garden plant (RHS, 2021).	Located on land within the Phase 2 quay construction footprint

As noted within Table 3.1, only Japanese rose was present within the terrestrial area of the Phase 1 footprint during the 2020 survey (Japanese knotweed was only located within the Phase 2 footprint).

As shown in Table 3.2, the marine INNS found within the Phase 1 footprint comprise:

- *Euchone limnicola* – subtidal grabs
- *Dipolydora quadrilobate* – subtidal grabs and intertidal cores
- *Polydora cornuta* – subtidal grabs
- *Streblospio benedicti* - subtidal grabs and intertidal cores
- *Streblospio gynobranchiata* - subtidal grabs and intertidal cores
- *Austrominius modestus* – scrapes from infrastructure and intertidal cores
- *Yoldia limatula* – subtidal grabs

All of the marine INNS detailed in Table 3.2 were found within the Phase 2 footprint.

Figure 3.1 Terrestrial ecology figure

Table 3.2 Marine INNS recorded within the Phase 1 scheme footprint during site-specific survey

Phylum	Taxa	Status	Habitat / background	Origin	Occurrence in the 2020 site specific survey		
					Scrape sample	Intertidal core sample	Grab sample
Annelida	*Alitta virens*	Non-native	Invasive alien species which has become established in many areas worldwide since 1915 (van der Have *et al*., 2015).	Western Atlantic	X	X	✓ (GS13)
Annelida	*Euchone limnicola*	Non-native	First reported from California in fine mud sediments where the species constructed a mucoid tube with fine particles adhering to it (Reish, 1959). Reported as an INNS in different localities of southern Australia, New Zealand, UK, and France, always in sandy and muddy sediments of harbours with a high degree of contamination and degradation, up to 24m depth. Tolerates copper pollution and may be an indicator of high copper conditions. In newly colonised areas it forms dense and stable populations, competing with native species for natural resources, albeit its grade as a potential hazard is low due to its small impact and invasive processes (Cepeda & Lattig, 2017, Guyonnet & Borg, 2015).	California	X	✓ (CS04)	✓ (All subtidal grabs apart from GS01)
Annelida	*Dipolydora quadrilobata*	Cryptogenic	This polychaete is reported from New England in intertidal sandy muds and in muddy substrates of dredged rivers (Blake, 1971), from Japan in mud deposits with other polychaetes of the family Spionidae (Sato-Okoshi, 2000) and from the Romanian coast of the Black Sea, most common and abundant in mud between 40 m and 60 m (Surugiu, 2012).	Cosmopolitan	X	✓ (CS04, CS09, CS10)	✓ (GS04)
Annelida	*Polydora cornuta*	Cryptogenic	This polychaete is widely distributed from the Atlantic to the Pacific and has been reported for the first time in the Mediterranean in 2008 (Simboura *et al*., 2008). Along the Romanian coast of the Black Sea, P. cornuta is reported to occur on various types of substrata (rocks, stems of reeds, water-soaked branches of bushes, seagrasses, clay-rock, soft mud, sandy mud or sand) on which it builds fragile tubes of silt particles and fine sand grains (Surugiu, 2012). This polychaete is known to be an opportunistic species and has been widely found in organically enriched and polluted environments (Simboura *et al*., 2008).	Cosmopolitan	X	✓ (CS01, CS04)	✓ (GS04, GS05, GS08, GS09, GS10, GS11, GS13, GS14, GS15, GS25, GS26)
Annelida	*Streblospio benedicti*	Non-native	Small tube-dwelling, highly productive, opportunistic polychaete commonly known as the bar-gilled mud worm. Native to the Western Atlantic, from the Gulf of St. Lawrence to Venezuela. Found in mudflats and soft sediments of estuaries and coastal waters and can tolerate a wide range of temperatures and salinities. It can attain very high abundances in introduced locations where it is probably a significant grazer of phytoplankton (Fofonoff *et al*., 2021).	Western Atlantic	X	✓ (CS04, CS09)	✓ (GS01 – GS11, GS13, GS15, GS21 - GS22, GS24 – GS26)
Annelida	*Streblospio gynobranchiata*	Non-native	A recently described species native to the Gulf of Mexico, it breeds planktotrophic larvae in its gills. It has been introduced to the Turkish Mediterranean Sea, the Black Sea, and the Caspian Sea. It is almost identical to *Streblospio benedicti* and morphological differences between them remain uncertain (Fofonoff *et al*., 2021).	Gulf of Mexico			
Arthropoda	*Austrominius modestus*	Non-native	The barnacle *A. modestus*, first found in Hampshire, in 1945, naturally occurs in Australasia and was introduced from Australia or New Zealand, through ships' hulls or ballast water. This barnacle withstands reduced salinity, turbid waters, and lower temperatures than the native barnacles of the genus Chthamalus, and higher temperatures than the native barnacles of the genus Balanus. Other competitive advantages include a broad tidal range, as it occurs in the upper eulittoral and sublittoral, a rapid initial growth rate, reaching sexual maturity in its first season and multiple reproductive seasons per year. This species is also reported to colonise concrete breakwaters rapidly (Mineur *et al.,* 2012).	Australasia	✓ (All scrapes apart from SS03)	✓ (CS07, CS08)	X
Arthropoda	*Monocorophium insidiosum*	Cryptogenic	This amphipod has a wide global distribution and its native range is currently unknown. Populations are established in temperate and sub-tropical regions on both coasts of North America, both coasts of South America, Europe, Australia, and Asia. Likely vectors for its spread include travelling on the hulls of commercial ships and oyster transplants. It is found in shallow marine and estuarine waters where it builds tubes attached to hard surfaces, including rocks, bivalve shells, pilings, docks, buoys, and ships' hulls. It can form U-shaped burrows in mud and silt. In some areas it is an abundant pest species known for fouling maritime structures, but its impacts have not been quantified on a large scale (Fofonoff *et al*., 2021).	Cosmopolitan	X	✓ (CS04)	X
Mollusca	*Yoldia limatula*	Non-native	This bivalve occurs in shallow soft bottoms of boreal arctic seas of North America and Europe (Bender & Davis, 2012) and has not been previously reported in the UK. This bivalve is a subsurface and surface deposit-feeder, whose feeding activities result in sediment resuspension through expulsion of loose pseudofaeces directly into the water column (Bender and Davis, 2012)."	Western Atlantic	X	X	✓ (GS03, GS07, GS09, GS10, GS11, GS13, GS15, GS21, GS24, GS26)

Figure 3.2

3.1.4 Presence of marine INNS elsewhere in the Tees estuary and within the offshore disposal sites from site-specific survey

A benthic ecological survey was undertaken within the Tees estuary in March 2019 to inform the Northern Gateway Container Terminal (NGCT) Environmental Impact Assessment (EIA). The 2019 NGCT survey comprised the recovery of 44 subtidal 0.1m^2 Day grabs within the Tees estuary, approximately 1km downstream of the South Bank quay footprint. Two non-native species were identified within the 2019 NGCT survey, namely *Theora lubrica* (a small bivalve) and *Yoldiella c.f hyperborea*. *Yoldiella c.f hyperborea* was also found within samples recovered from the Tees Bay C and Tees Bay A offshore disposal sites during the 2019 NGCT survey.

3.1.5 WFD marine INNS

The United Kingdom Technical Advisory Group (UKTAG) was established to provide advice on technical aspects of the implementation of the WFD in the UK. The UKTAG considers that non-native species are one of the significant pressures which could prevent a water body from achieving good status. The UKTAG Alien Species Group was set up to assess the risk of non-native aquatic species. To assess the risk, non-native aquatic species have been assigned to one of four categories; high, moderate, low or unknown impact. High-impact species are defined as “alien species, known to be invasive, which have caused documented harm in habitats where they have become established”. The degree of risk depends on a number of factors including: the present location (e.g. already in the water body, in a nearby water body); availability of suitable habitat within the water body; presence/absence of known competitors; and factors which might increase the task of a non-native species becoming established (e.g. release of ballast water (UKTAG, 2015)).

The impact classifications of aquatic alien species are used to determine the WFD classification; where high-impact species are present the WFD classification may be downgraded depending on evidence of any adverse impacts. Sites where a high-impact species has become established cannot be classified as ‘high’ status and will fail to reach ‘good’ status if there is more than a light adverse impact on any of the biological elements (UKTAG, 2015).

None of the marine INNS found within the 2020 site-specific survey have been assigned risk impact ratings by the UKTAG to date (and consequently none of the high, medium or low risk species on the UKTAG’s list were present). A review of the GB Non-native Species Secretariat website has also been undertaken to determine if any of the marine species found in site-specific survey are classified as high risk; none of the marine species are included on the list developed by the Secretariat.

3.2 Understanding how INNS can be introduced to the site and identification of activities that could introduce or spread INNS

As noted in Section 2, the proposed scheme is anticipated to require the use of vessels and vehicles to support with the transport of construction materials to site. A range of other plant (predominantly land based, plus dredging vessels) will be required to construct the scheme. The construction phase therefore has potential to introduce a range of INNS to the area, especially if the vessels, vehicles and equipment to be used during construction have come from areas which also contain INNS and have similar environmental conditions to those in and immediately adjacent to the Tees estuary.

It is not considered feasible / practicable to assess where each bit of equipment / vehicle / vessel to be used during construction has previously been used; however, for the purposes of this document it is considered (as a worst case) that vessels, vehicles and equipment could have been used in similar environments to the Tees where invasive species could be present.

The construction phase activities that could present a risk of introducing or spreading terrestrial and marine INNS are presented in Table 3.3. These activities have been identified from the information in Section 2.

Table 3.3 Activities which present the risk of introducing or spreading INNS

Reference	Construction activity and brief description	Details of the activity risk to introducing or spreading INNS	Potential risk (low, medium, high)
1	Use of vessels to transport construction materials to site and undertake capital dredging	The construction phase will require the use of vessels (to both transport construction materials to site and undertake capital dredging and disposal activities). The exact number of vessels required and their origins has not been finalised at this stage. It is possible that such vessels could transport INNS into the Tees estuary (especially if they are arriving from a port / location which does not routinely transport goods to the Tees estuary, is known to contain INNS and has similar baseline conditions to the Tees estuary). Marine INNS could be attached to the hull of vessels, anchors and propellors, or they could be carried in ballast water (or residual water left in the hopper of dredging vessels from previous dredging campaigns).	High
		There is a risk that the rock to be used in the berth pocket may have INNS present on its surface on arrival to the site. The potential for INNS to be present on the rock is considered unlikely given the proposals to source rock directly from quarries in Scandinavia. Should any INNS present on the rock be able to survive both outside of water and within the tidal Tees estuary (which is considered highly unlikely), there is a risk that INNS could be spread into the Tees estuary as the rock is placed on the bed of the estuary.	Low
2	Transport of construction materials, plant and personnel to site by road introducing invasive INSS	A large number of construction vehicles will be required to transport materials and personnel to site. It is possible that such equipment and vehicles to be used during construction could transport terrestrial INNS from other construction sites (especially if the equipment and vehicles have arrived from sites known to contain terrestrial INNS). Construction staff arriving and leaving site may also unknowingly be carrying INNS on their personal protective equipment (PPE) from other construction sites.	High
3	Excavation of landside soils (including set up of site compound within the Phase 2 footprint)	Japanese rose has been identified locally within the very upstream area of Phase 1. The excavation, and re-use of soils from this area could therefore result in the spread of Japanese rose to other areas of the site (via wind should the soils containing Japanese rose be stockpiled or via direct placement of the soils in other areas around the site). Japanese knotweed has been identified within the Phase 2 boundary, in close proximity to the site compound required for Phase 1 (shown on Drawing PC1084-RHD-SB-DN-DR-C-1395).	High
4	Excavation of intertidal sediments to create the berth pocket.	A number of marine INNS have been identified within the intertidal core samples recovered during 2020. The excavation of this material (and the resulting disturbance of sediments) to create the berth pocket has potential to spread marine INNS to other areas of the Tees estuary via tidal currents. None of the species found within the intertidal sediments during the site-specific survey are contained on the UKTAG list of high, medium or low impact species. In addition, marine INNS (albeit different species) have been found in other recent surveys undertaken within other areas of the Tees estuary. In addition, as detailed in the EIA Report it is predicted that suspended	Low

Reference	Construction activity and brief description	Details of the activity risk to introducing or spreading INNS	Potential risk (low, medium, high)
		sediment would likely re-settle in areas close to the excavation activity due to the low tidal currents in the Tees (and would therefore be unlikely to spread significant distances).	
5	Demolition of marine infrastructure	The scrape samples from the 2020 survey confirmed the presence of *Austrominius modestus* on South Bank wharf and the two jetties immediately downstream. The use of mechanical plant to remove this infrastructure could result in individual barnacles becoming dislodged and travelling on the tidal currents to other infrastructure within the Tees. The barnacle is not included as a high risk species on the GB Non-native Species Secretariat website, and is not included on the UKTAG's list of high, medium or low impact species. As the barnacle was found in virtually all scrape samples recovered during 2020, and there is a significant amount of hard infrastructure already present in the Tees estuary, it is highly likely that this species is present throughout the estuary (although survey work has not been undertaken to confirm this). Given the low tidal currents in the Tees, any individuals that are dislodged during the removal process are unlikely to travel significant distances up or downstream. Ultimately, the infrastructure to be removed during construction will result in the permanent removal of the individuals attached to the infrastructure from the Tees estuary (as the infrastructure will be demolished and removed from the river).	Low
6	Capital dredging of marine sediments with offshore disposal into the Tees Bay C disposal site.	A number of marine INNS were identified within the subtidal sediments during the 2020 site-specific survey (and the 2019 NGCT survey). The dredging works have potential to result in spread of INNS present within sediments to other areas of the Tees (due to resuspension of sediments) and the Tees Bay C offshore disposal site (due to offshore disposal). Given the presence of contamination within some of the marine sediments within the proposed berth pocket, material is to be removed from a specific area of the berth pocket using an enclosed grab or similar. This approach will result in the release of virtually no suspended sediment during dredging, which will minimise the risk of spreading marine INNS to other areas. In addition, the material to be removed using the enclosed grab or similar is to be disposed of to land, and therefore once dry any marine INNS present would die. The disposal of dredged material from the other areas of the proposed dredge footprint (which does not require the use of an enclosed grab) has potential to spread marine INNS to other areas of the Tees and the offshore disposal site. However, maintenance dredging of the Tees estuary is undertaken on a daily basis with material disposed offshore. In addition, marine INNS have already been identified within the offshore disposal areas (Tees Bay C and Tees Bay A) during the 2019 NGCT survey. As detailed in the EIA Report it is predicted that suspended sediment would likely re-settle in areas close to the excavation activity due to the low tidal currents in the Tees (and would therefore be unlikely to spread significant distances). Based on the above, it is considered that the risk of spreading marine INNS during the dredge is low risk.	Low

Reference	Construction activity and brief description	Details of the activity risk to introducing or spreading INNS	Potential risk (low, medium, high)
7	Construction of a new solid piled quay structure set back into the riverbank	Refer to reference 1, 2 and 3. The presence of new artificial hard surfaces following construction of the proposed quay represents habitat that could be available for colonisation by marine INNS. The construction of a new quay wall is not considered likely to actively spread or introduce INNS into the Tees estuary, however, it does provide habitat which could become colonised by marine INNS which prefer hard surfaces (including the *Austrominius modestus* barnacle). However, given the prevalence of the *Austrominius modestus* barnacle during the site-specific survey and the extent or artificial hard surfaces already present within the Tees, it is considered likely that the barnacle is likely to be present elsewhere throughout the Tees.	Low

As noted in Table 3.3, there are a number of activities required during construction which are considered to be high risk and low risk of introducing and spreading INNS. The biosecurity control measures proposed to manage the high risk activities are detailed in Section 3.3. It is considered that best practice control measures to be implemented by the Contractor would minimise the risk of spreading or introducing INNS from the low risk activities, and therefore specific control measures for these are not considered necessary. The activities which have been categorised as low risk of spreading or introducing INNS are not considered further in this report.

3.3 Biosecurity control measures

This section of the report details the control measures to be adopted during construction to reduce the risk of introducing or spreading INNS.

3.3.1 Use of vessels to transport construction materials to site and undertake capital dredging

The exact number of vessels required during construction, their frequency of arrival / departure into the Tees and their origin has not been finalised at this stage. It is therefore not possible to undertake a detailed assessment of risk associated with transport of marine INNS to the Tees estuary from dredging or construction related vessels.

The information presented below therefore represents a strategy which should be adopted by the Contractor to minimise the risk of spreading or introducing INNS. Further assessment / consideration will be required by the Contractor when selecting the vessels to be used during construction and prior to transporting them to site; the assessment required by the Contractor is outlined below.

Generic measures to be adopted by the Contractor

The following generic measures are to be adopted by the Contractor with regard to the use of vessels to transport construction materials to site and undertake capital dredging:

- All vessels of 400 gross tonnes (gt) or above will be in possession of a current international anti-fouling system (AFS) certificate.
- All vessels of 24m or more in length (but less than 400gt) will carry a declaration on AFS signed by the owner or authorised agent accompanied by appropriate documentation.
- Details of all ship hull inspections and biofouling management measures will be documented by the Contractor and, where applicable, recorded in the Contractor's planned maintenance system.

- Each vessel to be used will implement biofouling management practices, including the use of anti-fouling systems and other operational management practices to reduce the development of biofouling. Each ship should also have a biofouling management plan which is specific to the ship and included in the ship's operational documentation.
- All submersible / immiscible equipment will be subject to pre-use and post-use inspection, including checks for the presence of marine growth. All equipment will need to be free of marine growth prior to mobilisation to site.
- All vessels are required to be compliant (where applicable) with the International Convention for the Control and Management of Ships' Ballast Water and Sediments Convention, developed and adopted by the International Maritime Organisation (IMO) (i.e. ships of 400gt and above designed / constructed to carry ballast water and operating in waters of more than one Member State), specifically:
    - Where relevant, management of ballast water will be undertaken in accordance with an approved Ballast Water and Sediments Management Plan and records of such management will be kept in a Ballast Water Record Book in accordance with the provisions of the Convention.
    - A requirement, where possible, and if required, for ballast water exchange to take place at least 200nm from the nearest land and in 200m depth of water.

Detailed vessel risk assessment to be undertaken by the Contractor

The Contractor will complete a biosecurity risk assessment for each individual vessel to be used during construction. The assessment will be undertaken in accordance with that detailed in Appendix B of the Marine Biosecurity Planning guidance (Scottish Natural Heritage and Firth of Clyde Forum, 2014), and will comprise the following staged approach:

- Step 1 – List site activities.
- Step 2 – Describe the activities.
- Step 3 – Split activities into tasks.
- Step 4 – Establish critical control points and control measures.
- Step 5 – Develop an action plan.

The assessment to be undertaken by the Contractor will take account of the following questions, as detailed in the aforementioned guidance:

- Has the vessel / equipment just arrived from UK territorial waters?
- Has the vessel / equipment had an anti-fouling coating applied to submerged structures within the last 12 months (or time recommended by manufacturer)?
- Are all the visible submerged surfaces free of bio-fouling (a green 'slime' is OK)?
- Do the visible submerged surfaces have more than a green 'slime' coating?
- Does the vessel / equipment have noticeable clumps of algae and / or animals clinging to the visible parts of the hull / rudder / propellor?
- Has the vessel / equipment just arrived from another country, region or water body with similar environmental conditions (e.g. seawater temperature)?
- Has the vessel / equipment just arrived from a water body known to have INNS present?
- Does the vessel / equipment spend long periods of time stationary at sites in between anti-fouling treatments?
- Is the vessel slow moving, such as a construction barge or drilling rig?

The assessment will determine the requirement for any further site-specific biosecurity measures that need to be implemented prior to transporting the vessel to the site and using as part of the construction phase

(which may include, for example, selecting an alternative vessel should the particular vessel in question be coming from an area which is known to contain high risk invasive species with similar environmental conditions to those within the Tees estuary).

A short marine INNS management report will be produced by the Contractor based upon the risk assessments and action plans developed for individual activities. These will be collated by the Ecological Clerk of Works and checks undertaken as part of a regular audit process to ensure mitigation measures are being appropriately applied.

3.3.2 Transport of construction materials, plant and personnel to site by road introducing invasive INSS

The movement of road vehicles has been shown to act as a pathway for the spread of INNS, where plant seeds and propagule are transferred in the tread of tyres. This pathway can result in the spread of seeds, plant material etc. which are picked up more easily on vehicular tyres than by other means of transportation. In addition to the type of plant, the season, weather, and environmental conditions effect the transport of INNS via vehicles (Von der Lippe & Kowarik, 2007; Ansong & Pickering 2013). The use of vehicles to transport personnel, construction materials and equipment to site therefore provides a mechanism for the transport of terrestrial INNS to site.

It is therefore vital that all road vehicles and machinery entering and leaving the site follow the biosecurity measures of the GB NNSS “check, clean, dry” guidance.

The following biosecurity protocols should be adopted by the Contractor as a minimum:

- All vehicles arriving on site should be checked to ensure that they are clean and free from any INNS prior to entering the site.
- If soil or other material is imported to the site, the Contractor shall gain documentation from suppliers to ensure that it is free from invasive species.
- Ensure footwear of construction workers is clean (visually from soil and debris) before entering and leaving the site.
- Ensure vehicles are kept clean, in particular removing any accumulated mud before entering and leaving the site.
- Ensure facilities (i.e. use of disinfectant) are provided on the site to clean footwear / equipment / vehicles prior to entering and leaving the site.
- Ensure appropriate disposal of removed material and/or disinfectant used to clean footwear / equipment / vehicles.
- Keep access to a minimum and ensure all vehicles and personnel keep to established tracks, with vehicles parked within designated areas and/or hard standing.
- Where possible avoid areas with known INNS.

Through the adoption of these measures, site vehicles and/or personnel visiting/working on multiple sites can be managed to ensure that the transport of INNS onto site is avoided as far as is practicable.

3.3.3 Excavation of landside soils (including establishment of the site compound for Phase 1 within the Phase 2 footprint)

3.3.3.1 Japanese knotweed

Japanese knotweed is listed under Schedule 9 to the Wildlife and Countryside Act 1981 and as such, it is an offence to plant or otherwise allow this species to grow in the wild. It must be prevented from spreading

into the wild. Any soil or plant material contaminated, or potentially contaminated, with Japanese knotweed can result in ecological damage and is classified as controlled waste.

The control and monitoring of Japanese knotweed will be the responsibility of the appointed Contractor to ensure the implemented control measures (detailed below) are effective and do not result in the spread of this invasive species.

An area of Japanese knotweed has been recorded within the Phase 2 quay construction footprint; although this INNS management plan relates only to Phase 1, it is understood that parts of the Phase 2 quay footprint will be required to construct Phase 1 (i.e. to house the Phase 1 site compound). It is therefore possible that the Japanese knotweed known to be present within the Phase 2 area could be subject to disturbance during Phase 1, and ultimately there is a risk of spreading this species to other areas (both on and off site).

The exact location of the site compound is yet to be confirmed, and therefore it is unknown at this stage if the Contactor will be required to physically interfere with the Japanese knotweed. Measures have been outlined below which are to be undertaken for both scenarios, namely working in an area adjacent to the known Japanese knotweed (with no physical interaction with it), and working within the area containing knotweed (requiring physical interaction with it).

Any works conducted to control or eradicate this invasive weed should be completed in accordance to the Environment Agency 'Treatment and disposal of invasive non-native plants: RPS 178 (Nov 2016)' and 'PCA (2014) Code of Practice for the management of Japanese knotweed, (V2.7).

Measures to be undertaken assuming no physical interaction required with Japanese knotweed during implementation of Phase 1

For works that are not within an area where Japanese knotweed is known to be present, but are within its proximity, the area containing Japanese knotweed should be fenced off and isolated from any activities on site immediately to avoid potential knotweed spread. The fencing will be erected at least 7m (but where possible up to 10m) away from any visible knotweed growth to protect rhizomes close to the surface from disturbance (see PCA (2014) Code of Practice for the management of Japanese knotweed, (V2.7) and Environment Agency 'Treatment and disposal of invasive non-native plants: RPS 178 (Nov 2016))'.

The following site protocol measures will need to be implemented by the Contractor:

- Establish the possible extent of the Japanese knotweed rhizome (root) system underground – as a minimum up to 7m horizontally and 3m vertically.
- Fence off the infested areas prior to works commencing and ensure fencing remains in place for the duration of the works.
- Clearly identify and mark out infested areas; erect signs to inform all site personnel of the risk and include within the environmental tool-box talks to be given to staff.
- Undertake regular checks of the fencing to ensure it remains in-tact and clearly demarcating the area restricting access.
- Ensure no access to the fenced area occurs throughout the duration of the works.

Measures to be implemented assuming physical interaction required with Japanese knotweed during implementation of Phase 1

Should physical interaction with the Japanese knotweed be required as part of the construction for Phase 1, the options available to the Contactor to treat the knotweed comprise spraying with chemicals, burying it and / or burning it. The treatment method to be used will be the responsibility of the Contractor, and the

Contractor will also be responsible for ensuring the implementation of control measures detailed below to minimise the risk of spreading this invasive species.

No material is to leave site from the Japanese knotweed areas, except as part of specially supervised knotweed treatment works. No new materials should be stored in or adjacent to, Japanese knotweed areas. Depending on which treatment option is chosen, permissions / consents (e.g. environmental permit, waste exemption etc.) may be required for its disposal; the Contractor will be responsible for ensuring the necessary permissions / consents are in place prior to disposal. Should the Japanese knotweed waste require off-site disposal, all vehicles must be brushed down or jet washed to clear them of any Japanese knotweed as well as being subject to visual inspection to check there are no trapped pieces of plant or rhizomes, prior to leaving site.

The following site protocol measures will need to be implemented:

- Establish the possible extent of the Japanese knotweed rhizome (root) system underground – typically up to 7m horizontally and 3m vertically.
- Fence off the infested areas prior to construction works where possible in order to avoid spreading seeds or plant fragments around or off the construction site.
- Clearly identify and mark out infested areas; erect signs to inform all site personnel of the risk and include within the environmental tool-box talks to be given to staff.
- Avoid, where possible using machinery with tracks in infested areas.
- Clearly identify and mark out areas where contaminated soil (with Japanese knotweed) is to be stockpiled on site (this cannot be within 50m of any watercourse or within a flood zone).
- Vehicles leaving the site to be inspected for any plant material and washed down into a contained area.
- Vehicles used in the transport of contaminated material will need to be visually checked and washed down into a contained area before being used for any other work, either on the same site or at a different site.
- Material gathered in dedicated wash down contained areas will need to be appropriately treated along with other contaminated soil on site.
- Ensure all site users are aware of measures to be taken and alert them to the presence of the INNS management plan.
- Erection of adequate site hygiene signage in relation to the management of material containing INNS.

Information relating to the presence, measures and agreed treatment of Japanese knotweed will be clearly displayed on site and checked by the Ecological Clerk of Works as part of their regular audit process to ensure mitigation measures are being appropriately applied.

3.3.3.2 Japanese rose

Two stands of Japanese rose have been recorded at the upstream end of the Phase 1 works boundary. Japanese rose is listed under Schedule 9 to the Wildlife and Countryside Act 1981 and as such, it is an offence to plant or otherwise allow this species to grow in the wild. Given the location of this species, there will be the need for excavation of soils in this area during Phase 1.

There are two options which could be adopted by the Contractor to control and remove Japanese rose, namely mechanical or chemical control. Mechanical control could include the cutting of Japanese rose several times a year over a number of years which overtime can reduce its spread (infestation) or the plants and root system can be excavated. However, it should be noted that the entire root systems need to be

removed, and all excavated material must be disposed of at a licenced landfill site. The chemical control method comprises the application of a herbicide.

Regardless of the method chosen, the following biosecurity protocols will be implemented as a minimum when working in and around the two stands of Japanese rose:

- All site personnel and vehicles will be inspected on their arrival to site to ensure that they are clean and free from any evidence of Japanese rose.
- All site personnel are to ensure their footwear is clean (visually from soil and debris) before leaving the site.
- All vehicles are to be kept clean - in particular any accumulated mud will be removed before leaving the site.
- Ensure facilities (i.e. use of disinfectant) are provided on site to clean footwear / equipment / vehicles and ensure these are used prior to entry and departure from the site.
- Ensure appropriate disposal of removed material and/or disinfectant used to clean footwear / equipment / vehicles.
- All access within and out of the area containing Japanese rose will be kept to a minimum.
- All site personnel and vehicles working in or around the areas of Japanese rose are to keep to established tracks and vehicles are to park within designated areas and/or areas of hard standing.

The chosen method to control and monitor Japanese rose will be the responsibility of the Contractor to ensure the control measures are implemented, are effective and do not result in the spread of this invasive species.

Regular inspections will be required (and will be the responsibility of the Contractor) to check for signs of re-colonisation following the implementation of the selected control method to note any signs of re-growth. If required, remedial measures (i.e. repeating of the selected control measure) will be undertaken.

Information relating to the presence, measures and agreed treatment of Japanese rose will be clearly displayed on site and checked by the Ecological Clerk of Works as part of their regular audit process to ensure mitigation measures are being appropriately applied.

4 SITE SURVEILLANCE AND REPORTING

As detailed in the Marine Biosecurity Planning guidance (Scottish Natural Heritage and Firth of Clyde Forum, 2014), the early detection of an INNS on site is important as this will increase the likelihood of successful containment and the potential for full eradication.

This section of the report outlines the actions to be implemented by the Contractor to encourage and support the monitoring for INNS within the site boundary as well as on any vessels / vehicles brought onto site; these are detailed in Table 4.1.

Table 4.1 Site surveillance and reporting actions prior to and during construction

Action	Responsibility	When
All site staff to be trained on the importance of INNS awareness, identification and the reporting procedure.	Contractor	Prior to works commencing
All staff to be made aware of the Check, Clean, Dry protocol and its importance throughout the period of construction.	Contactor	Prior to works commencing
All site staff to be provided with INNS identification material.	Contractor	Prior to works commencing
All site staff instructed to report any potential INNS found when undertaking works (beyond those which are already known to be present on site).	Contractor	Throughout construction works
Ensure all material imported to site is inspected. Delivery drivers must confirm the origin and type of material being delivered on arrival to the site.	Contractor	Throughout construction works
Oversee implementation of contingency plan (detailed below) should INNS (apart from those already known to be present on site) be suspected.	Contractor	Throughout construction works

4.1 Contingency plan

If the biosecurity control measures detailed in Section 3 fail to be successful and INNS are introduced and/or spread as a result of the construction works, contingency protocols must be implemented. The required actions are detailed in Table 4.2.

Table 4.2 Contingency plan if INNS are introduced and/or spread as a result of the construction phase

Action	Responsibility
Stage 1 – Suspected arrival of high alert species	
Stop works, collect sample, take photograph and place in plastic bag.	Contractor
Conduct a survey to establish the extent and distribution of the INNS.	Contractor
Confirm identification of ‘suspect’ species and make note of the species, location and distribution in a biosecurity logbook.	Contractor
Inform neighbouring users of INNS and mark out the area.	Contractor
Stage 2 – Presence of high alert species confirmed	
Seek advice on the species and appropriate management.	Contractor
Initiate immediate containment measures.	Contractor
Carry out wider surveys of structures, vehicles and equipment throughout the site.	Contractor
Stage 3 – Eradication / long term control measures	

Action	Responsibility
Seek advice from the Environment Agency and Natural England on the most appropriate eradication measures and long-term control measures.	Contractor

5 SUMMARY

The construction phase of the South Bank quay scheme has potential to result in the introduction and spread of marine and terrestrial INNS. The activities considered to be at greatest risk of introducing and spreading INNS comprise:

- Use of vessels to transport construction materials to site and undertake capital dredging.
- Transport of construction materials, plant and personnel to site by road
- Excavation of landside soils known to contain invasive species (locally).

Providing the control measures detailed in Section 3 are implemented (including the detailed risk assessment to be undertaken by the Contractor for each vessel to be utilised), the risk of introducing or spreading INNS will be kept to a minimum. Together with implementation of site surveillance actions and the contingency plan (where required), the biosecurity risks associated with the construction phase are considered to be low.

6 REFERENCES

Ansong, M., Pickering, C. (2013) Are Weeds Hitchhiking a Ride on Your Car? A Systematic Review of Seed Dispersal on Cars. PLoS ONE 8 (11): e80275. https://doi.org/10.1371/journal.pone.0080275

Defra, 2015. The Great Britain Invasive Non-Native Species Strategy

GB Non-native species secretariat 2015 (GBNNSS) Alert list https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/455526/gb-non-native-species-strategy-pb14324.pdf

National Trust, undated. Rosa Rugosa an invasive species found at Sandscale Haws, available at: https://www.nationaltrust.org.uk/sandscale-haws-national-nature-reserve/features/rosa-rugosa-sandscale-haws. Accessed June 2021.

RHS, 2021. Japanese knotweed. Available at: https://www.rhs.org.uk/advice/profile?pid=218. Accessed June 2021.

UKTAG, 2015. Revised classification of aquatic alien species according to their level of impact. Version 7.6. UK Technical Advisory Group on the Water Framework Directive

Von der Lippe, M., Kowarik, I. (2007) Long-distance dispersal of plants by vehicles as a driver of plant invasions. Conserv Biol (21) p. 986-996. doi:https://doi.org/10.1111/j.1523-1739.2007.00722.x. PubMed: 17650249.

Appendix 7.3: Main Contract Environmental Construction Plan

Drawing B3553F05-3000-DR-0448 Main Contract Environmental Construction Plan (Sh 1 – 7)

Appendix 7.4: Environmental Action Plan

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
1	**Embedded mitigation**				
1.1	Minimise the risk from accidental spillages of oils, fuels and chemicals	• Undertake construction in accordance with Pollution Prevention Guidelines (PPG) No.5 (Version 1.2, 2018). • All vessels to adhere to the requirements of the MARPOL Convention Regulations. • Works to be undertaken in accordance with the Construction Industry Research and Information Association (CIRIA) Coastal and marine environmental site guide (2nd edition) (C744); and CIRIA Guidance note C741 Environmental Good Practice on Site Guide (4th Edition). • Appropriate spill kits to be available around the site and staff to be trained to use them. • Suitable bunding and storage facilities to be employed to prevent the release of fuel oils, lubricating fluids associated with the plant and equipment into the marine environment.	Employer and Contractor		
1.2	Minimise the risk of material falling into the Tees estuary during demolition	• Best practice working methods to be adopted during demolition / excavation adjacent to the Tees estuary to ensure that transport of debris into the Tees is minimised as far as possible. • Should any debris fall into the river channel during demolition, this would be removed as early as practicable.	Contractor		
1.3	Minimise the risk of spreading invasive non-native species (INNS)	• A separate INNS management plan has been produced to minimise this risk (refer to Appendix A).	Contractor		
1.4	Minimise the risk associated with contaminated land	• Implementation of the measures detailed in the outline remediation strategy (Wood, 2019), comprising: ○ Placement of a capping layer on the surface in order to break pollutant linkages. This technique includes the	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		placement of either hardstanding or chemically 'suitable for use' materials up to 0.3m in thickness over contaminated ground. ○ Clean service runs are recommended to protect both future land users and utility assets. ○ Selective excavation and disposal at the adjacent hazardous waste facility of limited 'hotspots' of contamination to complement the capping layer remediation approach. ○ Testing of soils and materials for re-use within the proposed scheme footprint to determine their suitability. ○ Adherence to Construction (Design and Management) Regulations 2015. ○ Development of a materials management plan (MMP).			
2	**Marine sediment and water quality**				
2.1	Minimise reductions in water quality due to resuspension of contaminants during dredging	• The dredging activities may not commence until a water quality monitoring scheme has been submitted to and approved in writing by the MMO. The scheme shall include detail related to: ○ Baseline monitoring prior to commencement. ○ A programme to monitor dissolved oxygen levels and turbidity during dredging. ○ A programme to monitor post completion of the dredge. • Should a reduction of 1mg/l of dissolved oxygen be observed during dredging, the operations causing that effect should temporarily pause for a period of six hours or until the reading returns to the previously observed level.	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		• Use of an enclosed grab to dredge material in the vicinity of BH34 (exclusion zone as defined by the MMO) given the elevated concentrations of contaminants in sediment at that location. • The trailing suction hopper dredger (TSHD) and backhoe would be limited to working within one side of the river at a time. • Dredging operations will be undertaken in long strips along the axis of the estuary rather than dredging across the width of the river.			
2.2	Minimise release of sediment during riverbank excavation to create berth pocket	• Control measures to be put in place to reduce spills as far as possible and use of a backhoe to remove the material. • Removal of as much material as possible at low water and therefore out of the water.	Contractor		
3	**Land quality and geology**				
3.1	Minimise impacts on groundwater quality during earthworks and piling	○ Prior to commencement of construction activities/relevant phase, a programme of site characterisation works is to be undertaken and submitted to RCBC to ascertain if contaminants are present in concentrations that could result in pollution to controlled waters. The programme shall include the following components: A preliminary risk assessment which has identified: ○ all previous uses ○ potential contaminants associated with those uses ○ a conceptual model of the site indicating sources, pathways and receptors ○ potentially unacceptable risks arising from contamination at the site	Employer and Contractor		
3.2	Minimise impact on surface water quality from discharge of dissolved phase contaminants in groundwater and surface runoff		Employer and Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off-site. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action. Any changes to these components require the written consent of RCBC. The scheme shall be implemented as approved. • A Piling Risk Assessment shall be submitted to and approved in writing by RCBC prior to commencement of piling. Any mitigation measures identified as part of the assessment shall be implemented throughout the construction phase unless agreed in writing.			
3.3	Minimise impacts on human health due to construction	• Construction works will follow best practice and guidance including compliance with the Health and Safety at Work Act 1974 legislation, Construction (Design and Management)	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		Regulations 2015 and Control of Substances Hazardous to Health (COSHH) Regulations. • This will include the production and adoption of site and task specific health and safety plans. • The plan will outline the use of risk mitigation strategies including appropriate Personal Protective Equipment (PPE), provision of welfare facilities and relevant good working practices applied to avoid potential risk to human health from any potential ground contamination, in line with relevant available guidance. • Adoption of measures outlined within the air quality section of this CEMP.			
4	**Marine ecology**				
4.1	Minimising / offsetting direct loss of habitat	• Use of verti-pools on the quay face at different heights within the tidal frame. • Implementation of measures within the South Tees Regeneration Masterplan Environment and Biodiversity Strategy. • Minimising the footprint of the proposed dredge as far as practicable within the constraints of delivering a development that meets the operational need.	Contractor		
4.2	Minimise the risk of spreading or introducing INNS species	• Adoption of the measures set out in the INNS management plan (Appendix A).	Contractor		
5	**Marine mammals**				
5.1	Minimise disturbance to marine mammals from underwater noise, vessel interaction, disturbance at haul out sites, changes in water and quality and changes to prey resource	• No mitigation measures required beyond the adoption of best practice working measures.	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
6	**Terrestrial ecology**				
6.1	Minimising disturbance or loss of foraging and commuting habitat for bats	• Night-time lighting of construction working areas to be minimised where possible. • If night-time lighting is required, it will be designed in accordance with the Bats and artificial lighting in the UK (BCT, ILE, 2018) and Guidance Notes for the Reduction of Obtrusive Light (ILE, 2011). This is likely to require: ○ No direct lighting of the water's edge, or nearby scrub habitats and use of dark buffer zones. ○ Consideration of appropriate luminaire specifications, sensitive light configuration, screening, glazing, dimming and part-night lighting.	Contractor		
6.2	Minimising indirect disturbance or injury to commuting otters	• Specific otter tool-box talks will be provided to all construction staff by a suitably qualified ecologist prior to works commencing. • The working methodology will follow construction industry good practice guidance detailed in Section 11.2.2 of the EIA Report. • Screening will be used (where possible and feasible to do so) against the river edge to reduce the noise and visual impacts from construction on foraging / commuting otters. • Where artificial light if required, it will be directed away from the river to allow otters to migrate through the area undisturbed. • A pre-construction otter survey will be undertaken eight weeks prior to construction starting (to allow time for a Natural England disturbance licence application, if required) to re-assess otter activity. The survey will be undertaken within the proposed footprint of construction plus a 250m buffer zone,	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		to determine current use at the time of construction (otters may increase their use of the site in the interim period between the current survey and the commencement of construction). The surveys will be undertaken in appropriate weather condition and following guidance in the 'New Rivers and Wildlife Handbook' (Holmes et al, 1994), Chanin (2003) and Strachan & Jefferies (1996). Should an active resting site be found, a European Protected Species licence is likely to be required to undertake work within the area. Consultation will be required with Natural England to discuss the mitigation measures required, which will subsequently form the basis of the otter licence. This is likely to include the following: ○ Construction vehicles and equipment should not be active on, or stored by the riverbank for longer than is essential. ○ The risks can be further reduced by following best practice and guidance produced by Design Manual for Roads and Bridges (DMRB Volume 10 section 4). ○ An Ecological Clerk of Works (ECoW) will be present during the works. Work should stop should an otter holt or resting place be found within 250m, and Natural England consulted, as a licence may be necessary before works can continue. ○ A temporary ramp will be placed in trenches over 0.5 m deep in order to allow a potentially trapped animal to exit the trench. ○ Any open pipes will be capped to prevent animals gaining access.			

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		○ All excavations and pipe systems will be checked at the start of each working day.			
6.3	Minimising disturbance / harm to breeding birds or destruction of nests	• The removal of trees, scrub, buildings, structures or other habitat with the potential to support breeding bird nests will be undertaken outside the breeding bird season where possible (which is typically March to August inclusive) to remove the risk of damage or destruction of active nests • Should this not be possible, a nesting bird survey will be undertaken by a suitably experienced ecologist immediately prior to works commencing.	Contractor		
6.4	Minimising disturbance and habitat loss to brown hare / hedgehog	• Areas of potential habitat containing hedgehogs will be cleared gradually, leaving areas of scrub where possible as these may provide nesting habitat and/or shelter for hedgehogs, if present. If this is not possible, piles of dead wood and/or brash piles will be created in areas outside of working areas to mitigate for the removal of potential habitat. • Placement of temporary shelters, such as hedgehog house, will be placed where habitat connectivity for hedgehogs may have been removed. • As a precaution, deep trenches and excavations dug across the proposed scheme footprint will be covered overnight or be left with a plank or similar material with a slope no more than 45°, in order to allow hedgehog and small mammals to exit trenches or excavations if they fall in. • Any netting to be used during construction will be kept off the ground to avoid any entanglement of hedgehogs (or other animals) and any loose netting will be securely tied.	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		• All rubbish associated with the site works will be kept in contained and designated areas to avoid animals becoming trapped in litter. • In the event that a hedgehog is found during the works and/or welfare of an animal is concerning, the Ecological Clerk of Works is to be contacted to seek guidance on the next steps to be taken. This may include contacting the Hedgehog Preservation Society.			
6.5	Minimise the risk of spreading or introducing terrestrial INNS	• Adoption of the measures detailed in the INNS management plan (Appendix A)	Contractor		
6.6	Offsetting loss of terrestrial habitat	• Part A) No development shall take place until a Biodiversity Assessment is submitted to, and approved in writing by, the Local Planning Authority. The assessment will: ○ Identify and measure biodiversity unit loss (in habitats and river units) resulting both directly and indirectly from the approved development. • Any subsequent variations to this assessment, shall be agreed in writing by RCBC. • Following the Biodiversity Assessment, and within 12 months of the grant of this planning permission, an Environment and Biodiversity Strategy shall be submitted to, and agreed in writing by RCBC which confirms the approach to ensuring biodiversity loss (identified in Part A) is to be mitigated within the development site, and where demonstrated not to be feasible, to be compensated for off-site, together with the mechanisms for its provisions and on-going management.	Employer		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		• The Strategy shall be approved by RCBC. The identified mitigation and, where demonstrated to be necessary and feasible, compensation, shall be provided in accordance with the Strategy and any subsequent agreed amendments to it, and shall be implemented within 12 months of operation.			
7	**Marine and coastal ornithology**				
7.1	Minimising impacts associated with loss of supporting habitat due to dredging and excavation / demolition works	• Surveys should be undertaken to check for the presence of potential nesting habitat and nests prior to demolition and other construction-phase works, if undertaken during the breeding season (March to August). In the event that nests are identified, an exclusion zone would be established around the nest and works not permitted within the exclusion zone until the nest is confirmed as no longer in use. This would be overseen by an experienced ornithologist.	Contractor		
7.2	Minimising impacts on feeding and food resources due to reductions in water quality	• Adoption of measures detailed in Reference 2.1.	Contractor		
7.3	Minimising noise and visual disturbance to birds	• Use of noise reduction shrouding on piling rigs. • Adoption of measures detailed in Reference 2.1. • Construction lighting will be installed in a manner that reduces (where possible) light spill over the river.	Contractor		
8	**Fish and fisheries**				
8.1	Minimising impacts to fish due to reductions in water quality from dredging	• Adoption of measures detailed in Reference 2.1.	Contractor		
8.2	Minimising impacts to fish due to underwater noise from dredging	• Adoption of measures detailed in Reference 2.1. This will help to ensure that noise levels at the opposite side of the river from the dredger remain as low as possible over a dredge/disposal cycle.	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
8.3	Minimising impacts to fish associated with loss / alteration of habitat and food resources	• Adoption of measures detailed in Reference 4.1.	Contractor		
8.4	Minimising impact to fishing activities	• As a matter of course PD Teesport will manage any conflicts with vessels through coordination via the Harbour Master and use of Vessel Traffic System. • Notices to Mariners will be issued prior to works commencing informing other operators of proposed works.	Contractor		
9	**Commercial and recreational navigation**				
9.1	Minimising potential conflicts between construction activities and commercial navigation	• Adherence to risk control measures listed within the current Port Navigation Risk Assessment. • Use of the existing VTS. • Post dredge surveys and promulgation. • Issue of Notices to Mariners at appropriate times. • Regular liaison between the Contractor and the Harbour Master. • Development of a robust Safety Management System which would be implemented and adhered to. • Construction vessels would use appropriate signals as required by International Regulations to allow safe navigation.	Contractor		
10	**Traffic and transport**				
10.1	Minimising disturbance to the highway network	• Development of a Construction Traffic Management Plan (CTMP) which would be implemented and adhered to.	Contractor		
11	**Archaeology and cultural heritage**				
11.1	Loss of assets due to demolition	• A suitable record of the structures to be demolished (South Bank wharf and the three downstream jetties) will be prepared prior to demolition, anticipated to comprise a	Employer and Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		photographic record and drone footage of the wharf and jetties. • The suitability of this record will be confirmed in advance of demolition with RCBC and submitted to the RCBC HER.			
11.2	Minimising risk of impact to any submerged heritage assets during dredging / excavation	• An archaeological reporting protocol will be adopted to mitigate the potential impact on any as yet unidentified marine archaeological remains arising from construction activities. • The protocol will be formalised in a Written Scheme of Investigation (WSI) which will be produced by a suitably qualified marine archaeological specialist. • The WSI shall make provision for: ○ Before development commences, and taking into account the evaluation where relevant, an agreed site monitoring strategy that provides for interpretation and recording of areas of expected archaeological sensitivity, and for any unexpected discoveries of archaeologically significant deposits or structures. ○ The systematic recording by photographic and photogrammetric means (including drone survey where appropriate) of structures to be demolished (including old jetties, pumping and custom houses) ○ Reasonable notification to the local planning authority of commencement and completion of archaeological work. ○ Details of staff involvement in carrying out of archaeological work, and their qualifications and responsibilities.	Employer and Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		○ The timetable for completing any post-excavation assessment, archiving and report.			
12	**Noise and vibration**				
12.1	Minimising on-site construction noise and vibration	• No mitigation measures are required beyond best practice measures to minimise noise and vibration risks to human receptors. • As detailed on the planning permission, works at the site can be undertaken 24 hours a day 7 days per week.	-		
13	**Air quality**				
13.1	Minimising construction dust and release of particulate matter	Communications • Display the head or regional office contact information and display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. Dust management • Develop and implement a CEMP (i.e. this document). • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. • Carry out regular site inspections to monitor compliance with the CEMP and record the results.	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		• Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Impose and signpost a maximum-speed-limit of 15 mph on surfaced, and 10 mph on unsurfaced, haul roads and work areas. • Implement a Travel Plan that supports and encourages sustainable travel for contractor operatives and staff (public transport, cycling, walking, and car-sharing). • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable. • Erect solid screens or barriers around dusty activities where practicable. • Take measures to control site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Cover, seed or fence stockpiles to prevent wind whipping. • Remove materials that have a potential to produce dust from site as soon as possible. • Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as			

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use covered skips where practicable. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. • Bonfires and burning of waste materials should not be permitted. Measures specific to demolition • Soft strip inside any buildings or structures before demolition. • Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. • In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.			

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		Measures specific to earthworks • Re-vegetate earthworks and exposed areas to stabilise surfaces as soon as practicable, or use hessian, mulches or trackifiers. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • Only remove the cover in small areas during work and not all at once. Measures specific to construction • Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Measures specific to trackout • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes where practicable, which are regularly damped down			

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Install a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where reasonably practicable. • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Locate site access gates at least 10 m from receptors where possible. Measures specific to Non-Road Mobile Machinery (NRMM) NRMM and plant should be well maintained. If any emissions of dark smoke occur, then the relevant machinery should stop immediately, and any problem should be rectified. In addition, the following controls should apply to NRMM: • All NRMM should use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004). • All NRMM will comply with regulation (EU) 2016/1628 of the European Parliament and of the European Council. • All NRMM should be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting). • The ongoing conformity of plant retrofitted with DPF, to a defined performance standard,			

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		should be ensured through a programme of onsite checks. • Implementation of energy conservation measures including: ○ instructions to throttle down or switch off idle construction equipment; ○ switch off the engines of trucks while they are waiting to access the site and while they are ○ being loaded or unloaded; and ○ ensure equipment is properly maintained to ensure efficient energy consumption.			
14	**Landscape and visual**				
14.1	Minimising effects on physical landscape features, landscape character and visual receptors	No mitigation measures required based on assessment presented in the EIA Report.	-		
15	**Flood risk and coastal defence**				
15.1	Minimising risk of flooding at and adjacent to the proposed scheme	• During the construction phase, a continuous defence line will need to be retained, using the existing, revised or a combined defence line (i.e. quay) such that a continued standard of protection will be provided throughout construction that is comparable with the existing.	Contractor		
15.2	Minimising vulnerability to flooding of those using the site	• The risk of a flood event occurring and its impact on human health can be controlled through the implementation of the following mitigation measures: ○ Development of a construction phase Flood Risk Emergency Plan (FREP). ○ Prior to works commencing, all construction workers will undergo site induction training prior to being	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action
		allowed access to the proposed scheme site. This will include actions required in the event of a flood risk emergency incident, such as those included in the FREP including obtaining flood warnings /alerts, responding to warning sirens and following escape routes in the event of a site evacuation. ○ No workers would be allowed on site unless they have undergone a site induction. ○ Arrangements will be identified and made for safe access to and from the site. ○ In the event of tidal surge and / or significant storm events, prior warning will be given to the site ○ users in order to cease construction works and evacuate site workers to higher ground.			
16	**Socio-economics**				
16.1	Minimise adverse socio-economic impacts	No mitigation measures required based on assessment presented in the EIA Report.	-		
17	**Climate change**				
17.1	Minimising the release of greenhouse gas emissions	• Reduce quantities of materials required during construction through efficient design, and use materials with a lower embodied GHG intensity where possible. • Ensure preference for materials that are locally sourced to minimise transport distances. • Implement a CTMP to minimise the number of journeys required during construction.	Contractor		

Reference	Objective	Actions to achieve objective	Responsibility	Comments	Further action

		• Use electrical powered construction plant over fossil fuelled construction plant.
		• Implement a Travel Plan that supports and encourages sustainable travel for contractor operatives and staff (public transport, cycling, walking, and car-sharing).
		• Ensure all vehicles switch off engines when stationary - no idling vehicles.
		• Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
		• Implementation of energy conservation measures with respect to the use of NRMM and plant, including:
		  ○ instructions to throttle down or switch off idle construction equipment;
		  ○ switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded; and
		  ○ ensure equipment is properly maintained to ensure efficient energy consumption.			

18	**Offshore disposal of dredged material**				
18.1	Minimising risk to navigation due to offshore disposal	• Dredged material is to be evenly spread within the offshore disposal site.	Contractor		

Appendix 7.5: Construction Traffic Management Plan

SEE CONSTRUCTION PHASE PLAN

Appendix 7.6: Materials Management plan

Appendix 7.7: Flood Risk Emergency Plan