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**York Potash Project
Habitats Regulations
Assessment: Part 2,
Appendix 11.3**

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Abbreviations

AA	Appropriate Assessment
AAS	Assessment of Alternative Solutions
bgl	below ground level
bCD	below Chart Datum
CBC	Common Bird Census
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
EMS	European Marine Site
EU	European Union
HRA	Habitats Regulations Assessment
IROPI	Imperative Reasons of Overriding Public Interest
LSE	Likely Significant Effect
MHF	Materials Handling Facility
MMO	Marine Management Organisation
Mtpa	Million tonnes per annum
MTS	Mineral Transport System
NYMNP	North York Moors National Park
NYMNPA	North York Moors National Park Authority
P&R	Park & Ride
PINS	Planning Inspectorate
RCBC	Redcar and Cleveland Borough Council
SAC	Special Area of Conservation
SPA	Special Protection Area
WeBS	Wetland Bird Survey
YPL	York Potash Limited
YPP	York Potash Project
ZOI	Zone of Influence

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1 INTRODUCTION AND BACKGROUND

1.1 Purpose of this Report

1.1.1 This report presents the findings of the Habitats Regulations Assessment (HRA) that has been undertaken for the York Potash Project (YPP) on behalf of York Potash Limited (YPL). It considers the YPP as a whole in the context of the Conservation of Natural Habitats and Species Regulations 2010 (the 'Habitats Regulations') and provides information to enable 'screening' of the YPP (inclusive of all project elements) with respect to its potential to have a Likely Significant Effect (LSE) on European sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) and Ramsar sites. LSE is, in this context, any effect that may be reasonably predicted as a consequence of the project affecting the conservation objectives of the qualifying features for which a site is designated, but excluding trivial or inconsequential effects (also refer to **Section 1.5**).

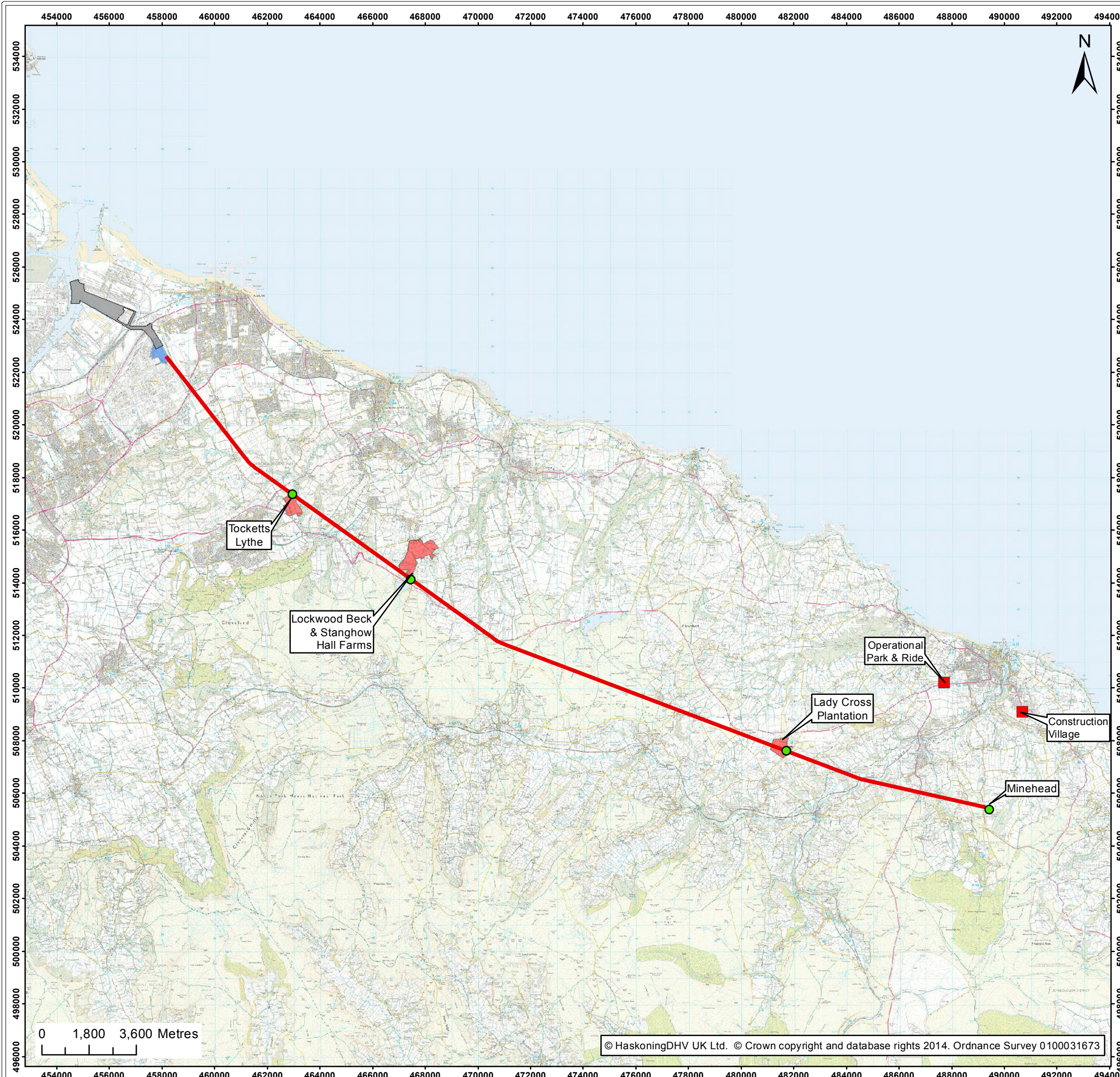
1.1.2 Following the information to enable screening of the YPP, this report provides the information required to enable a conclusion to be drawn with regard to the effect of the YPP on European site integrity. With regard to the YPP Harbour facility, further information will be provided as YPL's HRA for these facilities is developed prior to the Development Consent Order (DCO) application being made to the Planning Inspectorate in December 2014. This document does, however, include an assessment of the proposed Harbour facility under the Habitats Regulations insofar as this is possible given the status of the Environmental Impact Assessment (EIA) for the Harbour.

1.2 Background to the York Potash Project

1.2.1 YPL (a subsidiary of Sirius Minerals Ltd) intends to develop a new mine at Dove's Nest Farm, south of Whitby, North Yorkshire (NGR NZ894 051) (**Figure 1.1**), to extract polyhalite. Together four distinct project elements comprise the YPP, namely:

1. the winning (the process of gaining access to the mineral) and working (the process of extracting the mineral) of polyhalite (the Mine);
2. a mineral transport system (MTS) for the removal and transfer of the resource;
3. a materials handling facility (MHF) for processing the polyhalite into a granulated product; and,
4. Harbour facilities to export the polyhalite.

1.2.2 YPL proposes to win and work product from two deep polyhalite seams which lie beneath the North York Moors National Park, one of which extends eastwards beneath the North Sea. A marine licence for this aspect has already been granted by the Marine Management Organisation (MMO). Once extracted, the dry product would be crushed, loaded onto hoppers, and transported to the MHF at Wilton through the underground MTS. The product would be granulated within the MHF in preparation for onward distribution via the Harbour facility. A proportion of the product would be distributed within the UK from the Wilton site (up to 150,000 tonnes of product, per annum, may be exported by road).



- Legend:
- Shaft Location
 - Indicative Mineral Transport System Route
 - Proposed Harbour Facility
 - Proposed Material Handling Facility
 - Intermediate Shaft and Spoil Sites
 - Sea

Client: York Potash Limited	Project: York Potash Project Habitats Regulation Assessment
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Title:
The York Potash Project

Part: 2	Figure: 1.1	Drawing No: PB1110-P1-1-001			
Rev: 0	Date: 25/09/2014	Drawn: TC	Checked: HC	Size: A3	Scale: 1:145,000

Co-ordinate system:
British National Grid



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1.2.3 The YPP is designed to provide 6.5 million tonnes per annum (Mtpa) of polyhalite when it first becomes fully operational in 2019 (first ore would be produced in 2018), which would increase to 13Mtpa within six years of first production. Some facilities will be designed to provide 13Mtpa at the outset, whilst other facilities will be designed to provide 6.5Mtpa and later duplicated or replaced (see Section 2 for further information).

1.2.4 The YPP has four main geographical locations and the following consenting routes:

- The Mine and other ancillary facilities for the mine are proposed to be located at Dove's Nest Farm, near Whitby, with a proposed Construction Village and Park and Ride (P&R) to be located approximately 1.6km to the south of Whitby (although the Construction Village remains an option only). Operational phase P&R facilities would be located 2km to the east of Whitby (at Cross Butts roundabout) and at the Scarborough P&R, if required.
- The MTS would extend approximately 36.5km from Doves Nest Farm (where the MTS access shaft would be located) to the MHF at Wilton. The MTS would include three intermediate shafts installed along its route, located approximately 9km, 24km and 29km from the Mine.
- An application is to be made jointly to the North York Moors National Park Authority (NYMNPA) and Redcar and Cleveland Borough Council (RCBC) for the Mine and MTS; and applications are to be submitted to Scarborough Borough Council (SBC) and the NYMNPA for the Construction Village and P&R facilities and northern Operational P&R facilities respectively.
- The MTS Portal and MHF would be located at Wilton. An application is to be made to RCBC for the MHF.
- The Harbour facility would be located on the Tees estuary and connected to the MHF by an overland conveyor. The Harbour facility requires a DCO from the Secretary of State for Transport.

1.2.5 For the purposes of the YPL's HRA, as far as possible, the entire YPP is being assessed as one scheme with a maximum production of 13Mtpa. Due to the separate applications being progressed for the various elements of the YPP, the competent authorities for the HRA will be the NYMNPA, RCBC and the Secretary of State for Transport.

1.3 Structure of this Report

1.3.1 This report is structured as follows:

- **Section 1** - (This section) Introduction, background to the project, legislative context and HRA process.
- **Section 2** - Description of the project, including options under consideration.
- **Section 3** - Consultation undertaken to inform the HRA.
- **Section 4** - The approach adopted for screening European and Ramsar sites into the assessment.
- **Section 5** - Plans and projects to be considered in-combination with the YPP.
- **Section 6** - Identification of the European and Ramsar sites potentially affected.
- **Section 7** - Description of the baseline environment within and adjacent to the YPP boundary.
- **Section 8** - Screening assessment of the project for the purposes of identifying any LSEs on European and Ramsar sites.
- **Section 9** - Screening statement.

- **Section 10** – Information for Appropriate Assessment (YPP alone).
- **Section 11** - Information for Appropriate Assessment (YPP in combination with other plans and projects).
- **Section 12** – Summary and Conclusions.
- **Section 13** – References.

1.4 Legislative Context

- 1.4.1 European Union (EU) obligations in respect of habitats and species are met through Council Directive 92/43/EEC (the Habitats Directive) on the conservation of natural habitats and of wild fauna and flora, which requires Member States to schedule important wildlife sites through the European Community as SACs and to give protection to habitats and species listed in the Directive as being threatened or of Community Interest.
- 1.4.2 The EU meets its obligations for birds through Directive 2009/147/EC (Birds Directive) on the conservation of wild birds. This provides a framework for the conservation and management of wild birds in Europe. Of particular relevance is the requirement to identify and designate SPAs for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance. Together with SACs, SPAs form a network of protected areas known as *Natura 2000* sites or European sites.
- 1.4.3 The Habitats Directive is transposed into UK law by the Conservation of Habitats and Species Regulations 2010, as amended by the Conservation of Habitats and Species (Amendment) Regulations 2012.
- 1.4.4 The HRA process helps meet the requirements of Article 6(3) of the Habitats Directive which states that any plan or project, that is not directly connected with or necessary to the management of an European site, but would be likely to have a significant effect on such a site, either on its own or in-combination with other plans or projects, will be subject to an ‘appropriate assessment’ of its implications for the European site in view of its conservation objectives. In light of the conclusions of that assessment and subject to the provisions of Article 6(4) of the Habitats Directive, the competent authority will agree to the plan or project only having ascertained that it will not adversely affect the integrity of the site(s) concerned. Article 6(4) provides that if, in spite of a negative assessment of the implications for the site, and in the absence of alternative solutions, the plan or project must nevertheless be undertaken for imperative reasons of overriding public interest (IROPI), the Member State will take all compensatory measures necessary to ensure that the overall *Natura 2000* sites are protected.
- 1.4.5 As a matter of policy, the UK Government also applies the HRA process to designated Ramsar sites. These are sites which are regarded as being wetlands of international importance as defined following the Convention on Wetlands (Ramsar, Iran, 1971), which is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their internationally important wetland habitats.
- 1.4.6 There is no explicit definition of LSE in the legislation and in the context of HRA it is typically taken as any effect that may reasonably be predicted as a consequence of the project that may significantly

affect the conservation or management objectives of the features for which a site was designated. By definition, this assessment is based on the consideration of a number of factors, for example, the spatial extent and duration of an identified effect, and other considerations such as the availability of appropriate mitigation. When considering such effects, a precautionary approach is adopted.

1.4.7 The conservation status of a natural habitat, as defined in the Habitats Directive, means the “sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2”. The conservation objectives for a SAC or SPA are considered when identifying LSE. The conservation status of a natural habitat is taken as ‘favourable’ when:

- Its natural range and area it covers within that range are stable or increasing.
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable as defined in (a).

1.5 HRA Process

1.5.1 The HRA process follows a four staged approach:

1. **Screening:** The process of identifying potentially relevant European and Ramsar sites, and whether the likely impacts of a project upon the qualifying features of the site, either alone or in-combination with other plans and projects, are likely to be significant.
2. **Appropriate Assessment (AA):** The consideration of the potential impacts on the integrity of the site(s), either alone or in-combination with other plans and projects, with regard to the site’s structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects then development consent can only be given if the tests set out in stages 3 and 4 can be passed.
3. **Assessment of Alternative Solutions (AAS):** Examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on the site(s).
4. **Imperative reasons of over-riding public interest (IROPI):** Where no alternative solution exists and where an adverse effect on site integrity remains, the next stage of the process is to assess whether the development is necessary for IROPI and, if so, the identification of compensatory measures needed to maintain site integrity or the overall coherence of the designated site network.

1.5.2 If it is concluded at Stage 1 that there is no potential for LSE, there is no requirement to carry out subsequent stages of the HRA.

2 DESCRIPTION OF THE YORK POTASH PROJECT

2.1 Introduction

2.1.1 This section of the HRA provides a description of the proposed works required to construct and operate the YPP. The information presented within this report is based on the design information available at the time of writing. The detail of the YPP will be developed and confirmed during the detailed design stage. The project description provided is based on the realistic worst case scenario for the project and is used as the basis for the applicant's HRA.

2.1.2 Liaison will be maintained with NYMNPA, RCBC and the Planning Inspectorate throughout the development of the detailed design to ensure that the implications of any minor variations to the design, as presented in this report, for the planning and environmental assessment processes are discussed and understood.

2.1.3 Each component of the YPP is described below (see **Appendix A** for location maps of each of the scheme elements).

2.2 Mine

2.2.1 The Mine surface development site (the minehead) would be located on a greenfield site at Dove's Nest Farm, approximately 4km south of Whitby within the boundary of the North York Moors National Park (NYMNP). This element of the YPP includes:

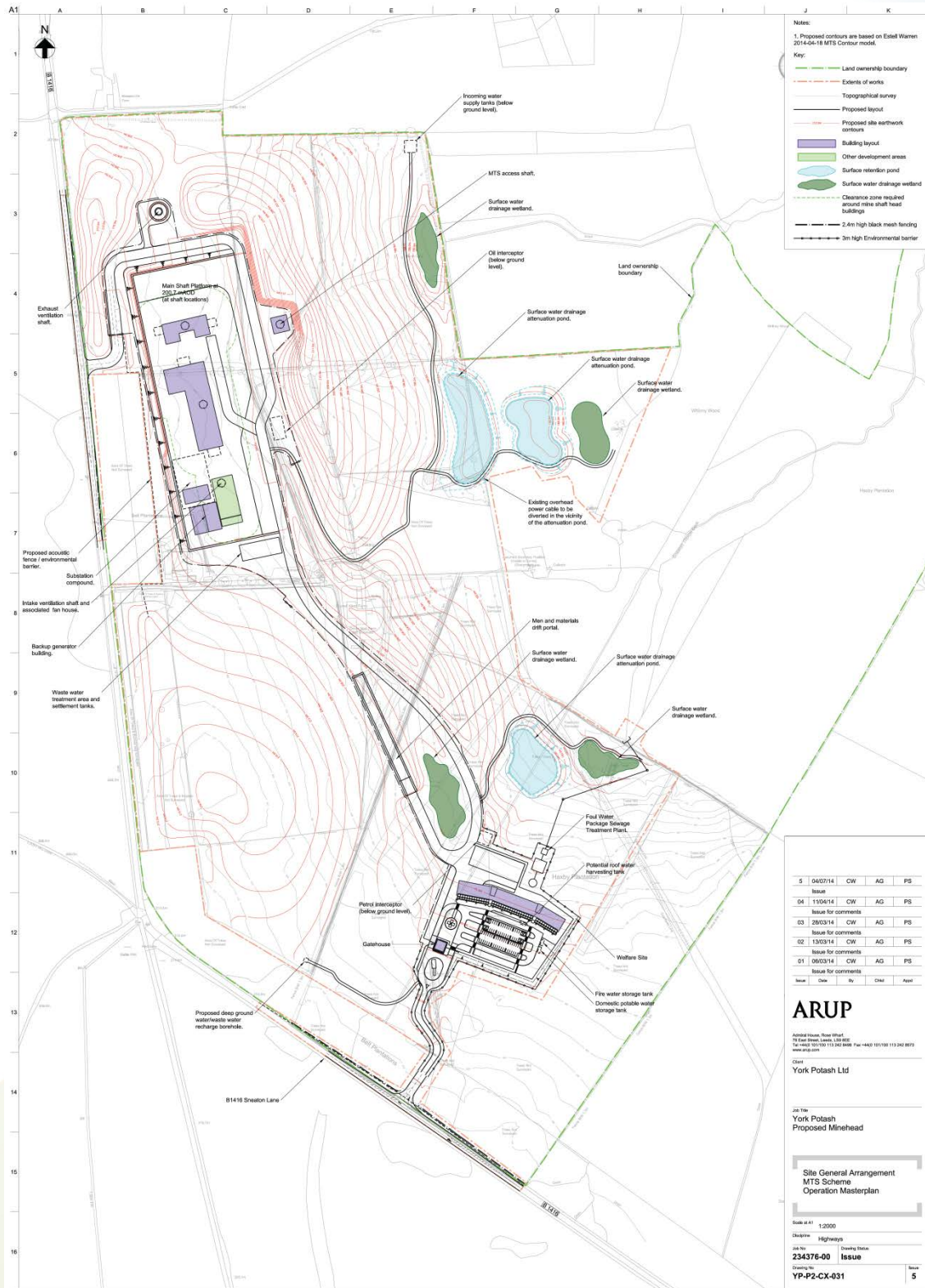
- A mine at a depth of about 1,520m below ground level (bgl).
- Two access shafts.
- Two ventilation shafts.
- An additional shaft to provide maintenance access to the mine end of the MTS.
- Subsurface infrastructure.
- Support facilities including staff amenities, workshops for mobile and fixed equipment maintenance, diesel fuel area, mine pump station, electrical sub-station and stores located in the pit bottom.
- Surface infrastructure, including mine site buildings, welfare facilities, Modular Wastewater Treatment Plant, gatehouse, parking and access roads (see **Figure 2.1** for an indicative layout of surface infrastructure).

2.2.2 The construction of the Mine would include the following:

- Conventional drill and blast methodology.
- Conventional methods of dozer, scrapers, peckers and excavators. Drill and blast maybe required for harder substrata.

2.2.3 In recognition of the sensitivity of developing the Mine within the boundary of a National Park, a number of measures have been included in the design of this aspect to ensure that it is consistent with the visual amenity policies of the NYMNPA. These measures include:

Figure 2.1 Minehead operational site master plan



- The main portion of the winding head-frames would be located below ground level.
- All mining equipment, mineral handling equipment, support facilities, personnel and materials would be sent down a shaft and assembled or constructed underground.
- Winding hoists would be housed within agricultural style buildings of limited ridge height.
- Conveyance of workforce, machinery, materials and mineral to be via below ground access shafts or drifts.

2.2.4 During operation there would be continuous sub-surface operations taking place for the working of polyhalite. The infrastructure in place to achieve this would comprise of:

- A production shaft. This would be used for minerals hoisting.
- A support shaft. This would be used for transportation of personnel, equipment and materials.
- A mine ventilation system. This would ensure airflow through the shafts.
- Support facilities. These would be located at the pit bottom and provide welfare support to mining operators.
- Mining infrastructure. This would comprise of infrastructure for working polyhalite at the pit bottom.

2.2.5 All mining would occur within the two polyhalite seams or adjacent salt. A room and pillar mining method using continuous miners would extract the mineral from the polyhalite seam.

2.2.6 The method comprises of cutting tunnels up to 12m wide and between 5 and 40m high using conventional continuous mining and drill and blast technology. Pillars vary in size depending on extraction height and would be left in-situ to provide local and regional support to the openings and overlying strata and to avoid impacts on aquifers and surface topography (subsidence). Strata control such as rock-bolts would be installed, where required by local conditions, to provide stability within the mining chambers.

2.3 Construction Village, Construction and Operational Park and Rides

2.3.1 In addition to the Mine, there would be a Construction P&R and may be a Construction Village, which would be located approximately 1.6km to the south west of Whitby town centre, covering approximately 2ha. The proposal comprises two components, namely;

- A temporary construction worker P&R.
- The option of a temporary construction village.

2.3.2 The need for the Construction Village is dependent upon the preference of the contractor and the availability of alternative overnight accommodation in the area at the time of the development

2.3.3 The village would include a two storey accommodation block, four single storey buildings, gatehouse, car parking (390 spaces), bus stop and outdoor recreational area. This site is located in Whitby, outside of the National Park and approximately 3km from the closest European site (the North York Moors SAC and SPA). Given the developed nature of its location and distance from these sites, as well as the relatively minor nature of the proposed works, the works associated with the development of the

Construction Village and P&R have not been considered further in the Screening assessment provided below (albeit that the transport assessment for the Mine has incorporated use of the P&R).

2.3.4 Two Operational P&Rs are proposed for use; one to the west of Whitby which is currently being operated by North Yorkshire County Council, and the existing Scarborough P&R. YPL are looking to use the Whitby (Cross Butts) site, in conjunction with the existing P&R scheme, as part of the YPP. At the current time any alterations to the existing Whitby P&R are expected to be minor but may include an additional 100-120 car parking spaces and a proposed security gatehouse. Hence the Operational P&Rs have not been considered further in the Screening assessment provided below (see **Sections 8 and 9**).

2.4 Minerals Transport System

2.4.1 The MTS would transport mined polyhalite between the proposed mine below Dove's Nest Farm and the MHF at Wilton, Teesside. The MTS would be capable of an initial capacity of 6.5Mtpa and, after upgrading of the conveyor drive system, a capacity of 13Mtpa. The tunnel would accommodate a conveyor, maintenance train track and provision for 66kV mine power supply cables.

2.4.2 The tunnel would be accessed by a shaft at the mine and a portal at Wilton. Between these two ends, it is proposed that the tunnel would be accessed from three intermediate shafts located at Lady Cross Plantation near Egton; Lockwood Beck near Stanghow; and Tocketts Lythe near Guisborough for inspection and maintenance purposes. Each of these access points also acts as a secondary evacuation point.

2.4.3 The MTS would comprise the following:

- A single tunnel approximately 36.5km in length with an internal finished diameter of approximately 5m, which increases to 6.5m for segmented lined sections, at an average depth of 250m bgl.
- Intermediate shafts installed along the route located approximately 7km, 23km and 29km from the minehead.
- A system of linked conveyor belts capable of transporting crushed polyhalite from the production shaft at the minehead to the MHF at Wilton.
- Operational phase surface buildings at the three intermediate shaft sites in the style of agricultural barns to house ventilation, man and equipment lifting, and maintenance equipment.
- A MTS portal area at Wilton, which would include a train shed, store for conveyor drives, control room, welfare facilities and car parking. The spoil, expected to be in the order of 1.2 to 1.4 million cubic metres, is anticipated to largely consist of mudstone. Arisings are proposed to be spread on land adjacent to the intermediate shaft locations (and at Wilton, see **Section 2.5** below) and compacted, within the site boundaries, raising the local topography. Surface cover would then be restored on top of this landform.

2.4.4 The MTS tunnel is proposed to be driven through mudstone deposits, which are of low permeability. In addition, there is a lack of groundwater dependant features present along the route of the proposed MTS tunnel which could be affected. Based on the above, and the proposed depth of the tunnel, (expected to be an average depth of 250m bgl), the tunnel itself has not been considered in the

Screening assessment provided below as it does not have the potential to impact on European designated sites; moreover, no interactions or combined effects with other projects would arise on European designated sites or qualifying features due to the tunnel itself. The applicant's HRA, therefore, only considers the potential effects of the shaft site at the minehead, the three intermediate shaft sites and the portal at Wilton in the context of the MTS.

2.5 Materials Handling Facility

2.5.1 The MHF would be located on a site on the eastern edge of the Wilton International Complex. It comprises two parcels of land with a combined area of 37ha. It would be linked to the Harbour facility by a conveyor system.

The MHF site would include:

- The tunnel portal (MTS Portal).
- Processing plant for crushing, screening and granulation.
- Storage buildings to hold 700,000t of finished polyhalite granular product. Conveyors to transport the product to the port terminal would run from the buildings.
- Run of mine material emergency store capable of holding 8,000t of run of mine material.
- Support infrastructure facilities.
- A spoil disposal area.

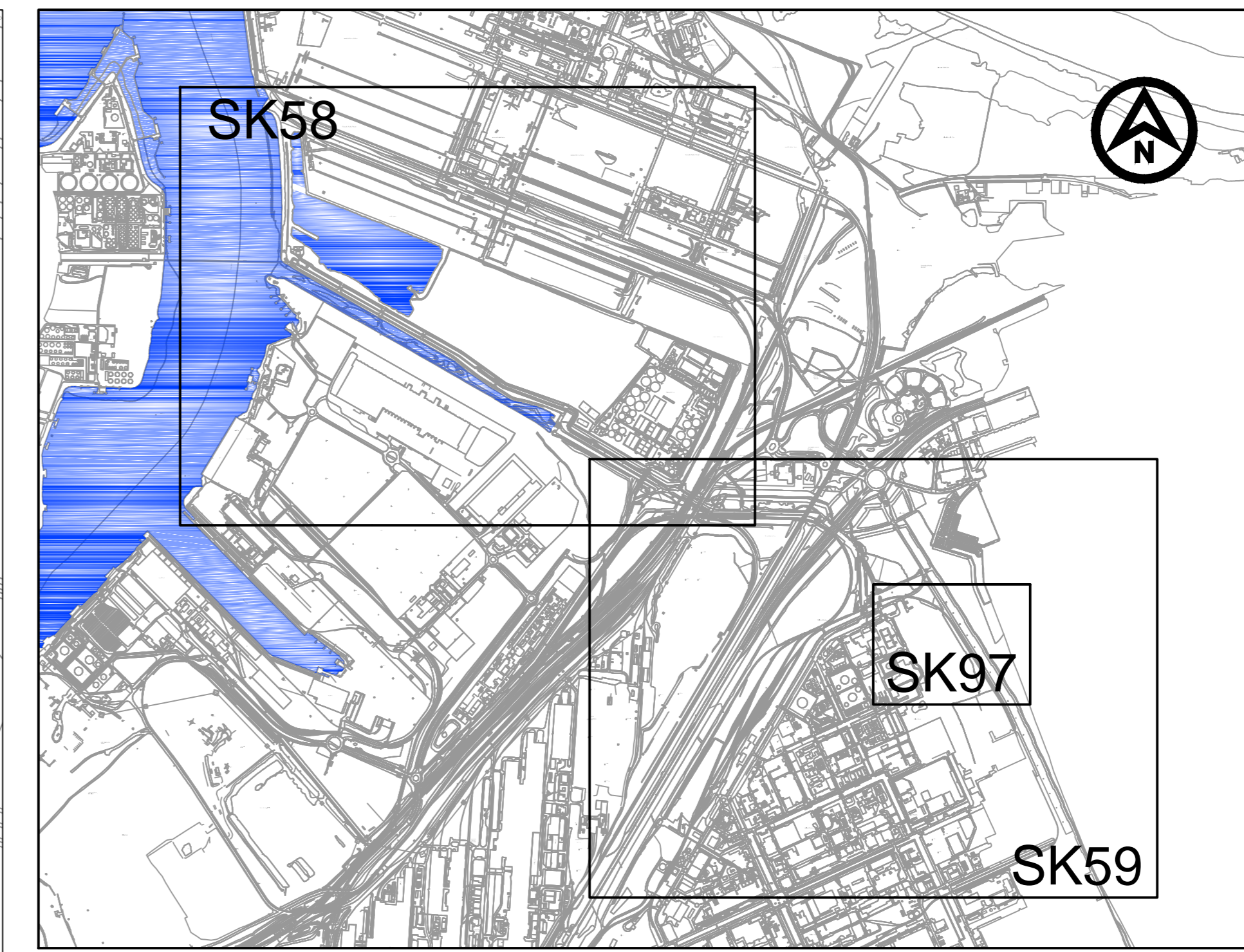
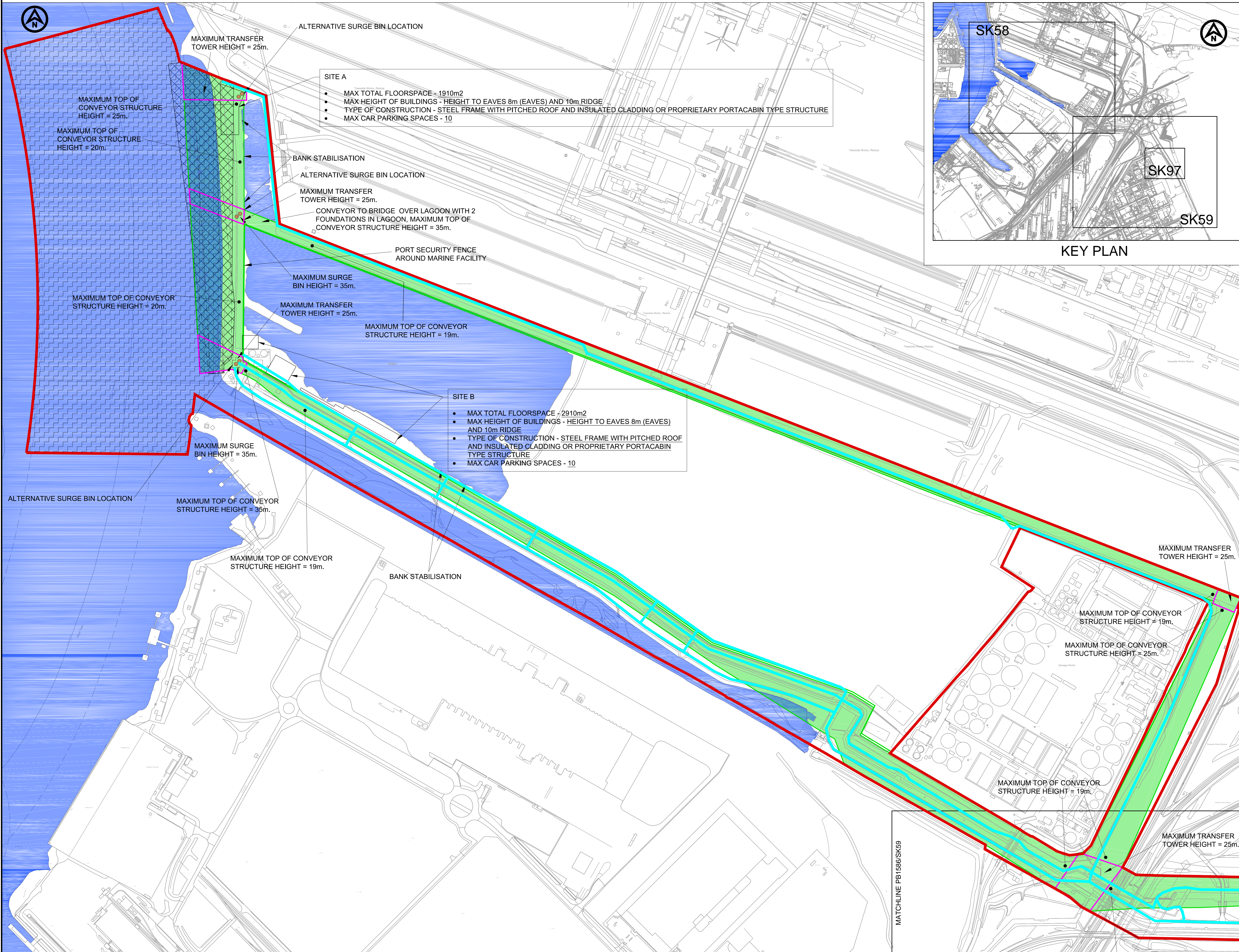
2.5.2 The main site works would include the following:

- Continuous flight auger piling at the product storage building, locomotive shed and the processing plant.
- The excavation and construction of MTS Portal.
- The construction of reinforced concrete bases and rafts.
- The construction of underground drains and other services.
- The erection of steelwork for structures and conveyors.
- The cladding of structures.
- Construction of roads and hard standing areas.
- Earthworks and spoil contouring.
- Installation of process equipment and associated electrical, mechanical and control services.

2.5.3 It is estimated that approximately 300,000m³ of spoil would be generated from the 7km section of the tunnel at the Wilton end. Space on the site has been allocated for spoil mounds and it is anticipated that a cut-fill balance can be achieved.

2.6 Harbour facility

2.6.1 The Harbour facility would be developed in two phases to provide the necessary export facilities to mirror the predicted increase in polyhalite production from an initial 6.5Mtpa to 13Mtpa. As illustrated on **Drawings PB1586/SK58** and **PB1586/SK59**, the facility would comprise:



KEY PLAN

- KEY**
- ORDER LIMITS
 - INDICATIVE ACCESS ROUTES
 - CONVEYOR ROUTE ENVELOPE
 - CONVEYOR TRANSFER TOWER AREA (INCLUDING ACCESS ROUTES)
 - SURGE BINS
 - DREDGED AREA ENVELOPE
 - QUAY AREA ENVELOPE
 - ADMINISTRATIVE
 - PARKING
 - WORKSHOP
 - WAREHOUSE
 - ADMINISTRATION OFFICES
 - WELFARE FACILITIES
 - ANCILLARY BUILDINGS

DRAFT FOR CONSULTATION

REV	DATE	DESCRIPTION	BY	CHK	APP
2	26/06/14	DRAFT FOR CONSULTATION	IT	TJR	TJR
1	31/05/14	PLANNING ISSUE	GIC	TJR	TJR
0	30/07/14	PLANNING ISSUE	NAT	SRS	RP

REVISIONS



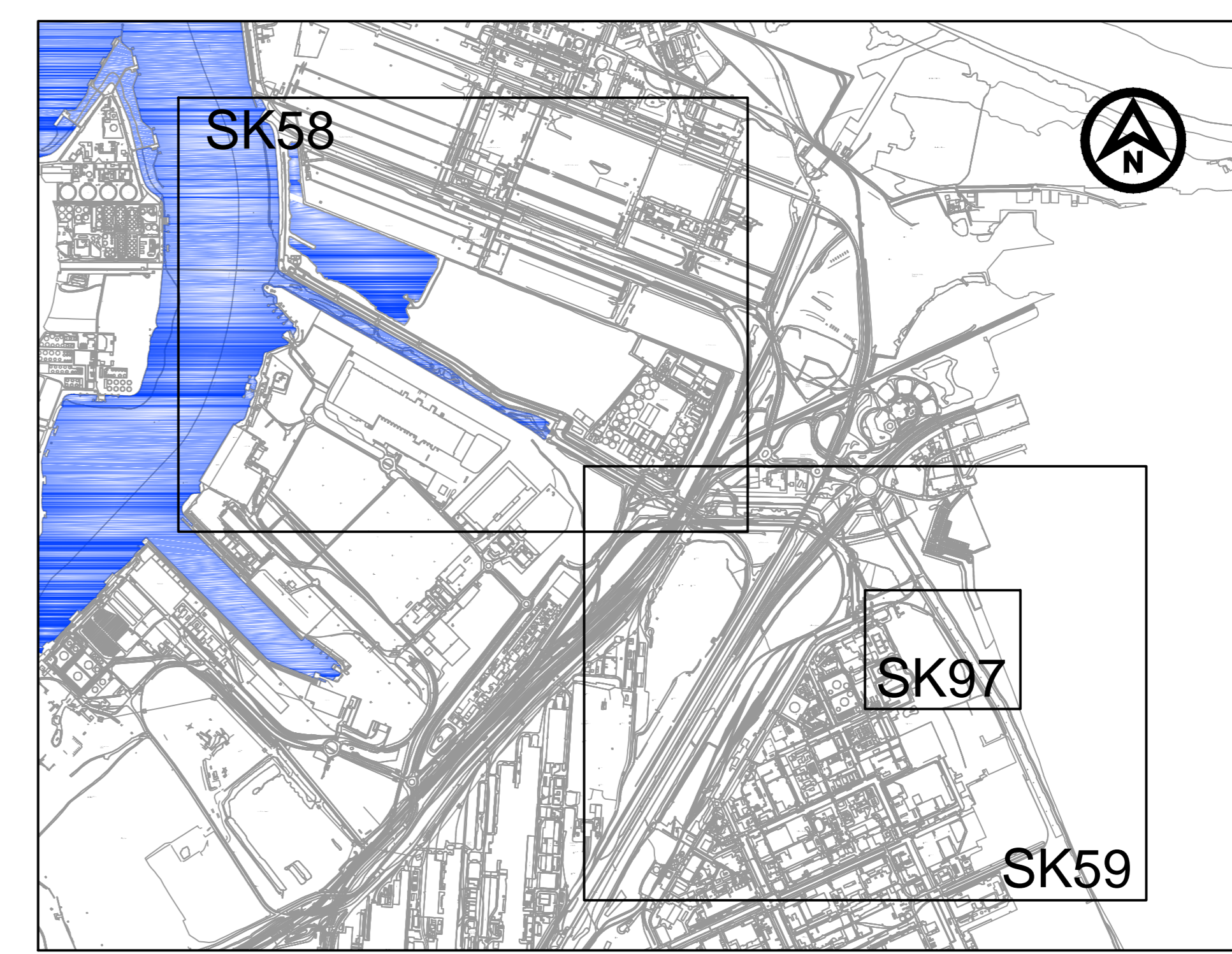
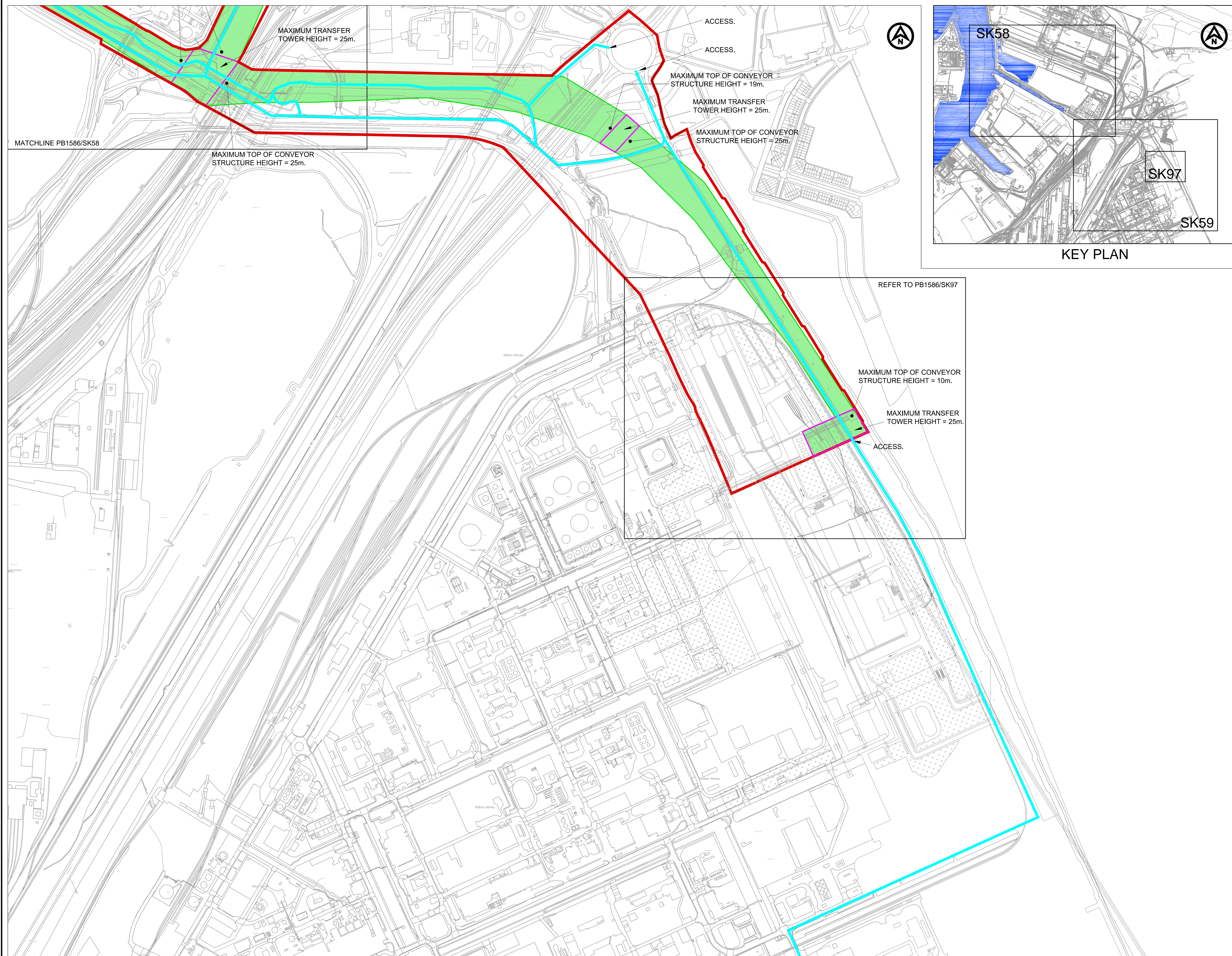
PROJECT
YORK POTASH

TITLE
THE YORK POTASH HARBOUR FACILITIES ORDER 201X LAYOUT PLANS (PERMANENT) REGULATION 5 (2)(o) DOCUMENT 3.4A

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DATE	JUNE '14	CLIENT'S REF.			
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DRAWING No. PB1586/SK58 REVISION 2



- KEY**
- ORDER LIMITS
 - INDICATIVE ACCESS ROUTES
 - CONVEYOR ROUTE ENVELOPE
 - CONVEYOR TRANSFER TOWER AREA (INCLUDING ACCESS ROUTES)
 - SURGE BINS
 - DREDGED AREA ENVELOPE
 - QUAY AREA ENVELOPE
 - ADMINISTRATIVE
 - PARKING
 - WORKSHOP
 - WAREHOUSE
 - ADMINISTRATION OFFICES
 - WELFARE FACILITIES
 - ANCILLARY BUILDINGS

DRAFT FOR CONSULTATION

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0	30/07/14	PLANNING ISSUE	NAT	SRS	RP

REVISIONS



PROJECT
YORK POTASH

TITLE
THE YORK POTASH HARBOUR FACILITIES ORDER 201X LAYOUT PLANS (PERMANENT) REGULATION 5 (2)(o) DOCUMENT 3.4B



DRAWN	NAT	CHECKED	SRS	PASSED	RP
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					2

- Quay structure, with two berths to accommodate the throughput requirements of the facility (13Mtpa).
- Berth pocket, to allow vessels to remain alongside the quay during all states of tide.
- Ship loaders, with sufficient numbers and capacities to accommodate the throughput requirements of the facility.
- Conveyor systems between the storage area (at the MHF) and ship loaders, with sufficient capacities to accommodate the throughput requirements of the facilities. Two possible conveyor route envelopes are being considered for the conveyor system between the MHF and the port terminal (to the north and south of Bran Sands lagoon). It should be noted that a conveyor system within only one of these routes would be required during operation.
- Surge bin (storage) facilities, one per conveyor system, which would be 7.5m in diameter and up to 35m high.
- Capital dredging (i.e. deepening beyond the current maintained depth) of a section of the approach channel and to create a berth pocket to allow the maximum design vessels proposed access to the port terminal.

2.6.2 As noted above, two conveyor route envelopes are currently being considered. One is proposed to initially run in a northerly direction parallel to the Northumbria Water Ltd (NWL) Sewage Treatment Plant on its eastern side, once it has crossed over from the MHF before heading in a north-westerly direction along the north boundary of the Bran Sands site. This route bridges the narrow finger of the lagoon at its western end and it is envisaged that two foundations would be required in the lagoon to support the conveyor; the need for these supports will be confirmed as the design of the conveyor evolves. The other route is proposed to run along the southern boundary of the Bran Sands site before heading north, parallel to the southern bank of the Tees estuary. This route does not bridge the lagoon, although it is envisaged that some stabilisation of the bank of the lagoon would be required in areas where the land along the conveyor route between Dabholm Gut and the lagoon is at its narrowest. It is currently envisaged that conveyor bridge supports would be required at the upstream end of Dabholm Gut for the southern conveyor. These are currently defined as design parameter 'envelopes' within which the conveyor systems would run.

2.6.3 Key parameters of the proposed quay structure with a capacity for 13Mtpa include:

- Minimum quay length of 540m.
- Quay width up to 85m.
- Estimated deck level of +8.45m Chart Datum (CD).

2.6.4 Two options are currently being considered for the quay construction – an open quay structure and a solid quay structure.

2.6.5 Under the open quay structure, the quay and access bridge structures would be suspended deck structures comprising a reinforced concrete deck supported by approximately 400 steel tubular piles. It is anticipated that the piles would be in the order of 0.9m diameter. The piles would support the concrete deck onto which the ship loader rails and supports for the conveyor would be fixed.

- 2.6.6 Access to the quay would be via approach bridge platform structures. Two of these access bridges would be constructed during Phase 1, allowing one to be used for construction of Phase 2 whilst maintaining the other for operational access.
- 2.6.7 Under the solid quay structure option, the quay structure would be a combi-pile wall comprising a line of steel tubular king piles linked by pairs of steel sheet piles. The king piles would be connected via tie rods to a steel sheet pile anchor wall approximately 30-40m behind the berth line. The king piles would support a reinforced concrete cope beam onto which the waterside ship loader rails would be fixed. A piled beam would be required, parallel to the cope beam to support the landside ship loader rails. The remaining area would be covered by a ground bearing concrete slab that would form the foundation for the conveying system.
- 2.6.8 Approximately 210 king piles (approximately 2m in diameter) and a 315m length of sheet piles wall would be required for the combi-wall, with a 420m length of sheet pile, required for the anchor wall. A total of 35 piles (approximately 660mm diameter) would be required for the cope beam to support the landside shiploader rails.
- 2.6.9 For both options it is anticipated that in order to maintain the hydraulic connectivity between Bran Sands lagoon and the Tees estuary, the existing pipe which passes through the embankment between these two water features would be extended as the reclamation activities are being undertaken. However, during recent consultation, Natural England recommended that the potential for enhanced control of water exchange between the Tees estuary and Bran Sands lagoon should be investigated as a means of enhancing the habitats within the lagoon (e.g. creating intertidal fringes). It was suggested that such measures could provide a form of mitigation for impacts that would arise to the intertidal foreshore in the Tees estuary due to the construction of the port terminal. This potential mitigation is currently being investigated as part of the Harbour facility EIA.
- 2.6.10 Capital dredging of the berth pocket (and approaches to the pocket) would be required in order to allow the maximum design vessels proposed access to the port terminal. This dredging would be undertaken in two phases and is linked to the phased construction of the quay. Dredging would also be required to create the stable slope beneath the quay for the open suspended deck option. As part of the Phase 2 dredging, capital dredging would be required within the approach channel in order to provide the required access for vessels in addition to the Phase 2 dredging of the berthing pocket.
- 2.6.11 Within the area that would require dredging in the current approach channel, the existing depth of the channel is 10.4m below CD (bCD). It is proposed that the approach channel in this area would be deepened to 14.1m bCD to match the depth of the remainder of the approach channel downstream of this point to the mouth of the Tees. The approach channel dredging required would be the same for both the open quay structure and solid quay structure.
- 2.6.12 The existing level of the seabed within the footprint of the proposed berth pocket and between the proposed berth pocket and the shoreline varies between approximately 0.9m above CD and approximately 11.6m bCD. It is proposed that dredging to 16m bCD would be undertaken to create the berth pocket.

- 2.6.13 The total volume of material to be dredged is estimated at up to approximately 1.15Mm³ to create the berth pocket and stable slope beneath the quay for the open suspended deck option. For the solid quay option, there is no requirement to create the stable slope and the dredge volume to create the berth pocket for this option would be approximately 700,000m³. For both options, approximately 500,000m³ of material would be dredged from the approach channel. The maximum dredge volume is therefore anticipated to be up to 1.65Mm³ for the open quay structure and 1.2Mm³ for the solid quay structure.

3 CONSULTATION

3.1 Introduction

- 3.1.1 Informal consultation has been ongoing with Natural England, RCBC and NYMNPA since 2012 regarding the potential requirement for Appropriate Assessment, and consequently HRA, for different elements of the YPP as the project has evolved.

3.2 Consultation to determine LSE

- 3.2.1 Formal EIA Scoping Opinions have been received for the Mine (from the NYMNPA), for the MTS (from the NYMNPA and RCBC), for the Harbour facility (from the Planning Inspectorate) and for the MHF (from RCBC). These Scoping Opinions have included advice on the need for AA and the preparation of HRAs in compliance with the Habitats Regulations. This advice has been used to assist in the preparation of the applicant's HRA.

- 3.2.2 Natural England has advised that the proposed Harbour facility in particular, has the potential to result in a LSE on interest features of European and internationally designated sites (specifically the Teesmouth and Cleveland and Coast SPA and Ramsar site). This is because Bran Sands lagoon and Dabholm Gut are considered to be functionally linked to the SPA. For example, through the Scoping Opinion for the Harbour facility, Natural England advised that consideration should be given to:

“the loss of roosting and foraging habitat for SPA/Ramsar waterbirds (both on the intertidal and terrestrial), disturbance to SPA/Ramsar birds both within and outside the designated site boundary during construction and operation and impacts to any additional features of SSSIs in close proximity.”

- 3.2.3 As such, an Appropriate Assessment will need to be undertaken by the Secretary of State for the Harbour facilities and Natural England have advised that this Appropriate Assessment should apply to the whole of the YPP.

- 3.2.4 Through the Harbour facility Scoping Opinion, PINS advised that:

“it would be preferable for the applicant to produce a standalone report for the purposes of the Habitat Regulations, containing the information identified with the latest version of PINS's Advice Note 10: HRA, including the appended screening and if appropriate, integrity matrices, which cross-refer to the ES as appropriate.”

3.2.5 In response to this, YPL is producing an applicants' standalone HRA report for the YPP (i.e. this document), which will be submitted alongside each planning application to meet the requirements of the Habitats Regulations. This has been produced in accordance with PIN's Advice Note 10 (The Planning Inspectorate, 2013).

3.2.6 Consultation with Natural England and the relevant 'competent authorities' under the Habitats Regulations will continue as this HRA is further developed with respect to the Harbour facility.

3.3 Consultation to identify plans and projects to be considered in-combination

3.3.1 Consultation has been undertaken to identify and confirm the plans and projects to be considered by the in-combination assessment. This consultation was undertaken as part of the Cumulative Impact Assessment (CIA) being undertaken on the YPP (refer to **Part 5 Cumulative Impact Assessment** of the ES) and included engagement with the following organisations relating to recent or planned plans and projects within their areas of jurisdiction:

- NYMNPAs.
- RCBC.
- MMO.
- North Yorkshire County Council.
- Hambleton District Council.
- Ryedale District Council.
- Middlesbrough Council.
- Stockton-On-Tees Borough Council.
- Scarborough Borough Council.
- East Riding of Yorkshire Council.
- Hartlepool Borough Council
- The Highways Authority.
- PD Teesport (as Harbour Authority).

3.4 Consultation on the HRA screening report

3.4.1 An HRA Screening Report (Royal HaskoningDHV, 2014) was issued to Natural England and the NYMNPAs for comment in July and August 2014. The comments received have been incorporated and/or considered within into this HRA.

4 SITE SCREENING METHODOLOGY

4.1.1 In order to identify relevant European and Ramsar sites that have the potential to be affected by the proposed scheme a generic 5km buffer was initially applied (see **Figure 4.1**) around the following YPP component elements:

- the Mine;
- the three MTS intermediate shaft sites;



Legend

- Shaft Location
- Indicative MTS Route
- ⬡ 5km Buffer around Sites
- ⬡ Buffer around Harbour facilities
- Proposed Transportation Routes
- ▨ Site of Special Scientific Interest (SSSI)
- ▨ Teesmouth and Cleveland Coast Ramsar
- ▨ North York Moors and Teesmouth and Cleveland Coast SPA
- ▨ Arnecliffe & Park Hole Woods SAC
- ▨ North York Moors SAC

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Client: York Potash Limited Project: York Potash Project
 Habitats Regulations Assessment

Title: York Potash Project
 Designated Sites, Proposed Transportation Routes and Site Buffers

Figure: 4.1 Drawing No:

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid



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- the MHF site, Wilton; and,
- the Harbour facility, Teesside .

4.1.2 In addition to the above, European and Ramsar sites adjacent to the existing road network that have the potential to be affected by the proposed scheme have also been considered (and are detailed in **Section 6**).

4.1.3 Beyond this buffer it is acknowledged that different effects have the potential to have different areas of influence; the predicted zones of influence (ZOI) in this case are set out in **Table 4.1**. Consultation with Natural England during July 2014 assisted with the identification of ZOIs for the topics considered in **Table 4.1**.

4.1.4 The assessment of LSE in the context of these sites then comprised the following:

- Expert assessment of the likely effects of the construction, operation and decommissioning phases. This included analysis of the extent to which potential impacts could occur (ZOI) for specific environmental parameters (see **Table 4.1**).
- Analysis of available ecological survey results.

4.1.5 This screening exercise considered the geographical features of the study area, the features and reasons for designation of the relevant European and international sites and the mechanism by which the proposed works could affect designated features.

5 PLANS AND PROJECTS TO BE CONSIDERED IN-COMBINATION

5.1 Introduction

5.1.1 Under the Habitats Regulations it is necessary to assess the potential for in-combination effects to arise with respect to the project (in this case the whole YPP) under consideration and other plans or projects when considering the implications of development on a European site. The plans and projects that have been identified as having the potential to result in in-combination effects with the YPP are presented below and the Screening assessment of these is included in **Section 8.2.3**.

5.2 Relevant plans and projects

5.2.1 The relevant plans and projects to be considered by the in-combination assessment were identified from those being considered by the CIA being undertaken for the YPP. The CIA has identified the maximum geographical area around the YPP as a whole where there is the potential for impacts to occur. As set out in **Section 4**, the ZOI of a project can differ for each environmental topic and potentially for different types of impact associated with the same topic. Hence an amalgamated ZOI (defined primarily by the large ZOIs for transport, coastal process and landscape effects) formed the search area for non-YPP developments in the first instance.

Table 4.1 The ‘zone of influence’ of potential impacts for relevant environmental parameters

Environmental Parameter	Zone of influence of potential effect
Ecology	The direct footprint of the works and the ZOI of noise, air quality, lighting, visual, hydrological and groundwater effects (as detailed below).
Transport	All routes included in the Transport Model for the YPP Transport Assessments (see Figure 4.1).
Noise	<p>1km from each of the YPP component elements.</p> <p>50m either side of all highways used by the YPP traffic.</p> <p>With regard to underwater noise generated by the construction of the harbour facility, the results of noise modelling undertaken (Subacoustech, 2014) predicts audible noise to extend up to 4.9km from the noise source. Modelling of impact ranges for behavioural response (strong avoidance reaction) has shown that the largest impact ranges from impact piling are 2.37km for fish. A precautionary maximum ZOI of 2.5km has, therefore, been used for underwater noise generated during the construction of the harbour facilities.</p>
Air quality	<p>5km radius from the boundary of the YPP components for project emissions, given the sensitivity of the North York Moors SAC and SPA.</p> <p>It was not considered appropriate to implement a 5km ZOI for air quality at the Harbour facility and MHF sites given the low sensitivity of the designated interest features and supporting habitats of the Teesmouth and Cleveland Coast SPA to the air quality effects predicted to be likely and the nature of the ambient environmental conditions on Teesside.</p> <p>A ZOI of 200m has been applied for the MHF and Harbour facility with regard to air quality.</p> <p>200m either side of all highways used by the YPP traffic for road traffic emissions.</p>
Light	<p>In general, 50m from the boundary of the YPP components; the zone of potential (controlled) light spill.</p> <p>With respect to bats, Natural England stated that impacts could be experienced up to 5km from the light source and, therefore, a 5km buffer zone has been applied to the location of the proposed Mine and intermediate shaft sites. As bats are not a designated interest feature of the Teesmouth and Cleveland Coast SPA, the implementation of this buffer around the Harbour facility or the MHF is not deemed necessary.</p>

Environmental Parameter	Zone of influence of potential effect
Visual disturbance	500m from each of the YPP components.
Geology and land contamination	500m radius from the boundary of the YPP components.
Groundwater and Hydrology	Generally taken to be 1km radius from the boundary of the YPP components, although this could be larger where a groundwater connection exists. Due to the wider potential effects that could arise from the construction of the Mine, a precautionary 10km boundary, radiating from the mine shaft has been applied (as directed by Natural England).
Marine sediment and water quality / coastal hydrodynamics	The tidal Tees estuary between Teesmouth and the Tees Barrage and Tees Bay, incorporating the existing dredged material disposal sites.

- 5.2.2 A review of relevant Development Plans (and emerging Development Plans - with an appropriate weighting being given as they move closer to adoption), non-statutory plans (such as Shoreline Management Plans and River Basin Management Plans) and strategies (such as Flood Risk Management and Coastal Strategies) was undertaken. In addition, consultation with the relevant Planning Authorities (see Section 3.3) and an independent search of their planning registers was undertaken to produce a 'long list' of plans and projects to be considered by the CIA. In accordance with the Scoping Opinion issued by the Planning Inspectorate for the Harbour facility, this list took account of:
- projects that are under construction;
 - permitted application(s) not yet implemented;
 - submitted application(s) not yet determined;
 - all refusals subject to appeal procedures not yet determined;
 - projects on the National Infrastructure's programme of projects;
 - projects identified in the relevant development plans, recognising that much information on any relevant proposals will be limited; and,
 - proposals in the area currently at the scoping stage.
- 5.2.3 The planning search encompassed a five year period, which took into account projects that received planning consent over three years ago and which have been implemented, thereby ensuring that the consent remains valid after the three year expiry date, but are not yet complete.
- 5.2.4 In addition to the above, a search of the Marine Management Organisation's (MMO) Public Register (which lists Harbour Revision Order (HRO) and marine licence applications) was undertaken to identify those projects with the potential to result in significant environmental impacts that require consideration within the CIA and HRA.
- 5.2.5 A high level screening exercise was then undertaken to remove certain types of development that are considered to be insignificant in nature and scale (e.g. change of use or conversions to existing buildings and erection of agricultural buildings) and, as such, unlikely to have the potential to contribute to significant cumulative impacts. This reduced the number of plans and projects under consideration for the CIA from over a thousand to approximately one-third of this number.
- 5.2.6 As the extent of the combined ZOI was predominately led by Transport, due to the potential for transport routes to extend more widely to the south and west, a further scoping exercise was undertaken to determine whether a project had the potential to have a significant impact on the transport network. This exercise was based on expert judgement and projects that were considered to have a negligible impact on transport, and which were outside the ZOI of all other topics, were also scoped out of the CIA; further reducing the number of plans and projects to be considered. The search of the MMO Public Register identified two significant projects to be included in the CIA (the Northern Gateway Container Terminal (NGCT) and QEII Berth Development).

5.2.7 From this filtered list of projects, relevant plans and projects to be considered in the in-combination assessment were identified using the ZOIs of potential effects described in **Table 4.1**. These ZOIs have been applied in two ways:

1. To the different YPP elements to identify non-YPP proposals whose potential environmental effects could interact with those of the YPP element under consideration and effect a European site (interactive effects are only considered to have the potential to occur where the ZOI of both the non-YPP proposal and YPP element overlap within a European site or an area that supports qualifying features for the site) (see **Table 5.1**).
2. To non-YPP proposals that have the potential to affect the same European site, or qualifying feature of the designated site, as a YPP element (irrespective of its location), resulting in a potential additive effect (see **Table 5.2**).

Potential interactive effects

5.2.8 Plans and projects that are considered to have the potential to result in interactive effects on a European site with a YPP element are described below (and shown on **Figure 5.1**). The 'Project ID's' presented in **Tables 5.1** and **5.2** relate to the number of the project within the master list of projects prepared for the CIA.

Table 5.1 Plans and projects with the potential to have interactive effects on a European site with a YPP element *

Project ID	Description	YPP element	Distance from YPP component element (m)	European site potentially affected
172	Maintenance dredging within the Tees Estuary	Harbour facility	0	Teessmouth and Cleveland Coast SPA and Ramsar site
173	Northern Gateway Container Terminal (terminal and capital dredging)		0	
174	QEII Berth Development		1,200	
120	Construction of a poly ethylene terephthalate (PET) chemical plant	MHF	760	
124	Erection of 14 industrial units in 4 blocks (classes B1, B2 & B8) with associated service area and 76 space car park (phase 2)		999	
130	Proposed anaerobic digestion and combined heat & power plant	MHF and Harbour facility	130 (MHF); overlaps with Harbour facility	

Project ID	Description	YPP element	Distance from YPP component element (m)	European site potentially affected
163	Reserved Matters Application for 41 houses and flats plus open space	Mine	5,400	North York Moors SAC and SPA
165	Residential development of 179 dwellings including areas of public open space and associated infrastructure		3,800	

* This table has been revised from that included in the HRA Screening Report to include projects identified from a search of the MMO Public Register and to exclude one application that was part of the the wider Northern Gateway Container Terminal project (which is now included as Project ID 173)

Potential additive effects

5.2.9 Plans and projects that have the potential to result in additive effects on a European site in-combination with the YPP are described (**Table 5.2**) below and shown on **Figure 5.1**.

6 DESIGNATED SITES POTENTIALLY AFFECTED BY THE PROJECT

6.1 European and Ramsar sites included in the Screening assessment

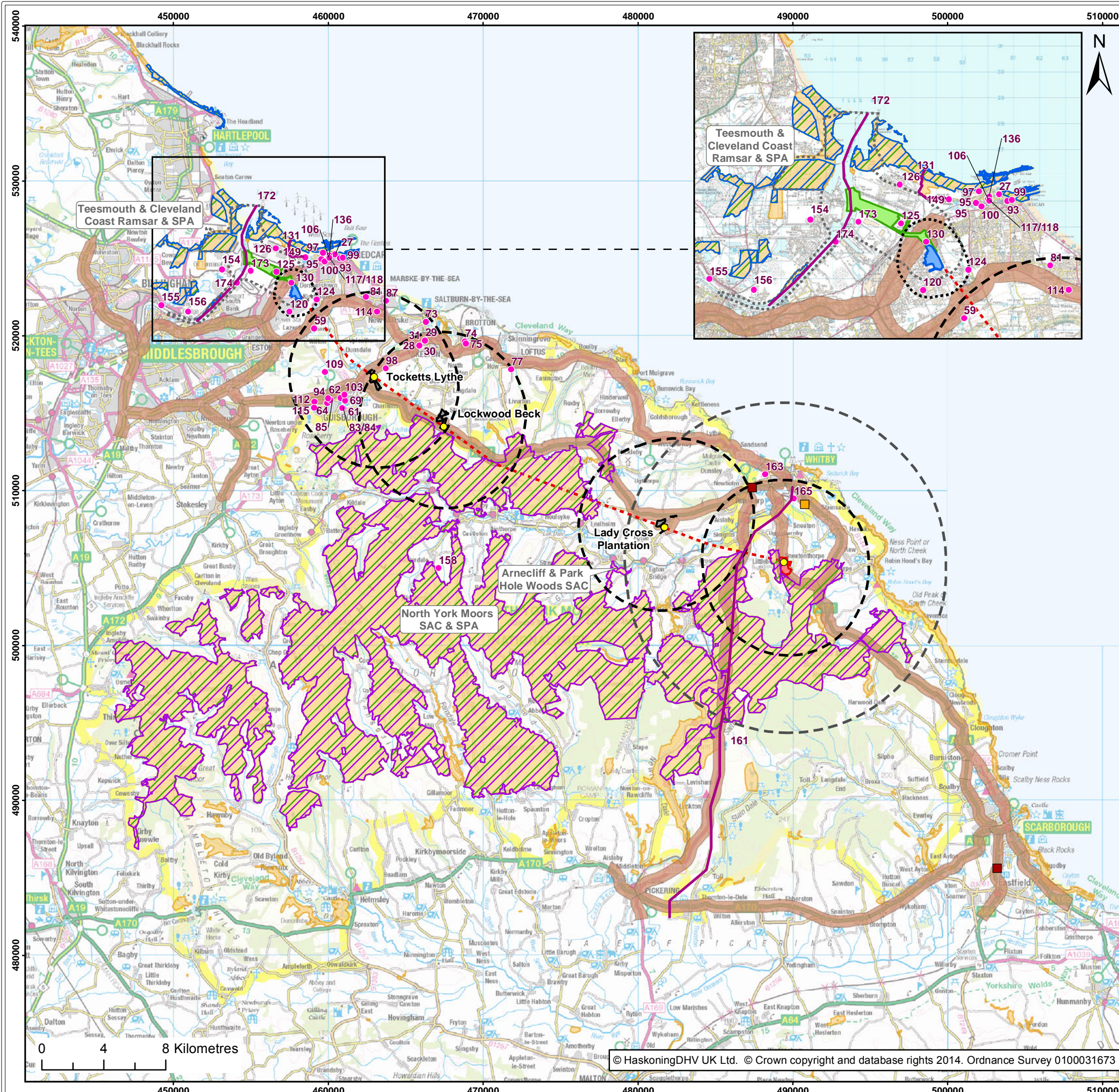
6.1.1 Five European sites and one Ramsar site have been screened into the applicant's HRA, namely:

- North York Moors SAC and SPA;
- Arnecliff and Park Hole Woods SAC; and,
- Teesmouth and Cleveland Coast SPA and Ramsar site.

6.1.2 The distances between the designated sites and the closest point of the YPP are shown in **Table 6.1**. Details of each designated site are provided below.

Table 6.1 European and Ramsar sites within 5km of the YPP

European/Ramsar site	Closest point to the YPP scheme boundary
North York Moors SAC and SPA	Adjacent to the Mine and Lockwood Beck Intermediate Shaft Site
Arnecliff and Park Hole Woods SAC	3km from Lady Cross Plantation Intermediate Shaft Site
Teesmouth and Cleveland Coast SPA and Ramsar site	900m from the Harbour facility 2.3km from MHF



Legend:

- 10km Minehead Zone of Influence
- 5km Minehead & Intermediate Shaft and Spoil Site Zone of Influence
- 1km MHF & MTS Portal Zone of Influence
- Harbour Facility Zone of Influence
- Minehead – Extent of Works
- Intermediate Shaft and Spoil Site – Extent of Works
- MHF and MTS Portal – Extent of Works
- Harbour Facility & Conveyor System - Extent of Works
- Transportation Route
- MTS Tunnel Alignment
- Shaft Location
- Construction Village and Park & Ride
- Park & Ride Location (Operational)
- Project Location
- Project Location
- Ramsar
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

Client: York Potash Limited

Project: York Potash Project Mine, MTS and MHF Habitats Regulations Assessment

Title: York Potash Project Plans and Projects to be considered in-combination

Part:	HRA	Figure:	5.1	Drawing No:	PB1110-HRA-1-001
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Table 5.2 Plans and projects with the potential to have additive effects on a European site with the YPP *

Project ID	Description	European site potentially affected	Distance from European site (m)
27	Demolition of existing buildings and creation of 4/5 storey buildings	Teessmouth & Cleveland Coast SPA & Ramsar site	55
93	Two storey residential care home		180
95	Three storey 72 bed care home		500
97	Proposed arts and media centre (this has now been constructed – the Tuned In! facility at Redcar).		110
99	Four storey residential care home		80
100	Two storey teaching block and 300 seat lecture theatre		760
106	Demolition of health centre and erection of new three storey health centre		480
117	Demolition of existing building and outline application for re-development of site for leisure use		580
118	Leisure centre, business, civic and community buildings		580
125	Erection of 2No centrifuges		613
126	Erection of pulverised coal injection plant		600
131	Provision of underground cables along South Gare access road and Coatham Sands to serve offshore wind farm		65
136	Erection of two storey community and education centre		385
149	Erection of 10 industrial units		360
155	Retrospective revised application for change of use to waste transfer system		810
81	Outline application for 23 no. Dwellings with private garages and associated roads		2694m
87	Residential development comprising of 14 two storey detached dwellings with new access and landscaping		3531
59	Installation of 2 wind turbines (140m maximum height to tip; rotor diameter 112m; generating capacity 19.68gwh per annum) including substation; control building and new vehicular access onto a174	7126	
114	Outline application for up to 1000 dwellings together with ancillary uses and a neighbourhood centre, park- and-ride car park; petrol filling station; drive-thru; public house/restaurant and 60 bed hotel with details of access	3834	

Project ID	Description	European site potentially affected	Distance from European site (m)
28	Renewal of extant planning permission R/2007/0448/rsm for residential development comprising 309 (no) dwellings, garages and associated roads	North York Moors SAC & SPA	4471
29	Renewal of extant planning permission R/2007/0448/rsm for residential development comprising 309 (no) dwellings, garages and associated roads		4814
30	Erection of 262 residential units including garages; vehicular and pedestrian accesses with associated landscaping (amended scheme)		4471
31	Erection of 262 residential units including garages; vehicular and pedestrian accesses with associated landscaping (amended scheme)		4814
74	Erection of 30 residential units with associated vehicular and pedestrian accesses and landscaping		5868
75	Residential development of 68 new dwellings, new access and car parking		5513
77	Erection of 51 dwellings including new vehicular and pedestrian accesses		4076
98	Installation of an anaerobic digestion facility to provide combined heat and power plant including silage/digestate clamp, digester, lagoon, CHP plant in shipping container, flare stack and ancillary access roads, landscaping and grid connection		3543
61	Residential development comprising 39 two storey dwellings including vehicular and pedestrian accesses and landscaping		1638
62	22 dwellinghouses including new vehicular and pedestrian access and associated landscaping		2369
64	Demolition of existing dwelling and erection of 40 detached dwellings and garages; electricity sub-station; public open space and new vehicular and pedestrian accesses (resubmission)		2387
69	Demolition of vacant commercial and residential buildings to allow layout and siting of detached three storey apartment building (comprising 26 one bedroom units and 14 two bedrooed units); new vehicular and pedestrian accesses with associated car parki		2083
73	Erection of 23 dwellings with associated vehicular and pedestrian accesses, road layouts and associated landscaping		6017
83	Outline application for residential development including new vehicular access off Enfield Chase		1680
84	Residential development (85 units) including vehicular and pedestrian accesses and associated landscaping		1680

Project ID	Description	European site potentially affected	Distance from European site (m)
85	Outline application for residential development including roads and landscaping		2462
94	Three storey care home (79 bed) with associated car parking and landscaping (resubmission)		2644
98	Installation of an anaerobic digestion facility to provide combined heat and power plant including silage/digestate clamp, digester, lagoon, CHP plant in shipping container, flare stack and ancillary access roads, landscaping and grid connection		3543
103	Erection of a 56 bed residential care home with associated 11 space car parking; hard standings; new vehicular and pedestrian accesses; landscaping and 1.8m high close boarded boundary gates and fences with 1m metal railings on frontage (resubmission)		2448
109	Wind farm including 5 no. Wind turbines, control building and associated access		4252
112	Reserved matters application (appearance, landscaping, layout and scale) following appeal decision app/v0728/a/13/2190009/nwf for erection of 328 dwellings and associated garaging; provision of open space; ecological enhancement area and landscaping		2725
115	Residential development (188 dwellings) with associated vehicular and pedestrian accesses including landscaping		2356
158	A potential gas transmission pipeline from Westerdale to the Kirkleatham/Wilton area if the Westerdale gas borehole proves economic. This proposal is at pre-application stage but was mentioned in the borehole planning application submitted to the Authority		280
161	The rebuilding of the 66kv power line from Thornton le Dale to Whitby by Northern Powergrid – this scheme is supported by Offgen and, although works to upgrade the more southerly section of the line have already taken place, the northern section is still to be completed.		0

* This table has been revised from that included in the HRA Screening Report to exclude projects which are known to be completed and which were only predicted (in the HRA Screening Report) to have the potential for an effect during the construction phase. Additional projects have been included given the increased size of the ZOIs.

6.2 North York Moors SAC

6.2.1 The North York Moors SAC covers an area of 44,082ha with a general character of heath and scrub, inland water bodies, bogs and marshes, dry grassland, humid grassland and woodland. It qualifies as a SAC for the following features:

- Northern Atlantic wet heaths with *Erica tetralix*, for which this is considered to be one of the best areas in the United Kingdom.
- European dry heaths, for which this is considered to be one of the best areas in the United Kingdom.
- Blanket bogs, for which the area is considered to support a significant presence.

6.2.2 Natural England has developed conservation objectives for the SAC which aim to avoid the deterioration of the qualifying habitats and the habitats of qualifying species, and significant disturbance of those qualifying species; ensuring that the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features. Details of the site's conservation objectives are provided in **Appendix B**.

6.3 North York Moors SPA

6.3.1 The North York Moors SPA covers an area of 44,082ha and qualifies under Article 4.1 of the Birds Directive by supporting populations of European Importance of the following Annex 1 species:

- Golden Plover *Pluvialis apricaria*, 526 pairs representing at least 2.3% of the breeding population in Great Britain (at the time of designation in 2001).
- Merlin *Falco columbarius*, 40 pairs representing at least 3.1% of the breeding population in Great Britain (at the time of designation in 2001).

6.3.2 The conservation objectives of the SPA aim to avoid the deterioration of the habitats of the qualifying features, and significant disturbance of the qualifying features; ensuring that the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive. Details of the site's conservation objectives are provided in **Appendix B**.

6.4 Arnecliff and Park Hole Woods SAC

6.4.1 The Arnecliff and Park Hole Woods SAC covers an area of 52.49ha with a general character of mixed woodland, broad-leaved deciduous woodland, inland rocks, bogs and inland water bodies. It qualifies as a SAC for the following Annex 1 habitat:

- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.

6.4.2 The site also qualifies on the basis of supporting Annex II species, *Trichomanes speciosum* (Killarney Fern), for which this is one of only four known outstanding localities in the United Kingdom.

6.4.3 The conservation objective for this SAC is to avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and significant disturbance of those qualifying species; ensuring that the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features. Details of the conservation objective are provided in **Appendix B**.

6.5 Teesmouth and Cleveland Coast SPA

6.5.1 The Teesmouth and Cleveland Coast SPA includes both marine (i.e. sediment either continuously or intermittently covered by tidal waters) and terrestrial habitats. The marine component of the site is also termed a European Marine Site (EMS). The site is of European importance because it is used regularly by at least 1% of the Great Britain population of the following species listed in Annex I of the Birds Directive (79/409/EC) (see **Table 6.2**).

Table 6.2 Annex I species

Annex 1 species	Mean	% of GB population
Little tern <i>Sterna albifrons</i>	37 pairs (1993-1996)	1.5
Sandwich tern <i>Sterna sandvicensis</i>	2,190 birds (1991-1995)	5.2

6.5.2 In addition, the SPA is used regularly by 1% or more of the biogeographical population of the following migratory species (which are qualifying features other than those listed in Annex I) in any season (see **Table 6.3**).

Table 6.3 Non-Annex I migratory species

Non-Annex 1 migratory species	Mean	% East Atlantic Flyway
Knot <i>Calidris canutus</i>	4,190 (1991/92-1995/96)	1.2
Redshank <i>Tringa totanus</i>	1,648 (1987-1991)	1.1
Ringed plover <i>Charadrius hiaticula</i>	634 (1991-1995)	1.3 (Europe/North Africa population)

6.5.3 The SPA further qualifies as it is used regularly by over 20,000 waterbirds, or 20,000 seabirds in any season. The SPA supported a peak mean of 21,406 individuals over the period 1991/92 to 1995/96.

6.5.4 In addition to the above, the SPA supports nationally important populations of Cormorant *Phalacrocorax carbo*, Shelduck *Tadorna tadorna*, Teal *Anas crecca*, Shoveler *Anas clypeata*, and Sanderling *Calidris alba*.

6.5.5 Natural England has developed conservation objectives for the SPA which aim to maintain, in Favourable Condition, the quality, distribution and extent of the designated habitats which support the cited bird species. Details of these conservation objectives are provided in **Appendix B**.

6.6 Teesmouth and Cleveland Coast Ramsar Site

6.6.1 This site comprises a range of habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) which support internationally important numbers of waterbirds. The Ramsar Criteria for the Teesmouth and Cleveland Coast Ramsar site are Criteria 5 and 6. The justifications for these criteria are as follows:

Ramsar Criterion 5

6.6.2 The site has assemblages of international importance (peak counts in winter) of 9,528 waterfowl (5 year peak mean 1998/99 – 2002/03).

Ramsar Criterion 6

6.6.3 The justification for Ramsar criterion 6 is presented in **Table 6.4**.

Table 6.4 Species occurring at levels of international importance

Species	Population
<i>Species with peak counts in spring/autumn</i>	
Common Redshank	883 individuals, representing an average of 0.7% of the GB population (5 year peak mean 1998/9-2002/3)
<i>Species with peak counts in winter</i>	
Red Knot	2579 individuals, representing an average of 0.9% of the GB population (5 year peak mean 1998/9-2002/3)
In addition, several species occur at levels of national importance including Little Tern, Northern Shoveler, and Common Greenshank, <i>Tringa nebularia</i> .	

7 DESCRIPTION OF THE BASELINE ENVIRONMENT

7.1 Mine

7.1.1 Baseline ecological surveys for the Mine were undertaken from October 2011 to October 2012 and during the period February 2013 to January 2014 by an independent ecologist, Paul Chester & Associates Ltd. (PCA). These surveys were supplemented by information obtained from a detailed ecological desk-based study and information obtained from stakeholders.

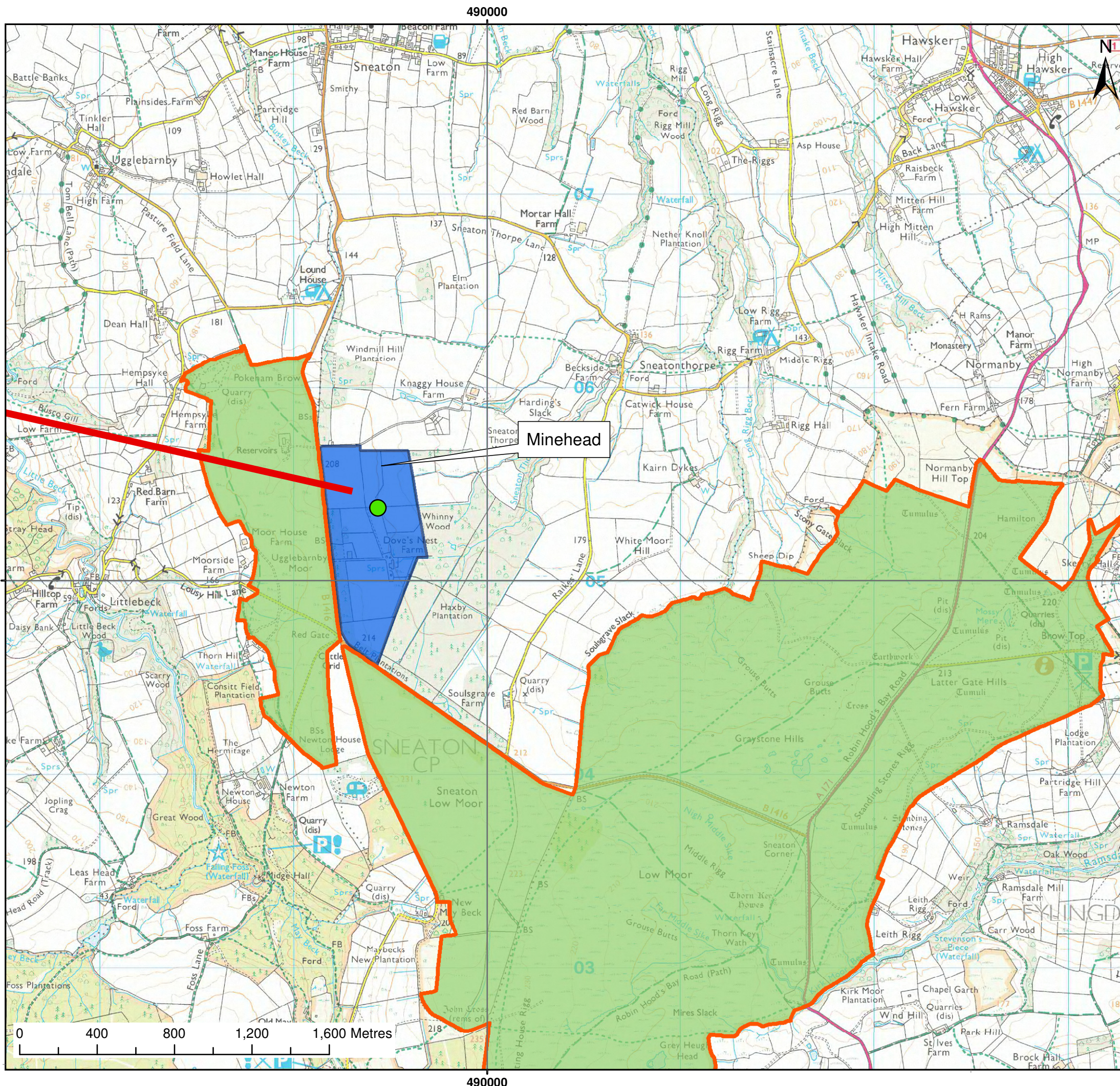
7.1.2 **Table 7.1** summarises the ecological surveys which have been undertaken in support of the mine site. Further information and copies of the report are provided separately (PCA, 2014a).

Table 7.1 Summary of ecological surveys in respect to the Mine site

Ecological survey	Reference	Description
Phase 1 Habitat Survey (2012)	Proposed Mine baseline ecology surveys report (PCA, 2014a)	These surveys followed Joint Nature Conservation Committee (JNCC, 2010) guidance which was extended to include a search for evidence of the presence of, or potential to support, notable and protected species in or adjacent to the Site, as recommended by IEEM.
NVC survey (2012 and 2013)		A botanical walkover survey of the Site was undertaken and broadly followed the standard methodology for Phase 2 vegetation surveys (National Vegetation Classification, Rodwell, 2000).
Breeding bird surveys (2012, 2013 and 2014)		Breeding bird surveys of the site which were undertaken in accordance with the Common Bird Census (CBC) methodology, described in Marchant, 1983. Golden plover and other moorland waders survey followed the Brown and Shepherd (1993) methodology for censusing upland waders. Merlin survey followed the methodology set out by Hardey <i>et al</i> (2009).
Wintering bird survey (2011/2 and 2013/14)		Winter and passage bird surveys of the site.
Amphibian survey (2012 and 2014)		Presence/absence surveys of water bodies (which has been identified during the Phase 1 Habitat Survey) which had the potential to support breeding populations of great crested newts were undertaken and in accordance with the Natural England Mitigation Guidelines, 2001.
Water vole and otter surveys (2012)	Proposed Mine baseline ecology surveys report (PCA, 2014a)	The surveys followed standard methods as set out in the Water Vole Conservation Handbook (Strachan, 2006) and involved the survey of minor streams, ditches and rush-pasture/marsh habitats and were based on a detailed search for field signs.
Invertebrate survey (2013)		Invertebrate survey was undertaken and included standard techniques of sweeping grasses, rushes, sedges, herbs and foliage over a beating tray (Kirby, 1992). The upper reaches of Sneaton Thorpe Beck were sampled using the Biological Monitoring Working Party (BMWP) survey.
Badger survey (2012 and 2014)		A badger survey of the Site was undertaken and followed the methodology of Harris <i>et al</i> (1989) and Macdonald (1998) and signs of badger presence including setts, latrines, paths, hairs, prints and push-throughs were noted.
Reptile survey (2012)		Presence/absence surveys for reptiles were undertaken of the Site between April and May 2012, following the reptile survey methodology produced by Froglife (1999) and the advice note produced by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998).

Ecological survey	Reference	Description
Bat survey (dusk and dawn emergence/re-entry surveys and monthly activity transect surveys) (2012 and 2014)		Bat emergence/re-entry and activity transect surveys were carried out with reference to bat survey and mitigation guidance (Bat Conservation Trust, 2012; English Nature, 2004) and the Bat Mitigation Guidelines IN136 (Natural England, 2006) of features which had been assessed as having potential to support bats during the Phase 1 Habitat Survey.

- 7.1.3 The proposed Mine is located at National Grid Reference (NGR) NZ 894 051 within fields at Dove's Nest Farm, with some ancillary infrastructure proposed to be located to the east in Haxby Plantation. As a mixed farm, pastures are present and are predominantly heavily improved grasslands which are managed to maximise their productivity. Examples of poor semi-improved grassland are present rarely, whilst damp neutral grassland and rush pasture habitats are also present locally. Very rarely, open damp grasslands are present at the woodland edge and are not, therefore, used for agricultural purposes. In the absence of any agricultural usage, these habitats are typically more species-rich.
- 7.1.4 The main part of Haxby Plantation is coniferous plantation woodland. The plantation is densely planted and includes even-aged blocks of trees supporting several species, including Japanese Larch, *Larix kaempferi*, Lodgepole Pine, *Pinus contorta*, Scots Pine, *Pinus sylvestris* and, more rarely, Sitka Spruce, *Picea sitchensis*. Within the main planted blocks, naturally occurring trees are typically rare or absent. Occasionally, however, sections of woodland have a more mixed composition, particularly towards the southern boundary. Other woodland is associated with Belt Plantation, which extends along the southern and south-western boundary of the proposed mine, along with a small area of mature damp willow dominated woodland to the north-east of the Dove's Nest Farm buildings.
- 7.1.5 The Mine site is adjacent to the North York Moors SAC and SPA, the boundary of which follows the south (Sneaton Low Moor) and west (Ugglebarnby Moor) perimeter of the proposed development site (see **Figure 7.1**). Sneaton Low Moor, which is to the south of the Mine site and part of the North York Moors SAC, comprises of predominately dry heath with occasional wetter heath sections (PCA, 2013). Patches of acid grassland are also present. To the west of the Mine site is Ugglebarnby Moor which comprises of a dense band of trees and shrubs as well as a mosaic of wider habitat with patches of gorse, scattered self-established birch and scots pine. Further to the west, the habitat becomes more open with scattered trees and a mosaic of wet heath and purple moor-grass dominated mire (PCA, 2013). **Figure 7.2** shows the NVC vegetation map for Ugglebarnby Moor.
- 7.1.6 Breeding bird surveys of the mine and surrounding area were completed during 2012, 2013 and 2014. These followed the methodology for the Common Bird Census (CBC) (Marchant, 1983). The surveys extended into the moorland sections to the south and west, with particular attention paid to the SPA qualifying interests, namely Golden Plover and Merlin. For these species, the survey was extended for a distance of up to 500m from the mine surface development area in 2012 and a distance of 1km into Sneaton Low Moor and the whole of Ugglebarnby Moor in 2013.



- Legend**
- Shaft Location
 - Indicative Mineral Transport System Route
 - North York Moors SAC
 - North York Moors and Teesmouth and Cleveland Coast SPA
 - Terminals of the Mineral Transport System

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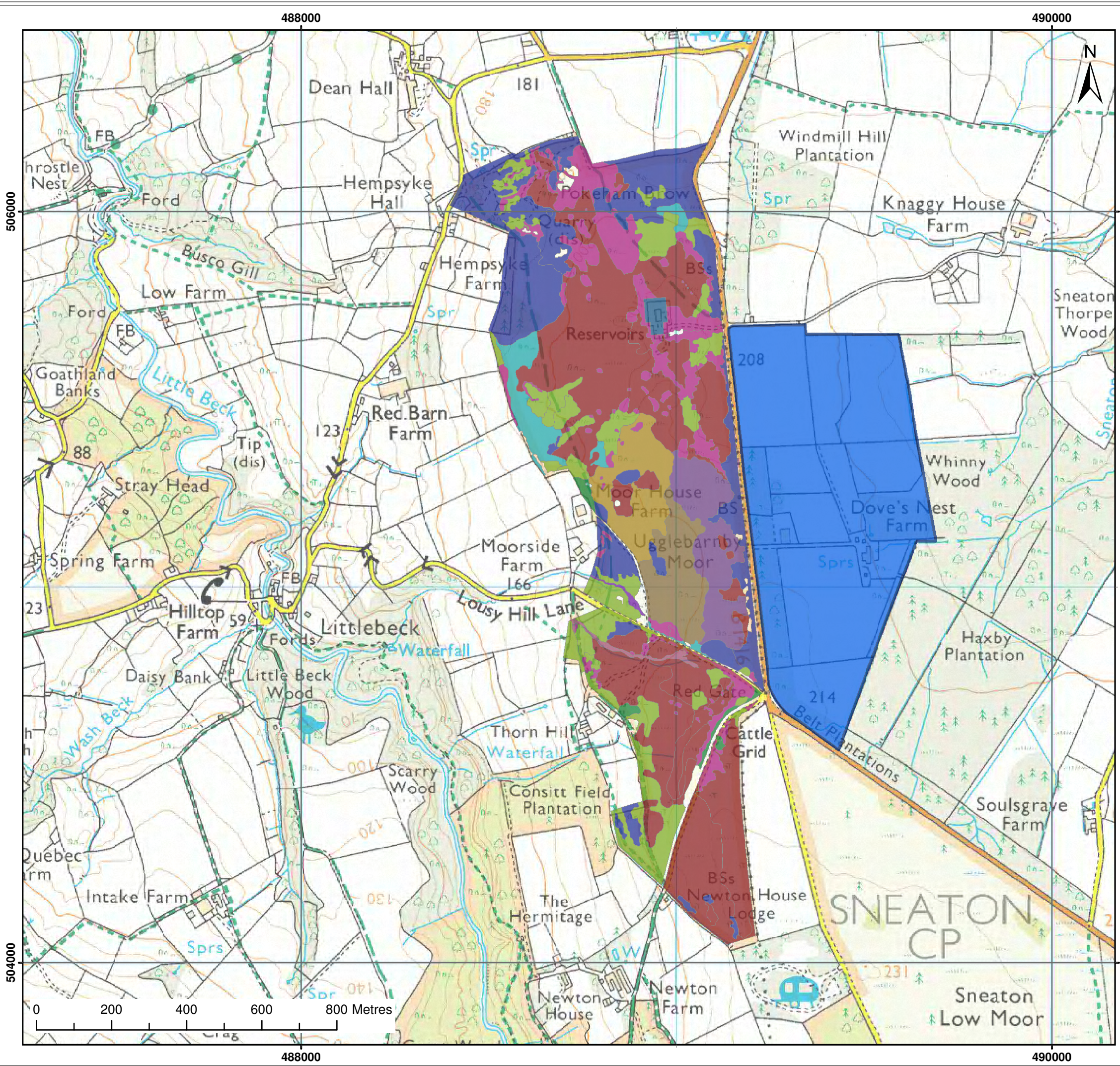
Title: European Designated sites in the vicinity of the Minehead

Figure: 7.1	Drawing No:				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	08/09/2014	TC	HC	A3	1:20,000

Co-ordinate system: British National Grid



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Legend

- Minehead of the Mineral Transport System
- Reservoir
- Ruderals
- W4 *Betula pubescens* - *Molinia caerulea*
- U20 *Pteridium aquilinum* - *Galium saxatile*
- H12 *Calluna vulgaris* - *Vaccinium myrtillus*
- M16d *Juncus squarrosus* - *Dicranum scoparium*
- W23 *Ulex europaeus* - *Rubus fruticosus*
- M25 *Molinia caerulea* - *Potentilla erecta* mire
- S10 *Equisetum fluviatile*
- M23a *Juncus acutiflorus* - *Galium palustre*
- M15 *Scirpus cespitosus* - *Erica tetralix*
- M25a *Molinia caerulea* - *Potentilla*

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Title: Ugglebarnby Moor NVC Vegetation Mapping

Figure: 7.2	Drawing No:				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	08/09/2014	TC	HC	A3	1:10,000

Co-ordinate system: British National Grid



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7.1.7 The site of the proposed Mine and its immediate surrounds is assessed as providing poor breeding bird habitat and supports a typical range of common species. No evidence of breeding Golden Plover or Merlin was apparent during the 2012, 2013 and 2014 surveys. The habitats recorded at Ugglebarnby Moor are unsuitable for both of these species and the general age of established scrub and woodland indicates that it is unlikely that such species have used this habitat in recent decades. With regard to Sneaton Low Moor, whilst this area provides a more characteristic open moorland habitat, the surveys to date have shown the moor to provide extremely poor breeding bird habitat, which supports a limited number of species, with no evidence of Golden Plover or Merlin (PCA, 2014a).

7.2 Minerals Transport System

7.2.1 The majority of the proposed intermediate shaft and spoil deposition sites are located within or adjacent to areas of agricultural land, grassland, woodland and areas of hard-standing, such as access tracks. Lockwood Beck is immediately adjacent to the North York Moors SAC and SPA, with Tocketts Lythe situated 4km from the North York Moor SAC and SPA. Lady Cross Plantation is 3km from Arnecliffe & Park Hole Woods SAC (see **Appendix A** for figures).

7.2.2 An Extended Phase 1 Habitat Survey of the area within each proposed MTS site boundary was undertaken in February 2014 (PCA, 2014b). The methodology for this survey followed JNCC (2010) guidance which was extended to include a search for evidence of the presence of, or potential to support, notable and protected species in or adjacent to each MTS site, as recommended by CIEEM.

7.2.3 **Table 7.2** summarises the ecological surveys which have been undertaken in support of each of the MTS sites. Further information and copies of the report are provided separately (PCA, 2014b) and **Table 7.3** presents the key findings of the 2014 survey for each intermediate shaft location

Table 7.2 Summary of ecological surveys in respect to each MTS site

Ecological survey	Reference	Description
Hedgerow survey (2014)	MTS baseline ecology surveys report (PCA, 2014c)	Surveys undertaken in accordance with the Hedgerows Regulations 1997 and Hedgerow Evaluation and Grading System (HEGS) (Clements and Toft, 1993).
NVC survey (2014)		A botanical walkover survey of each MTS site was undertaken and broadly followed the standard methodology for Phase 2 vegetation surveys (National Vegetation Classification, Rodwell, 2000).

Ecological survey	Reference	Description
Breeding bird survey (2014)		Breeding bird surveys of each MTS which were undertaken in accordance with the Common Bird Census (CBC) methodology, described in Marchant, 1983. Moorland waders - Brown and Shepherd (1993) methodology for censusing upland waders. Merlin - Methodology as recommended in Raptors: A Field Guide for Surveys and Monitoring (Hardey et al, 2009). Other - Common Bird Census (CBC) (Marchant, 1983).
Wintering bird survey (2012/3)		Winter and passage bird surveys of the Site.
Amphibian survey (2014)	MTS baseline ecology surveys report (PCA, 2014c)	Presence/absence surveys of water bodies (which has been identified within 250m of each MTS site during the Phase 1 Habitat Survey) which had the potential to support breeding populations of great crested newts were undertaken and in accordance with the Natural England mitigation Guidelines, 2001.
Water vole and otter surveys (2014)		The surveys followed standard methods as set out in the Water Vole Conservation Handbook (Strachan, 2006) and involved the survey of ditches, marshes, ponds and were based on a detailed search for field signs.
Invertebrate survey (2014)		Invertebrate survey was undertaken and included standard techniques of sweeping grasses, rushes, sedges, herbs and foliage over a beating tray (Kirby, 1992). Watercourses were sampled using the Biological Monitoring Working Party (BMWP) survey.
Badger survey (2014)		A badger survey of each MTS site was undertaken and followed the methodology of Harris et al (1989) and Macdonald (1998) and signs of badger presence including setts, latrines, paths, hairs, prints and push-throughs were noted.
Reptile survey (2014)		Presence/absence surveys for reptiles were undertaken of each MTS site between April and May 2012, following the reptile survey methodology produced by Froglife (1999) and the advice note produced by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998).

Ecological survey	Reference	Description
Bat survey (dusk and dawn emergence/re-entry surveys and monthly activity transect surveys) (2014)		Bat emergence/re-entry and activity transect surveys were carried out with reference to bat survey and mitigation guidance (Bat Conservation Trust, 2012; English Nature, 2004) and the Bat Mitigation Guidelines IN136 (Natural England, 2006) of features within each MTS site which had been assessed as having potential to support bats during the Phase 1 Habitat Survey.

Table 7.3 Key findings of the 2014 survey at each intermediate shaft location (Paul Chester and Associates, 2014)

Intermediate shaft location	Summary of key findings
Lady Cross Plantation	Habitats within the site boundaries were noted to provide the potential to support great crested newts, over-wintering and breeding birds, reptiles, water vole, bats and badgers. However, no evidence of the presence of these species was noted during the 2014 survey.
Lockwood Beck	Habitats within the site boundaries were assessed as having the potential to support great crested newts, roosting bats within trees, otter, water vole, reptiles, invertebrates, over-wintering and breeding birds and badgers. However, no evidence of the presence of these species was noted during the 2014 survey. Ongoing surveys have found no evidence of merlin near the site. One pair of golden plover have been identified 1.1km from Lockwood Beck (PCA, <i>pers comm</i> .)
Tocketts Lythe	Habitats within the site boundaries were assessed as having potential to support great crested newts, roosting bats within trees, otter, reptiles, over-wintering and breeding birds and foraging habitat for badgers. However, no evidence of these species was noted during the 2014 survey.

7.3 Materials Handling Facility

7.3.1 **Table 7.4** summarises the ecological surveys which have been undertaken in support of the MHF. Further information and copies of the individual reports are provided separately (INCA, 2014a-c).

7.3.2 A significant proportion of the footprint of the proposed MHF comprises grassland / scrub vegetation, with areas of hardstanding (access tracks, roads and two small buildings), with a drain and a pond occupying the remaining areas. There are also scattered trees and linear stretches of trees throughout the proposed footprint.

7.3.3 The bird surveys undertaken within the Wilton site confirmed that none of the species found to be present are cited as interest features in the Teesmouth and Cleveland Coast SPA. Curlew was the most significant wader present and this species forms part of the overall waterbird assemblage of the

SPA. It was regularly recorded as feeding in the short grass sward areas at Wilton. Over the course of the survey, a peak count of 17 curlew was recorded across the site in October 2013, which represented 2% of the Teesmouth population recorded by WeBS for this month. In March 2014, 11 curlew were recorded, which represented 2.3% of the WeBS count. It is generally accepted that 1% or more of a total population is significant to the population as a whole.

7.3.4 Oystercatcher was the only other species of wader recorded, although numbers were very low.

Table 7.4 Summary of ecological surveys in respect to the MHF

Ecological survey	Reference	Description
Phase 1 Habitat Survey (2013)	Phase 1 Habitat Survey Report (INCA, 2014a), Reptile Survey Report (INCA, 2014b), Bat Survey Report (INCA, 2014c) and Bird Survey Report (INCA, 2014d)	These surveys followed Joint Nature Conservation Committee (JNCC, 2010) guidance which was extended to include a search for evidence of the presence of, or potential to support, notable and protected species in or adjacent to the Site, as recommended by IEEM.
Reptile survey (2014)		Presence/absence surveys for reptiles were undertaken of the site between September and October 2013, following the reptile survey methodology produced by Froglife (1999) and the advice note produced by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998).
Bat survey (dusk and dawn emergence/re-entry surveys and monthly activity transect surveys) (2014)		Bat emergence/re-entry and activity transect surveys were carried out with reference to bat survey and mitigation guidance (Bat Conservation Trust, 2012; English Nature, 2004) and the Bat Mitigation Guidelines IN136 (Natural England, 2006) of features within the site which had been assessed as having potential to support bats during the Phase 1 Habitat Survey.
A survey of birds on the eastern area part of the Wilton International site: September 2013 to May 2014		A total of 25 bird counts were undertaken between September 2013 and May 2014 in an area in the eastern part of the Wilton International site.

7.4 Harbour facility

7.4.1 **Table 7.5** summarises the ecological surveys which have been undertaken in support of the Harbour facility. Further information and copies of the individual reports are provided separately (INCA, 2014a-c and e).

7.4.2 Breeding and over-wintering bird surveys have been undertaken of the areas within the footprint of the proposed Harbour facility by INCA for approximately 7 years. The surveys were undertaken in

accordance with the Common Bird Census (CBC) methodology. Each survey undertaken by INCA lasted between one and two hours and was undertaken during various states of the tide.

7.4.3 Bird distribution plots for Bran Sands lagoon, Dabholm Gut and the intertidal frontage adjacent to the proposed location of the marine terminal have been produced using the data collected by INCA from surveys undertaken between January 2012 and March 2014. These plots capture data from surveys undertaken over this period and represent a comprehensive understanding of the recent (since January 2012) use of these areas by waterbirds, including more than two complete winter periods.

Table 7.5 Summary of ecological surveys in respect to the Harbour facility

Ecological survey	Reference	Description
Phase 1 Habitat Survey (2014)	Phase 1 Habitat Survey Report (INCA, 2014a), Water vole and otter Survey Report (2014e), Reptile Survey Report (INCA, 2014b) and Bat Survey Report (INCA, 2014c)	These surveys followed Joint Nature Conservation Committee (JNCC, 2010) guidance which was extended to include a search for evidence of the presence of, or potential to support, notable and protected species in or adjacent to the Site, as recommended by IEEM.
Water vole and otter surveys (2014)		The surveys followed standard methods as set out in the Water Vole Conservation Handbook (Strachan, 2006) and involved the survey of ditches, and ponds and were based on a detailed search for field signs.
Reptile survey (2014)		Presence/absence surveys for reptiles were undertaken of the site between September and October 2013, following the reptile survey methodology produced by Froglife (1999) and the advice note produced by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998).
Bat survey (dusk and dawn emergence/re-entry surveys and monthly activity transect surveys) (2014)		Bat emergence/re-entry and activity transect surveys were carried out with reference to bat survey and mitigation guidance (Bat Conservation Trust, 2012; English Nature, 2004) and the Bat Mitigation Guidelines IN136 (Natural England, 2006) of features within the site which had been assessed as having potential to support bats during the Phase 1 Habitat Survey.
Waterbird surveys		Preliminary analysis of bird data for Bran Sands Lagoon and Dabholm Gut (Barber, 2014a), Bird use of the VOPAK Foreshore (Barber, 2014b)

7.4.4 The plots show that Bran Sands lagoon, Dabholm Gut and the intertidal area immediately adjacent to the proposed port terminal are used by a range of bird species, including common tern, curlew,

goldeneye, lapwing, redshank, sandwich tern, shelduck, teal and turnstone. **Appendix C** shows the bird distribution plots (summarising data from surveys undertaken by INCA between January 2012 and March 2014), demonstrating that the foreshore has relatively low usage compared to Bran Sands lagoon and Dabholm Gut.

7.4.5 **Tables 7.6 and 7.7** present the annual peak counts for key birds species within Bran Sands lagoon and Dabholm Gut, respectively, from 2009 to 2013. Data from 2009 to 2012 was published by Teesmouth Bird Club in their annual Cleveland Bird Reports. The annual report for 2013 is not yet available; however, INCA was able to obtain data from 2013 prior to official publication (the 2013 data will be published within the 2013 report by Teesmouth Bird Club). These data have been used to calculate a five year average of usage within Bran Sands lagoon, which has been compared to the WeBS five year average data for the Teesmouth WeBS sector. The species highlighted in bold in **Tables 7.6 and 7.7** are listed as interest features of the Teesmouth and Cleveland Coast SPA and Ramsar. Dabholm Gut does not form part of the WeBS count sector, whereas Bran Sands lagoon does.

Table 7.6 Peak counts and five year averages for key bird species from 2009 to 2013 within Bran Sands lagoon, compared against five year average data for the Teesmouth WeBS count sector (source: INCA, 2014)

Species	Peak counts per year					5 year average	WeBS 5 year average	% of WeBS 5 year average
	2009	2010	2011	2012	2013	2009 – 2013	2009 - 2013	
Little grebe	3	6	19	14	12	11	65	17
Shelduck	189	104	106	68	73	108	451	24
Mallard	28	37	72	13	16	33	304	11
Gadwall	9	21	2	13	3	10	407	3
Teal	97	176	185	32	125	123	1661	7
Goldeneye	22	31	80	63	24	44	85	52
Red breasted merganser	9	16	70	25	43	33	74	45
Turnstone	13	0	7	1	7	6	233	3
Redshank	82	86	30	3	99	60	1,235	5

Species	Peak counts per year					5 year average	WeBS 5 year average	% of WeBS 5 year average
	2009	2010	2011	2012	2013	2009 – 2013	2009 - 2013	
Common tern	0	34	0	0	19	11	570	2
Sandwich tern	0	0	0	0	18	4	221	2

Table 7.7 Peak counts and five year averages for key bird species from 2009 to 2013 within Dabholm Gut, compared against five year average data for the Teesmouth WeBS count sector (source: INCA, 2014a)

Species	Peak counts per year					5 year average	WeBS 5 year average	% of WeBS 5 year average
	2009	2010	2011	2012	2013	2009 – 2013	2009 - 2013	
Shelduck	18	67	83	74	74	63	451	14
Mallard	18	90	64	30	38	48	304	16
Gadwall	8	37	45	48	26	33	407	8
Teal	120	314	275	422	241	274	1,661	17
Turnstone	11	56	9	17	20	23	233	10
Redshank	79	132	111	89	156	113	1235	9

7.4.6 **Table 7.8** summarises waterbird usage (5 year summary from 2009-2013) of the intertidal area along the river frontage within the footprint of the proposed port terminal. **Table 7.8** shows that the number of waterbirds present is low, but exceeds 1% of the Teesmouth WeBS counts for shelduck, turnstone and redshank.

Table 7.8 Peak counts and five year averages for key bird species from 2009 to 2013 along the river frontage (including intertidal area), compared against five year average data for the Teesmouth WeBS count sector (source: INCA)

Species	Peak counts per year					5 year average	WeBS 5 year average	% of WeBS 5 year average
	2009	2010	2011	2012	2013	2009 – 2013	2009 - 2013	
Shelduck	5	6	6	2	6	5	451	1.1
Gadwall	9	-	-	-	-	2	407	0.5
Teal	13	4	5	-	-	4	1661	0.2
Mallard	2	2	-	-	-	<1	304	<0.3
Lapwing	-	-	4	-	90	19	4218	0.5
Curlew	3	2	10	3	6	5	1195	0.4
Turnstone	3	2	2	1	10	4	233	1.7
Redshank	59	10	5	8	3	17	1235	1.4

8 ASSESSMENT OF POTENTIAL FOR LIKELY SIGNIFICANT EFFECT

8.1 Introduction

- 8.1.1 This section considers the potential effects associated with the proposed YPP. Each element of the project is assessed to determine whether there is likely to be a LSE with respect to each relevant qualifying feature for the screened in designated sites. This has been undertaken in line with the Planning Inspectorate's Guidance Note 10 (The Planning Inspectorate, 2013) and agreed with Natural England.
- 8.1.2 If there is any uncertainty as to whether or not a LSE could arise, the precautionary principle has been applied and LSE concluded to ensure that the potential implications for the site are assessed further at the AA stage.

8.2 Screening assessment

8.2.1 A summary of the potential effects that could influence each relevant European and Ramsar site is presented in **Table 8.1**. The potential effects are described in more detail in **Tables 8.2 to 8.5**, with the potential for LSE identified in **Tables 8.6 to 8.9**. The Screening assessment of the potential for effects to arise due to the YPP in-combination with the effects of other relevant plans and projects is presented in **Section 8.2.3**.

Table 8.1 Summary of the potential effects associated with the YPP that could affect designated European and Ramsar sites

Designation	Potential effects	Presented in screening matrices as
North York Moors SAC	The direct effect of dust generated during construction, for example from the earthworks and use of the haul roads, and operation settling onto the habitats.	Dust
	Indirect effects associated with the emissions on and around the development sites (including vehicle emissions) and deposition of nitrogen from the generator ventilation stacks.	Emissions
	Indirect effects associated with airborne emissions associated with increased vehicular movements (road traffic) which could result in changes in nitrogen deposition (although because the prevailing wind is from the south west this change is not expected to be significant).	Emissions
	Indirect effects associated with lighting requirements for the construction and operation of the development on bird and bat populations using the SAC.	Disturbance
	Alteration to ground and surface water flows effecting water dependent habitats and species within the SAC.	Alteration to ground and surface water
North York Moors SPA	Disturbance to birds (merlin and golden plover) from noise and visual disturbance.	Disturbance
	Indirect effects associated with the emissions on and around the development sites (including vehicle emissions) and deposition of nitrogen from the generator ventilation stacks.	Emissions
	Indirect effects associated with airborne emissions in the form of dust generated from earthworks and haul roads and associated with the increased vehicular movements which could result in changes in nitrogen deposition rates.	Emissions

Designation	Potential effects	Presented in screening matrices as
	Alteration to ground and surface water flows effecting water dependent habitats and species within the SPA.	Alteration to ground and surface water
Arnecliff and Park Hole Woods SAC	The direct effect of dust generated during construction, for example from the earthworks, and operation settling onto the habitats.	Dust
	Indirect effects associated with the emissions on and around the development sites (including vehicle emissions) and deposition of nitrogen from the generator ventilation stacks.	Emissions
	Alteration to groundwater effecting water dependent habitats within the SAC.	Alteration to ground and surface water
Arnecliff and Park Hole Woods SAC	The direct effect of dust generated during construction, for example from the earthworks, and operation settling onto the habitats.	Dust
	Indirect effects associated with the emissions on and around the development sites (including vehicle emissions) and deposition of nitrogen from the generator ventilation stacks.	Emissions
	Alteration to groundwater effecting water dependent habitats within the SAC.	Alteration to ground and surface water
Teesmouth and Cleveland SPA and Ramsar site	Changes in coastal processes affecting the extent of feeding habitat. Disruption to the sediment budget (e.g. loss of fluvial sediment to offshore disposal sites due to maintenance dredging and potential impacts to bird feeding and interruption of sediment flow to Coatham Sands due to offshore disposal of maintenance dredged material).	Coastal processes
	Potential for direct take or physical disturbance of contributory habitat (e.g. the intertidal foreshore, Bran Sands lagoon and Dabholm Gut)	Loss of habitat
	Disturbance to feeding and roosting areas for overwintering and passage birds (e.g. visual disturbance arising from personnel movements and lighting).	Disturbance

Designation	Potential effects	Presented in screening matrices as
	Effects on food resources due to reduced water and sediment quality following dredging and piling. Potential implications for water levels in Bran Sands lagoon due to changes in permeability of the existing embankment between the lagoon and the Tees estuary due to construction of the proposed port terminal.	Water and sediment quality

8.2.2 Potential impacts associated with subsidence have been screened out because the Mine and MTS have been designed to avoid subsidence; that is, the 'room and pillar' mining method is proposed to be used as a means of ensuring stability. Specifically, around each shaft an area of the mineral would be left unworked in the polyhalite seams equivalent to a radius from the shaft of approximately half the depth of the shaft. This would generate an oval shape in the mineral through which only access tunnels are excavated and bunkers would be constructed. Retention of this mineral in situ creates a 'pillar of support' for the shafts, which provides stability and significantly reduces the potential for seismic interference with the shafts. Geodiversity is also not considered to require assessment in this context, due to the absence of sensitive/designated geological features in the baseline environment.

Screening Assessment of the Proposed Scheme in Isolation

North York Moors SAC

8.2.3 Qualifying features:

- Northern Atlantic wet heaths with *Erica tetralix*;
- European dry heaths; and,
- Blanket bogs.

Table 8.2 Potential effects of the YPP on the North York Moors SAC

Project element	Distance from site	Description of potential effects of the proposed scheme
Mine	0km	<p>The Mine site is not located within the boundary of the SAC; however, qualifying SAC habitats are located adjacent to the site boundary. Distances at the closest points are:</p> <ul style="list-style-type: none"> • Northern Atlantic wet heaths with <i>Erica tetralix</i> – which is approximately 340m west at its closest point from the mine site boundary. • European dry heaths – which is approximately 60m at its closest point from the mine site boundary. • Blanket bogs – which ranges between 60 and 250m at its closest point from the mine site boundary.

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p><i>Dust</i></p> <p>During the construction phase, potential impacts could be associated with airborne emissions in the form of dust which could be generated from earthworks and vehicles using the haul roads.</p> <p>Existing vegetation within the boundaries of Dove's Nest Farm (i.e. the mine surface development site), as well as the band of naturally established woodland along the edge of Ugglebarnby Moor and the direction of the prevailing winds, is expected to capture airborne dust. Any deposited material would then be removed by precipitation and, in combination with the distance of these habitats from the Mine site boundary and the prevailing (south westerly) wind direction, the potential for the deposition of dust onto the qualifying SAC habitats would be low.</p> <p>Given this, and proposed dust control measures (i.e. timing of the earthworks to avoid dry/windy conditions, and the installation of dust control measures such as rubble chutes and water suppressions on all construction plant), a LSE is not expected to occur in this context.</p> <p><i>Emissions – road traffic movements</i></p> <p>Emissions could also be associated with increased road traffic movements which could result in changes in nitrogen deposition rates.</p> <p>A number of road transport mitigation measures are proposed to be implemented as part of the YPP to reduce the impact of road traffic movements on the North York Moors. These measures would reduce the impact of emissions from road traffic and include the use of designated transport routes for all staff vehicles, the use of the P&R facilities and a below ground MTS.</p> <p>Given these measures, the impact of road traffic would be minimised such that there would be a negligible effect on local air quality and, therefore, a LSE is not predicted to arise in this context.</p> <p><i>Emissions – vehicle movements on and around the mine surface development site and ventilation stacks</i></p> <p>Indirect impacts on the areas of heathland and blanket bogs associated with the North York Moors arising from increased emissions at and around the minehead and the deposition of nitrogen from generator ventilation stacks could also be experienced. Twenty generators within two ventilation stacks (both 40m high) are proposed within the mine surface development site.</p> <p>Baseline nitrogen deposition rates for 2015 in the North York Moors (predicted to range between 17.5 and 21.6 kg N/ha/yr) are in some cases predicted to be above the upper critical load (which is 20 kg N/ha/yr) for the habitats associated with the North York Moors.</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p>These elevated values are largely due to the contribution of the background nitrogen deposition rates in the wider area. However, by 2020 and 2030, background concentrations are expected to have reduced so that the critical load for nitrogen deposition is within the acceptable range.</p> <p>The predicted changes in the annual mean concentrations of oxides of nitrogen (NO_x) (in the air) and the deposition rates of nitrogen and acid due to the mine development are provided in the URS minehead air quality technical report (URS, 2014). The calculated rate of nitrogen deposition due to the construction works ranges between 0.1 and 0.2 kg N/ha/yr and the calculated rate of acid deposition is 0.1 keq N/ha/yr.</p> <p>The largest impact on annual mean NO_x concentrations and nitrogen and acid deposition rates is predicted to occur during the 2015 construction scenario (with increased construction traffic) and would influence the section of North York Moors adjacent to the mine surface development site which is closest to the A171 (see figures in Appendix D). In this location there would be an exceedance in the daily national air quality objective for the North York Moors (which is 75µg/m³) and the deposition rates set out above would be experienced. However, the works would not cause any additional exceedances in the critical loads for nitrogen or acid deposition beyond those predicted in the baseline assessment (i.e. exceedances would be due to the already elevated background deposition rates experienced in the area). These effects would be localised and would last for the duration of the construction works.</p> <p>In sections of the North York Moors which are further away from the A171, concentrations of NO_x are predicted to be significantly less.</p> <p>In the 2020 and 2030 operational scenarios, impacts on the North York Moors would be markedly less. The operation of the proposed development would not cause an exceedance of the national air quality objective for annual mean NO_x concentrations. There would continue to be some exceedance of critical load values for nitrogen and acid deposition in the North York Moors in the vicinity of the mine site, but the dominant contributions would be the elevated background deposition rates experienced in the area (URS, 2014).</p> <p>Due to the close proximity of the mine surface development site to the SAC and the potential additions to the already exceeded critical loads for the North York Moors due to the works, a LSE cannot be ruled out at this stage. Further modelling and assessment will be undertaken to determine the significance of these impacts.</p> <p><i>Groundwater and surface water</i></p> <p>Groundwater could be affected during construction (through dewatering requirements) and the operation of the mine, potentially impacting the SAC habitats. However, the 2013 Ugglebarnby Moor vegetation and mapping exercise (PCA, 2013) concluded that the communities recorded within Ugglebarnby Moor do not represent groundwater dependent</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p>moor communities. It was considered that the recorded communities are more driven by topographical features and the gently downward slopes (i.e. soil conditions). The findings of this work considered that the SAC habitats are not suitable for the interest species for either nesting or foraging and are often associated with damp ground but are not necessarily fed by groundwater, specifically purple moor-grass dominated and rush pasture habitats are more typically associated with damp conditions created by poorly drained typically acidic soils (PCA, 2013). The potential for groundwater change to affect these habitats is low, but present,</p> <p>It is envisaged that there would be no surface water effects due to the proposed drainage control measures that would be put in place as part of the proposals.</p> <p>However, due to the close proximity (approximately 20m at its closest point) of the mine site to the SAC, and the potential impact on groundwater flows, a LSE cannot be ruled out at this stage. Further modelling will be undertaken to assess these impacts.</p>
Lady Cross Plantation Intermediate Shaft Site	4.2km	Due to the distance the shaft site is from the SAC, no direct or indirect potential impacts are considered to be likely (i.e. a LSE is not predicted).
Lockwood Beck Intermediate Shaft Site	0km	<p><i>Dust</i></p> <p>Construction activity has the potential to result in impacts associated with airborne emissions in the form of dust generated from earthworks and construction vehicles using the haul roads.</p> <p>It is proposed that the materials arising from ground works and the shaft construction would be almost entirely re-used within the mine surface development site, which would minimise the number of off-site vehicle movements. In addition, mitigation measures to control dust impacts would be implemented and adhered to throughout the construction period. These measures are envisaged to include the timing of earthworks to avoid dry/windy conditions, and the installation of dust control measures such as rubble chutes and water suppressions on all construction plant. A 'dust management plan' would also be prepared. Hence, in this context, a LSE is not expected to occur.</p> <p><i>Emissions – road traffic movements</i></p> <p>Emissions could also be associated with increased vehicular movements which could result in changes in nitrogen deposition rates.</p> <p>As set out for the Mine, a number of road transport mitigation measures would be implemented to reduce the impact of road traffic movements on the North York Moors. These measures would reduce the impact of emissions from road traffic and would include designated transport routes for all staff vehicles, use of P&R facilities and a below ground</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p>MTS.</p> <p>Given these measures, the impact of road traffic would be minimised such that there would be a negligible effect on local air quality and, therefore, a LSE is not predicted to arise in this context.</p> <p><i>Emissions – vehicle movements on and around the mine surface development site and ventilation stacks</i></p> <p>Indirect impacts on the areas of heathland and blanket bogs associated with the North York Moors arising from increased emissions at and around the Lockwood Beck Shaft Site and the deposition of nitrogen from generator ventilation stacks could also be experienced. Seven generators with one 30m high stack are proposed within this site.</p> <p>As for the mine site, the key impact on annual mean NO_x concentrations and nitrogen and acid deposition rates is predicted to occur during the 2015 construction period and would have most influence on the section of North York Moors adjacent to the intermediate shaft site which is closest to the A171. In this location there would be an exceedance in the daily national air quality objective for the North York Moors (which is 75 µg/m³) and the annual deposition of mineral particles through ventilation generally would be less than 0.2 kg/ha/yr. In some years, meteorological conditions may cause deposition to increase to 0.2 kg/ha/yr or above, but only a small portion of the North York Moors would be affected and the same area would not be affected each year (URS, 2014).</p> <p>As for the mine, the works would not cause any additional exceedances in the critical loads for nitrogen or acid deposition beyond those predicted in the baseline assessment. These effects would be localised and would last for the duration of the construction works.</p> <p>In sections of the North York Moors adjacent to the intermediate shaft site which are further away from the A171, concentrations of NO_x are predicted to be significantly less.</p> <p>In the 2020 and 2030 operational scenarios, impacts on the North York Moors would be markedly less. The operation of the proposed development would not cause an exceedance of the annual or daily mean national air quality objective values for NO_x. There would continue to be some exceedance of critical load values for nitrogen and acid deposition in the North York Moors in the vicinity of the shaft site, but the dominant contributions would be the elevated background deposition rates experienced in the area (URS, 2014).</p> <p>Due to the close proximity of the Lockwood Beck Intermediate Shaft Site to the SAC and the potential additions to the already exceeded critical loads for the North York Moors due to the works, a LSE cannot be ruled out at this stage. Further modelling and assessment will be undertaken to determine the significance of these impacts.</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p><i>Groundwater</i></p> <p>Detailed quadrat surveys undertaken in 2014 (in accordance with the NVC methodology) of habitats within the shaft site boundaries concluded that the habitats (in theory) could be impacted by alteration to the groundwater flow. However, the species found during these surveys indicate a species poor habitat. Furthermore within Ugglebarnby Moor, there is general movement of water downslope through these habitats, with sections locally demarked with a central open section (PCA, 2014). During the survey visits, the habitats were noted to be dry and therefore suggesting that the perceived importance of groundwater to this habitat is not the case. Rather, the surveys suggest that there is an existing fluctuating water table which results in these habitats being dry for prolonged periods with the associated species subsequently being recorded. When considered alongside the general topography of the site, there is little evidence to suggest that groundwater has any significant influence on the vegetation across the moor, the vegetation communities recorded during the surveys are indicative of typically surface water fed habitats associated with free draining ground or lower lying damper ground where the soils may be damper primarily as a result of topographical influences. Therefore the risk of a significant impact arising with respect to the SAC is considered to be negligible (i.e. a LSE is not predicted).</p>
Tocketts Lythe Intermediate Shaft Site	4km	Due to the distance of these project elements from the SAC, no direct or indirect potential impacts are considered to be likely (i.e. a LSE is not predicted).
MHF	11.5km	
Harbour facilities	13km	

North York Moors SPA

8.2.4 Qualifying features:

- golden plover; and
- merlin.

Table 8.3 Potential effects of YPP on North York Moors SPA

Project element	Distance from site	Description of potential effects of the proposed scheme
Mine	0km	<p><i>Disturbance</i></p> <p>Breeding bird surveys have been undertaken during 2012, 2013 and 2014 and found no evidence of golden plover or merlin within the mine surface development site or adjacent habitat (up to approximately 1km from the site boundaries) (PCA, 2014). These surveys extended into the moorland sections to the south and west of the mine site for the surrounding area. Whilst these surveys recorded all breeding bird activity, particular attention was given to golden plover and merlin. In addition, in order to facilitate further assessment of potential impacts to the North York Moors SPA, further surveys of the adjacent Ugglebarnby Moor and Sneaton Low Moor were undertaken in 2013 and 2014.</p> <p>The habitats within the proposed mine surface development site have been assessed as being poor breeding bird habitat, supporting a typical range of common bird species, with key species being skylark and meadow pipit (PCA, 2014). The habitats within the adjacent SPA have been assessed as providing poor breeding and foraging habitat for golden plover and merlin (PCA, 2013 and 2014). It is considered that the habitat within the SPA is unsuitable to support these species due to the general age of the established scrub and woodland within its site boundaries (PCA, 2014).</p> <p>Although no golden plover or merlin have been recorded during the breeding bird surveys undertaken to date, consultation with Natural England has indicated that both golden plover and merlin have been recorded in these areas previously and therefore (despite these species not being recorded during 2012, 2013 and 2014) there does remain the potential that they could return to the area. Given this, in combination with the habitats within the wider area having the potential to support merlin and golden plover, a LSE cannot be ruled out at this stage and consideration of indirect effects due to noise, visual change and lighting (in construction and operation) on foraging golden plovers and merlin will be undertaken.</p> <p>With respect to lighting, a strategy has been prepared in accordance with RSPB and Bat Conservation Trust guidance to minimise potential impacts.</p> <p><i>Groundwater</i></p> <p>Groundwater could be affected during construction (through dewatering requirements) and the operation of the Mine, potentially impacting the habitats within the ZOI.</p> <p>However, as SPA interest features have not been found near the mine surface development site, and no suitable habitat has been identified for breeding birds (merlin and golden plover) which could be impacted by alteration to the groundwater flow, the risk of a significant impact arising with respect to these interest features is considered to be negligible (i.e. a LSE is not predicted).</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
Lady Cross Plantation Intermediate Shaft Site	4.2km	<p><i>Disturbance</i></p> <p>The habitat within this shaft site boundary has been assessed as providing low quality habitat for both golden plover and merlin (PCA, 2014). Furthermore, bird surveys to date have not recorded either of these species within or adjacent to this shaft site.</p> <p>Due to the distance the shaft site is from the SPA, no direct effects are considered to be likely. However the proposed works may give rise to indirect lighting impacts on foraging golden plover and merlin during the construction phase (albeit that they have not been recorded in surveys). As set out above, due to this risk a lighting strategy has been prepared in accordance with guidance to minimise potential impacts. With the implementation of this strategy, and given the distance of the SPA from the intermediate shaft site, a LSE is not predicted.</p>
Lockwood Beck Intermediate Shaft Site	0km	<p><i>Disturbance</i></p> <p>Breeding bird surveys have been undertaken between April and June 2014 (PCA, 2014) and have recorded no golden plover or merlin within the site boundaries or within 1km of the site. Golden plover (a single pair) has been recorded approximately 1.1km to the south of this shaft site. The main breeding bird survey area focussed on the proposed extent of works boundary but was extended to include Stanghow Moor and Moorsholm Moor (both sites are located within the North York Moors SAC). At these locations, the breeding bird surveys extended for a distance up to 1km from the proposed works and to include adjacent woodland sections, the majority of which form part of the wider Kilton Beck Complex Local Wildlife Site (PCA, 2014).</p> <p>The habitat in this shaft site has been assessed as having limited suitability as a breeding habitat and this is reflected in the few species recorded during the surveys undertaken to date. The majority of the breeding bird records were associated with the adjacent woodland habitats as opposed to the proposed extent of the working area (PCA, 2014). However, the habitats within Stanghow Moor provide a wider variety of breeding bird habitats, such as dry heathland, streams and linear sections of marsh (PCAS, 2014). No evidence of breeding merlin was noted but golden plover records were associated with three territories, the closest of which is approximately 800m south-west of the shaft site. The habitats within Moorsholm Moor comprise an extensive area of moorland/moorland fringe habitat interspersed with mosaic of dry heath and acid grassland (PCA, 2014). No evidence of breeding golden plover or merlin was noted during the 2014 surveys.</p> <p>Despite the negative survey findings to date, based on the potential of the habitats within the wider area to support merlin and golden plover, a LSE cannot be ruled out at this stage during the construction phase and consideration of indirect effects due to noise, visual change and lighting on foraging golden plovers and merlin will be undertaken.</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p><i>Groundwater</i></p> <p>Groundwater levels and spring flows could also be affected during construction, which could have an effect on species using the supporting habitat.</p> <p>Detailed quadrat surveys undertaken in 2014 (in accordance with the NVC methodology) of habitats within the shaft site boundaries concluded that the habitats (in theory) could be impacted by alteration to the groundwater flow. However, based on the findings of the groundwater impact assessment, the risk of a significant impact arising with respect to the SPA's interest features is considered to be negligible (i.e. a LSE is not predicted).</p>
Tocketts Lythe Intermediate Shaft Site	4km	<p><i>Disturbance</i></p> <p>The Tocketts Lythe shaft site has been assessed as providing low quality habitat for both golden plover and merlin (PCA, 2014). Furthermore, bird surveys to date have not recorded either of these species within or adjacent to this shaft site.</p> <p>A lighting strategy has been prepared in accordance with guidelines to minimise potential impacts and, with the implementation of this strategy and given the distance of the SPA from the shaft site, a LSE is not predicted due to disturbance effects.</p>
MHF	11.5km	Due to the distance of this project element from the SPA, no direct or indirect potential impacts are considered to be likely (i.e. a LSE is not predicted).
Harbour facility	13km	<p>There is evidence of golden plover using Tees estuary, but (and importantly) the golden plover using the Tees estuary are not expected to be the same birds that are breeding in the North York Moors SPA. In addition, the golden plover within the Tees estuary frequent the north bank rather than the south bank of the estuary (i.e. outside of the proposed construction footprint for the marine terminal).</p> <p>As such, no alone impacts of the Harbour facility on the North York Moors SPA would arise due to the distance between the SPA and proposed Harbour facility (i.e. a LSE is not predicted).</p>

Arnecliff and Park Hole Woods SAC

8.2.5 Qualifying features:

- Old Sessile Oak woods with Ilex and Blechnum; and
- Killarney Fern.

Table 8.4 Potential effects of YPP on Arnecliff and Park Hole Woods SAC

Project element	Distance from site	Description of potential effects of the proposed scheme
Mine	10km	<p>Due to the distance of the project elements (including the proposed transportation routes which are approximately 3km away at their closest point) from this SAC, no direct or indirect potential impacts are considered to be likely.</p> <p>No impacts on ground or surface water are envisaged, due to the absence of a hydrological connection.</p> <p>Hence, a LSE is not predicted with respect to this site.</p>
Lady Cross Plantation Intermediate Shaft Site	3km	
Lockwood Beck Intermediate Shaft Site	15km	
Tocketts Lythe Intermediate Shaft Site	20km	
MHF	28km	
Harbour facility	31km	

Teesmouth and Cleveland Coast SPA and Ramsar site
8.2.6 Qualifying features:

- Little Tern (breeding);
- Sandwich Tern (passage);
- Ringed Plover;
- Knot;
- Redshank; and,
- Regularly supporting at least 20,000 waterfowl.

Table 8.5 Potential effects of YPP on Teesmouth and Cleveland Coast SPA and Ramsar site

Project element	Distance from site	Description of potential effects of the proposed scheme
Mine	35km	<p>Due to the distance of these project elements from the SPA, no direct or indirect potential impacts are considered possible (i.e. a LSE is not predicted).</p>
Lady Cross Plantation Intermediate Shaft Site	26km	

Project element	Distance from site	Description of potential effects of the proposed scheme
Lockwood Beck Intermediate Shaft Site	14km	
Tocketts Lythe Intermediate Shaft Site	8km	
MHF	2.3km	<p><i>Disturbance/displacement</i></p> <p>Given the distance (approximately 2.5km at its closest point) of the MHF from the SPA there are no routes for direct effects associated with the development of the MHF on estuarine habitats which support the qualifying features of the SPA or Ramsar site. However, the bird surveys undertaken over the winter of 2013/2014 have recorded that the proposed MHF site does, on occasion, support more than 1% of the Teesmouth population of curlew, which forms part of the overwintering assemblage of the SPA.</p> <p>As such, at this stage, a LSE cannot be ruled out.</p>
Harbour facility	900m	<p><i>Disturbance and sediment quality - construction</i></p> <p>Construction activities have the potential to impact on the SPA through noise (particularly piling for the marine terminal), vibration and visual disturbance; and through the release of uncontaminated and contaminated sediments during piling or dredging activities. Piling noise could impact upon birds using both banks of the Tees estuary.</p> <p><i>Habitat loss and alteration of water levels</i></p> <p>Both forms of the proposed quay construction under consideration would result in the direct loss of intertidal habitat due to the reclamation (solid quay structure) and the installation of a revetment over the re-graded intertidal habitat (open quay structure). Subtidal habitat would also be lost as a direct result of pile installation and reclamation (solid quay structure only). There is also potential for alteration to water levels within Bran Sands lagoon (and / or synchronicity in water level between the lagoon and the estuary) due to effects on the permeability of the existing embankment which separates the lagoon from the Tees estuary.</p> <p>An overland conveyor running to the north of Bran Sands lagoon would need to bridge a section of the lagoon and it is envisaged that two foundations would be required in the lagoon. Furthermore, some bank stabilisation may be required in localised areas in connection with construction of the conveyor along either the northern or southern routes for the conveyor. While these effects are not considered significant in terms of habitat loss, there is the potential for them to cause disturbance during the construction phase.</p> <p>The findings of the bird surveys undertaken to date show that the area of intertidal habitat that would be directly impacted is used by a range of species (albeit in very low numbers and only one is a SPA/Ramsar qualifying species, redshank), namely shelduck, teal, lapwing,</p>

Project element	Distance from site	Description of potential effects of the proposed scheme
		<p>redshank, turnstone and curlew. The loss of this habitat as a result of revetment installation or reclamation (for the open and solid quay structures respectively), therefore, would represent a reduction in feeding habitat available for the species which are known to utilise the area. However, consultation with INCA (who have undertaken bird surveys of the area for approximately 7 years at various states of the tide) has identified that the area of intertidal mudflat which is present at the proposed location of the port terminal is only available for feeding on spring tides and is of poor quality. As such, this intertidal habitat does not represent important feeding habitat that supports these species, although it is utilised by a small number of birds for feeding when the intertidal area is exposed.</p> <p><i>Habitats effects and disturbance - operation</i></p> <p>During the operational phase changes to coastal processes have the potential to affect the feeding and loafing resource of the designated interest features. Noise disturbance could also occur due to the increased shipping activity and conveyor activity at the site. Visual disturbance could also occur during the operational phase as a result of lighting and employee movements. There is potential for reductions in water quality associated with maintenance dredging, and emissions to air associated with the transport and handling of product.</p> <p>As such, at this stage, a LSE has been determined.</p>

Potential for project-wide interactions

- 8.2.7 **Tables 8.2 to 8.5** illustrate where the potential for a LSE has been determined or cannot be ruled out at this stage in the process and where no LSE can be determined. With respect to the potential for a LSE to arise, it is important to note that the interest features (and designated sites) that could be affected by the Mine and the Lockwood Beck intermediate shaft site (the North York Moors SAC and SPA) are not the same as the interest features (and designated sites) that could be affected by the Harbour facility and MHF. For example, LSE has been determined with respect to the Harbour facility and the Teesmouth and Cleveland Coast SPA and Ramsar site, and LSE cannot be ruled out for the MHF, but the works at the Mine and intermediate shaft sites would not affect these designated sites.
- 8.2.8 No LSE has been determined with regard to any project elements and Arnecliff and Park Hole Woods SAC.
- 8.2.9 For the North York Moors SAC and SPA, the Mine and Lockwood Beck Intermediate Shaft Site (during the construction and operational phases) have the potential to affect these sites; in each case affecting the same habitats and/or species. However, the SAC/SPA habitats that could be affected by the Mine are over 10km distant from the SAC/SPA habitats that could be affected by the works at Lockwood Beck. Hence these effects are not predicted to interact. Moreover, the effects predicted are limited in range; that is, local emission (deposition) and disturbance effects (noise and light).

Screening assessment of YPP in-combination with other relevant plans and projects

- 8.2.10 **Table 8.6** presents the screening assessment of the potential for effects to arise due to the YPP in-combination with the effects of other relevant plans and projects, as identified in **Section 5.2**.
- 8.2.11 Should any other developments become apparent within the study area, for example identified by statutory consultees and the local planning authorities, the potential for an in-combination effect to arise will be appropriately re-assessed.

Assessment of LSE

- 8.2.12 The assessment of LSE on the European and Ramsar sites screened into the assessment is presented in **Tables 8.7 to 8.10**.

Matrix Key:

✓ = Likely significant effect cannot be excluded.

x = Likely significant effect can be excluded.

C = construction.

O = operation.

D = decommissioning.

Where effects are not considered to be applicable to a particular feature, they have been 'grey' shaded.

Table 8.6 Screening assessment of the potential for effects to arise due to the YPP in-combination with the effects of other relevant plans and projects

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
Potential interactive effects			
172 - Maintenance dredging within the Tees Estuary	In-combination effects to marine water quality and food resources have the potential to arise should maintenance dredging be undertaken at the same time as the proposed dredging works associated with the harbour facility.	Teemouth and Cleveland Coast SPA and Ramsar site	Y
173 - Northern Gateway Container Terminal	During the construction phase, in-combination effects could occur due to interaction between sediment plumes created during capital dredging (with potential effects on food resources for waterbirds) and construction noise. During the operational phase, there is the potential for an in-combination effect on morphology of intertidal habitats used by waterbirds and an in-combination noise effect.		Y
174 - QEII Berth Development	During the construction phase, in-combination effects could occur due to interaction between sediment plumes created during capital dredging (with potential effects on prey species for waterbirds) and construction noise. During the operational phase, there is the potential for an in-combination effect on morphology of intertidal habitats used by waterbirds and an in-combination noise effect.		Y
120 - Construction of a poly ethylene terephthalate (PET) chemical plant	The information available regarding this proposed development states that the PET chemical plant is due to be online at the end of 2013, and as such, construction phase in-combination effects would not arise with the YPP. Ecological information produced to support the application stated that it is highly unlikely that the development would have any major influence on the existing flora and fauna. It is therefore concluded that operational in-combination effects would not arise.		N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
124 - Erection of 14 industrial units in 4 blocks (classes B1, B2 & B8) with associated service area and 76 space car park (phase 2)	This proposed developed was approved by RCBC in 2011, and has to be implemented within 3 years of the approval date. In-combination construction impacts would not therefore arise with the YPP. The proposed development is located in Kirkleatham Business Park, and as such is also distant from the Teesmouth and Cleveland Coast SPA and Ramsar. Given the nature of the development, no significant in-combination operational impacts are predicted to arise.		N
130 - Proposed anaerobic digestion and combined heat & power plant	This application was approved in 2013 and needs to be constructed within 3 years of the approval date. The planning decision makes no reference to ecological issues, and the application states that there is no designated site or protected species issues associated with it. No ecological work was carried out in support of the proposed development. Given that the SPA issues associated with the MHF and the conveyor leaving Wilton are purely due to the footprint of the MHF (i.e. disturbance to a limited number of curlew using the area), it can be concluded that there is no concern regarding construction overlap with the YPP in terms of noise. It is also concluded that there are no in-combination operational concerns for the Teesmouth and Cleveland Coast SPA and Ramsar or ecological receptors given the lack of requirement for ecological assessment.		N
59 – Installation of 2 wind turbines (140m maximum height to tip, rotor diameter 112m generating capacity 19.68gwh per annum including substation control building and new vehicular access onto A174	Ecological assessment undertaken to support this application stated that the likely effects on most species are considered to be negligible overall. The potential for collision impacts for all ornithological species was considered to be low, and no population level effects through collision are anticipated. Given that the SPA issues associated with the MHF and the conveyor leaving Wilton are purely due to the footprint of the MHF (i.e. disturbance to a limited number of curlew using the area), it can be concluded that there is no concern regarding construction overlap with the YPP in terms of noise. It is also concluded that there are no in-combination operational concerns for the Teesmouth and Cleveland Coast SPA and Ramsar or ecological receptors, as the MHF would not have an operational effect on the designated site.		N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
81 - R/2009/0504/OOM Outline application for 23 no. Dwellings with private garages and associated roads	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
87 - R/2013/0540/FFM Residential development comprising of 14 two storey detached dwellings with new access and landscaping	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
114 - R/2013/0669/OOM Outline application for up to 1000 dwellings together with ancillary uses and a neighbourhood centre, park- and-ride car park; petrol filling station; drive-thru; public house/restaurant and 60 bed hotel with details of access	A review of the planning application did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
163 - Reserved Matters Application for 41 houses and flats plus open space	Given the distance this project is from the SAC, the only potential in combination effect is from changes to groundwater. The residential development is not considered to have the potential to significantly affect groundwater and, as such, no in-combination effects are anticipated.	North York Moors SAC and SPA	N
165 - Residential development of 179 dwellings	Given the distance this project is from the SAC, the only potential in combination effect is from changes to groundwater. The residential development is not considered to have the potential to significantly affect groundwater and, as such, no in-combination effects are anticipated.		N
Potential additive effects			
27 - Demolition and creation of 4/5 storey buildings	A review of the ecological appraisal concluded that there was no potential for the works to affect the SPA and Ramsar site. Therefore, there is no potential for in-combination effects to arise.	Teessmouth and Cleveland Coast SPA and Ramsar	N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
93 - Two storey residential care home	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.	site	N
95 - Three storey 72 bed care home	A review of the environmental report identified no effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
97 - Proposed arts and media centre (this has now been constructed – the Tuned In! facility at Redcar).	The HRA undertaken for this project identified the potential for impacts to qualifying features of the SPA and Ramsar site, in particular redshank, from noise and visual disturbance.		Y
99 - Four storey residential care home	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
100 - Teaching block and lecture theatre	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
106 - Demolition and erection of new health centre	A review of the BREEM report did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
117- Demolition and outline application for leisure use	A review of the ecological statement determined that there was no potential for the SPA or Ramsar site to be affected. As such no in-combination effects are predicted.		N
118 - Leisure centre, business, civic and community buildings	A review of the EIA screening request concluded that the project would have no effect on the SPA or Ramsar site. As such no in-combination effects are predicted.		N
125 - Erection of 2No centrifuges	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
126 - Erection of pulverised coal injection plant	A review of the environmental report concluded no potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
131 - Provision of underground cables	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.	N	

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
136 - Two storey community and education centre	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
149 - 10 industrial units	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
155 - Change of use to waste transfer system	A review of the planning application did not identify any potential effects to the SPA or Ramsar site. As such no in-combination effects are predicted.		N
154 - 24MW energy facility	Ecological assessment undertaken for the application stated that ecological impacts to designated sites as a result of water quality, noise, lighting, traffic and air quality would be negligible. As such, no in-combination effects are predicted.		N
156 - 45MWe renewable energy plant	Ecological assessment undertaken for the proposed development states that no statutory sites of nature conservation would be directly affected by the development. Indirect effects to the designated sites are reported to be negligible within the ecological assessment undertaken for the proposed development. Hence no in-combination effects are predicted.		N
28 - Renewal of extant planning permission r/2007/0448/rsm for residential development comprising 309 (no) dwellings, garages and associated roads	A review of the planning application did not identify any potential effects to the SPA or SAC, primarily due to the distance of this project from the designated sites. As such no in-combination effects are expected to occur.	North York Moors SAC and SPA	N
30 – R/2012/0110/FFM Erection of 262 residential units including garages; vehicular and pedestrian accesses with associated landscaping (amended scheme)	A review of the planning application did not identify any potential effects to the SPA or SAC, primarily due to the distance of this project from the designated sites. As such no in-combination effects are expected to occur.		N
74 – R/2012/0040/FFM Erection of 30 residential units with associated vehicular and pedestrian accesses and landscaping	A review of the planning application did not identify any potential effects to the SPA or SAC, primarily due to the distance of this project from the designated sites. As such no in-combination effects are expected to occur.		N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
75 – R/2009/0546/FFM Residential development of 68 new dwellings, new access and car parking	A review of the planning application did not identify any potential effects to the SPA or SAC, primarily due to the distance of this project from the designated sites. As such no in-combination effects are expected to occur.		
77 – R/2011/0926?FFM Erection of 51 dwellings including new vehicular and pedestrian accesses	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site. As such no in-combination effects are predicted.		N
98 - R/2012/0583/FFM Installation of anaerobic digestion facility to provide combined heat and power plant including silage/digestate clamp, digester, lagoon, chp plant in shipping container, flare stack and ancillary access roads, landscaping and grid connection	A review of the planning application did not identify any potential effects to the SPA or SAC, primarily due to the distance of this project (in Skelton) from the designated sites. No EIA was undertaken and hence no significance environmental effects are predicted with respect to this application either alone or in-combination effects.		N
59 - Installation of 2 wind turbines (140m maximum height to tip; rotor diameter 112m; generating capacity 19.68gwh per annum) including substation; control building and new vehicular access onto a174	During the construction phase, in-combination effects with the Harbour facility could occur with respect to flight lines for birds using the coastal and land areas. This issue will be examined in more detail as part of the EIA for the Harbour. As this assessment is not yet complete, the outcome with regard to the potential for LSE cannot be determined at this stage. No in-combination effects identified for the Mine surface site or intermediate shaft sites.		Not determined
61 - R/2014/0128/FFM Residential development comprising 39 two storey dwellings including vehicular and pedestrian accesses and landscaping	Given the small nature of the proposals and the distance from the SPA and SAC, no in-combination effects are predicted.		N
62- R/2012/0919/FFM 22 dwellinghouses including new vehicular and pedestrian access and associated landscaping	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
64 - R/2011/0717/RSM Demolition of existing dwelling and erection of 40 detached dwellings and garages; electricity sub-station; public open space and new vehicular and pedestrian accesses (resubmission)	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
69 - R/2013/0851/CAM Demolition of vacant commercial and residential buildings to allow layout and siting of detached three storey apartment building (comprising 26 one bedroom units and 14 two bedroomed units); new vehicular and pedestrian accesses with associated car parking	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
73 - R/2012/0129/CAM Erection of 23 dwellings with associated vehicular and pedestrian accesses, road layouts and associated landscaping	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
81 - R/2009/0504/OOM Outline application for 23 no. Dwellings with private garages and associated roads	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
83 - R/2011/0931/OOM Outline application for residential development including new vehicular access off Enfield Chase	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
84 - R/2013/0727/FFM Residential development (85 units) including vehicular and pedestrian accesses and associated landscaping	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
85 - R/2012/0446/OOM Outline application for residential development including roads and landscaping	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
94 - R/2013/0609/RSM Three storey care home (79 bed) with associated car parking and landscaping (resubmission)	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
103 - R/2011/0096/RSM Erection of a 56 bed residential care home with associated 11 space car parking; hard standings; new vehicular and pedestrian accesses; landscaping and 1.8m high close boarded boundary gates and fences with 1m metal railings on frontage (resubmission)	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
109 - R/2013/0674/FFM Wind farm including 5 no. Wind turbines, control building and associated access	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
112 - R/2013/0830/FFM Reserved matters application (appearance, landscaping, layout and scale) following appeal decision app/v0728/a/13/2190009/nwf for erection of 328 dwellings and associated garaging; provision of open space; ecological enhancement area and landscaping	A review of the planning application (which did not include an ecological assessment) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N
115 - R/2013/0651/FFM Residential development (188 dwellings) with associated vehicular and pedestrian accesses including landscaping	A review of the planning application (including the ecological assessment report) did not identify any potential effects to the SPA or SAC site, primarily due to the distance of this project from the designated sites. As such no in-combination effects are predicted.		N

Project ID - Description	Potential in-combination effects	Designated site potentially affected	Potential for LSE (Y/N)
169 - A potential gas transmission pipeline	A review of the ecological assessment did not identify a LSE to qualifying features of the SAC and SPA. As such no in-combination effects are predicted.		N
172 - The rebuilding of the 66kv power line	No information was available for this project. However, given that the project runs through the SPA, it can be assumed that the construction works have the potential to disturb SPA qualifying features. It is also considered possible that the placement of any power line utility poles has the potential to result in habitat loss within the SAC. Whilst any habitat loss would be small, given the Mine's potential to affect SAC habitats through changes in groundwater, an LSE cannot be ruled out at this stage.		Y

Table 8.7 Potential for LSE on the North York Moors SAC

Distance to Proposed Scheme: Adjacent to the Mine surface site and Lockwood Beck Intermediate Shaft Site													
European site features	Project Element	Likely Effects of Proposed Scheme											
		<i>Dust</i>			<i>Alteration to (surface water)^c and groundwater</i>			<i>Emissions</i>			<i>In-combination</i>		
		<i>C</i>	<i>O</i>	<i>D^d</i>	<i>C</i>	<i>O</i>	<i>D^d</i>	<i>C</i>	<i>O</i>	<i>D^d</i>	<i>C</i>	<i>O</i>	<i>D^d</i>
<i>Northern Atlantic wet heaths with Erica tetralix</i>	Mine	x ^a	x ^a	x ^a	√ ^a	√ ^a	√ ^a	√ ^a	√ ^a	√ ^a	√ ^b	√ ^b	√ ^b
	Lady Cross Plantation												
<i>European dry heaths</i>	Lockwood Beck	x ^a	x ^a	x ^a	x ^a	x ^a	x ^a	√ ^a	√ ^a	x ^a	√ ^b	√ ^b	x ^b
<i>Blanket bogs</i>	Tocketts Lythe												
	MHF												
	Harbour facility												

^a see Table 8.2 for evidence supporting the conclusions.

^b see Table 8.6 for evidence supporting the conclusions.

^c no effects are predicted with respect to surface water.

^d for the purposes of this exercise, effects during the decommissioning phase at the Mine are taken to be as for the construction phase; at the Intermediate Shaft Sites effects during decommissioning are predicted to be very limited (as the works would be limited) and hence LSE has been 'screened out'.

Table 8.8 Potential for LSE on the North York Moors SPA

Distance to Proposed Scheme: Adjacent to the Mine and Lockwood Beck Intermediate Shaft Site													
European site features	Project Element	Likely Effects of Proposed Scheme											
		Disturbance			Emissions			Alteration to (surface water) ^c and groundwater			In-combination		
		C	O	D ^d	C	O	D ^d	C	O	D ^d	C	O	D ^d
<i>Golden Plover</i>	Mine	✓ ^e	✓ ^e	✓ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✓ ^b	✓ ^b	✗ ^b
<i>Merlin</i>	Lady Cross Plantation												
	Lockwood Beck	✓ ^e	✓ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✗ ^e	✓ ^b	✓ ^b	✗ ^b
	Tocketts Lythe												
	MHF												
	Harbour facility												

^e see Table 8.3 for evidence supporting the conclusions.

Table 8.9 Potential for LSE on the Arnecliff and Park Hole Woods SAC

Distance to Proposed Scheme: 3km from Lady Cross Plantation Intermediate Shaft Site										
European site features	Project Element	Likely Effects of Proposed Scheme								
		<i>Dust^f</i>			<i>Alteration to (surface water)^c and groundwater^f</i>			<i>In-combination^f</i>		
		<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Old Sessile Oak woods with Ilex and Belchnum</i> <i>Trichomanes speciosum, Killarney Fern</i>	Mine									
	Lady Cross Plantation									
	Lockwood Beck									
	Tocketts Lythe									
	MHF									
	Harbour facility									

^f see Table 8.4 for evidence supporting conclusions.

Table 8.10 Potential for LSE on the Teesmouth and Cleveland Coast SPA and Ramsar site

Distance to Proposed Scheme: 900m from the Harbour facility and 2.3km from MHF																			
European site features	Project Element	Likely Effects of Proposed Scheme																	
		Coastal processes			Habitat Loss			Disturbance			Water/sediment quality			Emissions			In-combination		
		C	O	D ^h	C	O	D ^h	C	O	D ^h	C	O	D ^h	C	O	D ^h	C	O	D ^h
<i>Little tern (breeding)</i>	Mine																		
<i>Sandwich tern (passage)</i>	Lady Cross Plantation																		
<i>Ringed Plover Knot</i>	Lockwood Beck																		
<i>Redshank</i>	Tocketts Lythe																		
<i>Regularly supporting at least 20,000 waterfowl</i>	MHF	x ^g	x ^g	x ^g	√ ^g	√ ^g	x ^g	x ^g	x ^g	x ^g	x ^g	x ^g	x ^g	x ^g	x ^g	x ^g	x ^b	x ^b	x ^b
	Harbour facility	√ ^g	√ ^g	x ^g	√ ^g	√ ^g	x ^g	√ ^g	√ ^g	x ^g	√ ^g	√ ^g	x ^g	√ ^g	√ ^g	√ ^g	√ ^b	√ ^b	√ ^b

^g see Table 8.5 for evidence supporting conclusions.

^h Decommissioning of the MHF would involve removal of plant and equipment. Decommissioning of the Harbour facilities would only involve removal of the overland conveyor. Effects are predicted to be very limited (as the works would be limited) and hence LSE has been ‘screened out’.

9 SCREENING STATEMENT

9.1 Introduction

9.1.1 The sections below provide a summary of the LSE conclusions derived from the screening assessment included above for each 'screened in' European designated site.

9.2 North York Moors SAC

9.2.1 For the designated features of the North York Moors SAC, it was concluded that a LSE cannot be excluded for the Mine (during construction, operation and decommissioning) and Lockwood Beck Intermediate Shaft Site (during construction) due to potential effects associated with the localised deposition of nitrogen due to the works from generator stacks and local vehicle movements. A LSE also cannot be excluded due to the potential for the alteration of the groundwater flows linked to the mine surface development works.

9.2.2 Potential in-combination effects could arise due to the building of the 66kv power line from Thornton le Dale to Whitby, associated with the potential loss of SAC habitats.

9.2.3 The other project elements, the Lady Cross Plantation intermediate shaft, Tocketts Lythe intermediate shaft, MHF and Harbour facility, have been 'screened out' at this stage of the HRA process due to their distance from the SAC and the absence of any relevant impact pathways.

9.3 North York Moors SPA

9.3.1 For the North York Moors SPA, a LSE cannot be excluded for the Mine (during construction, operation and decommissioning) and Lockwood Beck Intermediate Shaft Site (during construction) due to the potential for (noise and light) disturbance to the interest features.

9.3.2 The other project elements are considered to be too great a distance from the North York Moors SPA for a LSE to arise, and no relevant impact pathways are apparent. No potential in combination effects were identified with non-YPP developments.

9.4 Arnecliffe and Park Hole Woods SAC

9.4.1 Arnecliffe and Park Hole Woods SAC at its closest point is 3km from the nearest project element, Lady Cross Plantation, and none of the proposed YPP transport routes go through this site. Moreover, no impacts on groundwater or surface water are envisaged, due to the absence of a hydrological connection.

9.4.2 Therefore this site was 'screened out' of the HRA and was not be taken forward for a full assessment.

9.5 Teesmouth and Cleveland Coast SPA and Ramsar site

9.5.1 For the Teesmouth and Cleveland Coast SPA and Ramsar site a LSE was determined for the proposed Harbour facility due to potential direct and indirect loss of habitat, potential disturbance of the interest features due to noise and visual disturbance, potential reductions in water quality due to dredging and piling and the potential alteration of coastal processes which could impact on the availability of feeding resources.

9.5.2 Potential in-combination effects were identified with the following non-YPP projects:

- Construction and operation of the Northern Gateway Container Terminal (NGCT) from construction phase noise disturbance, creation of a sediment plume during capital dredging and changes to the hydrodynamic and sedimentary regimes during operation.
- Construction and operation of the QEII Berth Development from construction phase noise disturbance, creation of a sediment plume during capital dredging and changes to the hydrodynamic and sedimentary regimes during operation.
- Maintenance dredging within the Tees Estuary, from potential effects to marine water quality and food resources.
- Tuned In! arts and media centre from disturbance during operation (note that the centre has now been constructed).

9.5.3 For the MHF, LSE cannot be discounted at this stage due to the fact that the site of the MHF is used by more than 1% of the Teesmouth population of curlew and, therefore, the construction of the MHF would result in the loss of habitat used by waterbirds that form part of the population of the Teesmouth and Cleveland Coast SPA.

9.5.4 All other project elements were excluded from the Appropriate Assessment stage for these sites due to their distance from them.

9.6 Sites, project elements and likely effects to be taken forward to Appropriate Assessment

9.6.1 The sites, project elements and likely effects to be taken forward to the next stage (AA) were:

- North York Moors SAC – the Mine with respect to potential nitrogen deposition and groundwater effects and the Lockwood Beck Intermediate Shaft Site with respect to nitrogen deposition.
- North York Moors SPA – the Mine and Lockwood Beck Intermediate Shaft Site with respect to potential disturbance.
- Teesmouth and Cleveland Coast SPA and Ramsar site – the Harbour facility with respect to habitat loss, water quality, disturbance and the potential alteration of coastal processes, and the MHF with respect to disturbance/displacement.

9.6.2 No direct relationships or interactions have been identified between those different project elements, designated sites and interest features where the potential for LSE exists.

9.7 Other plans and projects to be taken forward to Appropriate Assessment

9.7.1 The other plans and projects to be taken forward to the next stage (AA) were:

- North York Moors SAC and SPA
 - The building of the 66kv power line from Thornton le Dale to Whitby, due to the potential for disturbance and the loss of SAC habitats.
- Teesmouth and Cleveland Coast SPA and Ramsar site
 - Construction of the NGCT and QEII Berth Development, due to disturbance and creation of a sediment plume during construction and changes to the hydrodynamic and sedimentary regime during operation.
 - Maintenance dredging within the Tees Estuary, due to potential effects to marine water quality and food resources.
 - Arts and media centre (Tuned In! at Redcar), due to disturbance during operation.

10 INFORMATION FOR APPROPRIATE ASSESSMENT (YPP ALONE)

10.1 Introduction

10.1.1 This section of YPL's HRA provides the information required for 'appropriate assessment' of the significant effects of the proposed YPP on European sites. Following the methodology set out in **Section 10.2**, for each relevant interest feature, its sensitivity, vulnerability and conservation objectives are presented. Following this, the baseline environment for the species or habitat feature under consideration is described with reference to specific technical chapters within the relevant ES.

10.1.2 For each interest feature, a list is provided of the proposed development activities and likely impacts associated with the construction, operation and (where relevant) decommissioning of the YPP. Subsequent to this, the effects of the project and predicted impacts on the interest features are described and assessed.

10.1.3 Assessment of the identified impacts against the defined conservation objectives of the European sites and for the relevant interest feature(s) is provided and a view is given on whether the YPP would have an adverse effect on the integrity of the site in question.

10.2 Approach to assessment of potential adverse effects

10.2.1 Determining whether, in view of the European site's conservation objectives, the plan or project 'either alone or in-combination with other plans or projects' would have an adverse effect (or risk of this) on the integrity of the site has been assessed in light of:

- site specific information obtained from project surveys;
- the advice of statutory bodies;

- the potential effects on European Sites screened into the assessment;
- evidence provided for and from the EIA; and
- professional judgement and lessons learned from other development projects.

10.2.2 The following definitions and approach were used to determine whether the YPP would result in an adverse effect on any European sites, and their features, screened into the HRA.

Site integrity

10.2.3 The assessment of adverse effects on the integrity of a site is addressed in light of the conservation objectives for each site. The integrity of a site is defined as the *“the coherence of the site’s ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated”* (ODPM Circular 06/2005).

10.2.4 EC guidance, *Managing Natura 2000 sites* (2000), emphasises that site integrity involves its ecological functions and that the assessment of adverse effect should focus on and be limited to the site’s conservation objectives.

Adverse effect

10.2.5 The possible impacts of the development at the construction, operation and decommissioning stages have been considered in the context of their effect on the different designated habitats and species-specific population levels of the site in question.

10.2.6 An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. In addition, an adverse effect would be one which caused a detectable reduction in the species and/or habitats for which a site was designated, at the scale of the site rather than at the scale of the location of the impact.

10.2.7 Article 1 of the Habitats Directive defines the conservation status of a natural habitat as ‘favourable’ when “the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future”. An adverse effect on site integrity will not occur if it can be shown that, in the long term, the habitat or population of the species in question as a viable component of the site will be maintained despite potential impacts. Long term is considered to be a period of at least five years. This is considered to be an appropriate timescale for the assessment of adverse effect on integrity because, for example, SPAs are usually designated in the UK on the basis of a five year population estimates. A five year rolling mean is used because it is considered to take account of sufficient data to demonstrate that birds use sites regularly, smoothing out any short term peaks and troughs in numbers.

10.2.8 Using the same argument, it is therefore logical to continue to review populations over the same time scale in order to demonstrate that observed use or ‘non-use’ of habitat is typical, and not a chance

event. In addition, bird breeding performance and productivity varies between species and between years, and many species have long life spans. Population dynamics data therefore need to take into account the possible short term fluctuations in the numbers of any species.

10.2.9 EC guidance (2000) also recommends that, when considering the 'integrity of the site', it is important to take into account a range of factors, including the possibility of effects manifesting themselves in the short, medium and long-term.

10.3 **Assessment of potential effect on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar**

Focus

10.3.1 With regard to the Teesmouth and Cleveland Coast SPA and Ramsar site, the HRA screening assessment determined that the potential for LSE existed with respect to the proposed Harbour facility due to the following:

- direct loss of habitat within the intertidal and subtidal areas of the Tees estuary;
- direct loss of habitat within Bran Sands lagoon and Dabholm Gut (due to the potential installation of foundations within the lagoon and conveyor bridge supports within Dabholm Gut) and the potential for changes in water levels in the lagoon;
- noise, vibration, visual disturbance and emissions;
- release of uncontaminated and contaminated sediments during piling / dredging; and,
- changes to coastal processes.

10.3.2 For the MHF, the screening assessment determined that LSE could not be discounted due to the loss of contributory habitat used by waterbirds that form part of the population of the Teesmouth and Cleveland Coast SPA.

10.3.3 Natural England stated within the advice that followed its review of the HRA Screening Report (Royal HaskoningDHV, 2014) that the Appropriate Assessment for the proposed Harbour facility should specifically consider the following:

- impacts arising from disturbance to un-contaminated sediment as well as contaminated sediment;
- impacts to existing conditions within Bran Sands lagoon due to changes to the frontage (e.g. potential changes to permeability within the embankment which could impact upon water levels);
- potential impacts from construction and operational phase dust emissions, including the potential for polyhalite dust escaping;
- visual disturbance from employees moving around site;
- lighting impacts along with any potential shadowing caused by structures on site (Natural England stated that whilst this is unlikely to be an issue this should be addressed within the assessment); and,

- water / sediment quality issues that may arise during the operational phase due to maintenance dredging.

10.3.4 The information within the following sections has been provided to assist with the understanding of whether the proposed scheme would result in an adverse effect on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar site.

10.3.5 Where information is not yet available to conclude the assessment, this is acknowledged and the issue will be addressed as the EIA and the HRA for the Harbour facility progress.

Direct loss of intertidal, subtidal and terrestrial habitat

10.3.6 The proposed scheme would result in the direct loss of intertidal and subtidal habitat due to capital dredging, piling, reclamation (for the solid quay only) and revetment installation (for the open quay structure only). The area of subtidal and intertidal habitat loss would differ depending on the option adopted for the quay construction, as presented within **Table 10.1**.

Table 10.1 Area of invertebrate resource which would be directly lost under each of the quay construction options

Option	Approximate area of habitat loss (m ²)	
	Piling	Reclamation / revetment
Open quay structure	255	See note below*
Solid quay structure	Part of the overall figure within the reclamation / revetment column (right hand column)	45,475 (of which a maximum of 35,000m ² ** is intertidal area)

*For the open quay structure, it is considered all existing intertidal habitat within the footprint of the proposed marine terminal would be impacted in order to install the revetment. Approximately 10,000m² of intertidal area would remain during the operational phase for the open quay structure option.

**This figure includes the existing sloped revetment along the upper shore and, potentially, an area within the shallow subtidal zone, seaward of the proposed quay line. As a result, this figure (35,000m²) is likely to be an overestimate of the intertidal area affected and will be fully defined in the EIA for the Harbour facility.

10.3.7 The overland conveyor and construction access road would largely be accommodated on existing land areas. For the construction phase access route, there may be a need for works in Bran Sands lagoon with a maximum of 2,000m² (0.2ha); this is considered to be insignificant in terms of loss of habitat given that the lagoon has an area of approximately 19ha.

10.3.8 For the southern conveyor route, there is a requirement for the installation of supports for the conveyor within the upstream section of Dabholm Gut. In addition, for the northern route it has been assumed that the conveyor crossing over the Bran Sands lagoon finger would require two supporting foundations within the lagoon (the need for these supports will be confirmed as the design of the conveyor evolves). Localised areas of stabilisation of the banks of the lagoon may be required in places, but this would not involve any significant encroachment into the lagoon.

- 10.3.9 The intertidal habitat that would be permanently lost due to the construction of the marine terminal (approximately 3.5ha) does not form part of the Teesmouth and Cleveland Coast SPA or Ramsar site. It does, however, represent habitat that provides a feeding and roosting function for waterbirds that constitute part of the SPA population. The direct loss of intertidal habitat, therefore, would represent a loss of supporting habitat to the SPA. The total area of intertidal within the Tees is approximately 300ha.
- 10.3.10 The footprint of the MHF at Wilton would result in the loss of an area that supports a small number of curlew on occasion, but is not used by other waterbirds. The use of this area by curlew is thought to be due to the fact that the vegetation is kept short on the site (INCA, pers. comm.). The area of the Wilton site is approximately 30ha.

Indirect effect on intertidal and subtidal habitat

- 10.3.11 This sub-section summarises the potential for the proposed scheme to have indirect effects on intertidal and subtidal habitats due to changes to the hydrodynamic and sediment transport regime. The two different quay options under consideration (open and solid quay) would cause effects of differing spatial extent and magnitude on the hydrodynamic and sediment transport regime. For the purposes of the HRA, the maximum (realistic worst case) effect is presented below, with justification provided.

Effect on tidal propagation

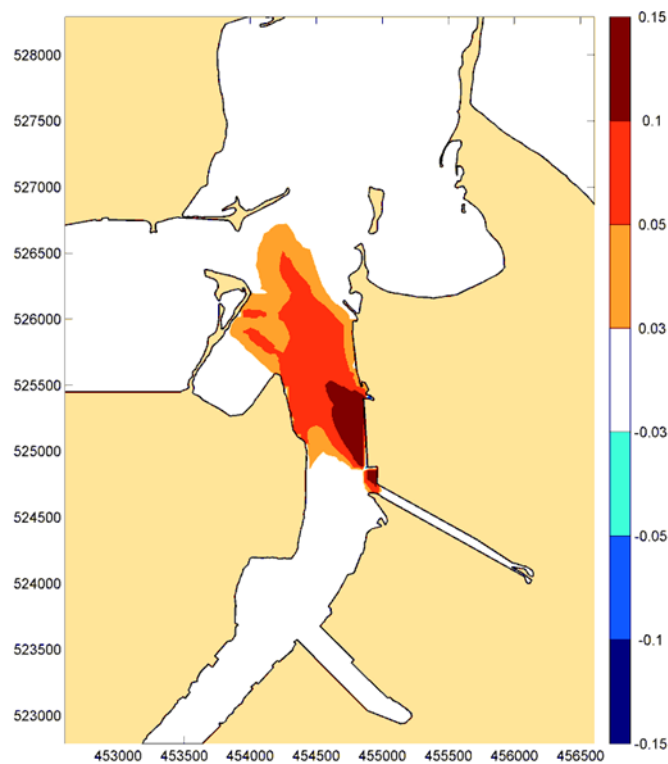
- 10.3.12 It is predicted that the proposed scheme does not have the potential to have a significant effect on tidal propagation given that the majority of capital dredging is limited to the deepening of a relatively short section of an already dredged approach channel. In addition, no dredging is proposed at the mouth of the Tees and, therefore, no effect on the way in which the tide propagates into the estuary.

Effect on wave climate

- 10.3.13 Given that no capital dredging of the approach channel is proposed, it is predicted that there would be no effect on the penetration of waves into the Tees estuary from offshore as a result of the proposed scheme. Wave modelling, therefore, was undertaken to predict the effects of the proposed quay options on wind generated waves.
- 10.3.14 The modelling results for the open quay structure show that this form of quay construction fully transmits wave energy through to the shore protection behind the proposed quay. The proposed shore protection has similar reflection characteristics to the existing shoreline and, therefore, the modelling has predicted no increase in wave energy in the estuary.
- 10.3.15 The modelling results for the solid quay structure show that the vertical face of the proposed quay has higher reflection properties than the existing shoreline, resulting in reflection of wave energy off the quay face and leading to localised areas of larger wave heights. **Figure 10.1** illustrates the maximum predicted effect of the proposed scheme on waves for 5 year south-westerly winds at mean high water spring (i.e. increase in significant wave height in the range 0.05m to 0.1m). No increases in wave

energy over the designated intertidal area at Teesmouth are shown, although some increases of very low magnitude may occur on the narrow spits located to either side of Seaton Channel.

Figure 10.1 Change in wave height (m) due to dredging and solid quay at high water, 5 year return period wind from 215 degrees



Effect on current speeds on flood and ebb tides

- 10.3.16 The capital dredging of the section of approach channel adjacent to the proposed quay is responsible for the majority of the predicted effect on current speed and direction, with currents predicted to be reduced within the deepened areas. Some current speed increases are predicted on the shoreline adjacent to the works, suggesting that the dredging is predicted to draw some of the flow to the south side of the estuary; although such effects are shown to be relatively localised to the proposed works. Away from the immediate area of the proposed scheme, the modelling work has predicted that the effect of the works is insensitive to the form of the port terminal (i.e. open quay or solid quay structure).
- 10.3.17 The modelling results predict localised increases in peak current speeds of up to 0.1m/s and reductions of up to 0.3m/s in the immediate vicinity of the proposed works. Peak current speed decreases of less than 0.05m/s are predicted across the section of dredged approach channel. **Figures 10.2** and **10.3** show the spatial extent and magnitude of predicted effect on peak tidal current speeds for the solid quay option at times of peak ebb and flood tide respectively.

Figure 10.2 Change in depth average currents due to dredging and the solid quay structure at time of peak ebb tide, spring tide, low river flow

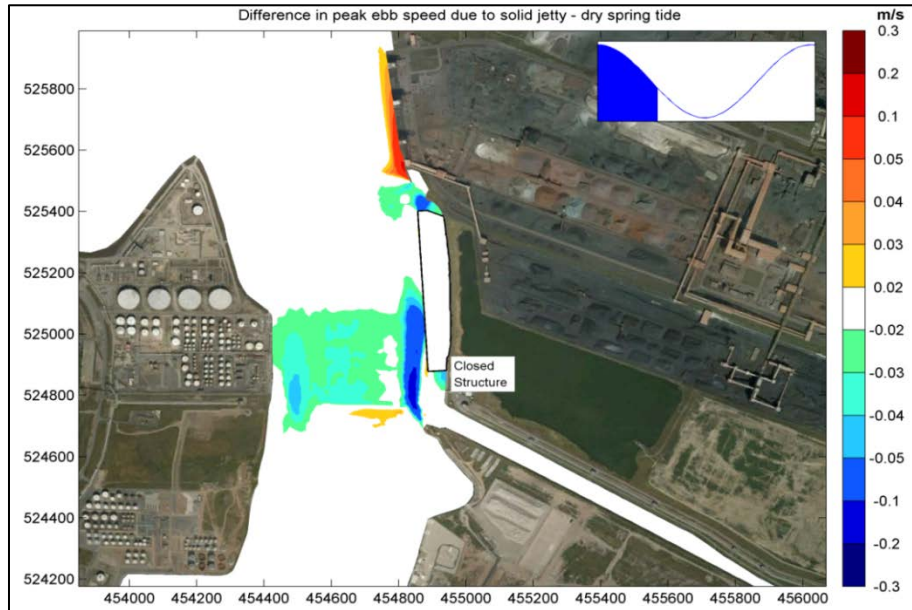
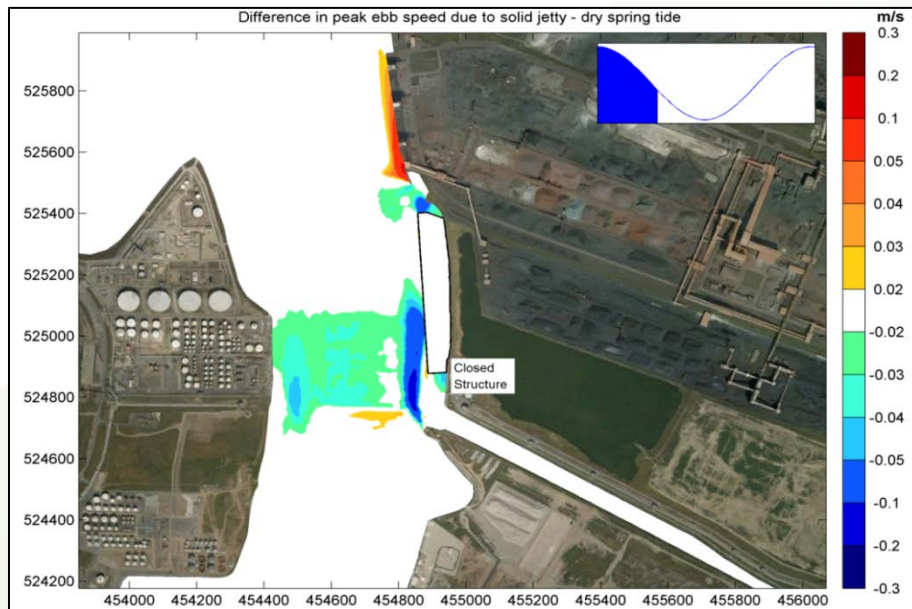


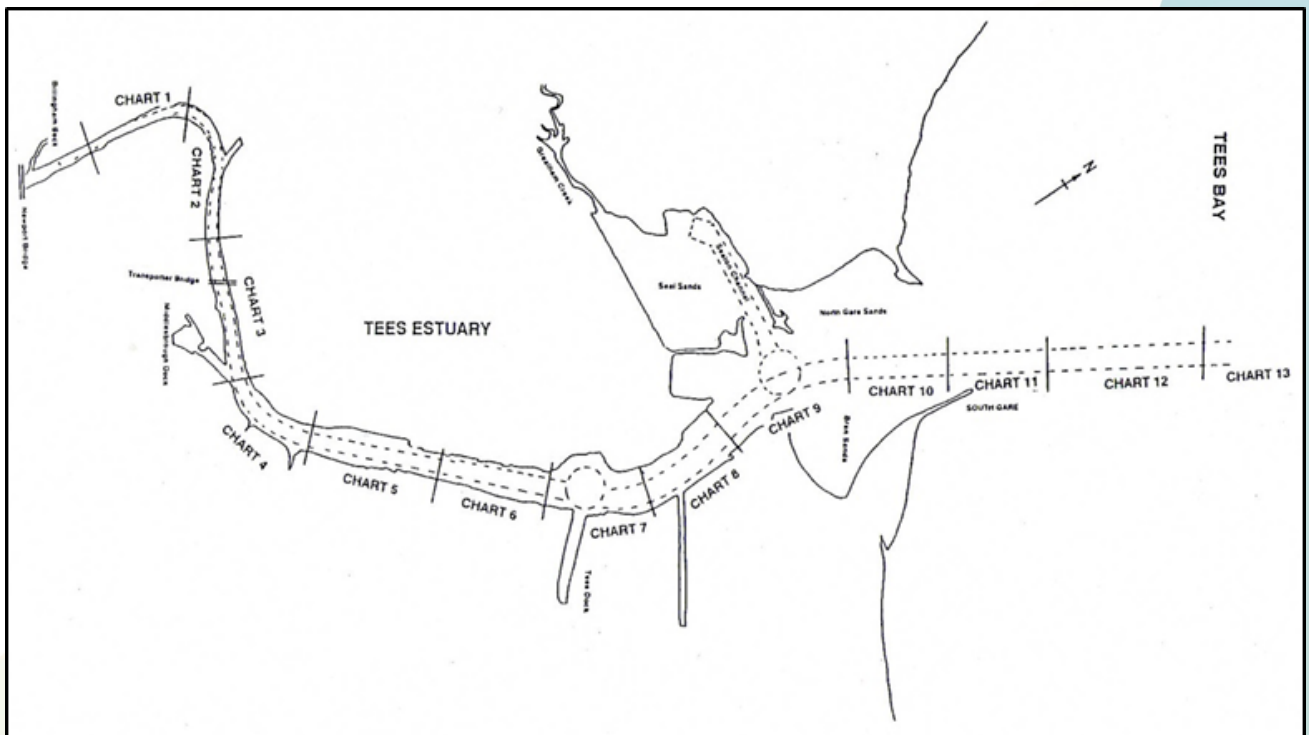
Figure 10.3 Change in depth average currents due to dredging and the solid quay structure at time of peak flood tide, spring tide, low river flow



Effect on sedimentary regime (budget) of the Tees estuary

- 10.3.18 The predicted effects of the proposed scheme on tidal propagation, wave climate and current speeds integrate to result in an effect on the sediment budget of the estuary.
- 10.3.19 The largest sediment input to the Tees estuary is from offshore and given that the proposed scheme does not include any changes to the outer sections of the approach channel, there would be no effect on the supply of material into the Tees estuary from offshore. In addition, no changes to sediment transport in the predominantly sandy areas around Teesmouth are expected and so no effect on sand transport is anticipated.
- 10.3.20 Sediment transport modelling has been undertaken to predict the increases in infill in the berth pocket, new dredged approaches and extended area of -14.1m CD channel. This modelling predicted a change in the pattern of distribution of sediment deposition in the subtidal zone, with a small increase in fine sediment infill in Chart area 9 (approximately 1%) (see **Figure 10.4**), associated with a small decrease in fine sediment infill in Chart area 8 (approximately 2 to 3%).

Figure 10.4 Tees estuary and approach Chart areas



- 10.3.21 In terms of maintenance dredging requirement of the proposed berth pocket and approach channel, average infill rates are predicted to be 5,100m³ per year for the solid quay structure and 5,900m³ per year for the open quay structure. Overall, therefore, the effect of the scheme is to result in a localised redistribution of locations of sediment deposition in response to predicted changes in current speeds as

a result of the proposed works. It is predicted that this very small change in the overall fine sediment regime would not alter the present frequency of, or methodology used for, maintenance dredging and no effect on sediment supply to intertidal areas throughout the Tees estuary would occur. Consequently, no effect on morphology of intertidal areas is predicted.

Effect on habitat quality and prey availability

10.3.22 The potential effect of the proposed scheme on habitat quality (as opposed to extent, which is addressed above) and prey availability (food resources) is linked to the effect of the proposed scheme on water and sediment quality. This sub-section focusses on potential effects of the proposed scheme on suspended sediment concentration in the water column during capital dredging, sediment deposition and water quality in Bran Sands lagoon. The potential effect of dust generation from handling of polyhalite and subsequent deposition onto habitats used by waterbirds is also discussed.

Suspended sediment concentration in the water column during capital dredging

10.3.23 Modelling of the dispersion of sediment during capital dredging has been undertaken for a range of scenarios during varying hydrodynamic conditions (low river flows and spring tide; and high river flows and neap tides). The modelling simulated dredging using three types of dredging plant to capture the most likely dredge method based on the bed material to be dredged throughout the proposed dredging. The dredgers that were simulated in the modelling are:

- backhoe dredger (BHD) in the river channel;
- trailing suction hopper dredger (TSHD) at the berth and quay construction area; and,
- cutter suction dredging (CSD) (with pumping into a barge) at the berth and quay construction area.

10.3.24 The locations of the simulated dredging operations are shown in **Figure 10.5**. The capital dredging works are expected to last for a duration of 13 weeks for Phase 1 and 10 weeks for Phase 2.

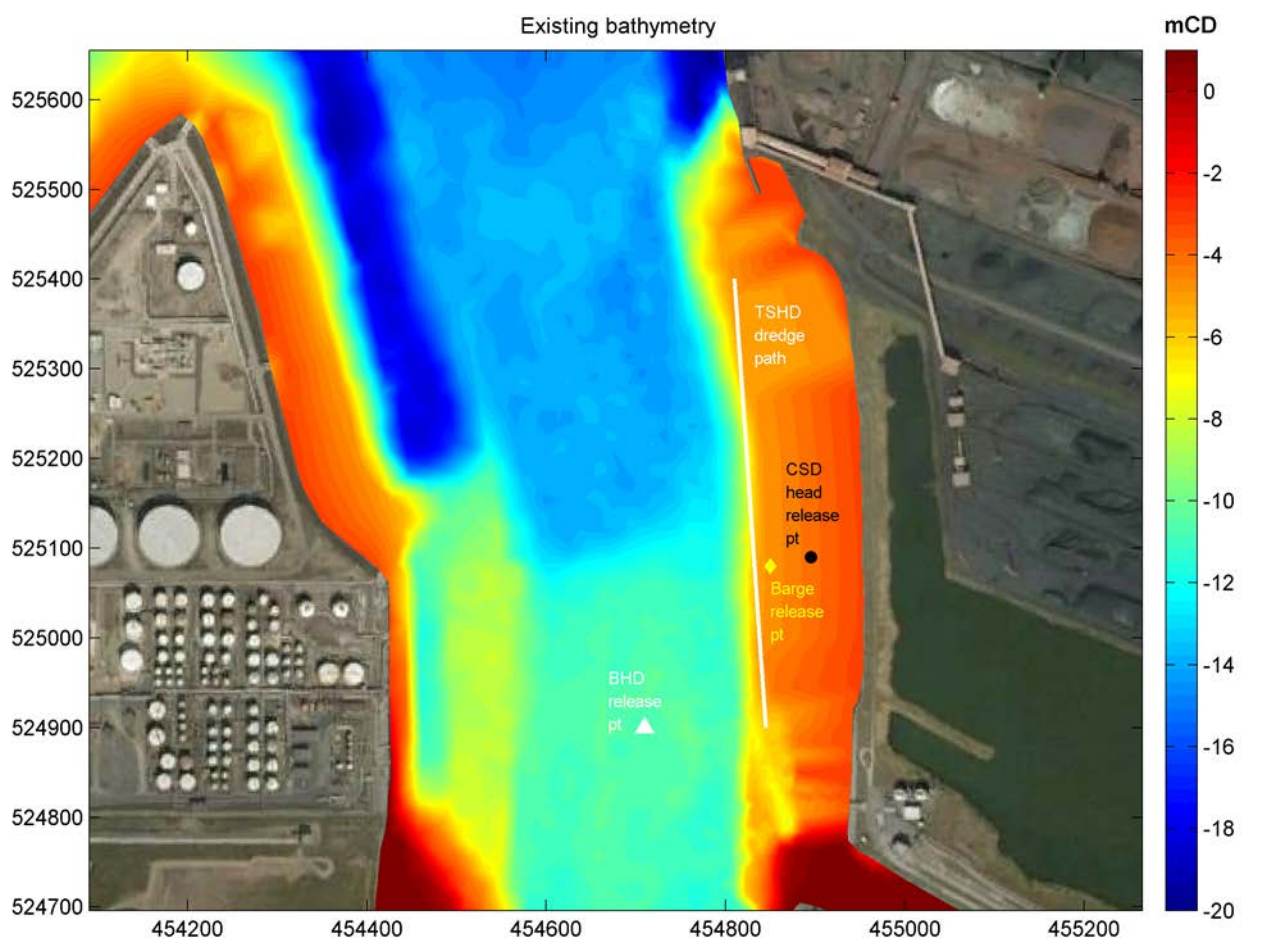
10.3.25 The results of the modelled simulations have shown that the mean increase in depth averaged sediment concentration above background concentrations in the vicinity of the dredger is predicted to be significantly lower for the backhoe dredger (greater than 10mg/l) in comparison with the CSD (greater than 500mg/l) and TSHD (greater than 200mg/l). This is illustrated within **Figures 10.6 to 10.8** for the low river flow, spring tide simulations. As shown on **Figure 10.7**, the TSHD results in the largest spatial extent of sediment plume.

10.3.26 As illustrated within **Figures 10.6 to 10.8**, predicted mean concentration increases of suspended sediment outwith the proposed dredge footprint are only a few tens of mg/l at most, on average. The simulations show that an area of elevated suspended sediment concentration, in the range of 10mg/l to 50mg/l above background may be anticipated in the channel, 1.5km either side of the dredging works.

10.3.27 Sediment quality testing has been undertaken at 8 stations located within the proposed berth pocket and section of approach channel that would be dredged. Sediment cores were taken from each station, with sub-samples taken at depth intervals throughout each core. The quality of the sediment to be

dredged as part of the Harbour facility proposals is currently being assessed. However, an initial analysis of the data from the survey has been undertaken and it appears that a number of determinands (notably hydrocarbons, mercury and copper) are elevated. Following full analysis of the data, the implications for the proposed scheme (e.g. method of dredging) will be discussed with the MMO, Natural England and the Environment Agency and the potential water quality impact assessed accordingly.

Figure 10.5 Locations of simulated dredging operations

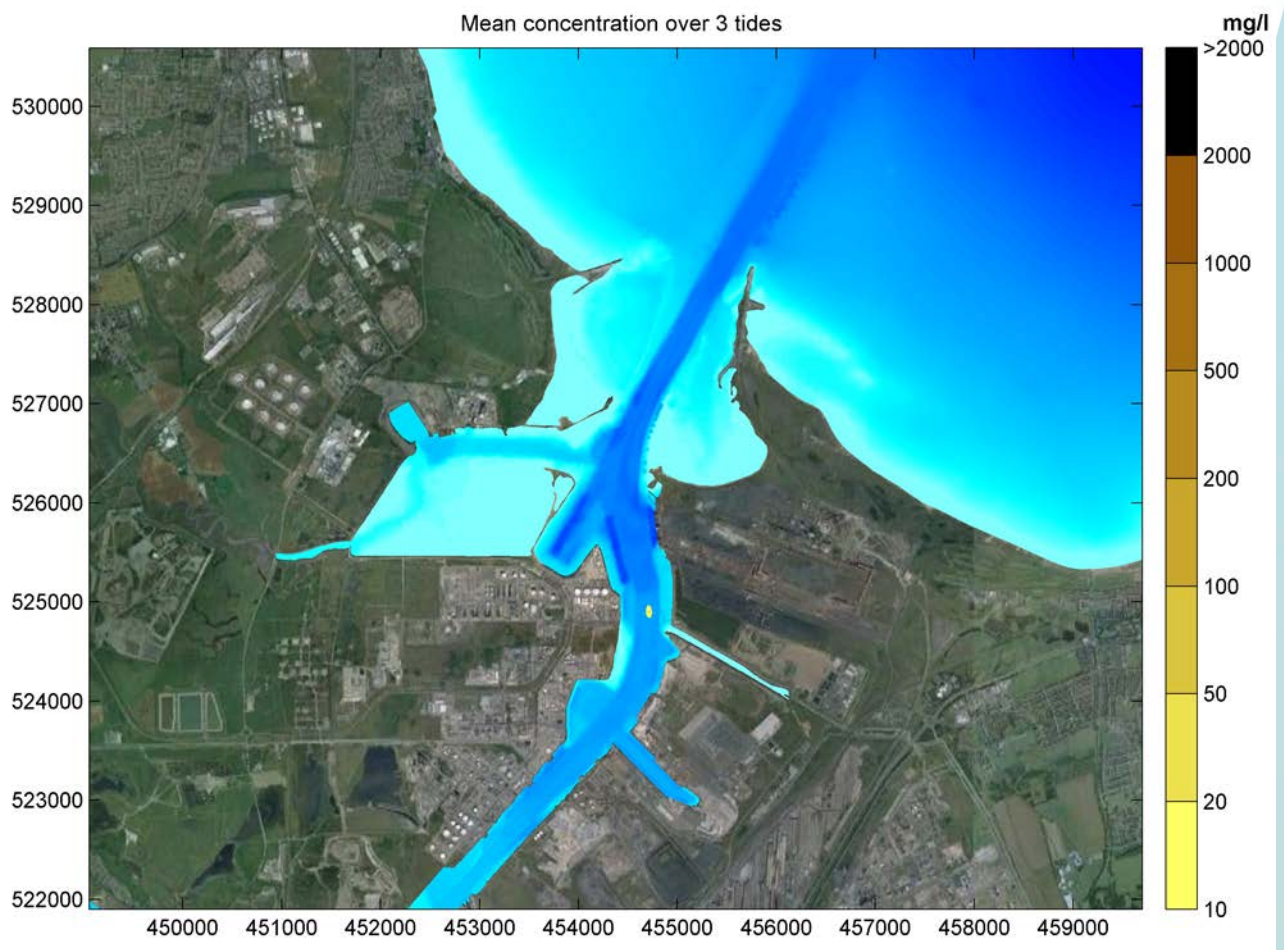


Sediment deposition onto the seabed

10.3.28 The sediment dispersion modelling made predictions of the extent and magnitude of deposition onto the seabed. A maximum deposition rate of 1 to 2mm per day in an area 2km either side of the proposed dredge footprint was predicted, with greater deposition in the immediate vicinity of dredging activity. The plume dispersion modelling predicted no average increase in suspended sediment concentration is shown over the intertidal areas, leading to a prediction of negligible sediment being

able to deposit on the intertidal areas. The maximum spatial extent of deposition is shown in **Figure 10.9** for dredging with TSHD in low river flow, spring tide conditions.

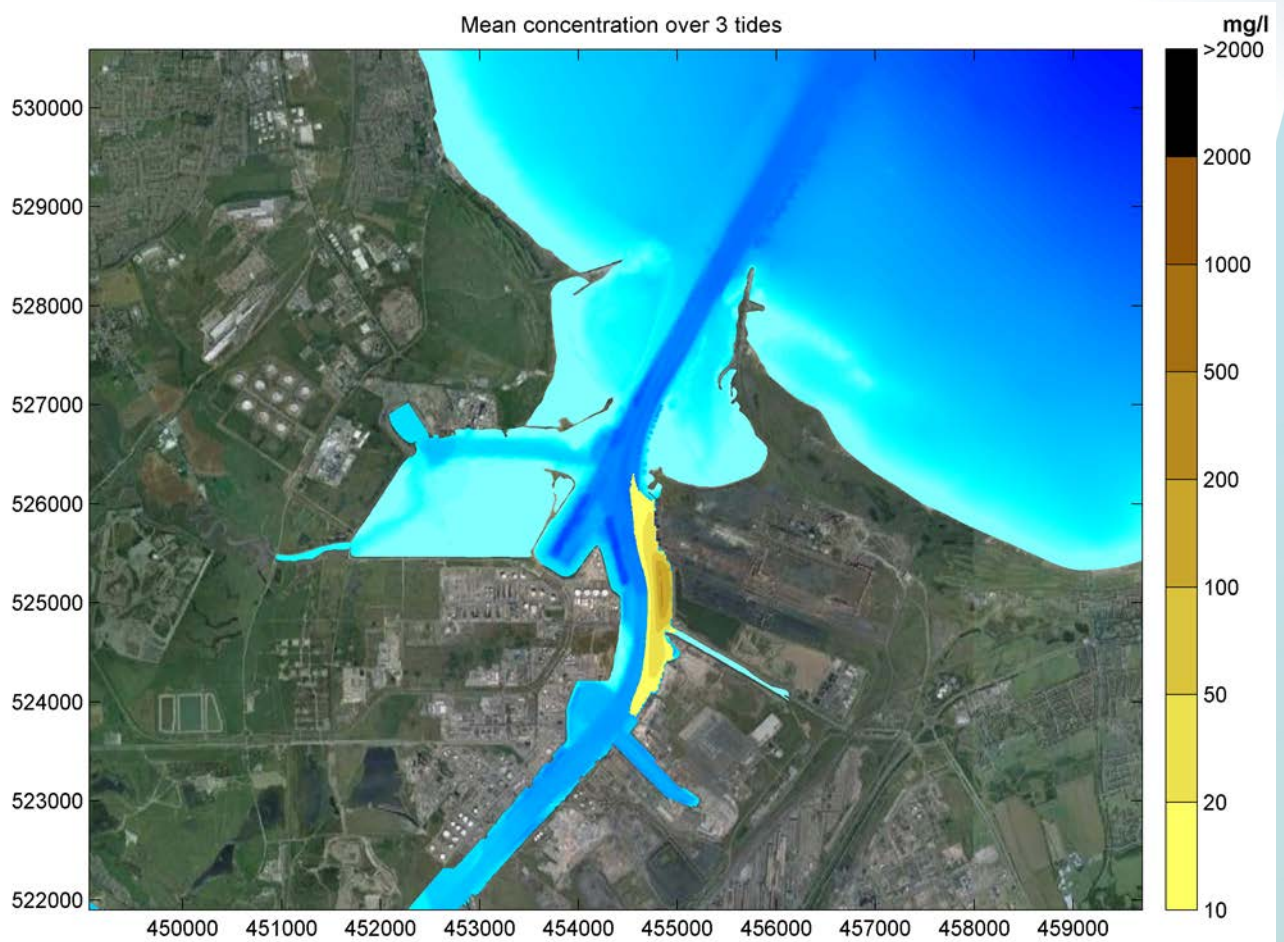
Figure 10.6 Predicted mean increase in depth averaged suspended sediment concentrations above background, backhoe dredger in low river flow, spring tide



10.3.29 During the operational phase, maintenance dredging would be required to maintain the dredged depth within the berthing pocket and approach channel. This would potentially result in an increase in total suspended sediment concentrations within the water column.

10.3.30 However, the sediment transport modelling has predicted that the effect of the proposed scheme is extremely small and well within any natural variability in the estuary. The predicted very small change in the overall fine sediment regime in the Tees is not predicted to alter the frequency of, or methodology used for, maintenance dredging.

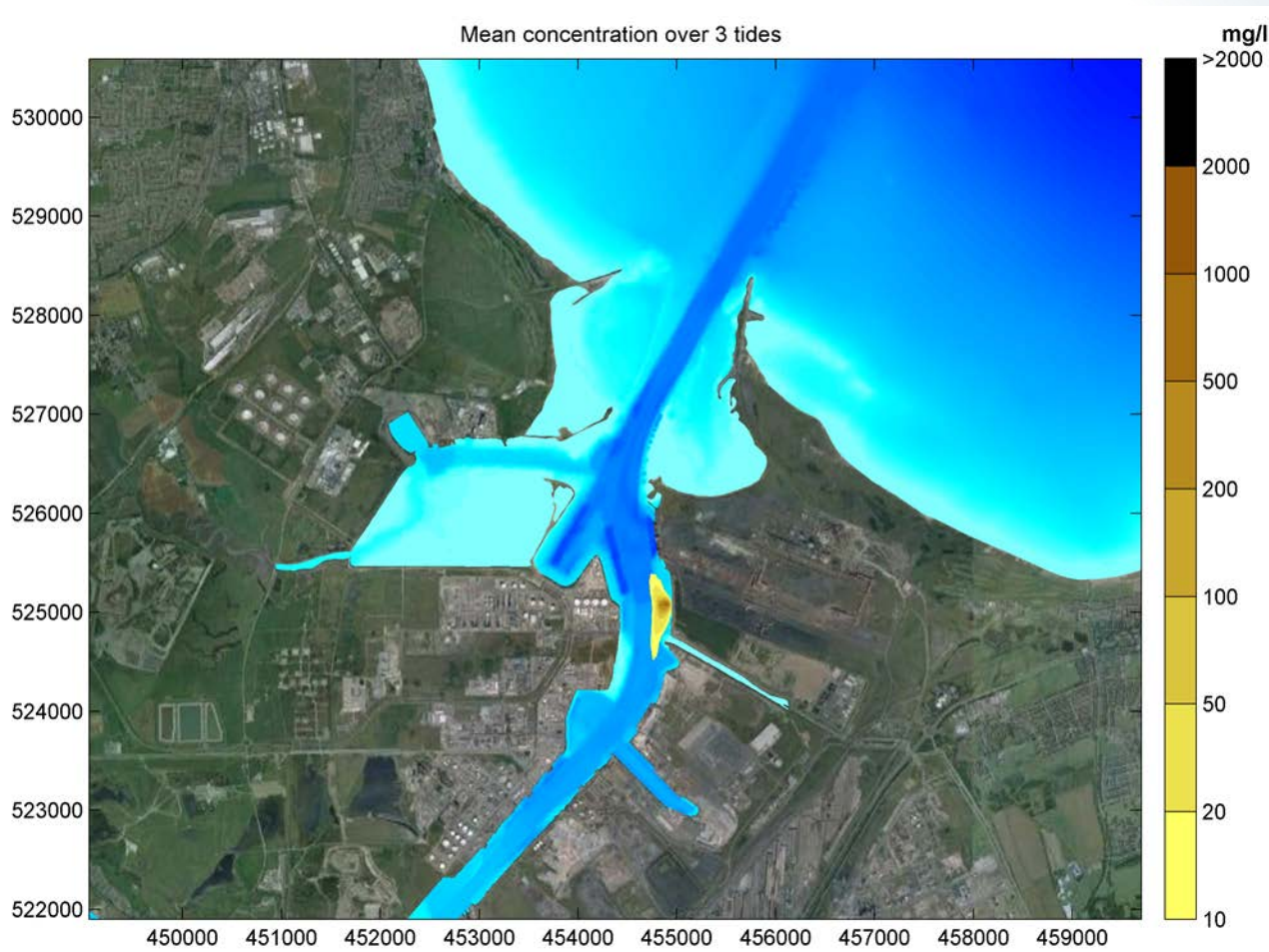
Figure 10.7 Predicted mean increase in depth averaged suspended sediment concentrations above background, TSHD dredger in low river flow, spring tide



10.3.31 The proposed scheme has the potential to impact upon water exchange between the Tees estuary and Bran Sands lagoon due to changes in permeability through the existing embankment which separates the lagoon from the estuary associated with the installation of a revetment for the open quay structure, and reclamation for the solid quay structure. This may impact upon the function of the lagoon, which is a supporting habitat to the SPA and Ramsar site.

10.3.32 It should be noted that the pipe through the embankment provides the most direct link between the Tees estuary and the lagoon and fluctuations in water level in the lagoon are largely due to water passing through this pipe in response to tidal variation in the Tees. It is proposed that this pipe connection would be maintained as part of the design of the quay and this linkage between the water bodies, therefore, would be maintained (and hence an impact would not arise).

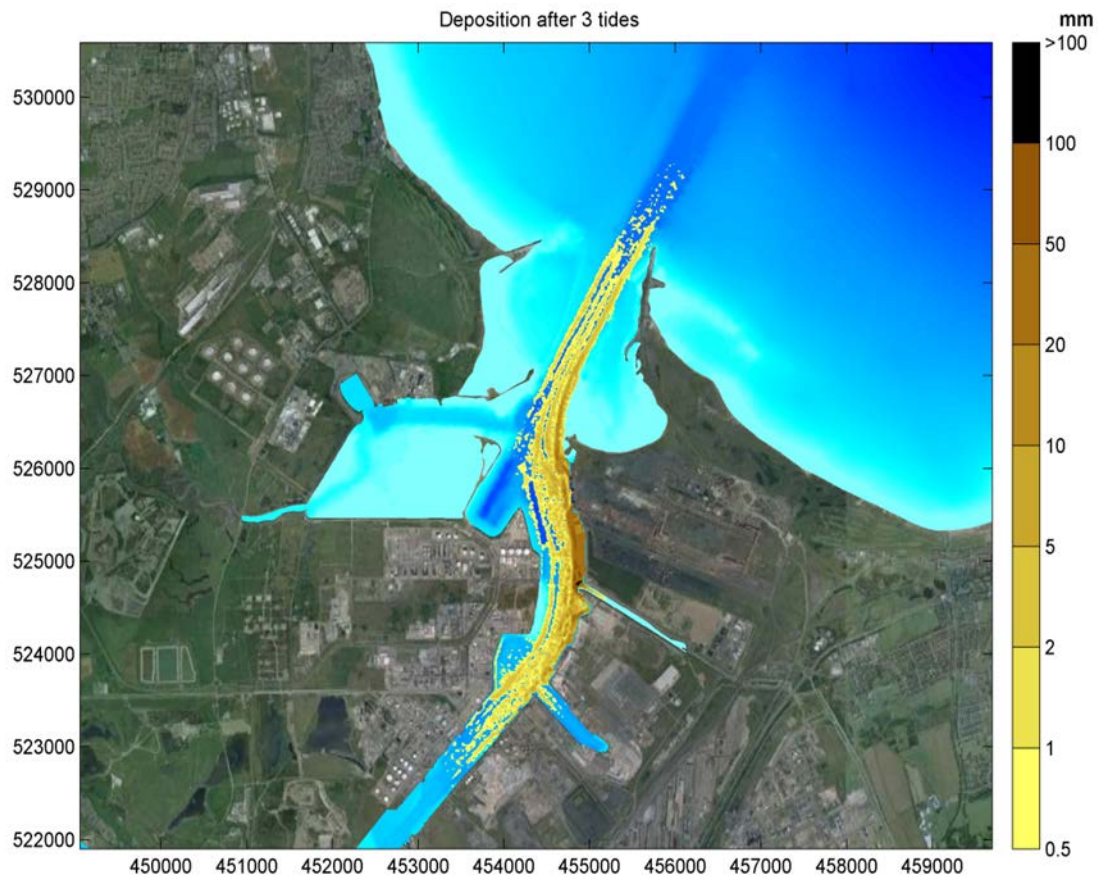
Figure 10.8 Predicted mean increase in depth averaged suspended sediment concentrations above background, CSD dredger in low river flow, spring tide



Potential impacts associated with changes to water exchange between the Tees estuary and Bran Sands lagoon

- 10.3.33 To investigate the nature of the water exchange between the Tees estuary and Bran Sands lagoon, a borehole has been advanced through the embankment and water levels have been monitored. When this data is available, a comparison will be made between water level variation in the borehole and tides in the Tees estuary. If there is water exchange between the two water bodies, it is likely that the current water level regime in the lagoon could be maintained by adjusting the design (diameter and / or level) of the pipe connecting the Tees estuary with the lagoon.

Figure 10.9 Predicted fine sediment deposition after three tides, TSHD dredging in low river flow, spring tide conditions



- 10.3.34 As noted in Section 2, further investigation is to be undertaken of the hydraulic linkage between Bran Sands lagoon and the Tees estuary in response to Natural England's recommendation that adjustments to the functioning of the lagoon should be examined, with a view to providing mitigation for the loss of intertidal area that would arise due to the direct impact of the proposed port terminal on the intertidal foreshore in the Tees estuary.

Generation and settlement of polyhalite dust

- 10.3.35 The polyhalite would be processed at the MHF at Wilton into a granulated (pellet) form of a specific size that would be coated in a layer of wax. The polyhalite product would also be screened at the MHF so that any fines or undersized pellets are reprocessed.
- 10.3.36 The product would be transported from the MHF to the port via an overland conveyor. The conveyor would be covered or enclosed along its entire length due to the need to ensure that the product is dry.

10.3.37 On the basis of the above, it is concluded that there is no significant potential for the release of dust from the handling of the polyhalite and, therefore, this issue is not considered further in this HRA.

Disturbance effects

10.3.38 The proposed scheme has the potential to give rise to a number of disturbance effects as follows:

- Noise generated by construction works.
- Movements of construction plant and personnel (i.e. visual disturbance).
- Lighting during the construction and operational phases.
- Interruption to sightlines.
- Overshadowing of Bran Sands lagoon and intertidal areas.
- Increased shipping activity.

Noise generated by construction works (airborne and underwater)

10.3.39 Airborne noise modelling has been undertaken to predict the noise levels due to piling; this aspect of the construction works has the greatest potential to result in disturbance to waterbirds. The results of the modelling show increases in noise levels extending across Bran Sands lagoon, Dabholm Gut and across the estuary including the intertidal area at Vopak foreshore (see **Figure 10.10**). It should be noted that (to date) the noise assessment has only considered piling for construction of the port terminal; piling noise associated with construction of the proposed conveyor is currently being undertaken as part of the EIA process.

10.3.40 The modelled predictions of piling noise emissions for three locations have been extracted from the model and are summarised below (noise emissions are based on 5 minutes of continuous hydraulic hammer piling):

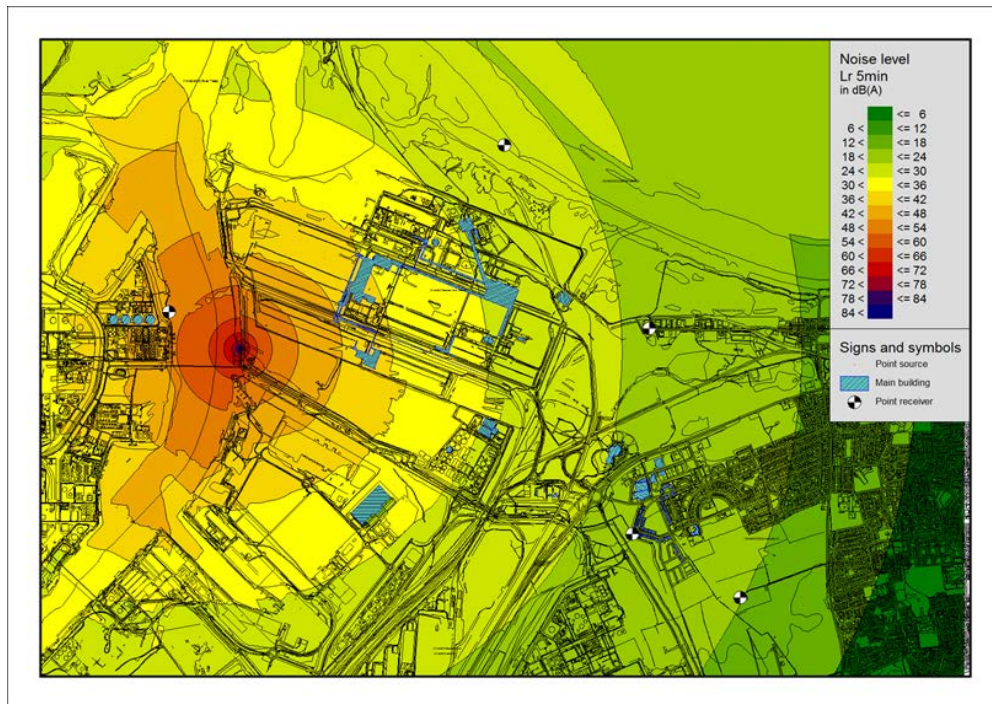
- Foreshore on the opposite bank of the Tees = 52.6dB LAeq 5mins.
- Centre of Bran Sands lagoon, approximately 375m from noise source = 52.9dB LAeq 5mins.
- Inland end of Bran Sands lagoon, approximately 700m from noise source = 47.0dB LAeq 5mins.

10.3.41 The piling works for the terminal are expected to last for an overall duration of 13 weeks for the construction of Phase 1. There would be a second period of impact for the construction of Phase 2 of the port terminal (several years after the completion of Phase 1) which is expected to have a duration of 12 weeks. The overall construction period is expected to be 17 months for Phase 1 and a further 17 months for Phase 2.

10.3.42 Research into the behaviour of waterbirds in response to impulsive noise would suggest that there would be no observable behavioural response to noise levels below 55dBA (Wright et al. (2010)). On the basis of the noise modelling predictions, it could be expected that no significant effects would occur to waterbirds on the inland half of the lagoon or on the opposite bank of the Tees estuary. Closer to the noise source, it would be expected that waterbirds would exhibit a non-flight behavioural response (e.g. moving away from the source of noise emission) or, in the immediate vicinity of the piling works, birds

may exhibit a flight response. No significant effect, in terms of noise emission, is predicted within the boundaries of designated sites, including North Tees Mudflat.

Figure 10.10 Noise contour plot for piling

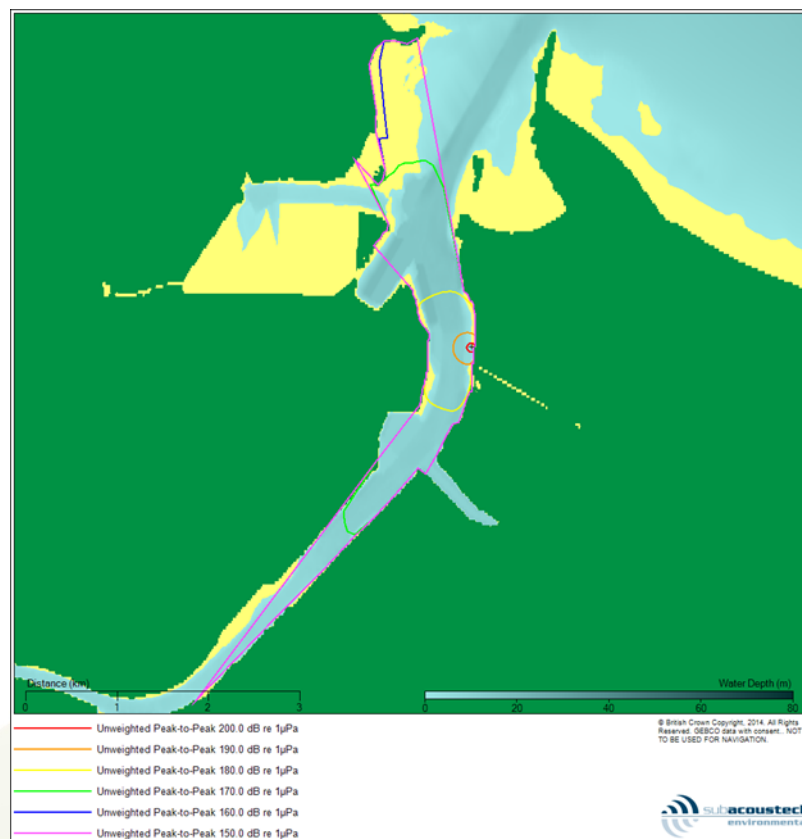


- 10.3.43 Reference to other research (by Cutts *et al.* 2008) states that sudden, irregular noise above 50dBA should be avoided as this causes maximum disturbance to birds. The research concludes that no effect would be expected for noise emissions below 50dBA, with head turning, scanning, reduced feeding and movement to other areas close by for noise emissions between 50dBA and 85dBA. The findings of this research would support the conclusion drawn above, in that no significant effects would be expected beyond the centre of Bran Sands lagoon, but with some behavioural response exhibited by waterbirds exposed to higher noise levels closer to the noise emission source.
- 10.3.44 This potential impact could be mitigated through the use of acoustic barriers along the embankment that forms the seaward end of the lagoon.
- 10.3.45 An operational phase noise impact assessment is currently being undertaken which will include the potential for operational noise at the port (including vessel movements) to cause disturbance to waterbirds, particularly those using Bran Sands lagoon and Dabholm Gut given the proximity of the waterbodies to the proposed terminal.
- 10.3.46 With regard to underwater noise, the modelling results from the proposed capital dredging operations show that underwater noise levels would not be sufficient to reach the criteria for lethal effect, physical injury or behavioural response to fish. The noise modelling predicted that behavioural responses

(avoidance reaction) would occur in fish species in an area that is highly localised to the dredger, and any avoidance reactions would be temporary for the duration of dredging.

- 10.3.47 During the operational phase, there would be no change to the maintenance dredging method or frequency and, therefore, there would be no significant underwater noise effect associated with maintenance dredging for the proposed berth pocket. The underwater noise modelling of the proposed piling predicted that audible underwater noise would extend to a maximum distance of 4.9km from the noise source (piling at the southern end of the proposed terminal) (**Figure 10.11**). Piling at the northern end would result in audible noise at a distance of 2.75km only.

Figure 10.11 Contour plot showing the predicted unweighted peak-to-peak SPL from impact piling operations at the south location (i.e. the maximum extent of the underwater noise footprint)



- 10.3.48 Modelling for behavioural response shows that the largest impact ranges from impact piling is 4.9km for herring (i.e. all modelled transects reached the riverbank at this distance before falling below the perceived level criteria for this species). The estimated behavioural impact ranges are predicted to be considerably lower for dab, salmon, sand lace and sea trout (less than 400m).
- 10.3.49 The impact zones identified above (using the various assessment criteria) are localised to the noise source (with the exception of a possible avoidance reaction in herring). Piling activities would not

present a constant noise source as the piling barge would need to be repositioned once activities at a particular location have been completed.

Movements of construction plant and personnel

- 10.3.50 The construction phase of the proposed scheme would require various personnel depending on the nature of the works being undertaken. It is envisaged that the following would be employed during the construction phase:
- Staff (management and technical specialists / engineers): 15 to 20.
 - Labour and plant operatives: 50 to 70.
 - Mechanical and electrical engineers: 20.
 - Operatives for dredging works: 5 to 10.
- 10.3.51 Construction plant would be present throughout the construction phase, with the focus of activity being along the corridor for the construction of the overland conveyor and along Tees frontage for the construction of the quay. For the works within the conveyor corridor (and construction traffic travelling to the Tees frontage), existing infrastructure (e.g. pipelines) and land form would screen the works from a direct line of sight to Bran Sands lagoon and Dabholm Gut to and significant visual disturbance to waterbirds is not envisaged for these works.
- 10.3.52 The construction works on the Tees frontage would be more visible to areas used by significant numbers of waterbirds, specifically the Bran Sands lagoon, and there is the potential for disturbance throughout the 17 month construction phase for both Phases 1 and 2 of the construction of the port terminal. It should be noted that the structures for the overland conveyor would be constructed as part of Phase 1.
- 10.3.53 The effect of visual disturbance cannot be assessed in quantitative terms (in the same way as for the effect of noise emissions). It is considered likely that waterbirds would exhibit a behavioural response to visual disturbance and redistribute away from the immediate vicinity of disturbance, but would be likely to become habituated to visual disturbance over time. It is unlikely that the zone of effect of visual disturbance would be greater than the zone of effect due to increased noise emissions and, as a worst case, it is envisaged that birds within the seaward (western) half of the lagoon would experience disturbance initially, with habituation occurring over time.
- 10.3.54 Operational phase staffing requirements are significantly reduced in comparison with the construction phase. It is predicted that there would be an operational staff of six per shift during Phase 1, and eight staff per shift during Phase 2. Such movements are not considered significant and no significant visual disturbance is predicted during the operational phase.
- 10.3.55 Natural England has, however, recommended that consideration is given to screening parking and storage areas immediately adjacent to Bran Sands lagoon in order to minimise disturbance during the

operational phase. This potential mitigation measure will be further explored during the EIA studies for the Harbour facility.

Lighting during the construction and operational phases

- 10.3.56 Working hours during the construction phase are planned to be during the day time only, with night time working available as a contingency. There is, therefore, the potential for lighting to be required during the construction phase should there be any night time working. In addition, lighting is also likely to be required during day time working hours when natural light levels are low, such as over the autumn and winter seasons.
- 10.3.57 There would be a requirement for lighting at the port terminal during the operational phase. Lighting would be provided to operational areas, access routes including walkways and platforms and to the working areas. Lighting levels would be provided to the minimum illumination levels as required by British Standard lighting requirements (BS EN 12464-2:2014 Light and Lighting, Lighting of Workplaces, Part 2: Outdoor Workplaces).
- 10.3.58 An assessment of the potential impact of both construction and operational phase lighting in the context of the existing environment will be undertaken when the lighting design for the terminal has been developed. It is envisaged that lighting would have the potential to affect waterbirds using Bran Sands lagoon and (potentially) Dabholm Gut and this will be confirmed on completion of the lighting assessment. However, mitigation measures would be adopted to minimise the potential for significant effects on the waterbirds utilising Bran Sands lagoon and Dabholm Gut; in particular ensuring that lighting is designed to avoid light spill onto these areas.
- 10.3.59 As part of the lighting design, the below key mitigation strategies would be adopted to assist with minimising the lighting effect on Bran Sands lagoon and Dabholm Gut:
- all lighting equipment on the proposed port site access roads to utilise flat glass luminaires, set horizontally, to eliminate any direct upward light and maximise control of spill light.
 - building mounted luminaires should utilise flat glass asymmetric floodlights to limit the angle of the glare produced by the luminaire. All building mounted floodlights would be angled at no greater than five degrees above the horizontal plane.
 - if any areas are not operational throughout the night, the opportunity to dim fittings or switch lighting circuits off should be assessed, subject to safety and security requirements.
 - the target illumination levels during both the construction and operational phases will be set according to the outlined requirements within the Lighting Technical Report. The illumination levels will be kept to a minimum to limit the effects of reflected upward light and light spill into the surrounding environment.
 - HGVs and other site traffic during both the construction and operational phases, would during the hours of darkness, be subject to a travel plan strategy that limits vehicle traffic and, therefore, vehicle lighting during hours of darkness.

10.3.60 Where possible, whilst considering the security requirements, the proposed lighting would be designed to minimise potential effects on waterbirds by utilising luminaires with suitable cowls, reflectors, and shield attachments. Cowls and diffusers would be provided to luminaires to direct light towards the required reference plane and limit light spill.

Interruption to sightlines and overshadowing

10.3.61 The proposed scheme comprises the construction of structures around the perimeter of Bran Sands lagoon and this has the potential to affect sightlines of waterbirds that use the lagoon as a feeding and roosting habitat. The most significant structures are as follows (refer to **Drawing PB1586/SK58**):

- overland conveyor that would run either along the northern or southern corridor alongside the lagoon (up to 19m high, rising to a maximum of 35m high as the conveyor enters the top of the surge bins);
- conveyor running along the embankment between the lagoon and the Tees estuary (up to 20m high);
- shiploaders located on the proposed quay;
- buildings of maximum height 8m to eaves and 10m to ridge; and,
- transfer towers (up to 25m high) or surge bins (up to 35m high) located at the port terminal (note that surge bins would be required at one location only along the port terminal frontage).

10.3.62 It can be seen that some of the above structures are of significant height, but they are not of significant mass and the number of structures adjacent to the lagoon is minimal given that transfer towers and surge bins would not be located at each location indicated on **Drawing PB1586/SK58**.

10.3.63 Given the above, the proposed scheme would not minimise sightlines in any direction and minimal overshadowing of Bran Sands lagoon would occur, with only localised overshadowing occurring at the seaward (western) end of the lagoon.

Increased shipping activity

10.3.64 An increase in shipping activity, or a change in the characteristics of vessels, can be a source of disturbance to feeding waterbirds in that shipwash can propagate across intertidal areas and causes birds to take flight with consequences for feeding efficiency.

10.3.65 The Tees estuary currently experiences high levels of shipping activity, with approximately 1000 vessel movements per month. The predicted increase in vessel numbers that is predicted to result during the operational phase (approximately 190 per year) is not considered significant in the context of existing overall vessel movements in the estuary. In addition, the Tees currently accommodates vessels of up to 350m in length, including large tankers which berth at the Tees North Sea Oil Terminal and large bulk carriers bringing coal and ore to Redcar Ore Terminal.

10.3.66 Given the above, and with relevant controls in place (such as speed limits), disturbance due to shipwash is not predicted to be an issue with respect to the proposed scheme.

10.4 Conclusion regarding the Teesmouth and Cleveland SPA and Ramsar site

- 10.4.1 From the above it can be concluded that the proposed Harbour facility and MHF would not directly affect habitats used by waterbirds within the boundary of the Teesmouth and Cleveland Coast SPA and Ramsar site; all proposed works are located outside the boundaries of the designated sites.
- 10.4.2 The predicted effects of the proposed marine terminal and capital dredging on the hydrodynamic and sedimentary regime during the operational phase (which have the potential to indirectly affect habitats within the designated sites) have been demonstrated to be of a localised nature and a low magnitude. Of particular importance in this context is the effect of the scheme on the sedimentary regime of the Tees estuary. This is predicted to be negligible, with no effect on the supply of sediment to intertidal areas within the Tees estuary or wider coastal processes.
- 10.4.3 The proposed Harbour facility and MHF would have a direct effect on habitats, outside the designated sites, used by waterbirds which form part of the SPA population; that is, the intertidal footprint of the proposed quay and the footprint of the MHF. While both areas are, on occasion, used by greater than 1% of the population (measured by the Teesmouth WeBS counts) for some species of waterbird (i.e. curlew at the MHF site and shelduck, redshank and turnstone on the river frontage), the total number of birds and species supported by these areas are low and the areas are not considered integral to the structure and function of the designated site.
- 10.4.4 Nevertheless the potential for mitigation measures to be implemented given the intertidal loss that would arise is currently being investigated as part of the EIA for the Harbour facility. Early consultation with Natural England on this matter has provided direction on the nature of mitigation that is considered likely to be beneficial and which will be investigated as part of the EIA, namely:
- altering the current hydraulic functioning of Bran Sands lagoon to create intertidal margins;
 - reinstatement of small islands within the lagoon to provide roosting and nesting opportunities; and,
 - wider habitat creation in the Tees estuary (e.g. recreation of islands at Bran Sands).
- 10.4.5 Two areas in close proximity to the proposed Harbour facilities (Dabholm Gut and Bran Sands lagoon) are considered to be of importance to the structure and function of the designated sites and this is clearly demonstrated through the comprehensive data available for these areas. However, it is concluded that the proposed scheme does not have the potential to have a significant effect on the habitats within these areas because any direct works within the lagoon would be minimal and temporary disturbance during construction is not expected to affect waterbird behaviour (to the extent that a flight response occurs) beyond the immediate vicinity of the piling works.
- 10.4.6 Nevertheless there would be impacts on waterbirds feeding and roosting in the lagoon and, to a lesser extent, Dabholm Gut. The most significant potential effect would be noise disturbance during the construction works, particularly during piling when some disturbance to waterbirds across the seaward (western) section of the lagoon would be expected and birds would redistribute away from the noise source. This potential impact could be mitigated through the use of acoustic barriers, which would also

act as a screen to personnel movements during construction. Based on the implementation of this measure, this effect is not predicted to have the potential to have an adverse effect on the waterbird population of the SPA and Ramsar site.

- 10.4.7 Visual disturbance due to lighting (in construction and operation) is also likely to arise. The effect of lighting has not yet been fully investigated; however, it is envisaged that mitigation measures (in terms of sensitive lighting design) can be effectively applied to avoid significant effects on the waterbirds utilising Bran Sands lagoon and Dabholm Gut.
- 10.4.8 The suspension and dispersion of sediment during capital dredging would temporarily affect water clarity, with a plume of sediment being dispersed along the axis of the navigation channel. The modelling work undertaken has predicted that there would be no increase in suspended sediment within the designated sites, and sediment deposition onto the seabed would be negligible beyond the immediate dredge footprint.
- 10.4.9 The sediment plume within the Tees is likely to affect birds that feed on small fish in the water column, with some redistribution in feeding activity likely to occur. The sediment plume modelling has predicted that suspended sediment concentrations would not be impacted at the estuary mouth and, therefore, bird feeding activity at the estuary mouth and within Tees Bay would not be affected.
- 10.4.10 Given that the initial assessment of the quality of marine sediments that would be dredged has revealed elevated levels of some contaminants, it is likely that specific mitigation would be required to limit the suspension and dispersion of sediment during capital dredging. This would reduce the spatial extent of the sediment plume as currently predicted by the EIA studies undertaken to date.
- 10.4.11 In conclusion, on the basis of the assessment undertaken to date, it is predicted that the proposed Harbour facility and MHF would not affect the structure and function of the Teesmouth and Cleveland Coast SPA and Ramsar site. This conclusion will be revisited when the full implications of the sediment quality data for the dredging methodology have been assessed, the lighting assessment and noise impact assessment (for the construction of the conveyor) have been completed and the potential options for mitigation of the loss of intertidal foreshore (due to the footprint of the port terminal) have been investigated. These aspects will be progressed as part of the EIA studies for the Harbour facility and reflected in the ES and final HRA to be submitted as part of the DCO application.

10.5 Assessment of potential effect on the integrity of the North York Moors SAC

Focus

- 10.5.1 The HRA screening assessment identified LSE with respect to the proposed Mine surface development and Lockwood Beck Intermediate Shaft Site due to the following:
- potential indirect impacts (emissions from vehicle movements and nitrogen deposition from ventilation stacks) on the areas of heathland and blanket bogs associated with the North York Moors

at and around the Mine surface development site and Lockwood Beck Intermediate Shaft Site; and,

- potential indirect impacts on groundwater dependent habitats through dewatering requirements at the Mine surface development site.

10.5.2 Natural England provided advice following their review of the HRA Screening Report (Royal HaskoningDHV, 2014) that the Appropriate Assessment for the proposed Mine surface development site and Lockwood Beck Intermediate Shaft Site as follows:

- Potential impacts on any groundwater fed features in the North York Moors SAC require consideration, particularly whether the flushes could be impacted a result of the proposed Mine surface development. Good evidence and justification will be required before such impacts can be ruled out from a hydrological perspective.
- Consideration of emissions from construction vehicles will also be required due to additional traffic movements associated with the intermediate shaft sites.

10.5.3 The information included within the subsequent sections has been provided to assist in understanding whether the YPP, but specifically the Mine surface development site and the Lockwood Beck Intermediate Shaft Site, would result in an adverse effect on the integrity of the North York Moors SAC.

Effects on groundwater dependent habitats in and around the Mine surface development site

10.5.4 As detailed in **Section 7**, the proposed Mine surface development site is adjacent to the North York Moors SAC, the boundary of which follows the south (Sneaton Low Moor) and west (Ugglebarnby Moor) perimeter of the proposed development site (see **Figure 7.1**). Sneaton Low Moor, which is to the south of the proposed Mine surface development site and part of the North York Moors SAC, is predominately comprised of dry heath with occasional wetter heath sections (PCA, 2013). This was reconfirmed during the 2014 surveys (PCA, 2014). Patches of acid grassland are also present. To the west of the proposed Mine surface development site is Ugglebarnby Moor, which comprises a dense band of trees and shrubs, as well as a mosaic of wider habitat with patches of gorse, scattered self-established birch and scots pine. Further to the west, the habitat becomes more open, with scattered trees and a mosaic of wet heath and purple moor-grass dominated mire (PCA, 2013 and PCA, 2014). **Figure 7.2** shows the NVC vegetation map for Ugglebarnby Moor.

10.5.5 The proposed Mine surface development comprises earthworks and substructures that would penetrate the superficial deposits into the bedrock strata and interact with the groundwater system. The principle earthwork elements would include the following:

- A shaft platform in the northern area of the mine surface development site, with an under drainage blanket discharging to surface waters.
- Landscape mounds over the northern eastern and southern areas, incorporating permanent mining waste facilities to contain non-inert, non-hazardous mining waste of low leachable content.

- Temporary mining waste facilities to contain non-inert, non-hazardous mining waste materials of moderate to high leachable content prior to their offsite disposal.

- 10.5.6 Construction of all below ground structures would involve an element of pre-grouting. All grouting materials would be specified to be non-leachable and non-polluting to the environment. During construction, groundwater that is removed from the excavations would be treated on site for either discharge as clean water to surface waters, for off-site disposal or for discharge into the aquifers. Therefore the grouting and subsequent lining of substructures would be the source of potential physical impacts on groundwater levels and flow paths in the groundwater aquifers.
- 10.5.7 Dewatering of aquifers may result in reduced groundwater levels in the vicinity of the Mine surface development site during its construction phase. It is proposed that the amount of water that needs to be pumped out from the Mine shaft during construction would be minimised to limit the effects on any groundwater dependent ecosystems. In this way, the potential to impact groundwater would be reduced but it is recognised that there could be localised effects on the water levels. These levels would also be influenced by natural processes, such as seasonal variations in rainfall, which could change the natural level of the water table by metres.
- 10.5.8 In order to provide a more up-to-date understanding of the habitats and species within Ugglebarnby Moor, updated botanical surveys were undertaken in 2014. These surveys were based on the classification and mapping of broad vegetation types across the moor. This was essentially based on the visual identification of homogenous stands of vegetation (PCA, 2014).
- 10.5.9 Following discussions with Natural England, detailed quadrat data was gathered from the flush habitat to the south of Lousy Hill Lane. This survey was initially completed in late August 2013, but as this survey was late in the survey season, this survey was repeated in July 2014 and involved 20 fixed quadrats. The results of these surveys are provided in **Appendix D**, which also includes a figure showing the quadrat locations.
- 10.5.10 Ugglebarnby Moor covers an area of approximately 92ha. The main block of moorland is to the north of Lousy Hill Lane. A further distinctive block of habitat is found south of Lousy Hill Lane through to Foss Lane, with a smaller block of habitat between Foss Lane and extending east to an arable field which marks the moorland edge (PCA, 2014). The western boundary of the moor is represented by the upper boundary of the improved pastures which are characteristic of the mid and upper slopes of the valleys associated with Little Beck.
- 10.5.11 Topographically, the main area of the moor has a distinctive plateau area at approximately 210m Above Ordnance Datum (AOD). This area is essentially associated with the section immediately to the west of the proposed mine surface development site and the B1416. From the plateau which forms the high point of the moor, the ground typically slopes gently to the north, south and west. This slope is more pronounced towards the northern and western edges of the moor, with the southern section less pronounced although always with a gentle approximate north-east to south-west or east to west slope. Less pronounced minor undulations in the ground surface are present throughout. To the south of

Lousy Hill Lane, this pattern continues with a similar plateau area at the extreme east of the site and then sloping ground to the moorland edge below.

- 10.5.12 The moor has largely remained unmanaged for many years, although recent cutting of heather has begun under a Higher Level Stewardship (HLS) agreement. Historic land uses include quarrying in the north-western corner and the planting of coniferous woodland on the western side. There is also an underground reservoir in the main plateau area with an access track to this facility off the B1416. Moor House Farm is located at the western boundary in the southern part of the moor, with the access track to the farm crossing the moor. A similar access track extends south-east off Lousy Hill Lane and provides the access to Thorn Hill.
- 10.5.13 The moor falls within Natural England Management Unit 86 of the North York Moors SSSI. The main vegetation type is described as 'dwarf shrub heath – upland'. The condition of this unit in the most recent Natural England condition assessment was assessed as “unfavourable recovering”.
- 10.5.14 In its entirety, the moor supports a relatively limited range of typical vegetation types. These can be classified into the following broad categories:
- Dry heath.
 - Wet heath/mire.
 - Spring/flush.
 - Bracken-dominated.
 - Gorse scrub.
 - Woodland.
 - Grassland.
 - Coniferous plantation.
 - Other.
- 10.5.15 Each of these is considered further below.

Dry heath

- 10.5.16 Large parts of the moor are characterised by a species-poor Heather dominated community. Heather is dominant and always at a cover which exceeds 90%. The only other species which attains any prominence is the moss *Hypnum jutlandicum* which is a constant and often extensive beneath the Heather. In terms of the classification of this habitat, much of the dry heath component of the North York Moors falls within either the *H9 Calluna vulgaris-Deschampsia flexuosa* or *H12 Calluna vulgaris-Vaccinium myrtillus* heaths. The dry heath on Ugglebarnby Moor is considered to be more closely representative of the H12 community, particularly the *H12a Calluna vulgaris* sub-community. Locally, however, there are variations and the community is more transitional. H12 is a vegetation type which is the typical sub-shrub community of acidic to circumneutral, free-draining mineral soils throughout the cold and wet sub-montane zone (Rodwell, 1991b). Despite being freedraining, climatic influences mean that the soils are moist for the majority of the year. This is evidenced in certain sections of this

habitat on Ugglebarnby Moor, where very small amounts of Purple Moor-grass are scattered through the sward. This type of vegetation is particularly associated with the higher plateau sections as well as the upper sections of the gently sloping ground. To the south of Lousy Hill Lane, whilst this pattern of vegetation continues, with a larger area of this habitat in the highest section along the eastern boundary, the dry heath on the sloping ground is often less Heather dominated, with more Bilberry in the sward.

Wet heath/mire

- 10.5.17 Wetter heath and mire sections across Ugglebarnby Moor are particularly associated with the lower southern and western sections of the moor. This follows a very distinctive pattern with Heather remaining a constant, albeit often co-dominant with other species, particularly Cross-leaved Heath and Purple Moor-grass. Other species are typically rare and represent only a minor element of the sward. *Hypnum jutlandicum* does, however, often remain abundant. In terms of the classification of this habitat, the typical wet heath community within the North York Moors is the *M16 Erica tetralix-Sphagnum compactum* wet heath, particularly the *M16d Juncus squarrosus-Dicranum scoparium* sub-community. Atypical here, however, is the virtual absence of bog mosses, particularly the normally constant *Sphagnum compactum* which is absent from large sections of the site. Notwithstanding this, the other main components of the species and particularly the relative abundance of Cross-leaved Heath, Heather and Purple Moor-grass are consistent with this community. This community is typical of acid and oligotrophic mineral soils or shallow peats that are at least seasonally waterlogged.
- 10.5.18 The vegetation also appears to share some affinities with the *M15 Scirpus cespitosus-Erica tetralix* wet heath. This community is associated with similar habitats to the M16 wet heath, although is particularly associated with thinner or better drained areas of ombrogenous peat (a peat-forming vegetation community lying above groundwater level; it is separated from the ground flora and the mineral soil, and is thus dependent on rain water for mineral nutrients) (Rodwell, 1991b).
- 10.5.19 Locally, Purple Moor-grass attains a much higher cover at the expense of Cross-leaved Heath and Heather. This is again typically species-poor vegetation. Bog mosses are generally very rare or absent. This vegetation is most prominent in the lower lying section of the main moorland to the east of the track to Moor House Farm. In terms of the classification of this vegetation type, whilst retaining some of the characteristics of the wet heath communities, it is probably better classified as the *M25a Molinia caerulea-Potentilla erecta* mire, *Erica tetralix* sub-community. Notwithstanding this, the typically constant species, Tormentil is surprisingly rare on Ugglebarnby Moor, whilst other common associates of the M25a such as Common Cotton-grass *Eriophorum angustifolium* are virtually absent. The M25 mire is a community of moist although well-aerated, acid to neutral peats and peaty mineral soils. This habitat is essentially a continuum which is difficult to map and defining where wet heath becomes a true mire is not straightforward. The mapping (see **Figure 7.1**) is therefore based upon the relevant proportion of Purple Moor-grass.

Spring/Flush

- 10.5.20 Such habitats are generally very rare on Ugglebarnby Moor although they are present, particularly adjacent to Lousy Hill Lane. These habitats are associated with springs/seepages. They form a distinctive lower lying community which is dominated by Sharp-flowered Rush.
- 10.5.21 Following discussions with Natural England, this habitat was subject to more detailed quadrat analysis. The initial assessment and more detailed quadrats confirmed the general composition of the habitat as variable and relatively species-poor. Whilst the 20 sampled quadrats yielded some 60 species (with 76 species recorded from the survey area as a whole), the average number of species per quadrat (14) was low. Only three species were constant. These were Marsh Thistle (Domin 1- 5), Sharp-flowered Rush (Domin 1-10) and Yorkshire-fog (Domin 1-9) (see **Figure 7.1**). Near constants were represented by *Eurhynchium praelongum* (15 Quadrats, Domin 1-4) and Velvet Bent (14 Quadrats, Domin 1-3). Other relatively commonly occurring species which were recorded in 9 to 12 of the sample quadrats were Bramble (Domin 1-4), Common Bent (Domin 1-3), Creeping Soft-grass (Domin 1-4), Devil's-bit Scabious (Domin 1-3), Marsh Willowherb (Domin 1-2), Soft-rush (Domin 1-8) and Tormentil (Domin 1-2). Other species were typically rare, with 38 of the remaining species being recorded in between 1 and 4 of the sampled quadrats. Bog-mosses were found to be typically very rare. This community is considered to be representative of the *M23a Juncus acutiflorus-Galium palustre* community.
- 10.5.22 The M23 community occurs over a variety of moist, moderately acid to neutral, peaty and mineral soils and is a community which can be found around the margins of soligenous flushes (a flush/mire that receives water from rain and slope run-off), around topogenous (a flush/mire that develops as a result of a high local groundwater table) and wet heaths. On Ugglebarnby Moor, there is a general movement of water downslope through these habitats, with sections locally demarked with a central open water section. Flattened vegetation likewise indicates that surface water flow can be significant at times, particularly below the access track to Thorn Hill. Of relevance during this survey was that the habitat was entirely dry in August 2013 and virtually dry in July 2014. This strongly suggests that groundwater is not important to this habitat in this case. Rather, the survey suggests that there is an existing fluctuating water table which results in these habitats being dry for protracted periods, with associated negative influences on the resultant vegetation as a result of these conditions.
- 10.5.23 Very rarely, the habitat is noticeably wetter with permanent or semipermanent ponding. Here, Sharp-flowered Rush gives way to Water Horsetail *Equisetum fluviatile* which occurs with occasional Lesser Spearwort. This is the *S10 Equisetum fluviatile* swamp community. It occurs here immediately downstream of the access track to Thorn Hill where the track has impeded/alterd the natural drainage and resulted in localised ponding.
- 10.5.24 To the north of Lousy Hill Lane, such habitats are rare. A small seepage, however, is present east of the access to Moor House Farm. This is again species-poor with patches of Sharp-flowered and Soft-rush, along with a small area of Common Cotton-grass.

Bracken

- 10.5.25 Bracken *Pteridium aquilinum* is locally extensive and forms distinctive stands of vegetation across the drier sections of the moor. This is characteristic of the *U20 Pteridium aquilinum-Galium saxatile* community. The majority of stands are species-poor with a sparse grass-dominated ground layer; whilst occasionally sparse Heather and Bilberry are a feature, with the latter becoming particularly frequent in the section south of Lousy Hill Lane. These variations are indicative of the *U20c Species-poor* sub-community and *U20b Vaccinium myrtillus-Dicranium scoparium* sub-community respectively. This is a commonly occurring vegetation type which is typically found on deeper, well aerated, although often quite moist soils which are base poor to circumneutral. Of the favoured habitat characteristics, a reasonable soil depth along with free movement of water and air through the profile are particularly important (Rodwell, 1992). It is a species which is intolerant of waterlogged soils.

Gorse scrub

- 10.5.26 Gorse I scrub is extensive and forms distinctive stands of vegetation across the drier sections of the moor, particularly occurring within and adjacent to areas of drier heath and Bracken-dominated vegetation. This is a typically species-poor habitat which is usually characterised by dense well established stands of mature Gorse. In NVC terms, this community is the *W23 Ulex europaeus-Rubus fruticosus* scrub community. It is typically associated with moderately to strongly acid brown soils which are free draining, although not always dry and not markedly oligotrophic (Rodwell, 1991).

Woodland

- 10.5.27 Whilst scattered trees are a feature of much of the moorland, more extensive woodland sections are also present. Much of this woodland is dominated by birch, particularly Downy Birch but also with more rarely occurring Silver Birch. The woodland is often evenaged and with a poor shrub layer comprising of very rarely occurring shrubs, particularly Holly. The ground flora is typically sparse with Purple Moor-grass in some woodland sections. In other sections, species such as Broad Buckler-fern, Creeping Buttercup, Creeping Soft-grass, Honeysuckle and Wood-sorrel are occasional and locally frequent. In NVC terms, these woodlands both have affinities with the *W4 Betula pubescens-Molinia caerulea*, particularly the *W4a Betula pubescens-Molinia caerulea, Dryopteris dilatata- Rubus fruticosus* sub-community and *W4c Sphagnum* sub-community. They are, however, somewhat atypical in that Sphagnum mosses are virtually absent from the sections where Purple Moor-grass is characteristic in the ground layer; whilst Purple Moor-grass is rare in sections where Broad Buckler-fern becomes the characteristic species. The W4 woodland is characteristic of moist, moderately acid, though not necessarily highly oligotrophic, peaty soils in a variety of mire types. It is especially characteristic of thin or drying ombrogenous peats around the margins of blanket mires and topogenous deposits that have become elevated above or isolated from the influence of more base rich and eutrophic ground waters. It also occurs on flushed peaty gleys (Rodwell, 1991a). In terms of the subcommunities, the W4a community is typically the longer-established and drier form of this habitat type, occurring where the peat is naturally thinner or has become much better drained, either through natural growth above a

ground water table or as a result of human activity. The W4c is most typical of wetter and deeper peats where the water table is sufficiently low for birch to become well established (Rodwell, 1991a).

- 10.5.28 In the north-west of the moor, a large area of historic quarrying is present. Birch is again a prominent species although with other species such as Sycamore and very rarely occurring Sessile Oak *Quercus petraea*. This is a generally much drier woodland habitat type which has affinities with the W11 *Quercus petraea-Betula pubescens-Oxalis acetosella* and W16 *Quercus ssp.-Betula ssp.-Deschampsia flexuosa* woodland types.
- 10.5.29 Other woodland types include less extensive areas where Grey Willow and more rarely Goat Willow are the most prominent species. This can be seen particularly along parts of the eastern fringe of the site, where an often linear band of willow can be seen along a poorly defined ditch which is present at the base of the roadside verge. This is probably representative of the W1 *Salix cinerea-Galium palustre* woodland, a community which is typical of wet mineral soils on the margins of standing or slow moving open waters and moist hollows (Rodwell, 1991a). The community becomes more extensive in the south-east corner adjacent to Lousy Hill Lane.
- 10.5.30 Blackthorn *Prunus spinosa* has established very rarely along Foss Lane and is representative of the W22 *Prunus spinosa-Rubus fruticosus* scrub.
- 10.5.31 Plantation woodlands are also represented with a large block of planted pine on the western side of the main block of moorland.

Grassland

- 10.5.32 True grasslands are rarely extensive and more often are associated with the ground layer of Bracken, scrub or woodland communities. They are most typically found immediately adjacent to roads and tracks where the verge is often grass-dominated. These are often species-poor grasslands characterised by common species such as Cock's-foot, Rough Meadowgrass and Yorkshire-fog. Within the moorland itself, true grasslands habitats are limited. Such habitats are, however, present rarely, for example, there is a small patch of Tufted Hair-grass dominated grassland to the south-east of the underground reservoir. This is probably representative of the MG9 *Deschampsia cespitosa-Holcus lanatus* grassland, particularly the MG9a *Poa trivialis* sub-community. The origin of this grassland is unknown and in being immediately adjacent to the track to the underground reservoir it is probable that it is not of entirely natural origin. A further large area of maintained grassland is present within the fenced boundary of the underground reservoir.
- 10.5.33 More typical moorland grasslands are present very rarely, particularly adjacent to paths and more rarely elsewhere. Nowhere extensive, these show affinities with the U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* and U5 *Nardus stricta-Galium saxatile* acid grassland communities.

Other habitat types

- 10.5.34 A number of other habitat types are present and are particularly associated with human influence. As such, sections along all of the roadside verges, i.e. B1416, Lousy Hill Lane, Foss Lane, as well as the accesses to Moor House Farm and Thorn Hill display a nutrient enriched grass or ruderal dominated band of vegetation. Significant nutrient enrichment is also evident in the vicinity of both farms, where farming activities have extended into the immediate moor environment.

Relative abundance of habitat types

- 10.5.35 Whilst it is difficult to take into account all distinct habitat patches, the approximate contribution of the above habitat types to the moor can be summarised as follows in **Table 10.2**.

Table 10.2 Approximate contribution of habitat types within the North York Moors SAC

Habitat type	Area (ha)	%
Dry heath	42	45.6
Wet heath	13	14.1
Mire	8	8.7
Spring/flush	1	1.1
Bracken	6.5	7.1
Gorse scrub	6	6.5
Woodland	11	12.0
Coniferous plantation	3	3.3
Grassland	0.5	0.5
Other	1	1.1
Total	92	100

Vegetation pattern

- 10.5.36 Ugglebarnby Moor displays a distinctive pattern of vegetation zonation and succession. This zonation can be broadly summarised as a pattern of dry heathland, with patches of Bracken and Gorse scrub in higher and drier eastern sections of the moor, which sees a gradual move towards wetter heath in the lower and more gently sloping sections, which grade into a transitional wet heath/mire community in the lowest and flattest sections. More rarely, spring/flush communities indicative of more permanently wet conditions are present, particularly in the section adjacent to Lousy Hill Lane.
- 10.5.37 Unlike large parts of the North York Moors which are managed for shooting purposes, Ugglebarnby Moor has not been managed for many years and, as such, displays patterns of succession which are

not seen in managed habitats. This is as evidenced by the locally extensive woodland sections and general abundance of scattered established trees throughout.

Soil type

- 10.5.38 The typical soil types associated with the moorland sections of the North York Moors are characterised by gleys and podzols. Whilst a soil survey was not completed as part of this survey, it is very likely that Ugglebarnby Moor is consistent with the wider moorland area. The plateau area, along with the naturally gently sloping topography suggests that the soils would be based upon podzols on higher and better drained upper slopes, with a gradation into surface water gleys in the lower slopes and more gently sloping or flat ground. Groundwater gleys are unlikely to be present across the majority of the site. This is with the exception of the more permanently waterlogged sections, particularly associated with the spring/flush sections adjacent to Lousy Hill Lane and more rarely east of the track to Moor House Farm.

Surface water

- 10.5.39 The high precipitation locally, distinctive gently sloping topography and pattern of vegetation would suggest that the behaviour of surface water has the greatest influence on the vegetation of the moor. The drier communities are associated with the highest sections and more steeply sloping ground with a noticeable shift to wetter heath/mire communities in the flatter lower slopes where surface water runoff is likely to be much slower.
- 10.5.40 Although not extensive, surface water drains are present and appear to influence vegetation types. Specific to this, a shallow poorly maintained ditch is present along the B1416 with several channels cut into the roadside verge to channel runoff from the road. This gives rise to the distinctive linear Willow dominated woodland/scrub which is present in this section. Another ditch is present throughout the length of Lousy Hill Lane and feeds surface water into the marsh/flush section to the south of Moor House Farm. A ditch is also present on the east side of the track to Moor House Farm.
- 10.5.41 Within the flush section, the presence of flattened vegetation indicates that this habitat could be subject to significant surface water flow at times. This is most evident below the track to Thorn Hill.

Groundwater

- 10.5.42 When considered alongside the general topography of the site, there is very little evidence to suggest that groundwater has any significant influence on the vegetation across the moor. This is with the exception of the spring/flush communities adjacent to Lousy Hill Lane and more rarely to the east of the track to Moor House Farm. The remaining vegetation communities are considered to be typically surface water fed habitats associated with free draining ground or lower lying damper ground where the soils may be damper, primarily as a result of topographical influences.

Other influences on the vegetation

- 10.5.43 Some of the most significant influences on the vegetation of the moor are as a result of human activity. This includes particularly the large area of historic quarrying in the north-western section, the large planted coniferous plantation in the west of the site and the underground reservoir off the B1416. The quarry has been long abandoned and is now reverting to a seminatural woodland habitat with locally extensive Bracken. The coniferous plantation has effectively destroyed an area which was probably previously dry/wet heath and continues to exert a negative influence as a result of the invasion of coniferous species into the adjacent moorland. With regard to the underground reservoir, whilst this would have destroyed an area of dry heath, its presence appears to exert little influence on the surrounding moorland, with the greatest negative effect being due to the access track which has resulted in both direct habitat loss as well as adjacent disturbance, as evidenced by an adjacent low scrub and patchy grassland habitat.
- 10.5.44 In terms of the roads adjacent to or running through the moor, all exert influences on the vegetation. Both the B1416 and Foss Lane in particular have associated wide verges which support atypical nutrient enriched grass and ruderal dominated vegetation. This negative influence is, however, localised and typically extends up to 5 to 10m from the roadside into the adjacent moor.
- 10.5.45 One of the more distinctive influences on vegetation is the track to Moor House Farm. The aerial photography clearly shows the distinctive break from wet heath/mire to the east of the road and drier Bracken and woodland habitats to the west. This strongly suggests that the natural surface water flow is impeded as a result of this track.
- 10.5.46 With regard to the other influences, the presence of Moor House Farm and Thorn Hill Farm exert a negative influence on the moorland, particularly in immediately adjacent habitats. As such, there is significant evidence of localised nutrient enrichment in the form of typical grass and ruderals dominated habitats. Given that these farms are at the lower western side of the moor, this nutrient enrichment is localised in nature.
- 10.5.47 Other human disturbance is locally prominent and has a negative influence on the vegetation. This includes locally significant disturbance from motorbikes, particularly in the disused quarry as well as the section of dry heathland east of the underground reservoir.
- 10.5.48 The moorland habitats of the North York Moors are typically maintained by rotational burning. Any cessation in management enables the process of vegetation succession to progress. This is seen throughout Ugglebarnby Moor, particularly with the very significant invasion of trees.

Emissions associated with the Mine surface development site and Lockwood Beck Intermediate Shaft Site

Introduction

- 10.5.49 Both the impact assessment associated with the traffic generated by the project and the air quality assessment adopted a cumulative approach with respect to the contributions of the whole YPP, as well as including those from committed developments (rather than assessing different project components separately). Therefore, for the purposes of this assessment, the potential air quality implications of the YPP, and in particular the Mine and Lockwood Beck Intermediate Shaft Site, for the North York Moors SAC have been dealt with together.
- 10.5.50 In addition to the additional traffic movements predicted (see **Part 2, Chapter 6** of the ES) 20 generators within two ventilation stacks, both of which are proposed to be up to 40m high, would be required within the proposed Mine surface development site.
- 10.5.51 Seven generators with one 30m high stack are proposed for the Lockwood Beck intermediate Shaft Site.

Air quality assessment - construction

- 10.5.52 Due to uncertainties regarding the rate at which background pollutant concentrations are decreasing, the air quality assessment undertaken utilised 2011 background pollutant concentrations for the 2013 and 2015 assessment scenarios (as a conservative approach). Background pollutant concentrations are still expected to decrease in the future, although uncertainties exist regarding the timeline for such decreases and, as such, 2020 and 2030 scenarios assume projected background concentrations for these years as provided by Defra. Background nitrogen and acid deposition rates used in the air quality assessment were obtained from the Air Pollution Information System (CEH, 2014) website.
- 10.5.53 2010 nitrogen deposition rates were assumed for the 2013 and 2015 assessment scenarios, due to the reasons set out above. For the 2020 and 2030 assessment years, nitrogen deposition background rates were adjusted to the appropriate years following the method described in the DMRB 207/07 (DMRB, 2007). Background acid deposition rates were fixed to 2010 for all of the scenarios the air quality assessment considered. The background deposition rate used for this assessment was 2.0 to 22.7kg N/ha/yr (nitrogen deposition) and 1.3 to 1.6 Nkeq/ha/yr (acid deposition).
- 10.5.54 NO_x concentrations were predicted using the ADMS-Roads model. The modelled road contribution of NO_x at the identified receptor locations was then converted to NO₂ using the NO_x to NO₂ calculator (v4.1, 2014) (Defra, 2014), and in accordance with Defra guidance. To consider emissions from the generator stacks, shaft emissions and mobile plant, nested domains were modelled to cover the entire area. The gridded model outputs were then taken to produce nitrogen deposition, acid deposition and oxide of nitrogen deposition plots. Copies of these are provided in **Appendix E**.

10.5.55 The North York Moors (as the key ecological receptor) was modelled in five discrete transect points, starting at the closest part of the site to the road source and extending across the site in 50m increments. **Drawing PB1110-P3-9-004, Appendix E** shows these transects. Baseline pollutant concentration and deposition data for each of these points is summarised in **Table 10.3** below. A transect of five discrete points was modelled at each ecological site (as listed in **Table 10.3**) and **Table 10.3** summarises the predictions made at each of these transects by providing the minimum and maximum range of prediction for each site.

Table 10.3 Range of pollutant concentration and deposition rate data at each ecological receptor (as shown on Drawing PB1110-P3-9-004, Appendix E) transect for the construction (2015) scenario

Receptor	Annual Mean NO _x Concentration (µg.m ⁻³)	Nitrogen Deposition Rate (kg N/ha/yr)	Acid Deposition Rate (keq N/ha/yr)
	2015	2015	2015
E1a-e	34.4 - 14.4	21.6 - 20.6	1.7 - 1.6
E2a-e	15.4 - 13.6	20.6 - 20.6	1.6 - 1.6
E3a-e	38.4 - 9.8	19.2 - 17.9	1.6 - 1.4
E4a-e	35.3 - 10.0	19.1 - 17.9	1.5 - 1.4
E5a-e	29.4 - 9.5	18.8 - 17.9	1.5 - 1.4
E6a-e	23.4 - 8.7	20.3 - 19.5	1.6 - 1.5
E7a-e	30.3 - 9.1	20.6 - 19.6	1.7 - 1.5
E8a-e	12.6 - 7.6	18.0 - 17.7	1.3 - 1.3
E9a-e	11.6 - 7.6	17.9 - 17.7	1.4 - 1.4
E10a-e	12.8 - 7.7	18.0 - 17.7	1.4 - 1.4
E11a-e	25.6 - 8.6	18.4 - 17.5	1.5 - 1.4

10.5.56 For both the Lockwood Beck Intermediate Shaft Site and the Mine surface development site, the annual mean baseline NO_x concentrations in 2015 are predicted to be above the air quality objective for the protection of ecosystems (30µg.m⁻³) on sections of Lockwood Hills (E1), Liverton Moor (E3) and Waupley Moor (E4) and parts of Ugthorpe Moor (E7), at locations closest to the A171. Annual mean concentrations decrease with increasing distance from the A171, so that the exceedences predicted in 2015 only affect a small proportion of those ecological sites that are closest to the road (**Drawing**

PB1110-P3-9-004, Appendix E). Elsewhere, concentrations are predicted to be below the national air quality objective value for that pollutant.

- 10.5.57 Future baseline nitrogen deposition rates in 2015 are predicted to be above the upper critical load for the North York Moors habitat type (20kg N.ha.yr⁻¹) at Lockwood Hills (E1), Smeathorns (E2) and Ugthorpe Moor (E6 and E7). These elevated values are mainly due to the magnitude of the contribution of the background nitrogen deposition rates for the area. Elsewhere, nitrogen deposition rates are below, but still close to the critical load at all sites considered (see **Appendix E**).
- 10.5.58 **Table 10.3** also shows that the future baseline rate acid deposition for 2015 is above the site specific critical loads at Lockwood Hills (E1), Ugthorpe Moor (E6), UGGLEBARNBY MOOR (E8 and E9), Sneaton Low Moor (E10) and Low Moor (E11).
- 10.5.59 The predicted change in the annual mean concentrations of NO_x, deposition rates of nitrogen and deposition rates of acid, during the construction phase (2015) as a result of the YPP as a whole at the ecological receptors considered, is set out in **Table 10.4**.

Table 10.4 Range of change in pollutant concentration and deposition rate data at each ecological receptor (as shown on Drawing PB1110-P3-9-004, Appendix E) transect for construction (2015) scenarios

Receptor	Annual Mean Background NO _x Conc. (µg.m ⁻³)	Background Nitrogen Deposition Rate (kg N.ha.yr ⁻¹)	Background Acid Deposition Rate (keq N.ha.yr ⁻¹)
	2015	2015	2015
E1a-e	+4.1-+0.4	+0.2-<0.1	<0.1-<0.1
E2a-e	+0.5-+0.2	<0.1-<0.1	<0.1-<0.1
E3a-e	+5.3-+0.3	+0.2-<0.1	<0.1-<0.1
E4a-e	+4.8-+0.4	+0.2-<0.1	<0.1-<0.1
E5a-e	+3.8-+0.3	+0.2-<0.1	<0.1-<0.1
E6a-e	+2.9-+0.2	+0.1-<0.1	<0.1-<0.1
E7a-e	+4.2-+0.3	+0.2-<0.1	<0.1-<0.1
E8a-e	+1.7-+0.1	+0.1-<0.1	<0.1-<0.1
E9a-e	+1.4-+0.1	+0.1-<0.1	<0.1-<0.1
E10a-e	+1.7-+0.1	+0.1-<0.1	<0.1-<0.1
E11a-e	+2.4-+0.2	+0.1-<0.1	<0.1-<0.1

- 10.5.60 The largest impact on annual mean NO_x concentrations, nitrogen deposition rates and acid deposition rates is predicted to occur during the 2015 construction scenario, where vehicle movements are related to the construction of the Mine site and MTS intermediate shaft sites. The largest changes are predicted to occur at the ecological sites adjacent to the A171, such as Lockwood Hills (E1), Liverton Moor (E3), Waupley Moor (E4 and E5) and Ugthorpe Moor, where the combined impact of Mine construction traffic and MTS intermediate shaft site construction traffic have a cumulative impact.
- 10.5.61 The 2015 construction phase assessment scenario shows NO_x concentration above the air quality objective for the protection of ecosystems (30µg.m⁻³) at the transect points that are closest to the A171 (**Drawing PB1110-P3-9-004, Appendix E**). At locations set back from the road, concentrations would be markedly less (see **Appendix E**). Therefore, such exceedences would affect a small section of the ecological sites and would be temporary in nature, only lasting for the duration of the construction phase.
- 10.5.62 The construction of the entire YPP development would not cause any additional locations to experience impacts greater than the critical load values for nitrogen deposition or acid deposition beyond those predicted in the baseline. Where impacts continue to occur at values above the critical load values, the dominant contribution remains the background deposition rates experienced in the area.
- 10.5.63 However, the plots in **Appendix E** show that the contribution of emissions from the MTS shaft, generators and mobile plant onto the North York Moors SSSI near the Lockwood Beck Intermediate Shaft Site, would lead to an increase in oxides of nitrogen concentrations, an increase in and nitrogen deposition rates and an increase in acid deposition rates.
- 10.5.64 The area of the North York Moors adjacent to the shaft site that would be affected by the proposed scheme would be as follows:
- Area where annual mean NO_x objective (30µg/m³) is exceeded: 0ha.
 - Area where 24hr NO_x objective (75µg/m³) is exceeded: 30.2ha.
 - Area where 1 % of lower critical load for N deposition is exceeded (0.1 kg N/ha/yr): 445.9ha.
 - Area where 1 % of lower critical load for acid deposition is exceeded (0.0235 N keq/ha/yr): 25.1ha.
- 10.5.65 This indicates that there would be a breach of less than 1% of the lower critical load for both acid and nitrogen deposition during the construction period at Lockwood Beck. The size of the North York Moors SAC is 44,082ha. Hence the percentage of the SAC where 1% of the lower critical load for nitrogen deposition would be exceeded (i.e. 0.1 kg N/ha/yr) equates to 1.01%. The percentage of the SAC where 1% of the lower critical load for acid deposition would be exceeded (i.e. 0.0235 N keq/ha/yr) equates to 0.06%.

Mitigation measures

- 10.5.66 Due to the potential impact, albeit of a temporary and localised nature, on the North York Moors SAC, York Potash Limited recognises that further mitigation options are available to reduce emissions from

the operation of the generators during the temporary construction phase of the project (beyond the measures already proposed as part of the Transport Strategy to road road traffic emissions). These mitigation options include the use of catalysed NOx emission reduction techniques, alternative fuel feed, stage power demand ramp-up and the transition to permanent power at an earlier stage of the construction phase. These measures are currently the subject to contractual negotiations; however York Potash Limited will investigate these options and the application of one or more of these during the construction phase to actively reduce emissions resulting from generator operation.

- 10.5.67 Based on the scale and duration of the effect, with such mitigation measures in place, it is concluded that an adverse impact on the integrity of the North York Moors SAC or its qualifying habitats would not arise.

Air quality assessment - operation

- 10.5.68 Predicted operational phase pollutant concentrations and deposition data for the ecological sites that were included in the assessment are summarised in **Table 10.5** and **Table 10.6**. The location of the sites are shown on **Drawing PB1110-P3-9-004, Appendix E**. A transect of five discrete points was modelled at each ecological site considered. The tables provide minimum and maximum pollutant concentrations and deposition values at those transects.

Table 10.5 Range of pollutant concentration and deposition rate data at each ecological receptor transect for the operational (2020 and 2030) scenarios

Receptor	Annual Mean NOx Concentration ($\mu\text{g}\cdot\text{m}^{-3}$)		Nitrogen Deposition Rate (kg N/ha/yr)		Acid Deposition Rate (keq N/ha/yr)	
	2020	2030	2020	2030	2020	2030
E1a-e	18.6 - 9.9	15.3 - 9.3	19.4 - 19.0	15.8 - 15.5	1.7 - 1.6	1.7 - 1.6
E2a-e	10.4 - 9.6	9.6 - 9.1	19.0 - 18.9	15.5 - 15.5	1.6 - 1.6	1.6 - 1.6
E3a-e	20.1 - 6.5	15.2 - 5.9	17.1 - 16.4	13.9 - 13.4	1.5 - 1.4	1.5 - 1.4
E4a-e	18.6 - 6.6	14.2 - 5.9	17.0 - 16.4	13.8 - 13.4	1.5 - 1.4	1.4 - 1.4
E5a-e	15.7 - 6.3	12.2 - 5.8	16.9 - 16.4	13.7 - 13.4	1.5 - 1.4	1.4 - 1.4
E6a-e	12.5 - 5.8	9.7 - 5.3	18.4 - 18.0	14.9 - 14.7	1.6 - 1.5	1.6 - 1.5
E7a-e	15.6 - 6.0	11.8 - 5.5	18.5 - 18.0	15.0 - 14.7	1.6 - 1.5	1.6 - 1.5
E8a-e	7.9 - 5.4	6.8 - 5.1	16.5 - 16.4	13.4 - 13.4	1.3 - 1.3	1.3 - 1.3
E9a-e	7.4 - 5.4	6.4 - 5.0	16.5 - 16.4	13.4 - 13.4	1.4 - 1.4	1.4 - 1.4

Receptor	Annual Mean NO _x Concentration (µg.m ⁻³)		Nitrogen Deposition Rate (kg N/ha/yr)		Acid Deposition Rate (keq N/ha/yr)	
	2020	2030	2020	2030	2020	2030
E10a-e	8.0 - 5.5	6.8 - 5.1	16.5 - 16.4	13.4 - 13.4	1.4 - 1.4	1.4 - 1.4
E11a-e	13.7 - 5.9	10.6 - 5.3	16.6 - 16.1	13.5 - 13.2	1.4 - 1.4	1.4 - 1.4

- 10.5.69 Annual mean NO_x concentrations in 2020 and 2030 are predicted to be below the air quality objective for the protection of ecosystems (30µg.m⁻³) at all of the ecological receptors identified.
- 10.5.70 Nitrogen deposition rates in 2020 and 2030 are predicted to be below the critical load (which is 20kg N.ha.yr⁻¹) for the habitats within the North York Moors at all of the ecological sites identified.
- 10.5.71 **Table 10.5** also shows that the acid deposition rates for 2020 and 2030 are above the site specific critical loads at Lockwood Hills (E1), Ugthorpe Moor (E6), UGGLEBARNBY MOOR (E8 and E9), Sneaton Low Moor (E10) and Low Moor (E11).
- 10.5.72 The predicted change in the annual mean concentrations of NO_x, deposition rates of nitrogen and deposition rates of acid, in the operational phase (2020 and 2030) as a result of the YPP development, at the ecological receptors considered, is set out in **Table 10.6**.

Table 10.6 Range of change in pollutant concentration and deposition rate data at each ecological receptor transect for operational (2020 and 2030) scenarios

Receptor	Annual Mean Background NO _x Concentration (µg.m ⁻³)	Background Nitrogen Deposition Rate (kg N.ha.yr ⁻¹)	Background Acid Deposition Rate (keq N.ha.yr ⁻¹)
	2015	2015	2015
E1a-e	+4.1-+0.4	+0.2-<0.1	<0.1-<0.1
E2a-e	+0.5-+0.2	<0.1-<0.1	<0.1-<0.1
E3a-e	+5.3-+0.3	+0.2-<0.1	<0.1-<0.1
E4a-e	+4.8-+0.4	+0.2-<0.1	<0.1-<0.1
E5a-e	+3.8-+0.3	+0.2-<0.1	<0.1-<0.1
E6a-e	+2.9-+0.2	+0.1-<0.1	<0.1-<0.1
E7a-e	+4.2-+0.3	+0.2-<0.1	<0.1-<0.1
E8a-e	+1.7-+0.1	+0.1-<0.1	<0.1-<0.1

Receptor	Annual Mean Background NO _x Concentration ($\mu\text{g.m}^{-3}$)	Background Nitrogen Deposition Rate (kg N.ha.yr^{-1})	Background Acid Deposition Rate (keq N.ha.yr^{-1})
	2015	2015	2015
E9a-e	+1.4-+0.1	+0.1-<0.1	<0.1-<0.1
E10a-e	+1.7-+0.1	+0.1-<0.1	<0.1-<0.1
E11a-e	+2.4-+0.2	+0.1-<0.1	<0.1-<0.1

10.5.73 In the 2020 and 2030 operational scenarios, impacts are markedly less than for the construction phase scenario at all of the ecological sites considered in this assessment. The operation of the proposed scheme would not cause an exceedence of the annual or daily mean national air quality objective values for NO_x. There would continue to be exceedences of the nitrogen and acid deposition critical loads, at some of the ecological sites. However, where exceedences are predicted to occur, this is associated with the elevated background deposition rates experienced in the area. There would continue to be some exceedence of critical load values for nitrogen and acid deposition in the North York Moors, but the dominant contributions would be the elevated background deposition rates.

10.6 Conclusion regarding the North York Moors SAC

10.6.1 The proposed Mine surface development site and Lockwood Beck Intermediate Shaft Site would not directly affect habitats within the boundary of the North York Moors SAC; all of the proposed works are outside the boundaries of this designated site.

10.6.2 The detailed 2013 and 2014 NVC surveys undertaken to date have shown that the vegetation communities within Ugglebarnby Moor are typically surface fed habitats associated with free draining ground or lower lying damper ground, where the soils are considered to be damper primarily as a result of topographical influences.

10.6.3 During the construction of the Mine surface development, the mine shaft would be sunk into the ground, with zones being sealed by advanced grouting, before the excavation of materials proceeds. Once a section is excavated it is then lined to prevent further ingress of groundwater into the shaft. It is the removal of groundwater by pumping that would lead to the local drawdown of the water table in the immediate vicinity of the shafts. The potential influence of this effect (due to the geological and topographic disposition) is mainly to the south of the shaft and would diminish in its southerly extent and to the east and west. However, this is not predicted to affect the vegetation communities within Ugglebarnby Moor because they are not groundwater dependant habitats.

10.6.4 Nitrogen deposition rates on the North York Moors SAC would be similar or increased by a very small amount in 2015 with the proposed development. During the construction works, the contribution from on-site emissions is predicted to increase concentrations of oxides of nitrogen and the deposition rate of nitrogen and the acid deposition rate. However the impact from emissions in 2020 and 2030 on

oxides of nitrogen concentrations (daily and annual), nitrogen deposition rates and acid deposition rates are predicted to be negligible. There would continue to be some exceedance of critical load values for nitrogen and acid deposition in the North York Moors (prior to mitigation), but the dominant contributions would be the elevated background deposition rates currently experienced in the area.

- 10.6.5 In conclusion, based on the information presented above, it is predicted that the proposed Mine surface development and Lockwood Beck Intermediate Shaft Site would not affect the structure or function of the North York Moors SAC. This is primarily as no groundwater dependent habitats have been identified during the botanical surveys to date and the air quality assessments have shown that, as a result of the development, the contribution of the project in the construction phase to the exceeded critical load for acid and nitrogen deposition would be small, and would influence only a very small area of the SAC. Moreover, mitigation measures are available to reduce the influence of this effect.

10.7 Assessment of potential effect on the integrity of the North York Moors SPA

Focus

- 10.7.1 The Screening assessment identified a LSE with respect to the proposed Mine surface development and Lockwood Beck Intermediate Shaft Site due to potential indirect impacts (noise and visual disturbance) on golden plover and merlin populations associated with the North York Moors SPA.
- 10.7.2 The information within this section has been provided to assist with understanding of whether the proposed scheme, and specifically the Mine surface development site and the Lockwood Beck Intermediate Shaft Site, would have an adverse effect on the integrity of the North York Moors SPA.

Potential indirect impacts on breeding golden plover and merlin populations in and around the mine surface development site and Lockwood Beck intermediate shaft site

Mine surface development site

- 10.7.3 The proposed Mine surface development site is a poor breeding bird habitat which supports a typical range of common species (PCA, 2014). Fields within Dove's Nest Farm were found to provide a poor and little-used habitat, with records limited to rarely occurring Skylark *Alauda arvensis* (one territory). Other birds recorded from these fields included occasional feeding Meadow Pipit *Anthus pratensis*. Field margins were also found to provide a poor habitat, with breeding records limited to occasional Pheasant *Phasianus colchicus* (three territories).
- 10.7.4 Moorland sections in the vicinity of the proposed Mine surface development were surveyed for breeding birds in 2012, and both Ugglebarnby and Sneaton Low Moor were subject to further full breeding surveys over an extended survey area in 2013 and 2014. Whilst the later surveys were undertaken with particular reference to those species which form the basis for the SPA and SSSI designations, the survey recorded all other species. Full details of these surveys are provided in **Appendix D**.

- 10.7.5 Ugglebarnby Moor provides a variety of breeding bird habitats. With regard to the open dry, wet heath and mire sections, of particular relevance to the breeding bird survey was the fact that there is scattered pine throughout these sections of the moor. In terms of other habitats which significantly influence the avifauna, there are large areas of Gorse scrub as well as Bracken dominated sections. Woodland sections are also found throughout, both as scattered tree groups and as more extensive woodland blocks. Various woodland types are present, including wet woodland dominated by birch or willow, drier birch woodland and coniferous plantation, and these support a different range of species. Other types of scrub are also present rarely, particularly patches dominated by Blackthorn.
- 10.7.6 The 2013 and 2014 surveys confirmed Ugglebarnby Moor to be a good quality breeding bird habitat, albeit one which is dominated by species which are associated with scrub and woodland habitats. Characteristic moorland species are either very rare or absent.
- 10.7.7 No evidence of breeding golden plover or merlin was found during the surveys between 2012 and 2014. It is acknowledged that golden plover and merlin have been recorded in the area in the past. However, on the basis that they are not currently present, it is predicted that the proposed YPP development would not affect these species; whilst acknowledging that they could move into the area as limited, suitable breeding habitat is present.

Lockwood Beck Intermediate Shaft Site

- 10.7.8 Lockwood Beck Intermediate Shaft Site provides a limited range of breeding habitat and this is reflected in the few species recorded during the 2014 bird surveys (PCA, 2014). The majority of the breeding records are associated with the adjacent woodland habitats.
- 10.7.9 Given the proximity of the proposed site to the North York Moors, the breeding bird survey was extended into the adjacent designated SPA and SSSI. This included a section of Stanghow Moor to the west of Smeathorns Road and a section of Moorsholm Moor to the east of Smeathorns Road. Whilst the survey was undertaken with particular reference to those species which form the basis for the SPA and SSSI designations, the survey recorded all other species. Full details of these surveys are provided in **Appendix D**.
- 10.7.10 Lockwood Beck is an extensive area of moorland to the south and west of Lockwood Beck reservoir which provides a variety of breeding bird habitats. Whilst there are extensive areas of typical dry heathland habitat, the headwater streams which feed the reservoir provide a series of linear sections of marsh which add diversity to the habitats. On flatter ground, these wetter habitats are locally more extensive and locally form quite large areas of wet heath/mire. Other habitats include occasional patches of Gorse scrub as well as Bracken-dominated sections. Patchy willow scrub is also found immediately to the south of the reservoir.
- 10.7.11 The survey was extended over an area of approximately 1km south of the A171 and 1km west of Smeathorns Road, and confirmed that the moorland supported a good range of characteristic moorland species.

- 10.7.12 No evidence of breeding merlin *Falco columbarius* was found, whilst golden plover *Pluvialis apricaria* records were associated with three territories. These were all some distance from the proposed intermediate shaft site, with the closest being approximately 800m to the south-west.

Visual effects

- 10.7.13 Temporary construction phase impacts on the ecological qualities of the North York Moors would include minor adverse impacts on the landscape structure, due to the loss of woodland, change in views, presence and movement of construction staff and vehicles, use of construction lighting and connectivity with adjacent areas of moorland.
- 10.7.14 Operational phase impacts on landscape and visual receptors (including golden plovers and merlins) would include initial impacts, when the new landforms are recently completed, which would be significantly reduced once the landscape restoration works mature and integrate with the site in both physical and visual terms. Lighting at the site would be discreet and designed to be sensitive to both birds and bats.
- 10.7.15 The long term residual impact of the restored site would be a beneficial contribution to the essentially wooded character of Ugglebarnby Moor, including continued biodiversity, habitat linkage, woodland cover and landscape character benefits including in the post-decommissioning phase).

Lighting

- 10.7.16 The key points that the lighting strategy has considered includes:
- Avoid over lighting and minimise upward reflected light.
 - Remove any bare bulbs and any lighting which is direct upwards.
 - Where possible use narrow spectrum bulbs (it has been shown that this would lower the range of species affected by the lighting).
 - Incorporation of lighting that emits minimal ultra-violet light.
 - Reduce light spill wherever possible.
 - Reduce the height of lighting columns to the minimum required.
 - Pedestrian lighting – use low level lighting that is directional as much as possible.
 - Roadway lighting – where possible use embedded road lights to illuminate the roadway and only light high risk stretches of road.
 - Limit the times which lights are on (allows times when it is dark for wildlife).
 - Prediction of light spills to be done.
- 10.7.17 To mitigate light pollution, the lighting systems at the Mine surface development site (and Lockwood Beck Intermediate Shaft Site) would be required to minimise any direct upward illumination and reduce any light spill and glare from the site. During the operation of the Mine, and based on the proposed lighting philosophy and mitigation strategies, the lighting systems installed would be designed and

controlled such that lighting effects are reduced as far as practicable with respect to the identified receptors (including ecological sensitivities).

- 10.7.18 Hence the proposed scheme (i.e. both at the Mine surface development site and Lockwood Beck Intermediate Shaft Site) would have short term landscape and visual impacts. However, and on establishment of the landscape restoration proposals at the sites, they would continue to make positive contributions to the landscape character and in turn contribute to the biodiversity value of the SPA.

Noise effects

- 10.7.19 The results of the noise assessment indicate that the majority of the construction related activities at the Mine site and Lockwood Beck were predicted to be no more than 10dB above the existing background noise levels and, consequently, are considered to be of negligible significance. However, and in order to mitigate any effect further, additional acoustic screening (i.e. close-boarded fence) would be installed. Furthermore, a good noise construction noise management plan would be prepared and incorporated into the Construction Environmental Management Plan (CEMP; see **Part 2, Appendix 17.1**) with particular reference to the SPA features (i.e. golden plover and merlin).

10.8 Conclusion regarding the North York Moors SPA

- 10.8.1 The proposed Mine surface development site and Lockwood Beck Intermediate Shaft Site would not directly affect habitats within the boundary of the North York Moors SPA; all of the proposed works are outside the boundaries of this designated site.
- 10.8.2 The bird surveys undertaken to date (and which have covered three survey seasons) have shown that the habitats within the Mine surface development site and Lockwood Beck Intermediate Shaft Site provide limited suitability for breeding golden plover and merlin. The majority of the breeding records obtained through extensive desk study were associated with the adjacent habitats rather than the habitats within the extent of works boundaries. Furthermore no golden plover or merlin have been recorded during the 2012, 2013 and 2014 surveys (but it is acknowledged that both golden plover and merlin have been recorded in the past). Nevertheless, the fact that they are not present at the moment is taken as an indication that they would not be affected by the disturbance of/change in the habitat.
- 10.8.3 Results of the noise assessment have indicated that the noise levels during the construction phase of the proposed scheme would not be significantly above those currently experienced in the area. Mitigation measures (i.e. acoustic screens) would be installed and these would further reduce the low predicted noise levels. With respect to landscape and visual impacts on SPA qualifying features (i.e. the golden plover and merlin), should they be present, there may be temporary impacts during the construction phase but these would be short-term. Landscape restoration proposals would be implemented and on their establishment would make a positive contribution to the landscape character and, in turn, the biodiversity value of the SPA and its qualifying features.

10.8.4 The lighting strategy would consider and manage potential impacts to birds (and bats) and has been designed in accordance with BCT and RSPB guidance; reducing any effects as far as possible.

10.8.5 In conclusion, on the basis of the information presented, it is predicted that the proposed Mine surface development and Lockwood Beck Intermediate Shaft Site would not affect the structure or function of the North York Moors SPA in the construction or operational phase.

11 INFORMATION FOR APPROPRIATE ASSESSMENT (YPP IN COMBINATION WITH OTHER PLANS AND PROJECTS)

11.1 Introduction

11.1.1 In-combination effects refer to effects on certain receptors from the project together with other developments (plans and projects) in the wider area. As set out in **Section 5.2** other plans and projects considered in this in-combination assessment – within the defined ZOI – include the following:

- projects that are under construction;
- permitted application(s) not yet implemented;
- submitted application(s) not yet determined;
- all refusals subject to appeal procedures not yet determined;
- projects on the National Infrastructure's programme of projects;
- projects identified in the relevant development plan (and emerging development plans); and,
- proposals currently at the scoping stage.

11.1.2 This in-combination assessment has adopted the following principle: in order for the YPP to be considered to have the potential to contribute to in-combination effects, there must be sufficient cause to consider that a relevant habitat or species is sensitive to effects due to the project itself (e.g. as a result of particular influence of sensitivity, or the presence of a species in notable numbers on at least one survey occasion, rather than simply being recorded within the site). Therefore, only where the project alone was determined to have the potential for LSE on Natura 2000 sites and features have these sites and features been included in the in-combination assessment. If a LSE was not determined with respect to a site due to the YPP, there is no real prospect of it suffering from an in-combination effect with another plan or project.

11.2 North York Moors SAC

Projects included within the assessment of potential in-combination effects

11.2.1 To summarise the outcome of the screening assessment (**Table 8.6**), the following project is included in the in-combination assessment for the North York Moors SAC:

- The rebuilding of the 66kv power line.

11.2.2 In addition, the Dogger Bank Teesside A&B landfall has also been considered.

- 11.2.3 The following summarises the key details of these projects in order to provide context for the in-combination assessment.
- 11.2.4 *Rebuilding of the 66kv power line* - No details in respect to this project are available. However, given that the project runs through the SAC, it can be assumed that the construction works associated with it (i.e. installation of wooden utility poles to carry the power lines) would result in localised losses of SAC habitat. However any habitat loss would be expected to be small.
- 11.2.5 *Dogger Bank Teesside A&B landfall* - The cable route associated with this offshore wind farm project would pass through the North Yorks Moors SAC. Earthworks would be undertaken for cable installation and the working areas would then be reinstated.

Assessment of potential in-combination effects

- 11.2.6 The environmental parameters to be assessed within the in-combination assessment have been defined through the screening assessment exercise, the conclusions of which are summarised in **Table 8.6**. The potential in-combination effect of the projects screened into the HRA are described and assessed below.

Habitat loss during the construction phase

- 11.2.7 Given the absence of information with respect to the proposed rebuilding of the 66kv power line project, despite assuming that the construction works would have the potential to result in the loss of SAC habitat, this cannot be quantified (although it is expected to be small). Consequently it is not possible to complete a meaningful in-combination assessment.
- 11.2.8 With respect to the Teesside A&B landfall, given the shallow nature of earthworks associated with it and that reinstatement of the working areas would be undertaken, this project is not considered to be likely to result in a significant or long term impact.

Conclusion

- 11.2.9 It is concluded that the works proposed at the Mine surface development site and the Lockwood Beck Intermediate Shaft Site, when assessed in-combination with other relevant projects (that is, where sufficient information allows an assessment to be undertaken), would not result in an adverse effect on the integrity of the habitats for which the North York Moors SAC is afforded its protection.

11.3 North York Moors SPA

Noise disturbance during the construction and operational phase

- 11.3.1 Details of the baseline environment, including protected species and the results of all surveys undertaken to date, and the assessment of construction and operational noise and vibration with respect to the YPP are provided in **Parts 2, 3 and 4, Chapter 11 Ecology**.

11.3.2 No golden plover or merlin have been recorded within the Mine surface development site and Lockwood Beck Intermediate Shaft Site during the 2012, 2013 and 2014 surveys to date (PCA, 2014). Furthermore, the habitat within the Mine surface development site and Lockwood Beck Intermediate Shaft Site has been assessed as having limited suitability as breeding habitats for these species.

11.3.3 The noise assessments undertaken to date for YPP (which have included committed development flows) have concluded that the construction and operational phases, in combination with relevant non-YPP projects, are unlikely to contribute to significant cumulative noise impacts. In addition, any impacts would be temporary, reversible and localised in nature. Further details are reported in **Part 5 YPP CIA (Chapter 23)** of the ES).

Conclusion

11.3.4 It is concluded that the proposed Mine surface development and the Lockwood Beck Intermediate Shaft, when assessed in-combination with other relevant projects, would not result in an adverse effect on the integrity of the species (i.e. golden plover and merlin) for which the North York Moors SPA is afforded its protection.

11.4 Teesmouth and Cleveland Coast SPA and Ramsar site

Projects included within the assessment of potential in-combination effects

11.4.1 To summarise the outcome of the screening assessment (**Table 8.6**), the following projects are included in the in-combination assessment:

- Maintenance dredging within the Tees estuary.
- QEII Berth Development.
- NGCT (terminal and capital dredging).
- Arts and media centre (i.e. the Tuned In! facility, Redcar).

11.4.2 The following summarises the key details of these projects in order to provide context for the in-combination assessment.

i. Maintenance dredging within the Tees estuary

11.4.3 PD Teesport carries out maintenance dredging in the reaches of the river shown in **Figure 11.1**. Most dredging occurs in the approach channel and low-middle estuary in order to maintain access to berth pockets and impounded docks. TSHDs are currently used for the majority of the dredging, supported by grab dredging and ploughing where required (Royal HaskoningDHV, 2014).

11.4.4 In 2013, the total volume of maintenance dredging was approximately 1.22 million m³; this figure is very similar to the annual average over the period 2001 to 2013 (1.21 million m³).

ii. QEII Berth Development

11.4.5 This project would comprise the construction of a new 260m long quay on the site of the existing QEII jetty. The project would include capital dredging to deepen the existing QEII berth from 10.9m bCD to 11.4m bCD and to extend the berthing pocket to 45m wide by 300m long. A total of approximately 225 tubular steel piles would be installed in rock sockets. It is estimated that piling operations may extend for a period of approximately 120 days (17 weeks). The total volume of capital dredging is expected to be in the region of approximately 36,000m³.

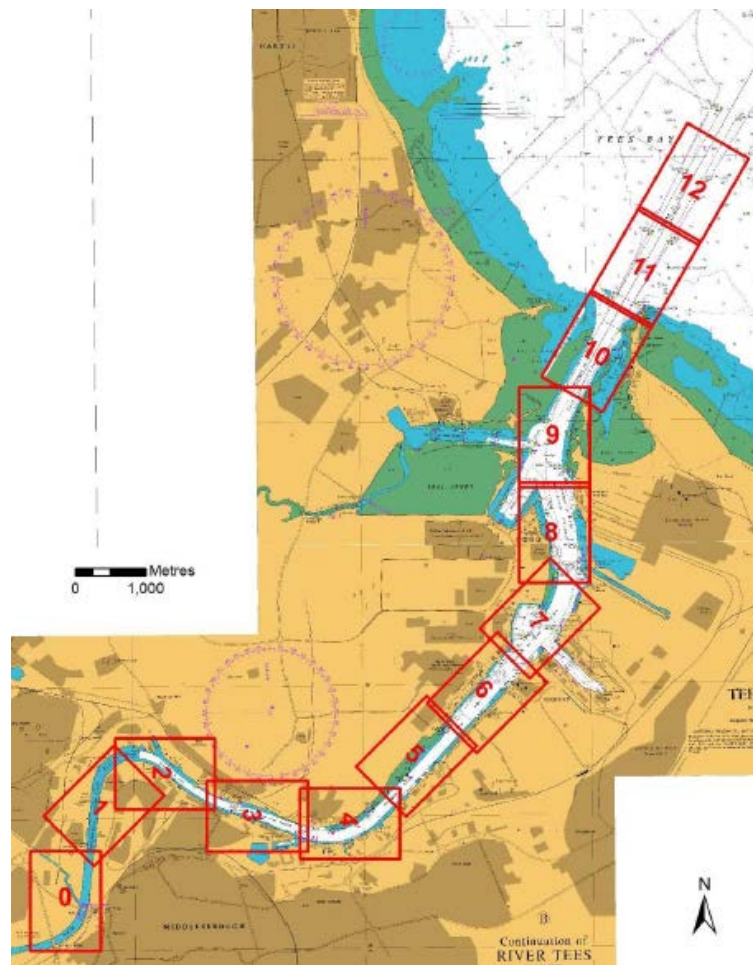
11.4.6 The timing for the implementation of this project is unknown.

iii. NGCT

11.4.7 This project is consented via an HRO which remains live. The project comprises the construction of a deep sea container terminal (1000m quay length) on the site of the existing Teesport Container Terminal 1, the redundant former Shell jetty and the Riverside Ro-Ro No. 3 at Teesport.

11.4.8 Capital dredging is proposed within the existing dredged approach channel to deepen the channel by 0.4m from 14.1m bCD to 14.5m bCD, with deepening from 10.4m below CD to 14.5m bCD for the final (approximately) 1km of the approach to the proposed terminal and to 16m bCD in berthing areas at the quay face. The total volume of material that will arise from the capital dredging will be approximately 4.8 million m³.

Figure 11.1 Reaches of the Tees where maintenance dredging is undertaken (Royal HaskoningDHV, 2014)



iv. Arts and media centre (the Tuned In! facility, Redcar).

- 11.4.9 Tuned In! is a youth facility catering for a range of creative arts and crafts and is located on the seafront at Coatham. An assessment of the impacts of the proposed scheme on the Teesmouth and Cleveland Coast SPA and Ramsar site was undertaken in June 2010 (E3 Ecology Ltd, 2010) to accompany the planning application for the facility.
- 11.4.10 Given that the scheme has been implemented, construction phase effects are not relevant to this in-combination assessment.
- 11.4.11 It is difficult to clearly define the characteristics of the operational phase for a development of this nature, but the assessment undertaken by E3 Ecology Ltd highlighted that the main concern with regard to the operational phase was disturbance to roosting waders using the Coatham Boating Lake

(disturbance through noise from the outdoor performance area and increased disturbance from an increase in visitor numbers in the immediate area of the boating lake).

Assessment of potential in-combination effects

11.4.12 The environmental parameters to be assessed within the in-combination assessment have been defined through the screening assessment exercise, the conclusions of which are summarised in **Table 8.6**. The following are of relevance to the Teesmouth and Cleveland Coast SPA and Ramsar site:

- noise disturbance during the construction phase;
- effects on marine water quality during capital dredging; and
- effect on the hydrodynamic and sedimentary regime resulting in a potential effect on morphology of intertidal and subtidal habitats.

11.4.13 The potential in-combination effect of the projects screened into the HRA are described and assessed in the following sub-sections.

Noise disturbance during the construction phase

11.4.14 As noted in **Sections 10.3** and **10.4**, the noise impact assessment for the Harbour facilities is ongoing as part of the EIA studies. The assessment undertaken to date concludes that there is the potential for noise disturbance to waterbirds using Bran Sands lagoon and Dabholm Gut associated with construction works for the port terminal (notably piling), although this potential impact could be mitigated by the use of acoustic barriers. It should be noted that the noise impact assessment is still to be completed with respect to the construction of the overland conveyor between the MHF and the port terminal, which would pass either to the north or south of Bran Sands lagoon.

11.4.15 In addition to the potential effect of the Harbour facility, the EIA studies will include a cumulative construction noise modelling exercise. The findings of that assessment will inform the HRA for the Harbour facility (i.e. an evolution of this document) to be submitted with the DCO application in December 2014. The cumulative noise assessment will include the predicted construction noise from the QEII Berth Development and the NGCT in order to model potential noise under a scenario where the construction phases overlap with that for the Harbour facility.

Effects on marine water quality and food (prey) resource for waterbirds due to capital and maintenance dredging

11.4.16 The potential for an interaction between sediment plumes that are predicted to be generated by capital dredging associated with various projects has been assessed in detail in **Part 5 Cumulative Impact Assessment (Chapter 23** of the ES).

11.4.17 It was concluded that there is only the potential for a cumulative effect to occur should the dredging programme for the Harbour facility coincide with that for the NGCT and/or the QEII Berth Development. Under such circumstances, the effect would be a greater increase in suspended sediment

concentration than predicted for the Harbour facility alone but within the same predicted spatial extent of the plume. The effect is, therefore, additive rather than cumulative.

- 11.4.18 Increased suspended sediment concentrations have the potential to effect fish populations (which represent part of the diet for some species of waterbird), resulting in a behavioural effect, with movement away from the zone of increased suspended sediment concentration. However, the effect of a combined plume (in the zone of interaction) is not likely to result in a different behavioural response in fish compared with the effect of the projects in isolation. Should the capital dredging for the three projects included in the CIA coincide, there would be an effect over a larger spatial extent than predicted for the YPP Harbour facilities alone; this effect is additive rather than cumulative. The combined effect on fish is, therefore, predicted to be negligible.
- 11.4.19 The deposition of sediment onto the seabed has the potential to affect benthic invertebrate resources which represent an important food source for waterbirds. The extent and magnitude of deposition associated with the capital projects scoped into the HRA is assessed in **Part 5 Cumulative Impact Assessment (Chapter 23)** of the ES).
- 11.4.20 Where the deposition footprints of the Harbour facility and the QEII Berth Development coincide, the potential cumulative impact is predicted to be negligible. The predicted footprints of sediment deposition for the NGCT and the Harbour facility are similar, although the effect of the NGCT capital dredge is more extensive and extends into Seaton Channel and onto Seal Sands. It was concluded that the only project with any potential to effect intertidal areas due to sediment deposition is the NGCT project; deposition due to that project was predicted to be of very low magnitude. No intertidal sediment deposition was predicted during capital dredging for the Harbour facility.
- 11.4.21 Maintenance dredging is targeted within areas that require dredging to maintain navigable depths and, although it would result in some losses of material into the water column, deposition onto the seabed is predicted to be insignificant. There would be no maintenance dredging taking place at the location of the proposed Harbour facility when the construction and capital dredging works are being undertaken and, therefore, should maintenance dredging be undertaken elsewhere in the Tees estuary, there is a low potential for suspended sediment arising from maintenance dredging to interact with a sediment plume from capital dredging. It should be noted that it is highly unlikely that maintenance dredging would be scheduled when a significant capital dredging project, with the associated release of fine sediment to the estuary, was being undertaken.
- 11.4.22 Mitigation measures to limit the suspension and subsequent deposition of sediment during capital dredging are proposed as part of the QEII Berth Development and the NGCT projects. For the former project, mitigation comprises the use of specialist dredging equipment (i.e. an enclosed grab loading into a sealed barge) for dredging of unconsolidated material to minimise resuspension in the water column. This requirement is specified because of the elevated concentration of contaminants within the dredged sediment, and this measure would limit sediment release into the water column as far as practicable.

11.4.23 As set out in **Section 10.3**, the quality of the sediment to be dredged as part of the Harbour facility proposal is currently being assessed following the recent completion of a sediment sampling exercise. However, an initial analysis of the data from the survey has been undertaken and it appears that a number of determinands (notably hydrocarbons, mercury and copper) are elevated. Following full analysis of the data, the implications for the proposed scheme (e.g. method of dredging) will be discussed with the MMO, Natural England and the Environment Agency and the potential water quality impact assessed accordingly. There may be a requirement for specific mitigation to be applied during the capital dredging as a result of these discussions.

Changes to the hydrodynamic and sedimentary regime resulting in a potential effect on morphology of intertidal and subtidal habitats

11.4.24 An assessment of the predicted effects of the projects scoped into the HRA on the hydrodynamic and sedimentary regime has been undertaken and reported in **Part 5 Cumulative Impact Assessment (Chapter 23)** of the ES). That assessment concludes by describing the predicted integrated effect of the various projects included within the assessment on the morphology of intertidal and subtidal habitats.

11.4.25 In summary, it is concluded that there would be no combined effect on morphology of estuarine habitats between the Harbour facility and other projects. The justification for this conclusion is that:

- the Harbour facilities would not change the supply of fine sediment to the Tees;
- deposition of sediment in the berth pocket of the YPP Harbour facility would be material that would (in the absence of the YPP Harbour facility) have deposited within the approach channel and been subject to maintenance dredging and offshore disposal as part of maintenance of the channel.

11.4.26 In summary, therefore, the effect of the Harbour facility would be to cause a redistribution of sediment that requires maintenance dredging. The predictive modelling for the Harbour facility concluded that the proposed scheme has no potential to affect the sediment budget of the estuary and, therefore, there would be no impact morphology of intertidal areas.

11.4.27 The only project predicted to have the potential to affect the estuary sediment budget was the NGCT. It was predicted that this project would result in a 10% increase in supply of material to the Tees estuary from offshore; this arises due to the deepening of the approach channel through the mouth of the Tees and the resultant effect on tidal flows and sediment transport. As a consequence of this effect, it was predicted that there would be an increase in maintenance dredging requirement of the same magnitude.

11.4.28 In terms of combined impact with the NGCT, it follows that a 10% increase (beyond the effect predicted for the scheme in isolation) in maintenance dredge requirement in the Harbour facility berthing pocket could be expected, but this does not represent an overall increase in maintenance requirement in the Tees for the reasons described above.

- 11.4.29 The studies for the QEII Berth Development did not identify any potential route for an effect on intertidal morphology, with the proposed scheme having a negligible effect on deposition of sediment in the berth and, therefore, no potential for a combined effect.
- 11.4.30 It is concluded that there would be no combined effect with respect to the maintenance dredging commitment and, therefore, no in-combination effect on the supply of material to intertidal and subtidal areas or on the morphology of the estuarine habitats.

Noise disturbance during the operational phase

- 11.4.31 As described above (*Noise disturbance during the construction phase*), the noise impact assessment for the Harbour facility is ongoing as part of the EIA studies; this will include an assessment of the potential in-combination noise impact and will be reported in the ES and HRA to be submitted with the DCO application in December 2014.
- 11.4.32 **Table 8.6** identifies that there is the potential for the Tuned In! arts and media centre to result in noise and visual disturbance, which could result in an additive (as opposed to interactive) in-combination effect.
- 11.4.33 The HRA for the Tuned In! facility (E3 Ecology Ltd, 2010) concluded that the disturbance effects of the facility would be minor, and effects could be readily mitigated by the provision of long-term screening on the boundary between the facility and Coatham Boatling Lake. In addition, other measures (already in place for the adjacent Coatham Boatling Lake) were deemed to be part of the mitigation, namely reduction in access to the island in Coatham Boatling Lake, the maintenance of wader sight lines, the improvement in roosting conditions, and appropriate design of new footpaths (E3 Ecology Ltd, 2010). Further measures to minimise disturbance to roosting waders have been implemented as part of the detailed design for the boating lake in the Coatham Enclosure master plan. The assessment concluded that there would be no adverse effect on the integrity of the SPA as a result of the proposed development.
- 11.4.34 Given the above mitigation and conclusion of the assessment for the Tuned In! facility, it is concluded that there is unlikely to be any potential for a significant in-combination effect on the SPA.

Conclusion

It is concluded that the proposed Harbour facility, when assessed in-combination with other project, would not result in an adverse effect on the integrity of the SPA.

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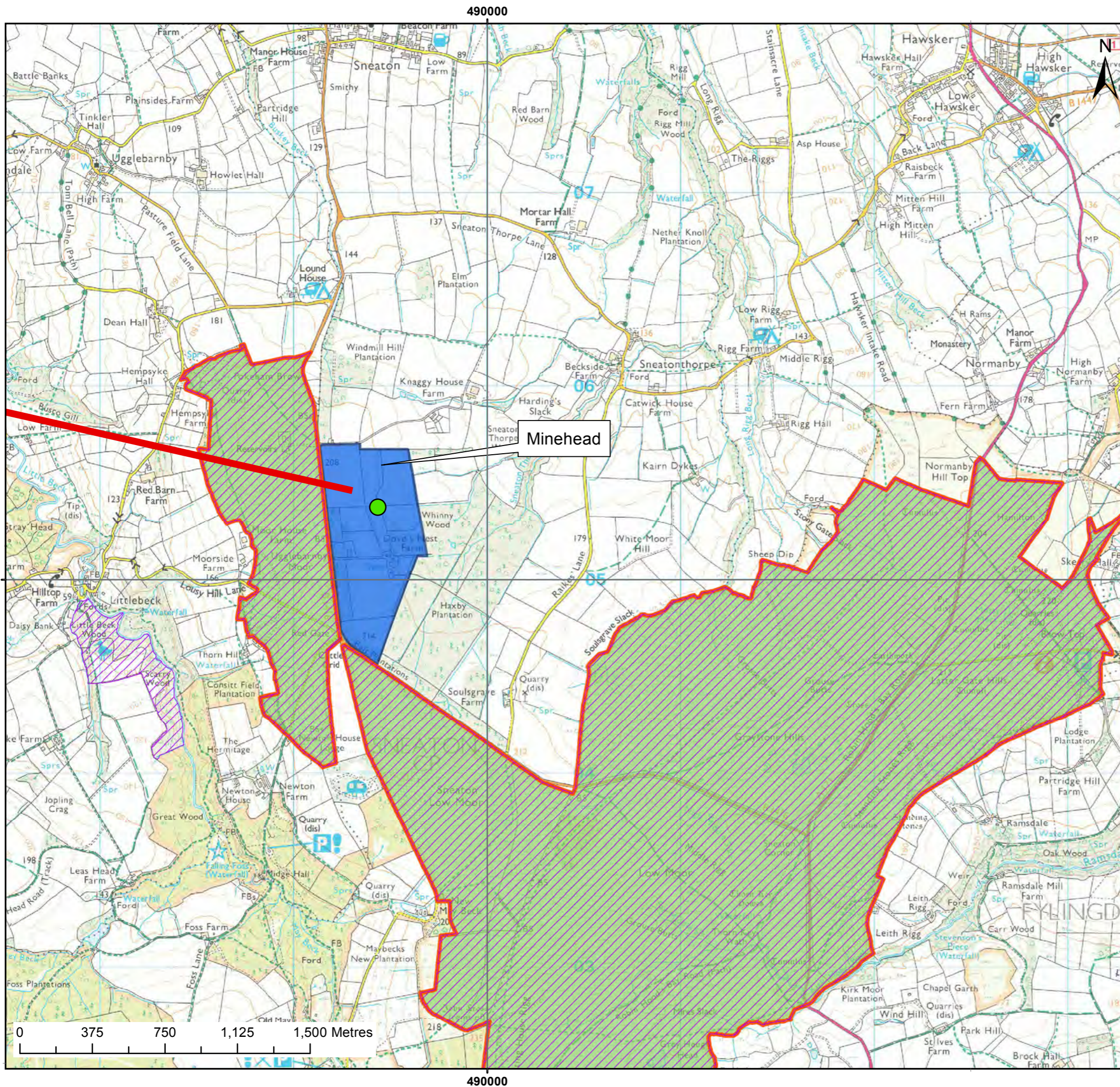
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Appendices**



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Appendix A



- Legend**
- Shaft Location
 - Indicative Mineral Transport System Route
 - Proposed Minehead Location
 - North York Moors SAC
 - North York Moors SPA
 - Site of Special Scientific Interest (SSSI)

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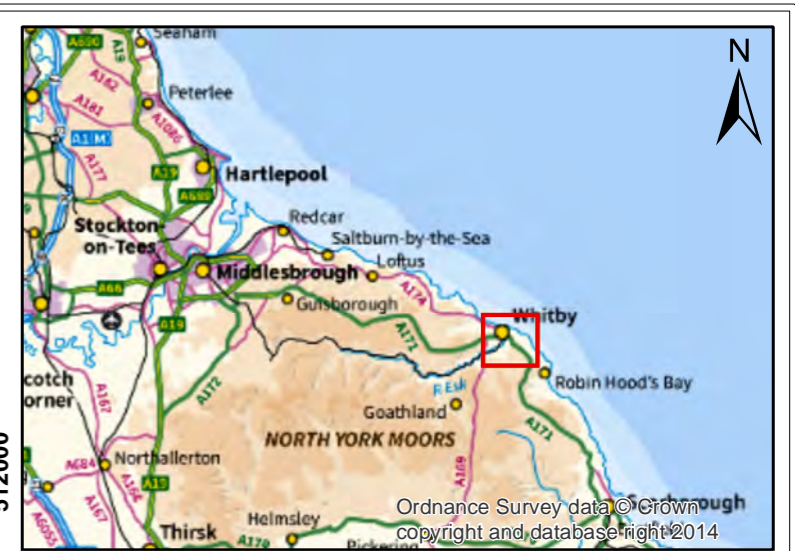
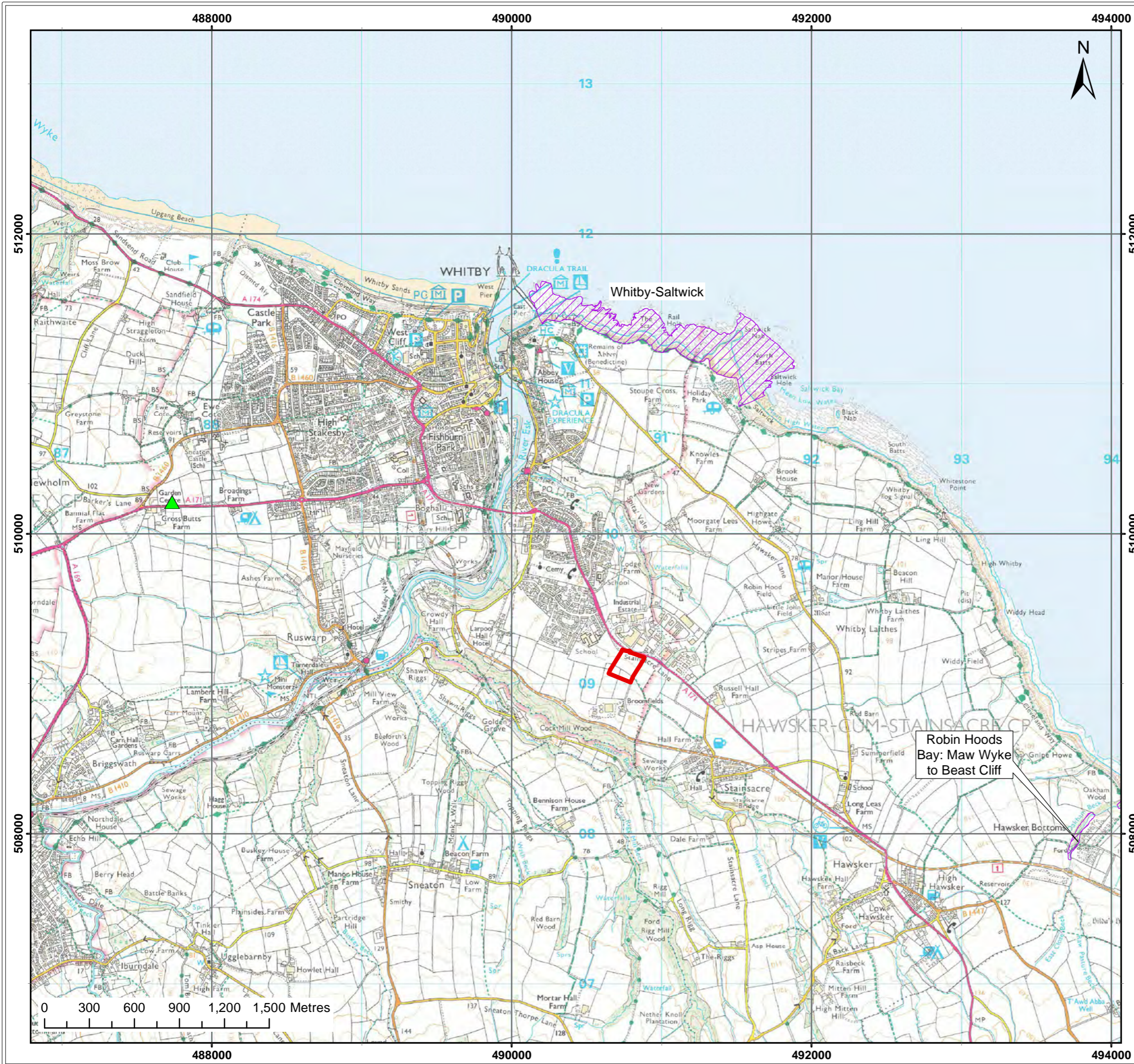
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- Legend**
- Construction Village / Park and Ride Site Boundary
 - ▲ Park and Ride Site
 - Site of Special Scientific Interest (SSSI)

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Title: **Location of Construction Village and Park and Ride**

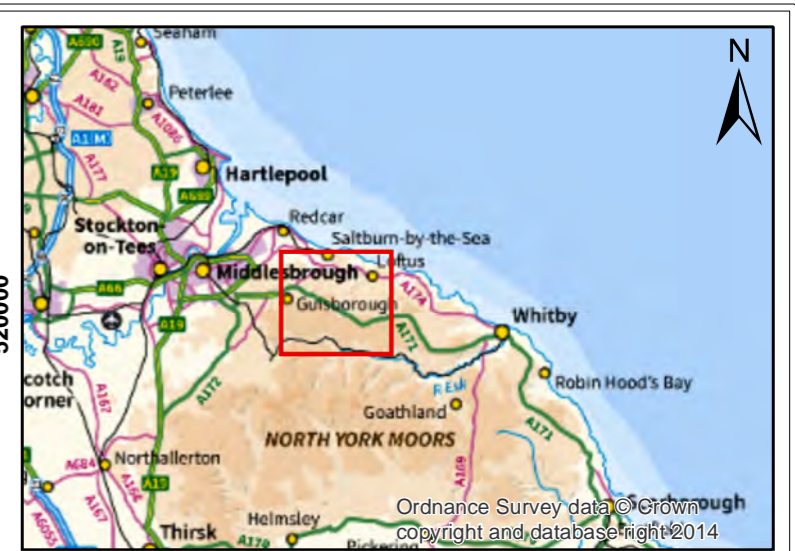
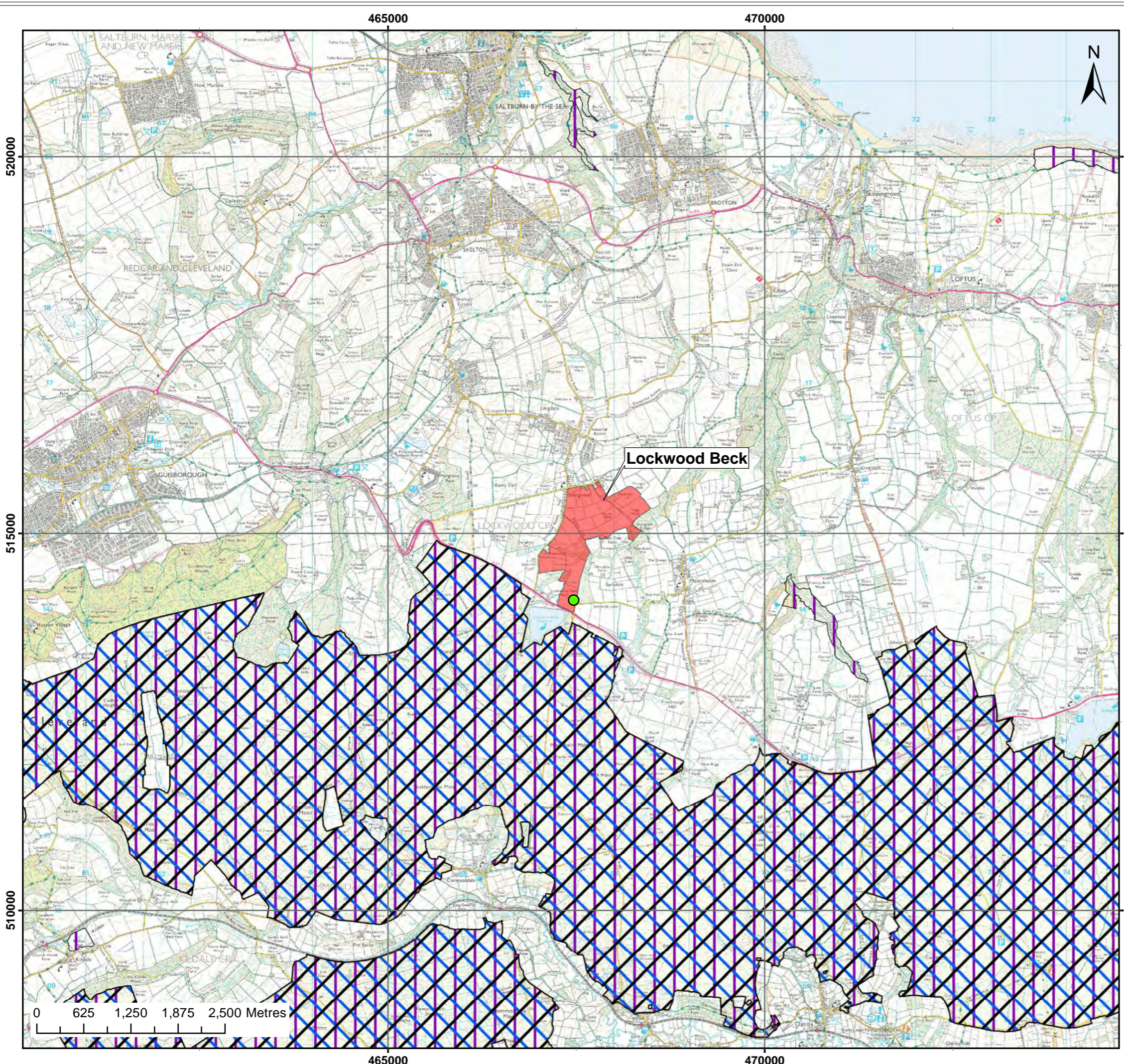
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- Legend**
- Shaft Location
 - Lockwood Beck
 - Special Areas for Conservation
 - Special Protection Areas
 - Site of Special Scientific Interest

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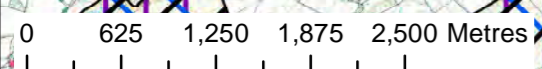
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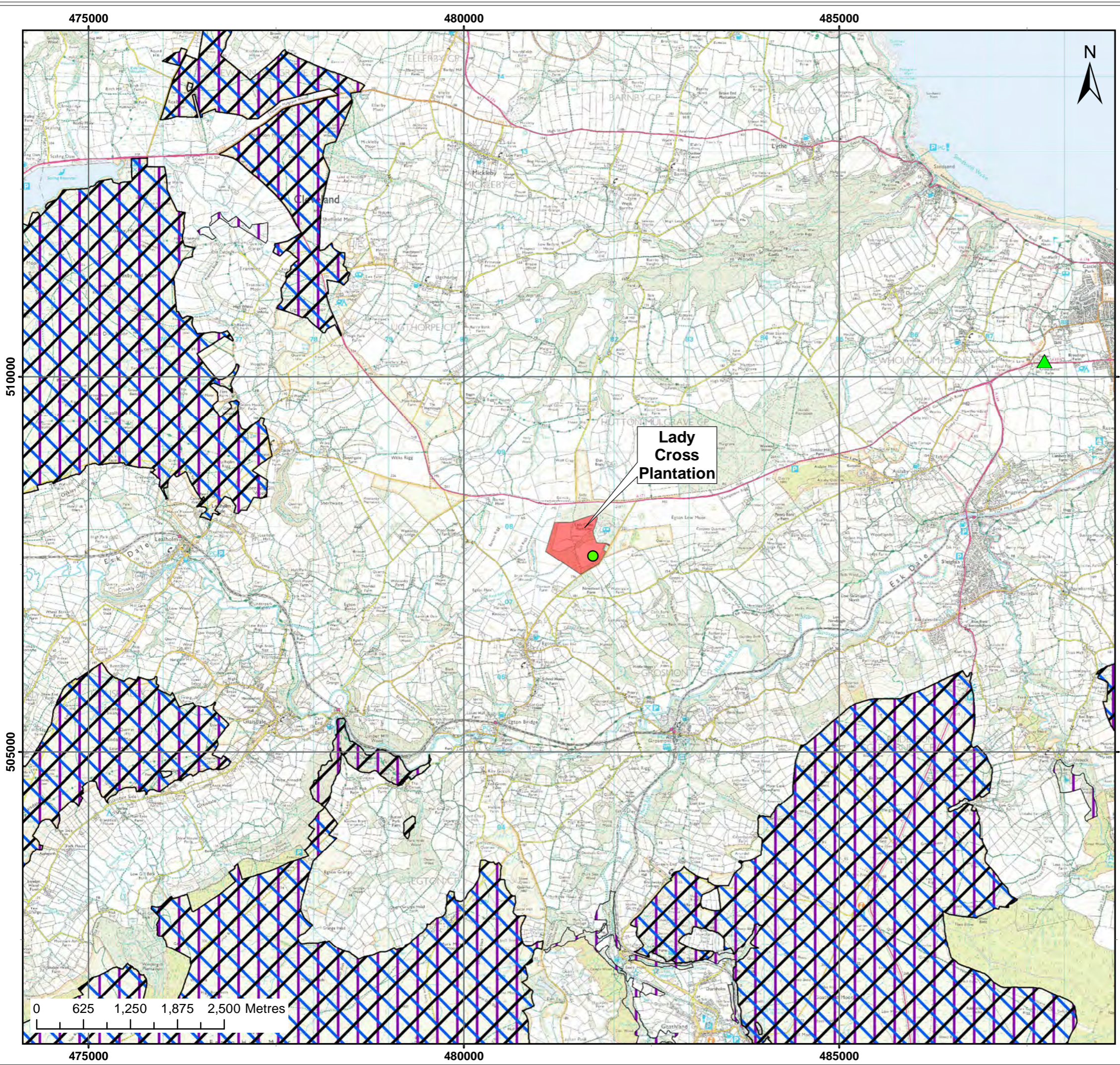
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Legend

- Shaft Location
- Lady Cross Plantation
- ▲ Park and Ride Site
- Special Areas for Conservation
- Special Protection Areas
- Site of Special Scientific Interest

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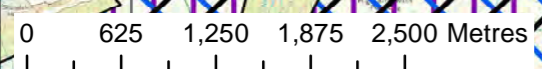
Client: York Potash Limited 	Project: York Potash Project Habitat Regulations Assessment Report
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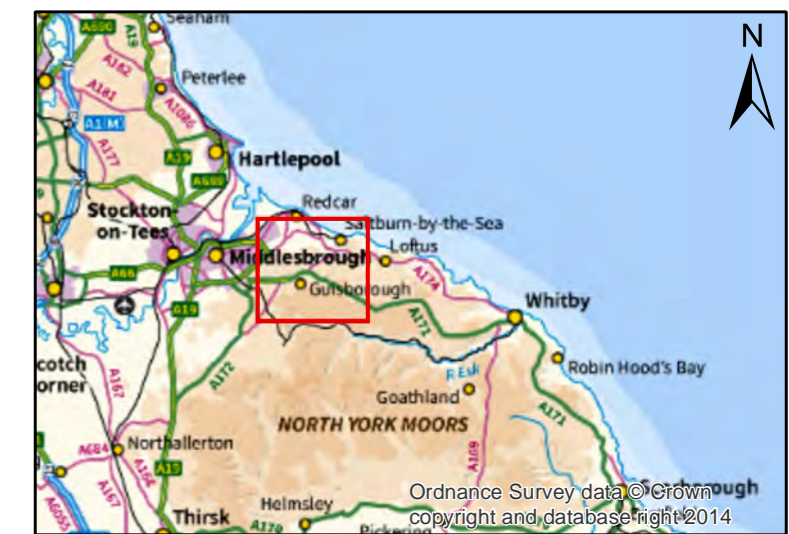
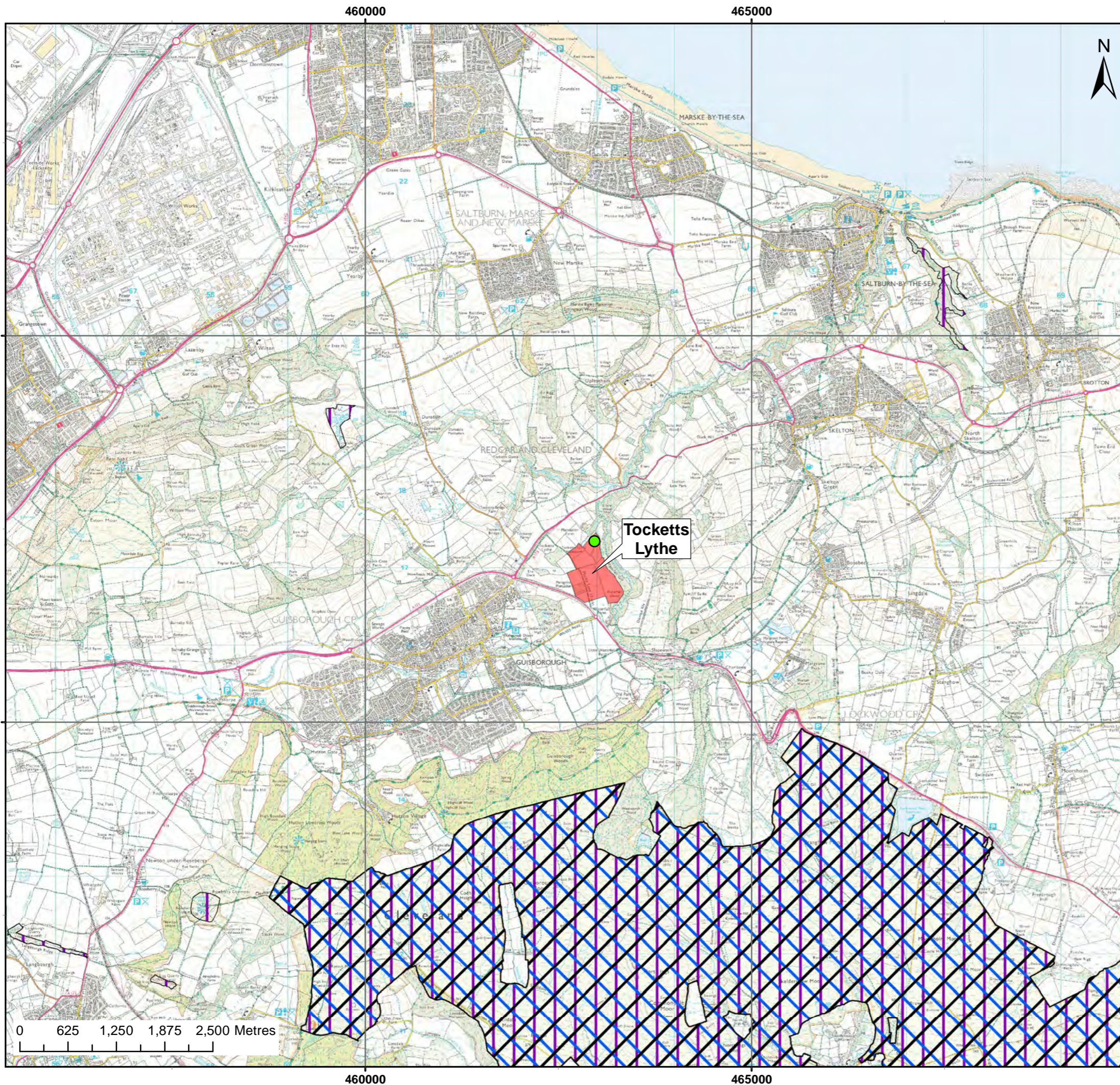
Title: **Lady Cross Plantation**

Figure:		Drawing No:			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	26/06/2014	MCP	HC	A3	1:50,000

Co-ordinate system: British National Grid

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Legend

- Shaft Location
- Tocketts Lythe
- Special Areas for Conservation
- Special Protection Areas
- Site of Special Scientific Interest

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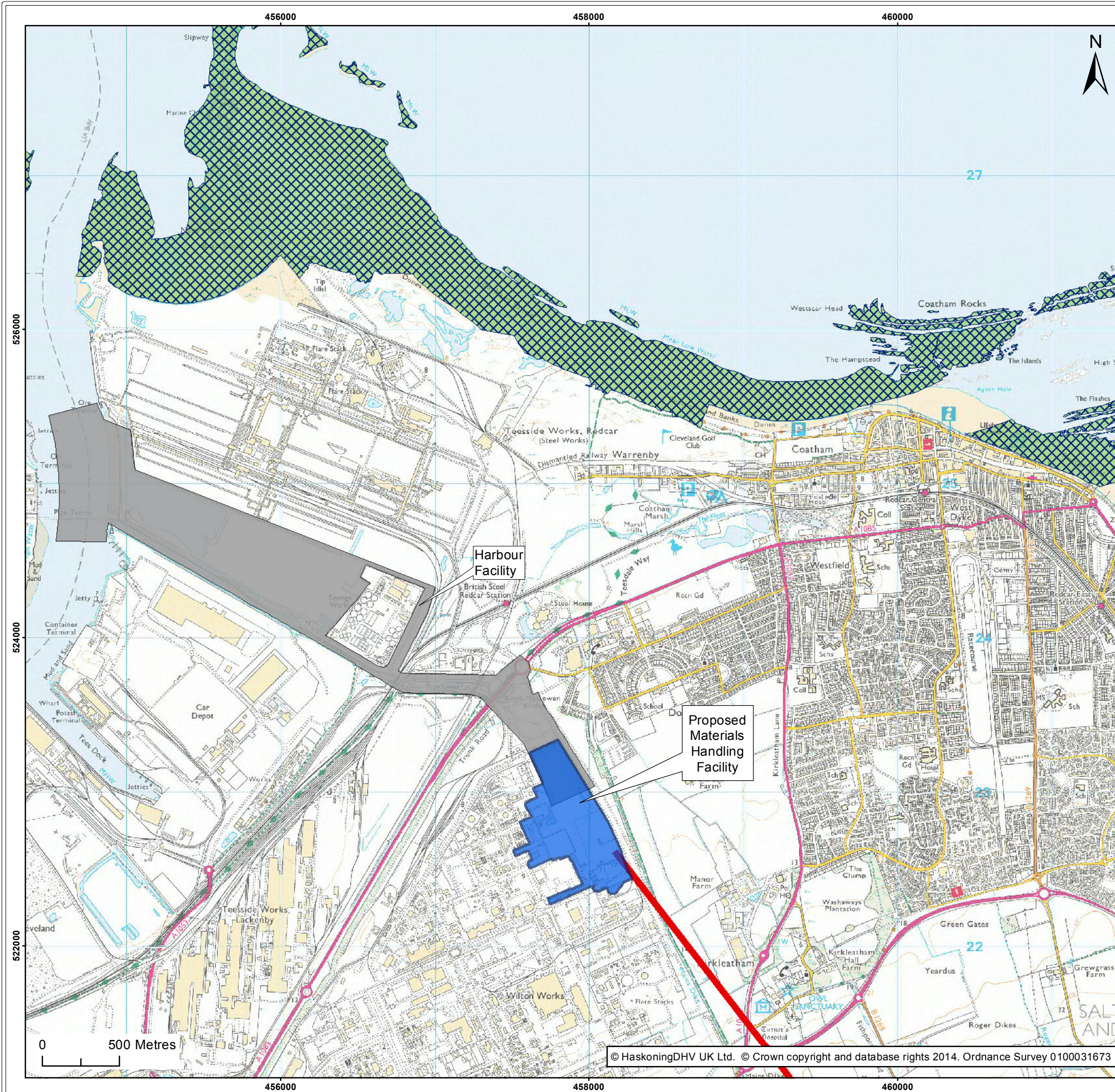
Client: York Potash Limited 	Project: York Potash Project Habitat Regulations Assessment Report
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Title: **Tocketts Lythe**

Figure:		Drawing No:			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	17/06/2014	MCP	HC	A3	1:50,000

Co-ordinate system: British National Grid

<p>Royal HaskoningDHV Enhancing Society Together</p>	<p>ROYAL HASKONINGDHV Rightwell House Bretton Peterborough, PE3 8DW +44 (0)1733 334455 www.royalhaskoningdhv.com</p>
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Legend:

- Shaft Location
- Proposed Materials Handling Facility
- Indicative Mineral Transport System Route
- Harbour Facilities
- Teesmouth and Cleveland and Coast Ramsar
- Teesmouth and Cleveland Coast SPA
- Sea

Client:	Project:
York Potash Limited	York Potash Project Habitats Regulation Assessment

Title:
European Designated sites
in the vicinity of the Port and MHF

Part:	Figure:	Drawing No:			
2		PB1110-P1-5-003			
Rev:	Date:	Drawn:	Checked:	Size:	Scale:
0	25/09/2014	TC	HC	A3	1:25,000

Co-ordinate system: British National Grid



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Appendix B

European Site Conservation Objectives for North York Moors Special Area of Conservation Site code: UK0030228

With regard to the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below);

Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.

Subject to natural change, to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species;
- The distribution of qualifying species within the site.

Qualifying Features:

H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath

H4030. European dry heaths

H7130. Blanket bogs*

* denotes a priority natural habitat or species (supporting explanatory text on following page)

* Priority natural habitats or species

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving favourable conservation status for those features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England's website. This list is far from exhaustive.

European Site Conservation Objectives for North York Moors Special Protection Area Site Code: UK9006161

With regard to the individual species and/or assemblage of species for which the site has been classified ('the Qualifying Features' listed below);

Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.

Subject to natural change, to maintain or restore:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The populations of the qualifying features;
- The distribution of the qualifying features within the site.

Qualifying Features:

A098 *Falco columbarius*; Merlin (Breeding)

A140 *Pluvialis apricaria*; European golden plover (Breeding)

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving the aims of the Birds Directive for those features. On the first page of this document there may be a list of ‘Additional Qualifying Features identified by the 2001 UK SPA Review’. These are additional features identified by the UK SPA Review published in 2001 and, although not yet legally classified, are as a matter of Government policy treated in the same way as classified features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England’s website. This list is far from exhaustive.

**European Site Conservation Objectives for
Arnecliff and Park Hole Woods Special Area of Conservation
Site code: UK0030142**

With regard to the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below);

Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.

Subject to natural change, to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species;
- The distribution of qualifying species within the site.

Qualifying Features:

H91A0. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; Western acidic oak woodland
S1421. *Trichomanes speciosum*; Killarney fern

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving favourable conservation status for those features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England’s website. This list is far from exhaustive.



**European Site Conservation Objectives for
Teessmouth and Cleveland Coast Special Protection Area
Site Code: UK9006061**

With regard to the individual species and/or assemblage of species for which the site has been classified ('the Qualifying Features' listed below);

Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.

Subject to natural change, to maintain or restore:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The populations of the qualifying features;
- The distribution of the qualifying features within the site.

Qualifying Features:

A143 *Calidris canutus*; Red knot (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage

Additional Qualifying Features Identified by the 2001 UK SPA Review:

A137 *Charadrius hiaticula*; Ringed plover (Non-breeding)

This is a European Marine Site

This site is a part of the Teesmouth and Cleveland Coast European Marine Site. These conservation objectives should be used in conjunction with the Regulation 35 Conservation Advice Package, for further details please contact Natural England's enquiry service at enquiries@naturalengland.org.uk, or by phone on 0845 600 3078, or visit the Natural England website at:

<http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx>

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving the aims of the Birds Directive for those features. On the first page of this document there may be a list of 'Additional Qualifying Features identified by the 2001 UK SPA Review'. These are additional features identified by the UK SPA Review published in 2001 and, although not yet legally classified, are as a matter of Government policy treated in the same way as classified features.

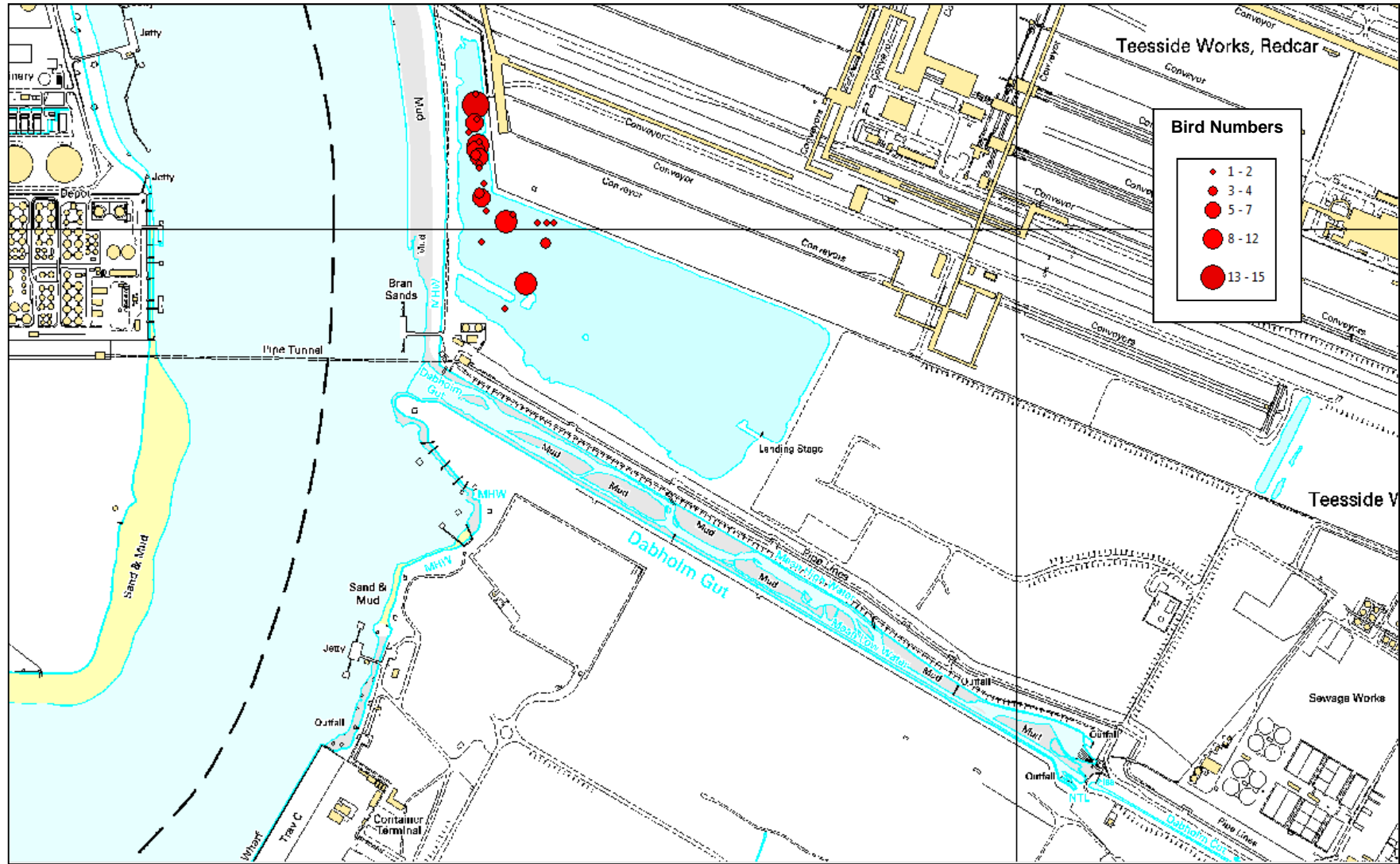
This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England's website. This list is far from exhaustive.



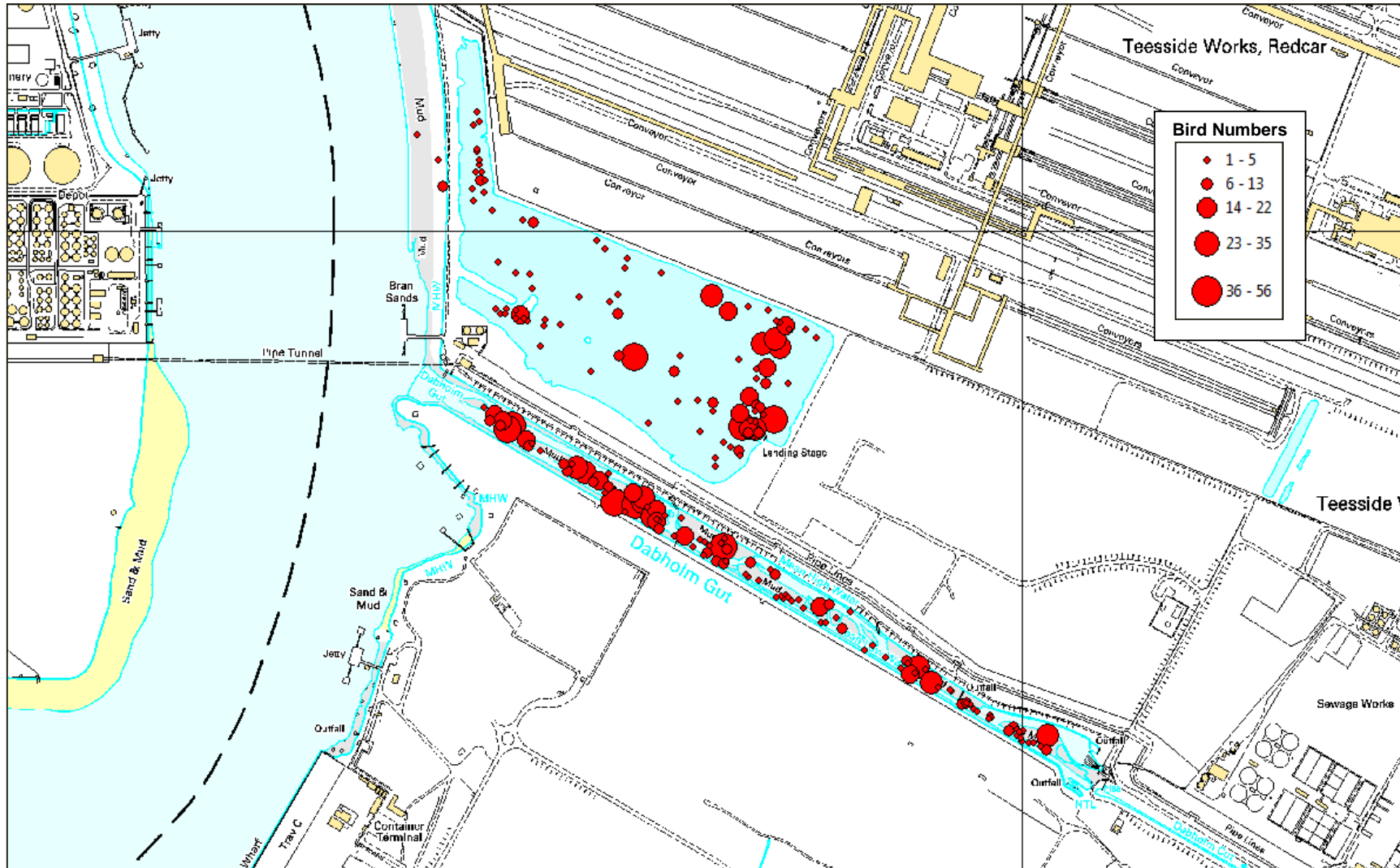
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Appendix C

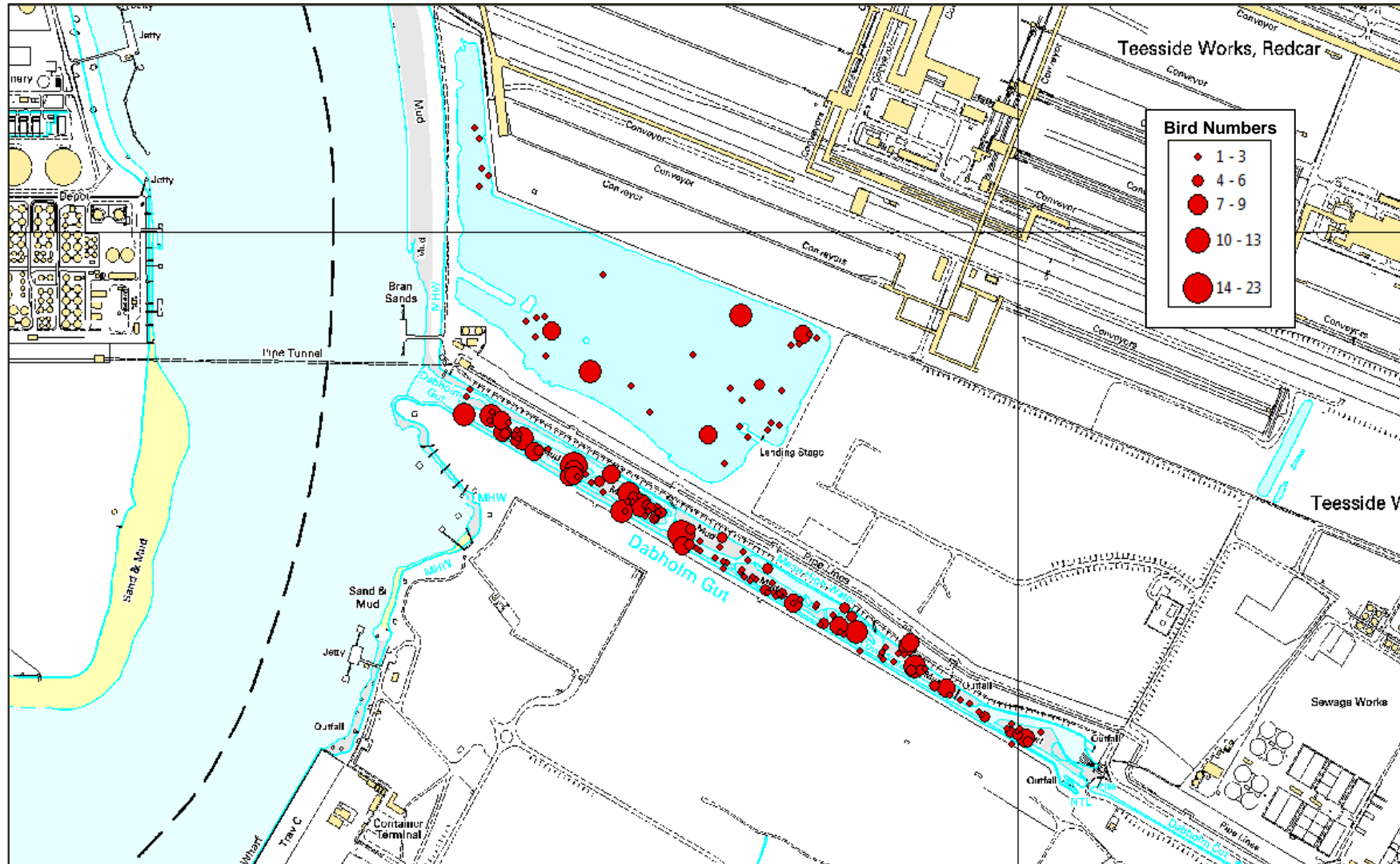
Little Grebe



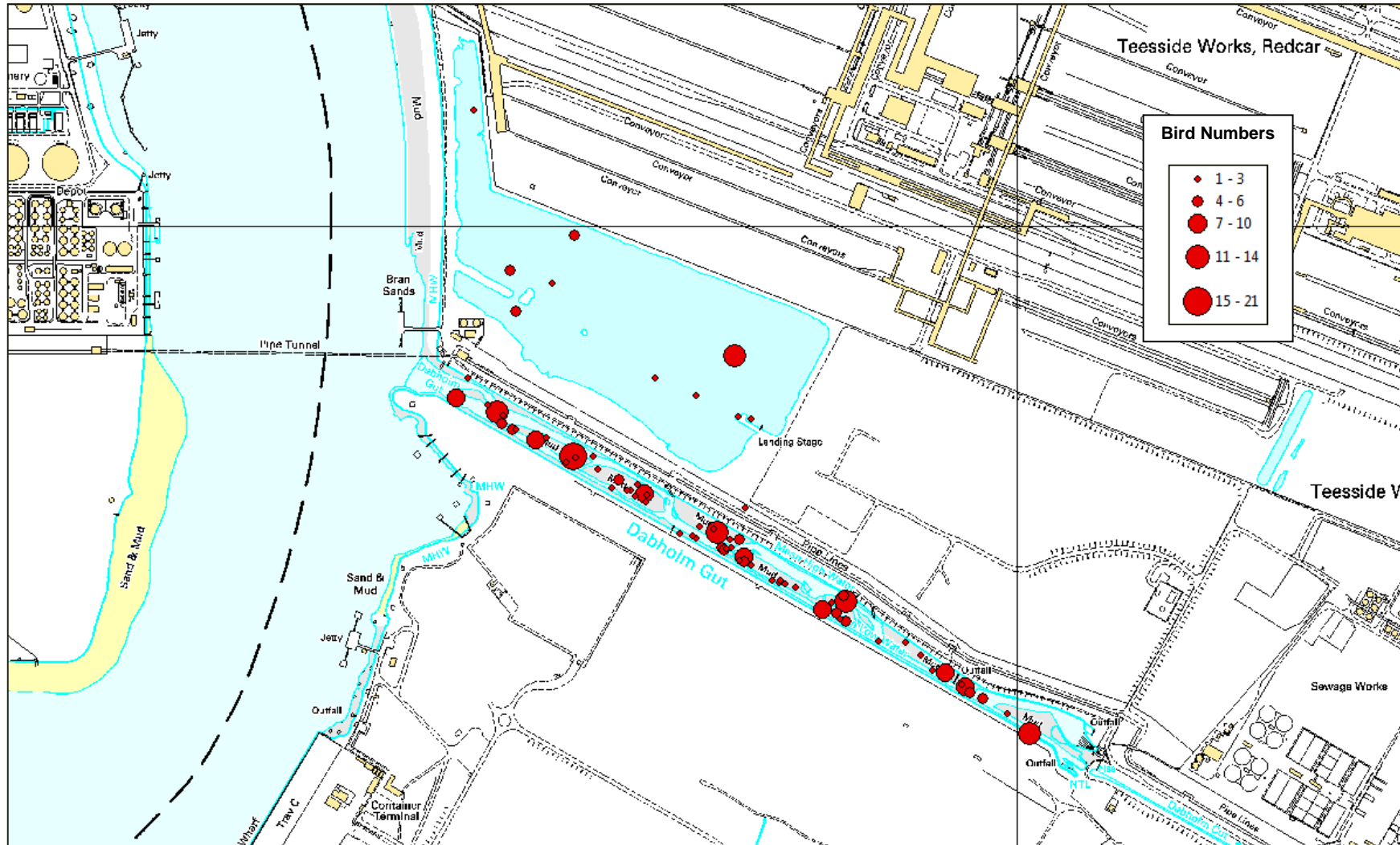
Shelduck



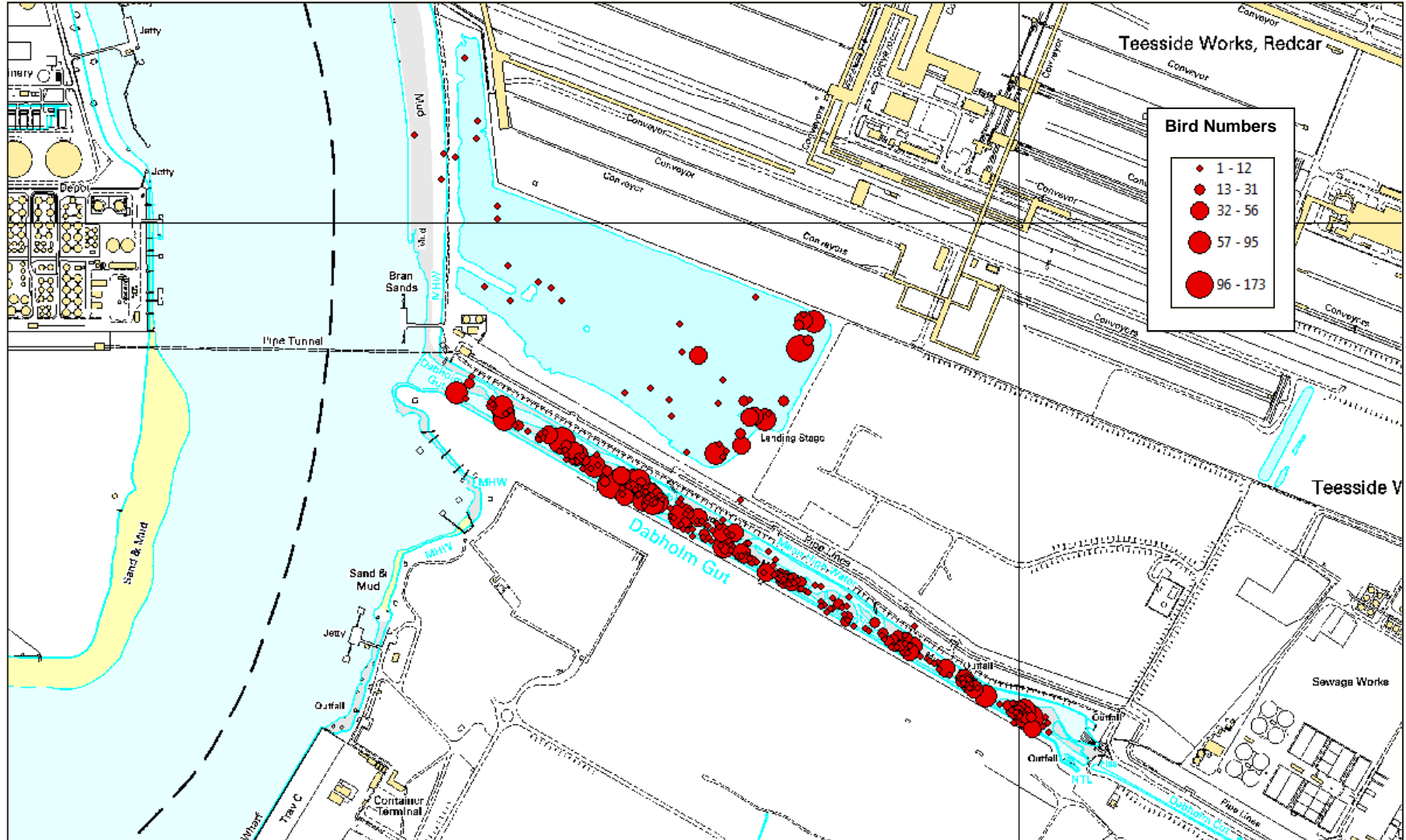
Mallard



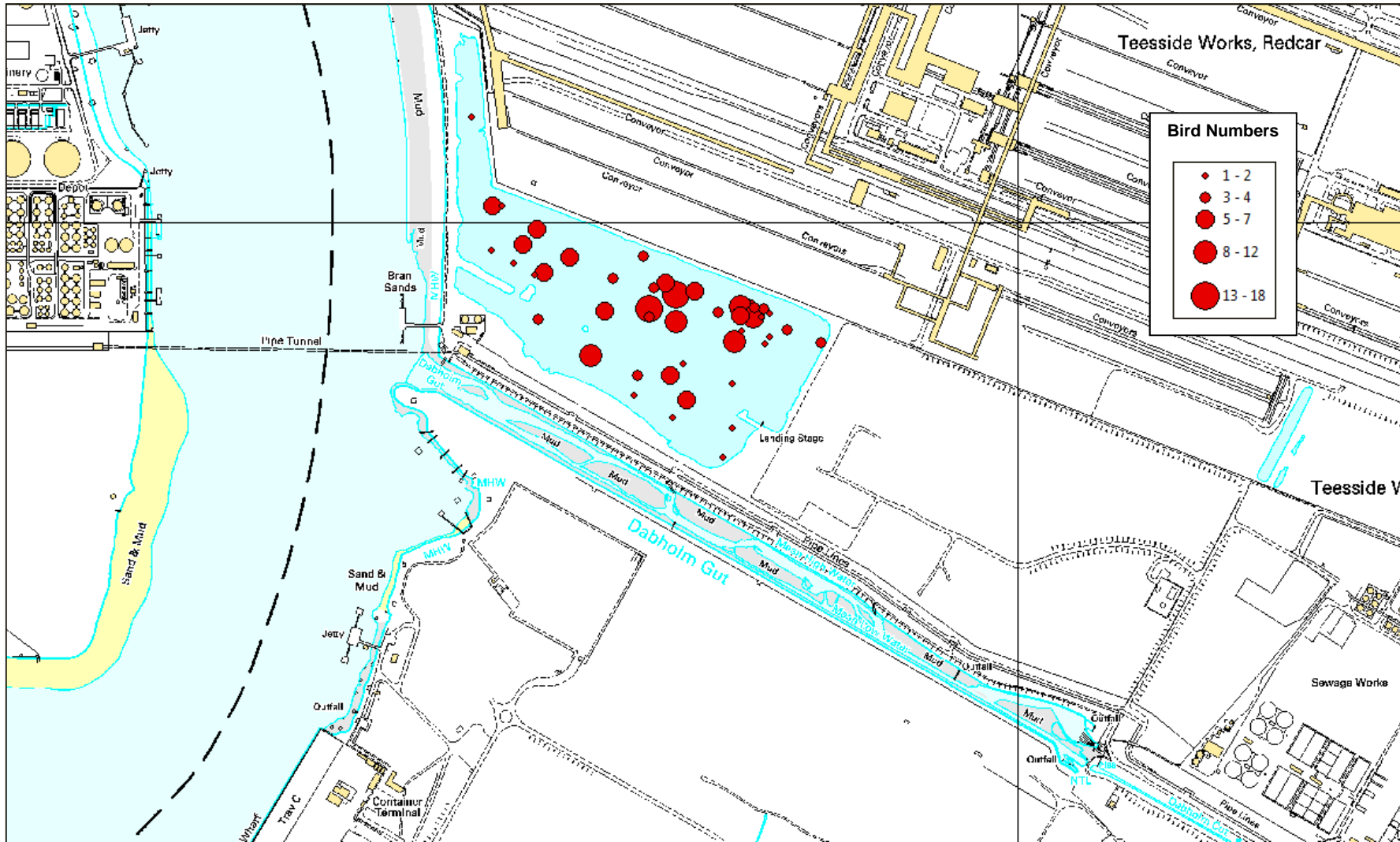
Gadwall



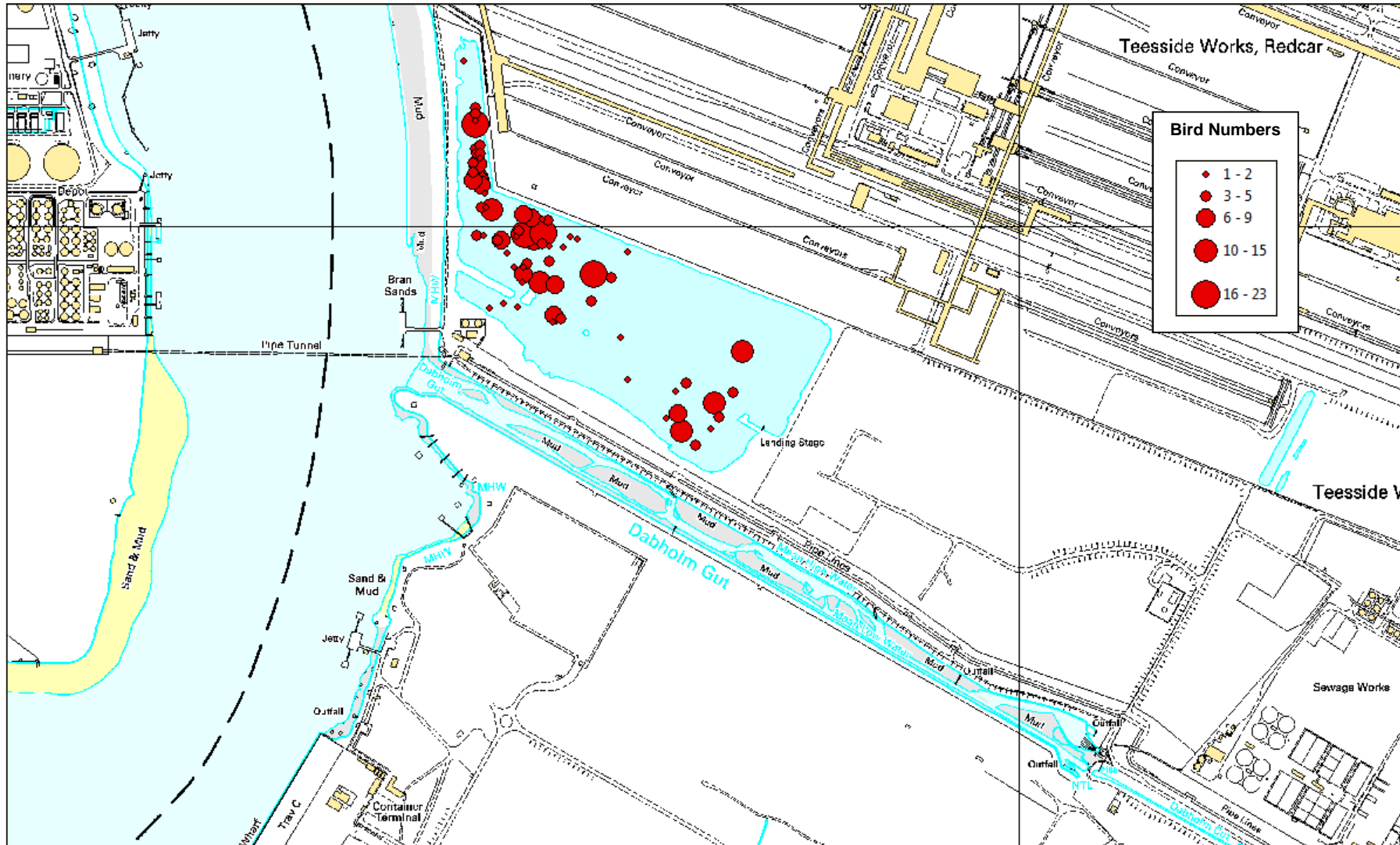
Teal



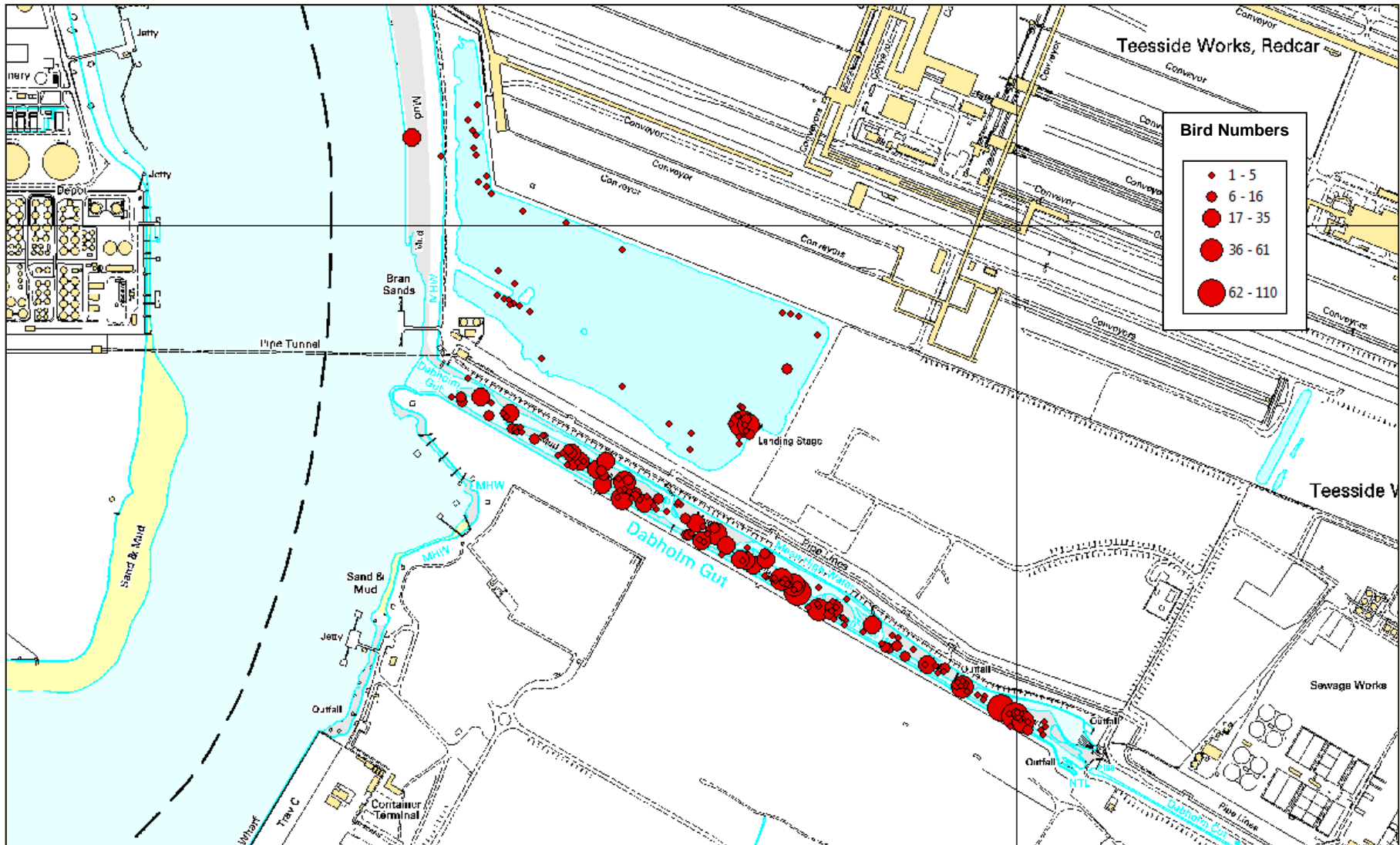
Goldeneye



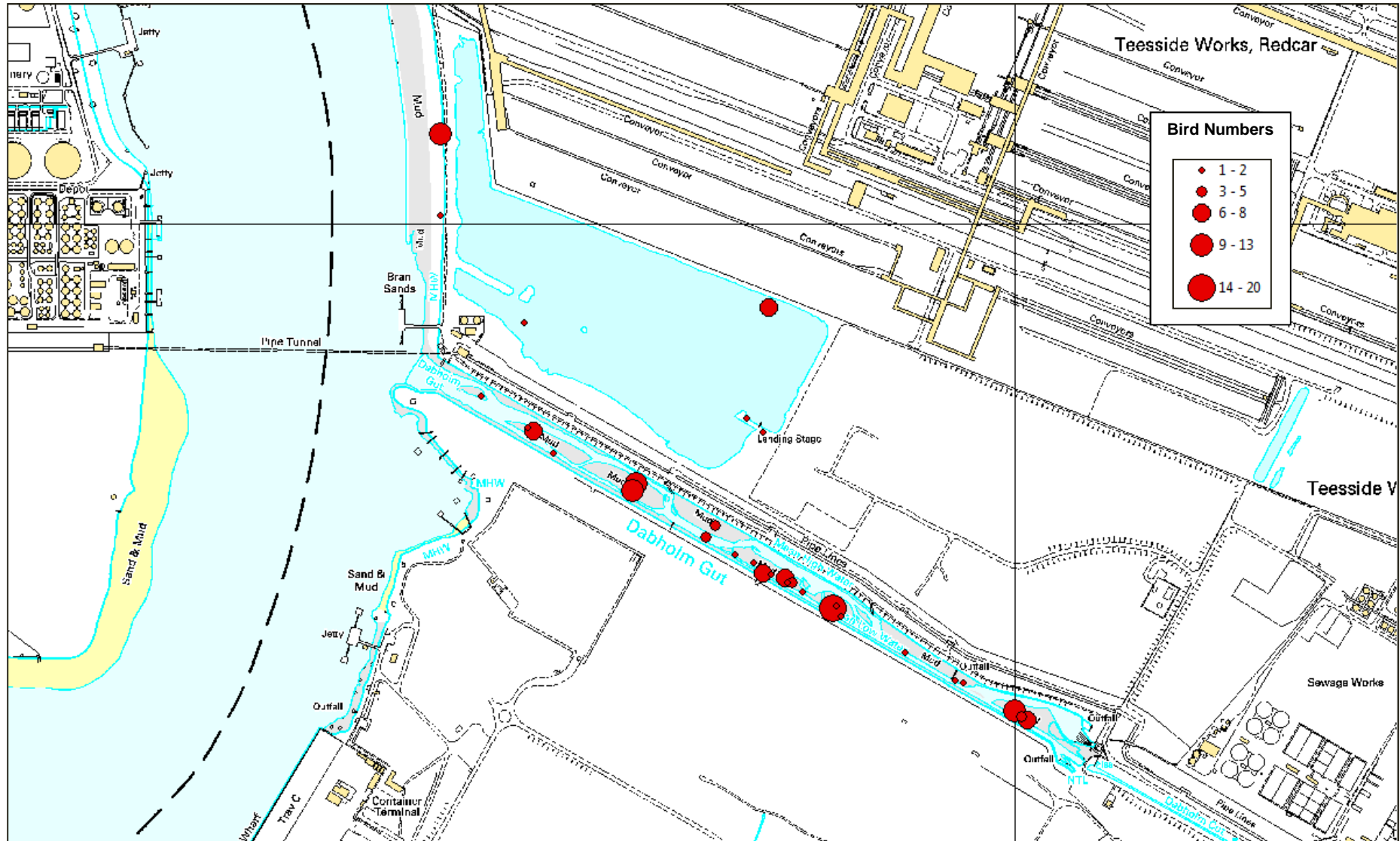
Red-breasted Merganser



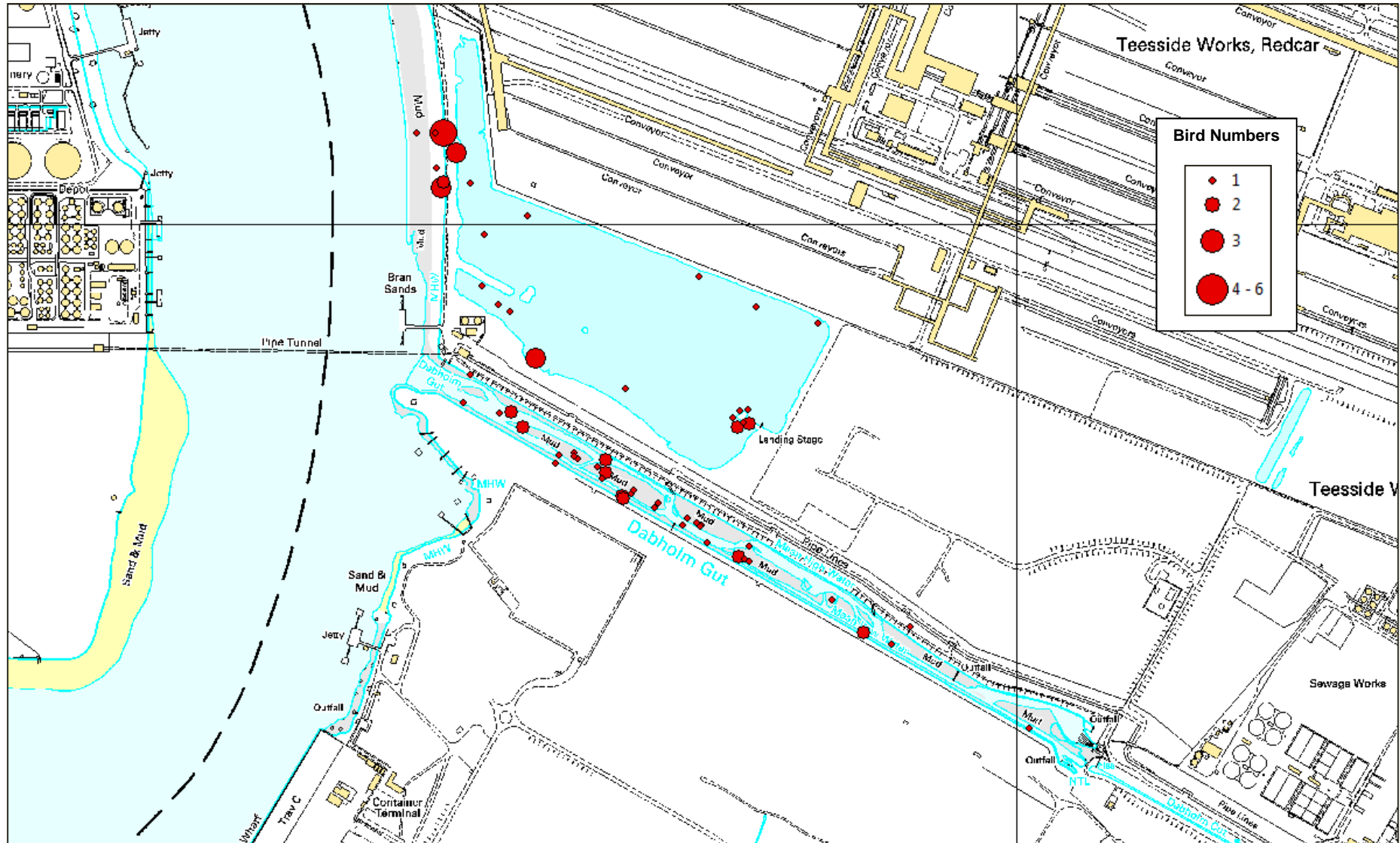
Redshank



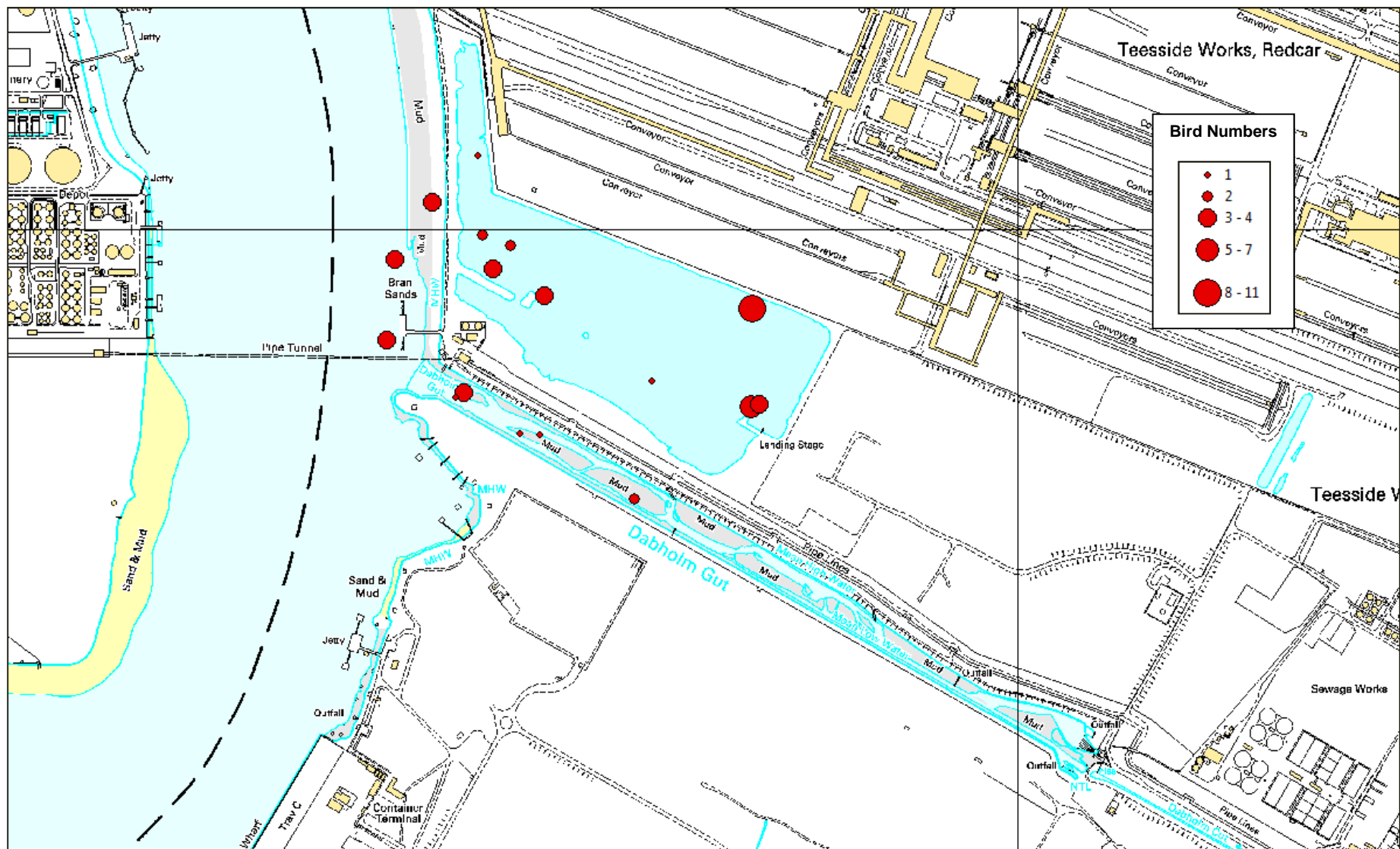
Turnstone



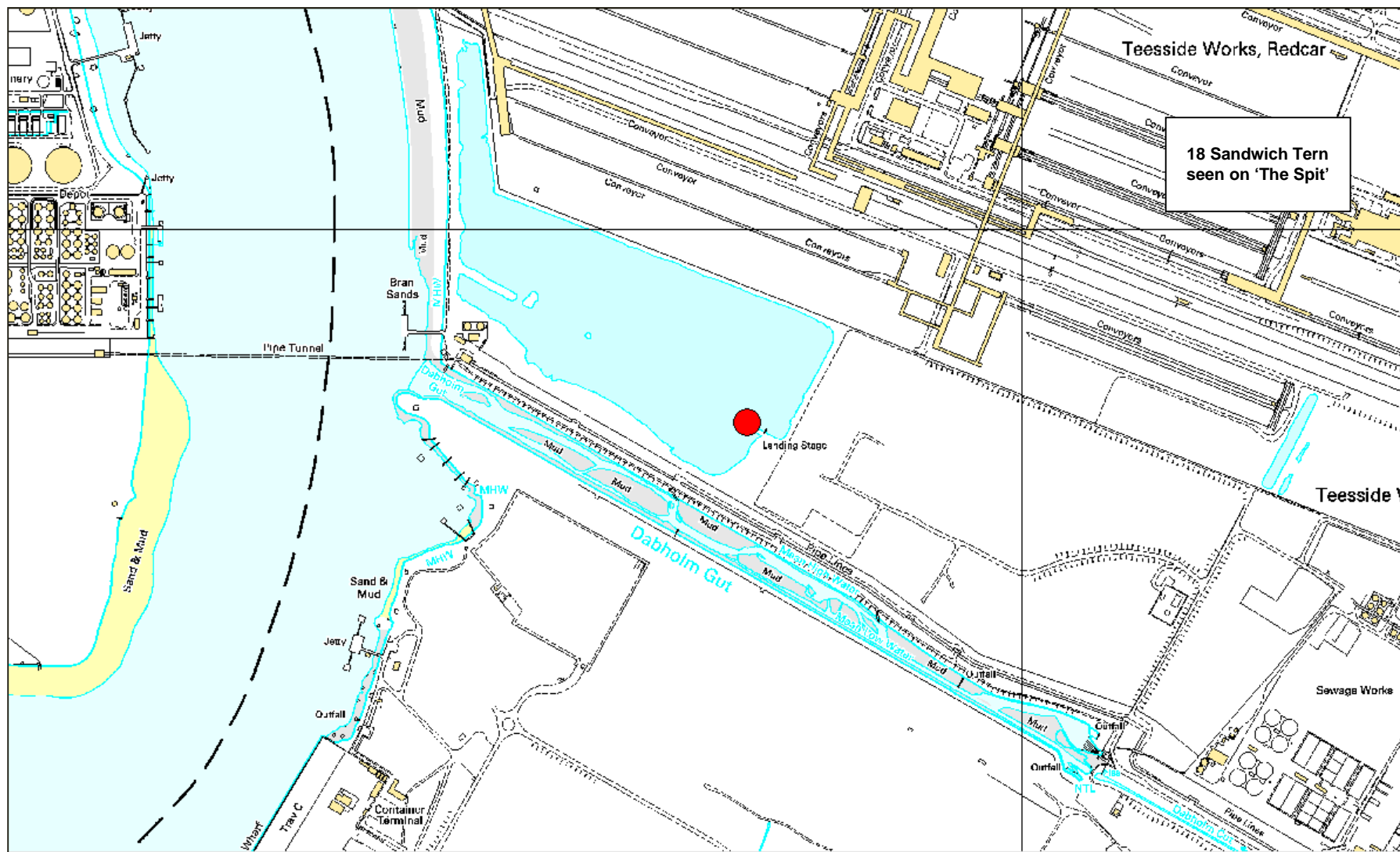
Curlew



Common Tern



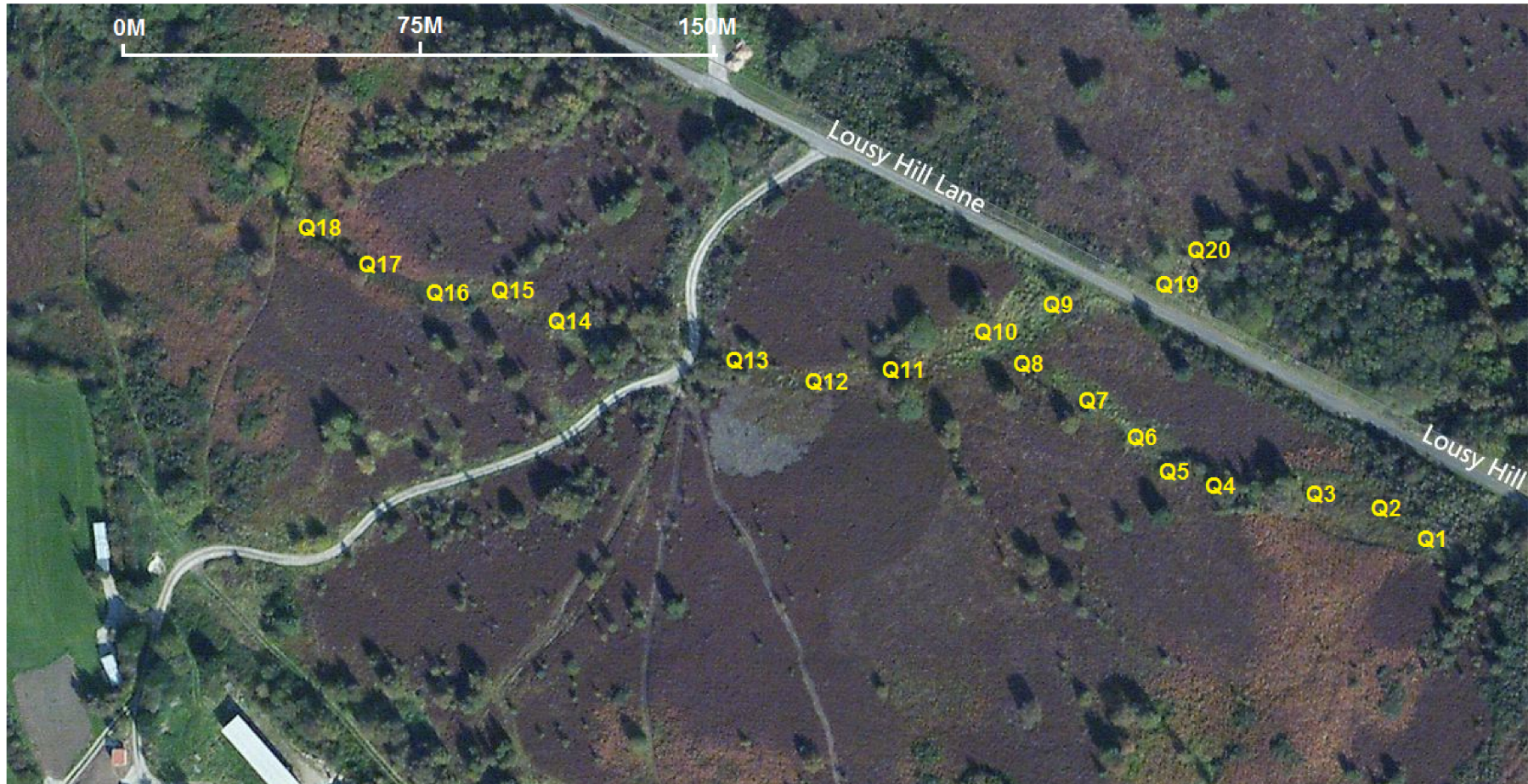
Sandwich Tern







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Appendix D



 Sirius Minerals PLC P10 Manor Court Manor Court Scarborough YO11 3JL							Project: SIRIUS MINERALS PLC - YORK POTASH PROJECT Drawing Title: UGGLEBARNBY MOOR - QUADRAT LOCATIONS		
							Drawing Number: FIGURE 3G Revision: A		
 Uray Hoak 2 Sunny Brow Castleton Whitby North Yorkshire YO21 2RH	A Revision	DRAFT Status	KCBT Drawn by	24/08/14 Date	PC Checked	24/08/14 Date	PC Approved	25/08/14 Date	Scale: File Path:
Revision Comments									

APPENDIX 5A: UGGLEBARNBY MOOR - FLUSH SECTION QUADRAT DATA

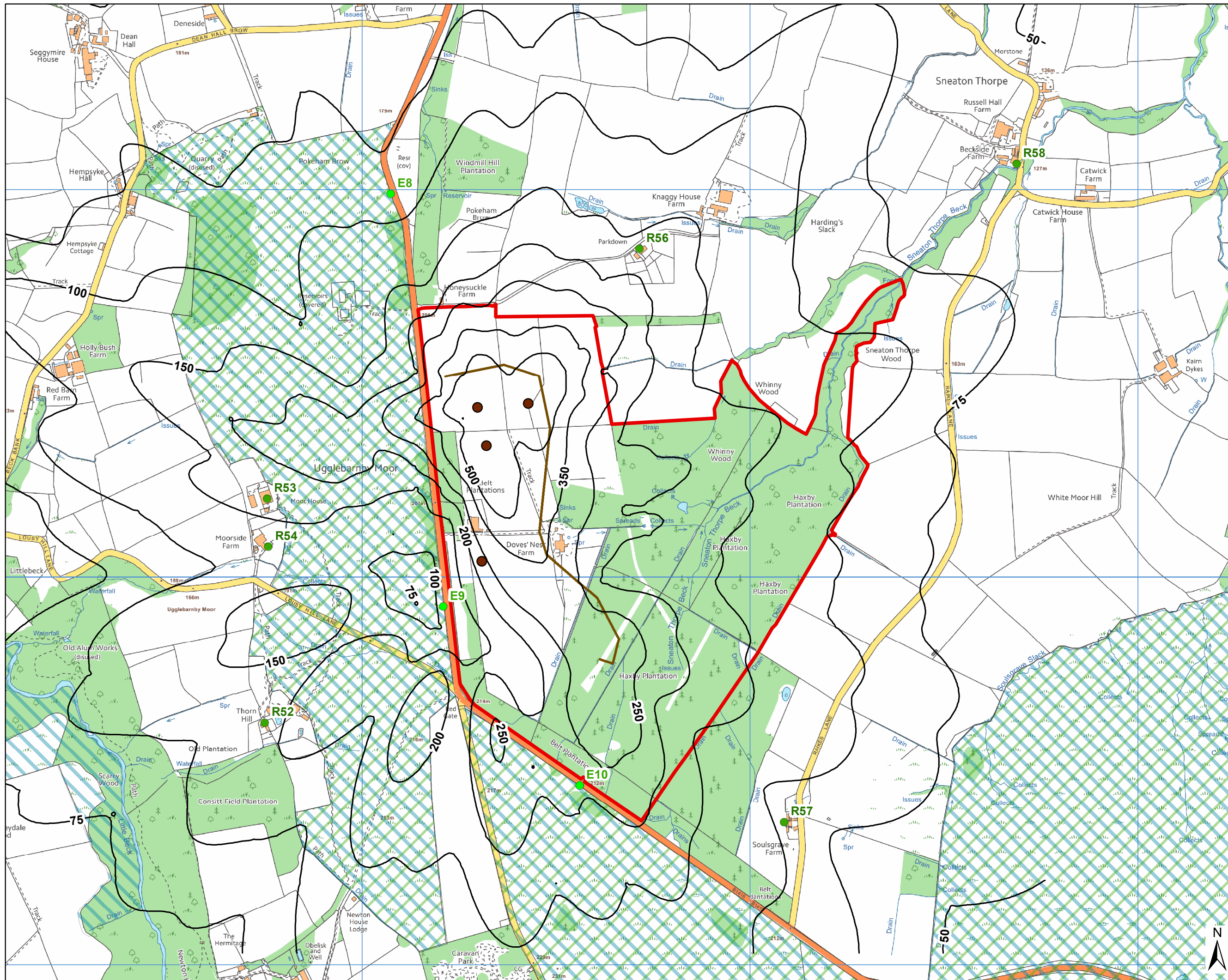
UGGLEBARNBY MOOR - FLUSH SECTION: QUADRAT DATA (2014)																						
Common Name	Scientific Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Av.
Sharp-flowered Rush	<i>Juncus acutiflorus</i>	1	6		9	8	8	8	8	8	8	8	9	9	7	10	10	2	9	2	8	V(1-10)
Yorkshire-fog	<i>Holcus lanatus</i>	2	6	2	3	3	3	2	3	7	1	1		1	4	3	3		1	9	3	V(1-9)
Marsh Thistle	<i>Cirsium palustre</i>	4	2	5	2	2	2	1	2	2	1	1			1	1	1	4	2	2	2	V(1-5)
Common Feather-moss	<i>Eurhynchium praelongum</i>	3	3	3	4	3	3	3	2	1	3	1		3	1		1				2	IV(1-4)
Velvet Bent	<i>Agrostis canina</i>		2	2		1		2	3		2	3	3	2	3	2	3	1			2	IV(1-3)
Soft-rush	<i>Juncus effusus</i>	8	4	5		2	1		2		1	2	1	2				6				III(1-8)
Bramble	<i>Rubus fruticosus agg.</i>	2		4		1	1		2		2		1					1	1	2	1	III(1-4)
Creeping Soft-grass	<i>Holcus mollis</i>			2			2			2	2				1	2	3		2	4		III(1-4)
Common Bent	<i>Agrostis capillaris</i>	3			2	2		2	1			1	1	2	1	2					1	III(1-3)
Devil's-bit Scabious	<i>Succisa pratensis</i>				1	2			1			1	2				1	2	1		1	III(1-2)
Marsh Willowherb	<i>Epilobium palustre</i>				2		2	2	2				1		2	2	2	1	1	1	1	III(1-2)
Tormentil	<i>Potentilla erecta</i>				1		2	1	2		1	1						2	1		2	III(1-2)
Purple Moor-grass	<i>Molinia caerulea</i>			1	4	5		6	4			5	1								4	II(1-6)
Red Fescue	<i>Festuca rubra sens. lat.</i>	2	2	2								1						5	1			II(1-5)
Wood Horsetail	<i>Equisetum sylvaticum</i>	4	3	4	2	2	3															II(2-4)
Wild Angelica	<i>Angelica sylvestris</i>						4	1		4	2									1	1	II(1-4)
Common Sorrel	<i>Rumex acetosa subsp. acetosa</i>	3		1				2	2	1		2							1			II(1-3)
Marsh Violet	<i>Viola palustris</i>			2			1				2			3			2					II(1-3)
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	2	3	1				1	2			2										II(1-3)
Common Marsh-bedstraw	<i>Galium palustre subsp. palustre</i>	2			2		1		1									1				II(1-2)
Cross-leaved Heath	<i>Erica tetralix</i>					1		2	1			1									2	II(1-2)
Broad Buckler-fern	<i>Dryopteris dilatata</i>			1		1	1					1							1		1	II(1)
Marsh Pennywort	<i>Hydrocotyle vulgaris</i>		9												8	3			3			I(3-9)
Cow-horn Bog-moss	<i>Sphagnum denticulatum</i>												6									I(6)
Bracken	<i>Pteridium aquilinum</i>	1		5																2		I(1-5)
Star Sedge	<i>Carex echinata</i>																		5			I(5)
Blunt-leaved Bog Moss	<i>Sphagnum palustre</i>										4											I(4)
Heather	<i>Calluna vulgaris</i>							4			1										1	I(1-4)
Tufted Hair-grass	<i>Deschampsia cespitosa subsp. cespitosa</i>														1				4	4		I(1-4)
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>		2			3																I(2-3)
Lesser Stitchwort	<i>Stellaria graminea</i>	1								3												I(1-3)
Meadow Vetchling	<i>Lathyrus pratensis</i>																			3		I(3)
Water Horsetail	<i>Equisetum fluviatile</i>														2				2			I(2)
Bulbous Rush	<i>Juncus bulbosus</i>																		2			I(2)
Common Fleabane	<i>Pulicaria dysenterica</i>			2																		I(2)
Honeysuckle	<i>Lonicera periclymenum</i>																				2	I(2)
River Feather-Moss	<i>Brachythecium rivulare</i>			2																		I(2)
Common Pouchwort	<i>Calypogeia fissa</i>	2																			1	I(1-2)
Common Yellow-sedge	<i>Carex demissa</i>			2															1			I(1-2)
Wavy Hair-grass	<i>Deschampsia flexuosa</i>							2	1													I(1-2)
Cleavers	<i>Galium aparine</i>								1							1				1	1	I(1)
Birch	<i>Betula sp. (seedling)</i>											1						1			1	I(1)
Common Mouse-ear	<i>Cerastium fontanum</i>	1									1											I(1)

UGGLEBARNBY MOOR - FLUSH SECTION: QUADRAT DATA (2014) (Continued)																						
Common Name	Scientific Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Av.
Compact Rush	<i>Juncus conglomeratus</i>										1							1				I(1)
Creeping Buttercup	<i>Ranunculus repens</i>									1									1			I(1)
Carnation Sedge	<i>Carex panicea</i>																				1	I(1)
Heath Bedstraw	<i>Galium saxatile</i>																				1	I(1)
Lady-fern	<i>Athyrium filix-femina</i>				1						1											I(1)
Narrow Buckler-fern	<i>Dryopteris carthusiana</i>	1					1															I(1)
Rosebay Willowherb	<i>Chamerion angustifolium</i>										1										1	I(1)
Bog Bead-moss	<i>Aulacomnium palustre</i>																				1	I(1)
Common Nettle	<i>Urtica dioica</i>																			1		I(1)
Crowberry	<i>Empetrum nigrum subsp. nigrum</i>								1													I(1)
Cuckooflower	<i>Cardamine pratensis</i>	1																				I(1)
False Oat-grass	<i>Arrhenatherum elatius</i>															1						I(1)
Goat Willow	<i>Salix caprea</i>																	1				I(1)
Grey Willow	<i>Salix cinerea subsp. cinerea</i>																	1				I(1)
Heath Wood-rush	<i>Luzula multiflora</i>			1																		I(1)
Rowan	<i>Sorbus aucuparia</i>																	1				I(1)
Sneezewort	<i>Achillea ptarmica</i>																	1				I(1)
Ash	<i>Fraxinus excelsior</i>																					P
Cock's-foot	<i>Dactylis glomerata</i>																					P
Common Knapweed	<i>Centaurea nigra</i>																					P
Common Spotted-orchid	<i>Dactylorhiza fuchsii</i>																					P
Compact Bog-moss	<i>Sphagnum compactum</i>																					P
Dog-rose	<i>Rosa canina</i>																					P
Gorse	<i>Ulex europaeus</i>																					P
Hemp-agrimony	<i>Eupatorium cannabinum</i>																					P
Herb-Robert	<i>Geranium robertianum</i>																					P
Jointed Rush	<i>Juncus articulatus</i>																					P
Lesser Spearwort	<i>Ranunculus flammula</i>																					P
Male-fern	<i>Dryopteris filix-mas</i>																					P
Mat-grass	<i>Nardus stricta</i>																					P
Rough Meadow-grass	<i>Poa trivialis</i>																					P
Short-fruited Willowherb	<i>Epilobium obscurum</i>																					P
Sycamore	<i>Acer pseudoplatanus</i>																					P
Number of Species in Quadrats		18	11	19	12	14	15	15	19	9	18	15	9	7	11	10	9	21	14	11	23	60
Average Number of Species Per Quadrat																						14
Total Number of Species																						76



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Appendix 9

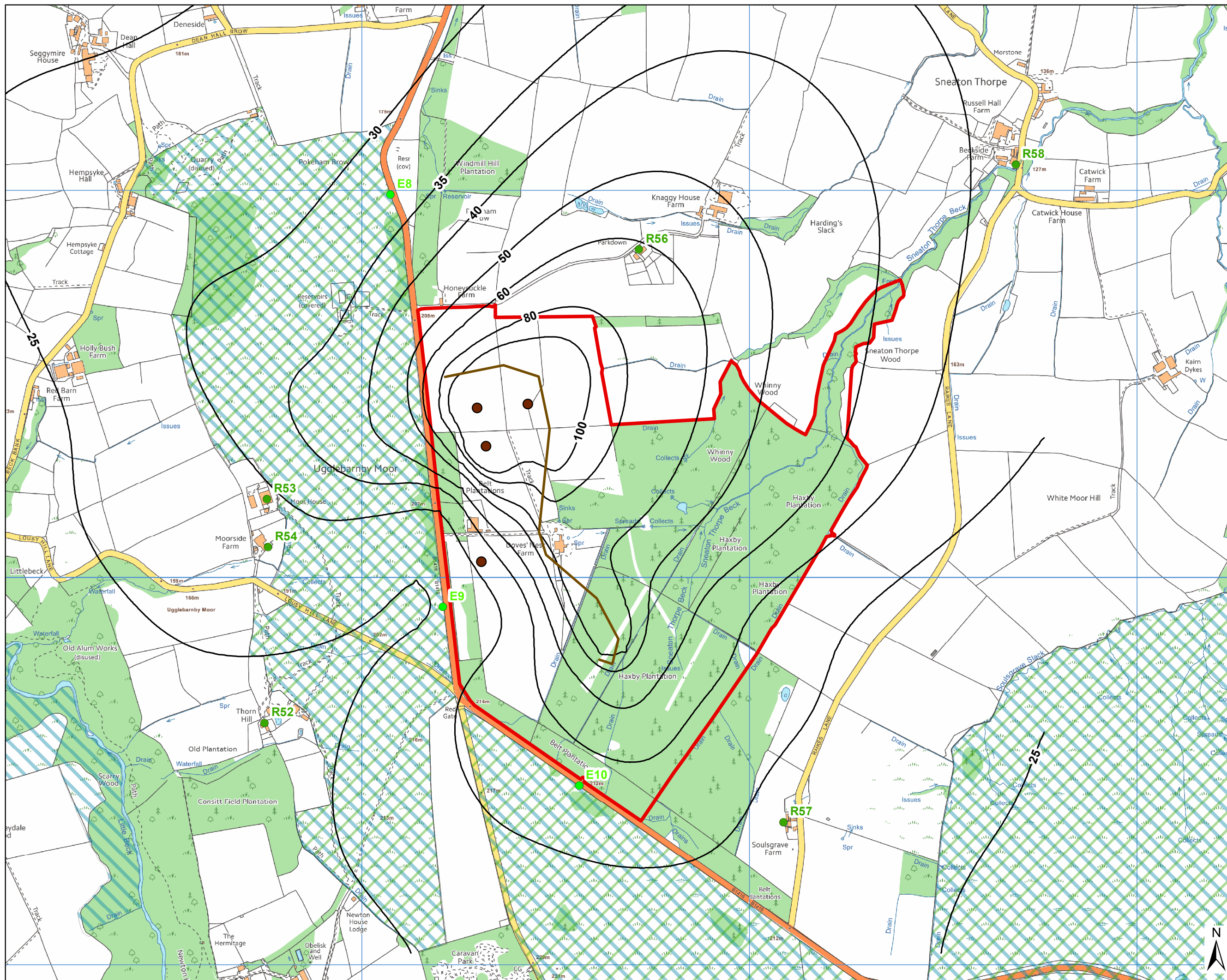


NOTES

- Generator and Shaft Sources
- Haul Road Source
- NO_x Concentration (µg/m³)
- Site Boundary
- SSSI
- SAC & SPA
- Human Receptors
- Ecological Receptors

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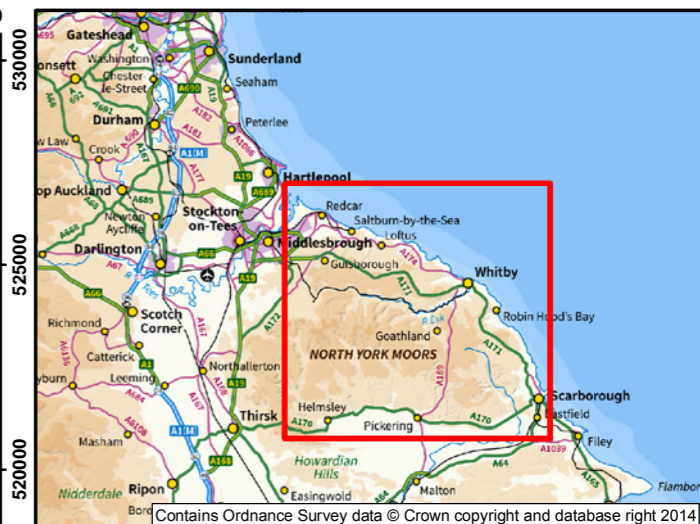
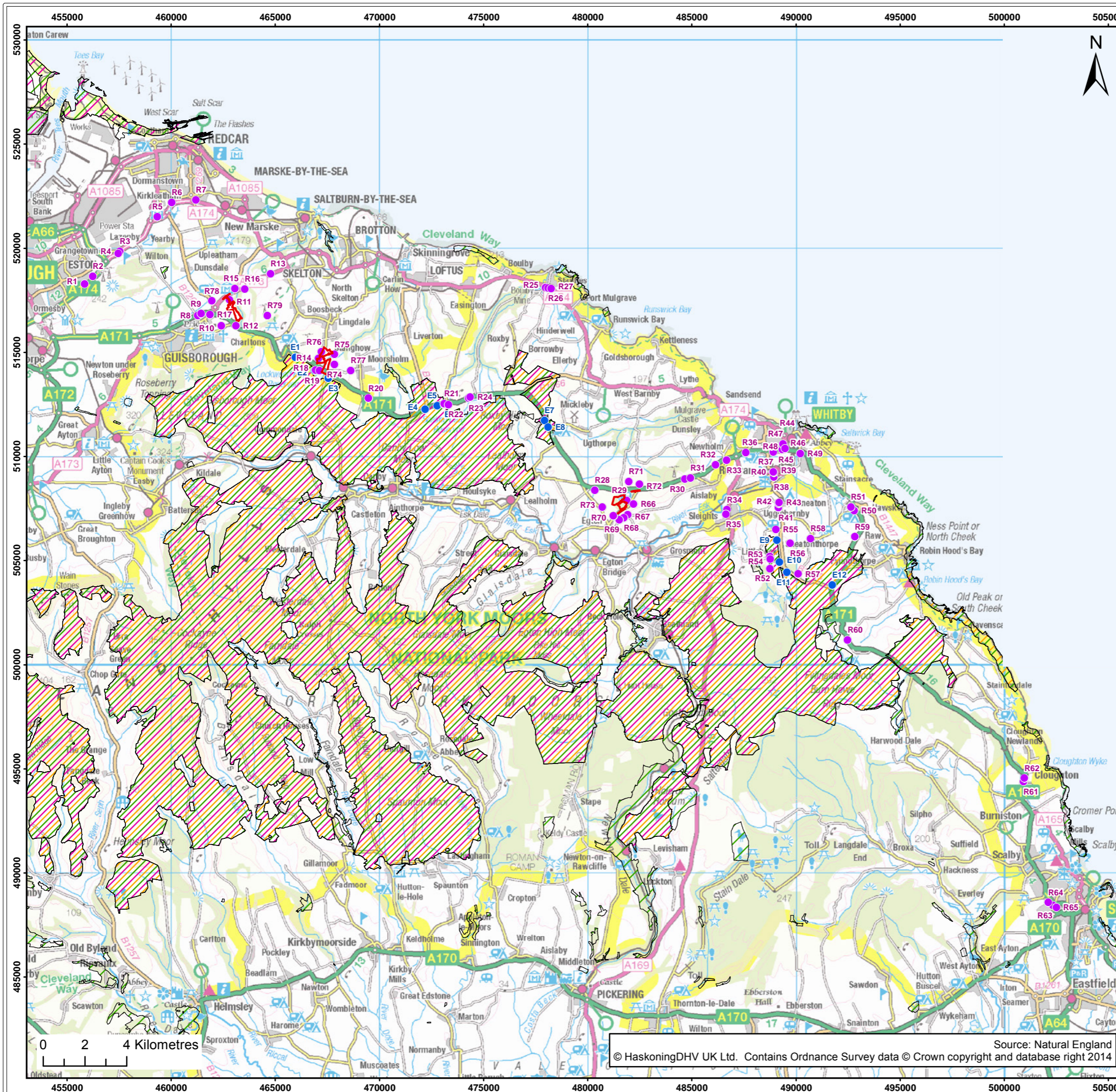
Revision Details	By	Check	Date	Suffix
Purpose of Issue: Final				
Client: York Potash Limited				
Project Title: York Potash Project				
Drawing Title: Process Contribution to the 100th %ile of 24 Hour NO_x Concentrations from Minehead Site Construction Phase Emissions				
Drawn: GH	Checked: GG	Approved: GG	Date: 20/08/14	
URS Internal Project No: 47069931		Scale @ A3: 1:9,000		
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Drawing Number: Figure B3				Rev: 01



- NOTES**
- Generator and Shaft Sources
 - Mobile Plant Source
 - Total N Deposition (kg N/ha/yr)
 - Site Boundary
 - SSSI
 - SAC & SPA
 - Human Receptors
 - Ecological Receptors
- Calculated based on a background nitrogen deposition rate of 19.6 kg N/ha/yr. Value sourced from the Air Pollution Information System (APIS)

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Revision Details	By	Check	Check Date	Suffix
Purpose of Issue	Final			
Client	York Potash Limited			
Project Title	York Potash Project			
Drawing Title	Total Nitrogen Deposition Rate During the Construction Phase of the Minehead Site (kg N/ha/yr)			
Drawn	Checked	Approved	Date	
GH	GG	GG	20/08/14	
URS Internal Project No. 47069931		Scale @ A3 1:9,000		
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Drawing Number	Rev			
Figure B5				01



- Legend:
- Intermediate Shaft and Spoil Site – Extent of Works
 - Special Area of Conservation (SAC)
 - Special Protection Area (SPA)
 - Site of Special Scientific Interest (SSSI)
 - Human Receptor Locations
 - Ecological Receptor Locations

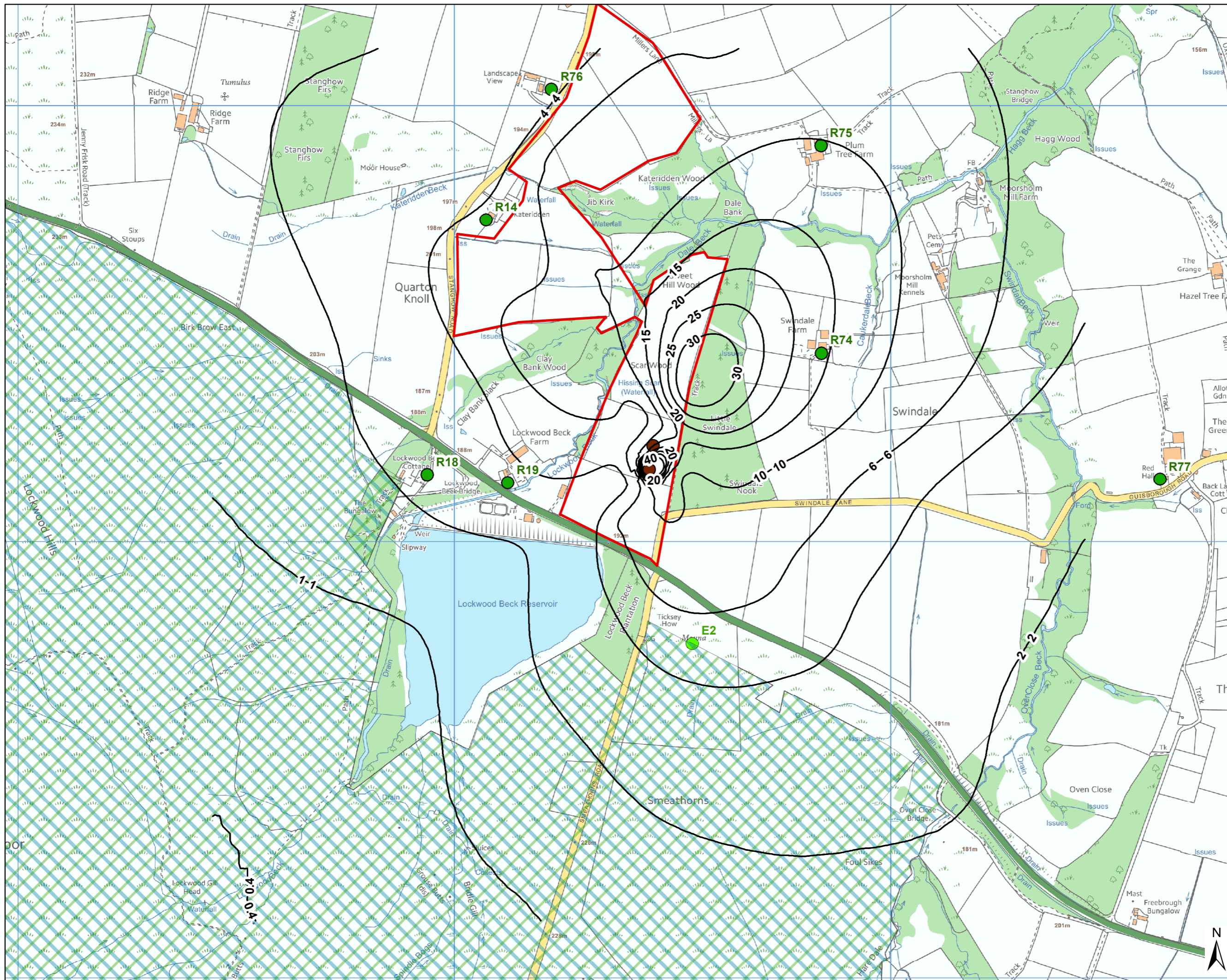
Client: York Potash Limited	Project: York Potash Project Mine, MTS and MHF Environmental Statement
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Title:
Receptor Locations for the Road Traffic Emissions
and Controlled Emissions Assessments

Part: 3	Figure: 9.4	Drawing No: PB1110-P3-9-004			
Rev: 0	Date: 11/09/2014	Drawn: JS	Checked: AP	Size: A3	Scale: 1:185,000

Co-ordinate system: British National Grid

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NOTES

- Generator and Shaft Sources
- Mobile Plant Source
- NO₂ Concentration (µg/m³)
- Site Boundary
- SAC & SPA
- SSSI
- Human Receptors
- Ecological Receptors

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Revision Details	By	Check	Check Date	Suffix

Purpose of Issue: **Final**

Client: **York Potash Limited**

Project Title: **York Potash Project**

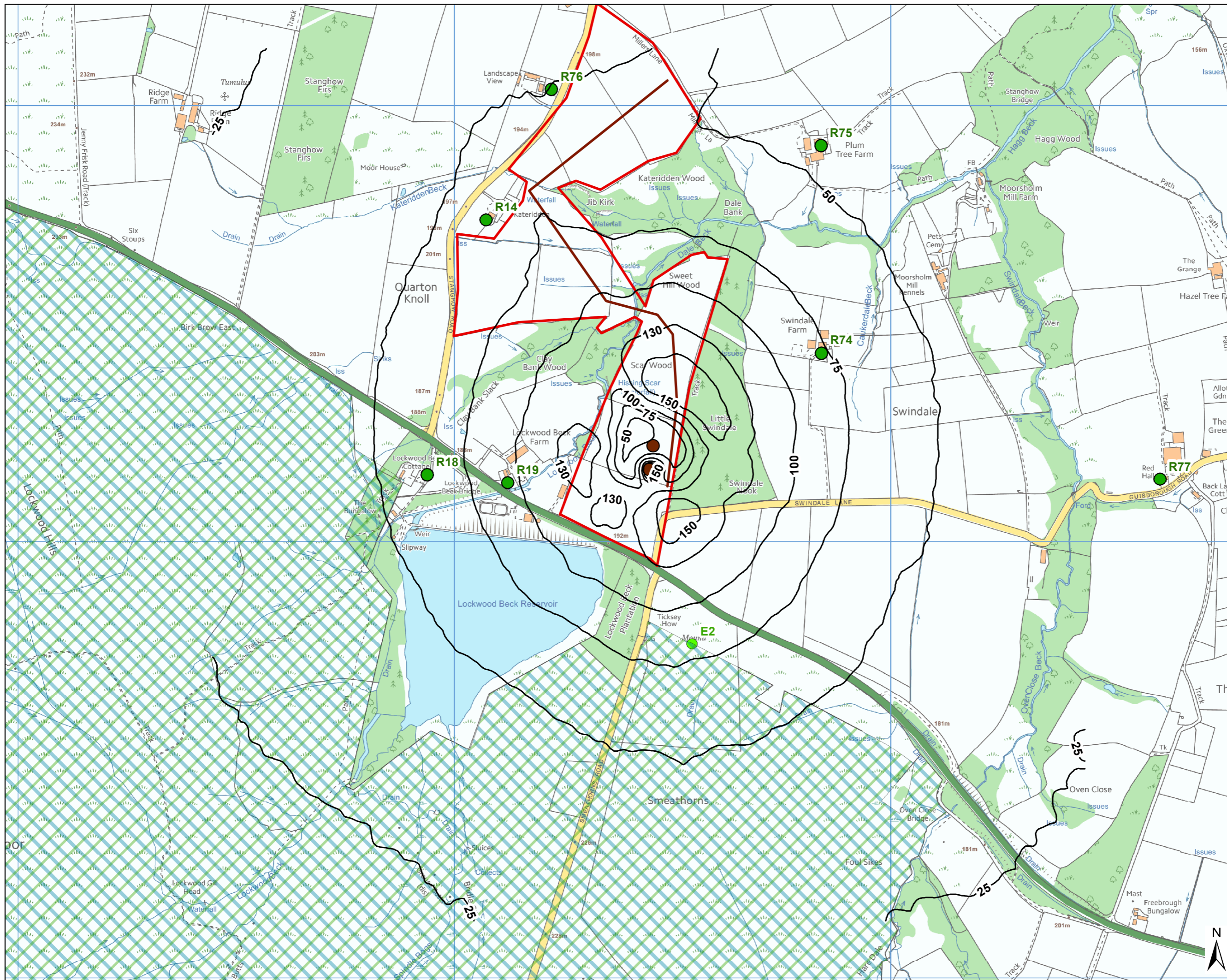
Drawing Title: **Process Contribution to Annual Mean NO₂ Concentrations from Lockwood Beck MTS Site Construction Phase Emissions**

Drawn GH	Checked GG	Approved GG	Date 22/08/14
URS Internal Project No. 47069931		Scale @ A3 1:8,000	

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NOTES

- Generator and Shaft Sources
- Mobile Plant Source
- NO₂ Concentration (µg/m³)
- Site Boundary
- SSSI
- SAC & SPA
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- Ecological Receptors

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Revision Details	By	Check	Check Date	Suffix

Purpose of Issue: **Final**

Client: **York Potash Limited**

Project Title: **York Potash Project**

Drawing Title: **Process Contribution to the 100th %ile of Hourly Mean NO₂ Concentrations from Lockwood Beck MTS Site Construction Phase Emissions**

Drawn: GH	Checked: GG	Approved: GG	Date: 22/08/14
URS Internal Project No: 47069931		Scale @ A3: 1:8,000	

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