THE YORK POTASH HARBOUR FACILITIES ORDER 201X

CUMULATIVE IMPACT ASSESSMENT

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YORKPOTASH
A Sirius Minerals Project

Royal HaskoningDHV
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York Potash Project Harbour facilities Environmental Statement: Cumulative Impact Assessment

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Part 1

Introduction and Approach

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1 APPROACH TO THE CUMULATIVE IMPACT ASSESSMENT

1.1 Requirement for Cumulative Impact Assessment

1.1.1 The Infrastructure Planning (EIA) Regulations 2009 SI No. 2263 requires that the likely cumulative impacts of proposed development(s) are assessed as part of an Environmental Impact Assessment (EIA). In their Guidelines for EIA (2004), IEMA define cumulative impacts as:

> *"…the impacts on the environment which result from incremental impacts of the action when added to other **past**, **present** and **reasonably foreseeable future actions** …"*

1.1.2 This document, therefore, considers the potential cumulative impacts of the York Potash Project (YPP) Harbour facilities with both the other elements of the YPP (i.e. the Mine, Minerals Transfer System (MTS) and Materials Handling Facility (MHF), plus other ancillary development) and other relevant plans and projects (see **Section 3**).

1.2 Approach to Cumulative Impact Assessment

1.2.1 As set out in **Section 4** of the Environmental Statement (ES), a tiered approach has been adopted for this Cumulative Impact Assessment (CIA) based upon the following definitions:

- **Site-specific (or within-development) cumulative impacts** - different effects associated with the Harbour facilities have the potential to interact and, together, influence common receptors (e.g. noise and visual effects on ecology). Where applicable, these inter-relationships are considered in the Harbour facilities ES (in **ES Section 23**) and Habitats Regulations Assessment (HRA; **Document 6.3**).
- **Project-wide cumulative impacts** which arise from the combined effects (additive or interactive) of the Harbour facilities with the other components of the YPP. These are considered in **Part 2** of this CIA.
- **Wider cumulative impacts** which are the combined impacts (additive or interactive) that may occur between the Harbour facilities, the YPP (where appropriate) and any other relevant 'non YPP' development(s). These are considered in **Part 3** of the CIA.

1.2.2 For the purposes of the CIA, the YPP has been assessed as a scheme with a maximum production of 13 million tonnes per annum (mtpa). Construction and operation phase cumulative impacts have been predicted, but not cumulative decommissioning impacts, as these are considered to be too speculative to predict with any confidence or certainty. Decommissioning impacts are considered with respect to the Harbour facilities in the ES and cumulative decommissioning impacts can be expected to be similar to, but of a lesser scale than, construction cumulative impacts. In addition, decommissioning of the Mine and MTS shaft sites would be governed by Mines Inspectorate best practice at the time and subject to relevant constraints (such as groundwater). At the point of decommissioning the current best practice would be followed.

1.3 YPP components

1.3.1 For the purposes of the CIA, the YPP components are considered to be:

- The Mine (inclusive of a MTS shaft), at Dove's Nest Farm.
- The MTS (inclusive of three intermediate shaft sites at Lockwood Beck, Lady Cross Plantation and Tocketts Lythe).
- The MHF and MTS Portal in Wilton.
- The Harbour facilities (inclusive of the port terminal (quay), habitat enhancement and the conveyor system),
- Construction Village and Park & Ride (south of Whitby).
- Whitby Operational Park & Ride (Cross Butts).

1.3.2 A description of the Harbour facilities is included in **ES Section 3**. A description of the other YPP components is included in **Part 1**, **Appendix 1.1**.

1.4 Approach to identifying relevant non-YPP developments

1.4.1 The approach that has been taken to identify non YPP developments to be included in the CIA is based upon the advice provided by the Department of Communities and Local Government (DCLG) in the consultation paper, Environmental Impact Assessment: A Guide to Good Procedures published in 2006, which states:

> "In most cases, detailed consideration of the combined effects of the development proposed together with other developments will be limited to those others that are already begun or constructed [present and past] or those that have not been commenced but have a valid planning permission [reasonably foreseeable]".

1.4.2 With respect to past projects, a useful ground rule in CIA is that the environmental impacts of schemes that have been completed should be included within the environmental baseline; as such, these impacts will be taken into account in the EIA process for each relevant project element. Consequently, generally, completed projects can be excluded from the scope of CIA (as their implications will be taken account of in the EIA). It is relevant to note, however, that the environmental impacts of recently completed projects may not be fully manifested and, therefore, the potential impacts of such projects should be taken into account in the CIA.

1.4.3 In the context of EIA, the term 'committed development' conventionally refers to development for which consent has been granted.

1.4.4 Projects that are currently being constructed or that are in the planning process (where sufficient information is publicly available), as well as on-going activities that have the potential to influence the same environmental parameters as the proposed development, are the focus of CIA. Future plans or projects for which sufficient information is not available on which to base a reliable assessment, which are unlikely to be submitted or receive consent until after the proposed development has been completed, cannot reasonably be assessed as part of a CIA. However, the applicants for such projects will be required to take the effect of the YPP into account in their own application (should it be in the consenting phase or have received consent).

1.4.5 In the absence of publicly available data, it is not possible to undertake a detailed cumulative assessment but it is possible to make judgements regarding potential impacts on the basis of the characteristics of the other projects being considered (where these are known) and whether there is the potential for the effects of the various projects to interact spatially and/or temporally.

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2 DEFINING THE ZONE OF INFLUENCE (SPATIAL INTERACTIONS)

2.1.1 To inform the CIA, the maximum geographical area around the YPP as a whole, where there is the potential for impacts to occur, has been identified. This is termed the impact Zone of Influence (ZOI). The ZOI can differ for each topic and potentially for different types of impact associated with the same topic. The extent of the ZOIs and assumptions used in this CIA are presented in **Table 2-1**.

Table 2-1 The 'zone of influence' of potential impacts for relevant environmental topics

Environmental Topic	Zone of influence of potential effect
Transport	All routes included in the Transport Model for the YPP Transport Assessments (see **Figure 2.1**).
Noise	1km from each of the YPP components. 50m either side of all highways used by the YPP traffic. With regard to underwater noise generated by the construction of the Harbour facilities, the results of noise modelling undertaken predicts that audible noise would extend up to 4.9km from the noise source. A precautionary maximum ZOI of 5km has, therefore, been assumed.
Air quality	A ZOI of 200m has been applied around the MHF and Harbour facility with regard to project emissions. Human receptors within 350m of the site boundary and 50m of routes used by construction vehicles up to 500m from the site access. 200m either side of all highways used by the YPP traffic for road traffic emissions. 50m from either side of all highways used by the YPP traffic for construction dust. 700m radius from the boundary of the YPP components for construction dust.
Visual disturbance	500m from each of the YPP components.
Hydrogeology and land quality	1km radius from the boundary of the YPP components (although this could be larger where a groundwater connection exists); however, 250m was considered in greater detail as this distance was considered to be of greater potential risk to human health and the environment.
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.

2.1.2 Based on this above, a combined YPP ZOI was produced, which was defined primarily by the ZOIs for Transport, Coastal Process and Landscape effects (see **Figure 2-1**). This amalgamated ZOI formed the search area for non YPP developments to be included within the CIA.

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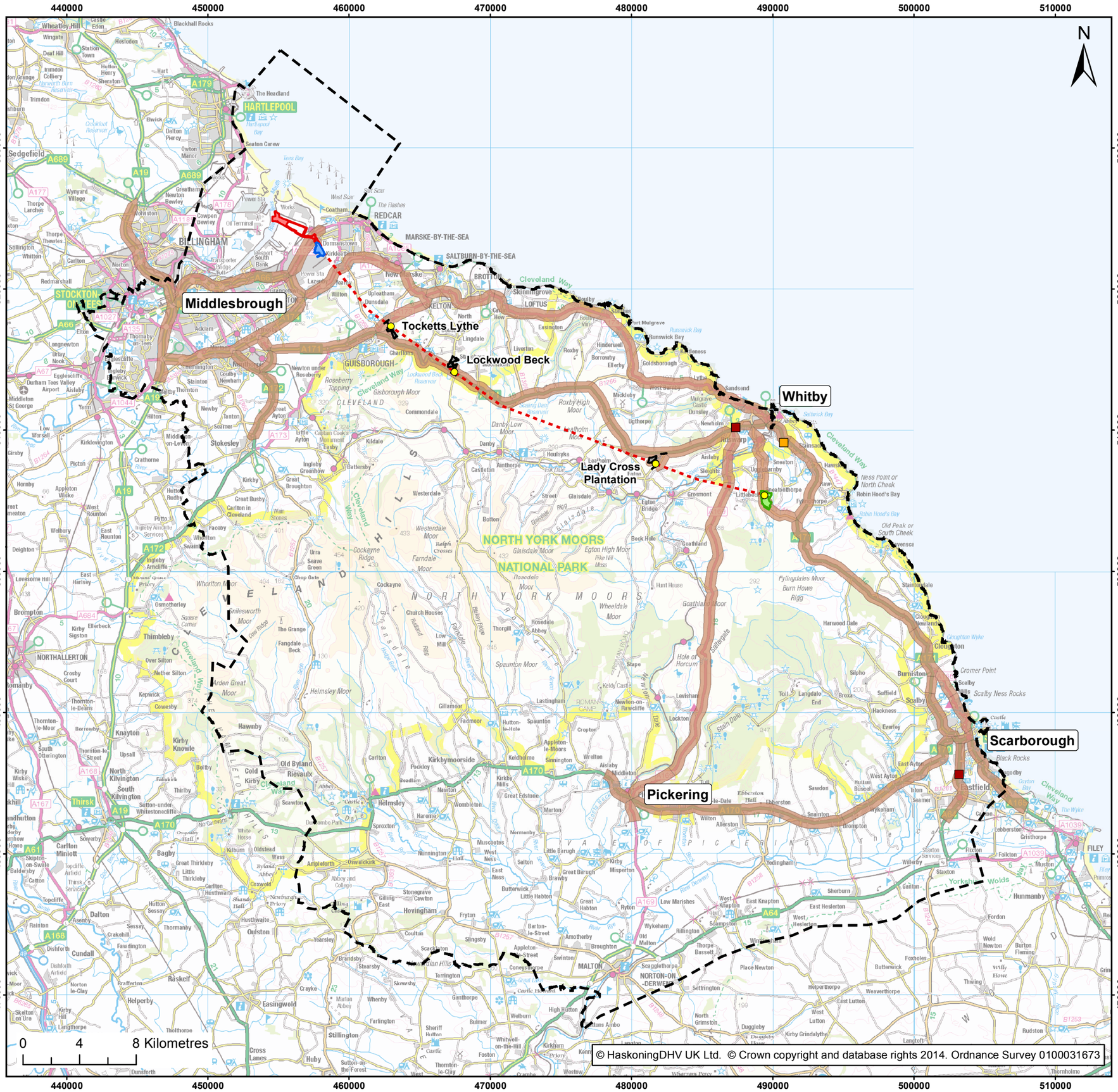

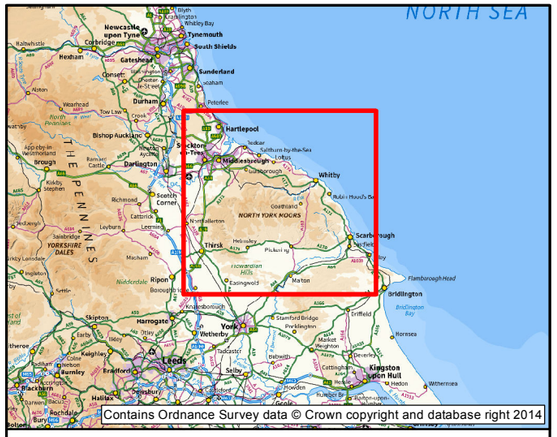

Legend:

- Zone of Influence
- Harbour Facilities - DCO Order Limits
- Minehead – Extent of Works
- Intermediate Shaft and Spoil Site – Extent of Works
- MHF and MTS Portal – Extent of Works
- Transportation Route
- MTS Tunnel Alignment
- Shaft Location
- Construction Village and Park & Ride
- Park & Ride Location (Operational)

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title:

Harbour Facilities CIA:
Combined Zone of Influence

Part:	Figure:	Drawing No:
HF	2.1	9Y0989-CIA-2-001

Rev:	Date:	Drawn:	Checked:	Size:	Scale:
1	06/03/2015	LB	MS	A3	1:275,000
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Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com

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3 IDENTIFYING NON YPP DEVELOPMENTS

3.1 Approach

3.1.1 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.

3.1.2 In addition, consultation with the relevant Planning Authorities and an independent search of their planning registers was undertaken to produce a 'long list' of plans and projects to be considered in the CIA. In accordance with the Scoping Opinion issued by the Planning Inspectorate for the Harbour facilities, 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 plan (and emerging development plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and,
- proposals in the area currently at the scoping stage.

3.1.3 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. However, as set out above, it is only possible to assess proposals where there is sufficient available information to undertake a CIA.

3.1.4 A search of the MMO's Public Register (which lists Harbour Revision Order (HRO) and marine licence applications) was also undertaken to identify those projects with the potential to result in significant environmental impacts that required consideration within the CIA.

3.2 Consultation

3.2.1 To inform the plans and projects to be considered in the CIA, consultation was undertaken with the following organisations:

- NYMNPA.
- 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).

3.3 High level scoping of non YPP developments

3.3.1 There are 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, are unlikely to have the potential to contribute to significant cumulative impacts. The criteria used to scope non YPP developments 'out' of the CIA and the types of development scoped out are presented in **Table 3-1**.

Table 3-1 High level 'scoping out' criteria

Criteria for Scoping Out	Comments (where relevant)
Extensions or alterations to an existing development considered to be minor in nature and certainly not previously subject to EIA.	
Erection of agricultural buildings (e.g. for storage and housing cattle/chickens, silage clams, feed hoppers etc.).	
Development for a proposed use that is NOT considered to be of a nature or of sufficient scale (i.e. < eight residential dwellings or an alternative use in a single building) to have the potential for significant cumulative interactions.	An element of professional judgement was used when applying this criterion, examples of which are provided below: • A single building development that has potentially sensitive use (i.e. large care home or hospital), would not meet this criterion, as the proposed use has the potential to result in cumulative effects. A scheme such as this would therefore be included in the master list. • Two separate buildings to accommodate six dwellings would meet this criterion and would therefore be scoped out of the master list. • An application for six industrial units would not meet this criterion as the description of the development does not provide sufficient detail to determine its scale and thus to determine the potential for cumulative effects to arise. Therefore, as a precautionary approach, this type of application would be scoped in.
Change of use or conversion of an existing building(s) (e.g. conversion of office buildings to provide residential dwellings). Applications for renewal of planning permission for retention of existing operational use. Variations to existing planning conditions.	Exceptions would be where the change in use is likely to have potential for cumulative effects (e.g. change of use of agricultural land to a caravan site may have potential for cumulative impacts, if in close proximity, with the YPP). In these instances, this application would be scoped into the master list as a precautionary measure. The existing planning permission would have formed part of the existing baseline and, therefore, does not need to be considered again for the CIA.

Criteria for Scoping Out	Comments (where relevant)
Application to change buildings materials on building frontages/roof etc. Applications for window installations/alteration.	
Listed Building consent – alterations.	
Works to trees with Tree Protection Orders.	
Minor infrastructure applications, e.g. single wind turbine, single access road and improvement works.	

4 DETAILED CUMULATIVE ASSESSMENT

4.1 Overview of approach

4.1.1 The scoping exercise identified the plans and projects to be considered cumulatively with the YPP. **Parts 2** and **3** of this CIA consider, for all relevant technical topic areas, the potential cumulative impacts (additive and interactive) which may arise during the construction and operational phases of the YPP in its entirety (the project-wide CIA) and with other plans and projects. Decommissioning effects are not considered herein, because details of the works proposed during this phase are limited and they can be expected to reflect, but be less significant than, the predicted cumulative effects of the construction phase.

4.1.2 For each technical topic (noise, ecology, etc.) the same methodologies were used within the CIA for determining significance as those which were used within the relevant topic sections in the ES.

4.1.3 The value and sensitivity of each receptor is taken to be the same for the CIA as defined within the relevant topic chapters of the EIA. The significance of any cumulative impacts is determined by the predicted change in magnitude of the effect as a result of combined effects.

4.1.4 The emphasis within the CIA was to undertake quantitative assessment using data that has been verified where possible. However, where this is not practicable, professional judgement has been used to determine the significance of a cumulative impact.

4.1.5 Where significant cumulative impacts have been identified, mitigation measures and monitoring proposals have been developed where appropriate. .

4.1.6 The technical topic areas included in the assessment are:

- Socio-economics.
- Traffic and transport
- Noise and vibration.
- Air quality.
- Hydrogeology and land quality.
- Hydrology and flood risk (including WFD compliance).
- Terrestrial ecology.
- Landscape and visual environment.
- Cultural heritage.
- Amenity and recreation.

4.1.7 Given that the Harbour facilities are the only element of the YPP involving marine works, project-wide cumulative impacts in the marine environment would not arise and marine topic areas (marine ecology, marine sediment and water quality, waterbirds, commercial navigation and hydrodynamic and sedimentary processes) are not included in the project wide assessment (**Part 2**) but are considered in the wider assessment (**Part 3**).

4.2 Results of high level scoping

4.2.1 As described in **Section 3.3**, a high level scoping exercise was undertaken to scope out those developments considered unlikely to have the potential to result in cumulative impacts with the YPP due to the location, nature and scale of the proposed development. This reduced the number of plans and projects under consideration as part of the CIA from over a thousand to 365.

4.2.2 As the extent of the combined YPP ZOI was predominately influenced by Transport (see **Part 2, Section 6**), due to the potential for transport routes to extend to the south and west, a further scoping exercise was undertaken to determine whether the 365 short listed projects had the potential to have a significant impact on the transport network. This exercise was undertaken using expert judgement. Based on this, projects that were predicted to have a negligible impact on transport, and which were outside the ZOI for all other topics, were also scoped out of the CIA; further reducing the number of plans and projects to be considered from 365 to 175.

4.2.3 The outcome of the above was a master list of non-YPP developments to be taken forward for further consideration in the CIA, i.e. detailed scoping and assessment as appropriate (see **Table 4-1** below and **Figures 4-1a** and **b**).

4.3 Projects identified from the MMO's Public Register

4.3.1 In addition to maintenance dredging in the Tees (listed in **Table 4-1**), a search of the MMO's Public Register of Harbour Revision Order (HRO) and marine licence applications revealed the following projects for consideration within the CIA (see also **Figure 4-2**):

i. QEII Berth Development

4.3.2 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 below Chart Datum (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 36,000 m^3.

4.3.3 All material arising from the capital dredging will be disposed of at the existing offshore disposal site in Tees Bay.

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

Table 4-1 Master list of plans and projects to be considered further in the CIA for the Harbour facilities

ID	Reference	Applicant Name	Proposal
MIDDLESBROUGH			
1	M/FP/0921/13/P	MRS Z LEWIS	ERECTION OF 3 STOREY EDUCATIONAL BUILDING (D1) WITH GROUND FLOOR CAFE (A3), LANDSCAPING/BOUNDARY TREATMENT, ACCESS AND ASSOCIATED WORKS
2	M/FP/1148/13/P	MR M BOYS	HYBRID APPLICATION INCLUDING FULL PLANS APPLICATION FOR 'URBAN PARK' INCLUDING REMEDIATION OF LAND, NEW ACCESS ROAD AND PUBLIC REALM WORKS WITH ASSOCIATED LANDSCAPING/BOUNDARY TREATMENT, AND OUTLINE PERMISSION FOR MIXED USE DEVELOPMENT ('URBAN PIONEERS') COMPRISING RESIDENTIAL(C3), BUSINESS(B1), SHOP(A1), FINANCIAL AND PROFESSIONAL SERVICES(A2), RESTAURANT/CAFE(A3), DRINKING ESTABLISHMENT(A4) AND NON-RESIDENTIAL INSTITUTIONS(D1)
3		MIDDLEHAVEN COMMERICAL	APARTMENTS - 455(+47); HOUSES - 343(+69); TOTAL RESIDENTIAL – 798(+116); NON-RESIDENTIAL USES, INCLUDING OFFICE & OTHER COMMERCIAL USES, LEISURE USES - 180,500SQM(+21,000SQM); RETAIL & COMMUNITY USES – 8,600 SQM (INCLUDES 3,000 SQM SUPERMARKET)
4	M/FP/0982/10/P	SAPPHIRE PROPERTY DEVELOPMENTS LTD	LIGHT INDUSTRIAL/WORKSHOP UNITS IN 3NO BLOCKS & 3 STOREY OFFICE BLOCK, GRD FLR RETAIL UNIT, ASSOC ACCESS & PARKING
5	M/FP/0773/13/P	TERRACE HILL (MIDDLESBROUGH) LTD	ERECTION OF FOODSTORE (A1), WITH ASSOCIATED PETROL FILLING STATION, CAR PARKING, LANDSCAPING AND BOUNDARY TREATMENT, ACCESS AND BUS TERMINUS
6	M/FP/0770/13/P	TERRACE HILL (MIDDLESBROUGH) LTD	PUBLIC HOUSE/RESTAURANT (A3/A4), DRIVE THRU RESTAURANT (A3/A5) AND DRIVE THRU COFFEE SHOP (A1/A3) WITH ASSOCIATED CAR PARKING, LANDSCAPING AND BOUNDARY TREATMENT, ACCESS AND BUS TERMINUS
7	M/FP/0760/13/P	TERRACE HILL (MIDDLESBROUGH) LTD & SAINSBURYS SUPERMARKETS	ERECTION OF MIXED USE DEVELOPMENT COMPRISING 9 NO. UNITS OF A1 AND A3/A4, 80NO BED HOTEL WITH ASSOCIATED CAR PARKING, LANDSCAPING AND HIGHWAYS IMPROVEMENTS (DEMOLITION OF SAINSBURYS SUPERMARKET & PETROL FILLING STATION)

ID	Reference	Applicant Name	Proposal
8	M/FP/1174/13/P	MR C ROBINSON	ERECTION OF 5 STOREY TEACHING/CONFERENCE BUILDING AND ASSOCIATED OFFICES, WITH CAR PARKING AND NEW OPEN LANDSCAPED 'CAMPUS HEART' SPACE
9	M/FP/0977/13/P	MR P ARKLE	ERECTION OF 153NO DWELLINGS WITH ASSOCIATED ACCESS, OPEN SPACE AND LANDSCAPING
10	M/GRG/0898/13/P	URBAN REGENERATION	WIDENING OF EXISTING ACCESS TO LADGATE LANE WITH SIGNALISED JUNCTION. CONSTRUCTION OF NEW ROAD WITH ROUNDABOUT, BOUNDARY TREATMENT, SIGNAGE AND ASSOCIATED WORKS
11	M/GRG/0899/13/P	URBAN REGENERATION	HYBRID APPLICATION INCLUDING OUTLINE PERMISSION FOR 130NO DWELLINGS AND ASSOCIATED WORKS,AND FULL PLANS APPLICATION FOR HOSPITAL CAR PARK, ACCESS ROAD, LANDSCAPING/BOUNDARY TREATMENT AND ASSOCIATED WORKS
12	M/FP/0985/13/P	MR P THORPE	DEVELOPMENT OF A SPORTS VILLAGE, INCLUDING 2 STOREY SPORTS HUB BUILDING (TENNIS COURTS, GRANDSTAND, CHANGING ROOMS/WC AND FITNESS STUDIOS), WITH OUTDOOR ATHLETICS TRACK, TENNIS COURTS, 2NO ALL WEATHER FOOTBALL PITCHES, CAR PARKING/ACCESS AND LANDSCAPING WITH ASSOCIATED FLOODLIGHTING AND FENCING.
13	M/FP/1046/11/P	MR P LUNNON	HYBRID APPLICATION FOR 56NO DWELLINGS, DOCTORS SURGERY AND PARKING. OUTLINE NURSING HOME,WORKS TO HALL INCLUDING EXTENSION AND RESTORATION AND LANDSCAPING
14	M/OUT/0226/11/P	DAVID WILSON HOMES NORTH EAST	RESIDENTIAL DEVELOPMENT OF UP TO 295 DWELLINGS, COMMUNITY CENTRE & ASSOCIATED ACCESS(OUTLINE)
15	M/FP/0210/14/P	MITCHELLS & BUTLER LEISURE RETAIL LTD	ERECTION OF PUBLIC HOUSE/RESTAURANT WITH ANCILLARY RESIDENTIAL USE AT FIRST FLOOR AND ASSOCIATED EXTERNAL AREAS, BOUNDARY TREATMENT/LANDSCAPING AND CAR PARKING/ACCESS
16	M/FP/0220/11/P	TAYLOR WIMPEY	ERECTION OF 106NO DWELLINGHOUSES AND ELECTRICITY SUBSTATION WITH ASSOCIATED ACCESS AND LANDSCAPING

ID	Reference	Applicant Name	Proposal
17	M/OUT/0173/11/P	CLEVELAND POLICE AUTHORITY	OUTLINE APPLICATION FOR RESIDENTIAL DEVELOPMENT WITH ASSOCIATED ACCESSES, LANDSCAPING AND OPEN SPACE
18	M/FP/0172/11/P	CLEVELAND POLICE AUTHORITY	ERECTION OF THREE STOREY POLICE AUTHORITY HQ WITH ASSOCIATED COMMUNICATIONS MAST/VEHICULAR ACCESS/PARKING & LANDSCAPING
19	M/FP/0261/14/P	MR R BAIRD	RESIDENTIAL DEVELOPMENT COMPRISING 164NO DWELLINGS
REDCAR AND CLEVELAND BOROUGH COUNCIL			
20	R/2010/0044/FFM	WARDS RECYCLING LTD	CHANGE OF USE FROM EXISTING SALT STORAGE UNIT (BUILDING NO.2) INTO A WASTE RECYCLING UNIT; INSTALLATION OF FUEL TANK MOUNTED ON A STEEL GANTRY(ADJOINING BUILDING NO. 5); STEEL PORTAL FRAMED LEAN-TO (64M X 18.5M) (ADJOINING BUILDING NO.4) INCLUDING CONCRETE APRON (RETROSPECTIVE)
21	R/2010/0045/FFM	MR M ILLINGWORTH	ERECTION OF AGRICULTURAL BUILDING FOR FREE RANGE HENS (12,000 BIRDS)
22	R/2010/0060/FFM	HMC PROPERTIES LTD	DEMOLITION OF EXISTING CHURCH AND REPLACE WITH 55 NO. BED RESIDENTIAL CARE HOME WITH ASSOCIATED 11 NO. SPACE CAR PARKING; HARD STANDINGS; NEW VEHICULAR AND PEDESTRIAN ACCESSES AND LANDSCAPING
23	R/2010/0141/FFM	GDF SUEZ ENERGY LTD	UPGRADE OF CURRENT POWER STATION (EXTENSION OF EXTANT PERMISSION R/2008/0062/FFM)
24	R/2010/0306/FFM	MR B BROWN	CHANGE OF USE FROM VACANT INDUSTRIAL WAREHOUSE TO TEMPORARY FIRE STATION
25	R/2010/0321/CAM	GUISBOROUGH TOWN OOUNCIL	IMPROVEMENTS TO AN EXISTING PUBLIC PARK TO INCLUDE COMBINED FOOTPATH / CYCLEWAY; RESURFACING; PERFORMANCE AREA; SEATS; BENCHES; RAILINGS; PEDESTRIAN BRIDGE; FOUR ARCHWAYS; ARTWORK/ SCULPTURE AND PLAY AREA
26	R/2010/0416/FFM	TEES, ESK AND WEAR VALLEYS NHS TRUST	REDEVELOPMENT OF BANKFIELDS COURT INCORPORATING A SINGLE STOREY LEARNING DISABILITIES CENTRE; COMPRISING 18 NO. RESIDENTIAL EN-SUITE BEDROOMS WITH SUPPORT FACILITIES, LANDSCAPING AND CAR PARKING

ID	Reference	Applicant Name	Proposal
27	R/2010/0428/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	DEMOLITION OF EXISTING DERELICT BUILDINGS AND CREATION OF 4/5 STOREY COMMERCIAL BUILDING (CREATIVE INDUSTRIES CENTRE)
28	R/2010/0512/FFM	BELLWAY HOMES (Site A)	RENEWAL OF EXTANT PLANNING PERMISSION R/2007/0448/RSM FOR RESIDENTIAL DEVELOPMENT COMPRISING 309 (NO) DWELLINGS, GARAGES AND ASSOCIATED ROADS
29	R/2010/0512/FFM	BELLWAY HOMES (Site B)	RENEWAL OF EXTANT PLANNING PERMISSION R/2007/0448/RSM FOR RESIDENTIAL DEVELOPMENT COMPRISING 309 (NO) DWELLINGS, GARAGES AND ASSOCIATED ROADS
30	R/2012/0110/FFM	TAYLOR WIMPEY LTD AND SKELTON FARMING LTD (Site A)	ERECTION OF 262 RESIDENTIAL UNITS INCLUDING GARAGES; VEHICULAR AND PEDESTRIAN ACCESSES WITH ASSOCIATED LANDSCAPING (AMENDED SCHEME)
31	R/2012/0110/FFM	TAYLOR WIMPEY LTD AND SKELTON FARMING LTD (Site B)	ERECTION OF 262 RESIDENTIAL UNITS INCLUDING GARAGES; VEHICULAR AND PEDESTRIAN ACCESSES WITH ASSOCIATED LANDSCAPING (AMENDED SCHEME)
32	R/2010/0527/FFM	MR K J GREENING	RENEWAL OF EXTANT PLANNING PERMISSION R/2007/0725/FFM FOR CONSTRUCTION OF 12 NO. DWELLINGS AND RELATED ACCESS ROAD, FOOTPATHS AND LANDSCAPING
33	R/2010/0540/FFM	TESCO STORES LTD	FULL PLANNING APPLICATION FOR RETAIL STORE (USE CLASS A1), PETROL FILLING STATION (SUI GENERIS), RETAIL UNITS (USE CLASSES A1, A2 AND A5) WITH ASSOCIATED ACCESS, PARKING AND LANDSCAPING. OUTLINE APPLICATION FOR PUBLIC HOUSE/RESTAURANT (USE CLASSES A3 AND A4) AND COMMUNITY FACILITY (USE CLASSES C2, D1 AND D2)
34	R/2010/0721/FFM	C J LEONARD AND SONS LTD	RENEWAL OF EXTANT PLANNING PERMISSION R/2007/0670/FFM FOR THE DEMOLITION OF EXISTING BUILDINGS AND ERECTION OF 15 APARTMENTS
35	R/2010/0800/FFM	MR PAUL JACKSON	EXTENSIONS TO EXISTING FACTORY; NEW PERIMETER ACCESS ROAD WITHIN SITE; RELOCATION OF 2M HIGH BOUNDARY FENCE TO NORTH; RE SITING OF MAIN ENTRANCE GATES TO NELSON STREET AND SIDE ENTRANCE GATES TO SERVICE ROAD

ID	Reference	Applicant Name	Proposal
36	R/2010/0937/RSM	MR J HORSLEY	CHANGE OF USE INCLUDING ALTERATIONS FROM VACANT BUS DEPOT TO 2 RETAIL UNITS (CLASS A1) INCLUDING CAR PARKING (RESUBMISSION)
37	R/2011/0014/FFM	LOTTE CHEMICAL UK LTD	STORAGE AREA FOR ROAD CONTAINERS
38	R/2011/0101/FFM	GRAPHITE RESOURCES LIMITED	RENEWAL OF EXTANT PERMISSION R/2007/0994/FFM FOR THE ERECTION OF WASTE AUTOCLAVE AND COMMUNITY RECYCLING FACILITIES; FOUR STOREY OFFICE ACCOMMODATION AND ASSOCIATED INFRASTRUCTURE
39	R/2011/0440/FFM	TERRACE HILL (SKELETON) LTD	ERECTION OF FOODSTORE (CLASS A1) AND PETROL FILLING STATION, WITH ASSOCIATED CAR PARKING, SERVICING, HIGHWAYS WORKS INCLUDING ACCESS ROAD AND CYCLE / FOOTWAYS, AND HARD AND SOFT LANDSCAPING
40	R/2011/0509/FFM	NORTHSTAR CAPITAL PROJECTS	RENEWAL OF EXTANT PLANNING PERMISSION ON R/2008/0387/FFM TO EXTEND TIME LIMIT FOR IMPLEMENTATION OF PROPOSED 40 NO. BED CARE HOME WITH ASSOCIATED ACCESS, CAR PARKING AND LANDSCAPING
41	R/2011/0920/FFM	WILLIMOTT DIXON CONSTRUCTION	RAISING OF EXISTING PERIMETER BUNDING IN NORTH EAST CORNER (MAXIMUM HEIGHT 20.42M)
42	R/2012/0075/FFM	MR JONATHAN STOTT	NEW BUILD ENTERPRISE CENTRE TO PROVIDE TEACHING SPACE; CAFE AREAS AND INCUBATER UNITS TO SUPPORT ENTERPRISE AND SMALL BUSINESS DEVELOPMENT
43	R/2012/0081/FFM	TERRACE HILL (SKELTON) LTD	EARTHWORKS COMPRISING LOWERING/RE-PROFILING OF EXISTING LAND LEVELS AND ERECTION OF SMALL EARTH RETAINING STRUCTURE
44	R/2012/0639/FFM	TRUSTEES OF REDCAR SCHOOL OF GYMNASTICS	CONSTRUCTION OF NEW GYMNASIUM WITH ASSOCIATED CHANGING FACILITIES AND CAR PARKING
45	R/2012/0757/OOM	MR BACHAN SINGH	RENEWAL OF EXTANT PERMISSION R/2009/0035/OOM OUTLINE APPLICATION FOR A MIXED USE DEVELOPMENT OF RESIDENTIAL AND B1 OFFICE/LIGHT INDUSTRIAL USES

ID	Reference	Applicant Name	Proposal
46	R/2013/0124/FFM	BG3 LTD	CHANGE OF USE OF EXISTING BUILDING FROM COMMUNITY YOUTH CENTRE TO 20 RESIDENTIAL FLATS
47	R/2013/0457/FFM	J HUGHES CONSTRUCTION	RENEWAL OF EXTANT PLANNING PERMISSION TO R/2010/0310/FFM FOR DEMOLITION OF BUILDINGS AND ERECTION OF 19 NO INDUSTRIAL UNITS WITH ASSOCIATED CARPARKING; LANDSCAPING; BOUNDARY FENCE & NEW VEHICULAR ACCESS
48	R/2010/0310/FFM	MR MARK HARKIN	DEMOLITION OF EXISTING BUILDINGS AND REPLACE WITH 19 INDUSTRIAL UNITS (6 SEPARATE BLOCKS); 54 SPACE CAR PARKING WITH ASSOCIATED LANDSCAPING; INSTALLATION OF 2.4M - 3M STEEL PALISADE BOUNDARY FENCING; PILLARS/GATES AND CREATION OF NEW VEHICULAR AND PEDESTRIAN ACCESSES
49	R/2013/0493/FFM	SALTBURN ARTS AND COMMUNITY ASSOCIATION	CHANGE OF USE FROM SCHOOL (CLASS D2) TO MIXED USE (SUI GENERIS) INCLUDING MINOR INTERNAL REPAIRS AND ALTERATIONS (RETROSPECTIVE)
50	R/2013/0501/FFM	ELRING KLINGER (GB) LTD	EXTENSION TO EXISTING FACTORY BUILDING WITH ANCILLARY NEW ACCESS ROADS
51	R/2013/0742/FFM	MILLER HOMES - NORTH EAST	MODIFICATION OF LAYOUT TO APPROVED PLANNING PERMISSION R/2011/0936/FFM AND SUBSTITUTION OF HOUSE TYPES TO PLOTS 6-9; 52-61 AND 66-67
52	R/2011/0936/FFM	MILLER HOMES AND MCINERNERY HOMES LTD	DEMOLITION OF FORMER CARETAKERS DWELLINGHOUSE AND ERECTION OF 158 DWELLINGHOUSES INCLUDING ASSOCIATED PARKING, ACCESSES AND LANDSCAPING
53	R/2013/0842/FFM	MR ALEX STEPHENSON	CHANGE OF USE AND CONVERSION OF VACANT NURSING HOME INTO 14 RESIDENTIAL UNITS WITH DEMOLITION OF LIFT/STAIRWELL IN SOUTH ELEVATION; EXTERNAL ALTERATIONS AND ASSOCIATED CAR PARKING AND LANDSCAPING
54	R/2013/0848/FFM	F J BOOTH CONSTRUCTION LTD	CHANGE OF USE FROM CLASS B8 (STORAGE AND DISTRIBUTION) TO B2 (GENERAL INDUSTRY)

ID	Reference	Applicant Name	Proposal
55	R/2013/0860/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	NEW BUILD TWO STOREY TEACHING BLOCK LINKED AT FIRST FLOOR LEVEL BACK TO EXISTING TEACHING WINGS
56	R/2011/0507/RMM	TAYLOR WIMPEY NORTH YORKSHIRE	APPLICATION SEEKING APPROVAL OF RESERVED MATTERS (ACCESS, APPEARANCE, LANDSCAPING, LAYOUT AND SCALE) FOLLOWING THE APPROVAL OF OUTLINE PLANNING PERMISSION UNDER REFERENCE R/2007/1220/OOM
57	R/2012/0788/FFM	TAYLOR WIMPEY (NORTH YORKSHIRE) LTD	ERECTION OF 33 DWELLINGS ON LAND PREVIOUSLY APPROVED FOR DEVELOPMENT OF 23 DWELLINGS AS PART OF OUTLINE PLANNING PERMISSION R/2007/1220/OOM AND RESERVED MATTERS APPROVAL R/2011/0507/RMM FOR ERECTION OF 200 DWELLINGS
58	R/2014/0059/FFM	TAYLOR WIMPEY (NORTH YORKSHIRE) LTD	AMENDED SITE LAYOUT TO INCREASE RESIDENTIAL UNITS FROM 43 TO 61 INCLUDING AMENDED HOUSE TYPES ON PART OF LAND PREVIOUSLY APPROVED UNDER RESERVED MATTERS APPLICATION R/2011/0507/RMM
59	R/2014/0074/FFM	AIRVOLUTION ENERGY LTD	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
60	R/2013/0716/SCP	SAVILLS	SCOPING REQUEST FOR 2 WIND TURBINES (140M MAX HEIGHT TO TIP) INCLUDING COMPOUND; EQUIPMENT BUILDINGS; NEW VEHICULAR ACCESS ONTO A174 AND ASSOCIATED INFRASTRUCTURE
61	R/2014/0128/FFM	PERSIMMON HOMES TEESSIDE	RESIDENTIAL DEVELOPMENT COMPRISING 39 TWO STOREY DWELLINGS INCLUDING VEHICULAR AND PEDESTRIAN ACCESSES AND LANDSCAPING
62	R/2012/0919/FFM	GENTOO HOMES LIMITED	22 DWELLINGHOUSES INCLUDING NEW VEHICULAR AND PEDESTRIAN ACCESS AND ASSOCIATED LANDSCAPING
63	R/2013/0097/FFM	GLEESON DEVELOPMENTS LTD	27 TWO STOREY 2, 3 AND 4 BEDROOM DWELLINGHOUSES AND GARAGES INCLUDING NEW VEHICULAR AND PEDESTRIAN ACCESSES AND ASSOCIATED LANDSCAPING

ID	Reference	Applicant Name	Proposal
64	R/2011/0717/RSM	TAYLOR WIMPEY (NORTH YORKSHIRE) LTD	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)
65	R/2009/0766/FFM	COAST AND COUNTRY HOUSING ASSOCIATION	DEMOLITION OF EXISTING DWELLINGS AND ERECTION OF 123 NO. MIXED RESIDENTIAL DEVELOPMENT INCLUDING RELOCATION OF SUBSTATION
66	R/2011/0375/FFM	COAST AND COUNTRY LTD	DEMOLITION OF EXISTING DWELLINGS AND REDEVELOPMENT OF SITE TO PROVIDE 131 DWELLINGHOUSES
67	R/2013/0001/FFM	COAST & COUNTRY HOUSING LTD	SUBSITUTION OF 23 HOUSE TYPES TO PLOTS 74 - 83 (INCL); 95 - 98 (INCL); 104 - 112 (INCL); AND VARIATION OF CONDITIONS 27 AND 28 OF PLANNING PERMISSION R/2011/0375/FFM TO ALLOW AFFORDABLE OWNERSHIP IN LIEU OF OPEN MARKET UNITS
68	R/2012/0302/FFM	GLEESON DEVELOPMENTS LTD	DEMOLITION OF VACANT BUILDINGS AND REPLACE WITH 30 RESIDENTIAL UNITS WITH ASSOCIATED ROAD LAYOUT; NEW VEHICULAR ACCESS AND LANDSCAPING
69	R/2013/0851/CAM	MCCARTHY & STONE RETIREMENT LIFESTYLES LTD	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 AND LANDSCAPING
70	R/2009/0365/RSM	COAST AND COUNTRY LTD	ERECTION OF 14 DWELLINGS (REVISED SCHEME - CAR PORT TO BUNGALOWS)
71	R/2009/0437/RSM	COAST AND COUNTRY HOUSING	ERECTION OF 161 DWELLINGS AND 12 APARTMENTS TOGHETHER WITH COMMUNAL FACILITIES WITH ASSOCIATED HIGHWAY WORKS, PARKING FACILITIES AND NEW GREEN PUBLIC SPACES (REVISED SCHEME)
72	R/2011/0869/FFM	GLEESON DEVELOPMENTS LTD	ERECTION OF 19 TWO STOREY DWELLING HOUSES AND ASSOCIATED WORKS

ID	Reference	Applicant Name	Proposal
73	R/2012/0129/CAM	BELLWAY HOMES LTD NORTH EAST	ERECTION OF 23 DWELLINGS WITH ASSOCIATED VEHICULAR AND PEDESTRIAN ACCESSES, ROAD LAYOUTS AND ASSOCIATED LANDSCAPING
74	R/2012/0040/FFM	TAYLOR WIMPEY (NORTH YORKSHIRE) LTD	ERECTION OF 30 RESIDENTIAL UNITS WITH ASSOCIATED VEHICULAR AND PEDESTRIAN ACCESSES AND LANDSCAPING
75	R/2009/0546/FFM	TAYLOR WIMPEY HOUSE NORTH YORKSHIRE	RESIDENTIAL DEVELOPMENT OF 68 NEW DWELLINGS, NEW ACCESS AND CAR PARKING
76	R/2011/0117/FFM	PERSIMMON HOMES	ERECTION OF 31 RESIDENTIAL DWELLINGS; 10 GARAGES AND ASSOCIATED PARKING AND LANDSCAPING
77	R/2011/0926/FFM	C M YUILL LTD	ERECTION OF 51 DWELLINGS INCLUDING NEW VEHICULAR AND PEDESTRIAN ACCESSES
78	R/2009/0838/FFM	TAYLOR WIMPEY UK LTD	ERECTION OF 75NO. DETACHED DWELLINGS AND GARAGES WITH ASSOCIATED ACCESS ROADS, PARKING AREA AND PROVISION OF OPEN SPACE
79	R/2010/0850/FFM	GENTOO HOMES LIMITED	ERECTION OF 9 THREE BEDROOMED AND 6 TWO BEDROOMED DWELLINGS; DEMOLITION OF 2 DWELLINGS AND REFURBISHMENT OF 11 EXISTING TERRACED DWELLINGS INCLUDING DORMER EXTENSIONS AND ASSOCIATED PARKING AND LANDSCAPING
80	R/2009/0536/CAM	MCCARTHY & STONE RETIREMENT LIFESTYLES LTD	ERECTION OF SHELTERED HOUSING ACCOMMODATION (12 NO 1 BEDROOM AND 10 NO 2 BEDROOM APARTMENTS) INCLUDING COMMUNAL FACILITIES; DEMOLITION OF EXISTING OUTBUILDINGS TO PROVIDE ASSOCIATED CAR PARKING AND LANDSCAPING WITH NEW VEHICLE AND PEDESTRIAN ACCESSES (SCHEME 2)
81	R/2009/0504/OOM	THE EXECUTORS OF THE LATE MRS S PAWSON	OUTLINE APPLICATION FOR 23 NO. DWELLINGS WITH PRIVATE GARAGES AND ASSOCIATED ROADS
82	R/2013/0765/OOM	MR DAVID HUNWICK	OUTLINE APPLICATION FOR RESIDENTIAL DEVELOPMENT (10 UNITS)

ID	Reference	Applicant Name	Proposal
83	R/2011/0931/OOM	MR T P CHALONER	OUTLINE APPLICATION FOR RESIDENTIAL DEVELOPMENT INCLUDING NEW VEHICULAR ACCESS OFF ENFIELD CHASE
84	R/2013/0727/FFM	BELLWAY HOMES LTD	RESIDENTIAL DEVELOPMENT (85 UNITS) INCLUDING VEHICULAR AND PEDESTRIAN ACCESSES AND ASSOCIATED LANDSCAPING
85	R/2012/0446/OOM	TRUSTEES OF THE HEIRS FUNS	OUTLINE APPLICATION FOR RESIDENTIAL DEVELOPMENT INCLUDING ROADS AND LANDSCAPING
86	R/2009/0852/FFM	GUINNESS NORTHERN COUNTIES	PROPOSED DEVELOPMENT OF 37 NO. SHELTERED APARTMENTS AND ASSOCIATED COMMUNAL FACILITIES
87	R/2013/0540/FFM	GEFFEN CONSTRUCTION LTD	RESIDENTIAL DEVELOPMENT COMPRISING OF 14 TWO STOREY DETACHED DWELLINGS WITH NEW ACCESS AND LANDSCAPING
88	R/2010/0330/FFM	BELLWAY HOMES (NE) LTD	RESIDENTIAL DEVELOPMENT SUBSTITUTION OF HOUSE TYPES PLOTS: 113-119; 120; 121; 122 AND ADDITIONAL 4NO. PLOTS 119A; 120A; 121A AND 122A (14 PLOTS IN TOTAL)
89	R/2009/0781/CAM	WESTGATE DEVELOPMENTS	REVISED SCHEME COMPRISING OF ALTERATIONS TO COURTYARD DEVELOPMENT OF 14 NO. COTTAGES AND 4 NO. APARTMENTS FOLLOWING APPROVAL OF PLANNING REFERENCE NO: R/2006/0673/CAM (RETROSPECTIVE)
90	R/2010/0742/FFM	COAST AND COUNTRY LTD	DEMOLITION OF 314 DWELLINGS AND ERECTION OF 300 DWELLINGS AND ANCILLARY WORKS
91	R/2012/0829/FFM	KEEPMOAT	REDEVELOPMENT COMPRISING THE ERECTION OF 288 DWELLINGS AND ANCILLARY WORKS (AMENDED SCHEME)
92	R/2013/0427/FFM	KEEPMOAT AND COAST AND COUNTRY HOUSING	SUBSTITUTION OF 30 APPROVED HOUSE TYPES OF PLANNING PERMISSION R/2012/0829/FFM WITH 28 NEW HOUSE TYPES; BOUNDARY TREATMENTS AND ASSOCIATED LANDSCAPING AT PLOTS 140; 141; 145 - 153 (INCL); 157 - 166 (INCL); 169 - 171 (INCL); 221 - 224 (INCL)

ID	Reference	Applicant Name	Proposal
93	R/2012/0390/FFM	MR NIGEL DAWSON	TWO STOREY RESIDENTIAL CARE HOME (67 BEDS) WITH ASSOCIATED CAR PARKING; BOUNDARY WALLING/RAILINGS; LANDSCAPING AND NEW VEHICULAR AND PEDESTRIAN ACCESSES
94	R/2013/0609/RSM	HALCYON PROPERTY HOLDINGS LTD	THREE STOREY CARE HOME (79 BED) WITH ASSOCIATED CAR PARKING AND LANDSCAPING (RESUBMISSION)
95	R/2012/0838/CAM	CARE DEVELOPMENTS (NORTH EAST) LTD	THREE STOREY 72 BEDROOM CARE HOME; TWO STOREY 12 BEDROOM SPECIAL NEEDS UNIT AND A SINGLE STOREY 5 APARTMENT SPECIAL NEEDS UNIT INCLUDING NEW PEDESTRIAN ACCESS; CAR PARKING AND ASSOCIATED LANDSCAPING
96	R/2009/0346/FFM	EGDON RESOURCES UK LIMITED	RETENTION AND EXTENSION OF EXISTING WELL SITE; CONSTRUCTION OF UNDERGROUND GAS PIPELINE AND CABLE BETWEEN THE WELL SITE AND WILTON WORKS; CONSTRUCTION OF 2 (NO) CELLARS; MOBILISE DRILLING AND ANCILLARY EQUIPMENT TO DRILL 2 (NO) BOREHOLES
97	R/2010/0596/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	PROPOSED ARTS AND MEDIA CENTRE; INCLUDING INDOOR AND OUTDOOR PERFORMANCE SPACE, JUICE BAR, ASSOCIATED LANDSCAPING, ACCESS AND PARKING
98	R/2012/0583/FFM	JFS ASSOCIATES	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
99	R/2012/0775/FFM	SANDSTONE DEVELOPMENTS (NE) LTD	FOUR STOREY RESIDENTIAL CARE HOME (56 BEDROOMS); UNDERCROFT CAR PARKING AND NEW VEHICULAR AND PESESTRIAN ACCESS
100	R/2009/0595/FFM	REDCAR AND CLEVELAND COLLEGE	ERECTION OF TWO STOREY TEACHING BLOCK AND 300 NO. SEAT LECTURE THEATRE INCLUDING PROVISION OF ADDITIONAL 69 NO. CAR PARKING SPACES AND LANDSCAPING (PHASE 2)

ID	Reference	Applicant Name	Proposal
101	R/2009/0169/RSM	ASHLEY HOUSE PLC	ERECTION OF NEW DOCTORS SURGERY, DENTAL SURGERY, PCT FACILITIES, PHARMACY, OPTICIANS, COMMUNITY FACILITIES; ASSOCIATED CAR PARKING AND LANDSCAPING (RESUBMISSION)
102	R/2011/0718/CAM	PRIOR PURSGLOVE COLLEGE	ERECTION OF A THREE STOREY TEACHING BLOCK FOR CREATIVE ARTS & MEDIA INCLUDING LANDSCAPED COURTYARD
103	R/2011/0096/RSM	HMC PROPERTIES LTD	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 METAIL RAILINGS ON FRONTAGE (RESUBMISSION)
104	R/2010/0749/FFM	ASHLEY HOUSE	DOCTORS SURGERY AND PHARMACY WITH ASSOCIATED ACCESS ROAD
105	R/2009/0866/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	DEMOLITION OF EXISTING SCHOOL BUILDINGS AND REPLACE WITH NEW TWO STOREY PRIMARY SCHOOL; MUGA; PROVISION OF 42 NO. SPACE CAR PARKING AND LANDSCAPING INCLUDING WOODLAND PLAY AREA/HABITAT ZONE/KICKABOUT AREA; CREATION OF NEW VEHICULAR AND PEDESTRIAN ACCESSES
106	R/2009/0805/FFM	ETTRICK HEALTH LIMITED	DEMOLITION OF EXISTING HEALTH CENTRE AND ERECTION OF A NEW THREE STOREY HEALTH CENTRE INCLUDING PHARMACY; NEW VEHICULAR AND PEDESTRIAN ACCESSES AND 68 NO. SPACE CAR PARK WITH ASSOCIATED LANDSCAPING
107	R/2009/0286/OOM	CLEVELAND FIRE AUTHORITY	DEMOLITION OF EXISTING FIRE STATION AND TRAINING CENTRE AND OUTLINE APPLICATION FOR PROPOSED NEW COMMUNITY FIRE STATION
108	R/2013/0772/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	DEMOLITION OF 9NO. EXISTING AMENITY BUILDINGS AND CONSTRUCTION OF 9NO. NEW AMENITY BUILDINGS AND 1NO. COMMUNITY BUILDING WITH ASSOCIATED EXTERNAL WORKS AND BOUNDARY FENCING
109	R/2013/0674/FFM	BANKS RENEWABLES (BANKFIELD WIND FARM) LTD	WIND FARM INCLUDING 5 NO. WIND TURBINES, CONTROL BUILDING AND ASSOCIATED ACCESS

ID	Reference	Applicant Name	Proposal
110	R/2012/0830/SCP	THE BANKS GROUP	SCOPING OPINION FOR A WIND FARM COMPRISING 6 x 2.5MW TURBINES; EQUIPMENT BUILDINGS AND COMPOUND AND ASSOCIATED INFRASTRUCTURE
111	R/2011/0589/FFM	MR R ROBERTS	DEMOLITION OF EXISTING BUILDINGS AND ERECTION OF 41 DWELLINGHOUSES WITH ASSOCIATED ROADS AND CAR PARKING AND CREATION OF NEW VEHICULAR AND PEDESTRIAN ACCESSES
112	R/2013/0830/RMM	TAYLOR WIMPEY (NORTH YORKSHIRE) LTD	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
113	R/2013/0200/OOM	MR M BULMER	OUTLINE APPLICATION FOR RESIDENTIAL DEVELOPMENT COMPRISING 46 DWELLINGS UP TO TWO STOREYS IN HEIGHT
114	R/2013/0669/OOM	WEST MIDLANDS METROPOLITAN AUTHORITY PENSION FUND	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
115	R/2013/0651/FFM	BELLWAY HOMES LTD	RESIDENTIAL DEVELOPMENT (188 DWELLINGS) WITH ASSOCIATED VEHICULAR AND PEDESTRIAN ACCESSES INCLUDING LANDSCAPING
116	R/2012/0358/FFM	MEMORIA LTD	CONSTRUCTION OF CREMATORIUM WITH ASSOCIATED CAR PARKING, ACCESS ROAD FROM B1269, GARDENS OF REMEMBERANCE AND NATURAL BURIAL GROUND
117	R/2011/0075/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	DEMOLITION OF EXISTING BUILDINGS AND OUTLINE APPLICATION FOR RE-DEVELOPMENT OF SITE FOR LEISURE USE; BUSINESS USE; RESTAURANT AND CAFÉ USE; NON-RESIDENTIAL INSTITUTIONS; ENERGY CENTRE; MULTI LEVEL AND UNDERGROUND CAR PARKING; LANDSCAPING AND ASSOCIATED NEW VEHICULAR AND PEDESTRIAN ACCESSES

ID	Reference	Applicant Name	Proposal
118	R/2011/0599/RMM	REDCAR AND CLEVELAND BOROUGH COUNCIL	LEISURE CENTRE; BUSINESS, CIVIC AND COMMUNITY BUILDING; ENERGY CENTRE; UNDERGROUND AND ABOVE GROUND CAR PARKING AND LANDSCAPING (RESERVED MATTERS)
119	R/2012/0706/FFM	ETTRICK HEALTH LIMITED	TWO STOREY NURSING HOME (80 BEDS) WITH ASSCOCIATED CAR PARKING AND LANDSCAPING
120	R/2012/0314/FFM	LOTTE CHEMICAL UK LTD	CONSTRUCTION OF A POLY ETHYLENE TEREPHTHALATE (PET) CHEMICAL PLANT
121	R/2012/0605/RMM	PD TEESPORT LIMITED	APPROVAL OF RESERVED MATTERS (ACCESS, APPEARANCE, LANDSCAPING, LAYOUT AND SCALE) FOLLOWING THE APPROVAL OF OUTLINE PLANNING PERMISSION R/2006/0433/OO FOR A CONTAINER TERMINAL
122	R/2010/0010/FF	ETDE	CONSTRUCTION OF NEW EXTERNAL UTILITIES COMPOUND INCLUDING O2 TANK, CHILLER, COOLING TOWER, COOLING TOWER WATER TREATMENT, COMPRESSOR, CIP TANK AND GAS BOTTLE STORAGE
123	R/2012/0723/FF	SABIC UK PETROCHEMICALS	DISMANTLE BOILERS A AND B AND ERECT A NEW STACK 55M HIGH
124	R/2010/0949/FFM	RAVENSWORTH PROPERTY DEVELOPMENTS LLP	ERECTION OF 14 INDUSTRIAL UNITS IN 4 BLOCKS (CLASSES B1, B2 & B8) WITH ASSOCIATED SERVICE AREA AND 76 SPACE CAR PARK (PHASE 2)
125	R/2011/0530/FF	NORTHUMBRIAN WATER	ERECTION OF 2 NO. CENTRIFUGES
126	R/2011/0898/FF	AVIRIYA STEEL INDUSTRIES UK LIMITED	ERECTION OF A PULVERISED COAL INJECTION PLANT WITH ANCILLARY WORKS
127	R/2010/0891/FF	LDG COMMERCIAL PROPERTIES	ERECTION OF PORTAL FRAME BUILDING (38.50M x 16.65M) FOR USE FOR INDUSTRIAL AND STORAGE / DISTRIBUTION (CLASSES B2 & B8) PURPOSES AND ADDITIONAL 21 PARKING SPACES

ID	Reference	Applicant Name	Proposal
128	R/2013/0468/FF	NORTHUMBRIAN WATER	INSTALLATION OF ABOVE GROUND EFFLUENT MAIN PIPELINE TO REPLACE UNDERGROUND CORROSIVE PIPELINE
129	R/2012/0927/FF	SSI UK	MOBILE COAL WASHING PLANT AND FILTER WITH ASSOCIATED EQUIPMENT
130	R/2013/0369/FFM	EARTHYL ENERGY GROUP	PROPOSED ANAEROBIC DIGESTION AND COMBINED HEAT & POWER PLANT
131	R/2011/0542/FFM	TEESSIDE WINDFARM LIMITED	PROVISION OF UNDERGROUND CABLES ALONG SOUTH GARE ACCESS ROAD AND COATHAM SANDS TO SERVE OFFSHORE WIND FARM (NEW REALIGNMENT)
132	R/2010/0695/FF	FALCON PERFORMANCE UK LTD	STEEL FRAMED INDUSTRIAL UNIT FOR AUTOMOTIVE USES; ASSOCIATED HARDSTANDING AND 2 NO. NEW VEHICULAR ACCESS ROADS
133	R/2013/0373/FFM	WARD RECYCLING LTD.	STEEL PORTAL BUILDING FOR USE AS AN ANAEROBIC DIGESTION PLANT; SINGLE STOREY DETACHED OFFICE BUILDING; 6 STORAGE TANKS; ELECTRICITY SUB-STATION; CAR PARKING; HARDSTANDINGS AND ASSOCIATED LANDSCAPING (AMENDED SCHEME)
134	R/2013/0608/FFM	IMPETUS WASTE MANAGEMENT LIMITED	WASTE TREATMENT FACILITY
135	R/2009/0551/FFM	MR NICK BROWN (BERTSCHI UK LTD)	ERECTION OF STORAGE/PRODUCTION WAREHOUSE
136	R/2011/0300/FF	THE GRENFELL CLUB	ERECTION OF A TWO STOREY COMMUNITY AND EDUCATION CENTRE, 4 CAR PARKING AND 6 CYCLE SPACES ; BIN STORAGE; LANDSCAPING AND NEW VEHICULAR AND PEDESTRIAN ACCESSES
137	R/2012/0811/FF	SABIC UK PETROCHEMICALS	TWO STOREY MANAGEMENT BLOCK WITH ASSOCIATED 92 SPACE CAR PARK INCLUDING 2 LIGHTING COLUMNS AND ABOVE GROUND SEPTIC TANK (PERMISSION REQUIRED UNTIL 31 DECEMBER 2014)
138	R/2010/0857/FF	MR M WARD	TWO STOREY OFFICE BLOCK INCLUDING 38 SPACE CAR PARK

ID	Reference	Applicant Name	Proposal
139	R/2012/0659/RS	MR M NEARY	DEMOLITION OF VACANT COMMUNITY BUILDING AND REPLACE WITH 9 RESIDENTIAL UNITS IN TERRACED BLOCK WITH ASSOCIATED CAR PARKING AT REAR; LANDSCAPING; BOUNDARY FENCING (1.8M HIGH) AND NEW VEHICULAR AND PEDESTRIAN ACCESSES (RESUBMISSION)
140	R/2012/0615/CA	MR W SPRIGGS	DEMOLITION OF VACANT SOCIAL CLUB AND REPLACE WITH 9 DWELLINGHOUSES (5 WITH UNDERCROFT GARAGES) INCLUDING NEW VEHICULAR AND PEDESTRIAN ACCESSES AND 8 CAR PARKING SPACES
141	R/2009/0662/RT	MR P SANGHA	ERECTION OF 8 NO. FLATS (AMENDED SCHEME) (RETROSPECTIVE)
142	R/2013/0160/FF	MULGRAVE PROPERTIES (NUNTHORPE) LTD	ERECTION OF 9 NO. TWO STOREY DETACHED DWELLINGS WITH INTEGRAL GARAGES; NEW VEHICULAR ACCESS.
143	R/2011/0413/FF	AD PILLMOOR	RESIDENTIAL DEVELOPMENT COMPRISING 9 DETACHED TWO STOREY DWELLINGHOUSES WITH INTEGRAL GARAGES; NEW VEHICULAR AND PEDESTRIAN ACCESS AND ROAD LAYOUT
144	R/2013/0738/OO	MR C LIGHTWING	OUTLINE APPLICATION FOR ERECTION OF 8 DETACHED DWELLINGS
145	R/2009/0543/OOM	TREASURY SOLICITORS OFFICE (BONA VACANTIA)	OUTLINE APPLICATION FOR RESIDENTIAL DEVELOPMENT WITH ASSOCIATED CAR PARKING (8 NO. 2 BED APARTMENTS)
146	R/2009/0202/FF	PERSIMMON HOMES (NE) LTD	SUBSTITUTION OF 8 NO. HOUSE TYPES
147	R/2009/0857/FF	MR A HUSSAIN	DEMOLITION OF EXISTING DOUBLE GARAGE AND CONSTRUCTION OF CONVENIENCE STORE (CLASS A1) WITH NEW ACCESS OFF PARK ROAD AND ASSOCIATED LANDSCAPING
148	R/2009/0615/FFM	LIDL UK GmbH	DEVELOPMENT OF A FOOD RETAIL STORE AND ASSOCIATED CAR PARK
149	R/2010/0599/FF	MR K RUTHERFORD	ERECTION OF 10 INDUSTRIAL UNITS

ID	Reference	Applicant Name	Proposal
150	R/2011/0706/FFM	GRANTCHESTER DEVELOPMENTS (MIDDLESBROUGH) LTD	ERECTION OF 2 RESTAURANT/CAFE (CLASS A3) UNITS AND ATM FACILITY, ALTERATIONS TO CAR PARK AND INTERNAL ROAD NETWORK; PROVISION OF NEW ACCESS ONTO TRUNK ROAD AND ASSOCIATED LANDSCAPING
151	R/2013/0498/FFM	OAKGATE GROUP PLC	ERECTION OF A MCDONALD'S RESTAURANT AND DRIVE-THRU TAKE AWAY; PUBLIC HOUSE / RESTAURANT WITH RESIDENTIAL ABOVE TOGETHER WITH ASSOCIATED VEHICULAR ACCESS; CAR PARKING AND LANDSCAPING
152	R/2012/0137/PND	MR MICHAEL DIXON	PRIOR NOTIFICATION FOR PROPOSED DEMOLITION OF COMMUNITY CENTRE
153	R/2012/0001/SCP	TWMMAPF	SCOPING OPINION FOR 4 WIND TURBINES AND ASSOCIATED INFRASTRUCTURE
STOCKTON-ON-TEES BOROUGH COUNCIL			
154	12/2766/EIS	Seneca Global Energy Limited	ERECTION OF 24MW ENERGY FACILITY INCLUDING GASIFICATION TECHNOLOGY, ASSOCIATED INFRASTRUCTURE FOR MATERIALS HANDLING AND STORAGE, POWER GENERATION, POWER EXPORT, FUEL RECEIPT, PROCESS EMISSIONS CONTROL, MAINTENANCE, OFFICES AND CAR PARKING, INCLUDING A N
155	13/0452/REV	Roadstone Solutions Limited	RETROSPECTIVE REVISED APPLICATION FOR CHANGE OF USE TO WASTE TRANSFER STATION (SUI GENERIS)
156	14/1106/EIS	Prism Planning Ltd	PROPOSED 45 MWE RENEWABLE ENERGY PLANT, LAND AT CLARENCE WORKS, PORT CLARENCE ROAD, PORT CLARENCE.
157	13/3151/EIS	Impetus Reclamation Limited	REVISED APPLICATION FOR THE CONSTRUCTION AND OPERATION OF A THERMAL DESORPTION UNIT TO TREAT WASTES ON UNDEVELOPED LAND ADJACENT TO NORTH TEES ACCESS ROAD, HUNTSMAN DRIVE, SEAL SANDS.
NORTH YORK MOORS NATIONAL PARK AUTHORITY			
158	NYM/2012/0329/FL	Egdon Resources UK Limited	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

ID	Reference	Applicant Name	Proposal
159	NYM/2010/0262/EIA	Moorland Energy	THE GAS TRANSMISSION LINE BETWEEN EBBERSTON MOOR AND THE PROPOSED GAS PROCESSING PLANT AT THORNTON LE DALE (PART OF MOORLAND ENERGY'S PROPOSED DEVELOPMENT), REFERENCE NYM/2010/0262/EIA, FOR WHICH APPROVAL WAS GRANTED ON APPEAL ON 26 JUNE 2012;
160	NYM/2013/0593/EIA	Third Energy	THE PROPOSED THIRD ENERGY GAS TRANSMISSION PIPELINE FROM EBBERSTON/WYKEHAM GAS FIELD TO KNAPTON POWER STATION; THIS IS A 'STRADDLING' PLANNING APPLICATION SUBMITTED TO THE NATIONAL PARK AUTHORITY AND NORTH YORKSHIRE COUNTY COUNCIL. THE APPLICATION TO THIS AUTHORITY, REFERENCE NYM/2013/0593/EIA, WAS APPROVED IN DECEMBER 2013 AND WE UNDERSTAND THAT NYCC IS DUE TO CONSIDER ITS APPLICATION ON 25 MARCH 2014.
161		Northern Powergrid	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.
SCARBOROUGH BOROUGH COUNCIL			
162	09/02013/RM	Broadacres Services Ltd	RESERVED MATTERS APPLICATION FOR 68 DWELLINGS
163	09/02472/RM	Yorkshire County Homes Ltd	RESERVED MATTERS APPLICATION FOR 41 HOUSES AND FLATS PLUS OPEN SPACE
164	11/02181/FL	Mulgrave Properties Ltd	DEMOLITION OF HOTEL AND CONSTRUCTION OF 12 NO DWELLINGS
165	11/00213/FL	Barratt And David Wilson Homes (East) (Mr P Butler)	RESIDENTIAL DEVELOPMENT OF 179 DWELLINGS INCLUDING AREAS OF PUBLIC OPEN SPACE AND ASSOCIATED INFRASTRUCTURE
166	13/02662/FL	Mr Graham Wilkinson	RETROSPECTIVE PLANNING PERMISSION FOR CHANGE OF USE OF CLASS B1 OFFICE ACCOMMODATION TO A DENTAL SURGERY
167	12/00592/FL	Skelwith Group	A MIX OF 46 CONTEMPORARY AND TRADITIONAL HOLIDAY LODGES AND EDUCATIONAL CENTRE

ID	Reference	Applicant Name	Proposal
HIGHWAYS AGENCY			
168		HIGHWAYS AGENCY	A19/A174 PARKWAY PINCH POINT IMPROVEMENTS
CENTRAL GOVERNMENT			
169		FOREWIND	DOGGER BANK TEESSIDE A AND B LANDFALL
170		FOREWIND	DOGGER BANK TEESSIDE C AND D LANDFALL
171		CENTRAL AREA TRANSMISSION SYSTEM	CENTRAL AREA TRANSMISSION SYSTEM
MARINE MANAGEMENT ORGANISATION			
172		PD TEESPORT	MAINTENANCE DREDGING IN THE TEES
173		PD TEESPORT	NORTHERN GATEWAY CONTAINER TERMINAL
174		PD TEESPORT	QEII BERTH DEVELOPMENT

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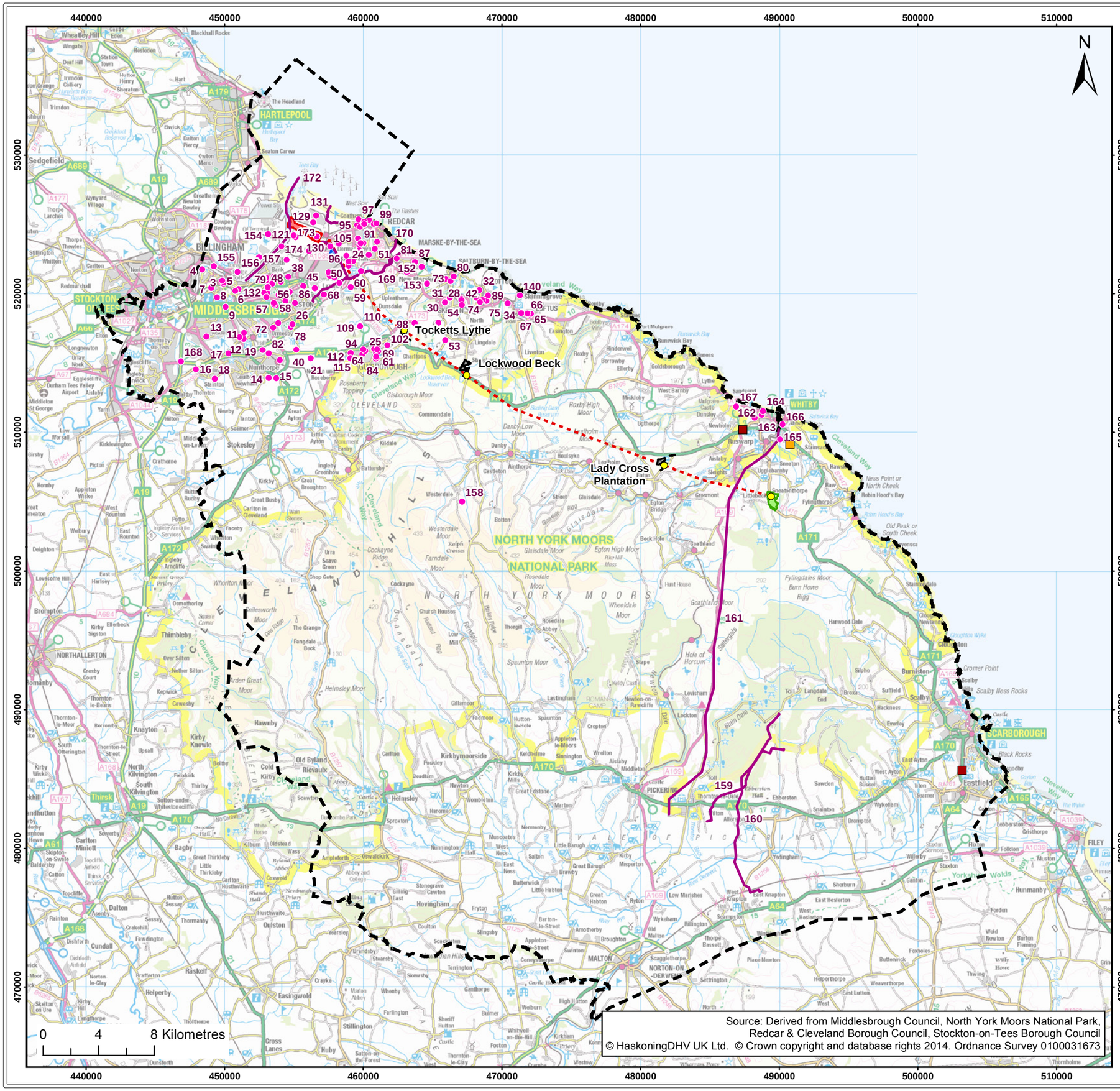
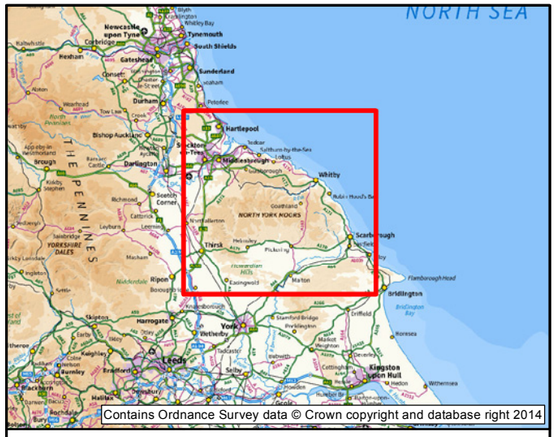




DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

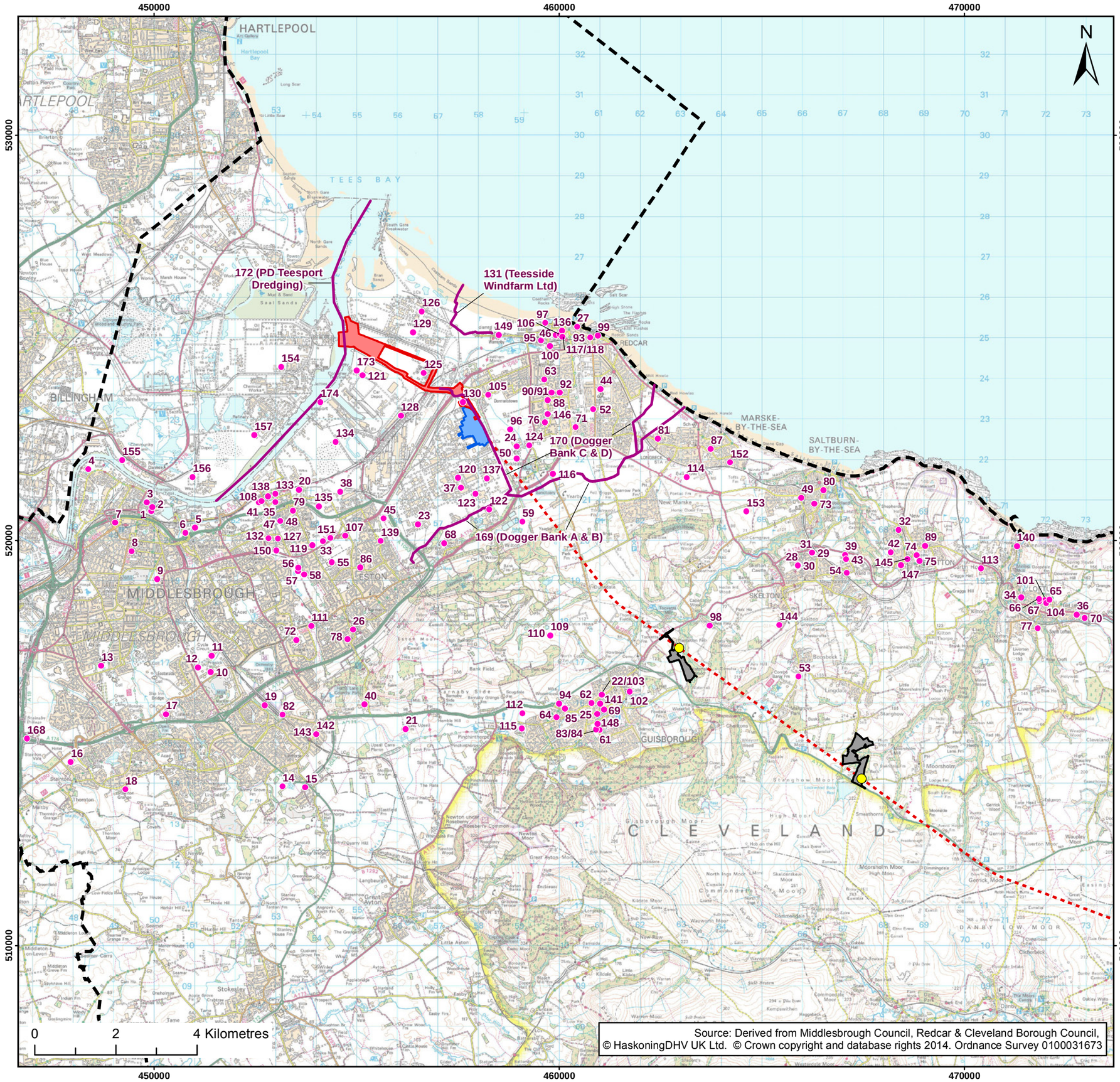
Title: Harbour Facilities CIA: Location of Non YPP Developments to be Included in the CIA

Part:	Figure:	Drawing No:
HF	4.1a	9Y0989-CIA-4-001

Rev:	Date:	Drawn:	Checked:	Size:	Scale:
1	06/03/2015	LB	MS	A3	1:275,000
0	10/12/2014	LB	MS	A3	1:275,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together
ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com



Legend:

- Zone of Influence
- Harbour Facilities - DCO Order Limits
- Intermediate Shaft and Spoil Site – Extent of Works
- MHF and MTS Portal – Extent of Works
- MTS Tunnel Alignment
- Shaft Location
- Project Location
- Project Location (Linear Projects)

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title:

Harbour Facilities CIA:
Location of Non YPP Developments
to be Included in the CIA

Part:	Figure:	Drawing No:
HF	4.1b	9Y0989-CIA-4-002

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

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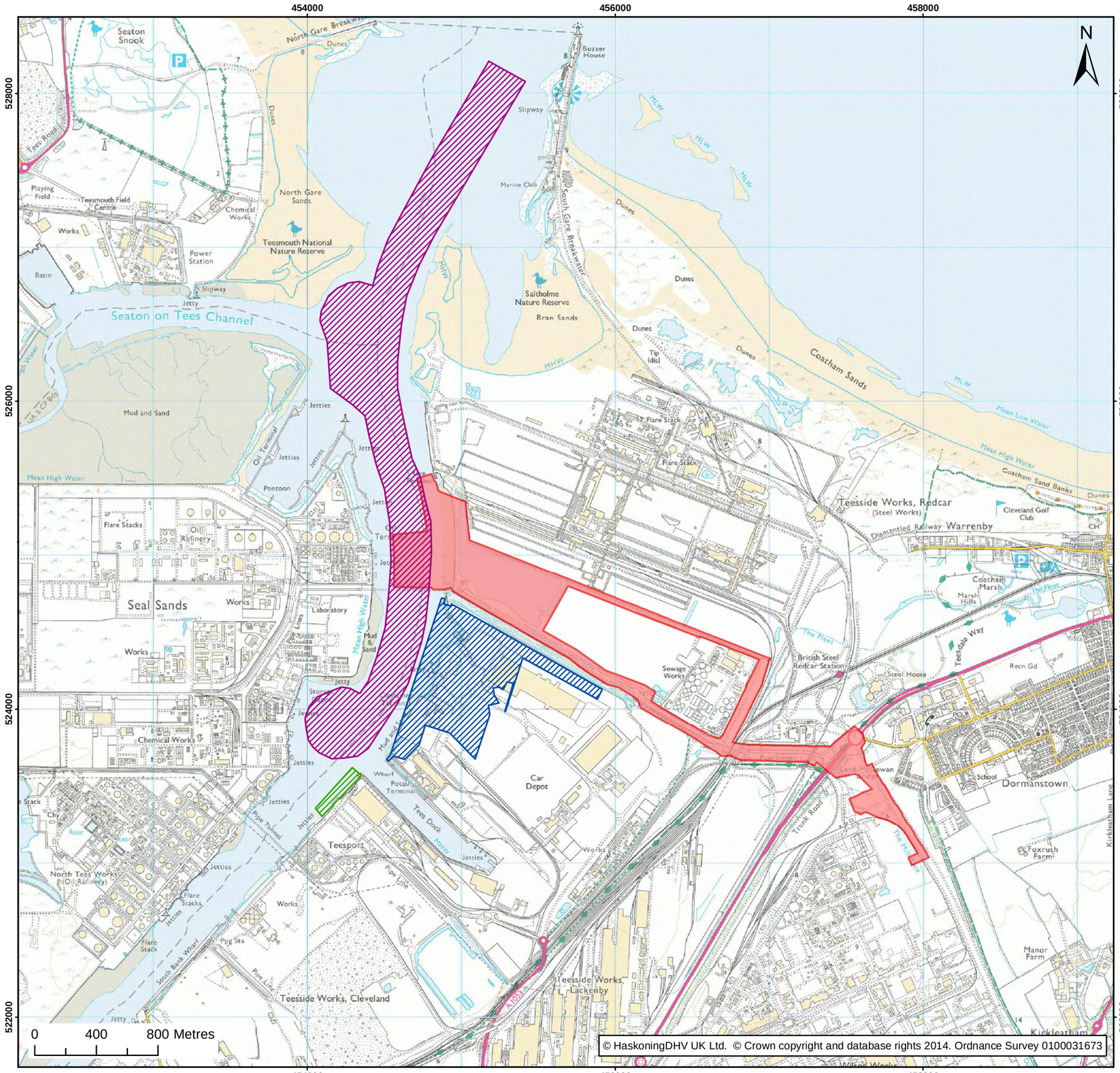
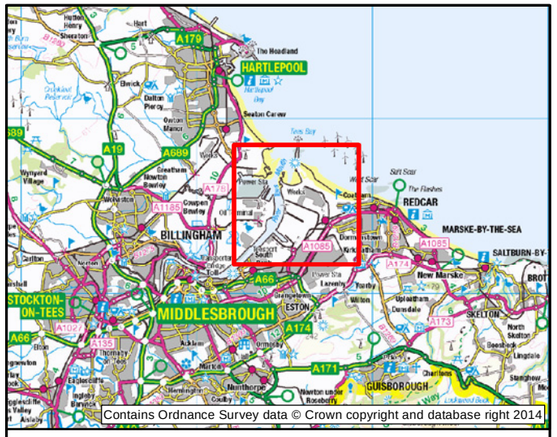
ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com





Legend:

- Harbour Facilities - DCO Order Limits
- NGCT Dredge Footprint
- NGCT Construction Footprint
- QEII Berth Development Dredge & Construction Footprint

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title:

Harbour Facilities CIA:
Projects Scoped into the CIA of
Relevance to the Marine Environment

Part:	Figure:	Drawing No:
HF	4.2	9Y0989-CIA-4-003

Rev:	Date:	Drawn:	Checked:	Size:	Scale:
1	06/03/2015	LB	MS	A3	1:25,000
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Co-ordinate system: British National Grid

ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com

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ii. Northern Gateway Container Terminal (NGCT)

4.3.5 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.

4.3.6 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 4.8Mm^3.

iii. Tees Dock No.1 Quay

4.3.7 Another significant project (reconstruction of No.1 Quay, Tees Dock) comprises the deepening and widening (capital dredging) of the berth at Tees Dock No.1 Quay, and resultant required strengthening / reconstruction of the existing quay (a total length of approximately 760m). The total volume of capital dredging would be approximately 262,000m^3, with material arising from the capital dredging being disposed of at the existing offshore disposal site 'Tees Bay C'.

4.3.8 This project is currently under construction and can be excluded from the CIA given that it would be completed well in advance of commencement of the YPP. In addition, the EIA for the project concluded that there are no means by which the project could affect the hydrodynamic and sedimentary regime of the estuary system and, therefore, the project would have no significant ongoing effects that require consideration as part of the CIA. The exception to this is for the cumulative impact on commercial navigation, which does include the potential operational impact of activities at No.1 Quay.

4.4 PINS Consultation

4.4.1 Although not directly related to the CIA, consultation comments from the Planning Inspectorate (PINS) on the draft Harbour facilities HRA referred to the need to consider the Dogger Bank Teesside A and B Offshore Wind Farm as part of the in combination assessment (the Teesside A and B landfall application is included as Project No. 172 in **Table 4.1** above). By extension, it also needs to be considered in the CIA.

4.4.2 The following part of this CIA (**Part 2**) considers each relevant environmental topic in turn (e.g. socio-economics, traffic and transport, noise etc.) in the context of the potential cumulative effects of the Harbour facilities in conjunction with other components of the YPP. **Part 3** considers each relevant environmental topic in the context of the potential cumulative effects of the Harbour facilities in conjunction with other 'scoped in' plans and projects.

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Part 2

YPP CIA

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5 SOCIO-ECONOMICS

5.1 Introduction

5.1.1 For the purposes of socio-economic assessment, the CIA has been undertaken for the whole of the YPP in order to demonstrate and assess the socio-economic influence of the project as a whole. This reflects the nature of socio-economic effects which are typically influential at a Regional or National level, rather than just at a local scale.

5.2 Project wide cumulative assessment of impacts during construction

Project wide peak construction employment

5.2.1 The construction of the proposed YPP components would generate construction employment, the level of which has been forecast using information produced by YPL with extensive input from contractors, together with socio-economic consultants Quod. This "bottom-up" approach was adopted to gain the best understanding of the potential size, nature and timing of demand for the construction workforce.

5.2.2 Assumptions made about the labour force requirements for the construction of the proposed YPP components are set out in more detail in *Socio-Economic Technical Note 2 (TN2): Construction and Operational Workforce Profiles* (see **Part 2 Appendix 5.1** of this CIA).

5.2.3 The construction period required to reach 6.5Mtpa output for the proposed YPP would be 58 months, including site preparation. A further 12 to 19 months of construction would be required to reach 13Mtpa, which could start as early as Month 82 or as late as Month 100.

5.2.4 The average construction employment demand of the proposed YPP over the 58 month period would be 771 employees per month. The average employment demand of the proposed YPP for the ramp up to 13Mtpa would be 227 employees per month.

5.2.5 The peak employment overall would be 1,671 construction employees across all proposed YPP components, in Month 25.

5.2.6 The proposed Dove's Nest site is considered to be the most sensitive site, as it would experience the largest construction employment peak, with both MTS and Mine employees on-site at once. The effect of construction employment at the proposed Dove's Nest site is assessed for the Dove's Nest Construction Zone (DNCZ). As set out in **Traffic and Transport** (**Part 2**, **Section 6** below), it is expected that construction workers would drive straight to the proposed MTS intermediate shaft sites. The proposed MTS site at Lady Cross Plantation is also within the North York Moors National Park (NYMNP) and could be expected to have a similar constriction employee commuting zone as the proposed Dove's Nest site. Construction employees at the proposed Lockwood Beck and Tocketts Lythe sites are expected to come from permanent or temporary accommodation within the Travel to Work Area (TTWA) as a whole.

5.2.7 The proposed MTS Portal at the MHF, MHF and Harbour facilities are all located within Dormanstown Ward in RCBC. Construction employees at these proposed sites would have direct road access. These construction employees would be expected to come from permanent or temporary accommodation within the TTWA, in particular from within RCBC, Stockton-on-Tees and Middlesbrough.

5.2.8 The proposed Construction Village, should it become operational, would be located in Whitby, within Scarborough District and would be expected to draw construction employees from outside the TTWA.

5.2.9 The potential project wide cumulative effects of peak construction employment at each cluster of sites and the proposed YPP components are presented below.

The Dove's Nest and Lady Cross Plantation sites (within the NYMNP)

5.2.10 Despite the significant pool of local labour, specialist contractors would be required to undertake the construction of certain elements of the YPP. For some tasks, these contractors would bring with them specialist skilled and experienced labour; however, local labour would be used where this is practical and exists within the local skills base. As set out in *TN2* (**Part 2 Appendix 5.1**), an assumption of 34% location recruitment for the proposed Mine and 26% at the MTS shaft site at Doves Nest has been established. This is a conservative estimate – more local recruitment will be achieved if possible. This assumption is based on the professional experience and views of YPL and relevant sub-contractors. It has been assumed that the proportion of local employees at the proposed MTS site at Lady Cross Plantation would be similar to that at the Dove's Nest site.

5.2.11 The peak construction employment required across these three sites would be 945 employees. Of these, 297 could be local (home-based) already living within the DNCZ; the remaining 583 could therefore seek temporary accommodation whilst they are employed on-site (of which *c.*470 would be employed at the Dove's Nest site).

5.2.12 The peak of home based employees would equate to 1.7% of residents within the DNCZ already engaged in the construction industry (and some may travel from homes farther afield). The peak construction demand for non-home based workers at the proposed Dove's Nest MTS, Mine and Lady Cross Plantation sites (*c.*583) is not likely to create any significant adverse effects in the context of the total number of residents already living within the DNCZ. It equates to a temporary increase in working age employed residents within the DNCZ of 0.2% at peak.

5.2.13 In the context of this wider employment market in the DNCZ, the proportion of employees who would come from outside the DNCZ and the mobility of the construction workforce, the total peak construction employment at the proposed YPP component elements would not result in any significant adverse effects on the labour market. The creation of new construction jobs would result in a **temporary moderate beneficial** impact at the **DNCZ level**.

5.2.14 Increasing capacity from 6.5Mtpa to 13Mtpa would not increase the labour demand peak, and therefore it would not result in any further significant effects.

All other sites outside the NYMNP

5.2.15 There would be a peak of 150 construction employees at each of the Lockwood Beck and Tocketts Lythe sites to reach a capacity of 6.5Mtpa. Peak construction employment at the Harbour facility, MHF and MTS Portal would be 175, 252 and 144 respectively. The employment peak at the Construction Village would be 86. The employment demand for each of these proposed development sites would not peak simultaneously so, in reality, the overall peak is likely to be lower than the sum of these peaks; at around 800.

5.2.16 This peak construction employment demand equates to 0.3% of the total number of employed residents within the TTWA and 3.4% of those residents within the TTWA already working in the construction industry; although in reality some would travel from outside the TTWA or move from outside into temporary local accommodation.

5.2.17 In the context of this wider employment market in the TTWA and the mobility of the construction workforce, the total peak construction employment across the sites outside of the NYMNP would result in a **temporary minor/moderate beneficial** impact at the **TTWA level**.

5.2.18 Increasing capacity from 6.5Mtpa to 13Mtpa would not increase the labour demand peak, and therefore it would not result in any further significant effects.

Project wide temporary accommodation supply

5.2.19 A proportion of the workforce for the construction of the proposed YPP components would come from outside of the DNCZ and could seek temporary accommodation. The potential effect of this is assessed below with respect to construction sites within and outside the NYMNP.

Within the NYMNP

5.2.20 There are three proposed YPP components within the NYMNP – the Mine and the MTS site at Dove's Nest and the Lady Cross Plantation Intermediate Shaft Site. Employees at these locations could be expected to live in temporary accommodation within the NYMNP, in particular around 15 miles from Dove's Nest or private rented accommodation in the wider DNCZ. The peak non-home based construction workforce at these sites equates to 583 people.

5.2.21 Within the DNCZ there are approximately 102,800 private rented bedspaces and 4,050 tourist accommodation bedspaces within 15 miles (or circa 25-30 minutes driving time) of Dove's Nest.

5.2.22 Based on 34% of the Mine construction employees and 26% of the MTS employees being home based, there would be 583 construction employees seeking non-home based accommodation. This equates to

0.5% of the 106,550 total private rented or tourist accommodation bedspaces within a reasonable travel distance of the three proposed YPP component elements within the NYMNP.

5.2.23 In an absolute worst case scenario, in terms of the potential effect on the tourism sector, all non-home based construction employees would decide to rent tourist accommodation within 15 miles of the proposed YPP components within the NYMNP. This would represent 14% of the available 4,050 accommodation bedspaces within 15 miles.

5.2.24 In the context of the NYMNP as a whole, this would be 2.3% of the available tourist accommodation.

5.2.25 This is a very unlikely scenario. Information obtained by YPL has indicated that a reasonable assumption would be that the non-home based workforce would be split evenly between caravans, self-catering/PRS and B&Bs.

5.2.26 Data from Visit England (2014a) indicated that average room occupancy in tourist accommodation was between 43% and 47% between 2011 and 2013 (in the Year to January) in Yorkshire. Across England, the summertime peak has been 72% to 77%. This would result in a minimum of 1,340 vacant rooms within 15 miles at summertime peak, and 8,358 in the NYMNP as a whole.

5.2.27 In this context, the impact on non-home based construction employee demand for temporary accommodation of the YPP components within the NYMNP would be **temporary, short term**, **minor** and **beneficial** at the **DNCZ level** (i.e. an increase in business for the owners of accommodation facilities is predicted).

5.2.28 Increasing capacity from 6.5Mtpa to 13Mtpa would not increase the labour demand peak, and therefore it would not result in any further significant effects.

5.2.29 As stated above, there is unlikely to be any significant adverse effects due to construction workers temporarily living within the DNCZ; however, should it be considered necessary or desirable to provide specific temporary housing for construction workers, YPL would be bring forward the proposed Construction Village in Whitby, Scarborough. The Construction Village would provide 400 bedspaces, which would reduce the potential demand for temporary accommodation (i.e. 400 of the potential 583 bedspaces would be provided), significantly reducing the potential for effects on the private rental and tourist accommodation markets in the NYMNP. It should be noted that the Construction Village would also reduce the potential for positive effects on local tourist accommodation occupancy rates.

Outside of the NYMNP

5.2.30 The proposed MTS intermediate shaft sites at Tocketts Lythe and Lockwood Beck, the MTS Portal, the MHF, the Harbour facility and the Construction Village (should be it progressed) are all outside NYMNP. They would have a peak construction employment of approximately 800 workers. As these sites are less constrained and less sensitive, the same level of detailed modelling of predicted home-based and non-home based employment as undertaken for the works proposed in the NYMNP has not been undertaken. A reasonable assumption is that a similar proportion of employees would be non-

home-based as for Dove's Nest. The Construction Village, Harbour facility and MHF are unlikely to require as specialised construction skills as the proposed developments at Doves' Nest.

5.2.31 An estimated 74% of MTS construction employees and 66% of MHF and Harbour facility construction employees could move temporarily to the area from outside the TTWA and could seek temporary accommodation within RCBC, Stockton-on-Tees or Middlesbrough (in the case of the MTS, MHF and Harbour facility sites) or Scarborough (in the case of the Construction Village).

5.2.32 The increased demand for temporary accommodation within RCBC, Stockton-on-Tees or Middlesbrough is estimated to be 610 employees. This increase in demand would equate to 2.2% of the 27,330 private rental stock in the three districts. In addition, the three districts have a supply of tourist accommodation amounting to 8,300 bedspaces. Even in the unlikely event that the all non-home based construction employees would chose to stay in tourist accommodation, the total demand would equate 7.4% of the total supply of bedspaces. Occupancy rates for tourist accommodation in the North East peak at around 55% in July and fall to between 28% and 40% in winter (Visit England, 2014b) (this data is not available to a district level). An increase in demand for bedspaces would, therefore, make a positive contribution to local accommodation providers who are under occupied.

5.2.33 In the context of the size of the private rental and the tourism stock, the increased demand for accommodation created by construction employment would create no adverse effects. In the context of the occupancy rate of tourist accommodation, increased demand would have a **temporary and minor beneficial** impact for accommodation providers in RCBC, Middlesbrough and Stockton-on-Tees. The effect would be **negligible** at other spatial scales.

5.2.34 The increased demand for temporary accommodation resulting from the construction of the Construction Village could be approximately 57 people. In the context of 20,850 private rented bedspaces in Scarborough and 42,450 tourist accommodation bedspaces, the increased demand would have a **negligible** impact at **all spatial levels**.

Project wide indirect and induced employment effects from construction expenditure

5.2.35 Expenditure by YPL on construction of the proposed YPP components would result in indirect beneficial economic effects in the wider supply chain. These are considered for the YPP as a whole and assessed in the context of the LEP and UK economies.

5.2.36 Indirect employment has been estimated using a breakdown of construction spending provided by YPL and drawing on the ONS Input-Output tables. These show that 60% of construction spending goes on materials and other parts of the supply chain, the remaining 40% is the Value Added. Most of the purchases (nearly 65%) remain within the construction supply chain with a further 20% going to manufacturing companies and the remainder split between energy and business, and financial services. This methodology is set out in the *Economic Impact Report* that accompanies the application.

5.2.37 **Table 5-1** sets out the expected indirect potential impacts resulting from construction expenditure.

Table 5-1 Construction spending indirect impacts (all components except Construction Village)

Impact	6.5Mtpa	Additional to reach 13Mtpa	Total at 13Mtpa
Investment	£1.4bn	£306m	£1.7bn
Supply Chain Expenditure	£810m	£180m	£990m
Of which: Construction	*£520m*	*£110m*	*£630m*
Manufacturing	*£160m*	*£40m*	*£200m*
Utilities and Services	*£130m*	*£30m*	*£160m*
Indirect Jobs (one year)	6,760	1,490	8,250
Indirect Jobs FTE (average per year)	1,400	940	-

Figures have been rounded

5.2.38 The proposed YPP components would result in an investment of £1.4bn for 6.5Mtpa and a further £306m to reach 13Mtpa, totalling £1.7bn. Through the supply chain, this would result in an average annual indirect employment effect of 1,400 FTE jobs in the economy.

5.2.39 YPL is committed to maximising the number of firms within the LEP that are able to access and succeed in tendering for opportunities and is working in partnership with the LEP stakeholders towards this goal. This is set out in more detail in the *Local Supply Chain Engagement Strategy* that accompanies the application. In the context of the LEP economy, the indirect impact of investment and job creation, therefore, could be **temporary, short term and major beneficial** at a **LEP level**.

5.2.40 In addition, the creation of private sector employment is considered to be key policy priority at a local, LEP and national level.

5.2.41 The additional construction employees would spend some of their increased incomes and thereby increase employment in local shops and services. In some cases, workers would move directly from unemployment to employment at the proposed YPP component elements. In other cases, they would move from existing jobs, thereby creating vacancies that other residents can fill. The overall result is that more people would be employed and there would be an overall increase in wages and spending. This spending would then support more employment and economic activity at other local businesses. This is set out in the *Economic Impact Report* that was submitted with the applications for the Mine and MTS and which accompanies this DCO application (**Document 7.3A**).

5.2.42 Induced employment resulting from increased local expenditure is predicted to be 1,240 (one year) jobs to reach 6.5Mtpa and a further 220 to reach 13Mtpa, totalling 1,470 induced (one year) jobs. The geographical distribution of this expenditure cannot be accurately estimated, however a significant proportion could be within the **TTWA** (including within the NYMNP and DNCZ). This would have a **temporary, short term and moderate beneficial** impact at the **TTWA level**.

5.2.43 The investment required to construct the proposed Construction Village would add to the beneficial effects in the LEP economies.

Project wide increase in GVA from construction expenditure

5.2.44 The ONS estimates that approximately 40% of spending on construction is Value Added, which is the sub-national measure of GDP. This is set out in the *Economic Impact Report*. For £1.47bn of construction investment, the direct GVA, therefore, would be approximately £560m at 6.5Mtpa and £680m at 13Mtpa. This should be considered in the context of the annual GVA generated within NYMNP of *c*.£200m, within the TV LEP area of £10.7bn and within the YNYER LEP area of £19bn, i.e. it is a locally and regionally significant increase.

5.2.45 This would result in a **major beneficial** impact at the **NYMNP level** and a **district level**, and a **moderate beneficial** impact at a **LEP level**.

5.2.46 As with employment, this would result in indirect and induced GVA effects via the supply chain and labour market. These would result in a total of £353m of additional GVA in the wider economy up to 6.5Mtpa and £428m at 13Mtpa, as set out in **Table 5-2**. In total, the construction of the proposed YPP would create £173m of GVA per year over 6.4 years once 13Mtpa is reached. The geographical distribution of this indirect and induced increase in output cannot be accurately estimated.

Table 5-2 Construction GVA effects

Impact	6.5Mtpa	Additional to reach 13Mtpa	Total at 13Mtpa
Direct GVA	£560m	£120m	£680m
Indirect GVA	£312m	£68m	£380m
Induced GVA	£41m	£7m	£48m
Total GVA	£913m	£195m	£1.1bn
GVA per year	£188m Over 4.8 years	£125m Over 1.6 years	£173m Over 6.4 years

Figures have been rounded

5.2.47 At a UK level, the impact with respect to GVA would be **negligible**.

5.2.48 As set out in the *Economic Impact Report,* the construction phase would not give rise to any deadweight or displacement effects.

Project wide tax effects from construction expenditure

5.2.49 During the construction phase, the Government would collect income tax and national insurance from the workers' salaries (both direct and indirect). This would amount to £155.5m over 4.8 years for 6.5Mtpa and a further £32m to reach 13Mtpa; totalling £186.5m over 6.4 years. This would represent a

beneficial effect which would be **negligible** in the context of the **UK's tax revenue** but **major** in the context of the **contribution of a single project**.

Project wide crime and fear of crime

5.2.50 The temporary increase in population arising from the non-home based construction workforce could have impacts on crime and anti-social behaviour, or the perception of such, and consequent impacts on the requirement for policing services. The presence of high value tools and plant may also increase the opportunities for theft crimes. Likely impacts on crime are difficult to estimate as they would depend on both the behaviour of workers and the behaviour of current residents.

5.2.51 Current police services are paid for through a Police Grant, which is formula-based funding based on a range of demographic, social, economic and crime indicators, and through Council Tax. Home based and non-home-based workers living in owner occupied accommodation and private rented accommodation, therefore, would have their services funded through normal mechanisms like any other local resident.

5.2.52 Therefore, the worst case scenario would be a peak 1,250 construction employees across all proposed YPP component elements who may be in temporary tourist accommodation and not be paying council tax; and therefore may not be accounted for in the Police Grant. In March 2014, there were 34,615 reported crimes within North Yorkshire Police jurisdiction in the year ending 2013. In the Cleveland Jurisdiction there were 38,983 in the same period. This equates to 57.8 crimes per year per thousand population in North Yorkshire and 69 in the Cleveland Jurisdiction. Based on these rates, an additional 1,250 residents could increase the number of crimes by 72-86 crimes per year spread out over a wide area, a *c*.0.2% increase, which would have a **negligible** impact at all spatial levels.

5.2.53 The North Yorkshire Safer Neighbourhoods Team (North Yorkshire Police Department, 2013) has recommended a number of actions which would limit the opportunities for crime. These would be adopted by YPL and include:

- Secure perimeter fencing and mechanism to regularly monitor potential breach.
- Having at least two registered security guards on duty at all times.
- Design of site cabins to limit access point/vulnerability and alarm systems.
- Limiting the quantity of expensive materials stored on-site as much as is practical.
- Access control via appropriate mechanism including photograph.
- High quality and 24hr CCTV stored for 31 days.
- Consideration of tools stored in cars – limiting or securing as much as is practical.

5.2.54 These measures would be implemented in order to minimise the potential opportunities for crime.

Project wide effects on special qualities

5.2.55 A number of special qualities of the NYMNP have been identified in the 2012 North York Moors Management Plan (NYMNP, 2012). The special quality that is relevant to the assessment of socio-

economics is *"distinctive skills, dialects, songs and customs; strong sense of community and friendly people".*

5.2.56 The introduction of a temporary new population of construction workers to the area could be perceived as a threat to this special quality. However, in the context of the size of the existing population, the potential non-home based workforce of up to 583 workers at sites within the NYMNP at peak would not be of a magnitude to have a significant effect on these special qualities. This peak represents 1.8% of the total number of people likely to be living in the NYMNP, and a proportion of workers would be living outside the NYMNP in the wider DNCZ. The addition of this small number of people to the NYMNP would not be large enough to alter, dilute or threaten in any way current local practices and traditions, or any existing activity related to these special qualities.

5.2.57 The construction of the YPP would have **no impact** on this special quality of the NYMNP.

Project wide indirect effects on the local economy: tourism

5.2.58 The proposed YPP could have indirect effects on the local NYMNP economy and, in particular, the tourism sector compared with the no development scenario. These effects are considered together for the construction and operation phase below.

5.3 Project wide assessment of impacts during operation

Project wide employment effects

5.3.1 The operation of the YPP would result in permanent employment creation. There would be 700 operational employees at 6.5Mtpa and 1,040 at 13Mtpa. Assumptions about the labour force requirements for the operation of the YPP are set out in more detail in **Part 2 Appendix 5.1**.

5.3.2 The permanent operational workforce would be drawn from a travel to work area around the proposed sites. It has been assumed that the TTWA represents a reasonable likely area from which operational employees at all proposed YPP component element sites would travel (within 90 minutes).

5.3.3 The operational jobs created by the YPP would represent an increase in the total number of jobs in the NYMNP and in RCBC. This should be seen in the context of unemployment of 760 people in the NYMNP (wards), 4,360 in RCBC and 19,470 in the TTWA. These jobs would help achieve the Government's target of full employment and the average wage paid to employees would be above the average for the region. As set out above, the areas around the YPP have employment rates below the Government's target of 73%. The TTWA contains areas with a low employment density, especially in RCBC. A significant proportion of employees could be existing residents of the NYMNP.

5.3.4 There would be further operational employment generated by the Construction Village in Scarborough, should this come forward. This would have further beneficial effects.

5.3.5 In the context of local unemployment, high dependency on seasonal tourism employment and local and LEP policy targets, this would have a **major beneficial** impact at **NYMNP** and **RCBC levels**, a **moderate beneficial** impact in the **TTWA** and a **minor beneficial** impact at a **LEP level**.

Project wide effect on the labour market

5.3.6 There is a large and dynamic labour force within the TTWA. This includes a large number of workers with existing experience in the mining sector or manufacturing sector, as well as the wider workforce that would be able to fill the majority of roles at the mine. The area also has a large number of people who move between employment and unemployment in any given month demonstrating a high level of flexibility within the labour force.

5.3.7 As set out in TN2 (**Part 2 Appendix 5.1**), 70% of operational jobs for the YPP as a whole would not require mining specific experience but would need would vocational experience relevant to their role, others would not require any prior work experience (although Level 2 to 3 qualifications are generally required). As a result, a significant number of operational jobs would be accessible to people already living and/or working in the area in a range of occupations and sectors, not just those with a mining background.

5.3.8 Employees would be drawn from a wide range of sectors, including other manufacturing or engineering trades and business support services, of which there is a large supply within the TTWA. Therefore the effects would spread across many industries not just the local mining industry. For the approximately 215 workers that would require prior mining experience in order for YPL to reach an operational output of 6.5Mtpa across all proposed YPP components, these would be recruited from across the UK and beyond. This would include some who already live within the TTWA, workers from current or former mining operations just outside the TTWA and others from further afield.

5.3.9 In this context, the demand for operational labour would not result in any pressure on the labour market that cannot be absorbed by the natural churn of employees and by people moving out of unemployment and economic inactivity. Therefore, there would be **no impact** due to the YPP on the labour market at any spatial level.

5.3.10 It is intended that the percentage of employees who would not need specific prior work experience would increase to 80% by full production. On-the-job training, which would become more viable once operations have begun, would also increase the proportion of locals with no experience at all who would be able to access jobs. YPL is committed to sourcing local labour where this is possible and would deliver a wide ranging training programme, which would include apprenticeship and graduate programmes and transferrable skills training.

Project wide demand for accommodation by operational employees

5.3.11 It is expected that all of the operational workforce would be home-based once they are employed at the relevant YPP component and there would be no demand for tourist accommodation resulting from

operation. Operational employees would be distributed within the TTWA and some may live beyond the TTWA, in the wider area. There are 14,070 dwellings within the NYMNP, 59,500 within RCBC and 277,350 within the TTWA. In the context of this many homes and the natural churn of the housing market, the likely impact with respect to demand for accommodation during operation would be **negligible** at all spatial levels.

Project wide economic effects: indirect and induced employment, GVA, tax and exports

5.3.12 This section addresses the macro-economic effects of the proposed YPP. The magnitude and significance of the effects is assessed as a whole in the concluding paragraph this assessment.

Indirect and induced employment

5.3.13 Spending generated by the operation of the proposed YPP would support more employment and economic activity at other local businesses and generate induced employment (this is set out in the *Economic Impact Report*). **Table 5-3** sets out the expected indirect and induced employment effects resulting from operational expenditure.

Table 5-3 Operational expenditure indirect and induced effects

Potential Impact	6.5Mtpa	13Mtpa
Total Supply Chain Expenditure per annum	£111m	£212m
Direct Jobs	700	1,040
Indirect Jobs	460	880
Induced Jobs	160	260
TOTAL	1,320	2,180

Figures have been rounded

5.3.14 YPL has undertaken a detailed assessment of its likely supply chain spending in terms of both the sectors where it would spend money and the likely location of suppliers. The locations were defined as "Local" (the districts of Scarborough and RCBC) and "Regional" (the former regions of Yorkshire and Humberside and the North East).

5.3.15 Just over half of the operational supply chain spending is on manufactured goods, with 56% of these supplied from the Local area and a further 24% from the rest of the Regional area. Together with spending on business services, this means a total of 35% of the supply chain spend would go into the Local economy and a further 15% into the remainder of the Regional economy. Spending on utilities is harder to disaggregate because although the bill may be paid to a local company, around half of the spend covers raw materials and distribution further upstream. There would be some additional local benefits, but these have not been estimated.

5.3.16 Taken together, this means that at least 160 of the indirect jobs at 6.5Mtpa and 310 of the indirect jobs at 13Mtpa are likely to be located across the two Regions.

5.3.17 The proposed YPP supply chain expenditure would result in 460 indirect jobs in the economy at 6Mtpa and 880 at 13Mtpa. Induced jobs would amount to 160 at 6.5Mtpa and 260 at 13Mtpa.

Increase in GVA from operation expenditure

5.3.18 The operation of the YPP would generate a significant amount of GVA, making a substantial contribution to the UK's GDP, and generating indirect and induced GVA effects as set out in **Table 5-4**.

Table 5-4 Operational GVA effects

Impact	6.5Mtpa	13Mtpa
Direct	£500m	£1bn
Indirect	£35m	£66.5m
Induced	£5m	£8.5m
Total	£540m	£1.1bn

Figures have been rounded

Tax effects from operation

5.3.19 The YPP would make a significant contribution to the national exchequer. The Government would collect income tax from the workers' salaries (both direct and indirect), from shareholders (on their dividends) and from landowners who receive royalties. They would also receive Capital Gains Tax, Stamp Duty, Corporation Tax and VAT (on domestic sales). YPL would pay local taxes and duties, including business rates and royalties to landowners. Of these, Corporation Tax is likely to be the most significant. As set out in more detail in the *Economic Impact Report.*, projected tax gains for local and national government would equate to £117m per year at 6Mtpa and £234m per year at 13Mtpa.

5.3.20 Included in these totals are local taxes and duties amounting to £27m per year in 2020, rising to £48m per year in 2024. This would include royalties to local land owners, dividends to local shareholders living in North Yorkshire and Teesside, payments to the York Potash Foundation and Business Rates which, under the new business rate retention scheme, would be retained for use and reinvestment by the LEP.

Export effects

5.3.21 As well as boosting GDP, the proposed YPP would help reduce the UK's trade deficit, which was £27bn in 2013. Assuming 6.4Mtpa of initial production is exported, this would equate to over £599m of exports each year (at $150 or £94 per tonne). For full production, assuming 12.8Mtpa of sales are

overseas, this would equate to £1.2bn of exports each year and would reduce the UK's trade deficit by just under 4%.

Project wide indirect effects on the local economy during operation

5.3.22 The proposed YPP could have indirect effects on the NYMNP economy compared with the no development scenario. This section considers how different effects of the scheme could affect the NYMNP economy and, in particular, the tourism sector. This includes how other impacts (e.g. noise, traffic, landscape and visual effects), could have socio-economic impacts.

Project wide crime and fear of crime

5.3.23 As all operational employees would be home-based once they are employed by the proposed YPP they would be factored into the Police Grant formula. Operational workers living in owner occupied accommodation and private rented accommodation, therefore, would have their services funded through normal mechanisms like any other local resident. The impact of the operation of the proposed YPP with respect to crime and fear of crime is, therefore, predicted to be **negligible** at all **spatial levels**.

Project wide special qualities

5.3.24 Cumulatively, a potential increase in employees working within the NYMNP would have **no impact** in the operational phase with respect to the special qualities of the NYMNP.

Project-wide effects on the local economy: tourism (construction and operation)

5.3.25 Each National Park Authority in the UK has identified a number of "special qualities" – the qualities they believe have led to their Park's designation[1]. These special qualities identify the local attributes that make NYMNP nationally significant as a tourism destination. The NYMNPA has defined its special qualities as follows:

- Great diversity of landscape.
- Wide sweeps of open heather and moorland.
- An abundance of forest and woodland.
- Special landforms from Ice Age.
- Majestic coastal cliffs and sheltered harbours.
- A special mix of upland, lowland and coastal habitats.
- Settlements which reflect their agricultural, fishing or mining past.
- Long imprint of human activity.
- A rich and diverse countryside for recreation.

[1] As stated by Nationalparks.gov.uk

- Strong religious past and present.
- Strong feeling of remoteness.
- Tranquillity (including dark skies and unpolluted air).
- Distinctive skills, dialects, songs and customs.
- A place of artistic, scientific and literary inspiration.

5.3.26 These factors are identified as the key reasons why visitors come to the NYMNP and it is possible that any damage to these qualities, perceived or otherwise, could reduce visitor numbers.

5.3.27 Where a potential effect on a Special Quality (or other factor that could influence visitor behaviour or amenity) has been identified, this has been assessed and the potential effects are summarised in this section. Relevant topics in this regard comprise:

- **Noise and Vibration** - relevant to impacts on visitor amenity caused by construction and operational noise/vibration; effects on tranquillity;
- **Traffic and Transport** - relevant to impacts on traffic disruption on visitors and businesses;
- **Landscape and Visual** - relevant to impacts on visitor amenity caused by adverse impacts on views and local landscape/townscape character; effects on feelings of remoteness; diversity of landscape;
- **Lighting** - relevant to impacts on dark skies;
- **Amenity and Recreation** - relevant to impacts on provision of access to rich and diverse recreational facilities;
- **Air Quality** - relevant to impacts on visitor amenity caused by dust and air pollution; effects on tranquillity; and,
- **Socio-Economics** - relevant to impacts on the economy and employment in tourist sectors including impacts on tourist accommodation arising from temporary construction workforce.

5.3.28 This assessment of potential effects on Special Qualities takes account of proposed mitigation. Where residual adverse effects are identified, these have been set in the local economic context and a qualitative or, where possible, quantitative assessment of the effect on the tourism sector has been made.

5.3.29 The determination of the nature, magnitude and significance of the effect was undertaken in line with the EIA methodology. The main sensitive receptors with respect to tourism would be the local businesses and communities within NYMNP. It is not possible to ascribe specific ‘values’ to socio-economic sensitive receptors due to their diversity in nature and scale. There has, therefore, been a focus on the qualitative “sensitivity” of each receptor and, in particular on their ability to respond to change based on recent rates of change and turnover. The socio-economic environment is a dynamic and adaptive one with constant background change and turnover, for example people moving into and out of the area and changing jobs. This qualitative sensitivity is based on professional judgement but broadly ascribes low sensitivity to those receptors that are easily adaptive to change and high sensitivity to those receptors that are not easily adaptive to change.

Approach

5.3.30 Effects on tourism are identified where there is an anticipated impact on visitors' experience, in particular in terms of diminished enjoyment of the NYMNP's Special Qualities, as outlined above. This assessment takes into consideration the relevant (environmental topic) impacts which have been assessed to have a moderate or major significant effect.

5.3.31 This section comprises a series of concise summaries of the relevant impacts of the YPP on define spatial areas. Each summary includes:

- **Impact summary** – a summary of the range of potential impacts. This only identifies areas where an impact is predicted (i.e. it is not necessary to list every thematic issue for each area to confirm there is not an impact).
- **Resultant effect on Tourism** – identification of the link between identified effects and a potential effect on tourism.
- **Mitigation Summary** – a summary of identified mitigation measures, to mitigate any significant impacts.

Study areas

5.3.32 The study areas considered are specific to each effect – for example, noise effects from construction and operation are highly localised, whilst visual effects may have a much wider impact area. The study areas have been identified by the technical specialists in the case of each technical assessment relating to the two surface access sites within the NYMNP, namely:

- The Mine and Doves Nest MTS Shaft.
- The MTS Shaft at Lady Cross Plantation.

5.3.33 The following assessment summarises the relevant direct effects and the resultant predicted effect on tourism in turn for each of element of the YPP. This is followed by a cumulative assessment which presents the likely significant effects on tourism in the NYMNP as whole.

Assessment of impacts

Construction

5.3.34 Various sensitive receptors and spatial scales have been identified, specific to each individual assessment, where a major or moderate significant impact has been identified for the Mine, the Doves Nest MTS Shaft and Lady Cross Plantation Intermediate Shaft Site during the construction phase. These are set out in **Table 5.5**.

Table 5-5 Spatial scale/sensitive receptors at Mine and Doves Nest (DN) MTS shaft and Lady Cross Plantation (LCP) with moderate to major effects: construction

	Site	Spatial scale/sensitive receptor	Type of receptor	Likely significant impact during construction
Landscape and Visual				
	Mine/DN	Stainsacre	Settlement	Moderate Adverse
	Mine/DN	Low Hawkser and High Hawkser	Settlement	Moderate Adverse
	Mine/DN	Coast to coast walk - Sleights moor, B1416, Stainsacre Laine, Hawkser bottoms	PRoW	Moderate to Major Adverse
	Mine/DN	Moor to Sea Cycle Network (route 9, Langdale End to Whitby) (except Louven Howe to Newton House Plantation to New May Beck routes)	PRoW	Moderate to Moderate/Major Adverse
	Mine/DN	Bridleway 333020 (Sneaton)	PRoW	Moderate/Major Adverse
	Mine/DN	Footpath 333014 (Sneaton)	PRoW	Moderate Adverse
	Mine/DN	Footpath 333019 (Sneaton)	PRoW	Moderate Adverse
	Mine/DN	Footpath 333022 (Sneaton)	PRoW	Moderate Adverse
	Mine/DN	Bridleway 312029 (Eskdaleside-cum-Ugglebarnby)	PRoW	Moderate/Major to Major Adverse
	Mine/DN	Bridleway 312031 (Eskdaleside-cum-Ugglebarnby) (part)	PRoW	Moderate/Major Adverse
	Mine/DN	Public rights of way (PRoW) within open moorland areas (Graystone Hills, Normanby Hill Top, Latter Gate Hills) to the east of the site	PRoW	Moderate and Moderate/Major Adverse
	Mine/DN	PRoW within rolling coastal hinterland farmland to the east of site	PRoW	Minor/Moderate to Moderate/Major Adverse
	Mine/DN	National Cycle Route 1 Moor to Sea Cycle Route 2 (Whitby to Ravenscar) The Cinder Track	PRoW	Minor/Moderate and Moderate Adverse
	Mine/DN	Visitors to tumuli east and south east of site at Latter Gate Hills, Graystones Moor and Low Moor	Visitors	Moderate to Moderate/Major Adverse

	Site	Spatial scale/sensitive receptor	Type of receptor	Likely significant impact during construction
	Mine/DN	Visitors to tumuli west of site at Sleights Moor (including Greenland's Howe)	Visitors	Moderate Adverse
	Mine/DN	Users of Access Land to the west of site: Ugglebarnby Moor (part);	Visitors	Major Adverse
	Mine/DN	Users of Access Land to the west of site: Sleights Moor (including areas within the 3-6km zone from the site boundary); Goathland Moor	Visitors	Minor/Moderate to Moderate/Major Adverse
	Mine/DN	Users of Access Land to the east of site: Graystone Hills, Latter Gate Hills, Normanby Top	Visitors	Moderate to Moderate/Major Adverse
	Mine/DN	Users of Access Land to the south and south east of site: Sneaton Low Moor, Low Moor	Visitors	Minor/Moderate to Moderate/Major Adverse
	Mine/DN	Visitors to Blue Bank car parks (2nr) The location is marked on OS mapping as a panoramic viewpoint	Visitors	Moderate Adverse
	Mine/DN	NW corner of site to Belt Plantations, Belt Plantations to Raikes' Lane, Raikes' Lane to A171	Users of Public Roads	Minor/Moderate to Major Adverse
	Mine/DN	A171 Robin Hood's Bay Road between Normanby Hill Top and Sneaton Corner (B1416)	Users of Public Roads	Moderate/Major Adverse
	Mine/DN	Raikes' Lane (common with Moor to Sea Cycle Route 9)	Users of Public Roads	Moderate/Major Adverse
	Mine/DN	Sneaton Thorpe Lane	Users of Public Roads	Minor/Moderate Adverse and Moderate/Major Adverse
	Mine/DN	Stainsacre Lane (part common with Coast to Coast Walk and Moor to Sea Cycle Route 9)	Users of Public Roads	Minor/Moderate and Moderate/Major Adverse
	Mine/DN	Back Lane (common with Coast to Coast Walk, part common with Moor to Sea Cycle Route 9)	Users of Public Roads	Minor/Moderate Adverse and Moderate/Major Adverse
	Mine/DN	May Beck Farm Trail (common with Moor to Sea Cycle Route 9)	Users of Public Roads	Moderate/Major Adverse

	Site	Spatial scale/sensitive receptor	Type of receptor	Likely significant impact during construction
	Mine/DN	Coast and Coastal Hinterland (4b) Whitby – Cloughton	Landscape Receptor	Moderate Adverse to Moderate/Major Adverse
	Mine/DN	Moorland (1b) Central and Eastern Moors - Ugglebamby Moor, LCA areas east of the site	Landscape Receptor	Moderate to Major Adverse
	Mine/DN	Wide Sweeps of Open Heather and Moorland	Special Quality	Minor/Moderate to Major Adverse
	Mine/DN	Long Imprint of Human Activity - wealth of archaeology and prehistory	Special Quality	Moderate Adverse
	Mine/DN	A rich and diverse countryside for recreation;	Special Quality	Minor/Moderate to Major Adverse
	Mine/DN	Tranquillity; dark skies at night and clear unpolluted air	Special Quality	Moderate Adverse
	Mine/DN	A place of artistic scientific and literary inspiration; a heritage of authors, artists, scientists and explorers - specifically Coast to Coast Walk	Special Quality	Negligible to Moderate/Major Adverse
	LCP MTS	Footpath 310049 (Egton) Crosses site – proposed to be diverted	PRoW	Major Adverse
	LCP MTS	Footpath 310050 (Egton)	PRoW	Moderate/Major Adverse
	LCP MTS	Footpath 310046 (Egton CP)	PRoW	Moderate/Major Adverse
	LCP MTS	Footpath 310066 (Egton)	PRoW	Moderate Adverse
	LCP MTS	Bridleway 322008 (Hutton Mulgrave)	PRoW	Moderate Adverse
	LCP MTS	Bridleway 310055 (Egton)	PRoW	Moderate Adverse
	LCP MTS	Lady Cross Plantation Caravan & Lodge Park	Passive Rec. Users	Moderate/Major Adverse
	LCP MTS	Users of Access Land to the east of site: Egton Low Moor	Passive Rec. Users	Moderate Adverse to Moderate/Major Adverse

	Site	Spatial scale/sensitive receptor	Type of receptor	Likely significant impact during construction
	LCP MTS	A171 road to north east of site	Users of Public Roads	Moderate Adverse
	LCP MTS	A171 road to north west of site	Users of Public Roads	Moderate Adverse to Moderate/Major Adverse
	LCP MTS	Lane between Egton to A171 passing immediately to the east of site.	Users of Public Roads	Moderate/Major Adverse
	LCP MTS	Short, interconnecting lane to north east of Egton (between lane north of Egton and lane near East End Farm to south east)	Users of Public Roads	Moderate/Major Adverse
	LCP MTS	Wide Sweeps of Heather moorland	Special Qualities	Minor Adverse to Major Adverse
	LCP MTS	A rich and diverse countryside for recreation	Special Qualities	Minor Adverse to Major Adverse
	LCP MTS	Central Valley (8b) Lower Esk Valley (character effects – upper flanks of the Esk Valley)	Landscape Receptors	Moderate/Major Adverse
	LCP MTS	Coast and Coastal Hinterland (4a) Boulby – Whitby	Landscape Receptors	Moderate Adverse
	LB MTS	Bridleway 104604, 104618 (Quakers' Causeway)	PRoW and Named Route	Moderate/Major Adverse
	LB MTS	Footpath 126/5/3 (Millers Lane)	PRoW and Named Route	Major Adverse
	LB MTS	Footpath 126/65/1, Jenny Frisk Rd and Open Access Land	PRoW and Named Route	Moderate/Major Adverse
	LB MTS	Visitors to cairn fields/round barrows, and Listed boundary stones on moors to south	PRoW and Named Route	Moderate/Major Adverse
	LB MTS	User of Access Land on moors	PRoW and Named Route	Moderate/Major Adverse

	Site	Spatial scale/sensitive receptor	Type of receptor	Likely significant impact during construction
	LB MTS	Anglers/Birdwatchers at Lockwood Beck Reservoir	PRoW and Named Route	Moderate/Major Adverse
	LB MTS	Grouse Butts on moorland	PRoW and Named Route	Moderate Adverse
	LB MTS	A171 within 1km	Users of Public Roads	Major Adverse
	LB MTS	Smeathorns Road	Users of Public Roads	Moderate/Major Adverse
	LB MTS	Stanghow Road	Users of Public Roads	Major Adverse
	LB MTS	Swindale Lane	Users of Public Roads	Major Adverse
	LB MTS	P2, P3 and P10, Moorland Fringe Farmland - South Lingdale and Moorsholm, Incised Wooded Valley (Kilton Beck, Handale Beck)	Landscape Receptors	Moderate Adverse
	LB MTS	Character effects on Moorland (1c) Northern Moors	Landscape Receptors	Moderate Adverse to Major Adverse (local)
	LB MTS	Character effects on Coast and Coastal Hinterland (4a) Boulby-Whitby	Landscape Receptors	Moderate Adverse to Major Adverse (local)
Light				
	Mine/DN	No Moderate or Major Adverse effects		
	LCP MTS	No Moderate or Major Adverse effects		
Socio-economics				
	Mine/DN	No Moderate or Major Adverse effects		
	LCP MTS	No Moderate or Major Adverse effects		

	Site	Spatial scale/sensitive receptor	Type of receptor	Likely significant impact during construction
Transport				
	Mine/DN LCP MTS	Severance at Link 45	Pedestrians	Major Adverse
	Mine/DN LCP MTS	Amenity at Link 42	Pedestrians	Major Adverse
	Mine/DN LCP MTS	Fear and intimidation at Link 17	All non-motorised users	Moderate Adverse
Noise				
	Mine/DN	No Moderate or Major Adverse effects		
	LCP MTS	No Moderate or Major Adverse effects		
Air quality				
	Mine/DN	No Moderate or Major Adverse effects		
	LCP MTS	No Moderate or Major Adverse effects		
Amenity and recreation				
	Mine/DN	No Moderate or Major Adverse effects		

Summary of significant impacts in construction

Landscape and visual environment

5.3.35 Visitors to tourist, natural or cultural heritage features, to named/panoramic viewpoints, and to passive/scenic recreational areas and access land, including PRoW and scenic roads/railways, are considered to be highly sensitive to change, in the YPP context.

5.3.36 During the construction of the Mine and the MTS intermediate shaft at Lady Cross Plantation, winding towers, cranes and generator stacks would be visible in distant views against the North Sea/sky horizon in views eastwards across the Ugglebarnby Moor ridge and would form a noticeable element within the

views from an number of other viewpoints within the NYMNP, including along the Coast to Coast Walk. These structures would be visible as man-made elements contrasting with the skyline, in particular from the footpaths and viewing points identified in **Table 5-5**. Cranes would be in operation during the full 58 month construction period.

5.3.37 Generator stacks would be in place from month 10 until month 57 (47 months duration). Construction phase lighting arrangements would remain in place for the full 58 month construction period. All temporary Phase 1 construction effects are considered to be reversible in the context of view character with the exception of landform changes which would a permanent and irreversible effect where visible.

5.3.38 This would result in moderate and major adverse impacts occurring along a number of public rights of way, public roads, visitor sites and landscape features, as set out in **Table 5-5**.

5.3.39 This represents a worst-case assessment, because users of these locations are likely to be transient and are unlikely to be subject to the same exposure duration as defined for fixed property receptor locations.

5.3.40 Nonetheless, this could be expected to divert or deter some visitors or tourists. The Ipsos Mori Visitor Survey was undertaken to assess potential park visitors' perceptions of the YPP and its effects on the NYMNP. This included a number of images illustrating how the Mine Site will look from a number of key viewpoints. When asked questions related to landscape damage to the park during the construction phase, less than a third of respondents stated that the damage would be "too much":

- During construction, the mine will cause too much damage to landscapes in the National Park – 29% agree and 31% disagree[2]
- During construction of the tunnel, the disruption will stop people coming to the National Park – 31% agree and 35% disagree.
- The construction of the access point within the National Park will cause too much damage to the national park – 28% agree and 31% disagree.

5.3.41 .For those survey respondents who stated that they were certain or likely to use the Coast to Coast walk were given a further description of the mine development including images of how it would appear from this walk. When asked what impact the development would have on the likeness to use the route just over half say it would make no difference (54%); 12% said they don't know and 19% say they would be less likely to. 11% stated that they would be more likely to so.

Traffic and transport

5.3.42 In line with the YPP Transport Strategy, a suite of assumptions have been developed to enable realistic worst case traffic generation to be established and inform the impact assessment. A worst case scenario has been assumed in terms of traffic volume, timings and number of HGVs to ensure that the

[2] Ipsos Mori, page 46

significant effects reflect maximum potential impact. As the traffic assessment relates to the full road network required to service the development, the YPP is assessed as a whole (see **Part 2**, **Section 6**). Traffic impacts have the potential to reduce tranquillity within NYMNP and deter visitors from certain routes.

5.3.43 An absolute worst case theoretical month has been derived, whereby the MTS would generate 212 two-way daily movements at the same time that the mine peaks at 100 two-way daily movements (month five). The peak period for HGV movements has also been assumed to coincide with the peak resourcing requirements of up to 1,411 employees (month 29 for the mine and months 24 – 26 for the MTS). Outside of the peak construction window, HGV numbers average out at 139 two-way HGV movements per day, whilst daily employee numbers averaged over the entire project for the mine and MTS are 714.

5.3.44 A wide range of local recreation clubs, destinations and associations have been contacted as part of the consultation process as outlined in **Part 2 Section 6 Traffic and Transport**. Some consultees raised concerns about the disruption caused by increased traffic and associated dust etc.

5.3.45 In consultation with North Yorkshire County Council (NYCC), a number of mitigation measures have been proposed, including the provision of a new footway along the A171 between Fairfield Way and Enterprise Way, diversion, improved crossing points, temporary speed limits and temporary route diversions and redistribution of bulk material deliveries to take account of sensitive receptors. These are set out in more detail in **Part 2 Section 6**. These interventions would reduce potential transport impacts to minor or negligible effects.

5.3.46 As set out in **Table 5-5**, moderate and major adverse impacts on non-motorised road users have been predicted at Link 45, 42 and 17. These relate to severance, reduced amenity and increased fear and intimidation on the road, respectively. These effects are geographically distant from each other meaning it is very unlikely that a visitor would experience all of these in a single trip. Effects on pedestrian and driver delay and safety are assessed to be negligible or minor on all links.

Recreation and amenity

5.3.47 The assessment of recreation and amenity considered the effects on visitors and residents of:

- Obstruction to PRoW.
- Disturbance to users of PRoW from traffic, noise, dust, and landscape and visual changes.
- Obstruction to sports and recreation facilities, open access land and public open space.
- Disturbance to sports and recreation facilities, open access land and public open space from traffic, noise, dust, and landscape and visual change during the various development stages.

5.3.48 The effects of the construction of the Mine with respect to these issues are predicted to be negligible or minor with the exception of:

- Obstruction due to increased traffic at A171 at Enterprise Way (PRoW 319655) – Link 23 (just outside NYMNP boundary).
- Obstruction due to increased traffic at B1416 (PRoWs 333022, 313660, 313661 and 313662).
- Obstruction due to increased traffic at A171 (PRoWs 30.5/3/1, 30.5/5/1 and 30.3/11/1) – Link 27.

5.3.49 Links 27 and 23, and associated PRoW are of local (low) importance and would experience a short term and intermittent effect only. With respect to the B1416, crossing between the proposed diversion onto PRoW 313662 via the B1416 would be facilitated by the implementation of a temporary speed limit of 30mph to mitigate against the increased HGV traffic, reducing the effect to intermittent and minor adverse.

5.3.50 No obstruction to sports or recreation facilities within the NYMNP is considered to be significant.

Socio-economics

5.3.51 See Project wide temporary accommodation supply above.

Operation

5.3.52 At Year 1 of operation, all of the landscape and visual impacts from PRoW would be reduced to minor or negligible significance, as mitigation in the form of green screening with vegetation matures. As this vegetation grows, the landscape and visual impact would decline to insignificance in all cases. There are no other significant adverse effects which could have an impact on tourism identified during the operation of the YPP.

Summary of Ipsos Mori findings

5.3.53 In order to support an assessment of the potential for the project to impact on tourism, York Potash commissioned a survey of visitor perceptions, which was undertaken by Ipsos Mori.

5.3.54 The objectives of the study were:

- To understand visitors' attitudes to the proposed development, their perceptions of how it may impact upon the National Park, and how it might affect their likelihood to visit the National Park in the future; and
- To calculate an estimate of overall impact in terms of visitor numbers to the National Park and also in terms of income from tourism.

5.3.55 The survey was designed to provide reliable data and evidence to support forecasting while recognising that even well-designed surveys will have limitations. Forecasting a possible impact based on stated intention cannot be completely accurate (nor without uncertainty), but it is still an accepted method of estimating impact.

5.3.56 The project was subject to external review by independent, industry-leading peer reviewers as well as internal review and as a result of these processes, Ipsos Mori is confident that the research delivers against the objectives set and that the survey and the estimates of economic impact are objective, balanced and robust. The report provides full transparency on the methods used, their assumptions, limitations and application, and the findings.

5.3.57 Despite this, in common with any perceptions survey, it has a number of limitations, which are clearly set out in the report on the survey's findings. Some of these are dealt with in the methodology, but there remain issues of response bias because of the prominence of the issue being surveyed (the Mine project). Whilst the survey is strong at measuring perceptions it is less reliable in actually predicting future actions (although the survey does include some factoring to deal with over-claim) and then quantifying the outcome in economic terms. To address this, the survey forms only part of Quod's overall assessment of tourism impacts.

5.3.58 The conclusions of the survey are primarily based on comparing the change in respondents' attitudes to visiting the NYMNP before and after they had been given a description of the project. Respondents were asked in what ways the description had changed their views on visiting the NYMNP and how many nights they would stay on their next visit. Comparing this to how many nights respondents said they would stay before the project was introduced, enabled Ipsos Mori to calculate the total percentage change in visiting behaviour. Those who were considering visiting for a day trip rather than an overnight stay, and those that had not visited the area before were much more likely to be affected by the project.

5.3.59 Ipsos Mori took the percentage change of visitor days and applied it to the NYMNP 2012 STEAM Report, which enabled them to estimate the possible economic impact of the project on tourism in the NYMNP as follows:

- a negative annual impact of -£10.3 million during the construction period; and,
- a negative annual impact of -£5.2 million during operations.

5.3.60 These overall results are relatively small in relation to total tourism income in the NYMNP – a loss of 3.4% during the construction phase and 1.7% during operations.

Mitigation

5.3.61 Based on the technical assessments summarised here, the potential for adverse impacts on tourism as a result of the YPP is limited. However, the perceptions survey produced by Ipsos Mori has raised the potential that some visitors may be deterred from visiting the area.

5.3.62 YPL is therefore proposing providing funding to support local, national, and international promotion of the North York Moors as a high quality tourism destination. This is set out in detail in the Economic Impact Report which is submitted alongside this application.

Residual impacts

5.3.63 In the context of the diversity and breadth of the NYMNP tourism offer, the impacts are expected to affect a limited area of the park and be limited in their nature.

5.3.64 The York Potash Project create would not create any significant adverse effects with respect to light, noise, socio-economics or air quality during either its construction or operation.

5.3.65 Some significant adverse effects arising during construction have been identified, namely:

- landscape and visual effects resulting from built structures; and,
- Disruption to a small number of pedestrian/cyclist routes.

5.3.66 These effects would last for the duration of the 58 month construction period although, for many visitors, their experience of these effects would be intermittent. For example, only certain sections of a PRoW may be affected by traffic obstruction or a view of the YPP. In the context of a full day spent in NYMNP, the effect would only be experienced for a small proportion.

5.3.67 The most prolonged visual impact would be experienced by walkers and cyclists along the Coast to Coast Walk and Moor to Sea Cycle Network (route 9, Langdale End to Whitby).

5.3.68 These effects would occur during the construction period. There would be no major adverse effects related to tourism that would continue beyond the construction period, and most remaining visual impacts would be reduced to minor or negligible significance after 1 year of operation; and negligible to neutral significance by 15 years, as plants designed for visual screening mature.

5.3.69 Whilst these assessments measure the actual effects on the landscape and environment of the NYMNP, the actual effect on the tourism industry and visitor numbers would relate to visitor perceptions of these effects. The visitors' survey commissioned by YPL was undertaken to supplement the technical assessments and gauge visitor perceptions of the proposals.

5.3.70 This indicates that, without mitigation, tourism numbers are expected fall, but the impacts would be slight in the context of the NYMNP tourist economy, and are likely be short term and would be experienced mostly during construction. Based on the survey responses this could equate to a potential income reduction of £10.3m during construction and £5.2m during operation. However, there is a recognised degree of uncertainty about these results, given the issue of response bias and an over representation of people in the sample who have knowledge of the proposals, as outline above.

5.3.71 Based on these factors and the limited extent of actual impacts, the perception survey is likely to overstate the impacts substantially and, whilst there is a risk of adverse effects, they would be smaller than the economic benefits associated with the YPP as a whole. Negative effects could be limited further through a marketing programme to offset negative perceptions, which would be funded by YPL.

5.3.72 The residual effect on tourism is therefore assessed to be no worse than **minor adverse** during the construction phase and **negligible** during operation **at a NYMNP level**.

Project wide effect on displacement

5.3.73 Included in the Economic Impact Report is an assessment of the potential displacement effects of operation of the YPP. In the context of the size of the global market, the capacity for the YPP to employ staff that do not require prior mining experience and the current investment at Cleveland Potash Ltd, the displacement effect is expected to be of **negligible** significance.

Conclusion: project wide macroeconomic effects during operation

5.3.74 The YPP would make substantial contributions to direct, indirect and induced employment, GVA and National Government tax. Whilst these effects are very large, especially for the effects of a single project, they may be dispersed around the country and, in the context of the UK economy as a whole, their significance would be **negligible**. However, inevitably, this would be true for any single project. Moreover, the project would have significant and positive economic benefits, directly, through employment and output and, indirectly, through the supply chain and employee expenditure. It would result in an increase in GDP; a nationally significant reduction in the trade deficit; over 1,000 high value direct jobs and many more in the supply chain, boosting the employment rate and spending power; corporate and income tax receipts; and royalty payments. The project would be effective in contributing to meeting a need to rebalance the national economy and substantially strengthen the regional and local economies.

5.3.75 The *Economic Impact Report* that accompanies this application (see **Document 7.3A**) sets out the economic effects of the proposals in detail, set in the context of national policy considerations and the Major Development Test.

5.3.76 The in-combination macro-economic effects at **national level** with respect to exports would be of **major beneficial** significance and permanent. The combined economic macro-effects at a **local and regional (LEP) level** would also be of **major beneficial** significance and permanent.

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6 TRAFFIC AND TRANSPORT

6.1 Introduction

6.1.1 The Harbour facilities **ES** (**Section 12 Traffic and Transport**) includes an assessment of the residual impacts of the traffic and transport associated with the construction and operational phases of the proposed Harbour development and forecasts worst case impacts of minor adverse and negligible significance.

6.1.2 It is noted, however, that other elements of the YPP would generate traffic flows that 'in-combination' potentially could increase the significance of the impacts assessed for the Harbour facilitates. Hence, this section of the CIA describes the existing environment in relation to traffic and transport and the potential impacts of the construction and operation phases of the YPP as a whole.

6.1.3 The assessment includes the traffic demand from all elements of the YPP and assesses the realistic worst case in-combination effects within the study area. **Table 6-1** below details the elements that have informed the worst case (in-combination) assessment scenarios adopted.

Table 6-1 Summary of realistic worst case assessment scenarios

Construction Worst Case (in-combination) Elements	Operation Worst Case (in-combination) Elements
1. Mine and mine surface development 2. MTS, including above ground activities at: - Dove's Nest (MTS shaft), and - all Intermediate MTS shaft sites 3. Wilton MTS Portal 4. MHF Phase one construction 5. Harbour facilities Phase one construction	• Mine, MTS, MHF and Harbour facility all operating at full phase two capacity of 13 Mtpa

6.1.4 Traffic borne noise, vibration and air quality effects are assessed separately in **Part 2**, **Section 7 Noise and Vibration** and **Part 2**, **Section 8 Air Quality**; and the predicted impact of increases in traffic upon landscape and ecology are assessed in **Part 2**, **Section 12 Landscape and Visual Environment** and **Part 2 Section 11 Terrestrial Ecology**.

6.2 Methodology

Introduction

6.2.1 The assessment methodology presented in **ES Section 12** has been utilised in this CIA. For clarity, the salient parts of that methodology are repeated to assist with an understanding of the approach adopted.

6.2.2 The baseline environmental studies, surveys and impact assessment for transport have been conducted in accordance with the relevant best practice and standard methodologies, as follows:

- The Design Manual for Roads and Bridges (DMRB), Department for Transport (1992) (and subsequent amendments).
- The Guidelines for the Environmental Assessment of Road Traffic (GEART) (Published January 1993 by the Institute of Environmental Assessment).

Transport strategy

6.2.3 ES Section 12 sets outs the policy imperative to manage traffic demand to mitigate adverse environmental impacts. However, the Mine and MTS intermediate shaft sites are located away from transport hubs/interchange which necessitates that all materials and the majority of personnel would arrive via road.

6.2.4 To address this conflict, an overarching YPP Transport Strategy was developed with a package of bespoke embedded mitigation measures to achieve the policy aim. The Transport Strategy consists of the following measures:

1. Clearly defined delivery routes for HGV deliveries utilising the 'A' road network for all trips (save for direct access to the Mine which utilises the B1416).
2. Stockpiling provision to manage the daily and hourly flows of HGVs on the network.
3. Park and Ride (P&R) facilities at Whitby for Mine construction personnel and/or direct bus /minibus transport to site.
4. P&R facilities at Whitby Cross Butts and Scarborough (A64) for Mine operational personnel.
5. A landscape strategy to retain the majority of Mine arisings on site.
6. A landscape strategy to retain MTS arisings at shaft site locations.
7. Restricted parking at the Mine, MTS intermediate shaft sites, MHF and Harbour for both construction and operation personnel.
8. A car sharing policy for direct trips to the MTS sites, MHF and Harbour during construction.
9. A car sharing policy for direct trips to the Mine during operation.

6.2.5 The Transport Strategy has informed a series of embedded mitigation measures which have, in turn, informed the traffic derivation for the impact assessment. Full details of the proposed embedded mitigation are contained in **Section 6.5**.

6.2.6 With regard to personnel trips, the level of contribution required from each of the Transport Strategy measures (e.g. number of P&R spaces, car share ratios, and mini-bus fleets) would be determined when the workforce is recruited and their demographic contribution assessed. In the interim, a socio-economics study has informed likely parameters, further details of which are included in **Section 6.4**.

Study area

6.2.7 The study area has been informed by the most probable routes for traffic, for both the movement of materials and employees, during both construction and operational phases of the project. A wider

study area has been developed to enable all traffic generated by all elements of the YPP to be assigned to the highway network and the in combination traffic effects assessed at a local level.

6.2.8 In consultation with stakeholders two local study areas have been developed to enable reviewers to concentrate on assessments specific to their administration areas. The local study areas and stakeholder interests are detailed in **Table 6-2; ES Chapter 12, Appendix 12.1, Figure 12.1 and 12.2** provides details of the wider study area and the local study areas.

Table 6-2 CIA local study area/stakeholders

Study Area	Stakeholder interest
Redcar and Cleveland	• Redcar and Cleveland Borough Council (RCBC) • Middlesbrough Council (MC) • Highways Agency (HA) • North York Moors National Park Authority (NYMNPA)
North Yorkshire	• North Yorkshire County Council • NYMNPA

6.2.9 For the purpose of the Harbour facilities, the relevant local study area is Redcar and Cleveland. This section, therefore, considers the cumulative traffic generated by all elements of the YPP and assesses the resultant effects that are evidenced within the Redcar and Cleveland local study area.

6.2.10 The cumulative impact of YPP traffic on the North Yorkshire local study area was considered in an application for the Mine and MTS to NYMNPA and RCBC reference NYM/2014/0679/MEIA and R/2014/0627/FFM respectively. For consistency and ease of cross reference between applications, link, junction and accident cluster notation for the wider study area has been adopted in all submission documents and is, therefore, referenced in this chapter.

Characterisation of the existing environment

6.2.11 Characterisation of the existing environment has been informed by a number of sources, including:

- Traffic count data from the Department for Transport.
- Traffic count data from sourced from MC, NYCC and the HA.
- Traffic count data from AECOM (for the withdrawn Mine application).
- Desktop studies and site visits.
- Personal injury collision data sourced from NYCC and RCBC.
- Traffic surveys commissioned by YPL.

Methodology for identifying sensitive highway links

Sensitive receptors

6.2.12 GEART identifies that it is useful to identify particular groups or locations which may be sensitive to changes in traffic conditions and provides a checklist of sensitive locations and groups; however the list is not exhaustive and can be added to by the assessor. Sensitive locations include:

- Hospitals.
- Churches.
- Schools.
- Tourist attractions, including historical buildings.
- Open spaces and recreational sites.
- Shopping areas.
- Residential areas.
- Sites of ecological/nature conservation value.

6.2.13 Sensitive groups include:

- Children.
- The elderly.
- The disabled.
- People walking and cycling.

Receptor susceptibility to changes in traffic

6.2.14 GEART notes "The perception of changes in traffic by humans, and the impact of traffic changes on various ecological systems will also vary according to such factors as:

- *Existing traffic levels;*
- *The location of traffic movements;*
- *The time of day;*
- *Temporal and seasonal variation of traffic;*
- *Design and layout of the road;*
- *Land-use activities adjacent to the route; and*
- *Ambient conditions of adjacent land-uses."*

6.2.15 GEART further notes "The same type of development with the same traffic generation may, however, produce a different environmental impact in one location from another, dependent upon traffic levels on the affected route and the adjacent land uses".

6.2.16 The premise for this statement is that different locations have different sensitivity to changes in traffic flow depending on the spatial environment. The methodology outlined below captures this guidance.

6.2.17 A desktop exercise augmented by site visits has been undertaken in this case to identify the main sensitive receptors in the local study area. These are illustrated graphically in ES Section 12, Appendix 12.1, Figure 12.3.

6.2.18 The highway network within the study area has then been divided up in to discrete lengths (links) reflecting the highway/spatial character.

6.2.19 The sensitive receptors within the study area have been assigned to the nearest highway link, and the relationship with the highway environment has been examined to understand the sensitivity of those receptors to change.

6.2.20 The link sensitivity has been determined by the concentration of sensitive receptors and the highway environment. For example, pedestrians are less sensitive to changes in traffic if there are adequate footways, and crossing facilities. However, links where there will be high concentrations of sensitive locations (such as Hospitals, Schools and Tourist Attractions) are likely to be highly sensitive to changes in traffic flow unless there is separation from traffic.

6.2.21 Table 6-3 sets out the parameters that have informed the assignment of link sensitivity.

Table 6-3 Link characteristics

Link sensitivity	Link characteristics
Low	Few sensitive receptors and / or highway environment can accommodate changes in volumes of traffic.
Medium	A low concentration of sensitive receptors (e.g. residential dwellings, pedestrian desire lines, etc.) and limited separation from traffic provided by the highway environment.
High	High concentrations of sensitive receptors (e.g. hospitals, schools, areas with high tourist footfall etc.) and limited separation provided by the highway environment.

6.2.22 All routes within the study area have been assessed and assigned link sensitivity. **Table 6-4** provides an overview of each of the links and the rationale for the determined link sensitivity. Further detail with regard to the existing baseline conditions for all of the links within the local study area is provided within **Section 6.3**.

Table 6-4 Link sensitivity

Link	Description	Link sensitivity	Rationale for link sensitivity
1	A19 (west of Middlesbrough)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
2	A66 (north of Middlesbrough)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
3	A1053 (east of Middlesbrough)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
4	A174 (south of Redcar)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
5	A174 (south of Middlesbrough)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
6	A171 (Ormesby Bank)	Medium	The link is a main (A) road with footways and crossing facilities but severs a residential area and has properties directly fronting the road.
7	A172 (Dixons Bank)	Medium	The link is a main (A) road with footways and crossing facilities but severs a community with schools, shops and residential properties fronting the road.
8	A172 (towards Stokesley)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
9	A1043 (south of Middlesbrough)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
10	A171 (Middlesbrough Road)	Low	A modern main (A) road designed to carry high quantities of traffic, with no frontage development.
11	A173 (Skelton Ellers)	Low	A main (A) road with no frontage development.
12	A171 (between the A173 and Scaling Dam)	Low	The link is a main (A) road with sporadic small settlements.

Link	Description	Link sensitivity	Rationale for link sensitivity
14	A174 (Apple Orchard Bank)	Medium	The link is a main (A) road with no frontage development until edge of Skelton-in-Cleveland settlement where there are residential properties and a community centre that front directly on to the road with narrow footways.
15	A174 (Skelton-in-Cleveland)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.
44	A1085 (Trunk Road)	Low	A modern main (A) road with no frontage development designed to carry high quantities of traffic.

6.2.23 In addition to the highway links, collision clusters and congested junctions have also been assigned a degree of sensitivity. Identified collision clusters and junctions with no reserve capacity have been assigned high sensitivity.

Screening process

6.2.24 The following rules, taken from the GEART, have informed the screening process and thereby defined the extent and scale of this assessment:

1. Rule 1: Include highway links where traffic flows are predicted to increase by more than 30 per cent (or where the number of HGVs is predicted to increase by more than 30 per cent).
2. Rule 2: Include any other specifically sensitive areas where traffic flows (or HGV component) are predicted to increase by 10 per cent or more.

6.2.25 In justifying these rules GEART examines the science of traffic forecasting and states:

"It is generally accepted that accuracies greater than 10% are not achievable. It should also be noted that the day to day variation of traffic on a road is frequently at least + or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact.

…a 30% change in traffic flow represents a reasonable threshold for including a highway link within the assessment."

6.2.26 Therefore, changes in traffic flows below the GEART Rules (thresholds) are assumed to result in no discernible or significant environmental effects and have not, therefore, been assessed further as part of this study.

6.2.27 Adapting GEART screening thresholds to the study area, Rule 1 has been applied to all low and medium sensitivity links and Rule 2 to all high sensitivity links.

Assessment of impacts

6.2.28 Having applied the screening exercise to narrow down the study area to only those links that have the potential to exhibit a significant impact, it is necessary to establish the significance of any impact. The methodology achieves this by examining the 'magnitude of effect' on the sensitive routes.

6.2.29 A magnitude of effect is established by applying GEART, which sets out considerations and, in some cases, thresholds in respect of changes in the volume and composition of traffic to facilitate a subjective judgement of traffic impact and significance.

6.2.30 The following environmental effects have been identified as being susceptible to changes in traffic flow and are appropriate to the local area.

Severance

6.2.31 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impede pedestrian access to essential facilities. Severance effects could equally be applied to residents, motorists, cyclists or pedestrians.

6.2.32 GEART suggests that changes in total traffic flow of 30 per cent, 60 per cent and 90 per cent are considered to be slight, moderate and substantial respectively.

Pedestrian amenity

6.2.33 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width and separation from traffic. GEART suggests that a threshold of a doubling of total traffic flow or the HGV component may lead to a negative impact upon pedestrian amenity.

Fear and intimidation

6.2.34 Pedestrians can experience fear and intimidation related to traffic, whereby the volume, speed, HGV composition and the proximity to people can increase the levels of fear and intimidation experienced. Whilst GEART recognises that there is an absence of commonly agreed thresholds it does suggest that average traffic flows over 18 hours of 600 – 1,200, 1,200 – 1,800 and 1,800 + could result in moderate, great and extreme impacts, although noting other factors such as the proximity to traffic, speed and pavement width need to be considered.

Pedestrian delay

6.2.35 Pedestrians can experience delays and difficulties crossing roads related to changes in traffic, volume, composition and speed. GEART advises that in general increases in traffic will lead to increases in delay, but also notes that delays will also be dependent upon the level of pedestrian activity, visibility and site conditions.

6.2.36 Research undertaken by the Transport and Roads Research Laboratory (1977) in supplementary report 356 (TRRL 356) developed formulas for calculating the potential for increases in pedestrian delay related to the volume of traffic at different types of crossings.

Highway safety

6.2.37 The salient GEART guidance on highway safety is as follows:

> *"Where a development is expected to produce a change in the character of traffic (e.g. HGV movements on rural roads), then data on existing accidents levels may not be sufficient. Professional judgement will be needed to assess the implications of local circumstances, or factors which may elevate or lessen the risk of accidents, e.g. junction conflicts."*

6.2.38 In accordance with the guidance an examination of the existing collisions within the study area has been undertaken to identify any collision clusters with an emerging pattern of collision types. These sites are considered to be sensitive to changes in traffic flows (sensitive receptors) and therefore more detailed analysis of local factors has been undertaken in the context of the proposals.

Driver delay

6.2.39 GEART recommends the use of proprietary software packages to model junction delay and therefore estimate increased vehicle delays. However, it is noted that vehicle delays are only likely to be significant when the surrounding highway network is at, or close to, capacity.

6.2.40 In addition to the consideration of driver delay at junctions, the potential for driver delay resulting from increased HGV traffic and the transportation of Abnormal Indivisible Loads (AILs) has been considered.

6.2.41 **ES Section 12, Appendix 12.3**, Annex 8 contains a routing feasibility assessment produced by Wynns Limited. The assessment considers a worst case load envelope (associated with the movement of a 3.7m square 90 tonne tunnel boring machine component) and details the most suitable routes and mitigation measures to reduce the impacts. Prior to movement of loads, full consultation would be undertaken with the highway authorities and Police to ensure delivery is scheduled to minimise delay on the highway network.

Impact evaluation

6.2.42 **Table 6-5** details the assessment framework used herein adapted from GEART. These thresholds are guidance only and provide a starting point from which additional evidence (for example more detailed traffic analysis and site observations) and professional judgement will inform an analysis of the magnitude of effect.

Table 6-5 Traffic and transport assessment framework

Effect	Magnitude of effect			
	Very Low	**Low**	**Medium**	**High**
Severance	Change in total traffic flow of less than 30%	Change in total traffic flows of 30-60%	Change in total traffic flows of 60-90%	Changes in total traffic flows of over 90%
Pedestrian amenity (including cyclists)	Changes in traffic flow (or HGV component) less than 100%	Greater than 100% increase in traffic (or HGV component) and a review based upon the quantum of vehicles, vehicle speed and pedestrian/cycle demand		
Fear and intimidation **	Average traffic flows over 18 hours of less than 600 vehicles/hour or 1,000 HGVs over 18 hours		Average traffic flows over 18 hours between 600 –1,200 vehicle/hour or more than 1,000 – 2,000 HGVs over 18 hours	Average traffic flows over 18 hours of more than 1,200 vehicles/hour or more than 2,000 HGVs over 18 hours
	Potential vehicle speeds and pedestrian provision are also a consideration.			
Pedestrian delay	A review of existing crossing facilities, pedestrian demand and calculated delays.			
Highway safety	1. Analysis of Personal Injury Collision records to identify clusters and/or trends. 2. Analysis of Personal Injury Collisions relating to overtaking on haul route links			
Driver delay	Vehicle delay and queues as forecast using junction modelling software and a review of journey times on haul route links.			

Notes:

*** Crompton 1981, uses the terminology moderate, great and extreme to describe the magnitude of effect, impacts less than moderate have been interpreted to be very low to low and impacts of moderate are interpreted as medium and great to extreme as high.*

6.2.43 **Table 6-6** sets out the assessment matrix adopted for routes that meet the screening criteria (Rule 1 and 2). This combines the assessment of the magnitude of effect, derived from the framework included in Table 6-5, with the receptor value presented in **Table 6-4** in order to determine the significance of the potential impact.

6.2.44 Note that for the purposes of this assessment, major and moderate impacts are deemed to be significant. In addition, whilst minor impacts are not strictly considered to be significant in their own right, it is important to distinguish these from other non-significant impacts, as they may contribute to significant impacts cumulatively or through impact interactions.

Table 6-6 Traffic and transport significance impact assessment matrix

Receptor / Link sensitivity	Magnitude of effect			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible

6.3 Baseline environment

Introduction

6.3.1 The proposed Mine would be located at Dove's Nest Farm approximately 4km south from the outskirts of Whitby on the B1416.

6.3.2 The MTS would transfer the minerals from Dove's Nest Farm approximately 36.7km in a north westerly direction to the proposed MHF and Harbour at Teesside. The MTS includes three intermediate shaft sites at Lady Cross Plantation, Lockwood Beck Farm and Tocketts Lythe which are within close proximity to the A171.

6.3.3 From the MHF, the product would be transported by conveyor to the proposed port terminal. Both the Harbour facilities and MHF can be accessed via the A66 and the A1085 Trunk Road.

6.3.4 Whitby is situated on the east coast of the UK, bounded by the NYMNPA to the west, south and east of the town, making it a popular tourist destination. Access to the wider strategic highway network is predominately via the A171 heading west linking to the A172, A174 and onto the A19. The A171 heads south from Whitby linking to the A64 south of Scarborough.

6.3.5 Scarborough is a large seaside town on the east coast of the UK bounded by the NYMNPA to the north

and west and the North Sea to the east. Access to the wider strategic network is from the A64, which heads south-west towards York, and via the A170 heading west, linking with the A19 and A1(M) near Thirsk. The A165 also heads south from Scarborough, along the east coast, towards Hull.

6.3.6 The NYMNP can be navigated by the A171 to the north and west linking Teesside to Whitby to Scarborough. The A170 located south of the park, links Scarborough to Thirsk. The A169 links Pickering to Whitby routing south to north through the park.

6.3.7 Teesside is the given name for a group of towns situated in the north east of England. It incorporates the towns Middlesbrough, Stockton-On-Tees, Thornaby-on-Tees, Billingham, Cleveland, Redcar and other smaller settlements near the River Tees. Access to the wider strategic highway network is predominantly via the A66 and A19 dual carriageways, which link to the A1(M). The A1(M) provides access to the key north south corridor passing close to Newcastle upon Tyne and Leeds. The A1(M) also provides access to the east west transport corridor of the M62.

6.3.8 The characteristics of the highway environment for the links within the Redcar and Cleveland study area are described below.

Link 1

6.3.9 The A19 connects York to the south with Newcastle upon Tyne to the north passing the North York Moors to the east. The A19 is a high speed modern dual carriageway with two lanes in each direction widening to three and four lanes within the Middlesbrough region. The road is subject to the national speed limit and forms part of the strategic road network.

Link 2

6.3.10 The A66 is the main west to east traffic route connecting Teesside to Workington on the west coast. To the west the A66 passes through Darlington and providing wider links to the A1(M) and M6 and to the east the A66 terminates at A1053/A1085 roundabout. Within the study area the A66 is a high speed dual carriageway with two lanes in each direction.

Link 3

6.3.11 The A1053 links the A66 to the north with the A174 to the south. The road is a dual carriageway and subject to the national speed limit. The A1053 forms part of the strategic road network.

Link 4

6.3.12 The A174 from its junction with the A1053 heading west is a high speed dual carriageway. The road narrows to a single carriageway after the roundabout for Grewgrass Lane, which is crossed by a PRoW.

Link 5

6.3.13 The A174 from its junction with the A1053 heading east is a modern dual carriageway and connects to the A19 to the west, where it connects to the wider highway network. The road is subject to the national speed limit and forms part of the strategic road network.

Link 6

6.3.14 The A171 south of the A174 travels through a residential area where properties front on to the road. The road is single carriageway with continuous footways on both sides and includes on-road cycle routes in parts. This section of the road is subject to a 30mph a speed limit.

Link 7

6.3.15 From its junction with the A174, the A172 extends south east through a built up urban environment passing sensitive receptors such as a school and residential properties to the junction with the A1043. This section of road is single carriageway and subject to 30 and 40mph speed limits with an on-road cycle lane in parts.

Link 8

6.3.16 From its junction with the A1043, the A172 changes in character to a modern 'A' road with no frontage development and continues south towards Stokesley. This section of the A172 is subject to national speed limit reducing to 40mph upon the approach to Nunthorpe, the road is also crossed by numerous PRoW.

Link 9

6.3.17 The A1043 connects the A172 to the A171 and is a modern single carriageway road subject to the national speed limit and is crossed by an existing PRoW.

Link 10

6.3.18 This section of the A171 is a modern dual carriageway to its junction with Guisborough where the road becomes a modern single carriageway; both sections are subject to the national speed limit. The road is crossed by a number of PRoW including 'Tees Link' a Long Distance Walking Route.

Link 11

6.3.19 The A173 is a single carriageway road subject to the national speed limit linking Guisborough with Skelton in Cleveland to the north. From its junction with the B1268 the route comprises a series of tight bends before entering Skelton in Cleveland.

Link 12

6.3.20 The A171 heads east towards Whitby and is the main east to west link through the NYMNP and is typically subject to the national speed limit apart from where the route passes by small sporadic settlements where the speed limit drops to 50mph. The road is mostly single carriageway; however, a crawler lane is provided in both directions where the road negotiates a series of tight bends and a 10% gradient hill at Birk Brow Bank. Two PRoW cross this section of road, one of which is the 'Cleveland Way' a National Trail.

Link 14

6.3.21 This section of the A174 is a single carriageway road passing some sensitive receptors in Skelton-in-Cleveland, such as residential frontage and a community centre. There are some sharp bends on the road as it passes through Spring Wood. The road is subject to national speed limit before reducing to 30mph within Skelton-in Cleveland.

Link 15

6.3.22 This section of the A174 is modern single carriageway road which bypasses Skelton-in-Cleveland and Brotton, as the road approaches Brotton a crawler lane is provided for slow moving vehicles up a steep section of road. The road is subject to the national speed limit and crossed by numerous PRoW.

Link 44

6.3.23 The A1085 begins at the junction with the A66 and A1053 and bounds Redcar to the north. The road is a dual carriageway subject to the national speed limit, with segregated cycle routes provided along both sides of the road.

Traffic flow data

6.3.24 Existing traffic flow data for all the key roads within the local study area has been captured from a number of primary and secondary sources. The datasets used in the assessment are summarised in **Table 6-7** below and shown graphically in **Part 2 Appendix 6.1, Figure 6.1**.

6.3.25 A total of 15 count sites have been employed for the purposes of this assessment, representing the most up to date validated data available at commencement of the assessment. The resultant baseline traffic flow data for the SRN and local highway network is summarised in **Table 6-8**.

6.3.26 It should be noted the technology employed at the permanent ATC sites classifies vehicle type by length, and it is not possible to differentiate HGVs from buses and coaches. Therefore, this assessment uses the term HGV as a proxy for a collective of those vehicle types for both baseline data, development generated traffic and (recognising the similar environment characteristics of the vehicle types) the impact assessment. All classified counts have been adjusted to provide the same input data as the ATCs.

Table 6-7 Traffic count data sources

Source / Commissioned by	Type	Available Data	Date / Period
Department for Transport	Calculated Annual Average Daily Flows (AADF)	Classified AADF	An average day in 2012
Royal HaskoningDHV (RHDHV)	Temporary Automatic Traffic Counts (ATC)	7-day ATCs on selected links.	22 November 2013 – 26 November 2013 8 May 2014 – 15 May 2014
RHDHV	Manual Classified Counts	Classified turning counts at selected junctions within RCBC area	12 March 2014 (07:30 – 09:30, 13:00 – 15:00 and 16:30 – 18:30)
iddlesbrough Council	Permanent ATC	Hourly traffic flows	1 October 2013 – 30 September 2014 Continuous seven day, 24 hour counts
North Yorkshire County Council	Permanent ATC	Hourly traffic flows	Vehicles length classification, 1 October 2012 – 30 September 2013 Continuous seven day, 24 hour counts

Table 6-8 Existing daily traffic flows

Link	Description	Background 2012/2013/2014 flows (24hr AADT*)	
		Total Vehicles	Total HGVs
1	A19 (west of Middlesbrough)	91,852	6,407
2	A66 (north of Middlesbrough)	26,136	2,208
3	A1053 (east of Middlesbrough)	12,179	1,057
4	A174 (south of Redcar)	30,855	1,286
5	A174 (south of Middlesbrough)	25,520	1,513
6	A171 (Ormesby Bank)	14,836	394

Link	Description	Background 2012/2013/2014 flows (24hr AADT*)	
		Total Vehicles	Total HGVs
7	A172 (Dixons Bank)	19,732	719
8	A172 (towards Stokesley)	11,196	454
9	A1043 (south of Middlesbrough)	13,044	553
10	A171 (Middlesbrough Road)	20,015	793
11	A173 (Skelton Ellers)	5,344	296
12	A171 (between the A173 and Scaling Dam)	9,683	525
14	A174 (Apple Orchard Bank)	11,601	393
15	A174 (Skelton-in-Cleveland)	10,646	537
44	A1085 – Trunk Road	17,406	839
Key			
*	AADT – Annual Average Daily Traffic		
	2012 traffic flows, sourced from the Department for Transport		
	2013 / 2014 traffic flows, from commissioned traffic counts		
	2013 / 2014 traffic flows, sourced from Middlesbrough Council		

6.3.27 To derive the future year baseline traffic demand for the CIA, the observed 2012, 2013 and 2014 traffic flows have been factored up to 2015 (the start of construction) and 2020 (the first year of operation) as presented in **Section 6.4**.

6.3.28 To take account of sub-regional growth in housing and employment, light vehicle traffic flows were factored up using the Department for Transport Trip End Model Presentation Programme (TEMPro) Version 6.2, with data set 6.2 for Redcar and Cleveland geographical area and HGVs have been factored up with National Trip End Model (NTEM) factors. This has accounted for emerging Local Plan allocations.

6.3.29 In addition to TEMPro growth, significant committed developments within the study area have been identified and assigned to the future year baseline scenarios. The supporting TA (ES Section 12,

Appendix 12.2) provides further details with regard to the methodology for factoring baseline traffic demand to future years.

Daily and seasonal variations in background traffic flows

6.3.30 To understand annual fluctuations in traffic within the Redcar and Cleveland local study area, data from a permanent ATC on the A66 has been extracted for a one year period between October 2013 and September 2014. **Chart 6-1** below demonstrates that monthly traffic profiles are broadly similar throughout the year with the peak of April being 3,065 vehicles per day (11.1%) greater than January traffic flows.

6.3.31 **Chart 6-2** sets out a neutral daily profile from an average of three temporary ATCs commissioned in the RCBC area. It can be observed from **Chart 6-2** that daily traffic profiles are typical of much of the UK whereby there are two distinct peaks. The first peak (morning peak) occurs between 7am and 9am and the second peak (evening peak) between 4pm and 6pm. The evening peak is, however, greater than the morning peak and therefore will inform the worst case assessment period for assessing Driver Delay effects

Chart 6-1 Traffic survey annual traffic profile

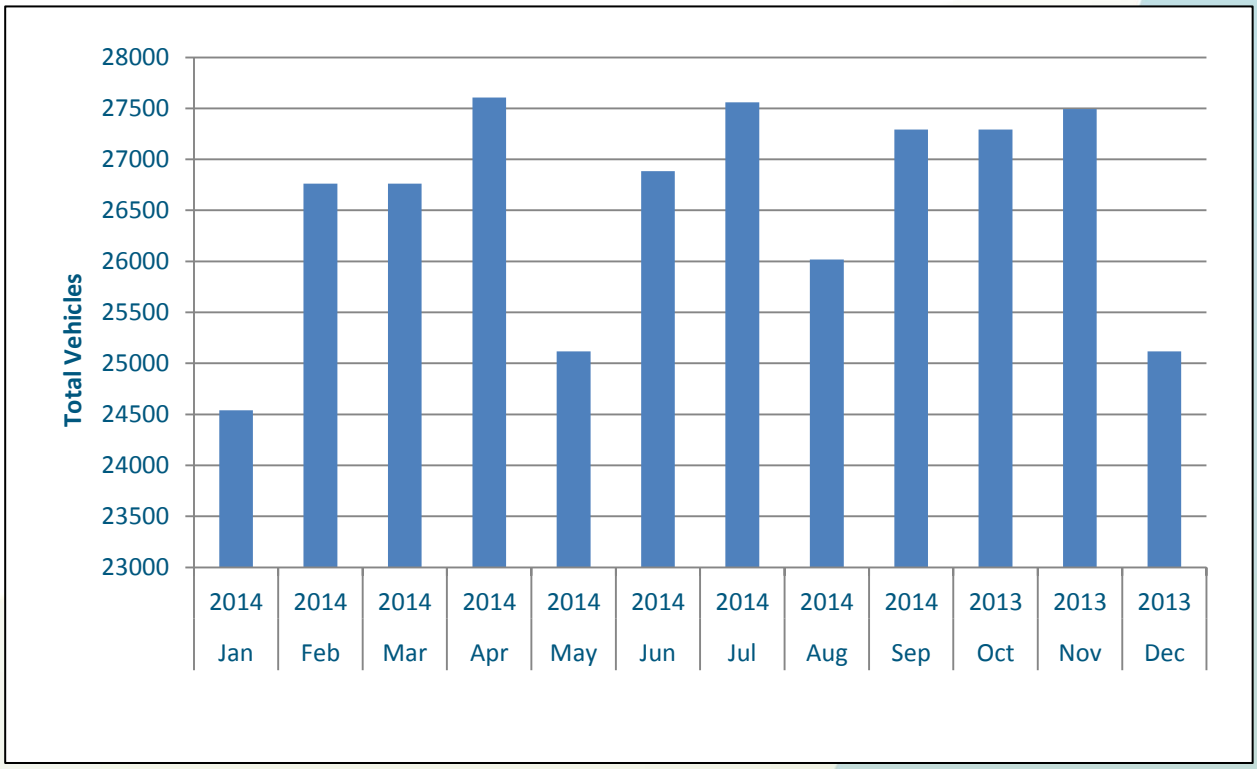
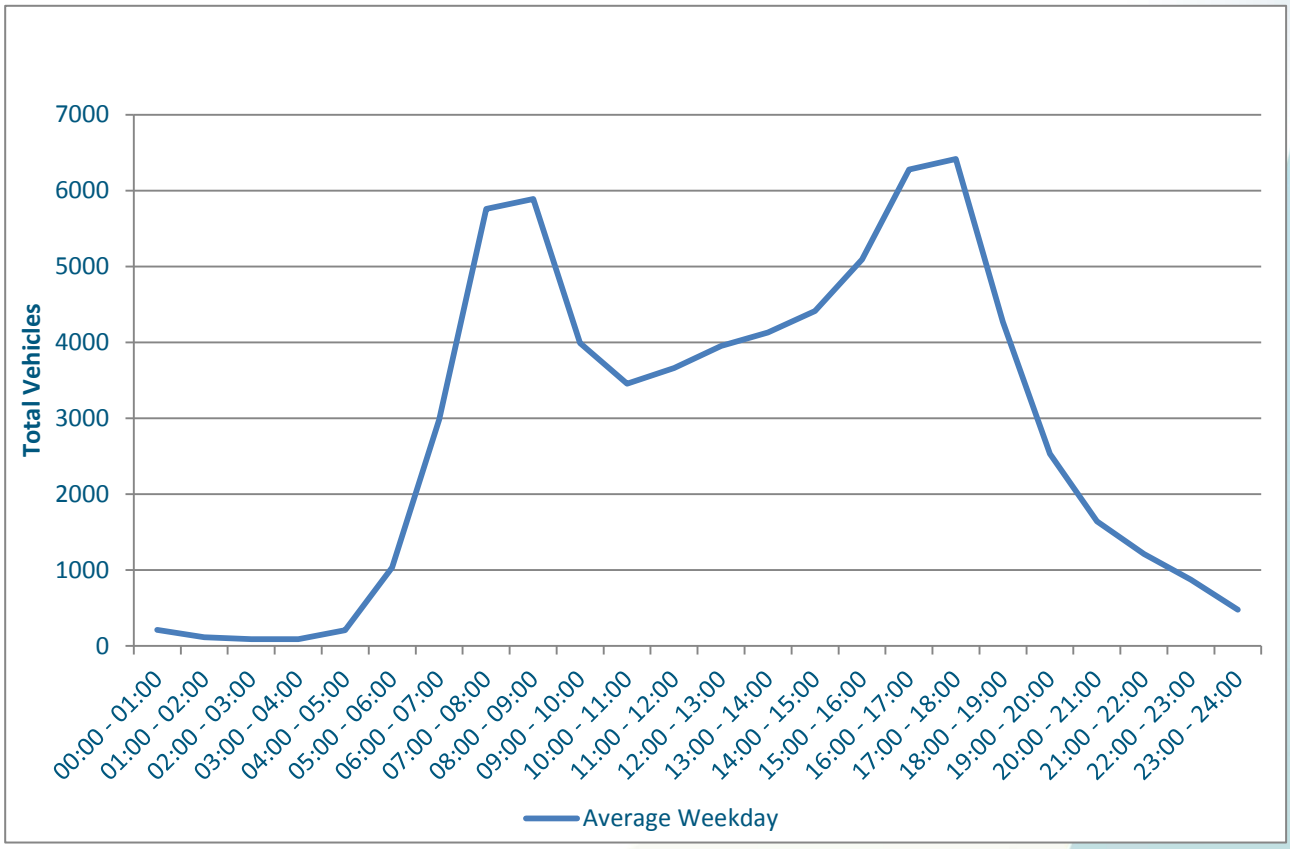


Chart 6-2 **Traffic survey data daily profile**



Establishing a seasonal baseline

6.3.32 **Table 6-7** outlines the sources of data that have been used to inform the baseline traffic flows. There are four types of data source, namely:

- AADF only counts[3], these counts provide details of average daily traffic flows classified to different vehicle types;
- Temporary ATCs, these sites provide fully classified counts for one week in the year;
- Permanent ATCs, these sites provide hourly traffic flows for each site in terms of total vehicles for each month; and

[3] AADF figures give the number of vehicles that will drive on that stretch of road on an average day of the year. The traffic figures are produced for each junction to junction link on the major road network for every year, whilst only a sample of points on the minor road network are counted each year. Data from these counts are used to produce estimates of traffic growth on minor roads.

- Classified Permanent ATCs, these sites provide classified hourly traffic flows for each site for each month.

6.3.33 Further to the consideration of daily and seasonal variations in background traffic flows presented in **Charts 6-1 and 6-2** it is necessary to convert these diverse data sources to a standard form to enable the application of seasonality factors.

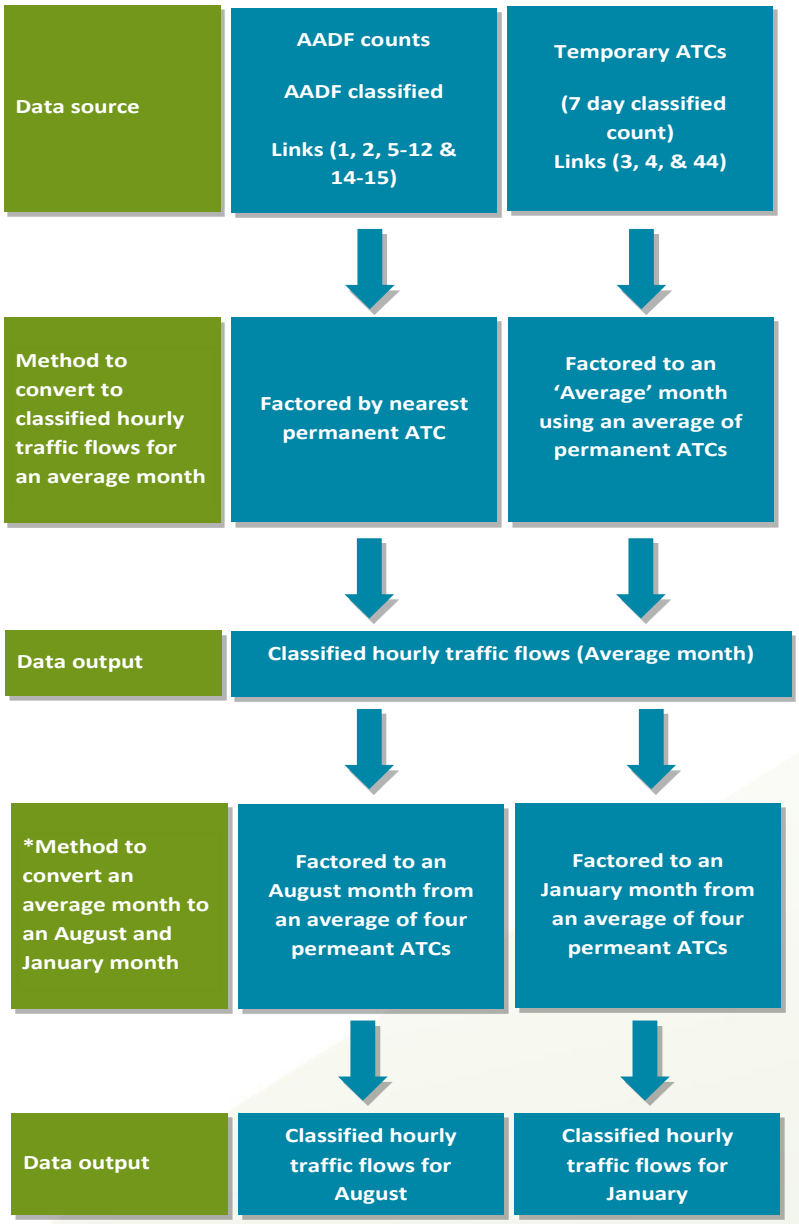
6.3.34 **Diagram 6-1** sets out the processes followed to derive traffic flows. **ES Chapter 12**, **Appendix 12.4** details the derived hourly traffic flows (with no growth applied), **Table 6-9** details 2015 January and August flows (with applied growth factors) which have informed the assessment of traffic effects contained in this section

Table 6-9 2015 assessment flows

Link	Description	Background January 2015 24hr flows		Background August 2015 24hr flows	
		Total Vehicles	Total HGVs	Total Vehicles	Total HGVs
1	A19 (west of Middlesbrough)	87,385	6,048	92,687	6,465
2	A66 (north of Middlesbrough)	25,162	2,106	26,373	2,228
3	A1053 (east of Middlesbrough)	11,815	1,012	12,296	1,062
4	A174 (south of Redcar)	29,500	1,207	31,223	1,298
5	A174 (south of Middlesbrough)	24,512	1,450	25,752	1,527
6	A171 (Ormesby Bank)	14,117	372	14,971	398
7	A172 (Dixons Bank)	19,319	701	19,911	726
8	A172 (towards Stokesley)	10,660	429	11,298	458
9	A1043 (south of Middlesbrough)	12,580	529	13,163	558
10	A171 (Middlesbrough Road)	19,319	771	20,197	800
11	A173 (Skelton Ellers)	5,107	279	5,393	299
12	A171 (between the A173 and Scaling Dam)	7,581	414	13,001	705
14	A174 (Apple Orchard Bank)	11,079	371	11,706	397

Link	Description	Background January 2015 24hr flows		Background August 2015 24hr flows	
		Total Vehicles	Total HGVs	Total Vehicles	Total HGVs
15	A174 (Skelton-in-Cleveland)	10,142	507	10,743	542
44	A1085 – Trunk Road	16,517	790	17,514	846

Diagram 6-1 Derivation of baseline traffic flows



Sustainable transport

6.3.35 The supporting Transport Assessment (**ES Section 12, Appendix 12.2**) contains a detailed review of the existing suitable transport options and considers the opportunities for construction and operational workers to travel by more sustainable forms of transport.

Highway safety

6.3.36 An examination of the routes within the study area has been undertaken to identify any 'collision clusters'. Collision cluster sites are considered to be sensitive to significant changes in traffic flows and could therefore potentially be impacted by the project.

6.3.37 Potential collision clusters within the study area for the both urban and rural areas have been identified using the same criteria adopted by NYCC when compiling their annual road casualty monitoring reports. The criteria are:

- A rural collision cluster sites is one at which there have been four or more personal injury collision within a 100m radius of each other during a three year period and the speed limit of the road is over 40mph.
- An urban collision cluster sites is one at which there have been four or more personal injury collision within a 50m radius of each other during a three year period and the speed limit of the road is 40mph or less.

6.3.38 The criteria used by NYCC for identifying collision clusters are also considered as a good benchmark when considering those sections of the study area that are managed by RCBC and the Highway Agency.

6.3.39 Personal Injury Collision (PIC) data was obtained from RCBC for the most recent five year period available and examined using the above criteria (**ES Section 12, Appendix 12.5** provides a graphical plot of all the collisions within the study area). This identified 23 clusters of which eight fall within the criteria for further assessment as set out by the criteria. The full list of sites is provided as **ES Section 12, Appendix 12.6**.

6.3.40 Where collision clusters are identified, it is also necessary to consider if there is a pattern of collision types which could be exacerbated by the development and if mitigation may be appropriate and effective. **ES Section 12, Appendix 12.7** examines the past five years of collision data for each of the collision clusters to understand if there is an emerging pattern or trend to collisions that could be exacerbated by the development proposals.

6.3.41 **ES Section 12, Appendix 12.7** identifies that within the Redcar and Cleveland area there were eight potential collision clusters, of which five demonstrate an emerging pattern of collisions that could be adversely impacted by the development proposals, these sites are discussed further below and the locations are presented graphically within **ES Section 12, Appendix 12.1, Figure 12.6**.

Cluster 44: roundabout junction of the A66 and B1513

6.3.42 The junction has experienced 15 collisions within the past five years with an emerging pattern of single vehicle loss of control and rear end shunt type collisions.

Cluster 48: roundabout junction of the A171 and A173

6.3.43 The junction has experienced 12 collisions within the past five years with an emerging pattern of single vehicle loss of control and rear end shunt type collisions.

Cluster 57: roundabout junction of the A1053 and A174

6.3.44 The junction has experienced 22 collisions within the past five years and demonstrates an emerging pattern of rear end shunt, loss of control type collisions.

Cluster 59: roundabout junction of the A174 and Redcar Lane

6.3.45 The junction has experienced 12 collisions within the past five years, of which 10 are attributable to rear end shunt type collisions.

Cluster 61: roundabout junction of the A174 and A1085

6.3.46 The junction has experienced seven collisions within the past five years with an emerging pattern of rear end shunt type collisions.

Highway capacity

Congested junctions

6.3.47 Within in the Redcar and Cleveland area, it has been agreed with the Highways Agency and RCBC that the junctions outlined in **Table 6-10** should be assessed as potentially being sensitive to the development's traffic generation.

6.3.48 **ES Section 12, Appendix 12.1, Figure 12.7** shows the locations of **Junctions 9 – 12** in the context of the study area.

6.3.49 The baseline queuing and delays for these identified junctions are considered within **Sections 6.5** and **6.6**, in order to provide a direct comparison with future year traffic scenarios.

Table 6-10 Junctions identified as sensitive to developments traffic generation

ES Junction notation	Location	Junction type
Junction 9	North west Redcar, junction of the A1085 Trunk Road with the Wilton works	Five arm roundabout
Junction 10	West Redcar, junction of the A1085 Trunk Road with the Freightliner Terminal	Four arm roundabout
Junction 11	North east Middlesbrough, junction of the A1085, A66 and A1053	Five arm partially signalised roundabout
Junction 12	South east Middlesbrough, junction of the A1053, A174 and B1380	Four arm partially signalised roundabout

6.4 Assessment of impacts

6.4.1 In line with the requirements of the codified EIA Directive (2011/92/EU), the impact assessment must comprehensively meet the requirements of the planning process and the expectations of key stakeholders. Equally, the impact assessment must be proportionate and balanced in all aspects and not fall into the bad practise of assessing data en masse that will not add to the significance of impact judgement.

6.4.2 To adopt a proportional approach a comprehensive review of baseline traffic data (as set out in Section 6.3) has been undertaken to facilitate an understanding of when the Mine, MTS, MHF and Harbour facilities traffic impact would be at the highest level. From this review the following seasonal parameters have been established:

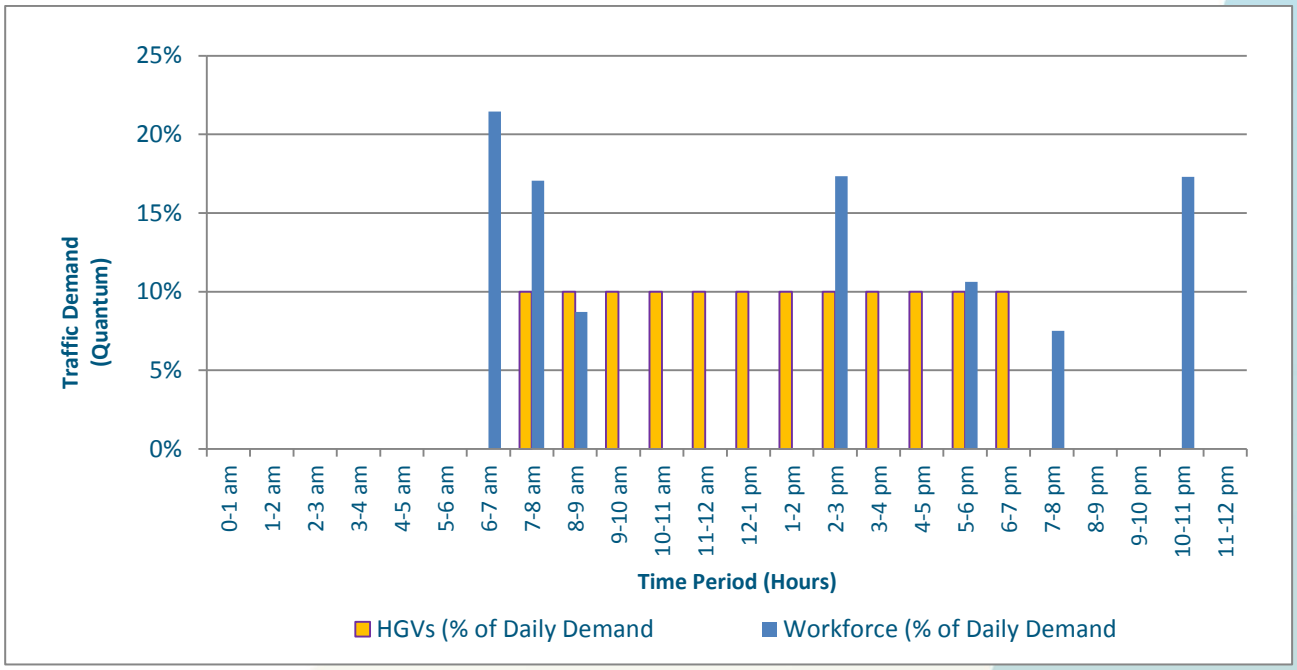
- January demonstrates the lowest baseline traffic flows and therefore represents the worst case month for the 'magnitude of change' the development's traffic would impose. This period has been selected for the initial screening exercise (GEART Rules 1 and 2) to ensure all highway links (and adjacent receptors) that would be subject to a significant impact are scoped in. Furthermore this period would inform those effects that are impacted by the greatest magnitude of change (Severance, Pedestrian Amenity)
- August demonstrates the highest baseline flows and therefore is the appropriate period for assessing the screened links that are impacted from the greatest combined baseline and development traffic flows (Fear and Intimidation, Pedestrian Delay)

6.4.3 It is noted that consultation with RCBC established that for the Redcar and Cleveland administrative area agreed neutral periods (typical average months) are appropriate for the TA (**ES Section 12, Appendix 12.2**) and have in turn informed Driver Delay and Highway Safety effects.

Identifying maximum impact periods

6.4.4 Having established the baseline traffic flows periods on which to undertake the impact assessment, the next stage was to identify those periods when the magnitude of effects would be at their highest to facilitate a more detailed and proportionate impact assessment. The starting point in this process is to understand the time periods when the development traffic would be distributed on to the highway network, and the quantum, to enable comparisons to be drawn with baseline daily traffic profiles. **Charts 6-3** and **6-4** set out the illustrative daily profile for the YPP HGV and employee traffic generation during peak construction and operational periods respectively (full detail of the traffic demand derivation is set out later in this Section).

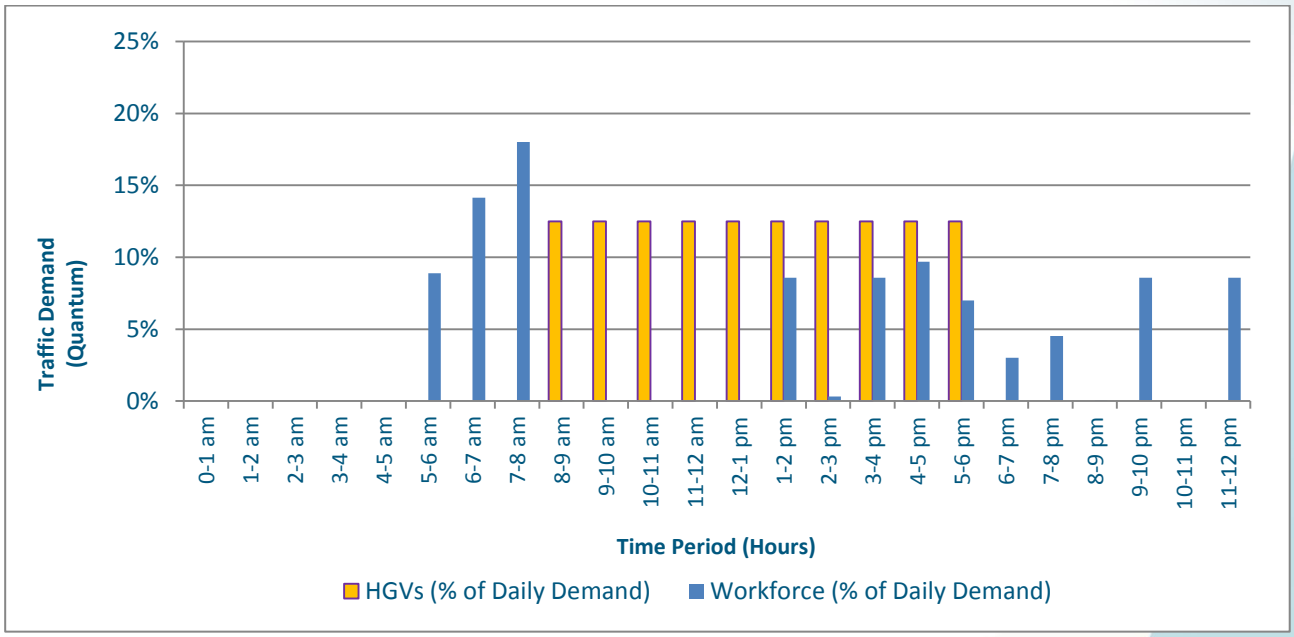
Chart 6-3 Construction traffic, daily profile



6.4.5 It is also important to consider when sensitive receptors are most likely to experience the highest impact from the development traffic, such as the school pick up and drop off and other periods of high pedestrian footfall.

6.4.6 **Chart 6-3** details that the maximum traffic demand for construction occurs between 6am to 7am and comprises of employee movements during shift change over, no HGV activity would occur during this period. This period occurs prior to the peak network flows and prior to significant sensitive receptor activity (i.e. people walking to work, school, etc.).

Chart 6-4 Operational traffic, daily profile



6.4.7 Therefore, in order to assess the highest potential impact the periods of 7am to 8am and 2pm to 3pm have been selected as representative of the highest YPP construction traffic effect which coincides with periods of high sensitive receptor activity (i.e. school run, travel to work, general pedestrian activity).

6.4.8 In addition, the 5pm to 6pm period has been selected as representative of the highest total traffic flow on the highway network (baseline traffic + YPP traffic) and has informed the junction capacity and Driver Delay assessments.

6.4.9 For operation, the periods 7am to 8am and 3pm to 4pm have been selected as representative of the highest YPP traffic effects, the combined maximum YPP and baseline traffic period would be identical to construction (5pm to 6pm). In summary, the critical periods adopted for the detailed impact assessment are:

- Construction, 7am to 8am, 2pm to 3pm and 5pm to 6pm;
- Operation, 7am to 8am, 3pm to 4pm and 5pm to 6pm.

6.4.10 The impact assessment considers the critical periods for a weekday, Saturday and Sunday scenario.

6.4.11 It should be noted that the assessment periods for traffic borne noise (as detailed **in Section 7 Noise and Vibration**) have been expanded to capture the specific requirements of this topic.

Realistic worst case definition

6.4.12 In context with the Transport Strategy set out in **Section 6.2**, a suite of assumptions have been developed to enable realistic worst case traffic generation to be established and inform the impact assessment. **Table 6-11** sets out these assumptions and provides a brief rationale. The detailed application of the assumptions is discussed throughout this section.

Trip demand

6.4.13 Transport Assessments are typically informed by the derivation of trip rates (i.e. to assist with quantifying the development's predicted traffic attraction) from interrogation of established trip rate databases such as TRICS. However, there is no such data in the existing trip rate databases that could confidently quantify the trip attraction associated with the construction of the Mine and tunnel of the YPP.

Table 6-11 Worst case assumptions

Parameter	Notes
Construction	
The maximum realistic monthly demand from each constituent part of the YPP is assigned to the highway network.	The maximum HGV demand is assessed per highway link (rather than on a worst case month) and therefore the derivation has tolerance to 'real-time' programme changes (e.g. slippage/acceleration).
Maximum personnel demand is assumed to occur during maximum HGV demand.	Represents the worst case combined HGV and light vehicle traffic demand building tolerance for programme/resource changes.
Start of construction 2015.	2015 is the earliest realistic construction start date for the assessment.
In-migrant construction workers employed at the minehead assumed to be based in private accommodation and travel to a central P&R site in Whitby .	In-migrant employees located within private accommodation would have the greatest potential to generate traffic, should a construction village or local bus pickup be provided this would reduce traffic impacts.
Monthly HGV movements profiled over twenty days per month (i.e. 5 day week Monday – Friday).	Represents HGV traffic generation profiled over weekdays resulting in higher daily demand than if weekend deliveries were employed. This provides a robust daily traffic demand profile on which to assess weekday impacts.
All trips to the Whitby Construction village/P&R site	Provides a robust baseline to assess traffic impact and a

Parameter	Notes
assumed to be single occupancy car.	benchmark for introducing Travel Plan measures.
Changeover between shifts is assumed to occur during one hour.	Construction of the MTS and Mine would run 24 hours a day, necessitating a three shift system. Employees would typically arrive in advance of the proceeding shift finishing enabling continuous working. For clarity, worst case shift change overs are assumed to occur during the same hour thereby intensifying traffic demand and providing maximum traffic flows that could occur during a changeover hour.
A contingency has been applied to all daily HGV traffic (full details are provided in **Section 6.4**).	Ensures minor omissions or design changes can be accommodated within the assessed traffic flows.
HGV deliveries profiled over a 10 hour window.	At 7am to 7pm (12hr) 'delivery window' has been assumed with ten hours delivery time allocated. This results in higher hourly HGV flows (than 12hrs) but allows for breaks in deliveries. The appropriate delivery window would be agreed via the CTMP (**ES Section 12, Appendix 12.3**) prior to the start of the works.
Car share ratio of 2.5 for worker travelling direct to the MTS shaft sites, MHF and Harbour.	Industry best practice* shows a typical ratio of 3.0 could be achieved on large construction sites. The lesser figure will ensure that the worker traffic demand is robust. Details of how the car share ratio would be monitored and enforced are contained within the supporting CTMP
Operation	
Operation horizon year.	2020 has been selected as a horizon year (representative of the first full year of typical operating conditions). For a robust assessment a theoretical scenario of the Mine operating at full production capacity (13Mta) in 2020 has been applied to the traffic demand.
No allowance for workers to be able to travel by non-car modes (bus, rail, walking and cycling) direct to either the Cross Butts (operational) P&R or Scarborough A64 (operation) P&R sites has been applied to the traffic demand. Single occupancy car trips have been assumed.	This assumption distributes employee travel to P&R by car only resulting in a higher traffic demand for the purpose of a robust assessment. In reality, it is likely that car-share and non-car modes will reduce the daily traffic demand but this is difficult to quantify until a workforce is appointed.

Parameter	Notes
All trips to the MHF assumed to be single occupancy car.	Recognising that some personnel trip origins for the MHF would be within the NYCC area, this assumption distributes employee travel to work by car only. This provides a robust baseline to assess traffic impact and a benchmark for introducing Travel Plan measures.
Annual operational HGV demand at the Mine spread over 240 days.	Assumes a worst case of HGVs making deliveries over 20 days per month (for assessment purpose) with no reduction for weekend deliveries.
HGV to make deliveries profiled over an eight hour window.	An 8am to 6pm (10hr) 'delivery window' has been assumed with eight hours delivery time allocated. This results in higher hourly HGV flows (than 10hrs) but allows for breaks in deliveries. The appropriate delivery window would be agreed with RCBC Highways prior to start of operations.
Decommissioning	
HGV and LCV traffic demand as per construction, assuming minimal opportunities to leave components in-situ or recycle materials on site.	Represents peak decommissioning traffic impacts.
* BAA 2003, Terminal 5 Construction Workers Public Transport Strategy 2003/04	

6.4.14 Therefore, the traffic generation that has informed this assessment has been derived by way of a 'first principles' approach. The first principles approach generates traffic volumes from an understanding of material quantities[4] and personnel numbers. To inform the first principle approach work streams were commissioned which focused on discrete elements of the Mine, MTS, MHF and Harbour facilities. The work streams were led by industry experienced consultants drawing on further professional expertise for specialist elements of the projects. **Table 6-12** gives an overview of how this combined expertise has provided transport input.

[4] Material is defined as all imports required to construct the YPP and exports resulting from reinstatement activities. The term does not the export of spoil or polyhalite off-site.

Table 6-12 Mine and MTS work streams

Work stream	Lead consultant	Supplementary specialist advice	Transport input
Earthworks strategy	Arup (UK)	Classification of arisings[5]	Earthworks quantities Bulk material requirements for platforms, haul routes, laydown Workforce requirement Earthworks duration
Mine shafts	Worley ParsonsTWP (RSA)	Shaft sinking specification	Construction and operation material requirements Workforce requirements Construction duration
MTS engineering	Arup	Tunnel Boring Machine (TBM) specification Tunnel specification	TBM component parts for transport Workforce requirements
Materials Handling Facility	K Home (UK)	n/a	Construction and operation material requirements Workforce requirements Construction duration
Harbour facilities	Royal HaskoningDHV (UK)	n/a	Construction and operation material requirements Workforce requirements Construction duration

Construction HGV demand

Material deliveries

6.4.15 YPL has developed a material import/HGV spreadsheet that collates these data from the five work streams and details the expected quantities of materials and plant movements for each discrete element of the project (Dove's Nest MTS site, intermediate MTS sites, Wilton MTS Portal, minehead and Mine, spoil export, MHF and Harbour). From these data the HGV classification and quantity required to transport the material and plant for each element has been derived and profiled over time according to the assumed rate of progress of construction.

[5] Input to the Earthworks Strategy provided by geology specialist FWS consultants Ltd

6.4.16 The material import/HGV spreadsheet is provided in support of this assessment, as **Part 2, Appendix 6.2**.

Spoil export

6.4.17 The earthworks strategy work stream indicated that there may be a requirement to export, by road, a quantity of material generated from the sinking of the Mine.

6.4.18 Borehole and soil classification data suggests that the sinking of the Mine shafts would generate some spoil that has either a marketable value or pollution potential and may require exporting off site to a suitable point of sale or disposal site.

6.4.19 **Part 2, Appendix 6.3** represents a summary from the earthworks strategy volumes and provides details of the estimated quantities that would be exported off-site per month.

6.4.20 There are two plans that require assessment for the export of material from DNF. The **proposed plan** to export spoil and, and a **contingency plan**, which includes the transportation of early product grade polyhalite (these plans are referred to as Option 1 and Option 2 respectively in earthworks quantities set out in **Part 2, Appendix 6.3**). The contingency plan, would only be implemented if programme slippage led to delays in fitting out the MTS.

Proposed Plan, Export of Spoil

6.4.21 Spoil is proposed to be exported based on an even profile from Month 18 to Month 40, generating 640 HGV movements per month (32 movements per day). From Month 41 the rate of export off site would have doubled until Month 57, by the end of which all material would be removed from site. Option 2, Export of Spoil and early product grade polyhalite. Contingency plan, Export of Spoil and early product grade polyhalite

6.4.22 Spoil is exported on an even profile from Month 18 to Month 48. Should polyhalite be required to be transported by road, this would occur from Month 41 and could continue until the end of Month 48. From Month 49, spoil export can be resumed as no polyhalite would be excavated during the four months up to the end of Month 52, as 12 months would have elapsed since Month 41 a high degree of confidence would exist that that the MTS would be operational.

6.4.23 When the export of spoil is suspended, product grade polyhalite would be exported off-site at the rate of 2,000 HGV movements per month (100 per day). After Month 48, the export of spoil would be resumed at a similar load intensity peaking during Month 54 and Month 55; at 2,340 HGV movements per month (117 per day).

6.4.24 It has been assumed that 29 tonne payload HGVs would be employed. To reflect this, the HGV derivation has been based on 28 tonne payloads (allowing for one tonne load inefficiencies) for the period of polyhalite export. The majority of the larger HGVs would be retained to facilitate hauling the remaining spoil off-site by Month 58, at an assumed average rate of 26.3 tonnes per HGV.

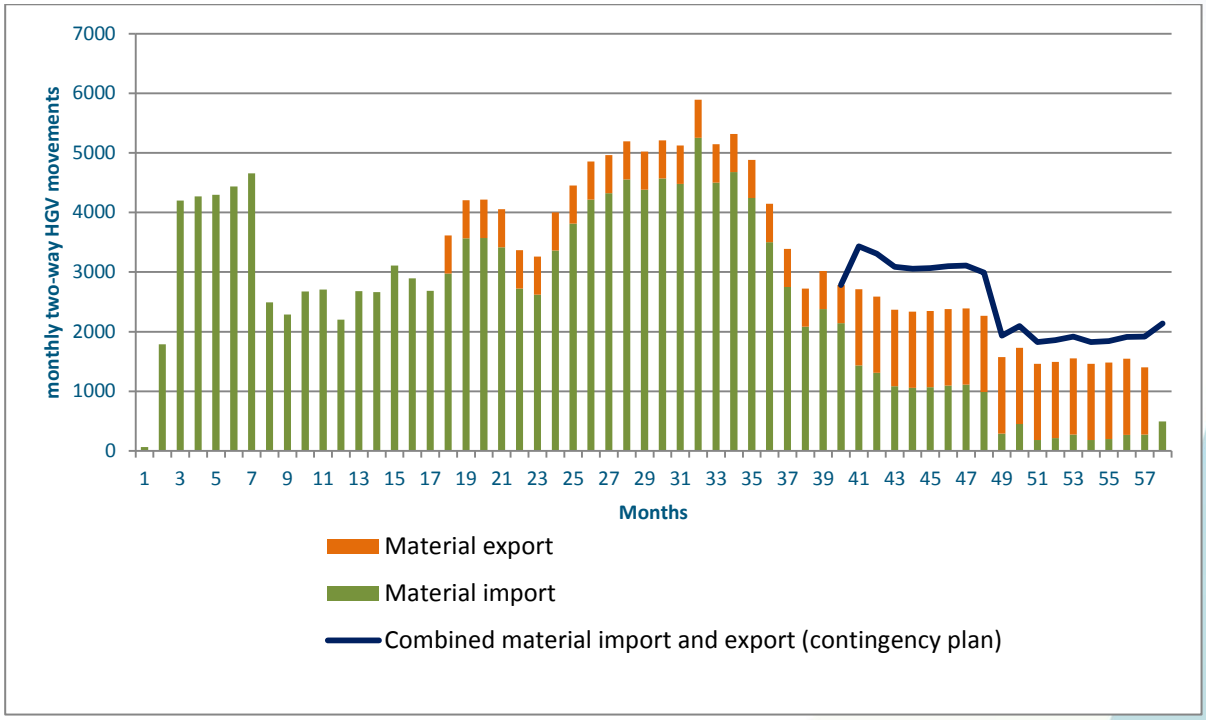
6.4.25 It is not envisaged (from borehole and geological information available) that the arising from the MTS would require export. Therefore, the earthworks strategy is for all arisings to be spread on the surface at appropriate sites in close proximity to the shaft via an internal haul route. However, should a quantity of material be classified as requiring removal from site, during construction, a contingency allowance for this eventuality has been applied and is discussed in the 'Contingencies' section (below).

Combined import and export construction HGV traffic demand

6.4.26 The combined HGV demand from the material import spreadsheet and earthworks strategy were informed by a consolidated programme to understand the in-combination daily HGV demand of all YPP principal developments.

6.4.27 The earthworks strategy was progressed with regard to the consolidated programme and has been developed to mitigate peak daily HGV flows. This is achieved by planning the spoil export programme around the demand for 'critical path' delivery of materials to ensure the import and export peaks do not overlap and therefore the intensity of HGV movements is managed. This is achieved by creating large stockpile facilities at the Mine to precisely control the HGV demand for exporting spoil. The resultant monthly and daily HGV demand for the YPP is summarised within **Part 2, Appendix 6.4**. **Chart 6.5** illustrates the combined material delivery and export for the Mine, Intermediate MTS Shaft Sites, MHF and Harbour facilities.

Chart 6-5 **Monthly HGV flows, Mine, Intermediate MTS Shaft Sites, MHF and Harbour facilities - combined material delivery and export**



6.4.28 In order to assess a worst case in-combination scenario, consideration has been given to the interdependencies between the Mine, MTS, MHF and Harbour and the potential for programmes to shift relative to one another. In this regard three discrete periods have been identified within the project programme whereby the combination of the project elements leads to intensive periods of HGV demand that has the potential to act in combination. Full details are contained in **Part 2, Appendix 6.4** and a summary of the derivation is provided below.

6.4.29 Period 1 has a duration of month four to 10 (inclusive), with traffic demand resulting from the Mine and MTS. Between months four and 10 the MTS sites combined would generate 213 two-way daily HGV movements (month nine for Wilton, month six for Tocketts Lythe, month seven for Lockwood Beck and Lady Cross Plantation, and month 10 for Dove's Nest) at the same time that the Mine peaks at 101 two-way daily movements (months six to eight, inclusive). This first period theoretically would result in up to 314 two-way HGV movements.

6.4.30 Period 2 has duration of month 17 to 21 (inclusive), with traffic demand resulting from the Mine, MTS and MHF. During this period two-way HGV movements comprise of 69 from the Mine during month 17, 32 from the export of spoil (during months 18 to 21), 74 from the MHF during month 18 and 158 from the MTS sites during month 20 for Wilton, Lockwood Beck and Lady Cross Plantation and month 21 for Tocketts Lythe and Dove's Nest. This second period theoretically would result in up to 333 two-way HGV movements.

6.4.31 Period 3 has duration of month 28 to 34 (inclusive), with traffic demand resulting from all elements of the project. During this period two-way HGV movements comprise of 65 from the Mine during month 32, 32 from the export of spoil (during months 28 to 34), 76 from the MHF during month 34, 35 from the Harbour during months 32 and 33, 31 from the conveyor between the Harbour and MHF during month 30 and 147 from the MTS sites (month 28 for Wilton and Dove's Nest, month 29 for Tocketts Lythe, 33 for Lockwood Beck and 34 for Lady Cross Plantation). This third period would theoretically result in up to 387 two-way HGV movements.

Contingencies

6.4.32 The following issues have the potential to change the HGV figures derived:

- Design revisions as the project progresses from planning design to tender design.
- Post application changes in method of working informed by appointed contractor.
- Incidental HGV trips.

6.4.33 It should be noted these issues could collectively reduce or increase overall HGV demand. To ensure the HGV data assessed represents a 'realistic worst case' scenario, a strategy of applying contingencies to the daily traffic demand for each element of the project has been adopted.

6.4.34 These contingencies have been informed by the work streams based upon the degree of certainty (confidence threshold) in the design outputs at the application 'freeze'. This feedback has informed a contingency that varies between 10% and 40% for the Mine traffic demand, 10% for the MTS, 7.5% for the MHF and 20% for the Harbour facilities. A figure of 10% has been applied to the alternative routes serving only quarry locations. No contingency has been applied to the Mine spoil strategy, as the removal of spoil represents a discrete contingency item which can be controlled to the levels to be assessed.

6.4.35 The varying contingency figure for the Mine is predominantly attributable to uncertainties in the treatment of waste water from the Mine. At the point of application, it has not been concluded whether the waste water can be disposed on site or, alternatively, if it has to be transported off site; therefore the adopted contingency is 20% between months 1 and 14, 40% between months 15 and 40 and 10% from month 41 onwards. This approach is considered to better reflect how the requirement for the export of waste water would change during construction.

Construction HGV distribution

Primary Haul Route

6.4.36 A review of the potential supply chain within the study area indicates that Teesside is the most likely source for all materials and, as such, the assessment assumes that all HGV trips would have an origin and destination in that region, with all traffic assigned to both the A66 (link 2) and A174 (link 5). HGVs associated with the removal of spoil have an origin at Billingham accessing via the A171 (link 5) and A19 (link 1), avoiding the A66.

6.4.37 From Teesside, access to the Harbour facilities and MHF would be via 'Trunk Road', whilst access to the Mine and MTS sites would primarily be via the A171 corridor before transferring to each site via the following routes:

- Access to the Tocketts Lythe Intermediate Shaft Site would be from a new access from the A173, HGVs would access the A173 from the A171 avoiding Skelton in Cleveland.
- Access to the Lockwood Beck Intermediate Shaft Site would be from a new access with the A171.
- Access to the Lady Cross Plantation Intermediate Shaft Site would be from a new access from an unnamed road towards Egton, HGVs would access the unnamed road from the A171 avoiding Egton.
- Access to the Mine would be from a new access from the B1416, HGVs would access the B1416 from the A171 avoiding Ruswarp.

6.4.38 The proposed delivery routes for HGVs during the construction phase are shown in **Part 2 Appendix 6.1, Figures 6.2 to 6.4**.

Alternative (Local) Haul Routes

6.4.39 A review of the potential supply chain in the area local to the Mine indicates quarries along the A170 between Pickering and Scarborough potentially would be the most likely alternative origin of bulk materials. These suppliers are CEMEX, Newbridge Quarry (Pickering) and Hanson, Wykeham Quarry, with both sites having permission for an annual export of circa 220,000 tonnes.

6.4.40 NYCC Highways have advised that an escalation of HGV demand on the routes serving the local quarries would not be permitted.

Summary distribution

6.4.41 Having established three periods of maximum construction traffic intensity (**Part 2, Appendix 6.4** refers) the resultant HGV flows per period have been compared on a link by link basis to ascertain which period would induce the maximum HGV flow. The highest flow for any one of these periods has then been assigned to the network to give a maximum demand per link. **Part 2, Appendix 6.5** details this derivation and introduces colour coding to enable ease of cross reference between **Part 2, Appendix 6.4** and **Part 2, Appendix 6.5**).

6.4.42 This link based methodology has two distinct advantages:

- It assesses worst case traffic demand per link regardless of when in the programme the HGV demand occurs (if a worst case month was simply chosen it may be that the individual elements do not generate significant traffic in parts of the study area at that time, therefore underestimating the traffic impact on some of the links).
- In calculating the maximum demand per link the methodology does not crudely sum all the links to provide unrealistic cumulative flows on the main highway corridor (A171).

6.4.43 The HGV movements for the alternative southern routes have been adjusted in accordance with the further analysis of aggregate supply.

6.4.44 The assigned peak daily HGV demand is illustrated in **Part 2, Appendix 6.1, Figure 6.5.**

Construction personnel traffic demand

6.4.45 The work streams described above have provided details of the expected resourcing requirements for the Mine, MTS, MHF and Harbour facilities. **Part 2, Appendix 6.6** details that the peak resourcing requirements for the Mine, MTS, MHF and Harbour would be 645, 766, 252 and 175 employees respectively.

6.4.46 Total employee numbers are then further disaggregated by shifts (**Part 2, Appendix 6.7** provides further details of the shift patterns). The Mine and MTS operate 24 hrs, seven days a week for some aspects of construction and the MHF and Harbour operate 'typical' daytime shifts. This results in a peak of:

- 324 employee movements between 6am to 7am for the Mine;
- 108 employee movements between 6am to 7am for each MTS site;
- 252 employee movements between 7am to 8am and 5pm to 6pm for the MHF; and
- 175 employee movements between 8am to 9am and 5pm to 6pm for the Harbour.

6.4.47 Embedded mitigation is being developed to reduce the impact of employees driving direct to the Mine and MTS shaft site at Dove's Nest. There are three potential options (or combination of options):

1. Option 1, private transport pick-up and transfer to site.
2. Option 2, P&R site located off the A171 south of Whitby.
3. Option 3, accommodation for in-migrant workers in combination with Option 2 (Construction Village).

6.4.48 For the purpose of developing a worst case transport scenario, Option 2 has been selected as it would induce the most trips for the shortest duration on the highway network.

6.4.49 A separate planning application (Reference: 15/00195/FL) for Option 3 in combination with Option 2 has been submitted to Scarborough Borough Council.

6.4.50 To get to the Construction village/P&R site it has been assumed, as a worst case, that employees travel by car with no allowance made for the propensity for employees to car share, walk, cycle or use public transport; therefore, resulting in peak vehicle movements of 432 vehicle movements between 6am – 7am (324 to the Mine and 108 to the Dove's Nest Farm MTS), of which there would be 250 arrivals and 181 departures.

6.4.51 Utilising 52 seat buses, 432 employee movements would result in approximately nine trips between the Mine and Construction village/P&R site.

6.4.52 For the sensitive period of 2pm – 3pm it is forecast there would be 362 vehicle movements (139 to the Mine and 42 to the Dove's Nest Farm MTS), of which there would be 181 arrivals and 181 departures, equating to approximately seven bus movements.

6.4.53 The strategy for the MTS sites (excluding Dove's Nest), the MHF (including the MTS portal) and Harbour facilities is for employees to travel direct with a managed vehicle to employee ratio of at least 2.5.

6.4.54 For the MTS intermediate shaft sites the strategy differs from that adopted for the Mine site as it is considered that serving three dispersed MTS sites from a central P&R site would be more likely to induce trips on the highway network; for example employees from Teesside and Whitby would need to drive along the A171 to a central P&R site and then be bussed back to the MTS sites along the same route.

6.4.55 For the Harbour facilities and MTS Portal and MHF at Wilton, it is considered that constructing a P&R facility would not be appropriate, recognising that the facilities are ideally located adjacent to the Strategic Road Network and central to the local labour markets in Teesside.

6.4.56 It is considered that targeting employees at their point of origin would be more appropriate. In this regard the 2.5 employees per vehicle ratio is considered to represent a worst case scenario in the context of:

- The established industry exemplar of Heathrow Terminal 5 (BAA 2003, Terminal 5 Construction Workers Public Transport Strategy 2003/04) established that a car share ratio of 3 employees per vehicle was achievable.
- The ratio does not take into account the propensity for employees to walk, cycle or use public transport or the constraint car parking on site.

6.4.57 This strategy would be augmented by the supporting CTMP (**ES Section 12, Appendix 12.3**) which include details of the processes proposed for managing, monitoring and enforcing any noncompliance. It should be noted this strategy does not preclude a travel plan being developed by the appointed contractor that exceeds the 2.5 ratio, rather it provides a realistic baseline on which to assess traffic impact.

6.4.58 **Table 6-13** set out how this strategy translates employee movements to vehicle movements and how this has informed the maximum parking provision at each site.

Table 6-13 Construction personnel vehicle and parking demand

Sites	Shift change over times	Employees movements		Vehicle movements			Maximum parking provision *
		Arrivals	Departures	Arrivals	Departures	Total	
MTS sites (excl. Doves Nest)	07:00 – 08:00	66	42	27	17	44	43
	15:00 – 16:00	42	42	17	17	34	
	20:00 – 21:00	0	24	0	10	10	
	23:00 – 24:00	42	42	17	17	37	
MHF	07:00 – 08:00	252	0	101	0	101	101
	17:00 – 18:00	0	252	0	101	101	

Sites	Shift change over times	Employees movements		Vehicle movements			Maximum parking provision *
		Arrivals	Departures	Arrivals	Departures	Total	
Harbour facilities	08:00 – 09:00	175	0	70	0	70	70
	17:00 – 18:00	0	175	0	70	70	
* Excludes provision for visitors and disable parking which will be provided in addition.							

Employee distribution

6.4.59 To inform the potential distribution of construction employees, the availability of local labour and rented accommodation has been reviewed as part of the socio economics study to inform the potential employee distribution.

6.4.60 The types of specialist skills required for projects such as YPP means that construction personnel often have to be drawn from across the country and not necessarily from the local labour area (i.e. within a 60 minute commute). **Table 6-14** details the percentage of the workforce that could be drawn from the local area for the three main disciplines required for the construction of the Mine and MTS.

Table 6-14 Availability of local labour

Construction activity	Local	Non-local
Mine sinking	35%	65%
Mine buildings	65%	35%
Mine management	10%	90%
MTS operatives	30%	70%
MTS supervisors	10%	90%
MTS site support staff	100%	0%

6.4.61 The socio-economic study has also advised that the types of skills required for the construction of the MHF and Harbour facilities could be accommodated from local labour markets.

6.4.62 Those personnel who are non-local (in-migrant labour), i.e. beyond a reasonable daily commute (up to

a 60 minute drive), are likely to base themselves within local rented accommodation. To inform the distribution of in-migrant labour the availability of bed spaces within local rented accommodation within commuting distances of the project has been captured.

6.4.63 The distribution of local rented accommodation per post code cluster is outlined within **Part 2, Appendix 6.8**. The distribution of bed spaces per postcode cluster has then been factored using a gravity model approach, whereby the number of bed spaces is divided by the journey time (taken from a route planner) from the centre of the postcode cluster to the Construction village/P&R site or MTS shaft sites.

6.4.64 **Part 2, Appendix 6.8** also assign each postcode cluster a point of entry on to the highway network to inform the distribution of in-migrant employees.

6.4.65 To inform the distribution of the employees who potentially could be drawn from the local area (resident workers), the socio economics study has examined the distribution of residents within the local area (a 60 minute drive) with the relevant skill sets.

6.4.66 The distribution of local employees per postcode cluster is outlined within **Part 2 Appendix 6.9**. This has then been factored using a gravity model approach, whereby the number of employees is divided by the journey time (taken from a route planner) from the centre of the postcode cluster to either the Construction village and P&R site, MTS shaft sites, MHF or Harbour facilities.

6.4.67 **Part 2 Appendix 6.9** also assigns each postcode cluster a point of entry on to the highway network to inform the distribution of local employees.

6.4.68 **Part 2 Appendix 6.1, Figures 6.6 to 6.10 and ES Section 12, Appendix 12.1, Figure 12.8**, provide a graphical representation of the distribution of in-migrant and local labour (respectively) in the form of a heat map.

6.4.69 From the Construction village and P&R site, local and migrant employees would then be transferred by bus/minibus to the Mine via the A171 and B1416. Minimal parking would be provided at the minehead site, designated for essential site visits and bus/minibuses only.

6.4.70 Utilising the socio-economic input, the derived peak employee demand has been assigned to the highway network **Part 2 Appendix 6.10** details the derivation**, Part 2 Appendix 6.1, Figure 6.11** details the resultant daily flows.

Combined construction traffic

6.4.71 The worst case traffic generation scenario assumes that the daily peak periods for HGV movements coincide with the peak resourcing requirements (and therefore maximum personnel trips). The resultant daily construction traffic flows are illustrated in **Part 2 Appendix 6.1, Figure 6.12,** together with baseline daily traffic flows for direct comparison**.**

Operational HGV demand

6.4.72 YPL has developed a material import HGV spreadsheet that collates data from the workstreams with regard to the expected quantities of materials and supplies that would be required post construction. These data are provided for twelve years after construction (2020 to 2032) and includes an allowance for the fit out of the Mine for the ramp up in production from 6.5 to 13Mtpa.

6.4.73 **Part 2, Appendix 6.4** contains a summary of the operational demand in the form of annual HGV numbers for the twelve years post construction extrapolated from the YPL spreadsheet. 2030 has been selected as the highest operational annual demand (noting that the phase two fitting out of the MHF for maximum capacity is completed in 2019). For the MHF an allowance of 40 two-way HGV trips per day has been assessed to cover export to UK markets and the import of processing products, for the Harbour facilities HGVs are anticipated to be infrequent demand and therefore have not been considered.

6.4.74 The maximum annual operational HGV demand for 2030 would be 2061 (two-way) for the Mine and 9600 (two-way) for the MHF. Applying 240 days per annum (12 months, 20 days per month) this would equate a daily two-way HGV total of 9 and 40 HGVs respectively.

Operational personnel traffic demand

6.4.75 The work streams have provided details of the expected resourcing requirements for operating the YPP at 6.5 and 13Mtpa. In order to represent a worst case, only the 13Mtpa scenario has been considered.

6.4.76 The operation of the MTS sites would not require a permanent workforce with only occasional maintenance visits, whilst the operation of the Harbour would only require a workforce of up to 34 employees with 18 required on anyone day. These 18 employees are then further disaggregated into three shifts. The operational workforce requirements of the MTS and Harbour facilities are insignificant in terms of traffic generation not, therefore, considered further.

6.4.77 **Part 2, Appendix 6.11** details that the operation of the Mine would require up to 725 employees and the MHF up to 199. However, these employees would work a rota system and, therefore, the maximum operational resourcing requirement (on any one day) for the Mine and MHF would be 483 and 147 employees respectively.

6.4.78 The total employee numbers for the Mine and MHF are further disaggregated into shift patterns (**Appendix 6.12** refers). For the Mine this results in a peak of 189 employee movements between 7am to 8am, whilst the combined network and development peak flow occurs between 1pm to 2pm and 3pm to 4pm when the forecast employee demand is 85 two-way movements.

6.4.79 For the MHF, when total employees are disaggregated by shifts there would be a morning peak of 59 employee movements between 6am to 7am and an evening peak of 56 employee movements between 4pm to 5pm.

Traffic distribution – operation

HGV distribution

6.4.80 During the operation of the YPP there would be an ongoing requirement for maintenance and servicing at the Mine and, in addition, the import and export of materials to and from the MHF facility. The Harbour and MTS would only have the occasional requirement for HGV maintenance vehicles and, therefore, are not considered further herein.

6.4.81 For the purpose of this assessment it has been assumed that the supplies for the Mine could equally originate from the A171 west (towards Teesside), A171 south (towards Scarborough) or A169 (towards Pickering). Given this, a 'sensitivity test' has been applied whereby 100% of all operational HGV traffic is routed via each of these routes.

6.4.82 For the MHF, it is assumed that materials would be imported and exported to the UK markets via the A171 and A66 in the same proportions as background HGV traffic.

6.4.83 The derived typical operational HGV demand has been assigned to the highway network **Part 2 Appendix 6.1, Figure 6.13** details the resultant daily flows.

Employee distribution

6.4.84 To inform the assessment distribution of the permanent employees at the Mine and MHF, the socio economics study has examined the distribution of residents within the local area (a 60 minute drive of the respective site) with the relevant skill sets.

6.4.85 The distribution of local employees per postcode cluster is outlined within **Part 2 Appendix 6.13** for the **Mine and Part 2 Appendix 6.14** for the MHF. The distribution of employees per postcode cluster has then been factored using a gravity model approach, whereby the number of employees is divided by journey time.

6.4.86 The preferred transport strategy for the Mine is to provide additional parking spaces at the Whitby Cross Butts P&R and make use of spare capacity at the Scarborough A64 P&R for onward bus transfer to DNF. This is supplemented by an allocation of parking spaces at the Mine for High Occupancy Vehicles (HOVs).

6.4.87 For employees at the Mine a scenario has been developed whereby the journey time is measured (using a route planner) from the centre of the postcode cluster to the most convenient operational P&R site, the journey time from the P&R sites (Scarborough or Whitby) has then been added to the drive time to the P&R sites to ensure that total journey times do not exceed 60 minutes. Whilst for employees at the MHF, the journey time is simply measured from the centre of the postcode cluster to the MHF site.

6.4.88 **Part 2 Appendix 6.1, Figures 6.14 and 6.15** provide a graphical representation of the distribution of labour in the form of a heat map for the Mine and MHF workforce respectively.

6.4.89 **Part 2 Appendices 6.13 and 6.14** then also assign each postcode cluster a point of entry on to the highway network (and P&R site for the Mine) to inform the distribution of employee trips.

6.4.90 For the Mine, from the Scarborough A64 P&R site, employees would be transferred by minibus to the Mine via the A64, A171 and B1416 and from the Cross Butts P&R site employees would be transferred by bus to the Mine along the A171 to the junction with the B1416 south of Whitby. Some of the buses may also divert and pickup from pre-arranged points in Whitby (such as the train station).

6.4.91 In addition to the P&R, provision has also been made for limited parking spaces at the Mine, of the 76 spaces, five would be reserved for visitors and eight for disabled employees (63 standard bays + 8 disabled bays), leaving an allocation of 71 spaces for employees. Assuming that permission is granted for the proposed changes to the Scarborough A64 and Cross Butts P&R sites, a target of an average of three employees per parking space is proposed for the Mine parking. However, should either of these permissions not be achieved then a higher target would need to be developed, most likely requiring local pickup by minibuses from pre-determined locations.

6.4.92 Therefore, in order to assess a worst case it is assumed that the P&R sites would operate as a collection point to which all employee trips would be attracted by single occupancy vehicle, from this point onwards employee trips to the Mine would reduce by two thirds to represent employees travelling direct to the minehead at an employee to vehicle ratio of three.

6.4.93 This assessment approach serves to load the maximum potential single occupancy vehicle trips on the network noting that it is likely that car sharing pools will reduce trips at journey origin (rather than the P&R site).

6.4.94 For clarity it has been assumed that during shift change over all the allocated parking spaces at the Mine would be available for arrivals (i.e. not occupied by previous shifts). Therefore, traffic generation during the peak hour is calculated using the maximum vehicles that could be attracted by the allocated

spaces (63) with no reduction for occupancy. For simplicity of assessment a simple employee to vehicle ratio of three has been applied to these trips to maximise available capacity.

6.4.95 In order to assess a worst case for employees travelling to the MHF it has been assumed that employees would travel by a single occupancy car trip with no allowance made for workers to car-share or to be able to travel by non-car modes bus, rail, walking and cycling.

6.4.96 The derived typical operation employee demand has been assigned to the highway network **Part 2 Appendix 6.15** details the derivation, **Part 2 Appendix 6.1, Figure 6.16** details the resultant daily flows.

Combined operational traffic

6.4.97 The derived peak operation combined demand has been assigned to the highway network, **Part 2 Appendix 6.1, Figure 6.17** details the resultant daily flows.

6.5 Assessment of impacts during construction

Embedded mitigation

6.5.1 In line with the transport strategy for the development, the following embedded mitigation measures are promoted and have been applied to the traffic forecasts contained in this chapter:

- Aggregate imported for temporary haul roads, shaft platforms and laydown areas that is not required for the operational layout would be retained onsite within the spoil placement cells, thereby reducing the need to export of materials for disposal at the end of the project.
- The implementation of car-sharing amongst construction staff for the MTS (excluding Dove's Nest) Harbour and MHF intermediate shaft sites at a minimum ratio of 2.5 employees to a vehicle to reduce light commercial vehicle (LCV) traffic.
- The implementation of a temporary Construction village and P&R facility near Whitby Business Park and/or private minibus pick up for construction workers based at the Mine and shaft location at Dove's Nest, to reduce the impact of employees travelling direct to the respective sites.
- MTS intermediate shaft sites to be located close to main 'A' roads to minimise the impacts upon local communities and utilise the most suitable roads.
- HGV traffic travelling to the Mine would not be permitted to route through Ruswarp and Sneaton.
- HGV traffic travelling to the intermediate MTS sites would only be permitted to route from A171.
- All arisings from the MTS sites to be retained on site to remove the requirement for spoil to be exported offsite.
- Areas onsite to allow for imported and exported materials to be stockpiled allowing for more even distribution of HGV movements and accommodate periods where deliveries cannot be made or are restricted for example during periods of bad weather and bank holidays.
- Parking controls at all sites.

Route screening

6.5.2 In accordance with GEART (Rule 1 and Rule 2), a screening process has been undertaken for the study area to identify routes that are likely to have sufficient changes in traffic flows and, therefore, require further impact assessment.

6.5.3 **Table 6-15** summarises the total daily movements of all materials, personnel and plant during the peak construction month, distributed across the highway network. The table also provides a comparison of the peak construction flows with the forecast background traffic flows in January 2015. By comparing the peak daily construction traffic flows with background traffic flows for the month with the lowest background traffic, the assessment considers the greatest potential for change, thereby ensuring a robust screening process.

Table 6-15 Existing and proposed daily traffic flows during the YPP construction phase

Link	Description	Link sensitivity	Background January 2015 24hr flows		2015 construction flows (two-way)		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
1	A19 (west of Middlesbrough)	Low	87,385	6,048	376	32	0.4%	0.5%
2	A66 (north of Middlesbrough)	Low	25,162	2,106	730	386	2.9%	18.3%
3	A1053 (east of Middlesbrough)	Low	11,815	1,012	580	271	4.9%	26.7%
4	A174 (south of Redcar)	Low	29,500	1,207	180	0	0.6%	0.0%
5	A174 (south of Middlesbrough)	Low	24,512	1,450	717	271	2.9%	18.7%
6	A171 (Ormesby Bank)	Medium	14,117	372	537	0	3.8%	0.0%
7	A172 (Dixons Bank)	Medium	19,005	701	498	271	2.6%	38.6%
8	A172 (towards Stokesley)	Low	10,660	429	11	0	0.1%	0.0%
9	A1043 (south of Middlesbrough)	Low	12,580	529	523	271	4.2%	51.1%
10	A171 (Middlesbrough Road)	Low	19,319	771	1,160	271	6.0%	35.1%
11	A173 (Skelton Ellers)	Low	5,107	279	254	43	5.0%	15.3%
12	A171 (between the A173 and Scaling Dam)	Low	7,581	414	1,319	228	17.4%	55.0%
14	A174 (Apple Orchard Bank)	Medium	11,079	371	65	0	0.6%	0.0%

Link	Description	Link sensitivity	Background January 2015 24hr flows		2015 construction flows (two-way)		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
15	A174 (Skelton-in-Cleveland)	Low	10,142	507	3	0	0.0%	0.0%
44	A1085 (Trunk Road)	Low	16,517	790	642	185	3.9%	23.4%
Key								
	Links exceeding GEART screening thresholds.							

Screening summary

6.5.4 In accordance with GEART, only those sensitive links that show a greater than10% increase in total traffic flows (or HGV component) or, for all other links, a greater than 30% increase in total traffic or the HGV component are considered when assessing the traffic impact upon receptors.

6.5.5 It is noted from **Table 6-15** that 6 of the 15 links (links 3, 5, 7, 9, 10, and 12) are above the screening threshold and are therefore taken forward for further assessment. The remaining links all fall below the GEART screening thresholds and are not, therefore, considered further in the impact assessment.

Impacts

6.5.6 The following paragraphs summarise the construction traffic impacts on the effects identified as being susceptible to changes in flow for the construction phase.

Severance

6.5.7 **Table 6-15** shows that the peak change in total daily traffic for all links is less than a 30% change in total traffic, whereby GEART suggest negative impacts maybe experienced. However, in addition to the consideration of daily severance impacts, consideration has also been given to hourly impacts for the peak sensitivity hours. **Table 6-16** demonstrates the increase in traffic for all screened links between 7am to 8am and 2pm to 3pm in January.

Table 6-16 Severance impacts

Link	January 2015 background flows (all vehicles)		Peak construction flows (all vehicles) (two-way)		Percentage increase		Link sensitivity
	7am – 8am	2pm – 3pm	7am – 8am	2pm – 3pm	7am – 8am	2pm – 3pm	
7	1,792	1,415	41	84	2.3%	5.9%	Medium
9	1,177	939	44	89	3.7%	9.5%	Low
10	1,819	1,438	100	242	5.5%	16.8%	Low
12	396	628	121	283	30.6%	45.1%	Low
Magnitude of effect key							
Very low < 30%		Low 30 – 60%		Medium 60 – 90%		High < 90%	

6.5.8 **Table 6-16** identifies that the impact upon severance between 7am to 8am and 2pm to 3pm for link 12, is above GEART thresholds of greater than a 30% increase in traffic.

6.5.9 The remaining links all experience traffic flows significantly below the 30% threshold and the magnitude of effect is assessed as very low; resulting in predicted impacts of minor adverse to **negligible** significance.

6.5.10 Link 12 comprises the A171 between Guisborough and Whitby. The link is considered to be of low sensitivity due to the fact that there is limited development and few sensitive receptors present. The main pedestrian activity results from PRoW crossing the road. Therefore the magnitude of effect is assessed as low on low value receptors; resulting in the prediction of negligible impacts.

Pedestrian amenity

6.5.11 A review of the daily peak change in HGV component flows presented within **Table 6-15**, highlights that no links show a greater than a 100% increase in HGV flows, whereby GEART suggests that negative impacts may be experienced. However, in addition to the consideration of daily pedestrian amenity impacts, consideration has also been given to hourly impacts. **Table 6-17 and Table 6-18** demonstrate the increase in traffic for all screened links in January for the peak sensitivity hours of 7am to 8am and 2pm to 3pm respectively.

Table 6-17 Pedestrian amenity impacts (7am – 8am)

Link	Background flows January 2015		Construction flows (two-way)		Percentage increase		Link sensitivity
	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	
7	1,792	62	41	27	2.3%	43.5%	Medium
9	1,177	48	44	27	3.7%	56.3%	Low
10	1,819	68	100	27	5.5%	39.7%	Low
12	396	17	121	23	30.6%	135.3%	Low

Table 6-18 Pedestrian amenity impacts (2pm – 3pm)

Link	Background flows January 2015		Construction flows (two-way)		Percentage increase		Link sensitivity
	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	
7	1,415	51	84	27	5.9%	52.9%	Medium
9	939	38	89	27	9.5%	71.1%	Low
10	1,438	56	242	27	16.8%	48.2%	Low
12	628	34	283	23	45.1%	67.6%	Low

6.5.12 **Table 6-17** identifies that links 5, 7, 9, 10, and 12 would experience increases in traffic flows above GEART thresholds between 7am to 8am. The remaining links would all experience impacts of minor adverse to negligible significance. **Table 6-18** identifies that no screened links are above GEART thresholds between 2pm to 3pm.

6.5.13 Links 5, 9 10, and 12 comprise main A road with the links are considered to be of low sensitivity noting that there is limited development and few sensitive receptors. The main pedestrian activity results from PRoW crossing the road and would be limited between 7am and 8am when peak impacts are predicted to occur. Therefore the magnitude of the effect is assessed as low on low value receptors; resulting in the prediction of a negligible impact.

6.5.14 Link 7 comprises of the A172 through Nunthorpe. This link is fronted by schools, shops and residential properties and currently provides for a on and off road cycle routes, wide footways, signalised pedestrian crossings, and pedestrian refuge islands. It is therefore considered that the existing highway layout is appropriate to accommodate the traffic increases and, consequently, the magnitude of the effect is assessed as low on a medium value receptor; resulting in the prediction of a minor adverse impact.

Fear and intimidation

6.5.15 **Table 6-19** provides a comparison of the existing and proposed traffic flows for all screened links. The comparison focuses on a worst case period of August where background and development traffic flows combined are at their highest and, therefore, are most likely to result in greater impacts.

6.5.16 **Table 6-19** identifies that, for fear and intimidation, link 10 would experience a moderate adverse impact and link 7, would experience major adverse impacts. The remaining links would all experience impacts of **minor adverse** to **negligible** significance.

6.5.17 Of those links that would experience moderate to major adverse increases in traffic, it is also necessary to consider other factors that may influence fear and intimidation, such as vehicle speeds and pedestrian provision.

Table 6-19 Fear and intimidation impacts

Link	Background flows August 2015		Background flows August 2015 + construction demand (two-way)		Link sensitivity	Impact
	Average traffic flow over 18 hour day Vehicles / hour	Total 18 hour HGV flows HGVs / 18 hours	Average traffic flow over 18 hour day Vehicles / hour	Total 18 hour HGV flows HGVs / 18 hours		
7	1,212	802	1,240	1,073	Medium	Major
9	802	607	831	878	Low	Minor
10	1,232	883	1,296	1,153	Low	Moderate
12	766	749	840	976	Low	Minor

Magnitude of effect key

Very Low - Low	Medium	High
Average traffic flows over 18 hours of less than 600 vehicles/hour or 1,000 HGVs over 18 hours	Average traffic flows over 18 hours between 600 –1,200 vehicle/hour or more than 1,000 – 2,000 HGVs over 18 hours	Average traffic flows over 18 hours of more than 1,200 vehicles/hour or more than 2,000 HGVs over 18 hours

6.5.18 Link 7 comprises of the A172 through Nunthorpe. This link is fronted by schools, shops and residential properties and, as set out above, the road currently provides for a on and off road cycle routes, wide footways, signalised pedestrian crossings, and pedestrian refuge islands. It is therefore considered that the existing highway layout is appropriate to accommodate the traffic increases and, consequently, the impact is predicted to be of **minor adverse significance**.

6.5.19 Link 10 comprises of the A171 which is a modern A road between the junction with the A1043 and A173 and is mainly dual carriageway and as such there is no pedestrian demand along this link. Based on this it is assessed that the magnitude of effect upon fear and intimidation would be low on low value receptors. Therefore the impact is predicted to be of negligible significance.

Pedestrian delay

6.5.20 In order to quantify the potential delays to pedestrians (and where applicable cyclists) a review of the types of crossing facilities upon screened routes has been undertaken. Utilising the formulas provided within TRRL 356, it is possible to calculate typical delays for different crossing types based upon hourly traffic flows.

6.5.21 **Table 6-20** details the types of crossing facilities on all screened links (where more than one type of crossing is present they are noted) and provides a comparison of the projected delays with and without development traffic. This comparison has been undertaken using the highest August peak traffic flows for the peak sensitivity hour (2pm – 3pm) in order to realise a worst case for assessment.

Table 6-20 Pedestrian delay impacts

Link	Projected pedestrian delay August 2015 traffic flows (seconds)			Projected pedestrian delay August 2015 traffic flows + (two-way) development traffic (seconds)			Projected increase in pedestrian delay (seconds)		
	Ref *	PX **	NF ***	Ref *	PX **	NF ***	Ref *	PX **	NF ***
7	8.0	9.5		8.5	10.1		0.4	0.6	
9			6.2			7.0			0.8
10			12.8			16.5			3.8
12			6.3			9.4			3.1

Notes	
Ref *	Pedestrian refuges/central splitter islands.
PX **	Pedestrian crossings, including, Toucans, Pelicans and Puffins.
NF ***	No formal crossing facilities.

6.5.22 **Table 6-20** identifies that pedestrian delay would on average not be projected to increase by more than five seconds for all screened links; whilst GEART does not suggest thresholds for where increases may

or may not be acceptable it recommends that assessors use their judgement to determine whether pedestrian delay is a significant impact.

6.5.23 Recognising that the peak increase in pedestrian delay is no more than five seconds, it is considered that the magnitude of the effect would be very low and result in an impact of no greater than minor adverse significance.

Highway safety

6.5.24 Having identified the collision clusters (see **Section 6.3**), an assessment has been undertaken to identify emerging patterns or factors that could be exacerbated by the developments traffic generation. This narrowed down the cluster sites to only those that demonstrated an emerging pattern of collision that could be adversely impacted by the development developments traffic.

6.5.25 It is considered that all collision clusters are high sensitive receptors and, therefore, screening has been undertaken utilising the GEART 10% increase threshold; a summary is provided in **Table 6-21**.

Table 6-21 Summary of highway safety impacts

Cluster description	Summary of assessment
Cluster 44 Roundabout junction of the A66 and B1513	Cluster 44 is located on link 2, which is screened out of the assessment on GEART screening thresholds. The impact is therefore assessed as very low on a high value receptor, resulting in a minor adverse impact.
Cluster 48 Roundabout junction of the A171 and A173	Cluster 48 is located at the intersection of links 10, 11 and 12 of links 10 and 12 are screened into the assessment. The impacts upon Cluster 48 are, therefore, assessed further.
Cluster 57 Roundabout junction of the A1053 and A174	Cluster 57 is located at the intersection of links 3, 4 and 5, of which links 3 and 5 are screened into the assessment. The impacts upon Cluster 57 are, therefore, considered further.
Cluster 59 Roundabout junction of the A174 and Redcar Lane	Cluster 59 is located on link 4, which is screened out the assessment on GEART screening thresholds. The impact is therefore assessed as very low on a high value receptor, resulting in a minor adverse impact.

Cluster description	Summary of assessment
Cluster 61 Roundabout junction of the A174 and A1085	Cluster 61 is located at the intersection of link 4 and 14, both of which are screened out of the assessment on GEART screening thresholds. The impact is therefore assessed as very low on a high value receptor, resulting in a minor adverse impact.

6.5.26 **Table 6-21** identifies that Clusters 48 and 57 would be impacted by the screened construction traffic. They are, therefore, considered further below to identify whether mitigation measures may be required.

6.5.27 Cluster 48 has experienced 12 collisions within the past five years with an emerging pattern of single vehicle loss of control type collisions on the A171 approaches. A review of the baseline road safety measures has identified that the junction is of a modern standard and with road safety measures, including high friction surfacing, advanced warning and direction signing on the A171 approaches, and is street lit.

6.5.28 Cluster 57 has experienced 22 collisions within the past five years and demonstrates an emerging pattern of rear end shunt, loss of control type collisions; however, discussions with the Highway Agency have identified that this junction was improved in December 2010 as part of the works for the Teesport Northern Gateway development and, therefore, now benefits from enhanced road safety measures.

6.5.29 For the collision clusters identified it is considered that the existing and proposed road safety measures are appropriate to mitigate the impact of the development traffic and, therefore, the overall impact upon road safety is assessed a very low on high value receptors; resulting in the prediction of a minor adverse impact.

Driver Delay

6.5.30 The GEART screening thresholds do not apply to this effect, as the potential impact is defined as significant when the traffic system surrounding the development under consideration is at or close to capacity. This section examines in detail the effects of Driver Delay by assessing the impact of YPP traffic on the sensitive junctions and links identified in **Section 6.3**.

6.5.31 **Section 6.4** has established that the highest combined network and development traffic flows would occur between 5pm to 6pm for the RCBC area.

6.5.32 The 5pm to 6pm period covers the period where employees who have been working at the MHF and Harbour facilities depart. In addition to the employee traffic movements there would also be HGVs making deliveries.

6.5.33 The supporting TA (**ES Section 12, Appendix 12.2**) provides full details of the methodology for the junction modelling, including information such as data capture, signal timings and model validation.

6.5.34 The CIA provides a summary of the modelled impacts for the peak construction period compared to background traffic flows. When assessing junction capacity, reference has been made to the Ratio of Flow to Capacity (RFC) and Degree of Saturation (DoS). RFC is the standard recognised threshold for priority and roundabout junctions in the UK and DoS is the standard recognised threshold for signalised junctions. When values for RFC and DoS are above 0.85 and 90% respectively, a junction is considered to be operating beyond its desirable capacity and mitigation measures may be required.

6.5.35 In addition, the term Practical Reserve Capacity (PRC) is referenced when assessing overall traffic signal junction performance. In general terms, a positive PRC indicates the junction has capacity and a negative PRC indicates a level of congestion is evident.

6.5.36 Reference is also made in the assessment to Passenger Car Units (PCUs). A PCU is a term used in traffic modelling to translate all vehicles into one common unit. For example a car is equivalent to one PCU whilst a HGV is typically equivalent to 2.3 PCUs.

Junction 9 - North west Redcar, junction of the A1085 Trunk Road with the Wilton works

6.5.37 **Table 6-22** summarises the modelled RFC, queuing and delay for junction 9 between 5pm to 6pm for 2015 for both with and without development scenarios.

Table 6-22 Junction 9, junction capacity, delay and queuing

	2015 (without development)			2015 (with development)		
Junction arm	**RFC**	**Queue**	**Delay (s)**	**RFC**	**Queue**	**Delay (s)**
A1085 (South)	0.435	0.8	3.3	0.433	0.8	3.2
Proposed Harbour Access	0.000	0.0	0.0	0.066	0.1	3.0
Tata Steel Access	0.194	0.2	2.3	0.200	0.2	2.4
A1085 (North)	0.307	0.4	3.5	0.317	0.5	3.7
West Coatham Lane	0.177	0.2	3.1	0.182	0.2	3.2
Wilton Access	0.029	0.0	2.3	0.109	0.1	2.6

6.5.38 It is observed from **Table 6-22** that, without the development, no arms of the junction exceed 0.85 (the "recognised threshold" for RFC), with queues of less than a single PCU. With the addition of the development traffic of 193 two-way vehicle movements (22 HGVs and 171 cars), the junction would continue to operate with spare capacity, with queues no greater a single PCU and delays of less than four seconds.

6.5.39 For junction 9 the magnitude of the effect is assessed as very low on a low value receptor and, therefore, the impact is predicted to be of **negligible** significance.

Junction 10 - West Redcar, junction of the A1085 Trunk Road with the Freightliner Terminal

6.5.40 **Table 6-23** summarises the modelled RFC, queuing and delay for junction 10 between 5pm to 6pm for 2015 for both with and without development scenarios.

Table 6-23 Junction 10, junction capacity, delay and queuing

	2015 (without development)			2015 (with development)		
Junction arm	**RFC**	**Queue**	**Delay (s)**	**RFC**	**Queue**	**Delay (s)**
A1085 (South)	0.361	0.6	2.5	0.368	0.6	2.5
Tata Steel Access	0.162	0.2	3.9	0.164	0.2	4.0
A1085 (North)	0.393	0.6	2.6	0.480	0.9	3.1
Wilton Access	0.020	0.0	4.0	0.022	0.0	4.4

6.5.41 It is observed from **Table 6-23** that without the development no arms of the junction exceeds 0.85 (the "recognised threshold" for RFC), with queues of less than a single PCU. With the addition of the development traffic of 193 two-way vehicle movements (22 HGVs and 171 cars) the junction would continue to operate with spare capacity, with queues no greater a single PCU and delays of less than five seconds.

6.5.42 For junction 10 the magnitude of the effect is assessed as very low on a low value receptor and, therefore, the impact is predicted to be of **negligible** significance.

Junction 11 - North east Middlesbrough, junction of the A1085, A66 and A1053

6.5.43 **Table 6-24** summarises the modelled DoS, queuing and delay for junction 11 between 5pm to 6pm for 2015 for both with and without development scenarios.

Table 6-24 Junction 11, junction capacity, delay and queuing

	2015 (without development)			2015 (with development)		
Junction arm	**DoS**	**Queue**	**Delay (s)**	**DoS**	**Queue**	**Delay (s)**
A1085 (North) Lane 1&2	63.5%	5.5	19.0	75.1%	8.2	22.3
A1085 (North) Lane 3	55.0%	6.0	19.7	67.1%	8.0	22.5
Wilton Works Access Lane 1	20.9%	0.8	12.8	45.9%	1.6	20.2
Wilton Works Access Lane 2	43.2%	1.2	22.5	24.1%	0.5	22.6
A1053 - Greystone Road Lane 1	37.6%	2.8	25.3	38.8%	2.9	25.5
A1053 - Greystone Road Lane 2	33.5%	2.5	24.7	37.1%	2.8	25.2
A1053 - Greystone Road Lane 3	6.3%	0.4	22.0	8.4%	0.6	22.1
A1085 (South) Lane 1	21.8%	1.1	6.4	25.5%	1.3	7.2
A1085 (South) Lane 2	23.2%	1.2	6.8	22.4%	1.1	7.4
A1053 - Tees Dock Road - Lane 1	44.6%	5.0	7.7	46.4%	5.4	7.9
A1053 - Tees Dock Road - Lane 2	64.3%	9.7	10.0	66.9%	10.5	10.4
PRC	40.0%			20.1%		

6.5.44 It is observed from **Table 6-24** that without the development the junction has a positive PRC with no arms exceeding 90% (the “recognised threshold” for DoS), with the largest queue of 10 PCUs on the A1053 Tees Dock Road approach. With the addition of the proposed development traffic of 221 two-way vehicle movements (49 HGVs and 172 cars), there would be a slight deterioration in DoS for some arms; however, junction would continue to operate with spare capacity, with queues only predicted to increase by up to three PCUs and delays by eight seconds, which is considered to be indiscernible.

6.5.45 For junction 11 the magnitude of the effect is assessed as very low on a low value receptor and, therefore, the impact is predicted to be of **negligible** significance.

Junction 12 - South east Middlesbrough, junction of the A1053, A174 and B1380

Table 6-25 summarises the modelled DoS, queuing and delay for junction 12 between 5pm to 6pm for 2015 for both with and without development scenarios.

Table 6-25 Junction 12, junction capacity, delay and queuing

	2015 (without development)			2015 (with development)		
Junction arm	**DoS**	**Queue**	**Delay (s)**	**DoS**	**Queue**	**Delay (s)**
A1053 - Greystone Road Lane 1	80.0%	6.6	21.3	87.5%	9.3	31.6
A1053 - Greystone Road Lane 2	80.0%	6.6	21.3	87.9%	9.4	32.4
A1053 - Greystone Road Lane 3	85.0%	7.9	27.3	90.0%	10.3	37.3
A174 (East) Lane 1	56.7%	0.7	2.1	56.7%	0.7	2.1
A174 (East) Lane 2	36.8%	3.6	17.1	36.8%	3.6	17.1
A174 (East) Lane 3	24.0%	2.3	15.5	24.0%	2.3	15.5
A174 (West) Lane 1	25.6%	2.5	8.3	28.6%	2.9	8.5
A174 (West) Lane 2 & 3	66.5%	6.6	10.3	67.1%	6.8	10.4
High Street Lane 1 & 2	75.4%	5.3	26.7	75.9%	5.3	27.1
PRC	5.9%			0.0%		

6.5.46 It is observed from **Table 6-25** that without the development the junction has a positive PRC, with no arms exceeding 90% (the “recognised threshold” for DoS), and with the largest queue of eight PCUs on the A1053 Greystones Road approach. With the addition of the proposed development traffic of 95 two-way vehicle movements (28 HGVs and 67 cars), there would be a slight deterioration in DoS for some arms; however, junction would continue to operate with spare capacity, with queues only predicted to increase by up to three PCUs and delays by ten seconds, which is considered to be indiscernible.

6.5.47 For junction 12 the magnitude of the effect is assessed as very low on a low value receptor and, therefore, the impact is predicted to be of **negligible** significance.

Saturday Route screening

6.5.48 **Table 6-26** summarises the total daily peak traffic movements during the peak month when distributed across the highway network. The table also provides a comparison of the peak construction flows with the forecast background traffic flows in for a Saturday in January 2015. By comparing the peak daily construction traffic flows with background traffic flows for the month with the lowest background traffic the assessment considers the greatest potential for magnitude of change, thereby ensuring a robust screening process.

Table 6-26 Existing and proposed daily traffic flows during the YPP construction phase (Saturday)

Link	Description	Link sensitivity	Background January 2015 24hr flows		2015 construction flows (two-way)		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
1	A19 (west of Middlesbrough)	Low	70,520	4,881	376	32	0.%	0.7%
2	A66 (north of Middlesbrough)	Low	20,364	1,704	730	386	3.6%	22.7%
3	A1053 (east of Middlesbrough)	Low	8,947	346	580	271	6.5%	78.3%
4	A174 (south of Redcar)	Low	26,290	663	180	0	0.7%	0.0%
5	A174 (south of Middlesbrough)	Low	19,775	1,175	717	271	3.6%	23.1%
6	A171 (Ormesby Bank)	Medium	11,361	300	537	0	4.7%	0.0%
7	A172 (Dixons Bank)	Medium	15,341	570	498	271	3.2%	47.5%
8	A172 (towards Stokesley)	Low	8,581	346	11	0	0.1%	0.0%
9	A1043 (south of Middlesbrough)	Low	10,158	428	523	271	5.1%	63.3%
10	A171 (Middlesbrough Road)	Low	15,603	626	1,160	271	7.4%	43.3%
11	A173 (Skelton Ellers)	Low	4,764	246	254	43	5.3%	17.5%
12	A171 (between the A173 and Scaling Dam)	Low	6,858	375	1,319	228	19.2%	60.8%
14	A174 (Apple Orchard Bank)	Medium	8,925	299	65	0	0.7%	0.0%
15	A174 (Skelton-in-Cleveland)	Low	9,460	445	3	0	0.0%	0.0%

Link	Description	Link sensitivity	Background January 2015 24hr flows		2015 construction flows (two-way)		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
44	A1085 (Trunk Road)	Low	12,494	433	642	185	5.1%	42.7%
Key								
	Links exceeding GEART screening thresholds.							

Saturday screening summary

6.5.49 In accordance with GEART, only those sensitive links that show a greater than10% increase in total traffic flows (or HGV component) or, for all other links, a greater than 30% increase in total traffic or the HGV component are considered when assessing the traffic impact upon receptors.

6.5.50 It is noted from **Table 6-26** that 6 of the 15 links (links 3, 7, 9, 10, 12 and 44) are above the screening threshold. The remaining links all fall below the GEART screening thresholds and are not, therefore, considered further in the impact assessment.

6.5.51 A comparison of **Table 6-15** for AADT (weekday) screening with **Table 6-26** for Saturday screening identifies that links 3 and 44 are now screened into the assessment and are demonstrating significant increases in magnitude of effect and are therefore further impact assessment is undertaken.

Impacts

6.5.52 The following paragraphs summarise the construction traffic impacts on the effects identified as being susceptible to changes in flow for the construction phase for links 3 and 44 (recognising the Highway Safety and Driver Delay assessment undertaken for the weekday impact assessment represents worst case and remain valid for a Saturday scenario).

Severance

6.5.53 **Table 6-26** shows that the peak change in total daily traffic for all links is less than a 30% change in total traffic, whereby GEART suggest negative impacts maybe experienced. However, in addition to the consideration of daily severance impacts, consideration has also been given to hourly impacts for the peak sensitivity hours. **Table 6-27** demonstrates the increase in traffic for all screened links between 7am to 8am and 2pm to 3pm in January.

Table 6-27 Severance impacts (Saturday)

Link	January 2015 background flows (all vehicles)		Peak construction flows (all vehicles) (two-way)		Percentage increase		Link sensitivity
	7am – 8am	2pm – 3pm	7am – 8am	2pm – 3pm	7am – 8am	2pm – 3pm	
3	328	739	80	66	24.4%	8.9%	Low
44	322	1099	119	50	37.0%	4.5%	Low
Magnitude of effect key							
Very low < 30%		Low 30 – 60%		Medium 60 – 90%		High < 90%	

6.5.54 **Table 6-27** identifies that the impact upon severance between 7am to 8am and 2pm to 3pm for link 44, is above GEART thresholds of greater than a 30% increase in traffic.

6.5.55 Link 3 falls below the 30% threshold and the magnitude of effect is assessed as very low; resulting in predicted impact of **negligible** significance.

6.5.56 Link 44 comprises the A1085 dual carriage way trunk road between Grangetown and Redcar. The link is considered to be of low sensitivity due to the fact that there is limited development and few sensitive receptors present. There are segregated cycle routes provided along both sides of the road. Therefore the magnitude of effect is assessed as low on low value receptors; resulting in the prediction of **negligible** impacts.

Pedestrian amenity

6.5.57 A review of the daily peak change in HGV component flows presented within **Table 6-26**, highlights that no links show a greater than a 100% increase in HGV flows, whereby GEART suggests that negative impacts may be experienced. However, in addition to the consideration of daily pedestrian amenity impacts, consideration has also been given to hourly impacts. **Table 6-28 and Table 6-29** demonstrate the increase in traffic for all screened links in January for the peak sensitivity hours of 7am to 8am and 2pm to 3pm respectively.

Table 6-28 Pedestrian amenity impacts (7am – 8am) Saturday

Link	Background flows January 2015		Construction flows (two-way)		Percentage increase		Link sensitivity
	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	
3	328	26	80	27	24.4%	103.8%	Low
44	322	20	119	18	37.0%	90.0%	Low

Table 6-29 Pedestrian amenity impacts (2pm – 3pm) Saturday

Link	Background flows January 2015		Construction flows (two-way)		Percentage increase		Link sensitivity
	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	
3	739	24	66	27	8.9%	112.5%	Low
44	1099	35	50	18	4.5%	51.4%	Low

6.5.58 **Table 6-28** identifies that link 3 would experience increases in traffic flows above GEART thresholds between 7am to 8am and link 44 would be close to the 100% 'significance' threshold for the same period. **Table 6-29** identifies that link 3 would experience increases in traffic flows above GEART thresholds between 2pm to 3pm.

6.5.59 Link 3 comprises of a main dual carriage way A road with low sensitivity noting that there is limited development and few sensitive receptors. There are no provisions for pedestrian activity therefore the magnitude of the effect is assessed as low on low value receptors; resulting in the prediction of a **negligible** impact.

6.5.60 Link 44 comprises the A1085 dual carriage way trunk road between Grangetown and Redcar. The link is considered to be of low sensitivity due to the fact that there is limited development and few sensitive receptors present. There are segregated cycle routes provided along both sides of the road. Therefore the magnitude of effect is assessed as low on low value receptors; resulting in the prediction of **negligible** impacts.

Fear and intimidation

6.5.61 **Table 6-30** provides a comparison of the existing and proposed traffic flows for all screened links. The comparison focuses on a worst case period of August where background and development traffic flows combined are at their highest and, therefore, are most likely to result in greater impacts.

6.5.62 **Table 6-30** identifies that, for fear and intimidation, links 3 and 44 would experience impacts of **minor adverse** to **negligible** significance.

Table 6-30 Fear and intimidation impacts (Saturday)

Link	Background flows August 2015		Background flows August 2015 + construction demand (two-way)		Link sensitivity	Impact
	Average traffic flow over 18 hour day Vehicles / hour	Total 18 hour HGV flows HGVs / 18 hours	Average traffic flow over 18 hour day Vehicles / hour	Total 18 hour HGV flows HGVs / 18 hours		
3	505	321	538	591	Low	Negligible
44	714	456	750	641	Low	Minor
Magnitude of effect key						
Very Low - Low Average traffic flows over 18 hours of less than 600 vehicles/hour or 1,000 HGVs over 18 hours			Medium Average traffic flows over 18 hours between 600 –1,200 vehicle/hour or more than 1,000 – 2,000 HGVs over 18 hours		High Average traffic flows over 18 hours of more than 1,200 vehicles/hour or more than 2,000 HGVs over 18 hours	

Pedestrian delay

6.5.63 In order to quantify the potential delays to pedestrians (and where applicable cyclists) a review of the types of crossing facilities upon screened routes has been undertaken. Utilising the formulas provided within TRRL 356, it is possible to calculate typical delays for different crossing types based upon hourly traffic flows.

6.5.64 **Table 6-31** details the types of crossing facilities on all screened links (where more than one type of crossing is present they are noted) and provides a comparison of the projected delays with and without development traffic. This comparison has been undertaken using the highest August peak traffic flows for the peak sensitivity hour (2pm – 3pm) in order to realise a worst case for assessment.

Table 6-31 Pedestrian delay impacts (Saturday)

Link	Projected pedestrian delay August 2015 traffic flows (seconds)			Projected pedestrian delay August 2015 traffic flows + (two-way) development traffic (seconds)			Projected increase in pedestrian delay (seconds)		
	Ref *	PX **	NF ***	Ref *	PX **	NF ***	Ref *	PX **	NF ***
3			5.3			5.9			0.6
44			9.1			9.7			0.6

Notes	
Ref *	Pedestrian refuges/central splitter islands.
PX **	Pedestrian crossings, including, Toucans, Pelicans and Puffins.
NF ***	No formal crossing facilities.

6.5.65 **Table 6-31** identifies that pedestrian delay would on average not be projected to increase by more than one second for all screened links; whilst GEART does not suggest thresholds for where increases may or may not be acceptable it recommends that assessors use their judgement to determine whether pedestrian delay is a significant impact.

6.5.66 Recognising that the peak increase in pedestrian delay is no more than one second, it is considered that the magnitude of the effect would be very low and result in an impact of **negligible** significance.

Sunday route screening

6.5.67 **Table 6-32** summarises the total daily peak traffic movements during the peak month when distributed across the highway network. The table also provides a comparison of the peak construction flows with the forecast background traffic flows in for a Sunday in January 2015. For this scenario Sunday construction traffic is assumed to be primarily maintenance and refuelling activities estimated at 10% of peak weekday flows. By comparing the peak daily construction traffic flows with background traffic flows for the month with the lowest background traffic the assessment considers the greatest potential for magnitude of change, thereby ensuring a robust screening process.

Table 6-32 Existing and proposed daily traffic flows during the YPP construction phase (Sunday)

Link	Description	Link sensitivity	Background January 2015 24hr flows		2015 construction flows (two-way)		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
1	A19 (west of Middlesbrough)	Low	49,839	3,447	347	3	0.7%	0.1%
2	A66 (north of Middlesbrough)	Low	14,479	1,210	383	39	2.6%	3.2%
3	A1053 (east of Middlesbrough)	Low	6,634	228	336	27	5.1%	11.8%
4	A174 (south of Redcar)	Low	21,535	419	180	0	0.8%	0.0%
5	A174 (south of Middlesbrough)	Low	14,026	836	474	27	3.4%	3.2%
6	A171 (Ormesby Bank)	Medium	8,018	212	537	0	6.7%	0.0%
7	A172 (Dixons Bank)	Medium	10,895	409	254	27	2.3%	6.6%
8	A172 (towards Stokesley)	Low	6,059	244	11	0	0.2%	0.0%
9	A1043 (south of Middlesbrough)	Low	7,219	305	279	27	3.9%	8.9%
10	A171 (Middlesbrough Road)	Low	11,093	449	917	27	8.3%	6.0%

Link	Description	Link sensitivity	Background January 2015 24hr flows		2015 construction flows (two-way)		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
11	A173 (Skelton Ellers)	Low	4,471	232	216	4	4.8%	1.7%
12	A171 (between the A173 and Scaling Dam)	Low	6,014	330	1,114	23	18.5%	7.0%
14	A174 (Apple Orchard Bank)	Medium	6,311	211	65	0	1.0%	0.0%
15	A174 (Skelton-in-Cleveland)	Low	8,875	420	3	0	0.0%	0.0%
44	A1085 (Trunk Road)	Low	10,948	270	475	18	4.3%	6.7%
Key								
	Links exceeding GEART screening thresholds.							

Sunday screening summary

6.5.68 In accordance with GEART, only those sensitive links that show a greater than 10% increase in total traffic flows (or HGV component) or, for all other links, a greater than 30% increase in total traffic or the HGV component are considered when assessing the traffic impact upon receptors.

6.5.69 It is noted from **Table 6-32** that none of the 15 links are above the screening threshold and, therefore, the impacts resultant from a Sunday scenario can be considered **negligible**. It is further noted that HGV construction traffic can be increased significantly on the low sensitive routes around Teesside without compromising the assessment. It is therefore proposed that the Sunday HGV demand is re-visited in the framework CTMP (**ES Section 12**, **Appendix 12.3** refers) and any proposed increases agreed with highway stakeholders.

6.5.70 The Highway Safety and Driver Delay assessment undertaken for the weekday impact assessment represents worst case scenario and remains valid for a Sunday.

6.6 Assessment of impacts during operation

6.6.1 In line with the transport strategy for the development, the following embedded mitigation measures are promoted and have been applied to the traffic forecasts contained in this chapter:

- Provision of dedicated parking spaces at the Cross Butts (operational) P&R and Scarborough A64 (operational) P&R sites for employees at the Mine to reduce the impact of employees travelling direct to the Mine.
- The implementation of car-sharing / private transport amongst employees travelling direct to the Mine at a minimum ratio of 3.0 employees per vehicle combined with parking controls at the Mine to reduce car demand.

Route screening

6.6.2 In accordance with GEART (Rule 1 and Rule 2), a screening process has been undertaken for the study area to identify routes that are likely to have sufficient changes in traffic flows and therefore require further impact assessment.

6.6.3 **Table 6-33** summarises the total daily peak movements of all materials and personnel in 2020 (first year of opening) for peak annual production (theoretical worst case scenario 13 million tonnes per annum) distributed across the highway network. The table also provides a comparison of the peak operational flows with the forecast background traffic flows for a weekday in January 2020. By comparing the peak daily operational traffic flows with background traffic flows for the month with the lowest background traffic the assessment considers the greatest potential for magnitude of change, thereby ensuring a robust screening process.

Table 6-33 Existing and proposed daily traffic flows during the YPP operational phase

Link	Description	Link sensitivity	Background January 2020 24hr flows		2020 operational flows		Percentage increase	
			Total vehicles	Total HGVs	Total vehicles	Total HGVs	Total vehicles	Total HGVs
1	A19 (west of Middlesbrough)	Low	73,198	4,936	120	40	0.2%	0.8%
2	A66 (north of Middlesbrough)	Low	18,747	1,476	299	31	1.6%	2.1%
3	A1053 (east of Middlesbrough)	Low	11,981	959	205	26	1.7%	2.7%
4	A174 (south of Redcar)	Low	30,411	1,139	133	0	0.4%	0.0%
5	A174 (south of Middlesbrough)	Low	16,025	576	249	26	1.6%	4.5%
6	A171 (Ormesby Bank)	Medium	11,822	304	281	0	2.4%	0.0%
7	A172 (Dixons Bank)	Medium	15,997	576	35	9	0.2%	1.5%
8	A172 (towards Stokesley)	Low	8,941	350	2	0	0.0%	0.0%
9	A1043 (south of Middlesbrough)	Low	10,654	433	91	9	0.9%	2.0%
10	A171 (Middlesbrough Road)	Low	16,389	633	387	9	2.4%	1.4%
11	A173 (Skelton Ellers)	Low	4,412	228	125	0	2.8%	0.0%
12	A171 (between the A173 and Scaling Dam)	Low	8,225	426	719	9	8.7%	2.0%
14	A174 (Apple Orchard Bank)	Medium	9,525	303	133	0	1.4%	0.0%
15	A174 (Skelton-in-Cleveland)	Low	8,590	414	135	0	1.6%	0.0%
44	A1085 (Trunk Road)	Low	16,039	744	334	40	2.1%	5.4%
Key								
	Links exceeding GEART screening thresholds.							

Screening summary

6.6.4 In accordance with GEART, only those links that show a greater than 10% increase in total traffic flows (or HGV component) for sensitive links or a greater than 30% increase in total traffic or the HGV component for all other links are considered when assessing the traffic impact upon receptors.

6.6.5 It is noted from **Table 6-33** that no links are above the screening thresholds and therefore the YPP operational impacts are assessed as negligible.

6.6.6 It is necessary to give further consideration to Driver Delay effects noting that congested junctions can be adversely affected by relative low flows. It can be noted by comparison of **Table 6-15** to **Table 6-26** that operational YPP traffic flows are substantially lower than YPP construction flows. Noting that construction flows were assessed as having a **negligible** impact Driver Delay it is therefore the maximum operational Driver Delay impact is also assessed as **negligible**.

6.6.7 It is considered that the level of operational traffic demand will not change the magnitude of effects materially for a Saturday and Sunday scenario and the impacts during these periods can is also assessed as **negligible**.

6.7 Summary

6.7.1 This section of the CIA has assessed the potential in-combination traffic and transport impacts of the Mine, MTS, MHF and Harbour facilities on the baseline highway environment within the identified study area. The assessment also takes into account proposed construction and operational P&Rs, as well as other committed developments within the study area. **Table 6-34** provides a summary of the potential impacts for the various traffic effects forecast to arise.

6.7.2 Residual impacts in relation to traffic and transport during the construction and operational phases are forecast to be of minor adverse significance at worst.

Table 6-34 Summary of predicted impacts of the York Potash Project on Traffic and Transport

Description of Impact	Key Mitigation Measures	Maximum Residual Impact
Construction		
Severance	No mitigation further to that embedded within the scheme design is considered to be necessary.	Minor adverse
Pedestrian amenity		Minor adverse
Fear and intimidation		Minor adverse
Pedestrian delay		Minor adverse

Description of Impact	Key Mitigation Measures	Maximum Residual Impact
Highway safety		Minor adverse
Driver delay		Negligible
Operation		
Severance	No mitigation further to that embedded within the scheme design is considered to be necessary.	Negligible
Pedestrian amenity		Negligible
Fear and intimidation		Negligible
Pedestrian delay		Negligible
Highway safety		Negligible
Driver delay		Negligible

7 NOISE AND VIBRATION

7.1 Predicted effects

7.1.1 **Table 7-1** presents a summary of the predicted noise and vibration effects associated with the Harbour facilities and the other YPP components that have the potential to result in cumulative impacts with regard to noise and vibration.

Table 7-1 Summary of potential Noise and Vibration cumulative impacts

Potential impact	YPP component with the potential to interact	Potentially affected receptors
Construction phase noise and vibration	Harbour facilities and MHF	The closest residential noise sensitive receptors in each geographical direction were taken into account in order to determine if an effect would arise, on the basis that receptors further from the each development would experience lower noise and vibration effects due to the increased separation distance from the noise source.
Offsite construction traffic noise	Harbour facilities, MHF, MTS, Mine and Construction Village and Park & Ride	Human receptors within 50m of the road network.
Operational noise	Harbour facilities and MHF	The closest residential noise sensitive receptors in each geographical direction were taken into account in order to determine if an effect would arise, on the basis that receptors further from the each development would experience lower noise and vibration effects due to the increased separation distance from the noise source.
Offsite operational traffic noise	Harbour facilities, MHF, MTS, Mine and Construction Village and Park and Ride	Human receptors within 50m of the road network.

7.2 Assessment methodology

Construction and operational phase noise and vibration

7.2.1 The assessment study area was defined and agreed during consultation with the local authority stakeholders in order to identify the potential extents of the direct and indirect effects associated with potential noise and vibration arising from the project. The key receptors considered were sensitive residential and ecological receptors close to the proposed YPP components.

7.2.2 The study areas for the individual noise and vibration assessments comprised the area immediately adjacent to the relevant YPP component (within 1km). The closest residential noise sensitive receptors

in each geographical direction were taken into account, on the basis that receptors further from the site would experience lower noise effects due to the increased separation distance from the noise source.

7.2.3 Further details regarding the assessment of construction and operational noise and vibration are provided in **ES Section 14 Noise and Vibration**.

Construction and operational phase road traffic noise

7.2.4 Traffic data provided by Royal HaskoningDHV and utilised in the Harbour facilities, MHF, MTS, and Mine construction and operational phase assessments included cumulative increases in traffic from all YPP scheme elements (see **Part 2 Section 6**).

The road traffic study area with respect to air quality encompassed an area 50m around the defined road network. The extent of the road network considered was defined through scoping discussions and consultation with NYCC, NYMNPA, RCBC, Scarborough Borough Council (SBC) and the Highways Agency to identify those roads and junctions that may experience a material increase in traffic as a result of each YPP component. Further details are provided in **ES Section 12 Traffic and Transport**.

7.3 Assessment of potential cumulative impacts

Construction and operational phase site based noise and vibration

7.3.1 A baseline noise survey and assessment was undertaken for all YPP component sites.

Assessment of cumulative impact

7.3.2 The zone of separation between the construction/operational areas of the port terminal and the MHF fall outside of the 1km air quality ZOI; however there would be potential interaction of effects during the construction and operation of the conveyor; with the Dormanstown residential area falling inside of this 1km ZOI. A construction and operational noise assessments for the Harbour facilities (**ES Section 14 Noise and Vibration**) and MHF (summarised below) were undertaken in accordance with industry guidance and specify best-practice mitigation to reduce any impacts at nearby residential receptors.

7.3.3 Phase 3 (Steel Erection) of the MHF construction was predicted to have the greatest potential impact on Dormanstown receptors. The cumulative impact of this construction activity occurring concurrently with the Harbour facilities overland conveyor piling during the daytime, in the vicinity of Dormanstown, has the potential to generate levels in the region of the 62dB $L_{Aeq,12hr}$, which is below the daytime noise threshold limit and would be of negligible significance. Any potential intermittent audibility would be temporary in nature and short in duration.

7.3.4 **ES Section 14** predicts an impact of moderate significance over the night time period at Dormanstown during the conveyor piling works; however, cumulative impacts with the MHF would not arise, as MHF construction works would only take place over the daytime period (07:00 to 19:00). Hence, **no cumulative impact** would arise at night.

7.3.5 In order to minimise the potential for cumulative noise impacts on residential rectors in Dormanstown, a Construction Environmental Management Plan (CEMP), would be implemented and would include the following measures:

- informing local residents about the construction works, including the timing and duration of any particularly noisy elements, and providing a contact telephone number to them;
- avoiding operating particularly noisy equipment at the beginning and end of the day;
- keeping potentially noisy deliveries, such as skips and concrete, to the middle or less sensitive times of the day where possible;
- locating noisy static plant, such as diesel generators, away from residential properties;
- appropriate use of site hoardings and barriers around site compounds;
- appropriate use of barriers around static construction equipment (i.e. generators, auger piling rigs);
- using the most modern equipment available and ensuring equipment is properly maintained; and,
- where possible, using silencers/mufflers on equipment.

7.3.6 Although the combined effect of adopting such methods cannot be quantified, it is expected that these methods would reduce source noise levels by some 5-10dB.

7.3.7 Operational noise emissions from the MHF site are predicted to have their greatest impact on Dormanstown residential receptors; albeit levels are predicted to be below the current day and night measured baseline levels and have a very low magnitude (at worst). Hence an impact of negligible impact is predicted at all receptors due to the MHF.

7.3.8 Operational noise impacts associated with the Harbour facilities and conveyor are described in **ES Section 14**, and are predicted to have a negligible impact at all residential and ecological receptors.

7.3.9 The cumulative operational impacts of the MHF, Harbour facilities and conveyor during the day and night periods in the vicinity of Dormanstown are also predicted to have a **negligible** impact, as cumulative emissions would not exceed the current day and night time measured baseline levels. Mitigation measures are also embedded within the scheme design for the MHF.

7.3.10 The MHF and Harbour facilities are located within the existing heavy industrial area of Wilton. Therefore it is predicted that, with the adoption of best-practice mitigation measures, any cumulative impacts associated with construction and operational noise and vibration would not be significant.

Construction and operational phase road traffic noise

7.3.11 Baseline noise levels at considered sensitive receptors are detailed in **ES Section 14**. Baseline noise levels at all receptor locations (without the YPP components) are predicted to be below the relevant DMRB standards and objectives.

Assessment of cumulative impact

7.3.12 The traffic data generated for the project included cumulative increases in traffic from all YPP components and the predicted traffic generated by committed developments (see **ES Section 12 Traffic and Transport** and **Part 2 Section 6**). Noise levels at all assessed receptor locations defined for the Harbour facilities, MHF, MTS and Mine components due to traffic were predicted to be below the relevant DMRB standards and objectives; hence **no cumulative impact** would arise.

8 AIR QUALITY

8.1 Predicted effects

8.1.1 **Table 8-1** presents a summary of the predicted air quality effects associated with the Harbour facilities and the other YPP components that have the potential to result in cumulative impacts on air quality.

Table 8-1 Summary of potential Air Quality cumulative impacts

Potential impact	YPP components with potential to interact	Potentially affected receptors
Construction phase fugitive dust and fine particles	Harbour facilities, MHF and MTS Portal	Human receptors within 350m of the site boundary and 50m of routes used by construction vehicles up to 500m from the site access.
Road traffic pollutants – construction and operation	Harbour facilities, Mine, MTS, and MHF	Receptors within 200m of assessed roads (see **ES Chapter 12 Traffic and Transport**).
Operational phase emissions - stack and shipping emissions	Harbour facilities and MHF	Receptors within the study area

8.2 Assessment methodology

Fugitive construction phase dust and fine particulate matter

8.2.1 Guidance is provided by the Institute of Air Quality Management (IAQM) (IAQM, 2014) on the distances from construction sites beyond which impacts associated with dust soiling and on human health are not anticipated to occur. In accordance with this guidance, YPP components within 700m of the Harbour facilities (i.e. to account for adjacent construction activities each up to 350m from a receptor), were considered in the assessment of project wide cumulative impacts.

8.2.2 Further details regarding the approach adopted to the assessment of fugitive construction dust and fine particulate matter are provided in **ES Section 13 Air Quality**.

Construction and operational phase road traffic emissions

8.2.3 Traffic data provided by Royal HaskoningDHV and utilised in the Harbour facilities construction and operational phase assessments included the predicted cumulative increases in traffic from all YPP elements. Further details of the traffic data utilised in the assessments are included in **ES Section 12 Traffic and Transport** and **Part 2 Section 6** herein.

Operational phase stack and shipping emissions

8.2.4 A desk-based study was undertaken in order to determine the potential cumulative effect of emissions from stacks at the MHF and vessel movements on the identified operational phase receptors (as set out in **Table 8-1**).

8.3 Assessment of potential cumulative impacts

Fugitive construction dust and fine particulate matter

8.3.1 Background annual mean PM_{10} concentrations are well below the Government's health-based Objective, the benchmark for assessment within the EIA, at all YPP component locations.

Assessment of cumulative impact

8.3.2 The ZOI for air quality of the Harbour facilities and the MHF overlap, as the boundary of the route of the conveyor that forms part of the Harbour facilities is adjacent to the planning application boundary for the MHF. Mitigation measures to minimise the risk of dust impacts at nearby receptors were included within the impact assessment for the Harbour facilities (**ES Section 13 Air Quality**) and similar mitigation was also proposed as part of the MHF impact assessment. It is considered that with the implementation of the embedded controls and mitigation measures proposed, impacts as a result of these potentially combined sources would be of **negligible** significance. Overall, potential cumulative impacts, as a result of construction phase dust and fine particulate matter emissions, are therefore predicted to be insignificant.

Construction and operational phase road traffic emissions

8.3.3 Increases in vehicle movements as a result of the construction and operational phases of the Harbour facilities have been screened against criteria provided in relevant guidance documents to determine whether a detailed assessment was required. As detailed in **ES Section 13 Air Quality**, increases in traffic movements as a result of the Harbour facilities are predicted to be below the relevant criteria, and a detailed assessment was not required for the Harbour facilities alone.

8.3.4 However, an assessment has been undertaken to determine the cumulative impacts on air quality of traffic generated by all YPP components during the construction and operational phases. Pollutant concentrations at all receptor locations, within the Harbour facilities and MHF study area, without the YPP were predicted to be below the Government's health-based objectives for all pollutants considered, with the exception of three receptors in 2013 and 2015 (as detailed in **ES Section 13 Air Quality**). Modelling at these receptors indicated annual mean NO_2 concentrations in exceedance of the relevant objective, both without and with YPP due to existing high traffic flows. The combined traffic generated by all YPP components, however, would give rise to only a very marginal increase in NO_2 at these three locations.

Assessment of cumulative impact

8.3.5 The traffic data used in the air quality assessment incorporated the cumulative changes from all YPP scheme elements and traffic generated by future committed developments within the vicinity of the YPP.

8.3.6 The assessment of these cumulative road traffic exhaust emissions concluded that impacts on human receptors were **not predicted to be significant** as a result of both the construction and operational phases of the YPP in 2015, 2020 and 2030. The cumulative assessment of road traffic impacts is also not predicted to be significant as a result of the proposed development of the YPP in respect of ecological receptors (see **Section 11**). Any other emissions effects would be site based, and hence the influence of the Harbour facilities would not combine with the construction effects at the MTS Intermediate Shaft Sites or Dove's Nest Farm.

Construction phase emissions - plant, controlled sources and shipping

8.3.7 Increases in vessel movements as a result of the capital dredging to be undertaken during Phases 1 and 2 of the construction of the Harbour facilities were assessed qualitatively to determine whether any significant impacts were likely. The assessment concluded that due to the short term duration of the dredging works associated with the Harbour facilities and the fact that the proposed dredging is not located in close proximity to sensitive receptors, further detailed assessment was not required. Further details are provided in **ES Section 13 Air Quality**.

8.3.8 A qualitative assessment of construction phase plant emissions was also undertaken. This assessment was undertaken on the assumption that two small, temporary 400kW generators may be required during the construction phase to provide power to the offices at the Harbour facility, and the generators would be located at the construction site compound. The compound would be located in excess of 1.5km from the closest residential receptor and, therefore, at this distance it was not anticipated that emissions from the temporary generators would lead to exceedences of the air quality objectives at these locations. Furthermore, existing background pollutant concentrations in Dormanstown (the closest residential area) are well below the relevant objectives. It was, therefore, considered that a detailed assessment of construction plant emissions was not required.

Assessment of cumulative impact

8.3.9 As pollutant emissions from vessels associated with dredging activities and emissions from plant to be utilised during the construction phase were determined not to require detailed assessment, the cumulative impact of these activities in combination is predicted to be **not significant**.

Operational phase emissions - stack and shipping emissions

8.3.10 Movements of vessels from the proposed quay out to sea were assessed qualitatively to determine whether further detailed assessment was required. It was concluded that the small increase in vessels associated with the YPP in the context of existing vessel movements within the Tees Estuary was

unlikely to result in a significant impact on air quality and a detailed assessment was not, therefore, required.

8.3.11 A quantitative assessment of emissions from vessels docked at the proposed quay was however undertaken, as stationary vessels at the quay are likely to utilise their auxiliary engines, which are more polluting than main engines. The quantitative assessment predicted pollutant concentrations at the nearest human receptors and designated ecological sites. The results of the assessment indicated that pollutant concentrations at human receptor locations were 'well below' the relevant air quality Objectives (i.e. less than 75% of the Objectives) at human receptor locations, and increases in nutrient nitrogen and acid deposition on ecological habitats were less than 1% of the relevant critical load and, therefore, not considered to be significant.

8.3.12 Detailed modelling was undertaken to predict pollutant concentrations at sensitive receptor locations as a result of pollutant emissions from stacks at the MHF during the operational phase. Predicted pollutant concentrations at sensitive human receptor locations, inclusive of background pollutant contributions, were predicted to be 'well below' the relevant air quality Objectives (i.e. less than 75% of the Objectives) (Royal HaskoningDHV, 2014).

Assessment of cumulative impact

8.3.13 Due to their relatively low number, increases in vessel movements were not anticipated to impact on air quality. Pollutant concentrations at sensitive receptors as a result of emissions from docked vessels and the MHF stacks were predicted to be 'well below' the relevant air quality objectives at all locations considered. The cumulative impact of these sources on air quality, therefore, is considered to be not significant.

9 HYDROGEOLOGY AND LAND QUALITY

9.1 Predicted effects

9.1.1 Potential effects relating to land quality (contamination) were scoped out of the impact assessment for the Mine and MTS intermediate shaft sites because the sites in question are predominantly greenfield sites, with a very low likelihood of contamination. Land quality impact assessments were, however, completed for the MHF and MTS Portal site and the Harbour facilities (**ES Section 6 Hydrology, Hydrogeology and Land Quality**).

9.1.2 Intrusive investigations have confirmed that, generally, the site of the proposed Harbour facilities is devoid of a natural surface soil resource and significant deposits of Made Ground are present. Laboratory testing of soil samples and subsequent data assessment has indicated that the soils contain potential contaminants of concern. Due to the industrial nature of the site, a land use and soils impact assessment was not undertaken.

9.1.3 For the Construction Village and Park & Ride, a land quality desk based study completed for the site identified an overall low risk for the site from contamination. In addition, only surface excavations are planned at this site, for which any potential impacts are expected to be limited to the site area itself.

9.1.4 Potential physical impacts on groundwater flows and levels at the Harbour facilities are predicted to be of negligible significance in **ES Section 6** and, consequently, such effects are not assessed cumulatively (i.e. there is no potential for a significant cumulative impact).

9.1.5 **Table 9-1** presents a summary of the predicted hydrogeology and land quality effects associated with the Harbour facilities that have the potential to result in cumulative impacts with other YPP components.

Table 9-1 Summary of potential Hydrogeology and Land Quality cumulative impacts, relevant YPP components and affected receptors

Potential impact	YPP components with potential to interact	Potentially affected receptors
Potential impacts on groundwater due to piling through contaminated ground	• MHF and MTS Portal • Harbour facilities	Tidal Flat Deposits (Secondary A Aquifer) – **low** sensitivity Bedrock mudstone (Secondary B Aquifer) – **very low** sensitivity Surface water (including Bran Sands Lagoon and Dabholm Gut – **high** sensitivity
Potential negligible to minor impacts on groundwater quality due to grouting, extractive material storage and existing groundwater contamination	• Lockwood Beck Intermediate Shaft Site • Tocketts Lythe Intermediate Shaft Site • MHF and MTS Portal • Harbour facilities • MTS tunnel	Tees Mercia Mudstone & Redcar Mudstone groundwater body (GB40302G701300) – **very low** sensitivity

9.2 Assessment methodology

9.2.1 The assessment methodology adopted here is based on the principles set out in **ES Section 6 Hydrology, Hydrogeology and Land Quality**.

9.2.2 In addition to cumulative impacts on individual receptors, this CIA assesses cumulative impacts to aquifers and surface waters at a catchment scale. Potential impacts on Water Framework Directive (WFD) groundwater bodies are considered in this section and WFD surface water bodies are assessed in **Part 2 Section 10**.

9.3 Assessment of potential cumulative impacts

Description of baseline where cumulative impact anticipated

9.3.1 The majority of the Harbour facilities site is underlain by Tidal Flat Deposits comprising sand, silt and clay, which is classed as a Secondary (Undifferentiated) Aquifer. The eastern section of the proposed conveyor corridor comprises Glaciolacustrine Deposits which are classified as unproductive strata (non-aquifer).

9.3.2 The superficial deposits are underlain by the Redcar, Penarth and Mercia Mudstone Secondary B Aquifer which form part of the Tees Mercia Mudstone & Redcar Mudstone groundwater body (GB40302G701300) that also underlies the Lockwood Beck, Tocketts Lythe and MHF sites. The groundwater body is currently at Good Quantitative Status, but is at Poor Chemical Status due the presence of priority hazardous substances from mines and urbanisation which are causing an adverse impact on surface waters

9.3.3 Contamination was identified in made ground (slag) deposits. Some contaminants were found to be present in leachable form (therefore in a form in which they may be able to migrate into groundwater and surface water). Contaminants were also detected in groundwater at the site. Significantly elevated ground gas concentrations were also recorded around the perimeter of the Bran Sands Landfill.

9.3.4 Potential chemical (contaminant related) impacts identified during the construction phase were:

- Potential impact to human health associated with existing contamination during earthworks.
- Potential impact to human health associated with potential exposure to ground gas.
- Potential impact to human health associated with the introduction of new contaminants through leaks and spillages and imported fill materials.
- Water pollution from leaks and spills on site.
- Potential impacts on surface water from suspected solids or contaminated runoff.
- Potential impacts on groundwater through contaminated runoff/infiltration or leaching.
- Potential impacts on groundwater due to piling through contaminated ground for construction of the conveyor, quay and silos.

9.3.5 Those identified for the operation phase were:

- Potential impact to human health associated with materials stored on-site e.g. polyhalite, fuels and oils.
- Potential impact to human health associated with exposure to contaminants within the made ground.
- Potential impact to human health associated with potential exposure to ground gas.
- Potential impacts on water quality due to accidental spillage of materials stored on-site.
- Potential impacts on water quality from contaminated site runoff.

9.3.6 At the MHF and MTS Portal site, contamination was identified in the Made Ground, in discontinuous perched water within the made ground and superficial deposits, and within the Secondary B Aquifer beneath (Redcar Mudstone). Groundwater flow within the Redcar Mudstone is indicated to be towards the north.

9.3.7 Potential chemical (contaminant related) impacts identified during the construction phase were:

- Direct contact with existing contamination in soils.
- Impact from existing contamination in groundwater (groundwater within the Redcar Mudstone is artesian).
- Potential water pollution from extractive materials stockpiles.
- Potential water pollution from pre-grouting of MTS tunnel portal.

9.3.8 Those identified for the operation phase were:

- Direct contact with existing contamination in soils.
- Impact from contaminated groundwater.
- Pollution from extractive materials stockpiles.

9.3.9 The Harbour facilities and MHF sites are underlain by the same bedrock aquifer (the Mercia, Penarth and Redcar mudstones) and the MHF and MTS Portal site drains to Dabholm Gut, which forms the south western boundary of the Harbour facilities. Hence there is the potential for cumulative impacts on groundwater and surface water quality but, in terms of cumulative impacts, the following impacts have been scoped out:

- Impacts from soils, since these are likely only to affect soils within the sites and would not cause a measureable cumulative impact. Fugitive soil dust emissions (including those from soils containing asbestos) have not been considered further since these would be controlled using mitigation applied at each individual site in the form of adherence to best practice for construction and use of appropriate Personal Protective Equipment on site (see **ES Section 6**).
- Impacts from existing contamination in groundwater (as, if this occurred, it would occur within the individual sites).
- Impacts on water quality from extractive materials stockpiles and pre-grouting of MTS Portal, since these would only be present at the MHF and MTS Portal site and would be contained via an engineered low permeability basal liner and cap.

- Impacts on water quality from leaks and spills on site and/or contaminated site runoff, since each site would have a dedicated and contained surface water management system incorporating best practice in design for removal of suspended solids and other contaminants.
- Potential cumulative impacts from the loss of product, since the MTS Portal, MHF, conveyor and surge pins at the port terminal would all be enclosed, with full containment of potential spillages.

9.3.10 Based on the sensitivity of the receptors shown in **Table 9-1,** the following cumulative impacts have been identified (see **Table 9-2**).

Table 9-2 Predicted Hydrogeology and Land Quality cumulative impacts

Potential impact	Potential impact significance of YPP components individually	Potential cumulative impact significance	Additional mitigation proposed
Chemical contamination due to piling	• MHF and MTS Portal - negligible • Harbour facilities - negligible (groundwater and surface water)	The cumulative impact on groundwater in the bedrock mudstone (Secondary B) aquifer would be **negligible**. There would be **no cumulative impact** on the Tidal Flat Deposits because they are absent from the MHF. There would be **no cumulative impact** on surface water because the Tidal Flat Deposits are absent from the MHF and, therefore, there would be no pathway to surface waters at the Harbour facilities site	None
Chemical contamination due to grouting, extractive material storage and existing groundwater contamination	Negligible to minor at: • Lockwood Beck Intermediate Shaft Site • Tocketts Lythe Intermediate Shaft Site • MHF and MTS Portal • Harbour facilities • MTS tunnel	At the catchment-scale, the Tees Mercia Mudstone & Redcar Mudstone groundwater body is considered to be tolerant of the negligible or minor impacts presented by the different elements of the York Potash project; therefore, the cumulative impact on the groundwater body would be **negligible**.	None

9.3.11 The significance of the potential impact on groundwater due to foundations and piling is predicted to be **negligible**.

9.3.12 The significance of the potential impact on the Tees Mercia Mudstone & Redcar Mudstone groundwater body is also predicted to be **negligible** and would not result in deterioration of the status the groundwater body.

10 HYDROLOGY AND FLOOD RISK (INCLUDING WATER FRAMEWORK DIRECTIVE COMPLIANCE)

10.1 Predicted effects

10.1.1 There is the potential for cumulative impacts to arise where activities at any of the YPP component sites have the potential to affect hydrologically-connected watercourses (i.e. rivers, estuaries and receiving coastal waters located downstream of each development site). Activities that result in changes to flood risk, hydrology, geomorphology and water quality potentially could cause these cumulative impacts.

10.1.2 Note that this section also includes an assessment of potential cumulative impacts associated with the YPP on compliance with the WFD. WFD compliance is closely related to the hydrological, geomorphological and water quality impacts on surface waters. WFD compliance for groundwater is considered in **Part 2 Section 9**.

10.1.3 **Table 10-1** presents a summary of the predicted effects on surface waters associated with the Harbour facilities that have the potential to interact with other components of the YPP.

Table 10-1 Summary of potential cumulative impacts on Surface Waters

Potential impact	YPP components with potential to interact	Potentially affected receptors
Increased supply of fine sediment and contaminants during construction	Harbour facilities, MTS Portal and MHF	Mains Dike Mill Race Tees Estuary (S Bank) river water body (GB103025072320) Tees Estuary (GB510302509900) water body

10.2 Assessment methodology

10.2.1 The assessment methodology adopted here is based on the principles described in **ES Section 6 Hydrology, hydrogeology and land quality**. Additional details on the methodology used to assess WFD compliance are provided in **ES Section 4 Appendix 4.3**.

10.3 Assessment of potential cumulative impacts

Increased supply of fine sediment and contaminants during construction

10.3.1 The construction of the MTS Portal, MHF and Harbour facilities would require extensive excavation, piling through potentially contaminated ground, topsoil stripping and disposal of spoil on the ground surface. These activities have the potential to increase sediment supply to the surface watercourses in the vicinity of the development sites. There is also the potential for the mobilisation of contaminants already stored in soils and groundwater, the accidental release of lubricants and fuel oils from

construction machinery and the accidental release of construction materials (including concrete) into the aquatic environment.

Description of baseline where cumulative impact anticipated

10.3.2 The MTS Portal, MHF and Harbour facilities (conveyor) are all located in close proximity to each other at Wilton. The sites of the proposed works are drained by watercourses which feed into the Tees Estuary (S Bank) river water body (GB103025072320) and the Tees estuary itself (GB510302509900).

10.3.3 The Tees Estuary (S Bank) river water body is assessed as being at Moderate Ecological Status due to physico-chemical pressures in the draft second River Basin Management Plan (RBMP2). Concentrations of copper, zinc and triclosan are too high, as are concentrations of priority hazardous substances such as cadmium, tributyltin, nonylphenol and Di(2-ethylhexyl)phthalate. The draft RBMP2 does not provide any classifications for the ecological quality elements, but the hydromorphology of the water body is reported to support good status.

10.3.4 The Tees Estuary water body has been designated as Heavily Modified for flood protection and navigation purposes, and the presence of the quay line. The draft RBMP2 states that the water body is at Moderate Ecological Potential as a result of pressures on invertebrates, macroalgae and angiosperms (flowering plants). This is likely to be a result of unsuitable concentrations of dissolved inorganic nitrogen, and high concentrations of priority hazardous substances such as tributyltin, brominated diphenylether (BDPE), fluoranthene, benzo(a)pyrene and mercury compounds. The hydromorphology of the water body supports good status. However, additional hydromorphological mitigation measures have been identified, including sediment management, measures to manage disturbance, measures to protect existing habitats, and measures to replace hard defences with soft engineering solutions.

Assessment of cumulative impact

10.3.5 An increase in fine sediment supply could result in localised increases in turbidity and increased sediment deposition in downstream channels, adversely impacting the geomorphology of the water bodies Furthermore, increased sediment supply potentially could affect existing aquatic habitats and reduce light penetration, which could affect the biology (e.g. macrophytes, aquatic invertebrates and fish) supported in each water body. The release of contaminants from existing soils and groundwater, construction materials and machinery during construction also has the potential to increase existing physico-chemical pressures and cause deterioration in water quality.

10.3.6 The proposed schemes include engineered barriers and capping systems that would be installed during the construction phase (i.e. mitigation measures embedded within the scheme design and drainage strategies, which would reduce sediment supply and minimise the possibility of water quality impacts associated with fuels, oils and construction materials). This means that surface runoff associated with infiltration from surface construction activities would be unlikely. The potential cumulative impact from the different scheme components is, therefore, predicted to be of **negligible** significance and would not

result in deterioration of the status of any surface water bodies (i.e. compliance with the WFD is expected).

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11 TERRESTRIAL ECOLOGY

11.1 Predicted effects

11.1.1 **Table 11-1** presents a summary of the predicted ecological effects associated with the Harbour facilities and the other YPP components that have the potential to interact.

Table 11-1 Summary of potential Terrestrial Ecology cumulative impacts

Potential impact	YPP components with potential to interact	Potentially affected receptors
Habitat loss	Land taken out of existing use for the construction of the Harbour facilities, MHF and MTS Portal	Land resource for protected species
Elevated noise levels and lighting causing disturbance to on-site fauna (specifically bats and birds) during construction	Lighting requirements for construction areas during construction phase at Harbour facilities, MTS Portal and MHF	Teesmouth and Cleveland Coast Special Protection Area (SPA) and Ramsar site (MTS Portal, MHF and Harbour facility) Protected species, specifically birds and bats
	Noise and vibration from construction activities at Harbour facilities, MTS Portal and MHF	
	Noise from construction vehicle movements at Harbour facilities, MTS Portal and MHF	
Noise levels and disturbance to off-site fauna during operational phase	Lighting and noise levels from operational plant at Harbour facilities, MTS Portal and MHF	Protected species, specifically birds and bats

11.2 Assessment of potential construction phase cumulative impacts

Habitat loss

11.2.1 The MHF and Harbour facilities are located within the existing heavy industrial area of Wilton. The habitat types present within the proposed scheme footprints are considered to be common in this area, with no terrestrial or freshwater BAP habitats located within them.

11.2.2 The impact of these proposed scheme components on terrestrial ecology would be linked directly to the footprint of each component and, therefore, there **no cumulative impac**t would arise in this context. Given the nature of the habitats present, the combined effect of the development of the Harbour facilities and the MHF on terrestrial habitat is not considered to be significant.

11.2.3 There would be no combined effects due to different YPP components in the marine environment.

Indirect impacts to designated sites, habitats and species from lighting, noise and vibration, air quality and transport emissions

Dust emissions during construction

11.2.4 Cumulative impacts as a result of construction phase dust are predicted to be insignificant and, consequently, **no cumulative impact** on terrestrial ecology is predicted.

Emissions from road traffic movements during construction

11.2.5 Both the traffic data generated for the YPP and the air quality assessments included cumulative increases from all of the project components, as well as including those arising from committed developments (see **ES Chapter 6 Traffic and Transport, Part 2 Section 6** and **ES Chapter 9 Air Quality**).

11.2.6 The cumulative assessment of road traffic impacts is not predicted to be significant as a result of the proposed development of the YPP in respect of ecological receptors. Consequently, **no cumulative impact** is predicted.

Noise disturbance

11.2.7 Details regarding the assessment of construction and operational phase road traffic noise are provided in **ES Chapter 8 Noise and Vibration** and the cumulative impact is assessed in **Part 2 Section 7**. It is concluded that there would be no significant cumulative noise impact. The MHF and Harbour facility are located within the existing heavy industrial area of Wilton and best-practice mitigation measures would be adopted. Therefore, **no cumulative impact** is predicted with respect to terrestrial ecology.

Lighting

11.2.8 Details of the assessment of construction phase lighting for the Harbour facility are provided in **ES Chapter 12 Landscape and Visual Environment**.

11.2.9 Predicted impacts on ecological receptors as a result of lighting requirements for the construction phase are detailed in **ES Chapter 11 Ecology**. Any construction lighting would be located away from potentially sensitive areas (e.g. bridges that may be used by roosting bats) so as to avoid disturbance. The only area of potential interaction due to construction lighting would be between the conveyor at its Wilton end and the MHF site, and this area is not considered to be ecologically sensitive. As a result, **no significant cumulative impacts** are predicted.

12 LANDSCAPE AND VISUL ENVIRONMENT

12.1 Predicted effects

12.1.1 **Table 12-1** presents a summary of the YPP components that have the potential to result in cumulative impacts on the landscape and visual environment. Given the potential intervisibility of various project components, a whole project approach has been adopted at the outset of this Cumulative Landscape and Visual Impact Assessment (CLVIA).

Table 12-1 Summary of potential Landscape and Visual cumulative impacts

Potential impact	YPP components with potential to interact	Potentially affected receptors
Visual character	Construction phase temporary winding towers (Mine and MTS Intermediate Shaft Sites)	Landscape character, designated landscape areas, visual receptors
Visual character	Construction phase temporary lighting (Mine, MTS Intermediate Shaft Sites, MHF and MTS Portal and Harbour facilities; YPP)	Landscape character, designated landscape areas, visual receptors
Visual character	Changes in traffic flow and type (YPP)	Landscape character, designated landscape areas, visual receptors
Physical character	Changes to landscape fabric and habitats (YPP)	Landscape character, designated landscape areas

12.2 Assessment methodology

12.2.1 Guidance (Landscape Institute (LI) & IEMA 2013, SNH 2012) on cumulative assessment advises that the methodology used should be aimed at identifying likely significant effects, rather than all effects that might arise from a project. The assessment should be reasonable and in proportion to the nature of the project under consideration (LI & IEMA 2013, page 121). The process adopted in this assessment was as follows:

- Identify which project elements have the potential to give rise to significant cumulative project-wide impacts.
- Identify which receptors should be assessed for project-wide cumulative effects.
- Use Zone of Theoretical Visibility (ZTV) mapping (with and without woodland included in the model) to identify an overall study area and locations where project elements are intervisible.
- Undertake field visits at selected representative viewpoints where project elements are intervisible to identify potential project-wide cumulative impacts on the identified receptors.

12.2.2 ZTV mapping has been prepared as follows:

- A Digital Terrain Model (DTM) has been constructed using Ordnance Survey Terrain 50 landform data.
- Existing woodlands, using publicly available Forestry Commission digital mapping, have been placed in the DTM to 10m height.

- ZTV maps for development features have been generated to their full extent within the National Park boundary using DTM models with and without woodlands.

12.2.3 The baseline used for the assessment of cumulative effects on landscape character comprises the North York Moors Landscape Character Assessment (WYG, 2003), the Redcar and Cleveland Landscape Character Assessment (RCBC, 2006) and the Scarborough Borough Landscape Study: Volume 1 – Borough wide Landscape Character Assessment (LUC, 2013).

12.2.4 In addition to the assessment of cumulative effects, an assessment of sequential effects on selected linear visual receptors has also been undertaken. Sequential effects are those effects experienced by a moving receptor (person) who experiences one project element, and then another (in sequence) rather than experiencing the effect of more than one project element at the same time. This identifies potential project-wide impacts on people travelling into the NYMNP or using major recreational routes within the NYMNP. The approach taken in the sequential assessment is as follows:

- Use ZTV mapping to identify potential sections of routes that are intervisible with project components.
- Inspect routes on site and take account of small scale screening features that are not included within the ZTV model (for example hedgerows and buildings).
- Plot sections of routes that would be intervisible with project components and identify both individual element impacts and cumulative project-wide impacts where more than one element is visible.
- Identify the distances of route that would be affected and measure the duration of impacts on users of the routes using average movement speeds.

12.2.5 The following movement speeds have been used to calculate the duration of sequential effects:

- Average walking speed – 5kph.
- Average cycling speed – 20kph.
- Average driving speed – 60kph.

12.2.6 The potential character effects of changes in traffic flow and type on adjoining landscape character areas during the construction and operational phases of the YPP has also been considered within this chapter.

12.2.7 Landscape and visual assessment methodology used in the assessment of cumulative effects is as described in **ES Section 20**.

12.3 Assessment of potential cumulative impacts

Identification of project components with potential for project-wide cumulative effects

12.3.1 The proposed MHF and Harbour facilities are located within the existing Teesside estuary heavily industrialised complex. They are not predicted to be significantly intervisible with Mine and MTS

scheme components or designated areas of landscape (the NYMNP or the North Yorkshire and Cleveland Heritage Coast). The MTS Portal forms a relatively minor element of the MHF site at Wilton and has been assessed as an integral part of that component. Within their local context, the MHF and Harbour facilities would not result in significant adverse effects on landscape character but would give rise to local significant adverse visual impacts (refer to **ES Section 20 Appendices 20.2 and 20.3** and Royal HaskoningDHV, 2014).

12.3.2 Although the Harbour facilities and MHF project components are intervisible at locations along the western edge of Dormanstown and within the A1085 road corridor at Lord McGowan Bridge, potential project wide impacts associated with these facilities would be no greater than the individual impacts arising from each development, as identified in the individual project assessments. On this basis, these developments features have not been considered further within the assessment. However, the CLVIA for the YPP as a whole is included in **Part 3**.

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13 CULTURAL HERITAGE

13.1.1 No project-wide cumulative impacts would result from the proposed developments at the Mine, the three MTS Intermediate Shaft Sites, the MTS Portal and MHF and the Harbour facilities.

13.1.2 In terms of potential physical cumulative impacts, none of the areas (extents of works) that would be affected by these separate components of the YPP have been found to contain significant concentrations of archaeological remains. Only a small number of primarily agricultural and industrial remains of recent origin and limited, if any, heritage significance have been identified. It has been agreed with English Heritage, the NYMNPA archaeologist and RCBC that the small number of possible anomalies identified during geophysical survey are anticipated to be of potentially limited significance and any impacts on them can be mitigated, if necessary, through an industry-standard programme of archaeological monitoring (e.g. controlled archaeological strip / watching brief). Only if a substantial number of these anticipated lower-value heritage assets were to be significantly adversely impacted across the entire YPP would a material cumulative impact occur, which is not predicted to be the case. Rather, only a small number of low-value heritage assets (predominantly post-medieval / modern agricultural and industrial features) have been identified as being susceptible to an overall limited level of impact. Cumulatively, therefore, **no physical impact** is anticipated with respect to the heritage resource.

13.1.3 In terms of potential non-physical cumulative impacts (for example a cumulative impact that occurs due to the alteration of the setting of heritage assets as a result of the YPP), only two Grade II Listed farm buildings at Plantation Farm are susceptible to any non-physical impact as a result of alteration to their setting. Grade II Listed is the lowest listed status and the farm buildings would only be susceptible to a possible small level of indirect impact as a result of the proximity of the proposed intermediate shaft at Tocketts Lythe. As no other heritage assets would sustain any level of harm through the alteration of their settings, and no other YPP components (including the Harbour facilities) have the potential to affect the Grade II Listed buildings that could be affected by Tocketts Lythe, **no non-physical cumulative impact** is anticipated with respect to the heritage resource.

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14 AMENITY AND RECREATION

14.1.1 **No direct or indirect cumulative amenity and recreation impacts** are predicted to result from the proposed development of the Harbour facilities with the Mine, the three MTS Intermediate Shaft Sites and the Construction Village and P&R, due to the physical separation between these components and the limited extent of physical impacts predicted on amenity and recreation assets (e.g. no impacts would occur on public open spaces, parks, playgrounds, leisure facilities, sports grounds and common land). Any effects on PRoW would be local to the works in question.

14.1.2 The MTS Portal and the MHF were 'scoped out' of the EIA process for amenity and recreation because the proposed works are located on privately owned land (the Wilton Industrial Complex) and the Wilton site does not contain any recreation facilities, include any access routes (footpaths) or provide any recreational opportunities. Consequently, **no cumulative impact** would occur due to the MHF and MTS Portal.

14.1.3 The cumulative effect of the YPP on tourism (rather than specific amenity and recreation activities) is considered in **Section 5** herein.

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Part 3

Other plans and Projects CIA

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15 INTRODUCTION

15.1.1 This section considers, for all relevant environmental topic areas, the potential cumulative impacts (additive and interactive) which may arise during the construction and operational phases of the Harbour facilities with other plans and projects (including other components of the YPP where relevant); the 'wider CIA'. The topic areas in this assessment that consider all elements of the YPP are socio-economics and the landscape and visual environment. Despite the conclusion drawn in Part 2 that there is no significant intervisibility between the Harbour facilities and MHF with the Mine and MTS scheme components, or designated areas of landscape, because a combined YPP LVIA has been requested by various stakeholders (including Natural England and the NYMNPA), it is provided here.

15.1.2 The potential impact of the whole YPP, in conjunction with other plans and projects, on traffic and transport has been considered in **Part 2** (rather than in this section), because the methodology adopted for traffic and transport assessment takes account of other (non-YPP) developments (committed development) in the first instance.

15.1.3 Decommissioning impacts are not considered herein, because details of the works proposed during this phase are limited and it is not possible to determine the potential impact of other (unknown) projects over this timescale. However, they can be expected to reflect, but be less significant than, the predicted cumulative effects of the construction phase. The topic areas included in this assessment are:

- Socio-economics.
- Noise and vibration.
- Air quality.
- Hydrogeology and land quality.
- Hydrology and flood risk (including WFD compliance).
- Terrestrial ecology.
- Landscape and visual environment.
- Cultural heritage.
- Amenity and recreation.

15.1.4 In addition, the following 'marine' topic areas are included in the assessment given the potential for the Harbour facilities to interact with other non-YPP projects that also have the potential to impact on the marine environment:

- Hydrodynamic and sedimentary regime.
- Marine water and sediment quality.
- Marine ecology.
- Waterbird populations.
- Commercial navigation.

15.1.5 The potential cumulative impacts associated with the disposal of dredged material are also considered.

15.1.6 **Figures 4-1a and 4-1b** and **Figure 4-2** present the locations of the YPP components and non-YPP plans and projects included in this assessment. **Table 4-1,** along with the details provided on the NGCT, QEII Berth Development and Dogger Bank Teesside A and B Offshore Wind Farm, summarise for all topic areas the non-YPP developments 'scoped in' to the detailed CIA because it was considered that, through a potential interaction with one of the components of the YPP, the potential exists for a significant cumulative impact to occur.

16 SOCIO-ECONOMICS

16.1 Methodology for the other plans and projects CIA

16.1.1 Determining a local impact area for cumulative socio-economic assessment is inappropriate. Socio-economic effects arise through labour and product markets which are not confined to a very local area. Therefore cumulative socio-economic assessment takes into account a wider area, with a greater ability to cope with change. As a result, the effects are typically positive; primarily increasing employment. The CIA for socio-economic effects, therefore, takes a different approach to a number of other topics in that it utilises broader "macro" projections of cumulative influences relevant to particular potential impacts (e.g. the impact on local and regional labour market), rather than focusing on potential cumulative impacts of specific developments on individual receptors. In this context, for the Harbour facilities, the socio-economic assessment of cumulative effects with other plans and projects has been undertaken for the YPP as a whole, as opposed to isolating the impact of the Harbour facilities.

16.1.2 The key potential cumulative impacts for assessment are:

- the impacts on the labour market and demand for labour;
- the impacts of the non-home-based workforce on demand for accommodation in the identified areas where potential impacts may occur; and,
- the environmental impacts that could affect the tourism economy, including the Special Qualities of the NYMNP.

Labour market

16.1.3 In the case of labour demand, construction labour demand would be a small part of a wider regional and national construction labour market, with smaller individual schemes forming part of an overall background trend in demand. Within the NYMNP, this background trend consists mainly of small-scale residential developments. Within RCBC, the background trend includes industrial developments in keeping with the scale and industrial nature of the area, as well as small and medium scale residential and commercial developments.

16.1.4 Those developments which are considered to be exceptional to the background trend of development in the area (within RCBC, SBC and the jurisdiction of NYMNPA) are:

- Egdon Resources UK Ltd, NYM/2012/0329/FL (ID 158).
- Moorland Energy, NYM/2010/0262/EIA (ID 159).
- Third Energy, NYM/2013/0593/EIA (ID 160).
- Northern Powergrid, (no current application) (ID 161).
- Forewind Dogger Bank Teesside A&B and C&D (ID 169 and 170 respectively).

16.1.5 These proposals have the potential for significant impacts on labour demand and therefore need to be considered individually (see below). Other developments are taken to be included in the background

trend, which can be accommodated by the natural fluctuations in labour market demand and labour and residential mobility (jobs and housing churn).

16.1.6 For the labour market assessment, the demand for construction and operational labour for the exceptional developments (as outlined) is considered in total and in the context of the supply of labour within the wider regional labour market (as set out in the Baseline environment section of **Section 19** of this ES). Where a proposed development may have demand for the same specialist skills as the YPP (where this level of detailed information is publically available), and may therefore put pressure on the supply of skilled labour, this impact has been assessed. The CITB Construction Skills Network: Yorkshire and Humber 2014 to 2018 report sets out the elements of the construction sector experiencing skills shortages within the region, to provide context.

Housing growth and population demand

16.1.7 In the case of overall population and household change and growth, the non-YPP developments under consideration include a large number of small and medium-sized residential schemes and mixed-use schemes including residential. Rather than assess potential impacts of each scheme individually, which would require the development of a complex series of assumptions about phasing and net impacts which would be subject to major uncertainty, it has instead been assumed that they will take place as part of wider background development trends, subject to market conditions

16.1.8 For the assessment of cumulative residential population on a scheme-by-scheme basis, it has been considered more appropriate to use household and population estimates produced by the Office for National Statistics (ONS) and the Department of Communities and Local Government (DCLG), plus the housing delivery assumptions set out in the planning policies of SBC and RCBC.

16.1.9 As the ONS population projections are based on both natural change and migration, the migration aspect extrapolated into the future acts as a proxy for estimating the demographic impacts of future housing growth. This is based on annual delivery of homes as recorded by the Borough councils, which is similar to the delivery rates identified in development plans.

16.1.10 As such, all of the non-YPP residential developments considered in the cumulative socio-economic assessment are assumed to be included in these projections, and have therefore been scoped-out from further consideration with respect to their impacts on population and public services – as these population increases will be planned for via Infrastructure Delivery Plans and will be accommodated for via local and national tax collection, based on population or dwelling numbers (i.e. funding formulae).

Special qualities of the NYMNP

16.1.11 Consideration has been given to the extent to which the exceptional cumulative developments could, in combination, create adverse effects on the Special Qualities of the NYMNP; which could result in secondary socio-economic effects on the tourism economy.

16.1.12 For this assessment, evidence has been drawn from publically available planning application documents for the exceptional developments. Where these indicate adverse impacts with respect to tourism, this has been presented here.

16.2 Assessment of potential cumulative impacts

Labour marker

Egdon Resources UK Limited

16.2.1 This application is currently only for the initial borehole drilling to support the potential development of a Gas Pipeline. The borehole site is within the NYMNP. At this stage, the peak number of employees would be 15. This would have a negligible effect with respect to employment and skills demand. Should the pipeline progress beyond the testing stage, the construction employment required is expected to increase, but as this is highly uncertain at this stage, it cannot be assessed.

Moorland Energy, NYM/2010/0262/EIA

16.2.2 This application for a gas transmission line between Ebberston Moor and the proposed gas processing plant at Knapton Power Station would have a peak construction workforce of 150 workers and a construction period of 18 months.

16.2.3 During operation, the development would generate employment for approximately 20 workers.

16.2.4 In the context of the workforce in the NYMNP and the TTWA area as a whole, this would be beneficial and would not put pressure on the supply of labour or skills.

16.2.5 It is anticipated that some of the construction workforce could use temporary accommodation in the form of rental or tourist accommodation in the vicinity of Thornton-le Dale or Pickering during the construction period.

Third Energy, NYM-2013/0593/EIA

16.2.6 This application is for the gas transmission pipeline from Ebberston / Wykeham gas field to the Knapton Power Station. It is anticipated that approximately 50 workers would be employed across the diverse range of construction trades required during the construction of the YPP. The effects of this would be beneficial and would not put pressure on the supply of labour or skills.

16.2.7 The creation of direct operational employment on the pipeline would be negligible

Northern Powergrid (no current application)

16.2.8 The Northern Powergrid is in the process of undergrounding some of the NYMNPA's electricity lines. There is no current planning application with permission or under consideration, so there are no further details available with respect to employment. However, this is part of an ongoing project across the NYMNP with employees having already been engaged at works in Hutton Buscel, Faceby, Robin Hood's Bay, Fylingthorpe, Ampleforth, Aislably, Kilburn and Swainby. It is not envisaged that the additional works would require any further employment or result in any further significant effects with respect to the labour market.

Forewind Dogger Bank Teesside A&B and C&D

16.2.9 These are the applications for an offshore wind farm off the coast of Teesside, submitted to the Planning Inspectorate. Teesside A&B and C&D represent different options that could be built; all four could come forward.

16.2.10 Teesside A&B would be expected to create up to 1,644 direct FTE jobs during construction and up to 984 indirect jobs during construction. Of the direct jobs, 40% are projected to come from within the North East; up to 658 jobs.

16.2.11 During operation, Teesside A&B would employ up to 300 FTE employees, with a further 216 indirect jobs created. This is not considered to have any adverse effects with respect to demand for skills and labour, and would have beneficial effects with respect to job creation at a regional level.

16.2.12 The application for Dogger Bank Teesside C&D is not due to be submitted until Q3 2015. However, as the generating capacity would be equal to that of A&B, it can be assumed that the employment created would be of a similar order of magnitude.

Conclusion

16.2.13 In total, the proposed developments and the YPP would create a maximum of 3,530 construction jobs – although it is very unlikely that these developments would have coinciding construction peaks.

16.2.14 These jobs would be drawn from a wide local and national labour pool. Based on evidence for the YPP and that set out in the other relevant applications, around 30 to 40% of construction workers could

come from within the region, with the remainder coming from further afield and potentially seeking temporary accommodation. In the context of the size of the housing market (especially the private rented market) and the stock and vacancy of tourist accommodation in the area (see Royal HaskoningDHV, 2014), and considering that the effect would be dispersed and peak at different times, this effect would be negligible. Cumulatively with the YPP, the workforce could have **minor beneficial** effects with respect to supporting local tourist accommodation providers.

16.2.15 The CITB Construction Skills Network: Yorkshire and Humber 2014-2018 report states that the skills which have the highest recruitment need over the next 4 years, i.e. those skills on which there may be increased pressure are mostly related to house-building. 50% of recruitment required over the next 4 years in the region is in wood-trades and interior / fit-out and bricklayers, skills which would not be demanded for the cumulative projects assessed here.

16.2.16 The total operational workforce for the combined projects, including YPP, would amount to 1,660 employees. All of the applicants intend to undertake employment and training programmes to help to ensure that the opportunities for existing local residents are maximised. YPP in particular (where the bulk of this operational employment is generated) expects to employ 80% of its workers from the local area once the project is at full production with on-site training opportunities.

16.2.17 The cumulative effect of this employment creation would be of **major beneficial** significance within RCBC, SBC and NYMNPA and of **minor** to **moderate beneficial** significance for the wider regional economy

Special Qualities

Egdon Resources UK Limited

16.2.18 There are no identified adverse environmental impacts and, therefore, no secondary adverse effects with respect to the NYMNP's Special Qualities or tourism.

Moorland Energy, NYM/2010/0262/EIA

16.2.19 Whilst the EIA supporting this application acknowledges some minor and short term (during construction) impacts with respect to landscape and amenity, the residual impact after mitigation (and in the context of job creation and positive economic impacts) is predicted to be neutral. Therefore, there would be no secondary adverse effects with respect to the NYMNP's Special Qualities or tourism.

Third Energy, NYM/2013/0593/EIA

16.2.20 The construction of the proposed development would result in short-term moderate adverse effects with respect to some landscape views within the NYMNP during construction. There would be no other moderate or major adverse effects resulting from the development in either the construction or operational phases and, therefore, no secondary adverse effects with respect to the NYMNP's Special Qualities or tourism.

Northern Powergrid (no current application)

16.2.21 As stated above, there is no current detailed information available on the Northern Powergrid's proposals for the NYMNP. However, the undergrounding of power lines is expected to have beneficial effects with respect to landscape views.

Forewind Dogger Bank Teesside A&B and C&D

16.2.22 These proposed developments will not be within or visible from the NYMNP and no effects are expected. Minor adverse effects could occur to onshore tourist destinations, recreation activities and the England coastal path during construction (which would begin in 2015). No significant adverse effects are expected with respect to tourism during operation.

Conclusion

16.2.23 Only the Third Energy Development is expected to have adverse effects with respect to tourism or the Special Qualities of the NYMNP, and these would be minor. Minor adverse effects would occur on-shore at Teesside as a result of the Dogger Bank Teesside Developments, but these would not interact with effects within the NYMNP due to the distance between them.

16.2.24 In combination with the minor adverse effects on tourism generated by the YPP, the cumulative effect on tourism would be no greater than **minor adverse**.

Population

16.2.25 None of these assessments predict a significant number of new residents coming to live in the area to work at the developments considered above during their operational phases. No assessment has identified adverse effects with respect to temporary construction workers' accommodation requirement. The cumulative effect of these developments on the long term housing market is assessed to be negligible.

16.2.26 The following table sets out the ONS projected population growth for the districts around the proposed developments. As shown in **Table 17-1**, which includes projections of migration (and which is the basis for council's housing delivery and infrastructure plans), in the areas around the proposed developments, working age population is projected to grow slowly or even decline. In this context,

provision of new jobs could help to arrest this decline in particular by encouraging residents to stay in the area.

Table 17-1 Population Projections 2012-2031

District	Age Group	2012	2021	2031	% change
Middlesbrough	under 20	36,100	37,000	38,100	6%
	20-74	92,700	93,900	93,200	1%
	75+	10,000	11,400	15,100	51%
	All ages	138,700	142,400	146,200	5%
Redcar and Cleveland	under 20	30,800	29,800	29,400	-5%
	20-74	91,900	89,800	85,800	-7%
	75+	12,300	15,400	19,600	59%
	All ages	135,000	135,000	134,700	0%
Stockton-on-Tees	Under 20	47,300	49,400	50,900	8%
	20-74	130,800	135,500	136,700	5%
	75+	14,400	17,700	24,300	69%
	All ages	192,400	202,600	211,800	10%
Hambleton	Under 20	19,100	18,400	18,300	-4%
	20-74	61,500	60,400	58,000	-6%
	75+	9,100	12,500	16,500	81%
Ryedale	Under 20	11,000	10,700	10,900	-1%
	20-74	35,400	35,300	34,300	-3%
	75+	5,700	7,200	9,400	65%
	All ages	52,100	53,200	54,600	5%
Scarborough	under 20	22,100	21,400	21,400	-3%
	20-74	74,100	72,700	70,000	-6%
	75+	12,200	15,100	19,500	60%
	All ages	108,600	109,100	110,700	2%

16.2.27 Any additional population growth arising from new employees at these proposed developments would be **negligible** or **beneficial**. Any population increase would be dispersed and small in the context of the population as a whole and would not put pressure on social infrastructure.

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17 NOISE AND VIBRATION

17.1 Scoping of non-YPP developments

17.1.1 **Figure 17-1** presents the 1km ZOI for noise and vibration, illustrating the non-YPP developments considered to have the potential to result in cumulative effects with the Harbour facilities. **Table 17-1** details the non-YPP developments that have been scoped out of this CIA.

Table 17-1 Scoped-out non-YPP developments – Noise and Vibration

ID	Planning App Ref	Applicant	Justification for 'scoping out' potential cumulative developments for the construction and operational phase
24	R/2010/0306/FFM	MR B BROWN	Due to the separation distance between these developments and the YPP components, the construction and operational phases of these developments are unlikely to contribute to significant cumulative noise impacts. Traffic data utilised in the YPP road traffic noise assessments included committed development flows (see **Part 2**, **Section 6**).
37	R/2011/0014/FFM	LOTTE CHEMICAL UK LTD	
50	R/2013/0501/FFM	ELRING KLINGER (GB) LTD	
96	R/2009/0346/FFM	EGDON RESOURCES UK LIMITED	
98	R/2012/0583/FFM	JFS ASSOCIATES	
105	R/2009/0866/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	
118	R/2011/0599/RMM	REDCAR AND CLEVELAND BOROUGH COUNCIL	
120	R/2012/0314/FFM	LOTTE CHEMICAL UK LTD	
124	R/2010/0949/FFM	RAVENSWORTH PROPERTY DEVELOPMENTS LLP	
137	R/2012/0811/FF	SABIC UK PETROCHEMICALS	
169	Central government	Forewind (Dogger Bank)	

17.2 Assessment of potential cumulative impacts

17.2.1 The study area for the noise and vibration assessment was defined and agreed during consultation with relevant local authority stakeholders in order to identify the potential extents of the direct and indirect effects associated with potential noise and vibration arising from the YPP. The key receptors considered were sensitive residential receptors close to each proposed YPP component. The closest residential noise sensitive receptors in each geographical direction were taken into account in order to determine if an effect would arise, on the basis that receptors further from the site would experience lower noise effects due to the increased separation distance from the noise and vibration source.

17.2.2 Further details regarding the assessment of construction and operational noise and vibration are detailed in **Section 14 Noise and Vibration** (and potential in combination effects on ecology are considered in the Harbour facilities Habitats Regulations Assessment, **Document 6.3**).

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TEES BAY

172 (PD Teesport Dredging)

170 (Dogger Bank C & D)

129 125 173 121 105 130 128 96

REDCAR

ESTON

0 1 2 Kilometres

Source: Derived from Middlesbrough Council, Redcar & Cleveland Borough Council, Stockton-on-Tees Borough Council

Legend:

- 1km Zone of Influence
- Harbour Facilities - DCO Order Limits
- MHF and MTS Portal – Extent of Works
- Project within Zone of Influence (Linear Projects)
- Project within Zone of Influence

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title: Harbour Facilities CIA: Zone of Influence - Noise and Vibration, Land Quality, Geology and Hydrogeology

Part:	Figure:	Drawing No:
HF	17.1	9Y0989-CIA-17-001

Rev:	Date:	Drawn:	Checked:	Size:	Scale:
1	06/03/2015	LB	MS	A3	1:50,000
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Co-ordinate system: British National Grid

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Enhancing Society Together

ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com

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17.2.4 A summary of the potential cumulative effects that could arise between the Harbour facilities and non-YPP developments within the 1km ZOI of the Harbour facilities is provided in **Table 17-2**. The potential cumulative impact of road traffic noise is considered in **Part 2 Section 7** (given that the road traffic data for the YPP includes other committed developments).

Table 17-2 Summary of potential cumulative noise and vibration impacts for the Harbour facilities and non-YPP developments

Potential impact	YPP component	Non-YPP development	Potentially affected receptors
Construction and operational noise and vibration	Harbour facilities	Anaerobic digestion (AD) and Combined Heat and Power (CHP) plant (130)	Closest residential noise sensitive receptors in Dormanstown
		Northern Gateway Container Terminal (173)	Closest ecological noise sensitive receptors in the River Tees
		QEII Berth Redevelopment (174)	Closest ecological noise sensitive receptors in River Tees

17.2.5 The Harbour facilities are located near the existing industrial area of Wilton, with the associated conveyor system entering into the Wilton complex to connect with the proposed MHF. As such, there are other industrial sources of noise and vibration within the vicinity of the site. However, these sources are not anticipated to significantly affect noise levels at the receptors assessed in **ES Section 14 Noise and Vibration**.

17.2.6 An anaerobic digestion (AD) and Combined Heat and Power (CHP) plant (Planning application reference R/2013/0369/FFM) (reference 130 in **Table 17-2**), is located approximately 50m north of the conveyor boundary, and there is therefore the potential for cumulative impacts at nearby receptors. It is not, however, anticipated that any cumulative impacts would be significant for the following reasons:

- As part of the planning application process for the AD and CHP plant, an operational noise assessment was undertaken in accordance with national guidance to specify best-practice mitigation to reduce the impacts at nearby receptors. The assessment (NEMS report reference 32267/R2/2, April 2013) concluded that the likelihood of complaints due to noise was marginal given that no evening or night time HGV movements are proposed. Noise mitigation measures are also embedded within the scheme design for the Harbour facility and Conveyor.
- Conservative assumptions were made throughout the Harbour facilities noise assessment and also the AD and CHP noise assessment.

- Traffic data utilised in the Harbour facilities assessment included other committed development flows (i.e. 130).

17.2.7 The edge of the consented Northern Gateway Container Terminal project (173) is located approximately 400m west of the Harbour facilities and, therefore, there is the potential for cumulative construction and operational impacts on nearby ecological receptors.

17.2.8 Based on the assessed receptors and impact assessment matrix in **Chapter 14 Noise and Vibration**, **Tables 17-3** and **17-4** present the cumulative noise levels predicted during the construction and operation of the Northern Gateway Container Terminal project (inclusive of piling operations to represent a conservative assessment).

Table 17-3 Predicted cumulative construction noise from YPP Harbour facilities and Northern Gateway

Receptor	Predicted YPP Harbour fcilities noise level ($L_{Aeq,5min}$)	Predicted Northern Gateway noise level+ ($L_{Aeq,5min}$)	Predicted Cumulative noise level ($L_{Aeq,5min}$)	Impact magnitude	Impact significance
P1	28	25	30	No impact	Negligible
P2	27	23	29	No impact	Negligible
P3	29	33	35	No impact	Negligible
P4	28	25	30	No impact	Negligible
P5	48	42	49	No impact	Negligible
P6	49	41	50	Low	Negligible
P7	43	43	46	No impact	Negligible
P8	34	48	48	No impact	Negligible
P9	39	49	49	No impact	Negligible
P10	54	50	56	Low	Negligible
P11	30	42	42	No impact	Negligible

+*Levels are derived from the PD Ports, Northern Gateway Container Terminal ES, Chapter 19 Noise and Vibration, Royal Haskoning 2006.*

Table 17-4 Predicted cumulative operational noise from YPP Harbour facilities and Northern Gateway

Receptor	Predicted YPP Harbour noise level* ($L_{Ar,16hr}$)	Predicted Northern Gateway noise level*+ ($L_{Ar,16hr}$)	Predicted Cumulative noise level ($L_{Ar,16hr}$)	Impact magnitude	Impact significance
P1	16	<30	30	No impact	Negligible
P2	21	<30	31	No impact	Negligible
P3	20	<30	30	No impact	Negligible

Receptor	Predicted YPP Harbour noise level* ($L_{Ar,16hr}$)	Predicted Northern Gateway noise level*+ ($L_{Ar,16hr}$)	Predicted Cumulative noise level ($L_{Ar,16hr}$)	Impact magnitude	Impact significance
P4	16	<30	30	No impact	Negligible
P5	44	54	54	Low	Negligible
P6	43	47	49	No impact	Negligible
P7	34	<30	36	No impact	Negligible
P8	27	<30	32	No impact	Negligible
P9	33	45	45	No impact	Negligible
P10	50	47	52	Low	Negligible
P11	20	<30	30	No impact	Negligible

**A +5dB penalty was applied to the specific noise level to provide a 'Rating Level' (Lr), representing a conservative approach.*

+Levels are derived from the PD Ports, Northern Gateway Container Terminal ES, Chapter 19 Noise and Vibration, Royal Haskoning 2006.

17.2.9 **Tables 17-3** and **17-4** indicate that potential cumulative construction and operational noise from the Harbour facilities and the Northern Gateway Container Terminal project has a predicted magnitude of **no impact / low** and, consequently, a **negligible** impact at all residential and ecological receptors is expected.

17.2.10 Given the above, the cumulative impact on sensitive receptors is predicted to be not significant.

17.2.11 The edge of the consented QEII Berth development (174) is located approximately 1370m west of the Harbour facilities, and there is therefore the potential for cumulative construction and operational impacts at nearby ecological receptors.

17.2.12 Using the assessed receptors and impact assessment matrix in **Chapter 14 Noise and Vibration, Tables 17-5** and **17-6** present the predicted cumulative noise levels during the construction and operation of the QEII Berth project (inclusive of piling operations to represent a worst-case).

Table 17-5 Predicted cumulative construction noise from YPP Harbour facilities and QEII Berth

Receptor	Predicted YPP Harbour facilities noise level ($L_{Aeq,5min}$)	Predicted QEII Berth noise level+ ($L_{Aeq,5min}$)	Predicted Cumulative noise level ($L_{Aeq,5min}$)	Impact magnitude	Impact significance
P1	28	30	32	No impact	Negligible
P2	27	25	29	No impact	Negligible
P3	29	30	33	No impact	Negligible

Receptor	Predicted YPP Harbour facilities noise level ($L_{Aeq,5min}$)	Predicted QEII Berth noise level+ ($L_{Aeq,5min}$)	Predicted Cumulative noise level ($L_{Aeq,5min}$)	Impact magnitude	Impact significance
P4	28	30	32	No impact	Negligible
P5	48	40	49	No impact	Negligible
P6	49	40	50	Low	Negligible
P7	43	35	44	No impact	Negligible
P8	34	35	38	No impact	Negligible
P9	39	40	43	No impact	Negligible
P10	54	40	54	Low	Negligible
P11	30	35	36	No impact	Negligible

+Levels are derived from the PD Ports, Teesport QEII Berth Development ES, Chapter 18 Noise and Vibration, Royal Haskoning 2009.

Table 17-6 Predicted cumulative operational noise from YPP Harbour facilities and QEII Berth

Receptor	Predicted YPP Harbour facilities noise level* ($L_{Ar,16hr}$)	Predicted QEII Berth noise level*+ ($L_{Ar,16hr}$)	Predicted Cumulative noise level ($L_{Ar,16hr}$)	Impact magnitude	Impact significance
P1	16	35	35	No impact	Negligible
P2	21	30	31	No impact	Negligible
P3	20	30	30	No impact	Negligible
P4	16	30	30	No impact	Negligible
P5	44	45	48	No impact	Negligible
P6	43	50	51	Low	Negligible
P7	34	50	50	Low	Negligible
P8	27	45	45	No impact	Negligible
P9	33	50	50	Low	Negligible
P10	50	50	53	Low	Negligible
P11	20	40	40	No impact	Negligible

**A +5dB penalty was applied to the specific noise level to provide a 'Rating Level' (Lr), representing a conservative approach.*

+Levels are derived from the PD Ports, Teesport QEII Berth Development ES, Chapter 18 Noise and Vibration, Royal Haskoning 2009.

17.2.13 **Tables 17-5** and **17.6** indicate that potential cumulative construction and operational noise from the Harbour facilities and the QEII Berth development has a predicted magnitude of **no impact / low** and, consequently, a **negligible** impact at all residential and ecological receptors is expected.

17.2.14 Given the above, the cumulative impact on sensitive receptors is predicted to be not significant.

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18 AIR QUALITY

18.1 Scoping on non-YPP developments

18.1.1 **Figure 18-1** presents the ZOI for air quality construction dust emissions, illustrating the non-YPP developments that have the potential to result in cumulative effects with the Harbour facilities. There is potential for cumulative impacts to occur as a result of construction dust emissions in the vicinity of the port terminal and conveyor and, therefore, the construction phase has been considered below.

18.1.2 **Table 18-1** details the non-YPP developments that have been scoped out of the CIA for the operational phase of the Harbour facilities. Of the six developments in the ZOI in the vicinity of the Harbour, there are three developments which can be scoped out for cumulative impacts as a result of operational emissions.

Table 18-1 Scoped-out non-YPP developments – Air Quality

ID	Planning App Ref	Applicant	Justification for 'scoping out' potentially cumulative developments for the operational phase
105	R/2009/0866/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL – demolition of existing primary school and construction of new school	The operational phase of this development is unlikely to contribute to significant cumulative air quality impacts. Traffic data utilised in the YPP assessments included committed development flows.
125	R/2011/0530/FF	Northumbrian Water – erection of two centrifuges	The operational phase of this development is unlikely to contribute to significant cumulative air quality impacts.
129	R/2012/0927/FF	SSI UK – mobile coal washing plant with associated equipment	The operational phase of this development is unlikely to contribute to significant cumulative air quality impacts.

18.2 Assessment of potential cumulative impacts

Fugitive construction dust and fine particulate emissions

18.2.1 Potential cumulative impacts as a result of fugitive construction dust and fine particulate matter emissions associated with non-YPP developments are detailed in **Table 18-2**.

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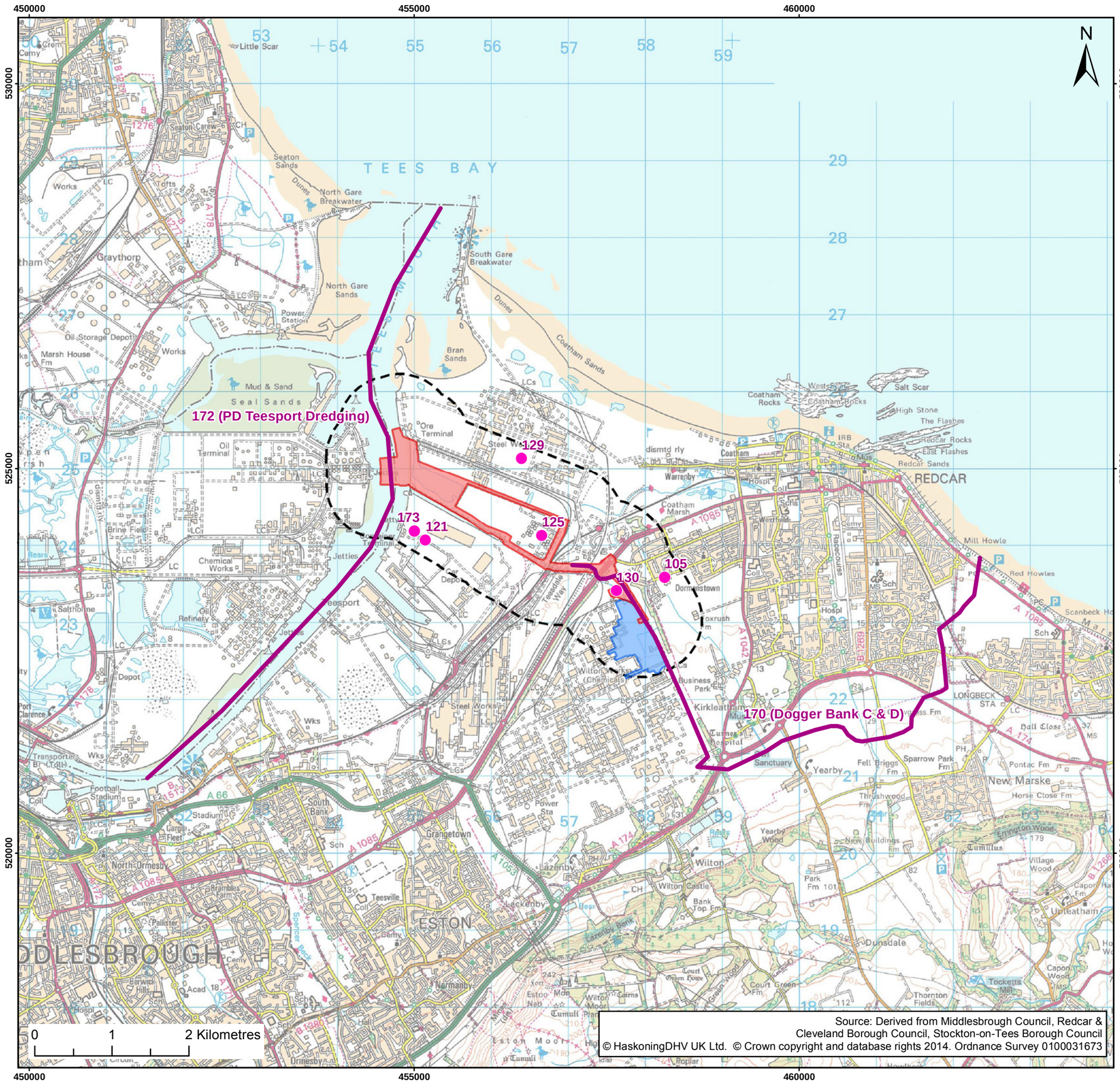

Legend:

- 700m Zone of Influence
- Harbour Facilities - DCO Order Limits
- MHF and MTS Portal – Extent of Works
- Project within Zone of Influence (Linear Projects)
- Project within Zone of Influence

DCO Order Limits as of 24/02/15

Source: Derived from Middlesbrough Council, Redcar & Cleveland Borough Council, Stockton-on-Tees Borough Council

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title: Harbour Facilities CIA: Zone of Influence - Air Quality

Part:	Figure:	Drawing No:
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Co-ordinate system: British National Grid

ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com

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Table 18-2 Summary of potential cumulative air quality impacts for the Harbour facilities, YPP and non-YPP developments

Potential impact	YPP component	Non-YPP development ID	Potentially affected receptors
Fugitive construction dust and fine particulate emissions	Harbour facilities and MHF	105	Human receptors within 350m of the site boundary and 50m of routes used by construction vehicles up to 500m from the site access. Ecological receptors within 50m of the site boundary and within 50m of routes used by construction vehicles up to 500m from the site access.
		121	
		125	
		129	
		130	
		173	

18.2.2 Guidance is provided by the Institute of Air Quality Management (IAQM, 2014) on the distances from construction sites beyond which impacts on dust soiling and human health are not anticipated to occur. The guidance requires assessment of receptors within 350m of each site boundary where construction works will take place. Therefore, in accordance with the guidance, construction sites within 700m of the Harbour facilities were considered in the assessment of potential cumulative impacts, to account for the 350m zone around the site. Further details regarding the assessment of fugitive construction dust and fine particulate matter from the Harbour facilities are detailed in **ES Section 13 Air Quality**.

18.2.3 There are six committed developments within the construction dust ZOI for the Harbour facilities that have the potential to act in combination with the Harbour facilities. It is anticipated that as part of the planning applications for these developments, construction dust assessments would have been undertaken in accordance with industry guidance to specify best-practice mitigation to reduce the impacts on nearby receptors. Mitigation measures are also embedded within the scheme design for the Harbour facilities. It is therefore considered that, with the adoption of best-practice mitigation measures, cumulative impacts of fugitive dust and fine particulate matter would be not significant.

Construction and operational phase controlled plant, shipping, traffic and process emissions

18.2.4 The Harbour facilities are located within the existing industrial area of Wilton. An anaerobic digestion (AD) and Combined Heat and Power (CHP) plant (Planning application reference R/2013/0369/FFM) (reference 130 in **Table 18-2**), is located in the immediate vicinity of the Harbour facilities and there is, therefore, the potential for cumulative pollutant emission impacts at nearby receptors. However, it is not anticipated that cumulative impacts would be significant, as construction and operational phase generator, shipping and Harbour facilities traffic emissions were not considered to require detailed assessment, and were screened out of the Harbour facilities air quality assessment (as detailed in **ES Section 13**). Therefore, it is not anticipated that cumulative pollutant concentrations from these activities, in combination with emissions from the AD and CHP plant, would cause exceedences of the relevant air quality objectives at receptor locations.

18.2.5 Given the above, the cumulative impact of controlled plant, shipping, traffic and facility emissions is predicted to be **not significant**.

Construction and operational phase vessel emissions

18.2.6 Potential impacts resulting from pollutant emissions from vessels associated with the construction and operation of the proposed Harbour facilities were assessed qualitatively in **ES Section 13 Air Quality**. The assessment concluded that pollutant emissions from vessel were not anticipated to be significant.

18.2.7 Committed development 173 (Northern Gateway Container Terminal) (Planning application reference R/2012/0605/RMM), is located approximately 400m south of the Harbour facilities boundary, therefore there is the potential for cumulative pollutant emission impacts at nearby receptors.

18.2.8 As increases in vessel emissions associated with the Harbour facilities were not considered to be significant when compared to the number of existing vessels in the Tees Estuary. It is, therefore, predicted that the cumulative impact of the additional vessels in combination with the container terminal would be **not significant**.

19 HYDROGEOLOGY AND LAND QUALITY

19.1 Introduction

19.1.1 This section of the CIA deals with potential groundwater level and flow impacts due to the construction and presence of substructures associated with the Harbour facilities. Cumulative impacts relating to land quality, including the potential for the creation of contaminant pathways due to piling at Wilton and the Harbour facilities, are addressed.

19.2 Scoping on non-YPP developments

19.2.1 As described in **ES Section 6 Hydrology, Hydrogeology and Land Quality**, potential impacts were identified on the following receptors, due to the Harbour facilities:

- Groundwater flow, level and quality, due to the introduction and presence of piled foundations.
- Land, groundwater and surface water quality, due to leaks and spills of polluting substances, introduction of contaminants contained within imported fill materials, or removal of site infrastructure.
- Surface water quality, where groundwater connectivity provides a pathway for any ground contamination described above during decommissioning.
- Human health, due to ground gas or dust inhalation.

19.2.2 All of the above were predicted, after the implementation of appropriate mitigation, to be of negligible or minor significance.

19.2.3 Within the 1km ZOI around the Harbour facilities, eight non-YPP developments have been identified (see **Figure 17-1**).

19.2.4 Based on BGS geological mapping presented in **ES Section 6**, all non-YPP development sites are underlain by the same bedrock mudstone Secondary B Aquifer that underlies the Harbour facilities and MHF sites. The bedrock mudstone aquifer is assessed in **ES Section 6** to be of very low sensitivity. Hence even a very high magnitude (physical or chemical) effect on this receptor would result in a minor impact.

19.2.5 Three of the non-YPP development sites (ID Nos. 96, 105 and 130) (**Figure 17-1**) are underlain by low permeability superficial (glacio-lacustrine) deposits, which would prevent or severely limit the downward passage of any potential groundwater contamination originating at the surface or within the shallow soils. The remainder (ID nos. 121, 125 128, 129, 173) (**Figure 17-1**) are underlain by Tidal Flat Deposits, which are of variable composition, comprising sand, silt and clay. These are classified as a Secondary (Undifferentiated) Aquifer and are likely to be in hydraulic continuity with the underlying bedrock aquifer and surface waters in Bran Sands lagoon, Dabholm Gut and the Tees estuary.

19.2.6 Based on the available planning documents, none of the identified projects involves major underground works or substructures, other than piled foundations. No subsidence or ground stability impacts are anticipated. Potential physical effects may include localised dewatering during construction or

obstruction of shallow groundwater flow. Neither is likely to cause significant physical impacts on the bedrock mudstone aquifer and, when combined with the negligible and minor impacts due to the YPP development, cumulative impacts are likely to be insignificant.

19.2.7 Potential chemical effects due to non-YPP developments may comprise the deterioration of aquifer quality due to accidental leakages or spillages during construction or operation and use of potentially polluting substances, such as grout. However, given the very low to low sensitivity of groundwater in the area, the presence of the low permeability superficial deposits at some sites and the requirement for projects to adhere to environmental best practice, when combined with the negligible and minor impacts predicted for the YPP development, the potential cumulative impacts for developments located more than 250m from the site boundary are likely to be insignificant. These have been scoped out from further assessment, as shown in **Table 19-1**. In addition, maintenance dredging at Teesport has been scoped out as this does not involve landside works.

Table 19.1 Scoped-out non-YPP developments – Hydrogeology and Land Quality

ID	Planning App Ref	Applicant	Justification for 'scoping out' potentially cumulative developments
96	R/2009/0346/FFM	EGDON RESOURCES UK LIMITED	Many of these developments may involve significant earthworks on potentially contaminated sites and/or installation of piled foundations, potentially into the mudstone bedrock. Due to the very low sensitivity of the Mercia / Penarth / Redcar Mudstone aquifer and low sensitivity of the Tidal Flat deposits superficial aquifer, it is considered that the cumulative impacts of these schemes in terms of the mobilisation of any contamination into groundwater is unlikely to be significant (e.g. even an impact with the maximum magnitude of 'very high' on the very low sensitivity receptor would result in an impact of minor adverse significance).
105	R/2009/0866/F3M	REDCAR AND CLEVELAND BOROUGH COUNCIL	
121	R/2012/0605/RMM	PD TEESPORT LTD	
128	R/2013/0468/FF	NORTHUMBRIAN WATER	
129	R/2012/0927/FF	SSI UK	

19.2.8 As discussed in **ES Chapter 6**, potential contamination sources located within 250m of the footprint are considered to have a greater potential to interact with the human health and environmental effects of the proposed Harbour facilities. These are considered in greater detail below.

19.2.9 R/2011/0530/FF – Northumbrian Water: Two proposed centrifuges for sludge treatment at the existing Bran Sand Regional Sludge Treatment Centre adjacent to the Harbour facility (non-YPP development ID No. 125). These are noted to be in locations that are not known for heavy land contamination but, for geotechnical reasons, will require piled foundations that will breach an existing installed membrane

(assumed to have been installed to protect surface receptors from deeper contamination). The Design and Access Statement states that the membrane will be resealed following the completion of piling. Given this mitigation and the very low to low sensitivity of the bedrock and superficial aquifers, cumulative impacts on groundwater are not considered significant.

19.2.10 *R/2013/0369/FFM Earthyl Energy Group: Proposed AD and CHP Plant (non-YPP development ID No. 130)*. It is considered possible that piled foundations may be required for some structures. No detailed information on land quality was publicly available for this proposed development. Although it is possible that land at this site may be impacted by contaminants and that piled foundations could form a potential vertical pathway for contaminant migration, it is not considered that cumulative impacts between this development and the YPP development sites would be significant for these effects, due to the low to very low sensitivity of the superficial and bedrock aquifers.

19.2.11 *Dogger Bank Teesside Windfarm onshore grid connections (non-YPP development ID No. 169 and 170)*. Although the onshore study area for this development encompasses the Wilton and Harbour facilities sites, the landfall and cable route alignments have yet to be confirmed. However, the project information indicates that a cable may need to be laid which connects to the Tod Point National Grid Substation. As set out above, this cable route would pass adjacent to the eastern site boundary of the MHF and MTS Portal site boundary and would follow the approximate alignment of a section of the conveyor system to the north and north-west of this site. Given the shallow nature of earthworks associated with the cable installation compared to the small surface disturbance of the deeper piled foundations required for the conveyor system, this is not predicted to be likely to result in a significant cumulative impact.

19.2.12 *Northern Gateway Container Terminal (ID No 173)*. It is likely that significant piling will be required in the construction of the container terminal. Based on the results of intrusive site investigation, a medium risk to shallow groundwater in the Tidal Flat deposits was identified due to the presence of leachable contaminants, but there was a negligible risk to deeper groundwater in the bedrock mudstone aquifer. Given the low to very low sensitivity identified for the superficial and bedrock aquifers, impacts on groundwater are not predicted to be significant.

19.2.13 For all of the above projects, the superficial aquifer provides a potential pollution pathway to surface waters in Dabholm Gut and Bran Sands lagoon, which are considered to be of high sensitivity. However, it is assumed that all works and site operations associated with the non-YPP developments would be undertaken in accordance with best practice guidelines for management of polluting substances, such that the risk to surface waters from leaks and spills would be minimal.

19.3 Assessment of potential cumulative impacts

19.3.1 Based on the information presented above (and the minimal risks predicted), the potential cumulative impact which could be associated with risks to land quality due to piling activities (as a result of the Harbour facilities combined with non-YPP developments) is predicted to be of **negligible** significance.

19.3.2 With respect to surface water quality, the Harbour facilities site drains to Bran Sands lagoon and Dabholm Gut (which are of high sensitivity). However, with appropriate controls and management procedures in place, the potential impact on surface water quality from leaks and spills on site is predicted to be of negligible significance (with a low risk of arising). Impacts associated with contaminated runoff and leachates from the landfill have also been predicted to be of negligible significance for the Harbour facilities (particularly given the controls that are proposed to be implemented in conjunction with the habitat enhancement proposals). Hence the likely cumulative impact on the water quality in Bran Sands lagoon and Dabholm Gut is predicted to be of **negligible** significance.

19.3.3 Impacts on the Tees Mercia Mudstone & Redcar Mudstone groundwater body (GB40302G701300) due to the Harbour facilities in combination with other YPP component elements are assessed in **Part 2 Section 9** as being of negligible significance. Using the same methodology, the cumulative effect of YPP and non-YPP developments on the WFD groundwater body as a whole, is predicted to be **negligible**.

20 HYDROLOGY AND FLOOD RISK (INCLUDING WFD COMPLIANCE)

20.1 Scoping on non-YPP developments

20.1.1 **Figure 20-1** presents the ZOI for hydrology and flood risk (including WFD impacts), illustrating the non-YPP developments that have the potential to have cumulative effects with the Harbour facilities.

20.1.2 Only projects in sites with direct connectivity to the surface drainage network in the vicinity of the port facilities, conveyor route and MHF (taken to be 250m either side of the channel centreline, which represents the potential floodplain and contributing slopes in an unobstructed environment) have the potential to result in cumulative impacts with the YPP components. A total of 19 projects fall within this boundary, as shown in **Figure 20-1**. (The main named ordinary watercourses considered as part of the surface water network are The Mill Race, Mains Dyke, Dabholm Gut and the River Tees.)

20.1.3 However, it is possible to scope a number of these projects out of this CIA because the proposed activities do not have the potential to impact upon water receptors, either because of their proximity to surface waters (e.g. sites within the buffer may not be directly connected in urban areas) or because of the nature of the activities planned. The projects that have been scoped out of the CIA are listed in **Table 20-1**.

Table 20-1 Scoped-out non-YPP developments - Hydrology and Flood Risk (including WFD)

ID	Planning App Ref	Applicant	Justification for 'scoping out' potentially cumulative developments
27	R/2010/0428/F3M	Redcar and Cleveland Borough Council	No direct connectivity to watercourse
71	R/2009/0437/RSM	Coast and Country Housing	No direct connectivity to watercourse
90	R/2010/0742/FFM	Coast and Country Housing	No direct connectivity to watercourse
91	R/2012/0829/FFM	Keepmoat	No direct connectivity to watercourse
92	R/2013/0427/FFM	Keepmoat and Coast and Country Housing	No direct connectivity to watercourse
93	R/2012/0390/FFM	Mr Nigel Dawson	No direct connectivity to watercourse
95	R/2012/0838/CAM	Care Developments (North East) Ltd.	No direct connectivity to watercourse
97	R/2010/0596/F3M	Redcar and Cleveland Borough Council	No direct connectivity to watercourse
99	R/2012/0775/FFM	Sandstone Developments (NE) Ltd.	No direct connectivity to watercourse
100	R/2009/0595/FFM	Redcar and Cleveland College	No direct connectivity to watercourse
131	R/2011/0542/FFM	Teesside Windfarm Ltd.	No direct connectivity to watercourse

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TEES BAY

172 (PD Teesport Dredging)

131 (Teesside Windfarm Ltd)

170 (Dogger Bank C & D)

169 (Dogger Bank A & B)

173 174 130 97 27 95 93 99 100 90 92 91 71 59 60

REDCAR

ESTON

0 1 2 Kilometres

Source: Derived from Middlesbrough Council, Redcar & Cleveland Borough Council, Stockton-on-Tees Borough Council

Legend:

- 250m Zone of Influence
- Harbour Facilities - DCO Order Limits
- MHF and MTS Portal – Extent of Works
- Project within Zone of Influence (Linear Projects)
- Project within Zone of Influence

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title: Harbour Facilities CIA: Zone of Influence - Hydrology and Flood Risk (including WFD Compliance)

Part:	Figure:	Drawing No:
HF	20.1	9Y0989-CIA-20-001

Rev:	Date:	Drawn:	Checked:	Size:	Scale:
1	06/03/2015	LB	MS	A3	1:50,000
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Co-ordinate system: British National Grid

ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com

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20.2 Assessment methodology

20.2.1 The assessment methodology adopted here is described in detail in the **York Potash Project Harbour Facilities Water Framework Directive Compliance Assessment** (**ES Section 4 Appendix 4.3**). This document also contains a description of the baseline water body status and an assessment of the impacts that are likely to arise as a result of the proposed Harbour facilities.

20.3 Assessment of potential cumulative impacts

20.3.1 **Table 20-2** presents a summary of the YPP component elements that have the potential to result in cumulative impacts, alongside a number of non-YPP developments, with the Harbour facilities.

Table 20-2 Summary of potential cumulative Hydrology and Flood Risk impacts for the Harbour facilities and relevant YPP and non-YPP developments

Potential impact	YPP component element	Non-YPP development	Potentially affected receptors
Increased supply of fine sediment and contaminants during construction	MTS Portal, MHF and Harbour facilities	R/2014/0074/FFM: Airvolution Energy wind turbines (x2) (59) R/2013/0369/FFM: Earthyl Energy anaerobic digestion and combined heat and power plan (130) Forewind Dogger Bank Teesside A&B (169) and C&D (170) landfall and cable routes R/2012/0605/RMM: Northern Gateway Container Terminal (173) PD Teesport maintenance dredging (172)	Mains Dike Mill Race Tees Estuary (S Bank) river water body (GB103025072320) Tees estuary water body (GB510302509900)
Direct disturbance of surface watercourses during construction	MTS Portal, MHF and Harbour facilities	R/2013/0369/FFM: Earthyl Energy anaerobic digestion and combined heat and power plant (130) Forewind Dogger Bank Teesside C&D landfall and cable route (170)	Mains Dike Mill Race Tees Estuary (S Bank) river water body (GB103025072320) Tees estuary water body (GB510302509900)

Potential impact	YPP component element	Non-YPP development	Potentially affected receptors
Increased surface flows from site drainage during operation	MTS Portal, MHF and Harbour facilities	R/2014/0074/FFM: Airvolution Energy wind turbines (x2) (59) R/2013/0369/FFM: Earthyl Energy anaerobic digestion and combined heat and power plant (130)	Mains Dike Mill Race Tees Estuary (S Bank) river water body (GB103025072320)

Increased supply of fine sediment and contaminants during construction

20.3.2 The construction of the MTS Portal and MHF at Wilton and the Harbour facilities would require extensive excavation, topsoil stripping, and disposal of spoil on the ground surface. These activities have the potential to increase sediment supply to the surface watercourses in the vicinity of the Harbour facilities development site. There is also the potential for the accidental release of lubricants and fuel oils from construction machinery and the accidental release of construction materials (including concrete) into the aquatic environment.

20.3.3 The proposed development of two wind turbines (R/2014/0074/FFM), an AD and CHP plant (R/2013/0369/FFM), Northern Gateway Container Terminal (R/2012/0605/RMM) and landfall cables from Dogger Bank Teesside offshore wind farm also have the potential to increase sediment supply though ground disturbance and cause the accidental release of contaminants from machinery and construction materials.

20.3.4 The developments listed in the previous paragraph are all in close proximity to the Mains Dike or Mill Race, which combine and flow into Dabholm Gut. This is classified under the WFD as the Tees Estuary (S Bank) river water body (GB103025072320). This water body drains into the Tees estuary water body (GB510302509900), which includes Dabholm Gut.

20.3.5 An increase in fine sediment supply could result in localised increases in turbidity and increased sediment deposition in the channels downstream, adversely impacting upon the geomorphology of the water body. Furthermore, increased sediment supply could potentially smother existing bed habitats and reduce light penetration, which could affect the biology (e.g. macrophytes, aquatic invertebrates and fish) supported in each watercourse. The release of contaminants during construction has the potential to cause deterioration in water quality.

20.3.6 However, a series of mitigation measures are embedded within the scheme designs for the proposed MTS Portal, MHF and Harbour facilities at Wilton, including a construction phase site drainage management plan and a permanent Sustainable Drainage System. These both incorporate measures to decrease runoff and prevent the supply of sediment and other contaminants to the surface drainage system. These measures would reduce sediment supply and minimise the possibility of water quality impacts associated with fuels, oils and construction materials. This means that the potential for

adverse impacts on the receiving waters is significantly reduced. The impacts arising from the YPP components at Wilton and the Harbour facilities are, therefore, predicted to be of negligible significance.

20.3.7 The proposed wind turbines (R/2014/0074/FFM), AD and CHP Plant (R/2013/0369/FFM), Northern Gateway Container Terminal (R/2012/0605/RMM) and landfall cables (Dogger Bank Teesside) all include construction drainage management plans and drainage systems designed to prevent the release of fine sediments and contaminants into the river (as appropriate). The impact from these schemes is, therefore, also predicted to be negligible.

20.4 Description of baseline where cumulative impact anticipated

20.4.1 The Wilton (tidal Tees) Area water body (GB103025072320) is at Moderate Ecological Status due to pressures on its natural hydrology. The Tees estuary water body (GB510302509900) has been designated as Heavily Modified under the WFD for navigation purposes (i.e. dredging). It is currently at Moderate Ecological Potential as a result of high phosphate concentrations, which put pressure on fish populations.

20.5 Assessment of cumulative impact

20.5.1 Based on the information presented above, the impacts associated with the YPP developments at Wilton and the Harbour facilities would be controlled by mitigation measures embedded in the scheme designs and, as such, are predicted to be of negligible significance. They would not, therefore, combine with the impacts of the wind turbines, anaerobic digester, NGCT or cable crossings to adversely impact upon the water bodies. This cumulative impact is therefore predicted to be of **negligible** significance and would not result in deterioration of the status of any of the surface water bodies.

Increased surface flows from site drainage during operation

20.5.2 The change in land use at the MHF and Harbour facilities at Wilton to include new buildings, access roads, hard standing and landscaped bunds, has the potential to increase the volume of surface runoff that discharges into the surface drainage network. Changes to flow conditions mean that stream power could increase, leading to greater bed and bank scour in the river network. This erosion could lead to geomorphological adjustment in the form of bed incision and/or undercutting of the banks. These adjustments have the potential to permanently change in-channel habitats, which could adversely impact upon macrophytes, aquatic invertebrates and any fish.

20.6 Assessment of cumulative impact

20.6.1 The Airvolution Energy wind turbine development (R/2014/0074/FFM) and the Earthyl Energy AD and CHP Plant (R/2013/0369/FFM) are both adjacent to the Mains Dike / Mill Race system. Both developments involve an increase in the area of impermeable surfaces adjacent to the watercourse, and as such have the potential to further increase flows in Mains Dike, the Mill Race, and downstream watercourses that drain into the Tees estuary.

20.6.2 However, all three proposed developments incorporate detailed strategies to manage and attenuate site drainage and minimise any changes to flow volumes and velocities. Hence the water discharged to the surface drainage network would be minimised. The significance of this impact is therefore predicted to be **negligible**. The cumulative impact would not result in deterioration of the status of any of the surface water bodies.

21 TERRESTRIAL ECOLOGY

21.1 Scoping of non-YPP developments

21.1.1 **Figure 21-1** presents the ZOI for terrestrial ecology, illustrating the non-YPP developments considered to have the potential to result in cumulative effects with the Harbour facilities.

21.1.2 In general, only projects in sites with a direct connection to the YPP components (i.e. those which are in the direct footprint of the YPP components or within the ZOIs for noise, air quality, visual disturbance, hydrology and hydrogeology) have the potential to result in cumulative impacts with YPP components.

21.1.3 Therefore the projects that have been scoped out with respect to noise, air quality, hydrology and hydrogeology have also been scoped out for terrestrial ecology. Three non-YPP projects have been scoped in (see **Table 21-1**). **Figure 21-1** shows the locations of these projects.

21.2 Assessment of potential cumulative impacts

21.2.1 **Table 21-1** presents a summary of the YPP components that have the potential to result in cumulative impacts, alongside non-YPP developments, with the Harbour facilities.

Table 22-1 Summary of potential cumulative Terrestrial Ecology impacts for the Harbour facilities, YPP and non-YPP developments

Potential impact	YPP component	Non-YPP development	Potentially affected receptors
Habitat loss	MHF site (approximate loss of 28.1ha) Harbour facility	Northern Gateway Container Terminal (173)	Habitats such as (but not limited to) broadleaved woodland and rough grassland.
Disturbance to protected species	MHF site (reptiles, birds) Harbour facility	Northern Gateway Container Terminal (173)	Common reptile species Bird species

21.3 Assessment of potential cumulative impacts

Impacts on habitats and habitat loss

21.3.1 The YPP components that are relevant in this context would result in the loss of the following habitat types:

- MHF site = total loss of 28.1ha – comprising of 1.1ha of scrub; 26.8ha of rough grassland; and 0.3ha of ponds/ditches.
- Harbour facilities = comprising scattered trees and scrub, and areas of rough grassland.

21.3.2 The habitat types within the MHF and Harbour facilities sites are considered to be commonly occurring habitats and no BAP habitats have been recorded in the surveys.

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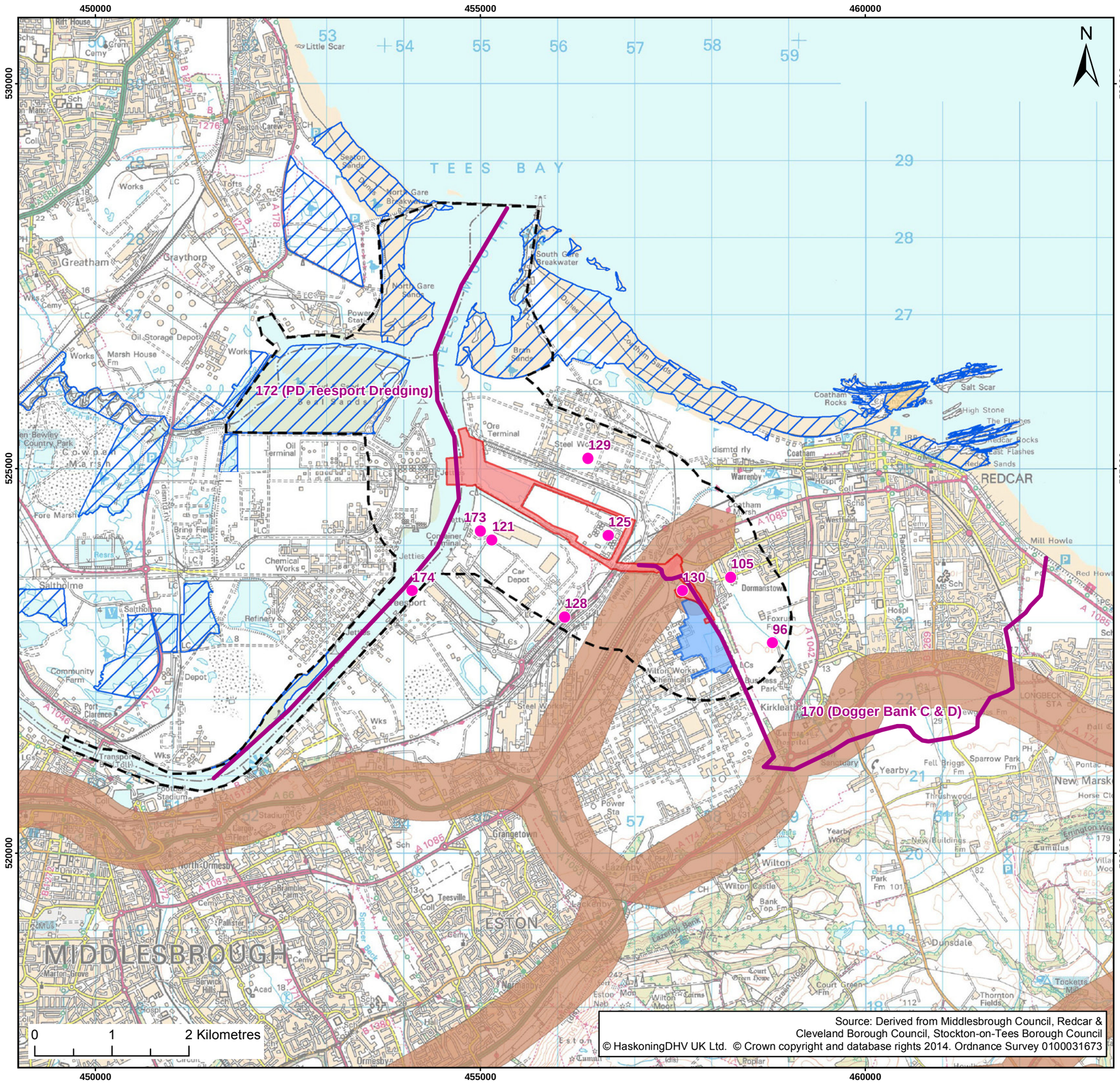

Legend:

- Zone of Influence
- Harbour Facilities - DCO Order Limits
- MHF and MTS Portal – Extent of Works
- Transportation Route
- Teesmouth & Cleveland Coast Ramsar & Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Project within Zone of Influence (Linear Projects)
- Project within Zone of Influence

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title:

Harbour Facilities CIA:
Zone of Influence - Terrestrial Ecology

Part:	Figure:	Drawing No:
HF	21.1	9Y0989-CIA-21-001

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1	06/03/2015	LB	MS	A3	1:50,000
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ROYAL HASKONINGDHV
INDUSTRY, ENERGY & MINING
RIGHTWELL HOUSE
BRETTON
PETERBOROUGH
PE3 8DW
+44 (0)1733 33 44 55
www.royalhaskoningdhv.com

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21.3.3 Based on available records, the habitats associated with the non-YPP developments considered in this terrestrial ecology CIA are also commonly occurring; none of which have been identified as (terrestrial) BAP habitats.

21.3.4 The construction works associated with these non-YPP developments would result in habitat losses. However, all of the habitats are considered to be of negligible or low nature conservation value. Therefore the cumulative impacts of the MHF and the Harbour facilities with non-YPP developments with respect to habitat loss are predicted to be of **negligible** significance.

Impacts on protected species

21.3.5 There is the potential for a cumulative impact to arise with respect to protected species, should the construction phase of one or more of the projects considered above coincide. The most significant potential impact is likely to be the loss of habitats which protected species (such as reptiles and birds) may use, along with associated indirect impacts such as noise disturbance. Without mitigation, the cumulative impact could be of **minor adverse** significance.

Mitigation

21.3.6 Mitigation for protected species, specifically reptiles and birds, is included within the Harbour facilities (see **ES Section 10 Ecology**) and MHF project proposals.

21.3.7 With the implementation of these mitigation measures, and the knowledge that similar mitigation measures would be put in place for the protection of protected species for the NGCT development, a residual cumulative impact of **negligible** significance is predicted.

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22 LANDSCAPE AND VISUAL ENVIRONMENT

22.1 Scoping of non-YPP developments

22.1.1 Given the nature of landscape and visual effects, a whole YPP approach has been adopted as the starting point for the Cumulative LVIA. Following discussions with the NYMNPA and Natural England, the following existing and proposed developments were taken into account in the cumulative assessment of the YPP and non-YPP developments with respect to the landscape and visual environment:

- Proposed Bank Field wind farm, near Guisborough.
- Existing Boulby Mine dryer stack, near Staithes.
- Existing RAF Fylingdales SSPA Radar structure, at Fylingdales Moor.

22.2 Assessment methodology

22.2.1 The assessment methodology adopted follows that set out at **ES Section 20**, with the addition of existing and proposed non-YPP developments included within the ZTV model; as presented in **Table 22-1**.

Table 22-1 Non-YPP development data used for ZTV model

Winding Tower	Height (m AOD*)
RAF Fylingdales SSPA Radar	298m AOD (40m height with FFL** of 258m AOD)
Boulby Mine dryer stack	167.5m AOD (87.5m height with FFL of 80m AOD)
Bank Field wind farm	296m AOD (132m to hub with FFL of 164m AOD)

*m AOD – metres above Ordnance Datum
**FFL – finished floor level or ground level

22.2.2 ZTV mapping was used to identify potential locations where the YPP components and non-YPP developments would be intervisible. Representative viewpoint analysis was then used to identify whether interactions would result in additive cumulative impacts that would be greater than the individual impacts occurring at each location.

22.3 Assessment of potential cumulative impacts

22.3.1 ZTV mapping results for cumulative effects with non-YPP developments are shown on the following figures:

- **Figure 2327.ZTV CU01, Part 3 Appendix 22.1**, Designated landscapes without woodlands;
- **Figure 2327.ZTV CU02, Part 3 Appendix 22.1**, Designated landscapes with woodlands;
- **Figure 2327.ZTV CU03, Part 3 Appendix 22.1**, Landscape character without woodlands;
- **Figure 2327.ZTV CU04, Part 3 Appendix 22.1**, Landscape character with woodlands;

- **Figure 2327.ZTV CU05, Part 3 Appendix 22.1**, Sequential receptors, access and panoramic viewpoints without woodlands; and,
- **Figure 2327.ZTV CU06, Part 3 Appendix 22.1**, Sequential receptors, access and panoramic viewpoints with woodlands.

22.3.2 A range of panoramic photographs and photomontages was used to examine the potential effects of the YPP. The proposed YPP features and non-YPP development features are shown on these images (see **Part 3 Appendix 22.1**).

22.3.3 An assessment of cumulative impacts with non-YPP developments was carried out based on representative viewpoints, with the results included at **Part 3 Appendix 22.2**.

22.3.4 The representative viewpoint assessment did not identify any potential additive cumulative landscape character or visual impacts between YPP component elements and the existing or proposed non-YPP development features listed in **Table 22-1**.

22.3.5 Whilst proposed YPP structures (winding towers) would be intervisible with the non-YPP developments at a number of locations, as indicated on the ZTV mapping, the additive cumulative impact of both sets of development features would not exceed the individual visual impacts occurring at any one location, primarily due to the large distances between the assessed features.

22.3.6 In terms of landscape character impacts, the combined distant visibility of both the YPP features and non-YPP developments would create a wider spread of perceptible development features, primarily across open moorland areas, but would not be sufficient to alter the existing key characteristics or impact on character that arises from any one YPP element or other development. Cumulative impacts between the YPP and non-YPP developments are, therefore, predicted to be of **negligible** significance in the context of both the landscape and visual environments.

Assessment of potential cumulative impacts of the YPP

22.3.7 Likely significant project-wide cumulative effects are not expected to arise from the operational phase of the Mine or MTS components with the MHF, MTS Portal or Harbour facilities due to a lack of intervisibility between the completed sites, the relatively discrete nature of completed landform and building components, and the use of discreet lighting at the sites.

22.3.8 Physical changes to the landscape character at the Mine and MTS sites during the construction phase are not predicted to give rise to significant cumulative effects due to the avoidance of loss of distinctive or rare landscape features and the widespread geographical distribution of the component elements across different landscape character areas.

22.3.9 During the construction phase, the Mine and MTS component elements have the potential to give rise to significant cumulative landscape/visual effects due to the use of 45m high temporary winding towers and temporary lighting columns (to 10m column height). In addition, ground level activity at the shaft top locations and spoil disposal areas during the construction phase, although not intervisible between

the sites or with areas affected by baseline tall developments, could give rise to sequential effects in closer range views for users of linear features (e.g. roads, footpaths).

22.3.10 The Construction Village and Park & Ride would be located in an arable field between the Whitby Business Park and Whitby Sewage Treatment Works, off the A171 to the east of the town. The site is located outside the boundary of the NYMNP and is contained within a perimeter of dense, tall hedgerows that restrict local views into the site. The site lies outside the combined ZTV mapping for the Mine and MTS winding towers and is, therefore, not intervisible with other YPP component elements. Views to the site from the adjoining A171 are screened by the existing roadside hedge.

22.3.11 The Wilton Operational Park & Ride ride facility would form a minor extension of the existing Whitby Park and Ride (near Cross Butts Farm on the A171, west of Whitby). The proposed extension would not significantly alter the character of the existing park and ride facility or its appearance in external views. In addition, this area would not be intervisible with the operational Mine or MTS sites.

22.3.12 On the basis of the above, the following YPP components are not predicted to give rise to significant project-wide cumulative impacts:

- Construction Village and Park & Ride.
- MHF and Harbour facility (construction and operation).
- Mine and MTS Intermediate Shaft Sites (operation)
- Wilton Operational Park & Ride.

22.3.13 The following YPP elements have been identified as having potential to give rise to significant project-wide cumulative impacts:

- The Mine and MTS construction phase temporary winding towers.
- The Mine and MTS construction phase temporary lighting, including ground level lighting and red aviation warning lights on the winding towers[6].

22.3.14 The ZTV modelling data used for each winding tower is set out in **Table 22-2**.

Duration of project activities

22.3.15 The duration of activity at the Mine and MTS sites, and duration of tall structures (temporary winding towers and temporary generator stacks, is set out in the **Tables 22-3** and **22-4**.

[6] Note that following further consultation with the relevant authorities the use of red aviation warning lights on the winding towers is no longer proposed. However, they were included on a precautionary basis within the CLVIA when it was undertaken.

Table 22-2 Temporary winding tower data used for ZTV model

Winding Tower	Height (m AOD*)
Mine	245.7m AOD(45m height with FFL** of 200.7m AOD)
Lady Cross Plantation	247.4m AOD(45m height with FFL of 202.4m AOD)
Lockwood Beck	232.8m AOD(45m height with FFL of 187.8m AOD)
Tocketts Lythe	128.9m AOD(45m height with FFL of 83.9m AOD)

*m AOD – metres above Ordnance Datum
**FFL – finished floor level or ground level

Table 22-3 Duration of overall activity at sites

Site	Start	Finish	Overall period
Mine	Month 1	Month 58	58 months
MTS Lady Cross Plantation	Month 2	Month 40	38 months
MTS Lockwood Beck	Month 2	Month 40	38 months
MTS Tocketts Lythe	Month 2	Month 34	32 months

Table 22-4 Duration of temporary structures

Structure	Installation	Removal	Overall period in place
Mine - Production shaft winding tower	Month 9	Month 57	47 months
Mine - Services shaft winding tower	Month 9	Month 48	38 months
Mine - MTS shaft winding tower	Month 11	Month 40	28 months
Mine – Temporary generator stacks	Month 9	Month 57	47 months
MTS Lady Cross Plantation –generator stack	Month 8	Month 40	32 months
MTS Lady Cross Plantation – winding tower	Month 11	Month 40	28 months
MTS Lockwood Beck –generator stack	Month 8	Month 40	32 months
MTS Lockwood Beck – winding tower	Month 11	Month 40	28 months
MTS Tocketts Lythe –generator stack	Month 8	Month 34	32 months
MTS Tocketts Lythe – winding tower	Month 11	Month 34	23 months

Identification of receptors

22.3.16 A project wide study area (**Figure 2327.CLVIA 01**, **Part 3 Appendix 22.1**) was defined using preliminary ZTV mapping. **Table 22-5** presents the following landscape and visual receptors identified for inclusion within the project-wide cumulative assessment.

Table 22-5 Landscape and Visual Receptors included in the project-wide cumulative assessment

Receptor Type	Location/ Description
Designated landscapes Refer to **Figure 2327.CLVIA 02, Part 3 Appendix 22.1**	North York Moors National Park
	North Yorkshire and Cleveland Heritage Coast
Landscape character areas	Areas as shown on the **Figure 2327.CLVIA 03, Part 3 Appendix 22.1**
Access land	Areas as shown on the **Figure 2327.CLVIA 04, Part 3 Appendix 22.1**
Panoramic viewpoints Refer to **Figure 2327.CLVIA 04, Part 3 Appendix 22.1**	Danby Beacon
	Highcliff Nab
	Roseberry Topping
Sequential visual receptors Refer to **Figure 2327.CLVIA 04, Part 3 Appendix 22.1**	A169 northbound
	A171 eastbound
	A171 westbound
	Cleveland Way National Trail
	National Cycle Route 1
	Regional Cycle Route 165
	Coast to Coast Walk

ZTV mapping results and representative viewpoints

22.3.17 As acknowledged above, ZTV mapping results for project-wide winding tower cumulative effects are shown on the following figures:

- **Figure 2327.ZTV CU01, Part 3 Appendix 22.1**, Designated landscapes without woodlands.
- **Figure 2327.ZTV CU02, Part 3 Appendix 22.1**, Designated landscapes with woodlands.
- **Figure 2327.ZTV CU03, Part 3 Appendix 22.1**, Landscape character without woodlands.
- **Figure 2327.ZTV CU04, Part 3 Appendix 22.1**, Landscape character with woodlands.
- **Figure 2327.ZTV CU05, Part 3 Appendix 22.1**, Sequential receptors, access and panoramic viewpoints without woodlands.
- **Figure 2327.ZTV CU06, Part 3 Appendix 22.1**, Sequential receptors, access and panoramic viewpoints with woodlands.

22.3.18 Based on the above results, a series of representative viewpoints has been identified for the purposes of undertaking field work and preparing illustrative material (photographs and photomontages) as presented in **Table 22-6**.

Table 23-6 Representative viewpoints identified for the project-wide cumulative assessment

Reference	Location	Photograph and photomontage references
Viewpoint 1	Roseberry Topping Panoramic Viewpoint (within NYMNP)	**2327.PAN01** and **2327.view 1 SF, Part 3 Appendix 22.1**
Viewpoint 2	Highcliff Nab Panoramic Viewpoint (within NYMNP)	**2327.PAN01** and **2327.view 2 SF, Part 3 Appendix 22.1**
Viewpoints 3a & 3b	Airy Hill – Cleveland Way National Trail	**2327.PAN01, Part 3 Appendix 22.1**
Viewpoint 4	Smeathorns Road/ Moorsholm Moor (Access Land within NYMNP)	**2327.PAN02** and **2327.view 4 SF, Part 3 Appendix 22.1**
Viewpoint 5	Rockhole Hill (within NYMNP)	**2327.PAN02** and **2327.view 5 SF, Part 3 Appendix 22.1**
Viewpoint 6	Liverton Moor (Access Land within NYMNP)	**2327.PAN02, Part 3 Appendix 22.1**
Viewpoint 7	Danby Beacon Panoramic Viewpoint (Access Land within NYMNP)	**2327.PAN02, 2327.PAN03** and **2327.view 7 SF, Part 3 Appendix 22.1**
Viewpoint 8	Newton Mulgrave Moor (within NYMNP)	**2327.PAN03, Part 3 Appendix 22.1**
Viewpoint 9	Potato Hill (A174) (within NYMNP)	**2327.PAN03, Part 3 Appendix 22.1**
Viewpoint 10	Egton Low Moor (within NYMNP)	**2327.PAN03, Part 3 Appendix 22.1**
Viewpoint 11	Egton village (within NYMNP)	**2327.PAN03** and **2327.view 11 SF, Part 3 Appendix 22.1**
Viewpoint 12	Egton High Moor (Access Land within NYMNP)	**2327.PAN04, Part 3 Appendix 22.1**
Viewpoint 13	Danby High Moor (Access Lane within NYMNP, close to Coast to Coast Walk)	**2327.PAN04** and **2327.view 13 SF, Part 3 Appendix 22.1**
Viewpoint 14	A169 at Goathland Moor (within NYMNP)	**2327.PAN04, Part 3 Appendix 22.1**
Viewpoint 15	Sleights Moor/ Breckon Howe (Access Land within NYMNP)	**2327.PAN04** and **2327.view 15 SF, Part 3 Appendix 22.1**
Viewpoint 16	Fylingdales Moor (Access Land within NYMNP)	**2327.PAN05, Part 3 Appendix 23.1**
Viewpoint 17	Ugglebarnby Moor (Access Land within NYMNP)	**2327.PAN05** and **2327.view 17 SF, Part 3 Appendix 22.1**
Viewpoint 18	Hawsker Bottoms/ National Cycle Route 1 (within NYMNP)	**2327.PAN05** and **2327.view 18 SF, Part 3 Appendix 22.1**
Viewpoint 19	Howdale Moor (Access Land within NYMNP)	**2327.PAN05, Part 3 Appendix 22.1**

22.3.19 The assessment of potential project-wide cumulative effects at the representative viewpoints is presented at **Part 3 Appendix 22.2**.

Panoramic photographs and photomontages

22.3.20 Given the scale of the project and its setting, panoramic photography has been used to illustrate the nature of existing views and character at the representative viewpoints (refer to **Figures 2327.PAN 01 to 2327.PAN05, Part 3 Appendix 22.2**).

22.3.21 A series of photomontages has been prepared from a range of viewpoints (as listed in the table above) to assist in the assessment of scheme effects, these are included on **Figures 2327.PAN 01 to 2327.PAN05, Part 3 Appendix 22.2**. Project elements (winding towers) have been superimposed in 3D on the DTM model, renders prepared using a virtual camera set to the representative viewpoint co-ordinates and the resulting image matched to the panoramic photograph. In addition, a series of real single frame (A3) images, as listed in **Table 22-6** above, have been prepared to show affected parts of the panoramic images at real world scale. These images are keyed to the panoramic photographs using a light grey dashed box.

22.3.22 Photomontages have been prepared to convey the sense of scale of the proposed temporary winding towers within available views, rather than presenting a photo-realistic effect. Proposed towers have been shaded in magenta on the panoramic photographs and a light grey colour on the single frame images to more closely represent the proposed tower cladding colour. Intervening vegetation cover would screen parts of some project elements within the photomontages and this has been taken into account within the assessment.

Summary of project-wide cumulative impacts

Designated landscape impacts

22.3.23 The North Yorkshire and Cleveland Heritage Coast is typically remote from the Mine and MTS sites. Representative viewpoint analysis indicates that project-wide cumulative impacts on the Heritage Coast would be limited due to the large distances between the various YPP component element sites and the Heritage Coast designated area. Overall, the impact on the Heritage Coast designated area is predicted to be **minor adverse**.

22.3.24 The potential overall cumulative impact of the construction phase of the YPP on the NYMNP has been examined using ZTV mapping as presented on:

- **Figure 2327.NYMNP01, Part 3 Appendix 22.1** shows the full extent of the Mine and MTS winding towers ZTV overlaid on the NYMNP.
- **Figure 2327.NYMNP02, Part 3 Appendix 22.1** shows the Mine and MTS winding towers ZTV within a 6km radius of each site overlaid on the NYMNP.
- **Figure 2327.NYMNP03, Part 3 Appendix 22.1** shows the Mine winding tower ZTV to a 4km radius around the site and the MTS winding towers, ZTVs to a 2km radius around each site, overlaid on the NYMNP.

22.3.25 Representative viewpoint analysis indicates that the large distances between the Mine and MTS sites, combined with their specific settings and context, would not result in cumulative impacts over and above the individual impacts arising at each site. Whilst multiple winding towers at the various sites may be seen in succession, or in-combination from open and elevated viewpoints, the cumulative effect is not sufficient to increase the individual impacts or alter the overall perception of landscape character at the viewpoints. On this basis, the full extent ZTV, **Figure 2327.NYMNP01, Part 3 Appendix 22.1**,

would include distant areas within the NYMNP where **negligible** or **imperceptible** impacts would be expected to occur.

22.3.26 **Figure 2327.NYMNP02, Part 3 Appendix 22.1** illustrates the extents of the 6km ZTVs (based on the limits of the individual site study areas) around the sites, which indicate that cumulative winding tower visual and character impacts could occur within the NYMNP between the Mine and Lady Cross Plantation MTS sites along the River Esk valley and at Sleights Moor. The Lockwood Beck and Tocketts Lythe 6km ZTVs are not intervisible with the other scheme sites. The ZTV mapping indicates a small area of intervisibility between these two sites at High Moor, however, this is considered to be a result of using 10m high woodland within the ZTV model, with actual woodland being considerably taller and screening views of the Tocketts Lythe tower. Representative viewpoint analysis indicates that **minor adverse** impacts could occur at worst case distances up to 16km from limited elevated vantage points (Mine towers viewed from Danby Beacon, viewpoint 7).

22.3.27 Significant adverse impacts associated with the winding towers (and ground level activity) are typically constrained to areas that are relatively close to the sites. **Figure 2327.NYMNP03, Part 3 Appendix 22.1** illustrates a 4km radius around the Mine site and 2km radii around the MTS sites, broadly representing the likely limits of significant (moderate adverse or greater) character and visual impacts for the sites.

22.3.28 National Park moorland and dark skies special qualities would be affected by the YPP during the construction phase. Intervisibility with towers and ground level activity at close range across moorland areas around the Mine and to the south of Lockwood Beck MTS site would result in a **temporary moderate** to **major adverse** impact on the moorland special quality. More distant intervisibility with winding towers from other areas of moorland would result in a **negligible** and **minor adverse** impact on the moorland special quality across the northern part of the NYMNP. Construction phase lighting would result in **temporary major** and **moderate major adverse** impacts close to the Mine and MTS sites, with lower level impacts occurring across the wider northern part of the NYMNP where adverse impacts associated with vehicle lights on major roads and distant sky glow from the Teesside conurbation form part of the baseline night sky characteristic.

22.3.29 In addition to the extent of winding tower ZTVs for the sites, the duration of tower impacts should also be considered. The towers at the Mine site would be in place for up to four years (48 months). At the Lady Cross Plantation, Lockwood Beck and Tocketts Lythe MTS sites, the towers would be in place for a shorter duration. On this basis, cumulative in-combination and in succession visual and character effects associated with the Mine and MTS towers would last for up to three years, with the more limited impacts associated with the Mine winding towers alone continuing for a further year.

22.3.30 The overall cumulative impact of the Mine and MTS winding towers on the character of the NYMNP is predicted to be **minor adverse**, with the impact mainly occurring across areas of open moorland within the northern part of the NYMNP. The temporary impact of winding towers on NYMNP character would be short term and fully reversible.

22.3.31 Although the operational phase of the project is not predicted to give rise to significant cumulative impacts, lower level effects on the NYMNP have been considered. Permanent physical changes to the NYMNP would involve changes to topography, the loss of agricultural land, coniferous plantation and limited areas of broadleaved woodland, and new surface buildings. The habitats that would be removed are relatively commonplace and of low scenic value. They would be replaced by a richer series of habitats that would contribute more strongly to the character of the NYMNP and the aims of the Management Plan (NYMNPA, 2012) for the Park. The landform changes would be in keeping with their existing settings and would be rapidly re-assimilated into the physical fabric of the NYMNP as restoration planting develops (as described in Royal HaskoningDHV, 2014).

22.3.32 Permanent character changes within the NYMNP would involve an increase of woodland cover at the Mine and Lady Cross Plantation sites in keeping with, and reinforcing, the predominantly wooded existing baseline character at both sites. Landform changes would be rapidly assimilated into existing landscape character at both sites. Proposed buildings would be discreet and imperceptible within views from surrounding landscape character areas after the proposed restoration planting has established.

22.3.33 The proposal to replace marginal farmland with, say, 2000ha of native broadleaved woodland (as a carbon offsetting measure to be delivered through a payment to the NYMNPA) would be expected to have a wider **minor beneficial** cumulative impact across the NYMNP. The location and concentration of these measures is not known at this stage, and would be determined by the NYMNPA.

22.3.34 During the operational phase, Lockwood Beck and Tocketts Lythe MTS sites would be intervisible with the edge of the NYMNP but would not alter the balance of existing views from the NYMNP or landscape character within the NYMNP, with both sites being designed to reflect baseline character.

22.3.35 Operational phase lighting at the Mine and MTS sites would be minimal and would not be intervisible between the sites, with **no cumulative impact** predicted on NYMNP character.

22.3.36 Operational phase traffic flow changes (see below) are not predicted to have an adverse impact on Park character.

22.3.37 Overall, permanent operational phase physical and character changes within the NYMNP are predicted to provide a **minor cumulative benefit** to its physical fabric and landscape character.

Landscape character impacts

22.3.38 The cumulative extent of winding tower intervisibility with landscape character areas within the NYMNP and Borough of Redcar and Cleveland is shown on **Figure 2327.CU03, Part 3 Appendix 22.1**.

22.3.39 Landscape character impacts within the NYMNP would be as described for designated landscapes above, with **localised major adverse character impacts** close to the Mine and MTS sites and more widespread lower level impacts across wider areas. Character impacts on valley landscapes would typically be intermittent and constrained in scale, given extensive tree and hedgerow cover, and the

changing nature of views. Character impacts on open moorlands would be more widespread with greater intervisibility with winding towers associated with the project sites from higher areas of moorland. Although multiple winding towers would be visible at various valley and moorland locations (for example Egton, Hawsker Bottoms, Rockhole Hill, Sleights Moor and Danby Low Moor), the cumulative impact would not exceed that of the worst case individual tower within views.

22.3.40 Cumulative landscape character effects within the Borough of Redcar and Cleveland would be limited due to a lack of intervisibility between the Lockwood Beck and Tocketts Lythe MTS sites and their temporary winding towers. A **minor adverse** impact, based on individual impacts associated with towers at Lockwood Beck and Tocketts Lythe, is predicted at Warsett Hill within the East Cleveland Plateau landscape tract (see viewpoint 5, Rockhole Hill (**Part 3 Appendix 22.2**) for comparative assessment).

22.3.41 Cumulative impacts would not occur within Scarborough Borough landscape character areas (within the Whitby enclave and not included on the 1:50,000 ZTV mapping) due to the Mine and Lady Cross Plantation sites and winding towers not being intervisible with any single character area.

Access land impacts

22.3.42 Proposed winding towers would be visible from access land across the northern part of the NYMNP, as shown on **Figure 2327.CU06, Part 3 Appendix 22.1**). Significant individual site adverse impacts would be confined to moorland areas close to the proposed Mine (Graystone Hills, Latter Gate Hills, Sneaton Low Moor and Sleights Moor) and Lockwood Beck MTS (Moorsholm Moor and Stanghow Moor) sites, where ground level activity would be visible in addition to winding towers. From other moorland access land, winding towers would be visible at varying distances and in varying site combinations, as shown on the **Figure 2327.CU06, Part 3 Appendix 22.1**. Impact within views from these wider areas would range between **negligible** and **minor adverse**; with the winding towers appearing as small or very small scale features within panoramic long distance views. The cumulative in-combination and/or in succession impact of multiple visible towers would not exceed the worst case impact of the closest range tower or towers within views from each area.

Panoramic viewpoint impacts

22.3.43 The Tocketts Lythe winding tower would be visible in isolation from Roseberry Topping, amongst woodland and beyond the Guisborough urban area within a complicated and undulating landscape backdrop, resulting in a **minor adverse** impact (viewpoint 1 (**Part 3 Appendix 22.2**)). The Tocketts Lythe tower would also be visible from Highcliff Nab (viewpoint 2 (**Part 3 Appendix 22.2**)), at closer range and in association with ground level activity, resulting in a **minor** to **moderate adverse** impact. These impacts would last whilst the tower is in place.

22.3.44 Within views from Danby Beacon (viewpoint 7 (**Part 3 Appendix 22.2**)), the Mine, Lady Cross Plantation and Lockwood Beck winding towers would be visible as distant features resulting in a **minor adverse** impact. The Mine towers and Lady Cross Plantation tower would be seen in combination

within the same field of view to the east, with the Lockwood Beck tower then being seen in succession to the north west. In-succession and in-combination impacts would last for up to three years, after which the Lockwood Beck and Lady Cross Plantation winding towers would be removed and the Mine winding towers would remain in place for a further year.

Sequential receptor assessment

22.3.45 The assessment of sequential impacts on linear receptors is presented at **Part 3 Appendix 22.3** and is illustrated on the following sets of figures:

- A169 (northbound) Figure 2327.SEQ A169, Part 3 Appendix 22.3;
- A171 (eastbound) Figure 2327.SEQ A171, Part 3 Appendix 22.3;
- A171 (westbound) Figure 2327.SEQ A171, Part 3 Appendix 22.3;
- Cleveland Way National Trail Figure 2327.SEQ CW, Part 3 Appendix 22.3;
- National Cycle Route 1 Figure 2327.SEQ NCR1, Part 3 Appendix 22.3;
- Regional Cycle Route 165 Figure 2327.SEQ RCR1, Part 3 Appendix 22.3; and,
- Coast to Coast Walk Figure 2327.SEQ C2CW, Part 3 Appendix 22.3.

22.3.46 No significant project-wide in-combination cumulative impacts are predicted within views from linear receptors. General sequential impacts, arising within views of the individual sites or combinations of the sites are described below.

A169 (northbound) sequential impacts

22.3.47 Approaching the study area from the south, distant views towards the Lady Cross Plantation winding tower would be possible from the A169 at Goathland Moor, resulting in **negligible** to **minor adverse** impacts. **Minor** to **moderate adverse** impacts would occur within oblique views of the Mine winding towers where the road crosses Sleights Moor.

22.3.48 No significant adverse impacts would occur with less significant impacts occurring for a combined duration of 6.50 minutes out of a total journey time of 21 minutes.

A171 (eastbound) sequential impacts

22.3.49 Travellers entering the study area from the north would not experience visibility of the Tocketts Lythe MTS site, with screening vegetation and higher intervening landform preventing views from the road to the site. Eastbound views towards the site at the A171 roundabout near Waterfall Farm are only possible as reverse views. Road users would first experience the project as they pass Birk Brow, with distant forward views to the Lockwood Beck winding tower giving way to a **major adverse impact** as the shaft construction site and winding tower are passed near Lockwood Beck Reservoir. These impacts would jointly last for approximately 2km or 2 minutes journey time.

22.3.50 After passing the Lockwood Beck site, a range of **no change**, **negligible adverse** and **minor adverse** impacts would occur with distant forward views available to Lady Cross Plantation and, to a lesser extent, Mine winding towers.

22.3.51 **Moderate adverse** and **moderate/major** adverse impacts would arise in oblique filtered and open views near Barton Howl as the Lady Cross Plantation winding tower becomes more visible above woodland cover. These impacts would last for approximately 700m or 43 seconds.

22.3.52 Continuing east towards Whitby, distant open and filtered oblique views of the Mine winding towers on the horizon would result in intermittent **minor adverse** impacts between Selly Hill and Broad Ings Farm.

22.3.53 After leaving the Whitby urban area, road users would experience filtered and intermittent views of the Mine winding towers and ground level activity at breaks in hedgerows and buildings between Stainsacre and Hawsker, with **minor/moderate adverse** impacts.

22.3.54 The proposed construction phase park and ride site and construction village would be passed on the right opposite Whitby Business Park. Views into the site would be screened by an existing dense roadside hedgerow with no significant impact predicted. Worst case, filtered winter views could give rise to a **minor adverse** impact, but this effect would be experienced in the context of a busy urban area.

22.3.55 Between Hawsker and Normanby Hill Top, views to the Mine site and Lady Cross Plantation tower would be screened by hedgerows and intervening vegetation cover. Between Normanby Hill Top and Standing Stones Rigg the road crosses moorland with oblique and perpendicular open views to the Mine towers and ground level activity resulting in a **moderate/major** adverse impact for approximately 2km or 2 minutes.

22.3.56 Beyond the B1416 the YPP sites would lie behind road users and would be out of view.

22.3.57 Out of a journey time within the study area of approximately 56 minutes, road users would experience intermittent views of winding towers and/or ground level activity at the Mine and MTS sites for a combined duration of approximately 12 minutes. Within this total, significant adverse impacts would occur at three locations over a combined duration of approximately 5 minutes.

A171 (westbound) sequential impacts

22.3.58 Entering the study area from the south east, road users would first experience the YPP near Stony Marl Moor with distant forward views of the Mine towers resulting in a **minor adverse** impact.

22.3.59 Where the road crosses moorland, between Standing Stones Rigg and Normanby Hill Top the Mine site, including towers and ground level activity would be visible in open oblique and perpendicular views, resulting in a **moderate/major adverse** impact over approximately 2km or 2 minutes.

22.3.60 The proposed construction phase park and ride site and construction village would be passed on the left opposite Whitby Business Park, with no adverse impact predicted, as noted above for the eastbound A171 journey.

22.3.61 A **minor/moderate adverse** impact would occur in perpendicular, filtered and intermittent views to the Mine site along the section of road between Hawsker and Stainsacre. **Minor adverse** impacts would occur within perpendicular filtered and intermittent views to the Mine winding towers between Broad Ings Farm and Selly Hill.

22.3.62 At Egton Low Moor, filtered and intermittent views would be possible to the Lady Cross Plantation winding tower rising above woodland cover, with a **moderate adverse** impact occurring for approximately 40 seconds.

22.3.63 Between Lady Cross and Freebrough Farm, intermittent **negligible adverse** and **minor adverse** impacts would occur within forward distant views of the Lockwood Beck winding tower.

22.3.64 From Freebrough Farm to Lockwood Beck Reservoir, impacts would rise progressively over 1.3km from **minor** to **major adverse** as the Lockwood Beck is directly passed, with close range views of both ground level activity and the winding tower.

22.3.65 On approaching the A171 roundabout near Waterfall Farm, filtered views to the Tocketts Lythe winding tower and spoil placement area would be possible resulting in a **minor adverse** impact. At the roundabout a short section of open views would be possible into the Tocketts Lythe site, resulting in a **moderate adverse** impact. The combined duration of effects in this area would be approximately 11 seconds.

22.3.66 Out of a total journey time within the study area of 56 minutes, elements of the YPP would be visible for a combined duration of approximately 16 minutes, with significant adverse impacts occurring for approximately 4 minutes.

Cleveland Way National Trail sequential impacts

22.3.67 The Cleveland Way typically passes through an open coastal landscape and is distant from all YPP sites. A **minor adverse** impact would occur in views from parts of the route near Whitby Abbey and between Tellgreen Hill and Seaveybog Hill, with the Mine winding towers distantly visible. Further north and west, **minor adverse** impacts would also occur within views at Rockhole Hill and near Skinningrove, with the Lockwood Beck winding tower being distantly visible in the south. To the west of Warsett Hill further **minor adverse** impacts would occur where the Lockwood Beck and Tocketts Lythe winding towers are predicted to be visible.

22.3.68 In the vicinity of the Tocketts Lythe site, the section of route crossing Airy Hill is screened from the site by mature plantation cover.

22.3.69 To the south west of the Tocketts Lythe, the route follows the elevated and partially open escarpment of the Cleveland Hills. The Tocketts Lythe winding tower would be visible in distant views at breaks in plantation cover, resulting in **moderate adverse** impacts at openings in woodland and plantation cover. A **minor/moderate adverse** impact would occur in views from the section of route passing Highcliff Nab.

22.3.70 The total journey time along the route within the study area is approximately 14 hours and 23 minutes. The combined duration of visible project elements would be approximately 1 hour and 44 minutes, with significant impacts occurring for approximately 3 minutes.

National Cycle Route 1 sequential impacts

22.3.71 The route enters the study area from the south at Burniston, following the Cinder Track (former Scarborough to Whitby Railway) to Ravenscar, Hawsker and Whitby. A separate, northern, section of the route runs from Staithes to Middlesbrough.

22.3.72 Oblique and perpendicular open and filtered views to Mine ground level activity and winding towers, as well as distant views to the Lady Cross Plantation winding tower, would be possible from sections of the route between Hawsker Bottoms and Stainsacre, resulting in **moderate adverse** impacts.

22.3.73 Remaining sections of the southern part of the route are more enclosed by tree and hedgerow cover, with limited filtered views to Mine winding tower and ground level activity resulting in **minor adverse** and **minor/moderate adverse** impacts. The distant Lady Cross Plantation winding tower would be difficult to perceive within views from these sections of the route due to foreground cover and complexity.

22.3.74 The northern section of the route would be distantly intervisible with the Lockwood Beck winding tower, near Loftus and Brotton, resulting in **minor adverse** impacts.

22.3.75 The Wilton MHF and MTS Portal site are visible from a short section of the route at the A174/ A1042 roundabout, at gaps in foreground tree and hedgerow cover. Within limited views, the proposed YPP would be seen against the existing Teesside industrial backdrop, resulting in a **minor/moderate adverse** impact.

22.3.76 Total journey time within the study area for the southern part of the route is approximately 80 minutes, with YPP elements being visible for a combined duration of 6 minutes. Significant adverse impacts would last for a combined duration of approximately 3 minutes.

Regional Cycle Route 165 sequential impacts

22.3.77 The route enters the study area in the west near Easby before following the Esk valley through Danby, Egton, Aislaby, Sleight and Ruswarp and joining National Cycle Route 1 at the Cinder Track near Larpool Hall.

22.3.78 Between Oakley Side and Barton Rigg, very distant views of the Lady Cross Plantation and Mine winding towers would result in **negligible** and **minor adverse** impacts.

22.3.79 From Barton Rigg to Watergate Farm, intermittent views to the Lady Cross Plantation winding tower would be possible above intervening woodland cover, resulting in **minor adverse** and **minor/moderate adverse** impacts. Very distant views of the Mine winding towers would also be possible to the south east. This section of the route passes through a complex, intimate area of landscape with extensive plantation, woodland, mature tree and hedgerow cover, typically combining to foreshorten, screen or filter potential views.

22.3.80 East of Haystones Manor, the route follows Egton Road to Aislaby with a sequence of elevated filtered and open oblique distant views to the Mine winding towers resulting in **minor adverse** impacts.

22.3.81 Out of a total journey time within the study area of approximately 2 hours, winding towers would be visible for a combined duration of approximately 28 minutes.

Coast to Coast Walk sequential impacts

22.3.82 The route enters the study area in the west at Farndale Moor. Distant views to combinations of the Lockwood Beck, Lady Cross Plantation and Mine winding towers would occur along sections of the route crossing open moorland at Danby High Moor, Glaisdale Rigg, Glaisdale Low Moor, resulting in **minor adverse** impacts.

22.3.83 **Minor/moderate adverse** impacts would occur in views where the route rises up the southern Esk valley flank along Fair Head Lane, with the Lady Cross Plantation winding tower distantly visible above woodland cover on the northern valley flank.

22.3.84 At the Sleights Moor watershed, Lady Cross Plantation and Mine winding towers would be visible in succession along a very short section of the route. Continuing east across Sleights Moor the Mine winding towers would be clearly visible on the eastern horizon in forward views, resulting in **minor/moderate adverse** and **moderate adverse** impacts for approximately 17 minutes.

22.3.85 Emerging from Little Beck valley, the route crosses open moorland at Sneaton Low Moor, Graystone Hills and Normanby Hill Top, with open oblique and perpendicular views towards the Mine site. **Moderate adverse** and **moderate/major** adverse impacts would occur along this section of the route with Mine winding towers and ground level activity being clearly visible from the route as it crosses moorland areas to the east of the Mine. Very distant views to the Lady Cross winding tower would also be possible from this part of the route but would not result in cumulative impacts. Impacts in this area would last for approximately 48 minutes.

22.3.86 Walkers on sections of the route from Stainsacre Lane to Hawsker Bottoms would typically be moving eastwards with their backs to the Mine. In reverse views however, **moderate adverse** impacts would occur at breaks in enclosing tree and hedgerow cover along short sections of Stainsacre Lane and Back Lane.

22.3.87 The total journey time along the section of the route within the study area is approximately 8 hours 4 minutes. YPP elements would be visible for a combined total time of 3 hours and 22 minutes, with significant adverse impacts occurring for approximately 80 minutes (including sections of the route with reverse views).

Cumulative traffic impacts

22.3.88 Potential changes in traffic flow and type (for example an increase in the HGV component) could affect the character of the landscape adjoining the affected roads. In the absence of a recognised methodology for assessing the impact of changes in traffic flow on landscape character, general guidance given in GEART (IEA, 1993) has been used in this assessment. GEART suggests that a doubling or halving of overall traffic flow or of the HGC component would act as a threshold for perception of impact on pedestrian amenity.

22.3.89 Traffic flow information during the construction and operational phases of the YPP has been overlaid on designate landscape areas and on landscape character mapping to identify where traffic changes would occur relative to these features, as presented on the following figures:

- Designated landscapes with construction phase traffic flow changes **Figure 2327.TRA01, Part 3 Appendix 22.1**.
- Landscape character areas with construction phase traffic flow changes **Figure 2327.TRA02, Part 3 Appendix 22.1**.
- Designated landscapes with operational phase traffic flow changes **Figure 2327.TRA03, Part 3 Appendix 22.1**.
- Landscape character areas with operational phase traffic flow changes **Figure 2327.TRA04, Part 3 Appendix 22.1**.

22.3.90 **Figures 2327.TRA01** and **2327.TRA02**, **Part 3 Appendix 22.1** shows that the HGV component of traffic would more than double on the section of the B1416 between the A171 and the northern Mine entrance, and between the A171 and the Lady Cross Plantation MTS site entrance during the construction phase.

22.3.91 Adverse effects at the road near Lady Cross Plantation would be relatively limited on both local and wider landscape character, due to this section of highway being mostly enclosed by mature woodland cover or hedgerows.

22.3.92 On the B1416, traffic flow changes would occur within an area of open moorland landscape and would be more noticeable. This area of landscape is currently adversely affected by visibility of traffic on the B1416 and the A171, and the noise created by this traffic, in particular noise associated with motorcycles. Changes in the HGV component on the B1416 would be expected to result in localised a **moderate adverse** impact on the Central and Eastern Moors (1B) character area along the road corridor, given that the existing baseline character is already affected by traffic to a reasonable degree. The B1416 is noted by Wainwright (2003) as a 'busy road' in his description of the Coast to Coast

Walk, suggesting that users of the Walk, which crosses the B1416, would already be expecting to encounter considerable traffic at this point in their journey.

22.3.93 Changes in construction traffic and HGV flows on other roads would be less perceptible, with small changes occurring on most roads and the larger changes (although not doubling) occurring on the already busy A171 and A169 routes. Given the existing significant adverse character effects that occur along the A171 and A169 corridors, it is considered that proposed changes in flows arising from YPP construction traffic and other committed development would result in a **minor adverse** impact only.

22.3.94 Changes in operational phase total vehicle and HGV flows are typically less than 10% on the wider road network and would not be expected to give rise to a noticeable change in landscape character. At the B1416 the HGV flow would increase by 46.8%, well under the GEART threshold. Given the existing busy and high speed nature of this road, it is not predicted that the operational change in traffic flow would have a perceptible impact on landscape character within adjoining moorland areas.

22.4 Summary

22.4.1 As agreed with the NYMNPA and Natural England, the proposed Bank Field wind farm, the existing Boulby Mine dryer stack and the existing RAF Fylingdales SSPA Radar structure were taken into account in the cumulative assessment of the YPP and non-YPP developments with respect to the landscape and visual environment.

22.4.2 Of the YPP construction phase elements, the temporary winding towers at the Mine and MTS sites were identified as having the potential to create project-wide cumulative impacts. However, assessment of the YPP, using ZTV mapping and fieldwork, identified that the proposed winding towers would **not cause project-wide cumulative impacts** due to the large distances between the towers and their relative scale within expansive views. At all locations assessed, the cumulative impact would not exceed the worst case individual winding tower impact.

22.4.3 Changes in construction phase traffic and HGV flows (which include other committed developments) would give rise to a localised **moderate adverse** impact on landscape character along the B1416 corridor where it would pass through the Central and Eastern Moors (1B) character area. Construction phase traffic is predicted to result in a **minor adverse** impact along other road corridors, including the A171 and A169. Operational phase traffic flows are not predicted to have an impact on landscape character, with perceptible effects remaining.

22.4.4 The overall construction phase cumulative impact of the YPP and the other relevant non-YPP projects on the designated landscapes of the NYMNP and North Yorkshire and Cleveland Heritage Coast is predicted to be **minor adverse**.

22.4.5 The duration of winding tower impacts would be up to four years at the Mine site and up to three years at the Lady Cross Plantation, Lockwood Beck and Tocketts Lythe MTS sites. Hence cumulative in-combination and in-succession visual and character effects associated with the Mine and MTS towers

would last for up to three years, with the more limited impacts associated with the Mine winding towers alone continuing for another year.

22.4.6 Sequential impacts within views from linear receptors would broadly comprise **significant adverse** impacts for sections of routes that lie relatively close to the project sites and are within open areas (moorland for example), and a wider range of less significant impacts for sections of routes that are distant from the sites or pass through complex wooded landscape (the Esk valley for example).

22.4.7 Adverse cumulative impacts are not predicted to arise during the operational phase of the YPP or the other development taken into account, due to the limited extent of scheme effects, the distance between the operational sites and the lack of intervisibility between the sites. **Minor beneficial** operational phase cumulative impacts are predicted to occur as a result of the proposed habitat improvements at the Mine and Lady Cross Plantation sites, and proposed native broadleaved woodland planting across the NYMNP as a carbon offsetting measure.

23 CULTURAL HERITAGE

23.1.1 There would be no permanent physical or non-physical (i.e. via a setting alteration) cumulative impact on heritage as a result of the Harbour facilities, other elements of the YPP and other non-YPP developments.

23.1.2 In terms of the physical cumulative impact, none of the areas (extents of works) that would be affected by the YPP development have been found to contain significant concentrations of archaeological remains. Only a small number of agricultural and industrial remains of recent origin and limited, if any, heritage significance have been identified. It has been agreed with English Heritage, the NYMNPA archaeologist and RCBC that the small number of possible features identified for example during geophysical survey are anticipated to be of potentially limited significance and any effects on them can be mitigated, as necessary, through an industry-standard programme of archaeological monitoring (e.g. controlled archaeological strip / watching brief).

23.1.3 It is not possible to assess the extent or level of significance of the buried archaeology that might be impacted by surrounding developments outside the scope of the EIA process for the YPP. However, the regenerative nature and urban location of the majority of these developments (predominantly re-builds, upgrades and new builds in existing urban/modern industrial contexts) means that they are unlikely to have a significant effect upon any substantive significant buried archaeological assets. Should significant buried archaeology be present, then the very limited level of identified impact resulting from the YPP, including the Harbour facilities, would have a negligible (if any) influence on this overall effect and **no significant cumulative impact** is, therefore, predicted.

23.1.4 In terms of the non-physical cumulative impact (i.e. a cumulative impact occurring via alteration to the setting of heritage assets as a result of Harbour facilities, other elements of the YPP and non-YPP development), almost all of the identified potential non-YPP developments are concentrated within existing urban areas, in particular: to the south of Middlesbrough, Redcar, Guisborough, Boosbeck, Skelton and Whitby. These developments comprise a mixture of re-builds, upgrades and new builds in existing urban/modern industrial contexts. Hence they would not substantially (if at all) alter the nature or the character of those urban landscapes. The landscapes in which the YPP components, including the Harbour facilities, would be located, therefore, **would not be significantly altered** from their present form.

23.1.5 The landscape around the Harbour facilities, the MHF and the MTS Portal would remain one of intensive modern industrial and urban development. The landscapes around the MTS Intermediate Shaft Sites and Mine site would remain rural expanses of enclosed fields, plantation woodland and open moorland, rich in industrial remains and interspersed with towns and villages. There would not, therefore, be any significant alterations to the settings of heritage assets within those landscapes as a result of the Harbour facilities, any other components of the YPP or any other non-YPP development. Hence **no cumulative impact** resulting from the Harbour facilities with other elements of the YPP or non-YPP developments is predicted to arise.

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24 AMENITY AND RECREATION

24.1 Scoping of non-YPP developments

24.1.1 Amenity and recreation assets occur frequently and can vary widely, hence the cumulative impact assessment that has been undertaken in this context has focused on activities and Public Rights of Way (PRoW) local to the Harbour facilities study area and other plans and projects that could interact with these. Wider implications on the users of PRoW (in particular) are considered in **Part 3**, **Section 23** (with respect to landscape and visual effects) and in **Part 2, Section 6** (with respect to traffic).

24.1.2 Direct impacts, including for example the physical obstruction to amenity and recreation receptors, are considered herein. Indirect impacts, including disturbance effects such as noise, air quality (dust), visual intrusion and transport (traffic), are considered where they are relevant in the other sections of this CIA (and not here).

24.2 Assessment methodology

24.2.1 The methodology adopted for the assessment of potential cumulative construction and operational phase impacts on recreation and amenity receptors is based upon that described in **ES Chapter 21 Recreation and Access**. The potential magnitude of cumulative impacts on the PRoW network is assessed at the county level.

24.2.2 There are no specific guidelines or thresholds for the assessment of physical disturbance to PRoW or other recreation and amenity assets.

24.3 Assessment of potential cumulative impacts

24.3.1 **Table 24-1** presents non-YPP developments that have the potential to result in cumulative recreation and amenity impacts with the Harbour facilities.

Table 24-1 Summary of potential cumulative Recreation and Amenity impacts for the Harbour facilities and non-YPP developments

Potential impact	YPP component	Non-YPP development	Potentially affected receptors
Obstruction / loss of amenity and recreation asset during construction and operation	Harbour facilities	Northern Gateway Container Terminal (173) Northumbrian Water (2 Centrifuges) (125) Northumbrian Water Underground Pipe (128) SSI UK Mobile Coal Washing Plant (129)	Teesdale Way National Trail and PRoW that may be designated as part of the National Trail Traffic-free cycle route adjacent to the A1085 Other local PRoWs

Obstruction to PRoWs

24.3.2 Activities associated with the following non-YPP projects potentially could affect the Teesdale Way National Trail and other local PRoWs:

- Northern Gateway Container Terminal.
- Northumbrian Water 2 Centrifuges.
- Northumbrian Water Underground Pipe.
- SSI UK Mobile Coal Washing Plant.

24.3.3 Baseline information the relevant PRoWs is presented in **ES Chapter 21**.

Assessment of cumulative impact

24.3.4 Obstructions to PRoW during the construction and operational phases associated with the Northern Gateway Container Terminal, Northumbrian Water centrifuges and Underground Pipe and SSI UK Mobile Coal Washing Plant would occur during the construction phase for the Harbour facilities. However, as described in **ES Section 21**, only temporary night time closures of the PRoWs that coincide with the construction locations for the Harbour facilities are proposed and a residual impact of negligible significance is predicted.

24.3.5 The other projects identified above (with the exception of the Northumbrian Water Underground Pipe) do not require the diversion of the Teesdale Way National Trail given their locations in relation to the Trail and any other effects on local PRoW would be minor. The proposed Northumbrian Water Underground Pipe is located in the immediate vicinity of the Teesdale Way National Trail; however the planning application for this development states that the proposals do not require any diversion/extinguishments and/or creation of PRoWs.

24.3.6 Given the above, no significant cumulative impacts are predicted.

25 HYDRODYNAMIC AND SEDIMENTARY REGIMES

25.1 Introduction

25.1.1 The ZOI for the hydrodynamic and sedimentary regime (and all marine elements) is presented in **Figure 25-1**.

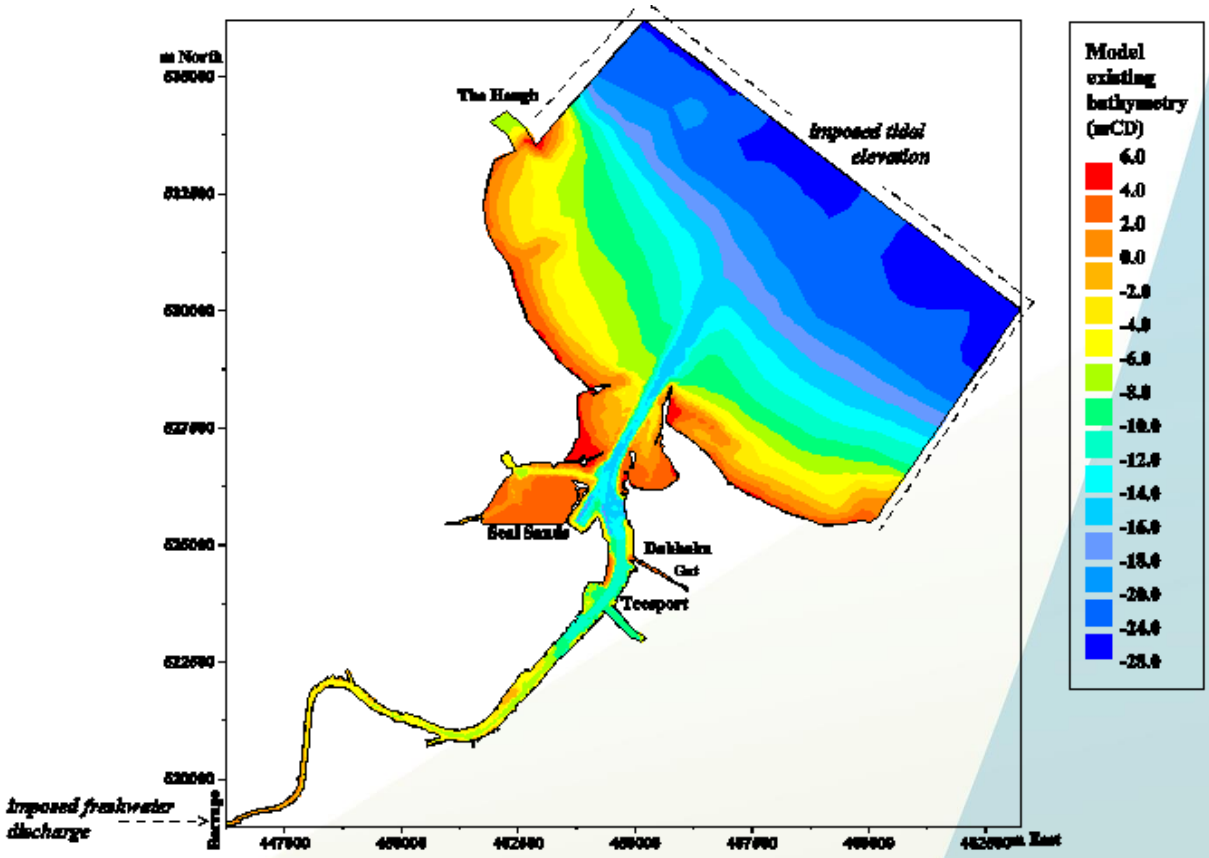


Figure 25-1 Numerical modelling domain for the hydrodynamic and sedimentary studies

25.1.2 **Table 25-1** identifies potential cumulative effects on the hydrodynamic and sedimentary regimes from the proposed Harbour facilities (specifically the port terminal and capital dredging) with relevant non-YPP developments. In this context, the Dogger Bank Teesside A and B Offshore Windfarm has been scoped out of the assessment, given that the potential impact of the Harbour facilities is confined to within the Tees estuary and there is no potential for interaction with the effects of this project.

25.2 Assessment methodology

25.2.1 Potential cumulative effects on the hydrodynamic and sedimentary regimes of the Tees estuary have been identified and assessed using the publically available EIA studies that have been undertaken for the projects scoped into the CIA. This applies to the following projects:

- NGCT (Royal Haskoning, 2006).
- QEII Berth Development (Royal Haskoning, 2009).

Table 25-1 Summary of potential cumulative effects on the Hydrodynamic and Sedimentary Regime for the Harbour facilities and non-YPP developments

Potential effect	Non-YPP development	Potentially affected receptors
Dispersion of suspended sediment during capital dredging and deposition on the seabed (i.e. a construction phase effect)	• QEII Berth Development. • NGCT • Maintenance dredging	The potentially affected receptors during the construction and operational phases are: • Marine water and sediment quality. • Marine ecology (including fish populations) • Waterbird populations (and their supporting habitats). The assessment of potential cumulative impact, therefore, has been undertaken with regard to these environmental parameters rather than for the hydrodynamic and sedimentary regime.
Changes to tidal propagation		
Changes to wave conditions		
Changes to tidal currents		
Changes to estuarine sediment budget		

25.2.2 As part of the EIA studies for the above projects, numerical modelling was undertaken by HR Wallingford to predict the potential effects of the proposed schemes during their construction and operational phases on the hydrodynamic and sedimentary regimes. The modelling tools were first established and calibrated in support of the EIA for the NGCT. This suite of modelling activities included tidal flow modelling, wave modelling, sediment transport, bed change modelling and modelling of sediment plume released from construction activities.

25.2.3 The maintenance dredging programme in the Tees has not been subject to EIA; however, a Maintenance Dredging Baseline Document (Royal Haskoning, 2008) has been prepared in accordance with the 'Maintenance Dredging Protocol' (Defra, 2007). This Baseline Document has been reviewed and updated annually since 2008. The Baseline Document assesses the implications of maintenance dredging on European sites (in this case the Teesmouth and Cleveland Coast Special Protection Area (SPA)).

25.2.4 The potential for cumulative effects to arise due to these projects, the Harbour facilities and the maintenance dredging programme has been assessed using expert judgement, informed by the findings of the EIA studies undertaken for each project and the Maintenance Dredging Baseline Document (and subsequent annual updates).

25.2.5 It should be noted that the implications of any predicted changes to / effects on the hydrodynamic and sedimentary regimes are assessed in terms of the significance of the potential cumulative impact of such changes on various environmental parameters (marine ecology (including fish populations), water and sediment quality and waterbird populations). The assessment of cumulative impacts on these parameters encompasses a description of the potential cumulative effects on the hydrodynamic and sedimentary regime.

25.3 Description of baseline environment where cumulative impact anticipated

25.3.1 The study area for the assessment of hydrodynamic and sedimentary effects encompasses the tidal Tees estuary (between Teesmouth and the Tees Barrage) and Tees Bay. The domain for the numerical modelling represents the study area and is shown in **Figure 25-1**. This area, therefore, represents the area within which cumulative impacts could potentially arise on the various marine environmental parameters included within the scope of the CIA.

25.3.2 Suspended sediment concentrations are typically low within the estuary and Tees Bay. The highest observed values tend to occur on spring tides, with extreme values attributed to either high rainfall or storm events. In general, the suspended sediment concentrations appear to be dominated by freshwater inputs above Middlesbrough Reach and marine influences further downstream.

25.3.3 In the middle to lower reaches of the estuary, suspended sediment concentrations are, for the most part, less than 20mg/l with short-term peaks from 40mg/l to 80mg/l. In terms of the tidal sequence, the highest suspended sediment levels occur close to high water.

25.3.4 The main source of material to the estuary is that entering from Tees Bay. This material comes in on the flood tide, particularly during times when sediment concentrations in Tees Bay are raised by the resuspension of material from the sea bed during storm events. The coarser material, mostly sand, is then able to settle out in the lower estuary, whereas the finer material is drawn further up the estuary by the gravitational circulation.

25.4 Assessment of potential cumulative impacts

Dispersion of suspended sediment and deposition on the seabed during capital dredging

25.4.1 The YPP Harbour facilities, QEII Berth Development and the NGCT would involve capital dredging, which would create a plume of sediment in the water column which would disperse according to prevailing currents and subsequently deposits on the seabed. Sediment depositing on the seabed in quiescent areas or when tidal currents slow around slack water can be re-suspended as current speeds increase, followed by further dispersion.

25.4.2 The extent of sediment plume created by capital dredging is heavily dependent on the dredging plant that is adopted, and this is determined (amongst other factors) by the nature of the bed material and dredge volume. The EIA studies make informed assumptions about the most likely dredge plant that would be adopted and, in some cases, assumed that different types of plant would be used for dredging different sediment types as part of the same project. Consequently, for the purposes of this CIA, the maximum potential spatial extent of sediment plume generation and deposition footprint has been identified from the EIA studies undertaken for each project and the CIA assumes that the construction phases of the projects could be implemented at the same time.

25.4.3 **Table 25-2** summarises the conditions that result in the maximum potential effects and **Table 25-3** presents a summary of the results of the predictive modelling of suspended sediment concentration and deposition onto the seabed.

Table 25-2 Summary of conditions used in the predictive modelling of the maximum extent of sediment plume dispersion and deposition onto the seabed during capital dredging

Project	Modelled conditions used to inform CIA
YPP Harbour facilities	Trailing Suction Hopper Dredger (TSHD) in low river flow, spring tide
NGCT	TSHD dredging sand in the approach channel in low river flow, spring tide
QEII Berth Development	Cutter suction dredger in low river flow, spring tide

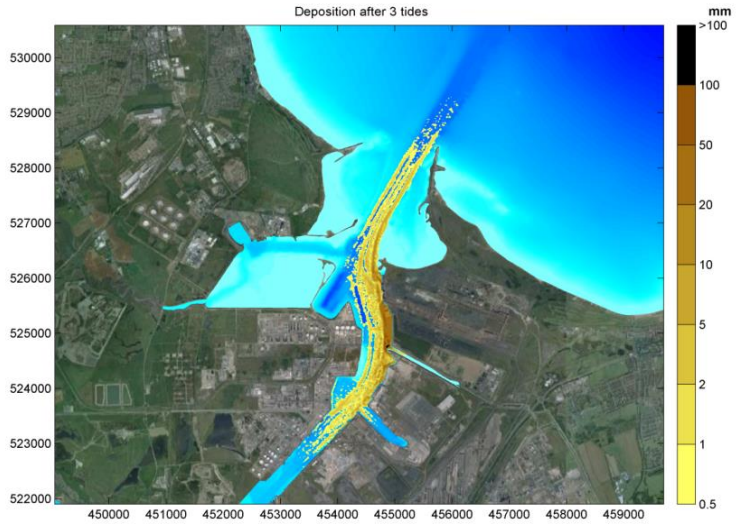
25.4.4 In all cases, the maximum increase in suspended sediment concentration in the water column is predicted in close proximity to the dredger, with dispersion of the plume resulting in a significantly reduced concentration beyond this zone. For the NGCT modelling, a second zone of high increase in suspended sediment is predicted at the location of the proposed terminal. This is due to the fact that the modelling incorporated run-off of water with a high suspended sediment load, representing the de-watering of dredged material placed during reclamation works for the proposed terminal.

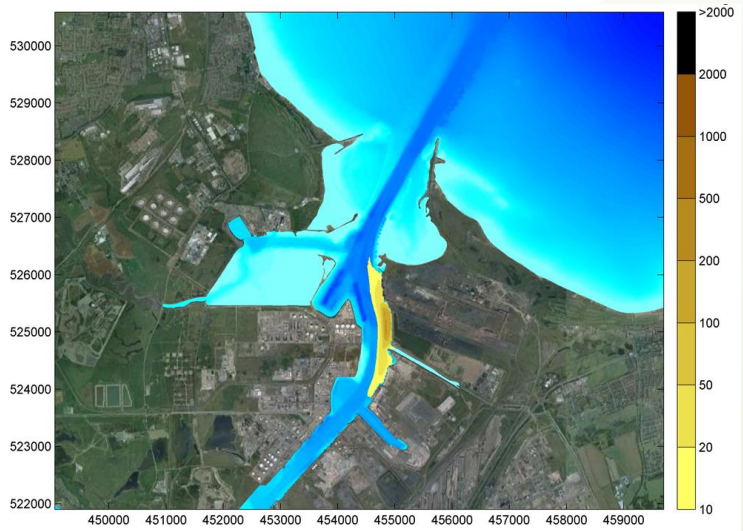
25.4.5 For each project, significant deposition of sediment onto the seabed is predicted to occur only in close proximity to the dredging (and reclamation) activity over the slack water period; this is largely within the dredged footprint of the proposed works and, in practice, much of this material would be re-dredged as part of the capital works. The magnitude of deposition beyond this zone is predicted to be of the order of a few millimetres and, given that this material is unconsolidated, it would be expected to disperse as tidal currents increase with no long term accumulation on the seabed at the initial point of deposition.

Table 26-3 **Summary of results of the predictive modelling of suspended sediment concentration and deposition onto the seabed from the EIA studies for the YPP Harbour facilities, NGCT and QEII Berth Development**

YPP Harbour Facilities

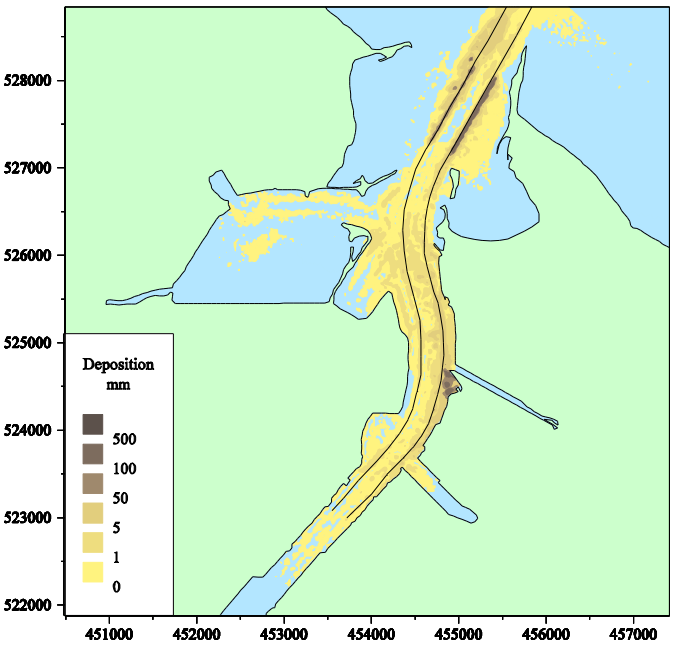
Predicted increase in suspended sediment concentration (upper) and deposition onto the seabed (lower)

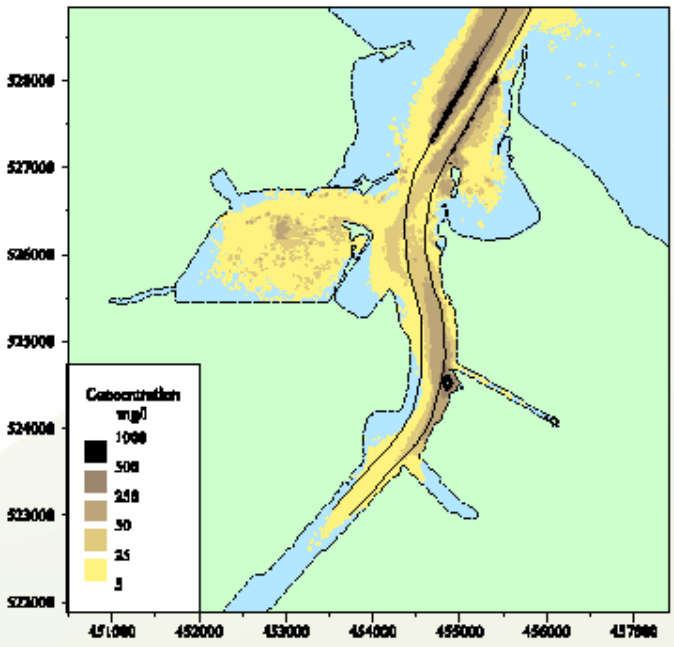




NGCT (Royal Haskoning, 2006)

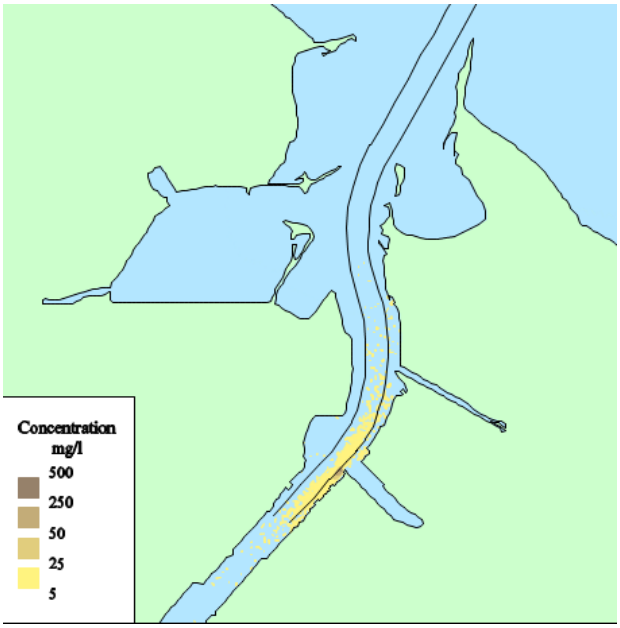
Predicted increase in suspended sediment concentration (upper) and deposition onto the seabed (lower)





QEII Berth Development (Royal Haskoning, 2009)

Predicted increase in suspended sediment concentration (upper) and deposition onto the seabed (lower)



25.4.6 As set out above, the potential impacts of the maintenance dredging programme in the Tees are considered within the Maintenance Dredging Baseline Document (Royal Haskoning, 2008). This consideration is specifically in the context of the implications of maintenance dredging for Teesmouth and Cleveland Coast SPA and Ramsar site and comprises assessment of the following:

- potential for impact on the morphology of the SPA and Ramsar site;
- effect of increases in suspended sediments during maintenance dredging on food resources of SPA interest features;
- remobilisation and redistribution of sediments (which may be contaminated); and,
- increased noise levels (disturbance) during maintenance dredging.

25.4.7 The Maintenance Dredging Baseline Document 2008 concluded that maintenance dredging represents a potential supply of fine material to Seal Sands, with the timing of maintenance dredging in relation to the state of the tide being an important control on the supply of fine material to this intertidal area. Overall, however, the Maintenance Dredging Baseline Document concluded that the maintenance dredging activity does not appear to be having (or has historically had) an impact on the designated site that would alter or affect its condition.

25.4.8 The latest annual update to the Maintenance Dredging Baseline Document (Royal HaskoningDHV, 2014a) included a WFD compliance assessment. This concluded that, at a water body level, maintenance dredging at current permitted levels has no significant impact on estuary morphology, marine ecology or marine water quality.

25.4.9 The potential for cumulative impacts to arise between the projects that have been scoped into the CIA, an assessment of the significance of such impacts and recommendation of appropriate mitigation measures (where appropriate) are presented in **Section 26** (marine water and sediment quality), **Section 27** (marine ecology) and **Section 28** (waterbird populations).

Predicted effect on tidal propagation

25.4.10 The proposed works associated with the YPP Harbour facility and the QEII Berth Development would not result in an impact on tidal propagation or water levels due to the limited area of proposed dredging for these projects.

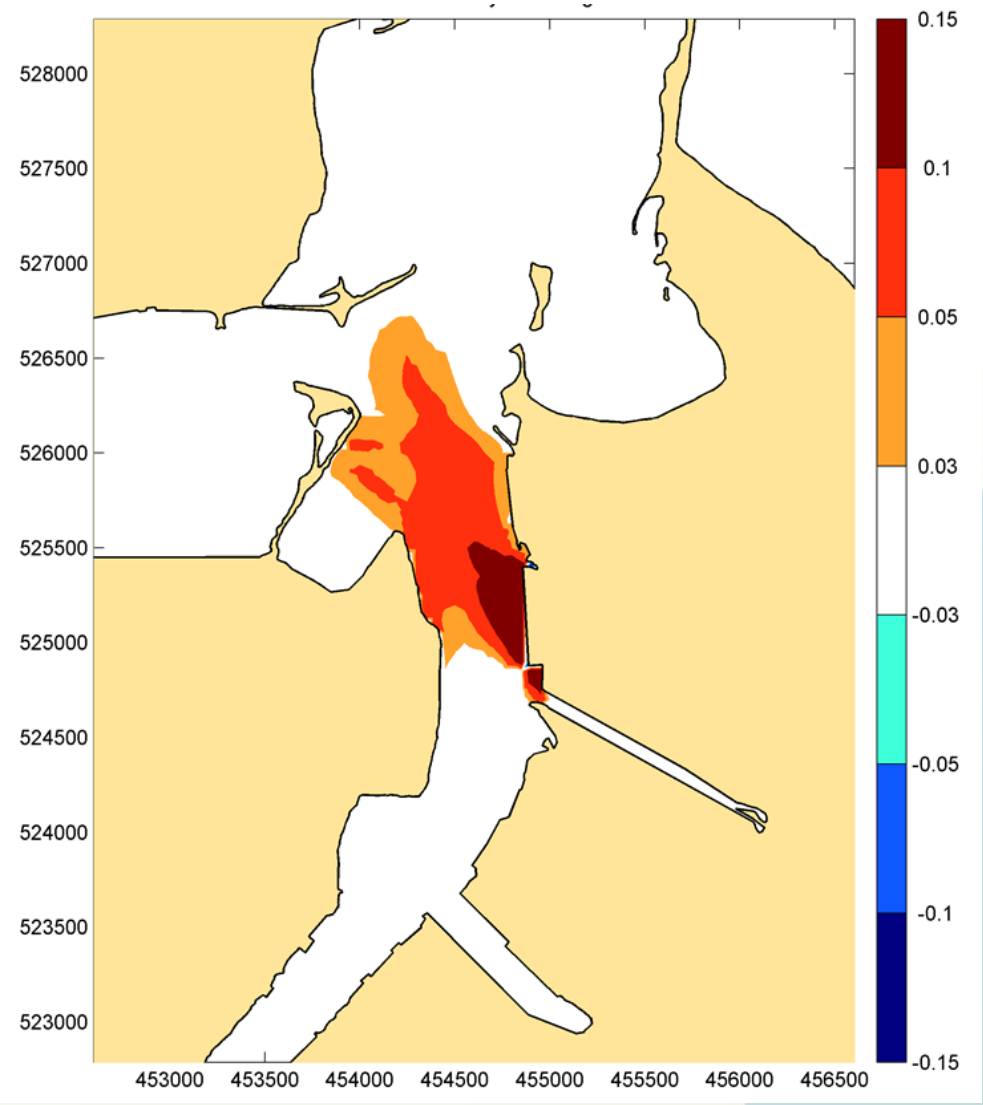
25.4.11 The proposed NGCT was predicted to have a very small effect on water levels. Tidal range was predicted to be increased by less than 4mm, with the tide arriving up to 2 minutes earlier.

Predicted effect on wave conditions

25.4.12 Predictive modelling of the effect on wave conditions was undertaken as part of the EIA studies for the YPP Harbour facility and NGCT. For the QEII Berth Development, HR Wallingford undertook a qualitative assessment of potential effect on wave climate.

25.4.13 The maximum extent of effect on wave climate for the YPP Harbour facility is predicted for the solid (reclamation) option. **Figure 25-2** shows the predicted change in wave height for this option (including proposed capital dredging) for a 5 year return period and wind from 215°.

Figure 25-2 Change in wave height (m) due to dredge and solid quay at high water, 5 year return period, wind from 215° (YPP Harbour facilities)

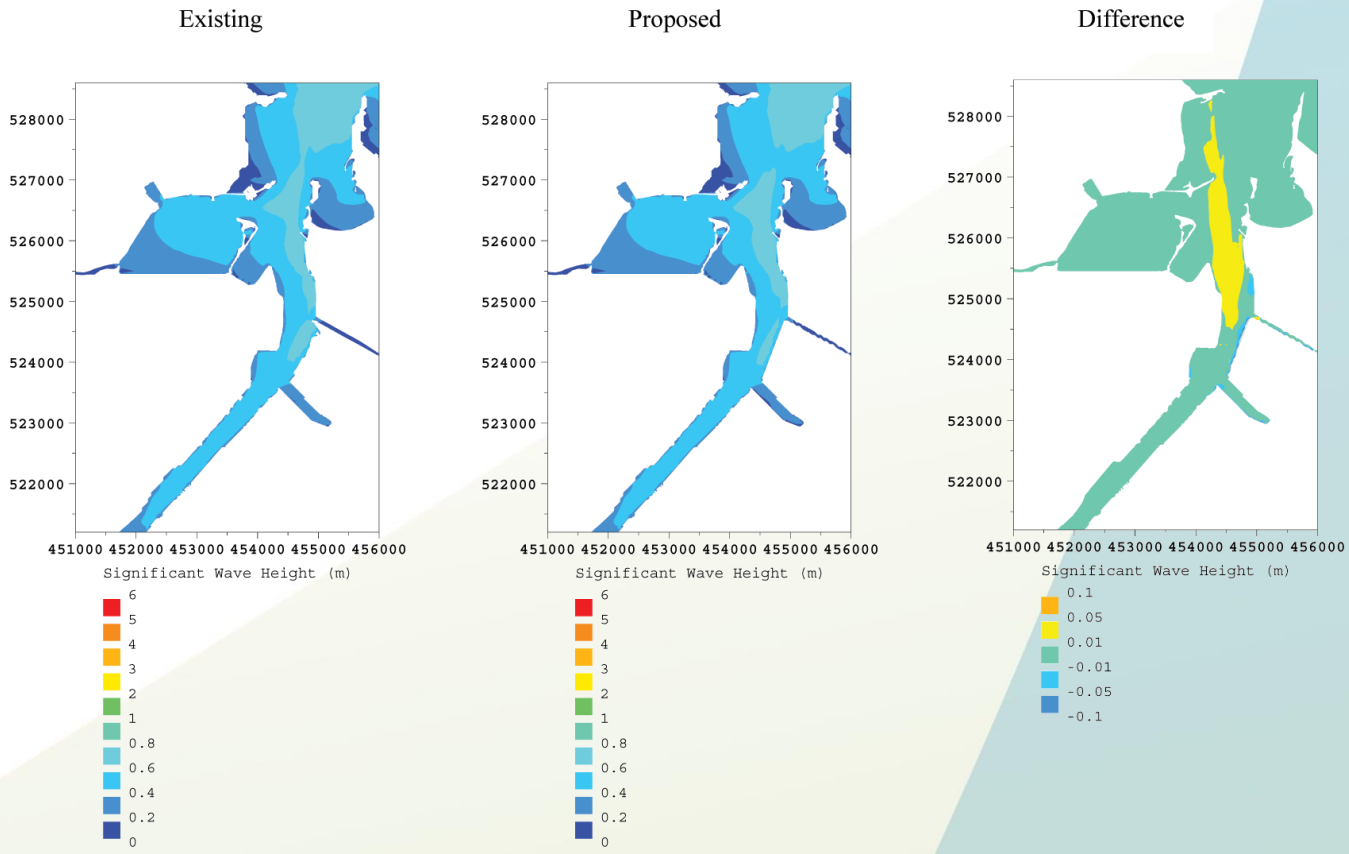


25.4.14 The effect of the solid quay structure in reflecting wave energy towards the north provides increases in significant wave height in the range 0.05m to 0.1m. No increases in wave energy over the designated intertidal areas at Teesmouth are shown, although some increases of very low magnitude may occur on the narrow spits located to either side of Seaton Channel.

25.4.15 Wave modelling for the NGCT considered the wind and swell components separately. Wind waves are generated within the estuary (short period waves) and it was predicted that these waves would be affected by the reflective properties of the proposed container terminal but, as they are short period waves, they are unaffected by the increased depth of the channel. Swell waves (long period waves from offshore) do not penetrate far into the estuary and, therefore, are not affected by the proposed NGCT. Swell waves would, however, be affected by the increased depth of the channel in the lower estuary that would arise from capital dredging for the NGCT. Given that the YPP Harbour facility does not have the potential to affect swell waves, there is no potential for cumulative effect on swell waves and this aspect is not assessed within the CIA.

25.4.16 **Figure 25-3** shows the predicted effect of the NGCT on wind generated waves. The change in significant wave height is small (less than 10cm throughout).

Figure 25-3 Predicted change in wind induced waves (for 20 m/s wind from the south-west) for the proposed NGCT (Royal Haskoning, 2006)



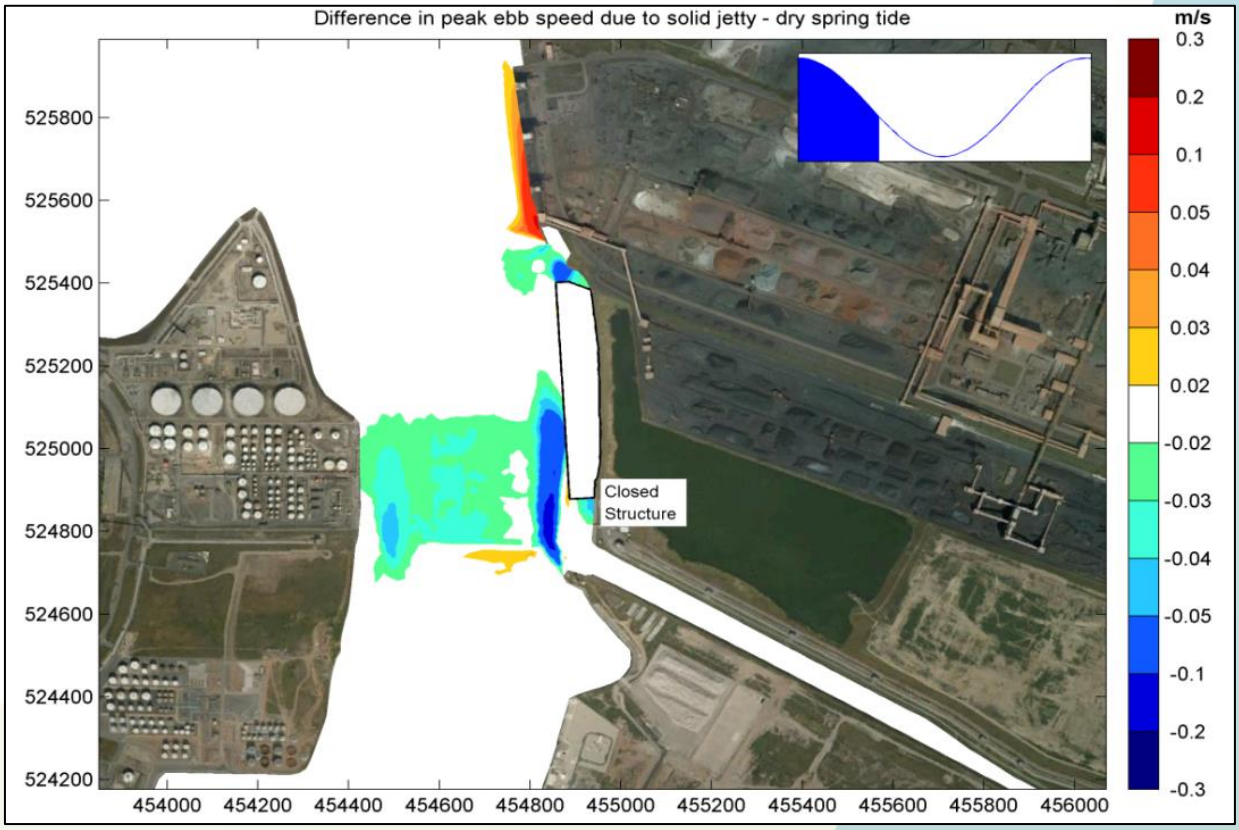
25.4.17 For the QEII Berth Development, it was predicted that the majority of the time there would be no change in wave reflection because waves would only be influenced by the embankment beneath the quay, which would be at a shallower slope than the existing situation. At very high water levels (i.e.

above mean high water on spring tides), an increase in wave reflection was predicted due to the interaction of waves with the cope beam of the quay and, at these times, it was estimated that wave heights immediately adjacent to the proposed quay may increase by up to 20% due to increased reflectivity. For the vast majority of the time, the cope beam would have no influence on waves.

Predicted effect on tidal currents

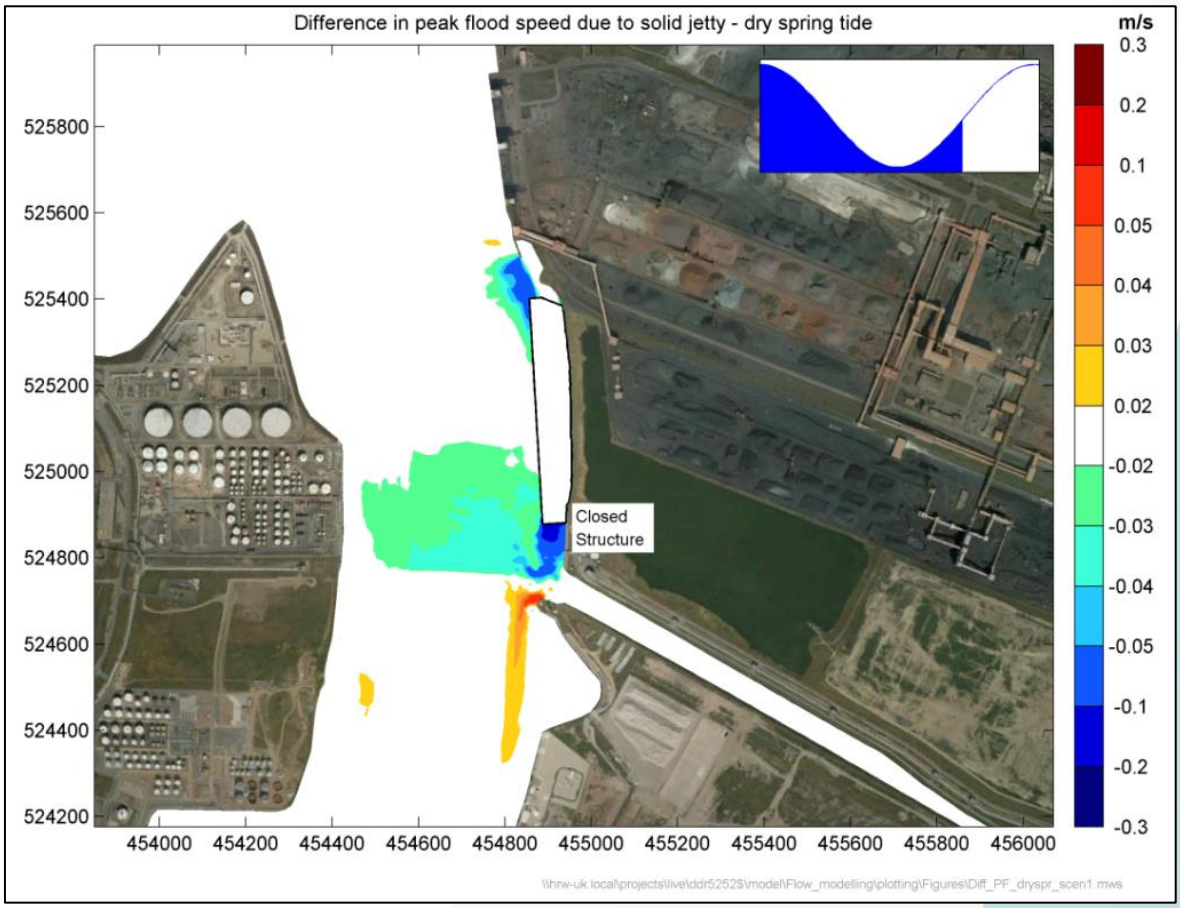
25.4.18 **Figure 25-4** and **Figure 25-5** show the predicted effect of the proposed Harbour Facilities on tidal currents (peak ebb and flood) for the solid quay option. The majority of the effects illustrated are a function of the capital dredging, with currents predicted to be reduced within the deepened 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.

Figure 25-4 Change in depth average currents due to the Harbour facilities (solid quay structure) at time of peak ebb tide, spring tide, low river flow



25.4.19 **Figures 25-6a** and **25-6b** show the predicted effect of the NGCT on current speeds at the time of peak ebb and peak flood on spring tides.

Figure 26-5 Change in depth average currents due to the YPP Harbour facilities (solid quay structure) at time of peak flood tide, spring tide, low river flow



25.4.20 Changes, of low magnitude, are predicted in the vicinity of the proposed development and at the mouth of the estuary. In the vicinity of the proposed development, a decrease in current speeds of up to 0.10m/s is predicted, with increases of a similar order of magnitude closer to the shores of the estuary. This area (adjacent to the proposed reclamation) experiences the greatest effect on flows. Further downstream at the mouth of the estuary, very little effect on tidal current speeds is predicted (decreases in current speeds of the order of 0.05m/s).

25.4.21 For the QEII Berth Development, extremely small change in currents, of the order of 1 cm/s in the immediate area of the dredging, are predicted. The predicted effects are very localised to the location of the proposed works (**Figure 25-7**).

Figure 25-6a Change in depth average currents due to the NGCT (peak ebb tide, spring tide, low river flow) (Royal Haskoning, 2006)

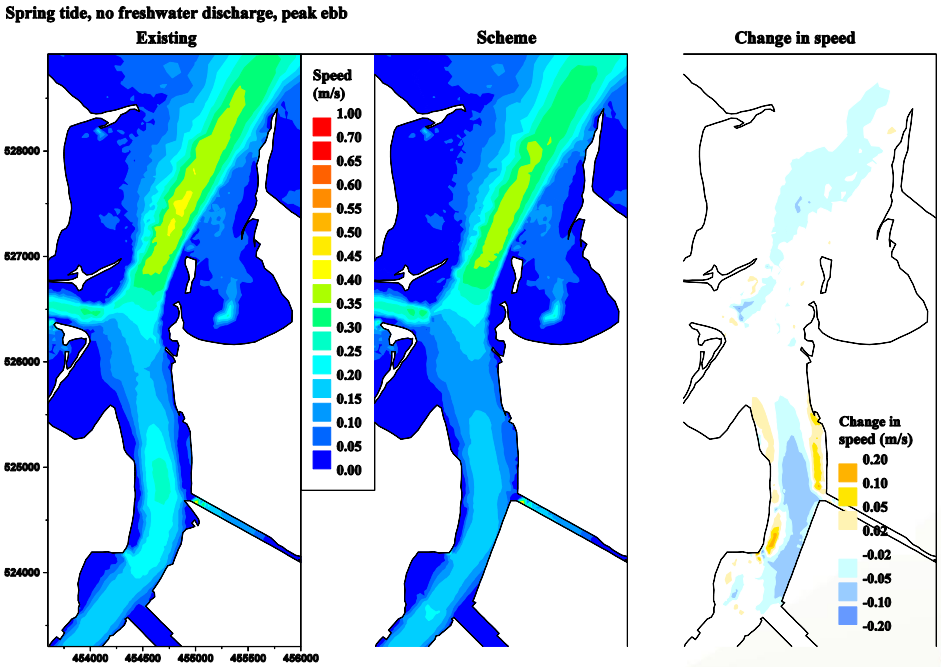


Figure 25-6b Change in depth average currents due to the NGCT (peak flood tide, spring tide, low river flow) (Royal Haskoning, 2006)

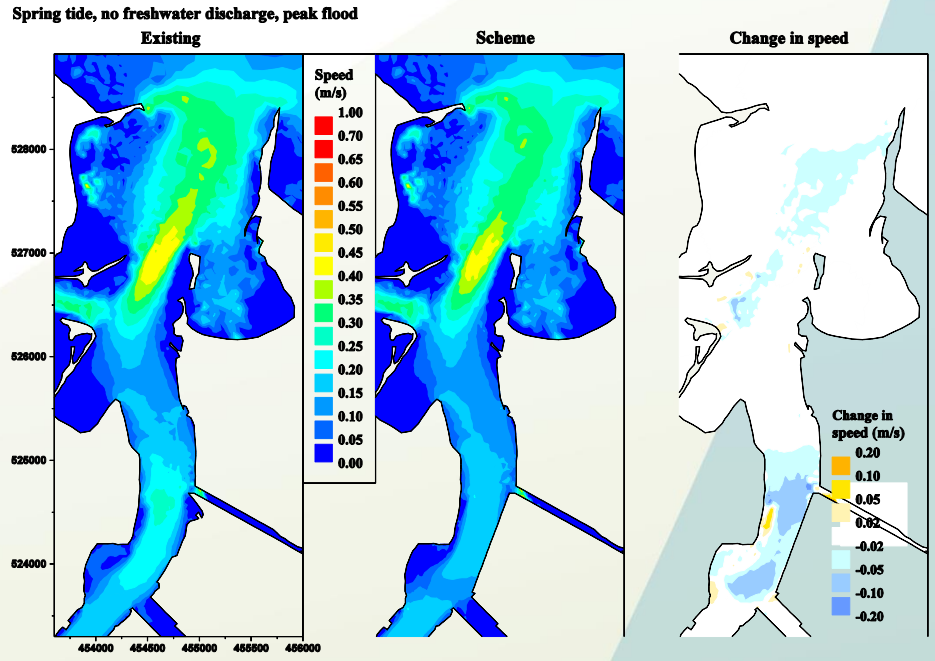
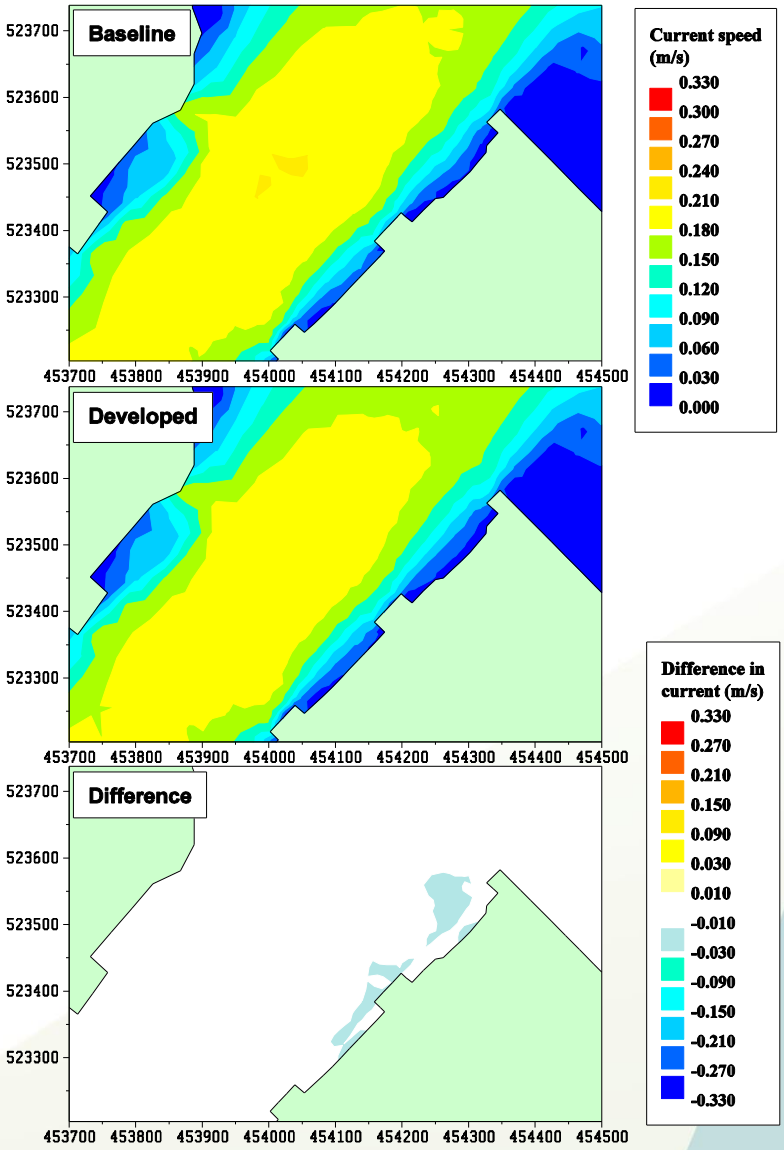


Figure 25-7 Speed magnitude changes for the QEII Berth Development for peak ebb spring tide, low freshwater flow



Changes to estuarine sediment budget

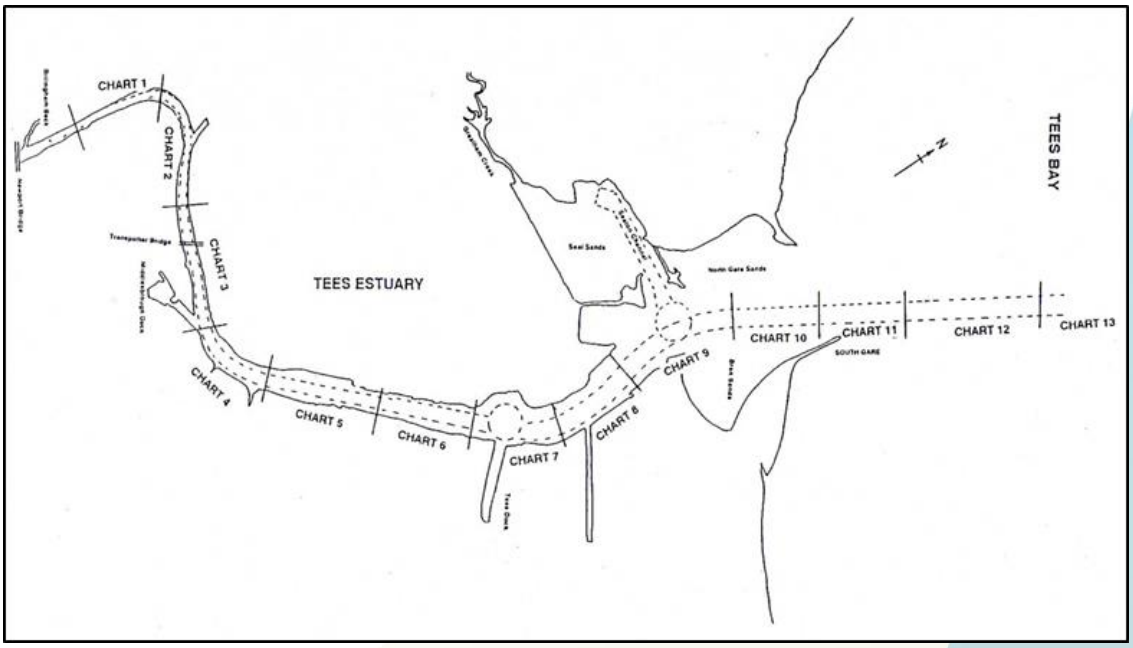
25.4.22 The predicted effects of a project on tidal propagation, wave climate and current speeds integrate to potentially result in an effect on the sediment budget of the estuary and, consequently, the morphology of intertidal and subtidal habitats.

25.4.23 The largest sediment input to the Tees estuary is from offshore and given that the proposed Harbour facilities and the QEII Berth Development do 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.

25.4.24 For the Harbour facilities, 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 bCD 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 25-8**), associated with a small decrease in fine sediment infill in Chart area 8 (approximately 2 to 3%).

Figure 25-8 Tees estuary and approach chart areas



25.4.25 In terms of maintenance dredging requirements associated with the proposed YPP berth pocket and approach channel, average infill rates are predicted to be 5,100m^3 per year for the solid quay structure and 5,900m^3 per year for the open quay structure. Given that the proposed scheme is not predicted to affect sediment supply into the Tees estuary, the predicted effect would result in a localised redistribution of the 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 due to the Harbour facilities.

25.4.26 The effect of the QEII Berth Development on tidal flows, waves and fluvial or offshore sediment supply were predicted to be either zero or negligible. No means were identified by which the scheme could affect the overall estuary morphology.

25.4.27 Local to the proposed QEII Berth Development, slightly reduced current speeds were predicted and this would allow some accretion in the berth pocket and potentially in the immediate surroundings of the dredged area (predicted to be of the order of. 3,500 to 4,500m^3 per year). Some local redistribution of bed sediment types may be expected; however, any increase in the deposition of fine sediments would also be subject to disturbance from the vessels using the berth, reducing any build-up of sediment in the berth pocket.

25.4.28 The proposed NGCT was predicted to have some effect on estuary morphology and the ES described these changes for various zones within the estuary.

25.4.29 The ES for the NGCT concluded that the effect of construction on tidal propagation would be minor, with no change in elevation of either high or low water downstream of the site of the proposed scheme.

25.4.30 A minor increase in the level of low water of the order of 2mm (at low water on spring tides) was predicted at the site of the NGCT. It was estimated that the effect of this change would be to convert approximately 160m^2 (0.016ha) of intertidal habitat at North Tees mudflat to very shallow subtidal habitat under these tidal conditions.

25.4.31 The ES for the NGCT described the potential integrated effect of the proposed scheme on physical processes, which have the potential to combine to result in an effect on estuarine morphology. For the deepened approach channel, reduced through-depth flows were predicted which, combined with a strengthened near-bed landward flow, were expected to result in increased import of fine material to the Tees estuary from offshore; with the potential to increase the maintenance dredging requirements by about 10%. No increase in sandy infill was predicted.

25.4.32 For Seal Sands, the morphological effects were predicted to be small, with an increase (order of 10%) in the supply of fine material to Seal Sands (via Seaton Channel). No changes to tidal flows were predicted in this area and the route for this potential effect was identified as an increase in supply of fine sediment (as described in the previous paragraph)

25.4.33 The proposed NGCT was not predicted to have a significant effect on the intertidal areas at North Gare and Bran Sands. No changes to tidal flows were predicted, although decreases in the swell wave heights are predicted over these areas which may result in some localised redistribution of bed material.

25.4.34 As stated above, the maintenance dredging programme represents a potential supply of fine material to Seal Sands. However, the latest annual update to the Maintenance Dredging Baseline Document (Royal HaskoningDHV, 2014a) concludes that no means have been identified by which the current maintenance dredging regime can adversely affect the overall estuary morphology and the ongoing morphological processes at work.

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26 MARINE WATER AND SEDIMENT QUALITY

26.1 Introduction

26.1.1 **Table 26-1** identifies the potential cumulative effects on marine water and sediment quality from the proposed Harbour facilities (specifically the port terminal and capital dredging) with relevant non-YPP developments.

Table 26-1 Summary of potential cumulative effects on Marine Water and Sediment Quality for the Harbour facilities and non-YPP developments

Potential effect	Non-YPP development	Potentially affected receptors
Dispersion of suspended sediment during capital and maintenance dredging and deposition on the seabed (i.e. a construction phase effect)	• QEII Berth Development • NGCT • Maintenance dredging	The potentially affected receptor during the construction phase is marine water quality of the Tees estuary

26.2 Assessment methodology

26.2.1 The assessment of potential cumulative impact on marine water and sediment quality was based upon results of the EIA studies undertaken for the projects scoped into the CIA and draws, in particular, on the findings of the hydrodynamic and sedimentary studies that are discussed in **Section 25**.

26.2.2 With regard to sediment quality, this section describes the potential for disturbance and dispersion of non-contaminated and potentially contaminated sediments during capital dredging and the consequences of this for marine water quality. The potential impacts associated with the deposition of these sediments are assessed within **Section 27 Marine Ecology** given that this is the receptor that has the potential to be impacted.

26.3 Description of baseline where cumulative impact anticipated

26.3.1 The study area, at is widest extent, is as described for the hydrodynamic and sedimentary regime. The potential for cumulative impact on water quality is considered to be within the middle to lower reaches of the estuary (as discussed within the impact assessment below) where suspended sediment concentrations are typically less than 20mg/l with short-term peaks from 40mg/l to 80mg/l. In terms of the tidal sequence, the highest suspended sediment levels occur close to high water. This baseline applies to each impact assessed in this section of the CIA.

26.3.2 The sediment quality survey undertaken for the NGCT did not detect the presence of contaminants that were a cause for concern. However, for the QEII Berth Development, elevated concentrations of contaminants were found to be present in the unconsolidated sediments overlying the geological material. This is also the case for the Harbour facilities.

26.4 Assessment of potential cumulative impacts

Potential for cumulative increase in suspended sediment concentration during capital and maintenance dredging (including potentially contaminated marine sediment)

26.4.1 Given that the generation of a sediment plume is a construction phase effect (i.e. would occur during capital dredging), the potential for a cumulative effect to occur only arises should the dredging programme for the YPP Harbour facilities coincide with that for the NGCT and/or the QEII Berth Development. In addition, the predictions made for each project (as summarised in **Table 25-3**) represent sediment plume dispersion under specific tidal conditions (to enable a realistic worse case to be identified and assessed). It is unlikely, therefore, that the timing of the projects and their respective programmes of capital dredging would coincide to result in a scenario where sediment plumes combine at peak concentration (as predicted by the EIA studies for each project) at any location.

26.4.2 Analysis of the results presented in **Table 25-3** indicates that the sediment plumes arising from dredging as part of the above three projects could, theoretically, overlap. The potential cumulative impact would be a greater increase in suspended sediment concentration than predicted for the Harbour facilities alone but within the same plume spatial extent (i.e. the spatial extent of the sediment plume predicted for the Harbour facilities would not be altered by interaction with the effects of other projects). It should be noted that the sediment plume predicted due to the NGCT encompasses, and extends beyond, the area of the plume predicted for the Harbour facilities. The impact is, therefore, additive rather than cumulative (i.e. the predicted impacts of each project would not interact to result in an impact that is of greater or lesser magnitude than the sum of the impacts in isolation).

26.4.3 With regard to the potential for dredging contaminated sediment, the marine licence for the capital dredging for the QEII Berth Development requires 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. The marine licence precludes the offshore disposal of this unconsolidated material. The underlying geological material would be dredged by either a cutter suction dredger or backhoe dredger (the implications of both types of dredger on suspended sediment concentrations were assessed in the EIA) and disposed offshore.

26.4.4 For the NGCT, there were some elevated concentrations of some contaminants identified but it was concluded that there would not be an environmentally unacceptable impact due to capital dredging and there were no constraints imposed on the dredging activity to limit potential water quality impacts.

26.4.5 The quality of the sediment overlying the geological material to be dredged as part of the Harbour facilities proposals has been found to be contaminated and it is proposed that this material is dredged using an enclosed grab in a similar manner to the consented QEII dredging in order to avoid any significant losses of material into the water column during the dredging of this material.

26.4.6 It is concluded that the predicted suspended sediment concentration generated by capital dredging for the various projects considered would lead to peak increases in concentration above those normally experienced in the estuary. However, the variation is expected to be acceptable given the temporary nature of the capital dredging and the intermittent nature of the peaks related to both tidal influence and location of the dredger. Should the capital dredging programmes of the projects considered in this CIA overlap, there would be an additive (combined) effect that is considered to be of **minor adverse** significance. Mitigation incorporated into each project to avoid dispersion of contaminated sediments (where required) would avoid a water quality impact during dredging of contaminated material.

26.4.7 As discussed above, the latest annual update to the Maintenance Dredging Baseline Document (Royal HaskoningDHV, 2014a) concludes that, at a water body level, maintenance dredging at current permitted levels has no significant impact on marine water quality. There would be no maintenance dredging taking place at the location of the proposed Harbour facilities 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.

Mitigation and residual impact

26.4.8 Mitigation to limit the dispersion of dredged sediment for the QEII Berth Development project (i.e. the use of specialist dredging plant due to the presence of elevated contaminants) is discussed above.

26.4.9 The significance of the potential cumulative impact between maintenance dredging and proposed capital dredging works was investigated as part of the NGCT studies. This concluded that the combined effect of maintenance dredging being undertaken during the capital works were not significantly different from those predicted as a consequence of the capital dredging alone, and this conclusion applies for the potential cumulative impact with the Harbour facilities. However, in practice, it is likely that maintenance dredging in the wider estuary would be timed to avoid being undertaken during a significant capital dredge and this would mitigate the potential for cumulative impact on water quality.

26.4.10 In terms of dispersion of suspended sediment during dredging, the EIA studies for the Harbour facilities (**ES Section 5**) do not indicate that an unacceptable water quality impact would arise. Consequently, it is considered that there is no requirement for bespoke (non-standard) mitigation measures. As noted above, it is however proposed that contaminated sediment would be dredged using an enclosed grab.

26.4.11 It is concluded that the residual impact would be of **minor adverse** significance.

Potential for cumulative water quality impact due to maintenance dredging

26.4.12 Although maintenance dredging forms part of the Harbour facilities and has, therefore, be assessed as part of the EIA, it is necessary to include maintenance dredging within the CIA in order to assess whether there is potential for the Harbour facilities to affect the nature of the ongoing maintenance dredging programme.

26.4.13 The hydrodynamic and sediment transport studies undertaken for the Harbour facilities included making an assessment of the likely maintenance dredging requirement (**ES Section 5**).. It is predicted that there would be a very small change in the overall fine sediment regime which would not alter the present frequency of, or methodology used for, maintenance dredging. The cumulative impact on water quality due to maintenance dredging for the Harbour facilities with the wider maintenance dredging programme in the Tees estuary is, therefore, predicted to be of **negligible** significance.

27 MARINE ECOLOGY

27.1 Introduction

27.1.1 **Table 27-1** identifies the potential cumulative effects on marine ecology (including fisheries) from the proposed Harbour facilities (specifically the port terminal and capital dredging) with non-YPP developments.

Table 27-1 Summary of potential cumulative effects on Marine Ecology for the Harbour facilities and non-YPP developments

Potential effect	Non-YPP development	Potentially affected receptors
Smothering of benthic invertebrate communities due to deposition of sediment that is dispersed during capital dredging	• QEII Berth Development. • NGCT. • Maintenance dredging.	Benthic communities within the footprint of deposition of sediment predicted from the construction of Harbour facilities.
Effect on fish populations due to creation of a sediment plume during capital dredging		Estuarine fish populations
Effect on benthic invertebrate communities due to effect on morphology of intertidal and subtidal habitats		Benthic communities of habitats predicted to be affected by changes in the hydrodynamic and sedimentary regime.
Disturbance to marine mammals and fish due to underwater noise generated during construction works		Marine mammals (seals) and fish populations

27.2 Assessment methodology

27.2.1 The assessment of potential cumulative impacts on benthic invertebrate communities is informed by the spatial extent and magnitude of the predicted effect of the Harbour facilities on the hydrodynamic and sedimentary regime (i.e. extent of sediment deposition during capital dredging and the nature of indirect effects of the Harbour facilities on intertidal and subtidal habitats). The potential effect on fish populations is also informed by the sediment plume dispersion studies undertaken for the Harbour facilities.

27.2.2 This section includes an assessment of the potential impact of disturbance, dispersion and deposition of non-contaminated and potentially contaminated sediments during capital dredging.

27.3 Description of baseline where cumulative impact anticipated

27.3.1 The study area, at is widest extent, is as described for the hydrodynamic and sedimentary regime. The potential for cumulative impact on benthic invertebrate communities is considered to be within the middle to lower reaches of the estuary (as discussed within the impact assessment below), where

deposition of sediment onto the seabed is predicted to occur as a result of capital dredging. Much of this area is within the existing dredged approach channel.

27.3.2 A survey of the benthic invertebrate communities was undertaken as part of the EIA for the YPP Harbour facility and this provides site-specific baseline data for the impact assessment (**ES Section 8**).

27.3.3 Tees Bay and the Tees estuary provide important habitats for a number of fish species which feed on benthic invertebrates found in subtidal and intertidal sediments. The lower Tees estuary supports many fish, some of which are estuary dependant (e.g. flounder *Platichthys flesus*) and some temporary residents (e.g. plaice *Pleuronectes platessa*), which use the estuary as a nursery ground (Tansley 2003), with herring (*Clupea harengus*), sprat (*Sprattus sprattus*), cod (*Gadus morhua*), spurdog (*Squalus acanthias*), anglerfish (*Lophius piscatorius*), whiting (*Merlangius merlangus*), lemon sole (*Microstomus kitt*) and nephrops (*Nephrops norvegicus*) also recorded in the general area.

27.3.4 Sandeels are also abundant in the local area and although there is no commercial fishery, they are an important food source for bird populations.

27.3.5 Migratory fish species are also present within the Tees estuary, including salmon (*Salmo salar*), sea trout (*S. trutta*), and European eel (*Anguilla anguilla*). The river lamprey (*Lampetra fluviatilis*) enters the Tees estuary to spawn and have been observed at the Tees Barrage at Stockton. Sea lampreys have also been recorded within the Tees estuary.

27.3.6 Seal Sands is an important haul-out site for both common (harbour) seals *Phoca vitulina* and grey seals *Halichoerus grypus*, and is also the only breeding site for common seals on the east coast between the Wash and the Tay. Both the common seal and grey seal are listed as vulnerable under the EC Habitats Directive.

27.3.7 This baseline applies to each impact assessed in this section of the CIA.

27.4 Assessment of potential cumulative impacts

Smothering of benthic invertebrate communities due to deposition of sediment that is dispersed during capital dredging

27.4.1 It is evident from the predictions of sediment deposition onto the seabed presented in **Table 25-3** that the footprint of deposition associated with the Harbour facilities, the NGCT and (to a lesser extent) the QEII Berth Development would overlap should the capital dredging phases of these projects coincide, which is unlikely.

27.4.2 Any deposition arising from capital dredging the YPP Harbour facilities would be in the subtidal zone, approximately aligned along the orientation of the navigation channel.

27.4.3 Where the deposition footprints of the Harbour facilities and the QEII Berth Development coincide, the peak deposition predicted due to the latter project is less than 1mm (except at the point of dredging for

the QEII Berth Development, where deposited material would be re-dredged); this is considered insignificant in terms of potential cumulative impact.

27.4.4 Maintenance dredging is targeted at 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.

27.4.5 The predicted footprints of sediment deposition for the NGCT and the Harbour facilities are similar, although the effect of the NGCT capital dredge is more extensive and extends into Seaton Channel and onto Seal Sands (see **Table 25-3**). However, should the NGCT and the Harbour facilities projects coincide, the area of the seabed directly affected by the capital dredging for the NGCT project (i.e. the footprint of the dredging) for the most part coincides with, and extends beyond, the area affected by deposition of sediment arising from the Harbour facilities capital dredging. As a result, the direct effect of the NGCT would represent the overriding impact on the benthic community (i.e. removal) within the footprint of the dredge. In this context, and any deposition of material from the Harbour facilities would be immaterial in terms of impact on benthic community.

27.4.6 There would be zones just outside the margins of the navigation channel where there would be combined deposition of material. However, for both the NGCT and Harbour facilities, predicted deposition is of the order of a few millimetres. As noted in **Section 26**, this deposition is likely to be temporary due to the unconsolidated nature of the material and the cumulative impact is predicted to be of **negligible** significance.

Mitigation and residual impact

27.4.7 The mitigation described in **Section 26** with regard to limiting suspended sediment increase and dispersion during capital dredging is also relevant here (i.e. sediment suspension and dispersion is directly related to deposition onto the seabed). The residual impact on benthic invertebrate communities would be of **negligible** significance.

Effect on fish populations due to creation of a sediment plume during capital dredging

27.4.8 As discussed in **Section 27**, there is the potential for the sediment plumes to coincide resulting in an additive effect on suspended sediment concentration within the zone of interaction. Suspended sediment increases are expected to result in a behavioural effect on fish, 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 is a different behavioural response in fish compared with the effect of the projects in isolation and, therefore, a cumulative impact of **negligible** significance is predicted.

27.4.9 The capital dredging associated with the three projects would result in an effect over a larger spatial extent than predicted for the Harbour facilities alone; however, this effect is additive as opposed to cumulative.

Mitigation and residual impact

27.4.10 The mitigation described in **Section 27** with regard to limiting suspended sediment increase and dispersion during capital dredging is also relevant here. The cumulative residual impact on fish populations would be of **negligible** significance.

Effect on benthic invertebrate communities due to effect on morphology of intertidal and subtidal habitats

27.4.11 The studies for the Harbour facilities have concluded that there would not be a change in supply of fine sediment to the Tees due to the proposed scheme. The predicted deposition of sediment in the berth pocket of the Harbour facilities (see **Section 25**) would be material that would (in the absence of the Harbour facilities) have deposited within the approach channel and been subject to maintenance dredging and offshore disposal as part of maintenance of the channel. The effect of the Harbour facilities would, therefore, be to cause a redistribution of sediment that requires maintenance dredging. Hence the predictive modelling for the Harbour facilities 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.

27.4.12 The NGCT was predicted to have an effect on sediment supply into the estuary (summarised in **Section 25**), with a predicted 10% increase in supply of material from offshore. In turn, it was predicted that there would be an increase in maintenance dredging requirement of the same magnitude.

27.4.13 In terms of cumulative 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 facilities berthing pocket could be expected, but this does not represent an overall increase in maintenance requirement in the Tees (for the reasons described above).

27.4.14 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 cumulative effect.

27.4.15 It is concluded that there would be no cumulative effect on the maintenance dredging commitment and, therefore, **no cumulative impact** on supply of material to intertidal and subtidal areas or effect on morphology of estuarine habitats.

Disturbance to marine mammals and fish due to underwater noise generated during construction works

27.4.16 Underwater noise modelling has been undertaken as part of the EIA studies for the Harbour facilities, primarily to inform the assessment of potential disturbance to seals and fish populations. The ES concludes that the potential impact on both marine mammals and fish would be of moderate adverse significance (before mitigation).

27.4.17 There is the potential for a cumulative impact to arise on marine mammals and fish should the construction phases of one or more projects coincide, particularly if any piling works overlap. This is only considered to be relevant for the NGCT project because the proposed method of construction for the QEII Berth Development would not involve percussive piling. The marine licence for the QEII Berth Development includes a condition to the effect that if the proposed method of construction changes, and percussive piling is proposed, then an application must be made to vary the marine licence.

27.4.18 Given the close proximity of the NGCT site to the Harbour facilities, it is considered likely that the spatial extent of underwater noise impact would not be dissimilar to that predicted for the Harbour facilities. The most significant potential impact is likely to be increased underwater noise levels associated with more than one project under construction at the same time, more intense noise impact and, potentially, an overall longer duration of piling impact. Without mitigation, the cumulative impact could be of **major adverse** significance.

Mitigation and residual impact

27.4.19 Mitigation for the predicted underwater noise impact is proposed within **ES Section 11.5** In order to prevent adverse impacts to adult migratory fish runs, no piling would be undertaken for three hours following low water between 1 March and 30 November. In addition, during May, no piling would take place in order to allow the migration of juvenile salmon and sea trout. Furthermore, as mitigation of the potential impact on marine mammals, a minimum of an eight hour continuous break in every 24 hour period would be implemented where no impact piling is carried out, which would also act to further mitigate the potential impact on fish.

27.4.20 The JNCC's guidelines '*Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise*' (JNCC, 2010) should be adhered to during pile driving. This would include checking for marine mammals during a pre-piling search prior to piling operations commencing, the establishment of a mitigation zone (i.e. an area within which a marine mammal could be exposed to sound levels which could cause damage) and the use of soft start techniques to allow any marine mammals time to leave the area of greatest disturbance.

27.4.21 With regard to mitigation of cumulative impact, should the piling works for the Harbour facilities overlap with the NGCT project, further measures would need to be considered such as coordinating the timing of works to ensure that sufficient windows of no piling noise were available to allow fish and seal passage.

27.4.22 With the implementation of the above mitigation measures, a residual impact of **minor adverse** significance is expected.

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28 WATERBIRD POPULATIONS

28.1 Introduction

28.1.1 **Table 28-1** identifies the potential cumulative effects on waterbird populations from the proposed Harbour facilities (specifically the port terminal and capital dredging) with non-YPP developments.

Table 28-1 Summary of potential cumulative effects on Waterbird Populations for the Harbour facilities and non-YPP developments

Potential effect	Non-YPP development	Potentially affected receptors
Potential effect on waterbird feeding resource due to increased suspended sediment during capital dredging	• QEII Berth Development. • NGCT. • Maintenance dredging.	Waterbirds feeding in the water column in the middle to lower reaches of the Tees estuary
Morphological effect on habitats used by feeding and roosting waterbirds (including effect on invertebrate food resource)		Intertidal habitats within the Tees estuary that support waterbird populations
Noise disturbance effect during construction works		Feeding and roosting waterbird populations

28.2 Assessment methodology

28.2.1 The assessment of potential cumulative impact on waterbird populations is informed by the spatial extent and magnitude of the predicted effect of the Harbour facilities on the hydrodynamic and sedimentary regime (i.e. extent of sediment deposition during capital dredging and the nature of indirect effects of the Harbour facilities on intertidal and subtidal habitats).

28.2.2 The potential cumulative construction noise impact has been assessed by predicting construction phase noise levels at areas used by feeding and roosting waterbirds (including Bran Sands lagoon, Dabholm Gut and the Vopak foreshore) due to the YPP Harbour facilities and other relevant projects (identified in **Table 28-1**).

28.3 Description of baseline where cumulative impact anticipated

28.3.1 There are a number of sites within the Tees estuary that are designated (either in whole or in part) for marine and coastal waterbird interests under national and international legislation. The Teesmouth and Cleveland Coast SPA and Ramsar site (and its constituent SSSI) are of relevance to this assessment in terms of potential for a cumulative morphological effect on intertidal areas used by waterbirds.

28.3.2 In addition, to the designated sites, there is potential for cumulative impact to waterbirds using habitats that are considered to contribute to the SPA (i.e. supporting habitats) at Dabholm Gut and Bran Sands lagoon.

28.3.3 Baseline waterbird data is presented in **ES Chapter 9.4**. The data shows that there is significant waterbird use of both Bran Sands lagoon and Dabholm Gut by a variety of bird species, with a variety of species found at numbers exceeding 1% of the corresponding Tees WeBS site monthly count for at least one month.

28.4 Assessment of potential cumulative impacts

Potential effect on waterbird feeding resource due to increased suspended sediment during capital dredging

28.4.1 This potential cumulative impact is linked to that described in **Section 28** (*Effect on fish populations due to creation of a sediment plume during capital dredging*) given that waterbirds potentially affected would be feeding on small fish. It was concluded in **Section 28** that a behavioural effect on fish would occur, 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 and, therefore, a cumulative impact of **negligible** significance is predicted on feeding waterbirds.

Mitigation and residual impact

28.4.2 The mitigation described in **Section 27** with regard to limiting suspended sediment increase and dispersion during capital dredging is also relevant here. The residual impact on feeding waterbirds would be of **negligible** significance.

Morphological effect on habitats used by feeding and roosting waterbirds (including effect on invertebrate food resource)

28.4.3 **Section 26** concludes that there would be no potential for a cumulative effect on the supply of material to intertidal or subtidal areas given that there would be no cumulative effect on the maintenance dredging requirement due to the YPP Harbour facility, NGCT and QEII Berth Development. Based on this conclusion, there is **no potential** for a cumulative impact on the morphology of habitats used by waterbirds in the Tees estuary.

Noise disturbance effect during construction works and during operation

28.4.4 The cumulative noise assessment (**Section 17**) considered the cumulative impact of piling for the proposed Harbour facilities with other significant projects. In addition, the operational noise was assessed. Noise levels have predicted at the receptor locations modelled as part of the EIA studies (**ES Section 14**). It was concluded that the cumulative construction and operational noise impact would be of **negligible** significance at all locations.

29 COMMERCIAL NAVIGATION

29.1 Introduction

29.1.1 **Table 29-1** identifies the potential cumulative effects on commercial navigation from the proposed Harbour facilities with relevant non-YPP developments.

Table 29-1 Summary of potential cumulative effects on Commercial Navigation for the Harbour facilities and non-YPP developments

Potential effect	YPP component	Non-YPP development	Potentially affected receptors
Potential effect on commercial navigation during the construction phase	Harbour facility	• QEII Berth Development. • NGCT. • No 1 Quay • Maintenance dredging.	Commercial marine traffic in the Tees

29.2 Assessment methodology

29.2.1 The assessment of potential cumulative impacts on commercial navigation is informed by the navigation studies undertaken as part of the EIAs for the various projects scoped into this assessment. Although this assessment is based on predictions of vessel traffic arising as a consequence of each development, the assessment is semi-quantitative in that judgements have been made with regard to the potential cumulative impact on vessel traffic in the event that each project was implemented and the predictions of vessel traffic that were made for each development were realised.

29.3 Description of baseline where cumulative impact anticipated

29.3.1 Many of the riverside industrial plants along the 17km stretch of the River Tees have docking and cargo facilities and, therefore, the River Tees experiences significant commercial vessel traffic. At present, there are up to approximately 1,000 shipping movements on the river every month.

29.3.2 The channel is maintained by PD Teesport which has a statutory responsibility to maintain the channel for safe navigation. Additionally, traffic in the Tees estuary is controlled by a sophisticated vessel traffic service (VTS).

29.4 Assessment of potential cumulative impacts

Potential effect on commercial navigation during the construction phase

29.4.1 During the YPP construction works, there is the potential for a cumulative impact to arise (including potential delays to shipping, increased risk collision, obscuring navigational aids and the prevention/interference of activities of other operators) should the timing of the construction phases of the projects included in the CIA coincide.

29.4.2 The QEII Berth Development works would be located in a different zone of the estuary to the YPP Harbour facility works and, therefore, there is no significant risk of these works interacting at the construction site, although there would be dredger movements in the main navigation channel associated with transport of dredged material to disposal sites in Tees Bay.

29.4.3 The NGCT and YPP Harbour facilities would be in close proximity to each other, particularly the channel dredging for the NGCT project which would pass adjacent to the site of the construction works for the YPP Harbour facility and, therefore, there is greater potential for cumulative impact on commercial navigation and conflict between these works.

29.4.4 For any marine construction works, a range of mitigation measures are typically required as standard measures in order to manage risk to navigation. The measures adopted are dependent on the location and scale of the works being undertaken, but are likely to comprise:

- one-way control of vessels and potentially re-timing of commercial vessel movements - this would be implemented via the VTS;
- deployment of additional buoys (as required) to mark construction areas and to warn other shipping of the works that are taking place;
- red lights would mark the location of the construction works (e.g. at either end of the construction site) as an aid to navigation;
- Trinity House would be consulted prior to the implementation of changes to buoyage and lighting that may be required during construction; and,
- a Notice to Mariners would be issued which would set out all of the above measures.

29.4.5 The implementation of the above measures would be expected to effectively manage the interaction between construction vessels associated with different projects. It is likely that there would be some effect on commercial navigation due to the need to adjust movements to accommodate any ongoing works, but the potential cumulative impact is predicted to be of **negligible** significance.

Potential implications for vessel traffic management associated with increased commercial activity during the operational phase

29.4.6 For the operational phase of the QEII Berth Development project, it was estimated that there would be up to eight vessels per month, or up to 96 ships per year. Approximately 50 ships per year (or approximately 4 per month) are predicted to call at No 1 Quay during the operational phase.

29.4.7 A detailed shipping traffic study was undertaken for the NGCT. It was estimated that the development would result in an increase in traffic of the order 100 movements per month within the estuary. Overall, the EIA concluded that that there would be an impact of negligible significance on existing and new shipping activity as a consequence of delay to vessel traffic.

29.4.8 During the EIA studies for the QEII Berth Development, No 1 Quay and NGCT (which included a cumulative impact assessment on commercial navigation that took account of each successive project), the Harbour Master was consulted and had no concerns with regards to shipping and navigation.

29.4.9 For the YPP Harbour facility, on completion of the development, it is estimated that there would be approximately 191 vessel calls per year at the port terminal (approximately 16 vessels per month assuming an even distribution of calls). This is considered a minimal change in the context of existing background movements and the cumulative impact is predicted to be of **negligible** significance.

29.4.10 All vessel traffic in the Tees estuary and Tees Bay is controlled by the VTS and this would, therefore, be applicable to all vessel traffic generated as a consequence of the proposed YPP Harbour facilities.

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30 DISPOSAL OF DREDGED MATERIAL

30.1.1 It is proposed that (aside from the contaminated material at the surface) the dredged material generated during the construction phase for the Harbour facilities is to be disposed of at the capital dredged material disposal site in Tees Bay (Tees Bay C); should no beneficial use options be forthcoming.

30.1.2 The ES concluded that the disposal of dredged material would not result in any significant impacts beyond the boundary of the disposal site. No significant impacts on water quality, fisheries or navigation were predicted and, hence, **no cumulative effects** are predicted.

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