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5.0 CONSTRUCTION PROGRAMME AND MANAGEMENT

5.1 Introduction

5.1.1 This chapter of the Preliminary Environmental Information (PEI) Report summarises the construction phase of the Proposed Development.

5.1.2 This chapter includes preliminary information on the expected construction programme and methods of working, based on current understanding at this stage in the design of the Proposed Development. At this stage, a detailed construction programme is not available as this is normally determined by the Engineering Procurement and Construction (EPC) contractor which has not yet been appointed. Where construction details cannot be confirmed at this stage, reasonable worst-case estimates have been made based on experience gained on similar developments and professional judgement.

5.1.3 All construction works will be undertaken in accordance with the Construction Design and Management Regulations (2015).

5.2 Construction Programme Scenarios

5.2.1 The construction programme is anticipated to commence shortly after the Development Consent Order (DCO) is granted (projected to be in Q2 2025) and after the Final Investment Decision (FID).

5.2.2 It is envisaged that the Proposed Development would be constructed in two Phases as outlined in Chapter 4: Proposed Development (PEI Report, Volume I). A single hydrogen production unit, on-site hydrogen storage and supporting utilities (Phase 1) would be constructed and commissioned first, with the second separate Phase 2 hydrogen production unit, on-site hydrogen storage and supporting utilities constructed thereafter. The H_2 pipeline network will be constructed and completed to facilitate transportation of hydrogen to offtakers.

5.2.3 Early enabling works for Phase 1 are expected to start in Q2 of 2025, with the main civils works beginning in Q3 of 2025. Construction of Phase 1 is likely to last approximately 32 – 36 months and is expected to be complete in early 2028.

5.2.4 The early enabling works for Phase 2 may overlap with commissioning for Phase 1 in Q1 2028. It is expected that the main civils works for Phase 2 will begin in Q2 of 2028 (after Phase 1 is commissioned) and be completed by the end of 2030. It is assumed that there will be no overlap between the main construction phases of Phases 1 and 2.

5.2.5 If the duration of the construction of Phase 2 is extended when compared to that for Phase 1 due to potential overlaps in Phase 1's operation and Phase 2's construction activities, ongoing management of the simultaneous operation and construction activities and minimisation of the associated risks and impacts would be required.

5.2.6 This PEI Report assesses construction, commissioning, operation and decommissioning of the Proposed Development and considers its phased nature. As

outlined in Chapters 2 and 4 (PEI Report, Volume I), the ES will include an assessment of any likely significant effects arising from the phased nature of the Proposed Development, including risks of major accidents from the proximity of construction activity to the operational hydrogen production plant.

5.2.7 Phase 1 construction works will include the Production Facility at the Main Site (Phase 1 components), associated on-site storage and the various utility connections required, including CO_2 export pipeline to Northern Endurance Partnership (NEP) infrastructure on the adjacent NZT site, the gas, water and electricity connections. Phase 1 will also include the construction of the majority of the hydrogen pipeline, except for short additional spurs of the hydrogen pipeline which will be constructed as part of Phase 2.

5.2.8 Phase 2 construction at the Main Site will include the infrastructure required for the second Hydrogen Production Unit to increase the capacity of the Production Facility. The additional Phase 2 infrastructure will be constructed within the Main Site, adjacent to the Phase 1 previously constructed infrastructure, and is likely to include:

- an additional Hydrogen Unit (up to 600 MWth);
- an additional cooling water circulation system;
- an additional Air Separation Unit (ASU) (if required);
- expansion of the demineralisation plant as required;
- additional connections and pipe racking as required within the Main Site;
- construction of a new flare or connection to the flare constructed as part of Phase 1; and
- short additional spurs of the hydrogen and natural gas pipelines and the electrical connection (including sub-stations) within the Main Site.

5.2.9 The key stages of the construction programme (including Phase 1 and 2) are outlined at a high level in Table 5-1. It is anticipated that within this high-level programme the following activities would take place following site preparation and remediation works to be undertaken by Teesworks in advance of site handover:

- construction of temporary construction laydown areas;
- construction of the Production Facility (Phase 1) – Main Site works (including new ASU if required);
- construction of utility connections tie ins for natural gas, electricity, water supply and discharge, CO_2 export, N_2 and O_2 import;
- construction of hydrogen pipeline and spurs;
- plant, utility and hydrogen pipeline Commissioning (Phase 1);
- construction of Production Facility Phase 2 elements (as described in paragraph 5.2.6); and
- Phase 2 plant and network commissioning.

5.2.10 The Production Facility will be located on the Main Site, which is part of the site of the former Redcar Steelworks. It is brownfield land that currently contains some above and below ground structures and redundant services associated with the former works and earlier development on the site. However, any demolition works to clear the Site will be undertaken by Teesworks prior to and irrespective of the Proposed Development taking place. Any remediation works required to create a suitable development platform would be undertaken by the Teesworks before the commencement of the construction of the Proposed Development on the Main Site, with the landowner obtaining all necessary consents and permits.

5.2.11 It is common for much of the groundwork (for example piling and pouring of concrete slabs) to be completed prior to the erection of any above ground structures. The erection of civil and structural components (such as cladding and external civil works) usually continues whilst mechanical erection is ongoing. However, the detailed phasing of construction is the responsibility of the appointed contractor and can vary dependent on plant layout and procurement of key equipment.

5.2.12 The Environmental Statement (ES) will include an assessment of the likely significant environmental effects of undertaking required 'enabling works' on the Main Site (including targeted remedial works).

Table 5-1: Indicative Construction Programme for the Proposed Development

DEVELOPMENT PHASE	2025				2026				2027				2028				2029				2030			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling Works Phase 1																								
Construction Phase 1																								
Phase 1 Operation Commences																								
Enabling Works Phase 2																								
Construction Phase 2																								
Phase 2 Operation Commences																								

5.3 Construction Methods

Construction Equipment

5.3.1 For the purposes of this PEI Report and the environmental assessments that will be presented in the ES (in particular for the noise assessment presented in Chapter 11: Noise and Vibration (PEI Report, Volume I)), worst case estimates will be made for the types and numbers of plant and machinery likely to be used on the Main Site during the construction period, as well as the potential use of piling at the Main Site.

5.3.2 Plant is likely to include (but not be limited to) the following:

- mobile plant and civils equipment;
- heavy lifting equipment (including cranes);
- concrete batching plant; and
- mobile power generating equipment.

5.3.3 There may be a requirement for point of use generators for site power during construction. Details of the number of generators, sizing and modes of operation are not yet available. These will be defined by the appointed contractor, as appropriate. Depending on aggregated plant capacities, an environmental permit or medium combustion plant permit will be applied for from the Environment Agency (EA), which will regulate emissions from the generators. Alternatively, site construction power may be provided by Teesworks or by a potential connection to the National Grid.

Site Clearance and Remediation

5.3.4 Site preparation and remedial works at the Main Site would be completed by Teesworks prior to the commencement of construction of the Proposed Development. Teesworks would obtain the necessary consents and permits to do this work. The scope of works anticipated to be undertaken by Teesworks' demolition and civils contractor includes:

- demolition of existing structures within the boundary of the Main Site and construction compounds and laydown areas within the Teesworks site (within the Proposed Development Site);
- turn-over of made ground within the boundary of the Main Site and construction compounds and laydown areas within the Teesworks site to a depth of up to 2.5m below ground level (bgl), including removal of derelict underground structures and obstructions and removal and treatment of historic environmental contamination as required;
- targeted removal of additional underground obstructions and remediation as requested by the Applicant; and
- placement of suitable material (either reused excavation spoil or imported fill) to form the appropriate platform levels for development.

5.3.5 The proposed remediation works will be subject to further review following the assessment of ground condition information.

5.3.6 Further remedial measures may be required during the construction phase of the Proposed Development. These would be localised, targeted remediation works. As such, these works are considered and assessed within this PEI Report as a reasonable worst-case scenario.

Main Site Civil Works

5.3.7 The Applicant's selected Contractor will commence with piling and excavation for the main foundations of the Proposed Development. The piling method to be utilised will be dependent on the findings of ongoing studies and ground investigations and any mitigation measures required to reduce impacts upon sensitive receptors (particularly ecological receptors including birds in the Teesmouth and Cleveland Coast SPA), fish and marine mammals.

5.3.8 A Piling Risk Assessment and associated Piling Methodology will be undertaken in accordance with EA guidance (EA, 2001) to consider and mitigate the risks of causing new pollutant linkages and/or worsening existing linkages with respect to risks to controlled waters during construction of the Proposed Development.

5.3.9 The main plant components for the Production Facility are likely to be a hybrid of modular and stick build. The modular elements would be constructed partially off-site and over-sized (classified as Abnormal Indivisible Loads – AILs). The exact routing of these is not known at this stage, but it is assumed these where required would be delivered by ship either to Teesport or via the Redcar Bulk Terminal (RBT) wharf.

5.3.10 Following ground and civils works, the contractor would commence the installation of plant. Erection of facilities and plant installation would be carried out as concurrent activities, noting that not all facilities would be erected prior to the commencement of plant installation. Large plant may be first placed on foundations with steelwork erected around it thereafter.

5.3.11 Mitigation of noise from piling works may be either through the choice of piling method or the seasonal timing of piling works, depending on the nature of the piling activity and the distance to the sensitive receptors. An assessment would be undertaken of potential noise and vibration effects from piling to determine the degree of mitigation that would be required in the ES. Control of noise during construction would be controlled under the DCO through the CEMP.

Spoil Management

5.3.12 Spoil material generated during construction would be stored temporarily within the Proposed Development Site. Re-use of spoil would be based on obtaining the necessary consents and permits to do this work. Any spoil which cannot be re-used would be removed from site for re-use or disposal. If necessary, suitable measures will be put in place to prevent sediment being washed off-site, with the stockpiles being monitored/measured for wash away. Further details of the measures which will be implemented will be included in a Framework Construction Environmental

Management Plan (CEMP) which will form part of the ES. The CEMP will be prepared by the Contractor prior to construction in accordance with the Framework CEMP.

5.3.13 Soils will be managed in accordance with the Department for Environment, Food and Rural Affairs (Defra) Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Defra, 2009) to minimise impacts on soil structure and quality. Appropriate measures to minimise short-term and long-term impacts on land drainage will be discussed with each landowner (where relevant, principally for the Hydrogen Pipeline Corridor). These measures will also be included in the Framework CEMP. Measures for the management of any contaminated soils will also be set out in the Framework CEMP. HGV traffic associated with export of soils has been accounted for in the traffic movements assessed in Chapter 15 Traffic and Transportation (PEI Report, Volume I).

5.3.14 Additionally, the Framework CEMP will incorporate measures to prevent an increase in flood risk during the construction works in land within Flood Zones 2 or 3 (including the presence of a small number of construction compounds).

Construction Laydown Areas and Welfare Facilities

5.3.15 To optimise the management of construction, construction compounds and laydown areas are required, for activities including (but not limited to) equipment and material storage, site offices, welfare facilities, car parking, environmental/waste handling areas, vehicle wheel wash areas, and operational activities such as concrete batching.

5.3.16 The location of construction compounds has been selected based on the following requirements:

- to support the type, scale and complexity of the works;
- to facilitate materials deliveries and storage in key locations;
- to be in suitable proximity to worksites and existing transport infrastructure, such as the strategic road network, rail and river access, to optimise vehicle movements and minimise impact on the environment and community;
- to provide the necessary facilities and operations capability to the project's construction workforce;
- to be close to the existing transport networks to enable the project's workforce to commute to their place of work; and
- taking account of feedback from stakeholders and landowners.

5.3.17 Based on these requirements, at this stage, it has been identified that around 12 construction compounds/laydown areas are required for construction of the Proposed Development.

5.3.18 The construction compounds and laydown areas would be required for varying amounts of time in support of Phase 1 and Phase 2 construction, depending upon their specific use and location. Some would be required for the full duration of the construction phase.

5.3.19 Project offices, welfare facilities and workshops would be constructed from a mix of single and modular units. These would be stacked where practicable to minimise the surface area taken up at ground level. The project anticipates units being stacked up to an equivalent maximum height of five units (approximately 15 m), with potential for viewing areas at the top of some.

5.3.20 Designated contractor parking is expected to be included in proximity to the Main Site. Details will be provided in the ES.

5.3.21 Water would be supplied by tanker and stored on-site. Sanitary facilities would be provided, and waste stored for off-site disposal.

5.3.22 Site clearance, levelling and ground preparation works for construction compounds and laydown areas may be required to provide a suitable working area. The surface material of laydown areas would be permeable to allow rainwater to percolate to ground, with suitably bunded locations identified as storage areas for any hazardous, polluting materials or chemicals to prevent the risk of pollution.

5.3.23 Habitats that would be temporarily lost or damaged during construction will be Compensated for in line with the Indicative Landscape and Biodiversity Management Plan included in the DCO application and Biodiversity Net Gain. Associated requirements for the protection of retained vegetation (e.g., during vehicle movements and construction/re-instatement works), vegetation restoration soil protection and handling, and temporary soil storage will be specified in the CEMP. These specifications will reflect current industry good practice and be location specific.

5.3.24 The locations of construction compounds and laydown areas will be refined as the design process progresses. Further information, including a plan showing the locations of proposed construction compounds and laydown areas, will be submitted with the ES. The use of these laydown areas will be assessed in the ES using conservative assumptions regarding the nature of activities to be undertaken.

Construction of Connection Corridors

Hydrogen Pipeline Corridor

5.3.25 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), a gaseous phase hydrogen pipeline network is required to connect various potential industrial offtakers across the Tees Valley to the Production Facility at the Main Site, as shown on Figure 4-4: Hydrogen Pipeline Corridor (PEI Report, Volume II).

5.3.26 Once processed to the required specification and compressed at the Main Site, H_2 would be exported using the proposed hydrogen pipeline, at up to 24” diameter and with a Maximum Operating Pressure (MOP) of up to 49 barg.

5.3.27 Various route options and construction methodologies are being considered throughout the proposed hydrogen pipeline network, including trenchless crossings (such as Horizontal Directional Drilling (HDD)), below ground open trench (buried), the installation of new or existing above ground support structures, and the repurposing and reuse of existing pipelines (where possible).

5.3.28 The pipelines will primarily be above ground, installed utilising existing support infrastructure (i.e., existing pipe racks, sleeper tracks, culverts and pipe bridges), within the linkline corridor operated by Sembcorp. If a pipe rack is at capacity, it is proposed that the pipe rack would be expanded to accommodate the additional line. It is anticipated that cranes would be used to lift sections of new pipeline into position with temporary crash decks used to protect existing pipelines during these operations. Existing disused pipelines would be repurposed and reused where possible.

5.3.29 Construction activities within the Hydrogen Pipeline Corridor where it is proposed to use existing pipeline corridors may include the following:

- survey of proposed new pipeline route, including dilapidation surveys;
- undertaking of ground surveys (e.g. topographical, EIA and geotechnical);
- obtain associated access permits and clearance certification;
- access roads and protection of existing infrastructure/pipelines;
- ground preparation and management of any associated excavation works;
- installation of new pipeline sections;
- construction of new pipe bridges and modification of existing;
- management of lifting operations for the positioning and installation of steelwork, piping sections, valves, materials and concrete supports etc;
- installation of temporary pig launching / receiving facilities;
- non-destructive testing of pipe work by radiography, magnetic particle inspection and ultrasonic;
- thickness surveys;
- hydrostatic piping testing;
- corrosion protection preparation and coating (including structural steel work supports) and installation of cathodic protection;
- electrical, control and instrumentation works;
- commissioning;
- reinstatement of fence lines, railing, supports, walkways and any other obstacles temporarily removed or modified by prior agreement to allow for construction and safe works access; and
- site clean-up.

5.3.30 For other connections the pipeline will be constructed using open-cut techniques. A working width of approximately 35 m is assumed at this stage. The method of installation for the sections of buried pipeline is expected to involve:

- segregating a working area using suitable fencing and safety signage;

- removal of topsoil if present and stockpile for reuse;
- laying out sections of pipe adjacent to pipeline route;
- welding pipeline joints together and test welds;
- coating pipe joints and perform checks;
- excavating a trench to the required depth with battered sides or suitable trench supports to suit the temporary works design and stockpile excavated material for reuse;
- installation of pipe bedding material at base of trench;
- lifting sections of pipeline into trench;
- installation of packing material around the pipe;
- backfill of the trench with excavated material and if required remove surplus material from site; and
- replacement of topsoil and reinstatement to agreed standards.

5.3.31 Where optionality is maintained, as a reasonable worst-case, it has been assumed that open-cut methods would be required.

5.3.32 Trenchless methods (such as HDD and micro-tunnelling) are being considered for the crossing of the River Tees and Greatham Creek due to their environmental sensitivity. The proposed trenchless technologies would be below the river/estuary bed at a depth to prevent impacts on river channel integrity, habitats and infrastructure (including other bores and tunnels).

5.3.33 For HDD drilling would involve the installation of sheet piles at the drilling site to provide anchorage for the drill rig. The first stage of the process would be to install a mud return line offset from the proposed pipeline using the drill rig. Following this, a pilot hole would be drilled along the proposed pipeline alignment. A reamer/hole opener would then be attached to the drill and working in the direction from the stringing site back to the drill site the bore diameter would be incrementally increased. Cleaning runs would then be used to remove any cuttings and obstructions in the bore. Finally, the reamer/hole opener would be attached to the pull head and the pipestring would be pulled back through the HDD bore. On the HDD stringing site, sections of pipe would be lifted into position using a crane, welded and coated sequentially until the full length of pipe is installed. Drill mud would be collected in the lagoon on the drill site as the pipe is pulled back for processing and removal from site to a licensed waste disposal facility. Excavations would then be backfilled, and temporary haul roads, plant and equipment removed.

5.3.34 Boring of a Micro-Bored Tunnel (MBT) is likely to require an area at the launch site to be prepared to allow excavation of a shaft to the required launch depth. The shaft should be supported by concrete rings to prevent soil slump to ensure integrity of the tunnel bore. The shaft allows for the installation and launch of the tunnel boring machine. The opposite end of the tunnel trajectory is likely to have a sloped entry point to allow for the installation of the pre-welded & tested pipe string. The MBT

head is designed to self-propel from the base of the shaft along a design trajectory surfacing at a specific point on the pre-constructed arrival ramp. The boring machine is likely to be driven by hydraulic fluid from a diesel-powered hydraulic pump system. Cuttings from the MBT machine will return along its own internal conveyor via slurry pumps with gravity separation in a slurry pond at the launch location. Separated solid material will be removed by road for re-use or disposal at a suitably permitted facility. Liquid wastes (including waste drilling mud) will be removed by tanker and disposed of at a suitability permitted facility. Upon completion, the MBT drill head will be removed from the tunnel. A pre-welded and tested pipe may be pulled from the exit point across its full length. Once fully installed, works at the shaft end will commence to install a single length of pre-welded and tested pipe between the pipe in the base of the shaft up to ground level. Once the weld is confirmed as good, then works to reinstate the removed spoil into the shaft and remediate the land at the exit from the tunnel will be undertaken. Following installation of the pipe strings into the tunnel, the work site will be demobilised, and the tunnel heads capped, with the surrounding land reinstated.

5.3.35 As well as these watercourse crossings, the Proposed Development is likely to include trenchless crossings of railways, roads and utilities infrastructure (by HDD), and trenchless methods are also being considered in other areas that are particularly environmentally sensitive.

5.3.36 The recommended construction methodologies are subject to ongoing design work, discussions with landowners and statutory consultees, and informed by environmental sensitive receptors and constraints and surveys.

CO_2 Export Connection Corridor

5.3.37 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), CO_2 captured and compressed after metering would be exported from H2Teesside to the NEP CO_2 gathering network on the adjacent NZT site via a CO_2 export connection pipeline of up to 22" diameter at a MOP of 28 barg.

5.3.38 At this stage in the design development, the CO_2 export connection may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open-cut construction methods have been assessed.

Natural Gas Connection

5.3.39 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), natural gas would need to be imported to the Production Facility for use in the reforming process. At this stage, it is anticipated that a 24" pipeline would be constructed which would connect the Production Facility at the Main Site to an existing pipeline.

5.3.40 It is assumed that the gas connection would be constructed by the Contractor, with works coordinated with National Grid. The construction of the Minimum Offtake Connection (MOC) from the National Grid Above Ground Installation (AGI) will be undertaken by a National Grid approved contractor.

5.3.41 The natural gas connection may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open-cut methods have been assessed.

5.3.42 The Natural Gas Connection Corridor is shown by Figure 4-5: Natural Gas Connection Corridor (PEI Report, Volume II)).

Electrical Connection Corridor

5.3.43 The Proposed Development would connect to the grid at an existing substation, at Teesworks or the NZT electrical connection. There is also potential to connect at other substations locally such as Lackenby and Grangetown. The connection between the Proposed Development and the sub-station would comprise high voltage electrical cables and control system cables.

5.3.44 It is anticipated that electrical cables would be routed below ground and installed using an open-cut methodology at a depth of approximately 1.1 m and overlain by suitable protective tiles and warning tape, using techniques similar to those described for the Hydrogen Pipeline Corridor. The Electrical Connection Corridor is shown by Figure 4-6: Electrical Connection Corridor (PEI Report, Volume II)).

Water Connections

5.3.45 The Water Connections are described in Chapter 4 Proposed Development (PEI Report, Volume I) and Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I). At this stage in the design and assessment process, it is considered that the water and wastewater connections may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open cut methods have been assessed. The corridor is shown by Figure 4-7: Water Connections Corridor (PEI Report, Volume II).

Other Gases Connections

5.3.46 As outlined in Chapter 4: Proposed Development, other gas connection pipelines may be required for the transportation of compressed O_2 and N_2 for use at the Production Facility, should a third-party ASU be used to supply the required gases. The corridor is shown by Figure 4-8: Other Gases Connection Corridor (O_2 and N_2) (PEI Report, Volume II)). At this stage in the design and assessment process, it is considered that these connections may be entirely above or below ground or a combination of the two, using construction methods similar to those described for the Hydrogen Pipeline Corridor. As a reasonable worst-case, open-cut methods have been assessed.

Construction Staff

5.3.47 Based on an initial estimate, it is considered likely that construction workforce peak numbers will be approximately 1,300 people per day for both Phases 1 and 2. This includes workers associated with both the Main Site and pipeline connections. Please refer to Chapter 15: Traffic and Transportation and Chapter 18: Socio economics and Land Use (PEI Report, Volume I) for further detail regarding this.

5.3.48 Construction staff are anticipated to travel to the Proposed Development via the existing trunk road and local networks. The Applicant will seek to maximise sustainable transport options such as public transport (including rail), cycling and car sharing in accordance with policy. This will be as outlined within a Framework Construction Workers Travel Plan that will accompany the ES.

5.3.49 Further detail regarding the approach to the Framework Construction Workers Travel Plan is presented within Chapter 15: Traffic and Transportation (PEI Report, Volume I).

Site Access

5.3.50 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I), the Main Site would be accessed from the A1085 Trunk Road, a dual carriageway road running north-east to south-west between Redcar and the A1053 Tees Dock Road. The road is subject to the national speed limit. Travelling south-west from the Main Site access, the A1085 Trunk Road provides a link to the A1053 Tees Dock Road, which in turn connects to the A174 to the south and the A66 to the north. The A1053 Tees Dock Road and A174 are part of National Highways core network.

5.3.51 Access routes to the Hydrogen Pipeline Corridor network north of the River Tees are assumed via the A1046 Haverton Hill Road/Port Clarence Road and the B1275, with compound access points proposed off the A178 Seaton Carew Road, A1185, Nelson Avenue, Cowpen Bewley Road and the unnamed road to Seal Sands (commonly known as Seal Sands Road). Access routes to the Main Site and Connection Corridors south of the River Tees are assumed via the A1085 Trunk Road “Steel House Gate” roundabout.

5.3.52 At this stage it is assumed that all construction HGVs associated with the Main Site would arrive/depart the site from Tees Dock Road via the A1053/A66/Tees Dock Road roundabout. At the junction with the A1053/A66/Tees Dock Road, it is assumed that 50% would head west on the A66 and 50% would head south on the A1053 then west on the A174. Alternatively, HGV traffic could access the A1085 Trunk Road from the Lackenby Steelworks entrance (accessed from the Main Site via the internal Teesworks road network) from where traffic could route via the A66 or A1053 as above. For further detail regarding access, please refer to Chapter 15: Traffic and Transport (PEI Report, Volume I).

5.3.53 Construction access routes for the hydrogen pipeline and connection corridors are yet to be finalised. Access points would be identified at suitable locations along the pipeline routes located north of the River Tees to ensure that disturbance is kept to a minimum for laydown, stockpiling, welfare facilities and parking.

5.3.54 Options for transportation of AILs during construction using the local ports are still being considered. The nearest commercial port to the Proposed Development Site is Teesport which could be used for the import of containerised equipment or modular plant. Use of modular plant would minimise the number of HGV movements required for their transportation. The use of the existing wharf at RBT for the transportation of abnormal loads would be considered for modular plant. Consideration would be given to the appropriate port and any required AIL routes during the design process.

5.3.55 The Applicant is also exploring the use of railways for the import of materials to the Main Site and associated connection corridors. The potential for reopening the mothballed Redcar British Steel railway station on the Tees Valley Line for construction worker access is under consideration by the landowner.

Construction Traffic

5.3.56 The principal vehicle movements associated with the Proposed Development construction phase will be managed in accordance with a Framework Construction Traffic Management Plan. Refer to Chapter 15: Traffic and Transportation (PEI Report, Volume I) for further detail regarding this.

5.3.57 The volume of construction vehicles associated with the delivery of plant and the labour force has not been fully determined at this stage, but as a worst-case scenario at this stage, daily staff numbers are anticipated to be approximately 1,300 for both Phases 1 and 2 during the peak month of construction. This equates to approximately 1,300 two-way vehicle movements per day (650 arriving and 650 departing) during the peak construction period, based upon an average car occupancy for workers of 2.

5.3.58 During the peak month, the volume of construction HGVs on the network is predicted to be 1,330 (730 and 600 of these are associated with the Main Site and Connection Corridors respectively). This equates to 67 per day (rounded from 66.5) based on 20 working days per month (37 and 30 of which are associated with the Main Site and Connection Corridors respectively).

5.3.59 For further detail please refer to Chapter 15: Traffic and Transportation (PEI Report, Volume I).

Construction Working Hours

5.3.60 Core construction working hours would generally be weekdays 07:00 to 19:00 and Saturday 07:00 to 16:00, plus, up to one hour before and/or after for mobilisation (start-up and close down) procedures. These standard working hours would apply to all works authorised under the DCO except in specific circumstances; it is likely that some construction activities will require 24 hour working at certain times.

5.3.61 This is principally for construction activities that cannot be stopped, such as large concrete pours or activities that are required to be carried out at night to maintain the development schedule (e.g., radiography). It also includes:

- some repair and maintenance work;
- tunnelling and below ground shaft works;
- some material movements;
- emergency or short notice working;
- abnormal loads and police escort loads;
- security; and
- monitoring (non-intrusive environmental and construction monitoring).

5.3.62 Where on-site works are to be conducted outside the core hours, they would comply with any restrictions agreed with the local planning authorities, particularly regarding the control of noise and traffic.

5.3.63 As a worst-case, in line with the above, some twenty-four-hour working have been assessed in this PEI Report, including Chapter 11: Noise and Vibration (PEI Report, Volume I), assuming less noisy activities occur at night. Chapter 11: Noise and Vibration sets out specific mitigation and control measures required to prevent disturbance from such night-time construction activities. Activities that could generate a noise nuisance would not be undertaken at night, including but not limited to sheet piling, piling, use of impact wrenches, concrete scabbling, use of reversing sirens and concrete jack hammering.

Storage of Construction Plant and Materials

5.3.64 There would be laydown areas with temporary surfaces positioned close to access roads on the Proposed Development Site (mainly in vicinity of the Main Site) where materials would be unloaded and then transported to the area of works. It is not envisaged that these would be used for long term storage of materials (storage would be for six months or less). At the end of each shift, small mobile plant would be returned to a secure overnight plant storage area where drip trays would be utilised under the various types of plant, if required.

5.3.65 Storage areas for flammable/toxic corrosive materials would be in a separate, locked, bunded and fenced off area. Material data sheets will be available for all these materials and the Control of Substances Hazardous to Health (COSHH) assessments kept within the relevant risk assessment for the task, all subject to the Applicant's approval.

5.3.66 Although options to utilise existing site power are also being explored, temporary generators are likely to be required during construction, with mobile generators being used along the construction corridors.

Lighting

5.3.67 Construction temporary site lighting is proposed to enable safe working on the construction site in hours of darkness. Construction lighting will be designed so as not to cause a nuisance outside of the Proposed Development Site in relation to views from residential receptors or light disturbance to ecological receptors. A construction lighting design for working in sensitive areas north of the Tees will be included in the DCO application.

Wheel Wash Facilities

5.3.68 A self-contained wheel wash would be installed and used by vehicles prior to exiting the Proposed Development Site and prior to them joining the public highway. For loads unable to use the fixed wheel wash, a localised wheel washing facility would be set up to cater for these, to minimise effects on the local highway network.

Framework Construction Environmental Management Plan (CEMP) and Site Waste Management Plan (SWMP)

5.3.69 A Framework CEMP will be included within the ES accompanying the DCO Application. It will set out the key measures to be employed during the Proposed Development construction phase to control and minimise the impacts on the environment. This will include industry best practice measures, and specific measures set out in this PEI Report.

5.3.70 The purpose of the Framework CEMP is to:

- ensure nuisance levels as a result of construction and operation activities are kept to a minimum;
- comply with regulatory requirements and environmental commitments; and
- ensure procedures are put into place to minimise environmental effects during construction.

5.3.71 A Final CEMP will be prepared by the Contractor in accordance with the Framework CEMP prior to construction. The submission, approval, and implementation of the Final CEMP will be secured by a Requirement of the draft DCO. The Applicant will require that the EPC Contractor maintains the CEMP to appropriately control site activities to minimise impacts on the environment.

5.3.72 To manage and monitor waste generated on the Site during Proposed Development's construction, a Framework SWMP will be developed as part of the Framework CEMP which will allow for waste streams to be estimated and monitored. The Framework SWMP will require that the construction contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from the Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Construction Traffic Management Plan (CTMP)

5.3.73 A CTMP will be implemented to control the impact of HGVs on the local road network during construction. A Framework CTMP will be prepared and included with the ES.

Commissioning

5.3.74 Commissioning of the Proposed Development will include testing of the process equipment and pipework. A Commissioning Plan will be required to be agreed with the EA under the environmental permit, which will specify monitoring and control procedures to be used and set out a schedule of commissioning activities. Phase 1 commissioning is programmed for Q1 2028 whilst that for Phase 2 is programmed for Q4 2030 (as shown in Table 5-1).

5.4 References

- Department for Environment, Food and Rural Affairs (2009). *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716510/pb13298-code-of-practice-090910.pdf.
- Environment Agency (2001). *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.*