QTS Project Wind

Environmental Setting and Site Design Report

QTS Data Centres

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Introduction

1.0 Introduction

1.1 The Site

QTS Data Centres (QTS, the Client) is proposing to construct a new data centre campus (Cambois Campus) on the site of the former coal-stock yards which serviced Blyth Power Station until the early 1990's. The wider Cambois Campus site consists of a parcel of land which is approximately 102 Ha in size and is located 3km north of Blyth town centre in Cambois, Northumberland. The approximate centre of the site is National Grid Reference (NGR) NZ 29820 84164.

This report relates to the Phase A area of the site as shown in red in the Figure below – 'The Site' approximate centre at NGR NZ 29637 84111. The wider Cambois Campus site boundary is presented in blue.

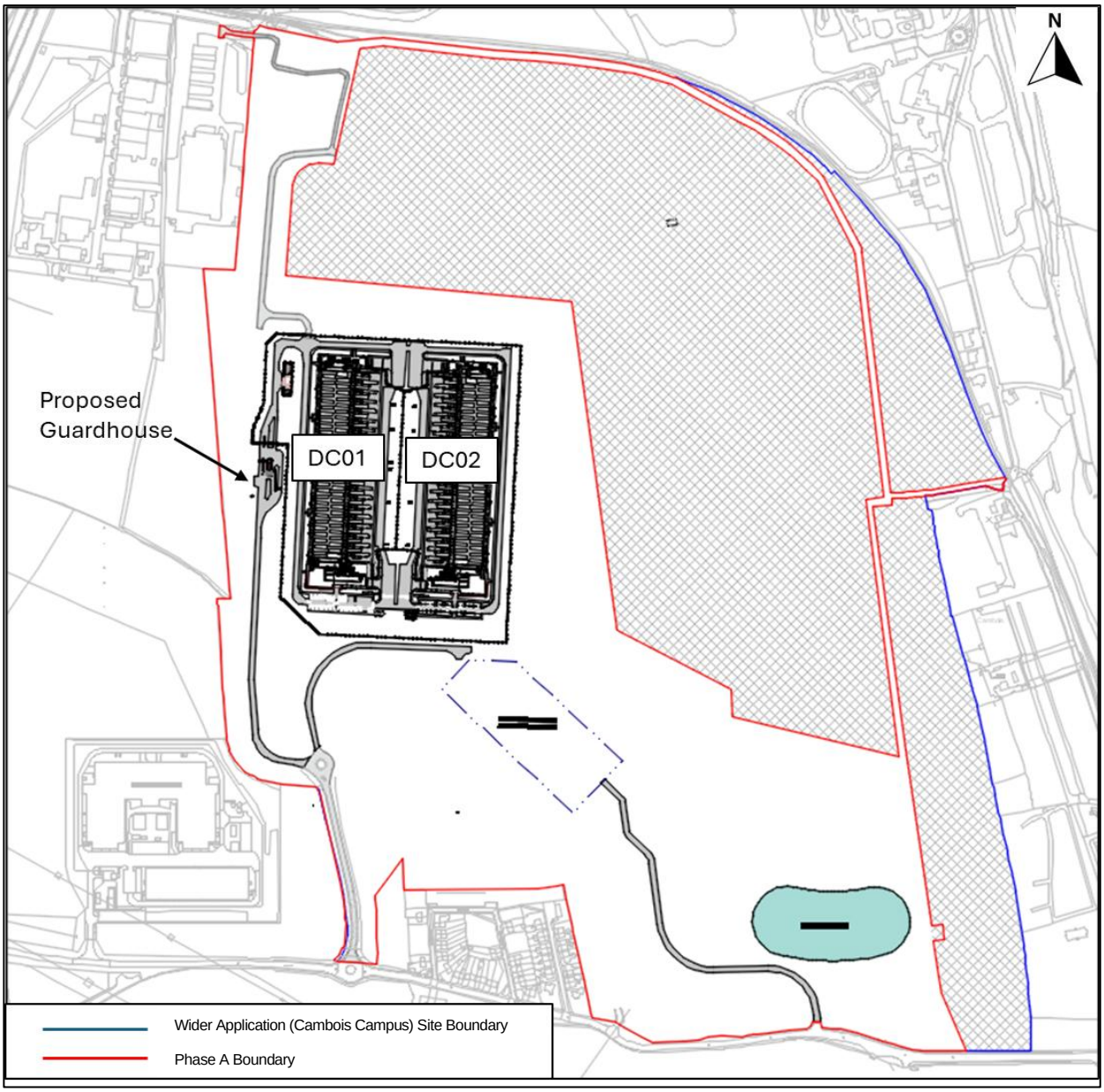


Figure 1-1: Site Layout (Red Line Boundary)

1.2 The Scheme

Development of the Cambois Campus site will commence following completion of a phase of enabling works (refer to Section 1.4, Reference 15). Development proposals within the Phase A boundary includes two data centre units, several ancillary buildings, associated soft and hard landscaping and an updated drainage system including a SuDS Pond.

The relevant planning permissions granted for the site with Northumberland County Council are outlined below.

- Outline planning application (24/04112/OUTES) relating to the entirety of the Cambois Campus site, with all matters reserved, for the erection of up to ten data centre buildings of Class B8 use totalling up to 540,000m^2 gross internal area (GIA) in addition to ancillary structures, substation, emergency generators and other associated works. This planning application has a Permitted status, granted on 8 May 2025.
- Reserved matters application (25/01725/REM) for enabling works including site preparation, earthworks and other works required prior to the construction and operation of the data centre campus, pursuant to approved planning application 24/04112/OUTES. This planning application has a Permitted status, granted on 20 August 2025.

1.3 Objectives

Cundall was commissioned by the Client to prepare an Environmental Setting and Site Design (ESSD) Report to support an environmental permit application for a deposit for recovery permit for the Burnt Shale material (also known as Red Shale) present on the Site. “Recovery of waste” is defined as any operation the principal result of which, is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function. This report aims to provide environmental context of the Site to demonstrate that the reuse of the Burnt Shale will not result in unacceptable risks to Controlled Waters, following methodology laid out by the Environment Agency (Landfill operators: environmental permits - What to include in your environmental setting and site design report - Guidance - GOV.UK).

It should be noted that the reuse of Burnt Shale under an Environmental Permit is at the request of the Environment Agency in pre-application correspondence. There have been no exceptional risks from Burnt Shale materials identified in previous assessments undertaken on the site.

Other materials proposed for reuse on site are considered to be low risk and are to be reused under the Definition of Waste Code of Practice (DoW COP) managed by CL:AIRE. At the time of writing the Materials Management Plan has been completed and declared, materials moved under the MMP are not considered within this report, other than to provide context.

1.4 Sources of Information

The following sources of information have been used in the preparation of this report, including references therein. Of the list below, documents in **bold** have been provided as a supporting information pack for the Environmental Permit.

1. **Cundall (8 October 2025) Maw Burn and Cow Gut Dye Tests. Report reference NCL1-DCZZ-STE-UG-RP-C-00-06**
2. Cundall (3 October 2025) Proposed External Surfaces. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-C-1220 V02
3. Cundall (3 October 2025) Proposed Finished Levels Overall. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-C-1301 V02
4. Cundall (3 October 2025) Proposed Site Layout. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-C-1201 V02
5. Cundall (3 October 2025) Existing Watercourse Diversion – Maw Burn. Drawing Reference GBR1 DCZZ CDL STE XX DR C 1105 V02
6. Cundall (3 October 2025) Existing Watercourse Diversion – Cow Gut. Drawing Reference GBR1 DCZZ CDL STE XX DR C 1105 V02
7. Cundall (3 October 2025) Phase 1 Geotechnical Design Report. Report reference GBR1-DCZZ-CDL-STE-XX-RP-B-0-0014 V02
8. **Cundall (30 October 2025) Waste Recovery Plan P03**

9. Cundall (29 August 2025) Geological Cross Sections. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-B-0013 V01
10. Arcadis (29 August 2025) Outline Landscape Specification. Report reference GBR1-DCZZ-ARC-STE-XX-SP-L-0001 V01.
11. **Cundall (14 August 2025) Proposed Drainage Strategy Phase 1. Report reference GBR1-DCZZ-CDL-STE-XX-RP-C-0003.**
12. Cundall (14 August 2025) Phase 1 Proposed Services Surface Water. Drawing reference GBR1-RMAP1-CDL-STE-XX-DR-C-1210.
13. **Cundall (14 August 2025) Detailed Remediation Strategy. Report Reference GBR1-RMAP1-CDL STE-XX-RP-0003**
14. **Cundall (1 August 2025) Enabling Works – Phase A Drainage Layout. Drawing reference GBR1-ENA1-STE-XX-DR-C-01-33.**
15. Cundall (1 August 2025) Enabling Works – Phase A Remediation and Earthworks Strategy -Enabling Works Proposals. Drawing reference GBR1-ENA1-XXX-UG-DR-B-01-10 V03
16. **Cundall (6 June 2025) Earthworks Specification. Report reference GBR1-ENA1-XXX-UG-SP-B-00-01**
17. Cundall (23 May 2025) Existing Ground Level to Enabling Finished Ground Level. Drawing reference GBR1-ENA1-STE-XX-DR-C-01-27 V02
18. Cundall (23 May 2025) Remediation and Earthworks Strategy. Report reference GBR1-DCZZ-XXX-UG-RP-B-00-11
19. Cundall (23 May 2025) Ground Conditions Summary Report. Report reference GBR1-DCZZ-XXX-UG-RP-B-00-01
20. Cundall (23 May 2025) Ground Gas Assessment. Report Reference GBR1-DCZZ-XXX-UG-RP-B-00-08 V03
21. **Cundall (25 April 2025) Enabling Works - Phase A Existing Site Drainage and Survey Schedule. Drawing reference NCL1-RMAPA-STE-XX-DR-C-01-04 P01**
22. **Cundall (25 April 2025) Addendum to Proposed Drainage Strategy – Enabling Works Phase A. Report reference NCL1-RMAPA-STE-UG-RP-C-00-02 P01**
23. **Arcadis (January 2025). Cambois Data Centre Campus Ground Investigation Report. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0017-01 Rev 01.**
24. Arcadis (January 2025) Ground Investigation Factual Report – Stage 1 Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01 Rev 03.
25. Arcadis (January 2025) Ground Investigation Factual Report – Stage 2 Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01 Rev 03.
26. Arcadis (November 2024) Cambois Data Centre Campus - Phase 2 Geoenvironmental Assessment. Report reference: 30226657-AUK-XX-XX-RP-ZZ-00112-01 Rev 01
27. 1st Horizon (21 October 2024) Blyth Topographic and Utility Survey. DWG reference A-B11243
28. Arcadis (October 2024). Phase 1B Geoenvironmental Desk Study – Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0006-01 Rev 01.
29. Rolton Group Limited (4th April 2024). Gas and Groundwater Monitoring Summary Report – Project Wind. Report reference: 210114-RGL-XX-XX-RP-G-0002 Rev S2-P01.
30. Rolton Group Limited (11th August 2022). Burnt Shale Trial Pit Investigations for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014A Rev S2-P03.
31. Rolton Group Limited (1st April 2022). Phase 1 & Preliminary Geo-Environmental Summary for Rail Head Land, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014 Rev S2-P02.
32. Rolton Group Limited (14th May 2021). Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.
33. Rolton Group Limited (7th April 2021). Phase 1 Geo-environmental Desk Study for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000005 Rev S2-P05.

34. Rolton Group Limited (18th February 2021). Coal Mining Risk Assessment for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000008 Rev S2-P04.
35. British Geological Survey (1990). Sheet NZ 28 SE. 1:10,560 Scale Solid and Drift Geology Map.
36. British Geological Survey (1990). Sheet NZ 38 SW. 1:10,560 Scale Solid and Drift Geology Map.
37. British Geological Survey (1975). Sheet 15 – Tynemouth. 1:63,650/1:50,000 Scale Solid Geology Map.
38. British Geological Survey (1975). Sheet 15 – Tynemouth. 1:63,650/1:50,000 Scale Drift Geology Map.

1.5 Limitations

The findings and opinions conveyed in this report are based on development proposals obtained from the client and the sources detailed within Section 1.4, which Cundall believes are reliable. The information contained in this report is to the best of our knowledge accurate at the date of issue. If new information becomes known pertaining to the site, Cundall reserves the right to review the information and revise the report. Should the standards, legislation, guidance, and best practice used in the production of this report be amended, updated, or withdrawn then the findings and recommendations of this report may be affected.

Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative, and liability cannot be accepted for its accuracy. There may be exceptional ground conditions elsewhere on the site which have not been recorded by previous ground investigation, and which have therefore not been considered.

2.0

Site Setting and History

2.0 Site Setting and History

2.1 Site Details

The geological and geoenvironmental setting of the Site extents have been determined based on the information contained within the references listed in Section 1.4 of this report. Where reference is made to other information sources, the source used is stated in the text.

Site Area and Shape	The Site is irregular in shape and occupies an area of 55 Ha.
Site Boundaries and Adjacent Land Use	▪ **North:** The far northern boundary is formed by the Cambois Branch railway line which trends from west-east along the northern boundary. The wider Cambois Campus forms the remainder of the northern Phase A boundary. ▪ **South:** The southern boundary is formed by mature trees (west) and Brock Lane (east) which separates the site from the former Blyth Power Station (now demolished). The River Blyth estuary is situated approximately 400m south of the site. The former Blyth Power Station (currently under redevelopment) and the National Grid Blyth substation occupies the land separating the site from the River Blyth. ▪ **East:** The eastern boundary extends partially through the wider site (as shown on Figure 1-1) separating the enabling works area from the wider Cambois Campus site. East of the boundary are stockpiles of pulverised fuel ash which rise to around 23m AOD from approximately 8m AOD. Beyond the eastern site ownership boundary, land is occupied by developments associated with Cambois town including residential and commercial developments along with Cambois Primary School. Beyond this is the North Sea. ▪ **West:** Land immediately west of the site is occupied by industrial development in the north, mature trees and undeveloped land in the south with the North Sea Link UK Converter Station beyond the southwest boundary. The A189 is situated approximately 500m west of the site.
Site Topography	Site levels grade from approximately 10.5m AOD in the northwest to around 4m AOD in the southeast. Localised level changes occur across the site associated with previous developments and the early stages of enabling works which were carried out in recent years by others. There are also a number of stockpiles across the site consisting of various materials; concrete, general made ground and pulverised fuel ash (PFA). The stockpile of PFA straddling the northern boundary is significant in size and rises up to approximately 15m AOD from approximately 10.5m AOD.
Existing Land Uses and Features	The Site is currently disused. The site features significant areas of asphalt and concrete hardstanding, relic foundations and informal roads (consisting of asphalt and gravel surfacing) associated with its former use as a coal stockyard. A network of concrete lined drainage channels (approximately 1m deep) is present around the hardstanding surfaces. Overhead power cables are present in the south, trending southeast to north west and then head directly north along the western boundary. A large site cabin / compound is present in the central southern part of the site.
Hydrology	Two named watercourses are present on site, Maw Burn in the north and Cow Gut in the south, flowing generally from west to east. The Blyth Estuary is located approximately 300m south of the site (outfall to Cow Gut). The North Sea is approximately 250m east of the site (outfall to Maw Burn).
Recent Site Developments	The previous developer (British Volt) responsible for enabling the site previously entered administration in January 2023 and works ceased immediately. Based on the sudden demobilisation, the earthworks are unlikely to have been complete in accordance with the proposed development plans and material movement and handling around the site has not been fully captured within the information available, no verification reporting is available for these works.

Table 2-1: Site Details

2.2 Site History

Based on historical mapping and aerial imagery, key development dates and changes that have occurred within The Site are recorded in Table 2-2.

Year	Site Activity
1865	The Site is used as agricultural land.
1924	A football pitch, pavilion, and embankment have been constructed on the Site.
1940	Railway line and sidings have been constructed to the north and east of the Site. Other areas of the Cambois Campus site are recorded to be used as allotments and welfare grounds.
1966	The site has been developed for use as a coal storage pad for the Blyth Power Station. A mineral railway with sidings has been developed through the centre of the site, and infrastructure including pylons, floodlighting, conveyors, reservoirs, and other ancillary buildings are recorded.
1992	Mapping from shows much of the site infrastructure to have been demolished. Two large mounds of PFA material have been deposited within the wider Cambois Campus, although not within the Site (Phase A) boundary.
2021	Aerial imagery shows evidence of surface scarring, likely associated with ground investigation and earthworks, as well as the construction of working platforms and haul roads. It is understood that this was in relation to works completed for a previously proposed development scheme.

Table 2-2: Key dates from historical mapping review

The presence of Burnt Shale on site is thought to be related directly to the historical development of the site where by it was likely imported as a construction material, and its provenance is discussed further in Section 3.1.

2.3 Ground Conditions

2.3.1 Published Geological Information

The British Geological Survey (BGS) 1:10,000 scale and 1:50,000 scale geological maps of the area (References 35 to 38, Section 1.4) have been reviewed and indicates the wider site is underlain by the following sequence.

Superficial Geology:

- The entire site is underlain by Till deposits to an anticipated depth of around 30mbgl (-25m AOD).

Solid Geology:

- Pennine Middle Coal Measures which are indicated as being interbedded sandstone, mudstone and siltstone in the northeast corner of the site and as sandstone across the rest of the site.
- Although not shown on the BGS mapping, Made Ground covers the majority of the site and Alluvial deposits are anticipated to be present across the original channels of the Maw Burn and Cow Gut watercourses.
- The West Sleekburn Dyke is recorded beneath the site, extending across the northern portion trending northwest to southeast. The dyke is recorded as present within the Yard and Plessey coal seam as shown on the BGS 1:10,560 scale map.

2.3.2 Previous Ground Investigations

The ground conditions described subsequently were recorded in the Cundall Ground Conditions report (Reference 19) and are summarised below. The ground conditions are based on information provided within the Rolton and Arcadis ground investigation reports (References 23 and 30). Shallow ground conditions recorded by Arcadis vary slightly to what was recorded by Rolton as a result of the enabling works undertaken between investigations. Exploratory hole locations are shown on the 'Combined Exploratory Hole Location Plan' drawing (appended to this report). A Geological Cross-Sectional drawing has been produced for the site and is also appended to this report (Reference 9).

Numerous intrusive ground investigations have been carried out at the site. Rolton undertook a series of investigations between 2021 and 2024 to support a different development scheme being brought forward by British Volt. Selected

enabling works including excavation and movement of material were undertaken by British Volt following the Rolton ground investigations, although the exact detail of these are not known as the scheme failed to complete and no verification records are available.

Arcadis then undertook a series of intrusive ground investigations in 2024 and 2025 for the current scheme proposals and produced an interpretive geotechnical and geoenvironmental ground investigation report, which has been accepted for discharge of planning conditions associated with applications outlined in Section 1.2.

2.3.3 Artificial Deposits

2.3.3.1 Made Ground

Made Ground was encountered across the entirety of the site and has been characterised into a variety of subcategories based on its visual appearance and BS 5930 description. Made Ground material categories are listed below.

- Topsoil
- Asphalt
- Concrete
- Railway Ballast
- Organic Made Ground
- Surface Cover Granular
- Pulverised Fuel Ash (PFA)
- Granular Subgrade
- Reworked Clay
- Granular General Made Ground
- Burnt Shale (Red Shale)

2.3.4 Superficial Deposits

Superficial geology at the site has been considered for the site as a whole and not just for the Phase A boundary. Ground conditions for the Phase A boundary are not anticipated to significantly deviate from the below.

2.3.4.1 Alluvium

Alluvium was identified in small clusters of positions which partially aligned to the historical channels of the Cow Gut and unnamed watercourse. However, Alluvial deposits did not follow the entire channel of the historical watercourses and is not considered to be present as a continuous layer across where the historical channels were located. Where Alluvium is present on site it is typically described as a soft to firm greenish brown / dark grey slightly sandy slightly gravelly clay. Gravel is fine to coarse subangular to subrounded of coal, siltstone, mudstone, sandstone and coal fines. Occasional pockets of organic inclusions and an organic odour were also recorded.

2.3.4.2 Till

Till is typically present across the site from ground level and approximately 2.5mbgl (depth to top). The depth to the top of the stratum is greatest in the central section of the site, associated with the historic channel of the unnamed watercourse becoming slightly deeper in the central section of the site (beneath the areas of asphalt surfacing). Till is logged as a clay in almost all exploratory holes. Descriptions are generally consistent across the site as firm to stiff, becoming very stiff with depth, dark greyish brown slightly sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse of various lithologies. Log descriptions for the upper 5m of Till are indicative of a slightly weathered profile with the material being recorded as a firm mottled light grey / blue sandy slightly gravelly clay.

Granular layers were recorded in a limited number of positions (around 9 locations). These were recorded as lenses and are not considered to be a continuous layer. Descriptions were given as dense to medium dense sand and gravel.

Gravel is of sandstone, siltstone and limestone. The thickness of Till is generally between 20m and 30m where the full thickness is proven.

A number of falling head permeability tests were undertaken in the well installations, targeting the slightly sandy slightly gravelly Glacial Till during both the Rolton and Arcadis ground investigation. The results are consistent with the expected permeability of clay ranging from an almost impermeable to very low permeability.

2.3.5 Bedrock

Solid geology at the site has been considered for the site as a whole and not just for the Phase A boundary.

2.3.5.1 Pennine Middle Coal Measures

Solid geology at the site is the Pennine Middle Coal Measures which features interlayered bands of extremely weak to moderately strong mudstone and siltstone and moderately strong sandstone. Rockhead was encountered from -13.6m to -27.6m AOD. Bands of coal were encountered at varying depths (from -18.91m and -85.65m AOD) and were typically described as extremely weak and weak coal with pyrite present.

2.3.5.2 West Sleekburn Dyke

The West Sleekburn Dyke was not encountered during the ground investigation but is shown on the 1:10,000 geological map to pass beneath the northern part of the wider Cambois site trending northwest - southeast. The West Sleekburn Dyke is a mafic igneous intrusion with a top surface at a similar level to the Pennine Middle Coal Measures. It is reported to be around 15m wide under Section 4.2.3 of the Arcadis Desk Study report (Ref 3, Section 1.4). This strata is not anticipated to be present within the Phase A boundary.

2.4 Landfills and Waste

The Envirocheck report obtained for the Arcadis desk study (Reference 28) indicate there are no active landfills within 1km of the site, however the two large mounds located with the central area of the wider Cambois Campus (although not within the Site boundary) are recorded as historical landfills, described as ‘ash mounds’. These are the not the PFA ash mounds listed in Section 2.3.3.1.

The mounds were constructed under a former Waste Management Licence and comprise the disposal of PFA and FBA. The operator and licence details are Innogy, Land adjacent to Blyth Power Station, Bedlington, Northumberland, NE22 7BW, reference 67373 dated 10 November 1992 for the deposition of waste including industrial waste equal to or greater than 75,000 tonnes per year. The licence was surrendered on 20 July 2004. This material is on the wider Cambois Campus site and is not required for re-use on the Phase A site as part of the works required for the Environmental Permit.

2.5 Mining Legacy

The Cambois Campus site is located within a coal mining reporting area with a portion of the site (north-west corner) falling in a high risk development zone, as defined by the Mining Remediation Authority (MRA - formerly the Coal Authority). The north western corner of the site is within the Phase A boundary. Coal Mining Risk Assessment Reports have been produced by both Rolton (Reference 34) and Arcadis (Reference 34). The following key observations and conclusions have been noted.

- Six coal seams are recorded beneath the site between 104 and 218m in depth. These are considered too deep to impact the proposed development and have not been considered further.
- Potential shallow mine workings were identified by the MRA in the northwestern portion of the site associated with the outcropping Charlaw / Moorland seam, this has been designated by MRA as a High-Risk Development Zone.
- None of the intrusive investigations, including one undertaken specifically to identify mine workings within the High-Risk Development Zone, recorded evidence of shallow mine workings or mining related voids.
- Intact coal seams were recorded within 100m of the surface.

- There is no evidence of mine entries, opencast mines, coal authority managed tips or spine roads on or within 100m of the site boundary.
- There is no Coal Authority record of a damage notice, claim, court orders, active stop notice or request for preventative works on or within 50m of the site boundary that may indicate subsidence issues.
- There is no record of mine gas emissions or mine water treatment schemes within 500m of the site boundary.
- There is no record of future underground mining intents or coal mining licences within 200m of the site.

Notably the site was never recorded to be a colliery, it is anticipated that the Burnt Shale material identified in Section 2.3.3.1 was imported to site as a general fill material during the construction of the coal stocking yard.

2.6 Ground Gas

To date ground gas monitoring has been undertaken in a number of phases, with some limited enabling works undertaken on site between the Rolton and Arcadis investigations. Ground gas monitoring undertaken to date is summarised in the Cundall Detailed Remediation Strategy (Reference 13). Thirty-seven boreholes were installed with monitoring wells within the Made Ground (or cross installed between Made Ground and Till). It is anticipated that only made ground with sufficiently high organic content would represent a potential source of ground gas risk, this does not include Burnt Shale Material.

Based on the limited ground gas sources present on site, the classification of the site as CS-1 based on the majority of data obtained to date and the further proposed removal of putrescible materials below the proposed buildings further reducing residual risks associated with potential ground gas sources during the enabling works; the site should be classified as Characteristic Situation 1 with no ground gas protection measures required. The Burnt Shale material does not represent a potential source of ground gas.

2.7 Hydrology and Water Features Survey

As reported within the Arcadis desk study (Reference 28), a small area in the south-east of the Site falls within Flood Zone 2. The remainder of the site is not located within a risk zone for flooding from rivers or the sea. Localised areas of the site associated with existing drainage channels are indicated to be at low to high risk of surface water flooding.

According to the Envirocheck report obtained for the Arcadis desk study (Reference 28), there are two surface water abstractions within 1km of the site. These relate to abstractions from the River Blyth approximately 185 and 210m south for general cooling uses, however these were issued to National Power Plc for the now demolished Blyth A and B Power Stations and so are considered no longer in use.

Two named watercourses are present on site, Maw Burn in the north and Cow Gut in the south. Both of these watercourses have been culverted for most of their length across the site and flow generally from west to east. The Maw Burn is predominantly within the wider Cambois Campus boundary, outfalling to the east into the North Sea. It should be noted that updates to this watercourse are not part of the Phase A development, and this watercourse does not form part of the Phase A drainage strategy, as discussed in Section 4.5. The Cow Gut enters along the western site boundary, exits along the southern boundary and outfalls into the Blyth Estuary. Details of the existing watercourses are shown in References 5 and 6. The location of these watercourses and their outfalls are shown on Figure 2-1.

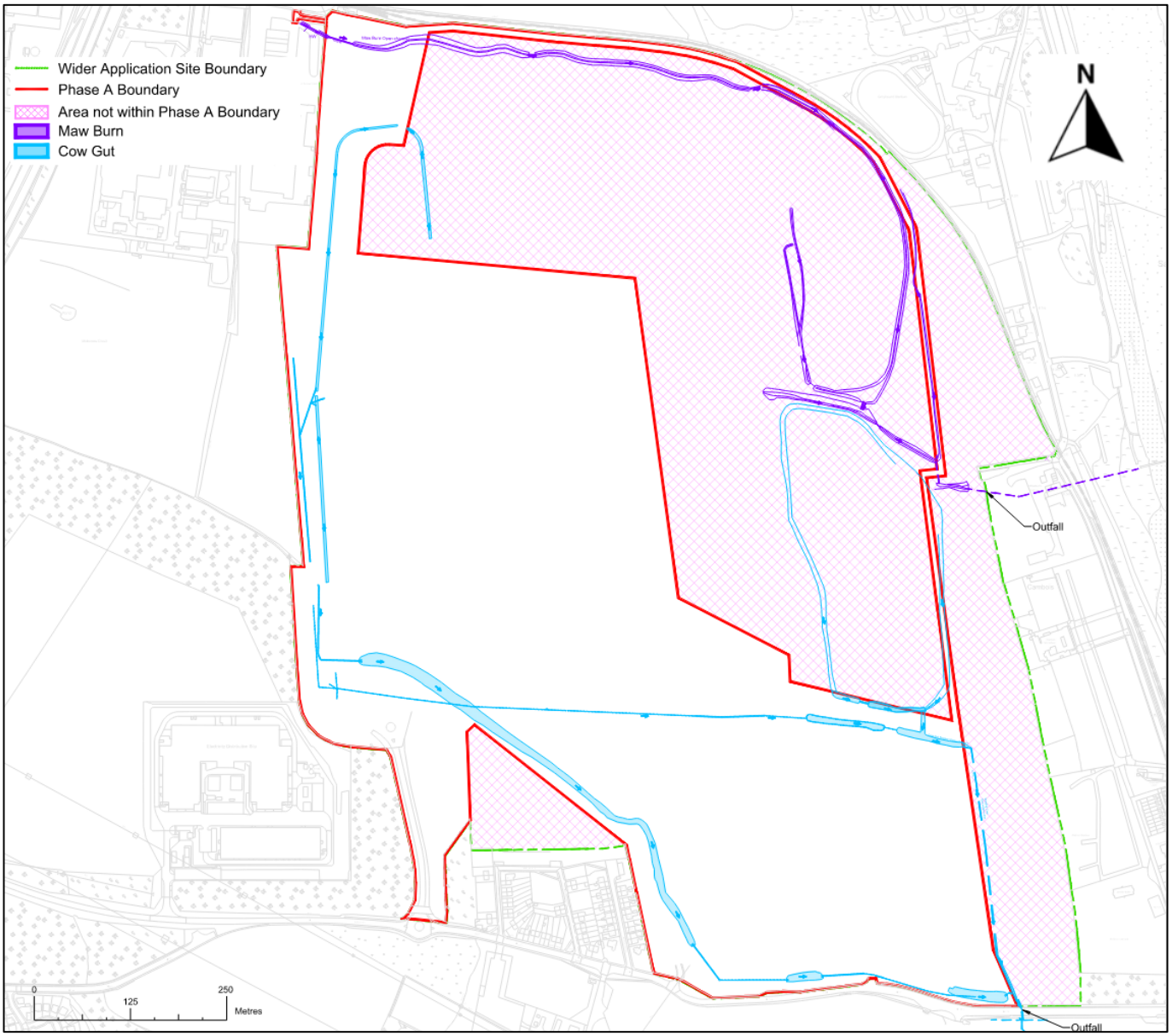


Figure 2-1: Existing Water Features Plan

The Arcadis desk study details a number of licensed discharge consents on the site, these are recorded as revoked or lapsed and relate to various operations and discharging predominantly into Cow Gut or Maw Burn. The routes of these watercourses were to be diverted as part of the previous British Volt scheme. The diversion of Maw Burn was completed with an open channel along the northern site boundary, connecting to an existing drainage channel around the eastern side of the northern PFA mound, before rejoining the original outfall from site.

The Cow Gut has been partially rerouted, with a secondary channel following the southern site boundary before rejoining the original route and outfalling into the Blyth Estuary; this route is partially culverted. Water currently flows along both routes of the Cow Gut, with the intention of removing a section of the original Cow Gut path during construction. This is discussed further in Section 4.5. Where the surface water bodies are not culverted, there is potential for contribution to baseflow from groundwater, if intersecting a groundwater body. Several open concrete-lined drainage channels are present across the site around the former coal stock areas and PFA mounds; these appear to drain into Maw Burn and Cow Gut.

Dye tests were successfully carried out in August and September 2025 to demonstrate the hydrological connectivity of Cow Gut from the proposed development to its outfall point into the River Blyth respectively (Reference 1). The results of

these tests satisfy the planning authority's requirements for surface water outfall verification and support the development's compliance with drainage and environmental standards.

The Blyth Estuary is located approximately 300m south of the site and is part of the Northumberland Shore SSSI. The Blyth water body has a 'Moderate' ecological status according to the Environment Agency. The North Sea is approximately 250m east of the site.

2.7.1 Surface Water Monitoring

Analysis of water samples from both the Maw Burn and Cow Gut were undertaken as part of the Arcadis ground investigation (Reference 26) and some marginal exceedances of the Environmental Quality Standards (EQS) were recorded; however, surface water samples recorded higher concentrations upstream of the site than downstream, indicating that site soils are not currently impacting the water quality.

2.8 Hydrogeology

2.8.1 Aquifer Characteristics

The superficial Glacial Till deposits are classified as a Secondary (undifferentiated) Aquifer (low vulnerability) and the Pennine Middle Coal Measures are classified as a Secondary A Aquifer (low vulnerability) by the Environment Agency. The site does not lie within 1km of a groundwater Source Protection Zone and no groundwater abstraction points are recorded within the site boundary.

2.8.2 Groundwater

The EA Groundwater Vulnerability Map indicates that groundwater within the Phase A boundary is Medium – Low Vulnerability. Groundwater monitoring was carried out during all phases of intrusive investigations with 85 installations in total with response zones present in Made Ground, Till, and Pennine Middle Coal Measures. Discontinuous water bodies were recorded in both the Made Ground and Till, and these are considered unlikely to plausibly support any potential abstraction or significant through-flow.

A laterally continuous groundwater body has been identified within the Pennine Middle Coal Measures Formation. According to the Arcadis Ground Investigation Report (Reference 23), groundwater levels recorded in monitoring wells installed within this stratum ranged from 2.633m AOD to 0.479m AOD (3.383m bgl to 9.520m bgl). These elevations indicate that the groundwater is confined beneath an overlying layer of Till, which varies in thickness between approximately 20m and 30m.

The presence of this substantial low permeability Till layer suggests that the groundwater within the Pennine Middle Coal Measures behaves as a confined aquifer, with limited vertical recharge and potential for artesian conditions. The consistency in groundwater levels within the Pennine Middle Coal Measures across the site further supports the interpretation of a laterally extensive groundwater body within the formation. Groundwater was not found to be tidally influenced but no definitive flow direction was able to be discerned due to the confined / perched nature of water-bearing strata. A 'Water Level Contour Plan and Sections' drawing has been produced and is appended to this report.

Groundwater quality levels / groundwater catchment area data does not exist for the Site under the Environment Agency.

3.0

Preliminary Conceptual Site Model

3.0 Preliminary Conceptual Site Model

The sections below relate only to the Burnt Shale material proposed to be reused under the deposit for recovery activity. The CSM for the wider Cambois Campus site, as presented by Arcadis Report (Reference 23), is reproduced in Appendix A for additional context. The CSM in Appendix A has been accepted for discharge of planning conditions associated with applications outlined in Section 1.2

3.1 Sources

As the conceptual site model outlined in this section is only in relation to deposit for recovery activities, the only potential source of contamination considered is Burnt Shale, at the request of the Environment Agency in pre-application correspondence. No other materials are proposed to be recovered under an Environmental Permit.

The last coal mine in Northumberland closed in 2005, prior to the Mine Waste Directive (2006/21/EC) in 2006. As such, the Burnt Shale present on site is considered the result of a purposeful import and placement as fill material. Historical records, including mapping, show the site was built for use as a Coal Stocking yard for the adjacent power station prior to 1966. The Burnt Shale material was likely produced or excavated at an off-site (unknown) source and subsequently placed on site as engineered fill. Most of the Burnt Shale is found below existing ground level, suggesting it was deliberately imported and placed.

Burnt Shale was recorded in a number of positions across the vast majority of the Site, between ground level and 2.75m bgl. Burnt Shale was recorded during all phases of investigations, but its extents were specifically investigated during the Rolton 'Burnt Shale' investigation. The approximate extents and thicknesses of Burnt Shale are shown on the Preliminary Earthworks Strategy - Approximate Location and Thickness of Burnt Shale drawing (Drawing number: GBR1-DCZZ-XXX-UG-DR-B-01-04 V03), appended to this report. Based on the ground model the total volume of Burnt Shale materials is anticipated to be approximately 17,000m^3.

Descriptions of the material as provided by both Rolton and Arcadis are diverse. All investigations were carried out in accordance with BS5930 and as such the proportion of Burnt Shale in a given stratum was not required to be quantified in the material description.

Rolton note the material as red / orange in colour and primarily encountered as sandy gravel with frequent cobbles of burnt shale. It was occasionally locally interbedded with general made ground and has likely been present on site for some time and is significantly weathered.

Arcadis encountered the material in just over 20 positions and described it as a reddish-brown gravel or sand where gravel is of burnt shale featuring other constituents (such as mudstone, concrete and sandstone). Notably Arcadis only classified the material as "Burnt Shale" where material was considered to comprise >50% visually Burnt Shale material.

Cundall's assessment of Burnt Shale has assumed that the classification of strata provided by others (Arcadis and Rolton) are reasonable, however, where Cundall have noted strata to have descriptions consistent with 'Burnt Shale' materials, these have been included within Burnt Shale dataset. The material classified as Burnt Shale for the purposes of this report are therefore likely to represent a reasonable upper bound volume of material to be classified as such.

3.2 Pathways and Receptors

Based on guidance presented in the Environment Agency's (EA) Land Contamination Risk Management (LCRM) guidance, the following potential pathways and receptors have been identified in relation to the recovery of Burnt Shale (the relevant potential source of contamination on site). These do not take into account any of the design proposals, which will be outlined in Chapter 4.0 with a refined conceptual site model in Chapter 5.0.

Potential Pathways
Overland flow into surface water features
Lateral / vertical leaching to surface water features via groundwater
Vertical migration to groundwater body
Preferential pathways from existing drainage
Potential Receptors
Cow Gut and Maw Burn (Surface Water)
Blyth Estuary (Surface Water)
North Sea (Surface Water)
Groundwater in Pennine Middle Coal Measures (Secondary A Aquifer)

Table 3-1: Potential Pathways and Receptors

4.0

Development Proposals

4.0 Development Proposals

4.1 Phasing Plan

The Phasing Plan for the Site (Phase A) comprises the following:

1. **Site Preparation and Enabling Works:** Earthworks to adjust site levels to formation level, including the removal of below ground obstructions and installation of temporary drainage systems to support pile mat construction. The enabling works proposals are appended to this report.
2. **Drainage Infrastructure Implementation:** Installation of a formal drainage system for Phase A, incorporating the rerouting of Cow Gut and the construction of a SuDS Pond in the south-eastern area of the site (References 11 and 22).
3. **Groundworks for Phase A**: Execution of below-ground preparatory works to support the development of Phase A.
4. **Construction:** Delivery of the development proposals as detailed in Section 1.2, including all associated structural and architectural elements. Following the enabling works, construction shall take place in five phases.

4.2 Elevations

Current Site levels grade from approximately 10.5m AOD in the northwest to around 4m AOD in the southeast (Reference 27). The change in existing levels to proposed levels are shown on drawing GBR1-ENA1-STE-XX-DR-C-01-27 (Reference 15). A minimal overall reduction in elevation is proposed for the Site, with the exception of areas where existing stockpile mounds exist and the SuDS Pond. Finished levels will remain approximately as existing (above the water table).

4.3 Earthworks Proposals

Current earthwork proposals (RIBA 3 design stage) include proposed excavation, re-engineering and replacement of Made Ground deposits (including Burnt Shale). Only geotechnically and chemically suitable material are to be re-used and limit values for chemical and geotechnical suitability are outlined in the relevant Earthwork and Remedial strategies, but notably the use of deleterious, compressible high organic material or any material with visual or olfactory evidence of contamination is precluded. The geotechnical and chemical suitability of Burnt Shale is also outlined in the Waste Recovery Plan (Reference 8).

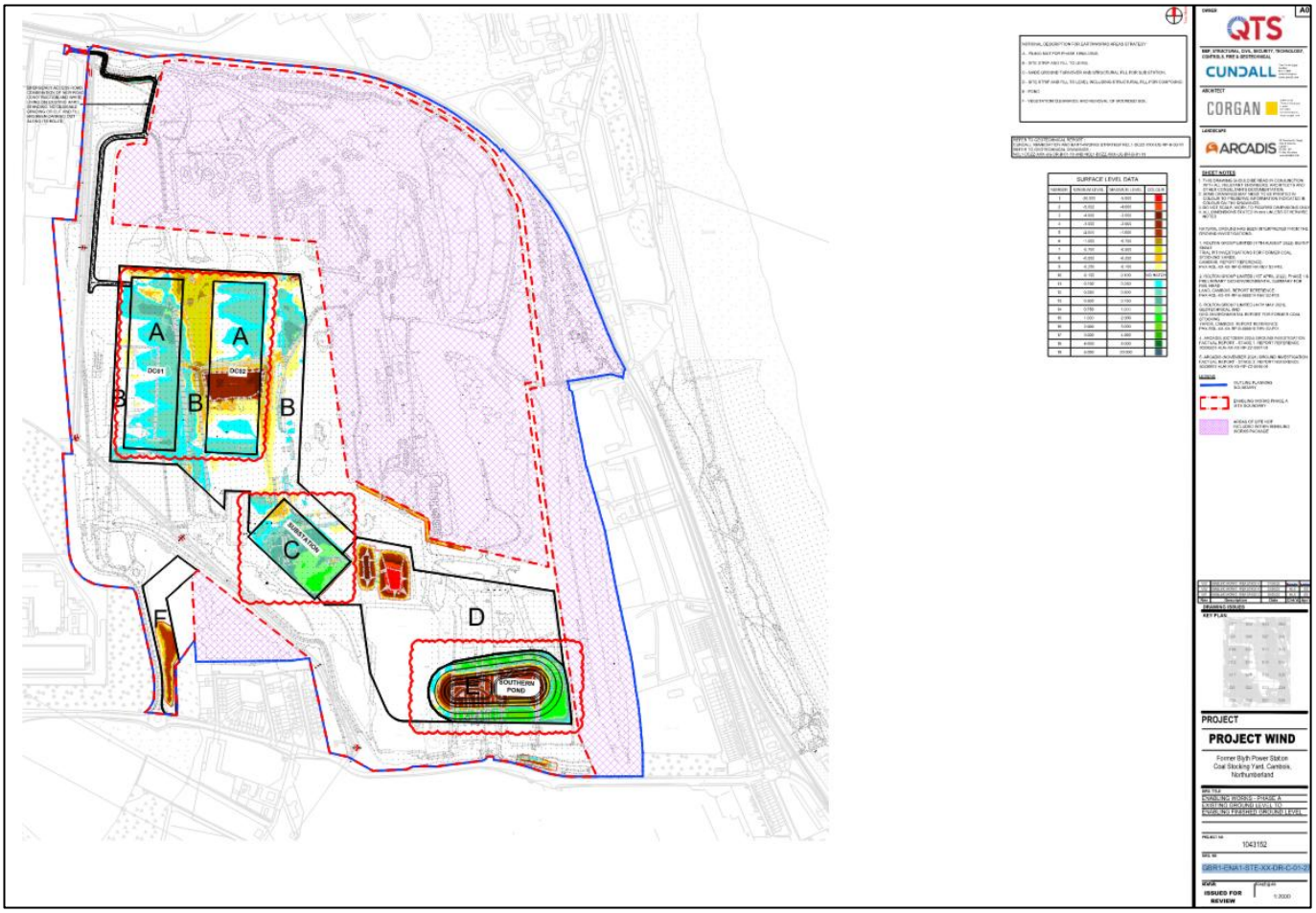


Figure 4-1- Drawing GBR1-ENA1-STE-XX-DR-C-01-27 (Enabling Works – Phase A Existing Ground Level to Enabling Finished Ground Level)

Zone A - Based on the proposed foundation and floor slab solution (see Section 4.6), the primary objective of earthworks in Zone A is to break out all surface material (hard and soft) (site strip) and excavate to a depth to accommodate a granular working platform. In the absence of a final design of the working platform this has been assumed to comprise 700mm of granular material installed 150mm below finished floor level (FFL).

Obstructions are required to be removed in their entirety (including below ground drainage such as land drains not proposed to be retained within the Surface Water Drainage Strategy). Where previously unidentified piles are encountered that extend significantly beyond the base of excavation these are unlikely to be removed completely. In this scenario piles shall be cropped and broken out to an agreed depth (as defined in the earthworks specification) and any obstructions remaining in the ground shall be surveyed and their locations recorded. Backfilling will comprise placement of engineered granular fill to achieve the enabling works finished ground level.

Zone B – This zone will predominantly comprise haul roads / access roads and external areas for storage / processing to be developed as part of the future construction phase. Earthworks are limited to 0.75m excavation (site strip) below existing level to recover suitable granular material. The earthworks will also remove known obstructions (as shown on GBR1-ENA1-STE-XX-DR-C-01-04 and GBR1-ENA1-XXX-UG-DR-B-01-11) and any unknown obstructions encountered during the site strip to 0.5m below invert level of deepest service corridor which may locally result in excavations as deep as 4-5m below existing surface levels. Backfilling will comprise the re-engineering of suitable material to achieve a graded site level and will include 150mm of granular material as a protective surface.

Zone C - Based on the anticipated foundation design of the substation requiring piles and the likely presence of obstructions and potentially hydrocarbon impacted soils, a full made ground turnover (site strip including excavation and replacement) will be undertaken to prove natural ground within Zone C.

Backfilling will comprise the placement of engineered general fill to 700mm below the enabling works finished ground level, followed by the placement of 700mm of engineered granular fill.

Obstructions are required to be removed in their entirety (including below ground drainage not proposed to be retained within the Surface Water Drainage Strategy). Where previously unidentified piles are encountered that extend significantly beyond the base of excavation these are unlikely to be removed completely. In this scenario piles shall be cropped and broken out to an agreed depth (as defined in the earthworks specification) and any obstructions remaining in the ground shall be surveyed and their locations recorded. Backfilling will comprise placement of engineered granular fill to achieve the enabling works finished ground level.

Zone D - Earthworks are proposed to be limited as no defined end use for building or development has been specified in this part of the site. Currently, Zone D comprises excess material from the prior British Volt scheme and rough / loose surfacing and vegetation. Vegetation clearance is required at discrete locations within this area. Bulk excavation will comprise the excavation and relocation of general fill from the north of Zone D and the breaking out and removal of below ground infrastructure.

The topographically low area in the south of Zone D will be used as a temporary Materials Management Area for stockpiling materials that may require treatment / screening / processing prior to reuse on other phases of the scheme. Fill materials generated as part of the enabling works will also be stockpiled in a predetermined location in Zone D for reuse under an MMP in other areas of the site.

Zone E - The attenuation pond will be constructed within Zone E and this is predominantly in an area of excavation. Earthworks will comprise excavation to 0.5m below base of pond, followed by the placement of 300mm cohesive material (landscape fill or engineered general fill), followed by the placement of 200mm of topsoil and in accordance with Cundall Civil Engineering Specification (GBR1-ENA1-STE-UG-SP-C-00-01) and Drawing GBR1-ENA1-STE-XX-DR-C-05-05. Obstructions will be required to be removed to a maximum depth of 0.50m below the invert level of the pond / site drainage.

Zone F - Within Zone F a mound of soil is present and is heavily vegetated with semi mature and mature trees. Currently, it is understood that this part of the site will be required as a corridor for incoming services and therefore the mounds of soil should be relocated as part of the enabling works. Given the absence of any ground investigation, supplementary testing will be required during the earthworks in the form of a discovery strategy, detailed in Section 5.7, to understand the fate of this material. No placement of fill will be required within Zone F at this stage of design.

4.4 Basal and Side Slope Engineering

All Burnt Shale materials are proposed to be reused as fill materials for the earthworks. No basal or side slope engineering is proposed for the development.

4.5 Proposed Surface Water Management

The Proposed Drainage Strategy (Reference 11) and Proposed Surface Water Services (Reference 12) have been submitted to and approved by the Lead Local Flood Authority (LLFA).

4.5.1 Enabling Works Drainage

The Drainage Strategy for the enabling works (Phase A) of the project has been submitted to enable the site ahead of the main construction.

Part of the enabling works drainage is temporary in nature and expected to be in place for a period of approximately 1 year. It should be noted that some of the permanent drainage to the project will be constructed as part of the enabling works – most notably the southern pond that discharges to Cow Gut. The on-site catchment area for the Cow Gut during enabling works has been calculated, which covers the entirety of the Phase A site.

The enabling works drainage is indicated on Figure 4-2 and is shown in further detail on the Phase A Drainage Layout (Reference 14). The works consist of;

- The permanent southern pond that discharges to Cow Gut
- A length of permanent buried drainage that connects the pond to the relevant enabling works platforms
- Enabling works drainage to three areas (DC1 and DC2 piling Mat, Substation Platform and the Construction Laydown Platform). This drainage will not form part of the final permanent drainage regime.
- Works to complete the Cow Gut Diversion

The contractor will submit a separate construction phase surface water management plan for approval to the LLFA for the construction works.

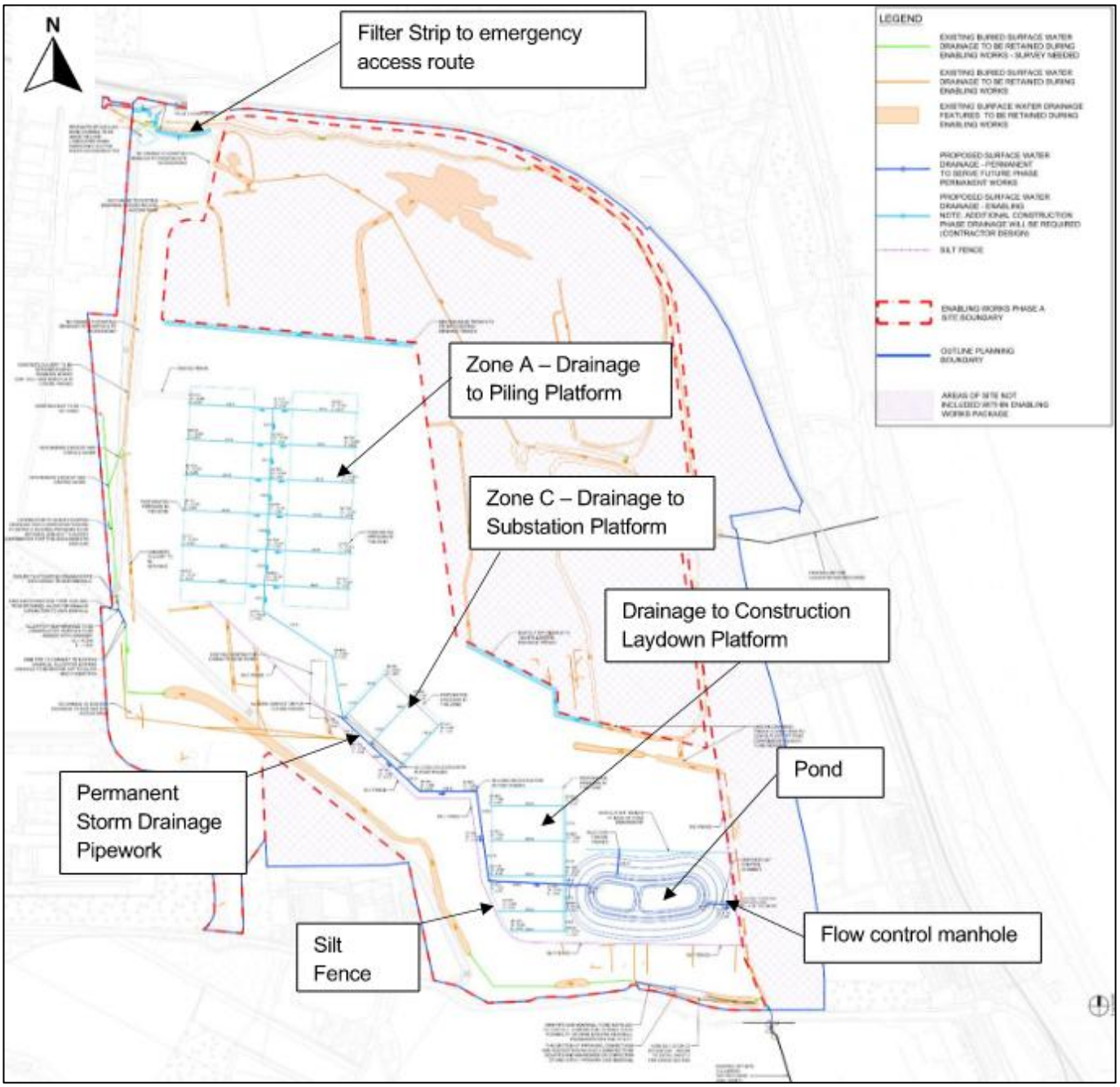


Figure 4-2: Phase A Enabling Works Drainage Layout (Reference 22)

Drainage proposals comprise the inclusion of a SuDS Pond in the southeast of the site, to be constructed as part of the enabling works package. The SuDS Pond shall act as a collection point for surface water on site (as indicated on the drainage layout) before discharging into the Cow Gut via an orifice flow control chamber, after which water shall discharge via the existing outfall from the Cow Gut into the Blyth Estuary. A silt fence will be constructed where there is

runoff from the enabling works platforms to Cow Gut. This is to capture sediment from the enabling works prior to discharge to Cow Gut (Reference 22).

4.5.2 Permanent Works Drainage

Following the enabling works for the site, permanent works will commence, building on the drainage strategy for Phase A outlined above. The strategy for Phase 1 (Reference 11) outlines the following:

- Existing drainage is being maintained or adapted where necessary
- Hardstanding has been accounted for within surface water runoff calculations
- SuDS have been included within the design, all of which collect surface water in a closed system.
- Hydraulic calculations have been included that detail what will be drained
- The discharge rate to the Cow Gut is provided following construction of Phase 1.

The existing outfall in the east of the site which discharges into the North Sea shall be maintained.

4.6 Foundations

The data centre buildings (DC01 and DC02) will be supported by piled foundations. The Geotechnical Design Report (Reference 7) proposes 25m length contiguous flight auger (CFA) piles to be constructed below the data centre buildings and the gantry support columns within the generator yards. Toe level is proposed at -15m AOD, terminating within the Till. Detailed design shall be completed by the Specialist Piling Contractor.

4.7 Surface Cover

Following completion of works, the Site is to comprise a combination of hard surfacing with formal drainage and soft landscaping. The drainage strategy for the site (Reference 12) indicates that the site is to be made up of a completely closed drainage system with two outfall points, one in the east of the site and one in the south east of the site, as shown on drawing GBR1-RMAP1-CDL-STE-XX-DR-C-1210. As per the Outline Landscape Specification (Reference 10), all new planting areas including trees, shrubs, grass, and wildflower are to be surfaced with imported topsoil to BS 3882. Areas proposed as Open Mosaic Habitat (OMH) are to comprise up to 100mm site-won soil (as per Remediation Strategy, Reference 18) with existing OMH seed bank. On this basis the effective recharge to the ground is likely to be negligible during the site's end use.

5.0

Refined Conceptual Site Model

5.0 Refined Conceptual Site Model

5.1 Review of Source

As the conceptual site model outlined in this section is only in relation to deposit for recovery activities, the only potential source of contamination considered is Burnt Shale, at the request of the Environment Agency in pre-application correspondence. No other materials are proposed to be recovered under an Environmental Permit.

Analysis to date has been undertaken in respect to leachability, combustibility and sulphates, alongside more general contamination testing in relation to the sites previous uses and the conceptual site model presented by Arcadis and accepted for discharge of the relevant planning application (Reference 23). The Burnt Shale material has a low-risk typical chemical signature consistent with other Made Ground units identified on site and therefore has not been determined to be exceptional material in the context of the Remediation Strategy prepared for the site and accepted for planning (Reference 13). All materials on site have been assessed by Arcadis in the GQRA for the site and with the exception of TPH hot spots have been found to be of a low risk to the environment and human health. Suitability criteria and the frequency of testing for placed is defined in the Cundall Detailed Remediation Strategy (Reference 13).

Preliminary Waste Classification of all materials encountered was undertaken by Arcadis as part of the GQRA submitted for the scheme (Reference 23). Fifteen samples of materials described as Burnt Shale were analysed using HazWasteOnline™ software to provide a preliminary classification. The majority of samples returned a non-hazardous classification, with only one sample being classified as Hazardous. The sample returning a Hazardous classification was from TP107 at 1.3m bgl, in a known hydrocarbon hotspot that will be removed as part of the enabling works, hazardous classification therefore due to cross contamination and not the inherent properties of the Burnt Shale material.

Waste Acceptance Criteria (WAC) testing was undertaken on four samples of Burnt Shale material. One sample did not exceed the limits for inert soils and therefore has a likely classification of inert. Two Burnt Shale samples were recorded to exceed the inert limits (total organic carbon, leachable sulphate and leachable fluoride) and therefore have a non-hazardous classification. One sample from TP107, within the known hydrocarbon hot spot, was classified as Hazardous based on the observed cross contamination, WAC did not record concentrations above the non-hazardous threshold. Based on the above the relevant waste code for the proposed waste to be recovered as part of the permit will be 17 05 04 (soils and stones not containing hazardous substances).

Although Cundall recognise that the number of samples utilised in the preliminary waste assessment are low for the volume of Burnt Shale materials anticipated (equivalent to approximately 1 in 1,350m^3), additional testing to ensure chemical suitability of materials placed as part of the site works is mandated as part of the Remediation Strategy (Reference 13) and records will be provided in the Remediation Verification report. No chemical treatment of the Burnt Shale materials are proposed prior to use, current characteristics as defined in the GQRA (Reference 23) and within this report will not change.

5.2 Review of Pathways

5.2.1 Overland Flow into Surface Water Features

The Maw Burn is located predominantly within the wider site boundary and to the north of locations where Burnt Shale could be placed. Site elevations are generally higher in the north of the site and are not anticipated to be significantly changed following the earthworks, the Maw Burn (and by extension the North Sea) are not considered to be likely to be reached by overland flow.

As described in Section 4.2, the proposed development shall comprise a combination of hard surfacing and soft landscaping. Any hard surfacing placed over the Burnt Shale will act as a physical barrier, preventing direct exposure between rainfall/surface water and waste materials. This barrier inherently prohibits the possibility of contaminants within Burnt Shale migrating via overland flow as water is unable to infiltrate and mobilise potential contaminants. Similarly, imported topsoil is stated as a requirement for all new planting areas, mitigating the risk of contaminants within Burnt Shale migrating through overland flow. The seed bank shall grow and create a surface organic layer that absorbs water

and reduces vertical migration, significantly reducing overland flow through rapid vegetation growth. Residual risks to surface waters via overland flow are transient in construction only prior to the completion of drainage works prior to placement of burnt shale materials.

5.2.2 Lateral / Vertical Leaching to Surface Water Features via Groundwater

As discussed in Section 2.8.2, localised shallow perched water is present in the Made Ground. It does not appear to be a continuous waterbody and therefore lateral migration will be limited; however, perched water could act as a pathway for contaminant migration in proximity to surface water receptors. The surface water drainage system designed for the site and to be implemented prior to the placement of Burnt Shale is a closed system with no contribution to baseflow from groundwater and so this is not a plausible pathway.

Surface water sampling undertaken to date by Arcadis (Reference 23) indicates that in the current layout (where groundwater can provide some baseflow to surface waters) site soils are not currently impacting water quality within the Maw Burn and Cow Gut as concentrations appear higher upgradient than downgradient (Section 2.7.1).

Development of the site shall include hard external surfaces, and a closed drainage design, all of which will further inhibit the leaching of contaminants to perched groundwater and subsequent migration to identified surface water bodies.

5.2.3 Vertical Migration to Groundwater Body

Once the development is in its site end use, effective recharge to the ground is likely to be negligible based on the applied surface cover and closed drainage system (Sections 4.5 and 4.7, respectively).

Groundwater monitoring has proven that a continuous confined groundwater body lies within the Pennine Middle Coal Measures (Secondary Aquifer). The geology of the site indicates that approximately 20 – 30m of superficial deposits (Till) lie between the Burnt Shale (identified potential source of contamination) and the aquifer. Till material is described to be predominantly a clay, and contaminant migration to the bedrock aquifer will be restricted by the significant thickness of relatively impermeable soils (as validated by permeability testing).

As discussed in Section 4.6, piles shall terminate in the Till (in line with the piling schedule presented in the GDR). This ensures that no preferential pathways are introduced between the Burnt Shale and the underlying Secondary A Aquifer. Consequently, the risk of contaminant migration via vertical flow is effectively mitigated.

This contaminant linkage therefore does not require further analysis as it is considered to be implausible and was not included within the Arcadis Conceptual Site Model (Appendix A).

5.2.4 Preferential Pathways from Existing Below Ground Drainage Infrastructure

As outlined in Section 4.3 all obstructions, including historical drainage systems and land drains are to be identified and removed as part of the earthworks where these intersect with any excavations. As such any Burnt Shale materials placed will not intersect with any land drains or other drainage infrastructure which could provide a preferential pathway to the drainage channels (and subsequent outfalls) on site.

Even in a worst case scenario where some limited residual drainage pathways were left in-situ then will they would still be disturbed and hydraulically disconnected from the new drainage system breaking any pollutant linkage pathway. The restricted infiltration to site won soils as outlined in Section 5.2.2 would likely prevent the accumulation of leachable contaminants that could travel via this pathway to the drainage system.

Pathways via existing below ground drainage infrastructure are therefore not considered to represent a plausible contamination risk.

5.2.5 Preferential Pathways from Proposed Below Ground Drainage Infrastructure

Drainage proposals outlined in Section 4.5 provide information pertaining to the formal drainage system, which encompasses the entirety of Phase A as a catchment area to the Cow Gut. The SuDS Pond in the south eastern corner is to be lined with cohesive material as discussed in Section 4.3 (Zone F).

Groundwater is confined beneath the Till, and perched water identified within the Made Ground material is limited and discontinuous. Furthermore, surface cover (discussed in Section 4.7) comprising hardstanding or 300mm of clean cover materials will limit recharge, prohibiting the mobilisation of contaminants via preferential pathways from proposed below ground drainage surrounds.

The restricted infiltration to site won soils as outlined in Section 5.2.2 would likely prevent the accumulation of leachable contaminants that could travel via this pathway to the drainage system.

Pathways via proposed below ground drainage infrastructure are therefore not considered to represent a plausible contamination risk.

5.3 Conceptual Site Model

Based on the low risk profile of the potential contaminant source (Burnt Shale materials as outlined in Section 5.1) and with no plausible pathways identified, no residual pollutant linkages exist in relation to the recovery operation.

It has therefore been qualitatively demonstrated that no further geoenvironmental risk assessment, including Hydrogeological Risk Assessments are required based on the absence of residual pollutant linkages within the Conceptual Site Model in both the permanent and temporary case.

6.0

Waste Compliance and Aftercare

6.0 Waste Compliance and Aftercare

6.1 Waste Compliance

Preliminary Waste Classification of the Burnt Shale was undertaken by Arcadis, indicating that if not re-used on site Burnt Shale materials will likely be removed as inert or non-hazardous (noting that additional testing to ensure chemical suitability of materials placed as part of the site works is mandated as part of the Remediation Strategy, to which the Burnt Shale must be compliant). Based on the above the relevant waste code for the proposed waste to be recovered as part of the permit will be 17 05 04 (soils and stones not containing hazardous substances).

As no pollutant linkages have been identified for the site in relation to controlled waters, ongoing monitoring is not required as no pollution control measures are deemed necessary above and beyond those identified for general fill materials on site. Control measures for general fill on site is outlined within the Remediation and Earthworks Strategies (References 13 and 18).

6.1.1 Geotechnical Requirements

Cundall has prepared an earthworks specification for the enabling works area, which is intended to be covered by the Environmental Permit (Reference 16). The specification is based the Series 600 Specification for Highway Works (SHW), Standards for Highways and references the standards required for classification of material types on site. Appendix 6/1 outlines the requirements for acceptability and testing etc. of earthworks material and applies to all materials on site, including Burnt Shale materials. The Cundall Earthworks Specification (Reference 16) reproduces Table 6/1 from SHW and outlines acceptable material properties for each material class.

Based on the characteristics of the Burnt Shale outlined in the Earthworks Specification and summarised within the Waste Recovery Plan (References 8 and 16, respectively), the majority of the 132 samples obtained indicate material gradings consistent with Class 1A or Class 1B, as defined in Table 6/2 of the Specification for Highway Works and referenced in Table 6/1 of the site's Earthworks Specification (Reference 16). Of the remaining samples, 34 samples were representative of a Class 2 material (28 a Class 2C and six a Class 2A/2B) with a fines content between 15% and 80% (Class 2C) or 80% and 100% (Class 2A/2B). It is important to note that although these Class 2 samples meet the criteria for stony cohesive material (Class 2C), the predominantly granular nature of the Burnt Shale suggests that it behaves more like a granular material. As such, it may not be suitable for remoulded undrained shear strength testing. Compliance with this aspect of the Earthworks Specification will therefore be assessed in situ, following placement and compaction, if required, and following the compaction trials.

There is also a contractual obligation, as per the specification, for field compaction trials to be undertaken on all material types, inclusive of the Burnt Shale. During compaction trials and / or earthworks, if it is observed that oversize particles within the Burnt Shale do not break down as expected to become compliant with the relevant grading requirements, these will revert to a Class U1A (unsuitable material). This is not anticipated based on the data obtained during the previous ground investigations at the site but is a measure in place to ensure only suitable materials are recovered. Burnt Shale materials in their current condition are generally considered to be geotechnically suitable for reuse during earthworks and do not require treatment.

6.1.2 Chemical Requirements

Error! Reference source not found. Table 6-1 is extracted from the Remediation Strategy (Reference 13), which outlines the suitability criteria for general fill materials for a Commercial end use and Soil Organic Matter (SOM) of 1%. Site won material is required to be tested a minimum of 6 per source or 1 per 100 m^3 (whichever is greater) unless justification can be made for a reduction can be made based on a robust statistical analysis. Burnt shale shall be verified following the same requirements as other site won materials and testing results shall be reviewed prior to the placement of material to confirm suitability, records will be provided in the Remediation Verification Report.

Test	Threshold Value	Units	Source
Asbestos			
Asbestos	<0.1% w/w		
Metals			
Antimony	7500	mg/kg	C4SL
Arsenic	640	mg/kg	CL:AIRE 2009
Barium	22000	mg/kg	CL:AIRE 2009
Beryllium	12	mg/kg	S4UL
Boron, Water Soluble	240000	mg/kg	S4UL
Cadmium	410	mg/kg	C4SL
Chromium III	8600	mg/kg	S4UL
Chromium, Hexavalent	49	mg/kg	C4SL
Copper	68000	mg/kg	S4UL
Lead	2330	mg/kg	C4SL
Elementary Mercury	58	mg/kg	S4UL
Inorganic Mercury	1100	mg/kg	S4UL
Methyl Mercury	320	mg/kg	S4UL
Molybdenum	17000	mg/kg	CL:AIRE 2009
Nickel	980	mg/kg	S4UL
Selenium	12000	mg/kg	S4UL
Vanadium	9000	mg/kg	S4UL
Zinc	730000	mg/kg	S4UL
TPH			
TPH Ali/Aro Total	1000	mg/kg	Class 1A carcinogenic threshold of 0.1% (WM3)
BTEX and MTBE			
Benzene	98	mg/kg	C4SL
Toluene	56000	mg/kg	S4UL
Ethylbenzene	5700	mg/kg	S4UL
Phenols			
Phenol - Monohydric	440	mg/kg	S4UL
PAHs			
Naphthalene	190	mg/kg	S4UL
Benzo(a)pyrene	77	mg/kg	C4SL

Table 6-1: Suitability Criteria for Site Won Soils (Commercial, SOM 1%)

6.1.3 Unsuitable Materials

Any non-compliant materials will most likely fall into a Class U1A material (geotechnically unsuitable), although some Burnt Shale materials that underly known contamination hot spots will more likely be Class U1B. As neither Class U1A or U1B materials are suitable for reuse on site these will not be recovered as part of the environmental permit and proof of their disposal and volume will be provided at permit surrender.

6.2 Post Closure Controls (Aftercare)

Based on the above assessments there are not considered to be any post-closure controls or monitoring required for the recovery activity. The inherent nature of the scheme design mitigates any residual pollutant linkages between the Burnt Shale materials and the identified controlled waters receptors. There is no mining legacy on site that would require any subsidence monitoring.

As outlined in the preceding section chemical and physical suitability will be confirmed prior to placement and any unsuitable material will be disposed of. At permit surrender verification of the chemical and geotechnical suitability will be provided, alongside material movement records.

Maintenance to the full site drainage, including the SuDS Pond, is as per Cambois Data Centre Campus – Drainage Strategy – Technical Document 4.13.

6.0

Conclusions and Future Assessments

7.0 Conclusions and Future Assessments

7.1 Conclusions

This report presents a comprehensive characterisation of the Site, including the site history, topography, geological and hydrogeological ground model. As the deposit for recovery activity is limited to the Burnt Shale material, therefore, this is the only potential source of contamination considered within this report at the request of the Environment Agency in pre-application correspondence. Burnt Shale materials were not identified to pose an exceptional risk to the site in the Arcadis GQRA (Reference 23). No other materials are proposed to be recovered under an Environmental Permit.

The potential source of contamination requested by the Environment Agency for review—Burnt Shale—has been assessed in terms of its current location, estimated volume, and chemical composition. Environmental sensitivities and key receptors have been evaluated in regard to Controlled Waters identifying the following receptors: Maw Burn, Cow Gut, Blyth Estuary, the North Sea, and groundwater within the Secondary A Aquifer (Pennine Middle Coal Measures). Engineering design considerations have been outlined, covering proposed earthworks, site drainage infrastructure, and final elevation levels.

A contaminant linkage assessment was undertaken using the source–pathway–receptor model in accordance with LCRM (2023). Based on a detailed review of the site's geology, hydrogeology, and development proposals, it was concluded that no viable pathway exists between the identified source and the sensitive receptors. For this reason, a Hydrogeological Risk Assessment cannot be prepared, as risk to the water environment is negligible.

7.2 Future Assessments

As outlined in the Environment Agency Guidance (Landfill operators: environmental permits - What to include in your environmental setting and site design report - Guidance - GOV.UK). consideration is to be given to the requirement for additional risk assessments when recovering waste materials. The requirement for additional risk assessments is summarised and outlined below.

7.2.1 Impacts on Amenity Value

Materials under the permitted recovery activities are to be excavated and placed to an engineering specification as part of a wider programme of earthworks. No treatment of the Burnt Shale material such as screening or crushing is proposed as part of the works and receptors are limited based on the extent of the wider Cambois Campus site and its generally industrial setting (see Table 2-1).

Construction controls are already in place as part of the Construction Environmental Management Plan and the Burnt Shale materials are not considered to pose any risks over and above other materials on site with regards to dust, bioaerosols, visible emissions or litter. Following the recovery activity, once the site is developed for the proposed end use, Burnt Shale materials will be capped and no pathway to any amenity receptors exist. A specific Amenity Value assessment is not considered to be required.

7.2.2 Gas Migration

As outlined in Section 2.6 a site-specific ground gas assessment concluding a Characteristic Situation 1 for the site has been approved by the local authority as part of the planning process. As Burnt Shale material is not high in organic materials that could be subject to degradation that would be a source of ground gas there is no additional ground gas risk posed by the placement of these materials. No ground gas risk beyond that already undertaken is considered to be required.

7.2.3 Slope Stability Assessment

As outlined in Section 4.4, all Burnt Shale materials are proposed to be placed below ground to an engineering specification with no slopes proposed to be constructed from the materials. A slope stability assessment is not required.

7.2.4 Hydrological / Hydrogeological Risk Assessment

As concluded by this report, there is no residual pollutant linkage to the controlled waters environment from the Burnt Shale materials to any of the identified receptors in the temporary (construction) or permanent case. Without a plausible pathway it is not possible to complete any further tiers of Hydrogeological Risk Assessment.

Drawings

Drawings

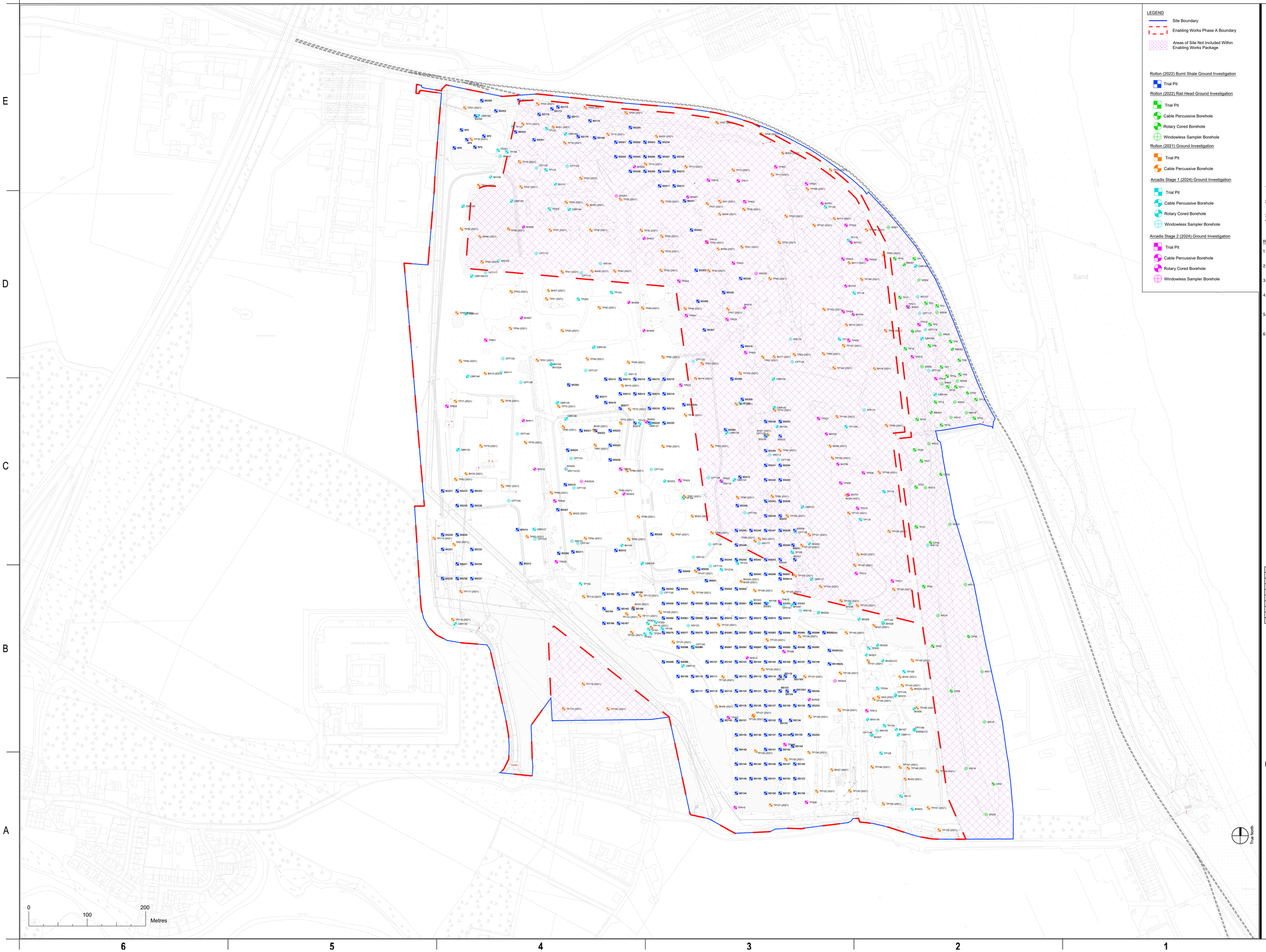
GBR1-DCZZ-XXX-UG-DR-B-01-01 Combined Exploratory Hole Location Plan

GBR1-DCZZ-CDL-STE-XX-DR-B-0013 Geological Cross Sections

GBR1-DCZZ-XXX-UG-DR-B-01-04 Approximate Location and Thickness of Burnt Shale

GBR1-DCZZ-XXX-UG-DR-B-01-03 Water Level Contour Plan and Sections

GBR1-ENA1-XXX-UG-DR-B-01-10 V03 Enabling Works – Phase A. Remediation and Earthworks Strategy -Enabling Works Proposals



LEGEND

- Site Boundary
- Enabling Works Phase A Boundary
- Areas of Site Not Included Within Enabling Works Package

Rolton (2022) Burnt Shale Ground Investigation
- Trial Pit

Rolton (2022) Rail Head Ground Investigation
- Trial Pit
- Cable Percussive Borehole
- Rotary Cored Borehole
- Windowless Sampler Borehole

Rolton (2021) Ground Investigation
- Trial Pit
- Cable Percussive Borehole

Arcadis Stage 1 (2024) Ground Investigation
- Trial Pit
- Cable Percussive Borehole
- Rotary Cored Borehole
- Windowless Sampler Borehole

Arcadis Stage 2 (2024) Ground Investigation
- Trial Pit
- Cable Percussive Borehole
- Rotary Cored Borehole
- Windowless Sampler Borehole

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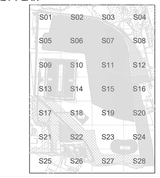
REFERENCES

1. Arcadis (October 2024) Ground Investigation Factual Report - Stage 1. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0007-01.
2. Arcadis (January 2025) Ground Investigation Factual Report - Stage 2. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01.
3. 1st Horizon (21st October 2024). Blyth Topographical & Utility Survey Sheet Overview. Drawing reference: A-B11243-01.
4. Rolton Group Limited (11th August 2022). Burnt Shale Trial Pit Investigations for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014A Rev S2-P03.
5. Rolton Group Limited (1st April 2022). Phase 1 & Preliminary Geo-Environmental Summary for Rail Head Land, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014 Rev S2-P02.
6. Rolton Group Limited (14th May 2021). Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.

Rev	Description	Date	Chk'd	Apr'd
V03	ENABLING WORKS - RIBA STAGE 4	23/05/25	JCh	KM
V02	ENABLING WORKS - RIBA STAGE 3	26/03/25	AL	GK
V01	ISSUED FOR RIBA STAGE 2	22/11/24	CL	KM

DRAWING ISSUES

KEY PLAN



PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

ENABLING WORKS - PHASE A
COMBINED EXPLORATORY HOLE LOCATION PLAN

PROJECT NO: 1043152

DWG. NO: GBR1-DCZZ-XXX-UG-DR-B-01-01

STATUS: ISSUED FOR REVIEW

SCALE @ A0: 1:2000

True North

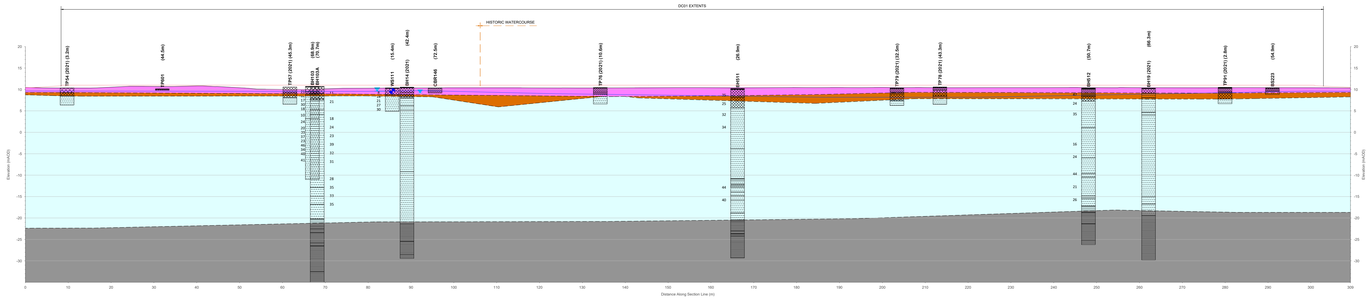
E D C B A

6 5 4 3 2 1

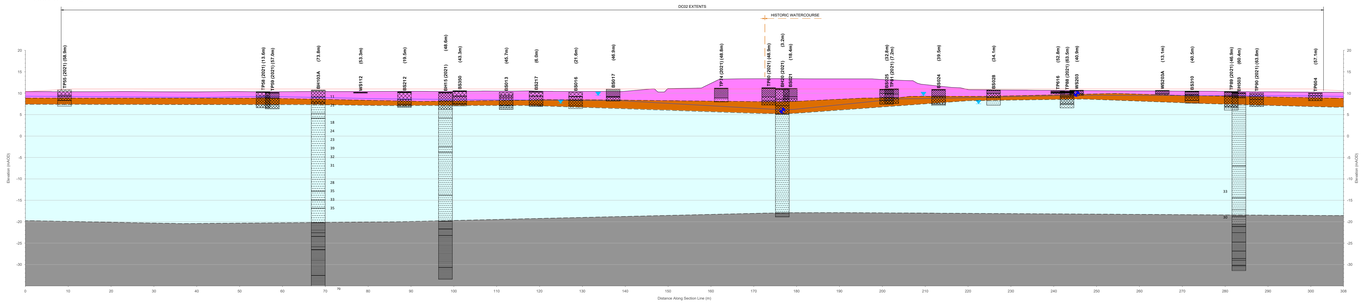
SECTIONS LEGEND

- Sections - Existing Ground
- Sections - Proposed Ground
- Sections - Inferred Geological Boundary
- Sections - Water Level
- Water Strike
- Highest Monitored Water Level
- (Xm) Offset from Section Line
- 14 SPT N Value
- Granular Made Ground
- Cohesive Made Ground
- Alluvium
- Till
- Pennine Middle Coal Measures

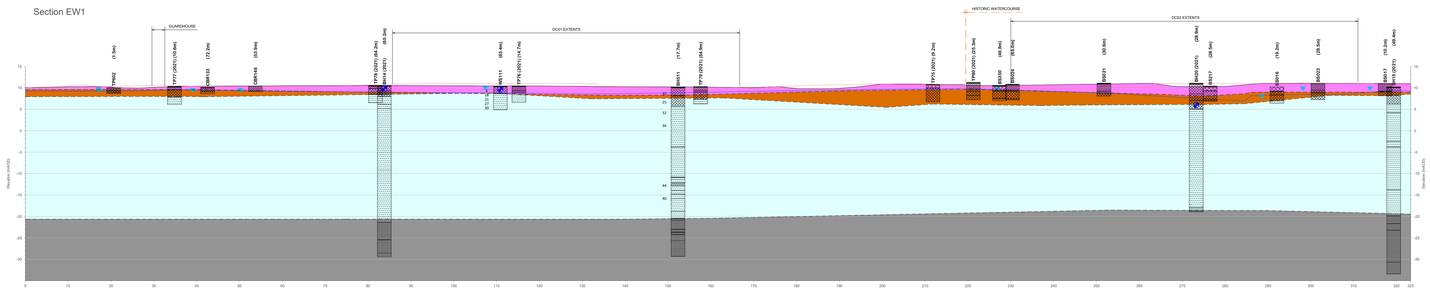
Section NS1



Section NS2



Section EW1

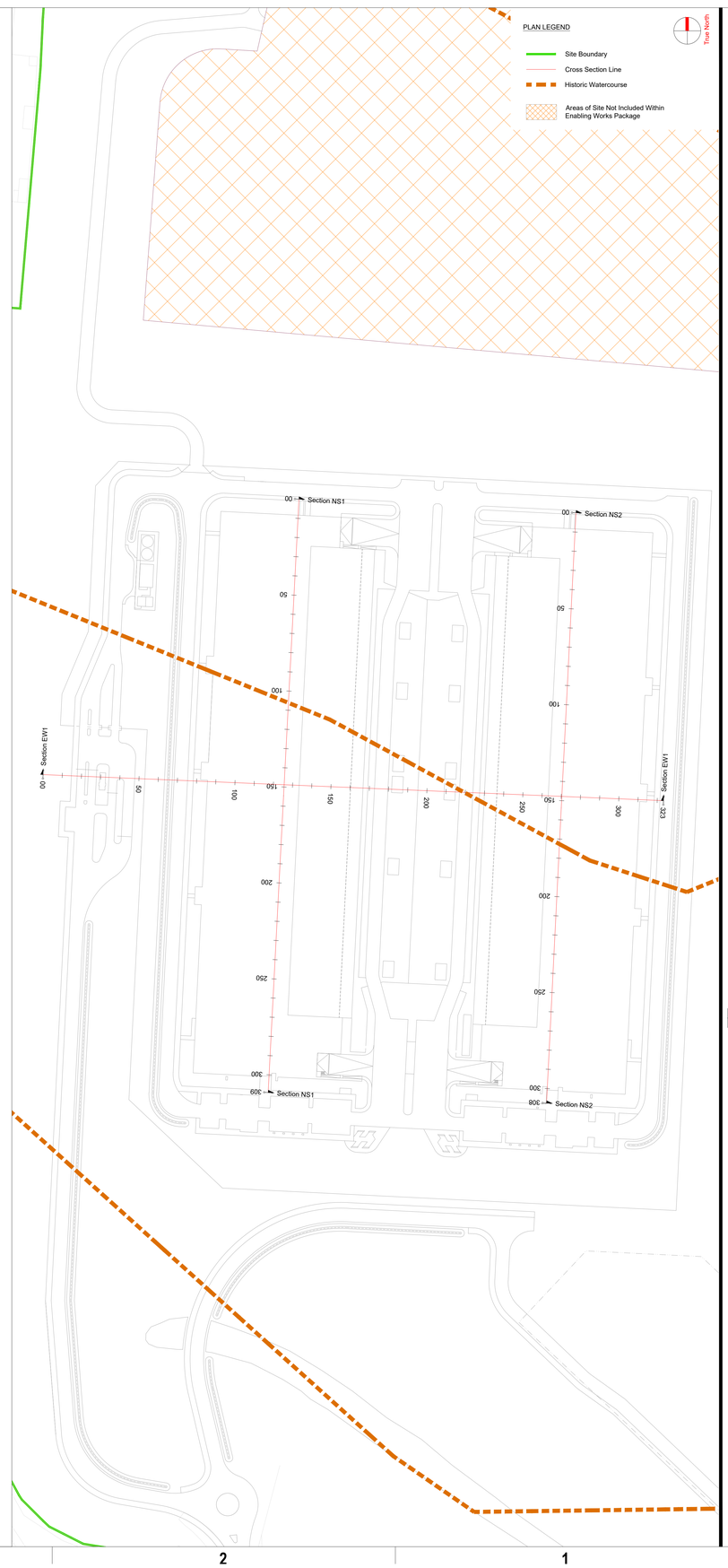


0 100 200 Metres

PLAN LEGEND

- Site Boundary
- Cross Section Line
- Historic Watercourse
- Areas of Site Not Included Within Enabling Works Package

True North



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The ground conditions illustrated represent the site prior to the commencement of Phase A enabling works.

These sections are to be reviewed in conjunction with the Cundall (2025), Ground Conditions Report, reference GBR1-DCZZ-CDL-STE-XX-RP-B-0-0013.

Although alluvium deposits are not shown on the section drawings, their location and extent can be found in Cundall (2025), Contour Plan - Top of Till, reference GBR1-DCZZ-CDL-STE-XX-DR-B-0010.

In the location of historic watercourses, localised and deeper made ground deposits may be present.

Rev	Description	Date	Chk'd	Apr'd
V01	RIBA3 ISSUE	29/08/25	RDavidson	RDavidson

DRAWING ISSUES

KEY PLAN

PROJECT

PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

GEOLOGICAL CROSS SECTIONS

PROJECT NO:

1043152

DWG. NO:

GBR1-DCZZ-CDL-STE-XX-DR-B-0013

STATUS:

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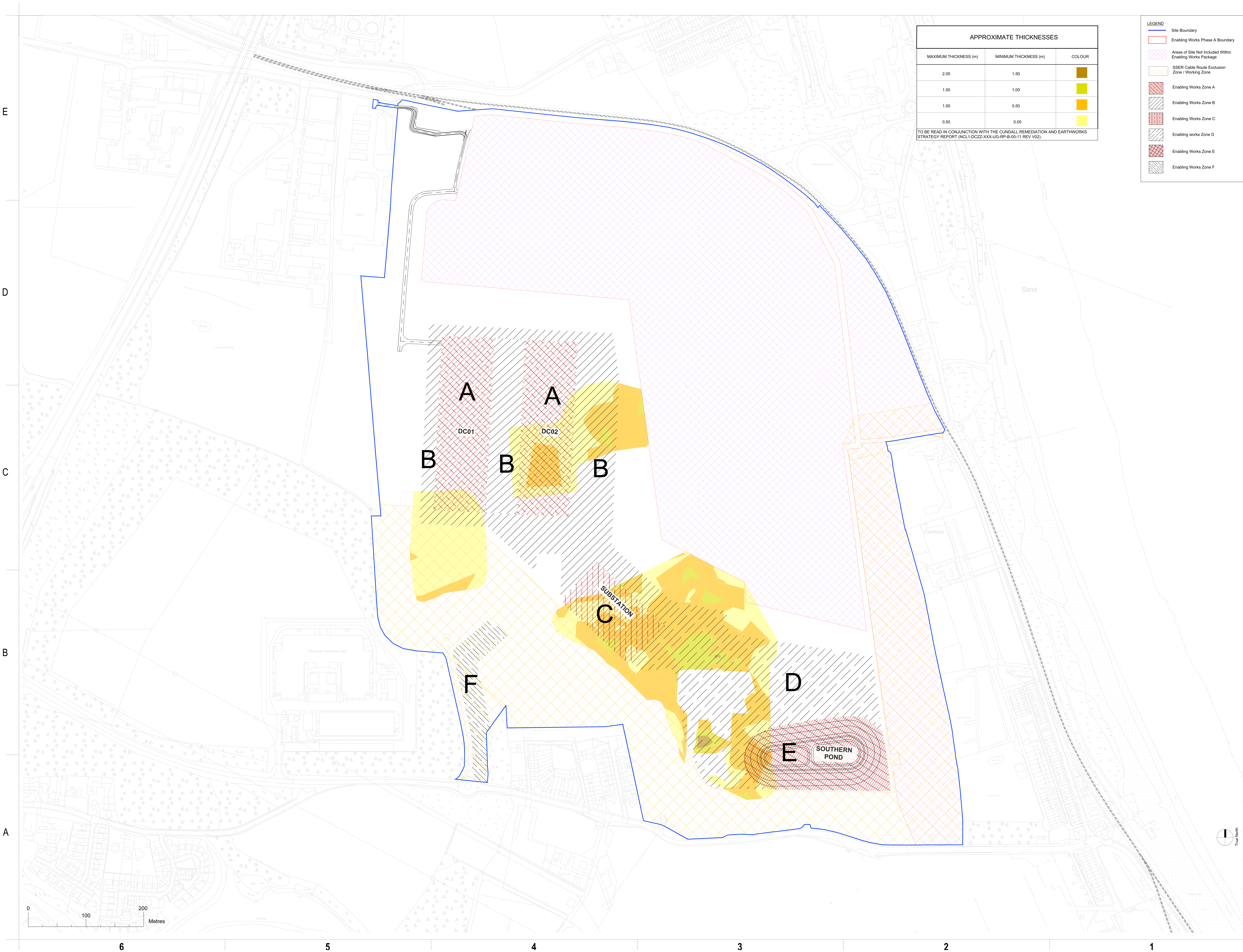
1:2000

E D C B A

6 5 4 3 2 1



APPROXIMATE THICKNESSES		
MAXIMUM THICKNESS (m)	MINIMUM THICKNESS (m)	COLOUR
2.00	1.50	
1.50	1.00	
1.00	0.50	
0.50	0.00	

TO BE READ IN CONJUNCTION WITH THE CUNDALL REMEDIATION AND EARTHWORKS STRATEGY REPORT (NCL1-DCZZ-XXX-UG-RP-B-00-11 REV V02).

LEGEND

- Site Boundary
- Enabling Works Phase A Boundary
- Areas of Site Not Included Within Enabling Works Package
- SSER Cable Route Exclusion Zone / Working Zone
- Enabling Works Zone A
- Enabling Works Zone B
- Enabling Works Zone C
- Enabling works Zone D
- Enabling Works Zone E
- Enabling Works Zone F

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NOTES

1. Ground conditions have been interpolated between exploratory hole locations and ground conditions may vary between locations.
2. Bulk earthworks have also been undertaken as part of a previous development in 2021 (post Rolton Ground Investigations) and these are likely to have resulted in the movement and / or relocation of material as part of those works. This operation may result in local variation of ground conditions across the site.
3. This drawing presents the extent and thickness of any mention of burnt shale in the borehole logs or the extent and thickness of material classed as 'burnt shale'.

Ground conditions are based on data obtained from the following ground investigations:

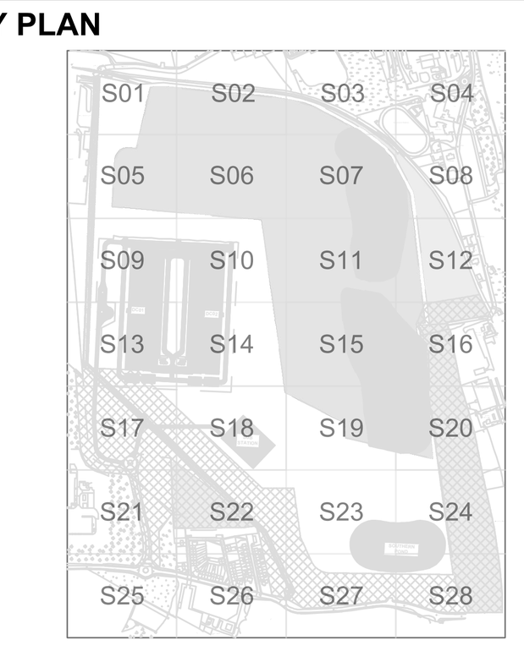
- Rolton Group Limited (11th August 2022). Burnt Shale Trial Pit Investigations for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014A Rev S2-P03.
- Rolton Group Limited (14th May 2021). Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.
- Arcadis (January 2025) Ground Investigation Factual Report - Stage 1. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0007-01.
- Arcadis (January 2025) Ground Investigation Factual Report - Stage 2. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01.

This drawing was previously issued as 'Preliminary Earthworks Strategy - Approximate Volume of Burnt Shale' (Rev V01) and has now been changed to 'Earthworks Strategy - Approximate Location and Thickness of Burnt Shale'.

Rev	Description	Date	Chk'd	Apr'd
V04	ENABLING WORKS - RIBA STAGE 4	01/08/25	Checked	Approved
V03	ENABLING WORKS - RIBA STAGE 4	23/05/25	CL	GK
V02	ENABLING WORKS - RIBA STAGE 3	26/03/25	AL	GK
V01	ISSUED FOR RIBA STAGE 2	22/11/24	CL	KM

DRAWING ISSUES

KEY PLAN



PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

ENABLING WORKS - PHASE A
EARTHWORKS STRATEGY - APPROXIMATE
LOCATION AND THICKNESS OF BURNT SHALE

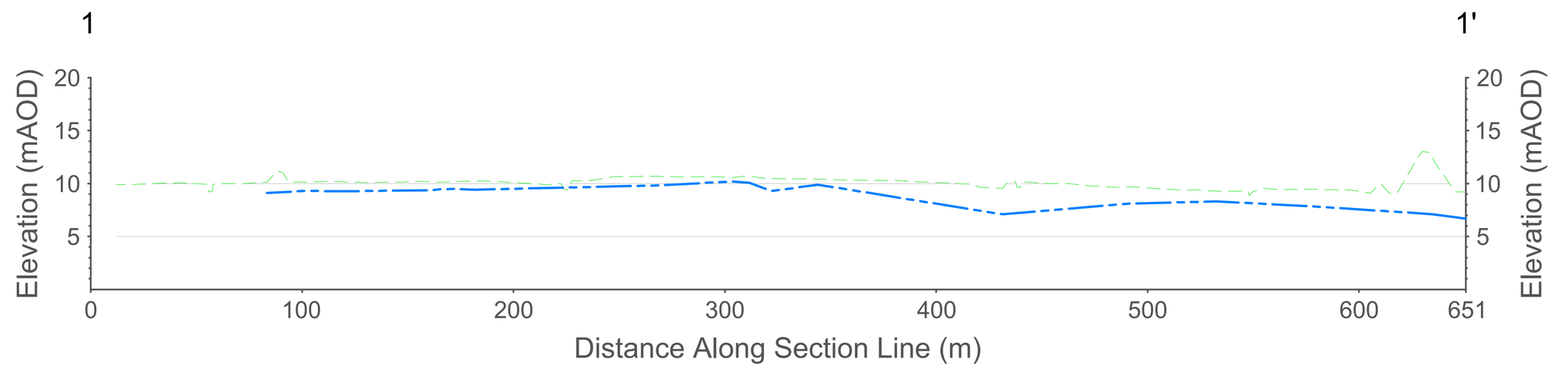
PROJECT NO: 1043152

DWG. NO: GBR1-DCZZ-XXX-UG-DR-B-01-04

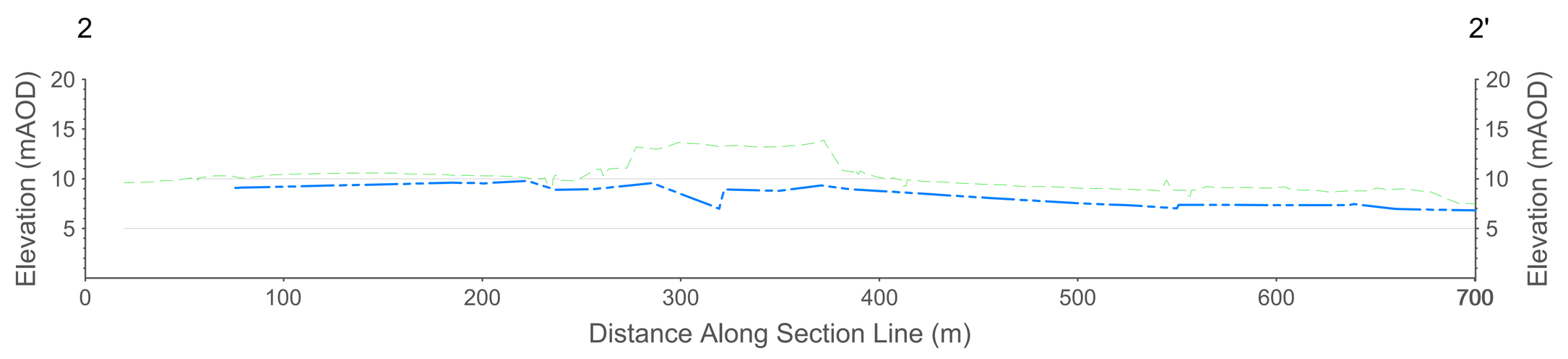
STATUS: ISSUED FOR REVIEW

SCALE @ A0: 1:2000

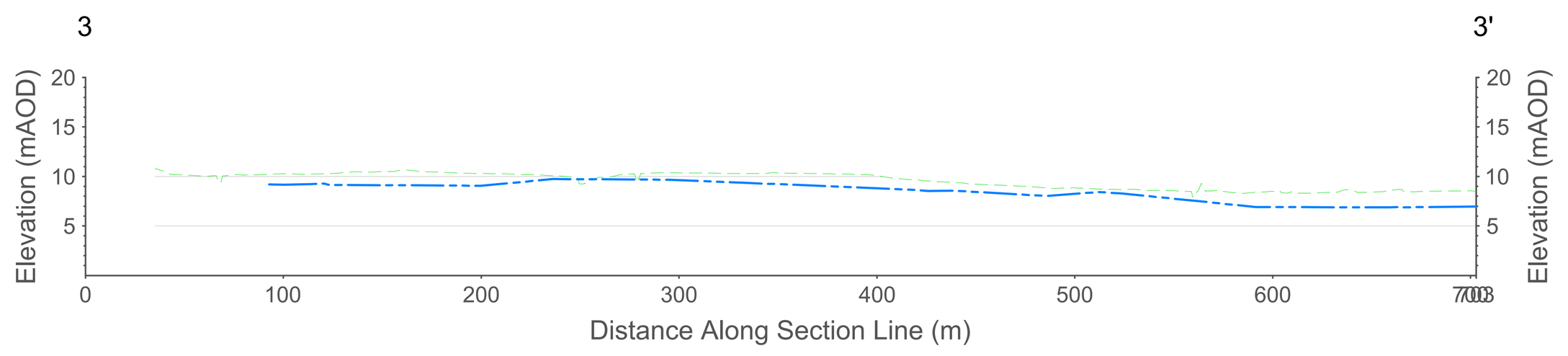
Section 1-1'



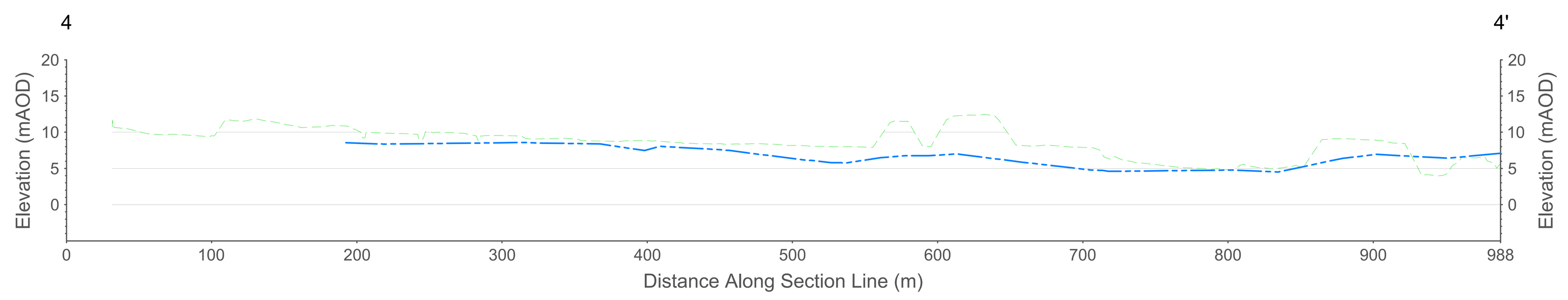
Section 2-2'



Section 3-3'



Section 4-4'



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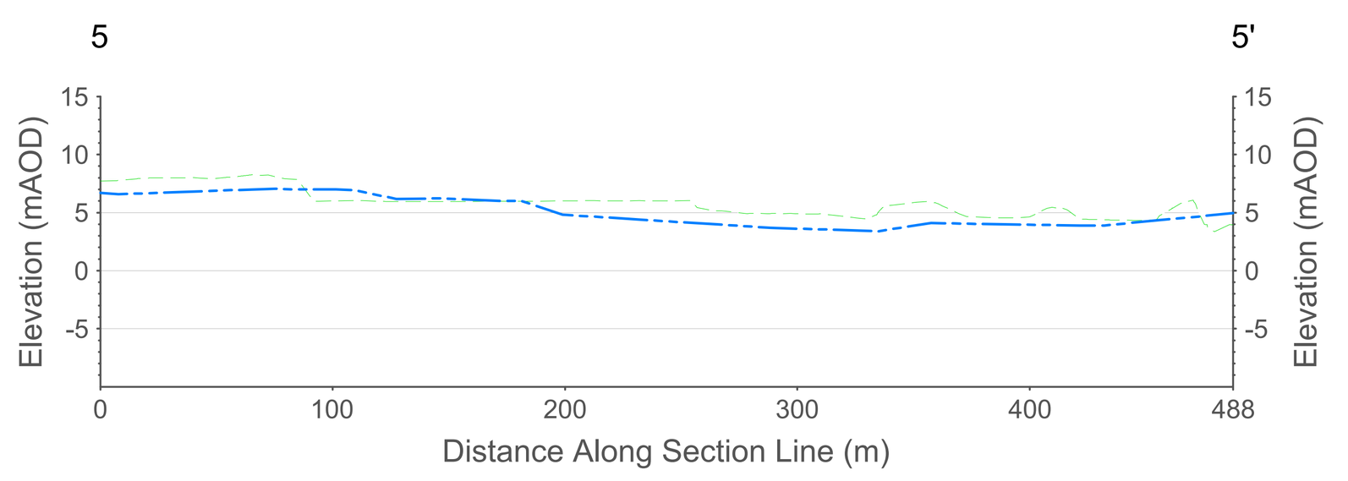

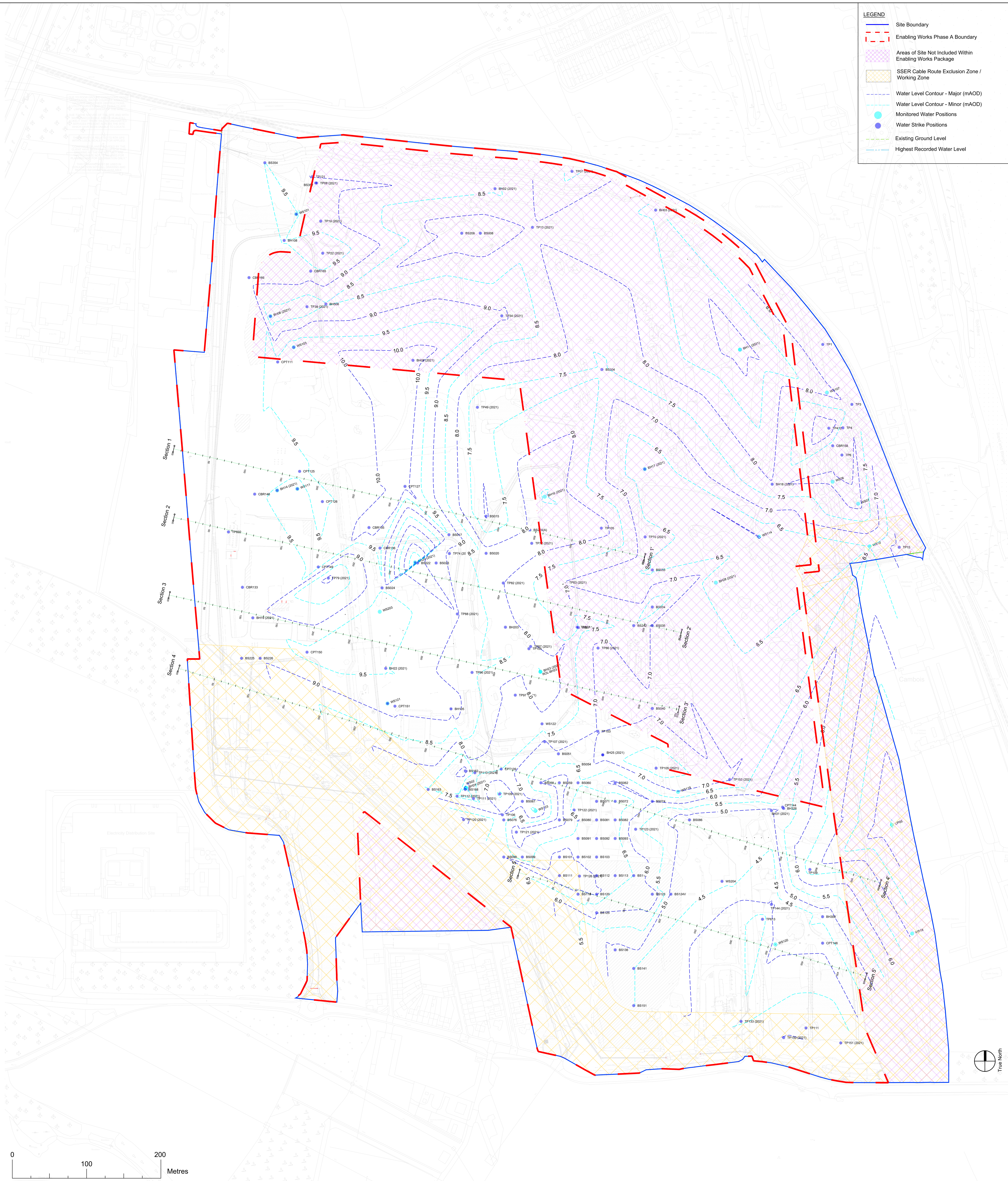

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NOTES

Water levels shown on this drawing are based on the following data:

- Data from water monitoring installations (where the response zones were within Made Ground or within Made Ground / Till deposits). This plan shows the shallowest monitored level.
- Data from water strikes recorded during the intrusive investigations. Only shallow strikes have been included on this drawing (2.5mAOD or shallower) given the purpose of this drawing is to provide information for the enabling works package.

Water data is based on the following ground investigations:

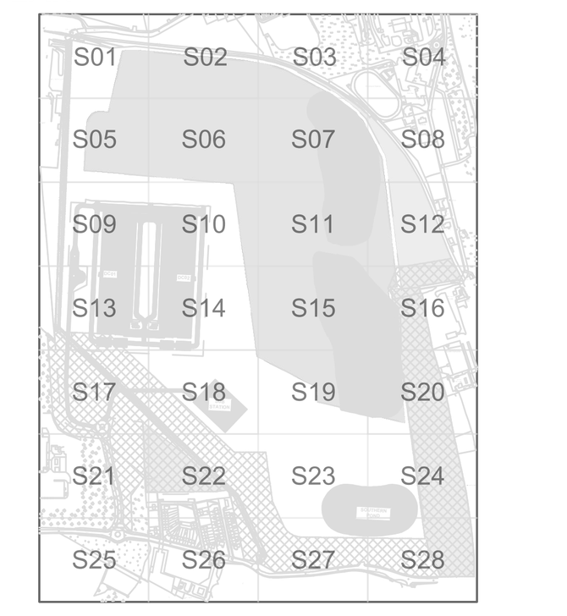
1. Arcadis (October 2024) Ground Investigation Factual Report - Stage 1. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0007-01.
2. Arcadis (January 2025) Ground Investigation Factual Report - Stage 2. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01.
3. 1st Horizon (21st October 2024). Blyth Topographical & Utility Survey Sheet Overview. Drawing reference: A-B11243-01.
4. Rolton Group Limited (4th April 2024). Gas and Groundwater Monitoring Summary Report – Project Wind. Report reference: 210114-RGL-XX-XX-RP-G-0002 Rev S2-P01.
5. Rolton Group Limited (1st April 2022). Phase 1 & Preliminary Geo-Environmental Summary for Rail Head Land, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014 Rev S2-P02.
6. Rolton Group Limited (14th May 2021). Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.

This drawing was previously issued as 'Water Contour Plan' (Rev V01) and has now been changed to 'Water Level Contour Plan and Sections'.

Rev	Description	Date	Chk'd	Apr'd
V03	ENABLING WORKS - RIBA STAGE 4	23/05/25	Checked	Approved
V02	ENABLING WORKS - RIBA STAGE 3	26/03/25	CL	KM
V01	ISSUED FOR RIBA STAGE 2	22/11/24	CL	KM

DRAWING ISSUES

KEY PLAN



PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

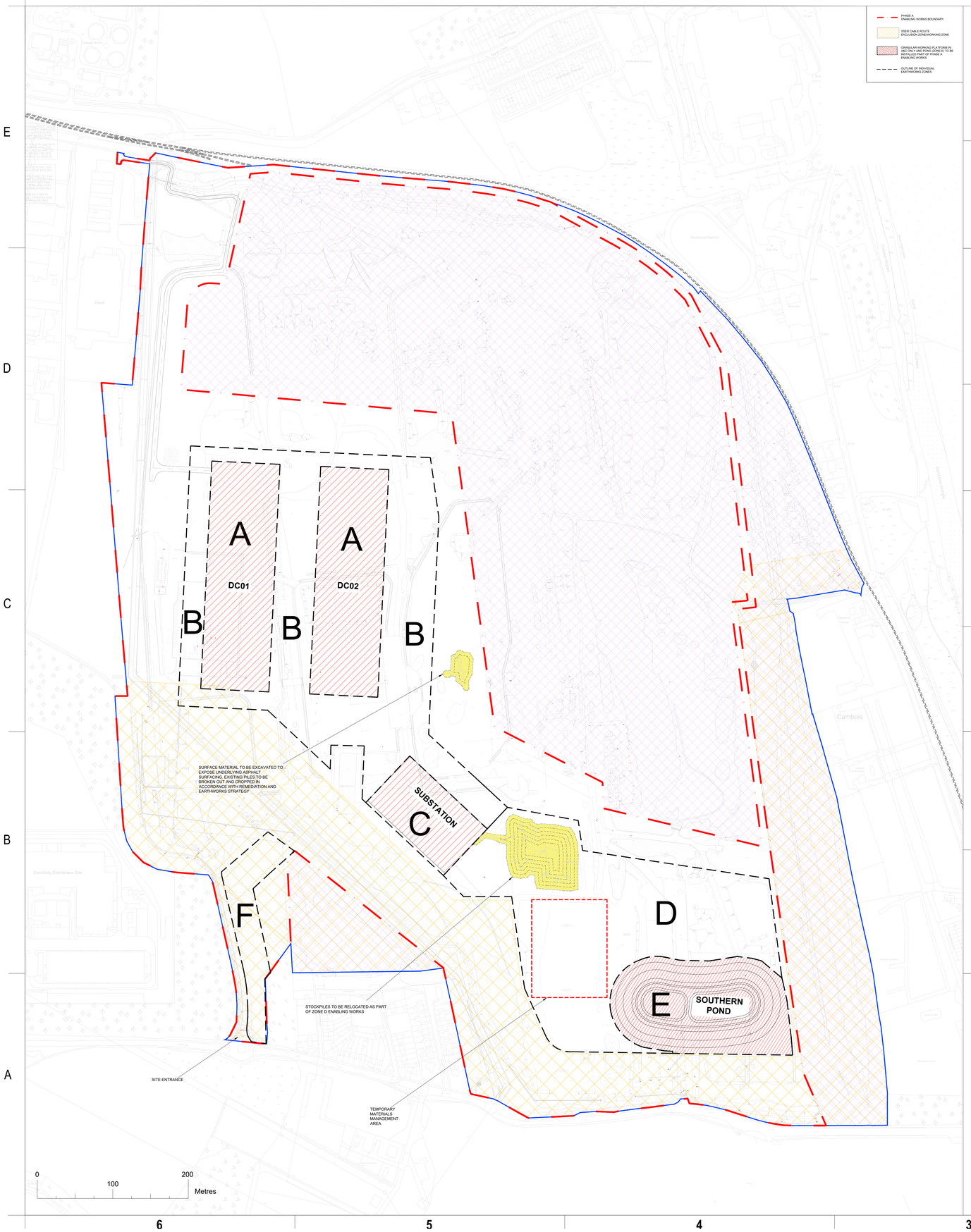
DWG. TITLE
ENABLING WORKS - PHASE A
WATER LEVEL CONTOUR PLAN AND SECTIONS

PROJECT NO:
1043152

DWG. NO:
GBR1-DCZZ-XXX-UG-DR-B-01-03

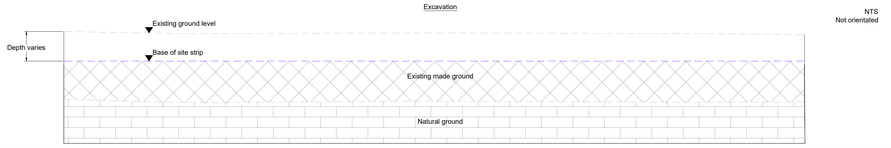
STATUS:
ISSUED FOR REVIEW

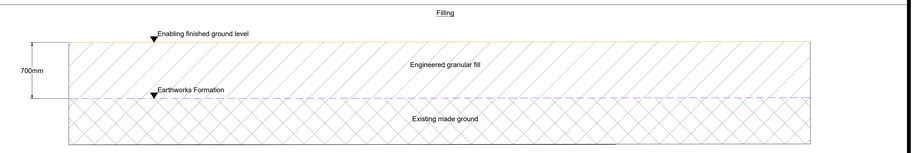
SCALE @ A0:
1:2000



Zone A - Typical Cross Section View

NTS
Not orientated





Zone B - Typical Cross Section View

NTS
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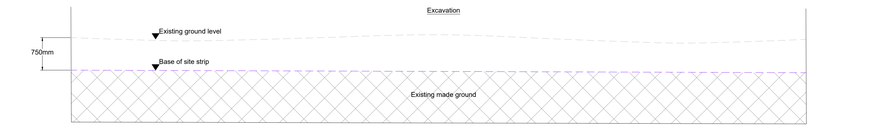
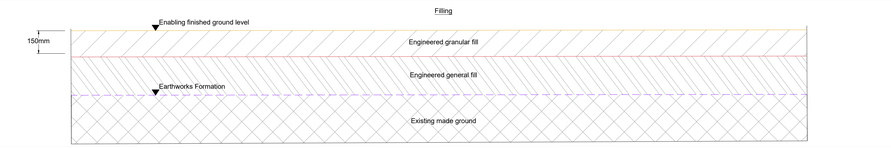
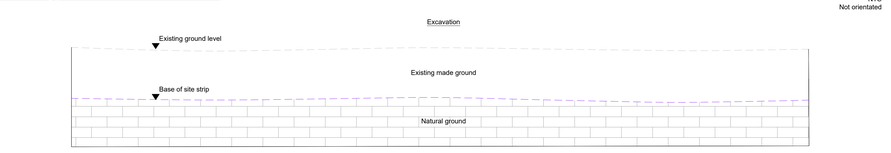
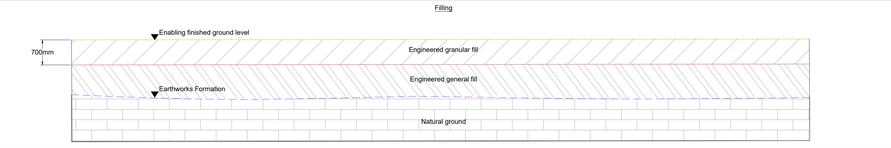




Zone C - Typical Cross Section View

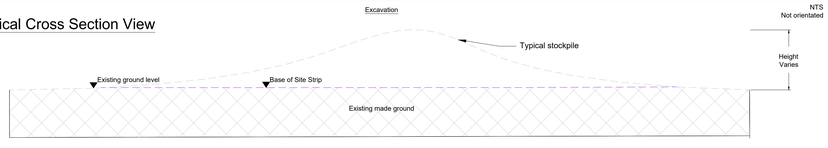
NTS
Not orientated

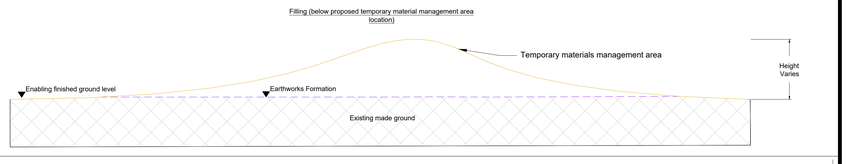




Zone D - Typical Cross Section View

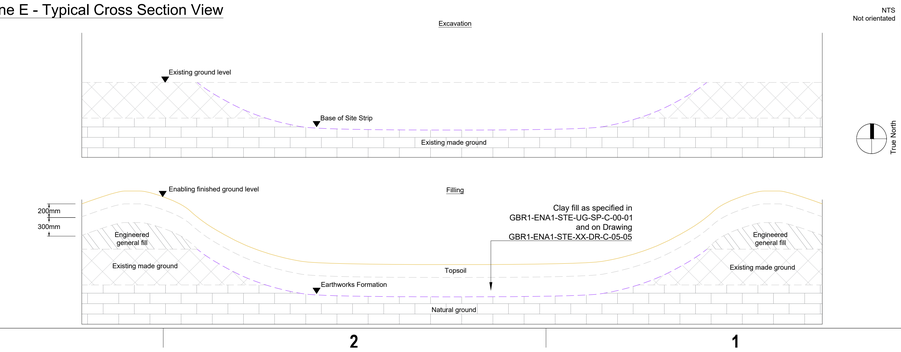
NTS
Not orientated





Zone E - Typical Cross Section View

NTS
Not orientated



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NOTES

For further detail on the Remedial and Earthworks Strategy, this drawing should be read in conjunction with the following Cundall reports:

- Ground Conditions Summary Report NCL1-DCZZ-XXX-UG-RP-B-00-01 Rev V03)
- Remediation and Earthworks Strategy (NCL1-DCZZ-XXX-UG-RP-B-00-011 Rev V02).

This drawing shall be read in conjuction with the following Cundall Civil Engineering Drawings:

- Enabling Works - Phase 1 - Site Strip Levels GBR1-ENA1-STE-XX-DR-C-01-20
- Enabling Works - Phase 1 - Formation Levels GBR1-ENA1-STE-XX-DR-C-01-21
- Enabling Works - Phase 1 - Enabling Works Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-22
- Enabling Works - Phase 1 - Existing Ground Level to Site Strip GBR1-ENA1-STE-XX-DR-C-01-24
- Enabling Works - Phase 1 - Site Strip to Formation GBR1-ENA1-STE-XX-DR-C-01-25
- Enabling Works - Phase 1 - Formation to Enabling Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-26
- Enabling Works - Phase 1 - Existing to Enabling Finished Ground Level GBR1-ENA1-STE-XX-DR-C-01-27

1. Zone F - A typical cross section view has not been provided for Zone F. Enabling works will comprise the removal of vegetation, excavation of the soil mounds and no filling will be required.

Refer to drawing GBR1-ENA1-STE-XX-DR-C-01-36 for works that will be undertaken within SSER corridor and shall be discussed and agreed with SSER.

Rev	Description	Date	Chk'd	Apr'd
V02	ENABLING WORKS - RIBA STAGE 4	23/05/25	(C)Checked	(C)Approved
V01	ENABLING WORKS - RIBA STAGE 3	26/03/25	MG	KM

DRAWING ISSUES

KEY PLAN

PROJECT

QTS PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

ENABLING WORKS - PHASE A
REMEDIATION AND EARTHWORKS STRATEGY - ENABLING WORKS PROPOSALS

PROJECT NO:

1043152

DWG. NO:

GBR1-ENA1-XXX-UG-DR-B-01-10

STATUS:

ISSUED FOR REVIEW

SCALE @ A0:

AS SHOWN

Appendices

Appendices

Appendix A CSM

Source	Pathway	Receptor	Potential Risk
Contaminated soils associated with previous use as a coal stocking yard, railway lines and sidings, fuel storage, workshops and factories, infilled ground.	Dermal Contact and Ingestion Particulate / Fibre Inhalation Vapour Inhalation	Human health – Future commercial end-users	**Low - Moderate**
	Soil Leaching / Aqueous Migration	Surface water – Maw Burn and Cow Gut	**Low**
PFA stockpiles	Dermal contact and ingestion Particulate / fibre inhalation Vapour inhalation	Human health – Future commercial end-users	**Low**
	Soil Leaching / Aqueous Migration	Surface water – Maw Burn and Cow Gut	**Low**
Ground gas – Made Ground, organic alluvial soils and coal seams	Vapour inhalation	Human health – Future commercial end-users	**Low**
	Structural damage owing to explosion of combustible gas	Buildings / enclosed structures	**Low**
Contaminated perched groundwater	Dermal contact Vapour inhalation	Human health – Future commercial end-users	**Low**
	Soil Leaching / Aqueous Migration	Surface water – Maw Burn and Cow Gut	**Low**
Chemically aggressive Made Ground, natural soils, rock and groundwater	Direct contact with buried concrete (e.g. piled foundations)	Buildings / structures	**Moderate**
Contaminated soil – phytotoxic contaminants	Vegetation root uptake	Future landscaping	**Moderate**
Organic contamination	Impacts to drinking water quality	Future water supply pipes	**Moderate**

Table A-1: Table 8-1 from Arcadis GQRA (Reference 23)

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