

MINERAL RESOURCE ASSESSMENT

HyHaul Swansea

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- Drawing 3** MSAs DWG-001
- Drawing 4** Initial Buffer Plan DWG-002
- Drawing 5** Topographical Survey 989/4907/1B

1 INTRODUCTION

1.1 Preamble

- 1.1.1 RPS Consulting Services Ltd (RPS) was commissioned by RPS Planning on behalf of Marubeni to produce a Mineral Resource Assessment (MRA) in support of a planning application for a proposed green hydrogen refuelling project in Swansea. A redline boundary plan is presented in Drawing 1 (ref. Location Plan 1463 PL001) and current indicative site masterplan in Drawing 2 (ref. PLO11 Proposed Site Plan). The site is herein referred to as the Application Site.
- 1.1.2 It is understood that Marubeni are to enter into a long-term lease of the Application Site, owned by Swansea University, to develop a hydrogen refuelling facility in support of key government funded large scale transportation trials, including providing fuel for the HyHaul Mobility Project along the M4 corridor.
- 1.1.3 The Application Site is understood to support the Swansea University led Gateway 2 Zero (G20) Project, after being gifted to the University by the Welsh Government in 2019, and to be used for promoting research projects with respects to decarbonisation.

1.2 Development Details

- 1.2.1 As illustrated within Drawing 2, the proposed hydrogen refuelling facility is to comprise a Hydrogen Buffer Storage (500 and 900 bar), Heavy Goods Vehicle (HGV), bus and car refuelling dispensers (350 bar and 700 bar), tube trailer unloading, hardstanding and demountable/containerised storage and welfare buildings, bin store, cycle shelter, fire walls and boundaries fences and gates and ancillary infrastructure (Chiller, high pressure compressors, air compressor, valve panel, nitrogen cylinders, electrical power supply and critical spares storage).
- 1.2.2 It is understood that no hydrogen will be produced as part of the proposed development at the Application Site, but due to its location, will be supplied with hydrogen produced at nearby facilities such as University of South Wales Hydrogen Centre and HyBont Green Hydrogen production facility in Bridgend should that scheme secure planning permission.

1.3 Report Structure

- 1.3.1 The remainder of this report presents a MRA for the Application Site.
- 1.3.2 The report structure is as follows:
- *Section 2: General Approach* – Provides a summary of the general approach adopted to deliver the agreed scope of works including a summary of all key data sources used in the MRA.
 - *Section 3: Review of Mineral Planning Policy* – Provides a summary of the National, Regional and Local planning policy context in relation to minerals. It also provides commentary on any supplementary planning documents relating to minerals.
 - *Section 4: Site Setting* – Provides a summary of key aspects of the site setting, including a description of the geological and hydrogeological context for the assessment. This section describes the mineral designations relevant to the Application Site.
 - *Section 5: Mineral Resource Assessment* – Provides the mineral resource assessment for the Application Site and likely constraints on mineral extraction and an evaluation against mineral planning policies.

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- *Section 6: Summary and Conclusions* – Summary of mineral resource assessment and evaluation of potential constraints for development resulting from criteria outlined in planning context applicable to the Application Site.

2 GENERAL APPROACH

2.1 Overview

- 2.1.1 This MRA utilises available published geological and site setting information to evaluate the constraint that mineral resources, present on the Application Site, are likely to place on the proposed development given local mineral planning policy. The MRA provides a resource assessment that defines the extent of viable (extractable) mineral resources present on the Application Site, principally in relation to designated Mineral Safeguarding Areas (MSAs) and Mineral Consultation Areas (MCAs) defined by the Mineral Planning Authority (MPA) of Neath Port Talbot County Borough Council (NPTCBC). The available mineral resource is then evaluated against the mineral planning policy for the Application Site, with the viability and practicability of extraction and practicability of prior extraction of the safeguarded resources considered.

2.2 Data Sources

- 2.2.1 The geological setting for the Application Site has been determined from a review of publicly available data sources that include:
- British Geological Survey (BGS) Geoindex Onshore;
 - BGS 1:10,000 scale drift and solid map, Sheet SS79SW (1970);
 - BGS 1:50,000 scale drift and solid map, Sheet 247 'Swansea' (2011); and
 - Coal Authority Interactive Map Viewer.
- 2.2.2 In addition to material published by the BGS, the following mineral planning documentation produced by the MPA at NPTCBC been reviewed. This includes:
- Neath Port Talbot County Borough Council Local Development Plan 2011 – 2026 (adopted January 2016); and
 - Neath Port Talbot County Borough Council Local Development Plan 2011 – 2026 Proposals Map (adopted January 2016).
- 2.2.3 The following documents of national legislation have been reviewed relating to mineral planning policies:
- Welsh Government Planning Policy Wales (PPW) Edition 12 (February 2024); and
 - Minerals Technical Advice Note (MTAN) Wales 1: Aggregates (March 2004).
- 2.2.4 RPS has also been commissioned to undertake a Desk Top Study of the Application Site and this should be read in conjunction with this MRA. The general environmental setting for the Application Site has been obtained from the RPS Desk Top Study report (ref. 794-PLN-WWP-00294 HyHaul Swansea DTS & PRA V1 R0).
- 2.2.5 In the absence of any site investigation reports provided by the Client or previous intrusive investigation by RPS, published borehole logs held by BGS for the Application Site and / or nearby ground investigations made available on the NPTCBC planning portal website, have been reviewed to assist with determination of the extent and thickness of identified mineral reserves.

3 REVIEW OF MINERAL PLANNING POLICY

3.1 Mineral Planning Context

- 3.1.1 For Wales, the key national planning policies for minerals are set out in the Planning Policy Wales (PPW), updated in February 2024, and is supported by a series of Technical Advice Notes (TAN) to provide a national planning policy framework for Wales. The primary objective of the PPW is to ensure that the planning system contributes towards delivering sustainable development.
- 3.1.2 One of the key aspects of the PPW is ensuring that mineral resources which may be needed in the future are safeguarded and the adequate supply of a diverse range of minerals is available over a long-term period. The document also recognises the productive and enterprising contribution presented by locally available minerals in reduction of energy from transport and in the provision of economic infrastructure from land use.
- 3.1.3 The PPW discourages the use of energy minerals for power generation, e.g. fossil fuels such as coal, in favour of reduction of greenhouse gas emissions and promotion of decarbonisation through encouragement of alternative energy sources. It is emphasised that potential construction related minerals are particularly important to Wales and a ‘steady and adequate supply of mineral with the protection of the amenity and the environment’ is necessary.
- 3.1.4 For planning purposes mineral extraction and related development ‘includes all minerals and substances in, on or under land extracted either by underground or surface working’. It is stated in the PPW that the access to mineral resources should be safeguarded by local planning policies to ensure that they are not sterilised by other types of permanent development and identified on relevant Local Development Plan (LDP) maps. Safeguarding indicates that the location and quality of the mineral is known and the environmental constraints associated with extraction including potential for extraction of mineral resources prior to undertaking other forms of development have been considered.
- 3.1.5 In the context of local planning, the Application Site is situated within the NPTCBC Local Authority area, which oversees all mineral matters within the county. The principal documents and policies relating to strategic mineral planning within NPTCBC are as follows:
- Neath Port Talbot County Borough Council Local Development Plan 2011 – 2026 (adopted January 2016); and
 - Neath Port Talbot County Borough Council Local Development Plan 2011 – 2026 Proposals Map (adopted January 2016).

3.2 Neath Port Talbot County Borough Council Local Development Plan 2011 – 2026

- 3.2.1 This document represents the currently adopted Local Development Plan (LDP) (adopted in January 2016).
- 3.2.2 Strategic Policy SP17 (*Minerals*) is the key policy of the LDP for setting the context to mineral safeguarding and non-mineral development, stating:
- “A proportionate contribution to meeting national, regional and local demand for a continuous supply of minerals will be made while balancing the impact of development on the environment and communities. This will be achieved by:*
- 1. Maintaining a minimum supply of aggregate throughout the Plan period;*
 - 2. Safeguarding identified resources of coal, hard rock and sand and gravel;*

3. *Promoting the efficient use of aggregates and encouraging the maximum use of alternative materials before the use of raw aggregate;*
4. *Ensuring that mineral development will not have an unacceptable impact on the environment and amenity of local residents;*
5. *Minimising the conflict between sensitive land uses and mineral operations by identifying buffer zones around mineral sites and protection zones around settlements.”*

3.2.3 Underpinning SP17 are a number of mineral policies that seek to fulfil the objectives of SP17. The LDP have defined Mineral Safeguarding Areas (MSAs) to implement the above strategic policy, and define the key mineral planning policy related to MSAs, Policy M1 (*Development in Mineral Safeguarding Areas*) which states the following:

“Development proposals within mineral safeguarding areas will only be permitted where it can be demonstrated that:

1. *The mineral concerned is no longer of any value or potential value; or*
2. *The mineral can be extracted satisfactorily prior to the development taking place; or*
3. *In the case of temporary development, it can be implemented and the site restored within the timescale that the mineral is likely to be needed; or*
4. *There is an overriding need for the development; or*
5. *The scale and location of the development would have no significant impact on the possible working of the resource.”*

3.2.4 Policy M1 seeks to ensure that appropriate weight is accorded to the prior extraction of minerals which would otherwise be sterilised by built / non-mineral development. The thresholds outlined in this policy will be used to assess against as part of this MRA.

3.2.5 An extract of the MSAs relevant to the Application Site and wider area, as defined by NPTCBC, is presented in Drawing 3 (ref. DWG-001). The Application Site falls partially within a Coal Resource MSA, and predominantly within a Category 1 Sand and Gravel MSA.

3.2.6 The Application Site also falls within an existing employment area. In line with Policy EC2 (*Existing Employment Area*) of the NPTCBC LDP, the Application Site falls within the Fabian Way employment site (EC2/1). Policy EC 3 (Employment Area Uses) states that:

“Within allocated and existing employment areas, unless otherwise specified and where appropriate, uses will be restricted as follows:

- *Uses within classes B1, B2 and B8;*
- *Ancillary facilities or services which support and complement the wider role and function of the primary employment use;*
- *Commercial services unrelated to class B.*

Developments will be required to demonstrate that proposals do not cause any adverse impacts on the overall function of the employment area and neighbouring commercial and residential properties, the proposal can be sustainably justified in this location and is appropriate in scale and form to the role and function of the employment area.”

3.2.7 The Application Site is understood to have been gifted to Swansea University in support of the Gateway 2 Zero (G20) Project and the land is to be used for promoting decarbonisation research projects. It is considered that the proposed hydrogen refuelling facility meets the criteria set out in Policy EC 3. Mineral extraction is not a Class B land use category and it is not considered that mineral extraction at the Application Site would be feasible where there are critical timelines for delivery of the HyHaul scheme.

4 SITE SETTING

4.1 General Site Setting

- 4.1.1 The Application Site comprises undeveloped land to the east of the Amazon Swansea distribution centre, and directly south and south-west of a self-storage centre (Dainton). The Application Site is centred at National Grid Coordinates 271525 E, 193506 N. To the south is the A483 roundabout, with connections to the B4290, A483 dual carriageway and the M4 motorway.
- 4.1.2 The Application Site is bounded by roads to the east and west, with rows of trees on the north-eastern and south-western borders, creating a physical buffer between the Application Site and any adjoining land. Access to the Application Site is gained from a roundabout off Ffordd Amazon leading to the A483.
- 4.1.3 Immediately beyond Ffordd Amazon to the west is a Public Rights of Way (PRoW) Route Footpath (12/271).
- 4.1.4 The majority of the Application Site comprises poor, semi-improved neutral grassland with a localised area of dense scrub in the west.

4.2 Hydrology and Hydrogeology

- 4.2.1 The most significant nearest surface water feature of note is the River Neath which runs approximately 320 m to the south of the Application Site, and eventually connects to Swansea Bay.
- 4.2.2 The Blown Sands and underlying South Wales Upper and Middle Coal Measures Formations are designated Secondary A Aquifers.

4.3 Geological Setting

Regional Geology

- 4.3.1 The regional geological setting for the Application Site has been determined from publicly available data sources of the BGS, including 1:50,000 (sheet map 247) and 1:10,000 mapping (SS79SW) and is summarised in Table 1 and Figure 1 below.

Table 1 – Regional Geology

Strata	Description	Approximate Thickness (m)
Landscaped Ground	Artificially modified ground whereby the land surface has been extensively remodelled	-
Blown Sand	Aeolian sands, typically fine to coarse grained	Up to 40 m**
Alluvium*	Typically comprises clay and silt	
Older Coastal Zone Deposits	Typically comprises clay, silt, sand and peat (including 'submerged forest')	
Glacial Till	Typically comprises sand and gravel in a clay / silt matrix	
South Wales Upper Coal Measures Formation	Typically comprises grey coal-bearing mudstones/siltstones with seatearths and minor grey, quartz-rich sandstones, coals and ironstones	Up to 80 m
South Wales Middle Coal Measures Formation	Typically comprises grey (productive) coal-bearing mudstones / siltstones with seatearths and minor sandstones.	Up to 240 m

*Alluvium identified to underlie Blown Sands on available 1:10,000 BGS maps and likely to overlie the Older Coastal Zone Deposits as identified within the 1:50,000 drift map.

**Based on the estimated superficial thicknesses map on Sheet 247.

4.3.2 A cross-section available on sheet map 247 identifying the anticipated superficial cover is also presented as Figure 2.

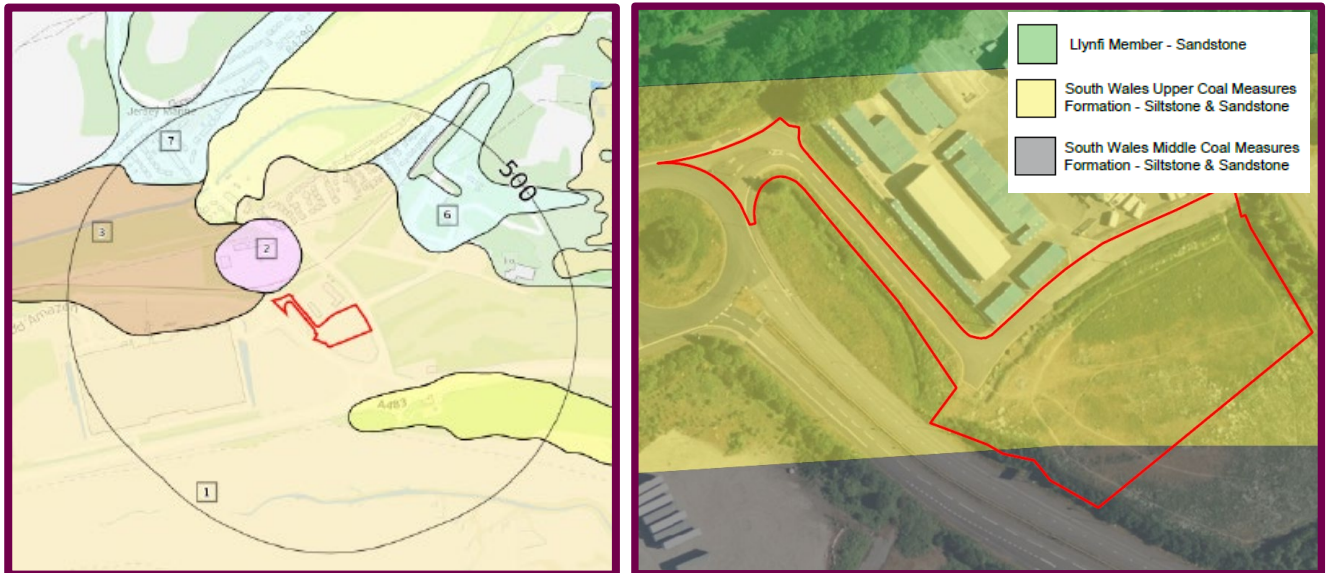


Figure 1 – Extract of Superficial (left) Geology 1:10,000 scale mapping from Groundsure Insights Report ref. GS-9KN-PJR-OAT-YC4) and Bedrock Geology (right)

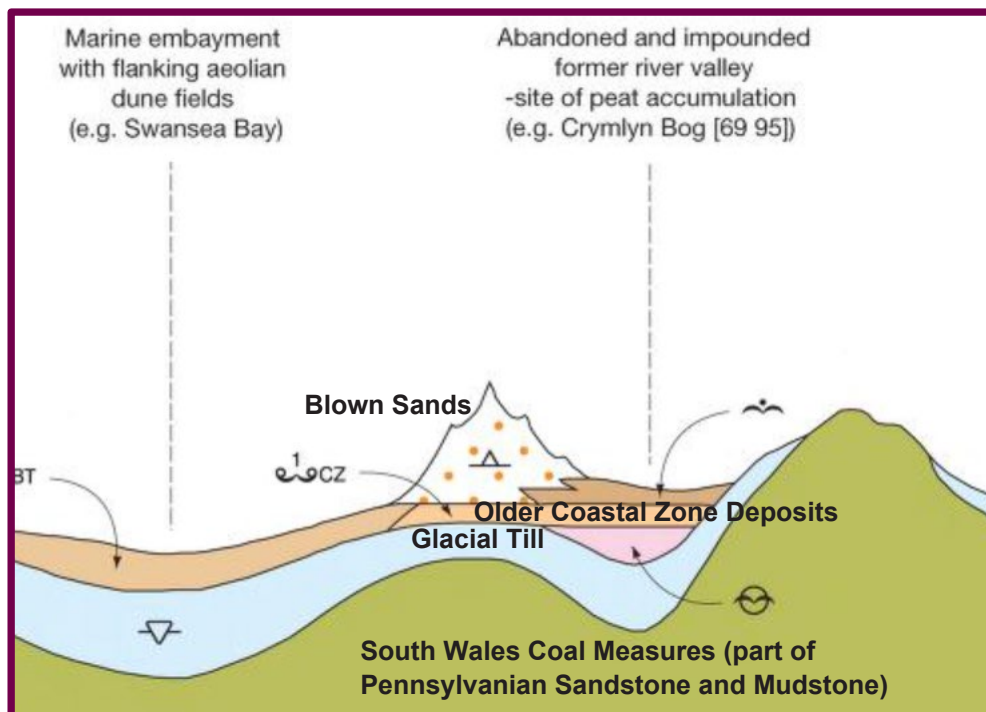


Figure 2 – Extract of cross-section available on 1:50,000 Sheet Map 247 (Contains OS data © Crown Copyright and database right 2020)

Safeguarded Mineral Resource

- 4.3.3 The superficial Blown Sands are considered to constitute the safeguarded Sand and Gravel mineral resource and the Middle Coal Measures Formation is considered to constitute the safeguarded coal resource present on the Application Site, as defined by the 'Safeguarded Category 1 Sand and Gravel Resources' and 'Coal Resource' MSAs presented on Drawing 1.

4.4 Site-Specific Geology

- 4.4.1 The nearest historical BGS borehole record is approximately 1 km from the Application Site. Given the variable nature of superficial cover and the influence of the site setting just off Swansea Bay being prone to aeolian sediment, it is not considered that the off-site historical borehole records would provide an accurate representation of the underlying geology at the Application Site.
- 4.4.2 A review of the Neath Port Talbot planning portal website has identified previous ground investigations undertaken by Earth Science Partnership (ESP) in 2018 on the Application Site and wider area to support a planning application for a three/four storey office development plus single storey energy centre and associated parking, access and landscaping (ref. P2019/5148). It is understood that the application was withdrawn in 2020. An exploratory hole location plan from ESP's ground investigation has been extracted from the available report and presented in Figure 3 below.



Figure 3 – ESP 2018 Area of Investigation and Exploratory Hole Location Plan

- 4.4.3 The yellow-line boundary on Figure 3 is the Application Site considered for the new planning application and the subject area of this MRA. There are therefore nine available exploratory hole logs that present site-specific data for the Application Site and a further four records immediately adjacent to the Application Site.
- 4.4.4 Blown Sands was identified in all 13 no. exploratory hole logs but only proven to base within the boreholes (BH01, BH02 and BH03). The top of the Coal Measures was proven during the investigation however the boreholes were terminated here and did not prove coal seams nor the base of the formation. A general summary of the findings from the ESP investigation is presented in Table 2.

Table 2 – Results of Intrusive Investigation (ESP, 2018)

Strata	Description	Proven Thickness (m)
Made Ground	Generally encountered as probably medium dense dark brown and occasionally black very gravelly sand or slightly gravelly sandy silt with a low angular sandstone cobble content with ash, brick, clinker, concrete and slag.	0.20 – 1.00
Blown Sands	Generally described as probably loose or medium dense greyish brown mottled orangish brown and brown fine and medium sand.	1.90 – 3.70*
Possible / Probable Tidal Flat Deposits	Generally described as very loose dark grey and brown silty slightly gravelly sand with a low sandstone cobble content and occasional lenses of pseudo-fibrous to amorphous peat.	6.20 – 6.70*
Probable Beach Deposits	Generally encountered as medium dense to very dense dark grey and grey silty very sandy sandstone gravel with cobbles.	7.50 – 9.20*
Middle Coal Measures Formation	Typically described as very dense grey and brown slightly sandy angular mudstone gravel.	n/a (base not proven)

*Only includes proven thicknesses from BH01, BH02 and BH03

- 4.4.5 In each borehole, the Blown Sands were identified to be underlain by probable Tidal Flat Deposits, generally comprising silty gravelly sand with cobbles and lenses of pseudo-fibrous to amorphous peat and probable Beach Deposits (both likely to be part of the Older Coastal Zone Deposits as per 1:50,000 drift maps).
- 4.4.6 The geological logs demonstrate that the Blown Sands on the Application Site are relatively consistent comprising fine and medium sand and therefore likely represent a 'clean' granular sand unit. The distribution of Blown Sand thickness across the Application Site is presented in Figure 4 below.



Figure 4 – Thickness of Blown Sands across the Application Site and immediate area

- 4.4.7 There does not appear to be any obvious trends in the thickness of Blown Sands across the Application Site although the deposit tends to be thicker in the west and south-west where proven.
- 4.4.8 The Blown Sands is also overlain by Made Ground at all locations, as summarised within Table 3 below. The average thickness of overburden is indicated to be approximately 0.60 m to approximately an average Blown Sands thickness of 1.40 m.

Table 3 – Thickness of Blown Sands Vs Overburden Made Ground

Exploratory Location	Blown Sands Thickness (m)	Made Ground Thickness (m)
TP07	1.15*	0.55
TP08	1.60*	0.60
TP09	1.30*	0.90
TP10	1.40*	0.70
TP11	1.30*	0.20
BH01	2.90	1.00
BH02	1.90	0.90
BH03	3.70	0.60
TP201	0.65*	0.75
TP202	0.90*	0.30
TP203	0.20*	0.75
TP204	0.50*	0.40
TP205	0.75*	0.30

*Exploratory position terminated within the inferred Blown Sands – full thickness not proven.

- 4.4.9 As part of the ESP investigation, Made Ground samples were tested for a number of contaminants. Asbestos was identified within two samples and concentrations of lead above Generic Acceptance Criteria (GAC) in all three samples. Leachate tests of the Made Ground material also identified exceedances of Copper, Mercury and a number of Polycyclic Aromatic Hydrocarbon (PAH) compounds.
- 4.4.10 Although there was no perched water identified by ESP within the Made Ground, given the relatively granular nature of the Made Ground and the presence of elevated contaminants, it is considered that the Blown Sands may have been adversely impacted by leaching through percolation by rainwater.
- 4.4.11 As part of any mineral extraction, the cost of overburden removal is a material consideration when determining feasibility of the resource. In this case, there are likely to be significantly greater costs associated with the removal of the asbestos-contaminated Made Ground (waste) materials.
- 4.4.12 With respects to the Middle Coal Measures Formation, the ESP investigation only proved the top of the Coal Measures and terminated at a maximum depth of 20.80 metres below ground level (m BGL). No evidence of coal seams were identified.

4.5 Hydrogeology

- 4.5.1 The Blown Sands deposits are a designated Secondary A Aquifer.
- 4.5.2 Water seepages were noted within the Blown Sands at a number of locations during the ESP 2018 investigation. In the trial pits, groundwater seepages were recorded at depths of 1.50 m, 1.60 m and 1.40 m below ground level (bgl) although it was noted that a number of trial pits were dry; and at 1.20 m, 1.50 m and 1.80 m bgl within the boreholes.

-
- 4.5.3 Soakaway infiltration tests were also completed within two trial pits; TP201 and TP202, during the investigation. The tests were undertaken within the Blown Sands deposits in each trial pit and repeated three times in accordance with BRE 365 guidance. ESP concluded that the soil infiltration rates were calculated to be between 5.38E-05 m/sec and 7.85E-05 m/sec within TP201 and between 5.21E-05 m/sec and 7.12E-05 m/sec in TP202.
- 4.5.4 It was also noted by ESP that significant spalling and collapse of trial pit walls were observed within Blown Sands, most notably where water seepages were also identified.

4.6 Environmental Sensitivity

- 4.6.1 There are a number of environmentally sensitive designated sites within 500 m of the Application Site, however the nearest is Crymlyn Burrows Site of Special Scientific Interest (SSSI) approximately 166 m to the south.

5 MINERAL RESOURCE ASSESSMENT

5.1 Extent of potentially viable mineral resource on the Application Site

Total volume of potentially viable mineral resource

Coal Resource

- 5.1.1 From a review of available BGS 1:10,000 solid geology maps (ref. SS79-SW (1970)), there are no coal seams indicated to outcrop on the Application Site and the closest inferred coal seam in the Upper Coal Measures outcrops approximately 275 m to the north of the Application Site. The general dip of the bedrock in this area is indicated to be around 38 degrees to the north. There is also no indication that a coal seam outcrops to the south that may extend beneath the Application Site. The map indicates the location of a historical trial borehole for coal, approximately 1.3 km to the south-west of the Application Site on the west side of the 'Line of Neath Valley Disturbance' faultline, that proved coal measures between approximately 17 m and 230 m depth although details were 'not reliable'. The bedrock in the vicinity of the Application Site has been heavily faulted and the main workable seams of the Middle Coal Measures are apparent to the east of the north-south trending Giant's Grave Fault which is some 2.5 km to the east but absent to the west. Give the lack of evidence to suggest seams are present on or to the south of the Application Site, it is not anticipated that there are any coal resources beneath the Application Site that could be worked from the surface or by underground means at shallow depth.
- 5.1.2 With this in mind, the remainder of the minerals assessment does not consider a viable potential coal resource nor the Coal Resource MSA. The coal resource MSA follows the mapped extents of the Middle Coal Measures geological unit (as per BGS mapping) and therefore does not indicate there to be **definitive commercially viable** coal resources beneath the areas of MSA, particularly at the Application Site.

Sand and Gravel Resource

- 5.1.3 The borehole logs summarised in Table 2 demonstrate that the safeguarded mineral resource of the Blown Sands is a relatively clean, granular unit with a recorded maximum thickness of 3.70 m and average confirmed thickness of 2.83 m. This deposit represents the potentially viable sand mineral resource on the Application Site that could be of commercial interest for mineral extraction. The variation in thickness of this deposit identified across the Application Site is presented in Figure 4.
- 5.1.4 Table 3 also demonstrates that the Blown Sands resource is situated beneath predominantly granular Made Ground overburden material with an average thickness of 0.60 m across the entire Application Site.
- 5.1.5 As it is a 'clean' sand mineral resource that is of potential commercial interest, it is reasonable to expect that:
- 1) Some mineral resource would be lost during excavation/removal of overburden by an over-dig into the mineral resource horizon to ensure all Made Ground materials have been removed; and
 - 2) Some mineral resource will be left in place at the base of each excavation to ensure underlying more cohesive strata is not intercepted during extraction.
- 5.1.6 Based on these assumptions, an estimate of the volume of potentially viable mineral resource on the Application Site has been estimated and summarised in Table 4. The total area of the

Application Site utilised in this assessment does not include the existing developed areas of the Application Site i.e. roadways in the north that are within the redline boundary nor the areas that do not fall within the designated Sand and Gravel MSA and the thickness of the deposit has been taken as the maximum recorded thickness as a conservative figure for calculation.

Table 4 - Volume of potentially viable Sand mineral resource

Site Area	Estimated Area (m ²)	Maximum Sand Thickness (m)**	Volume of Resource (m ³)	Volume of Resource Less 'Lost Resource' (m ³)
Total Area of Undeveloped Application Site (0.55 ha) that falls within the Sand MSA*	5,500	3.70	20,350	18,150***

*Area excludes the existing developed roadways of the Application Site where extraction would not be possible and areas that do not fall within a designated Sand and Gravel Resource MSA

**Based on data for relevant boreholes presented in Table 2

***Based on assumption that up to 40 cm of lost resource (i.e. 20 cm of resource below Made Ground overburden and above Older Coastal Zone Deposits)

5.1.7 The calculations presented in Table 4 suggest there is less than 20,000 m³ of potentially viable (i.e. extractable) sand mineral resource on the Application Site. This represents a small volume of potentially viable resources, which is considered unlikely to be of commercial interest to specialist extractors of aggregates. This calculation is also likely to be an overestimate of the volume of potential resource given the maximum proven thickness of Blown Sands has been utilised. It is therefore likely that the volume of potential resource is less than this in reality.

5.1.8 It should also be noted that this calculation does not account for the consistent groundwater table identified in the ground investigation within the Blown Sands. Where dewatering techniques are not adopted, any excavation may be limited to above the water table and therefore the potential volumes of extractable resource would be further reduced.

Buffer Zones and Constraints on Mineral Extraction

5.1.9 The estimate of potentially viable sand resource presented in Table 4 does not consider other limitations to mineral extraction that may reasonably be expected to apply given the site setting and nature of the extraction process. As described in Mineral Safeguarding in England: good practice advice (BGS, 2011) buffer zones are commonly applied around safeguarded mineral areas and used in the consideration of the extent of viable resources. Buffer zones limit the area of potentially extractable resource, by defining those areas where the extraction of safeguarded mineral resources would not be expected due to:

- Proximity to existing sensitive development that could be adversely affected by the effects of extraction (i.e. noise, dust, visual impact, transport and/or vibration as per paragraph 217c of the NPPF, 2023) most notably:
 - Schools, hospitals and nurseries.
 - Residential development and supporting infrastructure (e.g. parks and amenity areas).
 - Community centres.
- The requirement to protect sensitive environmental receptors protected under paragraphs 186, 217b and 217c of the NPPF (2023) that could be impacted by extraction and include:
 - Designated sites (e.g. SSSI).
 - Ancient Woodland.

- Strategic infrastructure including:
 - Roads & highways.
 - Above and below ground utilities and services.
- Geotechnical and operational considerations associated with mineral excavation, most notably securing a geotechnically sound site boundary.

5.1.10 The width of protective buffer zones that may potentially be applied are not prescribed in the planning policies reviewed as they would typically be determined as part of the planning process for a mineral extraction proposal. The Welsh Assembly Government takes the view that the following minimum distances should be adopted unless there are clear and justifiable reasons for reducing the distance, as set out in MTAN – 1 (aggregates):

- Sand and gravel (and others where no blasting is permitted): 100 metres; and
- Hard rock quarries: 200 metres.

5.1.11 Given that the neighbouring land use is of commercial / industrial nature and not particularly sensitive to dust or noise impacts, it is considered that a reduced buffer zone may be applied.

5.1.12 For the purpose of this MRA, the following buffer zones are considered reasonable and have been initially applied to further evaluate the distribution, extent and volume of viable mineral resource and its associated economic viability as a resource:

- 25 m standoff to protect mineral excavation boundary structural integrity;
- Existing Commercial / Industrial Development: 50 m standoff;
- Existing key road infrastructure: 50 m standoff (most notably the A438 to the south, Ffordd Amazon and Ashleigh Terrace);
- Utilities present around the perimeter of the Application Site: 30 m standoff (as presented on Drawing 5 (ref. 989/4907/1B); and
- Unnamed access road to the Application Site and utilised by the development to the north: 25 m standoff.

Potentially extractable mineral resources on the Application Site

5.1.13 By applying the conservative buffers defined above, mineral extraction is not viable at the Application Site. To demonstrate this, an initial buffer of 25 m has been applied from the redline boundary of the Application Site which represents the minimum distance extraction could occur from the site boundary to ensure the structural integrity of the excavation and minimise any disruption to the site boundaries and neighbouring developments and infrastructure. This is particularly important given the observed instability of pit walls, recorded by ESP (2018), during excavations within the Blown Sands. The buffer has been applied from the site boundary rather than the edge of the mapped MSA given the presence of Blown Sands proven across the whole Application Site.

5.1.14 The volume calculations of potentially viable mineral resources presented in Table 4 have therefore been revised to reflect the application of the initial 25 m structural integrity buffer and are presented in Table 5 and in Drawing 4 (ref. DWG-002).

Table 5 – Revised Volume of Potentially Viable Mineral Resource Following Application of Initial Buffer

Site Area	Estimated Area (m ²)	Maximum Sand Thickness (m)	Volume of Resource (m ³)	Volume of Resource Less 'Lost Resource' (m ³)
Total Area of Application Site (0.11 ha*) taking account of the 25 m structural integrity buffer	1,100	3.70	4,070	3,630

*Total area utilised in revised calculations is based on the available / developable area of the Application Site taking into account the application of a 25 m structural integrity buffer around the site to delineate the potential area for extraction prior to additional buffers

5.1.15 If additional buffers were to be applied as presented within paragraph 5.1.11, the area for potential extraction would be diminished further. Based on this and the presence of existing development and infrastructure within the vicinity of the Application Site and the potential volumes of sand resource, it is not considered that the Blown Sands are a viable mineral resource for extraction at the Application Site.

5.2 Practicability of Prior Extraction

5.2.1 Notwithstanding the assessment of the extent of viable resource on the Application Site and the economic viability for its commercial extraction, the practicability of the prior extraction of safeguarded mineral reserves, in advance of any proposed development, must also be considered. Prior extraction could involve either:

- Full extraction of safeguarded reserves in advance of, or in parallel with, construction.
- Incidental extraction – the extraction of safeguarded reserves by virtue of activities required as part of development construction activities (e.g. foundations, services, site reprofiling etc.).

Full Prior Extraction

5.2.2 The prior extraction of Sand is not considered practicable on the Application Site considering:

- The absence of 'viable' resources across the site, especially after the application of reasonable buffer zones;
- The questionable economic viability of that mineral resource given the very small volume of viable sand resource and assumed high cost associated with the removal and management of asbestos-contaminated Made Ground overburden material, coupled with the cost associated with the need for excavation backfill and restoration to the current ground level using imported infill materials of an appropriate quality to enable development; and
- The potential requirement for dewatering techniques and / or limited extraction depths as to not intercept the groundwater table within the Blown Sands.

Incidental Extraction

5.2.3 The indicative master plan provided in Drawing 2 (ref. 1442 SK026), demonstrates that construction is proposed where mineral resources are present beneath the Made Ground overburden. Given that excavations are proposed as part of the development design (i.e. foundations, subsurface utilities and drainage) it is likely that some incidental extraction of safeguarded sand resources will occur during the construction phase. If relatively 'clean' aggregate is excavated during construction, that small volume of mineral resource will either be reused on the Application Site to meet any development cut-fill balances where required and / or exported off site to the local market, subject to suitability and chemical testing.

5.3 Assessment Against Planning Policies

- 5.3.1 The finding of the mineral resource assessment presented above has been evaluated against the mineral planning policies relevant to the Application Site and described in Section 3. This assessment is presented in Table 6 below.

Table 6 – Assessment Against Mineral Planning Policies

Policy	Planning Condition / Position Statement	Summary of Assessment
Neath Port Talbot County Borough Council Local Development Plan 2011 - 2026		
Policy M1: Development in Mineral Safeguarding Areas	Development proposal within mineral safeguarding areas will only be permitted where it can be demonstrated that:	-
	1. The mineral concerned is no longer of any value or potential value; or	Applicable. No potentially viable sand resource has been identified on the Application Site when reasonable buffers to protect neighbouring existing development have been applied. There are not anticipated to be shallow coal seams beneath the Application Site. As such, the Application Site is not considered to contain a workable mineral deposit. Additionally, the overburden Made Ground material contains chrysotile asbestos fibres and elevated PAH and metals and given the relatively granular nature of the Made Ground, there is a possibility that contaminants are leaching via percolation (by rainwater) into the underlying Blown Sands, suggesting the Sand resource may not be chemically 'clean'. It is also considered that the thickness of Blown Sand extraction may be reduced further if extraction is limited to above the groundwater table.
	2. The mineral can be extracted satisfactorily prior to the development taking place; or	Applicable. Site wide prior extraction on the Application Site is not viable or practicable considering: - Mineral resources are not considered economically viable given the points presented above. - The Application Site falls within a designated existing employment area (Policies EC2 and EC3 of NPTCBC LDP) and approved uses for the site include Classes B1, B2 and B8 or commercial services. Any other class of development would need to demonstrate that proposals do not cause any adverse impacts on the overall function of the employment area and neighbouring commercial properties. Where a mineral extraction planning application would be put forward, the buffers to be implemented to ensure the protection of neighbouring developments and minimise any adverse impacts to those neighbouring developments and operations, there is no potentially extractable mineral deposit. It is however noted that incidental mineral extraction may occur during the excavations for foundations, services / utilities and drainage. That material will be reused on site to satisfy the development cut-fill balance where required and / or surplus material released into the local market, subject to suitability of the extracted material, chemically and geotechnically.

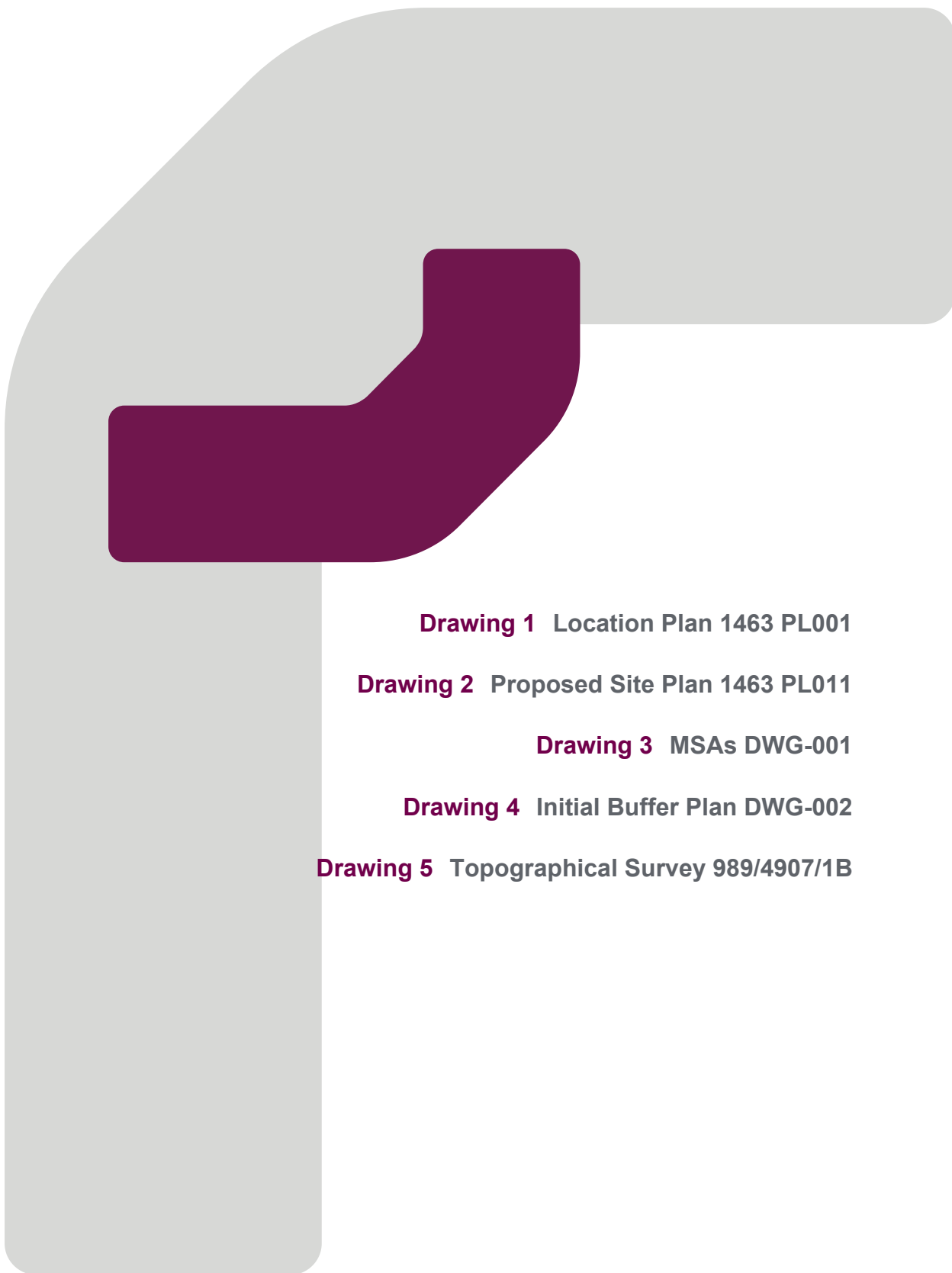
Policy	Planning Condition / Position Statement	Summary of Assessment
	3. In the case of temporary development, it can be implemented and the site restored within the timescale that the mineral is likely to be needed; or	Not Applicable.
	4. There is an overriding need for the development; or	Applicable. The Application Site is understood to have been gifted to Swansea University to support the Gateway 2 Zero Project, (part of the Swansea Bay Hydrogen Bus Project) and the land specifically to be used for promoting decarbonisation research projects. The proposed development will support key government funded large scale transportation trials, including providing fuel for the HyHaul Mobility Project along the M4 corridor and the hydrogen to be supplied from proposed and existing networks of hydrogen production facilities across Wales. This will form an important part of the Welsh Governments' commitment to reducing carbon emissions and achieving net zero by 2050.
	5. The scale and location of the development would have no significant impact on the possible working of the resource.	Applicable. There is considered to be no viable workable mineral resource beneath the Application Site and therefore the development would not needlessly sterilise potentially viable mineral resources.

6 SUMMARY AND CONCLUSIONS

- 6.1.1 A Mineral Resource Assessment (MRA) has been undertaken to support a planning application for a proposed green hydrogen refuelling facility on land off Ffordd Amazon, to the east of Amazon Distribution Centre, Skewen, Swansea.
- 6.1.2 The Application Site is understood to have been gifted by the Welsh Government in 2019 to Swansea University to support the Gateway 2 Zero Project and is to be used for promoting research projects with respects to decarbonisation. The proposed hydrogen refuelling facility will support key government funded large scale transportation trials, including providing fuel for the Hyhaul Mobility Project along the M4 corridor and is to be supplied hydrogen via existing and proposed hydrogen production facilities across South Wales.
- 6.1.3 The Application Site therefore falls within a designated existing employment area in line with Policies EC2 and EC3 of Neath Port Talbot County Borough Council Local Development Plan 2011 – 2026 (NPTCBC LDP).
- 6.1.4 The NPTCBC LDP also identifies that the Application Site falls partially within a Coal Resource Mineral Safeguarding Area (MSA) and predominantly within a Category 1 Sand and Gravel MSA associated with the South Wales Middle Coal Measures and superficial Blown Sands, respectively.
- 6.1.5 This MRA has therefore considered the mineral planning policies outlined in the NPTCBC LDP to determine whether the proposed development at the Application Site could needlessly sterilise potentially viable mineral resources. The MRA utilised publicly available geological information but has placed particular reliance on site-specific geological and hydrogeological data obtained from an intrusive ground investigation undertaken by Earth Science Partnership in 2018.
- 6.1.6 The safeguarded mineral resources present on the Application Site are superficial Blown Sands and coal of the Coal Measures Formation. The site specific dataset has demonstrated that the Blown Sands are a 'clean' granular deposit overlain by chemically and asbestos contaminated Made Ground overburden materials. The volume of potentially viable sand mineral resource was calculated to be less than 20,000 m³ and with the application of reasonable buffers to minimise any adverse impacts on the neighbouring developments and infrastructure of the Blown Sands is not considered to be a potentially economically viable mineral resource at the Application Site.
- 6.1.7 Based on available BGS 1:10,000 scale maps, there does not appear to be any shallow coal seams beneath the Application Site that could be considered viable for potential extraction and therefore coal has not been included within the mineral resource assessment.
- 6.1.8 The site wide prior extraction of the sand resource on the Application Site is not considered viable or practicable given:
- The absence of 'viable' resources across the Application Site, especially after the application of reasonable buffer zones;
 - Questionable economic viability of that resource given the small volumes of viable sand resource and high cost associated with the need for excavation backfill and importation of infill material, and the likely high costs associated with removal and transfer of asbestos-contaminated overburden Made Ground materials; and
 - Anticipated instability and spalling of the Blown Sands coupled with a consistent high groundwater table within this material and subsequent dewatering techniques that would be required during excavation and / or limitations on the volume of sand extraction to material above the water table.
- 6.1.9 The incidental extraction of safeguarded sand resource may occur during the construction phase and that small volume of mineral resource will either be re-used on the Application Site to meet the

development cut-fill balance and/or exported off site into the local market, subject to suitability chemically and geotechnically.

- 6.1.10 The results of the MRA have been evaluated against Policy M1: Development in Mineral Safeguarding Areas of the adopted NPTCBC LDP (2011 – 2026). That assessment has concluded that the proposed development will not result in the unacceptable sterilisation of mineral resources on the Application Site and is therefore considered consistent with Policy M1, without the need for prior extraction.



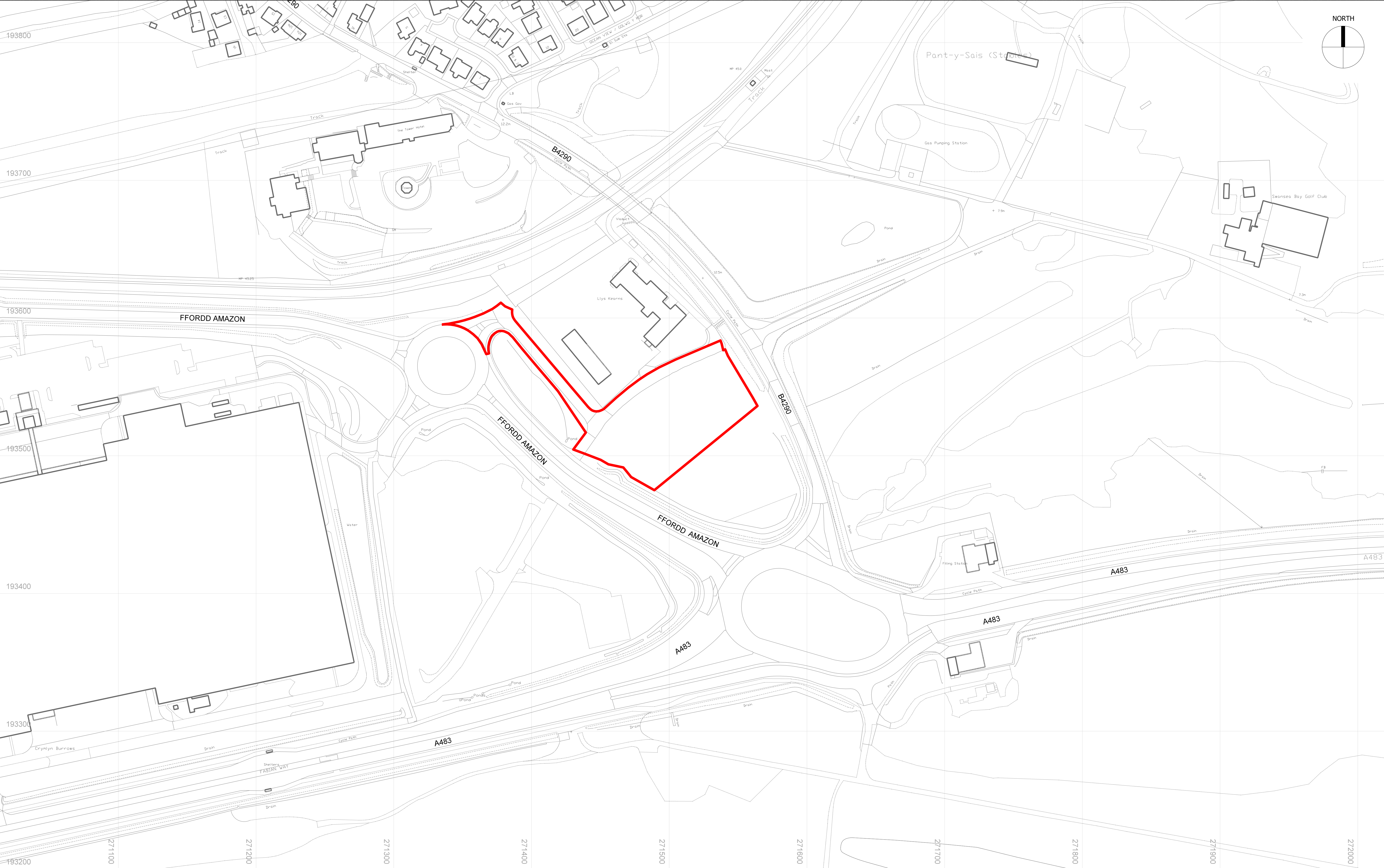
Drawing 1 Location Plan 1463 PL001

Drawing 2 Proposed Site Plan 1463 PL011

Drawing 3 MSAs DWG-001

Drawing 4 Initial Buffer Plan DWG-002

Drawing 5 Topographical Survey 989/4907/1B



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LEGEND

RED LINE APPLICATION BOUNDARY

0 10 50 100 250m

PROJECT					
SWANSEA HYDROGEN					
DRAWING					
Location Plan					
FOR PLANNING		-	24/09/25	Issued for Planning	
SCALE 1:1250@A1	24/10/02	A	24/10/02	Issued for Planning	
1463 PL001	A				
DWG. NO.	REVISION				

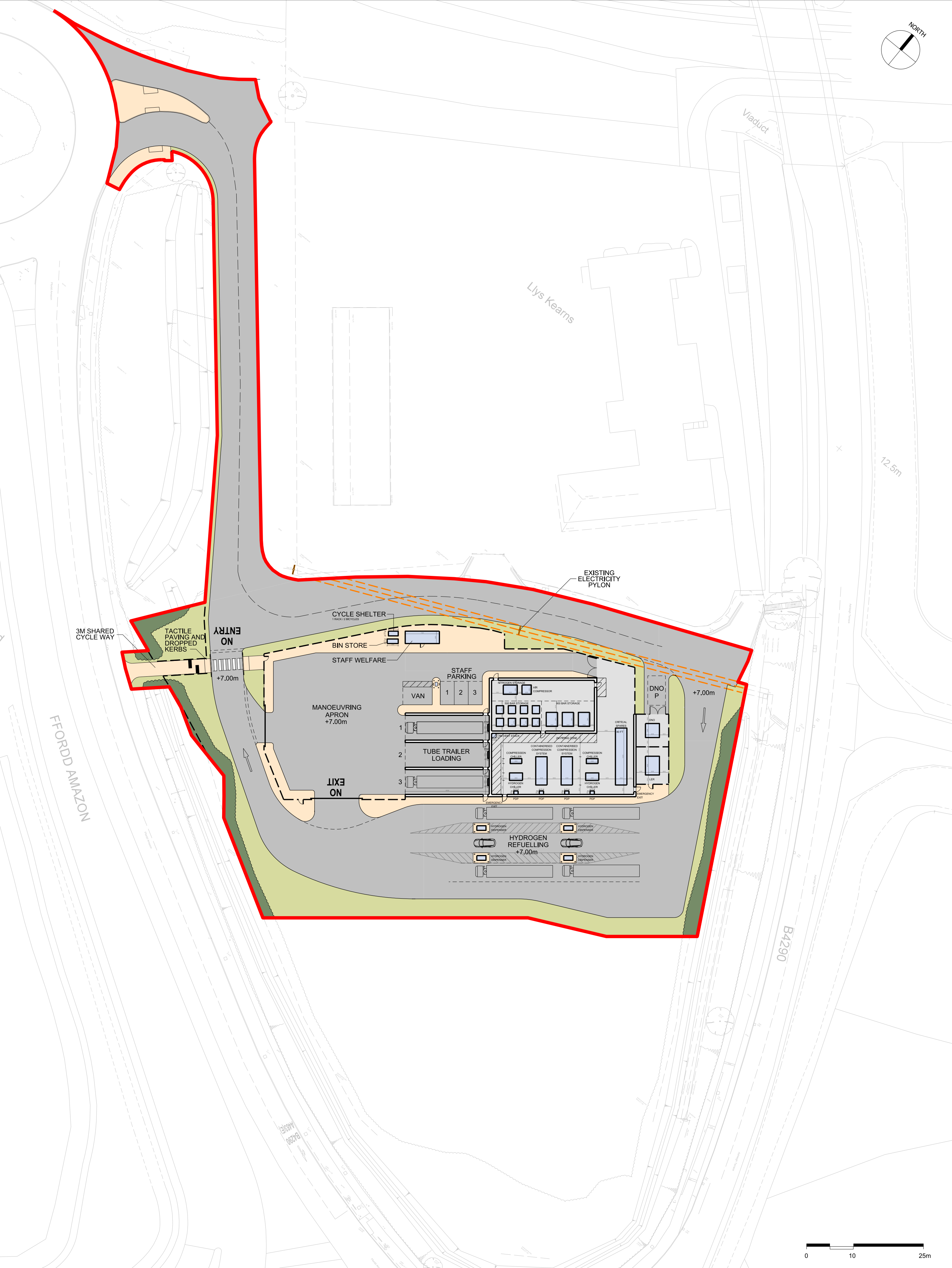
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LEGEND	
	RED LINE APPLICATION BOUNDARY
	GRASSLAND
	FOLIAGE AND TREES
	PEDESTRIAN WALKWAY
	ROADS
	HARDSTANDING
	OVERHEAD ELECTRICITY CABLES

PROJECT		SWANSEA HYDROGEN	
DRAWING		Proposed Site Plan	
FOR PLANNING		-	25/01/30
SCALE	1:250@A0 1:500@A2	DATE	25/01/30
1463 PL011			
DWG. NO.		REVISION	

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- Redline Site Boundary
- Cat 1 Sand & Gravel Safeguarding Area
- Coal Safeguarding Area

Rev	Description	By	CB	Date



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Client Marubeni

Project HyHaul, Swansea

Title Mineral Safeguarding Site Plan

Status	Drawn By	PM/Checked by
DRAFT	EL	LD
Job Ref	Scale @ A3	Date Created
794-PLN-WWP-00294	NTS	31/10/2024
RPS Drawing / Figure Number	Rev	
DWG-001		

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-  Redline Site Boundary
-  Cat 1 Sand & Gravel Safeguarding Area
-  Coal Safeguarding Area
-  25 m Site Boundary Buffer

Rev	Description	By	CB	Date



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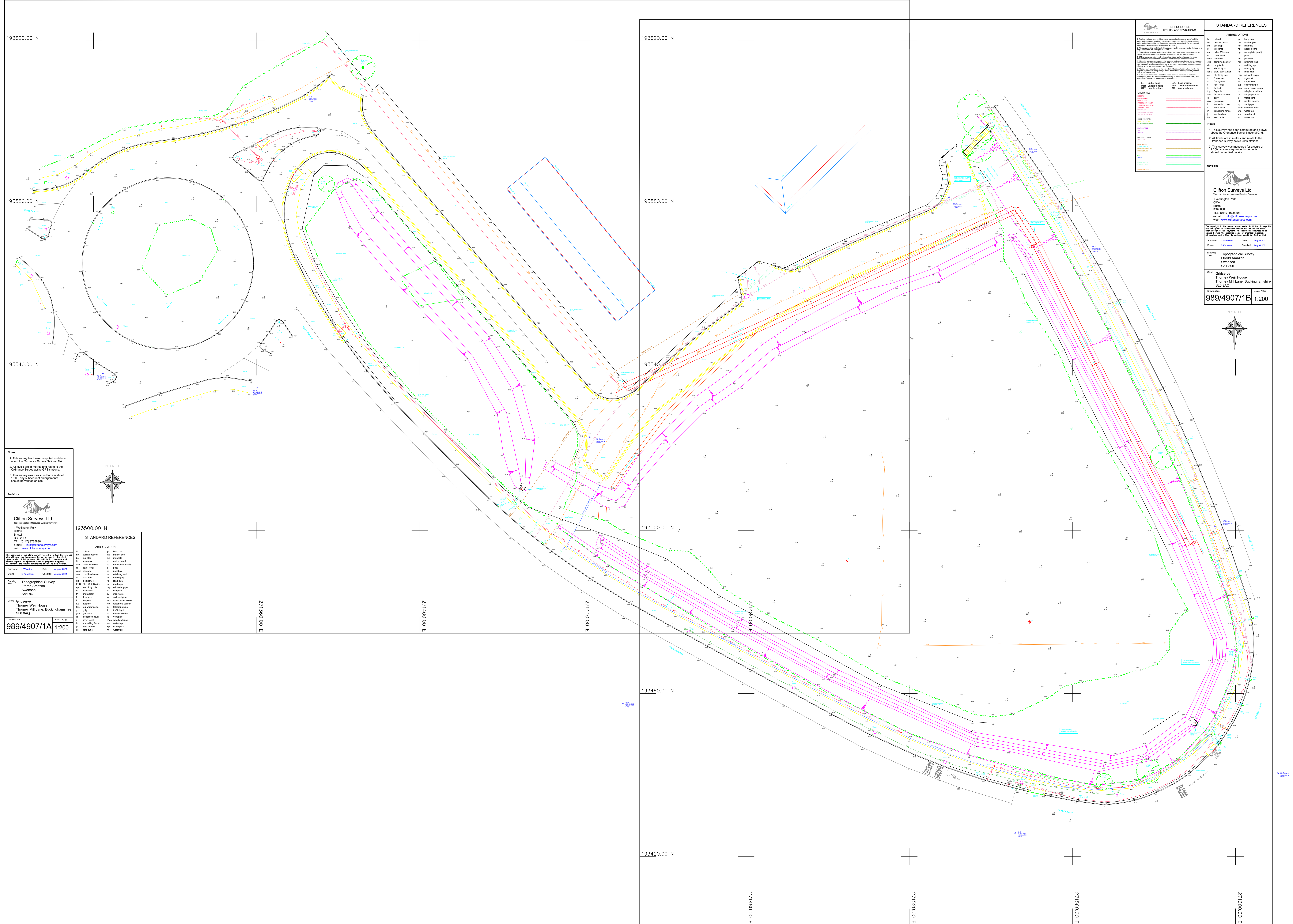
Client Marubeni

Project HyHaul, Swansea

Title Mineral Extraction Buffer Zone Plan

Status	Drawn By	PM/Checked by
DRAFT	EL	LD
Job Ref	Scale @ A3	Date Created
794-PLN-WWP-00294	NTS	31/10/2024
RPS Drawing / Figure Number	Rev	
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MINERAL RESOURCE ASSESSMENT

HyHaul Swansea

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