

Seiont Brickworks and Quarry - Waste Recovery Plan

Classification of Waste for Recovery from the A487 Road Scheme

The bulk of reclamation material at Seion quarry will be waste soil and stone sourced from the construction works on the A487 road scheme.

The road scheme is split into three construction sections with the Chainage showing the distance in metres along the centreline of the road measured from the starting location:

- Southern section (ch0-3500) running from 500m south of Llanwnda to 500m north of Bontnewydd; There are several farms and small holdings scattered throughout this section. The land use is predominantly agricultural.
- Central section (ch3500-6500) running from 500m north of Bontnewydd to 1km north of Caeathro; The majority of the section comprises farmland along with the Cibyn Industrial Estates and Caernafon Seiont Quarry located to the south west of Caernarfon. The proposed alignment intersects the A4085 Waunfawr road, A4086 Llanberis road as well as a number of minor roads. There are several small pockets of woodland throughout the section but these are mainly confined to the banks of the Afon Seiont.
- Northern section (ch6500-9700) running from 1km north of Caeathro to the Felinheli/Plas Menai roundabout. The majority of the corridor covers farmland with occasional woodland with the exception of where the proposed alignment intersects the B4366 which runs adjacent to the proposed alignment.

The section drawings are enclosed in Volume 7 of the Geo-environmental Site Investigation (GSI) carried out in 2015. The GSI comprised sampling from 82 trial pits and 89 boreholes across the scheme and analytical testing of soil samples for contaminated land assessment, including ground gas and groundwater monitoring. The Ground Investigation Report 'A487 Caernarfon and Bontnewydd Bypass Ground Investigation Report, 2015' is enclosed in Appendix D of the WRP, and the results are summarised below.

The extensive sampling and testing programme of the GSI 2015 demonstrated that other than the topsoil and peat, which will be dealt with under separate protocols, the excavation spoil within the road scheme can be generally categorised as naturally occurring soils or made ground.

The naturally occurring soils will derive from the local superficial and solid geological deposits. Superficial deposits are dominated by Glacially derived material of varying thickness from 1.00m to >20.00m. A combination of Glacial Till and Glaciofluvial deposits consist of varying proportions of clay, silt, sand, gravel, cobbles and boulders. The lithology of Gravel, cobbles and boulders reflecting the highly variable geological setting of Snowdonia. Lesser amounts of fluvially derived material are identified within close proximity to the main drainage channels which intersect the alignment, the Afon Seiont and the Afon Gwyrfa. Isolated zones of Peat have been identified and are associated with postglacial deposition.

The solid geology underlying the alignment is dominated by Ordovician mudstone of the Nant Ffrancon Subgroup. This is characterised by weak mudstones and shale. This is intersected at the north of the scheme by Granite and Rhyolite associated with the 'Twt Hill Granite' which is evident in a north east south west trending profile running parallel to the Menai Strait. The Nant Ffrancon Subgroup is intersected at the southernmost extents of the scheme by the Fachwen formation. This is characterised by alternating beds of siltstone/sandstone and conglomerate of Cambrian origin. An

unmapped Brecciated Rhyolite, previously unmapped has also been encountered within the vicinity of the Afon Gwyrfai. This is a very isolated example of this material and is not identified elsewhere along the alignment.

All collected soil samples (other than those sourced from made ground) fitted within a definition of naturally occurring soils and described as 'silty loam', 'sandy silty loam', 'clayey loam', 'silty clayey loam'.

The intention is to utilise these arising in the road scheme providing that the engineering properties of soil is suitable for intended use. As the ground materials are still largely insitu it is difficult to define the exact quality of the natural soil which will be classified as unsuitable to reuse with the scheme as this will in large be as a consequence of elevated moisture contents and not quality which in turn will depend upon the seasonal timings of the excavations and weather during the excavation operation. The estimated volume of the waste soil sourced at the road scheme will be 355,000m³.

Made ground was identified in isolated locations associated with agricultural land use, a waste tip adjacent to the road corridor, historic and current railway and small-scale industrial land use. The overall quantity of made ground arisings was not known at the time of preparing this Plan as the material remained unexcavated. Based on findings of the GSI 2015 the presence of made ground within the road scheme is minor and present in shallow deposits.

The description of made ground and its locations identifiable by chainage are summarised in Table 1 in reference to Chainage Drawings in Volume 7 of the GSI Report 2015.

Table 1 Summary of Made Ground

Chainage	Exploratory hole ID	Origin	Description
4210	TP41C	Local agricultural yard	Dark brown clayey slightly gravelly fine to coarse SAND with low cobble content. Gravel is angular to sub-rounded fine to coarse of quartzite, slate, brick fragments, pottery, slate and concrete. Cobbles are angular to subangular of concrete and brick.
5380 – 5430	BH51 BH52A BH54	Localised spoil and waste storage associated with the running of Glan Gwna Holiday Park	Brown slightly clayey gravelly fine to coarse SAND with a low cobble content. Gravel is angular to sub-rounded fine to coarse of quartzite and shale. Cobbles are sub-angular to sub-rounded of quartzite and shale.
5520	BH58	Deposits forming the embankment to the dismantled Carnarvon & Llanberis Railway (part of the London & North West Railway Company) – Glan Gwna Holiday Park.	Brown clayey very gravelly fine to coarse SAND with a low cobble content. Gravel is angular to sub-rounded fine to coarse of slate, siltstone and sandstone. Cobbles are sub rounded of sandstone.
5795	BH64 BH64A	Associated with the construction of the extension to the gas cylinder supplier yard, comprising earth embankment and plateaux.	Dark brown clayey slightly gravelly fine to coarse SAND. Gravel is angular fine to coarse of sandstone and brick.
6440 (adjacent, offsite)	BH68 BH68A TP56A TP56B TP60	Landfill	Brown slightly clayey sandy fine to coarse sub-angular to sub rounded GRAVEL of quartzite, slate, shale, plastic, glass, brick, concrete and steel with occasional roots.

Chainage	Exploratory hole ID	Origin	Description
6940	TP63A	Ground associated with the storage area of a local plant nursery and used uPVC window storage area	Bluish grey slightly clayey slightly sandy angular to sub-angular fine to coarse GRAVEL of slate.
9620	TP81	Reworked locally sourced ground associated with the construction of an access and egress ramp to local farm land.	Brown slightly clayey gravelly fine to coarse SAND with a low cobble content. Gravel is sub angular to sub-rounded fine to coarse of quartzite, shale and brick. Cobbles are sub angular of quartzite.
9650	TP82	Reworked natural material associated with the re-alignment and construction of the Plas Menai roundabout.	Dark brown slightly clayey gravelly fine to coarse SAND with a low cobble content. Gravel is sub-angular to sub rounded fine to coarse of shale and quartzite. Cobbles are sub-angular of quartzite.

As part of GSI 2015 all collected soil samples were tested for presence and concentrations of a wide range of inorganic parameters and organic contaminants to assess their hazardous properties and environmental risks. The analytical suite included metals (As, Ba, Cd, Cr, Cr_{VI}, Cu, Pb, Hg, Ni, Se, Zn), pH, w/s Sulphate, w/s Boron, total cyanide, total phenols, PAHs, BTEX, VOCs, SVOCs, TPH CWG(C6-C40), asbestos screen (and quantification if detected), moisture content, soil organic matter.

Chemical test results were benchmarked against conservative Generic Assessment Criteria (GAC) for protection of human health and controlled waters, based on a commercial land use of the site.

The results of the site investigation showed that the bulk of ground material on site (both naturally occurring soils and made ground) has negligible to low levels of contamination and likely to be classified as non-hazardous waste if deemed unsuitable construction material.

A small waste deposit was identified within Chainage 6440 offline the road corridor. The concentrations of Volatile Organic Compounds (VOCs) present within the soils showed a few marginal exceptions that coincide with the old waste tip. Otherwise (within the site) VOC results were 0 ppm. Odours were identified in BH68 and BH68A likely to be associated with the old waste tip. Elsewhere, no visual or olfactory evidence of contamination in soils or groundwater was encountered. Notwithstanding the foregoing, the location of the waste deposit at CH 6440 is outside of the construction area and therefore is unlikely to be disturbed during the project.

A few exceedances were also identified in BH08, BH20, BH40, BH64 and BH67. A review of the borehole logs and visual and olfactory information does not indicate any source of contamination for locations BH08, BH20 and BH40. In addition, soil samples from these locations did not record elevated concentrations of any determinants. It is therefore considered that these theoretical exceedances are not representative of the surrounding ground conditions and may be contamination introduced locally during drilling which has not been effectively purged from the well before sampling.

Ground gas analysis identified the highest GSVs across the scheme represent a Characteristic Situation 3 medium risk. However, this is not representative of the majority of the scheme. Of 61 boreholes monitored, 53 represent a Characteristic Situation 1 (very low risk).

All soil samples at the site with the exception of those taken in waste tip adjacent to the site boundary, generated a non-hazardous waste classification. There is no current intention to carry out excavations within the area of the tip. Should the waste is excavated, then the waste classification of the excavation spoil will need to be carried out to assess its hazardous properties in accordance with AE's Technical Guidance WM3.

Following the assessment of soils in GSI 2015, the Waste Acceptance Criteria (WAC) testing initiated in the summer of 2019 for the initial bulk of waste soils. The results of the full Waste Classification and WAC analysis confirmed that waste soils should be classified as a non-hazardous EWC 17 05 04, (Soil and stones other than those mentioned in 17 05 03). WAC test parameters comply with the inert waste landfill classification limits, and the material is suitable for disposal at an INERT LANDFILL. The test results are summarised below; and the factual reports and the location plan within the scheme, are enclosed in Appendix F.

Table 2 Summary of WAC testing (September 2019)

Sample Ref	Hazardous Status by WM3	WAC Classification
1	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
2	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
3	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
4	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
5	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
6	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
7	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
8	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
9	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
10	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
11	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
12	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
13	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
14	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
15	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
16	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
17	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
18	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
19	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria
20	Non-hazardous waste; EWC 17 05 04	Complies with all WAC Inert Waste criteria

Having carried an extensive site investigation to inform the waste classification and follow up full waste classification and WAC testing of waste soils there is a good level of confidence that the bulk of excavation spoil from the road scheme meets acceptance criteria for depot for recovery and thus can be used in reclamation of Seiont quarry.

As waste category EWC 17 05 04 waste soil and stone other than those mentioned in 17 05 03) this material does not need further testing. However, the principal contractor is committed to continue testing the excavated spoil at a rate of one sample per 5,000 tonnes. The proposed rate of WAC testing is in line with Technical Guidance EBPRI 11507B and reflects the level of confidence in understanding

of the waste soils from the road scheme construction. Soil sampling for WAC testing will be carried out in line with Sampling Plan (enclosed).

The isolated spots of potential ground contamination will be delineated, selectively excavated and stockpiled separately to enable their further chemical testing to inform waste classification. The analytical suite will be similar to that used in GSI2015 and comprise heavy, metals, common inorganic and organic determinants, asbestos screen, moisture content and organic matter content. If the made ground is proven to be uncontaminated the Principal Contract will make a decision regarding a suitability of this material in construction works.

If, however the made ground is deemed to be waste it will be WAC tested to determine its suitability for recovery purposes or otherwise disposal at landfill. Number of samples for WAC testing will depend on the volume of made ground and its degree of variability. Table 3 below from Environment Agency guidance *Waste Sampling and Testing for Disposal to Landfill*, will be used to guide the sampling frequency of made ground.

Table 3 Waste Testing requirements for waste classification and WAC

Volume of Waste (tonnes)	(homogeneous waste) Number of Samples	(new/heterogeneous waste) Number of Samples
< 100	2	5
< 500	3	8
< 1,000	5	14
10,000	11	22
+ per additional 10,000	+5 (pro rata)	+10 (pro rata)

All excavated ground materials which have unsuitable engineering properties for use in the road construction, will be subject to Waste Acceptance Procedures stated in the WRP. Waste sampling will be carried out according to the Sampling Plan which is enclosed with this Addendum.

Waste Soil Sampling Plan

Site:	Date:
Plan prepared for:	
Plan Prepared by:	
Objectives:	<p><u>Waste Classification</u>. Characterisation of chemical properties of soil to determine its hazardous properties.</p> <p><u>WAC Testing</u>: Testing requirements for waste materials to be disposed to the relevant landfill - inert, non-hazardous and hazardous.</p>
<p>General information to be provided onsite:</p> <ul style="list-style-type: none"> • Chainage /location of waste sample • Description of made ground sampled • Approximate volume of excavation spoil at each source of made ground • Made ground stockpiling location and storage arrangements • Photograph of excavated material and sampling locations. 	
<p>Analysis to comprise:</p> <p><u>Waste Classification Analytical Suite</u>: metals (As, Cd, Cr, Cr(VI), Pb, Zn, Cu, Ni, Hg), pH, PAHs, TPH CWG(C6-C40), asbestos screen (and quantification if detected), total cyanide, moisture content.</p> <p><u>WAC Testing</u>: 1. total concentrations (mg/kg): Total Organic carbon (TOC), BTEX compounds (benzene, toluene, ethyl benzene & xylenes), Polychlorinated biphenyls (PCBs) (7 congeners), Total Petroleum Hydrocarbons (C10 to C40), Polyaromatic Hydrocarbons; 2 Leachability (L/S10 mg/kg): As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, An, Se, Zn, CF, Sulphate, Phenol index, Dissolved Organic Carbon, Total Dissolved Solids.</p>	
<p>Health and safety precautions, and access restrictions:</p> <ul style="list-style-type: none"> • H&S Plan • Risk Assessments and Method Statements • CDM 2015 	
Identify sampling place and points	<ul style="list-style-type: none"> • Visual inspection of material • Regularly spaced samples (accounting for any visual variation if observed).
Sampling equipment needed	<ul style="list-style-type: none"> • Trowel • Number of containers supplied by the laboratory for the required analysis • Coolboxes with ice packs.
Sample details	<p>To include:</p> <ul style="list-style-type: none"> • Spot samples of representative material within the source of soil/made ground. • Number of samples depends on variability of made ground and volume (refer to Table 2 Addendum). • Sample reference number set up in line the with sample register. • Approximate percentage/volume of oversized material such as stone, brick etc larger fragments over 10mm, to be recorded to assist in classification following lab analysis. The laboratory

	only analyses the finer fractions, and this may lead to overestimation of contaminant concentrations and is conservative.
Packaging, preservation, storage, and transport requirements	
Packaging (type, size)	<p>Waste classification – sampling containers per sample:</p> <ul style="list-style-type: none"> • 1x 500 ml plastic tub • 1x 250 ml amber glass jar • 1x 60 ml amber glass jar. <p>Full WAC or Inert WAC suite – containers per sample:</p> <ul style="list-style-type: none"> • 1x1 litre plastic tub • 1x120ml amber glass jar • 1x 60ml amber glass jar.
Sample preservation following sampling	Samples to be stored and transported in coolboxes containing ice packs.
<p>Courier company details:</p> <p>Delivery date (within 24 hours from sample collection):</p>	
Laboratory details:	