

Penstrowed Quarry, Newtown

Proposed Holiday Park

Contamination Assessment

G F Grigg Ltd



GroundSolve Ltd

Consulting Geotechnical, Engineering Geology and Environmental Engineers

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1.0 INTRODUCTION

G F Grigg Ltd (GFG) propose to develop part of their dis used quarry at Penstrowed near Newtown as a Holiday Park. It is currently being used as a materials recycling centre. As part of this work, it is proposed to partially backfill sections of the quarry adjacent to the existing rock faces, the proposals for backfilling the quarry are presented in Reference 1, which should be read in conjunction with this report.

The quarry will be backfilled by using material processed on site under the current license and permit held by GFG, which allows the treatment of waste to produce soil and aggregates.

The quarry is classed as a Site of Special Scientific Interest (SSSI) and Planning Permission will be required for the proposed work. In addition, the Countryside Council for Wales (CCW) will be statutory consultees for any such application. In addition, early consultations have indicated that the scheme will probably have a planning condition related to potentially contaminated land.

Consequently, GFG have appointed GroundSolve Ltd (GSL) to address any potential contamination issues, and advise on the safe development of the Holiday Park.

This report presents the findings of limited desk study and site investigation. It also reviews the current operation of the recycling plant, and gives recommendation for the development of the Holiday Park, which will enable any contaminated land conditions to be satisfied.

This report is to be submitted as part of the planning Pre-Application, and will need to be updated when final development levels have been determined.

2.0 THE SITE

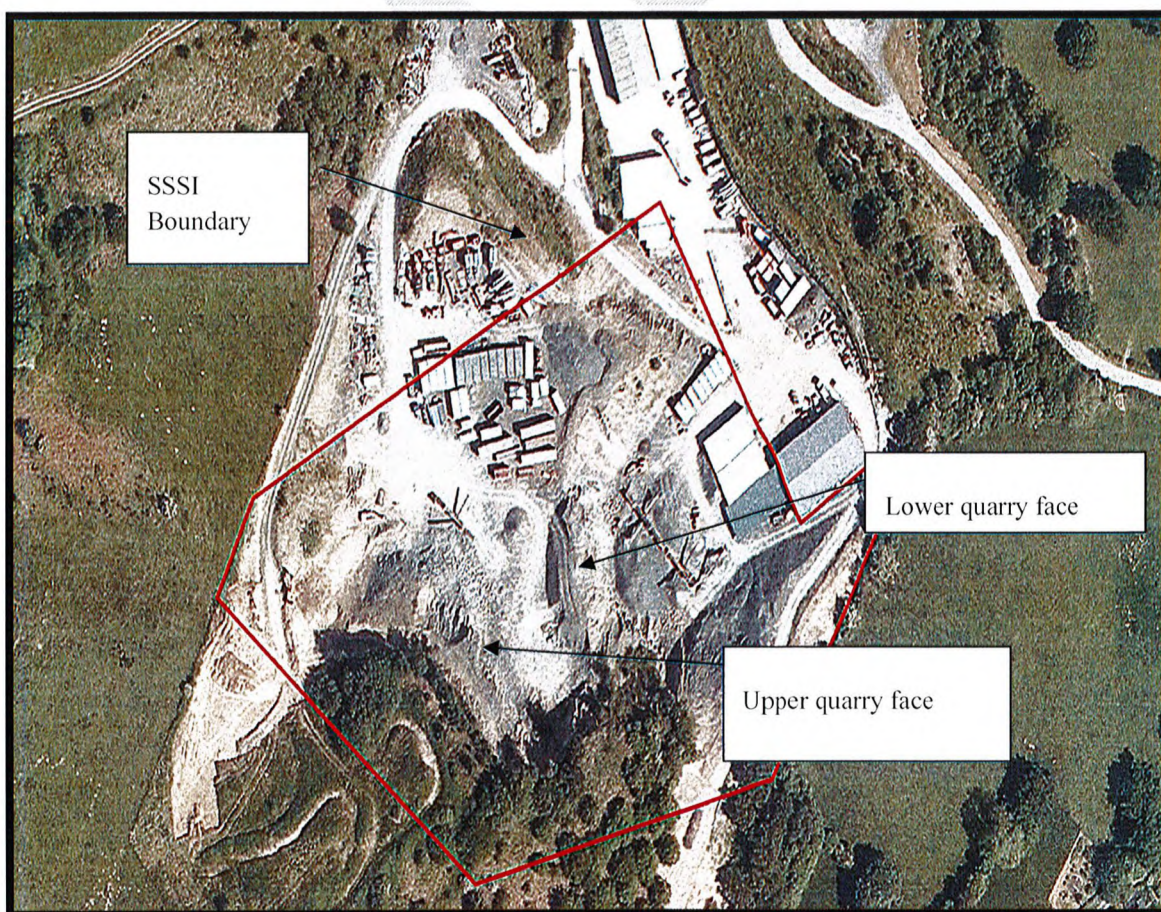
2.1 Site Location and Quarry Description

The quarry is located some 4km west of Newtown in the hills to the south of the A489T at National Grid Reference SJ 068 910, see Figure 1.

It comprises a dis used quarry cut into the north eastern flank of a hill known as Maesmawr. It is split into two levels, representing former quarry benches; see Figure 2 and Photograph 1.

The top quarry face is at an elevation of around 239mOD, falling to an elevation of 212mOD, some 27m high. A wide bench separates the upper and lower benches and the lower bench extends to an elevation of 195mOD, a height of some 17m. The quarry faces at present range from near vertical/vertical rock faces to faces with aggregate stored against the face.

The quarry faces trend in a south east to north west direction and the boundary of the SSSI is shown on Photograph 1 in red.



Photograph 1: Aerial photograph of the site

The existing buildings on site comprise a portacabin style office at the entrance to the site and steel framed warehouses in the working area on the lower norther section of the site.

2.2 Geology

The site lies within the, “Welsh Basin”, a marine depression surrounded by land, which was largely infilled during Lower Paleozoic times. It was filled with fine to coarse grained sediments from surrounding land masses, which comprise rhythmic alterations of mudstones (fine grained) and greywacke (coarse grained sandstone) of the Penstrowed Grits, which are Silurian in age.

These rocks outcrop in an extensive north to south trending belt running east of Newtown. They represent a classic turbidite sequence, which was deposited from sediment laden density currents (turbidity currents), which flowed north into deeper parts of the basin. These produced graded bedding shown by upward fining in grain size, along with an abundance of sedimentary structures, such as flute casts, seen on the underside of some coarse-grained units in the Penstrowed Grits, confirming the high energy depositional environment.

The Penstrowed Grits in the quarry consist of a rhythmic alternating sequence of cream coloured greywacke sandstones, and dark grey siltstones and shaley mudstones, see Photograph 2.



Photograph 2: Alternating sequence, lower quarry face

However, the reason the site has planning protection lies in the wide range of sedimentary structures found in the rocks on site, these include;

- Graded bedding, where coarse grained basal units pass up into a fine-grained laminated sandstone,
- The base of many of the sandstone beds are characterised by abundant sole structures, including flute casts and tool marks,
- Ripple marks on the top of sandstone beds.

The flute casts are formed when hollows were eroded into the top of the underlying bed and later infilled with coarser sediment. The tool marks appear as linear grooves and were produced by an object (tool) such as a pebble being dragged along the sea floor.

Turbidity currents transfer large quantities of sediment from shallow to deep marine environmental at high speed, with the coarser fragments settling out of suspension first followed by the finer grained silty material. The fine grained shaley mudstones overlying the sandstones representing the background sedimentation in the deep water immediately preceding the arrival of the next turbidity current.

2.3 Hydrogeology and Hydrology

Due to the general topography, i.e., sloping steeply to the north east and the presence of sandstone bedrock the groundwater is anticipated to be at significant depth beneath the site, with any groundwater flows being in the same direction as the slope towards the valley floor, containing the River Severn.

The only other watercourse in the vicinity of the site is a small stream, which is to the north of the site offices, and which flows in a south west to north east direction down slope towards the River Severn, see Figure 2.

2.4 History

Reference 1 records that prior to 1946 the quarry was owned and worked by the Local Council, which exploited the hard sandstone layers for use as building and road stone.

The quarry was connected by a short rail link to the main Shrewsbury-Aberystwyth railway some 600m to the north east of the site. However, this link was closed in 1937.

The previous owners purchased the site in 1946 and continued to work the quarry until 1984 approximately, when it was abandoned.

GFG purchased the quarry in March 2001 and it is currently used for the processing and storage of aggregates.

3.0 WORK PROPOSED TO SATISFY GEOLOGICAL PLANNING CONDITIONS

3.1 GSL Report

According to Reference 1, the main objective at Penstrowed quarry is to maintain the integrity of, and access to the rock faces particularly those, which are located on the upper level, since it is in this area that the best examples of sedimentary structures can be found.

Consequently, a scheme to prepare the site for development, whilst protecting the geological features for the future was prepared. Following issue of the report, meetings were held with CCW, and the proposal were agreed and revised slightly, see Figure 3.

The recommendations given in Reference 1 are important when it comes to an assessment of contaminated land, as it provides a suitable mechanism to ensure clean inert material is placed immediately below the proposed development area.

The agreed recommendations were to backfill the quarry face with inert material and leave the top 6m of face exposed for inspection on the upper quarry face. During the works the exposed rock faces should be battered back slightly to a more stable gradient. This will allow significant quantities of inert quarry won material to be generated for the development proposals.

The detailed proposals to create the development platforms are summarised below:

Prior to commencement of infilling the formation will then need to be prepared, which will involve ensuring the quarry has a back fall of around 1 in 100 towards the quarry face to ensure drainage away from the edge of the quarry. This can best be achieved by using a fine quarry dust to provide a level formation of low permeability.

The drainage for water percolating through the deposited material will then flow in a south easterly direction towards the quarry faces.

A granular drainage blanket should be constructed at the base of the proposed infilling. This should comprise a 300mm thick layer of single size stone (40mm), which can be processed/obtained from materials already on site. The drainage blanket should then be covered with a geotextile separator before placing the inert material.

At the base of the quarry face a trench/soakaway should be constructed in the sandstone bedrock, which should be some 1m deep and some 600mm wide. It will be necessary to excavate this trench using hydraulic/pneumatic excavators. This trench should also be backfilled with single size stone.

A granular drain should also be provided adjacent to the quarry face to intercept surface run off from above and also divert rainfall back into the drains.

The above drainage design should ensure that all water falling/flowing onto the deposited material is captured and taken to soakaway.

During placing of the materials, it is recommended that they be lightly compacted using the tracked machines used for placing the fill material. Side slopes for the inert material shall not exceed 1 in 2 (26.5°) to ensure side slope stability.

3.2 Proposed Work

Upper Rock face – Phase I

It is proposed to backfill this section first to enable the existing facility in the lower quarry to continue in operation in the short term.

CCW have requested that the top 6m of the upper face be left exposed, along with the outcrops at ground level at the southern end of the quarry. In addition, CCW have requested that an area where graptolite fossils have been found is left exposed.

This will involve backfilling against the face to approximately half way up the slope to an elevation of around 120mOD. A 3m wide access track will then be constructed at the base of the slope to comply with CCW requirements for inspections and to also enable plant access. The southern end of the deposited material will be battered back to ground level to secure access to the ground level outcrops, see Figure 3.

Behind the access path a slope at a gradient of 1 on 2 (26.5°) will be constructed to the main level plateau of 224mOD. This will allow the quarry face to be largely hidden once the site has been landscaped. To the north east of the level plateau a 1 on 2 slope will fall towards the top of the lower quarry face.

At the base of the slope the 3m wide access track will be constructed with an earth berm constructed between the access track and the top of the quarry face. This earth bund will be some 3m wide and around 1m high, and will act as a safety barrier for plant and personal visiting the quarry.

Lower Quarry Face – Phase II

An elevation of around 195mOD has been agreed as the development level.

The development platform will then extend in a north east direction, where a 1 on 2 slope will be formed to tie it into the existing quarry slopes, see Figure 3.

3.3 Slope Landscaping and Reinstatement

On completion of the work the side slopes can either be topsoiled and planted. Alternatively, they can be hydroseeded with a suitable mix that is similar to the land either side of the quarry.

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4.0 CURRENT DEVELOPMENT PLANS

4.1 General

The current development proposals have been prepared by Lambe Planning & Design (LPD), see Figure 4.

It is proposed for the recycling operation to cease, with a new Holiday Park constructed. This will comprise 81 single lodges, and 16 twin lodges, giving a total of 97 lodges with wraparound decks. Access roads are also proposed, along with attenuation ponds on the lower sections of the quarry.

A Pre-Application Statement has been submitted by Hughs Architects (HA) and the relevant points are summarised below:

- The lower platform is to provide a landscaped area suitable for around 24 touring caravans, with road access and shared amenity spaces.
- The mid and upper platforms will provide approximately 76, 1-to-3-bedroom holiday lodges.
- Significant soft landscaping is proposed to minimise negative visual impact.
- The existing buildings associate with the works are to be demolished, with the exception of the existing office, which will be converted into a reception building. A large surface water attenuation pond will be incorporated into the design to ensure sustainable water drainage.
- Foul water will be treated on site and discharged into the existing watercourse.
- The existing access to the site from the A489 will require improvement/upgrading.

4.2 Landscaping Proposals

The landscaping proposal have been prepared by Lockhart Garratt (LG) and are presented in Appendix A.

4.3 Foul and Storm Drainage

The current foul drainage proposal, as provided by Waterco is for a Package Treatment Plant that will discharge to the adjacent watercourse, which it is understood is a tributary of the River Severn.

Storm drainage will comprise soakaways into the underlying bedrock, and an attenuation pond.

5.0 CURRENT OPERATION OF THE WORKS

The site is currently operating under permission no EPR/GB3632AS, which is the Environmental Permitting (England & Wales) Regulations 2010. The relevant sections are summarised below, with the current issue date being the 17th September 2012.

It is presented in full in Appendix B, which presents the full lists of wastes allowed:

- The permit allows the storage of waste, and the treatment of waste by sorting, separating, screening, crushing and blending to produce soil, soil substitutes and aggregates,
- All wastes are to be stored and treated on hard standing, or impermeable surface, with sealed drainage,
- The permit does not permit the burning of any wastes,
- The permit does not allow any emissions into surface or groundwater except:
- Clean water from roofs, and parts of the site not used for waste activities, including storage of wastes.

The maximum quantity permitted was 92,000 tons per year.

The site is operated by a certified WAMITAB, Joseph Grigg, and his current continuing competence certificate is presented in Appendix C, which was issued in March 2021

Examples of the returns submitted by GFG to the Environment Agency are presented in Appendix D.

6.0 SITE INVESTIGATION

6.1 Fieldwork

A preliminary site investigation was undertaken on the 3rd February 2021, and comprised:

- Nine machine excavated trial pits, excavated to a maximum depth of 1.50m,
- Soakaway testing in one of the trial pits,
- Chemical testing of the made ground.

The trial pits were supervised and logged by a chartered GSL Engineer in general accordance with BS 5930, Reference 2. The Soakaway testing was carried out by filling the trial pits quickly with water from a 600-gallon water tanker and monitoring the water level in accordance with BRE Digest 365, Reference 3.

The locations of the trial pits are presented in Figure 2, with the trial pit logs presented in Appendix E. Most of the trial pits were excavated on the higher sections of the quarry, with TP 01 excavated at the lowest section of the quarry for soakaway testing.

6.2 Laboratory Work

Samples for chemical testing were taken from the made ground, placed in appropriate containers and a cool box, and taken immediately to the laboratories of Derwentside Environmental Testing Services (DETS) in County Durham for the following testing:

Metals & Non-metals - Arsenic (As), Boron (B), Cadmium (Cd), Chromium (Trivalent), Chromium (Hexavalent), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Phenol, Selenium (Se), and Zinc (Zn).

Petroleum Hydrocarbons - Benzene, Toluene, Ethylbenzene, o-xylene, m-xylene, p-xylene, Aliphatics >C5 – C44, Aromatics >EC5 – EC44.

Polyaromatic Hydrocarbons (PAH) – Acenaphthene, Acenaphthylene, Anthracene, Benz (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (g, h, i) perylene, Benzo (k) fluoranthene, Chrysene, Dibenzo (a, h) anthracene, Fluorene, Fluoranthene, Indeno (1,2,3-cd) pyrene, Naphthalene, Phenanthrene, Pyrene.

Other Contaminants – Sulphide (easily liberated), Water soluble Sulphate (2:1 extract), Cyanide, pH, Soil Organic Matter (SOM).

In addition, asbestos screening was carried out on all samples.

The results are summarised in Section 8.0, and the results presented in full in Appendix F.

7.0 GROUND CONDITIONS

The made ground was found to be highly variable, as would be expected from an aggregate recycling facility. The types of made ground can be split down into several types, as follows.

The spoil around the edge of the site, which was stripped prior to quarrying is referred to as the overburden mound. Other specific wastes were quarry fines, which is the remains of the aggregate processing, with the fines not being suitable for onward sale and are therefore left in the quarry.

Finally made ground associated with the recycling operations, with the following general descriptions.

General Made Ground

- Loose, brown, fine to coarse gravel, with occasional cobble in a silt/sand/clay matrix/Firm, brown, sandy clay, with some gravel and traces of plastic, metal, tarmac and occasional boulders of concrete, mainly derived from glacial deposits.
- As above, with traces of old topsoil and rotting organic matter, tarmac and concrete kerb and concrete boulders.
- Very soft, light brown, very plastic clay, with a little gravel and traces of old topsoil at top, derived from glacial deposits.
- Soft to firm, red brown, sandy clay, with a little gravel, derived from glacial deposits.
- Firm to stiff, brown and grey brown, silty clay/clayey silt, with much gravel, traces of plastic and occasional pockets of topsoil, mainly derived from glacial deposits.
- Firm, brown becoming dark brown, silty clay, with some too much sub angular to rounded gravel, with traces of plastic and terram, mainly derived from glacial deposits.

Overburden Mound

- Loose, brown, clayey, sub angular to angular, fine to coarse, gravel/ cobble and occasional boulder.

Quarry Fines

- Firm, grey brown, silty clay/clayey silt, with much sub angular to angular, fine to medium gravel.

Bedrock

In places, a layer of completely weathered bedrock was encountered above the intact bedrock, which was described, as follows:

- Medium dense/firm to stiff, brown, silty clay/clayey silt, with much sub angular to angular gravel and occasional cobble.

- Loose, brown, sandy, sub angular to angular, fine to coarse gravel, of very weak mudstone.

The underlying bedrock encountered in the trial pits was sandstone, with a bedding spacing of typically 250 to 300mm, and also some sub vertical joints, with a spacing of 300mm.

On the upper bench of the quarry, very weak, brown, highly weathered mudstone was encountered.

Permeability testing was only undertaken in one trial pit on the lower section of the site within the sandstone bedrock. The results are summarised in Table 7.1 below:

Table 7.1 Soakaway Test Results

TP No.	Depth (m)	Test No.	Infiltration Rate (m/sec)
1	1.00	1	9.17×10^{-4}
		2	8.03×10^{-4}
		3	8.65×10^{-4}

8.0 RESULTS OF CHEMICAL TESTING

Samples were taken from the made ground for chemical testing, with the sample depths presented in Table 8.1 below.

Table 8.1 Sample Depths

TP No	Depth (m)
TP2	0.00-1.00
TP4	0.00-0.40
TP5	0.00-1.00
TP6	0.00-0.90
TP7	0.00-1.20
TP9	0.00-0.10

The results of the soil analyses are presented below, where they have been compared to suitable generic assessment criteria (GACs), in order to allow a generic quantitative risk assessment (GQRA) to be carried out for the site and the proposed development.

The Category 4 Screening Levels (C4SLs) published by DEFRA (2014) have been adopted in the first instance, which have been published for six substances to date. Where a C4SL is unavailable, the “Suitable 4 Use Levels” (S4ULs) published by LQM/CIEH (2015) have been adopted.

These criteria have been derived using the CLEA model for a range of standard end-use scenarios and a range of soil organic matter (SOM) contents. It should be noted that the C4SL values are derived on the basis of a “low level of toxicological concern”, while the S4UL values are based on a “tolerable” or “minimal” level of risk. As such, the S4ULs describe a lower level of risk than the C4SLs, and are equivalent to the former Soil Guideline Values (SGVs, published by the Environment Agency) and the previous editions of the LQM/CIEH GAC values.

A “Public Open Space (POS)” end-use has been adopted for this analysis, based on a SOM content of 1.0%.

Note: the S4UL values presented below are Copyright Land Quality Management Limited, reproduced with permission; Publication Number S4UL3668. All rights reserved.

Metals & Non-Metals	BH101	BH101	BH102	BH103	BH104	BH104	Adopted Guideline (mg/kg)	Source	Exceedances
	0.20	1.50	1.2	1.5	0.2	0.7			
Arsenic	10	11	12	14	18	14	79	C4SL	0
Boron, Water Soluble	0.4	0.30	0.30	< 0.2	< 0.2	0.20	21000	S4UL	0
Cadmium	0.2	0.30	0.20	< 0.1	< 0.1	< 0.1	220	C4SL	0
Chromium III	30	24	28	25	22	24	1500	S4UL	0
Chromium, Hexavalent	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	21	C4SL	0
Copper	40	49	31	37	50	36	12000	S4UL	0
Lead	28	32	25	17	26	35	630	C4SL	0
Mercury	< 0.05	0.07	< 0.05	< 0.05	< 0.05	0.05	16	S4UL	0
Nickel	34	32	43	39	35	35	230	S4UL	0
Phenol - Monohydric	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	440	S4UL	0
Selenium	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1100	S4UL	0
Zinc	98	120	110	74	100	100	81000	S4UL	0

No exceedances above the relevant guidance values were recorded.

Petroleum Hydrocarbons	BH101	BH101	BH101	BH102	BH103	BH104	Adopted Guideline (mg/kg)	Source	Exceedances
	0.20	0.20	1.50	1.2	1.5	0.2			
Aliphatic C5-C6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	570000	S4UL	0
Aliphatic C6-C8	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	600000	S4UL	0
Aliphatic C8-C10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	13000	S4UL	0
Aliphatic C10-C12	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	13000	S4UL	0
Aliphatic C12-C16	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	13000	S4UL	0
Aliphatic C16-C21	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	250000	S4UL	0
Aliphatic C21-C35	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	250000	S4UL	0
Aliphatic C35-C40	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	56000	S4UL	0
Aromatic C5-C7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	56000	S4UL	0
Aromatic C7-C8	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	5000	S4UL	0
Aromatic C8-C10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	5000	S4UL	0
Aromatic C10-C12	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	5100	S4UL	0
Aromatic C12-C16	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3800	S4UL	0
Aromatic C16-C21	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	3800	S4UL	0
Aromatic C21-C35	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	3800	S4UL	0

No exceedances above the relevant guidance values were recorded.

Polyaromatic Hydrocarbons (PAH)	BH101	BH101	BH101	BH102	BH103	BH104	Adopted Guideline (mg/kg)	Source	Exceedances
	0.20	0.20	1.50	1.2	1.5	0.2			
Acenaphthene	0.55	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	15000	S4UL	0
Acenaphthylene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	15000	S4UL	0
Anthracene	0.74	0.06	< 0.03	< 0.03	< 0.03	< 0.03	74000	S4UL	0
Benzo(a)anthracene	1.1	0.22	< 0.03	< 0.03	< 0.03	< 0.03	29	S4UL	0
Benzo(a)pyrene	0.9	0.23	< 0.03	< 0.03	< 0.03	< 0.03	10	C4SL	0
Benzo(b)fluoranthene	1	0.28	< 0.03	< 0.03	< 0.03	< 0.03	7.1	S4UL	0
Benzo(g,h,i)perylene	0.32	0.11	< 0.03	< 0.03	< 0.03	< 0.03	640	S4UL	0
Benzo(k)fluoranthene	0.47	0.10	< 0.03	< 0.03	< 0.03	< 0.03	190	S4UL	0
Chrysene	1	0.21	< 0.03	< 0.03	< 0.03	< 0.03	57	S4UL	0
Dibenzo(a,h)anthracene	0.07	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.57	S4UL	0
Fluoranthene	3.3	0.54	0.03	< 0.03	< 0.03	< 0.03	3100	S4UL	0
Fluorene	0.44	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	9900	S4UL	0
Indeno(1,2,3-c,d)pyrene	0.26	0.10	< 0.03	< 0.03	< 0.03	< 0.03	82	S4UL	0
Naphthalene	0.1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	4900	S4UL	0
Phenanthrene	2.4	0.17	< 0.03	< 0.03	< 0.03	< 0.03	3100	S4UL	0
Pyrene	2.8	0.49	0.03	< 0.03	< 0.03	< 0.03	7400	S4UL	0

No exceedances above the relevant guidance values were recorded.

Other Contaminants / Testing	BH101	BH101	BH101	BH102	BH103	BH104	Adopted Guideline (mg/kg)	Source	Exceedances
	0.20	0.20	1.50	1.2	1.5	0.2			
Organic matter	1	0.40	< 0.1	< 0.1	1.2	0.7	-	-	-
pH	8.2	8.00	7.90	6.5	7.3	7.5	-	-	-
Sulphide	< 10	< 10	< 10	< 10	32	< 10	-	-	-
Cyanide, Total	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-
Sulphur (free)	< 0.75	2.30	1.70	< 0.75	< 0.75	< 0.75	-	-	-
Sulphate Aqueous Extract as SO4	170	29.00	65.00	15	430	54	-	-	-

No exceedances above the relevant guidance values were recorded.

In addition, no evidence of asbestos was recorded in any of the samples.

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9.0 CONCEPTUAL MODEL AND RISK ASSESSMENT

9.1 General

According to the Contaminated Land Regulation, to determine whether there is a significant possibility of significant harm, the following should be considered:

“The nature and degree of harm, the susceptibility of the receptors and the timescale within which the harm occur”.

Current good practice therefore requires that the findings from the desk study or site investigation be evaluated for contamination on a site-specific basis using a risk-based approach. Risk assessment involves identification of the hazards and evaluation of the risks associated with these hazards. Risk assessment requires an evaluation of a conceptual “source – pathway – receptor” linkage model and can be qualitative or quantitative.

The basis of an environmental risk assessment involves identifying a ‘source’ of contamination, a ‘pathway’ along which the contamination may migrate and a ‘receptor’ at risk from the contamination.

Current legislation defines the various elements of the pollution linkage as:

- A contaminant ‘source’ is a substance, which is in, or under the ground, and which has the potential to cause harm or to cause pollution of controlled waters.
- A ‘pathway’ is one or more routes through which a receptor is being exposed to, or affected by, a contaminant, or could be so affected.
- A ‘receptor’ is either a living organism, an ecological system, a piece of land or property, or controlled water.

A pollutant linkage indicates that all three elements have been identified. The site can only be defined as ‘Contaminated Land’ if a pollutant linkage exists and the contamination meets the criteria above.

5.2 Hazard Identification

On Site

The desk study has confirmed that the site’s previous land use was open fields prior to the site being used as a quarry, whereby stone was quarried and taken off site for use elsewhere.

Following this the site has been used as a recycling centre, whereby waste from construction activity is brought to site, processed, and is then sold onward and taken off site. The only material generally left on site from this process is the finer material that cannot be used in the

construction process. This was proved by the trial pits, where most of the made ground appears to have been derived from local excavations within the glacial deposits.

However, the lower section of the site has been used for vehicle maintenance and refueling, therefore, there is a potential for localised hotspots of hydrocarbon contamination.

In addition, there could be slight hydrocarbon hotspots from construction traffic using the higher levels of the site, and the site access roads. However, the risk from this possibility is considered to be low.

The existing buildings that are to be demolished may contain asbestos in some form, and it is recommended that prior to demolition an asbestos survey be undertaken. Any asbestos encountered will need to be removed from site by a suitably qualified contractor.

Off Site

The desk study did not reveal any potential sources of contamination close to the site.

5.3 Summary of Conceptual Ground Model

Potential Contamination Sources	Potential Contaminants of Concern	Potential Pathways	Receptor Group
Made Ground	Heavy Metals	Inhalation/ingestion of contaminated dust Dermal Contact	Construction workers
Possible Hydrocarbon Spills	PAH Petroleum Hydrocarbons	Ingestion of soil or home-grown vegetables Leaching of contaminated materials Lateral Migration and Infiltration	End Users Surface and Groundwater Building Materials and Buried Services

5.4 Pathways

In relation to any on site contamination reaching potential site users, the following pathways have been considered for the proposed development.

- Ingestion and skin contact with soils on site,
- Inhalation of ground gas,
- Inhalation of contaminated dust,
- Leaching of contaminated materials that may affect controlled waters,
- Direct contact with contaminated material during construction.

5.5 Receptors

The potential impact of a hazard must be assessed with regard to the following target groups:

- Future site users,
- Construction workers,
- Surface and groundwater, both on and off the site,
- Nearby vegetation,
- Building materials and buried services.

5.6 Future Site Users Risk Assessment

The site is to be developed as a Holiday Park, with a combination of single and twin chalets and mobile caravan spaces.

The desk study has revealed that the only site uses have been as a quarry and a recycling plant, which has been licensed by the Environment Agency. Consequently, the potential for contaminated land to be present is limited.

In addition, numerous visits to site over the last ten years, and the recent site investigation have failed to reveal any visual or olfactory evidence of contamination.

The site is to be a Holiday Park; therefore, domestic gardens will not be provided, and the site will be largely covered with buildings and hardstandings, with minor areas of landscaping. Hence the exposure potential risk to future site users is limited.

However, as discussed in Section 3.0, large sections of the development platform are to be raised to satisfy CCW conditions on the quarry faces.

Therefore, this gives the developer an opportunity to fill the site, and provide an inert upper 0.50m layer. Therefore, removing any pathways to future receptors from any residual contamination.

This could either be material gained from processing the abundant rock still present on site, and that to be gained from reprofiling the rock faces, or by using the overburden mound that surrounds the site.

In addition, the site will remain operational for approximately one year during the planning process, which gives the developer the opportunity to separate material suitable for capping the site.

5.7 Controlled Waters Risk Assessment

When considering the risk to controlled waters both surface waters and underlying aquifers have to be considered.

The surface water comprises an adjacent small stream, which is reported to eventually flow into the River Severn.

At presents all water falling onto the site will infiltrate into the made ground and potentially leach any contaminant into controlled waters. However, the development of the site, which will comprise buildings and hardstandings, will ensure that most water will instead of entering the ground be taken to the attenuation ponds, or straight to soakaway where it will be discharged into the bedrock.

Therefore, whilst the risk to surface water is considered to be very low at present, the risk will reduce substantially on development of the site.

This is the same for the underlying aquifer, whereby development of the site will reduce the risk to the aquifer.

Therefore, it can be concluded that the risks to controlled waters are very low, reducing to negligible on development of the site.

5.8 Construction Workers

The risk to construction workers is considered to be very low and can be catered for by appropriate PPE and washing facilities in accordance with good practice.

In accordance with current good practice, a watching brief should be kept on all excavations, should contamination be encountered it should be excavated, stored safely on site, tested and disposed of at a suitably licensed landfill facility.

5.9 Ground Gas

The desk study failed to reveal any source of landfill gas, and the made ground on site is inert. Therefore, the site is not affected by landfill gas.

Whilst a radon report has not been obtained, the fact that the development platforms are at the top of steep quarry faces ensures that the buildup of radon gas is not possible. Venting naturally at the quarry faces, as radon is 7.5 times heavier than air.

Therefore, no gas protection measures will need to be used in the construction of new dwellings or extensions.

5.10 Vegetation

At this stage, it has not been possible to identify the presence of any contaminants that may affect vegetation.

5.11 Protection of Building Materials

Chemical attack of buried services and building materials is considered unlikely based on the chemical test results to date.

10.0 DEVELOPMENT/ REMEDIATION STRATEGY

When undertaking the detailed design, it will be necessary to take into account the recommendations in Reference 1, which covers CCW requirement to keep features on the rock faces visible.

In addition, the following actions will be required as part of this work, which will ensure that contamination issues are addressed.

Firstly, it will be necessary to establish the development levels. At this stage, it is considered that the development areas will need to be raised.

In which case, prior to planning being granted it will be necessary to identify these materials that are inert for any potential capping requirements.

It is likely that the chalets will be founded on a granular raft, and reinforced raft foundations, therefore foundations will need to be underlain by suitable site won granular material.

Further site investigation will be necessary, but only in those areas where the development will be at grade, i.e., no filling is required.

It is therefore recommended that in the planning process:

- GFG identify, stockpile and test materials that are to be used as a capping layer.
- Determine quantities required in the earthworks.
- Produce a waste working plan.

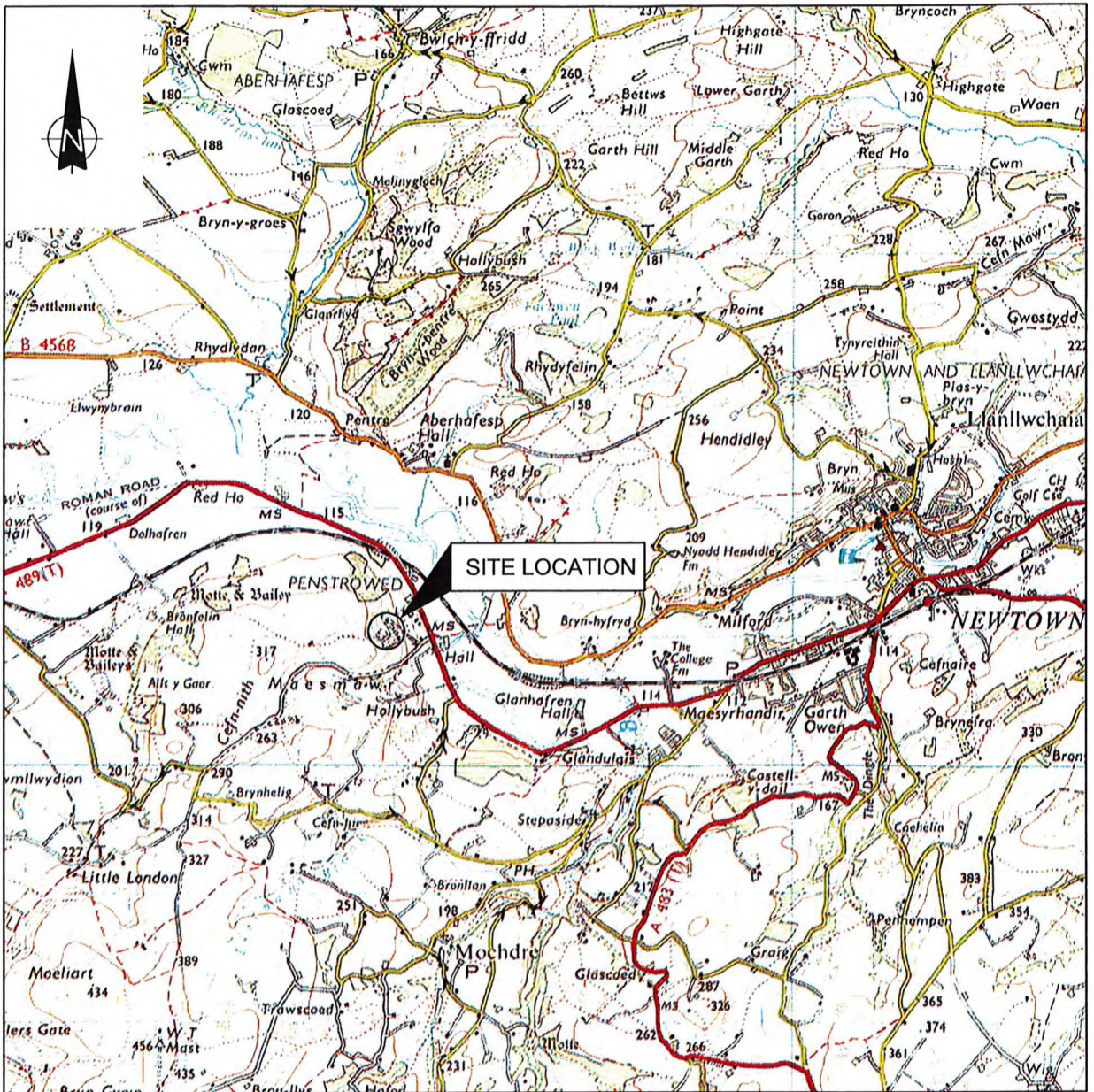
The lack of contamination encountered to date and the filling required means that a remediation strategy is unlikely to be required. Although this will be determined during the planning process.

REFERENCES

1. Backfilling report 2013
2. BS 5930
3. BRE Digest 365
4. .

DRAFT

FIGURES



SCALE - 1 : 50000

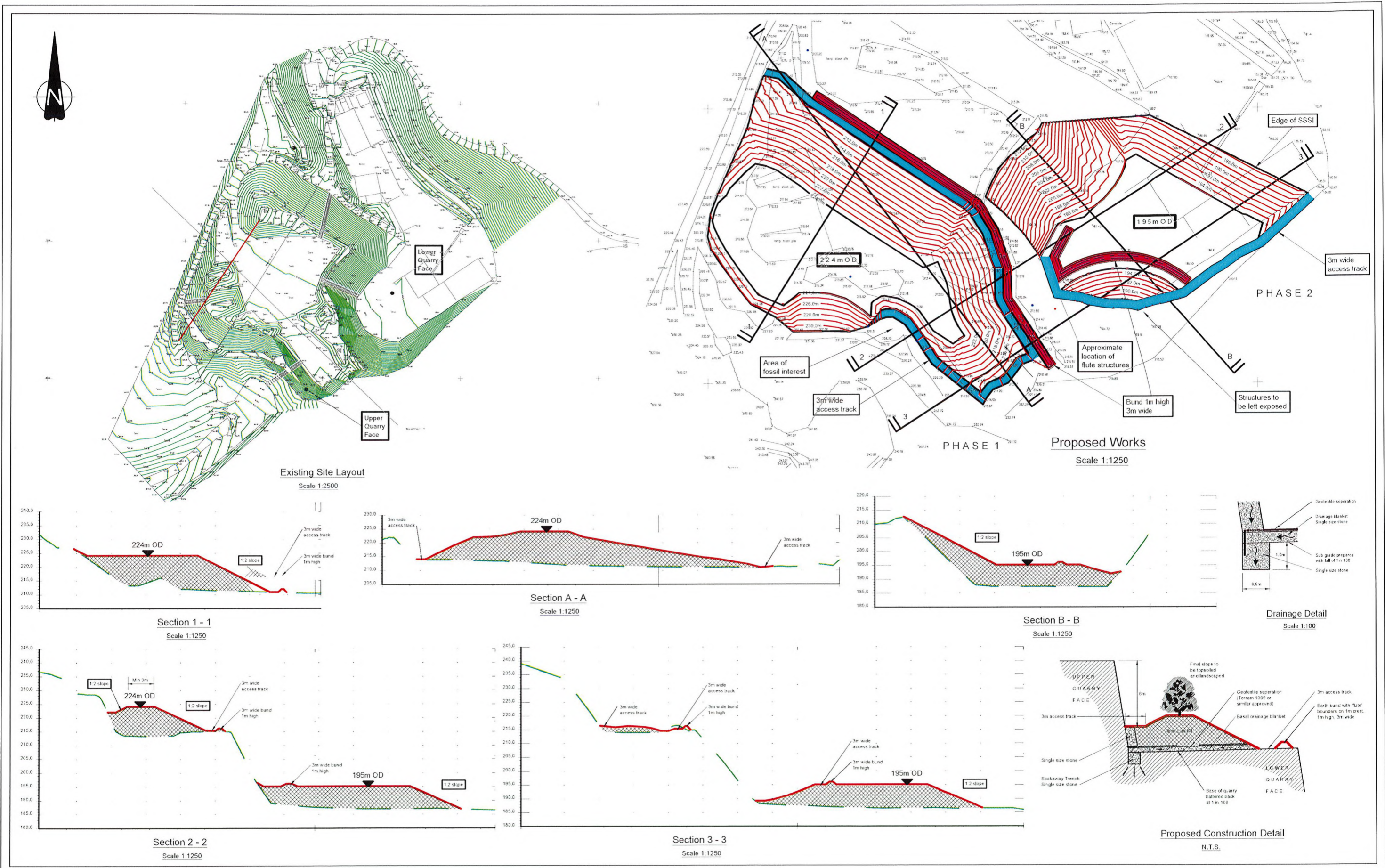
LICENSE No. 100030802

SITE LOCATION
 FIGURE **1**



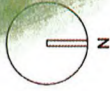
SCALE 1:1250 @ A3

Figure Title
Site Layout &
Location of Trial Pits
FIGURE 2



SCALE Various

Figure 1d
Proposed Quarry Infilling Works
FIGURE 3



SCALE 1:1250 @ A3

Figure 1 title
Proposed Development
FIGURE 4

APPENDIX A

Landscaping Proposals



- Key:**
- Proposed tree
 - Proposed woodland
 - Proposed shrub
 - Ornamental shrub / herbaceous
 - Marginal planting
 - Bulbs in amenity grass
 - Amenity grass
 - Proposed roadway
 - Excused Rock Face
 - Proposed waterbody
 - Proposed structure

LOCKHART GARRATT

Detailed Landscape Design
Inset 5

Penstrowed Quarry
G F Grigg Ltd

21-0763

V1

11/08/2021 1:250 @ A1

RF SL

Project approved with the permission of the Council of the City of Edinburgh Council. The design is subject to the approval of the Council of the City of Edinburgh Council. The design is subject to the approval of the Council of the City of Edinburgh Council. The design is subject to the approval of the Council of the City of Edinburgh Council.

For a full list of plants, please refer to the main landscape design. For a full list of plants, please refer to the main landscape design. For a full list of plants, please refer to the main landscape design.



- Key:**
- Proposed tree
 - Proposed woodland
 - Proposed shrub
 - Ornamental shrub/herbaceous
 - Marginal planting
 - Bulbs in amenity grass
 - Amenity grass
 - Proposed roadway
 - Exposed Rock Face
 - Proposed waterbody
 - Proposed structure

LOCKHART GARRATT

The Detailed Landscape Design
Inset 6

Penstrowed Quarry

G F Grigg Ltd

21-0763

V1

11/08/2021 1:250 @ A1

RF SL

For further information, please contact:
Lockhart Garratt Ltd, 100, The Quadrant, London, W1R 0AS
Tel: 020 7463 4444 Fax: 020 7463 4445
www.lockhartgarratt.com

APPENDIX B

Environmental Permit



Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

G. F. Grigg Limited

Penstrowed Quarry
Penstrowed
Caersws
Powys
SY17 5SG

Permit number

EPR/GB3632AS

Penstrowed Quarry

Permit number EPR/GB3632AS

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

This permit allows the storage of waste and the treatment of waste by sorting, separation, screening, crushing and blending of waste to produce soil, soil substitutes and aggregate. Permitted wastes do not include hazardous wastes. The annual throughput of the site must not exceed 92,000 tonnes per year.

All waste shall be stored and treated on hard standing or impermeable surface with sealed drainage.

This permit does not permit the burning of any wastes, either in the open, inside buildings or in any form of incinerator.

This permit does not allow any emission into surface waters or groundwater except:

- clean water from roofs and parts of the site not used for waste activities including storage of wastes.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit

Description	Date	Comments
Application EPR/GB3632AS/A001	Duly made 28/04/12	Application for waste treatment facility for the treatment of waste to produce soil, soil substitutes and aggregates.
Permit determined	17/09/12	Permit issued to G F Grigg Limited

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/GB3632AS

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

G.F. Grigg Limited (“the operator”),
whose registered office is

Andair
Canal Road
Newton
Powys
SY16 2AS

company registration number **04182756**
to operate waste operations at

Penstrowed Quarry
Penstrowed
Caersws
Powys
SY17 5SG

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Eirian Macdonald	17/09/12

Authorised on behalf of the Environment Agency

Conditions

Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.
- 1.1.4 The operator shall comply with the requirements of an approved competence scheme.

1.2 Avoidance, recovery and disposal of wastes produced by the activities

- 1.2.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.2.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 (a) For the following activities referenced in schedule 1, table S1.1. The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- (b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 Waste shall only be accepted if:
- (a) it is of a type and quantity listed in schedule 2 table(s) S2.1 [, S2.2 etc]; and
- (b) it conforms to the description in the documentation supplied by the producer and holder.

3 Emissions and monitoring

3.1 Emissions of substances not controlled by emission limits

3.1.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.1.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;
- (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2 Odour

3.2.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.2.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;
- (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;
- (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

- (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

- (a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;
- (b) the breach of a limit specified in the permit; or
- (c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address (es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "without delay", in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities

	Description of activities for waste operations	Limits of activities
Waste treatment facility for the production of soil, soil substitutes and aggregates	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	All waste shall be stored upon hard standing or impermeable surface with sealed drainage.
	R3: Recycling/reclamation of organic substances which are not used as solvents	Treatment consisting only of <ul style="list-style-type: none"> - sorting - separation - screening - crushing - blending of waste for recovery as soil, soil substitute or aggregate only.
	R5: Recycling/reclamation of other inorganic compounds	All waste shall be treated upon hard standing or impermeable surface with sealed drainage.
		Waste types as specified in Table S2.1
		Notwithstanding the waste types permitted in table S2.1 wastes which have any of the following characteristics shall not be accepted; <ul style="list-style-type: none"> - hazardous wastes - wastes consisting solely or mainly of dusts or powders - wastes which are odour producing or likely to be odourous

Table S1.2 Operating techniques

Description	Parts	Date Received
"How to comply with your environmental permit"	All	N/A
Application	G F Grigg Limited Environmental Management system, following sections	28/04/12
Application	Part 6 Operating Techniques following sections: <ul style="list-style-type: none"> 2.1.6 Control of dust and particulates 2.1.7 Control of noise 2.1.8 Monitoring and control of litter 	30/03/12

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Permitted waste types and quantities for waste treatment facility for the production of soil, soil substitutes and aggregates.

Maximum quantity	92,000 tonnes per year
Waste code	Description
01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS
01 01	wastes from mineral excavation
01 01 01	wastes from mineral metalliferous excavation
01 01 02	wastes from mineral non-metalliferous excavation
01 04	wastes from physical and chemical processing of non-metalliferous minerals
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
10	WASTES FROM THERMAL PROCESSES
10 12	wastes from manufacture of ceramic goods, bricks, tiles and construction products
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them
10 13 14	waste concrete and concrete sludge
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 01	concrete, bricks, tiles and ceramics
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 03	bituminous mixtures, coal tar and tarred products
17 03 02	bituminous mixtures other than those mentioned in 17 03 01
17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 08	track ballast other than those mentioned in 17 05 07
17 08	gypsum-based construction material
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01
17 09	other construction and demolition wastes
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 09	minerals (for example sand, stones)
19 13	wastes from soil and groundwater remediation
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01

Table S2.1 Permitted waste types and quantities for waste treatment facility for the production of soil, soil substitutes and aggregates.

Maximum quantity	92,000 tonnes per year
Waste code	Description
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 02	garden and park wastes (including cemetery waste)
20 02 02	soil and stones

Schedule 3 – Emissions and monitoring

There are no emission limits or associated monitoring requirements.

Schedule 4 - Reporting

There is no reporting under this schedule.

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

"accident" means an accident that may result in pollution.

"Annex II" means Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"authorised officer" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"emissions to land" includes emissions to groundwater.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit..

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

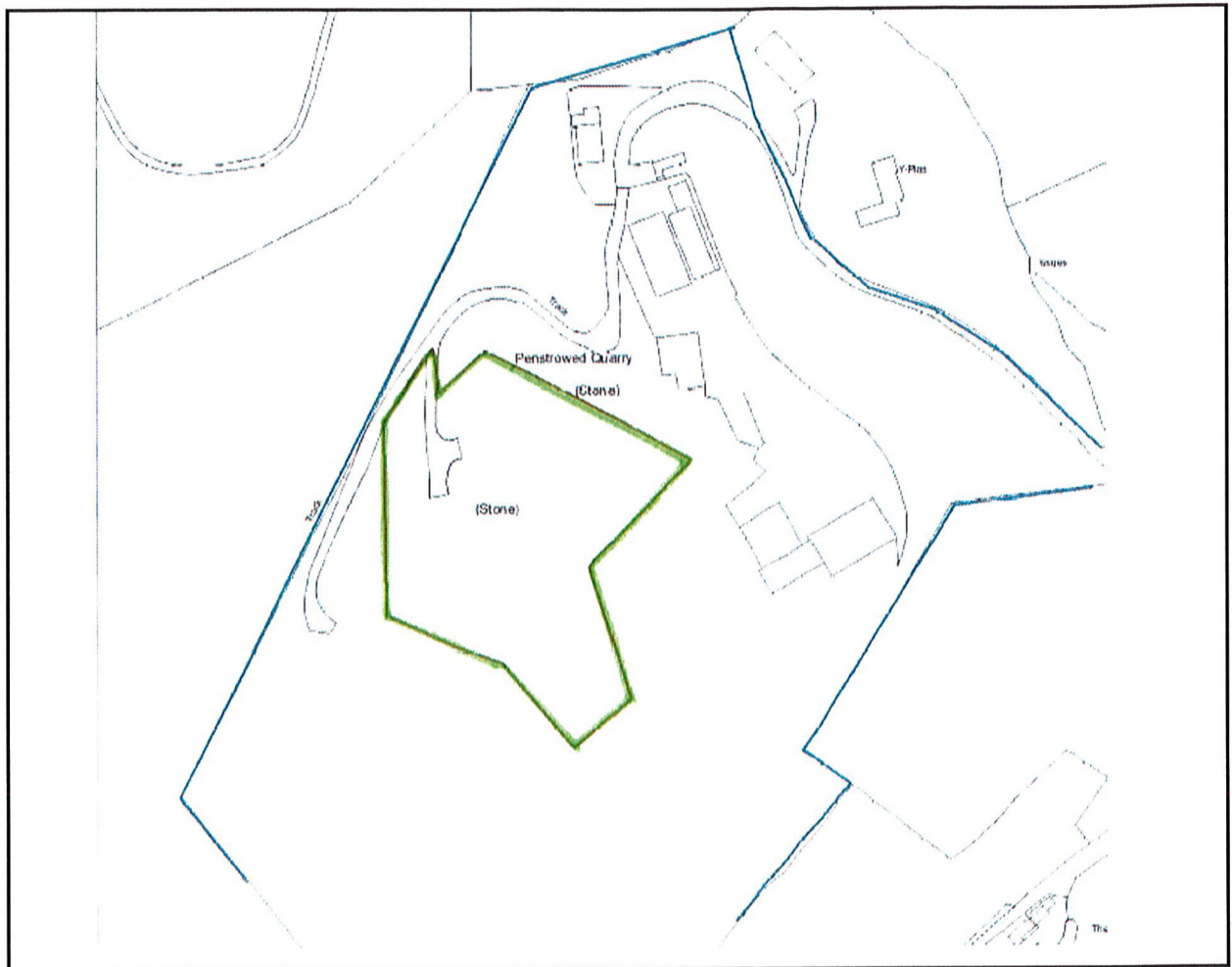
"R" means a recovery operation provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"Waste Framework Directive" or "WFD" means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.

"year" means calendar year ending 31 December.

Schedule 7 - Site plan



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END OF PERMIT

APPENDIX C

WAMITAB Certificate



Continuing Competence Certificate

This certificate confirms that

Joseph Grigg

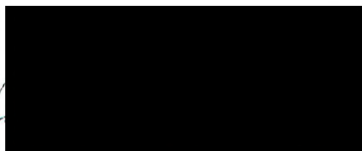
Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 31/03/2021

TMNH Treatment - Non Hazardous Waste

**Expiry Date:
31/03/2023**

Verification date: 16/03/2021

Authorised:



Director of Qualifications and Standards

Learner ID: 24181

Certificate No.: 5176697

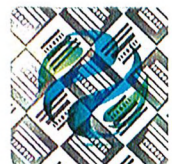
Date of Issue: 31/03/2021



CIWM Chief Executive Officer



The Chartered Institution
of Wastes Management



00155630

APPENDIX D

Examples of Submitted Waste Return Forms

3 Waste received on site

Please read the guidance notes 'How to fill in the form', and use the continuation sheet **WMS3W** provided, or a copy of it, if you need to. In the last column, D = final disposal, U = used on site, F = from another facility, for example a transfer station.

Origin	Description of waste	EWC code	Municipal source (Y/N)	Bio-degradable (Y/N)	State	Amount	Units	Pre-treatment	Additional information		
									(D)	(U)	(F)
POWYS	SOIL & STONE	1 7 0 5 0 F	N	N	SOLID	58.34	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	CONCRETE	1 7 0 1 0 1	N	N	SOLID	5.62	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	CONCRETE	1 7 0 1 0 1	N	N	SOLID	51.75	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	SOIL	1 7 0 5 0 F	N	N	SOLID	8.96	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	CONCRETE	1 7 0 1 0 1	N	N	SOLID	28.14	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	SOIL	1 7 0 5 0 F	N	N	SOLID	16.54	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	CONCRETE	1 7 0 1 0 1	N	N	SOLID	6.46	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	SOIL & STONE	1 7 0 5 0 F	N	N	SOLID	32.52	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	CONCRETE	1 7 0 1 0 1	N	N	SOLID	75.31	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWYS	SOIL	1 7 0 5 0 F	N	N	SOLID	14.24	TONNES	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

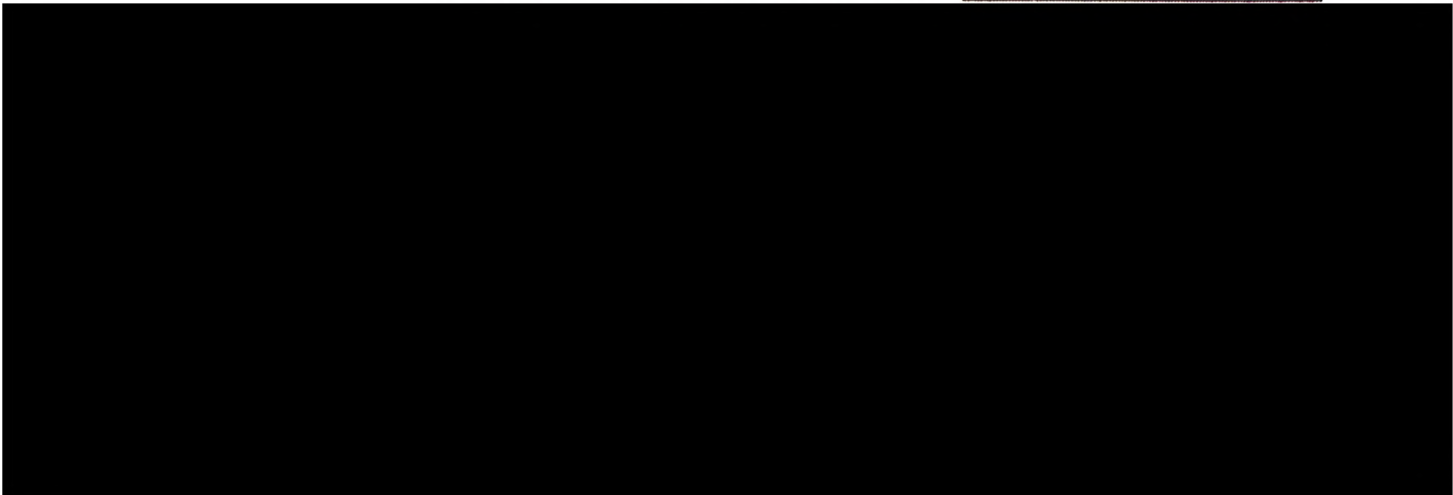
Total weight in tonnes of material received on site 289.88 tonnes

4 Waste removed from site

Please read the guidance notes 'How to fill in the form', and use the continuation sheet **WMS3W** provided, or a copy of it, if you need to. In the last column, facility types could include incinerator, transfer station, landfill, treatment, reprocessing, recycling.

Destination	Description of waste	EWC code	Municipal source (Y/N)	State	Amount	Units	Destination facility type

Total weight in tonnes of material removed from site tonnes



Waste return (Wales)



Asiantaeth yr
Amgylchedd Cymru
Environment
Agency Wales

The Environmental Permitting (England and Wales) Regulations 2007
Landfill Allowance Scheme (Wales) Regulations 2004 List of Waste Regulations (Wales) 2005
The Waste and Emissions Trading Act 2003

For Environment Agency use only

Date received (DD MM YYYY) Date processed (DD MM YYYY)

Local site licence number

EA/WML number or
Permit number

Original reference

National Operator Returns Team
Environment Agency
Quadrant Two
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

- Use this form to tell us the type and quantity of controlled waste you processed at each permitted facility within your site.
- Please read through the whole form and guidance notes before you start filling anything in.
- Please send the completed form back to us within 28 days of the end of return date at the address specified in the box above.

Disclosure and data protection

The information you provide will be used by the Environment Agency to enable it to fulfil its regulatory and waste management planning responsibilities.

For full information about how the data in this form will be used, please read the guidance notes that come with the form.

1 The period the return covers

1.1 The return period is (tick only one)

Quarter

from to

Year

2 Operator and site details

2.1 Site operator

Site name

WML number/Permit number

2 Operator and site details continued

Site address

Postcode

Contact details

Phone

Fax

Email

2.2 Type of facility

2.3 Was a weighbridge used?

No

Yes Please tell us the proportion weighed.

 percentage

2.4 Are you operating a landfill site?

No Go to section 3 'Waste received on site' on page 2.

Yes

Landfill sites only as at 31 March in the current year

2.5 Give the remaining void space covered by the licence

 cubic metres

2.6 Was the site fully surveyed before 31 March in the current year?

No

Yes Please tell us how the void space was calculated.

Now go to question 2.8

2.7 How have you estimated the remaining void space?

For example visually or other method.

2.8 Remaining life of site

 years

Now go to sections 3 and 4 on page 2.

Waste return (Wales)



Asiantaeth yr
Amgylchedd Cymru
Environment
Agency Wales

The Environmental Permitting (England and Wales) Regulations 2007
Landfill Allowance Scheme (Wales) Regulations 2004 List of Waste Regulations (Wales) 2005
The Waste and Emissions Trading Act 2003

For Environment Agency use only

Date received (DD MM YYYY)

Date processed (DD MM YYYY)

Local site licence number

EA/WML number or Permit number

Original reference

National Operator Returns Team
Environment Agency
Quadrant Two
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

- Use this form to tell us the type and quantity of controlled waste you processed at each permitted facility within your site.
- Please read through the whole form and guidance notes before you start filling anything in.
- Please send the completed form back to us within 28 days of the end of return date at the address specified in the box above.

Disclosure and data protection

The information you provide will be used by the Environment Agency to enable it to fulfil its regulatory and waste management planning responsibilities.

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1 The period the return covers

1.1 The return period is (tick only one)

Quarter
from to

Year

2 Operator and site details

2.1 Site operator

Site name

WML number/Permit number

2 Operator and site details continued

Site address

Postcode

Contact details

2.2 Type of facility

2.3 Was a weighbridge used?

No

Yes Please tell us the proportion weighed.
 percentage

2.4 Are you operating a landfill site?

No Go to section 3 'Waste received on site' on page 2.
Yes

Landfill sites only as at 31 March in the current year

2.5 Give the remaining void space covered by the licence

cubic metres

2.6 Was the site fully surveyed before 31 March in the current year?

No

Yes Please tell us how the void space was calculated.

Now go to question 2.8

2.7 How have you estimated the remaining void space?

For example visually or other method.

2.8 Remaining life of site

years

Now go to sections 3 and 4 on page 2.

3 Waste received on site

Please read the guidance notes 'How to fill in the form', and use the continuation sheet WMS3W provided, or a copy of it, if you need to. In the last column, D = final disposal, U = used on site, F = from another facility, for example a transfer station.

Origin	Description of waste	EWC code	Municipal source (Y/N)	Bio-degradable (Y/N)	State	Amount	Units	Pre-treatment	Additional information		
									(D)	(U)	(F)
Powys	Soil	170503	N	N	Solid	10,300	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	8,240	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	9,560	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	9,500	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	9,760	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	10,860	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	11,670	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	Soil	170503	N	N	Solid	13,340	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Powys	2. v. 2. gravel	170506	N	N	Solid	14,640	KG	N	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total weight in tonnes of material received on site **1547.90** tonnes

4 Waste removed from site

Please read the guidance notes 'How to fill in the form', and use the continuation sheet WMS3W provided, or a copy of it, if you need to. In the last column, facility types could include incinerator, transfer station, landfill, treatment, reprocessing, recycling.

Destination	Description of waste	EWC code	Municipal source (Y/N)	State	Amount	Units	Destination facility type

Total weight in tonnes of material removed from site _____ tonnes

Ple
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 WMS

APPENDIX E

Trial Pit Logs

TRIAL PIT 1 SO 06859 90946

Depth (m) Strata

0.00 – 1.00 Bedrock as quarry, Bedding spacing typically 250 to 300mm also some sub vertical joints, spacing 300mm

600-gallon bowser

Width 1.50m, Length 3.00m

Water level did not come above starting level

Test 1

Time (mins)	Level (m)	Fall (cm)	Cumulative fall (cm)
0	0.62	0	0
1	0.66	4	4
2	0.74	8	12
3	0.81	7	19
4	0.89	8	27
5	0.95	6	33
6	Dry	5	38

Test 2

Time (mins)	Level (m)	Fall (cm)	Cumulative fall (cm)
0	0.63	0	0
1	0.69	6	6
2	0.77	8	14
3	0.85	8	22
4	0.91	6	28
5	0.99	8	36
6	Dry	1	37

Test 3

Time (mins)	Level (m)	Fall (cm)	Cumulative fall (cm)
0	0.63	0	0
1	0.68	5	5
2	0.77	9	14
3	0.84	7	21
4	0.91	7	28
5	0.97	6	34
6	Dry	3	37



TRIAL PIT 2 SO 06654 90892

Depth (m)	Strata
0.00 – 1.00	Loose brown fine to coarse GRAVEL with occasional cobble in a silt/sand/clay matrix/Firm brown sandy CLAY with some gravel and traces of plastic, metal, tarmac and occasional boulders of concrete (MADE GROUND- mainly derived from glacial deposits)

Notes

1. Sample taken 0 -1.0m.
2. Sides of pit slightly unstable.
3. No groundwater seepage encountered.





TRIAL PIT 3 SO 06679 90907

Depth (m)	Strata
0.00 -0.50	Loose brown sandy sub angular to angular fine to coarse GRAVEL of very weak mudstone (Completely Weathered Bedrock)
0.50 – 1.00	Very weak brown highly weathered MUDSTONE excavated as above, but rock structure visible

Notes

1. No samples taken.
2. Sides of pit stable.
3. No groundwater seepage encountered.





TRIAL PIT 4 SO 06691 90884

Depth (m)	Strata
0.00 – 0.50	Loose brown fine to coarse GRAVEL in a silt/clay matrix with traces of old topsoil and rotting organic matter, tarmac and concrete kerb and concrete boulders (MADE GROUND –mainly derived from glacial deposits)
0.50 – 0.80	Very soft light brown very plastic CLAY with a little gravel and traces of old topsoil at top (probable MADE GROUND – Derived from glacial deposits)
0.80 – 1.20	Soft to firm red brown sandy CLAY with a little gravel (probable MADE GROUND – derived from glacial deposits)

Notes

1. Slightly organic odour between 0.00 – 0.50m due to rotting vegetation.
2. Sides of pit stable.
3. No groundwater seepage encountered.





TRIAL PIT 5 SO 06675 90965

Depth (m)	Strata
0.00 – 1.20	Firm brown becoming dark brown silty CLAY with some too much sub angular to rounded gravel, with traces of plastic and terram (MADE GROUND –mainly derived from glacial deposits)

Notes

1. Sample 0 – 1.00m.
2. Sides of pit stable.
3. No groundwater seepage encountered.





TRIAL PIT 6 SO 06610 90879

Depth (m)	Strata
0.00 – 1.20	Loose brown clayey sub angular to angular fine to coarse GRAVEL and COBBLE and occasional boulder (OVERBURDEN MOUND)

Notes

1. Sample 0.00 – 1.00m.
2. Sides of pit stable.
3. No groundwater seepage encountered.





TRIAL PIT 7 SO 06627 90890

Depth (m)	Strata
0.00 – 1.20	Firm grey brown silt CLAY/clayey SILT with much sub angular to angular fine to medium gravel (MADE GROUND- Quarry Fines)

Notes

1. Sample taken.
2. Sides of pit stable.
3. No groundwater seepage encountered.





TRIAL PIT 8 SO 06652 90917

Depth (m)	Strata
0.00 – 0.50	Brown CLAY with much gravel (MADE GROUND – derived from glacial till and weathered bedrock)
0.50 – 1.50	Medium dense/firm to stiff brown silty CLAY/clayey SILT with much sub angular to angular gravel and occasional cobble (Completely Weathered Bedrock)

Notes

1. No sample taken.
2. Side of pit stable.
3. No groundwater seepage encountered.





TRIAL PIT 9 SO 06677 90928

Depth (m)	Strata
0.00 -1.10	Firm to stiff brown and grey brown silty CLAY/clayey SILT with much gravel traces of plastic and occasional pockets of topsoil (MADE GROUND – mainly derived from glacial deposits)
1.10 – 1.50	Firm to stiff brown silty CLAY with a little gravel (GLACIAL TILL)

Notes

1. Sides stable.
2. No groundwater seepage encountered.
3. Sample taken of made ground.





APPENDIX F
Chemical Test Results



DETS

Certificate of Analysis

Certificate Number 21-02798

Issued: 16-Feb-21

Client GroundSolve Limited
Unit 1
Well House Barns
Bretton
Flintshire
FAO Adam Fenwick
CH4 0DH

Our Reference 21-02798

Client Reference 2402

Order No (not supplied)

Contract Title (not supplied)

Description 6 Soil samples.

Date Received 10-Feb-21

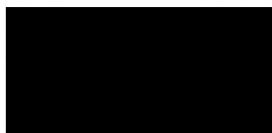
Date Started 10-Feb-21

Date Completed 16-Feb-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager





Summary of Chemical Analysis

Soil Samples

Our Ref 21-02798

Client Ref 2402

Contract Title

Lab No	1799681	1799682	1799683	1799684	1799685	1799686
Sample ID	TP2	TP4	TP5	TP6	TP7	TP9
Depth	0.00-1.00	0.00-0.50	0.00-1.00	0.00-1.20	0.00-1.20	0.00-0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	10	11	12	14	18	14
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.3	0.3	< 0.2	< 0.2	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.2	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	30	24	28	25	22	24
Chromium III	DETSC 2301*	0.15	mg/kg	30	24	28	25	22	24
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	40	49	31	37	50	36
Lead	DETSC 2301#	0.3	mg/kg	28	32	25	17	26	35
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.07	< 0.05	< 0.05	< 0.05	0.05
Nickel	DETSC 2301#	1	mg/kg	34	32	43	39	35	35
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	98	120	110	74	100	100
Inorganics									
pH	DETSC 2008#		pH	8.2	8.0	7.9	6.5	7.3	7.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.0	0.4	< 0.1	< 0.1	1.2	0.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	170	29	65	15	430	54
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10	< 10	32	< 10
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	2.3	1.7	< 0.75	< 0.75	< 0.75
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	0.10	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03



Summary of Chemical Analysis

Soil Samples

Our Ref 21-02798

Client Ref 2402

Contract Title

Lab No	1799681	1799682	1799683	1799684	1799685	1799686
Sample ID	TP2	TP4	TP5	TP6	TP7	TP9
Depth	0.00-1.00	0.00-0.50	0.00-1.00	0.00-1.20	0.00-1.20	0.00-0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.55	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	0.44	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	2.4	0.17	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	0.74	0.06	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	3.3	0.54	0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	2.8	0.49	0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	1.1	0.22	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	1.0	0.21	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	1.0	0.28	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.47	0.10	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.90	0.23	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.26	0.10	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.07	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.32	0.11	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	15	2.5	< 0.10	< 0.10	< 0.10	< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-02798

Client Ref 2402

Contract Title

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1799681	TP2 0.00-1.00	SOIL	NAD	none	Rebecca Burgess
1799682	TP4 0.00-0.50	SOIL	NAD	none	Rebecca Burgess
1799683	TP5 0.00-1.00	SOIL	NAD	none	Rebecca Burgess
1799684	TP6 0.00-1.20	SOIL	NAD	none	Rebecca Burgess
1799685	TP7 0.00-1.20	SOIL	NAD	none	Rebecca Burgess
1799686	TP9 0.00-0.10	SOIL	NAD	none	Rebecca Burgess

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-02798
 Client Ref 2402
 Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1799681	TP2 0.00-1.00 SOIL	03/02/21	GJ 250ml x2, GJ 60ml x2		
1799682	TP4 0.00-0.50 SOIL	03/02/21	GJ 250ml x2, GJ 60ml x2		
1799683	TP5 0.00-1.00 SOIL	03/02/21	GJ 250ml x2, GJ 60ml x2		
1799684	TP6 0.00-1.20 SOIL	03/02/21	GJ 250ml x2, GJ 60ml x2		
1799685	TP7 0.00-1.20 SOIL	03/02/21	GJ 250ml x2, GJ 60ml x2		
1799686	TP9 0.00-0.10 SOIL	03/02/21	GJ 250ml x2, GJ 60ml x2		

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report