

The Bacup Clay Company Ltd

Land Restoration at Tong Quarry

Environmental Setting and Site Design Report

Job No 213036

July 2021



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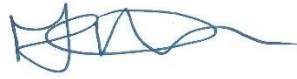
Report for
The Bacup Clay Company Limited
Tong Farm
Tong Lane
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1.0 SITE DETAILS AND ENVIRONMENTAL CONTEXT

Site land use and other application details

- 1.1 The site is located circa 1 km east of Bacup, off a private road extending east from Tong Lane, Bacup, OL13 9XA. The site is centred at National Grid Reference SD 88082 22704. The site location is shown in drawing 213036/D/001.
- 1.2 The site comprises open fields in the north, an active quarry (Tong Quarry) to the south and is bisected by an unnamed private road-oriented east to west. The site is bound by agricultural fields to the northwest, north, northeast, and southern boundaries of the site. Dry Corner Farm, Hey Head Farm Cottage and associated fields are to the east and southeast. The west is bound by residential and farmhouses of Tong Farm, Bent House and Daisy Hall. There is a single electricity pylon located within the along the eastern boundary of Tong Quarry. The southwestern corner of the site is bound by restored farmland and an infilled area of historic Tong Quarry arisings.
- 1.3 The nearest residential properties to the site are Dry Corner Farm, Hey Head Cottage and Tong Farm located circa 95 m west m south/southeast, 109 m southeast and 152 m west of the site, respectively. The residential area of Bacup is located circa 360 m west of the site and is circa 240 m southwest and 290 m northwest of the site. There are various Public Right Of Ways (PROW) bordering and very near to the site including the PROW that bisects the north and south of the site. This will be diverted before excavation. There are four springs along the northern boundary of the site, and a land drain along the north-eastern border of the site. The springs are shown in drawing 213036/D/012.
- 1.4 Detailed information about the site's environmental setting, the natural and cultural heritage and the surrounding receptors are shown in drawings 213036/D/002, 003A, and 003B.

Historical Development

- 1.5 The southern area of the site, Tong Quarry, was historically used as agricultural mixed pasture land until the early 1960's. Planning permission for mineral extraction was granted for quarrying and mineral extraction activities under Planning Permission reference 13/1/1606 in 1961 and has been subject to mineral extraction from 1961 to the present day. The southwestern area of the quarry void has been backfilled with quarry waste near existing ground levels. An infilled part of the quarry to the south was infilled by under a licence by Cairds, an independent operator, with inert waste and restored to agriculture in 1995.
- 1.6 The site has been accepting inert waste for the stabilisation of quarry faces and a 2 m deep layer on the quarry floor in line with Environmental Permit reference EPR/CB3138RW since it was granted 2012. A full transfer of the permit to the Bacup Clay Company Limited was issued on 5th October 2016 reference EPR/EB3307HK for the storage and use of permitted wastes for the purpose of restoration. A copy of the permits are within the Waste Recovery Plan.
- 1.7 Planning Permission (ref. LCC/2020/0018) (shown within the Waste Recovery Plan) was granted in 2020 for the *'extension of quarry with restoration by means of infill with inert construction, demolition and excavation waste together with ancillary activities, and the consolidation of existing planning permissions at Tong Quarry, Tong Lane, Bacup'*. This planning permission supersedes the permissions granted in 2011 and 2014.
- 1.8 The approved extension is into fields north of the site which have remained as agricultural fields since their earliest known. It is unlikely to be a source of significant contamination.

- 1.9 There has been one minor pollution incident recorded at the site on 24th May 1994. The source of the pollution incident was rubble / litter, and the cause was determined to be vandalism.

Proposed Development

- 1.10 It is proposed that the site is restored using inert waste to the pre-development levels across the site in keeping with the surrounding landscape. In 2020, the extant quarry void was estimated at 350,000 m³ and the approved extension of quarrying activities in the northern area of the site is estimated to generate a void of 580,000 m³. In total, the proposed import is 930,000 m³ (converted to 1,860,000 tonnes).
- 1.11 It is proposed that the site will not be infilled in a series of cells, but progressively infilled from east to west and progressing from south to north in line with the progression of the mineral extraction activities.
- 1.12 Acceptable inert mineral based wastes will be imported, placed and compacted under the Environmental Permit. The imported waste material will only be accepted following the principles and checks set out in an Importation Protocol (213036/IP) that details the waste acceptance criteria. The importation protocol is based upon the assessment and standards in the McDonnell Cole Hydrogeological Risk Assessment (HRA).
- 1.13 The proposed final landform is shown on drawing 213036/D/005.

Site General

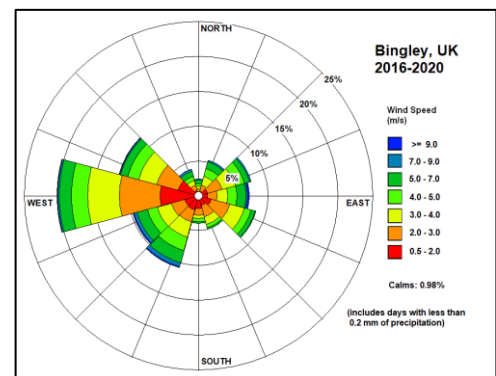
- 1.14 The site is accessed via a 600 m access track off Tong Lane. The mineral working / restoration area will be secured with a lockable gate. The gate will be locked outside of operational hours.
- 1.15 The perimeter of the mineral working area will be secured with security fencing to prevent unauthorised access to the site. The integrity of the perimeter fences and gates will be inspected on a weekly basis. If damage is noted repairs will be made by the end of the working day or temporary security measures will be implemented until damage has been repaired.
- 1.16 The recovery operation will not require groundwater abstraction.
- 1.17 Following mineral extraction, the base of the quarry void will be between circa 325 m AOD in the west and 335 m AOD in the east of the site. The base of the quarry will be above the groundwater table within the underlying Lower Pennine Coal Measure and Woodhead Hill Sandstone Formations.
- 1.18 Surface water management will be undertaken in accordance with the site's Surface Water Management Plan (May 2021) (appended in the Operational Plan).
- 1.19 The access road to the site will be surfaced with impermeable concrete surfacing. Once within the site, the site will be surfaced with compacted hardcore to create a stable running surface.
- 1.20 Fuel oil will be stored in a mobile self-bunded fuel bowser. Other oils and lubricants will be stored within their own sealed containers and will be kept within lockable units inside the site cabin.
- 1.21 The Importation Protocol (213036/IP) details the site acceptance procedures. Any non-conforming waste will be placed in a demarcated dedicated quarantine area. Waste will be removed by the producer or transferred to a suitably licenced facility.

Basal and Side Slope Engineering

- 1.22 The Hydrogeological Risk Assessment prepared by McDonnell and Cole in July 2021 stated that the need for a basal geological separation layer was not necessary due to the Basal Coal Measures mudstone with an assumed permeability of no greater than 1×10^{-9} m/s.
- 1.23 Side slopes of the quarry face and any former historical coal working along the base of the quarry will be sealed with 1 m of 1×10^{-9} m/s cohesive material to prevent the potential migration of contaminants from the waste, through the mine workings into the underlying water table.
- 1.24 Drawings 9865A/04A and 9865A/04B show the proposed mineral extraction working phases for the expansion to the northern area of the site. The side slopes of the quarry will be excavated at a near vertical (2:1) gradient. In order to create a stable landform the quarry void will be restored progressively through a series of lifts. Each lift will be 2 m high and will have a width of 1.0 m of granular drainage, 1.5 m of attenuation fill and 9 m of geological separation material with permeability of 1×10^{-9} m/s. The geological separation layer will be 3 m wide and then graded at a 1:3 gradient to create a stable landform. Following placement and compaction of inert waste and quarry arisings, the next lift will be constructed. Drawing 213036/CSM/001 shows the proposed cell side wall lining system.
- 1.25 The base of the quarry void in the northern area of the side will be circa 325 m in the west to circa 335 m AOD in the east. Current deep groundwater levels at the site from 288.79 m AOD in the west of the site to 328.7 m AOD in the east of the site. Shallow ground water will not enter the waste deposit and will be intercepted by the granular drainage along the side wall liner and drain via mine workings.
- 1.26 Once the quarry void has been restored, the area will be capped with soil that is proven to be suitable for agricultural land use. No engineered cap is required.

Air Quality / Climate

- 1.27 Meteorological wind data for 2016-2020, has been acquired from ADM Limited. The wind data has been taken from the Met Office Station in Bingley, which is approximately 24 km north east of the site and is considered to be representative of conditions at the site.
- 1.28 Data from the last 5 years shows the prevailing wind direction is from the west.
- 1.29 DEFRA Air Quality Management Areas (AQMAs) maps indicate that the site is not located within an AQMA. The nearest AQMA is located circa 6.1 km west of the site in Rossendale and declares the annual average for NO₂.



Geology and Hydrogeology

- 1.30 The topographical survey from 3rd February 2020 by MWP Planning¹ shows the site at 361 m AOD in the northeast, falling to 346 m AOD in the northwest, 341 m AOD to the southwest and 345 m AOD to the south east. Some areas within the existing quarry are shown to be up to 25 m AOD below the natural surrounding topography, and numerous stockpiles are scattered across the site. The general topography of the area falls in a southerly direction. The current topography at the site is shown in the Site Layout Plan (drawing 213036/D/004).

¹ Minerals and Waste Planning, Topographical Survey ref. 9865A/03 dated 03/02/2020

- 1.31 The BGS records identify that there are no superficial deposits on site. Bedrock geology of the site records Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone) in the north and west of the site, and the Great Arc Sandstone (Sandstone) is shown to predominate the south and east of the site. Drawings 213036/D/010, 011 and 012 outline geology and hydrogeology. For further detail on the geology and hydrogeology at the site see 'Groundwater Monitoring Scheme' attached in Appendix C. The geologic succession at the site is discussed in the Hydrogeological Risk Assessment.
- 1.32 Soilscape² identifies the soils in the majority of the site as 'slowly permeable wet very acid upland soils with a peaty surface', and as 'freely draining slightly acid loamy soils' in the far east of the site.
- 1.33 The southern half of the site, Tong Quarry, has been significantly reworked since the 1960s up to a maximum depth of c. 325 m AOD. The quarry is still active and has been restored to the original ground levels in the west and parts of the south. The northern half of the site is greenfield and is likely to have retained the natural geology.
- 1.34 The bedrock geology is designated as a Secondary A Aquifer.
- 1.35 The site is not located within a Groundwater Source Protection Zone, and there are no Groundwater Source Protection Zones within 1 km of the site.
- 1.36 The groundwater vulnerability for the eastern area of the site is categorised as being High, while the western area of the site is categorised as being Medium.
- 1.37 There are no historic BGS borehole records on site. The nearest BGS Borehole record is SD82SE54 at Beech Mill circa 675 m north west of the site. It records superficial Devensian Till deposits to 21.03 underlain by Pennine Coal Measures.
- 1.38 In June 2017, a total of eight boreholes for gas and groundwater monitoring in southern area of the site. Three perimeter wells (GW1, GW2 and GW3) were constructed along the site boundary between 30 to 50 m below ground level along the perimeter of the site. Six boreholes were constructed within the restored area between 10 to 18 m below ground level (BGL), of which five boreholes were fit with standpipe installations (WS1, WS2, WS3, WS4, WS6). The response zone for the perimeter boreholes is within the Woodhead Hill Rock, and the in-waste boreholes were installed within the backfill material. No samples of soil or groundwater were collected as part of the works. The perimeter boreholes generally showed Made Ground between 3.20 to 6.10 m BGL, over interbedded mudstone and sandstone to 39 m BGL, with 0.30 to 0.40 m of thick coal seam at depths between 12.60 and 13.3 m BGL (GW1, GW2) and 8.20 to 8.40 m BGL (GW3). Peat was identified at the surface to 2.70 m BGL at borehole GW3. Potential mine workings were identified between 26.7 to 28 m BGL, and 3.60 to 3.80 m BGL in GW3 and GW1 respectively. All in-waste boreholes were logged as 'backfill' between 8.90 to 16.50 m BGL underlain by 'hard strata'. W4, WS6 recorded 'waste' between 1.10/1.20 to 12.40/13.10 m BGL. Groundwater was struck at 9 and 28 m BGL in GW1, 34 m BGL in GW2 and at 54.50 m BGL in GW3.
- 1.39 Groundwater monitoring has been completed in 2017/2018 in the permitter boreholes only. GW2 is consistently dry and subsequently no chemical data is available for this borehole. Assessment of the groundwater monitoring is provided in the 2019 Revised Hydrological and Hydrogeological Impact Assessment (reference 135.05), which generally shows elevated manganese, TPH and PAH in GW3 (upgradient) and elevated manganese, selenium, sulphate TPH and PAH in GW1 (downgradient). The first sample in August 2017 from GW3 showed markedly high organic and inorganic

² <https://magic.defra.gov.uk/MagicMap.aspx>, accessed 12/05/2021

contaminants which have not been observed since. The report proposed that the groundwater quality in the area is variable, and that the contaminants observed indicate that the water is impacted by the historic mining activities and current drainage systems.

- 1.40 In February 2021, four deep (GW6D, GW7D, GW8D and GW9D) and four shallow (GW6S, GW7S, GW8S and GW9S) ground gas and groundwater monitoring boreholes were installed along the perimeter of the quarry extension area. An additional two deep (GW4D and GW5D) and two shallow (GW4S and GW5S) groundwater monitoring boreholes were installed along the southern boundary of the site. Deep boreholes were drilled between 48 m and 65 m BGL while the shallow boreholes were drilled to 20 m BGL. The response zone for the deep and shallow boreholes was installed within the Lower Pennine Coal Measures or Woodhead Hill Rock Formations. The perimeter boreholes generally showed topsoil underlain by gravelly clay from ground level to 1.8 m BGL, over interbedded mudstone, shale and sandstone with an upper coal seam between 1.0 m and 1.6 m thick and a lower coal seam between 0.8 m and 1.2 m thick. 3.20 to 6.10 m BGL.
- 1.41 Following the installation and development of the additional groundwater monitoring boreholes in February 2021, a total of 3 groundwater monitoring rounds were undertaken on 06/02/2021, 20/02/2021 and 08/04/2021. GW1 was recorded as being dry on 20/02/2021, while GW2 was recorded as being dry on 06/02/2021 as well as 20/02/2021. Groundwater samples were obtained from the remaining perimeter groundwater monitoring wells. An assessment of the groundwater quality and groundwater level is detailed in the HRA (document reference 213036/HRA).
- 1.42 Groundwater monitoring will be undertaken on a quarterly basis at each of the perimeter groundwater monitoring boreholes. Location of the groundwater monitoring boreholes are shown in Appendix C.
- 1.43 There are no licenced groundwater abstractions within a 1 km radius of the site. The nearest groundwater abstraction is located circa 1.15 km southwest of the site and is registered to Brian & Rita Hattersley (Licence number- 2569001252) for agricultural and domestic use. Table 1 below sets out the local private water supplies that have been reported as being present:

Table 1: Private water supplies within 1km radius of Tong Quarry			
Location	Easting	Northing	Distance from Site (m)
Higher Hogshead Farm	388586	422120	400 SE
Coal Pit Field Farm	388676	422055	500 SE
Dry Corner Farm	388475	422456	125 E
Gowther Fold Farm	388830	421938	675 SE
Hey Head Farm	388347	422225	125 SE
Moorview Farm	388426	422107	300 SE

- 1.44 There are springs surrounding the site used for water supply for some local dwellings such as Dry Corner Farm (125 m east) and Hey Head Farm (125 m south east). Anecdotal evidence of water supply at Hey Head Farm shows abstraction by borehole from the Woodhead Hill Rock at 65 m BGL, with the groundwater at circa. 50 m BGL. This groundwater level may be pumping water level rather than a resting water level. The water supply to Dry Corner from is from a spring source east of the quarry. Location of groundwater monitoring boreholes and spring locations area shown in Appendix C.
- 1.45 There are no active discharge consents at the site. The nearest discharge consent is circa 450 m south west of the site registered to Donald Peter Herbert (ref: 016993848) for sewage discharges to freshwater stream/ river.

Hydrology

- 1.46 The site is situated between two catchment areas of the River Irwell. The nearest main surface water course are the Oaken Clough and Hoyle Hey Clough located approximately 86 m northwest and 136

m northeast of the site, respectively. The Hoyle Hey Clough flows east to west and is partially culverted along a farm track to meet with the Oaken Clough in the west.

- 1.47 There are two springs on-site, one along the eastern border within the vicinity of an electricity pylon and the other in the west of the site alongside the private road. A drain is recorded along the southern boundary of the site. The drainage for the existing quarry is in accordance with the Surface Water Management Plan.
- 1.48 There are 4 springs along the northern boundary of the site, and a land drain along the north eastern boundary which likely drains into the nearby Hoyle Hey Clough. They are also recorded near to Daisy house to the south west, a south-flowing drainage ditch circa 130 m south of the site, and a spring is located just south of Dry Corner Farm east of the site.
- 1.49 The site is within Flood Zone 1 and is at a low probability of flooding.
- 1.50 The site is within a drinking water protection area (surface water).
- 1.51 The annual rainfall data for the site obtained from the Met Office website³ for 2020 was estimated to be between 1,500 mm and 2,500 mm.
- 1.52 There has been one minor pollution incident to Controlled Waters recorded onsite on 24th May 1994. The cause of the pollution incident was rubble / litter. The nearest significant pollution incident of an unknown agricultural pollutant to Controlled Waters recorded circa 240 m west of the site entrance and 680 m west of the quarry void on the 9th March 1997. There has been a number of minor pollution incidents to Controlled Waters.
- 1.53 Surface water monitoring will be undertaken on a quarterly basis in accordance with Appendix C.

Man-made Subsurface Pathways

- 1.54 The site has been subject to historic and on-going mineral extraction works. The site and the wider area has been subject to shallow coal mining. Quarry workings have proven the presence of shallow coal mining at depths of approximately 17 m below ground level.
- 1.55 An inert landfill exists to the southwest of the site which was restored in 1995 by an independent operator. The location of the landfill is shown on drawing 213036/D/003B and 004.

Noise

- 1.56 The site is set within a predominantly rural and agricultural setting which is expected to have low ambient noise levels. The site is an existing activity and there are no changes to the noise profile under the permit application.
- 1.57 A Noise Impact Assessment was submitted as part of the 2020 Planning Application by S&D Garritt Ltd (Appendix G). The assessment concluded that the noise was likely to not exceed the background levels by more than 10 dB, with the exception of working at the closest proximity of the site but is still assessed to remain within the upper limit of 55 dB LA_{EQ} at all times. Noise monitoring is not required as part of the permit. Condition 12 of the planning permission states that the noise should not exceeds 55 dB and if a complaint is received then monitoring should be completed at the locations shown in drawing 213036/D/006 at the point closest to the noise source.

Environmental Setting & Cultural and Natural Heritage

³ <https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-actual-and-anomaly-maps>, accessed 20/07/2021

- 1.58 The nearest designated habitat is Lee Quarry (SSSI) approximately 1.6 km southwest of the site, and Gorpley Clough (LNR) approximately 2.9 km northeast of the site. There is a composite of multiple designated habitats within the South Pennine Moors circa 5 km east of the site, south of Todmorden. There are no further statutory designated sites within 5 km of the site.
- 1.59 The site does not contain any priority habitats, but there are three within 500 m of the site. The details are provided in Table 2 below.

Table 2 – Priority habitats within 500 m	
Priority Habitat Name	Distance from site
Lowland Fens (alongside Railgate)	261 m south east
Lowland Fens (alongside Railgate)	376 m south east
Deciduous Woodlands (unnamed)	464 m south west

- 1.60 There are no European Protected Species within 500 m of the site.
- 1.61 The nearest listed building is a manor house located approximately 378 m north west of the site in Bacup. There are no further listed buildings within 500 m of the site, but there are numerous within Bacup and Rockliffe village between 800 – 1,000 m northwest to south west of the site respectively. For detailed information please refer to the natural and cultural heritage plan (drawing reference: 213036/D/003B).
- 1.62 The nearest scheduled Monument is the Wayside cross known as Mount Cross in Cross Hill, circa 4.9 km north west of the site.
- 1.63 The nearest schools are St Marys RC Primary School, circa 310 m south west of the site and Bacup Britannia Community Primary School circa 560 m south east of the site.
- 1.64 Irwell Medical Practice is located circa 917 m west of the site. The nearest hospital is Rossendale Primary Health Care Centre circa 6.25 km west of the site.
- 1.65 An extensive network of public rights of way are within the immediate locality. The Public Right of Way, which runs the middle of the site was the result of diverting former footpath which went through the extant quarry area. It was diverted in 2010 as part of the Planning Permission. It will be diverted gain before mineral extraction commences.
- 1.66 A plan of sensitive receptors is shown in drawing 213036/D/002.

Surface Water Management

- 1.67 Surface water will be managed in accordance with the Surface Water Management Plan.

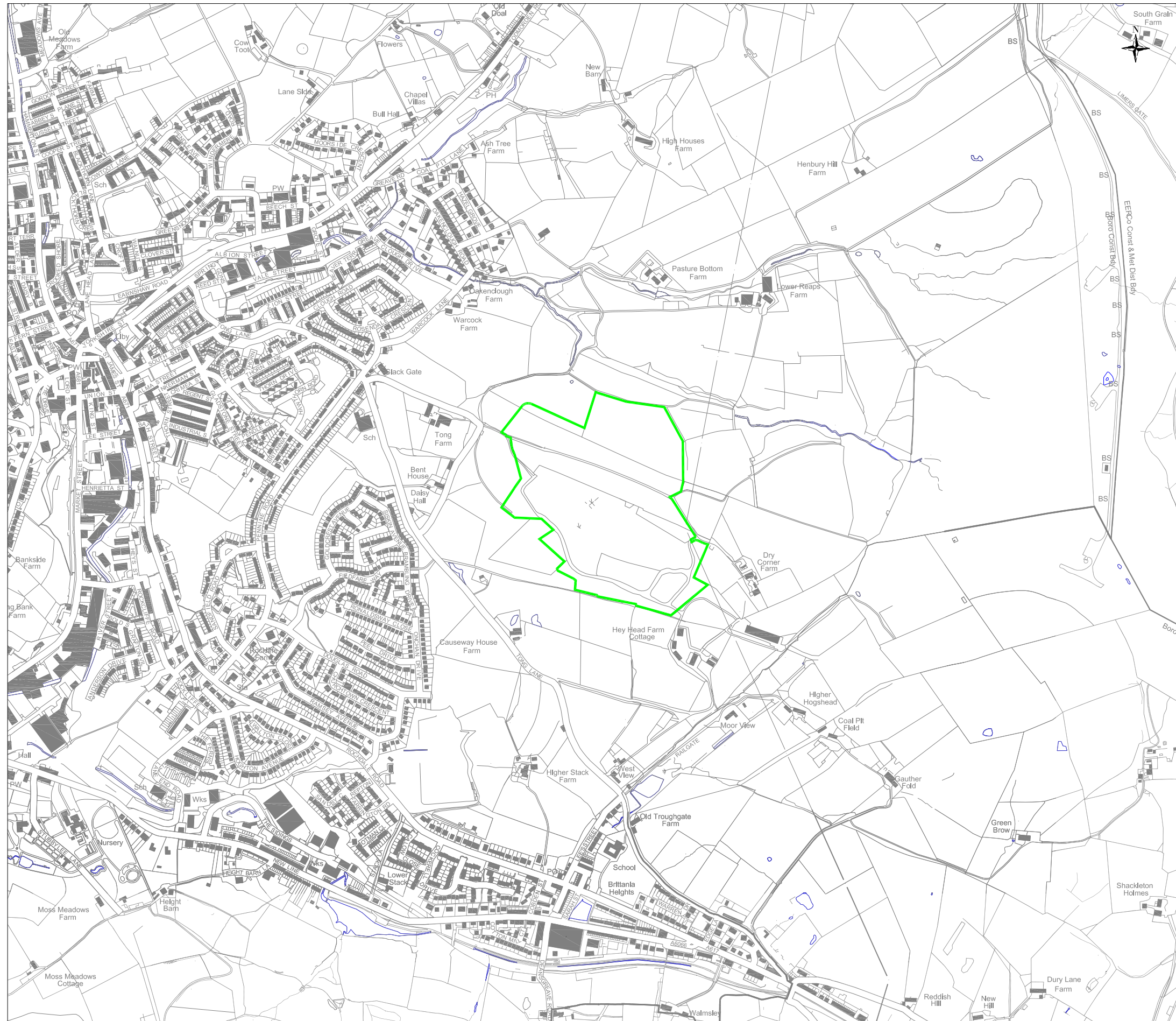
Gas Monitoring

- 1.68 Gas monitoring will be in accordance with the Gas Risk Assessment.


3.0 SOURCE PATHWAY LINKAGES AND CONCEPTUAL MODEL

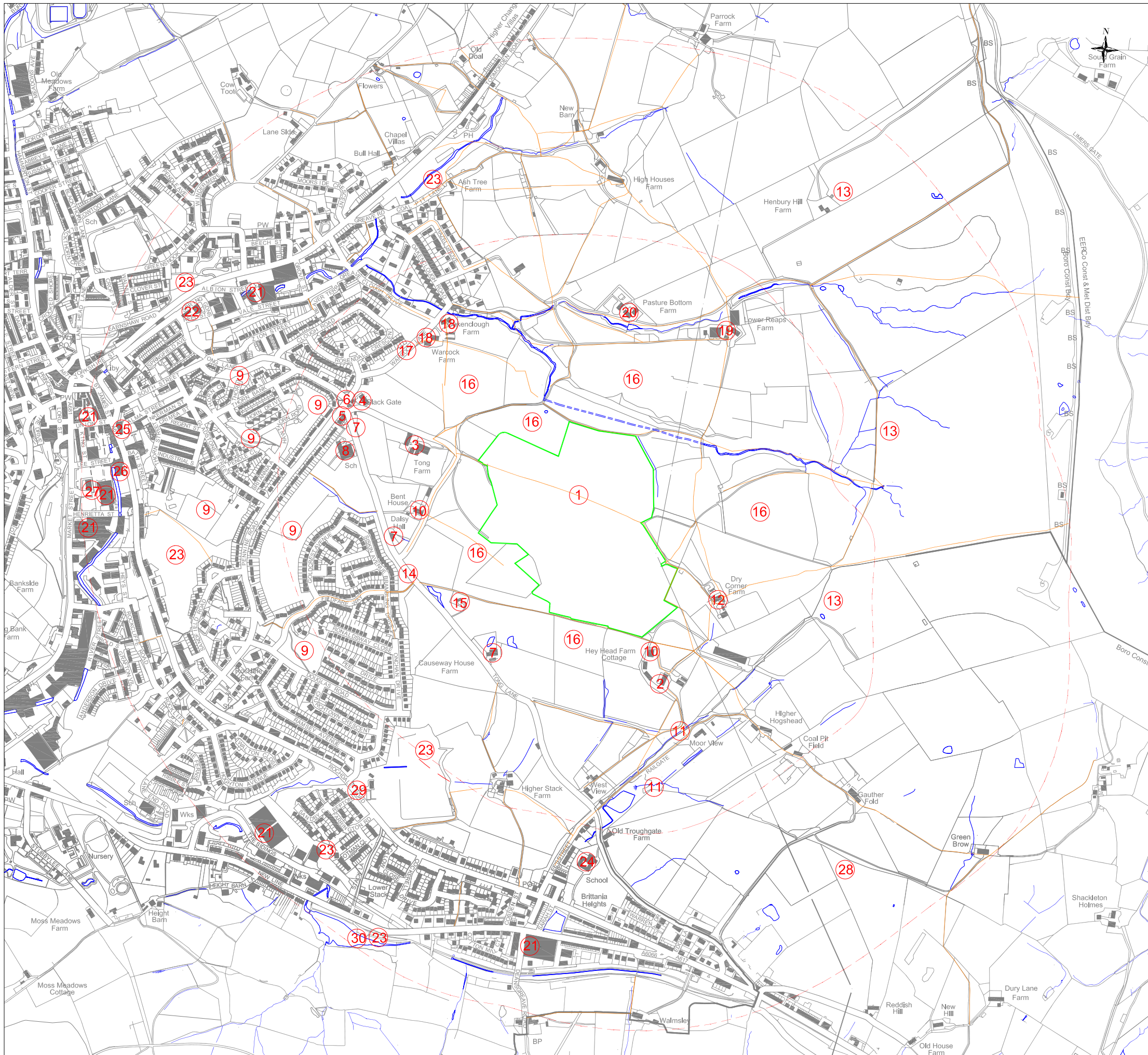
- 3.1 Human Health / Loss of Amenity – Noise and Vibration. The waste operations are an existing part of the background noise. The works involve the importation and placement of suitable material and treatment of inert construction and demolition arisings, which will involve the following plant: tipper lorries, dozers, excavators, crushers, screens, washers, generators and pumps. The SMA will utilise a power screen. The nearest sensitive receptors are the farmsteads, St. Mary's Roman Catholic Primary School, residential dwellings along Pennine Road and Tong Lane, and users of the public right of ways in the locality. No activities will take place outside of normal working hours. The operations have been assessed under an approved (by the local Authority) noise assessment and a noise management plan sets out the controls.
- 3.2 Human Health / Natural Heritage/ Loss of Amenity – Dust and mud. The works involve the importation, treatment, and placement of suitable material, which will involve tipper lorries, dozers, excavators, crushers, screens, washers, generators and pumps. The nearest sensitive receptors are the farmsteads, St. Mary's Roman Catholic Primary School, residential dwellings along Pennine Road and Tong Lane, and users of the public right of ways in the locality. Without suitable working controls the works may potentially cause fugitive dust emissions, mud deposition on the road and a loss of amenity and potential nuisance to surrounding sensitive receptors. The site employs a 600 m long internal haul route, and wheel wash at the site. A Dust Emissions Management Plan sets out the dust controls.
- 3.3 Cultural Heritage and Natural Heritage – Direct and Indirect impact: Given the distance and type of operations, there is a very low risk of direct or indirect impact on the Listed Structures or any Schedule Ancient Monuments. There are no SSSIs, SPAs, SACs, LNRs or Ramsar sites within 1 km of the site. There are no records of European Protected Species within 500 m of the site.
- 3.4 Controlled Waters – Pollution: - The import of potentially contaminated materials or spillages of oils and hydrocarbons creates a risk of potential pollutants entering the surface water. The implementation of the Importation Protocol (213036/IP) will ensure only acceptable fill material is imported. The Hydrogeological Risk Assessment (HRA) assesses the inert criteria for reuse of materials. The importation criteria will use the appropriate inert landfill, human health criteria and leachable criteria (in accordance with the site-specific HRA). The surface water management is in accordance with the Surface Water Management Plan. To note, any discharge of surface water (dewatering) during the quarrying/deposit for recovery phase, will only be undertaken once a Discharge Consent has been approved with the EA.
- 3.5 Ground Gas – Following the restoration, the site will be returned to agricultural land uses. The restoration works at the site will only import inert material, with a low organic content and use and site won material from the mineral extraction works. The risk of ground gas generation from inert material is not considered significant. The gas risk and monitoring are detailed in the Gas Risk Assessment shown in Appendix D.
- 3.6 Stability - The final land use is not at risk of the impacts of stability. Given the accepted waste types are limited to mineral / aggregate only, the risk of instability is not considered significant. The works will be in accordance with an approved design. The Operator will use well known earthworks compaction techniques to ensure material is suitably compacted during landfilling. A stability risk assessment has been submitted as part of this application.
- 3.7 A Site Condition Report detailing the current baseline conditions is submitted with the application.

DRAWINGS



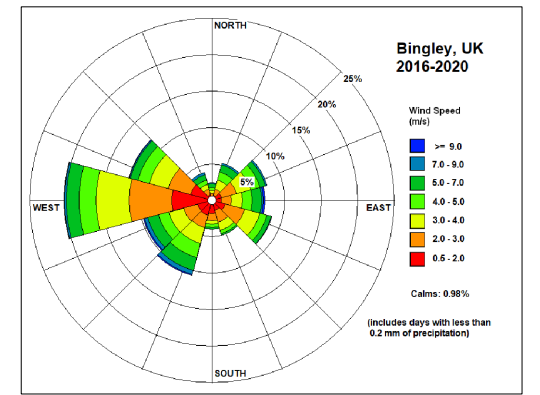
Key:
— Site Boundary

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Site Location Plan			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
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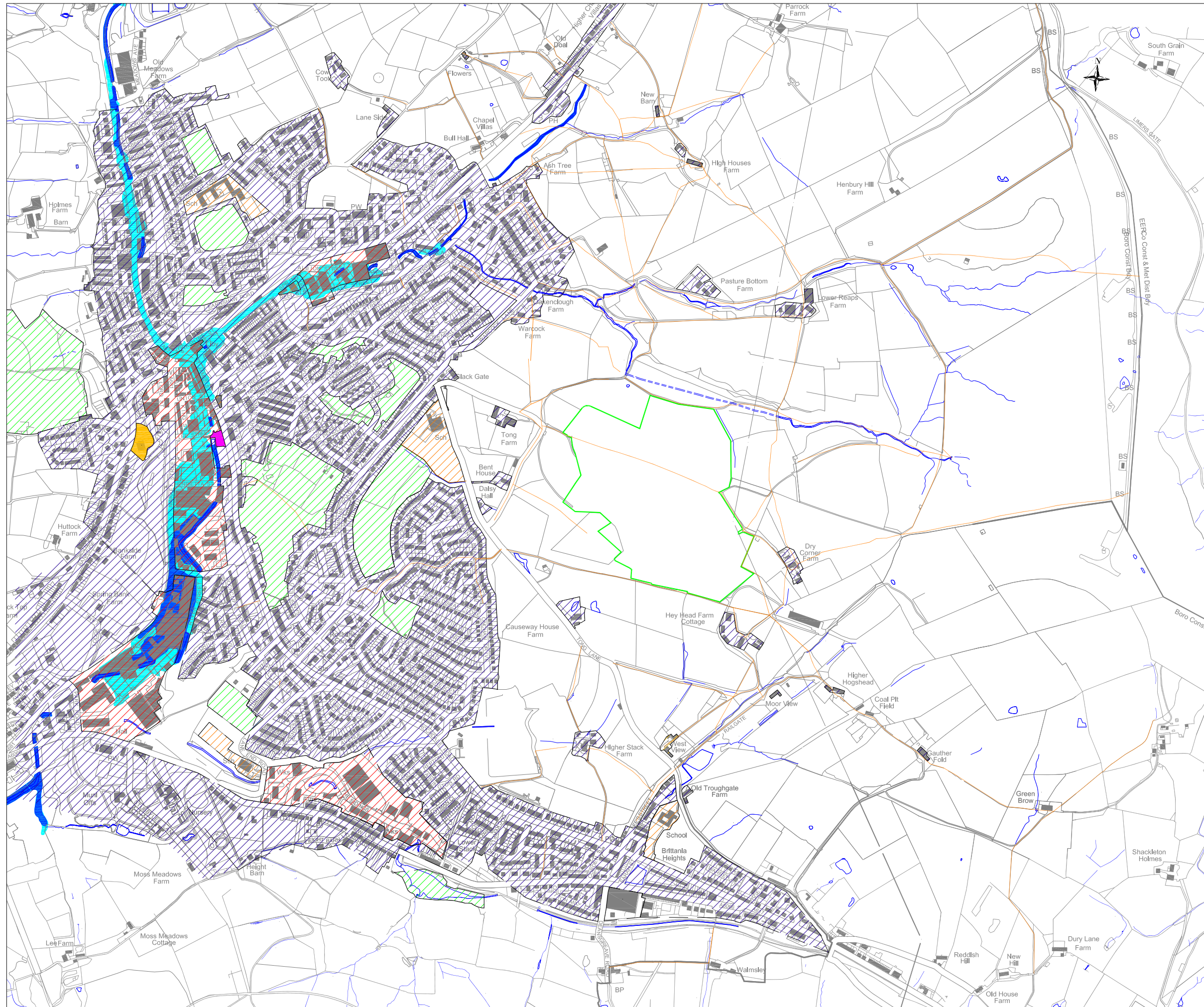


- Key:**
- ① Access Road
 - ② Hey Head Cottage
 - ③ Tong Farm
 - ④ Slack Gate
 - ⑤ Residential Dwelling along Pennine Road
 - ⑥ Pennine Road
 - ⑦ Dwellings along Tong Lane
 - ⑧ St. Marys RC Primary School
 - ⑨ Recreational Fields
 - ⑩ Hey Head Farm
 - ⑪ Lowland Fens Priority Habitat
 - ⑫ Dry Corner Farm
 - ⑬ Blanket Bog Priority Habitat
 - ⑭ Tong Lane
 - ⑮ Communications Tower
 - ⑯ Agricultural Fields
 - ⑰ Warcock Lane
 - ⑱ Dwellings along Warcock Lane
 - ⑲ Lower Reaps Farm
 - ⑳ Pasture Bottom Farm
 - ㉑ Commercial/Industrial Land Uses
 - ㉒ Vale Street Nursery
 - ㉓ Priority Deciduous Woodland Habitat
 - ㉔ Bacup Britannia Community Primary School
 - ㉕ Early Years & Childcare Centre
 - ㉖ Irwell Medical Practice
 - ㉗ European Protected Species- Bats
 - ㉘ Priority Grassland Habitat
 - ㉙ Rochdale Road (A671)
 - ㉚ New Line Picnic Site
 - Surface Water Course
 - 500 m and 1 km radius
 - Public Right of Way

Bingley Wind Rose:



Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Sensitive Receptors Plan			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
Scale	Date	Drg. No.	Rev.
1:10,000@A3	Sep '21	213036/D/002	
	Drawn	Chkd.	
	JM	ML	



- Key:**
- Site Boundary
 - Residential Areas
 - Commercial / Industrial Areas
 - Educational Areas
 - Recreational Areas
 - Medical Practice
 - Retirement Home
 - Flood Zone 2
 - Flood Zone 3
 - Surface Water Course
 - Public Rights of Way

Note:
 1. Areas that are not hatched are used for agricultural land uses.

Rev.	Details	Drawn Chkd.	Date
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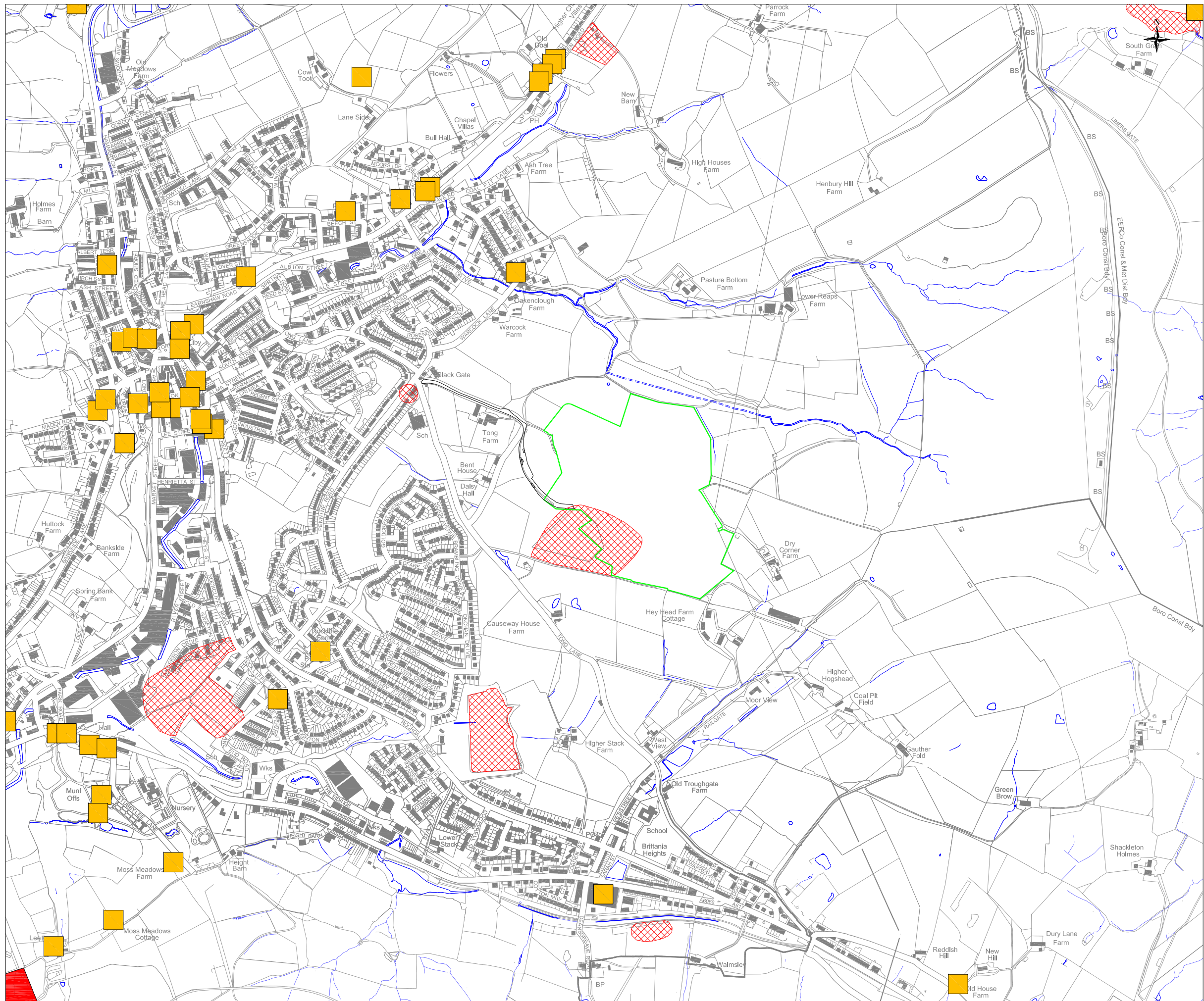
Project
213036
 Tong Quarry

Title
Environmental Site Setting

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Drawn JM	Chkd. ML		



- Key:**
- Site Boundary
 - Listed Building
 - Site of Special Scientific Interest (SSSI)
 - Historic Landfill
 - Surface Water Course

- Note:**
1. A Local Nature Reserve is located circa 2.9 km north east of the site.
 2. There are no further statutory designated sites within 5 km of the site.

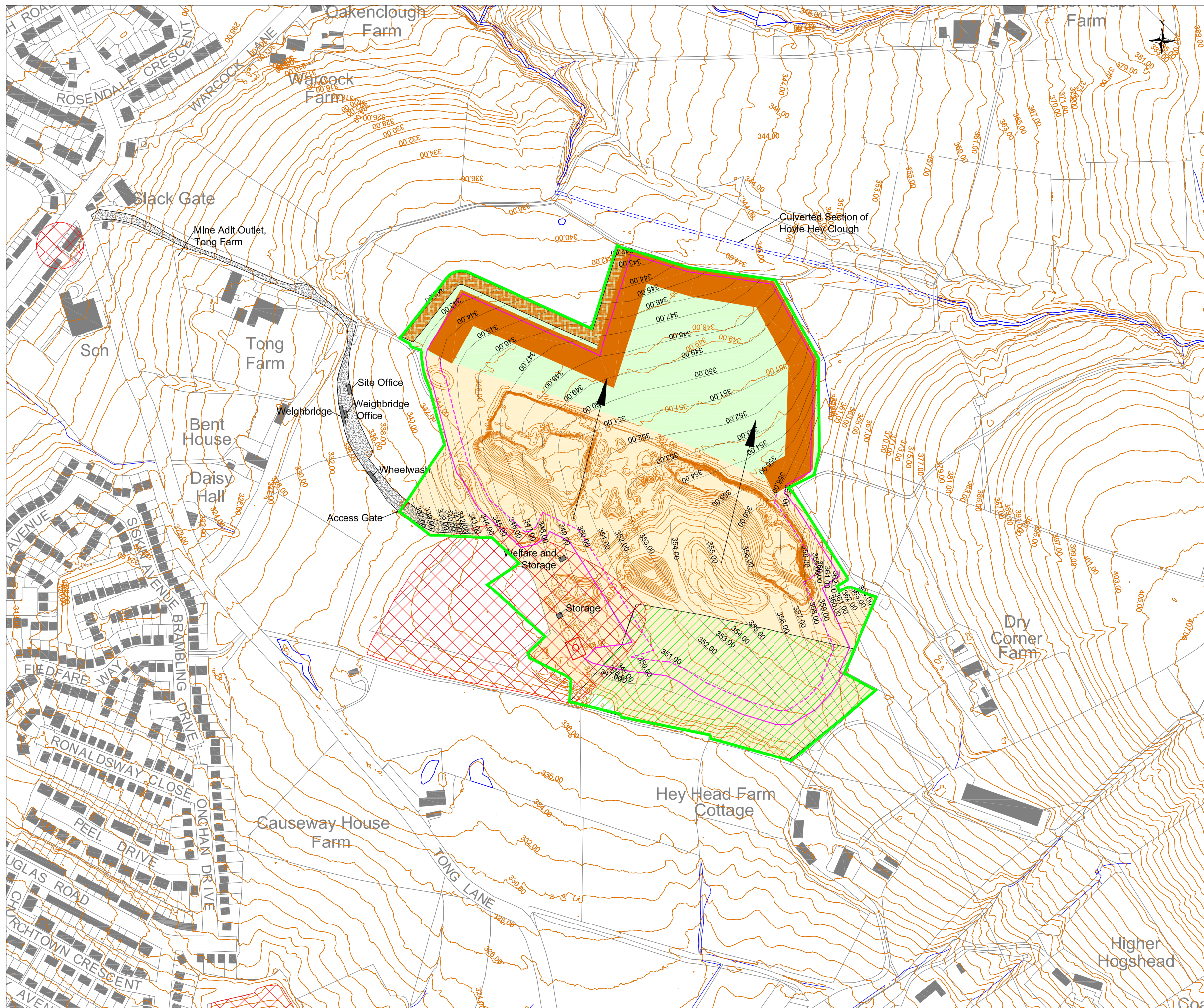
Rev.	Details	Drawn	Date
		Chkd.	

Project
213036
Tong Quarry

Title
Cultural and Natural Heritage

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- Key:**
- Site Boundary
 - Existing Contours
 - Proposed Contours
 - Quarry Extension Area
 - Quarry Area
 - Restored Area
 - Historic Waste Deposit
 - Engineered Sidewall Geological Separation Layer
 - Proposed / Existing Top of Quarry Face
 - Proposed / Existing Base of Quarry Face
 - Sequence of Mineral Extraction and Restoration Works

- Note:**
1. Existing contours taken from Digital Terrain Model supplied by National LiDAR Program from 2019.
 2. Proposed Contours taken from Restoration Scheme by Minerals and Waste Planning (drawing reference 9865A/05, January 2020).

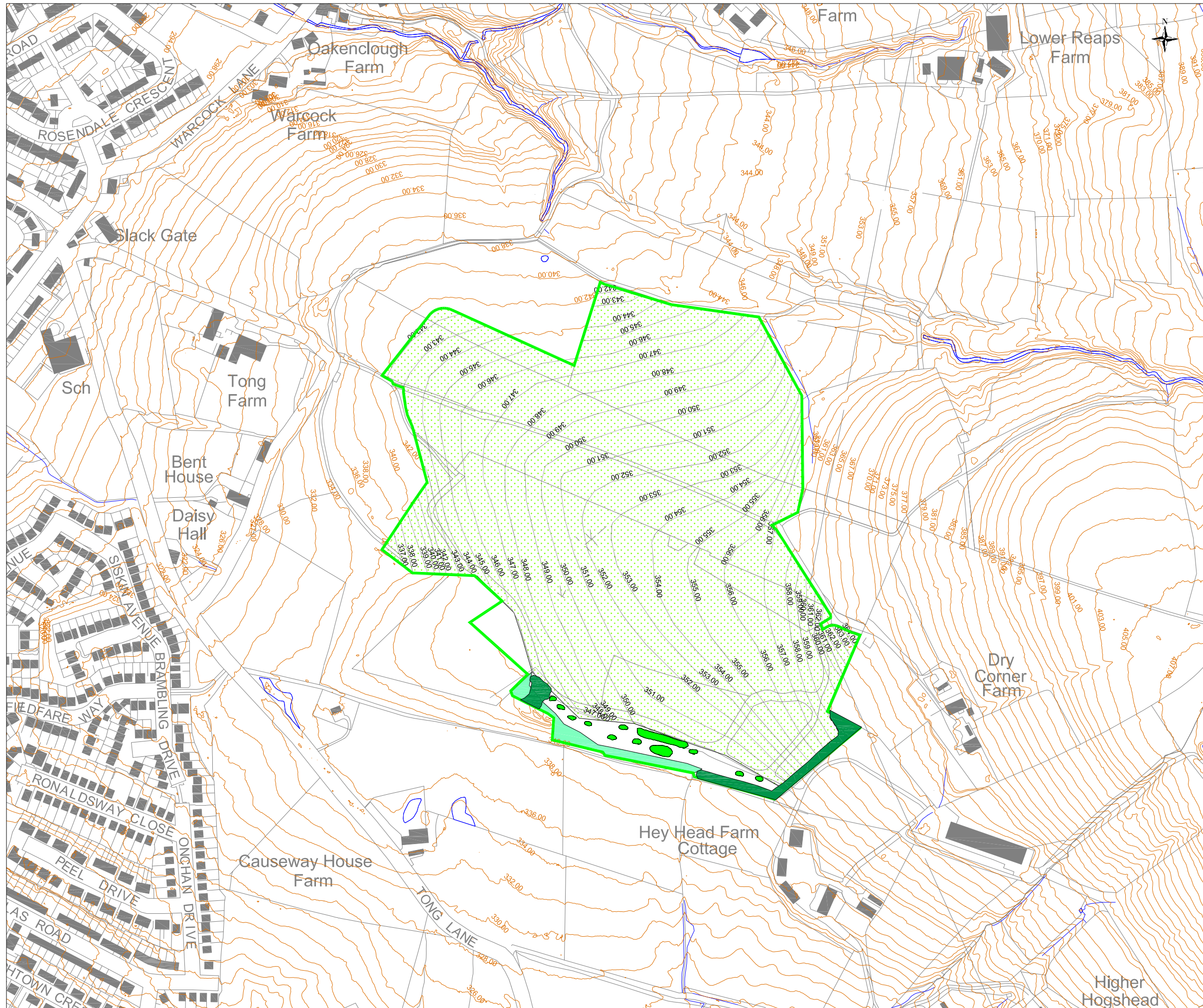
Rev.	Details	Drawn	Date
		Chkd.	

Project
213036
Tong Quarry

Title
Site Layout and Waste

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	JM	ML		



- Key:**
- Site Boundary
 - Existing Contours
 - Proposed Contours
 - Proposed Agricultural Grassland
 - Existing Marshland
 - Proposed Woodland
 - Proposed Shrub

Note:

1. Restoration landform design taken from 'Landscape Restoration Proposals and Context by Anne Dalley (drawing reference- L82/LG1, February 2013) and 'Landscape Details' by fda landscape (drawing reference- R/2278/1B, September 2019).
2. Proposed Contours taken from Restoration Scheme by Minerals and Waste Planning (drawing reference- 9865A/05, January 2020).

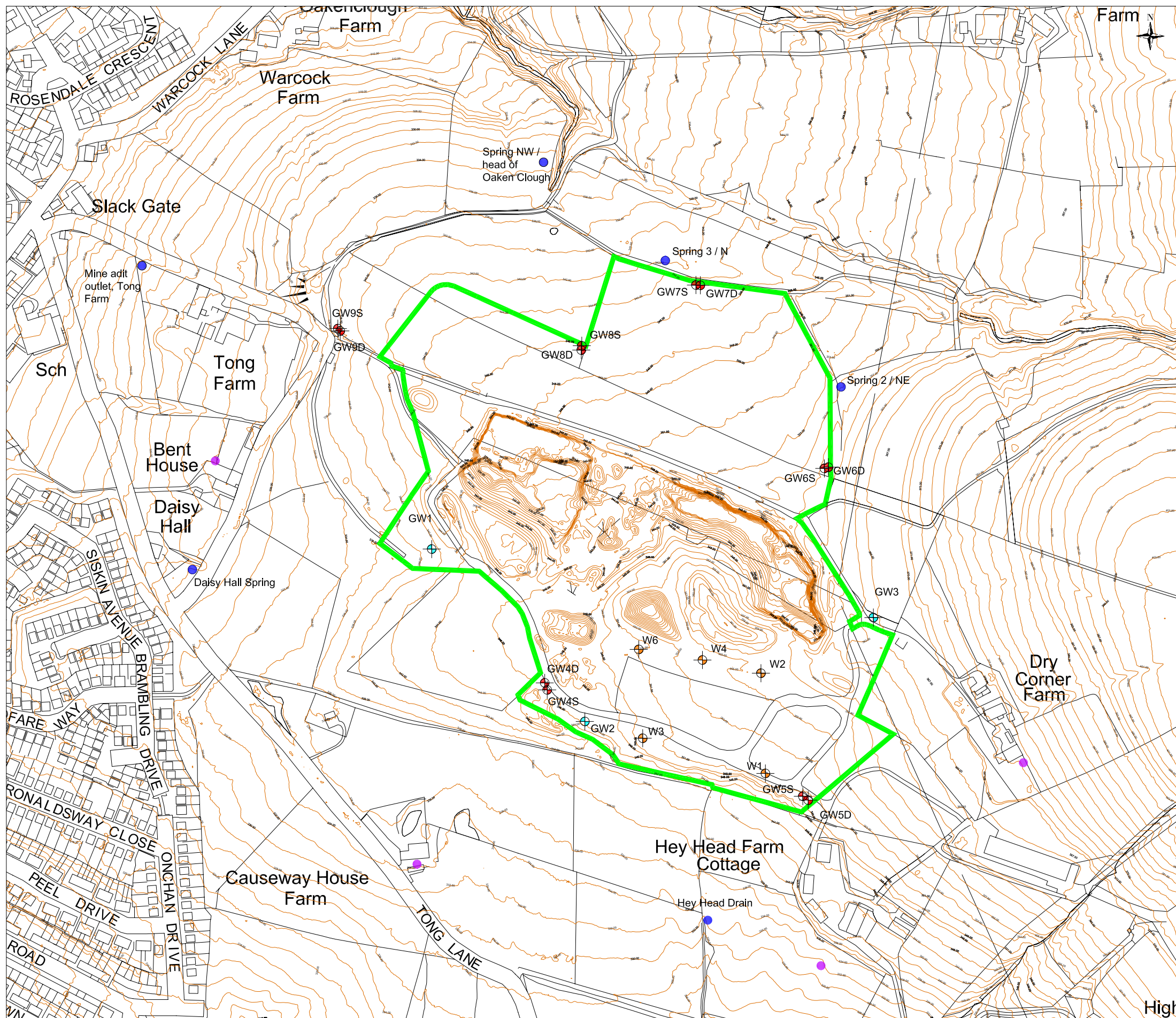
Rev.	Details	Drawn	Date
		Chkd.	

Project
213036
Tong Quarry

Title
Restoration Plan

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	Chkd.	ML		

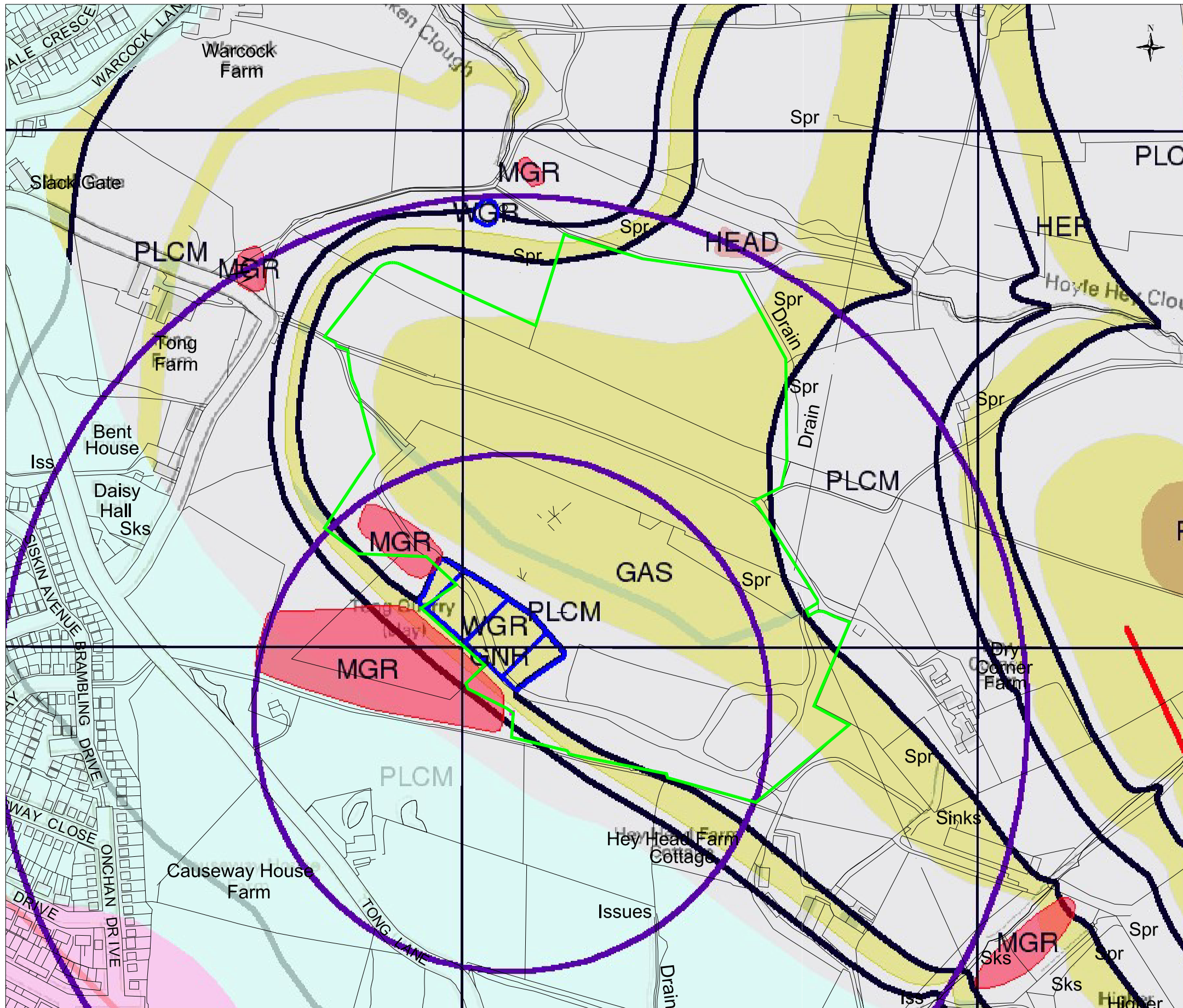


- Key:**
- Site Boundary
 - Perimeter Borehole (2021)
 - Existing Perimeter Borehole
 - Existing In-waste Borehole
 - Noise Monitoring Points
 - Surface Water Monitoring Points
 - Existing Ground Level Contour (m AOD)

Notes:
 1. Existing ground levels were taken from the National LiDAR Survey Data undertaken in 2019.

Surface Water Monitoring Point Coordinates		
ID	X	Y
Oaken Clough	388025	422994
Spring 3 / N	388146	422897
Spring 2 / NE	388320	422772
Hey Head Drain	388187	422245
Daisy Hall Spring	387678	422591
Mine adit outlet	387628	422892

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Monitoring Plan			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
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Drg. No. 213036/D/006		Rev.	



Key:

Site Boundary

Artificial Ground and Landfill

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
[Red]	MGR	Made Ground (Undivided)	Artificial Deposit	Holocene - Holocene
[Blue]	WGR	Worked Ground (Undivided)	Void	Holocene - Holocene
[Pink]	WMGR	Infilled Ground	Artificial Deposit	Holocene - Holocene
[Purple]	SLIP	Landslide Deposit	Unknown/Unclassified Entry	Quaternary - Quaternary

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
[Yellow]	ALV	Alluvium	Clay, Silt, Sand and Gravel	Flandrian - Pleistocene
[Light Blue]	TILLD	Till, Devensian	Derrinton	Devensian - Swelchian
[Light Green]	GFDUD	Glaciofluvial Deposits, Devensian	Sand and Gravel	Devensian - Swelchian
[Light Purple]	HEAD	Head	Derrinton	Quaternary - Ryzanian
[Light Brown]	PEAT	Peat	Peat (Unfilled Deposits Coding Scheme)	Quaternary - Ryzanian

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
[Light Grey]	PLCM	Pennine Lower Coal Measures Formation	Mudstone, Siltstone and Sandstone	Langsettian - Langsettian
[Light Yellow]	GNR	Ganister Rock	Sandstone	Langsettian - Langsettian
[Light Green]	GAS	Great Arc Sandstone	Sandstone	Langsettian - Langsettian
[Light Blue]	PLCM	Pennine Lower Coal Measures Formation	Sandstone	Langsettian - Langsettian
[Light Purple]	WH	Woodhead Hill Rock	Sandstone	Langsettian - Langsettian
[Light Yellow]	HER	Helpet Edge Rock	Sandstone	Langsettian - Langsettian
[Light Green]	DF	Darwen Flags	Sandstone	Langsettian - Langsettian
[Light Yellow]	MLRS	Milrow Sandstone	Sandstone	Langsettian - Langsettian
[Light Purple]	IR	Inch Rock	Sandstone	Langsettian - Langsettian
[Light Red]	RR	Rough Rock	Sandstone	Yeadonian - Yeadonian
[Light Red]	UH	Upper Haslingden Flags	Sandstone	Yeadonian - Yeadonian
[Light Red]	LH	Lower Haslingden Flags	Sandstone	Yeadonian - Yeadonian
[Light Green]	MG	Milstone Grit Group (See also Mgr)	Mudstone and Siltstone	Namurian - Namurian

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
[Black]		Rock		
[Red]		Fault		

Rev.	Details	Drawn Chkd.	Date
	Project 213036 Tong Quarry		
	Title Geology Plan		
	 AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk		
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1:2,500@A3	Drawn	JM	213036/D/010
	Chkd.	ML	Rev.



- Key:**
- Site Boundary
 - Perimeter Groundwater Monitoring Borehole
 - Spring Location
 - Surface Water Abstraction Location
 - Private Water Supply
 - 346 Groundwater Level Contour (m AOD)
 - Secondary A Aquifer- Bedrock
 - Secondary A Aquifer- Superficial
 - Secondary Undifferentiated- Superficial
 - Surface Water Feature

- Notes:**
1. The site is not located within a Groundwater Source Protection Zone.
 2. Groundwater levels were recorded by a C Eccles Brownfield Land Consultancy operative during a groundwater monitoring round undertaken on at the site on 06/02/2021.

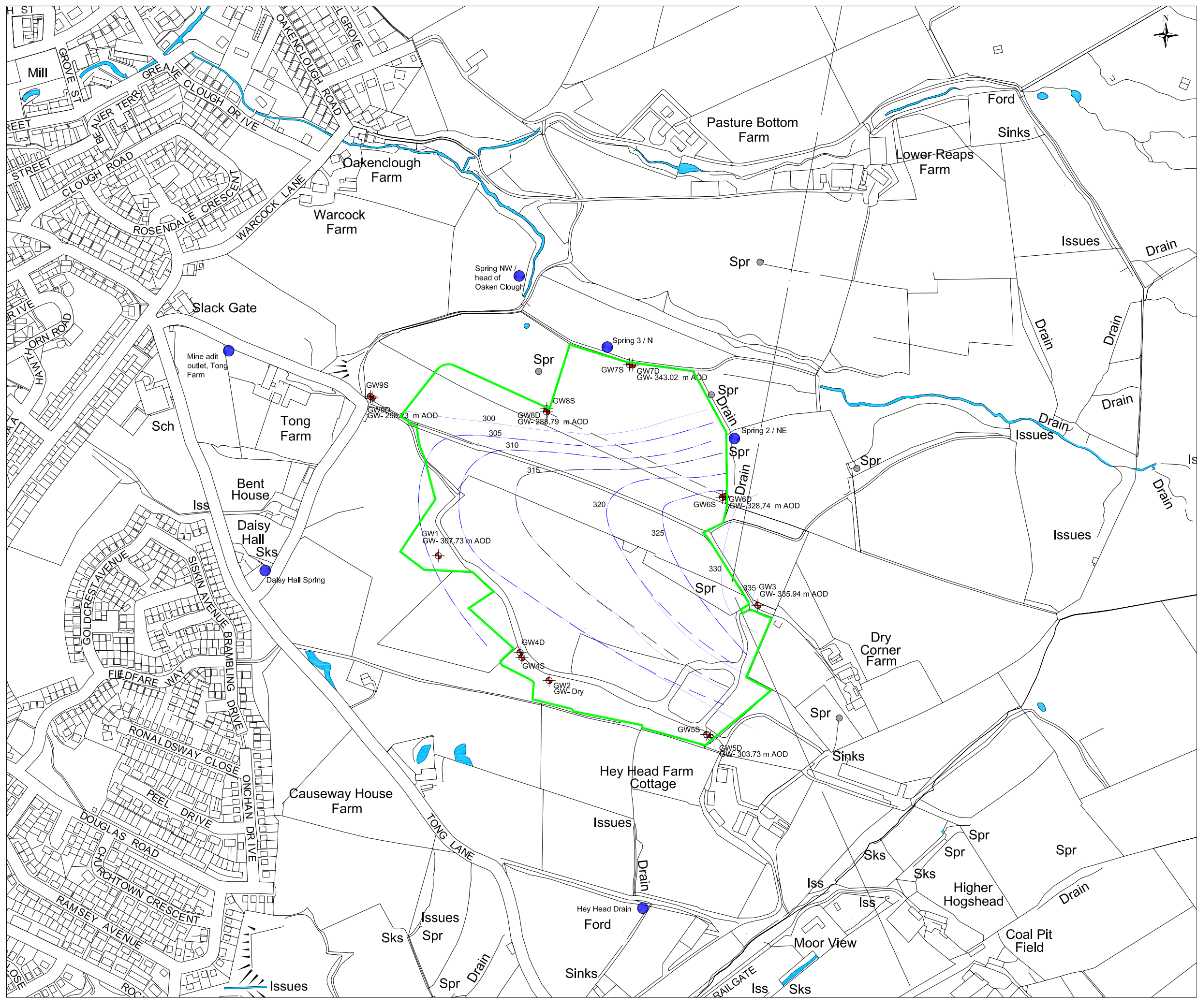
Rev.	Details	Drawn Chkd.	Date
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Project
213036
 Tong Quarry

Title
 Regional Hydrogeology

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1:5,000@A3	Drawn	Chkd.	213036/D/011	
	JM	ML		



- Key:**
- Site Boundary
 - + Perimeter Groundwater Monitoring Borehole
 - Surface Water Monitoring Location
 - Spring Location (Not Monitored)
 - 346 Groundwater Level Contour (m AOD)
 - Surface Water Feature

Notes:

- Groundwater levels were recorded by a C Eccles Brownfield Land Consultancy operative during a groundwater monitoring round undertaken on at the site on 06/02/2021.

Rev.	Details	Drawn Chkd.	Date
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Project
 213036
 Tong Quarry

Title
 Local Hydrogeology and Hydrology

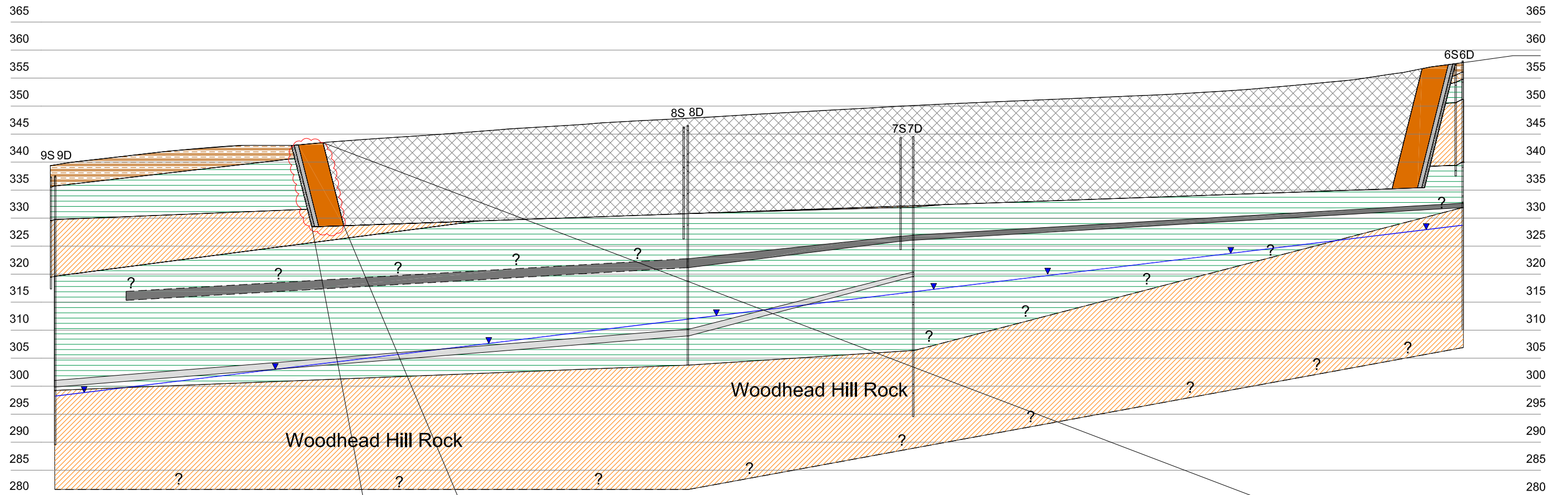


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1:5,000@A3	Drawn	JM	Chkd.	ML
			213036/D/012	

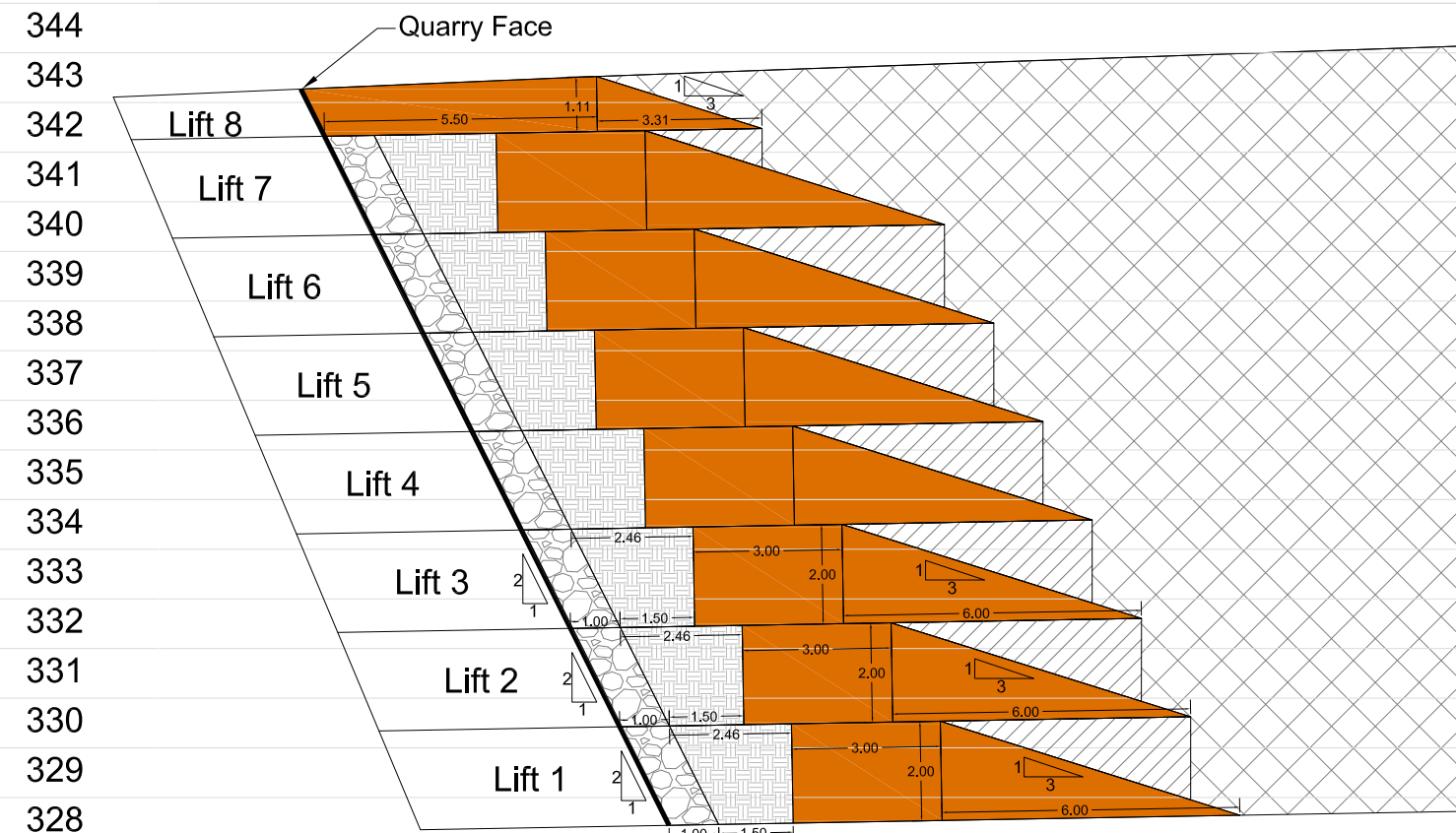
W

E



- Key:**
- Waste
 - Compacted Clay Liner
 - Granular Drainage
 - Attenuation Fill
 - General Fill Compacted to S.H.W Series 600
 - Topsoil / Gravelly Clay
 - Pennine Lower Coal Measures (Shale / Mudstone)
 - Lower Foot Mine Coal Seam
 - Lower Coal Seam
 - Sandstone
 - Deep Groundwater Level (06/02/2021)

- Notes:**
1. The Conceptual Site Model has a vertical exaggeration is 2:1 and a horizontal exaggeration of 1:1.
 2. The engineered side wall diagram has a vertical and horizontal exaggeration of 1:1.



Scale: 1:150@A3

Rev.	Details	Drawn	Date
		Chkd.	

Project
213036
Tong Quarry

Title
Conceptual Site Model



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1:1,500@A3	Drawn	JM	Chkd.	ML
			213036/CSM/D/001	

Appendix A
H1 Risk Assessment

Risk Assessment - 213036/RA

Table 1. Assessment of odour risks

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
<p>Odour from suitable soil wastes. Fugitive emissions from:</p> <ul style="list-style-type: none"> Storage activities Placement of waste Transfer and delivery activities 	<p>Residential dwellings < 5 m west of the site (owned by the Operator)</p> <p>St Mary's RC Primary school 86 m south west.</p> <p>Residential dwellings along Pennine Road and Warcock Lane</p> <p>Agricultural land adjacent to the site.</p> <p>Surrounding Public Right of Way footpaths</p>	<p>Nuisance, harm to health and loss of amenity value.</p>	<p>Atmospheric (fugitive). Air transport then inhalation.</p>	<p>Low</p>	<p>Medium</p>	<p>Low</p>	<p>Waste types being imported will predominantly be from construction and demolition sites and will not include odour generating wastes (putrescible waste).</p>	<p>Strict waste acceptance procedures and controls on the type of waste streams accepted. No other permitted waste types are to be accepted, therefore will not biodegrade to produce offensive odours.</p> <p>Recording any complaints and implementing controls, as outlined in the Operational Working Plan (OP).</p>	<p>Low</p>

Risk Assessment - 213036/RA

Table 2. Assessment of noise and vibration risks

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
Noise and vibration emissions mobile plant, delivery lorries, unloading and placement activities.	<p>Residential dwellings <5 m west of the site (owned by the Operator).</p> <p>St. Mary's RC Primary school 86 m south west.</p> <p>Residential dwellings along Tong Lane, Pennine Road and Warcock Lane. All residents are more than 250 m away.</p> <p>Agricultural land adjacent to the site.</p> <p>Surrounding Public Right of Way footpaths.</p>	Levels of noise that cause loss of amenity and nuisance to users and residents in the locale.	Airborne	Low	Medium	Low	<p>Nearest residential receptors are more than 250 m away.</p> <p>The majority of the works are well screened by the quarry rim.</p> <p>Although some potential noise risk when near restoration levels, this is an existing approved activity and there is no change to the noise profile.</p> <p>Works will adhere to normal operating hours.</p>	<p>All operatives inducted on the requirement to reduce noise emissions and adherence to the site's working hours. All works are in accordance with the Noise Management Plan.</p> <p>All plant and vehicles will meet current guidance and will be maintained in line with manufacturer's requirements.</p> <p>All equipment and vehicles, when not in regular use, shall be switched off.</p> <p>Stripped topsoil to be banded 3 m high to break line of sight, reducing noise emissions to sensitive receptors.</p>	Low

Risk Assessment - 213036/RA

Table 3. Assessment of fugitive emissions (other than odour, noise and vibration)

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
To Air									
Dust from on and off-site vehicle operations, unloading, placement and handling of waste, and use of internal haul routes.	Residential dwellings <5 m west of the site	Harm to human health, respiratory irritation and illness.	Airborne then inhalation.	Low	Medium	Low	Operations have the potential to generate dusts from off-site movements during prolonged dry periods.	Measures to control dust are set out in the DEMP (213036/DEMP)	Low to very low
	St. Mary's RC Primary school 86 m south west.	Nuisance – deposit on cars, homes, clothing etc.	Airborne then deposit.	Very Low	Low	Very Low	The risk of dust emissions comes from HGV's, and the movement and placement of waste.		
	Residential dwellings along Pennine Road and Warcock Lane	Harm to ecosystem – dust deposit of vegetation	Airborne then inhalation.	Low	Medium	Low	There is no change in the nature of works at the site or composition in waste types. The proposals under the variation do not change the potential dust risk profile of the operations. No additional controls or assessments deemed necessary.		
	Agricultural land adjacent to the site.								
	Surrounding Public Right of Way footpaths								
	Lowland Fens and Deciduous Woodland Habitats to south west								
To Controlled Waters									
Run-off from site surfaces or spillages.	Land drain within and surrounding site	Passive leaching to ground or existing land drains, from contamination or spillages on hardstanding surface and directly entering drainage system.	Land then surface water drainage systems.	Medium	High	Medium	Permitted waste types do not include leachates or liquids.	Controls on types of wastes accepted.	Low
	Spring located within western boundary of the site and surrounding springs.						No change in drainage arrangements from operations or site activities. Surface water managed in accordance with OP.	All fuel storage areas will be bunded to 110 % capacity. Spill kits will be provided on site.	
	Underlying groundwater within strata.						Importation protocol supported by site specific Controlled	Inspection and management regime as per OP	
	Secondary A aquifer in Lower Pennine Coal							All staff and operatives will be trained as per	

Risk Assessment - 213036/RA

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
	Measures and Great Arc Sandstone Formations						Water Risk Assessment deeming it low risk.	pollution prevention requirements.	
Run-off and infiltration from site surfaces or spillages.	Potentially isolated and localised groundwater underlying site.	Pollution to aquifer.	Land infiltration through free draining hardstanding.	Medium	High	Medium	Permitted waste types do not include leachates or liquids. No change in number of mobile plant and likelihood of potential spill remains the same.	Controls on types of wastes accepted and placed on site. Mobile bunded fuel bowser to be used with pipes and valves protected with spill trays. All staff and operatives will be trained as per pollution prevention requirements.	Low
Mud and litter									
Litter from storage areas and mud from site operation.	Humans (as per odour) and fauna.	Nuisance, loss of amenity and reduced safety.	Air and land.	Low	Medium	Low	Permitted wastes have low litter potential as waste is mainly C&D origin. There is no change in operations or types of waste therefore litter risk profile remains the same as originally approved.	All visible litter on site boundaries will be cleared as soon as practicable. Internal and external haulage routes will be maintained by mechanical sweeping to ensure mud is not generated. Inspection and corrective action regime will be undertaken in line with site management system.	Low
Pests and vermin									
Storage of waste attracting pests and vermin.	Human	Can cause increase populations and infestations of rats, mice, flies and other vermin.	Air transport and over land.	Low	Low	Low	All of the waste has low to negligible risk of organic / litter content to attract pests and vermin. There is no change in operations, volume or types of waste therefore pest/vermin risk profile	Adherence to waste acceptance procedures. Inspection of site by Site Manager on frequent basis. Implementation of controls as required.	Low

Risk Assessment - 213036/RA

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
		Result is harm to health, loss of amenity and nuisance.					remains the same as originally approved.		

Risk Assessment - 213036/RA

Table 4. Foreseeable Accident risk assessment and management

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
Fire (accidental, arson) and smoke.	Humans (as per odour) and environment.	Damage and loss of amenity, nuisance and carcinogenic particulates.	Direct contact, airborne.	Low	Severe	Medium	In the event of a major incident there is a serious health risk. Wastes to be imported or re-used are non-combustible soils only.	No wastes will be burned on site. All storage of waste and plant in accordance with existing EMS. The management of the waste has been developed in line with industry guidance to minimise volumes to manageable sizes. Incidents to be recorded in the Site Diary.	Low
Spillage of fuels, oils or polluting material.	Soil, surface waters and groundwater.	Pollution and/or contamination.	Land and drainage systems.	Low	High	Medium	Oils and fuels will be locked in a sealed container, when not in use. There is no additional risk from the new proposals. This remains unchanged.	The Contingency Plan will incorporate spillage controls. Spill kits will be maintained on site. All staff will be trained on controls.	Low
Spillage of waste.	Human health (as per odour), surface water drainage, groundwater.	Loss of amenity and nuisance, pollution and/or contamination.	Land, drain and air.	Low	High	Medium	Uncontrolled release could cause health or pollution issues. There is no additional risk from the new proposals. This remains unchanged.	All vehicles accessing the site will be sheeted or fully enclosed. Unloading and loading will be controlled at all times. Incidents recorded in the Site Diary.	Low

Risk Assessment - 213036/RA

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
Direct physical contact between humans and all wastes, machinery and vehicles.	Human health (site operatives and local population).	Bodily harm.	Direct contact.	Medium	High	Medium	<p>No public access during works.</p> <p>All wastes will adhere to the Importation Protocol and appropriate human health limits.</p> <p>There is no additional risk from the new proposals from machinery and vehicles. This remains unchanged.</p>	<p>Activities to be managed in accordance with site health and safety management system.</p> <p>Access to wastes to be restricted to trained and competent personnel.</p> <p>Delineation of activities and personnel.</p>	Low

Risk Assessment - 213036/RA

Table 5. Assessment of ground gas risks

Hazard	Receptors	Harm	Pathway	Probability of Exposure	Consequence	Magnitude	Justification	Risk Management	Residual Risk
<p>Inhalation of ground gases generated by waste deposit beneath the proposed earthworks.</p> <p>Inhalation of ground gases generated by soils from proposed earthworks</p> <p>Inhalation of volatile vapours with elevated concentrations of determinants.</p> <p>Explosive risk from bio-gas/ground gases.</p> <p>Surcharging of existing Made Ground during capping.</p>	<p>On site land users (agricultural)</p> <p>Temporary construction staff.</p>	<p>Intoxication</p> <p>Explosion</p> <p>Nuisance/loss of amenity</p>	<p>Emissions from existing Made Ground or imported material to air.</p>	<p>Severe</p>	<p>Negligible</p>	<p>Low</p>	<p>The imported waste material will be of mineral / soil content with low organic content. The risk of ground gas generation deposited waste is negligible.</p> <p>There will be no engineered cap, and waste deposit will be surfaced with topsoil. The likely gas migration pathway will dissipate slowly from the top of the waste deposit.</p>	<p>Adherence to importation protocol and construction scheme.</p>	<p>Very Low</p>
	<p>Off site land users (public right of way)</p> <p>Residential properties circa 145 m east and 185 m west of quarry void</p>	<p>Intoxication</p> <p>Explosion</p> <p>Nuisance/loss of amenity</p>	<p>Emissions from existing Made Ground or imported material to surrounding ground to air.</p>	<p>Severe</p>	<p>Negligible</p>	<p>Low</p>	<p>The imported waste material will be of mineral / soil content with low organic content. The risk of ground gas generation deposited waste is negligible.</p> <p>The surrounding land uses are low risk and no residential properties within 100 m of the quarry void.</p>	<p>Adherence to importation protocol and construction scheme.</p>	<p>Very Low</p>

Appendix B

Historic Maps

Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
County Burgh Boundary (Scotland)
Co. Boro. Bdy.
Co. Burgh Bdy.
BP BS Boundary Post or Stone **P.C.B** Police Call Box
B.R. Bridle Road **P** Pump
E.P Electricity Pylon **S.P** Signal Post
F.B. Foot Bridge **SL** Sluice
F.P. Foot Path **Sp.** Spring
G.P Guide Post or Board **T.C.B** Telephone Call Box
M.S Mile Stone **Tr.** Trough
M.P M.R Mooring Post or Ring **W** Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH Beer House **P** Pillar, Pole or Post
BP, BS Boundary Post or Stone **PO** Post Office
Cn, C Capstan, Crane **PC** Public Convenience
Chy Chimney **PH** Public House
D Fn Drinking Fountain **Pp** Pump
EI P Electricity Pillar or Post **SB, S Br** Signal Box or Bridge
FAP Fire Alarm Pillar **SP, SL** Signal Post or Light
FB Foot Bridge **Spr** Spring
GP Guide Post **Tk** Tank or Track
H Hydrant or Hydraulic **TCB** Telephone Call Box
LC Level Crossing **TCP** Telephone Call Post
MH Manhole **Tr** Trough
MP Mile Post or Mooring Post **Wr Pt, Wr T** Water Point, Water Tap
MS Mile Stone **W** Well
NTL Normal Tidal Limit **Wd Pp** Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m Bench Mark **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks Barracks **P** Pillar, Pole or Post
Bty Battery **PO** Post Office
Cemy Cemetery **PC** Public Convenience
Chy Chimney **Pp** Pump
Cis Cistern **Ppg Sta** Pumping Station
Dismtd Rly Dismantled Railway **PW** Place of Worship
EI Gen Sta Electricity Generating Station **Sewage Ppg Sta** Sewage Pumping Station
EI P Electricity Pole, Pillar **SB, S Br** Signal Box or Bridge
EI Sub Sta Electricity Sub Station **SP, SL** Signal Post or Light
FB Filter Bed **Spr** Spring
Fn / D Fn Fountain / Drinking Ftn. **Tk** Tank or Track
Gas Gov Gas Valve Compound **Tr** Trough
GVC Gas Governor **Wd Pp** Wind Pump
GP Guide Post **Wr Pt, Wr T** Water Point, Water Tap
MH Manhole **Wks** Works (building or area)
MP, MS Mile Post or Mile Stone **W** Well

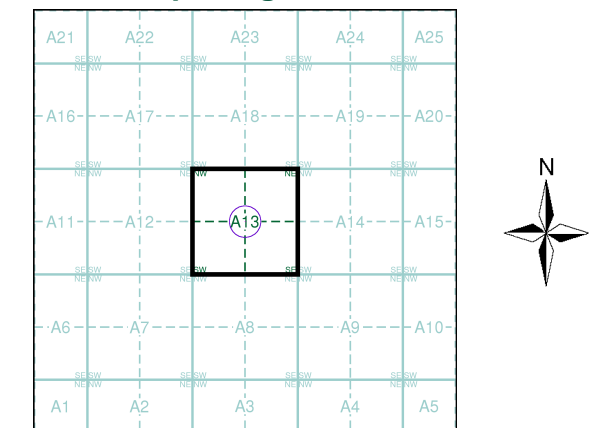
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1893 - 1894	2
Lancashire And Furness	1:2,500	1910	3
Lancashire And Furness	1:2,500	1930	4
Ordnance Survey Plan	1:1,250	1960	5
Ordnance Survey Plan	1:2,500	1962	6
Ordnance Survey Plan	1:1,250	1977	7
Additional SIMs	1:1,250	1977 - 1987	8
Additional SIMs	1:1,250	1981	9
Additional SIMs	1:1,250	1986	10
Large-Scale National Grid Data	1:1,250	1993	11
Large-Scale National Grid Data	1:2,500	1993	12

Historical Map - Segment A13



Order Details

Order Number: 274158604_1_1
 Customer Ref: 213036
 National Grid Reference: 388060, 422640
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 100

Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA

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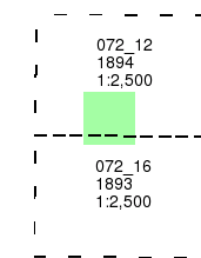
Lancashire And Furness

Published 1893 - 1894

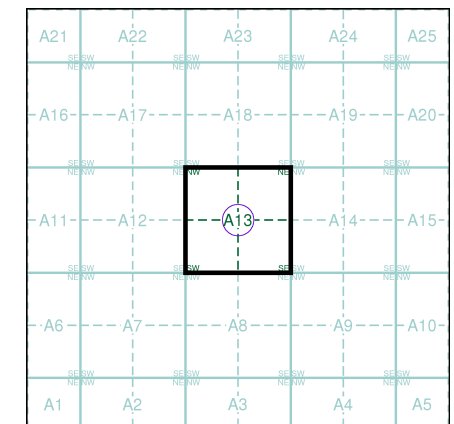
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Map Name(s) and Date(s)



Historical Map - Segment A13

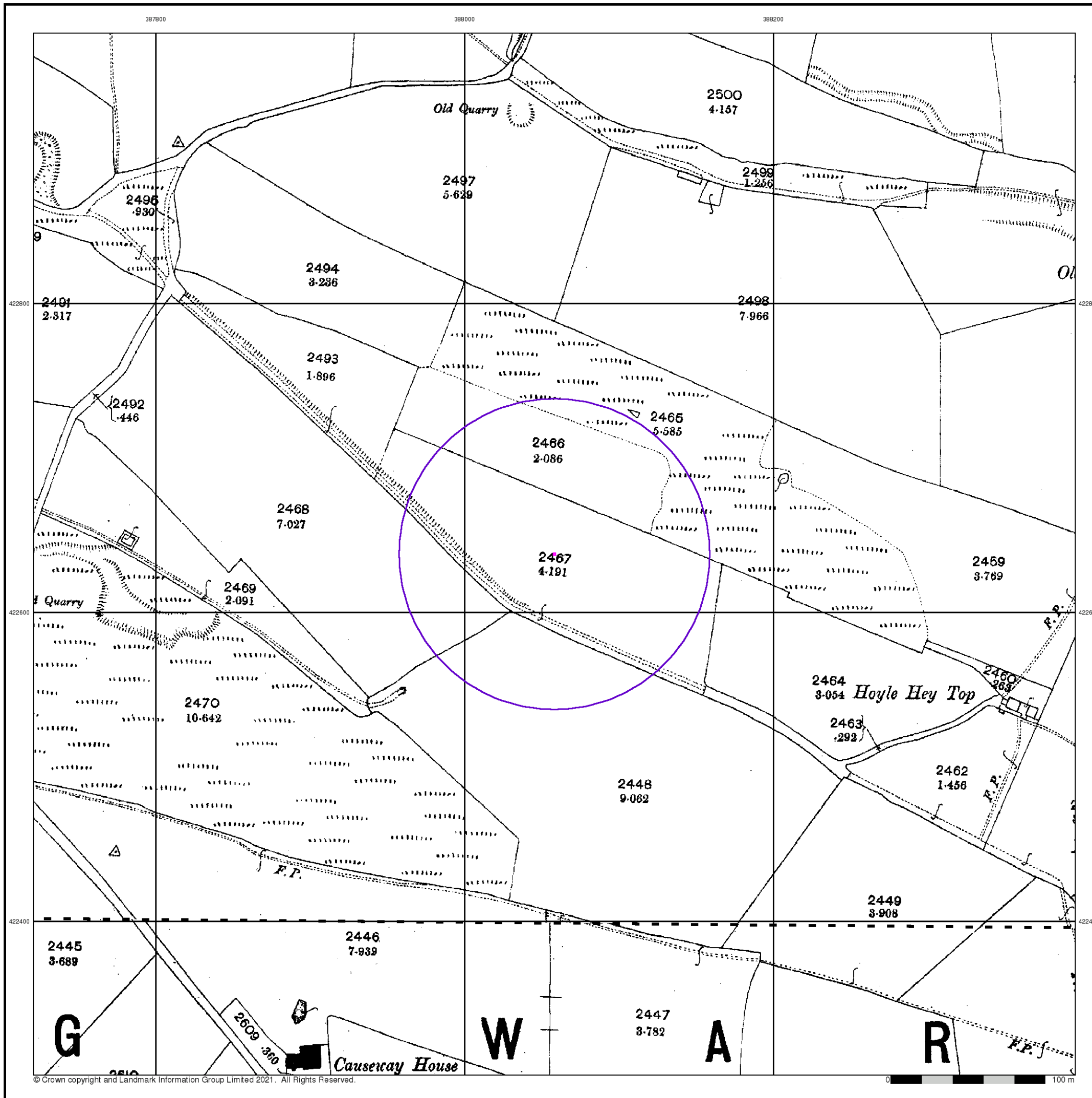


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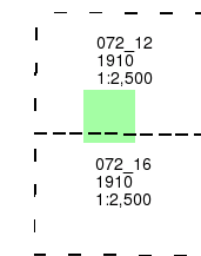
Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA

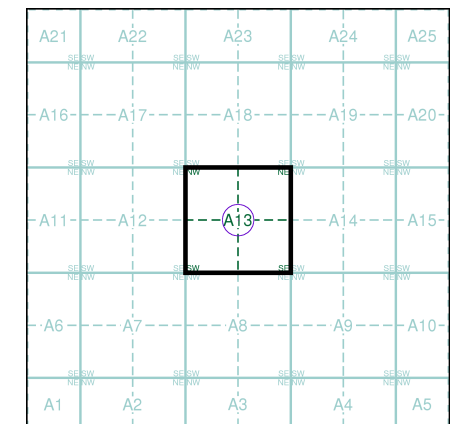


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Map Name(s) and Date(s)



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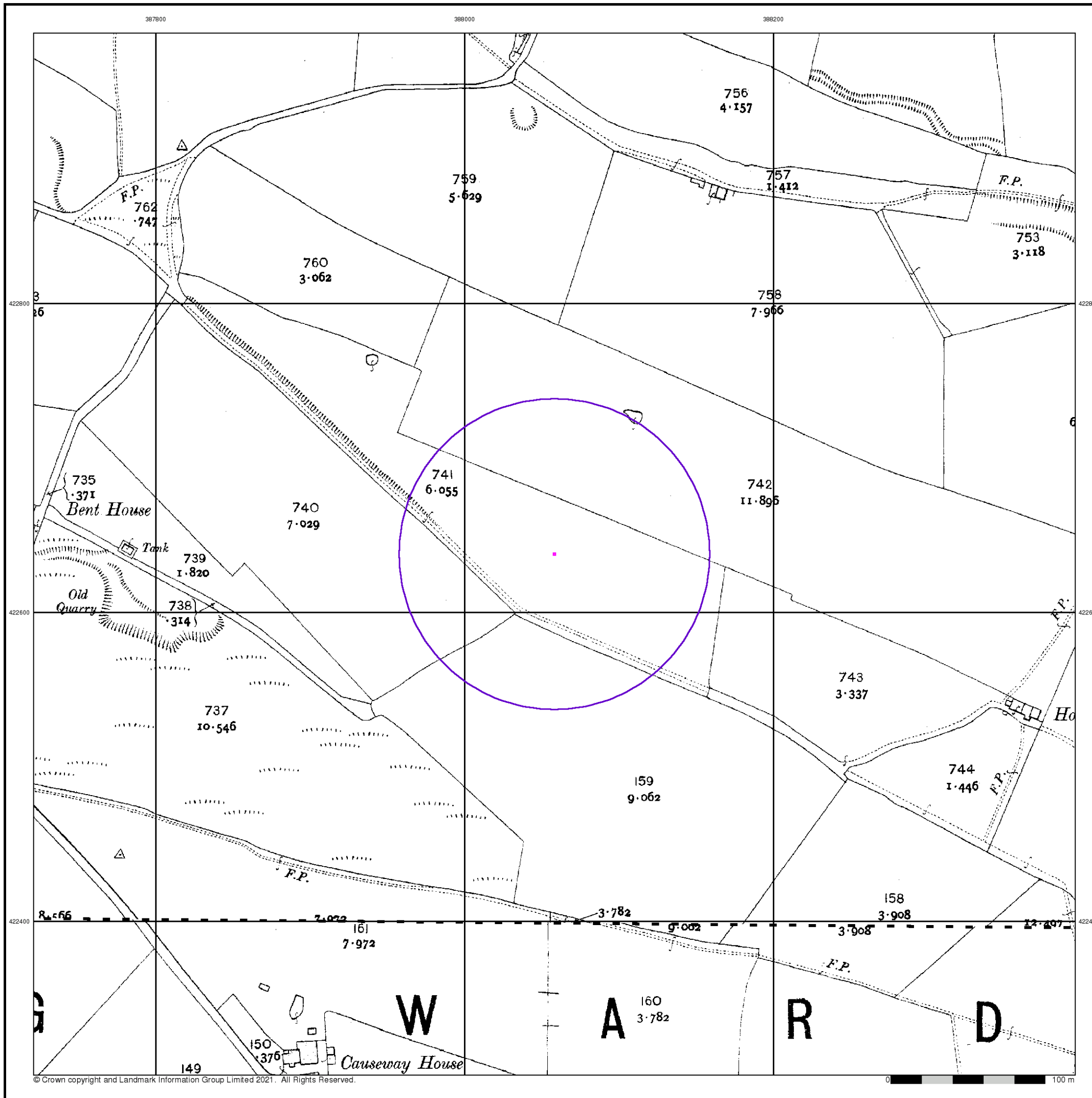


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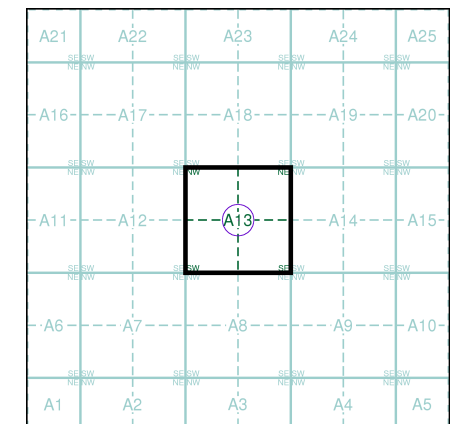


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Map Name(s) and Date(s)

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1930
1:2,500
072_16
1930
1:2,500

Historical Map - Segment A13

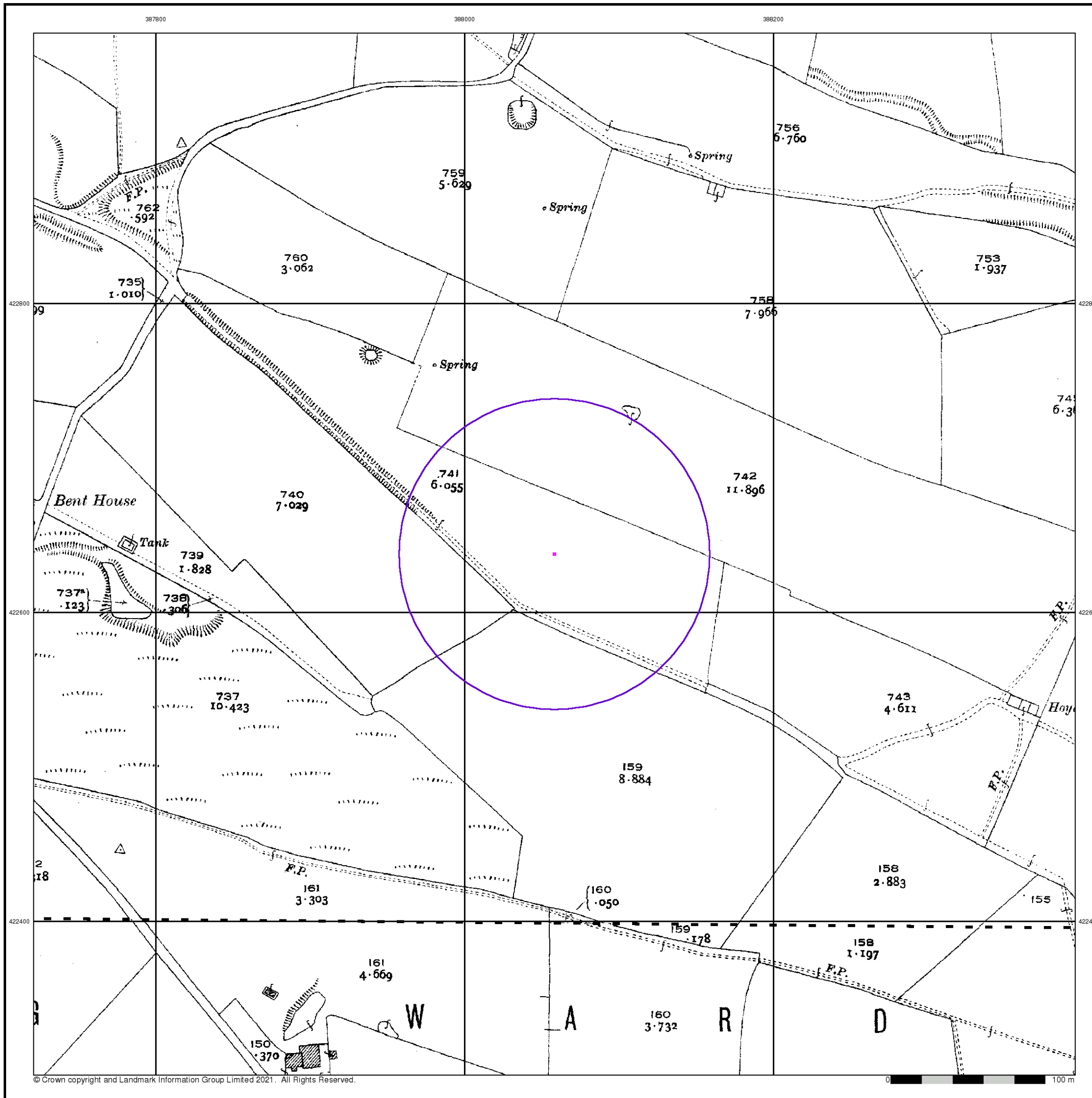


Order Details

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 National Grid Reference: 388060, 422640
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 Search Buffer (m): 100

Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



Ordnance Survey Plan

Published 1960

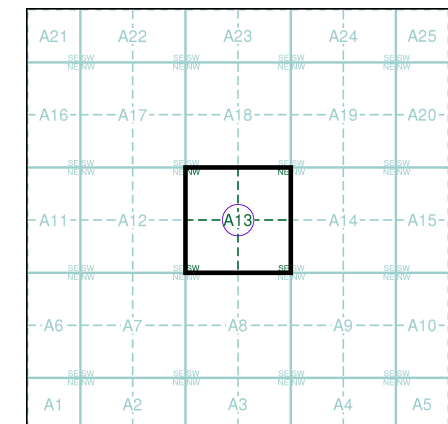
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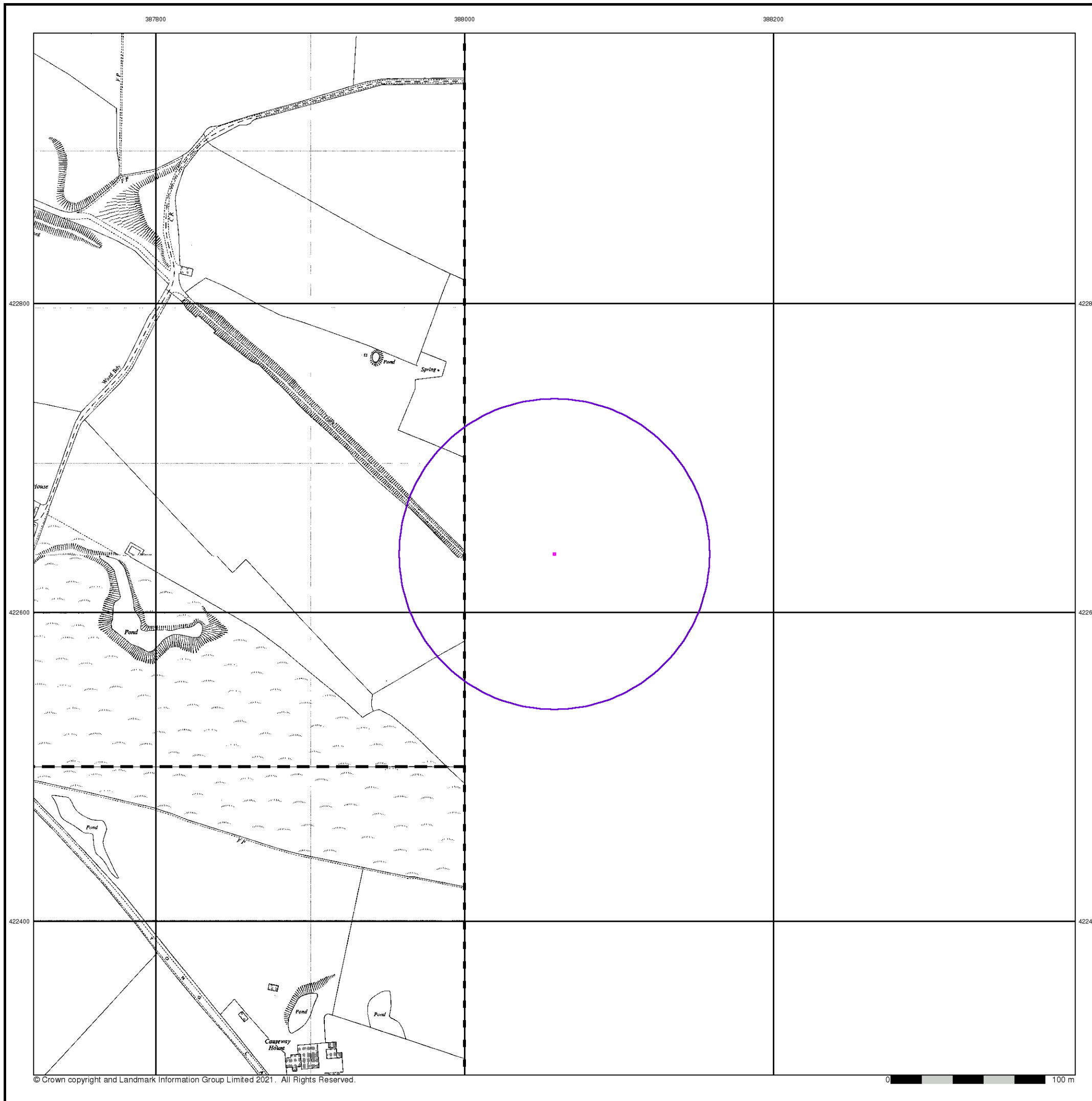


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Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



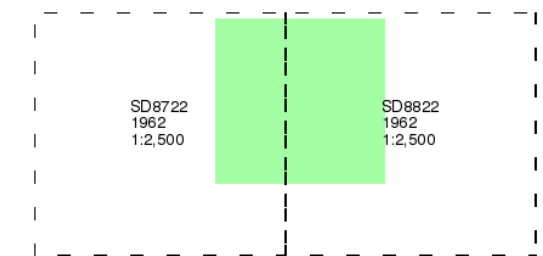
Ordnance Survey Plan

Published 1962

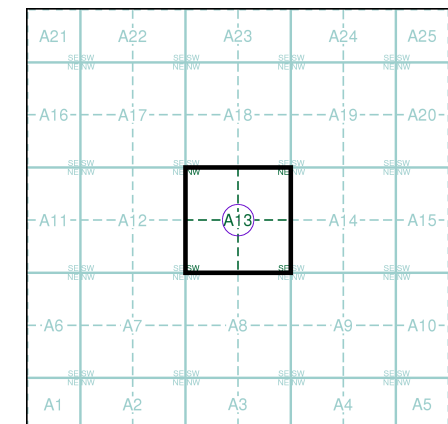
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Map Name(s) and Date(s)



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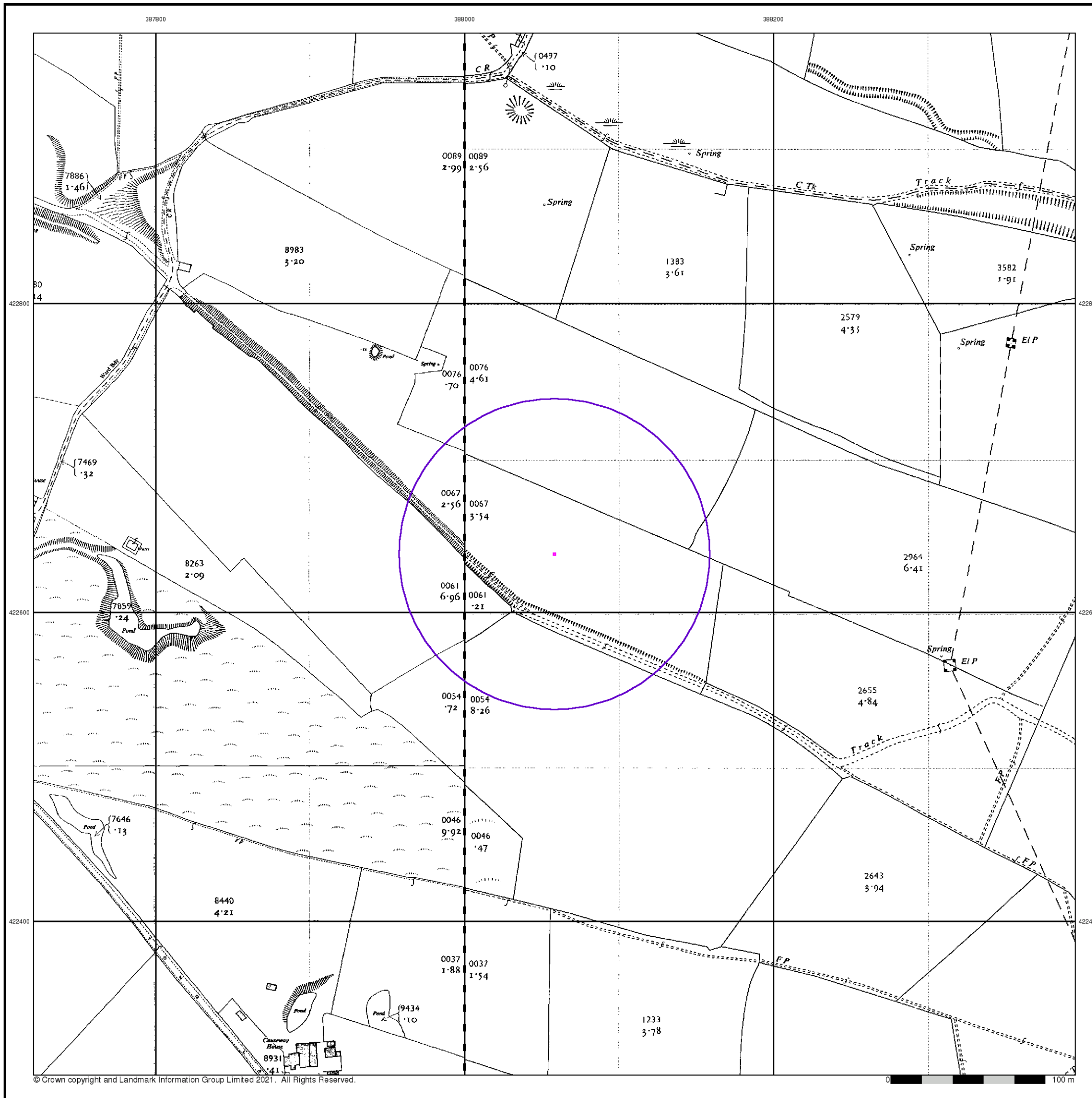


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 Search Buffer (m): 100

Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



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388000

388200

422800

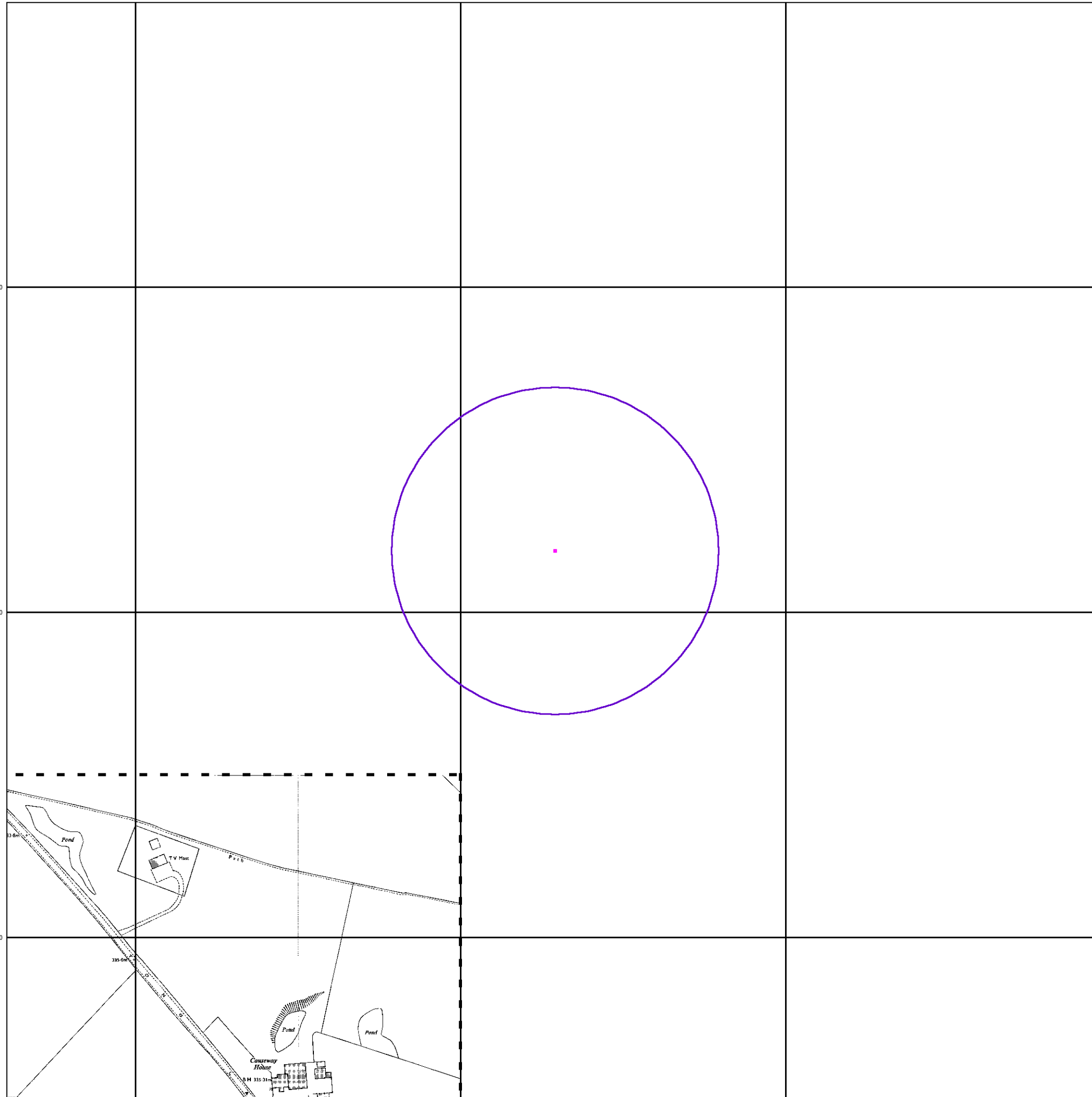
422800

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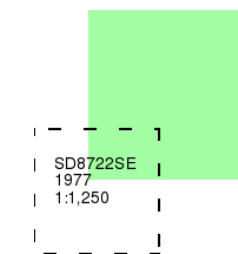
Ordnance Survey Plan

Published 1977

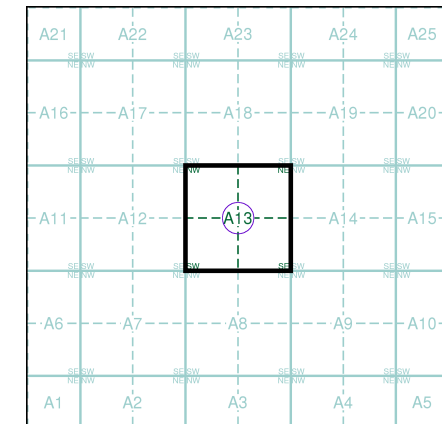
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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 National Grid Reference: 388060, 422640
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 100

Site Details

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Additional SIMs

Published 1977 - 1987

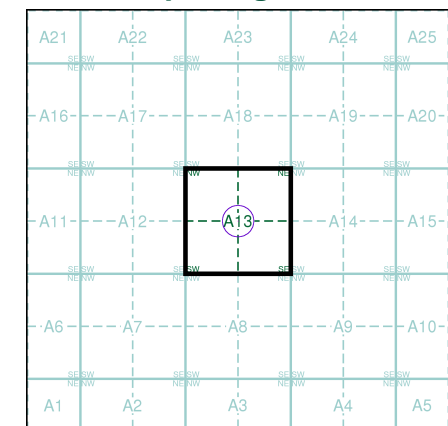
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

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1:1,250	
SD8722SE	
1977	
1:1,250	

Historical Map - Segment A13

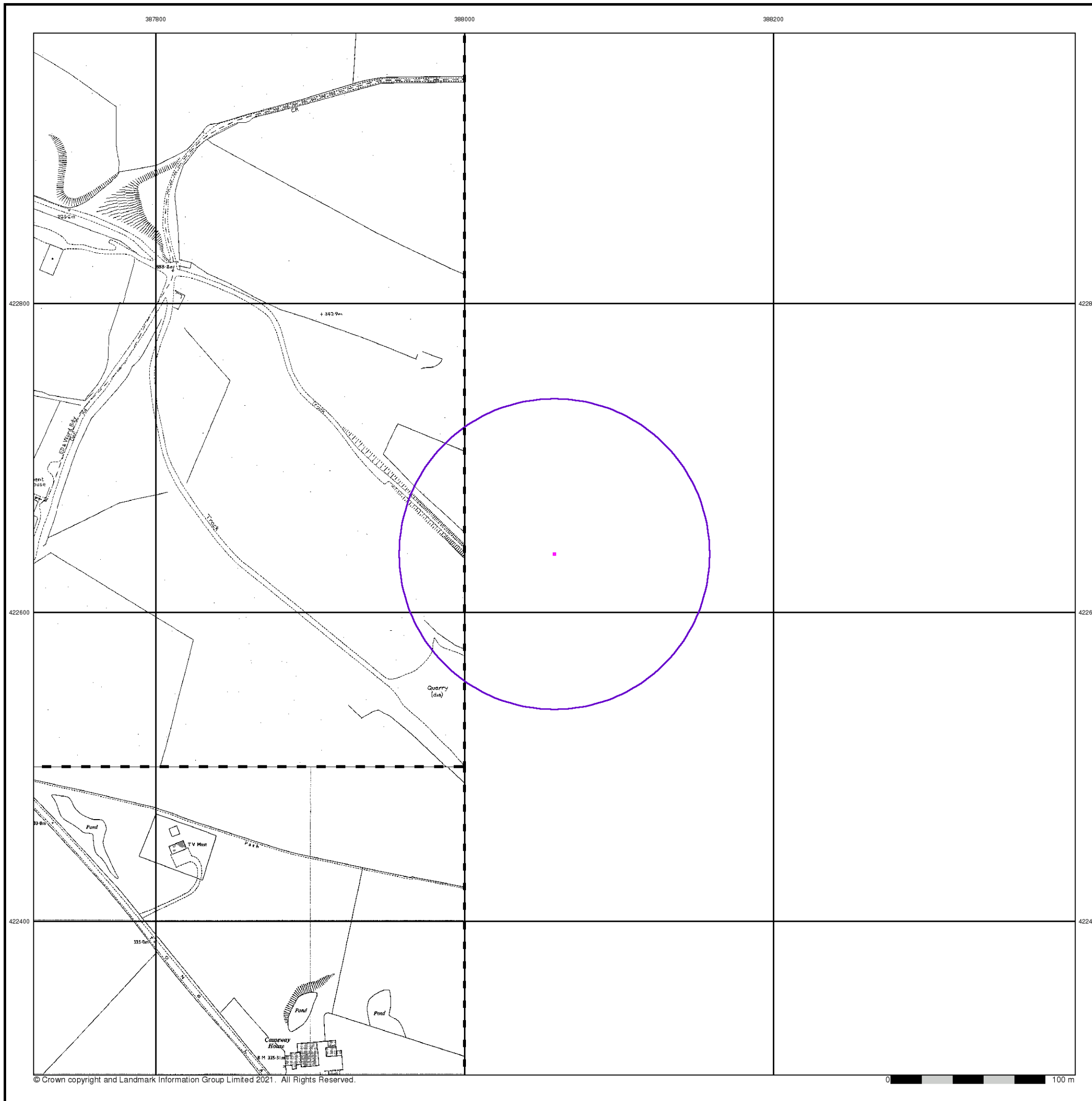


Order Details

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Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



387800

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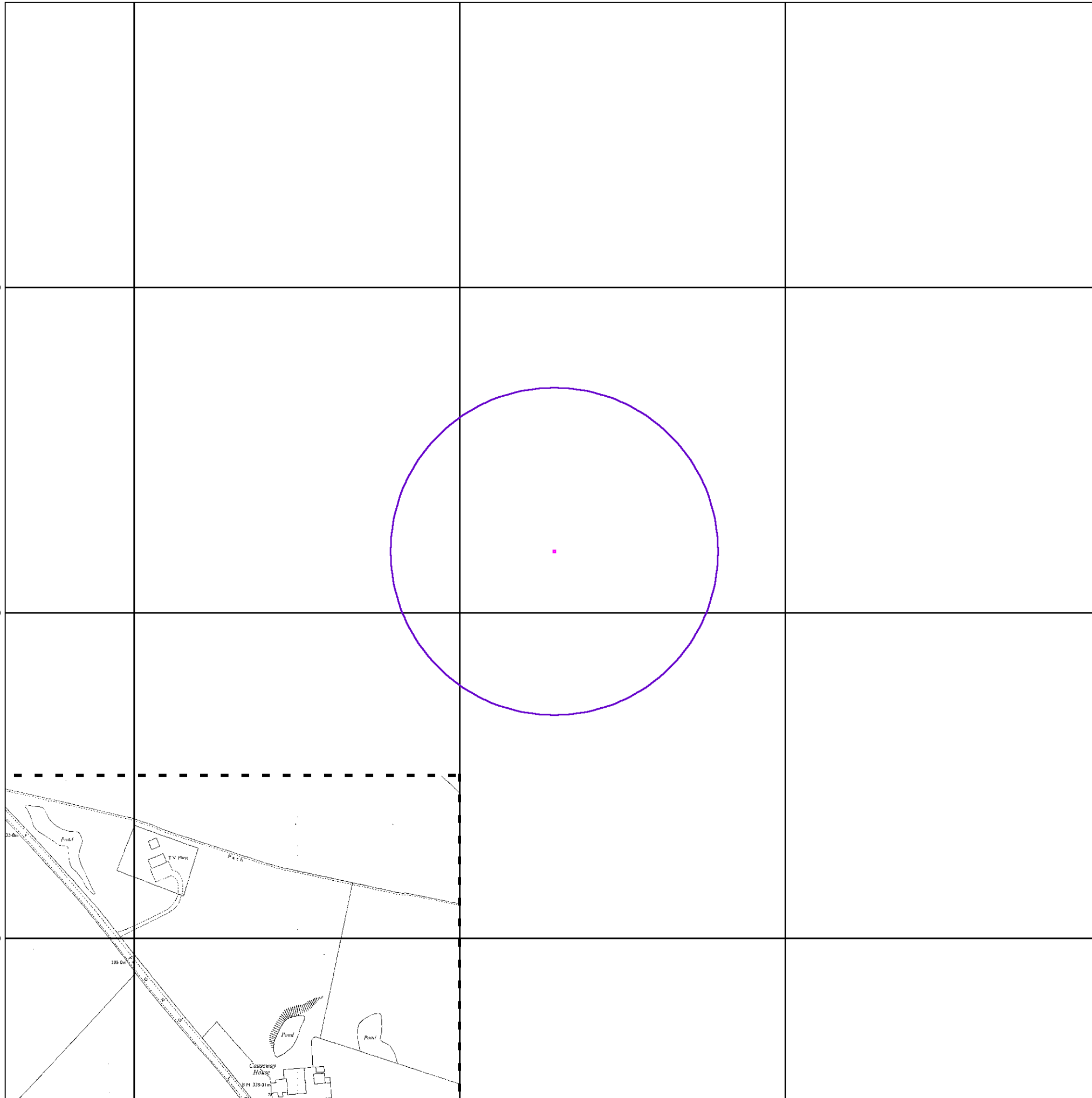
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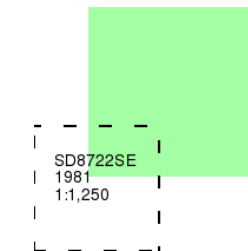
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Published 1981

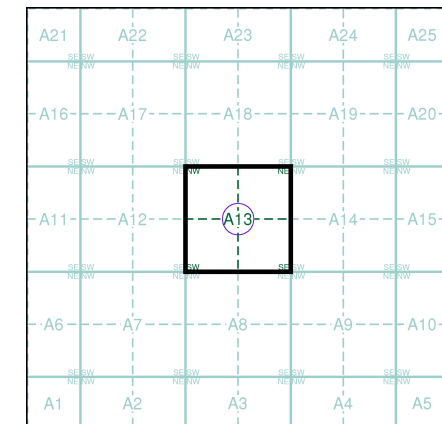
Source map scale - 1:1,250

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Map Name(s) and Date(s)



Historical Map - Segment A13



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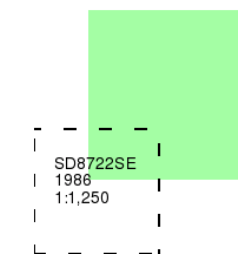
Additional SIMs

Published 1986

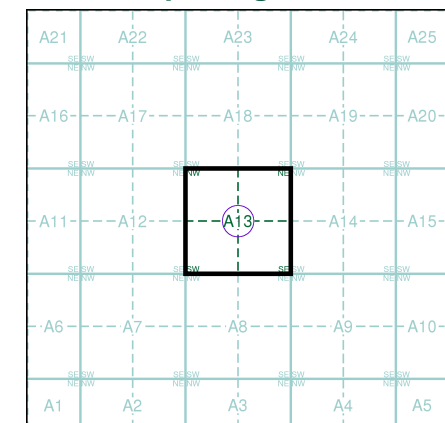
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Map Name(s) and Date(s)



Historical Map - Segment A13

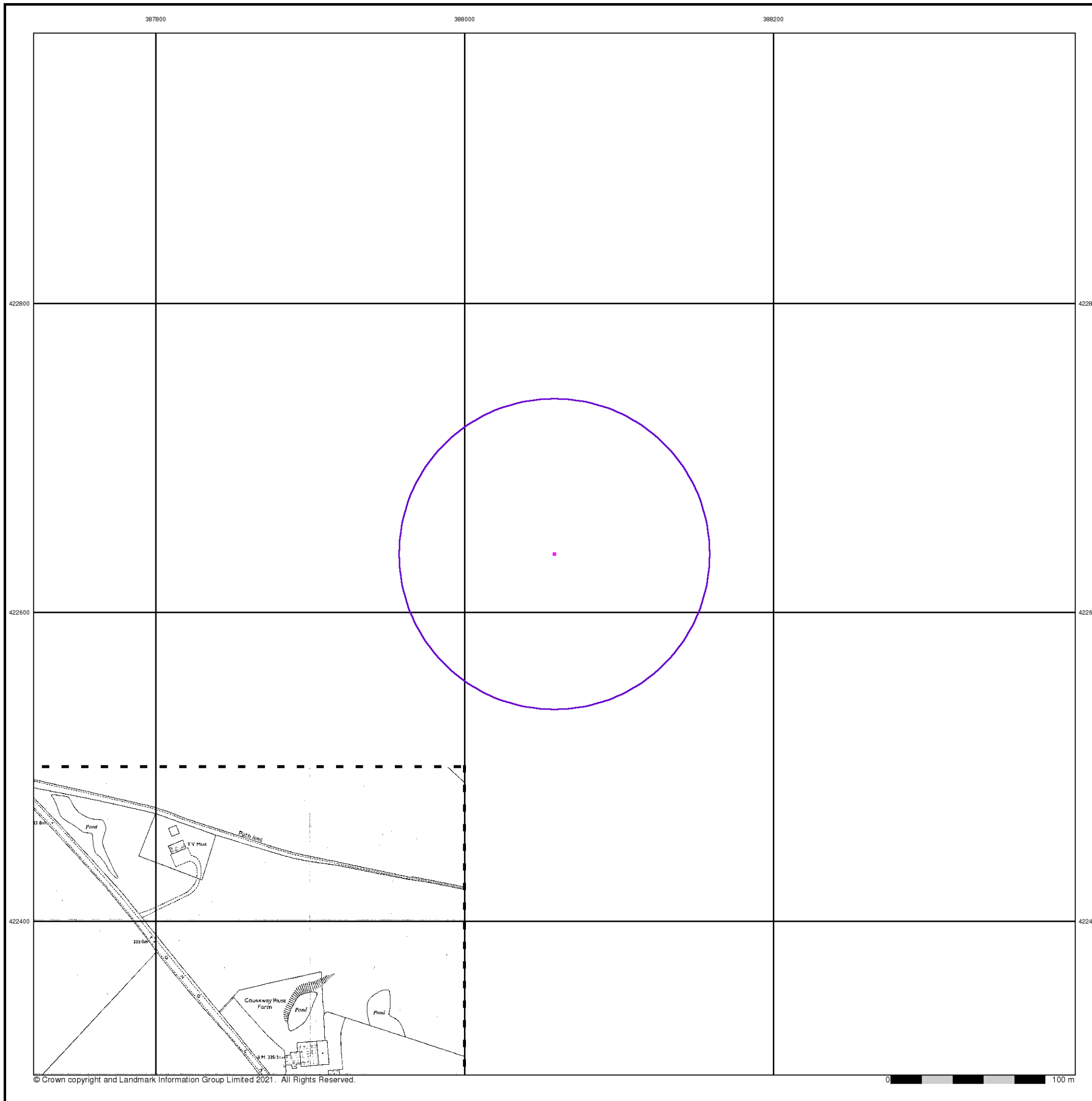


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 Search Buffer (m): 100

Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



Large-Scale National Grid Data

Published 1993

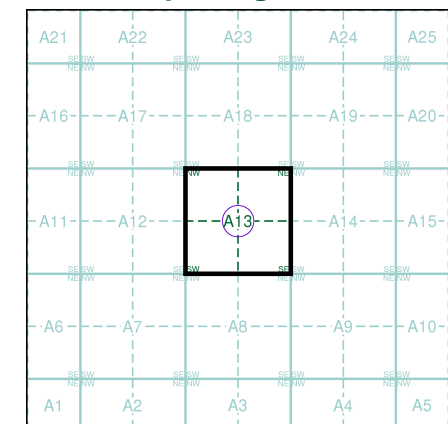
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SD8722NE	1993	1:1,250
SD8722SE		

Historical Map - Segment A13

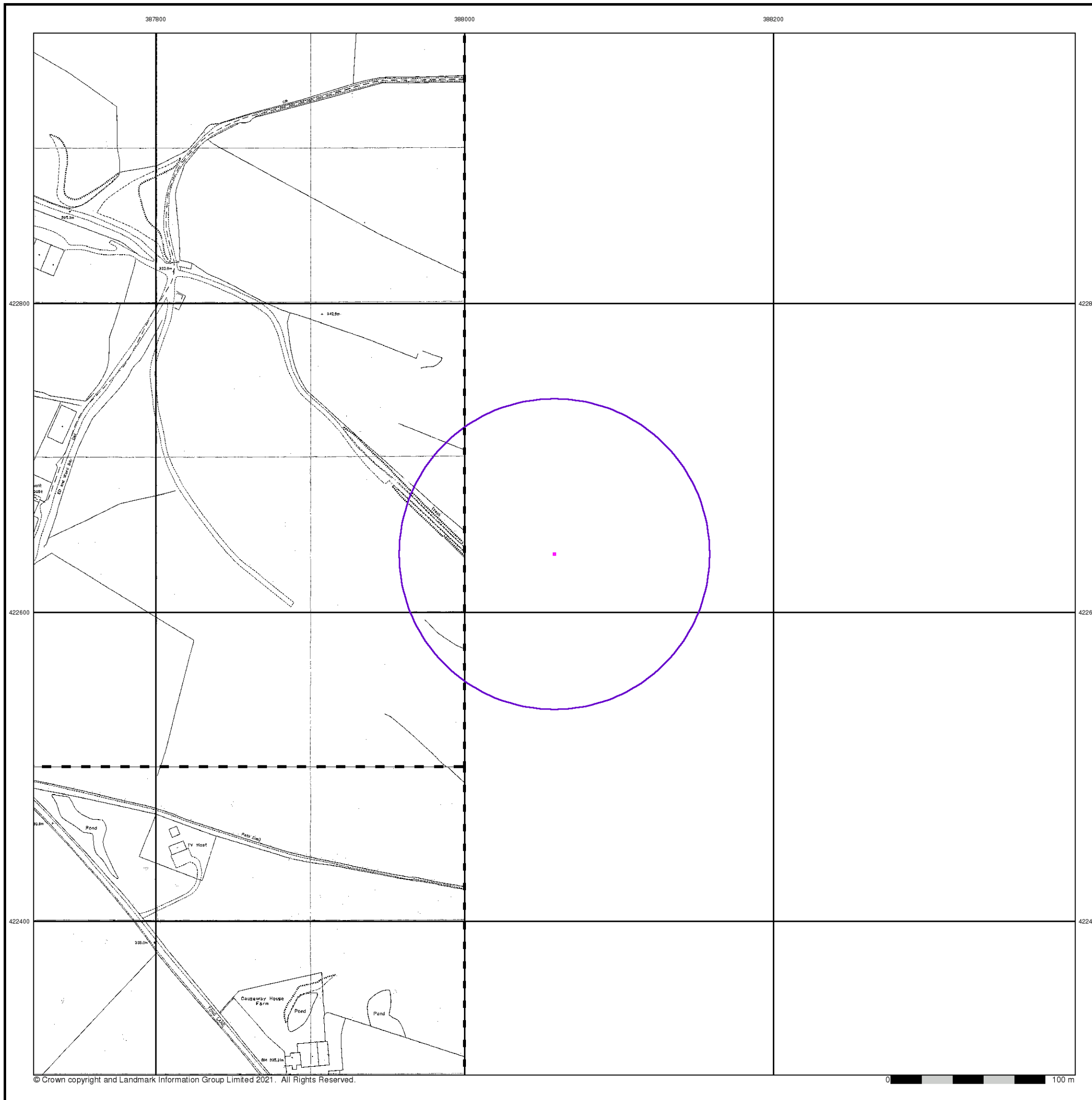


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Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



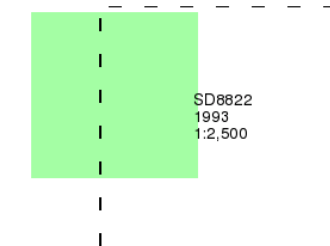
Large-Scale National Grid Data

Published 1993

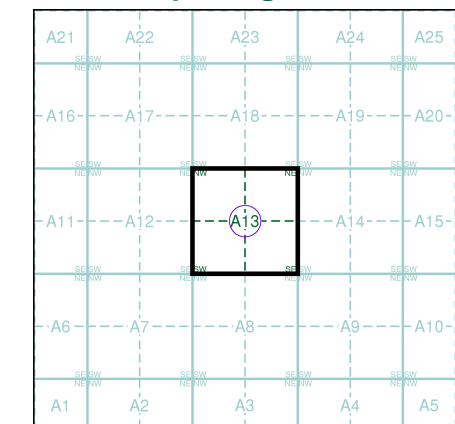
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'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

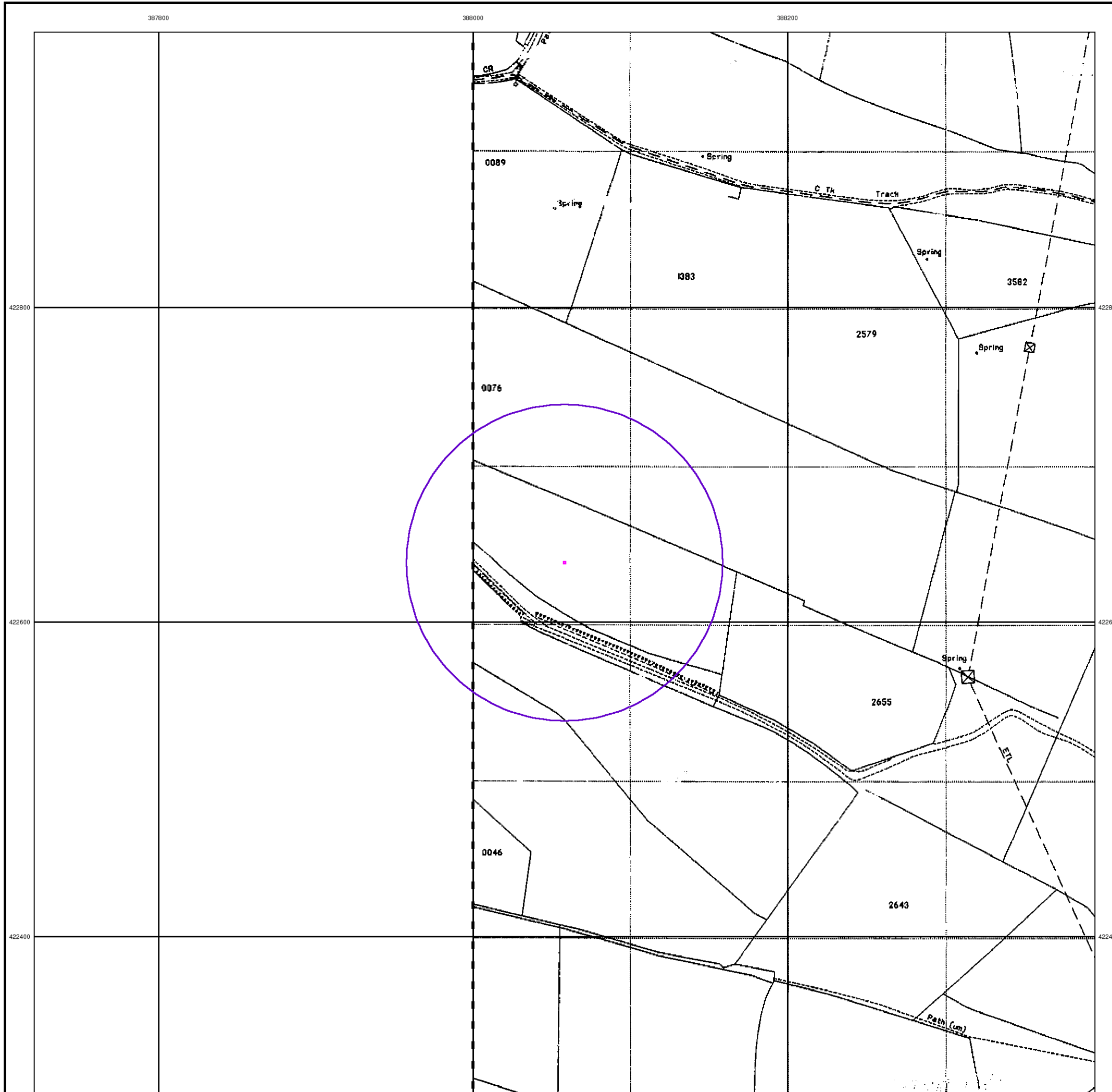


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Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



Appendix C
Groundwater Monitoring Scheme

GROUNDWATER MONITORING SCHEME

Report for:

213036/GWMS

Bacup Clay Company Ltd
Tong Farm, Bacup
Rossendale
OL3 9XA

1. INTRODUCTION

AA Environmental Limited (AAe) has been commissioned by The Clay Company Ltd to produce a Groundwater Monitoring Scheme (GWMS) to meet the requirements of planning permission reference LCC/2020/0018, Condition 5. The planning permission allows for the extension and restoration using inert waste of Tong Quarry, Tong Lane, Bacup. The site location is shown in drawing 213036/D/001.

Tong Quarry is located approximately 0.5 km east of Bacup in Lancashire. It is centred around National Grid reference SD880 226 and can be located by postcode OL3 9XA. The quarry is located on agricultural land and is surrounded by fields. Tong Lane is located approximately 300 m southwest of the site and the quarry access tracks are routed from here.

The quarry extracts sandstone, clay and coal. Initially a paragraph 9 exemption was being used to allow importation of materials for restoration. A subsequent waste recovery permit reference EPR/CB3138RW, was granted in 2012 and infilling under the permit is understood to have begun in 2012. The permit allows for the importation of inert waste, in line with an approved waste recovery plan, to raise ground levels to those within the planning permission.

This GWMS has been produced to address Condition 5 of the planning permission, which requires the following:

5. Prior to commencement of soil stripping or mineral extraction in the extension area subject of this permission, details of a groundwater level monitoring scheme shall be submitted to and approved in writing by the County Planning Authority. The scheme shall include the following details:-

- i. A fully enclosing envelope of groundwater level monitoring boreholes at horizontal spacing of not more than 200 metres around the boundary in each aquifer likely to be affected by the development.*
- ii. A copy of the Scheme of Monitoring incorporating a topographic plan of the monitoring points, borehole logs and construction details for each monitoring point and details of how the sump water level measurement will be established.*
- iii. Groundwater levels in each of the monitoring points shall be measured and recorded monthly throughout the term of the development, along with the water level in, and position of the sump (deepest part) of the progressive excavation.*
- iv. All monitoring point measuring datum levels, observed water levels, and locations shall be recorded in relation to Ordnance Datum and the Ordnance Survey National Grid.*
- v. The total amount of water (if any) that has been pumped out of the excavation per month and where it has been discharged to.*
- vi. All monitoring points should be located where they are unlikely to be lost or damaged as the excavation progresses and they shall be maintained throughout the development, being repaired, restored or replaced, like for like, within 2 months of any loss of functionality.*

The scheme shall be fully implemented and subsequently maintained in accordance with the approved details. Groundwater level monitoring boreholes shall be installed and operational prior to commencement of mineral excavation.

Reason: To ensure that the proposed development does not harm the water environment and to comply with Policy DM2 of the Joint Lancashire Minerals and Waste Local Plan.



2. ENVIRONMENTAL SETTING

The site is located in moorland to the east of The Rossendale Valley. Lee Quarry SSSI is approximately 2km southwest of the site.

The topography surrounding the quarry rises to hills and moors on the east, with a general fall towards Bacup in the west. The eastern boundary of the site is around 360 m AOD. There is a fall of approximately 20 m across the site to the west. The northern boundary of the existing quarry forms the centre of a gentle spur, such that ground levels also fall to the south across the area of excavation and to the north beyond the perimeter track.

The minimum floor level in the current workings is approximately 325m AOD in the west. It is proposed that the northern extension would be worked to a similar depth on the west, with the base rising to 335m AOD in the east. This would give depths of workings of around 15m in the west and 30 m in the east.

Details of local environmental features are presented in the Environmental Setting and Site Design (ESSD) report, prepared by AAe to accompany the 2021 environmental permit application.

3. GEOLOGY

3.1 Geological Succession

The geology and hydrogeology of the site is detailed in the 2019 Hydrological and Hydrogeological Impact Assessment (HIA), prepared by SM Foster Associates Limited to support the planning application. Extracts of the Envirocheck report are presented in Appendix A. These show the geological setting of the site.

The quarry is located within the Pennine Lower Coal Measures (PLCM), a series of interbedded mudstones, sandstones and coal. The Envirocheck maps show how the strata dip approximately northwards, with the younger strata in outcrop to the northeast and the base of the Coal Measures in outcrop to the southwest of the site. The geological succession in and around the quarry is shown in Table 1. All strata listed are part of the Pennine Lower Coal Measures. Further mudstone is encountered below the Woodhouse Hill Rock before reaching the strata of the Millstone Grit. The quarry has worked those horizons highlighted in Table 1, with the base resting in undifferentiated Coal Measures.

Formation	Description	Approx. thickness (m)
Darwen Flags	Fine grained flagstone	15
Upper Mountain Mine	Coal	
	Undifferentiated Coal Measures	24
Great Arc Sandstone	Irregularly bedded sandstone	20
Lower Mountain Mine	Coal	1
	Fireclay	1
Ganister Rock	Ganister	1
	Undifferentiated Coal Measures	6
Lower Foot Mine	Coal	
	Undifferentiated Coal Measures	16
Woodhead Hill Rock	Sandstone and Mudstone	24

There have been historical workings of the Lower Mountain Mine coal, which have been encountered by the quarrying activities. The Lower Foot Mine coal workings have been intermittently exposed in the quarry floor. Based on the dip of the strata to the north (report in the HIA to be approximately 1:100), it is estimated that if the quarry is extended northwards as proposed the Lower Foot Mine Coal is likely to be approximately 2m lower than in the existing area of excavation.

3.2 Existing Boreholes: 2017 Ground Support Services (UK) Ltd

The HIA reports on the installation of three new groundwater monitoring boreholes in 2017. The borehole logs are presented in C S Eccles 2020 report attached in Appendix B. Boreholes GW1 and GW2 were located on the southwestern boundary of the quarry at ground levels between approximately 340 and 345m AOD, with GW1 the most westerly. GW3 was located on higher ground to the east of the quarry at around 365m AOD. The geological sequence confirmed by these boreholes is give in Table 2.

Formation	Lithology	GW1		GW2		GW3	
		Depth to base (m)	Thickness (m)	Depth to base (m)	Thickness (m)	Depth to base (m)	Thickness (m)
Made ground	Clay/peat	3.2	3.2	6.1	6.1	2.7	2.7
Pennine Lower Coal Measures (PLCM)	Mudstone					8.4	5.7
Great Arc Sandstone	Sandstone					26.7	18.3
PLCM	Mudstone	3.6	0.3				
Lower Mountain Mine	Coal	5.8	2.2			28	1.3
PLCM	Mudstone	6.7	0.9			29	1
Ganister Rock	Sandstone	7.8	1.1	8.9	2.8	30.3	1.3
PLCM	Mudstone	12.6	4.8	13	4.1		
Lower Foot Mine	Coal	13	0.4	13.3	0.3		
PLCM	Mudstone	27.9	14.9	33.1	19.8	54.2	23.9
Woodhead Hill Rock	Sandstone	33 pen.	5.1	39 pen.	5.9	60 pen.	5.8

pen. – penetrated

3.3 2021 Additional Boreholes

In February 2021 a series of deep and shallow boreholes were constructed to give greater perimeter coverage of the site and proposed extension. Deep boreholes were drilled approximately 5m into the Woodhead Hill Rock, or deeper to obtain a water strike. A borehole location plan, together with a plan showing the locations of the boreholes, superimposed on the geology, are presented as Drawings reference 213036/BH/D/001 and 003. The Factual Report is presented in Appendix B. Table 3 gives some details of groundwater conditions for boreholes along the southern side of the site and Table 4 the northern side of the site. The depth of strike was used to determine the depth of installation.

Borehole	Depth to Woodhead Hill Rock		Depth of water strike		Groundwater level 6 Feb 21
	m bgl	m AOD	m bgl	m AOD	
GW9 (Westernmost)	38.3	299.25	42	295.55	298.23
GW1	33.1	313.17	9 28	330.3 311.3	307.73
GW4	33	313.38	56	290.38	337.75 ⁽¹⁾
GW2	33.1	313.17	34	312.27	DRY
GW5	34.4	316.2	42	295.55	303.73
GW3 (Eastermost)	54.2	310.04	54.5	309.74	335.94

Notes
¹ Potentially be affected by local ponding

Table 4. Northern Boreholes

Borehole	Depth to Woodhead Hill Rock		Depth of water strike		Groundwater level 6 Feb 21
	m bgl	m AOD	m bgl	m AOD	
GW9 (Westernmost)	38.3	299.25	42	295.55	298.23
GW8	42.8	303.76	59	287.56	288.79
GW7	44.2	300.36	44	300.56	343.02 ⁽¹⁾
GW6	Not reached		Dry @ 48	Dry @ 318.07	328.74
GW3 (Easternmost)	54.2	310.04	54.5	309.74	335.94
Notes					
⁽¹⁾ Affected by Spring 3					

Shallow boreholes were constructed to a nominal depth of 20 m below ground level. Details are given in Table 5. The variable groundwater levels recorded are indicative of the variable Coal Measures geology and represent water held locally between the interbedded and fractured horizons, rather than a highly transmissive aquifer system. Table 5 indicates the basal elevation of the boreholes relative to the quarry base, which falls from 335 m AOD in the east, to 325 m AOD in the west. The approximate base level at the location of each borehole is estimated.

Table 5: Shallow Boreholes

Geology	GW4S	GW5S	GW6S	GW7S	GW8S	GW9S
	Stratum Base m AOD	Stratum Base m AOD	Stratum Base m AOD	Stratum Base m AOD	Stratum Base m AOD	Stratum Base m AOD
Ground level	346.18	350.70	357.52	344.36	346.27	337.41
Topsoil			357.32		346.07	337.21
Made Ground	337.48	346.1				
Glacial Till		344.6		343.06		335.61
Mudstone/clay	336.18		355.52		345.37	
Sandstone			354.22			
PLCM			350.62			
Great Arc Sst			339.42	331.76	334.07	
PLCM			337.52	326.76	326.27	329.61
Lower Mountain Mine coal				325.86		
Ganister	332.08	341.6				
Lower Foot Coal ¹	331.08	339.8				
PLCM	326.18	337.5				
Coal		336.9				
PLCM		330.7		324.26		317.41 (Sst to 319.51)
Quarry Base	330 m AOD	335 m AOD	335 m AOD	330 m AOD	330 m AOD	325 m AOD
Water strike	none	none	none	none	none	none
GWL 6/2/21	333.08	334.88	349.39	328.84	343.43	320.85
Notes						
¹ Underdrained by adit to the west of Tong Farm, refer to 2019 HIA.						



4. HYDROGEOLOGY

The PLCM are designated as a Secondary A aquifer by the Environment Agency. The site is not located within a groundwater source protection zone. The quarry is reported in the 2019 HIA to be established above the prevailing groundwater level within the PLCM. The Woodhead Hill Rock is considered to be the principal groundwater bearing unit local to the site. This has been confirmed by boreholes GW1 and GW3 installed in 2017 and by the location of the major water strikes during borehole construction in 2021.

At the western extent of the quarry drilling (GW1) encountered water in a thin sandstone horizon in the undifferentiated PLCM. Geological mapping suggests this sandstone horizon is of limited lateral extent, but that it may feed a spring approximately 250 m southwest of GW1. The groundwater strike was around 330 m AOD and the spring is at an elevation of 327 m AOD. The sandstone was not encountered in GW2 or GW3. It is unclear whether the sandstone unit would extend below the floor of the quarry, but given the relative elevations, it may link to the Lower Foot Mine drainage adit.

During the drilling of GW1 to GW3 all boreholes recorded water strikes at round 310 m AOD, which equates to the top of the Woodhouse Hill Rock. Following installation and monitoring for approximately 18 months, GW2 was found to be dry on all occasions, GW3 on the higher ground to the east recorded levels of 335m AOD and GW1 on the west recorded levels of around 308 m AOD.

Details of water strikes in the deep 2021 boreholes are presented in Tables 3 and 4. All strikes were below the lowest level of the existing quarry ie less than 325 m AOD. No water strikes were recorded during the construction of the shallow (20 m) boreholes.

The following observations are made:

- Boreholes with bases and screened sections below the existing quarry level, have water levels resting below the quarry base.
- Boreholes with bases above the base of the quarry have accumulated water since installation, but at varying levels.
- Water level monitoring on 20 February was carried out during heavy rain. Water levels were observed to be actively rising after sampling in GW7D.
- GW7D (deep) has a water level close to surface. It appears this has intersected a large fracture, or fissure during construction. Further evidence of this is given in the water quality data presented below.
- GW7S (shallow), directly adjacent, is almost dry.

An interpretation of this data should consider the multi-layered nature of the PLCM and the prevalence of lower permeability mudstone horizons that inhibit flow. Flow through the unit as a whole will be influenced by the local occurrence of fractures and fissures.

A discussion with the quarry operators during field monitoring on 20 February 2021, revealed that the quarry, which was ponded across the quarry floor in the west at the time, drained freely under gravity into the mine adits at the base of the quarry wall within a few days after cessation of rainfall. It was reported that there was no current need to pump water from the quarry. (During 2010 it was reported that pumping from the deepest sump area was discharged to the mine adits.) Seepages were observed running down the quarry face and into the adits. Previous visits by Envireau Water in August 2010 and SM Foster in July 2019, recorded the face of the quarry to be dry and the adit outfall near Tong Farm to be almost dry. Photographs from February 2021 and July 2019 of Hoyle Hey Clough show the changes in water levels north of the proposed quarry extension area.

The principal water bearing unit locally is considered to be the Woodhead Hill Rock, however, the catchment is one of high rainfall and strata higher in the sequence are recharged rapidly after rainfall. Some of the recharge emerges as springs. Deeper recharge appears to be under-drained by the coal workings of the Lower Foot Coal. It is anticipated that the shallow 2021 boreholes will show a noticeable drop in groundwater level during the drier months of the year.



Prevailing groundwater level

The prevailing groundwater level is assessed using data from the following boreholes: GW1, GW3, GW5D, GW6D, GW8D and GW9D. The other boreholes are discounted on the following basis:

- The shallow boreholes show very variable levels and appear to be influenced rapidly by rainfall recharge;
- GW2 is dry;
- GW4D appears to have been affected by surface ponding;
- GW7D appears to be affected by the proximity to Spring 3.

Groundwater is highest in the east at around 336 m AOD in GW3 and 329 m AOD in GW6. There is fall of approximately 30 m to the westnorthwest, where groundwater in GW9 is at 299 m AOD. Over a distance of approximately 500 m this gives a hydraulic gradient of 0.06. There is a steeper fall in groundwater levels to GW8, which is on the northern boundary of the extension. It should be noted that groundwater was originally struck much deeper in this location. There are also falls in groundwater levels to GW1 in the westsouthwest (fall of 21 m over 350 m, giving a gradient of 0.06) and GW5 in the south (fall of 25 m over 250 m, giving a gradient of 0.1).

Data from the 2019 HIA indicates that the groundwater levels in GW1 and GW3 remain similar throughout the year. It is anticipated that the new deep boreholes will show a similar pattern, but that the shallow boreholes will show a noticeable seasonal variation.

Previous hydrogeological studies and the Envirocheck data set show no current licensed groundwater abstractions within 1km of the site. Table 6 sets out the local private water supplies that have been reported as being present.

Table 6: Private water supplies within 1km radius of Tong Quarry Landfill			
Location	Easting	Northing	Distance from quarry (m)
Higher Hogshead Farm	388586	422120	400 SE
Coal Pit Field Farm	388676	422055	500 SE
Dry Corner Farm	388475	422456	125 E
Gowther Fold Farm	388830	421938	675 SE
Hey Head Farm	388347	422225	125 SE
Moorview Farm	388426	422107	300 SE

All are east, or southeast of the site, away from the prevailing direction of groundwater flow local to the quarry. The catchment has several springs, which will result from the presence of interbedded sandstones with lower permeability mudstones in this area of high rainfall. The springs are described in more detail in Section 5.

Groundwater Quality

Groundwater resource, rather than groundwater quality is the principal focus of this report. A more detailed assessment of groundwater quality will be presented in the Hydrogeological Risk Assessment to be prepared in support of the environmental permit application for the site. However, it is relevant to briefly consider the results of the 6 February 2021 groundwater monitoring round in terms of what this indicates about the source of recharge to the new boreholes.

Water quality data from boreholes GW1 and GW3 obtained since installation in 2017 indicates evidence of coal mine contamination in the form of elevated iron, manganese, TPH and PAH. This is more noticeable in the upgradient borehole. Water Quality data from 6/2/21 is presented in Appendix B. This shows that the water quality from GW7D is much more similar to nearby spring water than that of the other deep groundwater boreholes. This is shown by noticeably low hardness, boron and manganese, but noticeably high aluminium. This information, coupled with the higher than expected groundwater levels, suggests this borehole is receiving recharge from close to surface and should not be used as an indicator of groundwater levels in the Woodhead Hill Rock at depth.



5. HYDROLOGY

The site is located within an area of high rainfall, reported in the HIA as 1481mm pa. Water Feature Surveys have been carried out during 2010 and 2014. A further survey was carried out in 2019 to support the HIA. Surface water drainage is from the high ground to the east towards the north, south and west. Runoff will ultimately drain to the River Irwell in Rossendale Valley to the southwest.

The HIA reports that at the western side of the existing quarry, surface water is directed to a sump from which it is intermittently pumped into former mine workings. This is connected to an old drainage adit, which discharges to a surface drain to the west of Tong Farm. It is reported that the eastern side of the quarry had also drained into old working exposed on the quarry floor, but these workings have been subsequently sealed by the deposit of inert waste. All surface water now drains to the west.

There are a number of springs surrounding the quarry to the north, east and southeast. Elevations are reported in the HIA (Section 4.28) to range between 355 and 375m AOD and are associated with the Upper Mountain Mine coal seam. Detailed studies are presented in the previous Water Feature Surveys of the site, as summarised in the HIA.

The springs considered most relevant to the existing quarry workings and its extension are as follows and as shown on drawing 213036/BH/D/001:

- Spring 2 / NE
- Spring 3 / N
- Spring NW / head of Oaken Clough
- Mine adit outlet, Tong Farm.
- Hey Head Drain
- Daisy Hall Spring

Spring 2 rises close to the base of a pylon on high ground to the east of the extension area. From here water runs south of the drystone wall in a westerly direction to meet a deep drain that flows north along the eastern boundary of the extension. The wall and drain bend to the northwest before the drain flows further north, just beyond the boundary of the extension to join the Hoyle Hey Clough. The Clough is a stone-lined channel covered with flagstones. It flows west to join Oaken Clough northwest of the extension area. It picks up the flows from Spring 3 as it passes the northern boundary of the site.

The mine adit outlet at Tong Farm is reported to receive all the underdrainage from the quarry. Photographic records during the August 2010 Water Feature Survey indicates it is almost dry at some times of the year.

Hey Head Drain is at the southeast of the quarry. There are a number of private water wells in this area, so this is considered a sensitive location for monitoring.

Daisy Hall spring, to the southwest, is thought to be connected to drainage from the shallow sandstone horizon encountered in borehole GW1.

6. PROPOSED MONITORING BOREHOLE LOCATIONS

Planning condition 5. i) requires the following:

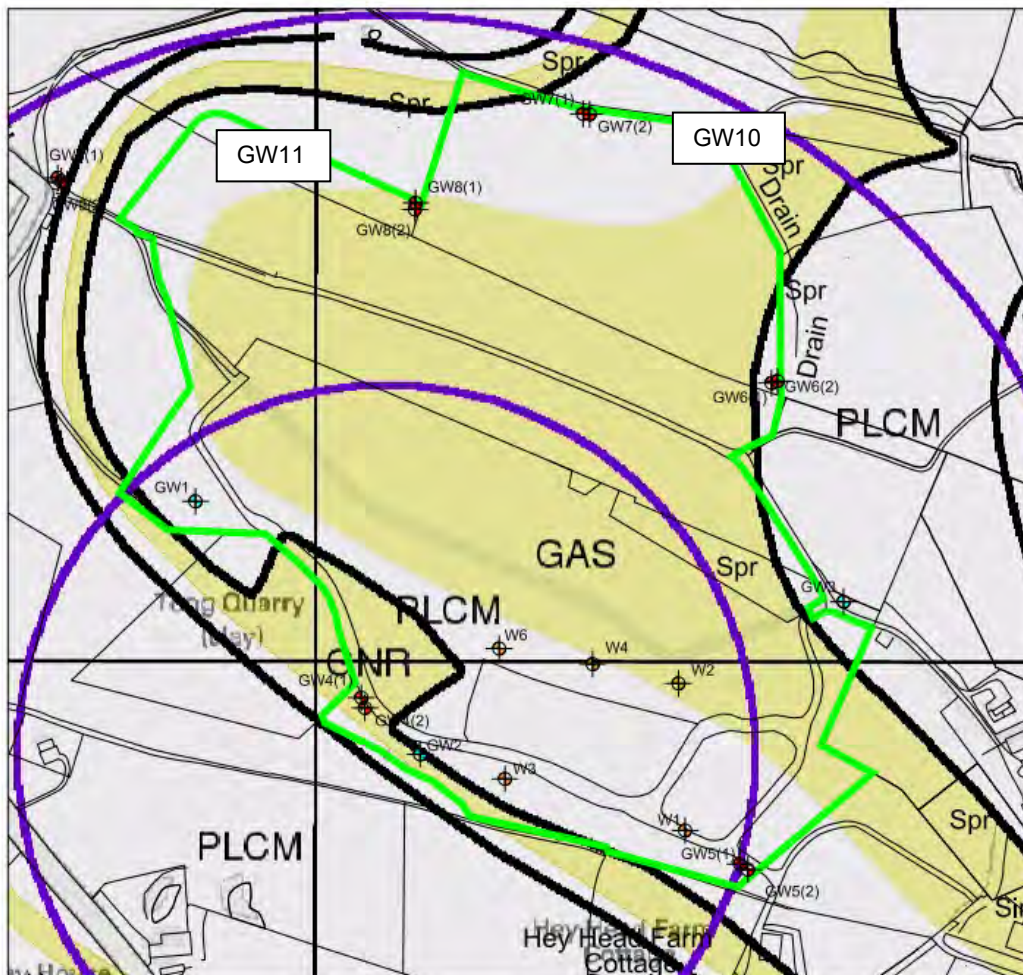
A fully enclosing envelope of groundwater level monitoring boreholes at horizontal spacing of not more than 200 metres around the boundary in each aquifer likely to be affected by the development.

Drawing 213036/BH/D/001 presents the locations of the existing boreholes. The positions of GW1 to GW3 supplemented by the 2021 new boreholes give a perimeter borehole spacing of approximately 200 m, allowing for suitable access arrangements. The deep boreholes have targeted the Woodhead Hill Rock and are

supplemented by shallow boreholes to better understand the groundwater characteristics higher in the geological sequence.

The deep borehole GW7 has been compromised by proximity to Spring 3 / Spring N. To complete the monitoring coverage in this part of the site it is proposed that two further deep boreholes are installed either side of GW8: one in the north-easternmost field corner and one midway along the boundary between GW8 and GW9, refer to Figure 1, locations GW10 and GW11. These positions should allow each of the new boreholes to encounter both the Lower Mountain Mine and Lower Foot Mine coal seams, to gain further information on their thickness and extent. They should be progressed into the Woodhead Hill Rock as the target monitoring horizon. It is proposed that borehole GW10 and GW11 will be single deep boreholes and will be installed on agreement of the Groundwater Monitoring Scheme with the Planning in Authority.

Figure 1: Proposed further borehole positions





7. MONITORING SCHEME

Planning condition 5 ii) requires the following:

- A copy of the Scheme of Monitoring incorporating a topographic plan of the monitoring points, borehole logs and construction details for each monitoring point and details of how the sump water level measurement will be established.

The requirements of this condition and conditions 5 iii) to 5 vi) are addressed below.

- I. Monitoring borehole locations are presented on drawing 213036/BH/D/001 and this drawing will be updated when the two additional boreholes are constructed.
- II. It is proposed that water level monitoring of boreholes will continue monthly throughout the life of the site.
- III. Water quality monitoring will be conducted quarterly. The monitoring suite will remain as that presented in Appendix B.
- IV. Water quality monitoring will include boreholes GW1 to GW11, with the following spring/surface water locations:
 - a. Spring 2 / NE
 - b. Spring 3 / N
 - c. Spring NW / head of Oaken Clough
 - d. Hey Head Drain
 - e. Daisy Hall Spring
 - f. Mine adit outlet, Tong Farm.
- V. A photographic record of the surface water locations will be made to record seasonal changes in levels.
- VI. Borehole logs and construction details are presented in Appendix B. Further details of the 2021 borehole construction are presented in Tong Quarry Groundwater Well Installation Report, reference 192.02.01, C. S. Eccles – Brownfield Land Consultancy, 2021.
- VII. Groundwater level in the quarry sump/base will be recorded monthly using a survey grade DGPS.
- VIII. All monitoring point measuring datum levels, observed water levels, and locations will be recorded in relation to Ordnance Datum and the Ordnance Survey National Grid.
- IX. The estimated amount of water (if any) that has been pumped out of the excavation per month will be recorded by the quarry manager and a copy given to the monitoring team at the time of each monthly monitoring event. This will include details of where the discharged has been made.
- X. Monitoring locations have been positioned at the site perimeter and access will be maintained during quarry development. In the event that the integrity of a borehole is compromised, it will be replaced by one of similar construction. This will take place within 2 months of any loss of functionality.



8. REPORTING

To address condition 6 of the planning permission, a groundwater (hydrometric) monitoring report will be submitted to the County Planning Authority at 12 monthly intervals following implementation of the groundwater monitoring scheme.

The report will document:

- Changes in groundwater levels
- Changes (if any) in borehole function
- Any required maintenance, or replacement
- The progress of the quarry development
- A record of any unexpected impacts, or characteristics of the quarry workings
- Tables for at least the last 12 months of data
- Hydrographs giving the full site data record
- All data will be related to Ordnance Datum
- A plan of monitoring points will be supplied and updated as required
- A summary of how quarry progress relates to the observed monitoring data
- A record (if any) of quarry pumping
- Any other maintenance details related to the monitoring network.

Author: Helen McDonnell, Associate
Reviewed: Matthew Lawman, Director
Status: Final
Date: March 2021

AA Environmental Limited
Registered Office:
Units 4 to 8 Cholswell Court,
Shippon, Abingdon.
Oxon. OX13 6HX
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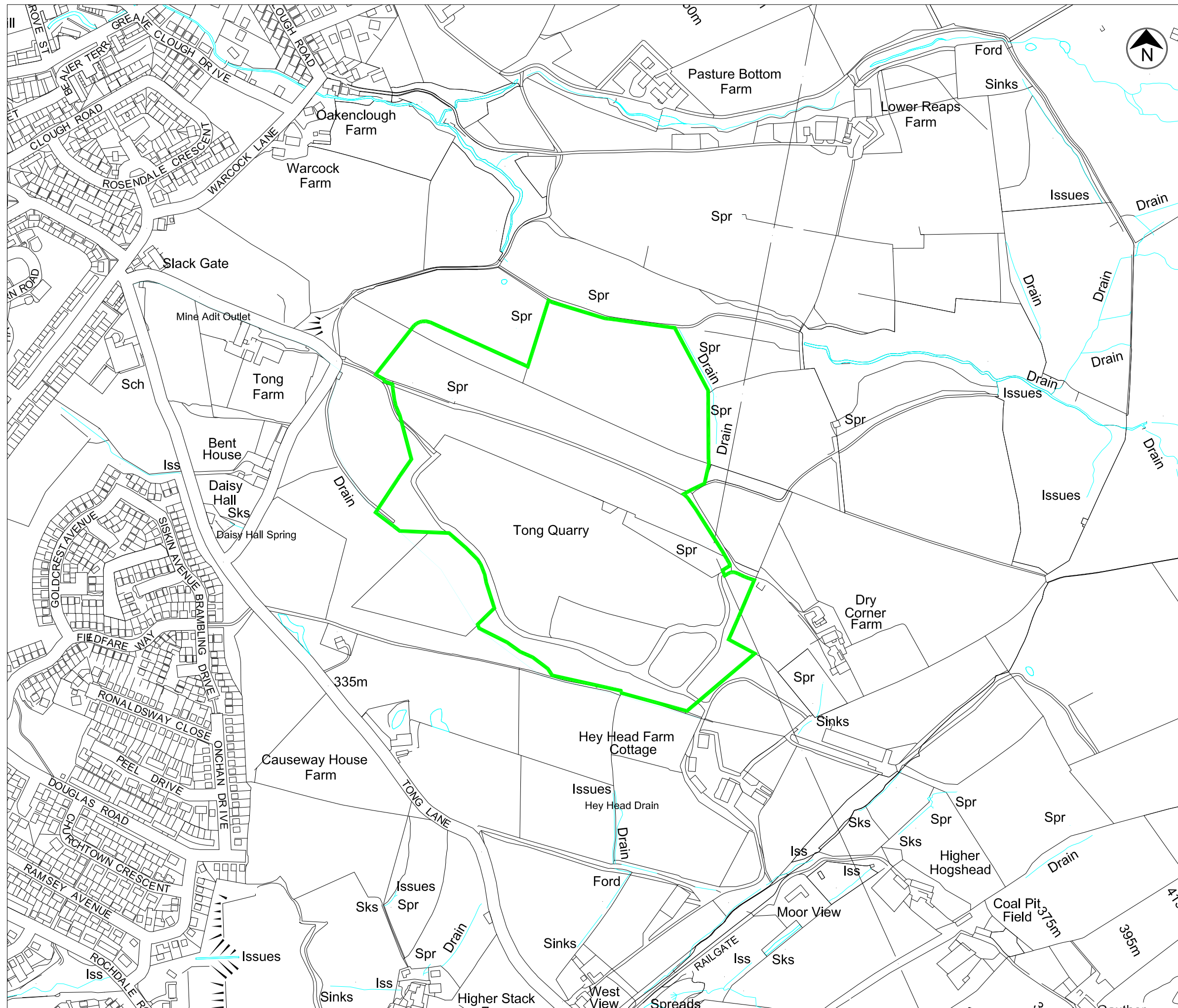
REFERENCES

SM Foster Associates Limited: 2019: Proposed Northern Extension, Tong Quarry, Bacup, Lancashire. Hydrological and Hydrogeological Impact Assessment. Report ref: 135/05/hia/0819.

C. S. Eccles – Brownfield Land Consultancy: 2021:Tong Quarry Groundwater Well Installation Report, reference 192.02.01,




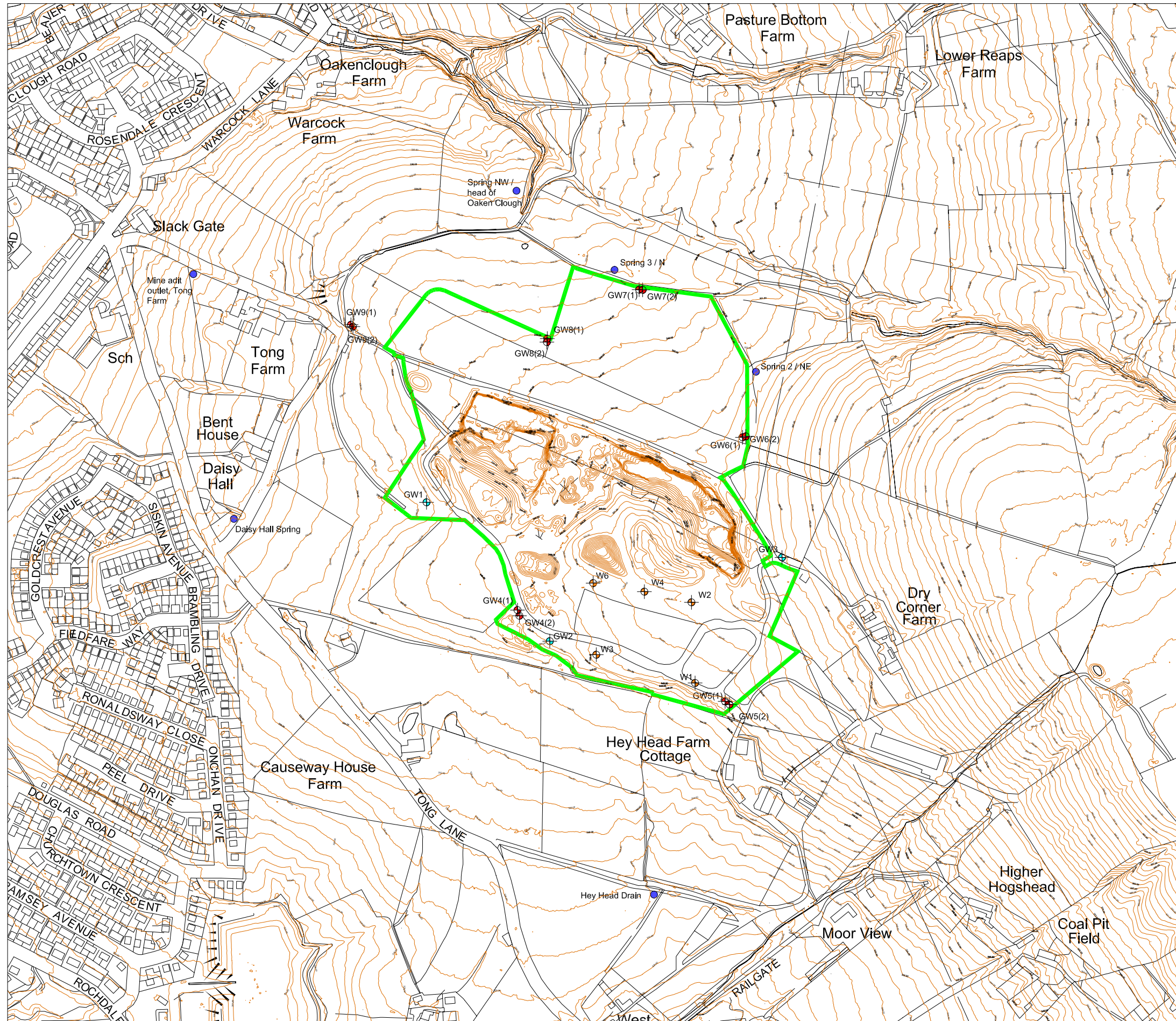
DRAWINGS



Key:
— Site Boundary

Notes:
 1. The site is centered at Grid Reference SD 88082 22704.

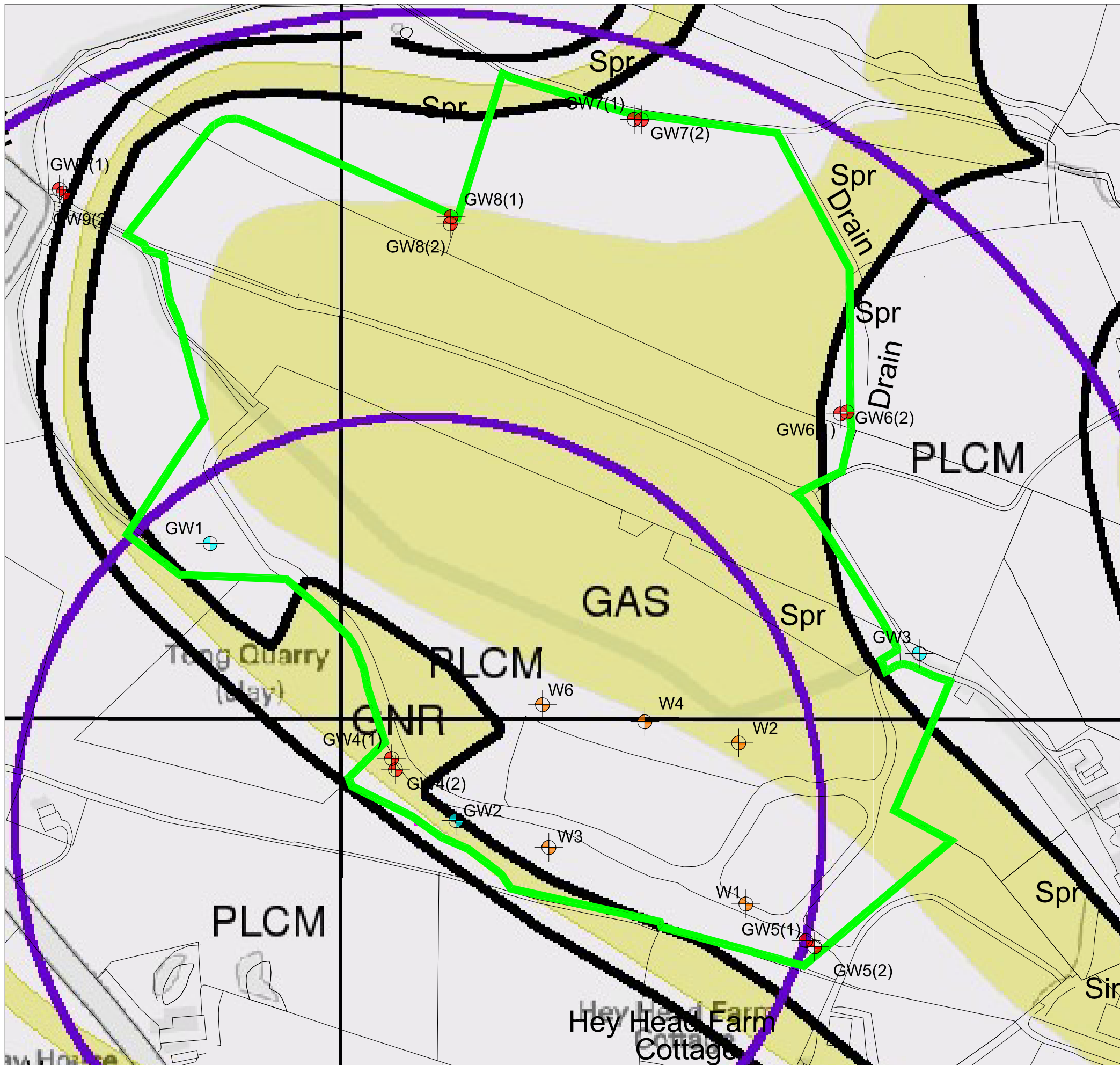
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Title Site Location Plan			
 AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk			
Scale 1:5,000@A3	Date Feb '21	Drg. No. 213036/D/001	Rev.
Drawn JM	Chkd. ML		



- Key:**
- Site Boundary
 - Perimeter Borehole (2021)
 - Existing Perimeter Borehole
 - Existing In-waste Borehole
 - Spring Location
 - Existing Ground Level Contour (m AOD)

Notes:
 1. Existing ground levels were taken from the National LiDAR Survey Data undertaken in 2019.

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Borehole Location Plan			
 AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk			
Scale	Date	Drg. No.	Rev.
1:5,000@A3	Feb '21 Drawn JM Chkd. ML	213036/BH/D/001	A



- Key:**
- Site Boundary
 - Perimeter Borehole (2021)
 - Existing Perimeter Borehole
 - Existing In-waste Borehole

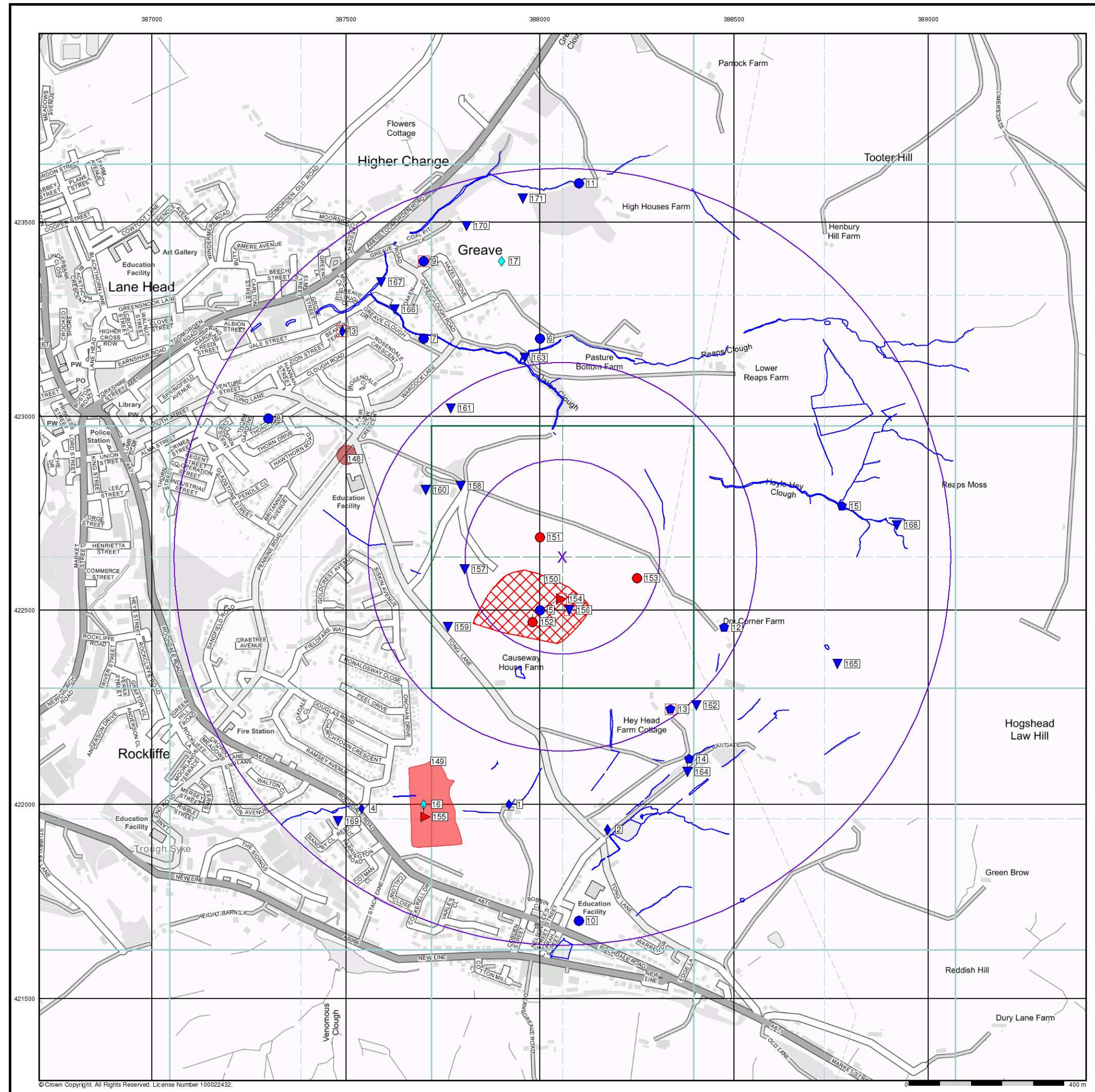
Bedrock and Faults				
Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	PLCM	Permian Lower Coal Measures Formation	Mudstone, Siltstone and Sandstone	Langsettian - Langsettian
	CNR	Genster Rock	Sandstone	Langsettian - Langsettian
	GAS	Great Arc Sandstone	Sandstone	Langsettian - Langsettian
	PLCM	Permian Lower Coal Measures Formation	Sandstone	Langsettian - Langsettian
	WH	Woodhead Hill Rock	Sandstone	Langsettian - Langsettian
	HER	Hilket Edge Rock	Sandstone	Langsettian - Langsettian
	DF	Derwen Flage	Sandstone	Langsettian - Langsettian
	MLRS	Milrose Sandstone	Sandstone	Langsettian - Langsettian
	IR	Irth Rock	Sandstone	Langsettian - Langsettian
	RR	Rough Rock	Sandstone	Yeadonian - Yeadonian
	UH	Upper Haslingden Flage	Sandstone	Yeadonian - Yeadonian
	LH	Lower Haslingden Flage	Sandstone	Yeadonian - Yeadonian
	MO	Milstone Gull Group (See also Mfg)	Mudstone and Siltstone	Namurian - Namurian

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
		Rock		
		Fault		

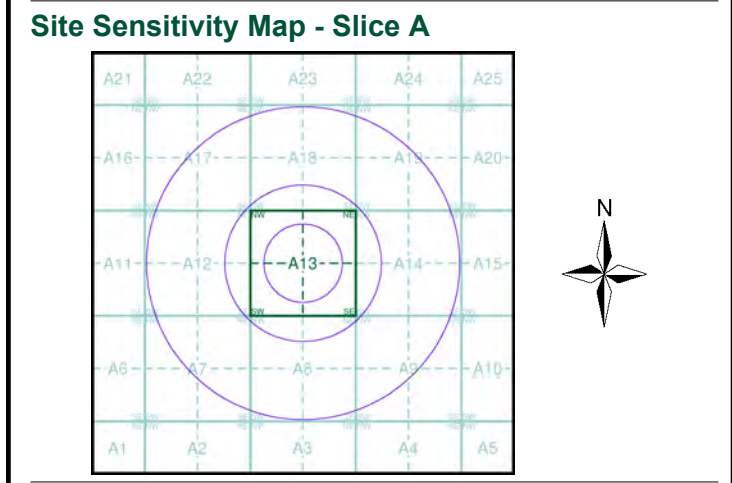
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Title Bedrock and Faults			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
Scale 1:2,500@A3	Date Feb '21	Drg. No. 213036/BH/D/003	Rev.
Drawn JM	Chkd. ML		



APPENDIX A
Envirocheck Extracts



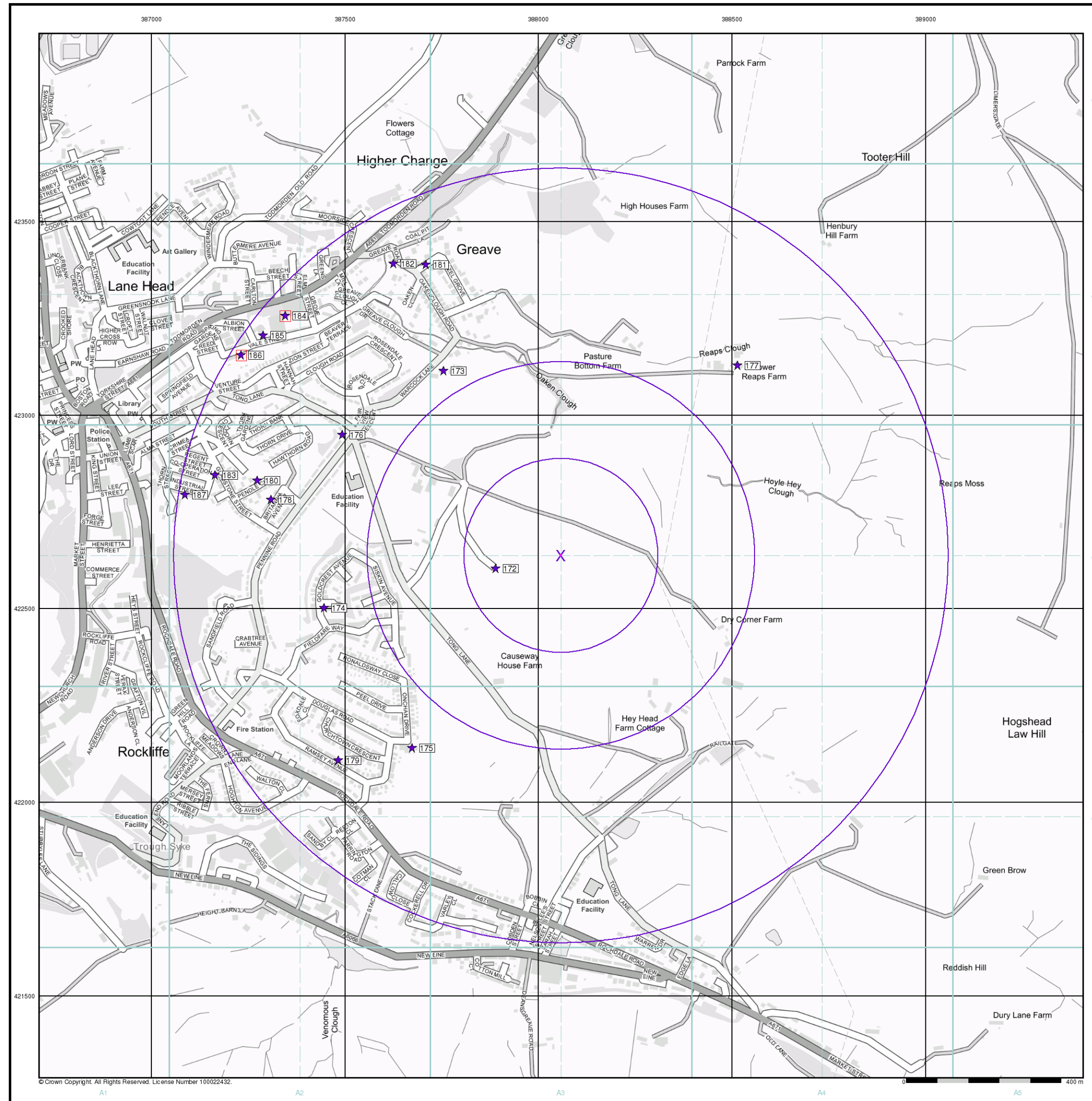
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- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
 - Several of Type at Location
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice (Location)
 - Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
 - Integrated Pollution Control
 - Integrated Pollution Prevention Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcement
 - Pollution Incident to Controlled Waters
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- Waste**
- BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill Boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Registered Landfill Site
 - Prosecution Relating to Authorised Processes
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
- COMAH Site
 - Explosive Site
 - NIHHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fuel Station Entry



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 Search Buffer (m): 1000

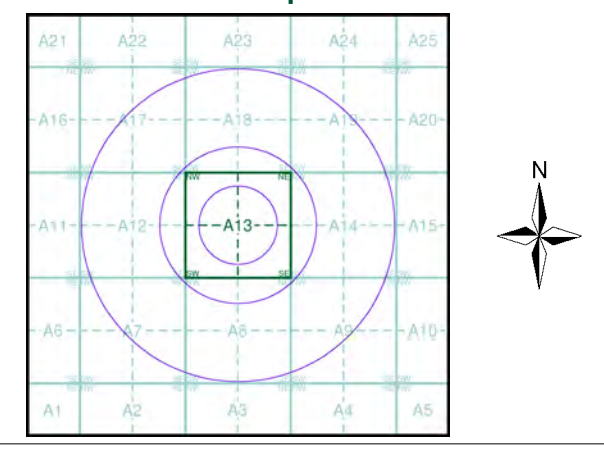
Site Details
 Tong Farm, Tong Lane, BACUP, OL13 9XA



Industrial Land Use Map

- General**
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 - Specified Buffer(s)
 - Bearing Reference Point
 - Slice
 - Map ID
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fuel Station Entry
 - Gas Pipeline
 - Underground Electrical Cables

Industrial Land Use Map - Slice A






Order Details






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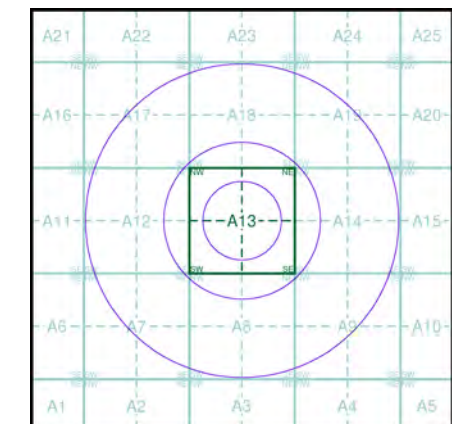
General

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-  Specified Buffer(s)
-  Bearing Reference Point

Agency and Hydrological (Flood)

-  Extreme Flooding from Rivers or Sea without Defences (Zone 2)
-  Flooding from Rivers or Sea without Defences (Zone 3)
-  Area Benefiting from Flood Defence
-  Flood Water Storage Areas
-  Flood Defence

Flood Map - Slice A

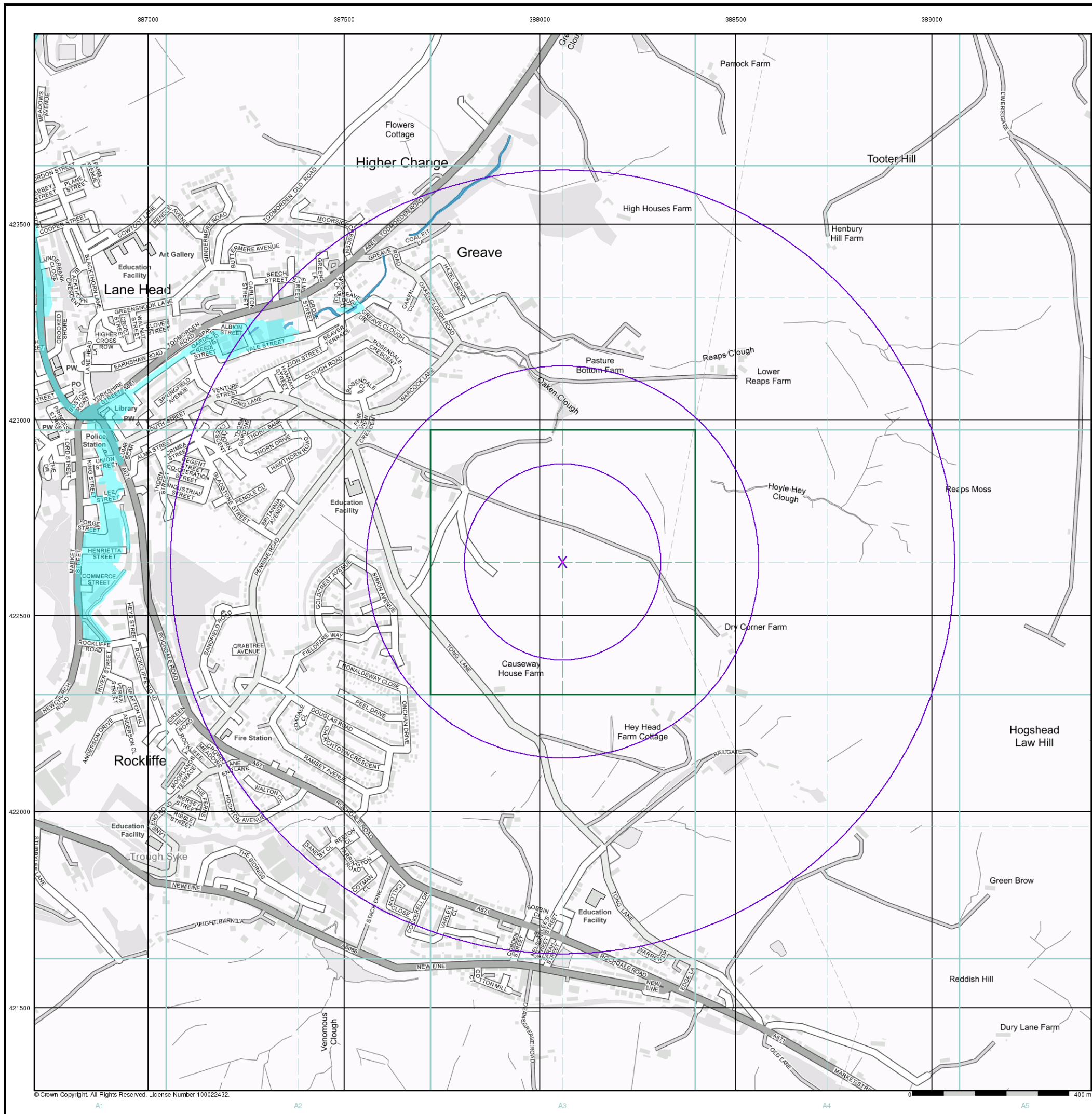


Order Details

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 Customer Ref: 213036
 National Grid Reference: 388060, 422640
 Slice: A
 Site Area (Ha): 0.01
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Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



General

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- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

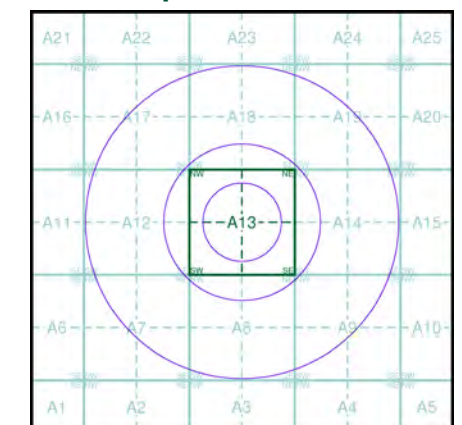
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A

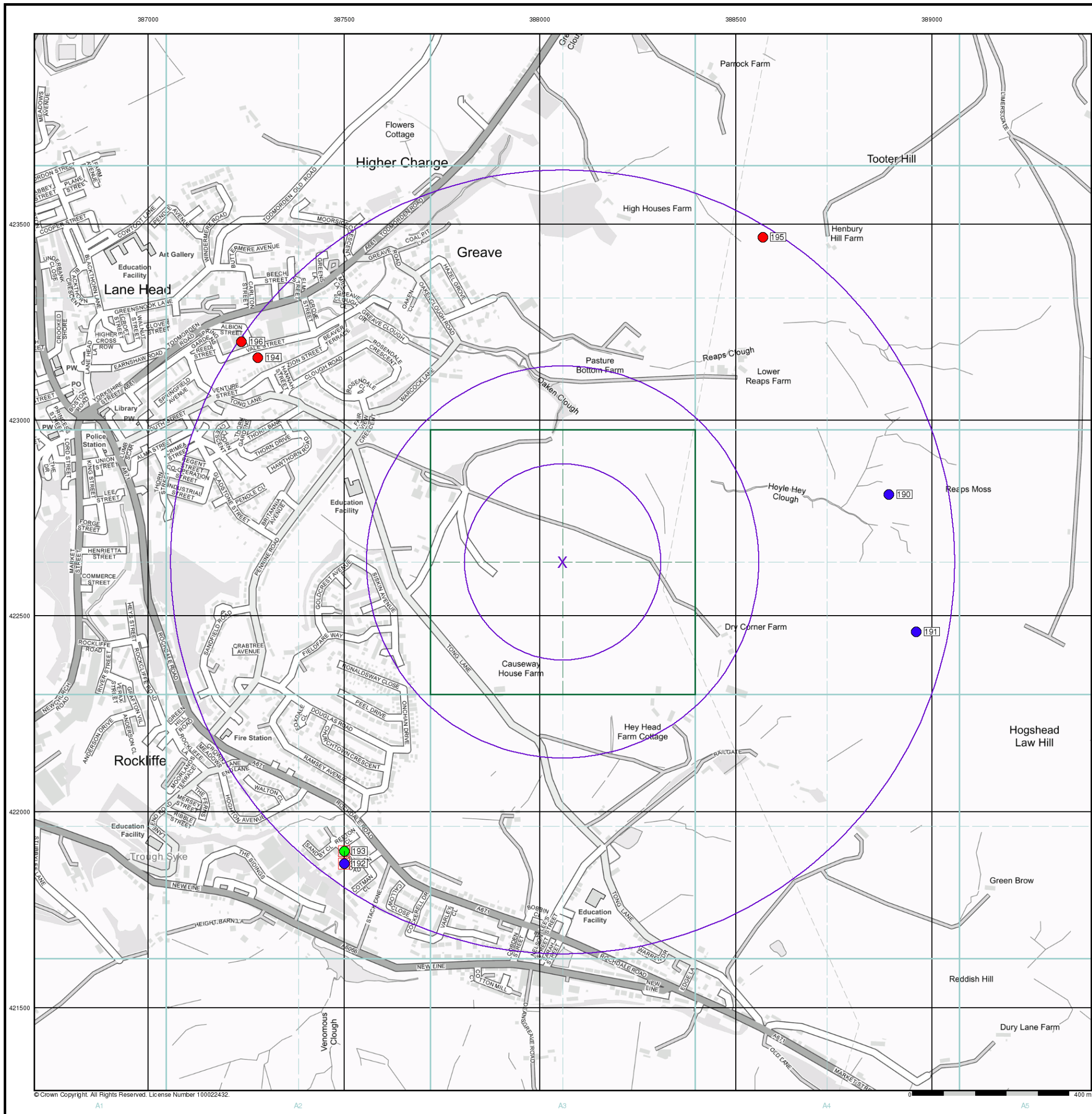


Order Details

Order Number: 274158604_1_1
 Customer Ref: 213036
 National Grid Reference: 388060, 422640
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

Tong Farm, Tong Lane, BACUP, OL13 9XA



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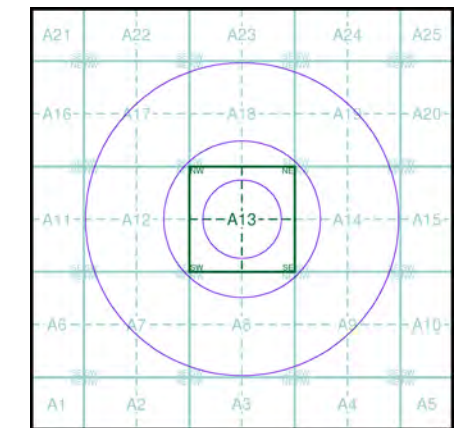
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- | | |
|--------------|-------------------------|
| Canal | Drain |
| Reservoir | Other |
| Foreshore | Lake |
| Marsh | Transfer |
| Tidal River | Lock Or Flight Of Locks |
| Inland River | Sea |

OS Water Network Map - Slice A

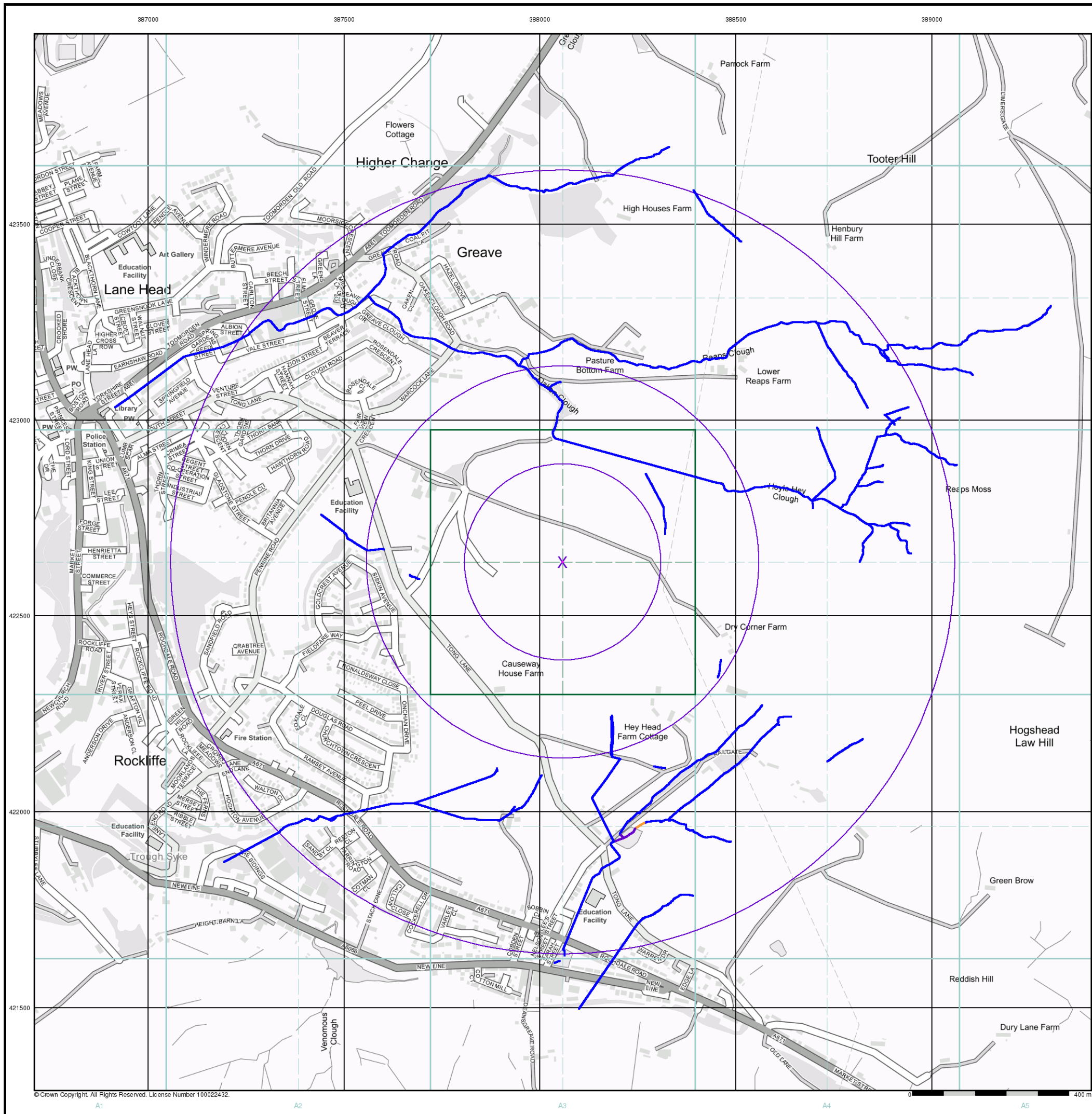


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Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

274158604_1_1

Customer Reference:

213036

National Grid Reference:

388060, 422640

Slice:

A

Site Area (Ha):

0.01

Search Buffer (m):

1000

Site Details:

Tong Farm, Tong Lane

BACUP

OL13 9XA

Client Details:

Mr M Lawman

AA Environmental Ltd

4-8 Cholswell Court

Shippon

Abingdon

OX13 6HX

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	23
Hazardous Substances	-
Geological	27
Industrial Land Use	31
Sensitive Land Use	33
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Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2				5
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls					
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3			Yes	
Pollution Incidents to Controlled Waters	pg 3		1		7
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 4			3	2
Water Abstractions	pg 5				2 (*5)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 7	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 7	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 7			13	117

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 23				2
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 23		1		
Licensed Waste Management Facilities (Locations)	pg 23		3		
Local Authority Landfill Coverage	pg 24	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Registered Landfill Sites	pg 24		3		1
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 27	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites	pg 27		2	5	10
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 30	Yes	n/a	n/a	n/a
Mining Instability	pg 30	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 30	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 30	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 30		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 30		Yes	n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 31		1		19
Fuel Station Entries					
Gas Pipelines					
Underground Electrical Cables					
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt	pg 33				2
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	0	1	388058 422638
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (S)	188	1	388058 422450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (S)	188	1	388050 422450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (S)	193	1	388100 422450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (SW)	210	1	387900 422500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (SW)	217	1	387950 422450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (S)	245	1	388000 422400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (W)	273	1	387800 422550
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	287	1	388250 422850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (S)	291	1	388100 422350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (S)	303	1	388150 422350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NW (S)	343	1	388000 422300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	358	1	387700 422638
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (SE)	367	1	388200 422300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	408	1	387650 422638
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	413	1	388058 423050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (S)	413	1	388200 422250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	424	1	387650 422750
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (SW)	430	1	387700 422400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (SE)	433	1	388250 422250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12NE (W)	458	1	387600 422638
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12NE (NW)	460	1	387650 422850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (W)	460	1	387600 422600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12SE (SW)	473	1	387650 422400
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (SE)	479	1	388250 422200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	486	1	387600 422800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (SW)	500	1	387650 422350
1	Discharge Consents Operator: Donald Peter Herbert Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: 5 Higher Stack Cottages Tong Lane, Britannia, Bacup, Rossendale, OI13 9xd Authority: Environment Agency, North West Region Catchment Area: Irwell Reference: 016993848 Permit Version: 1 Effective Date: 1st June 2006 Issued Date: 1st June 2006 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of The River Irwell Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A8NW (S)	653	2	387920 422000
2	Discharge Consents Operator: D. Armistead Esq. Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: Nanny Brow Cottage, Tong Lane, Bacup, Lancashire, OI13 9xb Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 01m105 Permit Version: 1 Effective Date: 30th May 1963 Issued Date: 30th May 1963 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Unknown Environment: Receiving Water: Unknown Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 10m	A8SE (S)	713	2	388174 421935
3	Discharge Consents Operator: United Utilities Water Limited Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Greave Clough Drive Cso 1 Greave Clough Drive, ., Bacup, Lancashire, OI13 9hp Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 016982934 Permit Version: 2 Effective Date: 8th November 1995 Issued Date: Not Supplied Revocation Date: 10th December 2019 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge: Freshwater Stream/River Environment: Receiving Water: Greave Clough Status: Post National Rivers Authority Legislation where issue date > 31/08/1989 Positional Accuracy: Located by supplier to within 100m	A17SE (NW)	814	2	387490 423220

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	<p>Discharge Consents</p> <p>Operator: United Utilities Water Limited Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Greave Clough Drive Cso 1 Greave Clough Drive, ., Bacup, Lancashire, O113 9hp Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: 016982934 Permit Version: 1 Effective Date: 14th June 1995 Issued Date: Not Supplied Revocation Date: 7th November 1995 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge: Freshwater Stream/River Environment: Receiving Water: Greave Clough Status: Authorisation revoked Positional Accuracy: Located by supplier to within 10m</p>	A17SE (NW)	814	2	387490 423220
4	<p>Discharge Consents</p> <p>Operator: United Utilities Water Limited Property Type: WTW/WATER COLLECTION/TREATMENT/SUPPLY Location: Sheephouses Wtp Rochdale Road, Britannia, Bacup, Lancashire Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 016950055 Permit Version: 1 Effective Date: 12th January 1980 Issued Date: Not Supplied Revocation Date: 1st September 1989 Discharge Type: Trade Discharge - Process Water Discharge: Freshwater Stream/River Environment: Receiving Water: Trough Syke Bk(Via Trib) Status: Authorisation revoked Positional Accuracy: Located by supplier to within 100m</p>	A7NE (SW)	830	2	387540 421990
	<p>Nearest Surface Water Feature</p>	A13NE (E)	272	-	388320 422709
5	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Rubble/Litter Or Solids Note: Trough Syke Brook Incident Date: 24th May 1994 Incident Reference: 94621087 Catchment Area: Irwell Receiving Water: Not Given Cause of Incident: Vandalism Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A13SW (SW)	150	2	388000 422500
6	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Natural Note: Greave Clough Bk; Ochre Incident Date: 21st April 1995 Incident Reference: 95620870 Catchment Area: Irwell Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A18SW (N)	566	2	388000 423200
7	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Miscellaneous Premises: Other Location: River Adjacent To Green Clough Drive, BACUP Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Foam Note: Is A Creamy Colour Incident Date: 12th January 1998 Incident Reference: SO980088 Catchment Area: Irwell Receiving Water: Freshwater Stream/River Cause of Incident: Natural Causes Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A17SE (NW)	667	2	387700 423200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Greave Close , BACUP Authority: Environment Agency, North West Region Pollutant: Agricultural: Unknown Note: Greave Clough Bk; Farm Effluent Incident Date: 9th March 1997 Incident Reference: 97620407 Catchment Area: Irwell Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	838	2	387300 422995
9	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Lancashire Authority: Environment Agency, North West Region Pollutant: Unknown Note: None Affected; None Pollution Found Incident Date: 21st October 1996 Incident Reference: 96622309 Catchment Area: Irwell Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17NE (NW)	838	2	387700 423395
9	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Lancashire Authority: Environment Agency, North West Region Pollutant: Unknown Note: No Water Involved; None Pollution Found Incident Date: 11th April 1996 Incident Reference: 96620740 Catchment Area: Irwell Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17NE (NW)	843	2	387700 423400
10	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Lancashire Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Unknown Note: Britannia Lodge; Unknown Incident Date: 18th January 1996 Incident Reference: 96620118 Catchment Area: Irwell Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8SE (S)	939	2	388100 421700
11	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Natural Note: Greave Clough; Ochre Incident Date: 7th June 1995 Incident Reference: 95621358 Catchment Area: Irwell Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18NE (N)	964	2	388100 423600
12	Substantiated Pollution Incident Register Authority: Environment Agency - North West Region, North Area Incident Date: 6th June 2018 Incident Reference: 1620257 Water Impact: Category 3 - Minor Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Inert : Construction / Demolition Material Pollutant: Inert : Other Pollutant: Asbestos Waste	A14SW (SE)	455	2	388475 422456

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	Substantiated Pollution Incident Register Authority: Environment Agency - North West Region, North Area Incident Date: 17th March 2020 Incident Reference: 1791313 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Specific Waste Materials: Other Specific Waste Material	A8NE (SE)	481	2	388338 422247
13	Substantiated Pollution Incident Register Authority: Environment Agency - North West Region, North Area Incident Date: 8th May 2018 Incident Reference: 1612082 Water Impact: Category 4 - No Impact Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Inert : Construction / Demolition Material Pollutant: Asbestos Waste	A8NE (SE)	482	2	388336 422245
14	Substantiated Pollution Incident Register Authority: Environment Agency - North West Region, North Area Incident Date: 13th March 2020 Incident Reference: 1790620 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Specific Waste Materials: Other Specific Waste Material	A8NE (SE)	615	2	388384 422117
15	Substantiated Pollution Incident Register Authority: Environment Agency - North West Region, North Area Incident Date: 22nd February 2019 Incident Reference: 1681848 Water Impact: Category 3 - Minor Incident Air Impact: Category 2 - Significant Incident Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: General Biodegradable : Other Pollutant: Inert : Construction / Demolition Material Pollutant: Asbestos Waste	A14NE (E)	732	2	388778 422768
16	Water Abstractions Operator: N.W.W.A. Eastern Division Licence Number: 2569001169 Permit Version: Not Supplied Location: Sheephouse & New Lime Reservoirs, Imp/Tributarys Of River Irwell, BACUP Authority: Environment Agency, North West Region Abstraction: Public Water Supply Abstraction Type: Not Supplied Source: Reservoir/Pond Daily Rate (m3): 3273 Yearly Rate (m3): 827372 Details: Licence Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	732	2	387700 422000
17	Water Abstractions Operator: Messrs John Taylor And Company Licence Number: 2569001146 Permit Version: Not Supplied Location: Scar End Brook & Springs, BACUP Authority: Environment Agency, North West Region Abstraction: Manufacturing Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 2273 Yearly Rate (m3): 0 Details: Licence Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18NW (N)	779	2	387900 423400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Water Abstractions</p> <p>Operator: N.W.W.A. Eastern Division Licence Number: 2569001169 Permit Version: Not Supplied Location: Sheephouse & New Lime Reservoirs, Imp/Tributarys Of River Irwell, BACUP Authority: Environment Agency, North West Region Abstraction: Public Water Supply Abstraction Type: Not Supplied Source: Reservoir/Pond Daily Rate (m3): 0 Yearly Rate (m3): 0 Details: Licence Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A7SE (SW)	1092	2	387500 421700
	<p>Water Abstractions</p> <p>Operator: Brian & Rita Hattersley Licence Number: 2569001252 Permit Version: 100 Location: A Spring Fed Catchtank At New Hill Farm, Shawforth Authority: Environment Agency, North West Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 3 Yearly Rate (m3): 1000 Details: Land At Drury Lane Farm, Shawforth Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 18th February 1998 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A4NE (SE)	1510	2	389050 421500
	<p>Water Abstractions</p> <p>Operator: John Prior Engineering Ltd Licence Number: 2569002150 Permit Version: 100 Location: Unnamed Trib Of R Spodden, Whitworth Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: General Cooling (Existing Licences Only) (Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 55 Yearly Rate (m3): 14184 Details: Peel Mill, Shawforth, Nr Rochdale Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 24th January 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A5NW (SE)	1754	2	389300 421400
	<p>Water Abstractions</p> <p>Operator: The Coal Authority Licence Number: 2569001288/R01 Permit Version: 1 Location: Land At Old Meadows Minewater Treatment Plant Off Burnley Rd Authority: Environment Agency, North West Region Abstraction: Other Environmental Improvements: Transfer between sources Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2019 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A21NE (NW)	1994	2	386820 424200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: The Coal Authority Licence Number: 2569001288 Permit Version: 1 Location: Land At Old Meadows Minewater Treatment Plant Off Burnley Rd Authority: Environment Agency, North West Region Abstraction: Other Environmental Improvements: Transfer between sources Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 6th May 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A21NE (NW)	1994	2	386820 424200
	Groundwater Vulnerability Map Combined Classification: Secondary Bedrock Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: >550 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: 3-10m Superficial Recharge: No Data	A13NE (NE)	0	3	388058 422638
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (NE)	0	3	388058 422638
	Superficial Aquifer Designations No Data Available				
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
18	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 166.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A13NE (E)	272	4	388320 422709
19	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 412.3 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A13NE (N)	300	4	388137 422926

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A13NW (N)	316	4	388040 422953
21	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A13NW (N)	321	4	388035 422958
22	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 131.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A13NW (N)	330	4	388033 422967
23	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 26.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A12SE (W)	369	4	387692 422594
24	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 99.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	413	4	388184 422245
25	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 95.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	415	4	388181 422242
26	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 282.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NW (NE)	432	4	388438 422844
27	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 37.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	443	4	388024 423079
28	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 100.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	443	4	388024 423079

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
29	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 193.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A12NE (W)	458	4	387602 422670
30	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 45.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14SW (SE)	476	4	388462 422388
31	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	507	4	388182 422147
32	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	508	4	388185 422147
33	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 144.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	513	4	388184 422141
34	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 435.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	513	4	387948 423138
35	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 27.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	513	4	387948 423138
36	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	528	4	387964 423157
37	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 98.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	529	4	387970 423159

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
38	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 105.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SE (N)	533	4	388205 423150
39	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 129.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SE (N)	545	4	388184 423168
40	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 231.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SE (NE)	546	4	388283 423135
41	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 126.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	547	4	388005 422094
42	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	554	4	387891 422111
43	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	558	4	387892 422105
44	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 13.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18SW (N)	560	4	388054 423197
45	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 18.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	562	4	387888 422103
46	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 28.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (SE)	572	4	388291 422116

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
47	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 206.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	578	4	387875 422091
48	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 124.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	608	4	388133 422035
49	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 72.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	613	4	388400 422129
50	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 68.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (SE)	615	4	388387 422119
51	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 89.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	617	4	388510 422218
52	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 79.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	617	4	388510 422218
53	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 154.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (SE)	625	4	388333 422077
54	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 15.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	637	4	387937 422013
55	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 133.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	652	4	387928 422000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
56	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 19.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NW (E)	654	4	388697 422775
57	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 78.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NW (E)	657	4	388696 422794
58	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 78.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NW (E)	657	4	388696 422794
59	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 58.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	678	4	388564 422186
60	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 57.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	678	4	388564 422186
61	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 49.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	681	4	388470 422097
62	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 72.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	681	4	388470 422097
63	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 1.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	681	4	388606 422234
64	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 39.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	681	4	388609 422239

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
65	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 10.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	682	4	388606 422233
66	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 35.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	684	4	388223 421974
67	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 61.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	686	4	388433 422064
68	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NW (SE)	688	4	388607 422224
69	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 53.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SW (NE)	691	4	388485 423181
70	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 21.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (SE)	694	4	388385 422026
71	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 51.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (SE)	696	4	388367 422015
72	OS Water Network Lines Watercourse Form: Marsh Watercourse Length: 27.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	699	4	388267 421971
73	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 68.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	699	4	388275 421974

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
74	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 128.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NW (S)	703	4	387803 421983
75	OS Water Network Lines Watercourse Form: Reservoir Watercourse Length: 37.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	707	4	388244 421956
76	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	709	4	388204 421944
77	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 183.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8NE (S)	712	4	388329 421980
78	OS Water Network Lines Watercourse Form: Reservoir Watercourse Length: 10.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	714	4	388207 421941
79	OS Water Network Lines Watercourse Form: Reservoir Watercourse Length: 27.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	722	4	388215 421933
80	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 57.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A7NE (SW)	723	4	387680 422022
81	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 82.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	723	4	388767 422774
82	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 72.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	723	4	388767 422774

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
83	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 142.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	726	4	388753 422848
84	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 87.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	727	4	388188 421923
85	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 103.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SW (NE)	743	4	388526 423214
86	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 114.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A7NE (SW)	756	4	387622 422020
87	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 112.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14SE (E)	758	4	388816 422638
88	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 51.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	775	4	388808 422831
89	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 68.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	775	4	388808 422831
90	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	782	4	388174 421865
91	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 25.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	786	4	388838 422734

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
92	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 44.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	786	4	388167 421860
93	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 46.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	810	4	388832 422875
94	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 102.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	810	4	388832 422875
95	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	810	4	388863 422731
96	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 191.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	811	4	388135 421831
97	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SE (NW)	825	4	387573 423305
98	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 13.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SE (NW)	829	4	387571 423308
99	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 88.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SW (NE)	831	4	388622 423247
100	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	839	4	388891 422735

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
101	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	839	4	388891 422735
102	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 165.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SE (NW)	839	4	387530 423288
103	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 7.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	841	4	388893 422736
104	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	842	4	388894 422730
105	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 100.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	842	4	388895 422727
106	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 122.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17NE (NW)	842	4	387561 423317
107	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 30.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A7NE (SW)	845	4	387510 421996
108	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 106.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A9NE (SE)	847	4	388734 422128
109	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 44.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	848	4	388900 422737

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
110	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 23.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A7NE (SW)	869	4	387481 421989
111	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 20.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 2	A7NE (SW)	869	4	387481 421989
112	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 199.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	870	4	388760 423149
113	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 54.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SW (NE)	875	4	388730 423198
114	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	880	4	388876 422960
115	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 213.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	884	4	388880 422961
116	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 42.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A14NE (E)	884	4	388880 422961
117	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 145.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A7NE (SW)	888	4	387463 421979
118	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 76.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SW (NE)	892	4	388708 423248

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
119	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 58.8 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SE (NW)	893	4	387425 423266
120	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 171.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	902	4	388360 421788
121	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 92.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	905	4	388880 423014
122	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17NE (NW)	909	4	387600 423423
123	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17NE (NW)	914	4	387623 423441
124	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 7.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	916	4	388901 422994
125	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 21.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	916	4	388901 422994
126	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 45.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17NE (NW)	917	4	387629 423447
127	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 260.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17NE (NW)	918	4	387683 423474

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
128	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 27.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SW (NW)	920	4	387369 423246
129	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 84.2 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SW (NW)	928	4	387347 423234
130	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 22.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19NW (NE)	936	4	388514 423455
131	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19NW (NE)	940	4	388497 423469
132	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 155.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19NW (NE)	941	4	388494 423471
133	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 100.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	941	4	388792 423226
134	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 263.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	944	4	388248 421713
135	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 17.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	944	4	388790 423233
136	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 267.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18NW (N)	946	4	388010 423582

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
137	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 44.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	972	4	388870 423171
138	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 12.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	975	4	388866 423183
139	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 57.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18NE (N)	977	4	388117 423613
140	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 31.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 2	A19SE (NE)	979	4	388881 423166
141	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 226.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	979	4	388891 423151
142	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 490.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A19SE (NE)	981	4	388877 423177
143	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 31.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SW (NW)	983	4	387281 423238
144	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 64.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A8SE (S)	984	4	388062 421654
145	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 393.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A17SW (NW)	991	4	387256 423219

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
146	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 179.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A18NE (N)	993	4	388175 423624
147	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 159.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Mersey Primacy: 1	A7SW (SW)	1000	4	387335 421949

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
148	Historical Landfill Sites Licence Holder: Not Supplied Location: Tong Lane, Bacup, Lancashire Name: Land off Tong Lane Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD17259 First Input Date: Not Supplied Last Input Date: Not Supplied Specified Waste: Not Supplied Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 2300/0700 BGS Ref: Not Supplied Other Ref: K1/14/065	A12NE (NW)	591	2	387524 422890
149	Historical Landfill Sites Licence Holder: Larfile Limited Location: Off Rochdale Road, Bacup, Lancashire Name: Sheephouse Reservoir Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD15638 First Input Date: Not Supplied Last Input Date: Not Supplied Specified Waste: Not Supplied Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 2300/0698 BGS Ref: Not Supplied Other Ref: R063, K1/14/63, Licence No 405	A8NW (SW)	617	2	387738 422111
150	Licensed Waste Management Facilities (Landfill Boundaries) Name: Tong Farm Landfill Site Licence Number: 53940 Location: Tong Lane, Bacup, Lancashire, OL13 9XA Licence Holder: Laycock James Authority: Environment Agency - North West Region, North Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Closure Issued: 15th December 1989 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied	A13SW (SW)	63	2	388032 422581
151	Licensed Waste Management Facilities (Locations) Licence Number: 403144 Location: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 PXA Operator Name: The Bacup Clay Company Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Treatment of waste to produce soil <75,000 tpy Licence Status: Issued Issued: 8th August 2016 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	77	2	388000 422688
152	Licensed Waste Management Facilities (Locations) Licence Number: 53940 Location: Tong Lane, Bacup, Lancashire, OL13 9XA Operator Name: Laycock James Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Licence Status: Closed Issued: 15th December 1989 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	168	2	387980 422490

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
153	<p>Licensed Waste Management Facilities (Locations)</p> <p>Licence Number: 103372 Location: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 9XA Operator Name: The Bacup Clay Company Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Use of waste in a deposit for recovery op Licence Status: Transferred Issued: 15th February 2012 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A13SE (E)	200	2	388250 422583
	<p>Local Authority Landfill Coverage</p> <p>Name: Rossendale Borough Council - Has supplied landfill data</p>		0	5	388058 422638
	<p>Local Authority Landfill Coverage</p> <p>Name: Lancashire County Council - Had landfill data but passed it to the relevant environment agency</p>		0	6	388058 422638
154	<p>Registered Landfill Sites</p> <p>Licence Holder: Caird Environmental Ltd Licence Reference: 20300 (L 300) Site Location: Tong Farm, Tong Lane, Bacup, Lancashire Licence Easting: 388000 Licence Northing: 422500 Operator Location: Broad Oak Industrial Estate, Manchester Road, Accrington, Lancashire Authority: Environment Agency - North West Region, South Area Site Category: Landfill Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Site Closed Dated: 15th December 1989 Preceded By: L 245 (S-223) Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Glass, Slate, Concrete, Brick, Ceram. Tarma Non-Haz. Metals Soil, Clay, Natural Sand, Rock Solid Fully Polymerised Plastics Timber (Not Shavings, Sawdust, Vegetat'N Prohibited Waste: Clinical Wastes Waste In Demountables</p>	A13SW (SW)	150	2	388000 422500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
154	<p>Registered Landfill Sites</p> <p>Licence Holder: James Laycock Licence Reference: L 245 (S-223) Site Location: Tong Farm, BACUP, Lancashire, OL13 9AX Licence Easting: 388000 Licence Northing: 422500 Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Landfill Max Input Rate: Undefined Waste Source: Some restriction on source of waste Restrictions: Status: Record supersededSuperseded Dated: 1st September 1985 Preceded By: Not Given Licence: Superseded By: L 245 (S-223) Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Cement Cement Asbestos Ceramics Glass Non Hazardous Metals Slate,Concrete,Brick Soil,Rock,Natural Sand Solid Fully Polymerised Plastics Timber Environment Agency Similar Waste N.O.S must give specific authorisation for this waste to be acceptedWaste requires prior approval</p>	A13SW (SW)	150	2	388000 422500
154	<p>Registered Landfill Sites</p> <p>Licence Holder: James Laycock Licence Reference: L 245 (S-223) Site Location: Tong Farm, BACUP, Lancashire, OL13 9AX Licence Easting: 388000 Licence Northing: 422500 Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Landfill Max Input Rate: Undefined Waste Source: Some restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st September 1985 Preceded By: L 245 (S-223) Licence: Superseded By: 20300 (L 300) Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Cement Cement Asbestos Ceramics Glass Non Hazardous Metals Slate,Concrete,Brick Soil,Rock,Natural Sand Solid Fully Polymerised Plastics Timber Environment Agency Similar Wastes N.O.S must give specific authorisation for this waste to be acceptedWaste requires prior approval</p>	A13SW (SW)	150	2	388000 422500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
155	<p>Registered Landfill Sites</p> <p>Licence Holder: Larfile Ltd Licence Reference: L 405 Site Location: Sheephouse Reservoir, Bacup, Lancashire Licence Easting: 387700 Licence Northing: 422000 Operator Location: 3 Freckerville Court, Knowsley Court, BURY, Lancashire, BL9 0ST Authority: Environment Agency - North West Region, Central Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st July 1992 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Glass, Slate, Concrete, Brick, Ceramic Soil, Clay, Natural Sand, Rock Prohibited Waste: Clinical Wastes Waste In Skips/Demountables Waste N.O.S.</p>	A7NE (SW)	732	2	387700 422000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Pennine Lower Coal Measures Formation And South Wales Lower Coal Measures Formation (Undifferentiated)	A13NE (NE)	0	1	388058 422638
156	BGS Recorded Mineral Sites Site Name: Tong Farm Quarry Location: Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 5824 Type: Opencast Status: Active Operator: Individual'S Name Withheld Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Fireclay Positional Accuracy: Located by supplier to within 10m	A13SE (S)	134	1	388075 422505
156	BGS Recorded Mineral Sites Site Name: Tong Farm Quarry Location: Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 5824 Type: Opencast Status: Active Operator: Individual'S Name Withheld Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A13SE (S)	134	1	388075 422505
157	BGS Recorded Mineral Sites Site Name: Bent House Location: Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25499 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13SW (W)	255	1	387805 422610
158	BGS Recorded Mineral Sites Site Name: Hoyle Hey Colliery Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25783 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	323	1	387795 422825
159	BGS Recorded Mineral Sites Site Name: Tong Lane Gravel Pit Location: Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 166540 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Quaternary, Devensian Geology: Till, Devensian Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	345	1	387762 422462

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
160	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Slack Gate Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25500 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A12NE (NW)	395	1	387705 422815
161	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hoyle Hey Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25785 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A18SW (NW)	483	1	387770 423025
162	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hogshead Colliery Coal Pit Location: Britannia, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 166573 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A9NW (SE)	506	1	388399 422264
163	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Oaken Clough Colliery Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25784 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A18SW (N)	527	1	387960 423155
164	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hogshead Colliery Coal Pit Location: Britannia, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 166572 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A8NE (SE)	618	1	388379 422110
165	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hey Head Location: Higher Hogshead, Rawtenstall, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 93762 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Darwen Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A14SE (E)	759	1	388766 422366

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
166	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Greave Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25786 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Woodhead Hill Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A17SE (NW)	775	1	387625 423280
167	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Greave Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25787 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Woodhead Hill Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A17NE (NW)	853	1	387590 423350
168	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Reaps Moor Location: Rockcliffe, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 93705 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Darwen Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A14NE (E)	866	1	388919 422724
169	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Sheephouse Clough Location: Trough Gate, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 93721 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Rough Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	885	1	387479 421969
170	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Greave Colliery Location: Greave, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25788 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A18NW (N)	893	1	387810 423495
171	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Change Location: Higher Change, Bacup, Lancashire Source: British Geological Survey, National Geoscience Information Service Reference: 25790 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Great Arc Sandstone Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A18NW (N)	933	1	387955 423565

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A13NE (NE)	0	7	388058 422638
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13NE (NE)	0	-	388058 422638
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	118	1	388087 422524
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	235	1	387952 422428
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	66	1	388025 422581
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	388058 422638

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
172	Contemporary Trade Directory Entries Name: Hurt Aggregates Location: Tong Lane, Bacup, OL13 9XA Classification: Sand, Gravel & Other Aggregates Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (W)	173	-	387889 422603
173	Contemporary Trade Directory Entries Name: J M Ashworth Waste Ltd Location: Warcock Farm, Warcock Lane, Bacup, Lancashire, OL13 9ES Classification: Waste Merchants Status: Inactive Positional Accuracy: Automatically positioned to the address	A18SW (NW)	565	-	387755 423115
174	Contemporary Trade Directory Entries Name: Exterm Hygiene Services Location: 1, Hawfinch Close, Bacup, Lancashire, OL13 9PT Classification: Pest & Vermin Control Status: Active Positional Accuracy: Automatically positioned to the address	A12SE (W)	627	-	387446 422502
175	Contemporary Trade Directory Entries Name: Gumbusters Location: 37, Douglas Road, BACUP, Lancashire, OL13 9PR Classification: Graffiti Removers Status: Active Positional Accuracy: Automatically positioned to the address	A7NE (SW)	629	-	387673 422141
176	Contemporary Trade Directory Entries Name: Boxshop Uk Location: 71, Tong Lane, Bacup, Lancashire, OL13 9LH Classification: Pallets, Crates & Packing Cases Status: Inactive Positional Accuracy: Automatically positioned to the address	A12NE (NW)	646	-	387493 422950
177	Contemporary Trade Directory Entries Name: Bright Fabrications Location: Todmorden Road, Bacup, Lancashire, OL13 9UZ Classification: Stainless Steel Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address	A19SW (NE)	671	-	388514 423129
178	Contemporary Trade Directory Entries Name: Valley Pest Control - Mole & Pest Management Location: 10, Britannia Avenue, Bacup, OL13 9JS Classification: Pest & Vermin Control Status: Active Positional Accuracy: Automatically positioned to the address	A12NW (W)	764	-	387308 422781
179	Contemporary Trade Directory Entries Name: Domestics Direct Ltd Location: 58, Ramsey Avenue, Bacup, Lancashire, OL13 9PJ Classification: Cleaning Services - Domestic Status: Inactive Positional Accuracy: Automatically positioned to the address	A7NE (SW)	782	-	387483 422108
180	Contemporary Trade Directory Entries Name: Dial A Daily Location: 20, Pendle Close, Bacup, Lancashire, OL13 9JT Classification: Cleaning Services - Domestic Status: Inactive Positional Accuracy: Automatically positioned to the address	A12NW (W)	809	-	387273 422831
181	Contemporary Trade Directory Entries Name: Millies Munchies Location: 8, Oakenclough Road, Bacup, OL13 9ET Classification: Pet Foods & Animal Feeds Status: Inactive Positional Accuracy: Automatically positioned to the address	A17NE (NW)	838	-	387687 423389
182	Contemporary Trade Directory Entries Name: Impact Polymers Ltd Location: 16, Greave Fold, Bacup, Lancashire, OL13 9EY Classification: Recycling Services Status: Inactive Positional Accuracy: Automatically positioned to the address	A17NE (NW)	870	-	387625 423391
183	Contemporary Trade Directory Entries Name: Prioory Polishes Location: 11, Gladstone Street, Bacup, Lancashire, OL13 9JN Classification: Floor Cleaning & Polishing Equipment - Manufacturers & Distributors Status: Inactive Positional Accuracy: Automatically positioned to the address	A12NW (W)	918	-	387164 422844

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
184	<p>Contemporary Trade Directory Entries</p> <p>Name: By Way Miller Location: Grove Mill, Todmorden Road, Bacup, Lancashire, OL13 9EF Classification: Bottling Machinery & Equipment Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A17SW (NW)	944	-	387346 423256
184	<p>Contemporary Trade Directory Entries</p> <p>Name: Orthoplastics Location: Grove Mill, Todmorden Road, Bacup, Lancashire, OL13 9EF Classification: Medical Equipment Manufacturers Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A17SW (NW)	944	-	387346 423256
185	<p>Contemporary Trade Directory Entries</p> <p>Name: Valley Auto Care Location: Unit 2, Albion Works, Albion Street, Bacup, OL13 9EQ Classification: Garage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A17SW (NW)	957	-	387288 423206
186	<p>Contemporary Trade Directory Entries</p> <p>Name: Vale Street Garage Location: Vale Street, Bacup, Lancashire, OL13 9EJ Classification: Garage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A17SW (NW)	968	-	387244 423161
186	<p>Contemporary Trade Directory Entries</p> <p>Name: P C Tyres & Exhaust Location: Unit J, Beech Industrial Estate, Vale Street, Bacup, Lancashire, OL13 9EL Classification: Tyre Dealers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A17SW (NW)	975	-	387232 423155
186	<p>Contemporary Trade Directory Entries</p> <p>Name: Axon Motorhomes Location: Unit J, Beech Industrial Estate, Vale Street, Bacup, OL13 9EL Classification: Caravan Dealers & Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A17SW (NW)	982	-	387224 423156
186	<p>Contemporary Trade Directory Entries</p> <p>Name: Axon Motorhomes Location: Unit J, Beech Industrial Estate, Vale Street, Bacup, OL13 9EL Classification: Caravan Dealers & Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A17SW (NW)	982	-	387224 423156
187	<p>Contemporary Trade Directory Entries</p> <p>Name: Clean & Green Location: 19, Industrial Street, Bacup, Lancashire, OL13 9JJ Classification: Commercial Cleaning Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A12NW (W)	985	-	387086 422795

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
188	<p>Areas of Adopted Green Belt</p> <p>Authority: Rossendale Borough Council, Planning Department Plan Name: Proposal Map Status: Adopted Plan Date: 9th November 2011</p>	A9NW (SE)	619	8	388499 422204
189	<p>Areas of Adopted Green Belt</p> <p>Authority: Rossendale Borough Council, Planning Department Plan Name: Proposal Map Status: Adopted Plan Date: 9th November 2011</p>	A9NW (SE)	619	8	388499 422204

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Burnley Borough Council - Planning and Environment Environment Agency - Head Office Rossendale Borough Council - Environmental Health Department Rochdale Metropolitan Borough Council - Environmental Health Department Calderdale Metropolitan Borough Council - Environmental Health	February 2013 June 2020 November 2015 October 2017 September 2014	Annual Rolling Update Annually Annual Rolling Update Annually Annual Rolling Update
Discharge Consents Environment Agency - North East Region Environment Agency - North West Region	January 2021 January 2021	Quarterly Quarterly
Enforcement and Prohibition Notices Environment Agency - North East Region Environment Agency - North West Region	March 2013 March 2013	Annual Rolling Update Annual Rolling Update
Integrated Pollution Controls Environment Agency - North East Region Environment Agency - North West Region	October 2008 October 2008	Variable Variable
Integrated Pollution Prevention And Control Environment Agency - North East Region Environment Agency - North West Region	January 2021 January 2021	Quarterly Quarterly
Local Authority Integrated Pollution Prevention And Control Rochdale Metropolitan Borough Council - Environmental Health Department Rossendale Borough Council - Environmental Health Department Burnley Borough Council - Planning and Environment Calderdale Metropolitan Borough Council - Environmental Health	July 2014 May 2016 November 2014 October 2014	Variable Variable Variable Variable
Local Authority Pollution Prevention and Controls Rochdale Metropolitan Borough Council - Environmental Health Department Rossendale Borough Council - Environmental Health Department Burnley Borough Council - Planning and Environment Calderdale Metropolitan Borough Council - Environmental Health	July 2014 May 2016 November 2014 October 2014	Annual Rolling Update Annual Rolling Update Not Applicable Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Rochdale Metropolitan Borough Council - Environmental Health Department Rossendale Borough Council - Environmental Health Department Burnley Borough Council - Planning and Environment Calderdale Metropolitan Borough Council - Environmental Health	July 2014 May 2016 November 2014 October 2014	Variable Variable Variable Variable
Nearest Surface Water Feature Ordnance Survey	October 2020	
Pollution Incidents to Controlled Waters Environment Agency - North East Region Environment Agency - North West Region	December 1998 January 2000	Not Applicable Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - North East Region Environment Agency - North West Region	March 2013 March 2013	Annual Rolling Update Annual Rolling Update
Prosecutions Relating to Controlled Waters Environment Agency - North East Region Environment Agency - North West Region	March 2013 March 2013	Annual Rolling Update Annual Rolling Update
Registered Radioactive Substances Environment Agency - North East Region Environment Agency - North West Region	June 2016 June 2016	
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points Environment Agency - Head Office	July 2012	Annually

Agency & Hydrological	Version	Update Cycle
Substantiated Pollution Incident Register		
Environment Agency - North East Region - Ridings Area	January 2021	Quarterly
Environment Agency - North East Region - Yorkshire Area	January 2021	Quarterly
Environment Agency - North West Region - Central Area	January 2021	Quarterly
Environment Agency - North West Region - North Area	January 2021	Quarterly
Environment Agency - North West Region - South Area	January 2021	Quarterly
Water Abstractions		
Environment Agency - North East Region	January 2021	Quarterly
Environment Agency - North West Region	January 2021	Quarterly
Water Industry Act Referrals		
Environment Agency - North East Region	October 2017	Quarterly
Environment Agency - North West Region	October 2017	Quarterly
Groundwater Vulnerability Map		
Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations		
Environment Agency - Head Office	January 2018	Annually
Superficial Aquifer Designations		
Environment Agency - Head Office	January 2018	Annually
Source Protection Zones		
Environment Agency - Head Office	October 2019	Quarterly
Extreme Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	September 2020	Quarterly
Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	September 2020	Quarterly
Areas Benefiting from Flood Defences		
Environment Agency - Head Office	September 2020	Quarterly
Flood Water Storage Areas		
Environment Agency - Head Office	September 2020	Quarterly
Flood Defences		
Environment Agency - Head Office	September 2020	Quarterly
OS Water Network Lines		
Ordnance Survey	September 2020	Quarterly
BGS Groundwater Flooding Susceptibility		
British Geological Survey - National Geoscience Information Service	May 2013	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites Environment Agency - Head Office	October 2019	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - North East Region Environment Agency - North West Region	October 2008 October 2008	Not Applicable Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area Environment Agency - North West Region - Central Area Environment Agency - North West Region - North Area Environment Agency - North West Region - South Area	January 2021 January 2021 January 2021 January 2021 January 2021	Quarterly Quarterly Quarterly Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area Environment Agency - North West Region - Central Area Environment Agency - North West Region - North Area Environment Agency - North West Region - South Area	January 2021 January 2021 January 2021 January 2021 January 2021	Quarterly Quarterly Quarterly Quarterly Quarterly
Local Authority Landfill Coverage Burnley Borough Council Calderdale Metropolitan Borough Council - Environmental Health Lancashire County Council - Waste Management Group Rochdale Metropolitan Borough Council - Environmental Health Department Rossendale Borough Council - Environmental Health Department	May 2000 May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Burnley Borough Council Calderdale Metropolitan Borough Council - Environmental Health Lancashire County Council - Waste Management Group Rochdale Metropolitan Borough Council - Environmental Health Department Rossendale Borough Council - Environmental Health Department	May 2000 May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Registered Landfill Sites Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area Environment Agency - North West Region - Central Area Environment Agency - North West Region - North Area Environment Agency - North West Region - South Area	March 2003 March 2003 March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area Environment Agency - North West Region - Central Area Environment Agency - North West Region - North Area Environment Agency - North West Region - South Area	March 2003 March 2003 March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area Environment Agency - North West Region - Central Area Environment Agency - North West Region - North Area Environment Agency - North West Region - South Area	March 2003 March 2003 March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Burnley Borough Council - Planning Services Calderdale Metropolitan Borough Council Lancashire County Council Rochdale Metropolitan Borough Council Rossendale Borough Council - Planning Department	February 2016 February 2016 February 2016 February 2016 February 2016	Variable Variable Variable Variable Variable
Planning Hazardous Substance Consents Burnley Borough Council - Planning Services Calderdale Metropolitan Borough Council Lancashire County Council Rochdale Metropolitan Borough Council Rossendale Borough Council - Planning Department	February 2016 February 2016 February 2016 February 2016 February 2016	Variable Variable Variable Variable Variable
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2020	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	January 2021	Quarterly
Fuel Station Entries Catalist Ltd - Experian	September 2020	Quarterly
Gas Pipelines National Grid	January 2021	
Underground Electrical Cables National Grid	December 2020	
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	February 2021	Bi-Annually
Areas of Adopted Green Belt Burnley Borough Council Calderdale Metropolitan Borough Council Rochdale Metropolitan Borough Council Rossendale Borough Council - Planning Department	June 2020 June 2020 June 2020 June 2020	As notified As notified As notified As notified
Areas of Unadopted Green Belt Burnley Borough Council Calderdale Metropolitan Borough Council Rochdale Metropolitan Borough Council Rossendale Borough Council - Planning Department	June 2020 June 2020 June 2020 June 2020	As notified As notified As notified As notified
Areas of Outstanding Natural Beauty Natural England	January 2021	Bi-Annually
Environmentally Sensitive Areas Natural England	January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	February 2021	Bi-Annually
Marine Nature Reserves Natural England	July 2019	Bi-Annually
National Nature Reserves Natural England	January 2021	Bi-Annually
National Parks Natural England	April 2017	Bi-Annually
Nitrate Sensitive Areas Natural England	April 2016	Not Applicable
Nitrate Vulnerable Zones Environment Agency - Head Office Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December 2017 October 2015	Bi-Annually
Ramsar Sites Natural England	August 2020	Bi-Annually
Sites of Special Scientific Interest Natural England	February 2021	Bi-Annually
Special Areas of Conservation Natural England	July 2020	Bi-Annually
Special Protection Areas Natural England	February 2021	Bi-Annually

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	 British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	Environment Agency - Head Office Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
4	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
5	Rossendale Borough Council - Environmental Health Department Town Hall, Rawtenstall, Rossendale, Lancashire, BB4 7LZ	Telephone: 01706 217777 Fax: 01706 224958 Website: www.rossendale.gov.uk
6	Lancashire County Council - Waste Management Group Environment Directorate, Guild House, Cross Street, Preston, Lancashire, PR1 8RD	Website: www.lancashire.gov.uk
7	The Coal Authority - Property Searches 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk Website: www2.groundstability.com
8	Rossendale Borough Council - Planning Department Town Hall, Rawtenstall, Lancashire, BB4 7LZ	Telephone: 01706 217777 Fax: 01706 224958 Website: www.rossendale.gov.uk
9	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



APPENDIX B
Groundwater Well Installation Report

Tong Quarry Bacup - Groundwater Well Installation Report



**TONG QUARRY, TONG LANE, BACUP,
LANCASHIRE, OL13 9XA
GROUNDWATER WELL INSTALLATION
REPORT**

FOR

THE BACUP CLAY COMPANY LTD

C. S. Eccles - Brownfield Land Consultancy

Contaminated Land Assessments, Options Appraisals, Remediation Strategy & Verification,
Geotechnical Design, Earthworks & Materials Reuse, Waste Assessments & Classification, Ecology

Tong Quarry Bacup - Groundwater Well Installation Report

DOCUMENT CONTROL SHEET

Report Title: Tong Quarry, Tong Lane, Bacup, Lancashire,
OL13 9XA - Groundwater Well Installation Report


Client: The Bacup Clay Company Limited

Report Reference: 192.02.01

Report Status: For Use

Version: 1.0

Report Date: 28th February 2021

Written by: Chris Eccles, BEng, MSc, DIC, FGS, CGeol, CSci, CEnv, SiLC, UK RoGEP Adviser CL:AIRE DoWCoP QP 020, NQMS Suitably Qualified Person	
	28 th February 2021

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The report is only valid when it is used in its entirety.

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Tong Quarry Bacup - Groundwater Well Installation Report

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	Cross Section Location Plan	
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3	WELL INSTALLATION MATERIALS	
4	WATER LEVEL & GROUND GAS MONITORING DATA - FEBRUARY 2021	
5	LABORATORY TEST DATA – ROUND 1 FEBRUARY 2021	
6	LABORATORY TEST DATA – ROUND 2 FEBRUARY 2021	

Tong Quarry Bacup - Groundwater Well Installation Report

1 INTRODUCTION

1.1 The Bacup Clay Company Ltd (the quarry owners) commissioned a series of new groundwater monitoring wells to be installed for the proposed extension of Tong Quarry, Bacup, Lancashire. The quarry is to be restored by means of infill with inert construction demolition and excavation waste.

1.2 Lancashire County Council has granted Planning Permission to extend the quarry (Application number is LCC/2020/0018). The location is presented in Figure 1 below. There is a requirement to propose and gain agreement for the installation of additional groundwater monitoring wells which are required at minimum 200 m intervals around the perimeter of the quarry. Groundwater monitoring and testing is also required for the Environmental Permit application for quarry restoration. A decision was made to:

1. Install six pairs of additional wells (two in existing quarry, four in extension);
2. Provide a factual report of the drilling and well installation;
3. Assess of the geological and hydrogeological conditions;
4. Then assess whether any further wells are required; and
5. Submit the proposal to the council for their approval.

1.3 This report presents the factual data from drilling the boreholes and installing the wells.

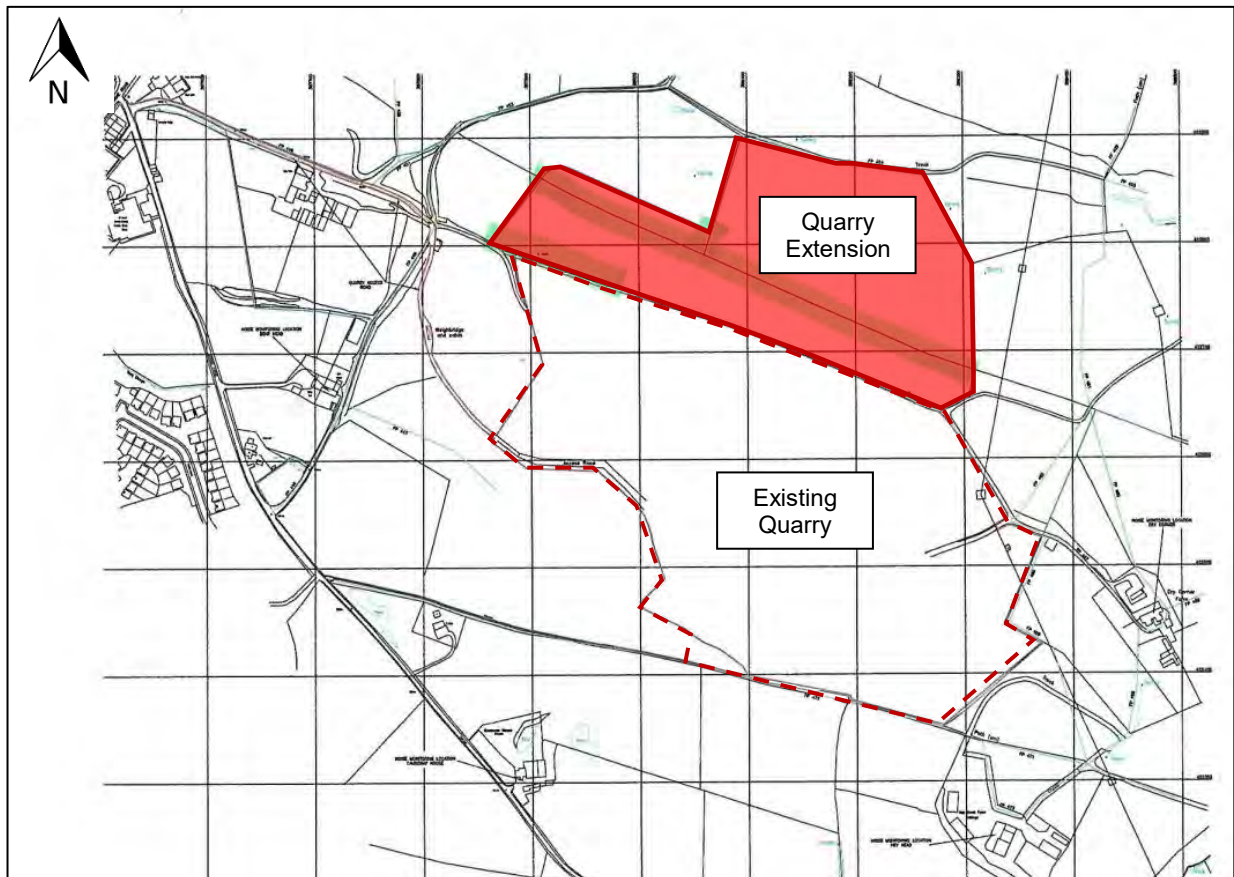


Figure 1: Tong Quarry - Existing Quarry and Extension Area

Tong Quarry Bacup - Groundwater Well Installation Report

2 SITE LOCATION & DESCRIPTION

2.1 Tong Quarry is located approximately 0.5km to the east of Bacup in Lancashire at grid reference SD 881 225. The site is situated approximately 600m to the south east of Tong Farm. The quarry is established on former agricultural land in an area that is predominantly rural. Tong Lane runs south east to north west 300m to the south west of the site. The only other access routes in the area are the quarry access track and agricultural access tracks. The location of the site is indicated in Figure 2.



Figure 2: Site Location

- 2.2 The existing quarry has been worked roughly from south to north. The southern and eastern part of the existing quarry has been backfilled and part restored along the southern boundary. The remaining reserve in the existing quarry is in the central part of the north.
- 2.3 The quarry extension area comprises parts of three grassed fields separated by drystone walls. The ground level falls to the north/north west in this extension area. There is a track which separates the existing quarry from the extension.

Tong Quarry Bacup - Groundwater Well Installation Report

3 GEOLOGY

3.1 Tong Quarry is established in the Lower Coal Measures which typically consists of a cyclical sequence of mudstones and thin sandstones with coal bands. The Lower Coal Measures are underlain by sandstones and shale of the Millstone Grit Group. The quarry has worked sandstone, coal and fireclay from the Lower Coal Measures, including the Great Arc Sandstone (formerly known as the Bullion Rock), Lower Mountain Coal and Ganister Rock. Local stratigraphy is illustrated in Table 1 below with formations exposed in the quarry highlighted in light green.

Table 1: General Geological Succession at Tong Quarry		
Formation Name	Description	Approximate Thickness (m)
Darwen Flags	Fine grained flagstone/sandstone	15
Upper Mountain Mine	Coal	
-	Undifferentiated Coal Measures	24
Great Arc Sandstone	Irregularly bedded sandstone	20
Lower Mountain Mine	Coal	1
-	Fireclay	1
Ganister Rock	Ganister – a hard fine grained sandstone	1
-	Undifferentiated Coal Measures	6
Lower Foot Mine	Coal	0.4
-	Undifferentiated Coal Measures	16
Woodhead Hill Rock	Sandstone & mudstone	24
<p>Note: Undifferentiated Coal Measures are principally mudstones with thinner/subordinate siltstone and sandstone beds</p>		

3.2 The local area has historically been subject to extensive small-scale coal mining activity resulting in underground workings with shafts and adits including ones encountered within the quarry,. Quarry excavations have proven the presence of shallow coal mining in the Lower Mountain Mine seam.

Tong Quarry Bacup - Groundwater Well Installation Report

4 SCOPE OF WORK

- 4.1 Three groundwater monitoring wells were installed in March 2017 around the existing quarry. These were: GW1 in the west, GW2 in the south and GW3 in the east and five wells (W1 to W4 and W6) within inert quarry backfill located in the south of the site. Groundwater wells GW1 and GW2 were put down with response zones into the top of the Woodhead Hill Rock with GW3 having the response zone deeper within this same strata. Limited groundwater well monitoring has been carried out but in GW2 the well has been dry except for one monitoring date.
- 4.2 In addition to the above there were five shallow wells (W1 to W4 and W6) installed into the inert waste in the south of the existing quarry.
- 4.3 Therefore it was proposed that six new deep wells would be installed into the Woodhead Hill Rock but if a significant groundwater strike was not encountered the holes would be drilled deeper to ensure the holes would be deep enough to record the water table. This was to ensure that the deep monitoring wells were not dry as per the earlier GW2. These deep wells would have a 6.0 m slotted section of pipe within a 6.5 m long response zone.
- 4.4 Adjacent to the locations of each of the six new deep wells (typically 3 m away), a shallower well was installed to a depth of 20 m to assess perched groundwater conditions. These wells would typically be 20 m deep and have a 3.0 m slotted section of pipe in the base with a 3.5 m long response zone.

Tong Quarry Bacup - Groundwater Well Installation Report

5 DRILLING

- 5.1 The boreholes were drilled and wells installed between 2nd and 7th February 2021. Fieldwork procedures were undertaken in accordance with the relevant sections of BS5930:2015+A1 2020 "Code of Practice for Site Investigations;" the wells were installed on the same day that the holes were drilled.
- 5.2 There were two drilling crews and rigs on site carrying out the works. A Commacchio 205 rig was used for the shallow holes (GW4S to GW9S) and a Commacchio 305 rig was used for drilling the deep holes and installing the deep wells (GW4D to GW9D). The rigs were drilled using open-hole methods with air-mist flush. The holes were 150 mm diameter with casing used to seal off the ground through the relatively thin drift deposits to ensure hole stability. Casing was also drilled into the rock to ensure stability in certain locations.
- 5.3 A geologist was present during the drilling to supervise the works.
- 5.4 The holes were set out from known reference points on the site then surveyed on completion using a survey grade DGPS. Both the 2017 and new wells were surveyed. The hole locations and depths are summarised below:

Table 2: Summary of Boreholes					
Borehole	Depth (m)	Reduced Level of Base (mOD)	Easting	Northing	Elevation (mOD)
GW1	33.0	306.30	387914.52	422611.73	339.30
GW2	39.0	307.27	388066.03	422441.14	346.27
GW3	60.0	304.24	388351.55	422543.98	364.24
GW4D	60.0	286.38	388026.35	422479.32	346.38
GW4S	20.0	326.18	388028.77	422472.39	346.18
GW5D	63.0	287.60	388287.04	422363.36	350.60
GW5S	20.0	330.70	388281.68	422367.15	350.70
GW6D	48.0	310.07	388307.02	422692.78	358.07
GW6S	20.0	337.52	388302.99	422691.51	357.52
GW7D	50.0	294.56	388180.20	422872.70	344.56
GW7S	20.0	324.36	388175.93	422872.97	344.36
GW8D	65.0	281.56	388062.50	422808.59	346.56
GW8S	20.0	326.27	388063.01	422812.94	346.27
GW9D	48.0	289.55	387824.02	422827.60	337.55
GW9S	20.0	317.41	387821.61	422829.87	337.41
W1	10.0	341.45	388244.69	422389.78	351.45
W2	17.0	338.44	388240.26	422488.89	355.44
W3	13.0	336.70	388123.25	422424.57	349.70
W4	17.0	337.27	388182.38	422501.98	354.27
W6	18.0	332.48	388115.78	422512.55	350.48

Tong Quarry Bacup - Groundwater Well Installation Report

- 5.4 The hole location plan and cross sections are presented in Appendix 1 with borehole logs presented in Appendix 2. Also included in Appendix 2 are typed versions of logs for GW1 to GW3 from 2017 so they are in the same format as the new logs to ease assessment of the geology. The geological formation names are presented on all the borehole logs following the naming system in Table 1.

Tong Quarry Bacup - Groundwater Well Installation Report

6 WELL INSTALLATION

6.1 The wells were installed using 51 mmID HDPE pipework. The shallow wells had 3.0 m long filter section at the base of the wells and the deep wells had 6.0 m long filter sections. The perforated section of pipework had 1 mm slots and a 425 µm 'geosoc' with 10 mm pea gravel used for the filter media and hydrated bentonite cement pellets used to provide impermeable backfill around the plain sections of pipework. All wells had lockable stick-up covers set in concrete.

6.2 Data sheets for the principal materials for the wells are presented in Appendix 3:

- MGS Duroscreen – 63 mm OD/51 mmID HDPE pipework
- Well filter media 6 – 10 mm silicious gravel
- Bentonite cement pellets

Tong Quarry Bacup - Groundwater Well Installation Report

7 QUALITY CONTROL DURING DRILLING & WELL INSTALLATION

7.1 The quality Control measures for the construction and installation of the monitoring wells are summarised below:

- Construction Supervision: by C S Eccles Brownfield Land Consultancy. Installation and supervision was supervised at all times by a suitably qualified geologist;
- Engineering Control: Setting out by C S Eccles Brownfield Land Consultancy and subsequent surveying by an engineer from Fox Brothers (Lancashire) Ltd;
- Holes drilled and wells installed by DP Drilling Ltd; and
- Wells developed by C S Eccles Brownfield Land Consultancy.

7.2 The following coal workings and difficulties were encountered during the works:

- GW6D: A void was encountered from 24.10 to 25.20 m depth. This was probably the worked seam of the Lower Mountain Coal. Time was spent trying to drill casing down to below the void but this proved to be difficult and casing was only drilled to 18.00 m depth. A decision was made to continue drilling without any flush returns with the flush going into the workings. No records of strata or water strikes were encountered below this depth.
- GW7S: Workings encountered at 17.60 to 18.50 m in the Lowe Mountain Mine. Note that this hole was dry during drilling and was also subsequently during the first two rounds of monitoring there was negligible water in this well (<0.05 m, this is just water in the end cap and not a groundwater level).
- GW7D: Groundwater was encountered at shallow depth of about 2.0 m and hole made water all the way down with additional water encountered at 44.00 m depth. This is in marked contrast to GW7S. During monitoring the groundwater level was at 1.54 m and is representative of surface water from the clough/spring just to the north of this location. Based on chemistry of this water it is assessed that this is surface water and it will not be sampled in any future rounds of monitoring.
- GW9S & GW9D: From 7.80 to 17.90 m flush was lost into fractures in the sandstone. Holes were cased to 17.50 m.

Tong Quarry Bacup - Groundwater Well Installation Report

8 WELL DEVELOPMENT, MONITORING & TESTING

8.1 After installation, all wells were developed by removing at least three well volumes of groundwater. This was carried out using disposable bailers for the shallow holes, GW7D, GW8D and GW9D. A submersible electric pump for developing the deep wells GW1 to GW6D (this was an MP1 pump). The new wells were developed by the geologist on the day following installation.

8.2 Two rounds of groundwater monitoring and sampling have been carried out:

- Round 1: 6th & 7th February 2021
- Round 2: 21st February 2021

8.3 Each round of monitoring and sampling comprised:

- Ground gas monitoring was carried out in accordance with BS8576:2013 in each of the wells using a GasData GFM435 infra-red meter to measure gas flow rate, methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide. Note that only wells GW2, GW7S, W1 to W4 and W6 act as true gas monitoring wells. All other wells have the filter sections of the wells flooded so these wells monitor gas coming out of solution in the wells.
- Measurement of groundwater level. Note that W3 was blocked so the groundwater level could not be measured.
- Groundwater sampling.
 - Round 1 sampling was carried out using disposable a bailers. With these wells having been developed in the few days preceding the sampling, just a single well volume was removed prior to sampling. The exception being W4 which has limited water in the well and is slow to recharge so this was sampled without further purging.
 - Round 2 sampling commenced with purging three well volumes from all wells except for W4. An MP1 submersible electric pump used for purging. New bailers were used for taking the samples.
 - Each sample was tested on site using a Hanna Instruments portable analyser for pH, conductivity, resistivity, temperature, dissolved oxygen, TDS and salinity.
 - Each sample comprised a vial, two 1 litre amber glass jars and a 1 litre plastic bottle.
 - All samples were stored in cool boxes and dispatched to the laboratory.
 - On first round no samples were taken from GW3 (dry), W3 (blocked) and GW7S (dry) and only a single vial was recovered from W1
 - On the second round of testing no samples were taken from GW1 (dry), GW 2 (dry), W2 (dry), W3 (blocked) and GW7S (dry).
- All samples were tested by Eurofins Chemtest for pH, metals, anions plus a range of organic compounds.

Tong Quarry Bacup - Groundwater Well Installation Report

- 8.4 In addition to the above rising head tests were carried out in wells GW4S, GW6S, GW7D and GW8S as part of the second round of monitoring. The MP1 pump was used to draw down the water levels for these tests.
- 8.5 The results of the above monitoring are presented in Appendix 4. Results of the first round of laboratory testing are reported in Appendix 5 and the second round in Appendix 6.

Tong Quarry Bacup - Groundwater Well Installation Report

9 SURFACE WATER MONITORING LOCATIONS

9.1 Three down-gradient surface water sampling locations around the extension are indicated in were sampled as part of Round 1 and 2 monitoring:

- Spr NW – From Oaken Clough after confluence of Hoyle Hey Clough
- Spr N – From indicated spring
- Spr NE – From below confluence of two springs

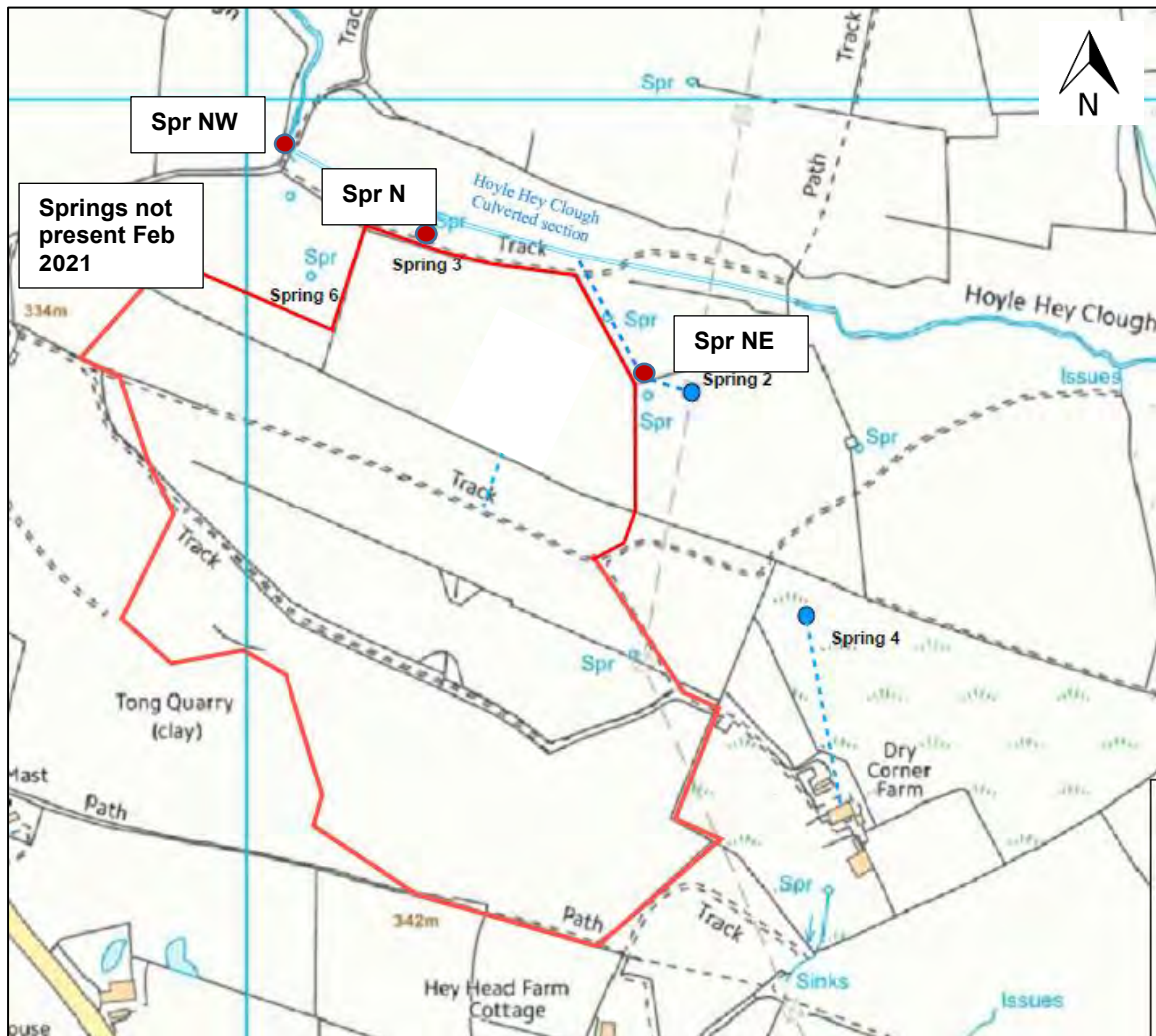


Figure 3: Location of Surface Water Monitoring Locations February 2021

9.3 The surface water samples were sampled by direct filling of the bottles and vials from the watercourse. They were tested on site as per the groundwater samples and were sent off site for the same analytical suite as the groundwaters. The results are reported in Appendix 5 and 6 with the groundwaters.

Tong Quarry Bacup - Groundwater Well Installation Report

9.2 In addition to the above, a round of surface water monitoring and sampling is proposed at three locations to the west and south of the quarry as indicated in Figure 4 below. These locations will be samples on 6th March 2021 and the data reported separately.

- The Mine Adit outlet
- Daisy Hall Spring
- Hey Head Drain

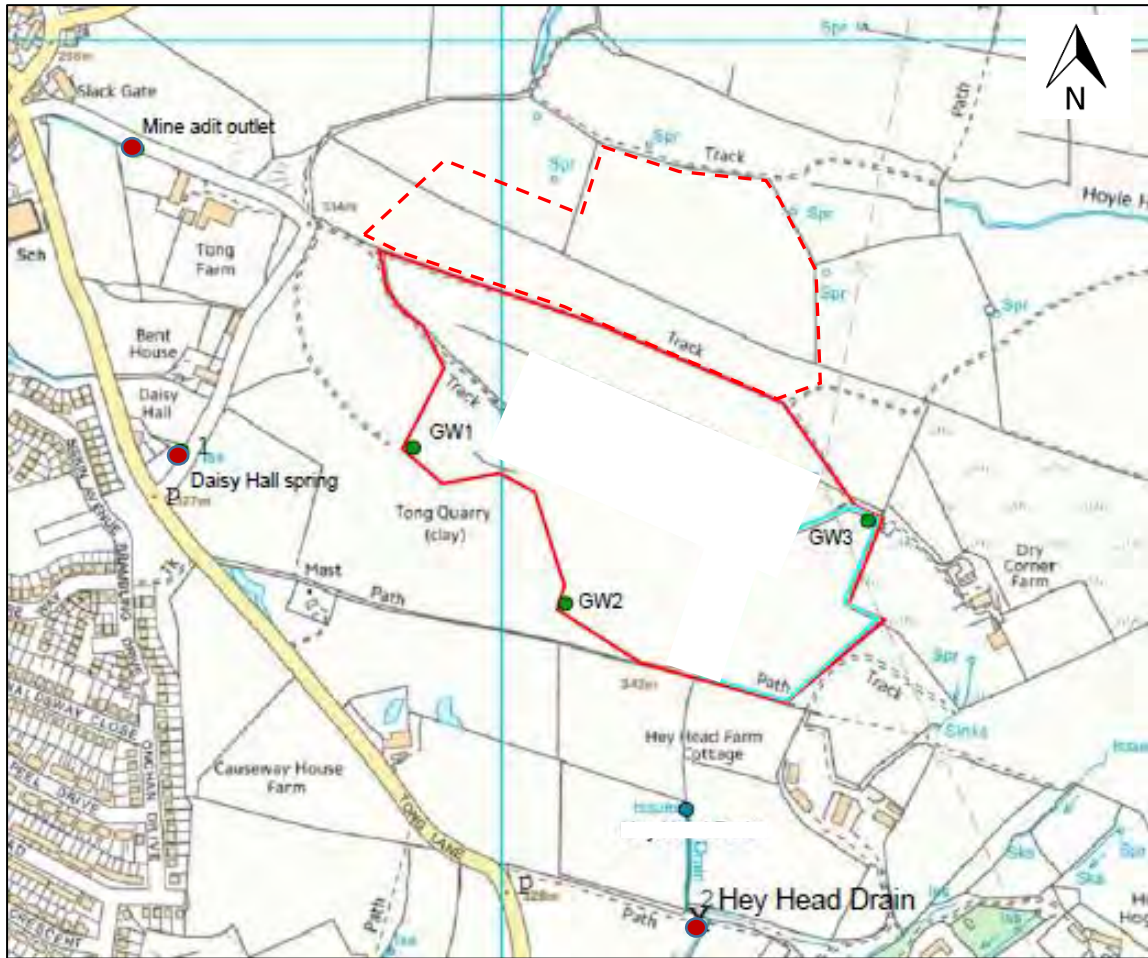


Figure 4: Locations of Surface Monitoring Wells to be Sampled in March 2021

APPENDIX 1

DRAWINGS

Exploratory Hole Location Plan

Cross Section Location Plan

Section Line 1 (Deep Wells)

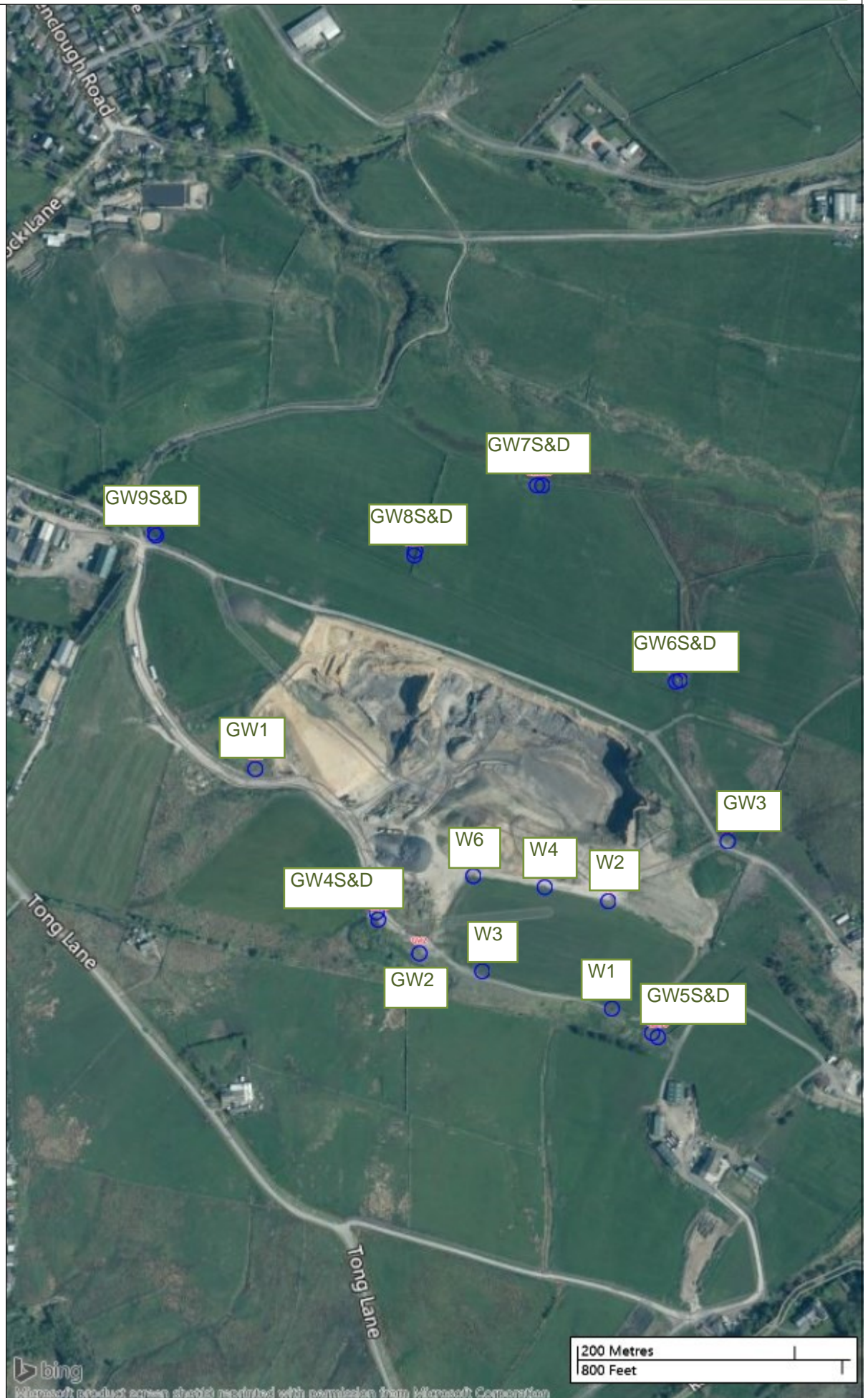
Section Line 2 (Deep Wells)

Exploratory Hole Location Plan

C S Eccles Brownfield
Land Consultancy

Legend Key

○ Locations By Type - RO



AGS
Issue: Final
Scale: 1:5000

Project: Tong Quarry
Project No: 21/12
Client: The Bacup Clay Company Ltd

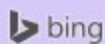
Drawing No:
21/12D002

Cross Section Location Plan

C S Eccles Brownfield
Land Consultancy

Legend Key

- Sections - Section line 1
- Sections - Section line 2
- Locations By Type - Empty
- Locations By Type - RO



Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation



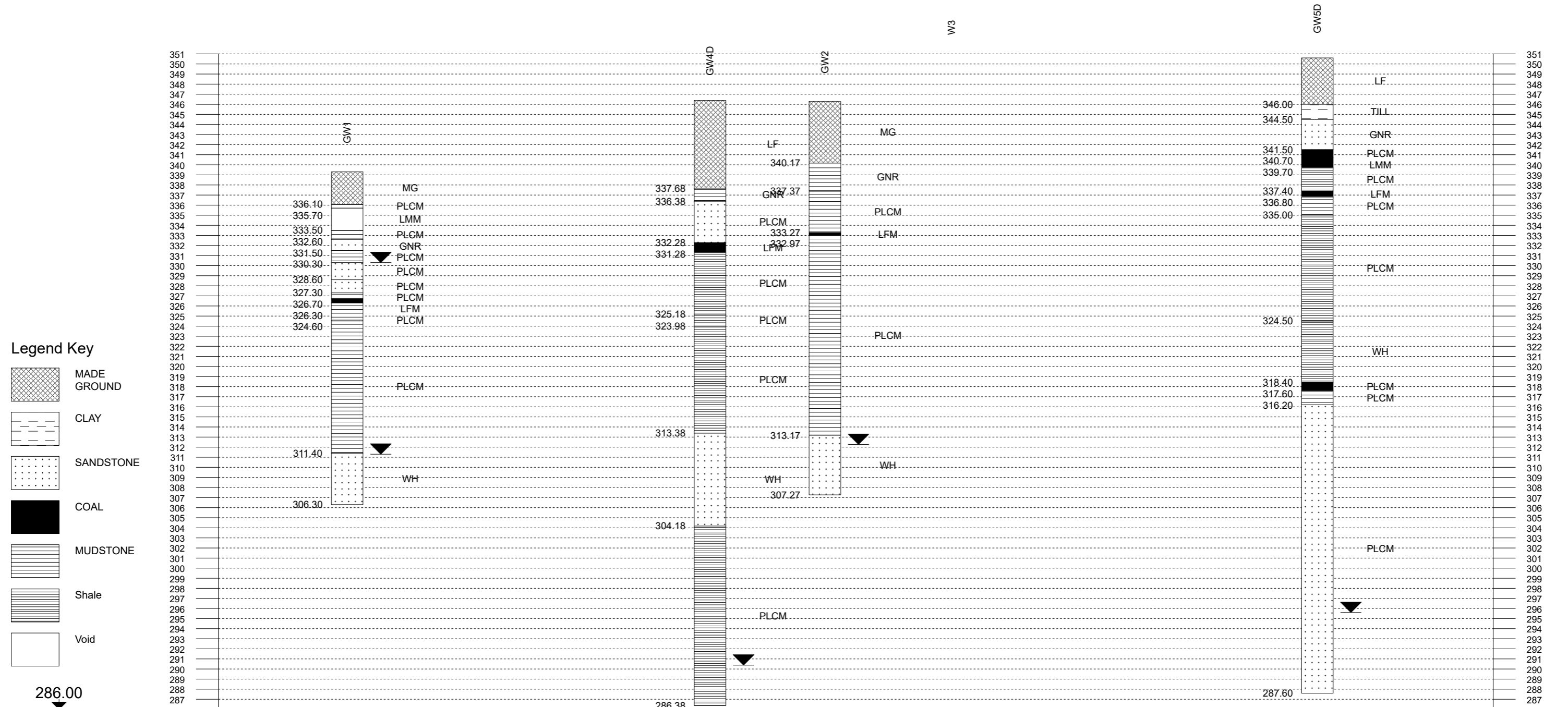
Issue: Final
Scale: 1:5000

Project: Tong Quarry
Project No: 21/12
Client:

Drawing No:

21/12D002

Section line 1 (Deep BHs)



Legend Key

	MADE GROUND
	CLAY
	SANDSTONE
	COAL
	MUDSTONE
	Shale
	Void

Chainage (m)	0.00	10.65	183.91	190.70	238.81	250.03	299.31	467.74	474.01	484.53
Elevation (mAOD)	339.30	339.30	346.38	346.18	346.27	346.27	349.70	350.70	350.60	350.60
Offset (m)	1.20	1.20	5.46	8.25	1.13	1.13	6.67	1.16	0.78	0.78

Notes: For explanation of symbols and abbreviations see Key Sheet.
 All depths and reduced levels are in meters.

Remarks: None












Issue: Open
 Drawn by: Geo
 Vertical scale: 1:391
 Horizontal scale: 1:1884

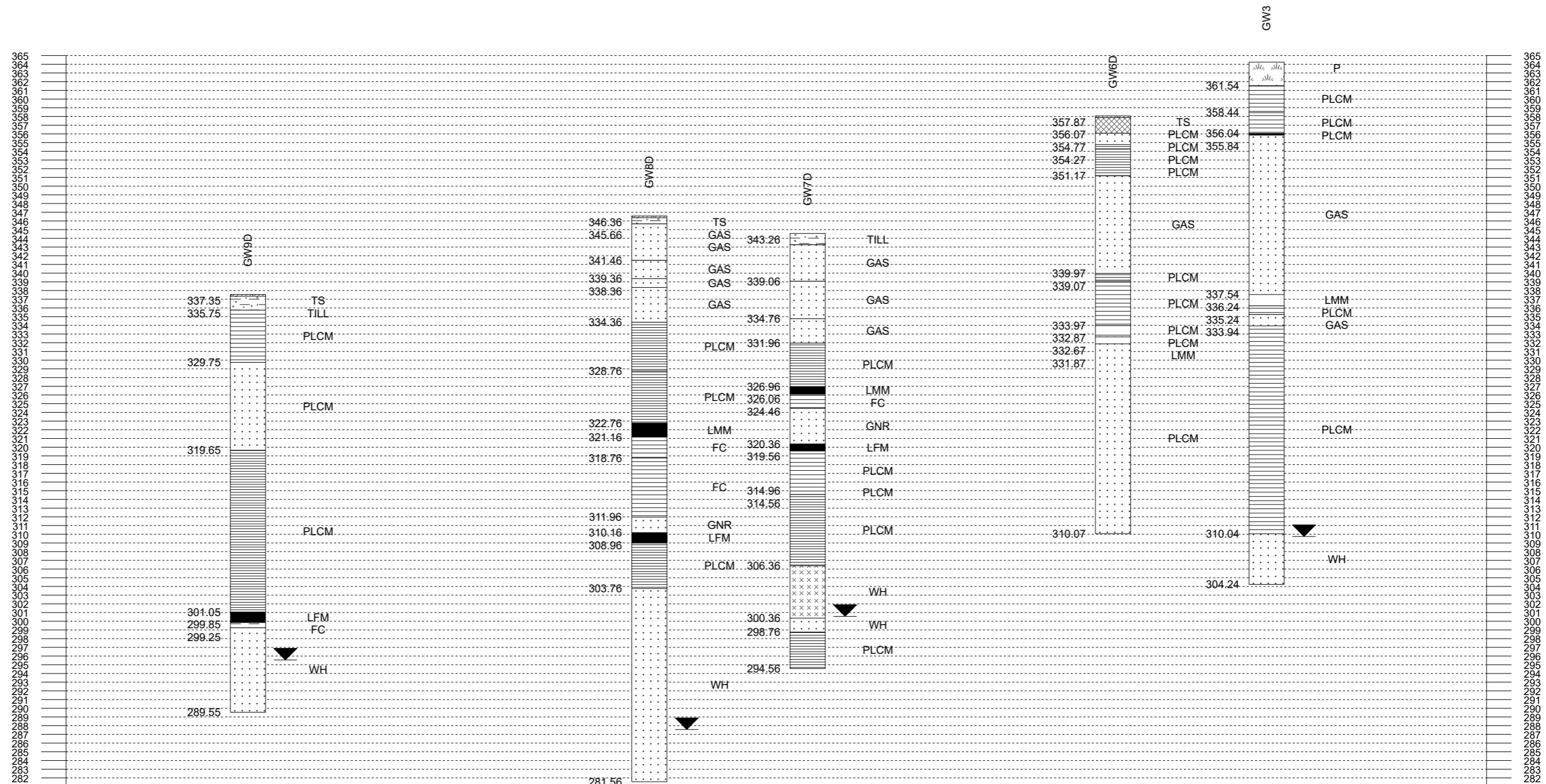
Project: Tong Quarry
 Project No: 21/12
 Client: The Bacup Clay Company Ltd

Drawing No:
Drawing No.

Section line 2 (Deep BHs)

Legend Key

-  PEAT
-  MUDSTONE
-  TOPSOIL
-  MADE GROUND
-  SANDSTONE
-  COAL
-  Shale
-  Gravelly CLAY
-  Void
-  SILTSTONE
-  CLAY



Chainage (m)	0.00	33.60	209.02	366.68	534.99	626.44	654.36
Elevation (mAOD)		337.45	346.86	344.38	356.67	364.24	
Offset (m)		13.98	47.22	138.80	7.86	117.45	

Notes: For explanation of symbols and abbreviations see Key Sheet.
 All depths and reduced levels are in meters.

Remarks:
 None

Issue: Open
 Drawn by: Geo
 Vertical scale: 1:505
 Horizontal scale: 1:2545

Project: Tong Quarry
 Project No: 21/12
 Client: The Bacup Clay Company Ltd

Drawing No:
Drawing No.

APPENDIX 2

EXPLORATORY HOLE LOGS

Borehole Log

Exploratory position reference:

GW1

Sheet 1 of 2


Borehole formation details:

Type: RO	From: 0.00	To: 33.00	Start date: 15-03-17	End date: 16-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 16-03-17	Remarks:	Location details: mE: 387914.52 mN: 422611.73 mAOD: 339.30 Grid: OSGB
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Backfill/Instaln	Water-strike	Legend	Level	Depth (thickness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/samples	
				3.20	MADE GROUND (MADE GROUND)							
			336.10	3.20	Brown MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED) Soft strata. Possible mine workings (LOWER MOUNTAIN MINE)							
			335.70	0.40								
				2.20								
			333.50	5.80	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			332.60	6.70	Grey SANDSTONE (GANISTER ROCK)							
			331.50	7.80	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			330.30	9.00	Brown SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			328.60	10.70	Grey SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			327.30	12.00	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			326.70	12.60	COAL							
			326.30	13.00	(LOWER FOOT MINE) Black MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			324.60	14.70	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries: Struck: 9.00 Rose to: 9.00 Casing: 6.00 Sealed:				Diameter & casing: Dia (mm): 146 Depth: 33.00 Casing: 6.00				Depth related remarks: From: to: Remarks:				Flush details: Depth: Type: Return: Colour:			
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 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.				Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd				Log issue: DRAFT Scale: 1:100			
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Borehole Log

Exploratory position reference:

GW1

Sheet 2 of 2

Borehole formation details:											Location details:				
Type: RO	From: 0.00	To: 33.00	Start date: 15-03-17	End date: 16-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 16-03-17	Remarks:	mE: 387914.52	mN: 422611.73	mAOD: 339.30	Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
				13.20	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
				27.90	Grey SANDSTONE (WOODHEAD HILL ROCK)						
				311.40							
				5.10							
				306.30	Borehole ends at 33.00 m (Termination reason: Target depth)						

Inst (Ø)	Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:			
Struck: 28.00	Rose to: 28.00	Casing: 6.00	Sealed:	Dia (mm): 146	Depth: 33.00	Casing: 6.00	From:	to:	Remarks:	Depth:	Type:	Return:	Colour:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
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Log issue: DRAFT
Scale: 1:100

Borehole Log

Exploratory position reference:

GW2

Sheet 1 of 2


Borehole formation details:

Type: RO	From: 0.00	To: 39.00	Start date: 17-03-17	End date: 17-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 17-03-17	Remarks:	Location details: mE: 388066.03 mN: 422441.14 mAOD: 346.27 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
					MADE GROUND (MADE GROUND)							
				6.10								
			340.17	6.10	Brown MUDSTONE (GANISTER ROCK)							
				2.80								
			337.37	8.90	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				4.10								
			333.27	13.00	COAL (LOWER FOOT MINE)							
			332.97	0.30	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				13.30								

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries: Struck: Rose to: Casing: Sealed:	Diameter & casing: Dia (mm): 146 Depth: 39.00 Casing: 6.00	Depth related remarks: From: to: Remarks:	Flush details: Depth: Type: Return: Colour:
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 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters. Log issue: DRAFT Scale: 1:100	Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
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Borehole Log

Exploratory position reference:

GW2


Sheet 2 of 2

Borehole formation details:

Type: RO	From: 0.00	To: 39.00	Start date: 17-03-17	End date: 17-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 17-03-17	Remarks:	Location details: mE: 388066.03 mN: 422441.14 mAOD: 346.27 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
				19.80	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				313.17	33.10	Grey SANDSTONE (WOODHEAD HILL ROCK)						
				5.90								
				307.27	39.00	Borehole ends at 39.00 m (Termination reason: Target depth)						

Groundwater entries: Struck to: 34.00 Rose to: 34.00 Casing: 6.00 Sealed:				Diameter & casing: Dia (mm): 146 Depth: 39.00 Casing: 6.00				Depth related remarks: From: to: Remarks:				Flush details: Depth: Type: Return: Colour:			
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 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd	
Log issue: DRAFT Scale: 1:100			

Borehole Log

Exploratory position reference:

GW3

Sheet 1 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 27-03-17	End date: 29-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 29-03-17	Remarks:
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Location details:

mE:	388351.55
mN:	422543.98
mAOD:	364.24
Grid:	OSGB

Backfill/Instaln	Water-strike	Legend	Level	Depth (thickness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/samples
				2.70	PEAT (PEAT)						
			361.54	2.70	Dark grey weathered MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
				3.10							
			358.44	5.80	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
				2.40							
			356.04	8.20	COAL (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
			355.84	8.40	Brown and grey SANDSTONE (GREAT ARC SANDSTONE)						
				18.30							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:

Struck: Rose to: Casing: Sealed:

Diameter & casing:

Dia (mm): 146
 Depth: 60.00
 Casing: 30.00

Depth related remarks:

From to: Remarks:

Flush details:

Depth: Type: Return: Colour:

AGS Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.

Log issue: DRAFT
 Scale: 1:100

Project: Tong Quarry
 Project No: 21/12
 Client: The Bacup Clay Company Ltd

Borehole Log

Exploratory position reference:

GW3

Sheet 2 of 3


Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 27-03-17	End date: 29-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 29-03-17	Remarks:	Location details: mE: 388351.55 mN: 422543.98 mAOD: 364.24 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
					Brown and grey SANDSTONE (GREAT ARC SANDSTONE)							
			337.54	26.70	Soft strata. Possible mine workings (LOWER MOUNTAIN MINE)							
			336.24	28.00	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			335.24	29.00	GANISTER (GREAT ARC SANDSTONE)							
			333.94	30.30	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries: Struck: Rose to: Casing: Sealed:	Diameter & casing: Dia (mm): 146 Depth: 60.00 Casing: 30.00	Depth related remarks: From: to: Remarks:	Flush details: Depth: Type: Return: Colour:
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 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters. Log issue: DRAFT Scale: 1:100	Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
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Borehole Log

Exploratory position reference:

GW3


Sheet 3 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 27-03-17	End date: 29-03-17	Crew: GP	Plant: Soimec 400	Barrel type: n/a	Drill bit: Tricone	Logger: GP	Logged: 29-03-17	Remarks:	Location details: mE: 388351.55 mN: 422543.98 mAOD: 364.24 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
				23.90	Dark grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				310.04	54.20	Grey SANDSTONE (WOODHEAD HILL ROCK)							
				5.80									
				304.24	60.00	Borehole ends at 60.00 m (Termination reason: Target depth)							

Groundwater entries: Struck: 54.50 Rose to: 54.50 Casing: 30.00 Sealed:	Diameter & casing: Dia (mm): 146 Depth: 60.00 Casing: 30.00	Depth related remarks: From: to: Remarks:	Flush details: Depth: Type: Return: Colour:
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 <p>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.</p> <p>Log issue: DRAFT Scale: 1:100</p>	<p>Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd</p>
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Borehole Log

Exploratory position reference:

GW4D

Sheet 1 of 3


Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 02-02-21	End date: 02-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 02-02-21	Remarks:	Location details:	
												mE: 388026.35	
												mN: 422479.32	
												mAOD: 346.38	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
				8.70	Concrete BOULDERS. Occasional wood (LANDFILL)								
			337.68	8.70	Grey MUDSTONE (GANISTER ROCK)								
			336.38	10.00	Strong grey SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				4.10									
			332.28	14.10	COAL (LOWER FOOT MINE)								
			331.28	15.10	Greyish black SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				6.10									

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	60.00						0.00 - 60.00	air/mist			

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Project: Tong Quarry
	Project No: 21/12
	Client: The Bacup Clay Company Ltd
Log issue: DRAFT	
Scale: 1:100	

Borehole Log

Exploratory position reference:

GW4D

Sheet 2 of 3


Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 02-02-21	End date: 02-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 02-02-21	Remarks:	Location details:	
												mE: 388026.35	mN: 422479.32
												mAOD: 346.38	Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
			325.18	21.20	Greyish black SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				1.20	Black SHALE with coal traces (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			323.98	22.40	Greyish black SHALE with occasional mudstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				10.60								
			313.38	33.00	Grey SANDSTONE (WOODHEAD HILL ROCK)							
				9.20								

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	60.00										

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW4D


Sheet 3 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 02-02-21	End date: 02-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 02-02-21	Remarks:	Location details: mE: 388026.35 mN: 422479.32 mAOD: 346.38 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
					Grey SANDSTONE (WOODHEAD HILL ROCK)							
			304.18	42.20	Grey SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				17.80								
		(51)										
		SP (51) (Ø)	206.38	60.00	Borehole ends at 60.00 m (Termination reason: Target depth)							

Groundwater entries: Struck: 56.00 Rose to: 56.00 Casing: Sealed:	Diameter & casing: Dia (mm): 150 Depth: 60.00 Casing:	Depth related remarks: From to: Remarks:	Flush details: Depth: Type: Return: Colour:
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 <p>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.</p> <p>Log issue: DRAFT Scale: 1:100</p>	<p>Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd</p>
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Borehole Log

Exploratory position reference:

GW4S

Sheet 1 of 1

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 02-02-21	End date: 02-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 02-02-21	Remarks:	Location details:	
												mE: 388028.77	
												mN: 422472.39	
												mAOD: 346.18	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing										
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples					
				8.70	Concrete BOULDERS. Occasional wood (LANDFILL)											
			337.48	8.70	Grey MUDSTONE (GANISTER ROCK)											
			336.18	10.00	Strong grey SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
				4.10												
			332.08	14.10	COAL (LOWER FOOT MINE)											
			331.08	15.10	Greyish black SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
		(51)		4.90												
		SP (51) (Ø)	326.18	20.00	Borehole ends at 20.00 m (Termination reason: Target depth)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck: Rose to: Casing: Sealed:				Dia (mm): 150	Depth: 20.00	Casing:	From to: Remarks:				Depth: 0.00 - 20.00	Type: air/mist	Return: Colour:		

 <p>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.</p>	Project: Tong Quarry
	Project No: 21/12
	Client: The Bacup Clay Company Ltd
Log issue: DRAFT	
Scale: 1:100	

Borehole Log

Exploratory position reference:

GW5D

Sheet 1 of 4


Borehole formation details:

Type: RO	From: 0.00	To: 63.00	Start date: 01-02-21	End date: 01-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 01-02-21	Remarks:	Location details:	
												mE: 388287.04	
												mN: 422363.36	
												mAOD: 350.60	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
				4.60	CLAY with abundant brick (LANDFILL)								
			346.00	4.60	Brown CLAY (GLACIAL TILL)								
			344.50	6.10	Grey SANDSTONE (GANISTER ROCK)								
			341.50	9.10	COAL (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
			340.70	9.90	COAL (LOWER MOUNTAIN MINE)								
			339.70	10.90	Blackish grey SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
			337.40	13.20	COAL (LOWER FOOT MINE)								
			336.80	13.80	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
			335.00	15.60	Dark greyish blackish grey SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	63.00						0.00 - 63.00	air/mist			

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW5D

Sheet 2 of 4

Borehole formation details:

Type: RO	From: 0.00	To: 63.00	Start date: 01-02-21	End date: 01-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 01-02-21	Remarks:	Location details:	
												mE: 388287.04	
												mN: 422363.36	
												mAOD: 350.60	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
			10.50		Dark greyish blackish grey SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
			324.50	26.10	Grey SHALE with sandstone bands (WOODHEAD HILL ROCK)								
			318.40	32.20	COAL (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
			317.60	33.00	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
			316.20	34.40	Strong grey SANDSTONE with occasional shale bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								

	Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	63.00										

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Project: Tong Quarry
	Project No: 21/12
	Client: The Bacup Clay Company Ltd
Log issue: DRAFT	
Scale: 1:100	

Borehole Log

Exploratory position reference:

GW5D

Sheet 3 of 4

Borehole formation details:

Type: RO	From: 0.00	To: 63.00	Start date: 01-02-21	End date: 01-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 01-02-21	Remarks:
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Location details:

mE:	388287.04
mN:	422363.36
mAOD:	350.60
Grid:	OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
				28.60	Strong grey SANDSTONE with occasional shale bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:

Struck: 55.00	Rose to: 55.00	Casing: Sealed:
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Diameter & casing:

Dia (mm): 150	Depth: 63.00	Casing:
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Depth related remarks:

From:	to:	Remarks:
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Flush details:

Depth:	Type:	Return:	Colour:
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AGS Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.
Log issue: DRAFT
Scale: 1:100

Project: Tong Quarry
Project No: 21/12
Client: The Bacup Clay Company Ltd

Borehole Log

Exploratory position reference:

GW5D

Sheet 4 of 4

Borehole formation details:

Type: RO	From: 0.00	To: 63.00	Start date: 01-02-21	End date: 01-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 01-02-21	Remarks:
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Location details:

mE:	388287.04
mN:	422363.36
mAOD:	350.60
Grid:	OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
					Strong grey SANDSTONE with occasional shale bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
			287.60	63.00	Borehole ends at 63.00 m (Termination reason: Target depth)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	63.00										

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Project:	Tong Quarry
	Project No:	21/12
	Client:	The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:


GW5S

Sheet 1 of 1

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 01-02-21	End date: 01-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 01-02-21	Remarks:	Location details:	
												mE: 388281.68	
												mN: 422367.15	
												mAOD: 350.70	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing										
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples					
				4.60	CLAY with abundant brick (LANDFILL)											
			346.10	4.60	Brown CLAY (GLACIAL TILL)											
			344.60	6.10	Grey SANDSTONE (GANISTER ROCK)											
			341.60	9.10	COAL (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
			340.80	9.90	COAL (LOWER MOUNTAIN MINE)											
			339.80	10.90	Blackish grey SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
			337.50	13.20	COAL (LOWER FOOT MINE)											
			336.90	13.80	Grey MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
			335.10	15.60	Dark greyish blackish grey SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
		(51)		4.40												
		SP (Ø)	330.70	20.00	Borehole ends at 20.00 m (Termination reason: Target depth)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:			
Struck: Rose to: Casing: Sealed:	Dia (mm): 150	Depth: 20.00	Casing:	From: to: Remarks:	Depth: 0.00 - 20.00	Type: air/mist	Return: Colour:						
 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.				Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd									
Log issue: DRAFT Scale: 1:100													

Borehole Log

Exploratory position reference:

GW6D

Sheet 1 of 3


Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 05-02-21	End date: 05-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 05-02-21	Remarks:	Location details:	
												mE: 388307.02	mN: 422692.78
												mAOD: 358.07	Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
			357.87	0.20	TOPSOIL (TOPSOIL)							
				1.80	Gravelly CLAY. Gravel is sandstone (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			356.07	2.00	Brown SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			354.77	3.30	Grey SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			354.27	3.80		Black SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
				3.10								
			351.17	6.90	Grey SANDSTONE with occasional shale bands (GREAT ARC SANDSTONE)							
				11.20								
			339.97	18.10	Greyish black SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			339.07	19.00	Black MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From	to:	Remarks:	Depth:	Type:	Return:	Colour:
				150	60.00					0.00 - 48.00	air/mist		

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Project: Tong Quarry
	Project No: 21/12
	Client: The Bacup Clay Company Ltd
Log issue: DRAFT	
Scale: 1:100	

Borehole Log

Exploratory position reference:

GW6D

Sheet 2 of 3


Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 05-02-21	End date: 05-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 05-02-21	Remarks:	Location details:	
												mE: 388307.02	mN: 422692.78
												mAOD: 358.07	Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
				5.10	Black MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			333.97	24.10	VOID (loss of flush) (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			332.87	25.20	Probably SANDSTONE							
			332.67	25.40	(PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				0.80	VOID (loss of flush)							
			331.87	26.20	(VOID - WORKED LOWER MOUNTAIN MINE?) Probably SANDSTONE							
					(PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				21.80								

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	60.00										

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW6D


Sheet 3 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 60.00	Start date: 05-02-21	End date: 05-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 05-02-21	Remarks:	Location details: mE: 388307.02 mN: 422692.78 mAOD: 358.07 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
					Probably SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
	(51)												
	SP (51)		310.07	48.00	Borehole ends at 48.00 m (Termination reason: Target depth)								
	Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks		

Groundwater entries: Struck: Rose to: Casing: Sealed:	Diameter & casing: Dia (mm): 150 Depth: 60.00 Casing:	Depth related remarks: From to: Remarks:	Flush details: Depth: Type: Return: Colour:
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 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters. Log issue: DRAFT Scale: 1:100	Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
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Borehole Log

Exploratory position reference:

GW6S


Sheet 1 of 1

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 05-02-21	End date: 05-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 05-02-21	Remarks:	Location details:	
												mE: 388302.99	mN: 422691.51
												mAOD: 357.52	Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing										
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples					
			357.32	0.20	TOPSOIL (TOPSOIL)											
				1.80	Gravelly CLAY. Gravel is sandstone (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
			355.52	2.00	Brown SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
			354.22	3.30	Grey SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
			353.72	3.80		Black SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)										
				3.10												
			350.62	6.90	Grey SANDSTONE with occasional shale bands (GREAT ARC SANDSTONE)											
				11.20												
				18.10	Greyish black SHALE with sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
				0.90												
			338.52	19.00	Black MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
				1.00												
			337.52	20.00	Borehole ends at 20.00 m (Termination reason: Target depth)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	to:	Remarks:	Depth:	Type:	Return:	Colour:
				150	20.00					0.00 - 20.00	air/mist		

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW7D

Sheet 1 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 50.00	Start date: 03-02-21	End date: 03-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 03-02-21	Remarks:	Location details:	
												mE: 388180.20	
												mN: 422872.70	
												mAOD: 344.56	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
				1.30	Gravelly CLAY. Gravel is sandstone (GLACIAL TILL)								
			343.26	1.30	Brown SANDSTONE (GREAT ARC SANDSTONE)								
				4.20									
			339.06	5.50	Grey SANDSTONE with weaker grey shale bands (GREAT ARC SANDSTONE)								
				4.30									
			334.76	9.80	Strong grey SANDSTONE (GREAT ARC SANDSTONE)								
				2.80									
			331.96	12.60	Grey SHALE with black bands and strong sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				5.00									
			326.96	17.60	COAL (LOWER MOUNTAIN MINE)								
			326.06	18.50	Interbedded black SHALE and MUDSTONE (FIRECLAY)								
				1.60									

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:		
Struck: Rose to: Casing: Sealed:	Dia (mm): 150			Depth: 50.00	Casing:	From: to: Remarks:	Depth: 0.00 - 50.00	Type: air/mist	Return: Colour:			

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue: DRAFT		
Scale: 1:100		

Borehole Log

Exploratory position reference:

GW7D

Sheet 2 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 50.00	Start date: 03-02-21	End date: 03-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 03-02-21	Remarks:
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Location details:

mE: 388180.20
mN: 422872.70
mAOD: 344.56
Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
			324.46	20.10	Interbedded black SHALE and MUDSTONE (FIRECLAY) Strong grey SANDSTONE (GANISTER ROCK)						
				4.10							
			320.36	24.20	COAL (LOWER FOOT MINE)						
			319.56	25.00	Interbedded black SHALE and MUDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
				4.60							
			314.96	29.60	Grey SANDSTONE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
			314.56	30.00	Dark greyish blackish grey SHALE with occasional sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
				8.20							
			306.36	38.20	Interbedded grey SILTSTONE and SANDSTONE (WOODHEAD HILL ROCK)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	50.00										

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW7D

Sheet 3 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 50.00	Start date: 03-02-21	End date: 03-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 03-02-21	Remarks:	Location details:	
												mE: 388180.20	mN: 422872.70
												mAOD: 344.56	Grid: OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
		XXXXXX		6.00	Interbedded grey SILTSTONE and SANDSTONE (WOODHEAD HILL ROCK)							
	▼		300.36	44.20	Grey SANDSTONE (WOODHEAD HILL ROCK)							
			298.76	45.80	Grey SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			294.56	50.00	Borehole ends at 50.00 m (Termination reason: Target depth)							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck: 44.00	Rose to: 44.00	Casing:	Sealed:	Dia (mm): 150	Depth: 50.00	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Log issue: DRAFT	Project: Tong Quarry
	Scale: 1:100	Project No: 21/12
		Client: The Bacup Clay Company Ltd

Borehole Log

Exploratory position reference:

GW7S


Sheet 1 of 1

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 03-02-21	End date: 03-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 03-02-21	Remarks:	Location details:	
												mE: 388175.93	
												mN: 422872.97	
												mAOD: 344.36	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing										
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples					
				1.30	Gravelly CLAY. Gravel is sandstone (GLACIAL TILL)											
			343.06	1.30	Brown SANDSTONE (GREAT ARC SANDSTONE)											
				4.20												
			338.86	5.50	Grey SANDSTONE with weaker grey shale bands (GREAT ARC SANDSTONE)											
				4.30												
			334.56	9.80	Strong grey SANDSTONE (GREAT ARC SANDSTONE)											
				2.80												
			331.76	12.60	Grey SHALE with black bands and strong sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
				5.00												
		(51)	326.76	17.60	COAL (LOWER MOUNTAIN MINE)											
			325.86	18.50	Interbedded black SHALE and MUDSTONE (FIRECLAY)											
				1.50												
		SP (Ø)	324.36	20.00	Borehole ends at 20.00 m (Termination reason: Target depth)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:			
Struck: Rose to: Casing: Sealed:	Dia (mm): 150	Depth: 20.00	Casing:	From: to: Remarks:	Depth: 0.00 - 20.00	Type: air/mist	Return: Colour:						

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.	Project: Tong Quarry
	Project No: 21/12
	Client: The Bacup Clay Company Ltd
Log issue: DRAFT	
Scale: 1:100	

Borehole Log

Exploratory position reference:

GW8D

Sheet 1 of 4


Borehole formation details:

Type: RO	From: 0.00	To: 65.00	Start date: 04-02-21	End date: 04-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 04-02-21	Remarks:	Location details:	
												mE: 388062.50	
												mN: 422808.59	
												mAOD: 346.56	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
			346.36	0.20	TOPSOIL							
				0.70	(TOPSOIL)							
			345.66	0.90	Gravelly CLAY. Gravel is sandstone							
					(GREAT ARC SANDSTONE)							
					Weathered brown SANDSTONE							
					(GREAT ARC SANDSTONE)							
				4.20								
			341.46	5.10	Strong grey SANDSTONE with weaker bands							
					(GREAT ARC SANDSTONE)							
				2.10								
			339.36	7.20	Weak brown SANDSTONE							
					(GREAT ARC SANDSTONE)							
				1.00								
			338.36	8.20	Light grey SANDSTONE							
					(GREAT ARC SANDSTONE)							
				4.00								
			334.36	12.20	Interbedded grey SHALE and MUDSTONE							
					(PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
				5.60								
			328.76	17.80	Black SHALE							
					(PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	65.00						0.00 - 65.00	air/mist			

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW8D

Sheet 2 of 4


Borehole formation details:

Type: RO	From: 0.00	To: 65.00	Start date: 04-02-21	End date: 04-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 04-02-21	Remarks:	Location details: mE: 388062.50 mN: 422808.59 mAOD: 346.56 Grid: OSGB
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Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
				6.00	Black SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						
			322.76	23.80	COAL (LOWER MOUNTAIN MINE)						
			321.16	25.40	Interbedded grey MUDSTONE and SHALE (FIRECLAY)						
			318.76	27.80	Greyish black MUDSTONE (FIRECLAY)						
			311.96	34.60	Grey SANDSTONE with shale bands (GANISTER ROCK)						
			310.16	36.40	COAL (LOWER FOOT MINE)						
			308.96	37.60	Greyish black SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries: Struck: Rose to: Casing: Sealed:	Diameter & casing: Dia (mm): 150 Depth: 65.00 Casing:	Depth related remarks: From to: Remarks:	Flush details: Depth: Type: Return: Colour:
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 <p>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.</p> <p>Log issue: DRAFT Scale: 1:100</p>	<p>Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd</p>
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Borehole Log

Exploratory position reference:

GW8D

Sheet 3 of 4


Borehole formation details:

Type: RO	From: 0.00	To: 65.00	Start date: 04-02-21	End date: 04-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 04-02-21	Remarks:	Location details:	
												mE: 388062.50	
												mN: 422808.59	
												mAOD: 346.56	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
			5.20		Greyish black SHALE (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			303.76	42.80	Grey SANDSTONE with shale bands (WOODHEAD HILL ROCK)							
				22.20								

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck: 59.00	Rose to: 59.00	Casing:	Sealed:	Dia (mm): 150	Depth: 65.00	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue: DRAFT	Scale: 1:100	

Borehole Log

Exploratory position reference:

GW8D

Sheet 4 of 4

Borehole formation details:

Type: RO	From: 0.00	To: 65.00	Start date: 04-02-21	End date: 04-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 04-02-21	Remarks:
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Location details:

mE:	388062.50
mN:	422808.59
mAOD:	346.56
Grid:	OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
*	*	*	281.56	65.00	Grey SANDSTONE with shale bands (WOODHEAD HILL ROCK)						
SP (51)					Borehole ends at 65.00 m (Termination reason: Target depth)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:

Struck: Rose to: Casing: Sealed:

Diameter & casing:


Dia (mm): 150
Depth: 65.00
Casing:

Depth related remarks:

From to: Remarks:

Flush details:

Depth: Type: Return: Colour:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.
Log issue: DRAFT
Scale: 1:100

Project: Tong Quarry
Project No: 21/12
Client: The Bacup Clay Company Ltd

Borehole Log

Exploratory position reference:

GW8S


Sheet 1 of 1

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 04-02-21	End date: 04-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 04-02-21	Remarks:	Location details:	
												mE: 388063.01	
												mN: 422812.94	
												mAOD: 346.27	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing										
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples					
			346.07	0.20	TOPSOIL											
				0.70	(TOPSOIL)											
			345.37	0.90	Gravelly CLAY. Gravel is sandstone											
					(GREAT ARC SANDSTONE)											
					Weathered brown SANDSTONE											
					(GREAT ARC SANDSTONE)											
				4.20												
			341.17	5.10	Strong grey SANDSTONE with weaker bands											
					(GREAT ARC SANDSTONE)											
				2.10												
			339.07	7.20	Weak brown SANDSTONE											
					(GREAT ARC SANDSTONE)											
				1.00												
			338.07	8.20	Light grey SANDSTONE											
					(GREAT ARC SANDSTONE)											
				4.00												
			334.07	12.20	Interbedded grey SHALE and MUDSTONE											
					(PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
				5.60												
			328.47	17.80	Black SHALE											
					(PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)											
				2.20												
			326.27	20.00	Borehole ends at 20.00 m (Termination reason: Target depth)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	to:	Remarks:	Depth:	Type:	Return:	Colour:
				150	20.00					0.00 - 20.00	air/mist		

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue: DRAFT	Scale: 1:100	

Borehole Log

Exploratory position reference:

GW9D

Sheet 1 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 48.00	Start date: 06-02-21	End date: 06-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 06-02-21	Remarks:	Location details:	
												mE: 387824.02	
												mN: 422827.60	
												mAOD: 337.55	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
			337.35	0.20	TOPSOIL (TOPSOIL)								
				1.60	Gravelly CLAY. Gravel is sandstone (GLACIAL TILL)								
			335.75	1.80	Grey MUDSTONE with shale and sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				6.00									
			329.75	7.80	Strong grey fractured SANDSTONE with clayey bands (loosing flush) (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				10.10									
			319.65	17.90	Black and grey banded SHALE with occasional sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								

	Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	48.00						0.00 - 48.00	air/mist			

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW9D

Sheet 2 of 3


Borehole formation details:

Type: RO	From: 0.00	To: 48.00	Start date: 06-02-21	End date: 06-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 06-02-21	Remarks:	Location details:	
												mE: 387824.02	
												mN: 422827.60	
												mAOD: 337.55	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples	
				18.60	Black and grey banded SHALE with occasional sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)							
			301.05	36.50	COAL (LOWER FOOT MINE)							
			299.85	37.70	Fire CLAY (FIRECLAY)							
			299.25	38.30	Grey SANDSTONE with shale bands (WOODHEAD HILL ROCK)							

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	48.00										

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW9D

Sheet 3 of 3

Borehole formation details:

Type: RO	From: 0.00	To: 48.00	Start date: 06-02-21	End date: 06-02-21	Crew: RP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: RP	Logged: 06-02-21	Remarks:
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Location details:

mE:	387824.02
mN:	422827.60
mAOD:	337.55
Grid:	OSGB

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
				9.70	Grey SANDSTONE with shale bands (WOODHEAD HILL ROCK)						
			289.55	48.00	Borehole ends at 48.00 m (Termination reason: Target depth)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
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Groundwater entries:

Struck: 42.00	Rose to: 42.00	Casing: Sealed:
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Diameter & casing:

Dia (mm): 150	Depth: 48.00	Casing:
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Depth related remarks:

From:	to:	Remarks:
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Flush details:

Depth:	Type:	Return:	Colour:
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AGS Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.
Log issue: DRAFT
Scale: 1:100

Project: Tong Quarry
Project No: 21/12
Client: The Bacup Clay Company Ltd

Borehole Log

Exploratory position reference:

GW9S


Sheet 1 of 2

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 06-02-21	End date: 06-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 06-02-21	Remarks:	Location details:	
												mE: 387821.61	
												mN: 422829.87	
												mAOD: 337.41	
												Grid: OSGB	

Backfill/ Instaln	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
			337.21	0.20	TOPSOIL (TOPSOIL)								
				1.60	Gravelly CLAY. Gravel is sandstone (GLACIAL TILL)								
			335.61	1.80	Grey MUDSTONE with shale and sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				6.00									
			329.61	7.80	Strong grey fractured SANDSTONE with clayey bands (loosing flush) (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
				10.10									
			319.51	17.90	Black and grey banded SHALE with occasional sandstone bands (PENNINE LOWER COAL MEASURES - UNDIFFERENTIATED)								
		(51)		2.10									
		SP (51) (Ø)	317.41	20.00									

Groundwater entries:				Diameter & casing:				Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:		From:	to:	Remarks:	Depth:	Type:	Return:	Colour:	
				150	20.00						0.00 - 20.00	air/mist			

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: Tong Quarry Project No: 21/12 Client: The Bacup Clay Company Ltd
Log issue:	DRAFT	
Scale:	1:100	

Borehole Log

Exploratory position reference:

GW9S

Sheet 2 of 2

Borehole formation details:

Type: RO	From: 0.00	To: 20.00	Start date: 06-02-21	End date: 06-02-21	Crew: DP	Plant:	Barrel type: n/a	Drill bit: Tricone	Logger: DP	Logged: 06-02-21	Remarks:
----------	------------	-----------	----------------------	--------------------	----------	--------	------------------	--------------------	------------	------------------	----------

Location details:

mE:	387821.61
mN:	422829.87
mAOD:	337.41
Grid:	OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
					Borehole ends at 20.00 m (Termination reason: Target depth)						

Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks
-------------	--	--	--	--	--	-------	--------	----------------	-------------------	----	-----------------

Groundwater entries:

Struck: Rose to: Casing: Sealed:

Diameter & casing:


Dia (mm): 150 Depth: 20.00 Casing:

Depth related remarks:

From to: Remarks:

Flush details:

Depth: Type: Return: Colour:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.

Log issue: DRAFT
Scale: 1:100

Project: Tong Quarry
Project No: 21/12
Client: The Bacup Clay Company Ltd

APPENDIX 3

WELL INSTALLATION MATERIALS



Applications

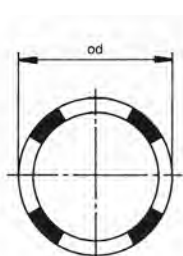
- Ground water monitoring
- Contaminated soil monitoring
- Landfill gas recovery
- Landfill leachate extraction

Features

- HDPE black pipe manufactured to DIN 8074/75
- Available slotted or perforated
- Resistant to aggressive chemicals
- High strength, tough and durable
- Flush threaded joints
- Slot sizes – 0.5, 1.0, 2.0 mm
- Lengths – 1.0, 2.0, 3.0 m

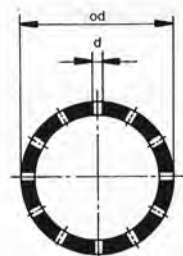
	Series 17/SDR 17.6/PN6			Series 11/SDR11/PN10		
Outside Diameter (OD) mm	Wall Thickness mm	Inside Diameter mm	Weight kg/m	Wall Thickness mm	Inside Diameter (ID) mm	Weight kg/m
63	Not available	Not available	Not available	5.8	51.4	1.05
90	5.1	79.8	1.39	8.2	73.6	2.12
110	6.3	97.4	2.08	10.0	90.0	3.14
125	7.1	110.8	2.66	11.4	102.2	4.08
140	8.0	124.0	3.34	12.8	114.4	5.11
160	9.1	141.8	4.35	14.6	130.8	6.67
180	10.2	159.6	5.48	16.4	147.2	8.42
200	11.4	177.2	6.79	18.2	163.6	10.40
225	12.8	199.4	8.55	20.5	184.0	13.10
250	14.2	221.6	10.60	22.8	204.4	16.20
280	15.9	248.2	13.20	25.5	229.0	20.30
315	17.9	279.2	16.70	28.7	257.6	25.70
355	20.1	314.8	21.20	32.3	290.4	32.60
400	22.7	354.6	26.90	36.4	327.2	41.40
450	25.5	399.0	34.00	40.9	368.2	52.40
500	28.3	443.4	41.90	45.4	409.2	64.60
560	31.7	496.6	52.50	50.8	458.4	81.10
630	35.7	588.8	66.50	57.2	515.6	102.50

Fully Slotted	
OD mm	No. Rows
63-90	2
110 - 140	3
160 - 225	4
250-280	5
315 - 355	6
400 - 450	8



Available slot sizes 2, 3, 4, 6mm; Standard axial slot spacing 15mm

Fully Perforated Pipe	
OD mm	No. Rows
63-90	6-7
110 - 140	8-12
160 - 225	12-18
250-280	18-24
315 - 355	24-30
400 - 450	30



d = Standard perforation 12mm; Standard axial hole spacing 30mm

Open Area Rating of Screens according to Slot Dimension (Based on pipe I.D.)						
OD mm	Rows	Slot 0.5 mm	Slot 1 mm	Slot 1.5 mm	Slot 2 mm	Slot 3 mm
63	2	2.0%	4.0%	6.1%	8.1%	12.1%
90	2	1.7%	3.3%	5.0%	6.6%	9.9%
110	3	2.3%	4.6%	6.9%	9.3%	13.9%
125	3	2.1%	4.3%	6.4%	8.6%	12.8%
140	3	2.0%	4.0%	6.0%	8.0%	12.0%
160	4	2.4%	4.8%	7.2%	9.5%	14.3%
180	4	2.2%	4.5%	6.7%	9.0%	13.4%
200	4	2.1%	4.2%	6.4%	8.5%	12.7%
225	4	2.0%	4.0%	5.9%	7.9%	11.9%
250	5	2.2%	4.5%	6.7%	8.9%	13.4%
280	5	2.0%	4.0%	6.0%	8.0%	11.9%
315	6	2.2%	4.4%	6.7%	8.9%	13.3%
355	6	2.1%	4.1%	6.2%	8.2%	12.4%
400	8	2.5%	5.1%	7.6%	10.2%	15.3%
450	8	2.3%	4.5%	6.8%	9.1%	13.6%

Material			
Property	Standard	Unit	Value PE80
Density	ISO 1183	g/cm	0.94
Melt Flow Index (190/5)	ISO 1133	g/10min	0.9
Tensile stress at yield	ISO 527	MPa	20
Elongation at yield	ISO 527	%	10
Elongation at break	ISO 527	%	Minimum 350
Impact strength (notched)	ISO 179	kJ/m ²	12
Modules of elasticity	ISO 527	MPa	750



Quartz is a natural mineral mainly composed of silica which is then washed, sieved, dried and bagged. It is neutral, slightly angular and has a beige / light grey colour.

Good quality filter media is essential for monitoring and extraction wells in order to retain most of the formation material and to maximise hydraulic response.

A well screen slot size is selected to retain about 90% of the filter media itself. The filter media should be well sorted to assure good porosity and hydraulic conductivity near the screen. Good quality filter media should have a uniformity co-efficient of approximately two and made from predominantly silica.

Applications

- Extraction boreholes
- Groundwater monitoring
- Dewatering
- Piezometers (traditional method)
- Water filtration

Features

- Excellent porosity
- Wide range of sizes
- Washed, dried & bagged
- Bulk density 1.5 T/m³
- Density 2.65 gr/cm³
- 25 Kg bags

Quartz Filter Media Grading	
	0.5 – 1 mm
	1 – 2 mm
	2 – 4 mm
	3 – 6 mm
	4 – 10 mm

Chemical Analysis	
SiO ₂	>96%
CaO	0.83%
K ₂ O	0.86%
Al ₂ O ₃	Max 2%
Fe ₂ O ₃	0.25%
MgO	0.27%
Na ₂ O	0.33%



Bentonite Cement Pellets are used in construction, drilling and tunnelling projects for sealing applications where more strength is required than can be achieved with pure Bentonite alone. This product is used to seal off contaminated land, seal around pipes or tunnels, seal up bore holes, fill voids, protect pipes and cables in conduits or provide a more conductive medium for cable grouting.

Applications

- Borehole sealing
- Borehole decommissioning

Packaging

- 25kg waterproof bags
- 40 bags per pallet

Features

- Pre-formed pellet
- No grouting / mixing machines required
- Simple & easy to use
- Environmentally friendly
- Low permeability

Specifications	
Pellet size	8mm (D) 5-15mm (L)
Specific gravity	2.2 - 2.5g/ml
Bulk density	1.05 - 1.10g/ml
Colour	Light grey
Contained swelling vol	Typ. 25- 50% after 48 hrs
Settling velocity	40cm/sec
Swelling onset	2 minutes

Typical Analysis	
SiO ₂	65.5%
Al ₂ O ₃	11.7
Fe ₂ O ₃	6.36
TiO ₂	0.63
CaO	1.01
MgO	3.35
K ₂ O	1.70
Na ₂ O	4.90
Loss on ignition	5.7

APPENDIX 4

WATER LEVEL & GROUND GAS MONITORING DATA - FEBRUARY 2021

GROUNDWATER AND GROUND GAS MONITORING

C Eccles Brownfield Land Consultancy

Site: Tong Quarry, Bacup

Location	Date	Monitored by	Well Details			Groundwater			Gas											Weather		Serial No.	
			Standpipe diameter (mm)	Ground Level (mOD)	Depth to Base (m bgl)	Water Depth (m bgl)	Water Level (mOD)	Water Sample Taken?	Atmospheric Pressure (mbar)	Atmospheric Pressure Comment	Relative Pressure (mb)	Flow (l/h)	Peak Flow (l/h)	CH ₄ (% v/v)	GSV CH ₄ (l/hr)	CO ₂ (% v/v)	GSV CO ₂ (l/hr)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)	Conditions		Ambient Temp °C
GW1	06/02/21	CE	51	339.30	32.11	31.57	307.73	Y	965	Steady	0.01	0.1	0.1	0.1	0.0001	0.4	0.0004	19.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	339.30	32.11	Dry	<317.19	N	954	Steady	0.01	0.1	0.1	0.1	0.0001	1.2	0.0012	17.8	1	1	Strong Winds & Rain	4 to 6	12417
GW2	06/02/21	CE	51	346.27	39.01	Dry	<307.26	N	966	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	20.2	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.27	39.01	Dry	<307.26	N	954	Steady	0.01	0.1	0.1	0.1	0.0001	1.3	0.0013	14.7	1	1	Strong Winds & Rain	4 to 6	12417
GW3	06/02/21	CE	51	364.24	32.80	28.30	335.94	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.3	0.0003	19.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	364.24	32.80	28.85	335.39	Y	958	Steady	0.01	0.1	0.1	0.1	0.0001	0.3	0.0003	19.6	1	1	Strong Winds & Rain	4 to 6	12417
GW4S	06/02/21	CE	51	346.18	20.30	13.10	333.08	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.7	0.0007	19.3	67	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.24	20.30	13.15	333.09	Y	958	Steady	0.01	0.1	0.1	0.1	0.0001	2.4	0.0024	17.5	1	1	Strong Winds & Rain	4 to 6	12417
GW4D	06/02/21	CE	51	346.38	57.64	8.63	337.75	Y	966	Steady	0.01	0.1	0.1	0.1	0.0001	2.2	0.0022	17.8	12	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.28	57.64	9.47	336.81	Y	958	Steady	0.01	0.1	0.1	0.1	0.0001	3.3	0.0033	12.9	1	1	Strong Winds & Rain	4 to 6	12417
GW5S	06/02/21	CE	51	350.70	20.09	15.82	334.88	Y	964	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	350.70	20.09	15.96	334.74	Y	952	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.1	1	1	Strong Winds & Rain	4 to 6	12417
GW5D	06/02/21	CE	51	350.60	64.13	46.87	303.73	Y	964	Steady	0.01	0.1	0.1	0.1	0.0001	0.6	0.0006	17.9	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	350.60	64.13	44.84	305.76	Y	952	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.0	1	1	Strong Winds & Rain	4 to 6	12417
GW6S	06/02/21	CE	51	357.52	19.83	8.13	349.39	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.3	0.0003	19.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	357.52	19.83	8.20	349.32	Y	954	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	20.0	1	1	Strong Winds & Rain	4 to 6	12417
GW6D	06/02/21	CE	51	358.07	37.53	29.33	328.74	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	358.07	37.53	28.72	329.35	Y	954	Steady	0.01	0.1	0.1	0.1	0.0001	3.0	0.0030	19.1	1	1	Strong Winds & Rain	4 to 6	12417

NOTES:

NM = Not Measured.
(x) = Peak value recorded.
[grey] = Below detection limit.

GSV (l/HR) = [gas concentration (%v/v)] x [gas well flow rate (l/hr)]

GROUNDWATER AND GROUND GAS MONITORING

C Eccles Brownfield Land Consultancy

Site: Tong Quarry, Bacup

Location	Date	Monitored by	Well Details			Groundwater			Gas											Weather		Serial No.	
			Standpipe diameter (mm)	Ground Level (mOD)	Depth to Base (m bgl)	Water Depth (m bgl)	Water Level (mOD)	Water Sample Taken?	Atmospheric Pressure (mbar)	Atmospheric Pressure Comment	Relative Pressure (mb)	Flow (l/h)	Peak Flow (l/h)	CH ₄ (% v/v)	GSV CH ₄ (l/hr)	CO ₂ (% v/v)	GSV CO ₂ (l/hr)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)	Conditions		Ambient Temp °C
GW7S	06/02/21	CE	51	344.36	15.57	15.52	328.84	N	967	Steady	0.01	0.1	0.1	0.1	0.0001	1.5	0.0015	18.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	344.36	17.68	17.54	326.82	N	956	Steady	0.01	0.1	0.1	0.1	0.0001	1.5	0.0015	18.4	1	1	Strong Winds & Rain	4 to 6	12417
GW7D	06/02/21	CE	51	344.56	44.00	1.54	343.02	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	344.56	44.00	4.54	340.02	Y	956	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.1	1	1	Strong Winds & Rain	4 to 6	12417
GW8S	06/02/21	CE	51	346.27	18.35	2.84	343.43	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	19.8	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.27	18.35	1.05	345.22	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.2	1	1	Strong Winds & Rain	4 to 6	12417
GW8D	06/02/21	CE	51	346.56	64.60	57.77	288.79	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.57	64.60	57.65	288.92	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.2	1	1	Strong Winds & Rain	4 to 6	12417
GW9S	06/02/21	CE	51	337.41	21.57	16.56	320.85	Y	966	Steady	0.01	0.1	0.1	0.1	0.0001	0.7	0.0007	18.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	337.41	21.57	15.49	321.92	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.2	1	1	Strong Winds & Rain	4 to 6	12417
GW9D	06/02/21	CE	51	337.55	45.28	39.32	298.23	Y	966	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.9	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	337.55	45.28	39.02	298.53	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	2.2	0.0022	9.7	1	1	Strong Winds & Rain	4 to 6	12417
W1	06/02/21	CE	51	351.45	8.22	8.01	343.44	1 Vial	964	Steady	0.01	0.1	0.1	0.1	0.0001	3.4	0.0034	7.4	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	351.45	8.22	Damp	343.23	N	952	Steady	0.01	0.1	0.1	0.1	0.0001	4.9	0.0049	16.3	1	1	Strong Winds & Rain	4 to 6	12417
W2	06/02/21	CE	51	355.44	12.16	4.39	351.05	Y	964	Steady	-0.62	-5.4	0.1	9.8	-0.5292	1.7	-0.0918	4.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	355.44	12.16	3.70	351.74	Y	952	Steady	0.01	0.1	0.1	4.0	0.0040	17.0	0.0170	0.8	1	1	Strong Winds & Rain	4 to 6	12417
W3	06/02/21	CE	51	349.70	-	Blocked	-	N	964	Steady	0.45	3.8	3.8	0.1	0.0038	0.8	0.0304	9.8	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	349.70	-	Blocked	-	N	954	Steady	0.01	0.1	0.1	0.1	0.0001	1.3	0.0013	7.2	1	1	Strong Winds & Rain	4 to 6	12417

NOTES:

NM = Not Measured.
 (x) = Peak value recorded.
 [grey] = Below detection limit.

GSV (l/HR) = [gas concentration (%v/v)] x [gas well flow rate (l/hr)]

GROUNDWATER AND GROUND GAS MONITORING

C Eccles Brownfield Land Consultancy

Site: Tong Quarry, Bacup

Location	Date	Monitored by	Well Details			Groundwater			Gas										Weather		Serial No.		
			Standpipe diameter (mm)	Ground Level (mOD)	Depth to Base (m bgl)	Water Depth (m bgl)	Water Level (mOD)	Water Sample Taken?	Atmospheric Pressure (mbar)	Atmospheric Pressure Comment	Relative Pressure (mb)	Flow (l/h)	Peak Flow (l/h)	CH ₄ (% v/v)	GSV CH ₄ (l/hr)	CO ₂ (% v/v)	GSV CO ₂ (l/hr)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)		Conditions	Ambient Temp °C
W4	06/02/21	CE	51	354.27	15.23	15.13	339.14	Y	966	Steady	0.01	0.1	0.1	33.2	0.0332	20.1	0.0201	0.1	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	354.27	15.23	15.01	339.26	N	952	Steady	1.30	13.3	13.3	41.9	5.5727	18.5	2.4605	0.1	1	1	Strong Winds & Rain	4 to 6	12417
W6	06/02/21	CE	51	350.48	12.15	6.37	344.11	Y	Pipe Found - Disconnected on Arrival - Now Repaired - Take Readings on 20/02/21										Snow Showers	1 to 3	12417		
	20/02/21	CE	51	350.48	12.15	7.08	343.40	Y	953	Steady	2.70	25.5	25.5	79.6	20.2980	15.4	3.9270	0.1	1	1	Strong Winds & Rain	4 to 6	12417
Below Detection Limit																							
Bung and Cover Removed - See Photo			Flow and DP Falls Rapidly - 1minute - remains steady																				

NOTES:

NM = Not Measured.
 (x) = Peak value recorded.
 [grey] = Below detection limit.

$$GSV (l/HR) = [\text{gas concentration (\%v/v)}] \times [\text{gas well flow rate (l/hr)}]$$

TEST DATE AND CONDITIONS		
Date	16/07/2020	
Atmospheric Pressure	1002	mB
Ambient Temperature	21.8	°C
Enviroics Serial No.	5089	

**GFM436 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD	
Unit 4, Fairfield Court	
Seven Stars Estate	
Wheler Rd	
Coventry	
CV3 4LJ	
Tel 02476303311	Fax 02476307711



Customer	
Certificate Number	121854
Order Number	326101

Serial Number	12417
Software Version	G436-00.0027/0009

Recalibration DUE Date
16/07/21

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	400	Accept > 200 cc/min	Pump Flow @ -200mB	200	Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
		60 <i>Accept ±3.0</i>	60	39.8 <i>Accept ±3.0</i>	40	20.9 <i>Accept ±0.5</i>
	5 <i>Accept ±0.3</i>	5	4.9 <i>Accept ±0.3</i>	5	6 <i>Accept ±0.3</i>	6
Zero Reading 100% N2	0 <i>Accept ±0.0</i>	0	0 <i>Accept ±0.0</i>	0	0 <i>Accept ±0.1</i>	0

Optional Gas Checks						
Gas Type	Applied Gas & Range	Concentration Tested @ (ppm)	Instrument Readings (ppm)			
			Zero Reading		Instrument Gas Reading	
H2S	5000	1500	0	<i>Accept ±0.0</i>	1500	<i>Accept ±5.0</i>
CO	2000	1000	0	<i>Accept ±0.0</i>	1000	<i>Accept ±5.0</i>
Hexane	2.0%	2.0%	0	<i>Accept ±0.0</i>	1.99	<i>Accept ±10.0</i>

NOTES:

NM = Not Measured.
(x) = Peak value recorded.
[grey] = Below detection limit.

$$GSV (l/HR) = [\text{gas concentration (\%v/v)}] \times [\text{gas well flow rate (l/hr)}]$$

Tong Quarry, Bacup																
Groundwater Monitoring - On-Site Water Testing										Round 1 & 2 - 2021			C Eccles Brownfield Land Consultancy			
Location	Date	Time	Temp [°C]	pH	mV [pH]	ORP [mV]	EC [µS/cm]	EC Abs [µS/cm]	RES [KOhm-cm]	TDS [ppm]	Salinity [psu]	Sigma T [sT]	Press [psi]	D.O. [%]	D.O. [ppm]	Remarks
GW1	06/02/2021	10:41:16	6.49	7.67	-15.0	8.8	1496	970	0.7	748	0.76	0.5	13.709	41.9	4.76	
GW1	20/02/2021															Insufficient water to sample
GW3	06/02/2021	13:45:06	7.66	7.88	-26.6	-78.1	360	242	2.8	180	0.17	0.0	13.634	33.2	3.66	
GW3	20/02/2021		10.07	6.63		229.3	289	218	3.5	144	0.14	-	991.0	37.5	3.94	
GW4S	06/02/2021	11:11:03	8.03	7.03	20.0	-75.7	1064	721	0.9	532	0.53	0.3	13.627	33.0	3.60	
GW4S	20/02/2021		9.96	6.45		315.5	854	642	1.2	427	0.42	-	991.1	15.5	1.63	
GW4D	06/02/2021	11:14:39	5.67	6.89	27.4	-16.4	1077	681	0.9	538	0.54	0.4	13.639	45.4	5.25	
GW4D	20/02/2021		10.20	6.71		261.3	2544	1878	0.4	1272	1.32	-	991.1	16.3	1.74	
GW5S	06/02/2021	11:47:09	5.68	7.75	-19.4	-11.3	6	4	167.0	30	1.77E-03	0.0	13.622	45.5	5.29	
GW5S	20/02/2021		9.65	6.88		284.4	279	209	3.6	140	1.30E-01	-	989.900	71.2	7.54	
GW5D	06/02/2021	11:49:39	7.74	7.44	-2.9	0.5	643	432	1.6	321	0.31	0.1	13.651	40.2	4.43	
GW6D	20/02/2021		9.78	7.22		212.3	620	464	1.6	310	0.30	-	989.700	46.5	4.90	
GW6S	06/02/2021	14:14:33	6.51	7.58	-10.0	-57.1	251	163	4.0	126	0.12	0.0	13.784	32.1	3.70	
GW6S	20/02/2021		9.28	6.43		241.5	210	155	4.8	105	0.10	-	990.200	32.7	3.50	
GW6D	06/02/2021	14:29:06	7.09	7.47	-4.2	-20.7	559	369	1.8	280	0.27	0.1	13.795	32.8	3.71	
GW6D	20/02/2021		10.06	7.09		219.0	185	136	5.4	93	0.09	-	990.2	50.3	5.41	
GW7D	07/02/2021	09:53:27	4.32	8.56	-62.1	53.4	76	46	13.2	38	3.52E-02	0.0	13.815	40.6	4.96	
GW7D	20/02/2021		10.80	5.64		348.3	75	54	13.3	37	3.00E-02	-	990.900	37.8	4.09	
GW8S	07/02/2021	10:22:52	6.93	7.93	-28.9	135.4	316	208	3.2	158	0.15	0.0	13.811	37.5	4.27	
GW8S	20/02/2021		9.35	6.02		316.8	127	978	7.9	64	0.06	-	991.000	47.2	4.94	

Tong Quarry, Bacup																
Groundwater Monitoring - On-Site Water Testing										Round 1 & 2 - 2021			C Eccles Brownfield Land Consultancy			
Location	Date	Time	Temp [°C]	pH	mV [pH]	ORP [mV]	EC [µS/cm]	EC Abs [µS/cm]	RES [KOhm-cm]	TDS [ppm]	Salinity [psu]	Sigma T [sT]	Press [psi]	D.O. [%]	D.O. [ppm]	Remarks
GW8D	07/02/2021	10:41:36	5.21	7.90	-27.2	-50.6	352	220	2.8	176	0.17	0.0	13.811	28.9	3.44	
GW8D	20/02/2021		10.75	6.03		351.0	139.0	104	7	70.0	0	-	991.1	47.000	5.0	
GW9S	07/02/2021	11:32:40	7.02	7.57	-9.6	-336.1	517	341	1.9	259	0.25	0.1	13.806	30.5	3.47	
GW9S	20/02/2021		10.00	6.39		294.0	304	223	3.3	152	0.15	-	990.7	33.4	3.60	
GW9D	07/02/2021	12:21:31	7.54	7.22	9.5	-218.4	583	390	1.7	291	0.28	0.1	13.813	32.9	3.70	
GW9D	20/02/2021		10.45	6.53		313.5	536	388	1.9	268	0.26	-	990.9	49.6	5.40	
W2	06/02/2021	11:49:52	7.67	7.43	-2.2	1.6	652	437	1.5	326	0.32	0.1	13.646	42.6	4.70	
W2	20/02/2021		9.19	7.07		236.9	481	355	2.1	240	0.23	-	991.100	18.7	2.01	
W4	06/02/2021	12:31:09	4.38	7.82	-22.6	44.6	519	315	1.9	259	0.25	0.2	13.620	31.8	3.82	
W4	20/02/2021															Insufficient water to sample
W6	06/02/2021	12:57:08	7.20	7.24	8.1	-4.6	1367	905	0.7	684	0.69	0.4	13.627	33.8	3.76	
W6	20/02/2021		9.44	6.92		249.4	1869	1352	0.5	935	0.96	-	991.0	21.9	2.37	
Spr NE	06/02/2021	14:40:35	1.58	8.40	-53.2	8.7	90	50	11.1	45	4.20E-02	0.0	13.816	41.9	5.51	
Spr NE	20/02/2021		4.34	6.71		295.4	44	33	22.7	22	2.00E-02	-	990.600	73.9	7.96	
Spr N	06/02/2021	14:41:39	2.17	8.48	-57.5	-1.3	87	50	11.5	44	4.06E-02	0.0	13.834	44.4	5.75	
Spr N	20/02/2021		4.56	7.46		269.9	89	67	11.2	45	4.00E-02	-	990.500	77.4	8.23	
Spr NW	06/02/2021	15:22:31	1.19	8.24	-44.5	-59.2	14	7	71.0	7	5.10E-03	0.0	13.815	41.7	5.54	
Spr NW	20/02/2021		4.23	7.20		283.6	87	63	11.5	43	4.00E-02	-	990.600	77.3	8.48	

All testing carried out using a Hanna Instruments HI98194 Multiparameter Meter. All times are GMT.

Tong Quarry, Bacup

21/02/2021

Rising Head Tests

C S Eccles Brownfield Land Consultancy

Location: GW4S	
Note: 30 litres removed	
Time elapsed (mins)	Dip
0	13.68*
2	13.48
4	13.44
6	13.37
9	13.30
15	13.26
20	13.23
GW dip before test = 13.15 bgl	
* couldn't get pump any deeper	

Location: GW6S	
Note: 50 litres removed	
Time elapsed (mins)	Dip
0	13.07
1	13.04
2	13.00
3	12.97
4	12.93
5	12.90
8	12.82
11	12.68
17	12.52
21	12.42
28	12.20
GW dip before test = 8.52 bgl	

Location: GW7D	
Note: 30 litres removed	
Time elapsed (mins)	Dip
0	5.82
2	5.46
4	5.07
6	4.70
9	4.24
15	4.11
20	4.04
GW dip before test = 4.54 bgl	

Location: GW8S	
Note: 120 litres removed	
Time elapsed (mins)	Dip
0	9.09
0.5	8.93
1	8.81
1.5	8.75
2	8.66
3	8.51
4	8.36
5	8.19
6	-
7	7.85
8	7.73
9	7.57
10	7.42
12	7.08
14	6.83
16	6.51
18	6.21
20	5.77
53	3.07
137	1.69
GW dip before test = 0.90 bgl	

All wells pumped with an MP1 submersible electric pump.

APPENDIX 5

LABORATORY TEST DATA – ROUND 1 - FEBRUARY 2021



Final Report

Report No.: 21-03718-1
Initial Date of Issue: 16-Feb-2021
Client: Mr C S Eccles
Client Address: 55 St Catherine Drive
Hartford
Cheshire
CW8 2FE
Contact(s): Chris Eccles
Project: 192.01 Tong Quarry
Quotation No.: Q21-22639
Date Received: 09-Feb-2021
Order No.: 192.01
Date Instructed: 09-Feb-2021
No. of Samples: 20
Turnaround (Wkdays): 5
Results Due: 15-Feb-2021
Date Approved: 16-Feb-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.: 21-03718											
Quotation No.: Q21-22639		Chemtest Sample ID.: 1138186											
Sample Location:		GW1	GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D			
Sample Type:		WATER											
Date Sampled:		06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	07-Feb-2021		
Determinand	Accred.	SOP	Units	LOD									
pH	U	1010		N/A	8.0	7.9	6.9	6.9	7.5	7.9	7.5	8.0	8.1
Electrical Conductivity	U	1020	µS/cm	1.0	1400	410	910	1700	400	630	240	470	120
Alkalinity (Total)	U	1220	mg/l	10	660	140	290	320	96	160	80	230	40
Chloride	U	1220	mg/l	1.0	34	9.6	120	340	23	22	8.6	12	3.6
Fluoride	U	1220	mg/l	0.050	0.21	2.1	7.0	4.3	1.2	0.43	3.7	0.25	0.18
Ammoniacal Nitrogen	U	1220	mg/l	0.050	2.7	0.58	2.3	3.9	0.23	0.28	0.16	0.24	0.070
Sulphate	U	1220	mg/l	1.0	140	55	44	38	57	130	44	34	3.4
Cyanide (Total)	U	1300	mg/l	0.050	0.15	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1415	mg/l	5.0	80	55	110	120	40	74	17	38	16
Potassium	U	1415	mg/l	0.50	6.4	3.1	11	8.8	2.1	2.9	2.5	3.4	1.1
Magnesium	U	1415	mg/l	0.50	16	11	23	23	8.9	16	6.9	9.9	2.7
Sodium	U	1415	mg/l	0.50	280	46	56	140	19	12	7.6	35	9.7
Total Hardness as CaCO3	U	1270	mg/l	15	270	180	360	380	140	250	71	140	51
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aluminium (Dissolved)	N	1450	µg/l	10	200	12	34	< 10	< 10	< 10	< 10	< 10	900
Arsenic (Dissolved)	U	1450	µg/l	1.0	3.1	< 1.0	3.0	2.0	< 1.0	< 1.0	6.2	< 1.0	< 1.0
Boron (Dissolved)	U	1450	µg/l	20	73	23	72	81	20	27	20	27	< 20
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	2.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0	7.3	1.6	2.0	1.5	< 1.0	< 1.0	< 1.0	1.1	15
Manganese (Dissolved)	U	1450	µg/l	1.0	650	940	4800	1900	610	910	410	550	63
Nickel (Dissolved)	U	1450	µg/l	1.0	12	18	55	63	7.2	3.7	7.8	2.0	5.4
Lead (Dissolved)	U	1450	µg/l	1.0	2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	1.9	< 1.0	3.0	4.5	1.3	1.0	< 1.0	10	1.0
Zinc (Dissolved)	U	1450	µg/l	1.0	22	45	68	50	23	42	39	5.3	29
Iron (Dissolved)	N	1450	mg/l	0.020	0.89	6.6	42	12	1.7	0.41	1.9	0.36	0.39
Total Organic Carbon	U	1610	mg/l	2.0	3.7	3.5	13	11	2.6	3.2	2.3	< 2.0	16
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138186	1138187	1138188	1138189	1138190	1138191	1138192	1138193	1138194	1138194
		Sample Location:		GW1	GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
		Date Sampled:		06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	07-Feb-2021
Determinand	Accred.	SOP	Units	LOD									
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138186	1138187	1138188	1138189	1138190	1138191	1138192	1138193	1138194	1138194
Sample Location:		GW1	GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Date Sampled:		06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	07-Feb-2021	
Determinand	Accred.	SOP	Units	LOD									
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138186	1138187	1138188	1138189	1138190	1138191	1138192	1138193	1138194	1138194
Sample Location:		GW1	GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Date Sampled:		06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	07-Feb-2021
Determinand	Accred.	SOP	Units	LOD									
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles	Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639	Chemtest Sample ID.:		1138186	1138187	1138188	1138189	1138190	1138191	1138192	1138193	1138194	1138194
	Sample Location:		GW1	GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW7D
	Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Date Sampled:		06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	07-Feb-2021
Determinand	Accred.	SOP	Units	LOD								
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138195	1138196	1138197	1138198	1138199	1138200	1138201	1138202	1138203	
		Sample Location:		GW8S	GW8D	GW9S	GW9D	W1	W2	W4	W6	Spr NW	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
		Date Sampled:		07-Feb-2020	07-Feb-2021	07-Feb-2021	07-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD									
pH	U	1010		N/A	[B] 8.0	8.1	7.5	7.6	7.9	8.1	7.2	8.0	
Electrical Conductivity	U	1020	µS/cm	1.0	[B] 360	370	500	570	490	120	1800	170	
Alkalinity (Total)	U	1220	mg/l	10	[B] 150	240	63	100	170	23	560	34	
Chloride	U	1220	mg/l	1.0	[B] 6.8	17	30	45	6.1	2.2	200	8.8	
Fluoride	U	1220	mg/l	0.050	[B] 0.16	0.16	8.2	0.74	0.19	0.12	0.89	0.18	
Ammoniacal Nitrogen	U	1220	mg/l	0.050	[B] 1.0	0.46	0.33	0.26	0.47	0.068	4.3	0.15	
Sulphate	U	1220	mg/l	1.0	[B] 23	46	150	110	98	26	210	17	
Cyanide (Total)	U	1300	mg/l	0.050	[B] < 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	
Calcium	U	1415	mg/l	5.0	[B] 47	63	29	51	68	49	320	37	
Potassium	U	1415	mg/l	0.50	[B] 6.9	4.0	6.9	5.0	3.2	2.3	15	2.5	
Magnesium	U	1415	mg/l	0.50	[B] 7.3	11	15	16	16	9.6	38	4.2	
Sodium	U	1415	mg/l	0.50	[B] 6.3	18	28	21	5.8	5.3	130	13	
Total Hardness as CaCO3	U	1270	mg/l	15	[B] 150	200	130	190	240	160	960	110	
Mercury (Dissolved)	U	1455	µg/l	0.05	[B] < 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Aluminium (Dissolved)	N	1450	µg/l	10	[B] < 10	< 10	< 10	< 10	70	220	160	95	
Arsenic (Dissolved)	U	1450	µg/l	1.0	[B] < 1.0	2.2	< 1.0	< 1.0	1.7	1.3	2.5	< 1.0	
Boron (Dissolved)	U	1450	µg/l	20	[B] < 20	40	720	360	61	40	590	22	
Cadmium (Dissolved)	U	1450	µg/l	0.080	[B] < 0.080	< 0.080	< 0.080	< 0.080	< 0.080	0.089	< 0.080	< 0.080	
Chromium (Dissolved)	U	1450	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.0	< 1.0	
Copper (Dissolved)	U	1450	µg/l	1.0	[B] < 1.0	1.0	< 1.0	< 1.0	4.8	4.2	2.6	3.7	
Manganese (Dissolved)	U	1450	µg/l	1.0	[B] 190	400	1200	800	810	140	2700	42	
Nickel (Dissolved)	U	1450	µg/l	1.0	[B] 6.1	4.7	45	19	3.6	29	26	3.3	
Lead (Dissolved)	U	1450	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	< 1.0	1.8	10	6.8	< 1.0	
Selenium (Dissolved)	U	1450	µg/l	1.0	[B] < 1.0	2.3	< 1.0	< 1.0	< 1.0	< 1.0	6.6	< 1.0	
Zinc (Dissolved)	U	1450	µg/l	1.0	[B] 3.0	4.7	23	22	7.7	17	22	35	
Iron (Dissolved)	N	1450	mg/l	0.020	0.19	0.30	8.2	1.1	0.51	2.0	6.9	0.13	
Total Organic Carbon	U	1610	mg/l	2.0	3.7	3.4	2.7	2.5	3.4	4.0	27	5.3	
Total TPH >C10-C40	U	1670	µg/l	10	[B] < 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Naphthalene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Acenaphthylene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Acenaphthene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Fluorene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Anthracene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Fluoranthene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Pyrene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[a]anthracene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Chrysene	N	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[b]fluoranthene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[k]fluoranthene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[a]pyrene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138195	1138196	1138197	1138198	1138199	1138200	1138201	1138202	1138203	
Sample Location:		GW8S	GW8D	GW9S	GW9D	W1	W2	W4	W6	Spr NW			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
Date Sampled:		07-Feb-2020	07-Feb-2021	07-Feb-2021	07-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD									
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	[B] < 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	[B] < 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	[B] < 5.0	< 5.0	< 5.0	[C] < 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	[B] < 2.0	< 2.0	< 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	[B] < 5.0	< 5.0	< 5.0	[C] < 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	[B] < 2.0	< 2.0	< 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	[B] < 10	< 10	< 10	[C] < 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	[B] < 5.0	< 5.0	< 5.0	[C] < 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	[B] < 10	< 10	< 10	[C] < 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	[B] 6.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	[B] < 10	< 10	< 10	[C] < 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	[B] < 10	< 10	< 10	[C] < 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	[B] < 2.0	< 2.0	< 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	[B] < 10	< 10	< 10	[C] < 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	[B] < 5.0	< 5.0	< 5.0	[C] < 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	[B] < 2.0	< 2.0	< 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138195	1138196	1138197	1138198	1138199	1138200	1138201	1138202	1138203	
		Sample Location:		GW8S	GW8D	GW9S	GW9D	W1	W2	W4	W6	Spr NW	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
		Date Sampled:		07-Feb-2020	07-Feb-2021	07-Feb-2021	07-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD									
Bromobenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	[B] < 50	< 50	< 50	[C] < 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	[B] < 50	< 50	< 50	[C] < 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	[B] < 2.0	< 2.0	< 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	[B] < 1.0	< 1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138195	1138196	1138197	1138198	1138199	1138200	1138201	1138202	1138203
Sample Location:		GW8S	GW8D	GW9S	GW9D	W1	W2	W4	W6	Spr NW		
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Date Sampled:		07-Feb-2020	07-Feb-2021	07-Feb-2021	07-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021
Determinand	Accred.	SOP	Units	LOD								
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles	Chemtest Job No.:		21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718	21-03718
Quotation No.: Q21-22639	Chemtest Sample ID.:		1138195	1138196	1138197	1138198	1138199	1138200	1138201	1138202	1138203
	Sample Location:		GW8S	GW8D	GW9S	GW9D	W1	W2	W4	W6	Spr NW
	Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Date Sampled:		07-Feb-2020	07-Feb-2021	07-Feb-2021	07-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021	06-Feb-2021
Determinand	Accred.	SOP	Units	LOD							
Total Phenols	U	1920	mg/l	0.030	[B] < 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138204	1138205	
		Sample Location:		Spr N	Spr NE	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD		
pH	U	1010		N/A	7.8	7.8
Electrical Conductivity	U	1020	µS/cm	1.0	96	87
Alkalinity (Total)	U	1220	mg/l	10	< 10	< 10
Chloride	U	1220	mg/l	1.0	4.9	4.0
Fluoride	U	1220	mg/l	0.050	0.22	0.21
Ammoniacal Nitrogen	U	1220	mg/l	0.050	0.070	< 0.050
Sulphate	U	1220	mg/l	1.0	23	21
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium	U	1415	mg/l	5.0	11	7.6
Potassium	U	1415	mg/l	0.50	1.4	1.1
Magnesium	U	1415	mg/l	0.50	1.7	1.2
Sodium	U	1415	mg/l	0.50	3.4	2.4
Total Hardness as CaCO3	U	1270	mg/l	15	35	24
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05
Aluminium (Dissolved)	N	1450	µg/l	10	480	490
Arsenic (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Boron (Dissolved)	U	1450	µg/l	20	< 20	< 20
Cadmium (Dissolved)	U	1450	µg/l	0.080	0.11	0.12
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0	5.9	6.1
Manganese (Dissolved)	U	1450	µg/l	1.0	79	76
Nickel (Dissolved)	U	1450	µg/l	1.0	6.8	6.4
Lead (Dissolved)	U	1450	µg/l	1.0	1.1	1.2
Selenium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Zinc (Dissolved)	U	1450	µg/l	1.0	19	19
Iron (Dissolved)	N	1450	mg/l	0.020	0.42	0.42
Total Organic Carbon	U	1610	mg/l	2.0	8.9	8.5
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138204	1138205	
		Sample Location:		Spr N	Spr NE	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD		
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138204	1138205	
		Sample Location:		Spr N	Spr NE	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD		
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles		Chemtest Job No.:		21-03718	21-03718	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1138204	1138205	
		Sample Location:		Spr N	Spr NE	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Feb-2021	06-Feb-2021	
Determinand	Accred.	SOP	Units	LOD		
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry

Client: Mr C S Eccles	Chemtest Job No.:		21-03718	21-03718		
Quotation No.: Q21-22639	Chemtest Sample ID.:		1138204	1138205		
	Sample Location:		Spr N	Spr NE		
	Sample Type:		WATER	WATER		
	Date Sampled:		06-Feb-2021	06-Feb-2021		
Determinand	Accred.	SOP	Units	LOD		
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1138195			GW8S	07-Feb-2020	B	Coloured Winchester 1000ml
1138195			GW8S	07-Feb-2020	B	EPA Vial 40ml
1138195			GW8S	07-Feb-2020	B	Plastic Bottle 1000ml
1138198			GW9D	07-Feb-2021	C	Coloured Winchester 1000ml
1138198			GW9D	07-Feb-2021	C	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C ₆ -C ₄₀); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

APPENDIX 6

LABORATORY TEST DATA – ROUND 2 - FEBRUARY 2021



Final Report

Report No.: 21-05451-1
Initial Date of Issue: 26-Feb-2021
Client: Mr C S Eccles
Client Address: 55 St Catherine Drive
Hartford
Cheshire
CW8 2FE
Contact(s): Chris Eccles
Project: 192.01 Tong Quarry, Bacup
Quotation No.: Q21-22639 **Date Received:** 23-Feb-2021
Order No.: 192.01 **Date Instructed:** 23-Feb-2021
No. of Samples: 17
Turnaround (Wkdays): 5 **Results Due:** 01-Mar-2021
Date Approved: 26-Feb-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.: 21-05451											
Quotation No.: Q21-22639		Chemtest Sample ID.: 1146563											
Sample Location:		GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S			
Sample Type:		WATER											
Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021			
Determinand	Accred.	SOP	Units	LOD									
pH	U	1010		N/A	7.1	6.7	6.8	7.2	7.1	6.9	7.0	6.8	6.5
Electrical Conductivity	U	1020	µS/cm	1.0	320	960	2700	570	460	380	470	140	140
Alkalinity (Total)	U	1220	mg/l	10	120	350	500	110	120	71	180	42	32
Chloride	U	1220	mg/l	1.0	15	130	630	74	23	10	13	5.7	9.8
Fluoride	U	1220	mg/l	0.050	0.81	3.9	0.48	0.20	0.16	3.5	0.39	0.16	0.16
Ammoniacal Nitrogen	U	1220	mg/l	0.050	1.5	3.6	6.8	0.86	0.23	0.20	0.20	0.12	0.18
Sulphate	U	1220	mg/l	1.0	53	31	40	66	100	49	45	20	14
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1415	mg/l	5.0	39	86	250	33	61	17	52	7.7	16
Potassium	U	1415	mg/l	0.50	1.9	7.2	21	3.7	12	2.3	3.3	2.0	2.4
Magnesium	U	1415	mg/l	0.50	8.6	31	310	14	10	6.4	27	9.6	16
Sodium	U	1415	mg/l	0.50	6.3	41	310	14	10	6.4	12	6.8	4.1
Total Hardness as CaCO3	U	1270	mg/l	15	130	340	1900	140	190	69	240	59	110
Aluminium (Dissolved)	N	1455	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	15	28
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20	0.52	0.72	< 0.20	< 0.20	0.23	< 0.20	0.32	0.50
Boron (Dissolved)	U	1455	µg/l	10.0	35	79	96	19	15	13	15	< 10	< 10
Cadmium (Dissolved)	U	1455	µg/l	0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (Dissolved)	U	1455	µg/l	0.50	76	77	75	83	83	86	90	83	83
Copper (Dissolved)	U	1455	µg/l	0.50	2.1	2.4	2.7	2.4	2.4	2.4	2.4	7.2	6.1
Manganese (Dissolved)	U	1455	µg/l	0.50	2500	4400	4100	1600	1100	2800	480	200	430
Nickel (Dissolved)	U	1455	µg/l	0.50	44	55	39	45	44	40	42	41	44
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	0.57	0.62	< 0.50	< 0.50	< 0.50	< 0.50	0.81	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	1.0	14	18	10	6.2	9.2	18	5.6	20	43
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Iron (Dissolved)	N	1455	mg/l	0.005	0.57	0.42	0.31	0.33	0.33	5.4	0.40	0.37	0.40
Total Organic Carbon	U	1610	mg/l	2.0	5.0	17	13	5.1	5.2	4.6	4.6	7.8	28
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639		Chemtest Sample ID.:		1146563	1146564	1146565	1146566	1146567	1146568	1146569	1146570	1146571	
Sample Location:		GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021
Determinand	Accred.	SOP	Units	LOD									
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.: 21-05451 21-05451 21-05451 21-05451 21-05451 21-05451 21-05451 21-05451 21-05451 21-05451 21-05451											
Quotation No.: Q21-22639		Chemtest Sample ID.: 1146563 1146564 1146565 1146566 1146567 1146568 1146569 1146570 1146571											
Sample Location:		GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER			
Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021
Determinand	Accred.	SOP	Units	LOD									
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles	Chemtest Job No.:				21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639	Chemtest Sample ID.:				1146563	1146564	1146565	1146566	1146567	1146568	1146569	1146570	1146571
	Sample Location:				GW3	GW4S	GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S
	Sample Type:				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Date Sampled:				20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021
Determinand	Accred.	SOP	Units	LOD									
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639		Chemtest Sample ID.:		1146572	1146573	1146574	1146575	1146576	1146577	1146578	1146579	
		Sample Location:		GW8D	GW9S	GW9D	W2	W6	Spr NW	Spr N	Spr NE	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
		Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	
Determinand	Accred.	SOP	Units	LOD								
pH	U	1010		N/A	6.4	6.6	6.6	6.9	6.8	7.5	7.4	7.3
Electrical Conductivity	U	1020	µS/cm	1.0	150	440	590	490	2000	170	130	97
Alkalinity (Total)	U	1220	mg/l	10	35	72	110	150	680	80	18	19
Chloride	U	1220	mg/l	1.0	8.9	16	57	12	250	27	8.0	8.6
Fluoride	U	1220	mg/l	0.050	0.14	0.17	0.31	0.23	0.33	0.28	0.29	0.29
Ammoniacal Nitrogen	U	1220	mg/l	0.050	0.21	0.12	0.22	0.40	5.0	0.53	0.11	0.15
Sulphate	U	1220	mg/l	1.0	16	130	130	110	210	41	23	26
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1415	mg/l	5.0	17	48	56	62	310	11	9.0	9.7
Potassium	U	1415	mg/l	0.50	1.8	3.2	4.2	3.0	13	3.4	2.1	1.6
Magnesium	U	1415	mg/l	0.50	8.7	17	1.5	2.7	3.6	20	21	1.7
Sodium	U	1415	mg/l	0.50	5.1	24	23	5.6	110	4.2	3.2	3.0
Total Hardness as CaCO3	U	1270	mg/l	15	78	190	150	170	790	110	110	31
Aluminium (Dissolved)	N	1455	µg/l	5.0	5.0	< 5.0	< 5.0	< 5.0	< 5.0	360	410	400
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.25	0.21	< 0.20	0.38	1.6	0.72	0.66	0.69
Boron (Dissolved)	U	1455	µg/l	10.0	< 10	68	390	57	530	28	12	11
Cadmium (Dissolved)	U	1455	µg/l	0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	0.10
Chromium (Dissolved)	U	1455	µg/l	0.50	79	80	85	76	85	84	69	80
Copper (Dissolved)	U	1455	µg/l	0.50	4.2	3.0	2.7	3.1	2.4	8.0	7.8	8.3
Manganese (Dissolved)	U	1455	µg/l	0.50	860	950	2200	460	1800	81	80	85
Nickel (Dissolved)	U	1455	µg/l	0.50	42	45	60	35	44	45	36	43
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.0	1.0	0.72
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.59	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	1.0	33	23	20	1.6	1.8	41	13	12
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.012
Iron (Dissolved)	N	1455	mg/l	0.005	0.32	0.32	0.34	0.30	0.37	0.71	0.70	0.68
Total Organic Carbon	U	1610	mg/l	2.0	25	14	16	13	50	20	29	30
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639		Chemtest Sample ID.:		1146572	1146573	1146574	1146575	1146576	1146577	1146578	1146579	
		Sample Location:		GW8D	GW9S	GW9D	W2	W6	Spr NW	Spr N	Spr NE	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
		Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	
Determinand	Accred.	SOP	Units	LOD								
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639		Chemtest Sample ID.:		1146572	1146573	1146574	1146575	1146576	1146577	1146578	1146579	
		Sample Location:		GW8D	GW9S	GW9D	W2	W6	Spr NW	Spr N	Spr NE	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	
		Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	
Determinand	Accred.	SOP	Units	LOD								
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639		Chemtest Sample ID.:		1146572	1146573	1146574	1146575	1146576	1146577	1146578	1146579	
Sample Location:		GW8D	GW9S	GW9D	W2	W6	Spr NW	Spr N	Spr NE			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER			
Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021
Determinand	Accred.	SOP	Units	LOD								
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451	21-05451
Quotation No.: Q21-22639		Chemtest Sample ID.:		1146572	1146573	1146574	1146575	1146576	1146577	1146578	1146579
		Sample Location:		GW8D	GW9S	GW9D	W2	W6	Spr NW	Spr N	Spr NE
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Date Sampled:		20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021	20-Feb-2021
Determinand	Accred.	SOP	Units	LOD							
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C ₆ -C ₄₀); optional carbon banding, e.g. 3-band - GRO, DRO & LRO	Pentane extraction / GC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

END OF REPORT



APPENDIX C
Monitoring Round Three Report

Tong Quarry Bacup - Monitoring Report Round 3, 2021



**TONG QUARRY, TONG LANE, BACUP,
LANCASHIRE, OL13 9XA
MONITORING REPORT ROUND 3, 2021**

FOR

THE BACUP CLAY COMPANY LTD

C. S. Eccles - Brownfield Land Consultancy

Contaminated Land Assessments, Options Appraisals, Remediation Strategy & Verification,
Geotechnical Design, Earthworks & Materials Reuse, Waste Assessments & Classification, Ecology

Tong Quarry Bacup - Monitoring Report Round 3, 2021

DOCUMENT CONTROL SHEET

Report Title: Tong Quarry, Tong Lane, Bacup, Lancashire,
OL13 9XA - Monitoring Report Round 3, 2021

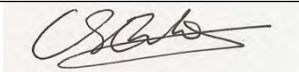
Client: The Bacup Clay Company Limited

Report Reference: 192.03.02

Report Status: For Use

Version: 2.0

Report Date: 19th March 2021

Written by: Chris Eccles, BEng, MSc, DIC, FGS, CGeol, CSci, CEnv, SiLC, UK RoGEP Adviser CL:AIRE DoWCoP QP 020, NQMS Suitably Qualified Person	
	19 th March 2021

This report has been prepared for The Bacup Clay Company Limited by C S Eccles Brownfield Consultancy with reasonable skill, care and diligence and taking account of the contract terms and conditions, manpower and resources devoted to it in agreement with the client. C S Eccles Brownfield Land Consultancy disclaims any responsibility to the client and others in respect of any matters outside the scope of the above.

The report is only valid when it is used in its entirety.

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Tong Quarry Bacup - Monitoring Report Round 3, 2021

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3 ROUND 3 MONITORING & TESTING.....3

APPENDICES

1 DRAWINGS
 Borehole Location Plan - AAE Plan 213036/BH/D/001 Rev A

2 WATER LEVEL & GROUND GAS MONITORING DATA - 6 MARCH 2021

3 PHOTOGRAPHS - DAISY HALL SPRING & MINE ADIT SPRING

4 LABORATORY TEST DATA – ROUND 3 - MARCH 2021

Tong Quarry Bacup - Monitoring Report Round 3, 2021

1 INTRODUCTION

1.1 The Bacup Clay Company Ltd (the quarry owners) commissioned a monitoring of a series of groundwater monitoring wells and surface water locations in accordance with the existing Environmental Permit and also to support a Permit application for the proposed extension of Tong Quarry, Bacup, Lancashire. The quarry is to be restored by means of infill with inert construction demolition and excavation waste.

1.2 Lancashire County Council has granted Planning Permission to extend the quarry (Application number is LCC/2020/0018). The location is presented in Figure 1 below.

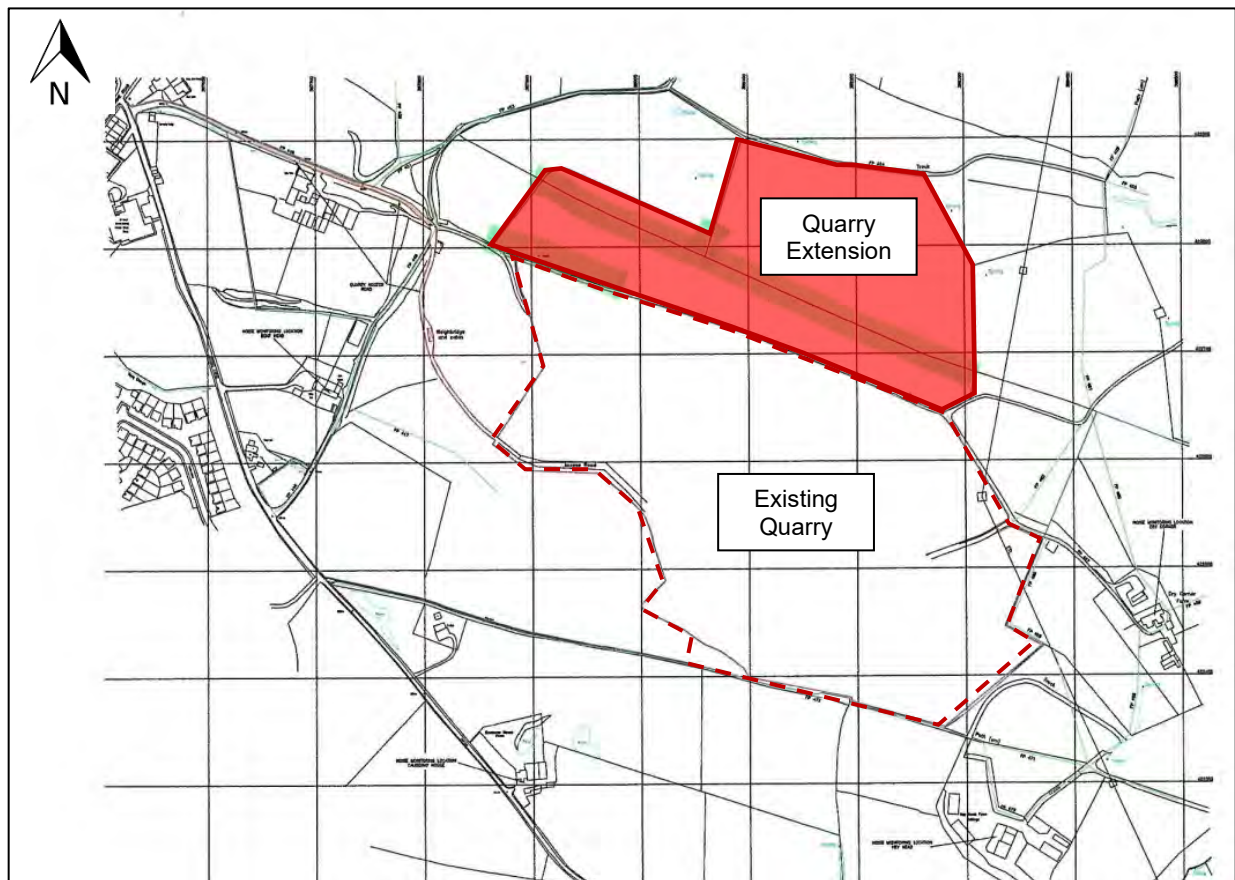


Figure 1: Tong Quarry - Existing Quarry and Extension Area

1.3 The monitoring locations are indicate in Appendix 1 and monitoring has comprised :

1. Three single wells installed in 2017 and additional pairs of wells (two in existing quarry, four in extension) installed in January 2021;
2. Monitoring rounds 1 and 2 in February 2021 included monitoring and sampling from the fifteen wells and three surface water monitoring locations together with laboratory chemical analysis;
3. Monitoring Round 3 comprises just water level and gas monitoring of all the wells and sampling and testing from three further surface water monitoring locations; and
4. Ground gas sampling and gas testing from two wells.

Tong Quarry Bacup - Monitoring Report Round 3, 2021

1.4 The installation of the additional wells and Monitoring Rounds 1 and 2 are reported in Report 192.02.01 of 28/03/21. This report presents the factual data from Round 3 fieldwork and chemical laboratory testing. A separate report will be provided on the gas sampling and laboratory gas testing.

2 SITE LOCATION & DESCRIPTION

2.1 Tong Quarry is located approximately 0.5km to the east of Bacup in Lancashire at grid reference SD 881 225. The site is situated approximately 600m to the south east of Tong Farm. The quarry is established on former agricultural land in an area that is predominantly rural. Tong Lane runs south east to north west 300m to the south west of the site. The only other access routes in the area are the quarry access track and agricultural access tracks. The location of the site is indicated in Figure 2.



Figure 2: Site Location

2.2 The existing quarry has been worked roughly from south to north. The southern and eastern part of the existing quarry has been backfilled and part restored along the southern boundary. The remaining reserve in the existing quarry is in the central part of the north.

2.3 The quarry extension area comprises parts of three grassed fields separated by drystone walls. The ground level falls to the north/north west in this extension area. There is a track which separates the existing quarry from the extension.

Tong Quarry Bacup - Monitoring Report Round 3, 2021

3 ROUND 3 MONITORING & TESTING

3.1 This third round of monitoring and sampling comprised:

- Ground gas monitoring was carried out in accordance with BS8576:2013 in each of the wells using a GasData GFM435 infra-red meter to measure gas flow rate, methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide. Note that only wells GW2, GW7S, W1 to W4 and W6 act as true gas monitoring wells. All other wells have the filter sections of the wells flooded so these wells monitor gas coming out of solution in the wells.
- Measurement of groundwater level. Note that W3 was blocked so the groundwater level could not be measured.
- Surface water sampling from three new locations:
 - Daisy Hall Spring, Mine Adit Spring & Hey Head Drain. However Hey Head Drain was dry so this was not sampled.
 - Both samples were tested on site using a Hanna Instruments portable analyser for pH, conductivity, resistivity, temperature, dissolved oxygen, TDS and salinity.
 - Each sample comprised a vial, two 1 litre amber glass jars and a 1 litre plastic bottle.
 - All samples were stored in cool boxes and dispatched to the laboratory.
- All samples were tested by Eurofins Chemtest for pH, metals, anions plus a range of organic compounds.

3.2 The results of the above monitoring are presented in Appendix 2 with photographs of the two surface water sampling locations Daisy Hall Spring and the Mine Adit Spring presented in Appendix 3.

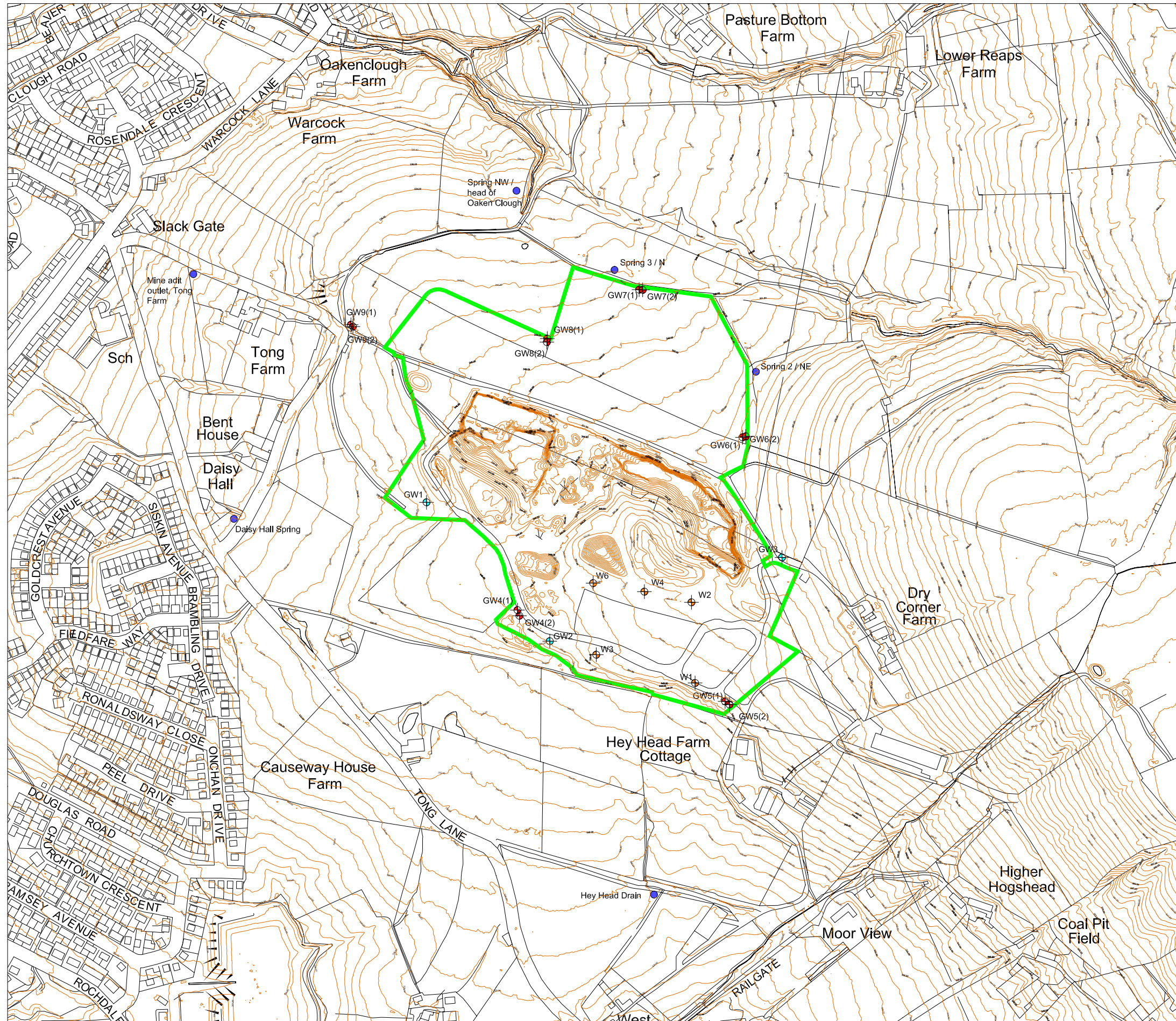
3.3 Note that there were floating sheen on the surface water at Daisy Hall Spring but this is assessed as being due to the bacterium *Leptothrix discophora* rather than hydrocarbons. This bacteria can form in iron and manganese rich water and forms an iridescent sheen which breaks up when disturbed (a hydrocarbon sheen would re-assimilate back together). *Leptothrix discophora* is one of several species of *Leptothrix*, known for its iron and manganese removing properties.

3.4 Results of the laboratory testing are reported in Appendix 4.

APPENDIX 1

DRAWINGS

Borehole Location Plan - AAE Plan 213036/BH/D/001 Rev A



- Key:**
- Site Boundary
 - Perimeter Borehole (2021)
 - Existing Perimeter Borehole
 - Existing In-waste Borehole
 - Spring Location
 - Existing Ground Level Contour (m AOD)

Notes:
 1. Existing ground levels were taken from the National LiDAR Survey Data undertaken in 2019.

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Borehole Location Plan			
 AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk			
Scale	Date	Drg. No.	Rev.
1:5,000@A3	Feb '21 Drawn JM Chkd. ML	213036/BH/D/001	A

APPENDIX 2

WATER LEVEL & GROUND GAS MONITORING DATA - 6 MARCH 2021

GROUNDWATER AND GROUND GAS MONITORING

C Eccles Brownfield Land Consultancy

Site: Tong Quarry, Bacup

Location	Date	Monitored by	Well Details			Groundwater				Gas										Weather		Serial No.	
			Standpipe diameter (mm)	Ground Level (mOD)	Depth to Base (m bg)	Water Depth (m bg)	Water Level (mOD)	Water Sample Taken?	Atmospheric Pressure (mbar)	Atmospheric Pressure Comment	Relative Pressure (mb)	Flow (l/h)	Peak Flow (l/h)	CH ₄ (% v/v)	GSV CH ₄ (l/hr)	CO ₂ (% v/v)	GSV CO ₂ (l/hr)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)	Conditions		Ambient Temp °C
GW1	06/02/21	CE	51	339.30	32.11	31.57	307.73	Y	965	Steady	0.01	0.1	0.1	0.1	0.0001	0.4	0.0004	19.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	339.30	32.11	Dry	<317.19	N	954	Steady	0.01	0.1	0.1	0.1	0.0001	1.2	0.0012	17.8	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	339.30	32.11	31.70	307.60	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	1.2	0.0012	18.5	1	1	Overcast	5 to 7	12717
GW2	06/02/21	CE	51	346.27	39.01	Dry	<307.26	N	966	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	20.2	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.27	39.01	Dry	<307.26	N	954	Steady	0.01	0.1	0.1	0.1	0.0001	1.3	0.0013	14.7	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	346.27	39.01	38.54	307.73	N	992	Rising	-11.91	-70.3	0.1	1.1	-0.7733	0.7	-0.4921	13.9	1	1	Overcast	5 to 7	12717
GW3	06/02/21	CE	51	364.24	32.80	28.30	335.94	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.3	0.0003	19.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	364.24	32.80	28.85	335.39	Y	958	Steady	0.01	0.1	0.1	0.1	0.0001	0.3	0.0003	19.6	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	364.24	32.80	28.43	335.81	N	989	Rising	0.01	0.1	0.1	0.1	0.0001	0.6	0.0006	19.4	1	1	Overcast	5 to 7	12717
GW4S	06/02/21	CE	51	346.18	20.30	13.10	333.08	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.7	0.0007	19.3	67	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.24	20.30	13.15	333.09	Y	958	Steady	0.01	0.1	0.1	0.1	0.0001	2.4	0.0024	17.5	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	346.24	20.30	13.32	332.92	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	3.6	0.0036	17.4	1	1	Overcast	5 to 7	12717
GW4D	06/02/21	CE	51	346.38	57.64	8.63	337.75	Y	966	Steady	0.01	0.1	0.1	0.1	0.0001	2.2	0.0022	17.8	12	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.28	57.64	9.47	336.81	Y	958	Steady	0.01	0.1	0.1	0.1	0.0001	3.3	0.0033	12.9	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	346.28	57.64	10.29	335.99	N	992	Rising	0.01	0.1	0.1	4.7	0.0047	3.3	0.0033	14.0	1	1	Overcast	5 to 7	12717
GW5S	06/02/21	CE	51	350.70	20.09	15.82	334.88	Y	964	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	350.70	20.09	15.96	334.74	Y	952	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.1	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	350.70	20.09	16.39	334.31	N	991	Rising	0.01	0.1	0.1	0.1	0.0001	1.1	0.0011	18.2	1	1	Overcast	5 to 7	12717
GW5D	06/02/21	CE	51	350.60	64.13	46.87	303.73	Y	964	Steady	0.01	0.1	0.1	0.1	0.0001	0.6	0.0006	17.9	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	350.60	64.13	44.84	305.76	Y	952	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.0	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	350.60	64.13	45.17	305.43	N	991	Rising	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.8	1	1	Overcast	5 to 7	12717
GW6S	06/02/21	CE	51	357.52	19.83	8.13	349.39	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.3	0.0003	19.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	357.52	19.83	8.20	349.32	Y	954	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	20.0	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	357.52	19.83	8.39	349.13	N	990	Rising	0.01	0.1	0.1	0.1	0.0001	0.8	0.0008	19.6	1	1	Overcast	5 to 7	12717
GW6D	06/02/21	CE	51	358.07	37.53	29.33	328.74	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	358.07	37.53	28.72	329.35	Y	954	Steady	0.01	0.1	0.1	0.1	0.0001	3.0	0.0030	19.1	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	358.07	37.53	29.45	328.62	N	990	Rising	0.01	0.1	0.1	0.1	0.0001	2.5	0.0025	19.2	1	1	Overcast	5 to 7	12717

NOTES:
 NM = Not Measured.
 (x) = Peak value recorded.
 [grey] = Below detection limit.

GSV (l/HR) = [gas concentration (%v/v)] x [gas well flow rate (l/hr)]

GROUNDWATER AND GROUND GAS MONITORING

C Eccles Brownfield Land Consultancy

Site: Tong Quarry, Bacup

Location	Date	Monitored by	Well Details			Groundwater				Gas									Weather			Serial No.	
			Standpipe diameter (mm)	Ground Level (mOD)	Depth to Base (m bgf)	Water Depth (m bgf)	Water Level (mOD)	Water Sample Taken?	Atmospheric Pressure (mbar)	Atmospheric Pressure Comment	Relative Pressure (mb)	Flow (l/h)	Peak Flow (l/h)	CH ₄ (% v/v)	GSV CH ₄ (l/hr)	CO ₂ (% v/v)	GSV CO ₂ (l/hr)	O ₂ (% v/v)	CO (ppm)	H2S (ppm)	Conditions		Ambient Temp °C
GW7S	06/02/21	CE	51	344.36	15.57	15.52	328.84	N	967	Steady	0.01	0.1	0.1	0.1	0.0001	1.5	0.0015	18.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	344.36	17.68	17.54	326.82	N	956	Steady	0.01	0.1	0.1	0.1	0.0001	1.5	0.0015	18.4	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	344.36	17.68	17.56	326.80	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	1.2	0.0012	18.7	1	1	Overcast	5 to 7	12717
GW7D	06/02/21	CE	51	344.56	44.00	1.54	343.02	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	344.56	44.00	4.54	340.02	Y	956	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.1	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	344.56	44.00	5.06	339.50	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	0.5	0.0005	19.8	1	1	Overcast	5 to 7	12717
GW8S	06/02/21	CE	51	346.27	18.35	2.84	343.43	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	19.8	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.27	18.35	1.05	345.22	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.2	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	346.27	18.35	4.98	341.29	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	2.4	0.0024	16.8	1	1	Overcast	5 to 7	12717
GW8D	06/02/21	CE	51	346.56	64.60	57.77	288.79	Y	967	Steady	0.01	0.1	0.1	0.1	0.0001	0.2	0.0002	19.7	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	346.57	64.60	57.65	288.92	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.2	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	346.57	64.60	57.97	288.60	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.0	1	1	Overcast	5 to 7	12717
GW9S	06/02/21	CE	51	337.41	21.57	16.56	320.85	Y	966	Steady	0.01	0.1	0.1	0.1	0.0001	0.7	0.0007	18.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	337.41	21.57	15.49	321.92	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.2	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	337.41	21.57	15.27	322.14	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	1.3	0.0013	15.4	1	1	Overcast	5 to 7	12717
GW9D	06/02/21	CE	51	337.55	45.28	39.32	298.23	Y	966	Steady	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	19.9	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	337.55	45.28	39.02	298.53	Y	957	Steady	0.01	0.1	0.1	0.1	0.0001	2.2	0.0022	9.7	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	337.55	45.28	39.14	298.41	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	0.1	0.0001	20.5	1	1	Overcast	5 to 7	12717
W1	06/02/21	CE	51	351.45	8.22	8.01	343.44	1 Vial	964	Steady	0.01	0.1	0.1	0.1	0.0001	3.4	0.0034	7.4	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	351.45	8.22	Damp	343.23	N	952	Steady	0.01	0.1	0.1	0.1	0.0001	4.9	0.0049	16.3	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	351.45	8.22	8.22	343.23	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	4.8	0.0048	13.0	1	1	Overcast	5 to 7	12717
W2	06/02/21	CE	51	355.44	12.16	4.39	351.05	Y	964	Steady	-0.62	-5.4	0.1	9.8	-0.5292	1.7	-0.0918	4.6	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	355.44	12.16	3.70	351.74	Y	952	Steady	0.01	0.1	0.1	4.0	0.0040	17.0	0.0170	0.8	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	355.44	12.16	4.78	350.66	N	990	Rising	-0.35	-4.2	0.1	7.8	-0.3276	2.2	-0.0924	1.9	1	1	Overcast	5 to 7	12717
W3	06/02/21	CE	51	349.70	-	Blocked	-	N	964	Steady	0.45	3.8	3.8	0.1	0.0038	0.8	0.0304	9.8	1	1	Snow Showers	1 to 3	12417
	20/02/21	CE	51	349.70	-	Blocked	-	N	954	Steady	0.01	0.1	0.1	0.1	0.0001	1.3	0.0013	7.2	1	1	Strong Winds & Rain	4 to 6	12417
	06/03/21	CE	51	349.70	-	Blocked	-	N	992	Rising	0.01	0.1	0.1	0.1	0.0001	0.9	0.0009	19.0	1	1	Overcast	5 to 7	12717

NOTES:
 NM = Not Measured.
 (x) = Peak value recorded.
 [grey] = Below detection limit.

$$GSV \text{ (l/HR)} = [\text{gas concentration (\%v/v)}] \times [\text{gas well flow rate (l/hr)}]$$

GROUNDWATER AND GROUND GAS MONITORING

C Eccles Brownfield Land Consultancy

Site: Tong Quarry, Bacup

Location	Date	Monitored by	Well Details			Groundwater			Gas										Weather			Serial No.		
			Standpipe diameter (mm)	Ground Level (mOD)	Depth to Base (m bgj)	Water Depth (m bgj)	Water Level (mOD)	Water Sample Taken?	Atmospheric Pressure (mbar)	Atmospheric Pressure Comment	Relative Pressure (mb)	Flow (l/h)	Peak Flow (l/h)	CH ₄ (% v/v)	GSV CH ₄ (l/hr)	CO ₂ (% v/v)	GSV CO ₂ (l/hr)	O ₂ (% v/v)	CO (ppm)	H2S (ppm)	Conditions		Ambient Temp °C	
W4	06/02/21	CE	51	354.27	15.23	15.13	339.14	Y	966	Steady	0.01	0.1	0.1	33.2	0.0332	20.1	0.0201	0.1	1	1	Snow Showers	1 to 3	12417	
	20/02/21	CE	51	354.27	15.23	15.01	339.26	N	952	Steady	1.30	13.3	13.3	41.9	5.5727	18.5	2.4605	0.1	1	1	Strong Winds & Rain	4 to 6	12417	
	06/03/2021 (09:10)	CE	51	354.27	15.23	15.23	339.04	N	990	Rising	0.06	0.9	0.9	28.7	0.2583	21.0	0.1890	0.1	1	1	Overcast	5 to 7	12717	
	06/03/2021 (10:16)	CE	51	-	-	-	-	N	991	Rising	0.1	1.6	1.6	17.0	0.2720	17.2	0.2752	3.5	1	1	Gas readings taken after Bulk Gas Sampling		12717	
W6	06/02/21	CE	51	350.48	12.15	6.37	344.11	Y	Pipe Found - Disconnected on Arrival - Now Repaired - Take Readings on 20/02/21													Snow Showers	1 to 3	12417
	20/02/21	CE	51	350.48	12.15	7.08	343.40	Y	953	Steady	2.70	25.5	25.5	79.6	20.2980	15.4	3.9270	0.1	1	1	Strong Winds & Rain	4 to 6	12417	
	06/03/2021 (09:15)	CE	51	350.48	12.15	7.79	342.69	N	990	Rising	0.21	4	4	82.7	3.3080	14.0	0.5600	0.1	1	1	Overcast	5 to 7	12717	
	06/03/2021 (10:28)	CE	51	-	-	-	-	N	991	Rising	0.25	4.4	4.4	70.7	3.1108	15.1	0.6644	2.1	1	1	Gas readings taken after Bulk Gas Sampling		12717	
Below Detection Limit																								
Bung and Cover Removed - See Photo			Flow and DP Falls Rapidly - 1minute - remains steady																					

NOTES:
 NM = Not Measured.
 (x) = Peak value recorded.
 [grey] = Below detection limit.

GSV (l/HR) = [gas concentration (%v/v)] x [gas well flow rate (l/hr)]

TEST DATE AND CONDITIONS		
Date	16/07/2020	
Atmospheric Pressure	1002	mB
Ambient Temperature	21.8	°C
EnviroNics Serial No.	5089	

**GFM436 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD	
Unit 4, Fairfield Court	
Seven Stars Estate	
Wheler Rd	
Coventry	
CV3 4LJ	
Tel 02476303311	Fax 02476307711



Customer	
Certificate Number	121854
Order Number	326101

Serial Number	12417
Software Version	G436-00.0027/0009

Recalibration DUE Date
16/07/21

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	400	Accept > 200 cc/min	Pump Flow @ -200mB	200	Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
		60 <i>Accept ±3.0</i>	60	39.8 <i>Accept ±3.0</i>	40	20.9 <i>Accept ±0.5</i>
	5 <i>Accept ±0.3</i>	5	4.9 <i>Accept ±0.3</i>	5	6 <i>Accept ±0.3</i>	6
Zero Reading 100% N ₂	0 <i>Accept ±0.0</i>	0	0 <i>Accept ±0.0</i>	0	0 <i>Accept ±0.1</i>	0

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Gas Type	Range (ppm)		Zero Reading		Instrument Gas Reading	
H ₂ S	5000	1500	0	<i>Accept ±0.0</i>	1500	<i>Accept ±5.0</i>
CO	2000	1000	0	<i>Accept ±0.0</i>	1000	<i>Accept ±5.0</i>
Hexane	2.0%	2.0%	0	<i>Accept ±0.0</i>	1.99	<i>Accept ±10.0</i>

NOTES:
 NM = Not Measured.
 (x) = Peak value recorded.
 [grey] = Below detection limit.

$$GSV (l/HR) = [gas\ concentration\ (\%v/v)] \times [gas\ well\ flow\ rate\ (l/hr)]$$

Tong Quarry, Bacup		Groundwater Monitoring - On-Site Water Testing							Round 1 to 3 - 2021				C Eccles Brownfield Land Consultancy				
Location	Date	Time	Temp [°C]	pH	mV [pH]	ORP [mV]	EC [µS/cm]	EC Abs [µS/cm]	RES [KOhm-cm]	TDS [ppm]	Salinity [psu]	Sigma T [sT]	Press [psi]	Press [mbar]	D.O. [%]	D.O. [ppm]	Remarks
GW1	06/02/2021	10:41:16	6.49	7.67	-15.0	8.8	1496	970	0.7	748	0.76	0.5	13.709		41.9	4.76	
GW1	20/02/2021																Insufficient water to sample
GW3	06/02/2021	13:45:06	7.66	7.88	-26.6	-78.1	360	242	2.8	180	0.17	0.0	13.634		33.2	3.66	
GW3	20/02/2021		10.07	6.63		229.3	289	218	3.5	144	0.14	-	991.0		37.5	3.94	
GW4S	06/02/2021	11:11:03	8.03	7.03	20.0	-75.7	1064	721	0.9	532	0.53	0.3	13.627		33.0	3.60	
GW4S	20/02/2021		9.96	6.45		315.5	854	642	1.2	427	0.42	-	991.1		15.5	1.63	
GW4D	06/02/2021	11:14:39	5.67	6.89	27.4	-16.4	1077	681	0.9	538	0.54	0.4	13.639		45.4	5.25	
GW4D	20/02/2021		10.20	6.71		261.3	2544	1878	0.4	1272	1.32	-	991.1		16.3	1.74	
GW5S	06/02/2021	11:47:09	5.68	7.75	-19.4	-11.3	6	4	167.0	30	1.77E-03	0.0	13.622		45.5	5.29	
GW5S	20/02/2021		9.65	6.88		284.4	279	209	3.6	140	1.30E-01	-	989.900		71.2	7.54	
GW5D	06/02/2021	11:49:39	7.74	7.44	-2.9	0.5	643	432	1.6	321	0.31	0.1	13.651		40.2	4.43	
GW6D	20/02/2021		9.78	7.22		212.3	620	464	1.6	310	0.30	-	989.700		46.5	4.90	
GW6S	06/02/2021	14:14:33	6.51	7.58	-10.0	-57.1	251	163	4.0	126	0.12	0.0	13.784		32.1	3.70	
GW6S	20/02/2021		9.28	6.43		241.5	210	155	4.8	105	0.10	-	990.200		32.7	3.50	
GW6D	06/02/2021	14:29:06	7.09	7.47	-4.2	-20.7	559	369	1.8	280	0.27	0.1	13.795		32.8	3.71	
GW6D	20/02/2021		10.06	7.09		219.0	185	136	5.4	93	0.09	-	990.2		50.3	5.41	
GW7D	07/02/2021	09:53:27	4.32	8.56	-62.1	53.4	76	46	13.2	38	3.52E-02	0.0	13.815		40.6	4.96	
GW7D	20/02/2021		10.80	5.64		348.3	75	54	13.3	37	3.00E-02	-	990.900		37.8	4.09	
GW8S	07/02/2021	10:22:52	6.93	7.93	-28.9	135.4	316	208	3.2	158	0.15	0.0	13.811		37.5	4.27	
GW8S	20/02/2021		9.35	6.02		316.8	127	978	7.9	64	0.06	-	991.000		47.2	4.94	

Tong Quarry, Bacup		Groundwater Monitoring - On-Site Water Testing										Round 1 to 3 - 2021			C Eccles Brownfield Land Consultancy		
Location	Date	Time	Temp [°C]	pH	mV [pH]	ORP [mV]	EC [µS/cm]	EC Abs [µS/cm]	RES [KOhm-cm]	TDS [ppm]	Salinity [psu]	Sigma T [sT]	Press [psi]	Press [mbar]	D.O. [%]	D.O. [ppm]	Remarks
GW8D	07/02/2021	10:41:36	5.21	7.90	-27.2	-50.6	352	220	2.8	176	0.17	0.0	13.811	952.2	28.9	3.44	
GW8D	20/02/2021		10.75	6.03		351.0	139.0	104	7	70.0	0.07	-	14.375	991.1	47.000	5.0	
GW9S	07/02/2021	11:32:40	7.02	7.57	-9.6	-336.1	517	341	1.9	259	0.25	0.1	13.806	951.9	30.5	3.47	
GW9S	20/02/2021		10.00	6.39		294.0	304	223	3.3	152	0.15	-	14.369	990.7	33.4	3.60	
GW9D	07/02/2021	12:21:31	7.54	7.22	9.5	-218.4	583	390	1.7	291	0.28	0.1	13.813	952.4	32.9	3.70	
GW9D	20/02/2021		10.45	6.53		313.5	536	388	1.9	268	0.26	-	14.372	990.9	49.6	5.40	
W2	06/02/2021	11:49:52	7.67	7.43	-2.2	1.6	652	437	1.5	326	0.32	0.1	13.646	940.9	42.6	4.70	
W2	20/02/2021		9.19	7.07		236.9	481	355	2.1	240	0.23	-	14.375	991.1	18.7	2.01	
W4	06/02/2021	12:31:09	4.38	7.82	-22.6	44.6	519	315	1.9	259	0.25	0.2	13.620	13.62	31.8	3.82	
W4	20/02/2021																Insuficient water to sample
W6	06/02/2021	12:57:08	7.20	7.24	8.1	-4.6	1367	905	0.7	684	0.69	0.4	13.627	939.5	33.8	3.76	
W6	20/02/2021		9.44	6.92		249.4	1869	1352	0.5	935	0.96	-	14.373	991	21.9	2.37	
Spr NE	06/02/2021	14:40:35	1.58	8.40	-53.2	8.7	90	50	11.1	45	0.04	0.0	13.816	952.6	41.9	5.51	
Spr NE	20/02/2021		4.34	6.71		295.4	44	33	22.7	22	0.02	-	14.367	990.6	73.9	7.96	
Spr N	06/02/2021	14:41:39	2.17	8.48	-57.5	-1.3	87	50	11.5	44	0.04	0.0	13.834	953.8	44.4	5.75	
Spr N	20/02/2021		4.56	7.46		269.9	89	67	11.2	45	0.04	-	14.366	990.5	77.4	8.23	
Spr NW	06/02/2021	15:22:31	1.19	8.24	-44.5	-59.2	14	7	71.0	7	0.01	0.0	13.815	952.5	41.7	5.54	
Spr NW	20/02/2021		4.23	7.20		283.6	87	63	11.5	43	0.04	-	14.367	990.6	77.3	8.48	
Daisy Hall Farm Spring	06/03/2021	07:50:22	5.40	8.33	-80.8	-110.8	271	170	3.7	135	0.13	0.1	14.231	981.2	34.2	4.6	

Tong Quarry, Bacup		Groundwater Monitoring - On-Site Water Testing							Round 1 to 3 - 2021				C Eccles Brownfield Land Consultancy				
Location	Date	Time	Temp [°C]	pH	mV [pH]	ORP [mV]	EC [µS/cm]	EC Abs [µS/cm]	RES [KOhm-cm]	TDS [ppm]	Salinity [psu]	Sigma T [sT]	Press [psi]	Press [mbar]	D.O. [%]	D.O. [ppm]	Remarks
Mine Adit Spring	06/03/2021	08:04:15	6.44	7.77	-20.6	-20.7	512	332	2.0	256	0.25	0.1	14.257	983.0	37.6	5.0	
Hey Head Drain	06/03/2021																Insuficient water to sample

All testing carried out using a Hanna Instruments HI98194 Multiparameter Meter. All times are GMT.

APPENDIX 3

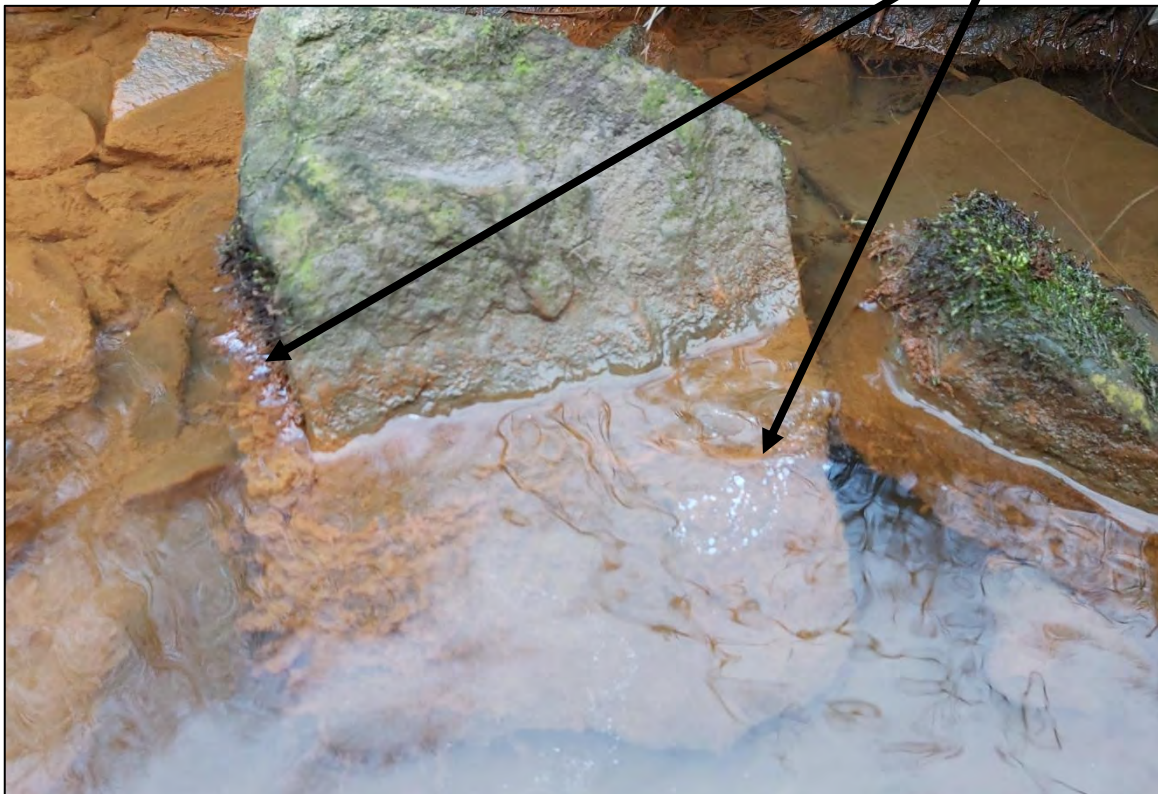
PHOTOGRAPHS -
DAISY HALL SPRING & MINE ADIT SPRING

Tong Quarry Bacup - Monitoring Report Round 3, 2021



Photograph 1: Daisy Hall Spring

Sheen due to
Leptothrix
discophora



Photograph 2: sheen due to *Leptothrix discophora*

Tong Quarry Bacup - Monitoring Report Round 3, 2021



Photograph 3: Sheen due to *Leptothrix discophora*



Photograph 4: Daisy Hall Spring Looking Downstream

Tong Quarry Bacup - Monitoring Report Round 3, 2021



Photograph 5: Daisy Hall Spring View of Spring Looking North

Tong Quarry Bacup - Monitoring Report Round 3, 2021



Photograph 5: Mine Adit Spring

No hydrocarbons visible

APPENDIX 4

**LABORATORY TEST DATA –
ROUND 3 - MARCH 2021**



Final Report

Report No.: 21-07435-1
Initial Date of Issue: 15-Mar-2021
Client: Mr C S Eccles
Client Address: 55 St Catherine Drive
Hartford
Cheshire
CW8 2FE
Contact(s): Chris Eccles
Project: 192.01 Tong Quarry, Bacup
Quotation No.: Q21-22639
Date Received: 09-Mar-2021
Order No.: 192.01
Date Instructed: 09-Mar-2021
No. of Samples: 2
Turnaround (Wkdays): 5
Results Due: 15-Mar-2021
Date Approved: 15-Mar-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-07435	21-07435	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1156613	1156614	
		Sample Location:		Mine Adit	Daisey Hall Spring	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Mar-2021	06-Mar-2021	
Determinand	Accred.	SOP	Units	LOD		
pH	U	1010		N/A	8.3	8.2
Electrical Conductivity	U	1020	µS/cm	1.0	530	270
Alkalinity (Total)	U	1220	mg/l	10	210	200
Chloride	U	1220	mg/l	1.0	23	13
Fluoride	U	1220	mg/l	0.050	0.16	0.13
Ammoniacal Nitrogen	U	1220	mg/l	0.050	1.0	1.0
Sulphate	U	1220	mg/l	1.0	140	23
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium	U	1455	mg/l	2.00	52	32
Potassium	U	1455	mg/l	0.50	3.5	2.0
Magnesium	U	1455	mg/l	0.20	23	3.8
Sodium	U	1455	mg/l	1.50	21	9.5
Total Hardness as CaCO3	U	1270	mg/l	15	230	95
Aluminium (Dissolved)	N	1455	µg/l	5.0	6.8	19
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.94	0.44
Boron (Dissolved)	U	1455	µg/l	10.0	100	81
Cadmium (Dissolved)	U	1455	µg/l	0.12	< 0.12	< 0.12
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	3.2	1.7
Manganese (Dissolved)	U	1455	µg/l	0.50	490	550
Nickel (Dissolved)	U	1455	µg/l	0.50	7.2	7.8
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	3.0	41	18
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010
Iron (Dissolved)	N	1455	mg/l	0.005	0.045	0.56
Total Organic Carbon	U	1610	mg/l	2.0	2.9	4.1
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-07435	21-07435	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1156613	1156614	
		Sample Location:		Mine Adit	Daisey Hall Spring	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Mar-2021	06-Mar-2021	
Determinand	Accred.	SOP	Units	LOD		
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-07435	21-07435	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1156613	1156614	
		Sample Location:		Mine Adit	Daisey Hall Spring	
		Sample Type:		WATER	WATER	
		Date Sampled:		06-Mar-2021	06-Mar-2021	
Determinand	Accred.	SOP	Units	LOD		
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-07435	21-07435
Quotation No.: Q21-22639		Chemtest Sample ID.:		1156613	1156614
		Sample Location:		Mine Adit	Daisey Hall Spring
		Sample Type:		WATER	WATER
		Date Sampled:		06-Mar-2021	06-Mar-2021
Determinand	Accred.	SOP	Units	LOD	
Naphthalene	N	1790	µg/l	0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-07435	21-07435
Quotation No.: Q21-22639		Chemtest Sample ID.:		1156613	1156614
		Sample Location:		Mine Adit	Daisey Hall Spring
		Sample Type:		WATER	WATER
		Date Sampled:		06-Mar-2021	06-Mar-2021
Determinand	Accred.	SOP	Units	LOD	
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C ₆ –C ₄₀); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

END OF REPORT

Appendix D
Gas Risk Assessment



GAS RISK ASSESSMENT

August 2021

213036/LGRA

Report for:
Bacup Clay Company Ltd
Tong Farm, Bacup
Rossendale
OL3 9XA

1. INTRODUCTION

AA Environmental Limited (AAe) has been commissioned by The Bacup Clay Company Ltd to produce a Gas Risk Assessment to support a waste recovery permit application for Tong Quarry, Bacup, in Lancashire. The site location is shown in drawing 213036/D/001.

Tong Quarry is located approximately 0.5 km east of Bacup in Lancashire. It is centred around National Grid reference SD880 226 and can be located by postcode OL3 9XA. The quarry is located on agricultural land and is surrounded by fields. Tong Lane is located approximately 300 m southwest of the site and the quarry access tracks are routed from here.

The quarry extracts sandstone, clay and coal. Initially a paragraph 9 exemption was being used to allow importation of materials for restoration. A subsequent waste recovery permit reference EPR/CB3138RW, was granted in 2012 and infilling under the permit is understood to have begun in 2012. The permit allows for the importation of inert waste, in line with an approved waste recovery plan, to raise ground levels to those within the planning permission.

This gas risk assessment is produced to document baseline ground gas conditions prior to the quarry extension and to produce a monitoring regime appropriate to the conceptual model of the site.

This document presents:

- site investigation details;
- recent gas monitoring data;
- a conceptual model of the site;
- an assessment of risks to sensitive properties and
- recommended monitoring measures.

2. ENVIRONMENTAL SETTING

2.1 Geology and Hydrogeology

The quarry is located within the Pennine Lower Coal Measures (PLCM), a series of interbedded mudstones, sandstones and coal. The strata dip approximately northwards, with the younger strata in outcrop to the northeast and the base of the Coal Measures in outcrop to the southwest of the site. The geological succession in and around the quarry is shown in Table 1. All strata listed are part of the Pennine Lower Coal Measures. Further mudstone is encountered below the Woodhouse Hill Rock before reaching the strata of the Millstone Grit. The quarry has worked those horizons highlighted in Table 1, with the base resting in undifferentiated Coal Measures.

Table 1. Geological Succession		
Formation	Description	Approx. thickness (m)
Darwen Flags	Fine grained flagstone	15
Upper Mountain Mine	Coal	
	Undifferentiated Coal Measures	24
Great Arc Sandstone	Irregularly bedded sandstone	20
Lower Mountain Mine	Coal	1
	Fireclay	1
Ganister Rock	Ganister	1
	Undifferentiated Coal Measures	6
Lower Foot Mine	Coal	
	Undifferentiated Coal Measures	16
Woodhead Hill Rock	Sandstone and Mudstone	24

There have been historical workings of the Lower Mountain Mine coal, which have been encountered by the quarrying activities. The Lower Foot Mine coal workings have been intermittently exposed in the quarry floor.

The PLCM are designated as a Secondary A aquifer by the Environment Agency. The site is not located within a groundwater source protection zone. The quarry is reported in the 2019 HIA, see references, to be established above the prevailing groundwater level within the PLCM. The Woodhead Hill Rock is considered to be the principal groundwater bearing unit local to the site. This has been confirmed by boreholes GW1 and GW3 installed in 2017 and by the location of the major water strikes during borehole construction in 2021.

The PLCM is a multi-layered aquifer with a prevalence of low permeability mudstone horizons that inhibit flow. Flow through the unit as a whole will be influenced by the local occurrence of fractures and fissures.

The quarry currently drains freely under gravity into the mine adits at the base of the quarry wall within a few days after cessation of rainfall.

The principal water bearing unit locally is considered to be the Woodhead Hill Rock, however, the catchment is one of high rainfall and strata higher in the sequence are recharged rapidly after rainfall. Some of the recharge emerges as springs. Deeper recharge appears to be under-drained by the coal workings of the Lower Foot Coal.

2.2 Surrounding Land Use

The site is located in moorland to the east of The Rossendale Valley. Lee Quarry SSSI is approximately 2 km southwest of the site.

The topography surrounding the quarry rises to hills and moors on the east, with a general fall towards Bacup in the west. The eastern boundary of the site is around 360 m AOD. There is a fall of approximately 20 m across the site to the west. The northern boundary of the existing quarry forms the centre of a gentle spur, such that ground levels also fall to the south across the area of excavation and to the north beyond the perimeter track.

Sensitive receptors local to the site are shown in AAe drawing 213036/D/002. The closest properties in all directions from the quarry and extension area are isolated farm houses. Residential properties are to the west along Tong Lane and Warcock Lane. Table 2 lists the closest receptors. There are seven residential receptors within 250 m of the perimeter. The extension to the north does not cause any further properties to fall within 250 m of the site boundary.

Table 2. Sensitive Receptors		
Number	Receptor	Min. estimated distance from site boundary
1	Hey Head Farm Cottage	95 m SE
2	Tong Farm	80 m W
3	Dry Corner Farm	100 m E
4	Daisy Hall	170 m W
5	Bent House	170 m W
6	Housing west of Daisy Hall	180m W
7	Causeway House Farm	180 m SW
8	Warcock Farm	280 m NW
9	Pasture Bottom	300 m N
10	Oakenclough Farm	300 m NW
11	Slack Gate	300 m W
12	School west of Tong Farm	300 m W
13	Moor View	300 m SE
14	Lower Reaps Farm	330 m NE

3. SITE INVESTIGATIONS

3.1 2017 Groundwater Boreholes

In 2017 three new groundwater monitoring boreholes were constructed: Boreholes GW1 and GW2 on the southwest of the quarry, with GW1 being the most westerly and GW3 on the east. The boreholes were used to derive the geological sequence given below.

Formation	Lithology	GW1		GW2		GW3	
		Depth to base (m)	Thickness (m)	Depth to base (m)	Thickness (m)	Depth to base (m)	Thickness (m)
Made ground	Clay/peat	3.2	3.2	6.1	6.1	2.7	2.7
Pennine Lower Coal Measures (PLCM)	Mudstone					8.4	5.7
Great Arc Sandstone	Sandstone					26.7	18.3
PLCM	Mudstone	3.6	0.3				
Lower Mountain Mine	Coal	5.8	2.2			28	1.3
PLCM	Mudstone	6.7	0.9			29	1
Ganister Rock	Sandstone	7.8	1.1	8.9	2.8	30.3	1.3
PLCM	Mudstone	12.6	4.8	13	4.1		
Lower Foot Mine	Coal	13	0.4	13.3	0.3		
PLCM	Mudstone	27.9	14.9	33.1	19.8	54.2	23.9
Woodhead Hill Rock	Sandstone	33 pen.	5.1	39 pen.	5.9	60 pen.	5.8

3.2 2021 Additional Boreholes

In February 2021 a series of deep and shallow boreholes were constructed to give greater perimeter coverage of the site and proposed extension. Deep boreholes were drilled approximately 5 m into the Woodhead Hill Rock, or deeper to obtain a water strike. A borehole location plan, together with a plan showing the locations of the boreholes, superimposed on the geology, are presented as drawings reference 213036/D/006. Shallow boreholes were constructed to a nominal depth of 20 m below ground level.

Gas monitoring has been undertaken monthly and groundwater quality quarterly since installation of the 2021 boreholes.



4. GAS MONITORING

4.1 Monitoring Regime

Gas monitoring has been undertaken by C Eccles Brownfield land Consultancy since February 2021. The latest report contains data for June to August 2021: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 9XA. Monitoring Report Round 6 to 8, June to August 2021, report reference 192.04-6.01. Refer to Appendix A Monitoring has been undertaken in the perimeter boreholes, together with six existing in-waste boreholes installed within the previously filled southern area of the quarry, refer to AAe drawing 213036/D/006.

Boreholes are monitored for

- Methane (CH₄) (% v/v)
- Carbon dioxide (CO₂) (% v/v)
- Oxygen (O₂) (% v/v)
- Carbon monoxide (CO) (ppm)
- Hydrogen sulphide (H₂S) (ppm)
- Gas flow (l/h)
- Water level
- Atmospheric pressure (mbar)
- Relative pressure (mb)

In addition to the above, gas samples were also taken from waste boreholes W4 and W6 during March 2021. The data and interpretation are presented in C.S. Eccles report ref: 192.06.01: April 2021: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 9XA. Gas testing and Source Assessment.

4.2 Results for In-Waste Boreholes

The monitoring data from 2021 is presented in Table 4. Earlier data, after borehole installation by ARP in 2017, shows similar concentrations and flows for each borehole, with the exception being initial high concentrations of methane and carbon dioxide in W1 and W2, refer to Appendix B. These are no longer present in 2021.

Gas sampling from W4 and W6 in 2021 concluded that the likely source of gas in W4 was of biogenic origin and could be caused by localised pieces of wood in the inert waste. The likely source of gas in W6 was concluded to be of geogenic origin, ie more likely to arise from mine workings. The influence of mines gas on the in waste boreholes may explain why initial gas concentrations were registered in W1 and W2. This may be due to encountering a gas pocket, which was dispersed by the presence of the borehole, rather than a constant biodegradable source adjacent to the well.

Well	Date	Depth to Base (m bgl)	Water Depth (m bgl)	Atmospheric Pressure (mbar)	Relative Pressure (mb)	Peak Flow (l/h)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)
W1	06/02/21	8.22	8.01	964	0.01	0.1	0.1	3.4	7.4	1	1
	20/02/21	8.22	Damp	952	0.01	0.1	0.1	4.9	16.3	1	1
	06/03/21	8.22	8.22	992	0.01	0.1	0.1	4.8	13.0	1	1
	10/04/21	8.22	8.22	972	0.01	0.1	0.1	4.8	16.9	1	1
	08/05/21	8.22	8.22	956	0.01	0.1	0.1	2.9	8.7	1	1
	19/06/21	8.22	8.22	973	0.01	0.1	0.1	1.8	17.8	1	1
	17/07/21	8.22	8.22	989	0.01	0.1	0.1	4.3	0.5	1	1
	14/08/21	8.07	7.94	975	0.01	0.1	1.9	4.6	0.2	1	1
W2	06/02/21	12.16	4.39	964	-0.62	0.1	9.8	1.7	4.6	1	1
	20/02/21	12.16	3.70	952	0.01	0.1	4.0	17.0	0.8	1	1
	06/03/21	12.16	4.78	990	-0.35	0.1	7.8	2.2	1.9	1	1
	10/04/21	12.16	4.78	972	0.01	0.1	11.7	2.5	13.5	1	1



Well	Date	Depth to Base (m bgl)	Water Depth (m bgl)	Atmospheric Pressure (mbar)	Relative Pressure (mb)	Peak Flow (l/h)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)
	08/05/21	12.16	1.72	956	3.26	30.1	11.1	2.0	0.1	1	1
	19/06/21	12.16	2.22	972	0.37	5.1	15.7	10.4	0.7	10	1
	17/07/21	12.16	3.85	989	0.04	0.8	4.6	4.8	0.1	1	1
	14/08/21	12.16	5.59	975	0.01	0.1	10.3	7.1	0.1	1	1
W3	06/02/21	-	Blocked	964	0.45	3.8	0.1	0.8	9.8	1	1
	20/02/21	-	Blocked	954	0.01	0.1	0.1	1.3	7.2	1	1
	06/03/21		Blocked	992	0.01	0.1	0.1	0.9	19.0	1	1
	10/04/21		Blocked	972	0.01	0.1	0.1	2.1	18.6	1	1
	08/05/21		Blocked	956	0.01	0.1	0.1	1.8	13.2	1	1
	19/06/21		Blocked	973	0.01	0.1	0.1	4.0	15.3	1	1
	17/07/21		Blocked	990	0.01	0.1	0.1	0.9	19.9	1	1
14/08/21		Blocked	976	0.01	0.1	0.1	5.4	8.5	1	1	
W4	06/02/21	15.23	15.13	966	0.01	0.1	33.2	20.1	0.1	1	1
	20/02/21	15.23	15.01	952	1.30	13.3	41.9	18.5	0.1	1	1
	06/03/21	15.23	15.23	990	0.06	0.9	28.7	21.0	0.1	1	1
	10/04/21	15.23	15.05	972	0.01	0.1	41.1	18.9	0.7	1	1
	08/05/21	15.23	15.08	956	2.56	24.2	44.2	18.9	0.3	9	1
	19/06/21	15.23	15.13	973	0.13	2.7	45.8	22.5	0.7	1	1
	17/07/21	15.23	15.23	990	0.01	0.1	30.5	17.5	1.9	1	1
14/08/21	15.23	15.14	975	0.04	0.6	47.1	19.3	0.7	1	1	
W6	06/02/21	12.15	6.37	Pipe Found Disconnected on Arrival - Now Repaired - Take Readings on 20/02/21							
	20/02/21	12.15	7.08	953	2.70	25.5	79.6	15.4	0.1	1	1
	06/03/21	12.15	7.79	990	0.21	4	82.7	14.0	0.1	1	1
	10/04/21	12.15	8.13	972	0.01	0.1	75.4	19.4	0.5	1	1
	08/05/21	12.15	8.48	956	1.74	18.1	72.3	23.8	0.1	1	1
	19/06/21	12.15	9.40	973	0.15	3.0	77.9	18.7	0.1	10	1
	17/07/21	12.15	9.93	990	0.34	4.4	80.5	17.9	0.1	10	1
	14/08/21	12.15	10.09	975	2.50	23.4	75.8	21.9	0.1	1	1

The gas generation data should also be considered alongside the flow data. To give an understanding of the significance of the low flow rate, Environment Agency guidance on how to surrender your environmental permit, The Landfill Sector, EPR 5.02, states that it will be accepted that a site meets completion criteria when the following conditions apply:

1. Site characteristic hazardous gas flow (Q_{hgs}), as defined in BS 8485 <0.7 l/hr.
Where Q_{hgs} = (gas concentration (%)/100) x gas flow (l/hr)
2. The maximum flow in any one borehole should be less than 70l/hr

Full details of gas flow conditions are presented in Appendix A. The values of Q_{hgs} (reported as GSV) are also shown. There are occasions where W2 and W4 have shown the Q_{hgs} >0.7 l/hr, but this is not consistently the case. W6, which is considered to be influenced by mines gas, has shown several recordings of Q_{hgs} >0.7 l/hr.

The data is indicative of generally inert waste, which is influenced by coal mines gas.



4.3 Results for Perimeter Boreholes

Perimeter gas monitoring data, including data obtained by ARP from 2017 to 2020 in boreholes GW1 to GW3, is presented in Appendix C. A summary of key data is presented below.

Table 5: Perimeter Gas Monitoring Data									
	GW1			GW2			GW3		
Date	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)
* 31/05/17	-	0	0.4	-	0	1	-	24.1	10.9
* 08/08/17	0.2	0	1.1	0.1	0	0.4	0.2	0	0.5
* 26/11/17	0	0	1.1	-0.1	1	2.3	-0.2	0	0.3
* 26/11/18	1	0	0.8	0.2	0	0.9	0.9	0	0
* 28/01/20	3.1	0	2.1	20	0.9	4.8	3.1	0	0.4
* 25/02/20	0.4	0	1.8	106.9	2.1	2	3	0	0.6
06/02/21	0.1	0.1	0.4	0.1	0.1	0.2	0.1	0.1	0.3
20/02/21	0.1	0.1	1.2	0.1	0.1	1.3	0.1	0.1	0.3
06/03/21	0.1	0.1	1.2	-70.3	1.1	0.7	0.1	0.1	0.6
10/04/21	0.1	0.1	0.8	0.1	0.1	0.5	0.1	0.1	0.5
08/05/21	0.1	0.1	0.8	0.1	0.1	0.8	0.1	0.1	0.4
19/06/21	0.1	0.1	0.1	-25.7	0.1	0.1	0.1	0.1	0.4
17/07/21	0.1	0.1	1.3	-69.6	0.1	0.1	0.1	0.1	0.3
14/08/21	0.1	0.1	1.4	0.1	0.1	0.4	0.1	0.1	0.2
	GW4S			GW4D			GW5S		
Date	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)
06/02/21	0.1	0.1	0.7	0.1	0.1	2.2	0.1	0.1	0.1
20/02/21	0.1	0.1	2.4	0.1	0.1	3.3	0.1	0.1	0.1
06/03/21	0.1	0.1	3.6	0.1	4.7	3.3	0.1	0.1	1.1
10/04/21	0.1	4.9	5.4	0.1	14.6	6.8	0.1	0.1	2.3
08/05/21	0.1	9.3	6.3	0.1	18.2	7	0.1	0.1	2.2
19/06/21	0.1	8.3	5.3	0.1	0.1	0.1	0.1	0.1	1.3
17/07/21	0.1	9.8	5.4	0.1	2.2	3.9	0.1	0.1	0.1
14/08/21	0.1	8.5	5.2	0.1	0.1	0.1	0.1	0.1	0.3
	GW5D			GW6S			GW6D		
Date	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)
06/02/21	0.1	0.1	0.6	0.1	0.1	0.3	0.1	0.1	0.1
20/02/21	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	3
06/03/21	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.1	2.5
10/04/21	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	1.7
08/05/21	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.1	2
19/06/21	0.1	0.1	0.5	0.1	0.1	1.1	0.1	0.1	0.5
17/07/21	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.8
14/08/21	0.1	0.1	1.6	0.1	0.1	1	0.1	0.1	0.7
	GW7S			GW7D			GW8S		
Date	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)



06/02/21	0.1	0.1	1.5	0.1	0.1	0.2	0.1	0.1	0.2
20/02/21	0.1	0.1	1.5	0.1	0.1	0.1	0.1	0.1	0.1
06/03/21	0.1	0.1	1.2	0.1	0.1	0.5	0.1	0.1	2.4
10/04/21	0.1	0.1	1.6	0.1	0.1	0.2	0.1	0.1	0.2
08/05/21	0.1	0.1	1.6	0.1	0.1	0.2	0.1	0.1	0.8
19/06/21	0.1	0.1	1.2	0.1	0.1	1.8	0.1	0.1	0.4
17/07/21	0.1	0.1	0.7	0.1	0.1	0.5	0.1	0.1	0.9
14/08/21	0.1	0.1	0.5	0.1	0.1	2.1	0.1	0.1	0.3
	GW8D	GW8D	GW8D	GW9S	GW9S	GW9S	GW9D	GW9D	GW9D
Date	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)	Flow (l/h)	CH4 (% v/v)	CO2 (% v/v)
06/02/21	0.1	0.1	0.2	0.1	0.1	0.7	0.1	0.1	0.1
20/02/21	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.2
06/03/21	0.1	0.1	0.1	0.1	0.1	1.3	0.1	0.1	0.1
10/04/21	0.1	0.1	0.1	0.1	0.1	0.9	0.1	0.1	0.7
08/05/21	0.1	0.1	0.1	0.1	0.1	1.1	0.1	0.1	1.1
19/06/21	0.1	0.1	1.1	0.1	0.1	1.4	-49	0.1	0.7
17/07/21	0.1	0.1	0.8	0.1	0.1	1.4	-30	0.1	0.1
14/08/21	0.1	0.1	0.8	0.1	0.1	1.3	-38.1	0.1	0.1

* - data obtained by ARP, prior to installation of the 2021 boreholes

	Data appears erroneous
	Exceedances of standard thresholds of 1% for methane and 1.5% for carbon dioxide, or very low oxygen

It is noted that while variable concentrations of gases have been observed, particularly with respect to GW4S and GW4D, the flow is negligible. There are stockpiles of organic material directly adjacent to GW4S/D. It is unclear whether this is having any influence on gas conditions within these two boreholes.

Environment Agency guidance LFTGN03 presents trigger levels for gas monitoring boreholes, ie those beyond the perimeter of the waste is as follows:

- Methane – 1 % above agreed background concentrations
- Carbon dioxide – 1.5 % above agreed background concentrations

The data in Table 5 shows that there is evidence of methane and carbon dioxide already above these thresholds at the site perimeter in all directions from the quarry. Based on the wide spread of the boreholes, this indicates that coal mine gas is affecting borehole concentrations.

It should be noted that there is reported to have been deposit of wastes without an environmental permit close to Dry Corner Farm and borehole GW3. This has the potential to influence local ground gas conditions.



5. CONCEPTUAL MODEL

5.1 Overview

The schematic of the conceptual site model is shown in drawing 213036/CSM/D/001.

5.2 Source

There are three potential sources of ground gas associated with the site.

1. Deposit for recovery, of inert wastes within the footprint of the quarry – gas generation potential low.
2. Mines gas associated with the worked coal seams of the Upper Mountain Mine, Lower Mountain Mine and Lower Foot Mine – gas generation proven; concentrations variable; presence not consistent.
3. Deposited waste close to Dry Corner Farm and borehole GW3 – gas generation potential unknown.

In addition to the above there are stockpiles of organic material adjacent to GW4S and GW4D.

5.3 Pathway

The pathway for gas migration is through the fissures and fractures within the Pennine Lower Coal Measures strata. It is generally considered that receptors within 250 m of a waste deposit are those most sensitive, refer to Environment Agency guidance: 2004: LFTGN03: Guidance on the Management of Landfill Gas.

The presence of worked coal seams adjacent to and below the quarry offer more highly permeable pathways, as do mine adits. The conditions of mine gas flow within these worked seams are likely to change if they are seasonally flooded with groundwater and therefore, the pattern of gas generation may be highly variable throughout the year.

The existing waste deposit in the southern area of the quarry is uncontained. As the extension is worked northwards, the north, east and west perimeters will have engineered clay placed against the quarry face to prevent ingress of water to the waste during wetter periods of the year. This will limit potential gas migration pathways laterally from the extension area.

5.4 Receptors

The most sensitive receptors to the deposit of waste are presented in Table 2. Distances are measured from the permitted boundary of the site. The closest receptors are Hey Head Farm and Tong Farm.

Receptors of mine gas migration can be anywhere above and adjacent to a worked seam. Migration pathways will be dictated by the prevalence of fissures and fractures and the worked seams themselves. Drainage adits, such as that which emerges at Tong Farm, can also act as preferential pathways for mines gas.

The closest receptor to the unlicensed waste deposit east of the quarry is Dry Corner Farm. It is understood that the waste has been placed here by the owners of Dry Corner Farm. Borehole GW3 could act as a potential receptor to any gas migration from this deposit.



6. GAS RISK ASSESSMENT

6.1 Current Conditions

Monitoring data from within the existing waste deposit has recorded high concentrations of methane and carbon dioxide in some, but not all boreholes. Gas flow conditions are generally low. The two boreholes with highest concentrations have been sampled and a detailed study of the gas undertaken. This has shown that where methane is highest the likely origin is mines gas. Gas from the second borehole is indicative of a biogenic source. However, as the waste is inert, it is thought that the concentrations could be accounted for by the presence of small amounts of wood waste, which has been wrongly discarded.

Concentrations of methane and more commonly carbon dioxide have been encountered in perimeter boreholes, although flow is often negligible. The likely origin is mines gas from the worked coal seams.

There is insufficient information on the unlicensed waste deposit to the east to describe its gassing potential.

6.2 Proposed Extension

The proposed extension is northwards from the existing quarry. Following quarrying of the mineral, the void will be infilled with inert materials as a deposit for recovery operation, refer to the Waste Recovery Plan, AAe, 2021, report reference 213036/WRP/001. There are few properties within close proximity to the extension. The closest remain more than 250 m from the permit boundary once the extension area has been filled.

6.3 Hazard Identification

The hazard considered in this assessment is the potential for generation of landfill gas from inert wastes. By definition the inert wastes have a low potential for generation of landfill gas. However, the wastes will be approximately 15 – 20 m in thickness and placed below original ground level. Environment Agency guidance on waste recovery plans:

<https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-recovery-plans-and-deposit-for-recovery-permits#risk-assessment-for-bespoke-deposit-for-recovery-activities>

requires monitoring of methane, carbon dioxide and oxygen if the waste is deposited more than 2 m below the original ground surface.

6.4 Hazard Assessment

The gas generation potential of the inert wastes is low. Coal mines gas generation is likely based on the geological setting of the site and has been positively identified and recorded. It is essential for this site that background gas conditions, reflective of the Coal Measures setting are established, such that any change to ground gas conditions, as a result of the inert wastes, can be detected. Unlike landfill gas generation, mines gas can arise with very variable conditions throughout the year and this may be connected to processes such as seasonal flooding of workings with groundwater.

Within a landfill setting compliance limits are typically set for methane and carbon dioxide. It is well recognised that carbon dioxide can arise from other sources, mine workings being one example, refer to the Industry Code of Practice: 2011: Perimeter Soil Gas Emissions Criteria and Associated Management (ICoP). The Code of Practice recognises that methane is a key indicator of landfill gas. However, as carbon dioxide can arise from other sources it should not be assigned compliance limits within a permit. Gas action levels can be derived to assist with detecting a change in ground gas conditions.



6.5 Conclusion

The infilling of Tong Quarry has a low gas generation potential; however, gas monitoring is required. Compliance limits for perimeter boreholes should be set for methane based on background gas conditions reflective of its Coal Measures setting. No compliance limits should be set for carbon dioxide; however, gas action levels should be derived using the methods given in the 2011 Industry Code of Practice.

Once the quarry is infilled the waste should be monitored for gas using boreholes installed at a frequency of 2 per hectare. Further gas sampling and analysis will be required to confirm the origins of any gas detected to support the final permit surrender application.

7. GAS MONITORING PLAN

On the basis of the above Gas Risk Assessment the following monitoring measures are proposed.

- Gas monitoring should continue monthly in all perimeter and in-waste boreholes.
- Further in-waste boreholes should be added, at a spacing of 2 per hectare, as the site progresses.
- Monitoring should continue for a period of two years after site closure at intervals of not more than 2 months, such that 12 data sets are available to support a surrender application.

Monitoring will be undertaken using a handheld GA5000 to record the following:

- Gases: methane, carbon dioxide, carbon monoxide, hydrogen sulphide and oxygen;
- Flow rate and differential pressure; and
- Meteorological data including atmospheric pressure.

Waste recovery guidance states that if a site records more than 1.5% methane within waste boreholes, a walkover gas survey should be carried out. Given the geological setting and the proven influence of mines gas on the site, this approach would not be appropriate to Tong Quarry. It is proposed that if the Qhgs is regularly above 0.7 l/hr then gas sampling must be undertaken to assess the source of the gas. This should be undertaken after a year of data has been obtained for a waste well. If more than one location is found to have gas of biogenic origin, a walk over survey may be considered.

Gas Action Levels

Gas action levels have been derived for perimeter monitoring boreholes for both methane and carbon dioxide. These are to be used to guide site management procedures and to alert the site to changes in gas conditions, which may warrant further investigation.

Gas action levels have been derived using the ICoP methodology. This refers to the Environment Agency P1-471 outlier test, a screening tool which removes outliers from a standardised dataset. Once the outliers have been removed the Tmax value is used to set action levels on the following basis:

- For every well the action level will be the Tmax (background) methane concentration plus 0.5%
- For every well the action level will be 1% carbon dioxide above the Tmax carbon dioxide concentration if the Tmax carbon dioxide concentration is less than 5%.
- For every well the action level will be 2% carbon dioxide above the Tmax carbon dioxide concentration if the Tmax carbon dioxide concentration is between 5 - 10%.
- For every well the action level will be 3% carbon dioxide above the Tmax carbon dioxide concentration if the Tmax carbon dioxide concentration is between 10 - 20%.
- For every well the action level will be 4% carbon dioxide above the Tmax carbon dioxide concentration if the Tmax carbon dioxide concentration is > 20%.
- No action levels are proposed for Tmax carbon dioxide concentrations above 25%



The data has been processed using the ESI Soil and Groundwater Statistics calculator version 2. This uses the same techniques as Environment Agency R+D technical report P1-471, A.3 Statistical Analysis assuming normality. Outliers are automatically flagged. The highest remaining value is then considered the Tmax.

When data is proven to be non-normal by the ESI calculator this is flagged. The method then applied is the Chebychev Theorem. Methods are based on the assumption that 's' - the estimate of the true population standard deviation 'σ' is close enough to the true value. Outliers can also be discounted by this method to determine the Tmax.

The derived gas action levels for methane and carbon dioxide are presented in Table 6. Appendix D presents extracts from the ESI calculator.

In the event a gas action level is exceeded the gas action plan will be:

- A return monitoring visit within one month to confirm whether the same gas conditions prevail.
- A review of all in-waste borehole data, including borehole integrity and water level conditions.
- Gas sampling if appropriate.
- Gas walk over survey if appropriate.

Methane Compliance Levels

Methane compliance levels are also derived in line with the ICoP methods. The compliance level is equal to Tmax plus 1%.

In the event a methane compliance level is exceeded the gas action plan will be:

- Report the exceedance to the Environment Agency.
- Return monitoring visit within one week to confirm whether the same gas conditions prevail.
- Increased frequency of monitoring until actions below have been completed.
- A review of all in-waste borehole data, together with perimeter data and submit a report of findings to the Environment Agency.
- Gas sampling if appropriate.
- Gas walk over survey if appropriate.

The calculated gas action levels and methane compliance levels are presented in Table 6.

Table 6: Gas Action and Methane Compliance Levels					
Borehole	Tmax CO2	Action level CO2	Tmax CH4	Action level CH4	Compliance level CH4
GW1	2.1	3.1	0.1	0.6	1.1
GW2	2.3	3.3	1.1	1.6	2.1
GW3	0.6	1.6	0.1	0.6	1.1
GW4S	6.3	8.3	9.8	10.3	10.8
GW4D	7	9	18.2	18.7	no compliance limit
GW5S	2.3	3.3	0.1	0.6	1.1
GW5D	0.6	1.6	0.1	0.6	1.1
GW6S	1.1	2.1	0.1	0.6	1.1
GW6D	2.5	3.5	0.1	0.6	1.1
GW7S	1.6	2.6	0.1	0.6	1.1
GW7D	2.1	3.1	0.1	0.6	1.1
GW8S	0.9	1.9	0.1	0.6	1.1
GW8D	1.1	2.1	0.1	0.6	1.1
GW9S	1.4	2.4	0.1	0.6	1.1
GW9D	1.1	2.1	0.1	0.6	1.1



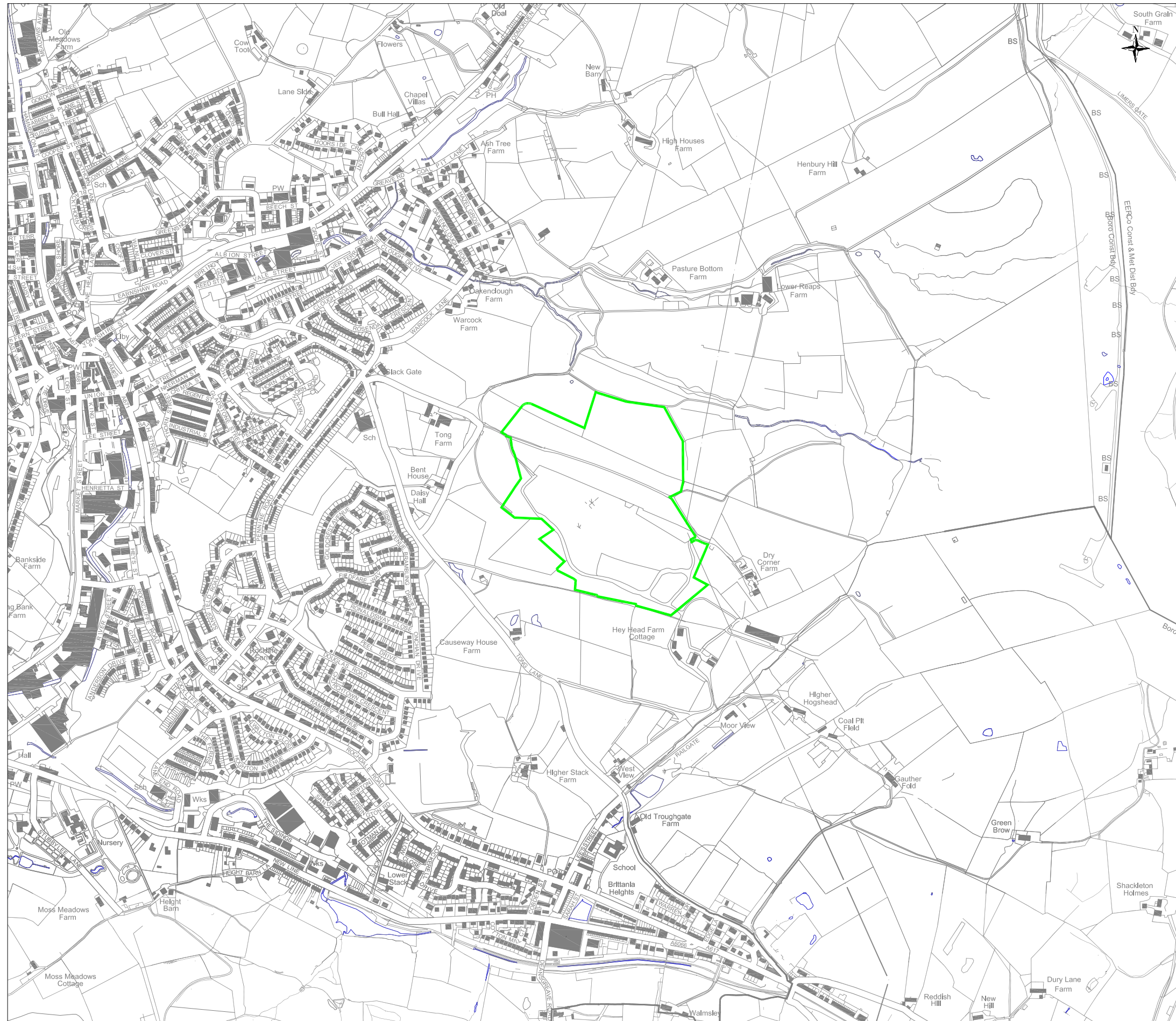
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1. AAe, 2021: Waste Recovery Plan, report reference 213036/WRP/001.
2. Environment Agency: 2014 : Additional Guidance for Landfill (EPR5.02) and other permanent deposits of waste. How to Surrender your Environmental Permit.
3. Environment Agency: 2014 : LFTGN03. Guidance on the Management of Landfill Gas.
4. C.S Eccles: 2021: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 9XA. Monitoring Report Round 6 to 8, June to August 2021, report reference 192.04-6.01
5. C.S. Eccles: April 2021: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 9XA. Gas testing and Source Assessment, report ref: 192.06.01
6. Industry Code of Practice: 2011: Perimeter Soil Gas Emissions Criteria and Associated Management (ICoP).
7. SMFoster Associates Limited: 2019: Proposed Northern Extension, Tong Quarry, Bacup, Lancashire. Hydrological and Hydrogeological Impact Assessment. Report reference 135/05/hia/0819.




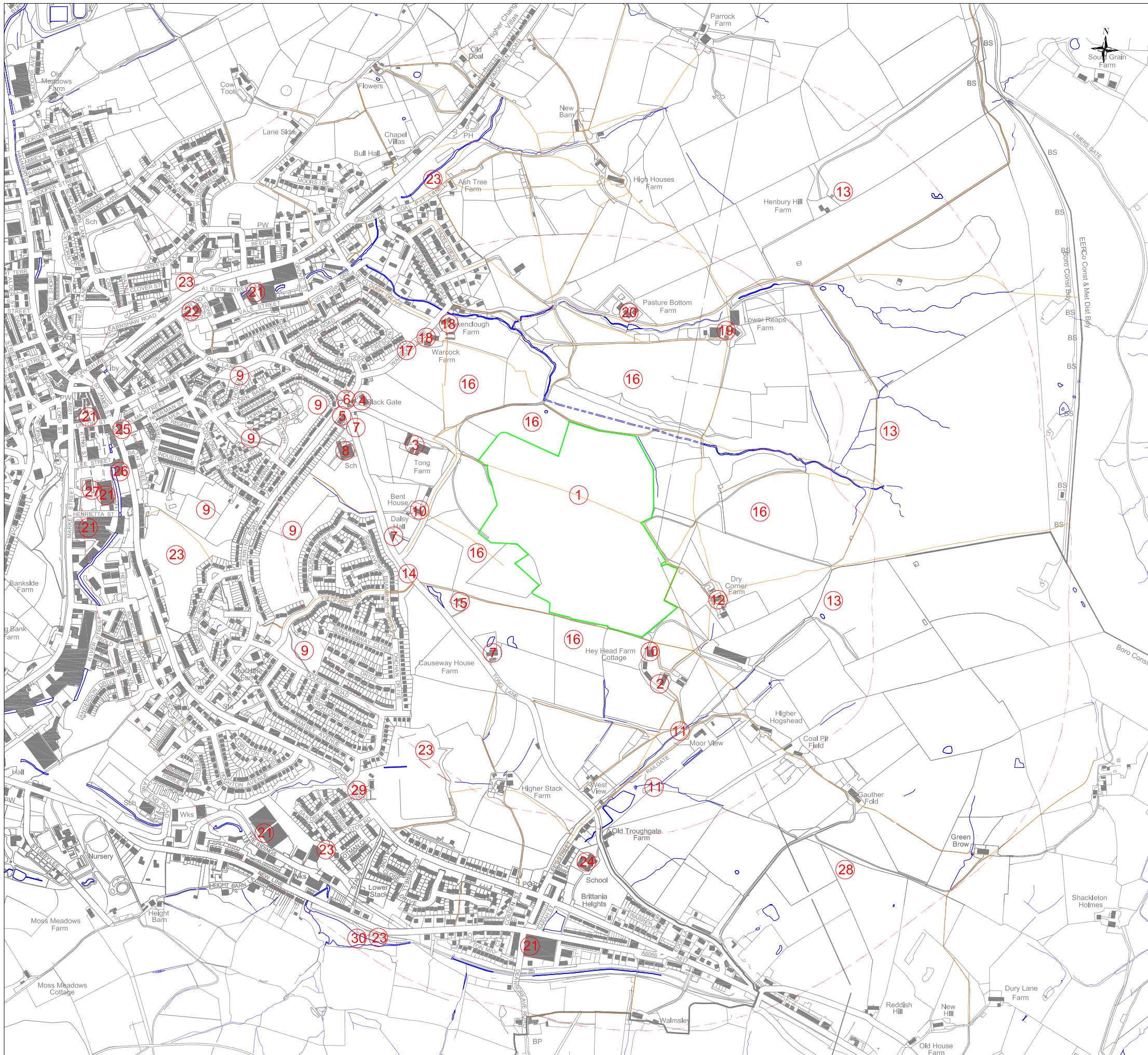
DRAWINGS

Site Location Plan - 213036/D/001
Sensitive Receptors - 213036/D/002
Boreholes Plan - 213036/D/006
Conceptual Site Model - 213036/CSM/D/001



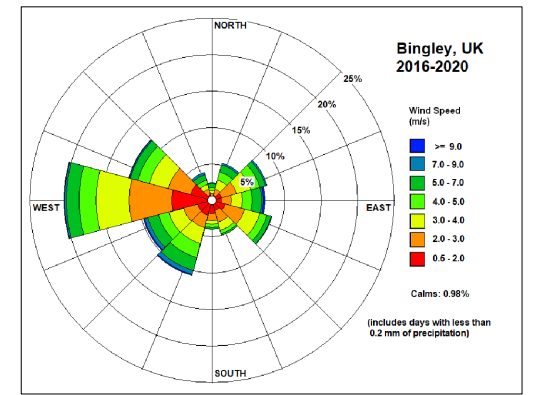
Key:
— Site Boundary

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Site Location Plan			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
Scale 1:10,000@A3	Date July '21	Drg. No. 213036/D/001	Rev.
Drawn JM	Chkd. ML		

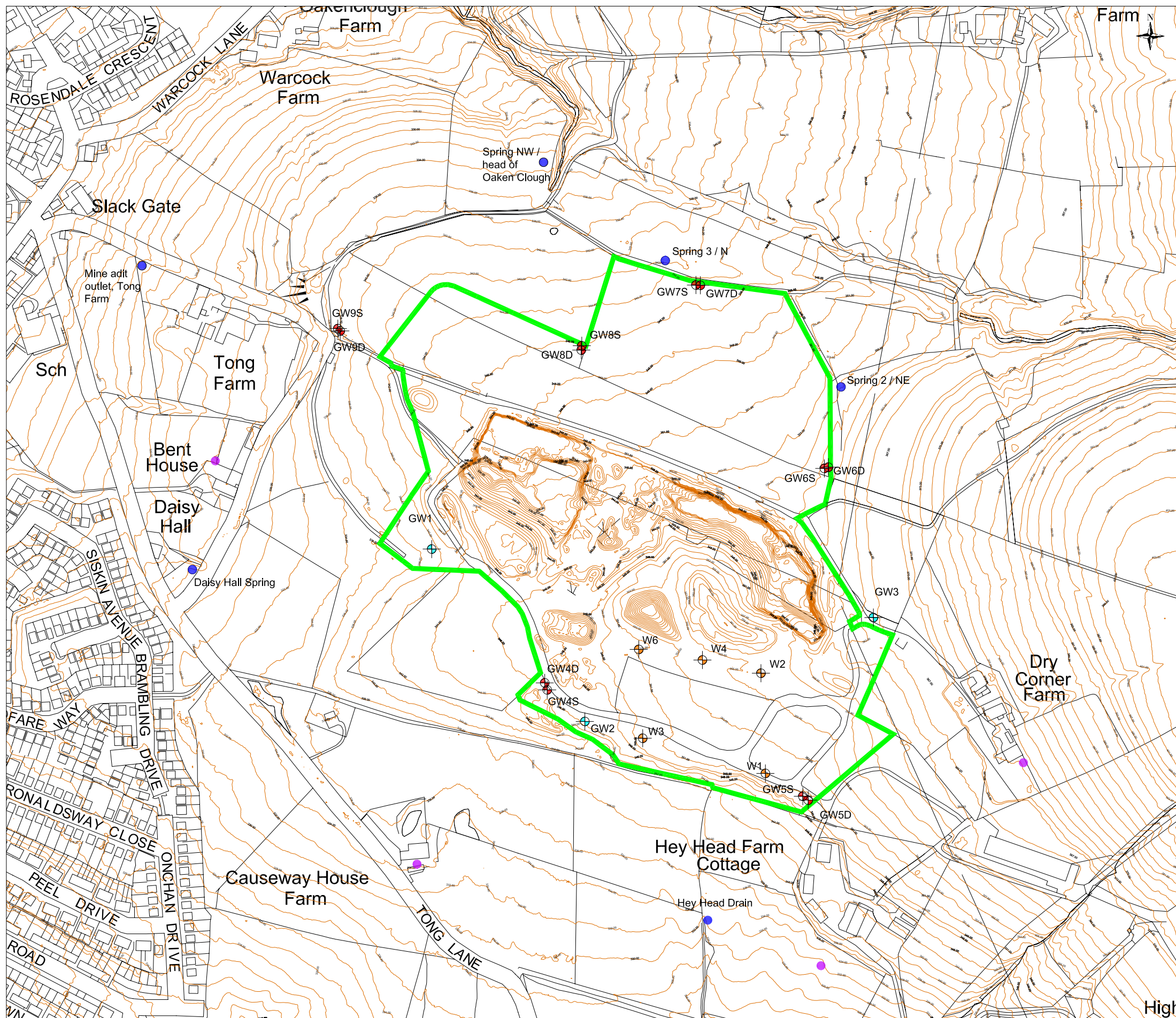


- Key:**
- ① Access Road
 - ② Hey Head Cottage
 - ③ Tong Farm
 - ④ Slack Gate
 - ⑤ Residential Dwelling along Pennine Road
 - ⑥ Pennine Road
 - ⑦ Dwellings along Tong Lane
 - ⑧ St. Marys RC Primary School
 - ⑨ Recreational Fields
 - ⑩ Hey Head Farm
 - ⑪ Lowland Fens Priority Habitat
 - ⑫ Dry Corner Farm
 - ⑬ Blanket Bog Priority Habitat
 - ⑭ Tong Lane
 - ⑮ Communications Tower
 - ⑯ Agricultural Fields
 - ⑰ Warcock Lane
 - ⑱ Dwellings along Warcock Lane
 - ⑲ Lower Reaps Farm
 - ⑳ Pasture Bottom Farm
 - ㉑ Commercial/Industrial Land Uses
 - ㉒ Vale Street Nursery
 - ㉓ Priority Deciduous Woodland Habitat
 - ㉔ Bacup Britannia Community Primary School
 - ㉕ Early Years & Childcare Centre
 - ㉖ Irwell Medical Practice
 - ㉗ European Protected Species- Bats
 - ㉘ Priority Grassland Habitat
 - ㉙ Rochdale Road (A671)
 - ㉚ New Line Picnic Site
 - Surface Water Course
 - 500 m and 1 km radius
 - Public Right of Way

Bingley Wind Rose:



Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Sensitive Receptors Plan			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
Scale 1:10,000@A3	Date Sep '21	Drawn JM	Chkd. ML
Drg. No. 213036/D/002		Rev.	



- Key:**
- Site Boundary
 - Perimeter Borehole (2021)
 - Existing Perimeter Borehole
 - Existing In-waste Borehole
 - Noise Monitoring Points
 - Surface Water Monitoring Points
 - Existing Ground Level Contour (m AOD)

Notes:
 1. Existing ground levels were taken from the National LiDAR Survey Data undertaken in 2019.

Surface Water Monitoring Point Coordinates		
ID	X	Y
Oaken Clough	388025	422994
Spring 3 / N	388146	422897
Spring 2 / NE	388320	422772
Hey Head Drain	388187	422245
Daisy Hall Spring	387678	422591
Mine adit outlet	387628	422892

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Monitoring Plan			
		AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk	
Scale 1:4,000@A3	Date Sep '21	Drawn JM	Chkd. ML
Drg. No. 213036/D/006		Rev.	



APPENDIX A

- A1 August Monitoring Report**
- A2 Gas Testing Report**

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



**TONG QUARRY, TONG LANE, BACUP,
LANCASHIRE, OL13 9XA
MONITORING REPORT ROUND 6 TO 8,
JUNE TO AUGUST 2021**

FOR

THE BACUP CLAY COMPANY LTD

C. S. Eccles - Brownfield Land Consultancy

Contaminated Land Assessments, Options Appraisals, Remediation Strategy & Verification,
Geotechnical Design, Earthworks & Materials Reuse, Waste Assessments & Classification, Ecology

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021

DOCUMENT CONTROL SHEET

Report Title: Tong Quarry, Tong Lane, Bacup, Lancashire, OL13 9XA -
Monitoring Report Round 4 & 5, April & May 2021

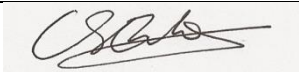
Client: The Bacup Clay Company Limited

Report Reference: 192.04-6.01

Report Status: For Use

Version: 1.0

Report Date: 27th August 2021

Written by: Chris Eccles, BEng, MSc, DIC, FGS, CGeol, CSci, CEnv, SiLC, UK RoGEP Adviser CL:AIRE DoWCoP QP 020, NQMS Suitably Qualified Person	
	27 th August 2021

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3	ROUND 5 & 6 MONITORING	3
4	ROUND 8 MONITORING & TESTING	3
5	SURFACE WATER FLOW MEASUREMENT	4

APPENDICES

1	DRAWINGS Borehole Location Plan - AAE Plan 213036/BH/D/001 Rev A
2	WATER LEVEL & GROUND GAS MONITORING DATA 2021
3	PHOTOGRAPHS
4	LABORATORY TEST DATA – ROUND 8 - AUGUST 2021

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021

1 INTRODUCTION

1.1 The Bacup Clay Company Ltd (the quarry owners) commissioned a monitoring of a series of groundwater monitoring wells and surface water locations in accordance with the existing Environmental Permit and also to support a Permit application for the proposed extension of Tong Quarry, Bacup, Lancashire. The quarry is to be restored by means of infill with inert construction demolition and excavation waste.

1.2 Lancashire County Council has granted Planning Permission to extend the quarry (Application number is LCC/2020/0018). The location is presented in Figure 1 below.

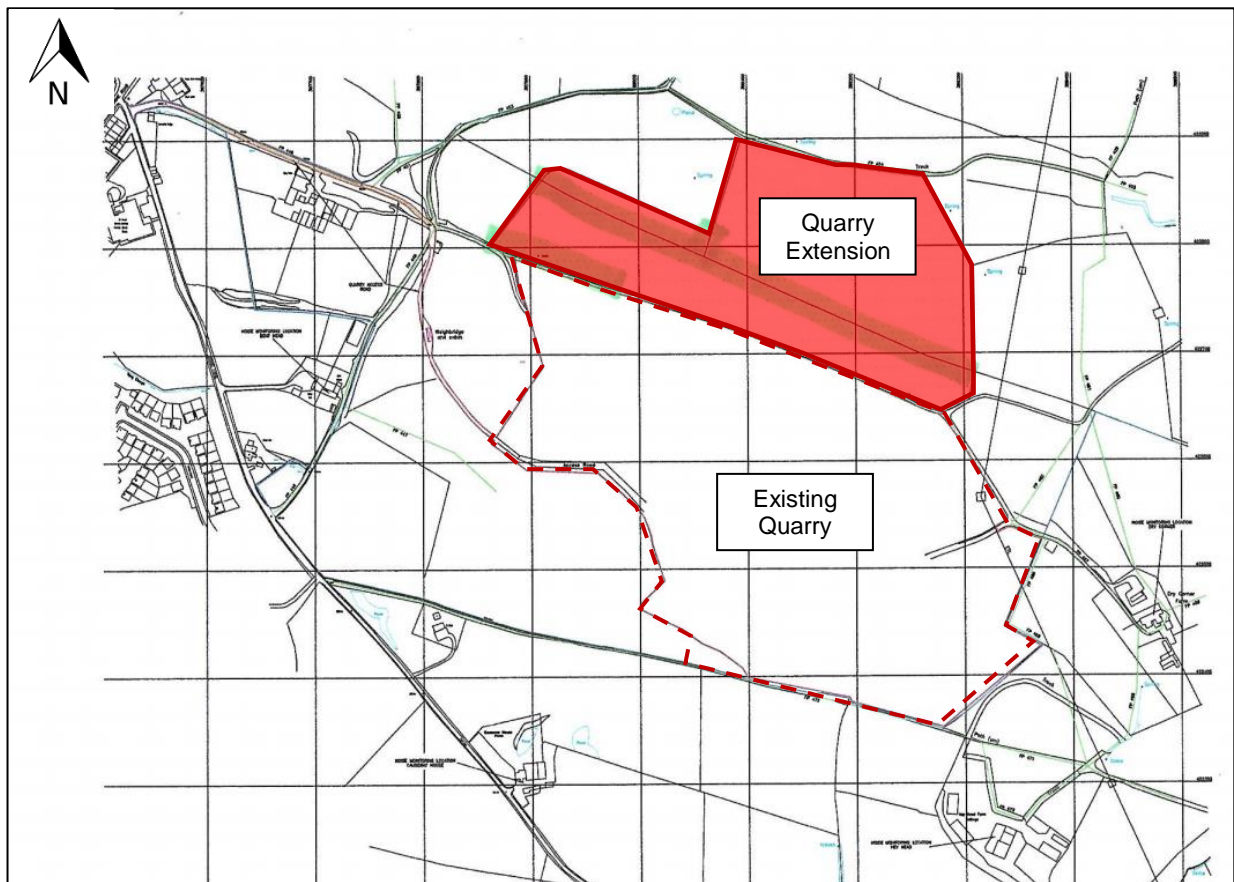


Figure 1: Tong Quarry - Existing Quarry and Extension Area

1.3 The monitoring locations are indicate in Appendix 1 and monitoring has comprised :

1. Three single groundwater monitoring wells installed in 2017 and additional pairs of wells (two in existing quarry, four in extension) installed in January 2021;
2. Five gas monitoring wells within infilled part of quarry.
3. Monitoring Rounds 6 and 7 in June & July 2021 were 'monthly rounds' of just water level and gas monitoring of all the wells. In June 2021 measurement of flow rates was also carried out in surface waters.
4. Monitoring Round 8 in August 2021 comprised a 'quarterly round':
 - Water level and gas monitoring in all wells;

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021

- Sampling and testing from all wells (which were not dry);
- Surface water sampling from six locations;
- Flow Rate measurement in the 'Mine Adit Spring.'
- Laboratory chemical analysis.

1.4 The installation of the additional wells and Monitoring Rounds 1 and 2 are reported in Report 192.02.01 of 28/03/21. The factual data from Round 3 fieldwork and chemical laboratory testing. Was reported in 192.03.02 of 19.03.21 and a separate report was provided on the gas sampling and associated laboratory gas testing carried out just in Round 3 in 193.06.01 of 07.04.21. Rounds 4 & 5 were reports in 192.04.05.01 of 18.05.21. This report presents the factual data from Rounds 6 to 8.

2 SITE LOCATION & DESCRIPTION

2.1 Tong Quarry is located approximately 0.5km to the east of Bacup in Lancashire at grid reference SD 881 225. The site is situated approximately 600m to the south east of Tong Farm. The quarry is established on former agricultural land in an area that is predominantly rural. Tong Lane runs south east to north west 300m to the south west of the site. The only other access routes in the area are the quarry access track and agricultural access tracks. The location of the site is indicated in Figure 2.



Figure 2: Site Location

2.2 The existing quarry has been worked roughly from south to north. The southern and eastern part of the existing quarry has been backfilled and part restored along the southern boundary. The remaining reserve in the existing quarry is in the central part of the north.

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021

2.3 The quarry extension area comprises parts of three grassed fields separated by drystone walls. The ground level falls to the north/north west in this extension area. There is a track which separates the existing quarry from the extension.

3 ROUND 5 & 6 MONITORING

3.1 The fourth round of monitoring and sampling comprised:

- Ground gas monitoring was carried out in accordance with BS8576:2013 in each of the wells using a GasData GFM435 infra-red meter to measure gas flow rate, methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide. Note that only wells GW2, GW7S, W1 to W4 and W6 act as true gas monitoring wells. All other wells have the filter sections of the wells flooded so these wells monitor gas coming out of solution in the wells.
- Measurement of groundwater level. Note that W3 was blocked so the groundwater level could not be measured
- Flow rate measurement in the surface waters was carried out as part of Round 5 and from Round 6 onwards the flow rate of the Mine Adit Spring is being monitored each month.

4 ROUND 8 MONITORING & TESTING

4.1 This fifth round of monitoring and sampling comprised:

- Ground gas monitoring was carried out in accordance with BS8576:2013 in each of the wells using a GasData GFM435 infra-red meter to measure gas flow rate, methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide. Note that only wells GW2, GW7S, W1 to W4 and W6 act as true gas monitoring wells. All other wells have the filter sections of the wells flooded so these wells monitor gas coming out of solution in the wells.
- Measurement of groundwater level. Note that W3 was blocked so the groundwater level could not be measured.
- Surface water sampling from three new locations:
 - Daisy Hall Spring, Mine Adit Spring & Hey Head Drain.
 - Samples were tested on site using a Hanna Instruments portable analyser for pH, conductivity, resistivity, temperature, dissolved oxygen, TDS and salinity.
 - Each sample comprised two vials, one 1 litre amber glass jars and a 1 litre plastic bottle.
 - All samples were stored in cool boxes and dispatched to the laboratory.
- All samples were tested by Eurofins Chemtest for pH, metals, anions plus a range of organic compounds.

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021

4.2 The results of the above monitoring are presented in Appendix 2 with photographs of the surface water sampling locations presented in Appendix 3 together with two photos of base of quarry.

4.3 Results of the laboratory testing are reported in Appendix 4.

5 SURFACE WATER FLOW MEASUREMENT

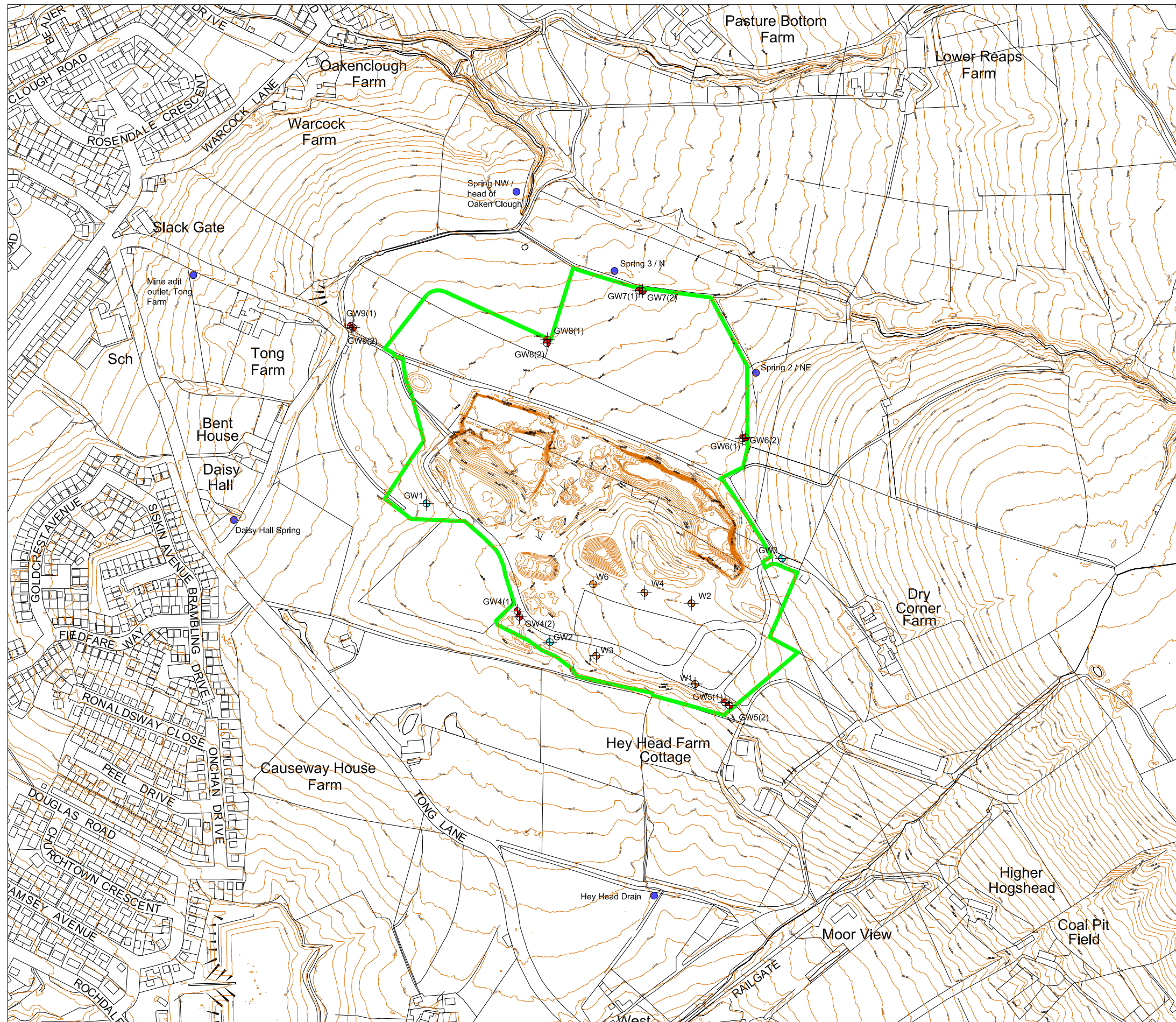
As part of Round 8 a decision to measure the flow rates in the surface waters and then Mine Adit Spring was to be measured on a monthly basis for the next year. The results of the monitoring are presented below:

Summary of Measured Flow Rates					
Surface Water Location	Date	Remarks	Measured Flow Rate (l/s)	Measured Flow Rate (l/min)	Measured Flow Rate (m ³ /hr)
Daisy Hall Spring	28/06/2021		0.0133	0.8	0.05
Mine Adit Spring	28/06/2021		0.45	27.0	1.62
	17/07/2021		0.375	22.5	1.35
	14/08/2021		0.375	22.5	1.35
Hey Head Drain	28/06/2021	Slight flow	<0.001	-	-
NW	28/06/2021		0.33	20.0	1.20
N	28/06/2021		0.20	12.0	0.72
NE	28/06/2021	No flow	-	-	-
Notes:					
Not possible to measure slight flow in Hey Head Drain 28/06/21					

APPENDIX 1

DRAWINGS

Borehole Location Plan - AAE Plan 213036/BH/D/001 Rev A



- Key:**
- Site Boundary
 - Perimeter Borehole (2021)
 - Existing Perimeter Borehole
 - Existing In-waste Borehole
 - Spring Location
 - 346 Existing Ground Level Contour (m AOD)

Notes:
 1. Existing ground levels were taken from the National LiDAR Survey Data undertaken in 2019.

Rev.	Details	Drawn Chkd.	Date
Project 213036 Tong Quarry			
Title Borehole Location Plan			
 AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T: (01235) 536042 F: (01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk			
Scale	Date	Drg. No.	Rev.
1:5,000@A3	Feb '21 Drawn JM Chkd. ML	213036/BH/D/001	A

APPENDIX 2

**WATER LEVEL & GROUND GAS
MONITORING DATA**

Tong Quarry, Bacup													C Eccles Brownfield Land Consultancy
Groundwater Monitoring - On-Site Water Testing													
Location	Date	Temp [°C]	pH	ORP	EC [µS/cm]	EC Abs [µS/cm]	RES [KOhm-cm]	TDS [ppm]	Salinity [psu]	Press [mbar]	D.O. [%]	D.O. [ppm]	Remarks
GW1	20/02/2021												Insufficient amount of water to obtain sample
	08/05/2021												Insufficient amount of water to obtain sample
	14/08/2021												Insufficient amount of water to obtain sample
GW3	20/02/2021	10.07	6.63	229.3	289	218	3.5	144	0.14	991.0	37.5	3.94	
	08/05/2021	10.30	6.59	73.7	268	N/A	3.7	134	0.13	974.0	33.0	3.47	
	14/08/2021	10.40	6.79	101.2	278	N/A	3.7	139	0.12	977.0	35.0	3.67	
GW4S	20/02/2021	9.96	6.45	315.5	854	642	1.2	427	0.42	991.1	15.5	1.63	
	08/05/2021	10.56	6.60	-20.2	1185	N/A	0.8	593	0.59	975.1	15.2	1.58	
	14/08/2021	10.48	6.68	120.4	980	N/A	1.0	490	0.48	975.0	14.3	1.41	
GW4D	20/02/2021	10.20	6.71	261.3	2544	1878	0.4	1272	1.32	991.1	16.3	1.74	
	08/05/2021	11.58	6.43	15.2	1297	N/A	0.8	649	0.65	974.8	21.4	2.24	
	14/08/2021	10.82	6.78	140.5	1518	N/A	0.7	759	0.78	975.0	18.4	1.92	
GW5S	20/02/2021	9.65	6.88	284.4	279	209	3.6	140	0.13	989.9	71.2	7.54	
	08/05/2021	10.58	6.52	76.7	256	N/A	3.9	128	0.12	975.1	32.6	3.41	
	14/08/2021	10.62	6.75	108.4	267	N/A	3.7	134	0.13	975.0	48.1	5.01	
GW5D	20/02/2021	9.78	7.22	212.3	620	464	1.6	310	0.30	989.7	46.5	4.90	
	08/05/2021	10.90	6.65	71.9	581	N/A	1.7	290	0.28	974.8	28.4	2.94	
	14/08/2021	10.82	7.01	120.5	602	N/A	1.8	301	0.18	975.0	30.2	3.14	
GW6S	20/02/2021	9.28	6.43	241.5	210	155	4.8	105	0.10	990.2	32.7	3.50	
	08/05/2021	10.50	6.25	81.8	109	N/A	9.2	54	0.05	974.6	21.3	2.23	
	14/08/2021	10.49	6.37	141.7	154	N/A	7.1	77	0.12	975.0	24.8	2.62	
GW6D	20/02/2021	10.06	7.09	219.0	185	136	5.4	93	0.09	990.2	50.3	5.41	
	08/05/2021	10.50	6.25	81.8	109	N/A	9.2	55	0.05	974.6	21.3	2.23	
	14/08/2021	10.69	6.74	130.6	140	N/A	7.7	70	0.08	975.0	14.8	1.82	
GW7D	20/02/2021	10.80	5.64	348.3	75	54	13.3	37	0.03	990.9	37.8	4.09	
	08/05/2021	10.31	5.81	157.9	62	N/A	16.1	31	0.03	974.5	34.4	3.62	
	14/08/2021	10.56	6.56	171.6	101	N/A	17.1	51	0.10	876.0	21.8	2.36	
GW8S	20/02/2021	9.35	6.02	316.8	127	978	7.9	64	0.06	991.0	47.2	4.94	
	08/05/2021	10.37	5.29	250.0	87	N/A	11.5	43	0.04	975.0	38.0	3.99	
	14/08/2021	10.51	6.53	130.5	135	N/A	9.7	68	0.08	976.0	27.3	2.98	
GW8D	20/02/2021	10.75	6.03	351.0	139	104	7.3	70	0.07	991.1	47.0	4.98	
	08/05/2021	10.34	6.72	126.1	326	N/A	3.1	163	0.16	975.4	29.8	3.13	
	14/08/2021	10.47	6.84	108.7	218	N/A	4.6	109	0.15	976.0	27.5	2.98	
GW9S	20/02/2021	10.00	6.39	294.0	304	223	3.3	152	0.15	990.7	33.4	3.60	
	08/05/2021	10.46	6.55	180.4	337	N/A	3.0	169	0.16	975.0	34.7	3.64	
	14/08/2021	10.59	7.01	201.5	329	N/A	3.2	165	0.18	976.0	23.7	2.58	
GW9D	20/02/2021	10.45	6.53	313.5	536	388	1.9	268	0.26	990.9	49.6	5.40	

APPENDIX 3

PHOTOGRAPHS

ROUND 6 - 28 JUNE 2021



View of Quarry From Southwest, Looking East



Daisy Hall Spring – Little Apparent Flow In the Spring

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



Daisy Hall Spring – Measurement point where stream narrows about 2.5 m downstream of the spring



Mine Adit – measurement location west of end of adit where flow passes through a drainage pipe rather than in a ditch

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



Hey Head Drain - Water Present but negligible apparent flow



Surface Water North

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



Surface Water Northwest – End of Drain



Surface Water Northwest – Flow Measurement Location About 10m from the End of the Drain

PHOTOGRAPHS ROUND 7 – 17 JULY 2021



View of Quarry From Southwest, Looking East

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021

PHOTOGRAPHS ROUND 8 – 14 AUGUST 2021



View of Quarry From Southwest, Looking East

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



View of Spring Northeast

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



View of Spring North

Tong Quarry Bacup - Monitoring Report Round 6 to 8, June to August 2021



View of Spring Northwest

APPENDIX 4

LABORATORY TEST DATA – ROUND 8 – 14 AUGUST 2021



Final Report

Report No.: 21-28639-1
Initial Date of Issue: 25-Aug-2021
Client: Mr C S Eccles
Client Address: 55 St Catherine Drive
Hartford
Cheshire
CW8 2FE
Contact(s): Chris Eccles
Project: 192.01 Tong Quarry, Bacup
Quotation No.: Q21-22639 **Date Received:** 18-Aug-2021
Order No.: 192.01 **Date Instructed:** 18-Aug-2021
No. of Samples: 21
Turnaround (Wkdays): 5 **Results Due:** 24-Aug-2021
Date Approved: 25-Aug-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:											
Quotation No.: Q21-22639		Chemtest Sample ID.:											
Sample Location:		Mine Adit	Daisey Hall Spring	Hey Head Drain	Spr NW	Spr N	Spr NE	GW1	GW3	GW4S			
Sample Type:		WATER											
Date Sampled:		14-Aug-2021											
Determinand	Accred.	SOP	Units	LOD									
pH	U	1010		N/A	7.4	7.4	6.7	4.0	3.8	6.3	7.2	6.7	6.5
Electrical Conductivity	U	1020	µS/cm	1.0	670	500	310	360	410	110	1400	340	820
Alkalinity (Total)	U	1220	mg/l	10	97	160	< 10	< 10	< 10	33	670	97	330
Chloride	U	1220	mg/l	1.0	21	14	11	9.8	9.0	10	36	10	81
Fluoride	U	1220	mg/l	0.050	0.22	0.20	0.46	0.51	0.51	0.13	0.19	0.15	3.8
Ammoniacal Nitrogen	U	1220	mg/l	0.050	0.16	0.065	< 0.050	0.057	< 0.050	0.18	< 0.050	0.10	3.7
Sulphate	U	1220	mg/l	1.0	260	77	130	130	140	17	120	56	36
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1455	mg/l	2.00	60	90	22	21	21	8.4	85	30	86
Potassium	U	1455	mg/l	0.50	3.7	4.1	1.6	1.6	1.6	3.0	6.6	1.7	5.6
Magnesium	U	1455	mg/l	0.20	28	7.0	10	9.3	9.8	1.8	20	9.1	19
Sodium	U	1455	mg/l	1.50	18	13	6.7	6.2	6.5	7.5	210	7.1	31
Total Hardness as CaCO3	U	1270	mg/l	15	270	260	97	91	93	28	290	110	290
Aluminium (Dissolved)	N	1455	µg/l	5.0	< 5.0	22	5400	5300	5600	37	400	300	12
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20	1.0	0.34	0.38	0.41	0.33	0.57	< 0.20	0.60
Boron (Dissolved)	U	1455	µg/l	10.0	86	170	19	17	20	14	45	13	62
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	0.86	0.82	0.84	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	5.6	9.7	9.5	10	4.5	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	0.96	6.2	38	38	39	2.6	1.0	< 0.50	< 0.50
Manganese (Dissolved)	U	1455	µg/l	0.50	390	110	740	730	780	630	100	2100	2300
Nickel (Dissolved)	U	1455	µg/l	0.50	7.0	5.7	57	57	60	5.5	6.2	11	11
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	0.58	1.8	1.7	1.6	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	2.9	1.2	1.3	1.4	< 0.50	0.82	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	23	< 2.5	71	72	78	10	< 2.5	7.4	< 2.5
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.18	0.39	0.034	< 0.010
Iron (Dissolved)	N	1455	mg/l	0.005	< 0.005	0.99	1.9	2.1	2.4	0.99	0.13	0.47	23
Total Organic Carbon	U	1610	mg/l	2.0	< 2.0	15	4.7	3.6	3.6	3.9	3.0	< 2.0	6.6
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	1.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:											
Quotation No.: Q21-22639		Chemtest Sample ID.:											
Sample Location:		Mine Adit	Daisey Hall Spring	Hey Head Drain	Spr NW	Spr N	Spr NE	GW1	GW3	GW4S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER			
Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD									
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262725	1262726	1262727	1262728	1262729	1262730	1262731	1262732	1262733	1262733
Sample Location:		Mine Adit	Daisey Hall Spring	Hey Head Drain	Spr NW	Spr N	Spr NE	GW1	GW3	GW4S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD									
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262725	1262726	1262727	1262728	1262729	1262730	1262731	1262732	1262733	
Sample Location:		Mine Adit	Daisey Hall Spring	Hey Head Drain	Spr NW	Spr N	Spr NE	GW1	GW3	GW4S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER			
Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021		
Determinand	Accred.	SOP	Units	LOD									
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:														
Quotation No.: Q21-22639		Chemtest Sample ID.:														
Sample Location:		Mine Adit	Daisy Hall Spring	Hey Head Drain	Spr NW	Spr N	Spr NE	GW1	GW3	GW4S						
Sample Type:		WATER														
Date Sampled:		14-Aug-2021														
Determinand	Accred.	SOP	Units	LOD												
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262734	1262735	1262736	1262737	1262738	1262739	1262740	1262741	1262742	
Sample Location:		GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S	GW8D	GW9S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD									
pH	U	1010		N/A	6.3	6.6	6.7	6.3	6.9	6.1	6.6	5.7	6.1
Electrical Conductivity	U	1020	µS/cm	1.0	1100	290	710	220	550	140	290	87	450
Alkalinity (Total)	U	1220	mg/l	10	360	36	200	54	210	25	170	21	39
Chloride	U	1220	mg/l	1.0	120	10	29	7.0	8.4	7.9	14	5.3	16
Fluoride	U	1220	mg/l	0.050	4.2	0.18	0.14	0.18	0.17	0.13	0.13	0.12	0.12
Ammoniacal Nitrogen	U	1220	mg/l	0.050	4.3	0.072	0.19	0.061	< 0.050	0.22	0.17	< 0.050	< 0.050
Sulphate	U	1220	mg/l	1.0	34	54	140	38	78	22	37	13	160
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1455	mg/l	2.00	100	18	91	13	64	110	53	7.0	41
Potassium	U	1455	mg/l	0.50	8.5	1.6	2.8	1.3	2.8	1.5	2.4	1.2	2.4
Magnesium	U	1455	mg/l	0.20	20	6.3	22	7.6	24	17	9.7	1.2	20
Sodium	U	1455	mg/l	1.50	65	7.7	11	5.5	8.2	4.4	13	3.4	10
Total Hardness as CaCO3	U	1270	mg/l	15	340	72	320	65	260	360	170	23	180
Aluminium (Dissolved)	N	1455	µg/l	5.0	65	860	65	6.9	750	260	25	140	< 5.0
Arsenic (Dissolved)	U	1455	µg/l	0.20	1.6	< 0.20	< 0.20	0.26	0.21	3.0	< 0.20	0.23	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	69	14	21	< 10	13	37	23	10	13
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.19	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	2.4	< 0.50	9.6	3.4	2.4	< 0.50	5.5	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	0.96	0.73	< 0.50	0.78	11	2.8	7.6	< 0.50
Manganese (Dissolved)	U	1455	µg/l	0.50	3900	280	590	2300	95	180	150	190	1000
Nickel (Dissolved)	U	1455	µg/l	0.50	46	10	0.94	9.3	2.6	6.0	2.8	5.0	5.7
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.8	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	2.2	< 0.50	< 0.50	< 0.50	< 0.50	1.6	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	6.4	2.8	4.0	< 2.5	820	2.8	19	5.5
Mercury Low Level	U	1460	µg/l	0.010	0.11	0.18	0.15	0.042	< 0.010	0.096	0.026	< 0.010	0.060
Iron (Dissolved)	N	1455	mg/l	0.005	60	0.46	0.36	0.44	0.34	4.5	0.013	0.080	0.009
Total Organic Carbon	U	1610	mg/l	2.0	9.7	< 2.0	2.4	< 2.0	< 2.0	< 2.0	3.9	5.7	< 2.0
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:										
Quotation No.: Q21-22639		Chemtest Sample ID.:										
Sample Location:		GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S	GW8D	GW9S		
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER		
Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021		
Determinand	Accred.	SOP	Units	LOD								
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles	Chemtest Job No.:		21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639
Quotation No.: Q21-22639	Chemtest Sample ID.:		1262734	1262735	1262736	1262737	1262738	1262739	1262740	1262741	1262742		
	Sample Location:		GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S	GW8D	GW9S		
	Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER		
	Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021		
Determinand	Accred.	SOP	Units	LOD									
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262734	1262735	1262736	1262737	1262738	1262739	1262740	1262741	1262742	
Sample Location:		GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S	GW8D	GW9S			
Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD									
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:											
Quotation No.: Q21-22639		Chemtest Sample ID.:											
Sample Location:		GW4D	GW5S	GW5D	GW6S	GW6D	GW7D	GW8S	GW8D	GW9S			
Sample Type:		WATER											
Date Sampled:		14-Aug-2021											
Determinand	Accred.	SOP	Units	LOD									
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639	
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262743	1262744	1262745	
		Sample Location:		GW9D	W2	W6	
		Sample Type:		WATER	WATER	WATER	
		Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021	
Determinand	Accred.	SOP	Units	LOD			
pH	U	1010		N/A	6.4	6.7	6.7
Electrical Conductivity	U	1020	µS/cm	1.0	670	1400	3600
Alkalinity (Total)	U	1220	mg/l	10	140	230	880
Chloride	U	1220	mg/l	1.0	86	130	510
Fluoride	U	1220	mg/l	0.050	0.13	0.14	0.21
Ammoniacal Nitrogen	U	1220	mg/l	0.050	0.19	0.42	10
Sulphate	U	1220	mg/l	1.0	68	370	320
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1455	mg/l	2.00	75	160	420
Potassium	U	1455	mg/l	0.50	2.8	6.3	21
Magnesium	U	1455	mg/l	0.20	17	49	54
Sodium	U	1455	mg/l	1.50	11	32	210
Total Hardness as CaCO3	U	1270	mg/l	15	260	600	1300
Aluminium (Dissolved)	N	1455	µg/l	5.0	< 5.0	< 5.0	< 5.0
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20	0.59	2.5
Boron (Dissolved)	U	1455	µg/l	10.0	25	45	740
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	1.7	2.3
Manganese (Dissolved)	U	1455	µg/l	0.50	470	2000	1900
Nickel (Dissolved)	U	1455	µg/l	0.50	1.9	10	7.1
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	3.3	< 2.5	< 2.5
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010
Iron (Dissolved)	N	1455	mg/l	0.005	< 0.005	2.1	5.0
Total Organic Carbon	U	1610	mg/l	2.0	< 2.0	9.0	80
Total TPH >C10-C40	U	1670	µg/l	10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262743	1262744	1262745
		Sample Location:		GW9D	W2	W6
		Sample Type:		WATER	WATER	WATER
		Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD		
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:		21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:		1262743	1262744	1262745
		Sample Location:		GW9D	W2	W6
		Sample Type:		WATER	WATER	WATER
		Date Sampled:		14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD		
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles		Chemtest Job No.:			21-28639	21-28639	21-28639
Quotation No.: Q21-22639		Chemtest Sample ID.:			1262743	1262744	1262745
		Sample Location:			GW9D	W2	W6
		Sample Type:			WATER	WATER	WATER
		Date Sampled:			14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD			
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 192.01 Tong Quarry, Bacup

Client: Mr C S Eccles	Chemtest Job No.:				21-28639	21-28639	21-28639
Quotation No.: Q21-22639	Chemtest Sample ID.:				1262743	1262744	1262745
	Sample Location:				GW9D	W2	W6
	Sample Type:				WATER	WATER	WATER
	Date Sampled:				14-Aug-2021	14-Aug-2021	14-Aug-2021
Determinand	Accred.	SOP	Units	LOD			
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C ₆ –C ₄₀); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

END OF REPORT



APPENDIX B
In-Waste Borehole Data from 2017 to present



Well	Date	Depth to Base (m bgl)	Water Depth (m bgl)	Atmospheric Pressure (mbar)	Relative Pressure (mb)	Peak Flow (l/h)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)
ARP data	31/5/17						0	0.3	18.3		
ARP	8/8/17		8.57			0.1	0	0.3	18.4		
ARP	28/11/17		8.59			-0.2	0	2.9	18.1		
ARP	26/11/18		7.97			1.0	0	1.1	19.4		
ARP	28/1/20		8.75			4.0	42.2	5.3	0		
ARP	25/2/20		6.71			3.0	22.8	7.2	0.5		
W1	06/02/21	8.22	8.01	964	0.01	0.1	0.1	3.4	7.4	1	1
	20/02/21	8.22	Damp	952	0.01	0.1	0.1	4.9	16.3	1	1
	06/03/21	8.22	8.22	992	0.01	0.1	0.1	4.8	13.0	1	1
	10/04/21	8.22	8.22	972	0.01	0.1	0.1	4.8	16.9	1	1
	08/05/21	8.22	8.22	956	0.01	0.1	0.1	2.9	8.7	1	1
	19/06/21	8.22	8.22	973	0.01	0.1	0.1	1.8	17.8	1	1
	17/07/21	8.22	8.22	989	0.01	0.1	0.1	4.3	0.5	1	1
	14/08/21	8.07	7.94	975	0.01	0.1	1.9	4.6	0.2	1	1
ARP data	31/05/17		5.67				50.7	42.5	0.4		
ARP	08/08/17		2.73			0.1	0.0	1.8	15.1		
ARP	28/11/17		4.58			-0.1	0.7	0.5	16.7		
ARP	26/11/18					0.0	0.9	0.5	19.3		
ARP	28/01/20					1.6	13.9	5.9	0.0		
ARP	25/02/20					4.0	11.1	5.3	0.1		
W2	06/02/21	12.16	4.39	964	-0.62	0.1	9.8	1.7	4.6	1	1
	20/02/21	12.16	3.70	952	0.01	0.1	4.0	17.0	0.8	1	1
	06/03/21	12.16	4.78	990	-0.35	0.1	7.8	2.2	1.9	1	1
	10/04/21	12.16	4.78	972	0.01	0.1	11.7	2.5	13.5	1	1
	08/05/21	12.16	1.72	956	3.26	30.1	11.1	2.0	0.1	1	1
	19/06/21	12.16	2.22	972	0.37	5.1	15.7	10.4	0.7	10	1
	17/07/21	12.16	3.85	989	0.04	0.8	4.6	4.8	0.1	1	1
	14/08/21	12.16	5.59	975	0.01	0.1	10.3	7.1	0.1	1	1
ARP data	31/05/17		dry				0.0	0.3	18.5		
ARP	08/08/17		11.44			0.3	4.6	6.9	14.0		
ARP	28/11/17		11.10			-0.2	0.0	0.1	20.7		
ARP	26/11/18		dry			0.7	0.0	0.0	20.5		
ARP	28/01/20		10.20			1.5	1.1	5.6	11.6		
ARP	25/02/20		7.27			8.0	0.0	1.0	8.7		
W3	06/02/21	-	Blocked	964	0.45	3.8	0.1	0.8	9.8	1	1
	20/02/21	-	Blocked	954	0.01	0.1	0.1	1.3	7.2	1	1
	06/03/21		Blocked	992	0.01	0.1	0.1	0.9	19.0	1	1
	10/04/21		Blocked	972	0.01	0.1	0.1	2.1	18.6	1	1
	08/05/21		Blocked	956	0.01	0.1	0.1	1.8	13.2	1	1
	19/06/21		Blocked	973	0.01	0.1	0.1	4.0	15.3	1	1

Well	Date	Depth to Base (m bgl)	Water Depth (m bgl)	Atmospheric Pressure (mbar)	Relative Pressure (mb)	Peak Flow (l/h)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	CO (ppm)	H ₂ S (ppm)
	17/07/21		Blocked	990	0.01	0.1	0.1	0.9	19.9	1	1
	14/08/21		Blocked	976	0.01	0.1	0.1	5.4	8.5	1	1
ARP data	31/05/17		8.50				0.0	2.8	17.2		
ARP	08/08/17		15.35			0.5	58.7	60.7	0.0		
ARP	28/11/17		15.34			-0.1	55.6	29.1	0.2		
ARP	26/11/18		dry			1.0	10.6	4.9	15.3		
ARP	28/01/20		14.60			3.0	55.3	16.7	0.0		
ARP	25/02/20		7.14			16.2	48.1	18.2	0.1		
	06/02/21	15.23	15.13	966	0.01	0.1	33.2	20.1	0.1	1	1
	20/02/21	15.23	15.01	952	1.30	13.3	41.9	18.5	0.1	1	1
	06/03/21	15.23	15.23	990	0.06	0.9	28.7	21.0	0.1	1	1
	06/03/21	-	-	991	0.1	1.6	17.0	17.2	3.5	1	1
W4	10/04/21	15.23	15.05	972	0.01	0.1	41.1	18.9	0.7	1	1
	08/05/21	15.23	15.08	956	2.56	24.2	44.2	18.9	0.3	9	1
	19/06/21	15.23	15.13	973	0.13	2.7	45.8	22.5	0.7	1	1
	17/07/21	15.23	15.23	990	0.01	0.1	30.5	17.5	1.9	1	1
	14/08/21	15.23	15.23	975	0.04	0.6	47.1	19.3	0.7	1	1
ARP data	31/05/17		11.70				0.0	0.8	18.3		
ARP	08/08/17		9.28				56.8	24.2	4.4		
ARP	28/11/17		10.40				40.5	7.9	10.2		
ARP	26/11/18		dry				36.6	7.3	11.9		
ARP	28/01/20		6.20				64.8	5.9	6.3		
ARP	25/02/20		6.00				68.9	6.1	5.2		
	06/02/21	12.15	6.37	Pipe Found Disconnected on Arrival - Now Repaired - Take Readings on 20/02/21							
	20/02/21	12.15	7.08	953	2.70	25.5	79.6	15.4	0.1	1	1
	06/03/21	12.15	7.79	990	0.21	4	82.7	14.0	0.1	1	1
	06/03/21	-	-	991	0.25	4.4	70.7	15.1	2.1	1	1
W6	10/04/21	12.15	8.13	972	0.01	0.1	75.4	19.4	0.5	1	1
	08/05/21	12.15	8.48	956	1.74	18.1	72.3	23.8	0.1	1	1
	19/06/21	12.15	9.40	973	0.15	3.0	77.9	18.7	0.1	10	1
	17/07/21	12.15	9.93	990	0.34	4.4	80.5	17.9	0.1	10	1
	14/08/21	12.15	10.09	975	2.50	23.4	75.8	21.9	0.1	1	1



APPENDIX C
Perimeter Gas Monitoring Data



APPENDIX D
Extracts from ESI Calculator

Derivation of Gas Action and Methane Compliance Levels using ESI Statistics Calculator

Data Assessment for Tmax – methane

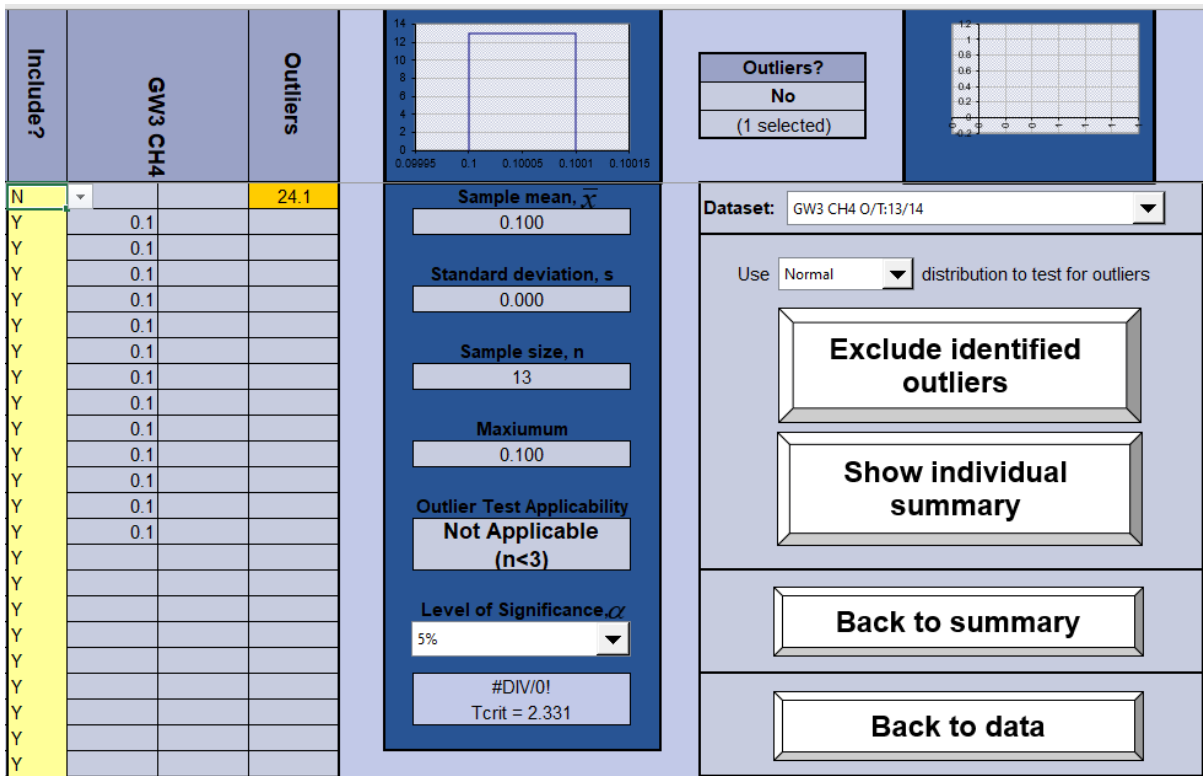
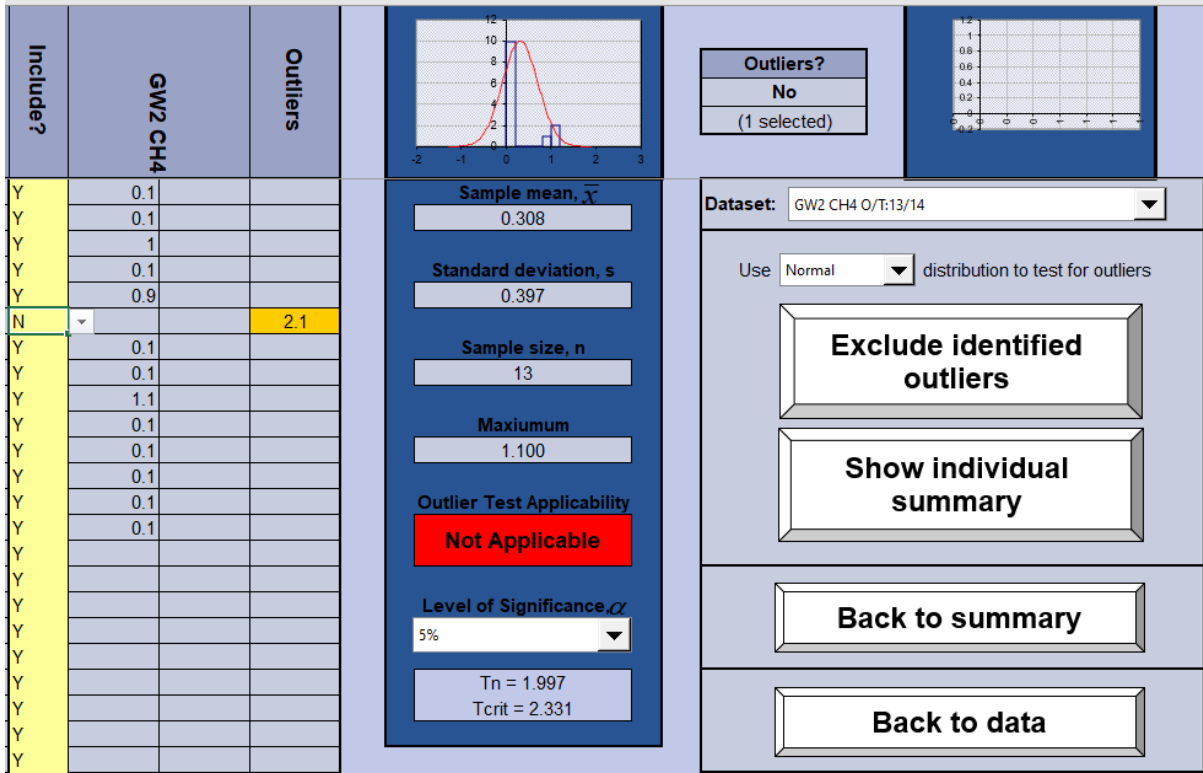
Data: note that where ARP recorded a zero value, this is substituted with 0.1 as an appropriate minimum detection limit.

User-defined 2	User-defined 3	Sample ID	GW1 CH4	GW2 CH4	GW3 CH4	GW4S CH4	GW4D CH4	GW5S CH4	GW5D CH4	GW6S CH4	GW6D CH4
			<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter
ARP	31/05/17		0.10	0.1	24.1						
ARP	08/08/17		0.10	0.1	0.1						
ARP	26/11/17		0.10	1	0.1						
ARP	26/11/18		0.10	0.1	0.1						
ARP	28/01/20		0.10	0.9	0.1						
ARP	25/02/20		0.10	2.1	0.1						
CSE	06/02/21		0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CSE	20/02/21		0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CSE	06/03/21		0.10	1.1	0.1	0.1	4.7	0.1	0.1	0.1	0.1
CSE	10/04/21		0.10	0.1	0.1	4.9	14.6	0.1	0.1	0.1	0.1
CSE	08/05/21		0.10	0.1	0.1	9.3	18.2	0.1	0.1	0.1	0.1
CSE	19/06/21		0.10	0.1	0.1	8.3	0.1	0.1	0.1	0.1	0.1
CSE	17/07/21		0.10	0.1	0.1	9.8	2.2	0.1	0.1	0.1	0.1
CSE	14/08/21		0.10	0.1	0.1	8.5	0.1	0.1	0.1	0.1	0.1

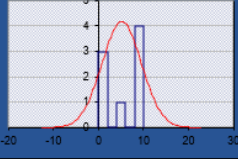
User-defined 2	User-defined 3	Sample ID	GW7S CH4	GW7D CH4	GW8S CH4	GW8D CH4	GW9S CH4	GW9D CH4
			<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter
ARP	31/05/17							
ARP	08/08/17							
ARP	26/11/17							
ARP	26/11/18							
ARP	28/01/20							
ARP	25/02/20							
CSE	06/02/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	20/02/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	06/03/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	10/04/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	08/05/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	19/06/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	17/07/21		0.1	0.1	0.1	0.1	0.1	0.1
CSE	14/08/21		0.1	0.1	0.1	0.1	0.1	0.1

Further assessment of boreholes GW2 to GW4

Where the data has more than a single value the outlier test is applied. Extracts from the ESI calculator are shown below. Where outliers are identified these have been excluded as shown.



Include?	GW4S CH4	Outliers
Y		
Y		
Y		
Y		
Y		
Y		
Y	0.1	
Y	0.1	
Y	0.1	
Y	4.9	
Y	9.3	
Y	8.3	
Y	9.8	
Y	8.5	
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(None selected)

Dataset: GW4S CH4

Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data

Sample mean, \bar{x}
5.138

Standard deviation, s
4.417

Sample size, n
8

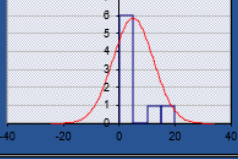
Maximum
9.800

Outlier Test Applicability
Not Applicable

Level of Significance, α
5%

Tn = 1.056
Tcrit = 2.032

Include?	GW4D CH4	Outliers
Y		
Y		
Y		
Y		
Y		
Y		
Y	0.1	
Y	0.1	
Y	4.7	
Y	14.6	
Y	18.2	
Y	0.1	
Y	2.2	
Y	0.1	
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(None selected)

Dataset: GW4D CH4

Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data

Sample mean, \bar{x}
5.013

Standard deviation, s
7.274

Sample size, n
8

Maximum
18.200

Outlier Test Applicability
Not Applicable

Level of Significance, α
5%

Tn = 1.813
Tcrit = 2.032

Action levels Carbon Dioxide

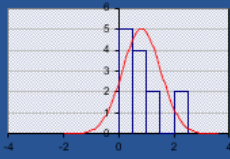
Data Assessment for Tmax carbon dioxide

User-defined 2	User-defined 3	Sample ID	GW1 CO2	GW2 CO2	GW3 CO2	GW4S CO2	GW4D CO2	GW5S CO2	GW5D CO2	GW6S CO2	GW6D CO2
			<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter
ARP	31/05/17		0.40	1.00	10.9						
ARP	08/08/17		1.10	0.40	0.5						
ARP	26/11/17		1.10	2.30	0.3						
ARP	26/11/18		0.80	0.90	0.1						
ARP	28/01/20		2.10	4.80	0.4						
ARP	25/02/20		1.80	2.00	0.6						
CSE	06/02/21		0.40	0.20	0.3	0.7	2.2	0.1	0.6	0.3	0.1
CSE	20/02/21		1.20	1.30	0.3	2.4	3.3	0.1	0.1	0.2	3
CSE	06/03/21		1.20	0.70	0.6	3.6	3.3	1.1	0.1	0.8	2.5
CSE	10/04/21		0.80	0.50	0.5	5.4	6.8	2.3	0.1	0.5	1.7
CSE	08/05/21		0.80	0.80	0.4	6.3	7	2.2	0.1	0.6	2
CSE	19/06/21		0.10	0.10	0.4	5.3	0.1	1.3	0.5	1.1	0.5
CSE	17/07/21		1.30	0.10	0.3	5.4	3.9	0.1	0.1	1	0.8
CSE	14/08/21		1.40	0.40	0.2	5.2	0.1	0.3	1.6	1	0.7

User-defined 2	User-defined 3	Sample ID	GW7S CO2	GW7D CO2	GW8S CO2	GW8D CO2	GW9S CO2	GW9D CO2
			<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter	<input type="checkbox"/> Filter
ARP	31/05/17							
ARP	08/08/17							
ARP	26/11/17							
ARP	26/11/18							
ARP	28/01/20							
ARP	25/02/20							
CSE	06/02/21		1.5	0.2	0.2	0.2	0.7	0.1
CSE	20/02/21		1.5	0.1	0.1	0.1	0.1	2.2
CSE	06/03/21		1.2	0.5	2.4	0.1	1.3	0.1
CSE	10/04/21		1.6	0.2	0.2	0.1	0.9	0.7
CSE	08/05/21		1.6	0.2	0.8	0.1	1.1	1.1
CSE	19/06/21		1.2	1.8	0.4	1.1	1.4	0.7
CSE	17/07/21		0.7	0.5	0.9	0.8	1.4	0.1
CSE	14/08/21		0.5	2.1	0.3	0.8	1.3	0.1

Where the ESI calculator has identified outliers in the carbon dioxide data this is illustrated below.

Include?	GW2 CO2	Outliers
Y	1	
Y	0.4	
Y	2.3	
Y	0.9	
N		4.8
Y	2	
Y	0.2	
Y	1.3	
Y	0.7	
Y	0.5	
Y	0.8	
Y	0.1	
Y	0.1	
Y	0.4	
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(1 selected)

Dataset: GW2 CO2 Q1:1314

Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data

Sample mean, \bar{x}
0.823

Standard deviation, s
0.692

Sample size, n
13

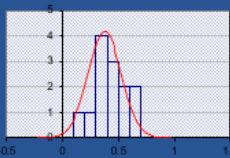
Maximum
2.300

Outlier Test Applicability
Applicable

Level of Significance, α
5%

Tn = 2.135
Tcrit = 2.331

Include?	GW3 CO2	Outliers
N		10.9
Y	0.5	
Y	0.3	
Y	0.1	
Y	0.4	
Y	0.6	
Y	0.3	
Y	0.3	
Y	0.6	
Y	0.5	
Y	0.4	
Y	0.4	
Y	0.3	
Y	0.2	
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(1 selected)

Dataset: GW3 CO2 Q1:1314

Use Normal distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data

Sample mean, \bar{x}
0.377

Standard deviation, s
0.148

Sample size, n
13

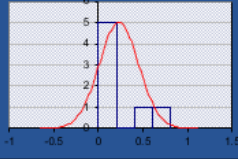
Maximum
0.600

Outlier Test Applicability
Applicable

Level of Significance, α
5%

Tn = 1.507
Tcrit = 2.331

Include?	GW5D CO2	Outliers
Y		
Y		
Y		
Y		
Y	0.6	
Y	0.1	
Y	0.1	
Y	0.1	
Y	0.5	
Y	0.1	
N		1.6
Y		
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(1 selected)

Dataset: GW5D CO2 QVT:78

Use distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data

Sample mean, \bar{x}
0.229

Standard deviation, s
0.221

Sample size, n
7

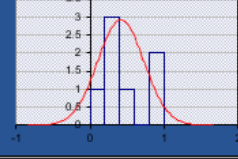
Maximum
0.600

Outlier Test Applicability
Not Applicable

Level of Significance, α
5%

$T_n = 1.677$
 $T_{crit} = 1.938$

Include?	GW8S CO2	Outliers
Y		
Y		
Y		
Y		
Y	0.2	
Y	0.1	
N		2.4
Y	0.2	
Y	0.8	
Y	0.4	
Y	0.9	
Y	0.3	
Y		
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(1 selected)

Dataset: GW8S CO2 QVT:78

Use distribution to test for outliers

Exclude identified outliers

Show individual summary

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Sample mean, \bar{x}
0.414

Standard deviation, s
0.313

Sample size, n
7

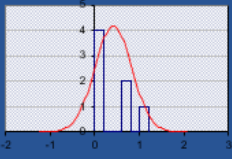
Maximum
0.900

Outlier Test Applicability
Applicable

Level of Significance, α
5%

$T_n = 1.551$
 $T_{crit} = 1.938$

Include?	GW9D CO2	Outliers
Y		
Y		
Y		
Y		
Y		
Y	0.1	
N		2.2
Y	0.1	
Y	0.7	
Y	1.1	
Y	0.7	
Y	0.1	
Y	0.1	
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		
Y		



Outliers?
No
(1 selected)

Dataset: GW9D CO2 QY:78

Use distribution to test for outliers

Exclude identified outliers

Show individual summary

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Back to data

Sample mean, \bar{x}
0.414

Standard deviation, s
0.414

Sample size, n
7

Maximum
1.100

Outlier Test Applicability
Not Applicable

Level of Significance, α
5%

Tn = 1.656
Tcrit = 1.938