

Preliminary Environmental Risk Assessment and Coal Mining Risk Assessment Technical Note – Trinity Academy Temporary School

Date: December 2020

Client Name: Department for Education

Document Reference: WIE17125-100-TN-001

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue

Prepared by

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Principal Consultant



1. Introduction

Waterman Infrastructure & Environment Limited ("Waterman") was instructed by Waterman Building Structures Limited on behalf of the Department for Education to undertake a Preliminary Environmental Risk Assessment for potential ground contamination, and a Coal Mining Risk Assessment, for the proposed erection of a Temporary School building at the Trinity Academy site. The Temporary School site, hereafter termed "the Site" is shown on Watson Batty Architects Drawing Ref: TRNTY WBA NB 00 DR A PL_101 P1, enclosed.

1.1 Objectives

This Technical Note has been prepared to assess the environmental and coal mining risks to the Site and should be read in conjunction with the reports prepared for the wider Trinity Academy site:

- Waterman Report "*Preliminary Environmental Risk Assessment*", Ref: WIE17125-100-R-1.2.1-RJM, Dated: July 2020.
- Waterman Report "*Coal Mining Risk Assessment*", Ref: WIE17125-100-R-7.1.3-CMRA, Dated: October 2020.

Ground investigation was undertaken across the Trinity Academy site, based on the findings of the above reports, and the results are included in:

- Waterman Report "*Geo-Environmental Assessment*", Ref: WIE17125-100-R-8.1.3-GeoEnv, Dated: November 2020.

1.2 Proposed Development

The proposed development includes the erection of a Temporary School building, with associated access road, parking, external play areas and associated works. The proposed development is in an area of Public Open Space in the western half of the wider Trinity Academy site.

A site location plan (Waterman Drawing Ref: WIE17125-103_GR_PRA_A1A) and a site layout plan (Watson Batty Architects Drawing Ref: TRNTY WBA NB 00 DR A PL_101 P1) are enclosed.

2. Hazard Identification

Full details of the hazards identified affecting the wider site are included in the Preliminary Environmental Risk Assessment. A summary is provided below.

2.1 Site Description

The Site is currently occupied by an area of Public Open Space (POS), comprising a flat grassed area bounded by trees and bushes. Ground level is higher than at the adjacent Keresforth Medical Centre to the east, at approximately 150m AOD.

Buildings comprising one-storey properties with pitched roofs are aligned along Keresforth Close to the east. A Boiler House is present to the north east of the Site, with an above ground fuel storage tank and chimney present (possibly a former incinerator).

Barnsley Fire Station, warehouses and undeveloped arable land are present to the north of the Site.

Residential properties are present to the east, south and west of the Site.

The A6133 highway is present at the western site boundary, and a school is present beyond the A6133.

2.2 Site History

The Site comprises vacant undeveloped land, likely in arable use from the date of the first maps (1850). In the vicinity of the Site a number of sandstone quarries are identified, the closest being approximately 200m to the west of the Site. Victoria Colliery, and an associated shaft, are identified approximately 650m – 700m south east of the Site.

Next available mapping from 1890 (1:10,560 scale) shows the Site to be unchanged. A substantial brick works is shown approximately 750m north west of the Site. Victoria Colliery is no longer shown. However, an unnamed Colliery is shown approximately 800m east of the Site.

Mapping from 1904 (1:10,560 scale) shows the Site to be unchanged. The unnamed Colliery shown approximately 800m east of the Site is now identified as a Velvet Works. Rob Royd Colliery and Rose Hill Colliery are shown just over 1km south and south west of the Site, respectively. Two “Old Shafts” are shown approximately 1.25km south east of the Site. The brick works to the north has expanded significantly and now includes two “Old Shafts”.

Mapping from 1929 (all 1:10,560 scale) shows no notable change to the Site, however, the surrounding area has undergone continued development. A clay pit extending to within 500m has been added to the brick works to the north of the Site with an “Old Shaft” being identified

approximately 600m north of the Site. Farm House Colliery is identified approximately 1km north west of the Site. Needlewood Colliery is shown approximately 800m south west of the Site. Houndhill Colliery is shown, and noted to be disused, approximately 700m south east of the Site, approximately 150m to the south west of the former site of Victoria Colliery. Rose Hill Colliery is no longer shown. A number of earthworks are shown extending linearly north-south from approximately 150m west of the Site to approximately 400m south of the Site.

The 1938, 1948 and 1956 mapping (1:10,560 scale) indicates that the Site and surroundings are largely unchanged. However, the 1956 map indicates that Farm House Colliery and Needlewood Colliery are now disused. The clay pit to the north of the Site is now described as an “Old Clay Pit”.

The area of the Temporary School building is first identified as playing fields on the 1959 mapping. An embankment is shown dividing the playing fields from the land to the north-east.

Houndhill, Needlewood and Farm House Collieries are no longer shown. A mine is shown in the location of Rob Royd Colliery, but it is no longer named. A significant number of the sandstone quarries identified on the earliest maps are no longer shown, however, the earthworks first shown on the 1929 mapping are still shown extending to the south of the Site.

Mapping from 1973 (1:10,000 scale) shows no notable change to the Site. Rob Royd Colliery is still shown to the south of the Site, however, the earthworks extending to the south of the Site on previous maps are no longer shown. A disused shaft and disused pit are identified in the area of the former brick works and coal pit to the north of the Site.

Mapping from 1983 (1:1,250 scale) shows the currently existing Keresforth Centre structures to be present to the east of the proposed Temporary School building. These are not shown on the 1982 1:10,000 mapping and, therefore, the construction of the existing buildings can be dated to 1982/1983. The 1982 mapping shows the area of the former brick works and clay pit to have been redeveloped.

The Groundsure Report identifies Keresford Hill Pit to have been present on site, however, this is not shown on any of the available historical maps. Kingston Pit is also shown in the Groundsure Report to have been present approximately 30m south east of the Site, again this not shown on any of the available historical maps.

2.3 Geology

The geology beneath the Site has been established from the British Geological Survey (BGS) 1:50,000 scale Geological Map, Sheet 87, Barnsley (Bedrock and Superficial) and borehole logs SE30NW209, SE30NW181, SE30NW221 and SE30NW185 (accessed via BGS website June 2020). Geology is summarised in Figure 1.

Figure 1: Geology

Bedrock



ID	Description
1	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone
3	Pennine Middle Coal Measures Formation - Sandstone

Superficial



ID	Description
1	Made Ground (Undivided)

Source: Groundsure Enviro Insight Bedrock and Superficial Geology (1:10,000)

The Site is indicated to be underlain by Made Ground. A summary of the geology is provided in Table 1.

Table 1: Site Geology

Stratum	Area Covered	Depth to Top of Stratum (m bgl)	Typical Description
Made Ground or Topsoil	Entire Site	0 to 1.0m	Topsoil over colliery waste or soft brown clay with fragments of brick, concrete and pottery
Glacial Till	Entire Site	0.45 to 1.06	Soft to firm grey laminated sandy clay with silt partings and bands of medium-coarse gravel.
Pennine Middle Coal Measures Formation	Entire Site	1.5 to 2.7	Interbedded hard, grey siltstone with bands of soft mudstone, and black coal shale. 5cm void reported in one location to the north of the Site.

Seams that are likely to be present beneath the Site are summarised in Table 2.

Table 2: Possible Coal Seams Beneath the Site

Coal Seam	Depth relative to previous seam	Approximate depth below site (m bgl)	Seam Thickness	Comment
Barnsley Rider Coal	-	0m	0.16m – 0.61m	Not shown to be worked in the vicinity of the Site
Barnsley Coal	40m	0m – 40m	2.29m – 3.1m	Thought to be worked beneath the Site and shown to be worked to the west of the Site in BGS borehole logs.
Dunsil Coal	22m	22m – 62m	0.46m – 0.81m	Possibly shown as a number of thin seams in BGS borehole to the north of the Site.
Gawber Coal	24m	46m – 86m	0.72m	-
Swallow Wood Coal	22m	68m – 108m	0.3m – 1.15m	-
Top Haigh Moor Coal	37m	105m – 145m	0.69m - 1.19m	-
Low Haigh Moor Coal	12m	117m – 157m	0.43m – 1.02m	-
Lidget Coal	42m	159m – 199m	0.3m – 1.52m	The deepest Pennine Middle Coal Measures seam thought to be present beneath the Site.

It should be noted that the coal seams are generalised to represent the entire Barnsley area, as such all seams may not be present across the Site, depths and thicknesses may also vary substantially.

The Barnsley Rider Coal is shown to subcrop beneath the eastern edge of the wider Trinity Academy site and given the regional dip direction to the east, is not considered to be present beneath the Site.

The height in which voids may migrate upwards is typically calculated using the T10 criteria based on 10 times the worked seam thickness in rock. The surface could clearly be impacted by void collapse in the Barnsley Coal given the shallow depth of the seam and the potential thickness of the seam. However, all other seams are at a depth where a thickness of rock greater than 10 times the potential worked seam thickness is present above the seam.

Seams of the Pennine Lower Coal Measures are thought to be present at depths greater than 140m, including the Flockton Thick, Fenton, Parkgate, Thorncliffe and Silkstone coal seams. These deeper seams are also thought to have been worked in the vicinity of the Site, but any workings are unlikely to impact the proposed development due to their depth.

3. Hazard Assessment and Preliminary Conceptual Model

The Preliminary Conceptual Model for the wider site is presented in the Preliminary Environmental Risk Assessment and is considered to be applicable for the Temporary School site. For ease of reference, the Conceptual Model is enclosed.

3.1 Contaminants of Concern

Contaminants of concern identified at the Temporary School site are summarised in Table 3.

Table 3: Contaminants of Concern

Source	Associated Contaminants
On-Site (current)	
Coal seams and mining activity	Ground gas
On-Site (historic)	
Arable land use	Pesticides and herbicides
Off-site (current)	
Boiler Room and Chimney/Incinerator	PAHs, metals, dioxins & furans
Above Ground Storage Tank	Oils and fuels (TPH)
Off-site (historic)	
Foundries ¹	Metals and semimetals, hydrocarbons inc. MTBE and BTEX, PCBs, asbestos, sulphates / chlorites
Colliery ²	Metals, hydrocarbons, VOCs and SVOCs, asbestos
Velvet works ³	Metals and semimetals, hydrocarbons, VOCs and SVOCs, asbestos
Brick works	Metals, hydrocarbons, asbestos
Fire and ambulance centre	Diesel fuel, asbestos
Unspecified mills, works and depots	Metals, hydrocarbons, asbestos

The suite of testing scheduled as part of the proposed ground investigation should address the contaminants of concern highlighted above.

4. Coal Mining Risk Assessment

The full details of the coal mining risks affecting the wider site are included in the Coal Mining Risk Assessment.

4.1 Coal Authority Interactive Map Viewer

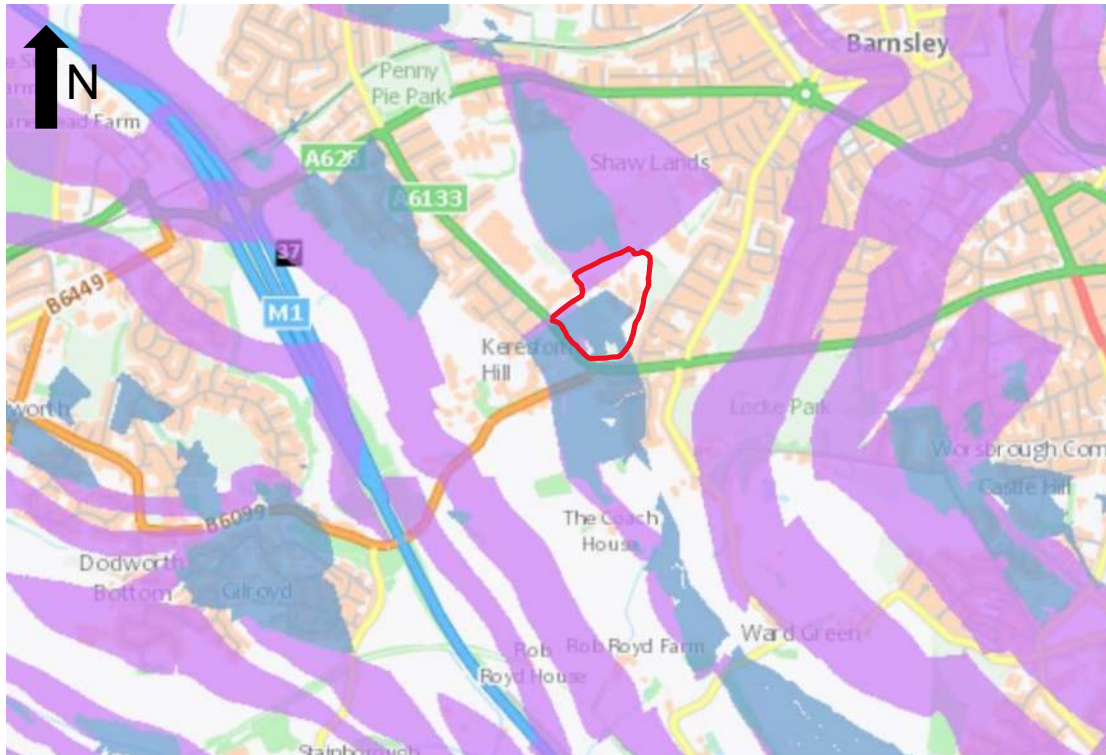
The online Coal Authority Interactive Map Viewer indicates that past shallow workings are present below the Site. There are further areas of probable shallow workings identified beneath the Site. These are considered to be associated with potential workings in the Barnsley Coal.

¹ DoE Industry Profile - Metal manufacturing, refining and finishing works - iron and steel works

² DoE Industry Profile - Gas works, coke works and other coal carbonisation plants

³ DoE Industry Profile - Textile works and dye works

Figure 2: Known and Probable Shallow Workings (Probable workings in purple and known workings in blue) (Coal Authority Interactive Map Viewer)



The Development High Risk Area generally corresponds to the areas of known and probable shallow workings.

4.2 Coal Authority Mining Report

The entire Trinity Academy site lies within an area where a Coal Authority Mining Report is required for new developments, with the area of the proposed Temporary School building defined as 'Development High Risk' by The Coal Authority. As part of the Coal Mining Risk Assessment, a Consultants Coal Mining Report was procured.

A summary of the report is presented below:

- Beneath the property, underground mining is recorded. An unnamed colliery mined the Barnsley Coal seam at a depth of between 10m and 21m with dipping rate 5.0° to 7.4° in an easterly direction. The seam had an extraction thickness of 274cm and was last worked in 1925;
- Dodworth Colliery, a Colliery approximately 2km west of the Site, and Rob Royd Colliery are identified to have worked beneath the Site;
- Dodworth Colliery worked the Flockton Thick, Top Fenton, Parkgate and Middleton Main seams at depths of between 140m and 253m below ground level in the area. Workings in the Top Fenton and Parkgate are identified beneath the Site itself at approximately 200m below ground level. The seams are identified to dip to the east and north east at an angle of between 3.6°

and 7.2°. The seams vary in extraction thickness between 66cm and 150cm. The last workings at Dodworth Colliery beneath the Site date to 1956, and the last workings at Dodworth Colliery in the area date to 1961;

- Rob Royd Colliery worked the Silkstone Coal seam beneath the Site at depths of between 278m and 293m below ground level. The seam is identified to dip to the east and north east at an angle of between 4.2° and 6.7°. The seam had an extraction thickness of 167cm and was last worked in 1910;
- The Coal Authority determine the property to be in an area with probable unrecorded mine workings;
- The Coal Authority Report recorded no spine roadways at shallow depth;
- 4No. mine shafts are identified in the report to be in the vicinity of the site. One of these, Coal Authority reference 433405-008, is shown to be on the Site itself. A Mine Entry Data Sheet purchased for this shaft confirmed that the Coal Authority do not hold any information relating to shaft or the treatment of the shaft;
- The following mine abandonment plan catalogue numbers intersect with some, or all, of the site boundary: CT86, 917, 780, NE565, 12461, SY209, NE584, NE1034, SY107. The report also notes that they hold further plans which could affect the Site;
- One outcrop within the site boundary is noted, this is the Barnsley Coal seam and it is determined as workable. The bearing of this outcrop is 330°;
- The Coal Authority have recorded one fault within the site boundary and surrounding area;
- The Coal Authority records that unlicensed opencast working has occurred approximately 400m to the west of the Site;
- The Coal Authority have recorded no Managed Tips within 500m of the site boundary;
- The Coal Authority record that the Site has been subject to previous remediation. A Surface Hazard Incident Report was subsequently obtained and provides some detail of the remediation work undertaken. An area of collapse, at the northern end of the POS, was treated by opening out the collapse to 2.2m by 1.5m and excavating to a depth of 4.5m below the surface to the base of the workings. 3No roadways could be seen to run off from the base of the excavation in a North-east, South-east (towards the proposed Temporary School building) and South-westerly direction. 12 Tonnes of clean 75 to 150mm limestone was placed and compacted in layers not exceeding 300mm to within 1.5m of the surface, whereupon a layer of geo-textile terram was placed across the stone and around the exposed sides. The as-dug sandy clay spoil was then placed and compacted in layers not exceeding 150mm thickness to the underside of the existing turf. Finally, the existing topsoil was used to reinstate the surface to the pre-existing field profile. The affected work area was tidied, and new grass seed placed. Full details and the location of the works are detailed in the Surface Hazard Incident Report enclosed;
- The Coal Authority has not received a damage notice or claim for the subject property, or any, property within 50m of the site boundary, since 31 October 1994;
- There is no current Stop Notice delaying the start of remedial works or repairs to the property;
- The Coal Authority is not aware of any request having been made to carry out preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991;

- The Coal Authority have recorded no mine gas within 500m of the site boundary;
- The Coal Authority have recorded no mine water treatment schemes within 500m of the site boundary;
- The Coal Authority have no record of future underground mining;
- The Coal Authority have not granted any coal mining license within 200m of the enquiry boundary;
- The Coal Authority have no record of court orders;
- No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence;
- The property is in an area where a notice to withdraw support was given in 1950;
- The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support;
- The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

The location of the mine shaft and previous remedial works are shown on Waterman Drawing Ref: WIE17125-100-WIE-ZZ-XX-DR-V-80-003, enclosed.

4.3 Coal Authority Mine Abandonment Plans

In order to determine the relevance of the above noted Abandonment Plans, The Coal Authority's Mining Consultant and Information Manager for the Barnsley region was contacted (4th September 2020). A large number of abandonment plans are available for the property; however, the majority relate to deep workings. 3No. abandonment plans relate to shallow workings within the Barnsley Coal, and these were obtained as part of the Coal Mining Risk Assessment.

Abandonment Plan 917, enclosed, dates to 1878 and relates to workings in the Barnsley Coal from Keresforth Colliery. This plan shows a "pit" in close proximity to the shaft (Shaft Ref: 433405-008), close to the proposed Temporary School building. The abandonment plan shows a small area of workings to be present in close proximity to this shaft, extending towards the proposed structure.

Larger scale workings and additional pits are shown to the west and south of the Site. These roughly correlate with the area of worked ground identified to the west and south of the Site in the historical mapping and the indicated line of the Barnsley Coal subcrop. It may be that Keresforth Colliery was formerly present in this area, but was not in existence at the time that the available historical maps were produced. Keresforth Colliery may relate to Keresford Hill Pit identified in the Groundsure Report.

Abandonment Plan 9746 relates to workings in the Barnsley Coal from Houndhill Colliery. This plan shows workings beneath the southern end of the area of POS to the south of the Site. These workings date to 1925 and are shown to be at approximately 128m AOD, approximately 22m below ground level.

Abandonment Plan 9116 also relates to workings in the Barnsley Coal from Houndhill Colliery; specifically, No. 2 Pit. This plan essentially provides the same information as shown on 9746.

4.4 Previous Ground Investigation

The previous phase of ground investigation undertaken across the wider Trinity Academy site assessed the risks to the proposed school in the east of the Site. Limited investigation was undertaken in the vicinity of the proposed Temporary School as the area is proposed for sports fields and landscaping as part of the final development.

Limited chemical testing identified elevated concentrations of beryllium, benzo(b)fluoranthene, benzo(a)pyrene and di-benzo(a,h)anthracene in the soils beneath the POS on which the Temporary School building is to be constructed, when compared to screening criteria for a residential without plant uptake end-use. Exceedances were relatively minor, however, the Geo-Environmental Assessment considered that a cover system is likely to be required in areas of landscaping to break the potential pathway between the site soils and end-users.

The mine shaft highlighted in the Coal Authority consultation was identified in TP110 and found to be uncapped and to have a diameter of approximately 2.5m. The shaft backfill was present from approximately 0.5m below ground level and comprised of Colliery Spoil.

4.5 Summary

The area of the Temporary School building is in a Coal Authority High Risk Development Area, and the research undertaken as part of the Coal Mining Risk Assessment and the previous phase of ground investigation indicate that the Barnsley Coal is potentially present at shallow depths beneath the Site. The potential presence of **shallow mine workings** is regarded as **probable**. The presence of a **mine shaft** was **confirmed** during the previous phase of ground investigation. This assessment aligns with the Coal Authority Consultants Coal Mining Report, which notes the site to be located in an area with known and probable shallow mine workings.

Considering all information reviewed in undertaking this study, the risk to the development associated with the mining legacy is currently assessed as **high**, and further works are recommended in order to reduce the risk to low.

5. Coal Mining Risk Mitigation Strategy

5.1 Further Works

The Coal Mining Risk Assessment has identified the following moderate to high coal mining related risks to the proposed development:

- Recorded and Unrecorded Shallow Mine Workings below the Site (ground collapse / settlement risk/ crown hole development) associated with potential workings in the Barnsley Coal Seam;
- Unrecorded Surface Mining (ground collapse / settlement risk/ crown hole development);
- A mine entry (ground collapse / settlement risk/ crown hole development) is identified to be present close to the proposed Temporary School building. The potential presence of unrecorded mine entries cannot be discounted.
- Potential for mine gas emissions associated with any historical mine workings; and,
- Potential for spontaneous combustion within the Barnsley Coal.

In order to mitigate against the risk of shallow workings, prior to construction of the Temporary School building, a targeted investigation (intrusive ground investigation) should be undertaken to confirm the mining position at the Site. This should be based on a conceptual mining (ground) model to be developed using mapping information currently available to create cross-sections in order to identify areas of the site at risk of shallow workings based on potential seam thicknesses.

Given the likely shallow depth of historical mining beneath the proposed Temporary School, the intrusive ground investigation should include rotary drilling to nominally 15m below ground level to confirm the presence/absence of coal seams below site and evidence of any workings in the form of mine waste or voids. Ground gas monitoring standpipes should be installed to assess the potential risk due to ground gas.

The area of previous remedial works carried out on behalf of the Coal Authority, and the reported shallow mining features associated with this, should be investigated to determine the extent of shallow mining. This investigation is likely to comprise a mix of trial trenching and shallow rotary open hole drilling.

The Risk Assessment and Method Statement prepared for the ground investigation should address the potential risk of hazardous mine gas emissions and spontaneous combustion. The design of the proposed development will also consider the potential risks to end users as a result of mine gas and spontaneous combustion.

By completing a detailed ground model first this will allow the ground investigation design to be optimised for the proposed site layout and as such reduce the scope of intrusive investigation required by assessing the likely depth and thickness of seams below site in relation to the T10 criteria as per CIRIA C758D.

The mine shaft should be appropriately treated during the mine treatment works, most likely by construction of a reinforced concrete cap. Given the proximity of the shaft to the proposed Temporary School building, the presence of the shaft should be considered in the design of the proposed foundations. Foundations should be designed to avoid additional load being transferred to the shaft lining and backfill, and the proposed concrete cap.

Following completion of the ground investigation, risk levels can be re-assessed and, if required, remedial measures appropriate to the development implemented. Dependant on the extents of workings this would most likely take the form of amending development layouts to avoid structures in areas of mining risk where possible, grouting up any former workings identified, utilising alternative foundation solutions, or a combination of these measures.

5.2 Coal Authority Permission

It should be noted that before a ground investigation is undertaken, prior written permission from The Coal Authority is required for intrusive activities which will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). An additional permit would then be required prior to commencing any proposed treatment works. Further information on The Coal Authority's permissions process can be found at: www.coal.gov.uk.

6. Conclusions and Recommendations

Full conclusions and recommendations are included in the various reports prepared for the wider Trinity Academy site.

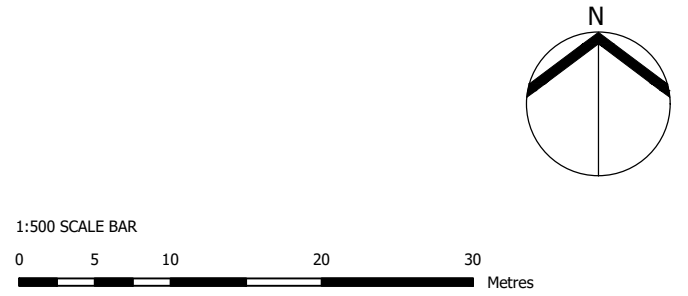
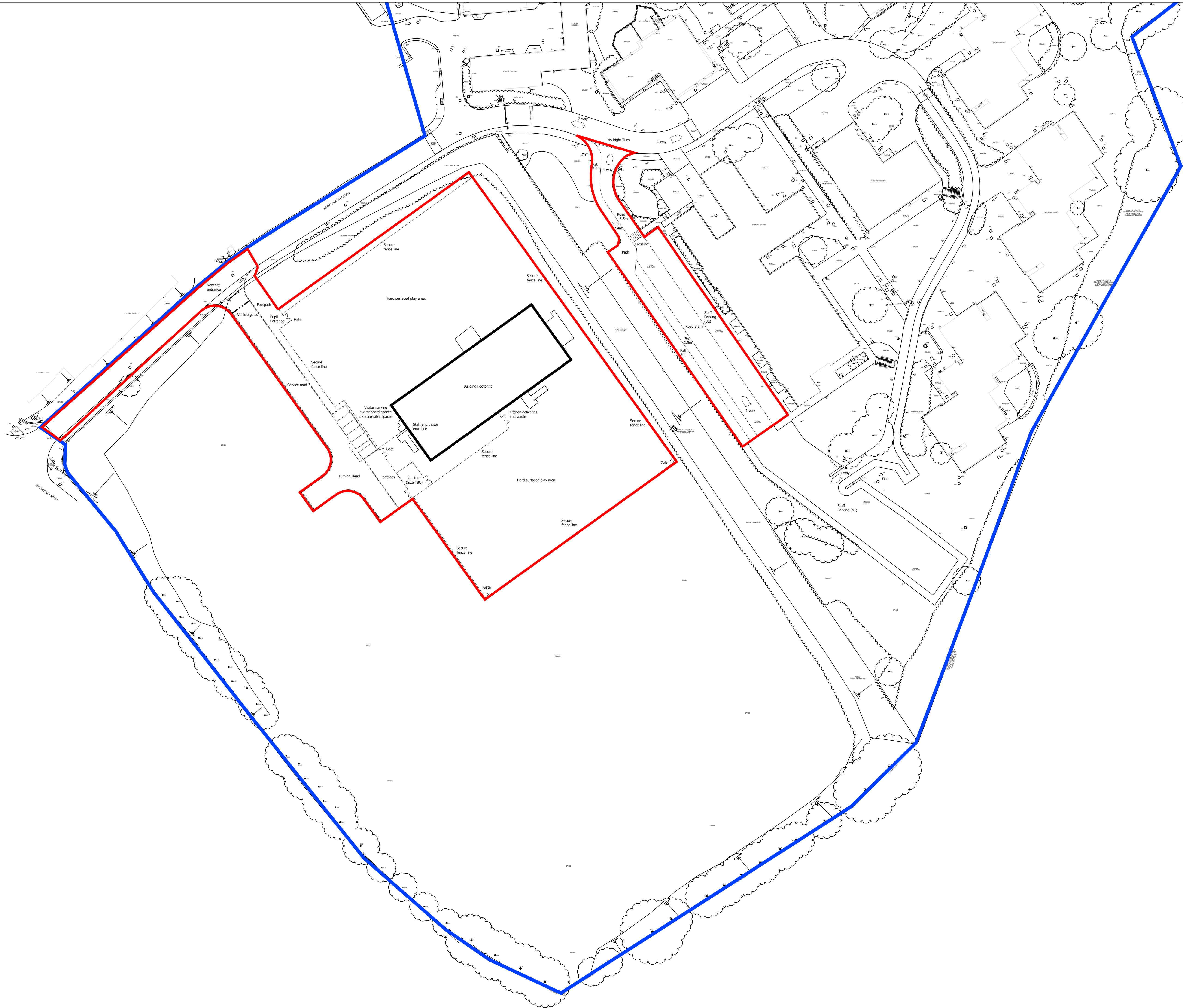
The Preliminary Conceptual Site Model, enclosed, indicates that the highest risk estimated for potential pollutant linkages was Medium. This rating was given to five of eight potential pollutant linkages. It is considered that the overall risk rating for the proposed development is **Medium**.

The recommendations of this report outline preliminary remedial and mitigation measures that require confirmation through additional works. However, once successfully implemented, the risks are anticipated to be Low. Therefore, the NPPF requirement that on completion the Site can no longer be captured under the Part IIA regime is expected to be met.

A geo-environmental ground investigation should be completed, including soil/groundwater sampling and ground gas/vapour monitoring to confirm risks to future site users and provide design parameters for the proposed development. The ground investigation should assess the potential presence of mining related features beneath the Site.



Project Details	WIE17125-103: Keresforth Academy
Figure Title	Figure A1: Site Location Plan
Figure Ref	WIE17125-103_GR_PRA_A1A
Date	June 2020
File Location	\\s-incs\wiel\projects\wie17125\103\graphics\pra\issued figures



Revision: P1 Date: 10/12/2020 Drawn: PB Checked: MS

PL	Planning
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Trinity Academy Temporary School

Proposed Block Plan

Location:
Land at Keresforth Close
Barnsley
S70 6RS

Client:
The Department for Education

UPRN	Originator	Zone	Level	Type	Role	Number	Revision
TRNTY	WBA	NB	00	DR	A	PL_101	P1
Date: 10/12/2020 Drawn: PB Checked: MS Scale: 1:500 @A1 Int Job No: 3766_015_XXX CAD REF:							

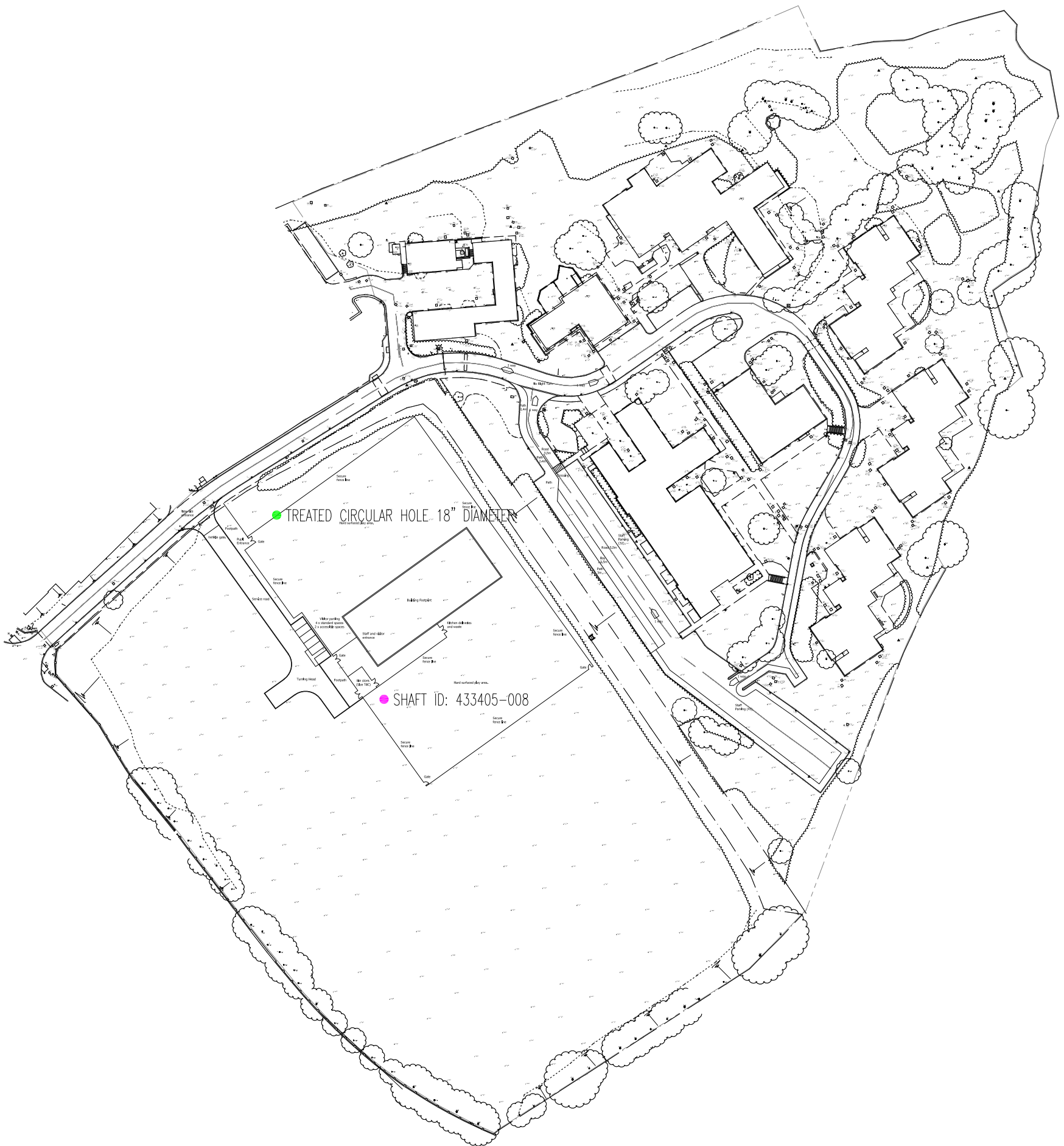
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FUTURE BUILT

Note: Do not Scale from this drawing. All dimensions to be checked on site.



This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.

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GENERAL NOTES

- SITE BOUNDARY
- LOCATION OF MINESHAFT
- TREATED CIRCULAR HOLE 18" DIAMETER

P01	15.12.20	PRELIMINARY ISSUE	DC
Rev	Date	Description	By

Amendments
Project
TRINITY ACADEMY BARNSLEY

Title
EXPLORATORY HOLE LOCATION PLAN (PROPOSED LAYOUT)
Client



2nd Floor South Central 11 Peter Street Manchester M2 5QR
t 0161 839 8392
mail@watermangroup.com www.watermangroup.com

Status	PRELIMINARY		
Designed By	AM	Checked By	AM
Drawn By	DC	Date	DECEMBER 2020
Waterman Ref		WIE17125-100	
Scales @ A3		1:1500	
Project - Originator - Volume - Level - Type - Role - Number			Revision
17125-100-WIE-ZZ-XX-DR-V-80-003			P01

Table 8: Preliminary Conceptual Model for the Site

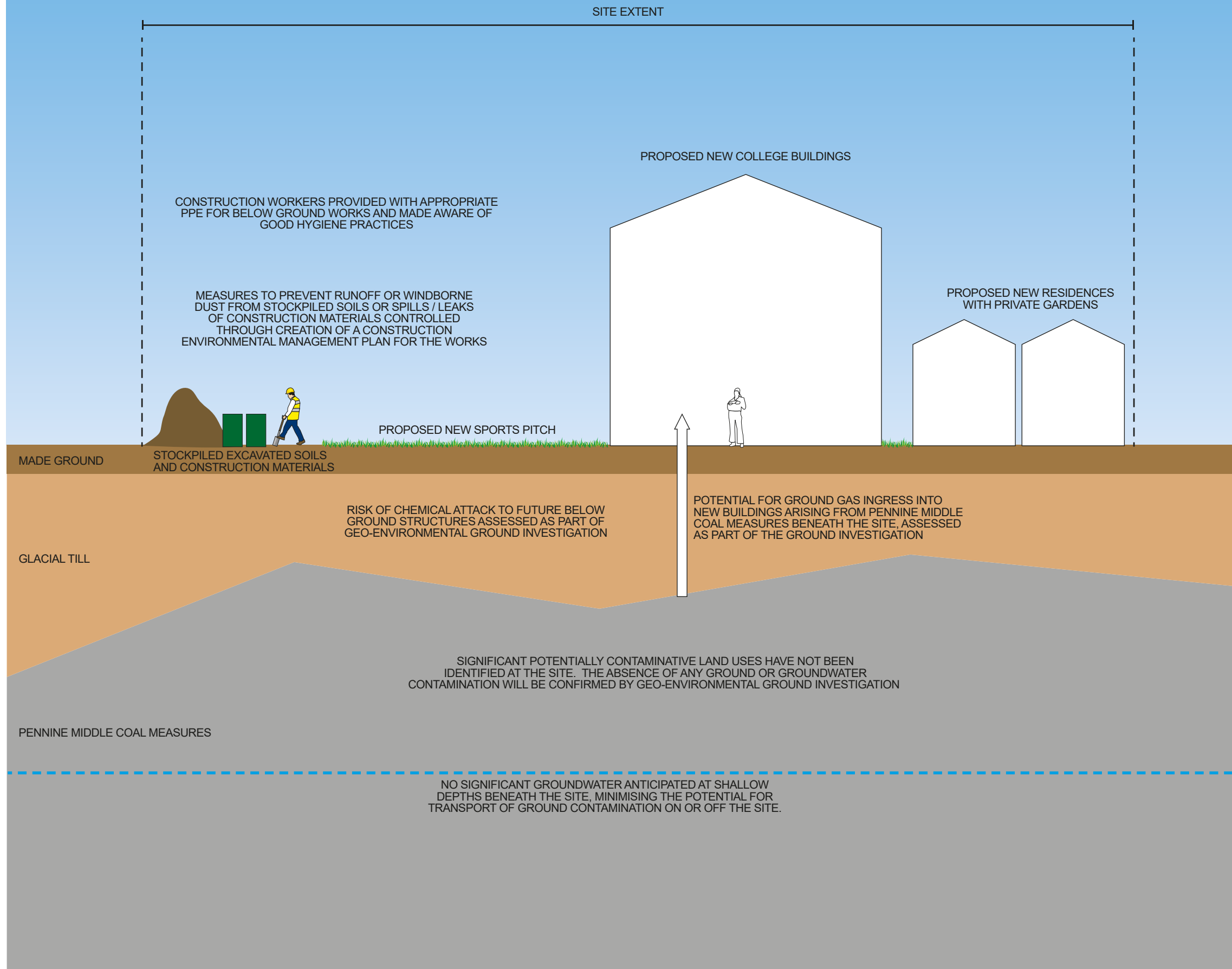
Source	Pathways	Receptor	Risk	Justification / Mitigation	Residual Risk
Human Health					
Potential contamination in Made Ground and shallow soils from land uses surrounding the Site.	Dermal contact and inhalation of dust from contaminated soils during works Contact with potential contamination in shallow soils in areas of soft landscaping.	Future Site Users	Low	Significant potentially contaminative land uses have not been identified at the Site. Within the surrounding area, some activities including foundries and collieries, along with various works may have caused minor ground contamination with the potential to migrate onto the Site via shallow groundwater within the Glacial Till. The proposed development works involve construction of new residential and academy buildings, surrounded by hardstanding with some soft landscaping and play areas. The Site is within an area identified by the Coal Authority as being high risk for new developments. Geotechnical ground investigation will be necessary to inform foundations design for future structures This investigation should include environmental testing of shallow soils and groundwater to identify if contamination from nearby land uses has impacted the Site.	Low
Worked Coal Seams (Ground gas and vapours)	Accumulation in confined spaces, leading to inhalation.	Future Site Users	Medium	The Site is within an area of coal seams, with the Middle Pennines Coal Measures present at shallow depths. This could act as a potential source for ground gas. The proposed ground investigation should include an assessment of the potential for ground gas or vapours. Findings should inform any mitigation or remediation measures necessary at the proposed development.	Low
Potential contamination in Made Ground and shallow soils.	Windborne, potentially contaminated construction dust. Runoff from stockpiled soils.	Off-Site Users and nearby residents	Medium	A Construction Environmental Monitoring Plan (CEMP) should be prepared for the works, including measures to minimise runoff from stockpiled soils, manage groundwater in excavations and suppress the generation of dust. Construction materials brought on-Site as part of works will be appropriately stored to prevent spills and leaks. This should prevent potentially contaminated material reaching off-Site residents.	Low

Source	Pathways	Receptor	Risk	Justification / Mitigation	Residual Risk
Potential contamination in Made Ground, shallow soils, and shallow groundwater.	Dermal contact and ingestion. Dust inhalation. Ground gas and vapour accumulation in trenches and confined spaces, leading to inhalation followed by asphyxiation and risk of explosion.	Construction Workers	Medium	Construction workers will be provided with appropriate personal protective equipment (PPE). Workers should be aware of good hygiene measures as protection against direct contact with contaminated Made Ground, contaminated groundwater, ground gas, vapours and dust inhalation. Works will be undertaken in accordance with the Control of Asbestos Regulations 2012.	Low
Unexploded Ordnance	Direct contact	Construction workers and nearby residents.	Low	An Unexploded Ordnance Desktop Assessment for the Site determined the risk from German and anti-aircraft unexploded ordnance as low. The risk of Allied ordnance was assessed as negligible. A UXO Risk Management Plan will be prepared for the Site. Site Specific UXO Awareness Briefings will be provided to all personnel conducting intrusive works.	Low
Property					
Contamination in Made Ground, shallow soils, and shallow groundwater.	Direct contact with building foundations and buried services leading to chemical attack.	Site structures and services	Medium	Geotechnical investigation as part of design works for the development should include sampling and testing of soils to assess the risk posed by chemical attack. If required, appropriately designed buried concrete and barrier water supply pipes should be used at the development.	Low
Contamination in Made Ground, shallow soils, and shallow groundwater.	Direct contact with building foundations and buried services leading to chemical attack.	Off-Site Structures	Low	No significant previous potentially contaminated land uses have been identified at the Site, and therefore the risk for potential impacts to off-site surrounding receptors is considered to be low.	Low
Controlled Waters					
Contamination in Made Ground, shallow soils, and shallow groundwater.	Migration through Glacial Till to nearby watercourses. Runoff from stockpiled soils.	Surface watercourse 26m south of the Site	Low	No significant previous potentially contaminated land uses have been identified at the Site, and therefore the risk for potential ground contamination sources causing impacts to the watercourse is considered low.	Low

Source	Pathways	Receptor	Risk	Justification / Mitigation	Residual Risk
Construction materials stored on-Site as part of development works.	Spills to ground, and the nearby watercourse.	Surface watercourse 26m south of the Site	Medium	A CEMP should be prepared for the demolition and construction works on-Site, detailing measures to minimise the potential risk to controlled waters. Construction materials brought on-Site as part of works should be appropriately stored to prevent spills and leaks. This should prevent potentially contaminated material reaching surface watercourses.	Low

W

E



Project Details	WIE17125-103: Keresforth Academy
Figure Title	Figure A3: Conceptual Site Model
Figure Ref	WIE17125-103_GR_PRA_A3A
Date	June 2020
File Location	\\s-Incs\wiel\projects\wie17125\103\graphics\pralissued figures

PLAYING FIELD OFF BROADWAY AT JUNCTION WITH KERESFORTH
CLOSE
BARNSELEY

Our reference:	7100_I-345748_1
Your reference:	
Date of your enquiry:	30 May 2014
Date we received your enquiry:	30 May 2014
Date of issue:	30 May 2014
Grid Reference	433309 405586

Public Safety Incident Report

Overview



Approximate position of property



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Mining Data

Stop Areas

There are no stop areas within 100m of the report site boundary.

AFMRI

There are no AFMRIs within 100m of the report site boundary

Designations

There are no designations within 100m of the report site boundary

Past Underground Mining

Colliery	Seam	Seam Code	Mineral	Panel	Depth (m)	Direction to working (degrees)	Disposition	Extraction Thickness (cm)	Dip Rate	Dip Direction (degrees)	Year
DODWORTH	FLOCKTON THICK	NY270K	Coal	6IE9	141	256	0.6	70	15.9	43	1942
DODWORTH	MIDDLETON MAIN	NY330Y	Coal	6IEH	244	267	0.3	150	11.7	54	1961
DODWORTH	PARKGATE	NY310K	Coal	6IEF	235	Beneath Property	0.0	137	15.1	61	1942
ROB ROYD	SILKSTONE	NY360K	Coal	6IEI	324	152	0.6	167	8.5	97	1901
ROB ROYD	SILKSTONE	NY360K	Coal	6IEJ	305	Beneath Property	0.0	167	13.6	50	1909
DODWORTH	TOP FENTON	NY290K	Coal	6IED	213	Beneath Property	0.0	91	13.0	54	1953

Spine Roadways at shallow or moderate depth (nearest roadway)

There are no spine roadways within 50m of the report site boundary that lie at less than 100m depth

Probable unrecorded workings (nearest workings)

Depth Indicator	Distance to working (m)	Direction to working (degrees)
Shallow	0.2	180

Outcrops

Seam Name	Seam Code	Mineral	Thin Indicator	Distance to Outcrop (m)	Direction to Outcrop (degrees)	Conjectured
BARNSELEY	NY210K	Coal	False	37.3	54	True

Licence Details (AOR)

There are no AORs within 100m of the report site boundary

Licence Details (Surface Hazard Area)

There are no surface hazard areas within 100m of the report site boundary

Geology

There is a Fault beneath the enquiry boundary. This position is conjectured.

Mine entries

There are no mine entries within 20m of the report site boundary

Opencast sites

There are no opencast sites within 100m of the report site boundary

Permits

There are no permits within 100m of the report site boundary

PS&S information

Subsidence Claims

There are no subsidence claims within 100m of the report site boundary

Coal mining related hazards

Reference	Status	Distance to CMRH (m)	Direction to CMRH (degrees)
I-345748	01 - Awaiting Decision	Beneath Enquiry	N/A

Mine gas

There are no mine gas incidents within 1000m of the report site boundary

Siteworks

There are no siteworks within 100m of the report site boundary

PLM information

Monitor Points

There are no monitor points within 100m of the report site boundary

Discharge Points

There are no discharge points within 100m of the report site boundary

Tips

There are no tips within 100m of the report site boundary

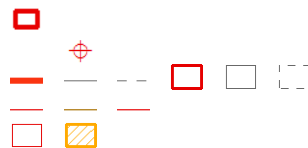
Other information

Properties

There are no properties within 100m of the report site boundary

The map displays a residential neighborhood with a grid overlay. The grid has horizontal labels from 432700 to 433900 and vertical labels from 405200 to 405900. Red crosshair markers are placed at various locations, each labeled with a unique identifier. The map includes features such as a 'Sports Facility', a 'Pond', and several 'Issues' and 'Sinks' marked in blue. A yellow dashed line runs diagonally across the map. Other labels include 'E0822-001-1', 'H600-001-1', and 'Locke Park'.

Hazards





The Coal
Authority

Date: 16th June 2014



INVESTOR IN PEOPLE

200 Lichfield Lane
Berry Hill
Mansfield
Notts
NG18 4RG
Web: www.coal.decc.gov.uk
Fax: 01623 637398

This matter is being dealt with by:

Our Ref: I-345748

Mr M Lyons
SYMAS
P O Box 604
Barnsley
South Yorkshire
S70 9FE

Mr Keith Ollivant
Tel: 07770 678394
Email: keithollivant@coal.gov.uk

Admin Officer
Sarah Musson
Tel: 01623 637282
Email: sarahmusson@coal.gov.uk

Dear Mark,

Surface Hazard at Playing Field adjacent to Keresforth Close, Barnsley.
O.S. National Grid Co-ordinates at centre of collapse are 433300mE and 405590mN.

I refer to the report of a surface hazard to the Coal Authority on 30th May, 2014, and our subsequent investigation of this ground collapse on 12th June, 2014, which was proven to be caused by shallow unrecorded workings within the Barnsley Seam. As such responsibility for its remediation rests with the Coal Authority.

It was treated by opening out the collapse to 2.2m by 1.5m and excavating to a depth of 4.5m below the surface to the base of the workings. 3No roadways could be seen to run off from the base of the excavation in a North-east, South-east and South-westerly directions. 12 Tonnes of clean 75 to 150mm limestone was placed and compacted in layers not exceeding 300mm to within 1.5m of the surface, whereupon a layer of geo-textile terram was placed across the stone and around the exposed sides. The as-dug sandy clay spoil was then placed and compacted in layers not exceeding 150mm thickness to the underside of the existing turf. Finally the existing topsoil was used to reinstate the surface to the pre-existing field profile. The affected work area was tidied and new grass seed placed. Approximately 10 Tonnes of surplus as-dug material was removed by grab wagon to a licensed waste site. The existing fencing has been taken down and laid to the side of the field for collection by your team.

To assist us in monitoring our service it would be appreciated if you could complete and return the attached customer satisfaction form using the enclosed stamped addressed envelope. Thank you for your prompt assistance in facilitating our works.

As discussed with you on site at the time of our works it would be appreciated if you could consider whether the Coal Authority can assist your organisation in the research, procurement or carrying-out of any future investigation of possible shallow workings, both coal and other minerals, which could exist under land which the Council may be considering developing on a commercial basis. Please feel free to contact either myself or my line manager Lee Cammack at any time on 01623 637214 should you identify any such business opportunities. Any such requests will be treated in a professional and confidential manner.

Meanwhile, should you have any concerns about the above or require any additional information please do not hesitate to contact me. Please use the above telephone numbers during office hours, or in the event of an **emergency out of office hours**, telephone 01623 646333, quoting reference number I-345748.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "K. Ollivant", followed by a short horizontal stroke.

Keith Ollivant
Regional Project Manager – Public Safety and Subsidence

APPLICATION FOR PAYMENT: Order No. ORD-014228 I-345748

LOCATION: PLAYING FIELD OFF BROADWAY AT JUNCTION WITH KERESFORTH CLOSE, BARNSELY

Item Ref.	Description	Quantity	Unit	Rate	Total
	Date work carried out: 12.6.2014				
Labour					
C1	Foreman	8	hrs	£25.20	£201.60
C9	Machine driver	8	hrs	£19.33	£154.64
C61	Grab lorry	8	hrs	£19.33	£154.64
C61	Delivery/collection	3	hrs	£19.33	£57.99
	Total to Summary				£568.87
Plant					
CECA 10(19)	8t Excavator	8	hrs	£30.93	£247.44
CECA 14(24)	Van	8	hrs	£16.77	£134.16
CECA 14(16)	16t Lorry	8	hrs	£28.31	£226.48
CECA 14(10)	Grab attachment	8	hrs	£2.53	£20.24
CECA 14(8)	Delivery/collection	3	hrs	£37.70	£113.10
	Percentage adj for CECA Plant	-10%		£741.42	-£74.14
	Total to Summary				£667.28
Materials					
P Watson	75mm to 150mm clean stone	12	tn	£18.00	£216.00
buntings	Grass Seed	1	bag	£72.00	£72.00
ACS Yard	Lotrack non woven	25	m2	£3.00	£75.00
	Percentage adj for Materials	12.50%		£363.00	£45.38
					£408.38
				TOTAL	£1,644.52

PUBLIC SAFETY AND SUBSIDENCE – PROJECT COMPLETION REPORT

Project Ref: P-018314 (I-345748)		Date reported 30/5/2014	
Address/Location of Hazard Playing Field off Broadway at Junction With Keresforth Close Barnsley South Yorkshire			
Coordinates: 433300, 405590		Mining Report Ref: MR-7100_I-345748_1-1401440490281	
Hazard reported as: Circular hole approx. 182 diameter, fairly deep			
Hazard Type		Mine Workings – Shallow – Not Recorded	
Shaft / Adit Ref No: (if applic)		N/A	
Coal Authority Desktop Investigation: Based on the coordinates given by the informant, there have been five seams of past recorded underground coal workings within the vicinity of this collapse, these being from the Flockton Thick (NY270K), Middleton Main (NY330Y), Parkgate (NY310K), Silkstone (NY360K) and Top Fenton (NY290K), these range in depth from 141m (Flockton Thick) up to 324m (Silkstone). The last recorded workings were in 1961 from the Middleton Main Seam at a depth of 244m. There is an area of past shallow workings 30m away to the South of this location. The collapse is sat on the edge of shallow probable unrecorded workings. There is a seam outcropping from the Barnsley Seam (NY210K) approximately 37m away to the North-east which dips towards the location. There is a conjectured fault beneath this location. The nearest mine entry is over 60m away to the south/south-east of this location. There have been no previous claims or incidents within influencing distance.			
Description of Investigation Works			
N/A			
Site Works Started		Site Works Complete	
Description of Treatment Works			
Treated by opening out the collapse to 2.2m by 1.5m and excavating to a depth of 4.5m below the surface to the base of the workings. 3No roadways could be seen to run off from the base of the excavation in a North-east, South-east and South-westerly directions. 12 Tonnes of clean 75 to 150mm limestone was placed and compacted in layers not exceeding 300mm to within 1.5m of the surface, whereupon a layer of geo-textile terram was placed across the stone and around the exposed sides. The as-dug sandy clay spoil was then placed and compacted in layers not exceeding 150mm thickness to the underside of the existing turf. Finally the existing topsoil was used to reinstate the surface to the pre-existing field profile. The affected work area was tidied and new grass seed placed. Approximately 10 Tonnes of surplus as-dug material was removed by grab wagon to a licensed waste site			
Treatment Works Started		Treatment Works Complete	
12/6/2014		12/6/2014	
Coal Authority Liability		YES	

Other Comments			
Signed		Date	

Copies to: Mining Reports & File

The Coal Authority
Incident Notification Report

Incident Report

Incident Reference: I-345748

Date Received: 30 May 2014

Time Received: 09:52

Call Officer: leccig

Duty Officer: sharlo

Nature of Incident:

CIRCULAR HOLE 18" DIAMETER FAIRLY DEEP

Occurrence of Incident:

YESTERDAY

Incident Location

Address: PLAYING FIELD OFF BROADWAY AT JUNCTION WITH KERESFORTH CLOSE,
BARNSELEY,

Authority Region: Yorkshire

Co-ordinates: 433309 mE 405587 mN

Location Details: APPROX COORDS 433309, 405587
S70 6RS

Interest: Informant

Name: Mr RAY HUNTER

Tel. No.: 01226 772684

Other No.:

Organisation: SYMAS

Address: BARNSELEY, SOUTH YORKSHIRE S70 9FE

KPI's

Rule Name	Start	Period		Completed
		Days	Hour	
Determine liability	30 May 2014 09:59	180	0	
Grade 2 - Priority Response - Deploy a competent person to site	30 May 2014 09:59		1	30 May 2014 10:12
Grade 2 - Priority Response - Competent person to arrive on site	30 May 2014 10:12		4	

Other Information

Desktop Investigation:

Based on the coordinates given by the informant, there have been five seams of past recorded underground coal workings within the vicinity of this collapse, these being from the Flockton Thick (NY270K), Middleton Main (NY330Y), Parkgate (NY310K), Silkstone (NY360K) and Top Fenton (NY290K), these range in depth from 141m (Flockton Thick) up to 324m (Silkstone). The last recorded workings were in 1961 from the Middleton Main Seam at a depth of 244m.

There is an area of past shallow workings 30m away to the South of this location.

The collapse is sat on the edge of shallow probable unrecorded workings.

There is a seam outcropping from the Barnsley Seam (NY210K) approximately 37m away to the North-east which dips towards the location.

There is a conjectured fault beneath this location.

The nearest mine entry is over 60m away to the south/south-east of this location.

There have been no previous claims or incidents within influencing distance.

