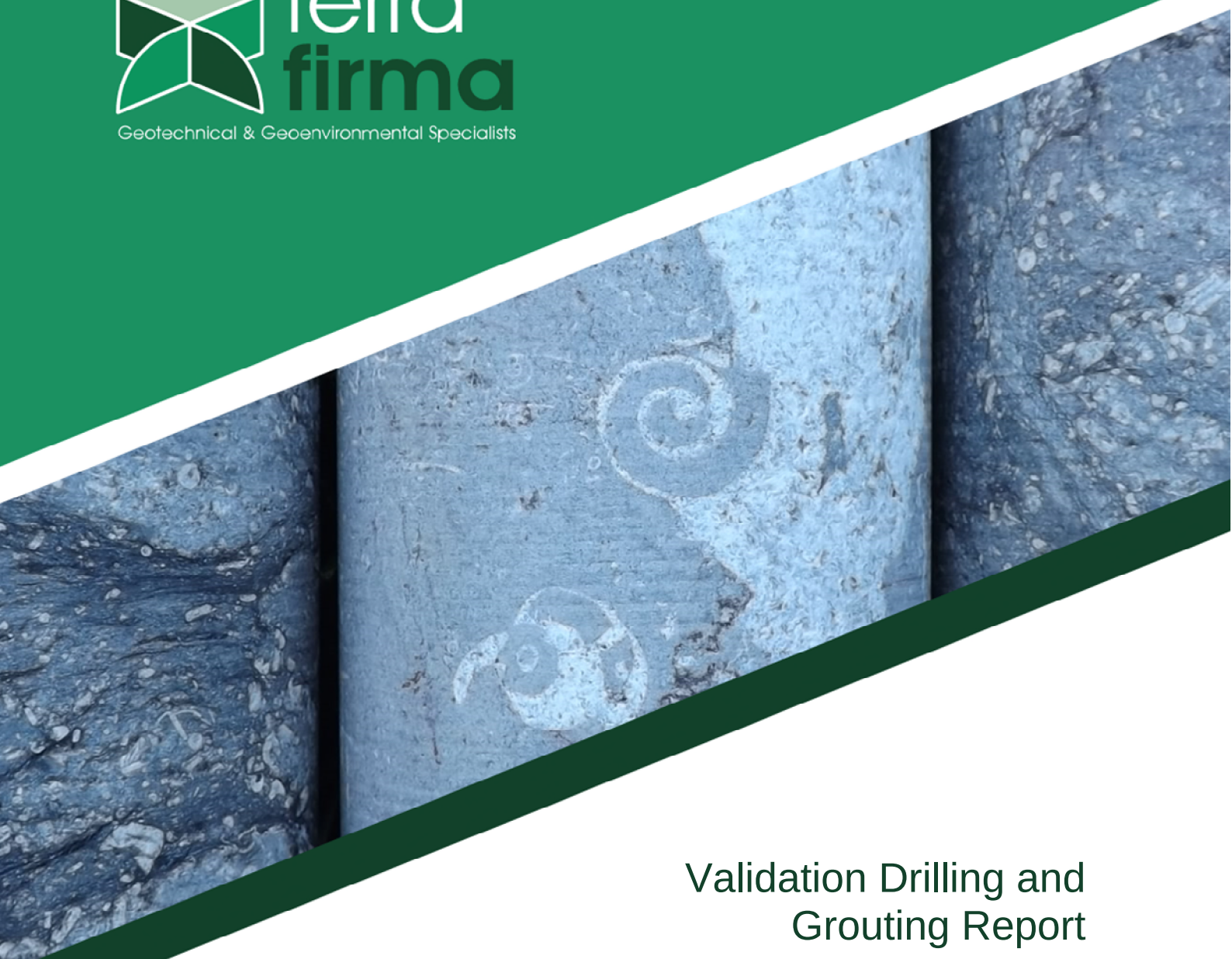




Validation Drilling and Grouting Report

Site: Proposed Residential Development,
Dragon Park, Merthyr Tydfil

Prepared For: Davies Homes Limited

Issue Date: September 2024

Job No: 17970

REPORT TITLE : **Validation Drilling and Grouting Report:
Proposed Residential Development, Dragon
Park, Merthyr Tydfil**

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SECTION 1 Introduction and Proposed Development

1.1 Introduction

Davies Homes Limited is proposing the development of residential housing at a former factory site at Dragon Park, Merthyr Tydfil. In 2023 Integral Geotechnique undertook a Coal Mining Risk Assessment of the site and concluded that there was a potential risk from shallow mining in the southwest of the site (Integral Geotechnique Report 12888/JJ/23/CMRA – Coal Mining Risk Assessment – Land at Dragon Parc, Abercanaid, Merthyr Tydfil, February 2023).

In view of the potential risks identified by Integral Geotechnique, Davies Homes Limited considered it prudent to undertake a Drilling and Grouting exercise to determine the risk to the proposed housing.

TFW Group Limited were commissioned by Davies Homes to provide part-time site attendance during the validation drilling and grouting works undertaken by Van Elle between 4th June 2024 and 20th June 2024, and record details of these works.

1.2 Objectives

The objective of the Validation Drilling and Grouting Report is to detail the works undertaken by Van Elle and assess the risk from shallow coal mining.

1.3 Previous Investigations and Assessments

The study site has been subject to multiple phases of investigation. Coal Mining Risk is detailed in the 2023 CMRA. This report should be read in conjunction with the following document;

- Integral Geotechnique Report 12888/JJ/23/CMRA – Coal Mining Risk Assessment – Land at Dragon Parc, Abercanaid, Merthyr Tydfil, February 2023

1.4 Limitations and Exceptions of Investigation

This report has been prepared for the sole internal reliance of the Client and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geo-environmental and geotechnical consultants. TFW Group Limited does not provide legal advice and the advice of lawyers may be required.

The current report focuses solely on Plots 185 - 200 and does not include an assessment of the rest of the site, including the former Willows Pit Mine Shaft located in the centre of the broader Dragon Park site, approximately 115m north of the current study area.

The boundary of the broader Dragon Park Development (in Blue) and the current study area (in red) is presented in **Figure 1.1**.



Figure 1.1 Broader Dragon Park Boundary (Blue) and Current Study Area (Red) (NTS)

1.5 Quality Assurance

The quality and environmental aspects of the assessment and investigation comply with UKAS Accredited ISO 9001:2015 and ISO 14001:2015 standards.

SECTION 2 Summary of Coal Mining Risk Assessment

The following subsection information has been summarised from previous investigations listed in **Section 1.3**.

2.1 Site Location and Description

The current study area comprises the footprints of plots 185 – 200 and covers an area of approximately 3,680 m². The site centres approximately on National Grid Reference 305440, 204130. The site was visited during the Validation Drilling and Grouting Works and was seen to comprise a relatively flat platform cleared of vegetation and thus surfaced with made ground. A drainage channel runs to the west of the area.

The location of the study site is presented in **Figure 2.1**.



Figure 2.1 Site Location (NTS)

2.2 Summary of 2023 Coal Mining Risk Assessment

In 2023 Integral Geotechnique undertook a Coal Mining Risk Assessment (CMRA). The following presents a summary of the conclusions pertaining to the current study area in the southwest of Dragon Park (Plots 185 to 200).

The Geological Vertical Section from the 1:10,560 Scale Geology Sheet shows the Two-Foot Nine seam (2 ft 6 inches thick (0.76m)) to overlie the Four Feet Seam (6ft (1.8m)) which overlies the Upper Six Feet (3ft (0.9m)) which, in turn, overlies the Lower Six Feet (4 ft (1.2m)). The Geological Sheet (SO 00 SE) shows the Geology to dip 10° in a south-southeasterly direction. A Coal Authority Consultants Report records workings dipping between 5.5° and 7.2° to the south in the shallow seams beneath the site.

Historical map review recorded the south of the site, including Plots 185 to 200 as Upper Abercanaid Pit. Coal Authority records reveal the mine entries associated with Upper Abercanaid Pit to locate to the southwest of the current study area.

Abandonment Plans for workings in the Four Foot Seam, the Nine Foot Seam, and the Seven Foot Seam show workings beneath the current study area.

No mine entries are recorded within the current study area. Shafts recorded in the broader area are presented in **Figure 2.2**.

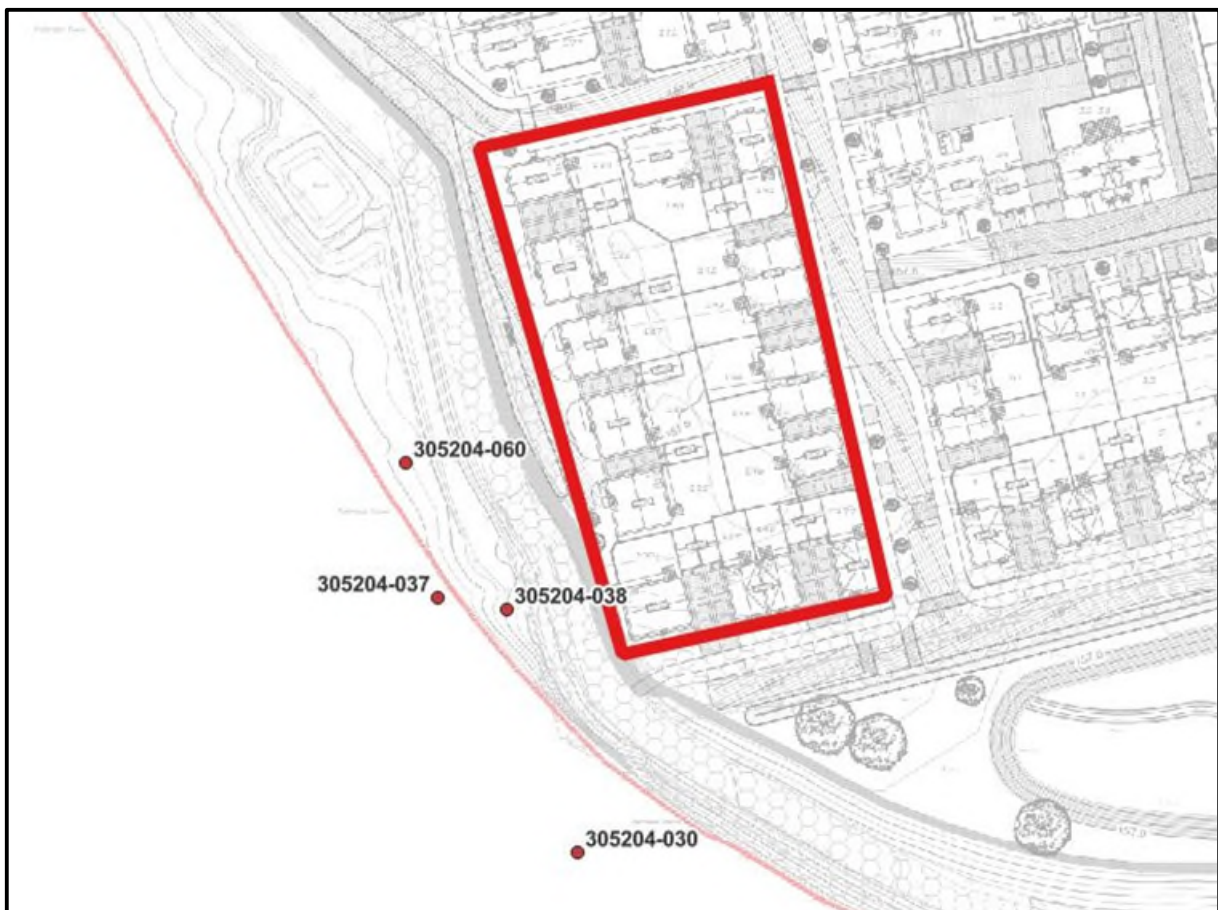


Figure 2.2 Location of Known Mine Entries in the vicinity of Study Area (NTS)

Records show that these mine entries have all be located historically and treated/capped.

The current study area is based on Plots 185 to 200. Integral Geotechnique Boreholes PH120, PH123 and PH137 locate within this area. Conditions encountered in these boreholes are summarised in **Table 2.1**.

Table 2.1 Summary of Integral Geotechnique Boreholes within Study Area

Borehole	Depth to Base of Fill (m bgl)	Depth to Rockhead (m bgl)	Coal Seam Depth and Thickness (m bgl/m)	Coal Seam Worked?
PH120	6.0	15.5	25.2 (1.5)	No
PH123	5.5	18.9	23.5 (1.4)	No
PH137	6.0	15.5	17.3 (0.5)	No

The approximate locations of the Integral Geotechnique Boreholes are presented in **Figure 2.3**.

**Figure 2.3 Approximate Location of Integral Geotechnique Boreholes within Study Area (NTS)**

Integral Geotechnique concluded that the south of the broader Dragon Park site could potentially be affected by the shallow coal mine workings.

SECTION 3 Validation Drilling and Grouting

3.1 Validation Drilling

To confirm ground conditions Van Elle adopted an approximate 6m grid, modified to target proposed structures. The validation drill and grouting grid is presented in

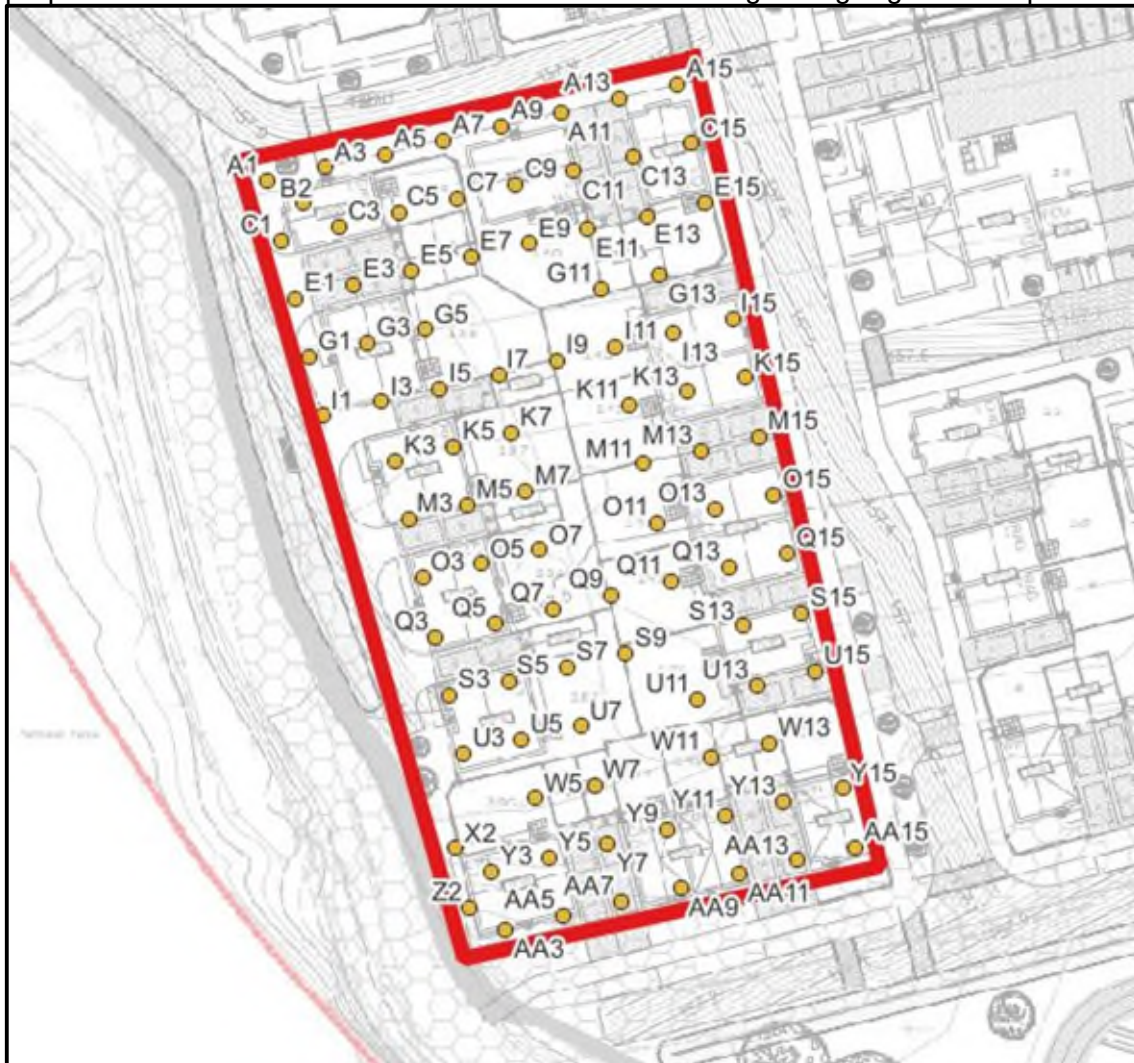


Figure 3.1.

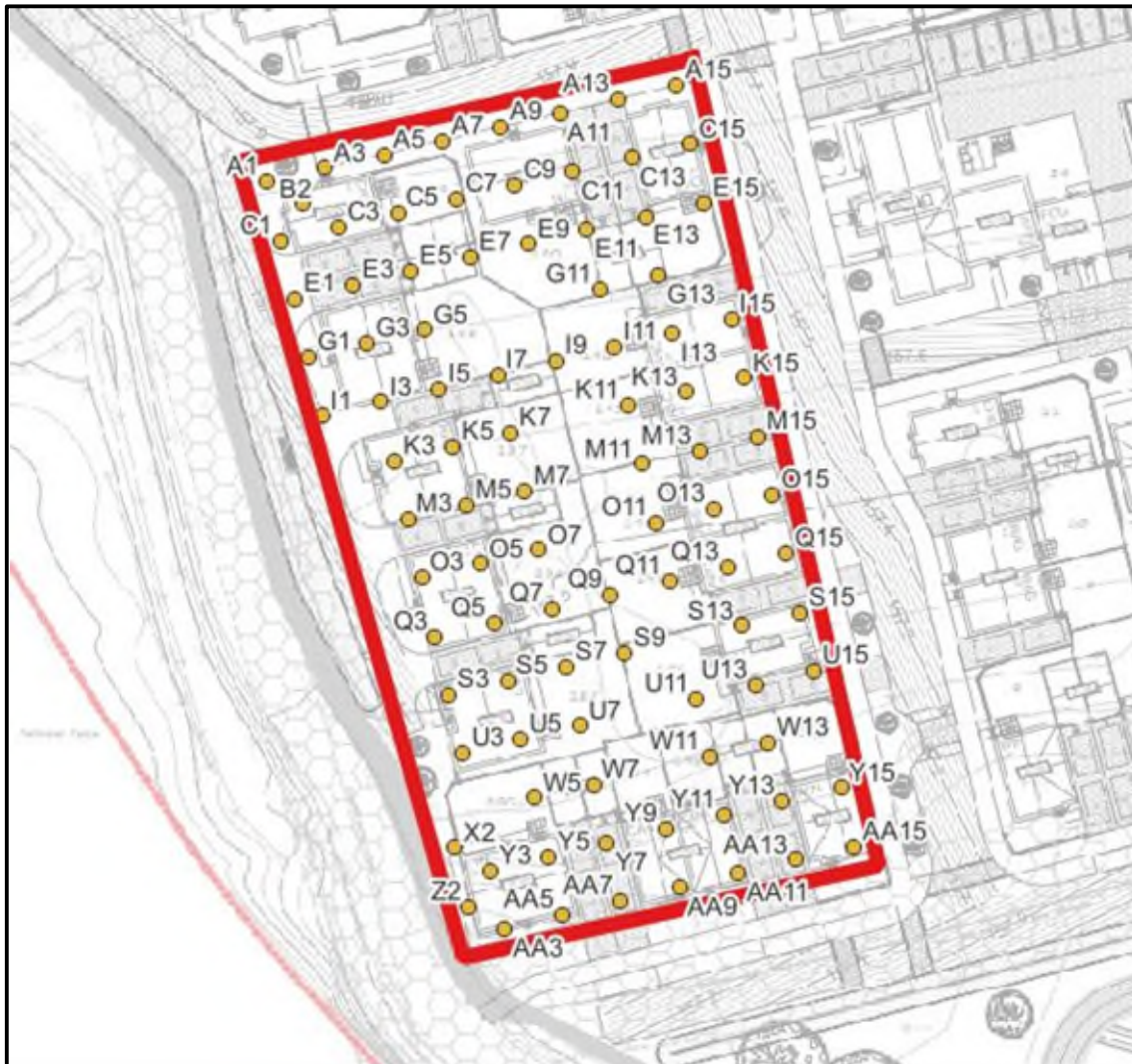


Figure 3.1 Validation Drilling and Grouting Grid

Van Elle drilled to a depth of 26m Below Ground Level to exceed the depth at which Integral Geotechnique encountered the Coal Seam in PH120 and PH123. Of the 95 No. boreholes completed, coal was only encountered within 6 No. boreholes. The ground conditions encountered are summarised in **Figure 3.2**.



Figure 3.2 Summary of Ground Conditions Encountered
(Yellow – No Coal Encountered, Black – Coal Encountered)

3.2 Validation Grouting

During grouting all holes took the minimum amount of grout required to backfill the boreholes (0.26 tonnes) with the exception of borehole S3, which took a marginally greater volume of grout (0.39 tonnes). S3 was noted as 'Soft Coal' from 20.5 m – 22.0 m bgl. Grout takes are summarised in **Figure 3.3**.

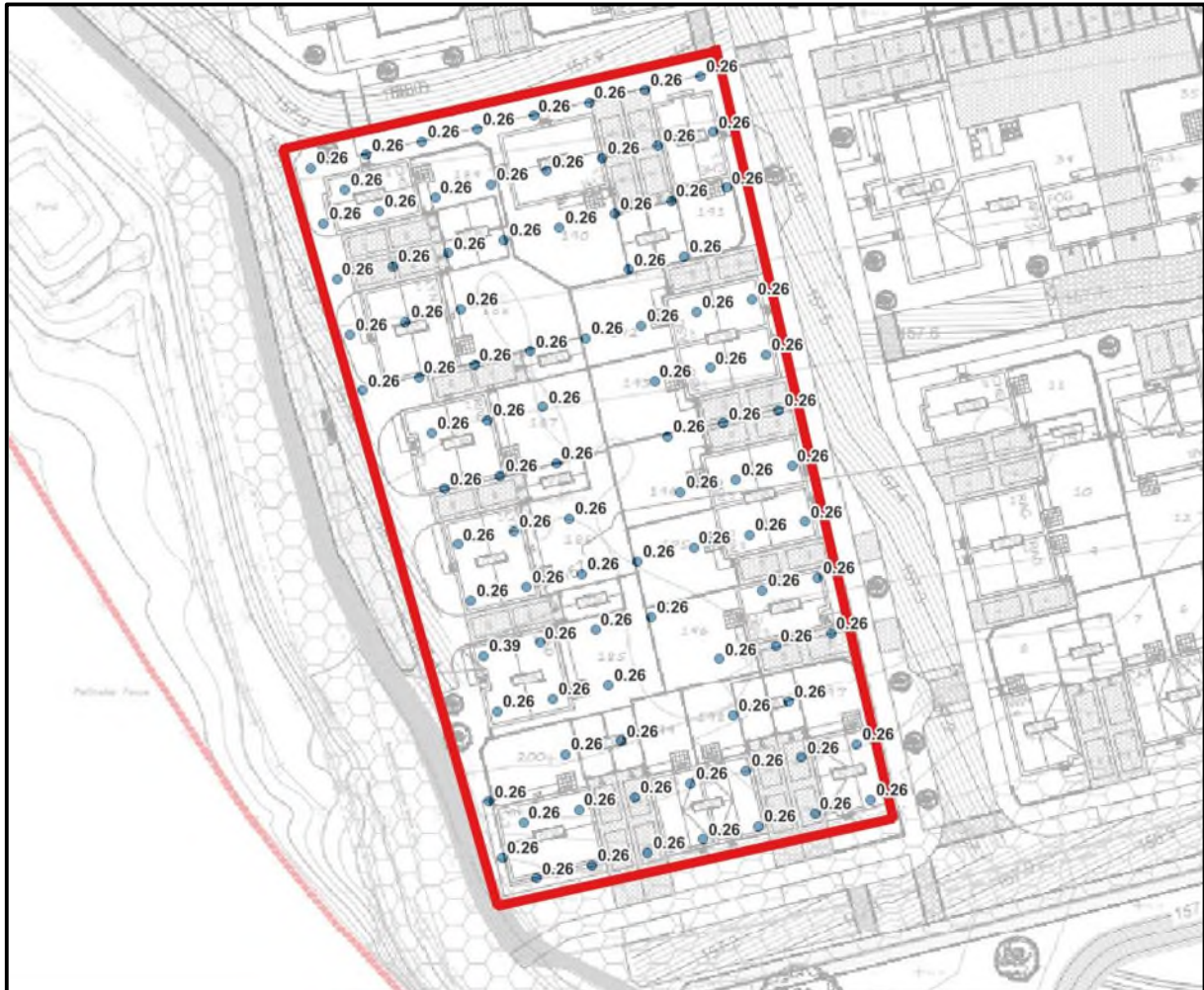


Figure 3.3 Summary of Grout Takes (Tonnes)

Due to the low grout takes in the primary holes it was not deemed necessary to perform secondary holes.

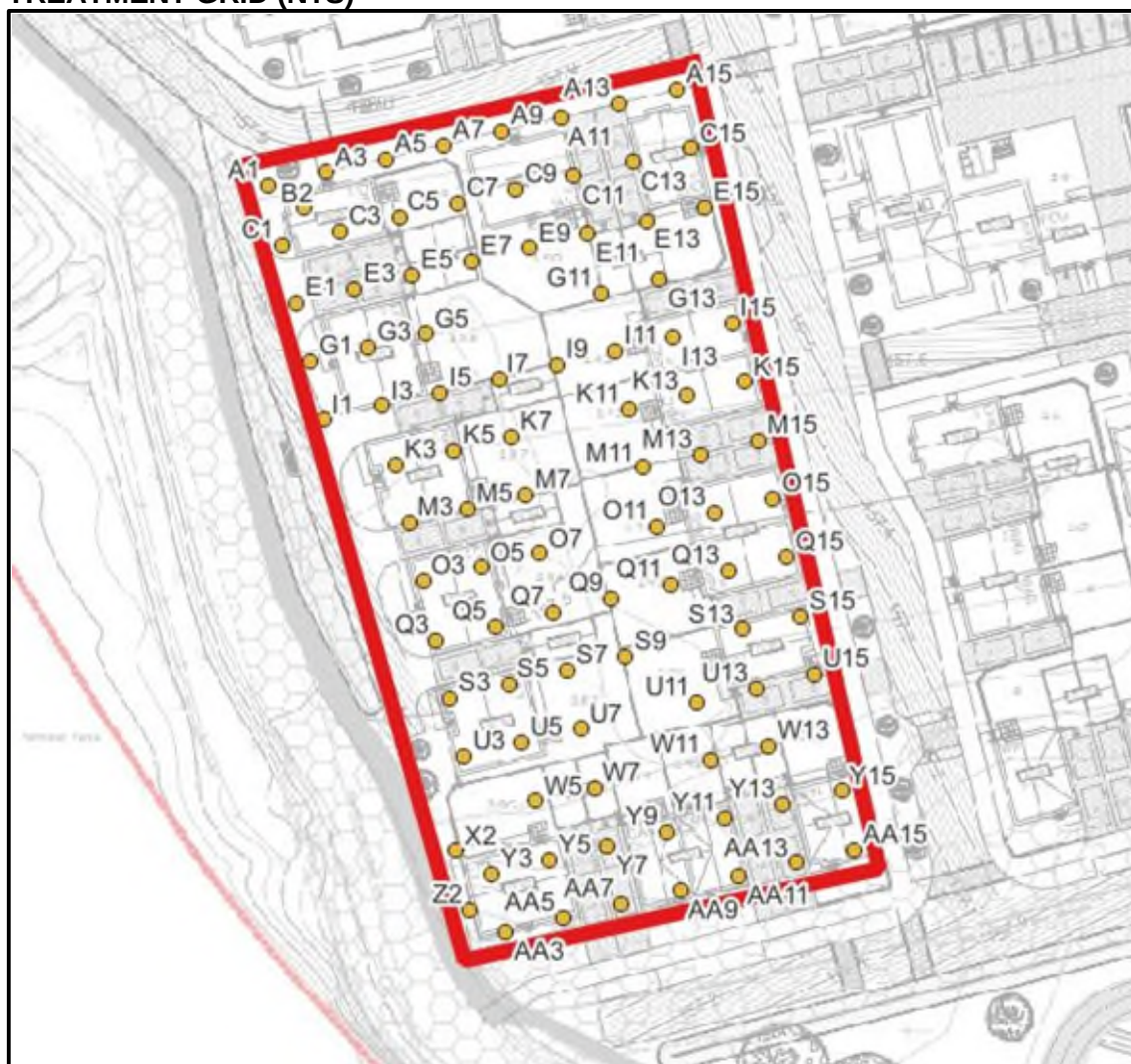
SECTION 4 CONCLUSION

The Validation Drilling has confirmed solid drill with no coal to a depth of at least 26m across the study area (Plots 185 – 200) with the exception of six locations where unworked coal was encountered.

The subsequent grouting confirmed that all locations took a minimal amount of grout required to backfill the hole (0.26 tonnes) with the exception of one location, S3, where a marginally higher grout take was recorded (0.39 tonnes).

We are satisfied that the validation works have confirmed the absence of shallow workings within influencing distance of the sites surface.

ANNEX A
List of Grout Takes

TREATMENT GRID (NTS)**GROUT TAKES (SEE OVERLEAF)**

BOREHOLE	X	Y		Bedrock	Coal	Grout (T) 07-06-2024	Grout (T) 14-06-2024	Grout (T) 20-06-2024		Total Grout
A1	305407.442	204161.426	05/06/2024	11.5	N	0.26				0.26
A3	305413.283	204162.798	05/06/2024	11.5	N	0.26				0.26
A5	305419.124	204164.17	05/06/2024	11.5	N	0.26				0.26
A7	305424.965	204165.542	05/06/2024	11.5	N	0.26				0.26
A9	305430.806	204166.914	05/06/2024	11.5	N	0.26				0.26
A11	305436.647	204168.286	05/06/2024	11.5	N	0.26				0.26
A13	305442.488	204169.658	05/06/2024	11.5	N	0.26				0.26
A15	305448.329	204171.03	05/06/2024	11.5	N	0.26				0.26
B2	305411.0485	204159.1915	20/06/2024	11.5	N			0.26		0.26
C1	305408.814	204155.585	06/06/2024	12.6	N	0.26				0.26
C3	305414.655	204156.957	06/06/2024	12	N	0.26				0.26
C5	305420.496	204158.329	06/06/2024	12	N	0.26				0.26
C7	305426.337	204159.701	06/06/2024	12	N	0.26				0.26
C9	305432.178	204161.073	06/06/2024	11.5	N	0.26				0.26
C11	305438.019	204162.445	05/06/2024	11.5	N	0.26				0.26
C13	305443.86	204163.817	05/06/2024	11.5	N	0.26				0.26
C15	305449.701	204165.189	05/06/2024	11.5	N	0.26				0.26
E1	305410.186	204149.744	06/06/2024	12	N	0.26				0.26
E3	305416.027	204151.116	06/06/2024	12	N	0.26				0.26
E5	305421.868	204152.488	06/06/2024	12	N	0.26				0.26
E7	305427.709	204153.86	07/06/2024	12	N	0.26				0.26
E9	305433.55	204155.232	07/06/2024	12	N	0.26				0.26
E11	305439.391	204156.604	07/06/2024	11.5	N	0.26				0.26
E13	305445.232	204157.976	07/06/2024	11.4	N	0.26				0.26
E15	305451.073	204159.348	07/06/2024	11.5	N	0.26				0.26
G1	305411.558	204143.903	10/06/2024	12	N		0.26			0.26
G3	305417.399	204145.275	10/06/2024	12	N		0.26			0.26
G5	305423.24	204146.647	07/06/2024	12	N	0.26				0.26
G11	305440.763	204150.763	07/06/2024	12	N	0.26				0.26
G13	305446.604	204152.135	07/06/2024	12	N	0.26				0.26
I1	305412.93	204138.062	10/06/2024	12	N		0.26			0.26
I3	305418.771	204139.434	10/06/2024	12	N		0.26			0.26
I5	305424.612	204140.806	11/06/2024	12	N		0.26			0.26
I7	305430.453	204142.178	11/06/2024	12	N		0.26			0.26
I9	305436.294	204143.55	11/06/2024	12	N		0.26			0.26
I11	305442.135	204144.922	11/06/2024	12	N		0.26			0.26
I13	305447.976	204146.294	11/06/2024	12	N		0.26			0.26
I15	305453.817	204147.666	11/06/2024	12	N		0.26			0.26
K3	305420.143	204133.593	12/06/2024	13	N		0.26			0.26
K5	305425.984	204134.965	12/06/2024	12.5	N		0.26			0.26
K7	305431.825	204136.337	12/06/2024	12	N		0.26			0.26
K11	305443.507	204139.081	12/06/2024	12	N		0.26			0.26
K13	305449.348	204140.453	11/06/2024	12.5	N	0.26				0.26
K15	305455.189	204141.825	11/06/2024	12.5	N	0.26				0.26
M3	305421.515	204127.752	12/06/2024	12	N		0.26			0.26
M5	305427.356	204129.124	13/06/2024	13	21.5 - 22.6		0.26			0.26
M7	305433.197	204130.496	13/06/2024	13	22 - 23		0.26			0.26
M11	305444.879	204133.24	13/06/2024	13	N	0.26				0.26
M13	305450.72	204134.612	13/06/2024	13	N		0.26			0.26
M15	305456.561	204135.984	13/06/2024	13	N		0.26			0.26
O3	305422.887	204121.911	12/06/2024	12.5	19 - 20.5		0.26			0.26
O5	305428.728	204123.283	12/06/2024	13	19.5 - 22		0.26			0.26
O7	305434.569	204124.655	13/06/2024	13	N		0.26			0.26
O11	305446.251	204127.399	14/06/2024	13	N		0.26			0.26
O13	305452.092	204128.771	14/06/2024	13	N		0.26			0.26
O15	305457.933	204130.143	13/06/2024	13	N		0.26			0.26
Q3	305424.259	204116.07	12/06/2024	12.5	19 - 20.5		0.26			0.26
Q5	305430.1	204117.442	13/06/2024	13	N		0.26			0.26
Q7	305435.941	204118.814	14/06/2024	13	N		0.26			0.26
Q9	305441.782	204120.186	14/06/2024	13	N		0.26			0.26
Q11	305447.623	204121.558	14/06/2024	13	N		0.26			0.26
Q13	305453.464	204122.93	14/06/2024	13	N		0.26			0.26
Q15	305459.305	204124.302	14/06/2024	13	N		0.26			0.26
S3	305425.631	204110.229	14/06/2024	13	20.5 - 22			0.39		0.39
S5	305431.472	204111.601	17/06/2024	12	N			0.26		0.26
S7	305437.313	204112.973	17/06/2024	13	N			0.26		0.26
S9	305443.154	204114.345	17/06/2024	13	N			0.26		0.26
S13	305454.836	204117.089	18/06/2024	13	N			0.26		0.26
S15	305460.677	204118.461	18/06/2024	13	N			0.26		0.26
U3	305427.003	204104.388	17/06/2024	13	N			0.26		0.26
U5	305432.844	204105.76	18/06/2024	13.5	N			0.26		0.26
U7	305438.685	204107.132	18/06/2024	13.5	N			0.26		0.26
U11	305450.367	204109.876	18/06/2024	13	N			0.26		0.26
U13	305456.208	204111.248	18/06/2024	13	N			0.26		0.26
U15	305462.049	204112.62	18/06/2024	13	N			0.26		0.26
W5	305434.216	204099.919	18/06/2024	13.5	N			0.26		0.26
W7	305440.057	204101.291	18/06/2024	13.5	N			0.26		0.26
W11	305451.739	204104.035	19/06/2024	13	N			0.26		0.26
W13	305457.58	204105.407	19/06/2024	13	N			0.26		0.26
X2	305426.1405	204094.9405	20/06/2024	13.5	N			0.26		0.26
Y3	305429.747	204092.706	17/06/2024	13	N			0.26		0.26
Y5	305435.588	204094.078	19/06/2024	13.5	N			0.26		0.26
Y7	305441.429	204095.45	19/06/2024	13.5	N			0.26		0.26
Y9	305447.27	204096.822	19/06/2024	13.5	N			0.26		0.26
Y11	305453.111	204098.194	19/06/2024	13	N			0.26		0.26
Y13	305458.952	204099.566	19/06/2024	13	N			0.26		0.26
Y15	305464.793	204100.938	19/06/2024	13	N			0.26		0.26
Z2	305427.5125	204089.0995	20/06/2024	13.5	N			0.26		0.26
AA3	305431.119	204086.865	20/06/2024	13.5	N			0.26		0.26
AA5	305436.96	204088.237	20/06/2024	13.5	N			0.26		0.26
AA7	305442.801	204089.609	20/06/2024	13.5	N			0.26		0.26
AA9	305448.642	204090.981	20/06/2024	13.5	N			0.26		0.26
AA11	305454.483	204092.353	20/06/2024	13	N			0.26		0.26
AA13	305460.324	204093.725	20/06/2024	13	N			0.26		0.26
AA15	305466.165	204095.097	20/06/2024	13	N			0.26		0.26



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