

**SOIL THICKNESS
INVESTIGATION
PHASE 1 NANTYCAWS
LANDFILL**

Soil Thickness Report

Report Number 2120r1v1d0121

Commissioned by

CWM Environmental Limited
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1 INTRODUCTION

1.1 Scoping and Objective of the Investigation

Geotechnology Limited (Geotechnology) has been commissioned by Cwm Environmental Ltd. (Cwm) to carry out a soil thickness investigation on the closed Phase 1 Landfill at Nantycaws in Carmarthenshire.

Cwm is evaluating the potential to place a number of solar panels on the surface of Phase 1. The thickness of the restoration soil is important in establishing any potential issues involved in placement of the panels.

1.2 Site Description

Carmarthenshire County Council (CCC) maintains Nantycaws (NYC) Phase I Landfill which is located east of Carmarthen and west of Cross Hands at National Grid Reference 247170 217170. It covers a site area of 11.14Ha or 111,400m² and currently ranges in elevation between 114m and 141m Ordnance Datum (see Figure 1).

The landfill is in Aftercare and has not accepted waste since March 1997. The landfill has been partially restored, with a full FML (Flexible Membrane Liner) placed over the capped area. The site is regulated by Natural Resources Wales (NRW) through Permit No. EA WML 34183.

Phase 1 of the landfill lies on the northern slope of the Bantwen Valley and is essentially a landraise, as opposed to a void in-fill, as is the case with the majority of landfills. The landfill comprises a plateau area, which possesses grades of between 1:13 and 1:22 with the flanks having grades of 1:6.5 on the southeastern side and 1:3 to 3:5 on the southwestern. The northern flank slopes at 1:5.

1.3 Other Information

Cwm Environmental Ltd has directly commissioned Geotechnology Ltd. (Geotechnology) to complete the soil thickness investigation.

The following parties are involved in the project:

- Client - Cwm Environmental Ltd.
- Report Authors - Geotechnology Ltd.

2 INVESTIGATION DETAILS

The investigation has comprised the following elements;

- Survey Plan interrogation to evaluate location of investigatory Trial Pits
- Undertake the excavation of 21 Trial Pits (TP) to establish restoration soil thickness only
- Survey each TP location at surface and at the (identified) liner level
- Evaluation of data and compilation of soil isopachyte

2.1 Survey Plan Interrogation

Cwm provided Geotechnology with detailed drawings of the existing landfill gas extraction system present in Phase 1 and operated by Infinis Ltd. The drawing was referenced "5620-GI08- Nant-y-Caws – Gas Infrastructure Plan 2014".

This plan was interrogated to establish safe locations away from gas pipes and manifolds where trial pits could be safely excavated. Geotechnology compiled a co-ordinate list of 21 locations to set out on site. The 21 locations were spread across the whole of the Phase 1 plateau area.

2.2 Trial Pitting

Following submission of method statements and acquisition of Cwm permits, the Trial Pit investigation was carried out on 2 July 2020.

A tracked backhoe excavator was provided by Cwm to undertake the work. A total of 21 trial pits were excavated and backfilled. Trial Pits were terminated, where feasible, above the HDPE liner within the thin drainage stone layer.

Photographs of each Trial Pit are included in Appendix 1 and a summary of the soil thicknesses encountered is provided in Appendix 2.

2.3 Survey

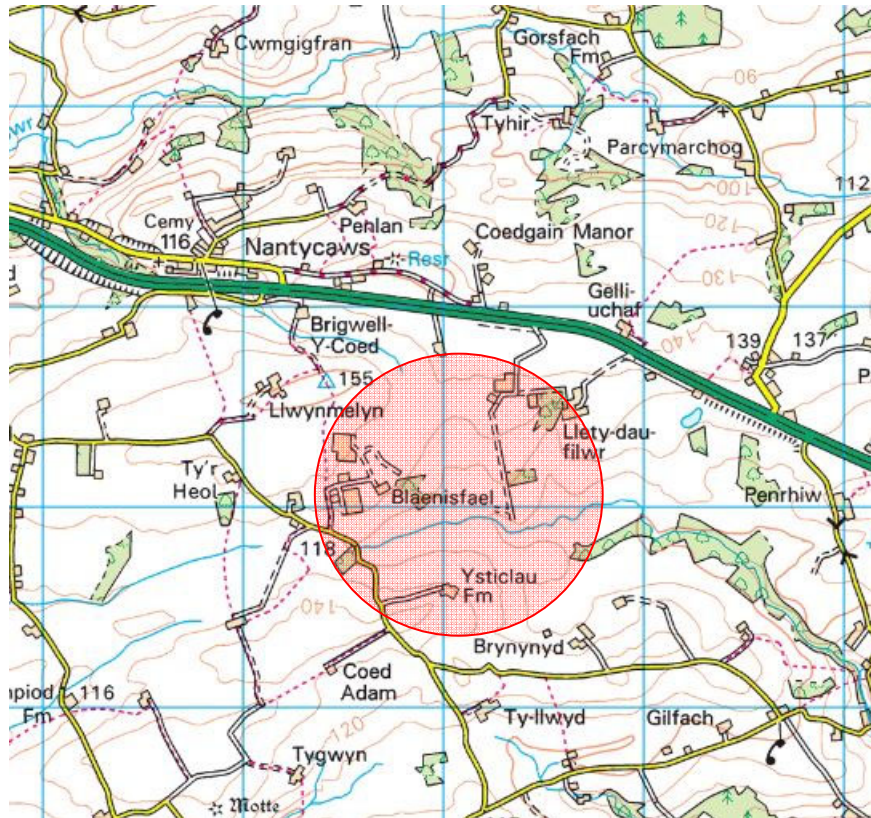
The instrument used to survey the Trial Pit locations was a Topcon GR3 differential global positioning system (dGPS) able to resolve to 15mm. All co-ordinates and levels obtained are to Ordnance Survey.

At each Trial pit location the ground surface and the base of pit (liner level) elevation was acquired.

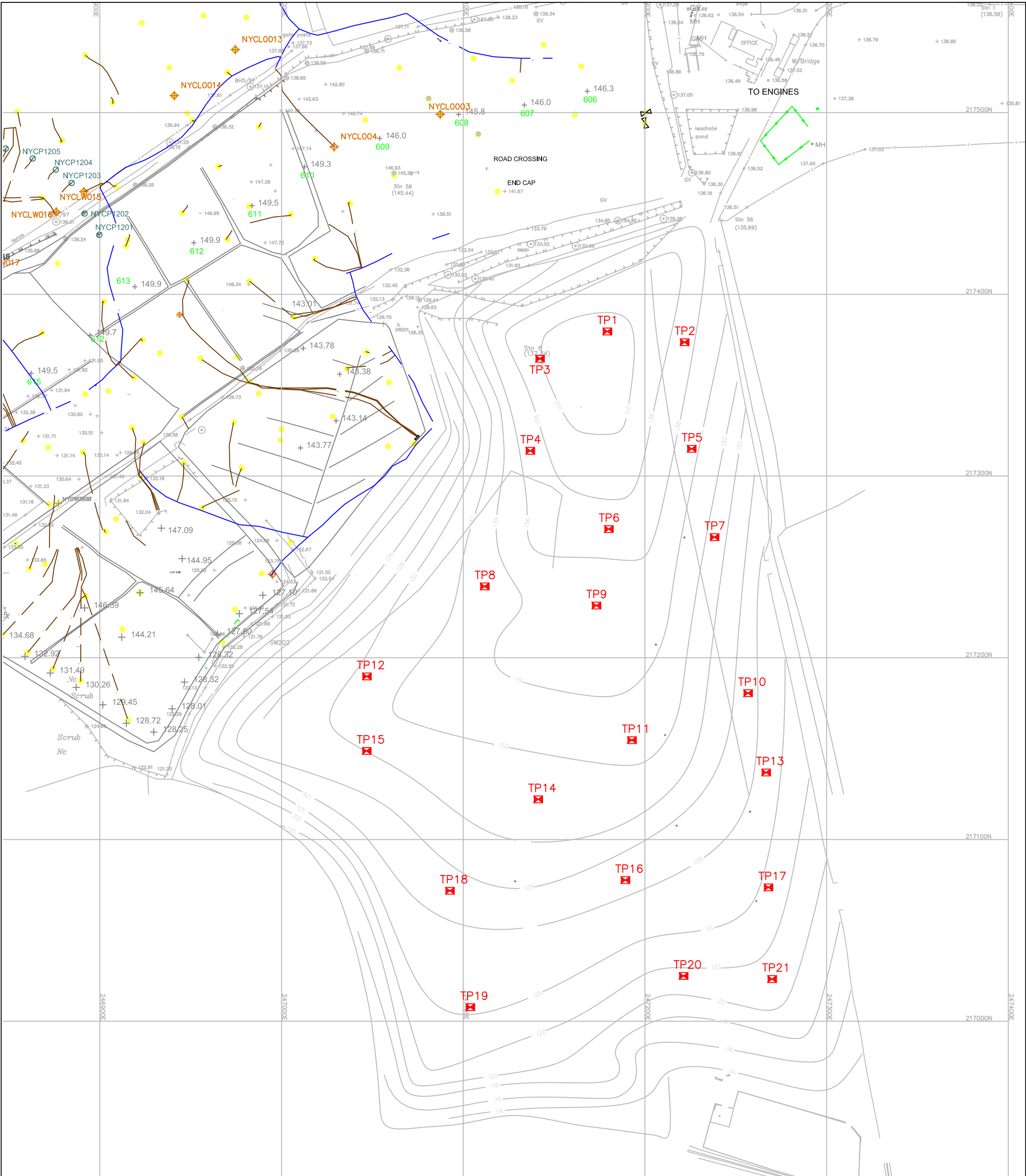
2.4 Data Analysis


The survey data acquired was used to generate two separate surfaces using ground modelling software. The surfaces have been used to create a soil isopachyte (thickness) across the Phase 1 area. A copy of this isopachyte plan is included as Figure 3.

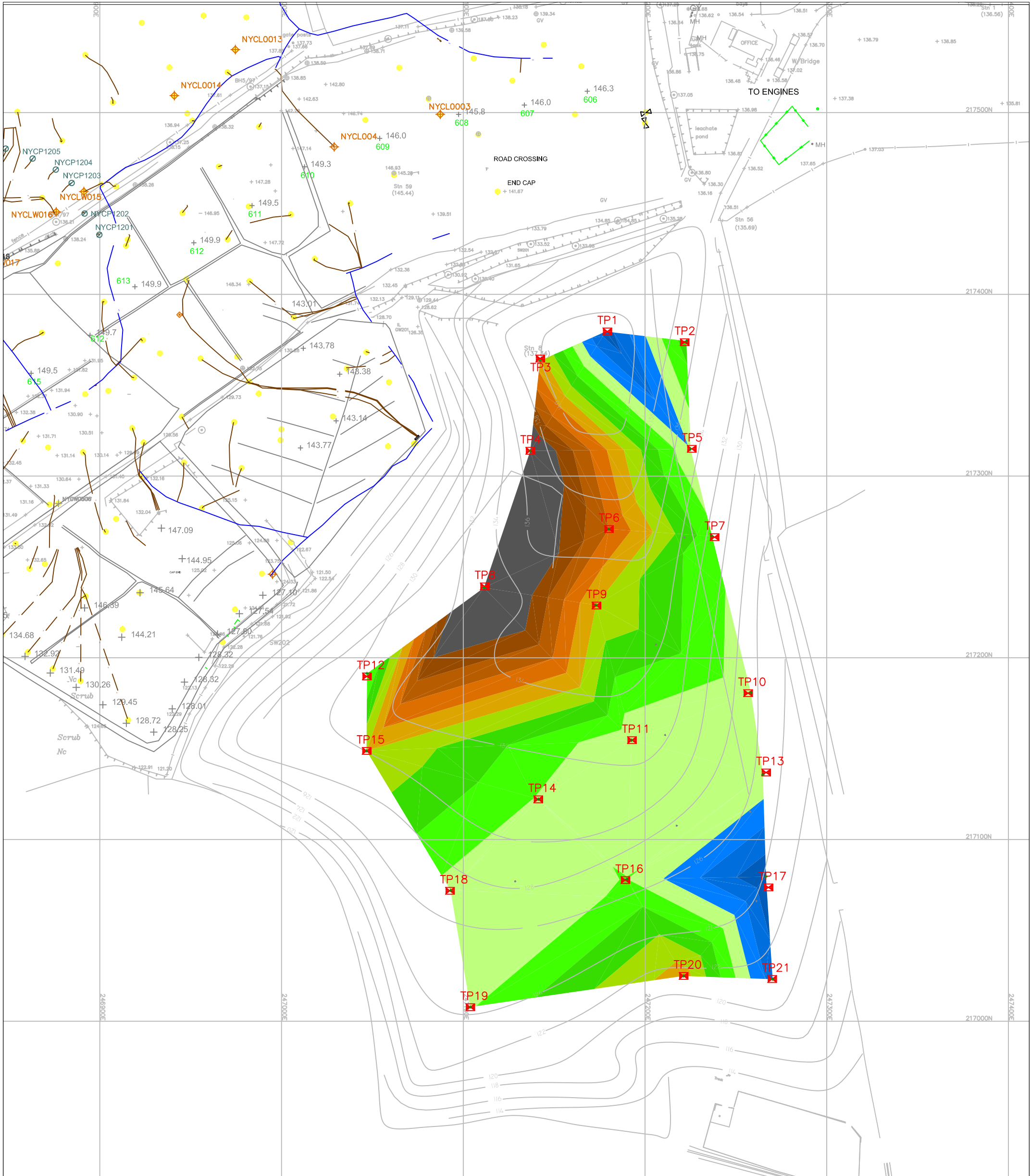
Figure 1 Site Location Plan



Reproduced from the Ordnance Survey Land Ranger Map
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Drawing Number 2120/2				CLIENT CWM ENVIRONMENTAL LTD		Rev Date Status/Amendments
LEGEND TP9 Trial Pit No. and Location				PROJECT SOIL THICKNESS INVESTIGATION PHASE 1 NANTYCAWS LANDFILL		DRAWING NUMBER 2120/2 REVISION 0
				TITLE SITE PLAN AND TRIAL PIT LOCATIONS		SCALE AT A3 As Shown DATE 01.21 DRAWN AWJ CHECKED
				Geotechnology Ty Coed, Cefn-yr-Allt, Aberdulais, Neath SA10 8HE 01639 775293 www.geotechnology.net		



Drawing Number 2120/3		Height ranges (m) 2.40 2.20 2.00 1.80 1.60 1.40 1.20		Height ranges (m) 1.00 0.80 0.60 0.40 0.20 0.00		CLIENT CWM ENVIRONMENTAL LTD		Rev 	Date 	Status/Amendments
LEGEND Trial Pit No. and Location						PROJECT SOIL THICKNESS INVESTIGATION PHASE 1 NANTYCAWS LANDFILL		DRAWING NUMBER 2120/3		REVISION 0
						SCALE AT A3 As Shown		DATE 01.21	DRAWN AWJ	CHECKED
						TITLE SOIL ISOPACHYTE		Geotechnology Ty Coed, Cefn-yr-Allt, Aberdulais, Neath SA10 8HE 01639 775293 www.geotechnology.net		

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**Appendix 1
Trial Pit Photographs**

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TP1 Excavation



TP2 Excavation



TP3 Excavation



TP4 Excavation



TP5 Excavation



TP6 Excavation



TP7 Excavation



TP8 Excavation



TP9 Excavation



TP10 Excavation



TP11 Excavation



TP12 Excavation



TP13 Excavation



TP14 Excavation



TP15 Excavation



TP16 Excavation



TP17 Excavation



TP18 Excavation



TP19 Excavation



TP20 Excavation



TP21 Excavation

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**Appendix 2
Trial Pit Data Summary**
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NANT-Y-CAWS PHASE 1 - SOIL THICKNESS - TRIAL PIT SUMMARY

Trial Pit Number	Eastings	Northings	Trial Pit Surface Elevation AOD	Trial Pit Base Elevation AOD	Depth (m) to liner (Soil Thickness)
1	247179.27	217379.58	139.34	139.03	0.30
2	247221.79	217373.67	136.29	134.99	1.31
3	247142.22	217364.59	138.75	137.08	1.68
4	247136.87	217313.90	135.63	132.93	2.70
5	247225.70	217315.03	134.31	133.50	0.81
6	247180.09	217270.84	135.60	133.60	2.00
7	247238.08	217266.71	131.04	129.97	1.07
8	247111.42	217238.58	133.52	130.52	3.00
9	247173.03	217229.01	133.64	132.04	1.60
10	247256.89	217180.58	127.55	126.68	0.87
11	247192.74	217154.76	130.07	129.22	0.85
12	247046.90	217189.78	129.16	128.16	1.00
13	247266.66	217136.93	125.55	124.57	0.98
14	247141.17	217121.85	128.69	127.70	0.98
15	247046.77	217148.77	127.95	126.35	1.60
16	247188.67	217077.65	125.00	123.99	1.00
17	247267.78	217073.66	122.78	122.54	0.24
18	247091.49	217070.47	125.07	124.14	0.93
19	247103.79	217006.99	122.54	121.56	0.98
20	247221.25	217024.92	118.80	117.10	1.70
21	247269.30	217023.33	118.56	118.06	0.50



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