



POROSITY REPORT



PROPOSED REPLACEMENT OF TREATMENT PLANT MAES MERDDYN CARREGLEFN

June 2026
Suitability S2
Revision P01

Prepared on Behalf of:

Dafydd Owen
Isle of Anglesey County Council
Council Offices
Llangefni
LL57 4BL

By:

Cadarn Consulting Engineers Ltd.
Suite B
Anglesey Business Centre
Bryn Cefni Business Park
Llangefni
LL77 7XA

SUITABILITY	REV	DATE	DESCRIPTION	Org.	Chk'd	App'd
S2	P01	04/06/2026	First Issue.	BJ	IR	

CONTENTS**PAGES**

1.0	Introduction	4
1.1	Project Background.....	4
1.2	Scope of Porosity Report	4
2.0	General Overview	5
3.0	Design Criteria.....	6
3.1	Test Results	6
3.2	Result Discussion.....	6
4.0	Conclusion	8

APPENDICES

APPENDIX A - Site Location Plan

APPENDIX B - Trail Pit Location Plan

APPENDIX C - Trail Porosity Test Calculations

1.0 Introduction

1.1 Project Background

1.1.1 Cadarn Consulting Engineers Ltd have been appointed to provide a porosity report to Isle of Anglesey County Council based on the investigation carried out at the developed site at Maes Merddyn, Carreglefn (National Grid Reference: **SH 38412 89142**). The site location plan is contained within **APPENDIX A**.

1.1.2 As part of the design the method to assess the suitability of the proposed drainage field for the disposal of treated wastewater should be undertaken in line with the recommendations of BS 6297:2007+A1:2008 – *Code of practice for the design and installation of drainage fields for use in wastewater treatment*. The assessment has been undertaken in support of a proposed discharge to ground and forms part of the information submitted to Natural Resources Wales (NRW).

1.1.3 The purpose of this report is to demonstrate that the proposed replacement drainage mound has been designed in accordance with recognised engineering practice and that the site conditions are suitable for the effective infiltration and final treatment of treated effluent. The assessment includes consideration of the site's geology, soil characteristics, groundwater conditions, percolation testing, topography, environmental constraints and the required separation distances to sensitive receptors.

1.1.4 The replacement drainage mound design has been developed using the results of on-site percolation testing and follows the methodology set out in BS 6297:2007+A1:2008. The proposed system has been designed to provide adequate treatment and dispersal of treated effluent.

1.2 Scope of Porosity Report

1.2.1 This porosity report aims to provide knowledge and understanding of the soil infiltration characteristics encountered on site.

1.2.2 The purpose of the calculations and accompanying details provided are to determine the infiltration value for the soil to produce a drainage layout that complies with the relevant legislation of BS6297:2007+A1:2008

2.0 General Overview

- 2.1.1 The main purpose of the investigation was to undertake soil infiltration tests, in accordance with BS6297:2007 (+A1:2008), to determine if the underlying strata is suitable for utilising infiltration systems for the disposal of treated foul effluent from the replacement installation.
- 2.1.2 On the 29/05/26, an intrusive site investigation was carried out to undertake porosity testing on the site of the proposal, which consisted of 2 trial holes, one of which was porosity tested. TP-2 was taken to a depth of 0.400m. Infiltration testing was conducted within the trial hole in order to assess the infiltration characteristics of the ground.
- 2.1.3 The trial pits were located as per the attached trial pit location plan drawing contained within **APPENDIX B**.
- 2.1.4 Infiltration tests were not undertaken in TP1, the purpose of this trial pit was to ascertain that the groundwater profile was not within 1m of the proposed replacement drainage mound. Groundwater was not encountered.
- 2.1.5 The current installation comprises a historic treatment plant with associated drainage mound to provide additional tertiary treatment. The current mound is defective due to a lack of ongoing maintenance, and the proposal is to replace the existing treatment tank with an upgraded treatment facility to achieve better treatment prior to discharge of effluent for further polishing in a replacement mound.
- 2.1.6 Infiltration testing has therefore been undertaken at shallow depths to mimic the action of infiltration from a mound.

3.0 Design Criteria

3.1 Test Results

- 3.1.1 The soil infiltration calculations are summarised within **Table 1** below. Refer to the porosity test calculation sheet contained within **APPENDIX C** for further information.

Table 1 – Test Results

Ref	Test N°	Depth	Ground Water Depth	Soil Infiltration Rate	Vp
TP-2	01	400mm	N/A	2.54E – 05m/s	18
TP-2	02	400mm	N/A	1.11E – 05m/s	35
TP-2	03	400mm	N/A	6.35E – 06m/s	58

3.2 Result Discussion

- 3.2.1 **TP-2** was excavated to a depth of 400mm and filled to within 100mm of the existing surface level. Three tests were carried out at this depth.

- 1) Water level was filled to within 300mm of the existing surface level. Three percolation tests were undertaken within the same trial hole to assess the infiltration characteristics of the underlying subsoil. Repeating the test in the same location provides confidence in the consistency and repeatability of the measured infiltration rate. The results indicate a degree of variability in the infiltration characteristics of the subsoil, with infiltration rates ranging from relatively rapid to moderately slow. This variation is not uncommon where natural soils exhibit changes in structure, density or moisture content within the test location. The average of the three test results should be used for the design of the proposed infiltration system, in accordance with the relevant guidance and standards.



Figure 1 – Trail pit 2

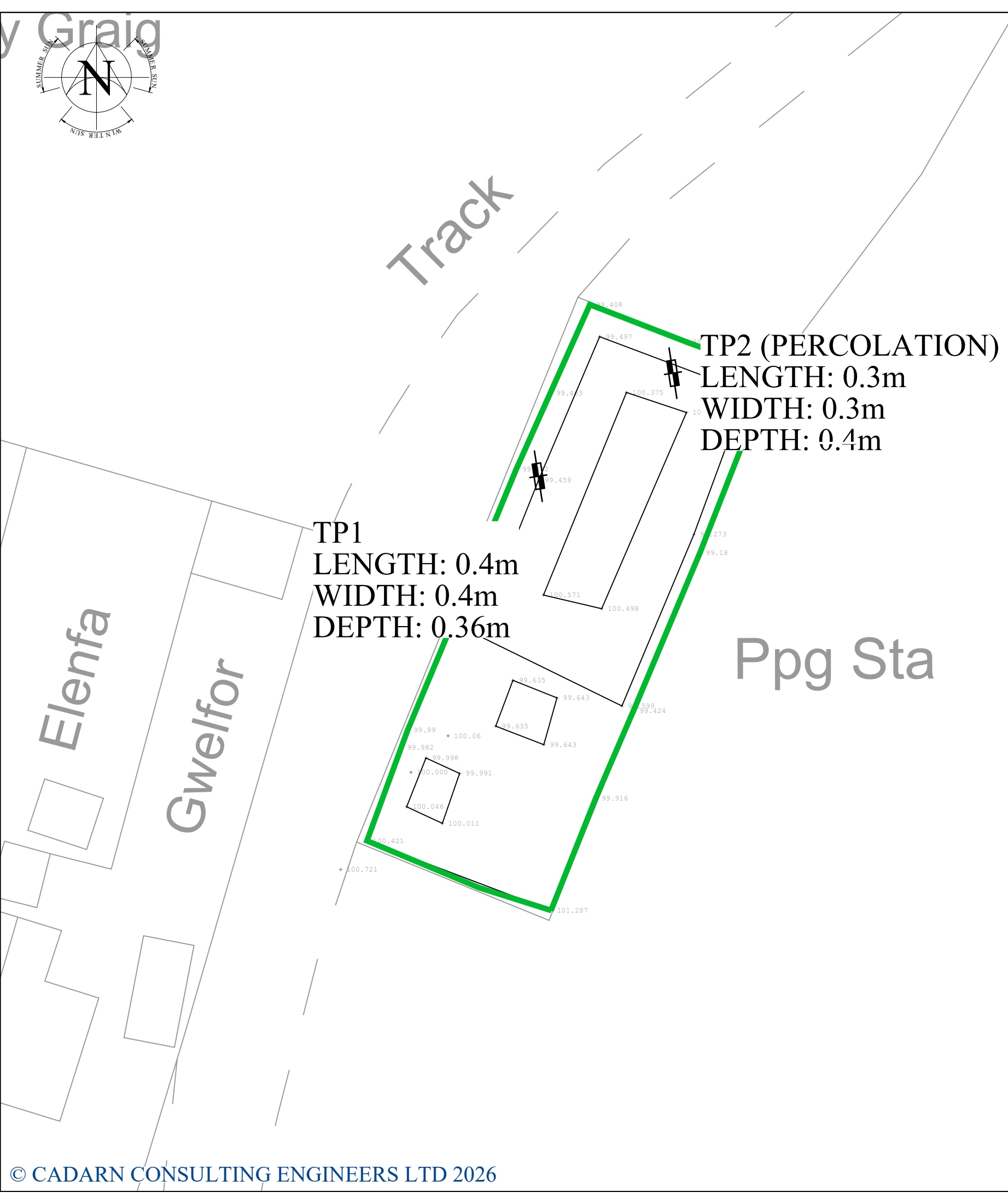
4.0 Conclusion

The results of the testing undertaken on the 29th May 2026 indicate that the use of a drainage mound as a method of treated wastewater disposal is considered to be a suitable method of discharge.

APPENDICES

APPENDIX A - Site Location Plan

APPENDIX B - Trail Pit Location Plan



1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS IN MILLIMETRES UNLESS NOTED OTHERWISE ON DRAWING.
3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.
5. REPRODUCED FROM THE ORDNANCE SURVEY'S MAPS WITH THE PERMISSION OF THE CONTROLLER OF HIS MAJESTY'S STATIONARY OFFICE. CROWN COPYRIGHT. LICENCE NO. AC0000855691

 DENOTES PROPOSED SITE BOUNDARY.

 TP0 DENOTES LOCATION OF TRAIL PIT.

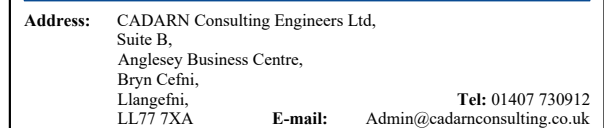
TENDER ISSUE

PROJECT TITLE:									
----------------	--	--	--	--	--	--	--	--	--

DRAWING TITLE:

DRAWING REF:

ORIGINATOR:	DATE:	SCALE @ A1:	SUITABILITY:	REVISION:
S.R	27.7.2026	1:250	S2	P01



APPENDIX C - Trail Porosity Test Calculations

TP2 - INFILTRATION CALCUALTIONS

Site: Maes Merddyn, Carreglefn

Doc Ref: 18026L TP2 - Test 1

Trial Pit Dimensions: Length (m) 0.300 Width (m) 0.300 Depth (m) 0.400

Depth of Groundwater from GL (m): N/A Thus Effective depth (m) = 0.300

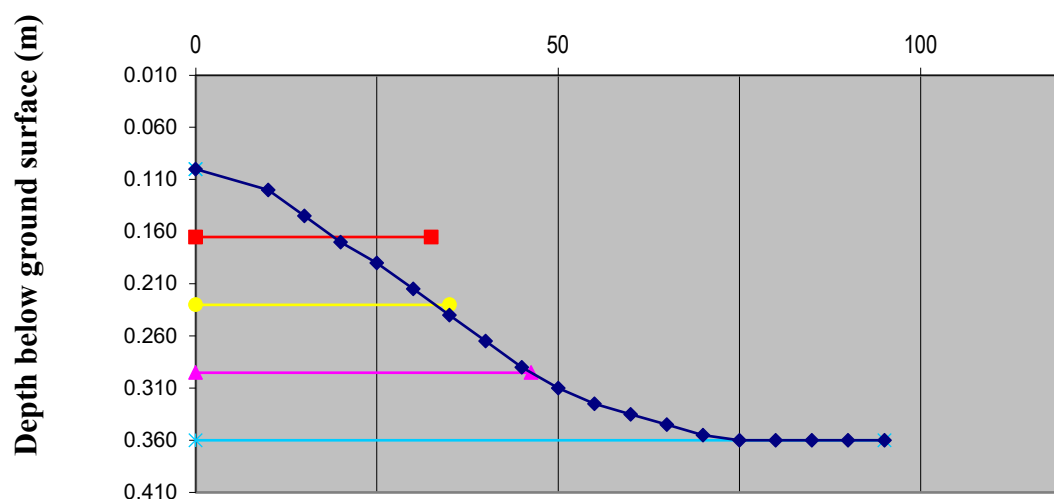
Time (mins)	Depth of water from (m)	Rate of change (m/min)
0	0.100	
10	0.120	0.0020
15	0.145	0.0050
20	0.170	0.0050
25	0.190	0.0040
30	0.215	0.0050
35	0.240	0.0050
40	0.265	0.0050
45	0.290	0.0050
50	0.310	0.0040
55	0.325	0.0030
60	0.335	0.0020
65	0.345	0.0020
70	0.355	0.0020
75	0.360	0.0010
80	0.360	0.0000
85	0.360	0.0000
90	0.360	0.0000
95	0.360	0.0000

Volume Outflow, Vp75-25	0.012 m ³
Surface Area, ap50	0.192 m ²
Time Taken, tp75-25	40.00 min

Soil Infiltration Rate, f	2.54E-05 m/s
Over Effective depth of	0.300 m
Part H Vp	18.46 s/mm

depth (%Full)	depth (m)	time (min)
0	0.360	0
	0.360	95.00
25	0.295	0.00
	0.295	46.25
50	0.230	0
	0.230	35.00
75	0.165	0
	0.165	32.50
100	0.100	0
	0.100	0.00

Time from filling to max. eff. depth (mins)



TP2 - INFILTRATION CALCUALTIONS

Site: Maes Merddyn, Carreglefn

Doc Ref: 18026L TP2 - Test 2

Trial Pit Dimensions: Length (m) 0.300 Width (m) 0.300 Depth (m) 0.400

Depth of Groundwater from GL (m): N/A Thus Effective depth (m) = 0.300

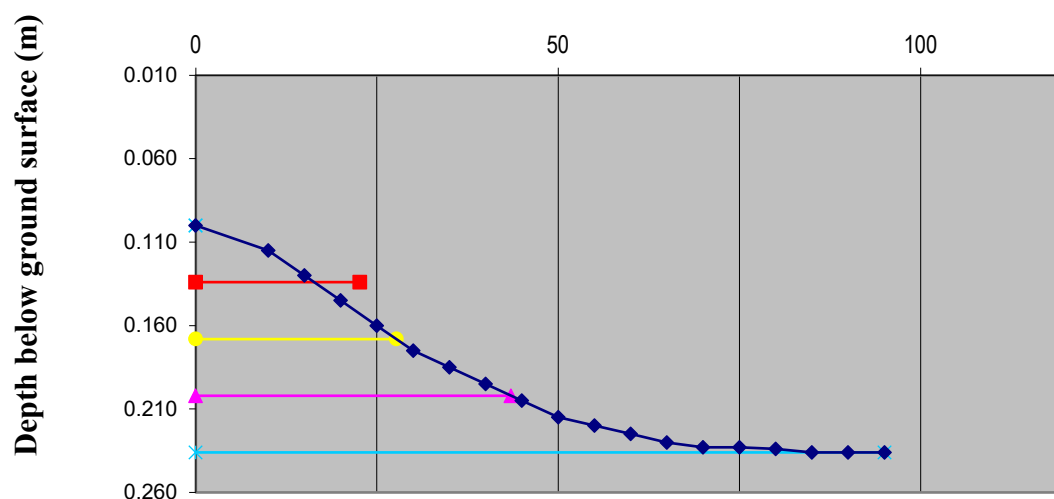
Time (mins)	Depth of water from (m)	Rate of change (m/min)
0	0.100	
10	0.115	0.0015
15	0.130	0.0030
20	0.145	0.0030
25	0.160	0.0030
30	0.175	0.0030
35	0.185	0.0020
40	0.195	0.0020
45	0.205	0.0020
50	0.215	0.0020
55	0.220	0.0010
60	0.225	0.0010
65	0.230	0.0010
70	0.233	0.0006
75	0.233	0.0000
80	0.234	0.0002
85	0.236	0.0004
90	0.236	0.0000
95	0.236	0.0000

Volume Outflow, Vp75-25	0.006 m ³
Surface Area, ap50	0.229 m ²
Time Taken, tp75-25	40.00 min

Soil Infiltration Rate, f	1.11E-05 m/s
Over Effective depth of	0.300 m
Part H Vp	35.29 s/mm

depth (%Full)	depth (m)	time (min)
0	0.236	0
	0.236	95.00
25	0.202	0.00
	0.202	43.50
50	0.168	0
	0.168	27.67
75	0.134	0
	0.134	22.67
100	0.100	0
	0.100	0.00

Time from filling to max. eff. depth (mins)



TP2 - INFILTRATION CALCUALTIONS

Site: Maes Merddyn, Carreglefn

Doc Ref: 18026L TP2 - Test 3

Trial Pit Dimensions: Length (m) 0.300 Width (m) 0.300 Depth (m) 0.400

Depth of Groundwater from GL (m): N/A Thus Effective depth (m) = 0.300

Time (mins)	Depth of water from (m)	Rate of change (m/min)
0	0.100	
10	0.115	0.0015
15	0.130	0.0030
20	0.140	0.0020
25	0.150	0.0020
30	0.155	0.0010
35	0.160	0.0010
40	0.165	0.0010
45	0.170	0.0010
50	0.175	0.0010
55	0.180	0.0010
60	0.180	0.0000
65	0.183	0.0006
70	0.183	0.0000
75	0.183	0.0000
80	0.183	0.0000
85	0.183	0.0000
90	0.183	0.0000
95	0.183	0.0000

Volume Outflow, V_{p75-25}	0.004 m ³
Surface Area, a_{p50}	0.245 m ²
Time Taken, t_{p75-25}	40.00 min

Soil Infiltration Rate, f	6.35E-06 m/s
Over Effective depth of	0.300 m
Part H V_p	57.83 s/mm

depth (%Full)	depth (m)	time (min)
0	0.183	0
	0.183	95.00
25	0.162	0.00
	0.162	37.25
50	0.142	0
	0.142	20.75
75	0.121	0
	0.121	13.83
100	0.100	0
	0.100	0.00

Time from filling to max. eff. depth (mins)

