APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: Mr First Name: WILL Surname: LYNCH

Address: COOLMINE, SAGGART, CO. DUBLIN

Site Location and Townland: COOLMINE, SAGGART, CO. DUBLIN

Number of Bedrooms: 5 Maximum Number of Residents: 7

Comments on population equivalent

Proposed Water Supply:

Mains ☑ Private Well/Borehole ☐ Group Well/Borehole ☐

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): Sandstone and shale till (Lower Palaeozoic)

Subsoil, (Specify Type): Till derived from Lower Palaeozoic sandstones and shales

Bedrock Type: Pollaphuca Formation. Silurian Metasediments and Volcanics

Aquifer Category: Regionally Important Locally Important LI Poor

Vulnerability: Extreme ☑ High ☐ Moderate ☐ Low ☐

Groundwater Body: KILCULLEN Status Good

Name of Public/Group Scheme Water Supply within 1 km:

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R2[1]

Presence of Significant Sites (Archaeological, Natural & Historical): NONE NOTED

Past experience in the area: NO

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

From above assessment, the site is suitable for on site effluent treatment.
Groundwater is a target risk.

Note: Only information available at the desk study stage should be used in this section.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position: Slight Slope

Slope: Steep (>1:5) ☐ Shallow (1:5-1:20) ☑ Relatively Flat (<1:20) ☐

Slope Comment | Area tested is <1:8 |

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses:

Houses>60m

Existing Land Use:

EQUINE/AGRICULTURE

Vegetation Indicators:

None noted

Groundwater Flow Direction: North

Ground Condition:

Firm

Site Boundaries:

>3m

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

>20m

Outcrops (Bedrock And/Or Subsoil):

None noted

Surface Water Ponding:

None noted

Lakes:

None noted

Beaches/Shellfish Areas:

None noted

Wetlands:

None noted

Karst Features:

None noted

Watercourses/Streams:*

None noted

*Note and record water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

>20m. Dry

Springs:*

None noted

Wells:*

None noted. Wells to be >40m from proposed/existing polishing filters

Comments:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

From above assessment, the site is suitable for on site effluent treatment.
Groundwater is a target risk.

*Note and record water level

3.2 Trial Hole (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas which are at or adjacent to significant sites, (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m): 2.1

Depth from ground surface to bedrock (m) (if present):

Depth from ground surface to water table (m) (if present):

Depth of water ingress:

Rock type (if present):

Date and time of excavation: 21-Aug-2021 10:20 Date and time of examination: 25-Aug-2021 09:35

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m	TOPSOIL		Crumb	Firm	Brown	Random
0.2 m						
0.3 m						
0.4 m S123	Sandy gravelly CLAY	Threads 3, 4, 4 Ribbon110,120,120 Not dilatant	Structureless massive	Firm	Brown	Random
0.5 m						
0.6 m						
0.7 m						
0.8 m SS123						
0.9 m						
1.0 m						
1.1 m						
1.2 m						
1.3 m	Sandy gravelly CLAY	Threads 3, 3, 3 Ribbon100,110,110 Not dilatant	Structureless massive	Stiff	Grey brown	Random
1.4 m						
1.5 m						
1.6 m						
1.7 m						
1.8 m						
1.9 m						
2.0 m						
2.1 m						
2.2 m						
2.3 m						
2.4 m						
2.5 m						
2.6 m						
2.7 m						
2.8 m						
2.9 m						
3.0 m						
3.1 m						
3.2 m						
3.3 m						
3.4 m						
3.5 m						

Likely Subsurface Percolation Value:

Likely Surface Percolation Value:

Note: *Depth of percolation test holes should be indicated on log above. ('Enter Surface or Subsurface at depths as appropriate).

** See Appendix E for BS 5930 classification.

*** 3 samples to be tested for each horizon and results should be entered above for each horizon.

**** All signs of mottling should be recorded.

3.2 Trial Hole (contd.) Evaluation:

No bedrock or groundwater was encountered at the excavated depth of 2.10m

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	500	500	500
Depth from ground surface to base of hole (mm) (B)	900	900	900
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	25-Aug-2021	25-Aug-2021	25-Aug-2021
	Time	09:57	09:57	09:57
2nd pre-soak start	Date	25-Aug-2021	25-Aug-2021	25-Aug-2021
	Time	12:03	12:03	12:03

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	26-08-2021	26-08-2021	26-08-2021
Time filled to 400 mm	09:47	09:47	09:47
Time water level at 300 mm	11:11	11:35	11:28
Time (min.) to drop 100 mm (T_{100})	84.00	108.00	101.00
Average T_{100}			97.67

If T_{100} > 300 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If $T_{100} \leq 210$ minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	11:11	12:43	92.00	11:35	13:35	120.00	11:28	13:26	118.00
2	12:47	14:43	116.00	13:39	15:51	132.00	13:30	15:38	128.00
3	14:47	17:11	144.00	15:55	18:31	156.00	15:42	18:10	148.00
Average Δt Value			117.33			136.00			131.33
	Average Δt/4 = [Hole No.1]		29.33 (t_1)	Average Δt/4 = [Hole No.2]		34.00 (t_2)	Average Δt/4 = [Hole No.3]		32.83 (t_3)

Result of Test: Subsurface Percolation Value = 32.06 (min/25 mm)

Comments:

T = 32. T Test Passed.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	K_{ts} = T_f / T_m	T – Value = 4.45 / K_{ts}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	K_{ts} = T_f / T_m	T – Value = 4.45 / K_{ts}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Result of Test: Subsurface Percolation Value =

0.00 (min/25 mm)

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	K_{ts} = T_f / T_m	T – Value = 4.45 / K_{ts}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_2)			0.00

Comments:

3.3(b) Surface Percolation Test for Soil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)	0	0	0
Depth from ground surface to base of hole (mm)	400	400	400
Depth of hole (mm)	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	25-Aug-2021	25-Aug-2021	25-Aug-2021
	Time	09:57	09:57	09:57
2nd pre-soak start	Date	25-Aug-2021	25-Aug-2021	25-Aug-2021
	Time	12:03	12:03	12:03

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	26-Aug-21	26-Aug-21	26-Aug-2021
Time filled to 400 mm	09:47	09:47	09:47
Time water level at 300 mm	11:07	10:43	10:15
Time to drop 100 mm (T_{100})	80.00	56.00	28.00
Average T_{100}			54.67

If T_{100} > 300 minutes then Surface Percolation value >90 – site unsuitable for discharge to ground
If $T_{100} \leq 210$ minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1	11:07	12:51	104.00	10:43	11:47	64.00	10:15	10:55	40.00
2	12:55	14:47	112.00	11:50	13:06	76.00	10:59	11:37	38.00
3	14:51	17:03	132.00	13:10	14:54	104.00	11:42	12:52	70.00
Average ΔT Value			116.00			81.33			49.33
	Average ΔT/4 = [Hole No.1]		29.00 (T_1)	Average ΔT/4 = [Hole No.2]		20.33 (T_2)	Average ΔT/4 = [Hole No.3]		12.33 (T_3)

Result of Test: Surface Percolation Value = 20.56 (min/25 mm)

Comments:

P = 21. Test Passed.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No.	1					
Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No.	2					
Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Percolation Test Hole No.	3					
Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_3)			0.00

Result of Test: Surface Percolation Value = 0.00 (min/25 mm)

Comments:

3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.

1. Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.
2. Supporting maps for vulnerability, aquifer classification, soil, subsoil, bedrock.
3. North point should always be included.
4. (a) Scaled sketch of site showing measurements to Trial Hole location and
   (b) Percolation Test Hole locations,
   (c) wells and
   (d) direction of groundwater flow (if known),
   (e) proposed house (incl. distances from boundaries)
   (f) adjacent houses,
   (g) watercourses,
   (h) significant sites
   (i) and other relevant features.
5. Site specific cross sectional drawing of the site and the proposed layout[1] should be submitted.
6. Photographs of the trial hole, test holes and site including landmarks (date and time referenced).
7. Pumped design must be designed by a suitably qualified person.

[1] The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

4.0 CONCLUSION of SITE CHARACTERISATION

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Slope of proposed infiltration / treatment area: 0-1%

Are all minimum separation distances met? ✓

Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system) 0.90

Percolation test result: Surface: 21.00 Sub-surface: 32.00

Not Suitable for Development ☐ **Suitable for Development** ✓

Identify all suitable options		**Discharge Route** [1]
1. Septic tank system (septic tank and percolation area) **(Chapter 7)**	No	Groundwater
2. Secondary Treatment System **(Chapters 8 and 9)** and soil polishing filter **(Section 10.1)**	Yes	
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)**	Yes	

5.0 SELECTED DWWTS

Propose to install: Secondary Treatment System and soil polishing filter

and discharge to: Ground Water

Invert level of the trench/bed gravel or drip tubing (m) 0.60

Site Specific Conditions (e.g. special works, site improvement works testing etc.

The polishing filter must have a minimum thickness of 900mm of free draining unsaturated soil between the point of infiltration of the effluent and the water table or bedrock. The Polishing filter must be constructed in accordance with section 10.1, EPA CoP 2021 and under the supervision of a suitably qualified person.

All works must be supervised and certified by a suitably qualified Civil Engineer or similar qualified person approved by the Local Authority.
Confirmation from the effluent treatment system suppliers that the system has been installed and is functioning correctly, should be obtained by the client.

The client must enter a maintenance contract and the system should be serviced periodically. The tank should be de-sludged periodically by a licensed contractor.

[1] A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.4.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m^3)		Percolation Area		Mounded Percolation Area	
		No. of Trenches		No. of Trenches	
		Length of Trenches (m)		Length of Trenches (m)	
		Invert Level (m)		Invert Level (m)	

SYSTEM TYPE: Secondary Treatment System (Chapters 8 and 9) and polishing filter (Section 10.1)

Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

Media Type	Area (m^2)*	Depth of Filter	Invert Level
Sand/Soil			
Soil			
Constructed Wetland			
Other			

Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type: See site suitability report

Capacity PE: 7

Sizing of Primary Compartment: 1.05 m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*:

Option 1 - Direct Discharge Surface area (m^2):

Option 2 - Pumped Discharge Surface area (m^2): 105.00

Option 3 - Gravity Discharge Trench length (m):

Option 4 - Low Pressure Pipe Distribution Trench length (m):

Option 5 - Drip Dispersal Surface area (m^2):

SYSTEM TYPE: Tertiary Treatment System and infiltration / treatment area (Section 10.2)

Identify purpose of tertiary treatment	Provide performance information demonstrating system will provide required treatment levels	Provide design information
Provide adequate treatment of effluent.	See site suitability report	See site suitability report and drawing attached

DISCHARGE ROUTE:

Groundwater	✓	Hydraulic Loading Rate * ($l/m^2.d$)	20.00	Surface area (m^2)	
Surface Water **		Discharge Rate (m^3/hr)			

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required

6.0 TREATMENT SYSTEM DETAILS

QUALITY ASSURANCE:

Installation & Commissioning

Installation should be supervised and certified by a suitably qualified Civil Engineer or similar qualified person approved by the Local Authority. Confirmation from the mechanical aeration system suppliers that the system has been installed and is functioning correctly, should be obtained by the client.

On-going Maintenance

The client must enter a maintenance contract and the system should be serviced periodically. The tank should be de-sludged periodically by a licensed contractor.

7.0 SITE ASSESSOR DETAILS

Company: DECLAN KEARNS & ASSOCIATES LTD.

Prefix: Mr First Name: DECLAN Surname: KEARNS

Address: Tullywest, Kildare, Co. Kildare

Qualifications/Experience: B.Eng., NCEA Dip. Env. Eng., NCEA, Cert. Eng., MIEI, FETAC CERT EF 241859 722383

Date of Report: 27-Aug-2021

Phone: 086 211 1590 E-mail info@dkassociates.ie

Indemnity Insurance Number: API0003097

Signature: 

LYNCH SITE - Photos

Figure 1. Trial Pit

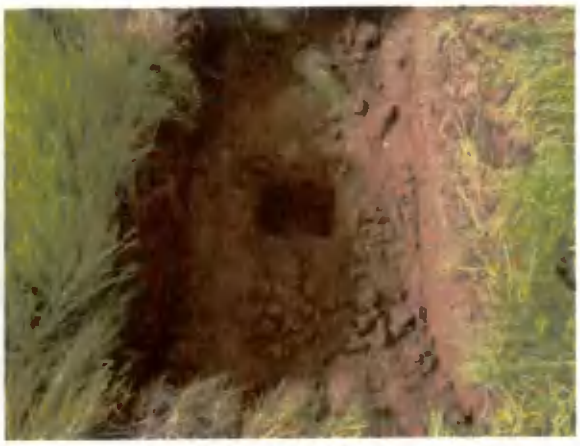


Figure 2. T – Test 1

Figure 3. T – Test 2

Figure 4. T – Test 3

Figure 5. P – Test 1

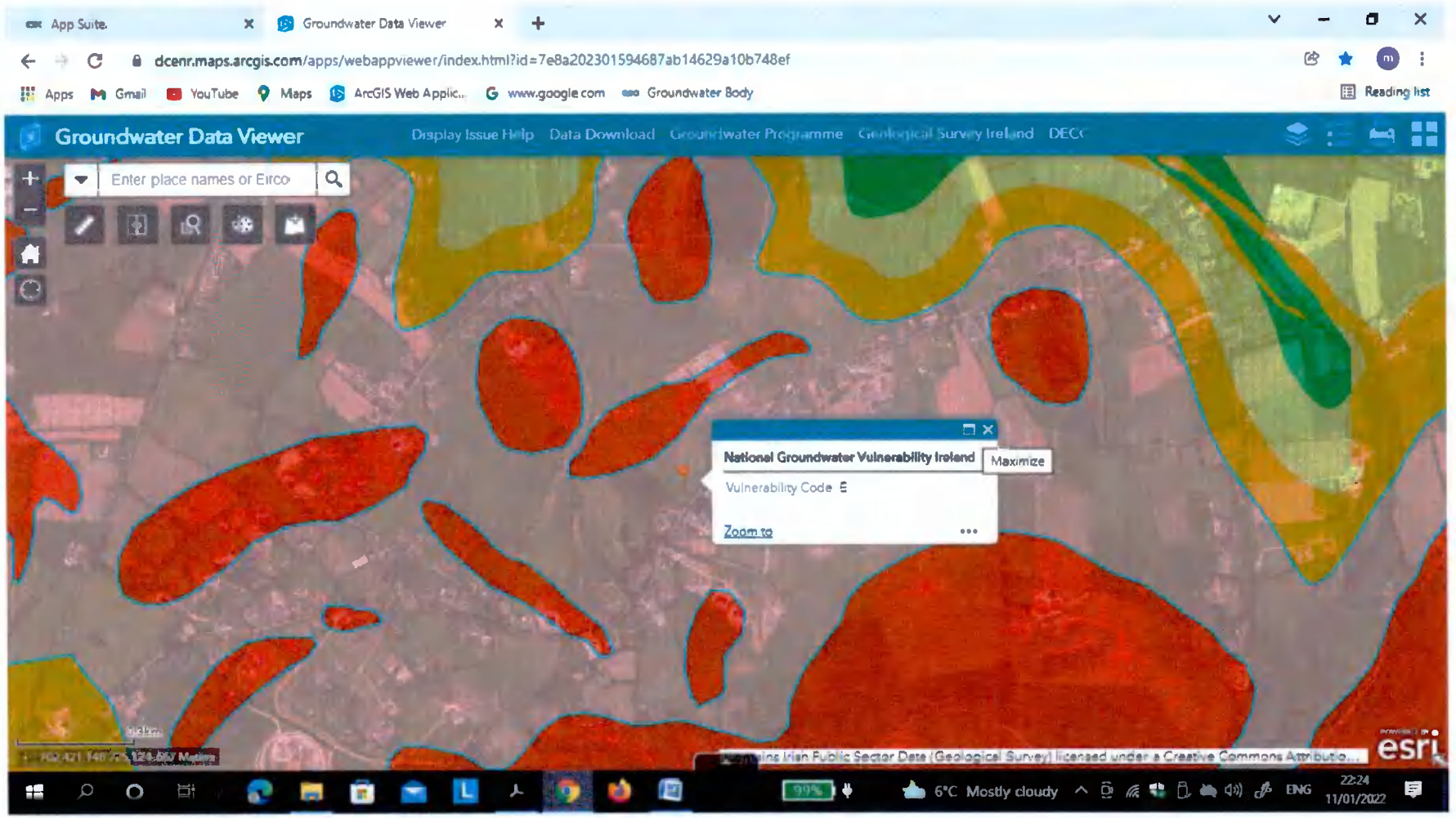
Figure 6. P – Test 2

LYNCH SITE - Photos

Figure 7. P – Test 3

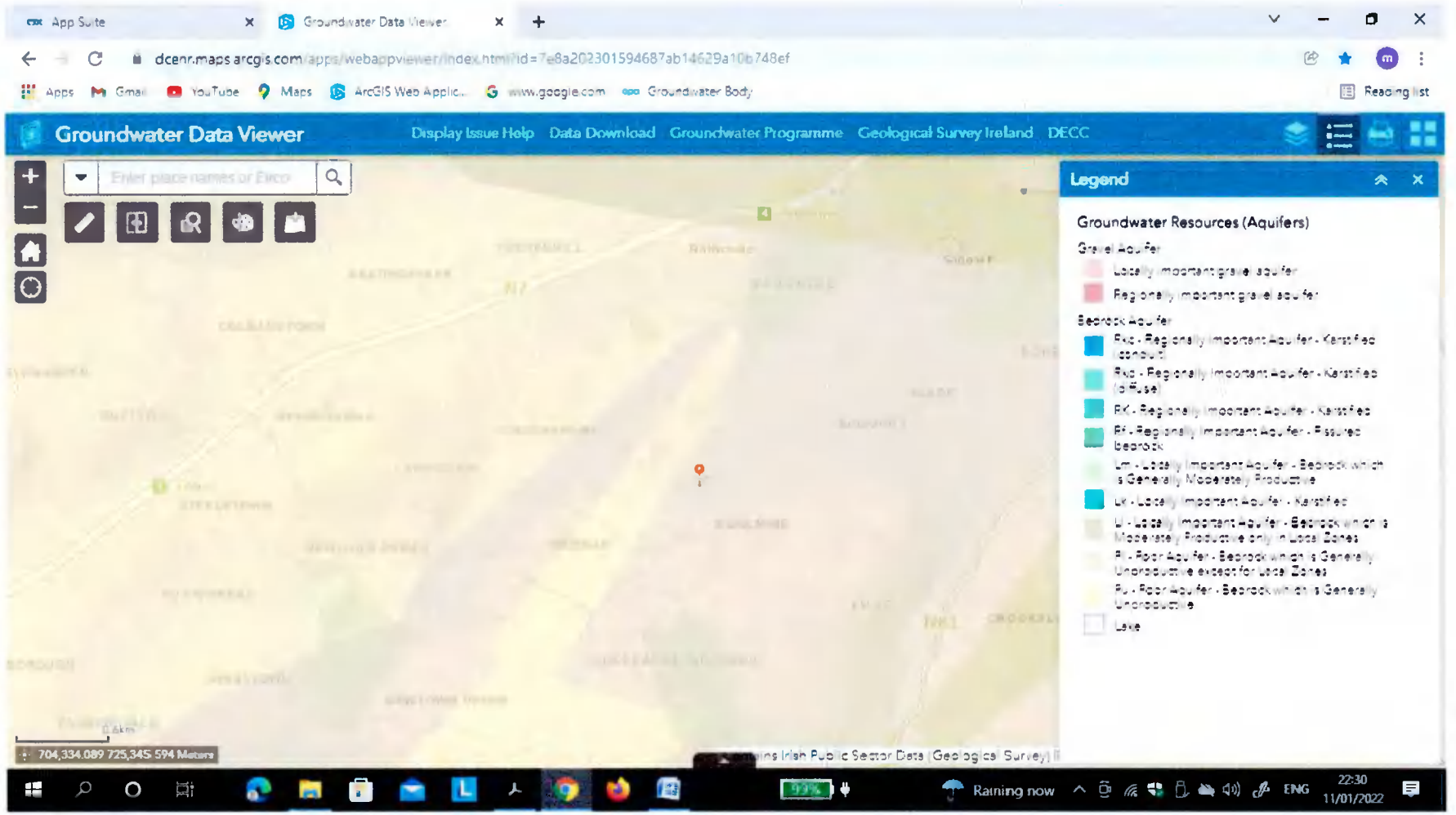
Figure 8. View of Site

LYNCH SITE - Site Characterisation Test



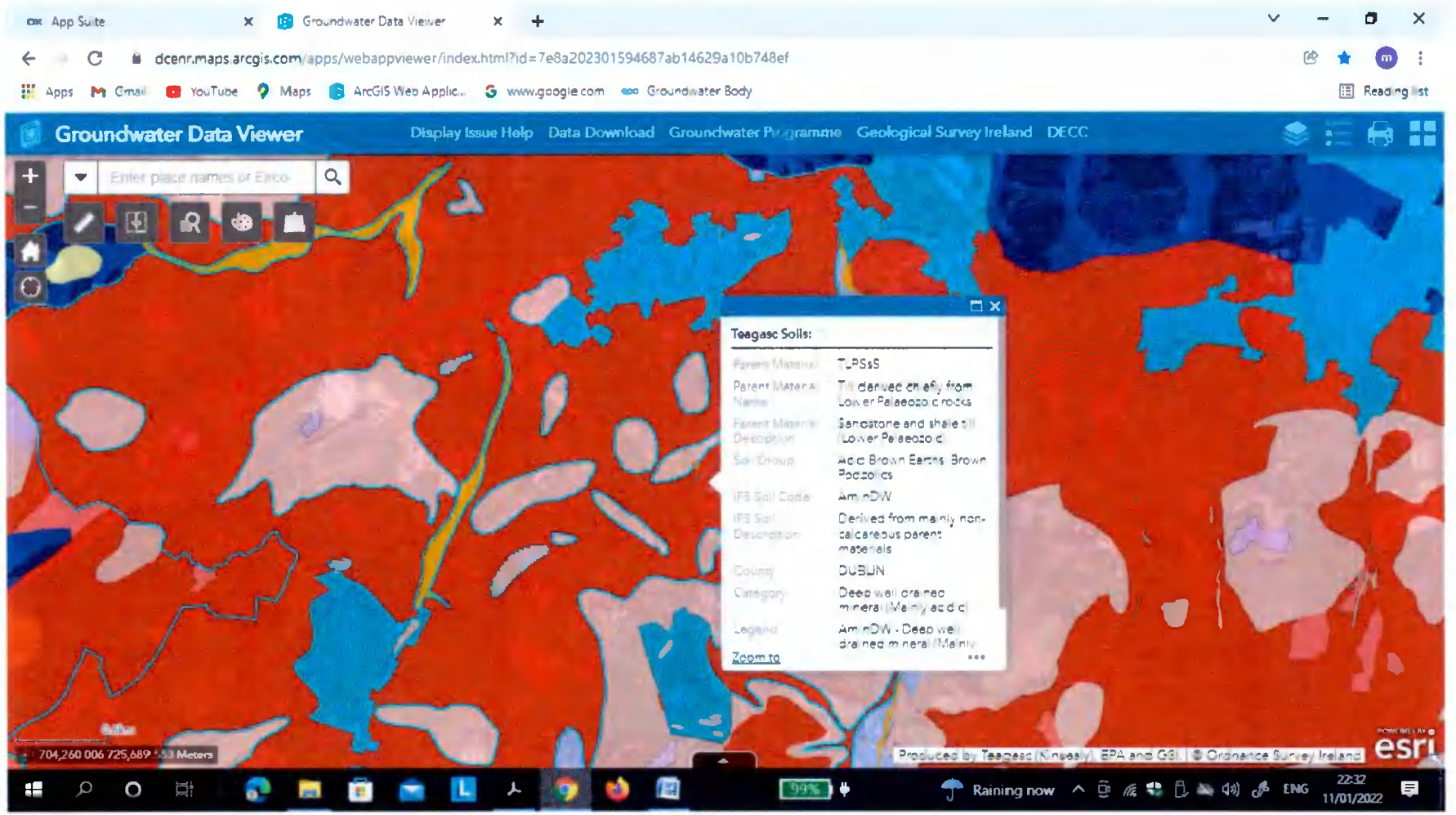
VULNERABILITY MAP

LYNCH SITE - Site Characterisation Test



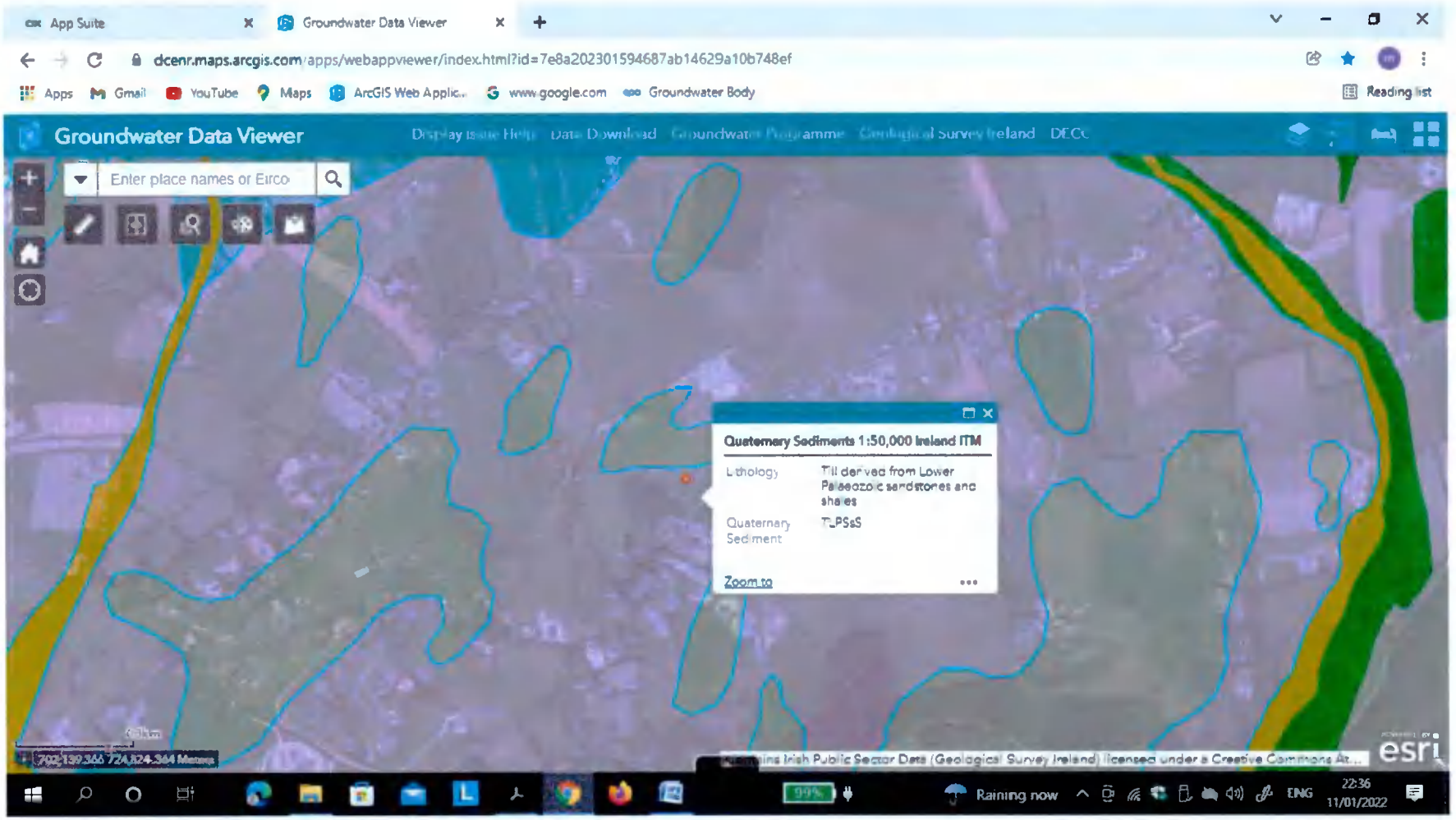
AQUIFER MAP

LYNCH SITE - Site Characterisation Test



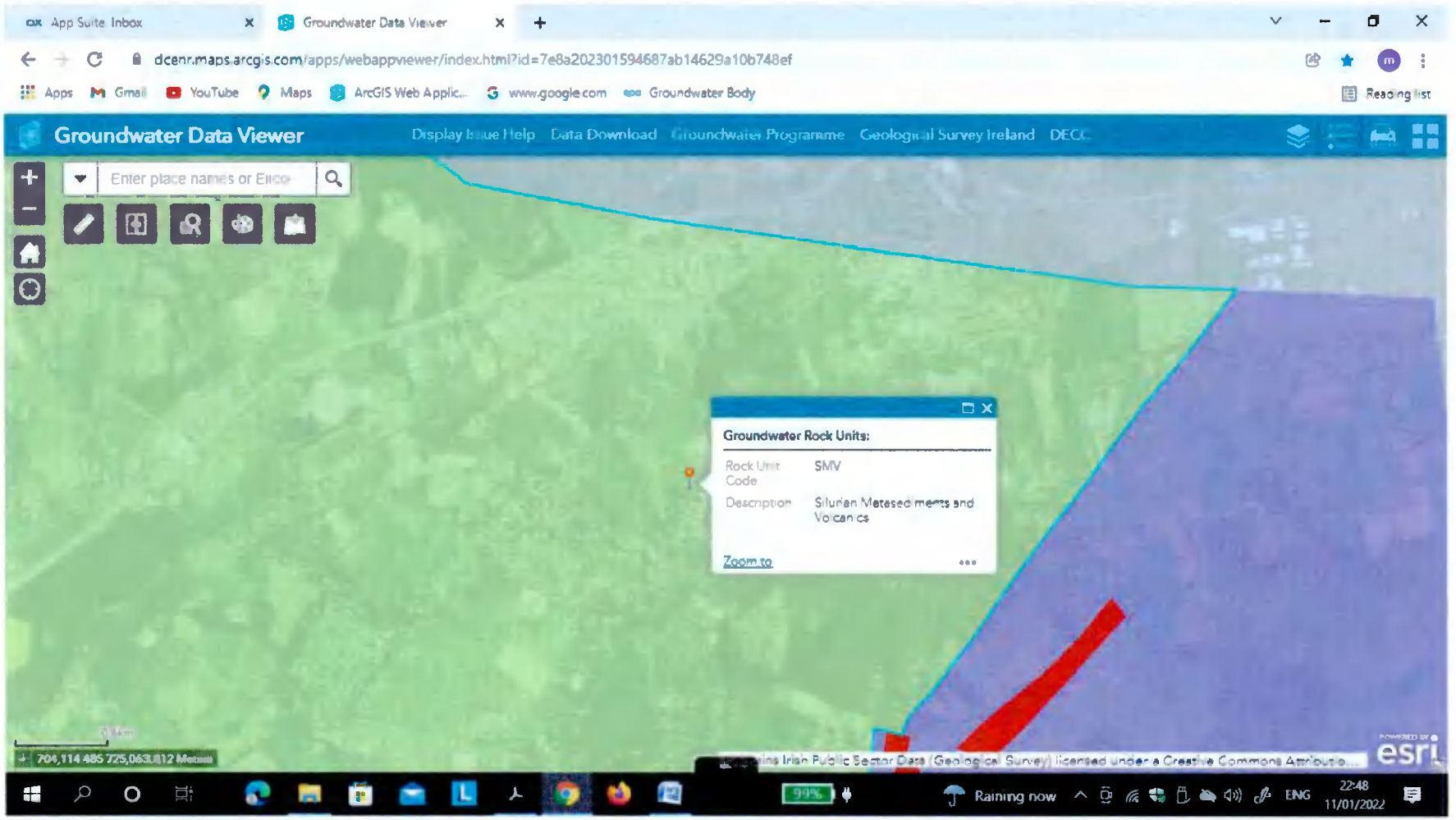
SOILS MAP

LYNCH SITE - Site Characterisation Test



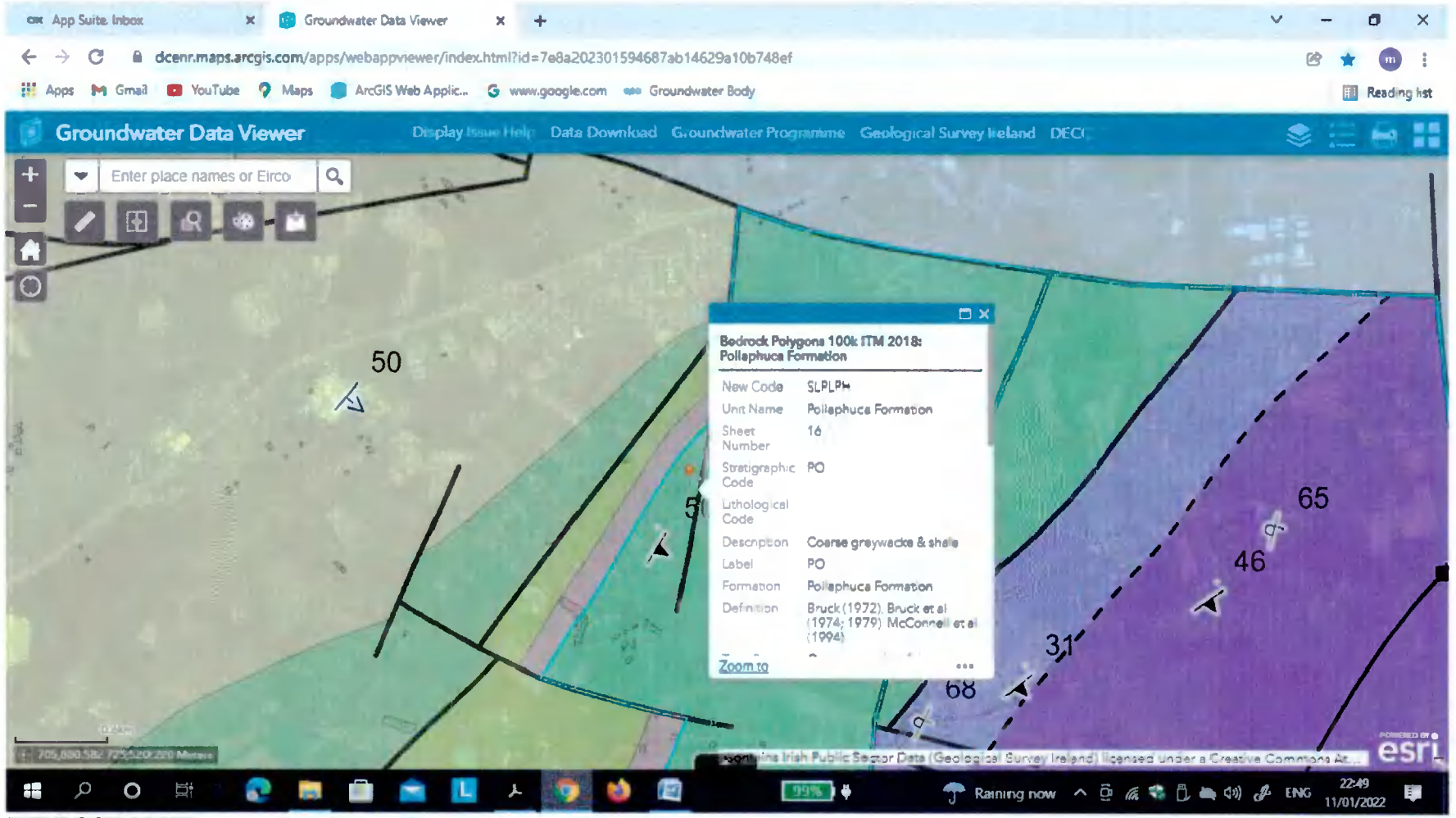
QUATERNARY SEDIMENTS MAP

LYNCH SITE - Site Characterisation Test



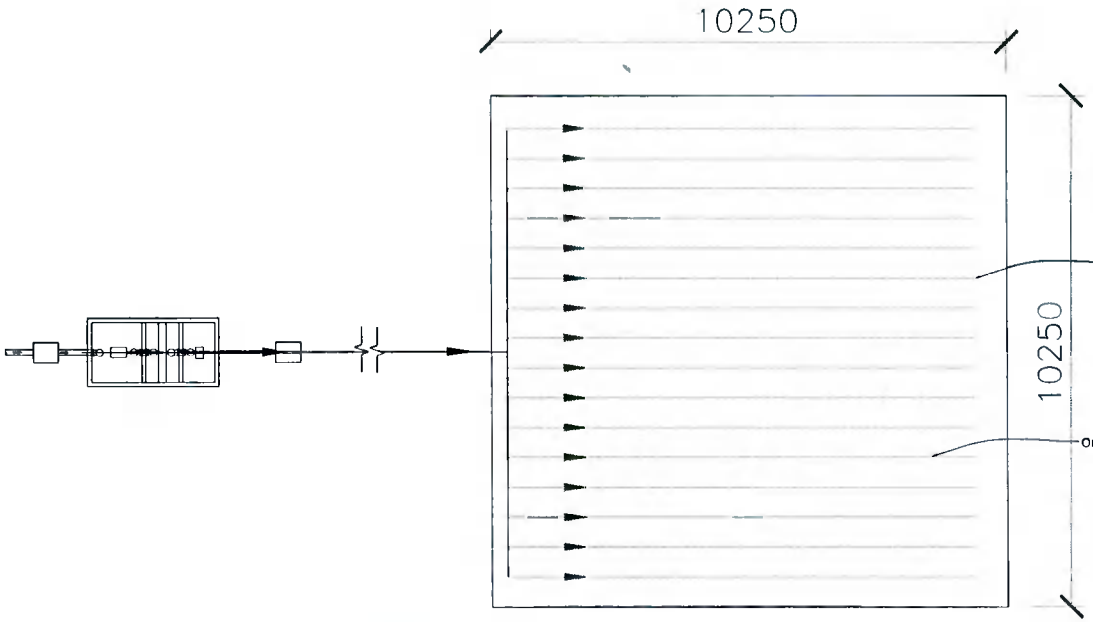
GROUNDWATER ROCK UNIT

LYNCH SITE - Site Characterisation Test



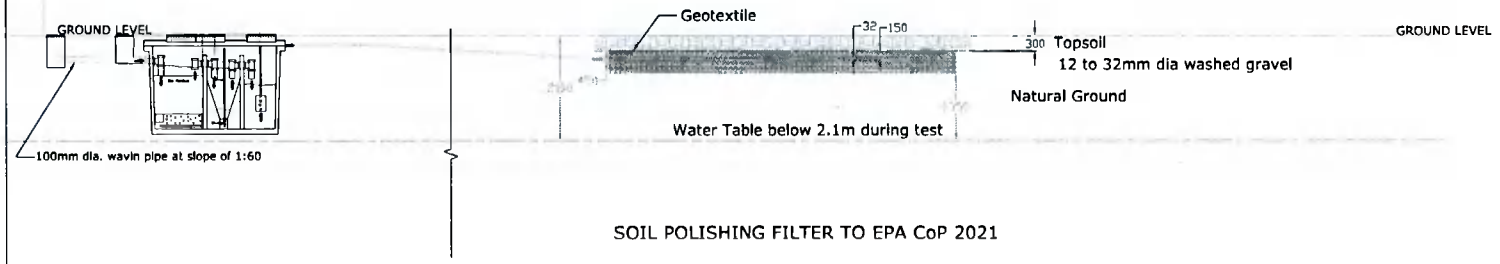
BEDROCK UNIT

ALL WORKS TO BE SUPERVISED AND CERTIFIED BY A SUITABLY QUALIFIED ENGINEER



TYPICAL PLAN OF ETS AND 105M2 SOIL POLISHING FILTER TO EPA CoP 2021

1. MINIMUM SOIL THICKNESS BENEATH INVERT OF DISTRIBUTION SYSTEM = >900MM
2. GRAVEL PROTECTION LAYER : 150MM OF 12 TO 32MM WASHED GRAVEL
3. INFILTRATION LATERALS : 25 to 32MM DIA. PVC
4. GRAVEL DISTRIBUTION LAYER : 300MM OF 12 TO 32MM WASHED GRAVEL
5. EFFLUENT TREATMENT SYSTEM AND POLISHING FILTER TO BE INSTALLED AND CONSTRUCTED IN STRICT ACCORDANCE WITH EPA CoP 2021



SOIL POLISHING FILTER TO EPA CoP 2021

TYPICAL SECTION THORUGH PROPOSED ETS

Rev.	DESCRIPTION	DATE

Declan Kearns & Associates Ltd.
Tullywest, Kildare, Co. Kildare
Phone : 045 520642 / 086 2111590
Email: info@dkassociates.ie

DKA

Project: PROPOSED DEVELOPMENT AT COOLMINE, SAGGART, CO. DUBLIN

Client: WILL LYNCH

Drawing Title: ETS AND SOIL POLISHING FILTER DETAILS

Date	Scale (A3)	Drawn by		
14/01/22	NTS	DK		

Status: PLANNING ☒ TENDER ☐ FOR APPROVAL ☐ FOR CONSTRUCTION ☐ AS BUILT ☐

Dwg. No. PF1