Bolger-HynesArchitectural Design

SITE SUITABILITY TEST REPORT

Client: Kilkenny county council –

Housing Technical department

Site Location: Scart, Dunbell,

Co.Kilkenny



APPENDIX A: SITE CHARACTERISATION FORM

File Reference:
1.0 GENERAL DETAILS (From planning application)
Prefix: First Name: Kilkenny county Council Surname: Housing Technical department
Address: Site Location and Townland:
Johns greenhouse, John green, John street, Kilkenny R95N927 Scart, Dunbell, Co.Kilkenny
Number of Bedrooms: 5 Maximum Number of Residents: 7
Comments on population equivalent
Design population for the 5 bedrooms Pe 7. Allowing for moderate to good P/T results a proposed new wastewater treatment system may not able to be installed within the site boundaries and therefore not meet all site restriction requirements.
Proposed Water Supply: Mains
2.0 GENERAL DETAILS (From planning application)
Soil Type, (Specify Type): Surface water gleys, Ground water gleys
Subsoil, (Specify Type): Till derived from from limestone
Bedrock Type: Dinantian upper impure limestones
Aquifer Category: Regionally Important Locally Important LI Poor
Vulnerability: Extreme ☐ High ☐ Moderate ☐ Low ✓
Groundwater Body: Clifden Status Good
Name of Public/Group Scheme Water Supply within 1 km:
Source Protection Area: ZOC SI SO Groundwater Protection Response: R1
Presence of Significant Sites (Archaeological, Natural & Historical): None within 300m
Past experience in the area: None.
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).
There maybe nearby wells in this area so minimum distances must be adhered. If there is not there should be no site restrictions. The studies so far indicate that the ground conditions may not be potentially suitable for discharging treated wastewater. sources: www.gsi.ie, archaeology.ie, osi.ie, epa.ie, Kilkennycoco.ie
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: Relatively Flat with slight slope Slope: Steep (>1:5) Shallow (1:5-1:20) Relatively Flat (<1:20) ✓ Slope Comment Slight slope Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres) Houses: Nearest house approximately: 40m in a southerly direction. 130m in a easterly direction. Existing Land Use: Side grass lawn Vegetation Indicators: Mainly grass. Groundwater Flow Direction: Probable direction of groundwater unknown. Ground Condition: Ground conditions firm on 23/03/2024. No evidence of ponding or poaching. Site Boundaries: South - Hedgerow with adjoining local road to the rear. East and north Blockwall with adjoining road West - Natural hedgerow.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:	
Regional road R712 approximately 8m in a northerly direction. Local road approximately 35m in a southerly direction.	
Outcrops (Bedrock And/Or Subsoil):	
None evident.	
Surface Water Ponding:	
None evident.	
Lakes:	
None evident.	
Beaches/Shellfish Areas:	
None evident.	
Wetlands:	
None evident.	
Karst Features:	
None evident.	
Notare a vive a /China vive a	
Natercourses/Streams:* Stream approximately 65m down gradient in a south westerly direction.	

*Note and record water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Orainage Ditches:*		
None evident.		
Springs:*		
None evident.		
vone evident.		
Vells:*		
None evident.		
omments: Integrate the information above in or	der to comment on: the potential suitability of the site, potential targets	gets at risk, the suitability of the site to treat the wastewat
d the location of the proposed sys	an within the site).	
egetation indicators sugges	that there could be good potential drainage on this sain on adjoining road to the south.	ite
he nearest target at risk is n	earby stream. However EPA CoP 2021 Minimum dista	ance requirements can be met.

^{*}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 gi to bedrock (m	round surface (if present):		oth from grou vater table (n			
Depth of water	er ingress:	Rock typ	e (if present):			
Date and time	of excavation: 2	1-Mar-2024 0	9:00 Date a	and time of examina	ation: 23-Mar-2	2024 10:30
Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour***	Preferential flowpaths
0.1 m 0.2 m	Horizon 1 0.0m - 0.200m		Crumb	Very soft	Dark Brown	Frequent grass rootlets
0.3 m	Clay loam Horizon 2 0.200m - 0.800m Slightly raspy feel Gravelly SILT CLAY	Threads 5 Ribbons 80mm Dilatancy- uncertain	Structureless subangular	Soft	Orange Brown	Variable grass rootlets Variable /occasional gravels
0.8 m	Horizon 3 0.800m - 2.100m Cohesive feel Gravelly CLAY	Threads 8 Ribbons 110 - 130mm Dilatancy - none	Structureless subangular	Soft	Brown	Variable gravels occasional cobbles and boulders
1.3 m 1.4 m 1.5 m						
1.6 m 1.7 m 1.8 m						No signs of mottling
1.9 m	Bottom of Trial hole 2.1m	No Bedrock present @ 2.1m	No W.T.L present @ 2.1m on 23/03/2024			
3.5 m						
Likely Subsurf	ace Percolation V	alue: 30				

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

25

Likely Surface Percolation Value:

^{**} 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:

Horizon 1 and 2 are free draining soil Horizon 3 has moderate permeability and generally could be suitable for percolation purposes.

There is no Bedrock present at 2.100m with no water table present. Following the trial hole analysis there seems to be good potential for percolation in this ground.

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

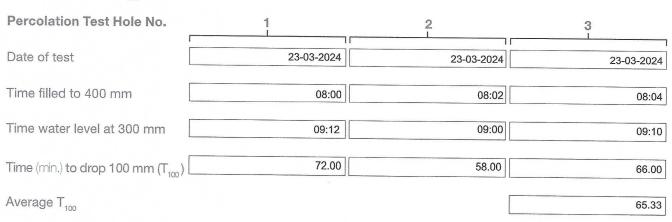
Percolation Test Hole	1		2		3	
Depth from ground surface to top of hole (mm) (A)		300		300		300
Depth from ground surface to base of hole (mm) (B)		700		700		700
Depth of hole (mm) [B - A]		400		400		400
Dimensions of hole [length x breadth (mm)]	300 X	300	300 X	300	300 x	300

Step 2: Pre-Soaking Test Holes

Pre-soak start	Date	22-Mar-2024	22-Mar-2024	22-Mar-2024
	Time	09:00	09:02	09:03
2nd pre-soak	Date	22-Mar-2024	22-Mar-2024	22-Mar-2024
start	Time	11:00	11:02	11:05

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

Step 3: Measuring T₁₀₀



If $T_{100} > 480$ minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground

If $T_{100} \le 210$ minutes then go to Step 4;

If T₁₀₀ > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \le 210$ 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	09:14	11:02	108.00	09:03	10:26	83.00	09:16	10:02	46.00
2	11:05	13:32	147.00	10:30	12:23	113.00	11:05	12:35	90.00
3	13:34	16:48	194.00	12:25	15:34	189.00	12:40	15:46	186.00
Average ∆t Value			149.67			128.33			107.33
	Average ∆t		37.42 (t ₁)	Average ∆t [Hole No.2]		32.08 (t ₂)	Average ∆t [Hole No.3		26.83 (t ₃)
Result of Te	st: Subsurfa	ce Percolat	ion Value =	:	32	2.11 (min/25	mm)	2000 to 1000 to	

Percolation

Test Hole No.

2

Value = 4.45 / K_{rs}

0.00

Comments:

Percolation

Test Hole No.

Average

T- Value

Horizon 2 & 3 has good potential percolation values in the range of 21-40

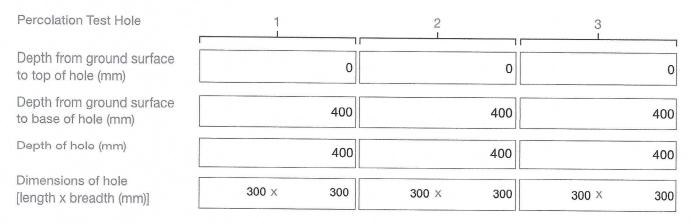
Step 5: Modified Method (where $T_{100} > 210$ minutes)

Fall of water in hole (mm)	Time Factor = T _r	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}	Fall of water in hole (mm)	Time Factor = T _r	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T _m	K _{fs} = T _f / T _m
300 - 250	8.1			0.00			300 - 250	8.1			0.00	
250 - 200	9.7			0.00			250 - 200	9.7			0.00	
200 - 150	11.9			0.00	-		200 - 150	11.9			0.00	
150 - 100	14.1			0.00			150 - 100	14.1			0.00	
Average Percolation Test Hole No.	T- Valu	е 3	T- Valu	e Hole 1	$= (T_1)$	0.00	Average Result of Te	T- Value	surface	Percol	e Hole 2 ation Va min/25	alue :
Fall of water in hole (mm)	Time Factor = T _f	Start Time hh:mm	Finish Tim§e hh:mm	Time of fall (mins) = T _m	K _{fs} = T _f / T _m	T – Value = 4.45 / K _{rs}	Comments:			-		
300 - 250	8.1			0.00								
250 - 200	9.7			0.00								
200 - 150	11.9			0.00								
150 - 100	14.1			0.00								

T- Value Hole $3 = (T_2)$ 0.00

3.3(b) Surface Percolation Test for Soil

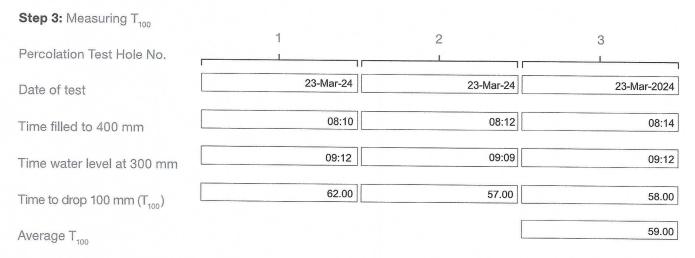
Step 1: Test Hole Preparation



Step 2: Pre-Soaking Test Holes

Pre-soak start	Date	22-Mar-2024	22-Mar-2024	22-Mar-2024
	Time	09:10	09:12	09:14
2nd pre-soak	Date	22-Mar-2024	22-Mar-2024	22-Mar-2024
start	Time	11:08	11:10	11:12

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



If T_{100} > 480 minutes then Surface Percolation value >90 – site unsuitable for discharge to ground If $T_{100} \le 210$ minutes then go to Step 4;

If $T_{100} > 210$ minutes then go to Step 5;

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

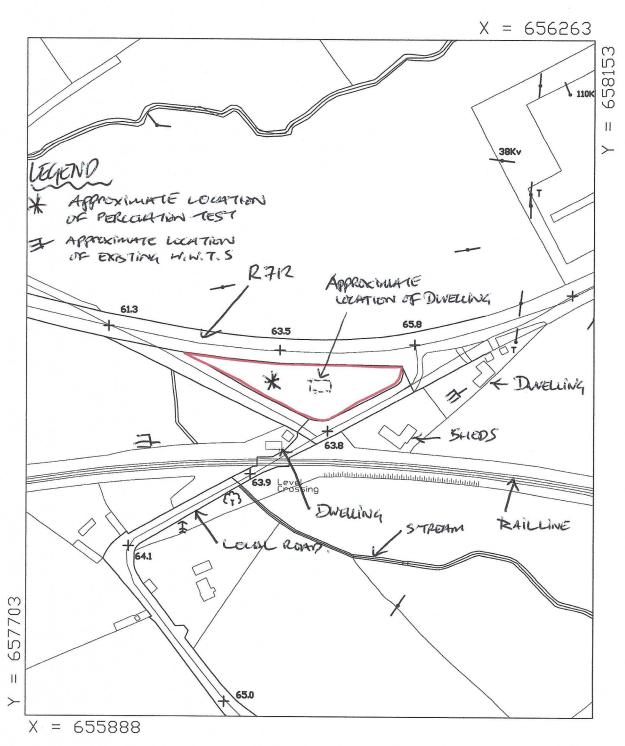
Percolation Test Hole		1			2			3	
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1	09:15	10:44	89.00	09:10	10:28	78.00	09:15	10:42	87.00
2	10:46	12:53	127.00	10:30	12:26	116.00	10:45	12:40	115.00
3	12:55	15:52	177.00	12:30	15:38	188.00	12:43	15:34	171.00
Average ∆T Value			131.00			127.33			124.33
	Average ΔT. [Hole No.1]	7/4 =	32.75 (T ₁)	Average ΔT [Hole No.2]		31.83 (T ₂)	Average \(\Delta \) [Hole No.3		31.08 (T ₃)
Result of Te	st: Surface F	Percolation	Value =		31.89	(min/25 mn	n)		
Comments:									

	Avera	ige ∆T/4	4 =			Average A	T/4 =		Aver	age ∆T/	4 =		
	[Hole	No.1]		32.7	'5 (T ₁)	[Hole No.:	2] 3	81.83 (T	₂) [Hol	e No.3]		31.	08 (T ₃)
Result of T		face Pe	ercolatio	on Value	9 = [31.89 (n	nin/25 n	nm)				
Comments	;												
Horizon 1 & 2	2 has goo	d potentia	al percola	tion value	s in the	range of 21-4	40						
Step 5: Mo	odified N	/lethod	(where	T ₁₀₀ > 2	10 mir	utes)							
Percolation Test Hole No.		1					Percolation Test Hole No.		2				
Fall of water n 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}	Fall of water in hole (mm)	Time Factor = T _r	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			300 - 250	8.1			0.00		
50 - 200	9.7			0.00			250 - 200	9.7		ĺ	0.00	-	
00 - 150	11.9			0.00			200 - 150	11.9			0.00		
50 - 100	14.1			0.00			150 - 100	14.1			0.00		
verage	T- Value	9	T- Value	e Hole 1	= (T ₁)	0.00	Average	T- Valu	ie	T- Valu	ue Hole 2	$2 = (T_2)$	0.00
							Result of	Test: S	urface l	Percola	tion Val	ue =	
Percolation Test Hole No.		3							(0.00	min/25	mm)	
Fall of water n hole (mm)	Time Factor = T _r	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T _m	K _{fs} = T _r / T _m	T – Value = 4.45 / K _{fs}	Comments:			***************************************			
00 - 250	8.1			0.00									
50 - 200	9.7			0.00									
00 - 150	11.9			0.00									
50 - 100	14.1			0.00									
verage	T- Value	Э	T- Value	e Hole 3	= (T ₂)	0.00		···					

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.
- 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.
- Site specific cross sectional drawing of the site and the proposed layout¹ 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.



Scart, Dunbell, Co. Kilkenny R95 N927

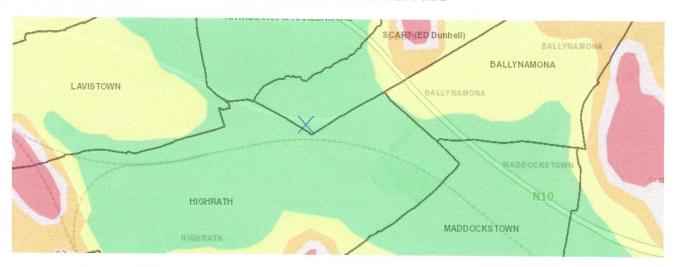
Ref.	Owner	Folio	Area	Townland	Description
2024L05	Kilkenny County Council	KK15778	0.2813Ha	Dunbell	Residential land

Areas: As shown	Townland: As Shown		Date: 27/03/2024	17
Scale: 1:2500	O.S. Map Ref: 4767-D	_4768-C	Prepared by: PT	//
Kilkenny County Co John St., Kilkenny. Comhairle Chontae	Tel:	056/7794000		EgE .

GROUNDWATER AQUIFER MAP



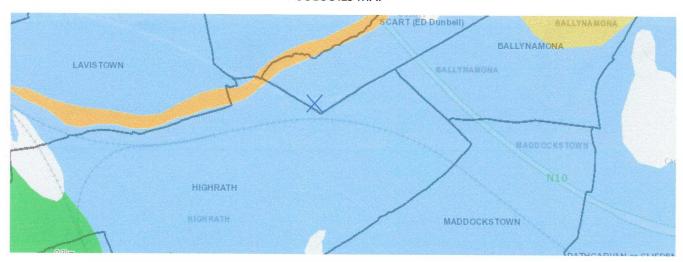
GROUNDWATER VULNERABILITY MAP



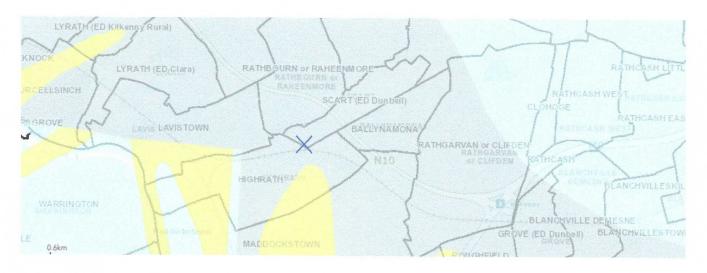
SOILS MAP



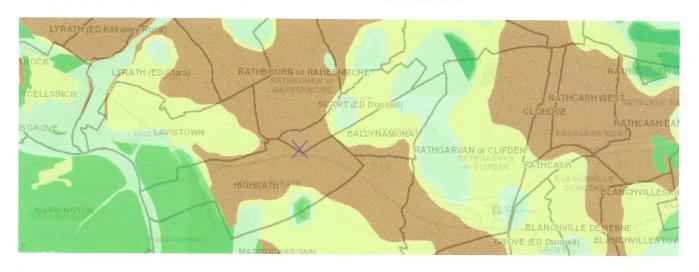
SUBSOILS MAP



BEDROCK MAP



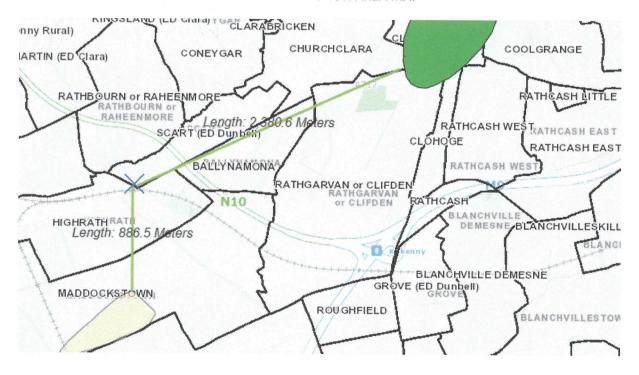
GROUNDWATER RECHARGE DATA MAP



KARST MAP



SOURCE PROTECTION AREA MAP





TRIAL HOLE

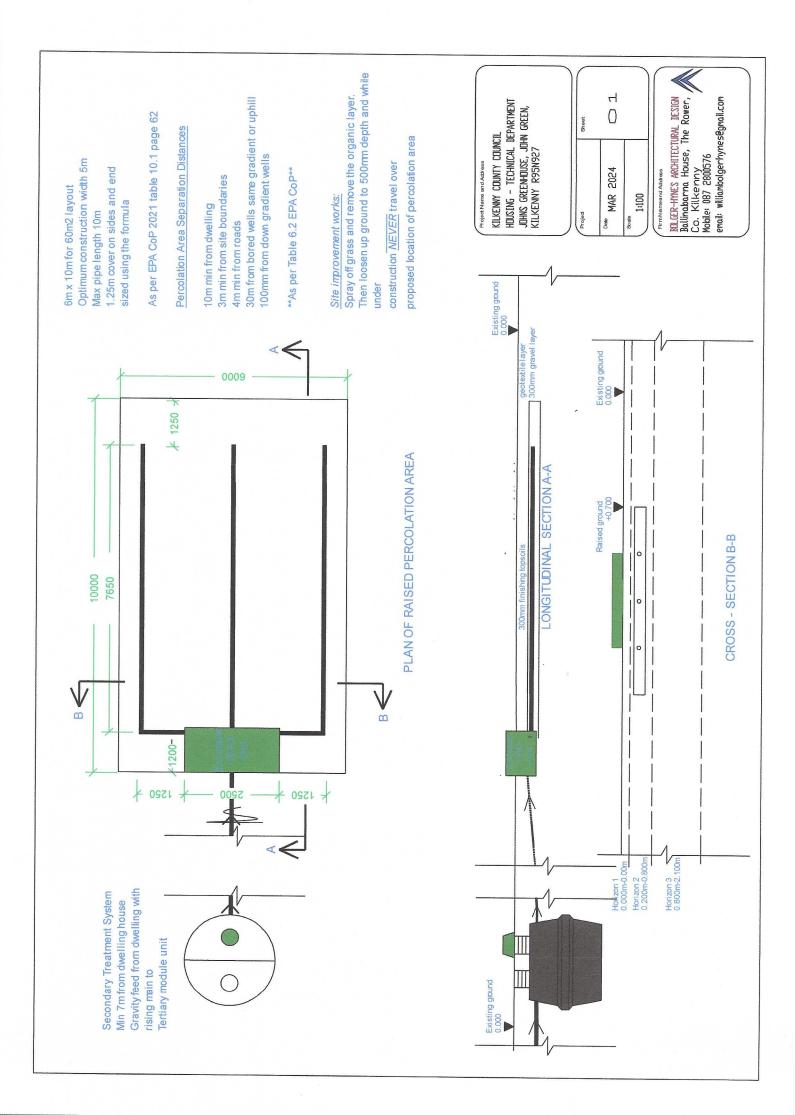


SIDE PROFILE OF TRIAL HOLE









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:	1:100
Are all minimum separation distances met?	√
Depth of unsaturated soil and/or subsoil beneath invert of grave (or drip tubing in the case of drip dispersal system)	vel 0.90
Percolation test result: Surface; 31.89	Sub-surface: 33.78
Not Suitable for Development	Suitable for Development
Identify all suitable options	Discharge Route ¹
Septic tank system (septic tank and percolation area) (Chapter 7) No	Discharge to ground
2. Secondary Treatment System (Chapters 8 and 9) and soil polishing filter (Section 10.1)	
3. Tertiary Treatment System and Infiltration / treatment area (Section 10.2)	
5.0 SELECTED DWWTS	
Propose to install: Tertiary Treatment System and Infiltration /t	reatment area
and discharge to: Ground Water	
Invert level of the trench/bed gravel or drip tubing (m)	0.45
	-0.45
Site Specific Conditions (e.g. special works, site improvement	works testing etc.
It is proposed to install a Tertiary Treatment System and Infiltration /tre Design criteria of Packaged wastewater treatment plant The sizing of the proposed packaged wastewater treatment plant shall Eurotank BAF P8 en12566/3 SR66.(Refer to EPA CoP 2021)	
Design criteria for soil polishing filter. (Percolation area) It is proposed to have the invert of percolation pipes -0.450m below the 0.9m of soil /subsoil below invert of the percolation pipe. PV values of 21 - 40 means 7.5m2 percolation area per person. Calcu	
(Refer to EPA CoP 2021 table 10.1 page 62) (See drawings attached.)	

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 (m³) 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 Packaged Secondary (Chapter 8) **Treatment Systems** receiving raw wastewater (Chapter 9) Media Type Area (m²)* Depth of Filter Invert Level Type Sand/Soil Biological aerator Soil Capacity PE 8 Constructed Wetland Sizing of Primary Compartment Other m^3 Polishing Filter*: (Section 10.1) Option 3 - Gravity Discharge 60.00 Surface Area (m2)* Trench length (m) Option 1 - Direct Discharge Option 4 - Low Pressure Surface area (m²) Pipe Distribution Option 2 - Pumped Discharge Trench length (m) Surface area (m²) 60.00 Option 5 - Drip Dispersal Surface area (m²) 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	
Site restrictions			

DISCHARGE ROUTE:

Groundwater	√	Hydraulic Loading Rate * (I/m².d)	8.57	Surface area (m²)	
Surface Water **		Discharge Rate (m³/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 and commissioning shall be carried out by a qualified personal in accordance in accordance with the EPA manual code of practice 2021.
On-going Maintenance
Regular de-sludging and maintenance on an annual basis accordance with the EPA Code of practise 2021. 7.0 SITE ASSESSOR DETAILS
Company: Bolger-Hynes Archectitural Design
Prefix: Mr First Name: William Surname: Bolger-Hynes
Address: Ballinabarna House, The Rower, Co.Kilkenny
Qualifications/Experience: Dip in Civil Eng. Fetac Certification in site suitability assessment
Date of Report: 29-Mar-2024
Phone: 087 2800576 E-mail williambolgerhynes@gmail.com
Indemnity Insurance Number: AP10002006
Signature: Millian Balgur-Hynes



Broker Reference: BOLG05PI01

Date:

26/04/2023

TO WHOM IT MAY CONCERN

Bolger-Hynes Architectural Design and Planning Ballinabarna House The Rower Co Kilkenny

We act as insurance broker for the above client and as such can confirm the following cover

Business Description

Engineer

Professional Indemnity Insurance

Limit of Indemnity :

€ 1,000,000, any one claim

Policy Excess

€ 1,000 each and every claim

Period of Cover

26/04/2023 to 25/04/2024

Both days inclusive local standard time at above address

Insurers

Lloyds -Professional Indemnity

Policy No

API0002006

Note

Policy extends to include PSDP cover

The cover provided contains no unusual terms or conditions and is fully applicable to any work which the Insured Practice may be appointed in connection with his business description.

Conor Brennan

Arachas Corporate Brokers Limited