

# EXISTING SEPTIC TANK & ASSOCIATED DISCHARGE INSPECTION

PROPOSED ALTERATIONS & EXTENSION
TO DWELLINGHOUSE
WOODEND COTTAGE
POTTERTON
ABERDEENSHIRE
AB23 8UR

Client: Mr and Mrs Copley

Architect: Annie Kenyon Architecture

*Contract No.:* 3481/23

Report Issued: 13 November 2023

# EXISTING DISCHARGE INSPECTION & RECOMMENDATIONS PROPOSED ALTERATIONS AND EXTENSION WOODEND COTTAGE, POTTERTON, ABERDEENSHIRE, AB23 8UR

# INTRODUCTION

At the request of Annie Kenyon Architecture on behalf of Mr and Mrs Copley a visit was made to the existing dwellinghouse and associated garden areas at Woodend Cottage, Potterton, Aberdeenshire.

#### Site Location Plan



It is proposed to extend the existing dwellinghouse and verification that the existing sewage treatment & discharge system serving the dwellinghouse have the capacity for the development are required.

The purpose of the visit was to carry out a walkover survey to ascertain the existing drainage serving the property and to: -

Inspect the existing septic tank to assess its condition and capacity.

Check Foul water discharge location.

Assess additional surface water disposal options.

# **WALKOVER SURVEY**

On the 28th September 2023, a walkover survey was undertaken at the site.

The existing dwellinghouse is served by a septic tank and associated foul water soakaway both located in the front garden and in the adjacent field.

The site is occupied by the existing cottage and associated sheds and garden areas with grassed areas, trees, and shrubs. The proposed new infiltration field is in the rear garden where the area is generally level.

# Existing Septic Tank

The existing septic tank is a traditional block/brick built rectangular tank, a capacity of 2,000-litres currently serving the 2-bedroom house.

The access cover to the septic tank is formed by secure lid and is safe and secure.

The septic tank appears to be working effectively and efficiently and the level was not above the outlet drain.

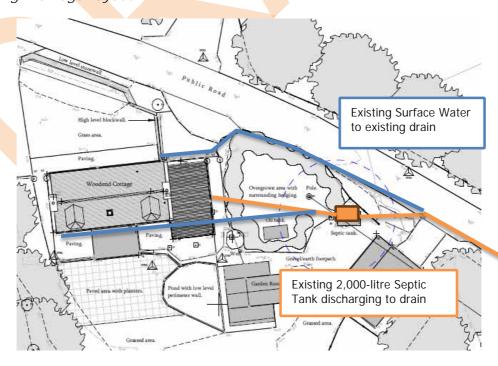
#### Foul Water Discharge

The foul water discharge from the septic tank is directed to drain along the public road and joins the Potterton Burn to the north. After periods of heavy rainfall, a grey discharge and odour are observed. This indicates the level of treatment provided by the septic tank is insufficient for discharge to the drain and the surface waters may overwhelm the septic tank causing this discharge.

#### Existing Surface Water Disposal

It appears that the surface waters from the roof areas of the dwellinghouse and existing outbuildings are directed to the outlet from the septic tank joining the drain along the road and discharging into the Potterton Burn to the north.

# Existing Drainage Layout



# **SITE ASSESSMENT**

# Trial Pits

On the 25<sup>th</sup> September 2023, a site and ground assessment were undertaken at the site. A tracked excavator with a 0.50m bucket excavated trial pits to carry out an assessment of the underlying ground conditions, to carry out percolation testing in the area of the potential new foul water sub-surface soakaway.

The locations of the trial pit were decided on site and are indicated on Fig. 2. Proposed Site Layout & Test Location Plan in Appendix A.

# Percolation Testing

On the 3<sup>rd</sup> October 2023 test holes were excavated to assess the underlying sub-soil and to carry out percolation testing adjacent to observation trial pits FW1 in accordance with Section 3.9 of the Scottish Building Standards Technical Handbook (Domestic) and SEPA WAT-RM-04.

The test results are shown on the following table: -

Date of Testing 3/10/2023	TP1A	TP1B	
Average time taken for water to drain 3 times in each sump hole (middle 150mm) 2790 3180			
Depth of Water Table below Ground Level (m)	>2.20		
Soil Percolation Values, Vp, s/mm	18.6 21.2		
Average Soil Percolation Values, Vp, s/mm	19	0.9	

# In-Situ HSVs

A test hole was excavated in the area of the new proposed extension to verify the safe bearing capacity of the underlying sub-soils to enable foundation design.

Trial Pit No.	Depth (m)	HSV 'Blows'
TP1	0.70	>120

#### Test Location Plan



# **GROUND ASSESSMENT**

# Published Geology

The British Geological Survey 1:50,000 Quaternary and Solid maps indicate that there are no recorded superficial deposits for the site. The site is underlain by Aberdeen Pluton – granite foliated. Igneous bedrock formed between 485.4 and 443.8 million years ago during the Ordovician Period.

# **Encountered Ground Conditions**

Topsoil: The areas are overlain by 300-500mm thickness of topsoil.

Natural Sub-Soils: The natural underlying sub-soils have an upper mantle of firm friable sandy gravelly clays extending to 0.90m in FW1 and proved to 1.20m in TP1.

Bedrock: Bedrock was not encountered during this investigation.

#### Groundwater Observations

Groundwater was not encountered during the investigation.

See following trial pit logs: -

GEOTECHNICAL & ENVIRONMENTAL ONSITE SERVICES		ICES	s.	A.MCG	REGOR	2	Site Woodend Cottage, Potterton  D) Client Mr & Mrs Copley		Trial Pit Number FW1 Job Number 3481/23	
xcavation racked exc 30m bucke	Method avator with et		Dimensions 0.60 × 1.00		Ground	l Level (mOD)				
		Locatio	n		Dates 2	8/09/2023	Architect Annie Kenyon Architect		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Fiel	ld Records	Level (mOD)	Depth (m) (Thickness)	De	escription	Legend	d
<del>l</del> an			Percolation 0.90m	n testing at		(0.40) - (0.50) - (0.60) - (0.60)		ry sandy very gravelly CLAY		RESERVATOR SECTION AND THE THE THE TRANSPORT AND ADMINISTRATION ADMINISTRATION ADMINISTRATION AND ADMINISTRATION ADMINIS
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GEOTECHNICAL	S.R. MCGREGOR  Site  Woodend Cottage, Potterton			on Trial F Numb					
xcavation racked exc	Method avator with	<b>Dimensio</b> 0.60 x 1.0		Ground	Level (mOD)	Client Mr & Mrs Copley	Job Number 3481/23		
.30m buck	et;	Location		Dates Architect		Architect		Sheet	
		25,007.00		Annie Kenyon Architect		Annie Kenyon Architect	1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend		
					(0.50) - (0.20) - (0.50) - (0.50) - (0.50) - (0.50)	Firm friable dark orange slightly sandy slightly gravelly CLAY  Firm friable lightl orange pink brown very sandy very gravelly CLAY  HSV @ 0.70m - 120  Complete at 1.20m		777877787778778	

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#### **DISCUSSION**

# Existing Septic Tank

The existing septic tank is too close to the proposed extension.

It is proposed to install a new treatment and discharge system in the rear garden of the property.

# New Sewage Treatment

The existing The soil percolation value, Vp = 19.9 s/mm and therefore a standard septic tank is suitable for the development.

However, it is recommended to install a Package Sewage Treatment Plant (PSTP) with minimum 3,600-litre capacity for the 3-bedroom house with PE=5.

#### New Foul Water Discharge

A sub-surface stone-filled soakaway (infiltration system) is considered suitable for the discharge of foul waters from a PSTP directly to the ground.

The soakaway should comply with the Domestic Technical Handbook (para. 3.9.2) which sets out guidance on design in accordance with the requirements of SEPA Regulatory Method (WAT-RM-04) Indirect Sewage Discharges to Groundwater.

#### Sub-Soils

The sandy gravelly clayey nature of the underlying strata and the results from the percolation testing confirmed the moderate draining properties of the sub-soils.

#### Existing Surface Waters

All the rainwater downpipes appear to go to either the existing septic tank, the outflow from the septic tank or directly to the existing drain along the roadside and into the Potterton Burn.

#### New SuDS & Surface Waters

It is proposed to re-align the surface water drains to accommodate the proposed extension.

The downpipes serving the front elevation will continue to the existing drain.

All the rear elevation downpipes are to have attenuation in place prior to discharge to the existing drain.

The disposal of all new surface waters from a new development needs to be assessed in terms of both the quantity and the quality of the discharge for Building Regulations and SEPA.

Using the SIA tool, the land use run-off has been determined as 'Very Low' from the roof areas for discharge to the watercourse, see following table: -

#### SIA Summary

Land Use Type	Residential Roofing
	(& permeable gravel hardstanding)
Pollution Hazard Level	Very Low
Pollution Hazard Indices	
TSS	0.2
Metals	0.2
Hydrocarbons	0.05
Surface Water Protection (SuDS)	
1 Component	Attenuation & Existing Drain
1 component	(discharge to waterbody)
	(
SuDS Pollution Mitigation Indices	
TSS	0.4
Metals	0.4
Hydrocarbons	0.4
Groundwater Protection Type	No discharge to ground
Groundwater Protection Type	The diserial go to ground
Combined Pollution Mitigation Indices	
TSS	0.4
Metals	0.4
Hydrocarbons	0.4
Acceptability of Pollution Mitigation	
TSS	Sufficient
Metals	Sufficient
Hydrocarbons	Sufficient
1.72.000.00110	

The SIA assessment confirms that the provision of attenuation measures with a controlled discharge to the existing drain and onto watercourse provides sufficient quality mitigation for the surface water run-off from the roof areas of the proposed development.

The appropriately design will be effective in all-weather conditions and is not considered to pose a risk to the water environment.

# **RECOMMENDATIONS**

# Sewage Treatment

The existing septic tank is too close to the proposed new extension.

It is recommended to install a new replacement Package Sewage Treatment Plant (PSTP) in the rear garden.

#### Foul Water Discharge

It is proposed to instal a new foul water soakaway in the rear garden and disconnect the discharge to the existing drain.

Due to constraints of the garden area, to reduce excavations, the removal of large amounts of soils and the imported transport of soakaway filter media (100mm clean, inert gravel) that the installation of 'Infiltration Tunnels' is recommended.

It is recommended to install 6No. infiltration tunnels in the ground sitting on a  $20m^2$  area of and 300mm depth filter gravel, see following table: -

Proposed Development	Population Equivalent, PE (as defined in BW COP:18.11/14)	No. Tunnels	Min. Base Area with PSTP only (m²)
Replacement Foul Water Soakaway	5 (up to 3-bedroom)	6	20

#### SEPA

The existing discharge is not registered with SEPA. An application under CAR should be made to SEPA on completion of the changes.

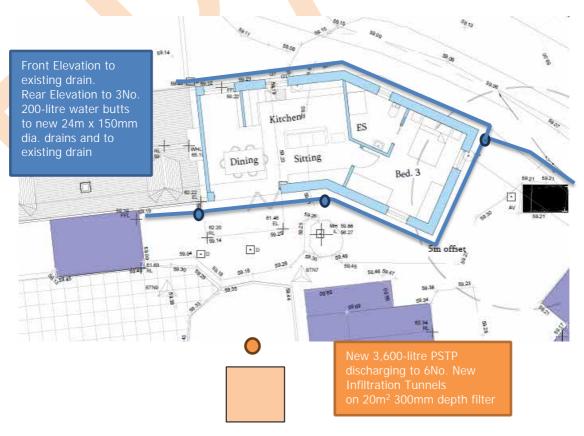
# Surface Water Disposal

The quantity of the surface water run-off must also be assessed and accommodated accordingly in the SuDS design: -

Impermeable Areas	Attenuation	Control	Outflow
Rear Elevation	3 x 200-litre Water Butts	New	25mm from water butts to
Roof Areas		24m long	new 150mm drain and into
Up to 83m <sup>2</sup>		150mm Dia. Drain	100mm existing drain

These dimensions include for a 1 in 200-year storm event and SEPA + Climate Change Peak Rainfall Intensity Allowance of +37% for the North East Scotland Region and in accordance with BRE Digest 365.

# Proposed Drainage Layout



#### Indicative Infiltration Tunnel Installation



# **FOUNDATION RECOMMENDATIONS**

# Safe Bearing Capacity

It is recommended that the foundations should be taken down through the topsoil and any made ground post demolition of the garage and rest on the firm friable clays at a minimum depth of below 0.60m below existing ground levels.

A safe bearing capacity of 120kN/m<sup>2</sup> at 0.60m may be applied for the design of the foundations for standard strip footings.

#### **Excavations**

Due to the clayey nature of the sub-soils all excavations, if left exposed, should be protected from rain and run-off waters to maintain the soils strength.

#### Settlement

It is considered that firm stiff and dense nature of the sub-soils will provide settlement within tolerable design limits.

#### De-Watering

It is not anticipated that de-watering of excavations will be required during construction.

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Date...DRAFT

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