

**S.A. MCGREGOR**



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 28<sup>th</sup> 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.

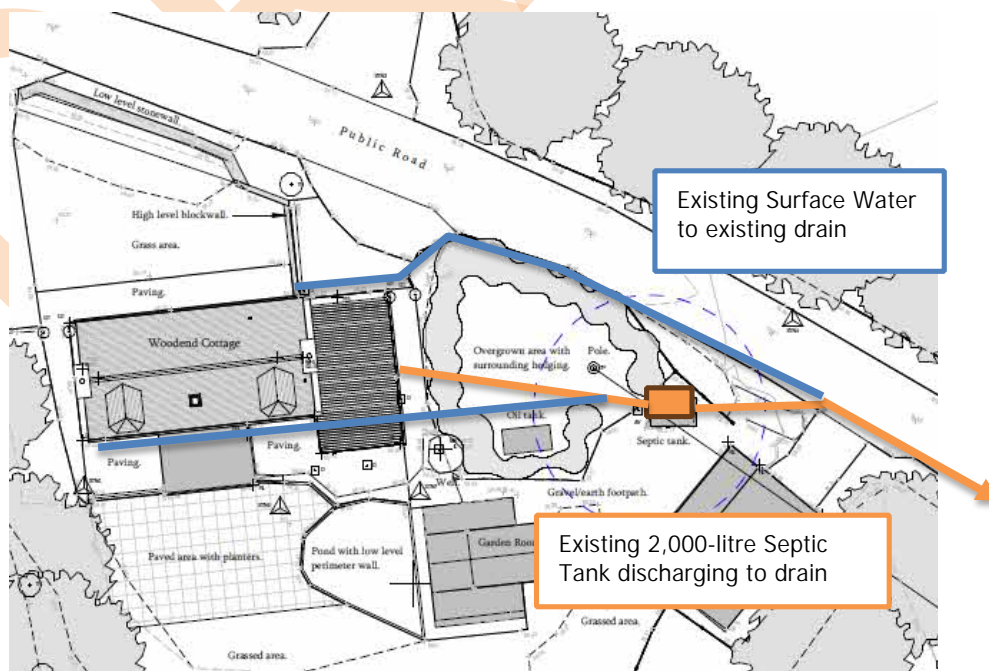
### *Foul Water Discharge*

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: -

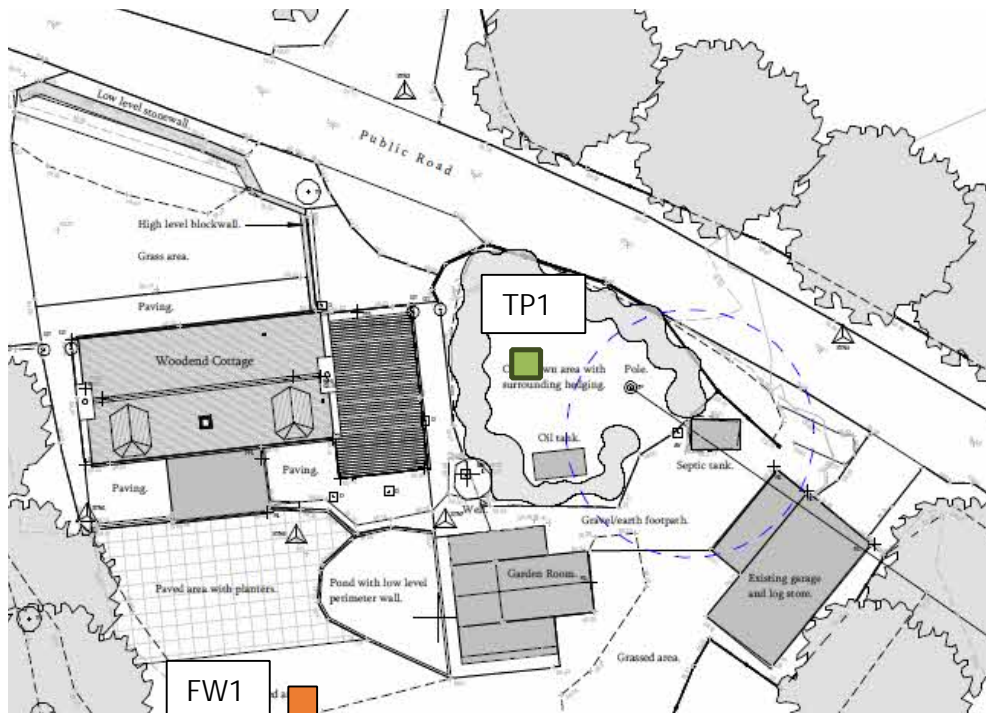
Date of Testing 3/10/2023	TP1A	TP1B
Average time taken for water to drain 3 times in each sump hole (middle 150mm)	2790	3180
Depth of Water Table below Ground Level (m)	>2.20	
Soil Percolation Values, Vp, s/mm	18.6	21.2
Average Soil Percolation Values, Vp, s/mm	19.9	

### *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.





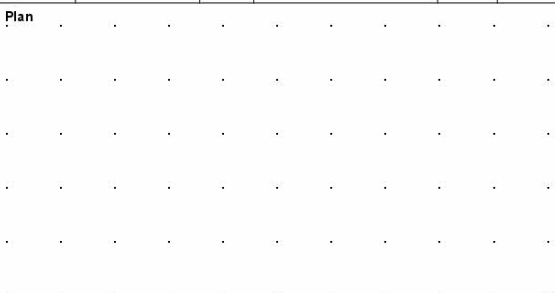
Natural Sub-Soils: The natural underlying sub-soils have an upper mantle of firm friable sandy gravelly clays extending to 0.90m in FW1 and proved to 1.20m in TP1.

Bedrock: Bedrock was not encountered during this investigation.




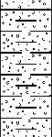
### *Groundwater Observations*



Groundwater was not encountered during the investigation.

See following trial pit logs: -

		<b>S.A. MCGREGOR</b>		<b>Site</b> Woodend Cottage, Potterton		<b>Trial Pit Number</b> <b>FW1</b>		
<b>Excavation Method</b> Tracked excavator with 0.30m bucket		<b>Dimensions</b> 0.60 x 1.00		<b>Ground Level (mOD)</b>		<b>Client</b> Mr & Mrs Copley		
		<b>Location</b>		<b>Dates</b> 28/09/2023		<b>Architect</b> Annie Kenyon Architect		
						<b>Job Number</b> 3481/23		
						<b>Sheet</b> 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Grass onto TOPSOIL		
					0.40	Firm friable pink, brown very sandy very gravelly CLAY		
			Percolation testing at 0.90m		0.90	Medium dense pink orange brown very clayey very gravelly SAND with cobbles		
			No groundwater ingress		1.50	Complete at 1.50m		
<b>Plan</b>				<b>Remarks</b>				
								
				<b>Scale (approx)</b> 1:20		<b>Logged By</b> SAM		
						<b>Figure No.</b> 3481/23 FW1		

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 <b>S.A. MCGREGOR</b> <small>GEOTECHNICAL &amp; ENVIRONMENTAL ON-SITE SERVICES</small>				<b>Site</b> Woodend Cottage, Potterton		<b>Trial Pit Number</b> TP1	
<b>Excavation Method</b> Tracked excavator with 0.30m bucket		<b>Dimensions</b> 0.60 x 1.00		<b>Ground Level (mOD)</b>		<b>Client</b> Mr & Mrs Copley	
<b>Location</b>		<b>Dates</b> 28/09/2023		<b>Architect</b> Annie Kenyon Architect		<b>Job Number</b> 3481/23	
<b>Depth (m)</b>		<b>Water Depth (m)</b>		<b>Level (mOD)</b>		<b>Sheet</b> 1/1	
<b>Sample / Tests</b>		<b>Field Records</b>		<b>Depth (m) (Thickness)</b>		<b>Description</b>	
						<b>Legend</b>	
						<b>Water</b>	
					0.50	Grass onto TOPSOIL	
					0.50 (0.20)	Firm friable dark orange slightly sandy slightly gravelly CLAY	
					0.70 (0.50)	Firm friable light orange pink brown very sandy very gravelly CLAY HSV @ 0.70m - 120	
					1.20	Complete at 1.20m	

## 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 soil percolation value,  $V_p = 19.9 \text{ s/mm}$  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 (discharge to waterbody)
SuDS Pollution Mitigation Indices	TSS 0.4 Metals 0.4 Hydrocarbons 0.4
Groundwater Protection Type	No discharge 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

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<sup>2</sup> 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 (m <sup>2</sup> )
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.

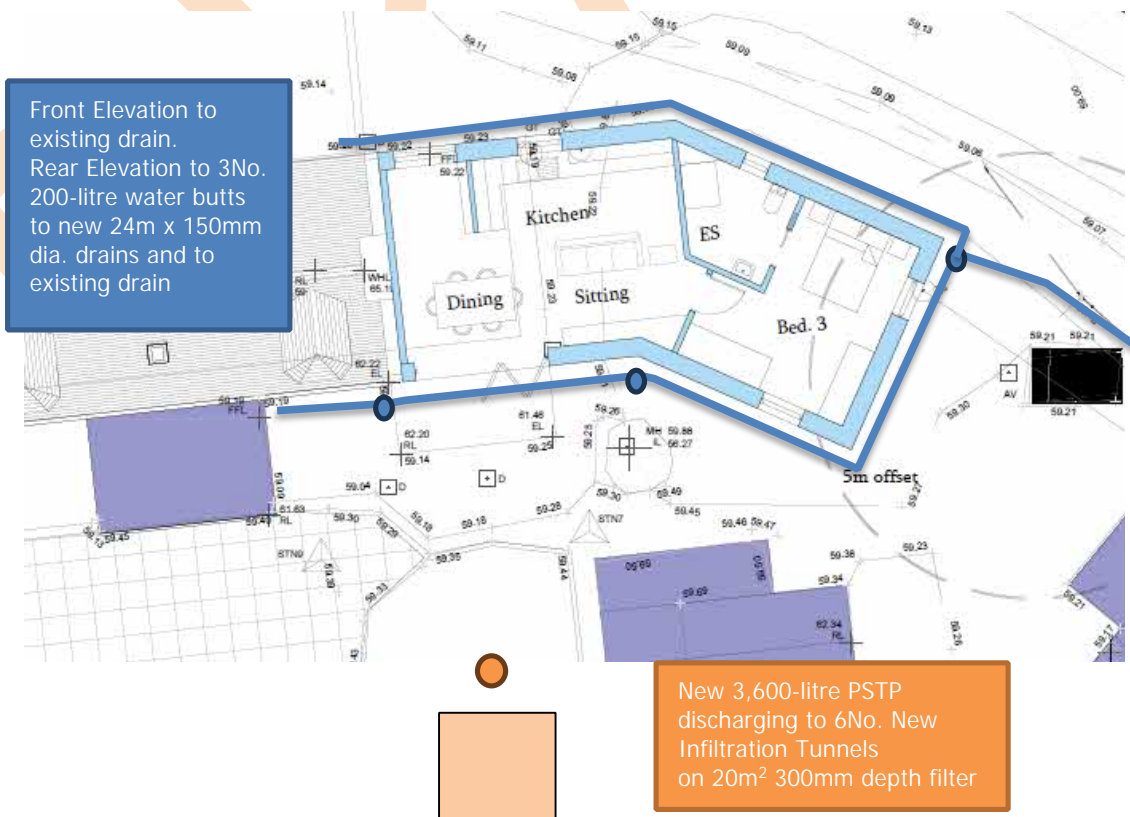
**Surface Water Disposal**

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

Signed .....

Date...DRAFT

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