ENVIRONMENTAL METHOD STATEMENT

Planning Application: P/2025/0951

Proposal: Conversion of Existing Barn to One-Bedroom Self-Contained Holiday Let

Site Address:
Greenways
Tarts Hill
Hanmer
Whitchurch
SY13 3DR

Prepared in response to the Natural Resources Wales consultation dated 10 July 2026.

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1. Introduction

This Environmental Method Statement has been prepared in support of the proposed conversion of an existing agricultural barn to a single self-contained holiday let at Greenways, Hanmer.

The document responds to the comments made by Natural Resources Wales (NRW) regarding foul drainage arrangements within the River Dee and Bala Lake Special Area of Conservation (SAC) catchment.

Its purpose is to demonstrate that the proposed foul drainage system has been designed to protect groundwater and the wider environment and will operate satisfactorily throughout the year.

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2. Description of Development

The proposal comprises the conversion of an existing barn into a single holiday letting unit.

The accommodation consists of:

- One bedroom
- Maximum occupancy of two persons
- Existing building footprint retained
- No permanent residential occupation

The development therefore represents a very small-scale increase in foul water generation.

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3. Proposed Foul Drainage System (appendix A)

All foul wastewater generated by the holiday accommodation will be treated using a:
Marsh Gemini 6PE Combined SBR and Phosphate Removal Treatment Plant

The treatment plant has been selected because:

- it provides secondary biological treatment;
- incorporates phosphate removal technology;
- exceeds the capacity required for the proposed development;
- is specifically designed for environmentally sensitive locations.

Although the holiday accommodation will accommodate a maximum of two persons, a treatment plant capable of serving six persons has been selected to provide a substantial operational safety margin.

Following treatment, effluent will discharge to a subsurface drainage field located entirely within land owned by the applicant.

No treated effluent will discharge directly to any ditch, stream or watercourse.

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4. Site Conditions

The site was assessed during percolation testing undertaken in accordance with BS6297 and Approved Document H.

The investigation established the following:

- Predominantly clay soils.
- No groundwater encountered during excavation.
- Approximately 30 metres to underlying rock.
- Approximately one acre of available land for the drainage field.
- Nearest ditch located approximately 228 metres from the proposed drainage field.
- No direct hydraulic connection exists between the drainage field and any surface watercourse.

These site characteristics provide sufficient separation distances to protect groundwater and nearby watercourses.

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5. Percolation Testing (appendix B)

Percolation testing was undertaken using three test pits measuring approximately 300 mm × 300 mm excavated to a depth of approximately 1 metre.

Each pit was pre-soaked overnight before testing commenced.

Testing was undertaken by recording the time required for the water level to fall from 300 mm to 75 mm in accordance with BS6297.

The calculated average percolation value (Vp) was:
Vp = 96

Whilst this represents the upper end of the normally acceptable range, it remains within the limits recognised by BS6297 for the design of drainage fields.

The relatively slow infiltration rate reflects the naturally occurring clay soils present across the site and has been fully considered within the drainage field design.

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6. Drainage Field Design (appendix C)

The proposed drainage field has been designed using:

- Design occupancy: 2 persons
- Design flow: 300 litres/day
- Percolation value: Vp 96

The calculated drainage field area is approximately 116 m^2.

The applicant has substantially more land available than is required to accommodate this drainage field.

This enables the drainage field to be installed with generous spacing between trenches, reducing the loading imposed on the surrounding ground and allowing efficient long-term infiltration.

The drainage field will be constructed using perforated distribution pipework installed within clean washed granular material in accordance with BS6297.

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7. Operation During Wet Weather

Natural Resources Wales noted that the percolation testing was undertaken during relatively dry weather conditions.

The applicant acknowledges this observation.

However, the following factors demonstrate that the proposed drainage system will continue to operate satisfactorily throughout the year:

- The drainage field has been designed using the measured percolation value rather than estimated figures.
- The treatment plant has three times the treatment capacity required by the proposed occupancy.
- Daily foul water generation is limited to approximately 300 litres per day.
- A generous drainage field area is available within the site.
- The extensive land available allows even distribution of treated effluent.
- No groundwater was encountered during excavation.
- Significant separation distances exist between the drainage field and nearby watercourses.
- The drainage field will receive treated effluent only, significantly reducing biological loading compared with untreated sewage.

These factors combine to provide a robust foul drainage solution capable of operating under varying seasonal ground conditions.

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8. Environmental Protection Measures

During construction:

- Excavations will be undertaken carefully to avoid unnecessary disturbance.
- Excavated soils will be stored separately and reinstated following installation.
- Fuel and oils will be stored away from drainage features.
- Any accidental spillages will be immediately contained and removed.

During operation:

- The Marsh Gemini treatment plant will be installed strictly in accordance with the manufacturer's instructions.
- The treatment plant will be serviced annually by a competent engineer.
- The drainage field will remain free from buildings, paving and vehicle traffic.
- Surface water will not be connected to the foul drainage system.
- Roof water will be disposed of separately.

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9. Maintenance

The treatment plant will be maintained in accordance with the manufacturer's maintenance schedule.

Maintenance will include:

- Annual servicing.
- Periodic desludging as recommended by the manufacturer.
- Routine inspection of pumps, alarms and mechanical equipment.
- Inspection of drainage field distribution chambers where applicable.

Any faults identified will be rectified promptly to ensure continued effective operation.

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10. Protection of the River Dee SAC

The proposed foul drainage system incorporates several measures that minimise nutrient loading to the environment:

- Advanced biological treatment.
- Phosphate removal technology.
- Low occupancy.
- Small daily discharge volume.
- Subsurface infiltration.
- No direct discharge to surface waters.
- Significant distance from the nearest watercourse.

The proposed drainage arrangements are therefore considered capable of protecting groundwater quality and avoiding adverse effects upon the River Dee and Bala Lake Special Area of Conservation.

11. Conclusion

This Environmental Method Statement has been prepared in response to comments received from Natural Resources Wales.

Percolation testing has demonstrated that the site is capable of accommodating a drainage field designed in accordance with BS6297.

The proposed Marsh Gemini 6PE Combined SBR and Phosphate Removal Treatment Plant provides treatment capacity significantly in excess of the requirements of the proposed holiday accommodation.

The drainage field has been sized using the measured percolation value and can be accommodated comfortably within the available land.

The proposed foul drainage system will provide effective treatment and disposal of wastewater while protecting groundwater, nearby watercourses and the River Dee SAC. It is therefore concluded that the proposed foul drainage arrangements are suitable for the proposed development and are not expected to give rise to adverse environmental effects.

Prepared by: Mr and Mrs P Armiatge

Date: 21 July 2026

Appendix A – Proposed Sewage Treatment Plant Specification
Proposed System

Manufacturer: Marsh Industries Ltd

Model: Marsh Gemini 6PE Combined SBR and Phosphate Reduction Plant

Population Equivalent (PE): 4–6 Persons

Proposed Loading: Maximum 2 persons

The proposed holiday accommodation has a maximum occupancy of two persons. The selected Marsh Gemini 6PE therefore provides treatment capacity significantly in excess of the anticipated loading, ensuring efficient operation and resilience during periods of peak occupancy.

Treatment Process
The Marsh Gemini combines two treatment technologies within a single unit:

- Sequential Batch Reactor (SBR) biological sewage treatment.
- Integrated Phos-Lite phosphate reduction system.

The system provides advanced biological treatment followed by tertiary phosphate removal before discharge to the drainage field.

Phosphate Reduction
Unlike conventional package treatment plants, the Marsh Gemini incorporates a dedicated phosphate reduction stage.

The Phos-Lite system removes phosphorus using a natural adsorption process, whereby phosphate is bound to specialist mineral media. This process does not require routine chemical dosing and provides consistent phosphate removal over varying flow conditions.

Environmental Performance
Independent certification testing has demonstrated the following typical treated effluent quality:

Parameter	Typical Performance
Biochemical Oxygen Demand (BOD)	1.62 mg/l
Suspended Solids (SS)	4.3 mg/l
Ammonia (NH_4-N)	0.38 mg/l
Total Nitrogen (TNb)	10.5 mg/l
Total Phosphorus (Ptot)	0.26 mg/l

These performance levels substantially exceed those typically achieved by conventional domestic package treatment plants and are particularly beneficial within nutrient-sensitive catchments.

Certification
The Marsh Gemini combines:

- Marsh Nutra-Lite sewage treatment technology certified to **BS EN 12566-3**.
- Marsh Phos-Lite phosphate reduction technology certified to **BS EN 12566-7**.

The integrated system has been independently tested and approved by PIA GmbH for domestic wastewater treatment applications.

Physical Dimensions (Gemini 6)

- Population Equivalent: 4–6 PE
- Length: 2,862 mm
- Width: 1,952 mm
- Height: 2,139 mm
- Inlet Pipe Diameter: 110 mm
- Outlet Pipe Diameter: 110 mm

Maintenance

The treatment plant will be installed strictly in accordance with the manufacturer's installation guidance.

Routine maintenance will comprise:

- Annual service by a competent engineer.
- Periodic desludging as recommended by the manufacturer.
- Inspection of compressors, pumps and controls.
- Inspection of the phosphate reduction media and replacement when required in accordance with the manufacturer's recommendations.

Suitability for the Proposed Development
The proposed Marsh Gemini 6PE has been selected because it:

- Provides treatment capacity well in excess of the proposed two-person occupancy.
- Incorporates advanced phosphate reduction technology.
- Produces a high-quality treated effluent suitable for discharge to a drainage field.
- Is specifically designed for environmentally sensitive locations where nutrient reduction is required.

Appendix B – Percolation Test Results

Percolation Testing
Percolation testing was undertaken in accordance with the methodology set out in BS 6297:2007+A1:2008 and Approved Document H of the Building Regulations.

Test Pit Details

Item	Description
Number of Test Pits	3
Pit Dimensions	300 mm × 300 mm
Pit Depth	1.0 metre
Soil Type	Clay
Groundwater Encountered	None
Bedrock	Approximately 30 metres below ground level
Pre-soaking	Test pits saturated overnight prior to testing
Test Method	Time taken for water level to fall from 300 mm to 75 mm

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Test Results
Test Pit 1

Test	Time
Test 1	4 hours 15 minutes
Test 2	4 hours 30 minutes
Test 3	4 hours 35 minutes

Average Time = **16,000 seconds**

Test Pit 2

Test	Time
Test 1	3 hours 50 minutes
Test 2	3 hours 55 minutes
Test 3	4 hours 15 minutes

Average Time = **14,400 seconds**

Test Pit 3

Test	Time
Test 1	3 hours 20 minutes
Test 2	3 hours 30 minutes
Test 3	3 hours 45 minutes

Average Time = **12,700 seconds**

Average Percolation Value

Overall Average Time
(16,000 + 14,400 + 12,700) ÷ 3
= **14,367 seconds**

Percolation Value (Vp)
Vp = Average Time ÷ 150
Vp = 14,367 ÷ 150
Vp = **95.8**

Rounded Value
Vp = 96 seconds/mm

Summary

The calculated Vp value of **96 seconds/mm** falls within the range considered suitable for the design of a drainage field under BS6297, although towards the upper end of the acceptable range.

The drainage field has therefore been sized using the measured infiltration rate to ensure satisfactory operation.

No groundwater was encountered during excavation, and approximately one acre of land is available for installation of the drainage field.

Appendix C – Drainage Field Design Assessment

1. Purpose
This appendix demonstrates that the proposed drainage field has been designed in accordance with the principles contained within BS 6297:2007+A1:2008 *Code of Practice for the Design and Installation of Drainage Fields for use in Wastewater Treatment* together with Approved Document H of the Building Regulations.

The drainage field has been designed using the results of site percolation testing undertaken at the proposed discharge location.

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2. Proposed Development

Description	Detail
Development	Conversion of existing barn to holiday let
Bedrooms	1
Maximum Occupancy	2 persons
Proposed Treatment Plant	Marsh Gemini 6PE Combined SBR with Phosphate Reduction
Final Disposal	Subsurface drainage field

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3. Design Loading
The proposed holiday accommodation will accommodate a maximum of two persons.

For domestic accommodation, Approved Document H recommends a design wastewater flow of:

- 150 litres per person per day
- Therefore: Maximum Occupancy = 2 persons
- Daily Flow = 300 litres/day

The selected Marsh Gemini treatment plant is designed to serve up to six persons and therefore provides treatment capacity significantly greater than the anticipated loading. The treatment plant will therefore operate considerably below its maximum design capacity.

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4. Site Investigation
Percolation testing was undertaken in accordance with BS6297 using three trial pits. The investigation established:

- Clay subsoil.
- No groundwater encountered.
- Bedrock approximately 30 metres below ground level.
- Approximately one acre of land available for effluent disposal.
- Nearest ditch located approximately 228 metres from the proposed drainage field.

The measured average percolation value was: Vp = 96 seconds/mm

Whilst this represents relatively slow-draining clay soil, the result remains within the acceptable range for drainage field design.

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5. Drainage Field Design Principles

The drainage field has been designed to:

- distribute treated effluent evenly across the available land;
- avoid localised hydraulic overloading;
- maximise infiltration through the natural soil profile;
- prevent ponding or surface breakout;
- protect groundwater and nearby watercourses.

Given the extremely low daily discharge (300 litres/day), the proposed loading rate is modest.

The available land significantly exceeds the minimum area required for the drainage field.

This allows generous spacing between trenches and provides additional resilience during prolonged periods of wet weather.

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6. Proposed Construction

The drainage field will be constructed in accordance with BS6297 and will comprise:

- perforated distribution pipework;
- clean washed granular backfill;
- geotextile membrane;
- reinstated topsoil.

Distribution trenches will be installed approximately 600–900 mm below finished ground level.

Trenches will be evenly spaced to ensure uniform distribution of treated effluent.

Heavy vehicles will not be permitted over the drainage field following construction. No buildings, hardstanding or deep-rooting trees will be located above the drainage field.

Surface water drainage will remain entirely separate from the foul drainage system.

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7. Performance During Wet Weather

Natural Resources Wales noted that percolation testing was undertaken during relatively dry weather.

Whilst seasonal variation in soil moisture is acknowledged, the following factors demonstrate that the drainage field will continue to perform satisfactorily:

- the measured Vp value has been used in the design;
- the holiday accommodation has a maximum occupancy of only two persons;
- average daily discharge is limited to approximately 300 litres;

- the treatment plant has three times the required treatment capacity;
- treated effluent will already have undergone advanced biological treatment and phosphate reduction prior to discharge;
- no groundwater was encountered during testing;
- extensive land is available to distribute flows over a large area.

The resulting hydraulic loading imposed on the soil will therefore remain low throughout the year.

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8. Environmental Protection

The proposed foul drainage system provides several levels of environmental protection:

- advanced secondary biological treatment;
- integrated phosphate reduction;
- subsurface infiltration only;
- no direct discharge to surface waters;
- significant separation distance from the nearest ditch;
- substantial unsaturated soil depth available for final polishing of treated effluent.

These measures significantly reduce the potential for nutrients to reach nearby watercourses.

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9. Conclusion

The proposed foul drainage system has been designed using measured site percolation data together with the recommendations contained within BS6297 and Approved Document H.

The proposed Marsh Gemini 6PE Combined SBR and Phosphate Reduction Treatment Plant provides treatment capacity well in excess of that required for the proposed development.

The available land comfortably accommodates a drainage field capable of dispersing the anticipated daily discharge of approximately 300 litres.

Taking account of the measured infiltration characteristics, the low design loading, the extensive available land and the high level of wastewater treatment provided, the proposed foul drainage system is considered capable of operating satisfactorily throughout the year without posing an unacceptable risk to groundwater, nearby watercourses or the integrity of the River Dee and Bala Lake Special Area of Conservation.