

PRELIMINARY RISK ASSESSMENT
PROPOSED SLURRY LAGOON AND SILAGE PAD
INSTALLATION

FOR
MANOR FARM PARTNERS

AT
MANOR FARM
UPTON LOVELL
WARMINSTER
WILTSHIRE
BA12 0JN

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Preliminary Risk Assessment (PRA)

Proposed Slurry Lagoon and silage pad Installation at Manor Farm

Application Number: - PL/2026/02994

1. Introduction

1.1 This Preliminary Risk Assessment (PRA) has been prepared to assess the potential environmental risks associated with the proposed installation and operation of a slurry storage lagoon and silage pad located within a Source Protection Zone (SPZ3 Total Catchment) and the River Avon Catchment Area, Special Area of Conservation (SAC).

1.2 The purpose of this assessment is to identify potential pollutant linkages, evaluate the likelihood and consequences of contamination, and outline the mitigation measures proposed to minimise risk to controlled waters, particularly the nearby SPZ3 and SAC.

1.3 This PRA has been prepared in accordance with relevant environmental risk assessment principles and is intended to support ongoing feasibility, planning, permitting, and design discussions.

2. Site Description

2.1 The proposed development site is located at Manor Farm, Upton Lovell, Warminster, BA12 0JN, on agricultural land, which is currently farmed with a 450 head dairy herd, and 510 Ha of cropped land for feeding the dairy herd and associated farming activities. The business also has export agreements with neighbouring arable farms of over 2,500 Ha to export manure to fertilise their crops, as part of the farms Nutrient Management Plan.

2.2 The proposal comprises the construction of a slurry storage lagoon designed to store agricultural slurry generated on the holding and a silage pad to store maize silage for feeding the dairy herd.

The lagoon is proposed to be:

- Engineered and excavated to SSAFO requirements;
- Fully lined using an impermeable engineered plastic liner system,
- Installed with an under-liner leak detection and monitoring system;
- Managed in accordance with current agricultural storage guidance and compliant with Farming Rules for Water;
- Subject to routine inspection and maintenance procedures.

The silage pad is proposed to be:

- Engineered and excavated to SSAFO requirements, including effluent channels and an effluent storage tank;
- Managed in accordance with current agricultural storage guidance and compliant with Farming Rules for Water;
- Subject to routine inspection and maintenance procedures.

2.3 It is a statutory requirement to inform the Environment Agency (EA) of the proposed construction of both the lagoon and silage pad, a minimum of 14 days before construction. Construction details must be discussed and agreed with the EA before construction.

2.4 The proposed lagoon and silage pad footprint are within a SPZ3 which is considered as part of the total catchment area for groundwater that ends up at the extraction point at the SPZ1 (the area immediately around an abstraction point for domestic supply or for food production purposes).

2.5 The proposed lagoon and silage pad footprint also fall within the River Avon SAC. Any development is required to demonstrate nutrient neutrality within this SAC, particularly nitrogen and phosphorous. Within Agriculture this is already highly regulated, with each farm being required by the EA to have a Nutrient Management Plan designed to be compliant with environmental regulations and Farming Rules for Water.

3. Desk Study

3.1 A preliminary desk study has been undertaken using available mapping, aerial photography, site observations, and existing environmental information.

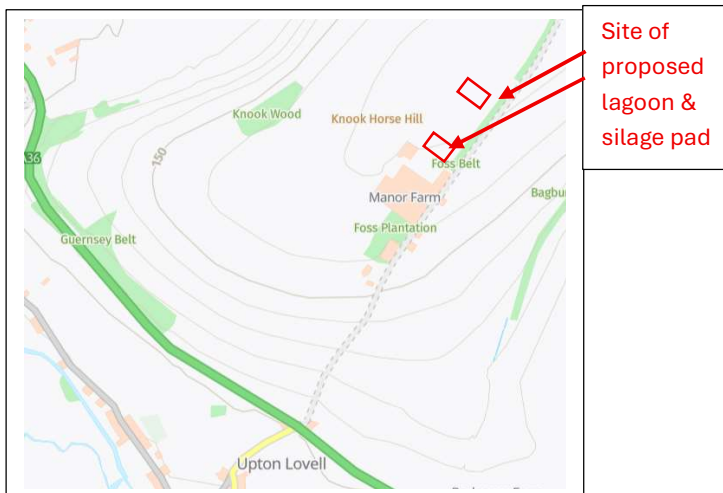


Figure. 1. Site Plan



Figure 2. Aerial map

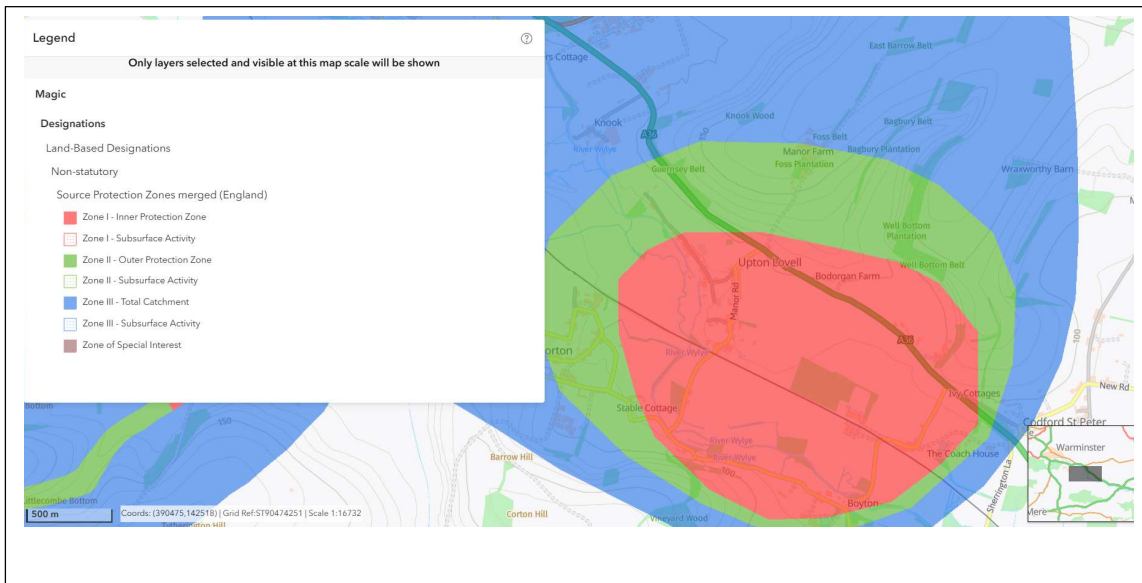


Figure 3. SPZ (source Magic Maps)

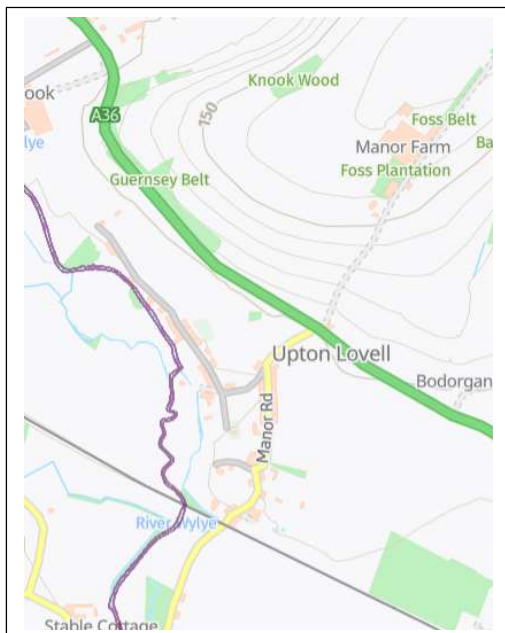


Figure 4. Special Area of Conservation (River Wylfe).

3.2 The desk study identified the following:

- The site lies within a rural agricultural setting;
- Ground conditions are anticipated to comprise topsoil over chalk bedrock typical of the local area;
- The river Wylfe flows approximately 2.0km to the south of the proposed site.
- The site is within the SPZ3.

- No known historical contamination sources have been identified on the immediate site;
- Agricultural activity in the wider area presents an existing baseline nutrient loading risk;
- The proposed lagoon and silage pad locations are outside any immediately identifiable watercourse.

4. Site Walkover Survey

4.1 A preliminary site walkover has been undertaken to visually assess site conditions and surrounding environmental receptors.

The walkover identified:

- Flat to gently sloping agricultural land;
- Existing livestock and agricultural operations in the vicinity;
- No visible evidence of existing pollution or distressed vegetation associated with contamination;
- Surface water pathways that may contribute to runoff during heavy rainfall events;

5. Conceptual Site Model (CSM)

5.1 Potential Source

5.1.1 The primary potential contaminant source is stored livestock slurry within the existing slurry lagoon, the proposed slurry lagoon, and silage effluent from the existing silage clamps and the proposed silage pad:

Potential contaminants include:

- Ammoniacal nitrogen;
- Nitrates;
- Phosphates;
- Silage effluent;
- Organic matter;
- Pathogens and bacteria;
- Suspended solids.

5.2 Potential Pathways

5.2.1 Potential pollutant pathways include:

- Leakage through liner failure;
- Leakage through construction defects;
- Groundwater migration through permeable strata;
- Surface runoff following overtopping or extreme rainfall events;
- Pipework or valve failure;
- Accidental operational spillages during filling or emptying activities.
- Overfill of existing slurry storage, due to insufficient storage capacity, as required for Farming Rules for Water
- Field run-off from slurry applications made during inappropriate weather conditions, or not at times of crop need, resulting from inadequate total storage lagoon volume, which reduces the flexibility to apply slurry and/or dirty water only during appropriate weather periods and in line with crop need.

5.3 Potential Receptors

5.3.1 Potential receptors include:

- Shallow groundwater;
- Downstream surface waters;
- Agricultural soils;
- Groundwater migration through permeable strata;

6. Initial Risk Evaluation and Mitigation

6.1 The principal environmental concern relates to potential contamination of groundwater and the nearby SPZ3 and SAC, arising from leakage, overtopping or failure of the slurry storage system and/or the effluent containment for the silage pad, or application at inappropriate periods of crop need or weather conditions.

However, the following mitigation measures substantially reduce the likelihood of pollution:

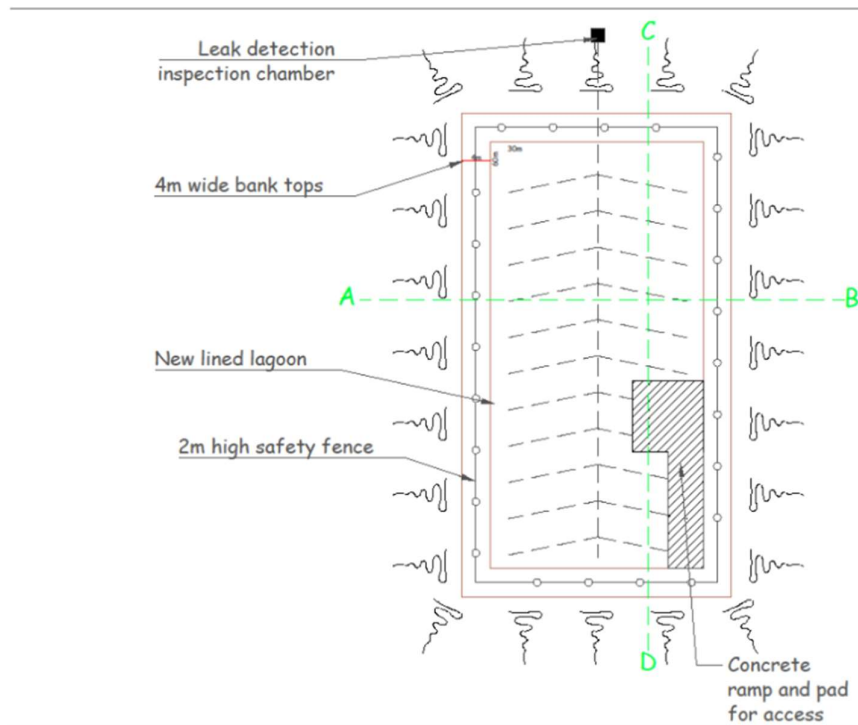
- The purpose of the proposal for the new slurry lagoon, is to reduce the pollution risk, increasing combined slurry storage volumes to be able to improve the flexibility of slurry applications at times of crop need and during appropriate weather conditions. This will allow best practice to be followed and ensure that the farming operations comply with Farming Rules for Water.

- Use of a high-integrity engineered impermeable plastic liner, designed to SSAFO regulation requirements;
- Installation of a leak detection layer/system beneath the liner (CIRIA report C759b 'Lined Lagoons'), as to be agreed with the Environment Agency;
- Appropriate freeboard allowance to prevent overtopping;
- Appropriate effluent containment and tank storage for the silage pad, as to be discussed and agreed with the EA, before construction;
- Routine monitoring and inspection procedures;
- Controlled operational management and compliance with Farming Rules for water;
- Separation distance from SAC and SPZ 1;
- Proposed maintenance and emergency response procedures.
- The farm has a comprehensive Nutrient Management Plan designed by an independent FACTS qualified Agronomist.
- The farm has nutrient export agreements with neighbouring arable farmers, to ensure nutrient neutrality and that nutrients are applied for crop need, and not applied inappropriately (ie to soils with phosphate indices of 3 or above).

Based on the current preliminary information, the residual environmental risk is considered:

- Moderate prior to mitigation;
- Low to low-moderate following implementation of the proposed engineering and operational controls.

Diagram illustrating leak detection system for the slurry lagoon.



7. Uncertainties, Data Gaps and Limitations

- Adverse weather conditions. However the increased storage volumes, will ensure that slurry can be applied at the optimum times for crop need and weather conditions and not applied during rainfall events or other inappropriate times.
- The additional storage provides over 12 months storage for the current dairy herd and significantly reduces the risk of overtopping of either slurry store during heavy rainfall events.

8. Recommended Further Works

To reduce uncertainty and support detailed design and permitting, the following works are recommended:

1. Development of an operational management and emergency response plan, including:
 - Shut-off any transfer pumps in operation;
 - Use of earth bunds, straw bales, temporary berms to dam the flow;
 - Plug field drains, if known and safe to do so;
 - Deploy heavy duty absorbent socks from the farm's spill kit;

- If capacity of the alternative lagoon allows, transfer to store 1 (if lagoon 2 the source); transfer to lagoon 2 (if store 1 the source);
- Clean the spill up with the farm's slurry tanker and transfer to storage, where available or to appropriate crop, where required/suitable;
- Notification to the Environment Agency 24/7 hotline (0800 80 70 60) of any potential pollution incident;

9. Conclusions

This Preliminary Risk Assessment has identified the nearby SPZ3 and SAC as sensitive environmental receptors requiring careful consideration in the design and operation of the proposed slurry lagoon and silage pad.

The proposed lagoon and silage pad design includes significant engineered mitigation measures, specifically:

- Increased lagoon slurry storage capacity;
- Designed to be compliant with SSAFO regulations, including a fully impermeable plastic liner system and effluent channels and tank storage;
- Leak detection infrastructure, design as required by the Environment Agency;
- Routine inspection and monitoring procedures.

Subject to detailed design, appropriate construction quality assurance it is considered that the risk of pollution to the nearby SPZ3 and SAC will be reduced following the proposed construction and that any risk can be appropriately managed.

10. Assumptions and Justification

The conclusions within this PRA are based upon the following assumptions:

- The lagoon and silage clamp will be constructed to recognised engineering standards (CIRIA report C759b); be compliant with SSAFO regulations
- Operational management procedures will be implemented to comply with Farming Rules for water.
- The higher outcome of the project is to achieve extra protection to the groundwater and source water by creating enough capacity to spread only at highly optimum times for crop take up of nutrients and reduce the risk of overtopping during periods of heavy rainfall.
- The outlined construction, with impermeable liner and leak detection system prevents the risk of leakage into the watercourse.

These assumptions are considered reasonable at the preliminary stage based on the information available.