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MENTERA

Technical Report for Farm infrastructure

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Ariennir gan
Lywodraeth Cymru
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1. Introduction

1.1 Objectives of this Report

The purpose of this report is to:

- **To calculate the volume of slurry produced at New Farm over a 5 month winter period.**
- **Estimate the available slurry storage capacity at New Farm.**
- **Offer advice to reduce the volume of slurry.**
- **Calculate additional slurry storage requirement for a cylindrical slurry store at New Farm.**

1.2 Disclaimer

This report is prepared from physical and financial information supplied by the farming client. The report is prepared in good faith and every effort has been made to ensure accuracy, however Kebek Ltd cannot accept liability for errors and omissions. Responsibility for actions taken lies with the client. Professional advice and statutory advice should be taken as appropriate.

1.3 Farming Connect

AgriPlan Cymru Ltd has been approved to deliver the Advisory Service on behalf of Farming Connect. This Technical Report should be part-funded through Farming Connect.

2. Summary

2.1 Background and opportunities

New Farm is a family run 100 acre dairy farm located to the north of Wrexham. The farm business has access to an additional 200 acres of rented land. The dairy herd comprises of 200 milking cows with an average annual milk yield of 6500 litres per head. Around 156 cows and 60 bulling heifers are housed on cubicles with the remaining herd, including followers, loose housed and bedded on straw.

The farm business acknowledges that the existing farm infrastructure requires improvement and is looking at investing in additional slurry storage capacity to bring the holding up to the 5-month storage capacity required under the Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 (CoAPR).

An expression of interest has been submitted to the Nutrient Management Investment Scheme (NMIS) for financial support for a new slurry store. The expression of interest has been accepted by Welsh Government and the farm business is in the process of completing the next stage in the NMIS application process.

The design specification of a new slurry store is based on 3 factors; the freeboard, the 5 month rainfall value for the farm and the volume of slurry produced over the 5 month winter period 1st of October to 1st of March.

Freeboard

The CoAPR state that a slurry store must have a freeboard maintained at all times. The freeboard is the distance from the surface of the slurry held in the store and the top of the retaining walls or embankments. The required freeboard of an earth banked slurry lagoon is 750 mm and **300 mm** for all other stores. As an example, the freeboard for a cylindrical slurry store is 300 mm.

Rainfall

When assessing the volume of slurry that has to be collected and contained over the 5 month winter period, a key factor is the amount of rain that falls onto the surface of the slurry store, and onto the open dirty yards, over the 5 month winter period. At New Farm 420 mm of rain will fall over the 5-month winter period as stated on the Welsh Government data map

https://datamap.gov.wales/maps/974

This equates to a monthly average rainfall of 84 mm per winter month.

2.2 Agreed route forward.

The business will assess the advice in the report and implement the improvement works to the infrastructure. The construction and installation of a new slurry store may need planning permission, and I would recommend that this process begins as soon as possible. Ensuring all improvement works and new structures have the relevant planning permission is also essential under the new regulations.

Natural Resources Wales (NRW) need to be informed of all improvement works to regulatory compliant structures **14 days prior to commencement of works** on site via their prior notification form. This is a legal requirement of the CoAPR. The 14 day notification will be required for the new slurry store and any refurbishment works on the open silage clamp.

The notification of the improvement works can be found on the NRW website and should be emailed to NRW prior to commencement of works on site.

Alternatively, notification of the improvement works can be submitted to NRW via the following link

Preconstruction notification of new slurry store and silage store

3. Business Profile

3.1 The Farm

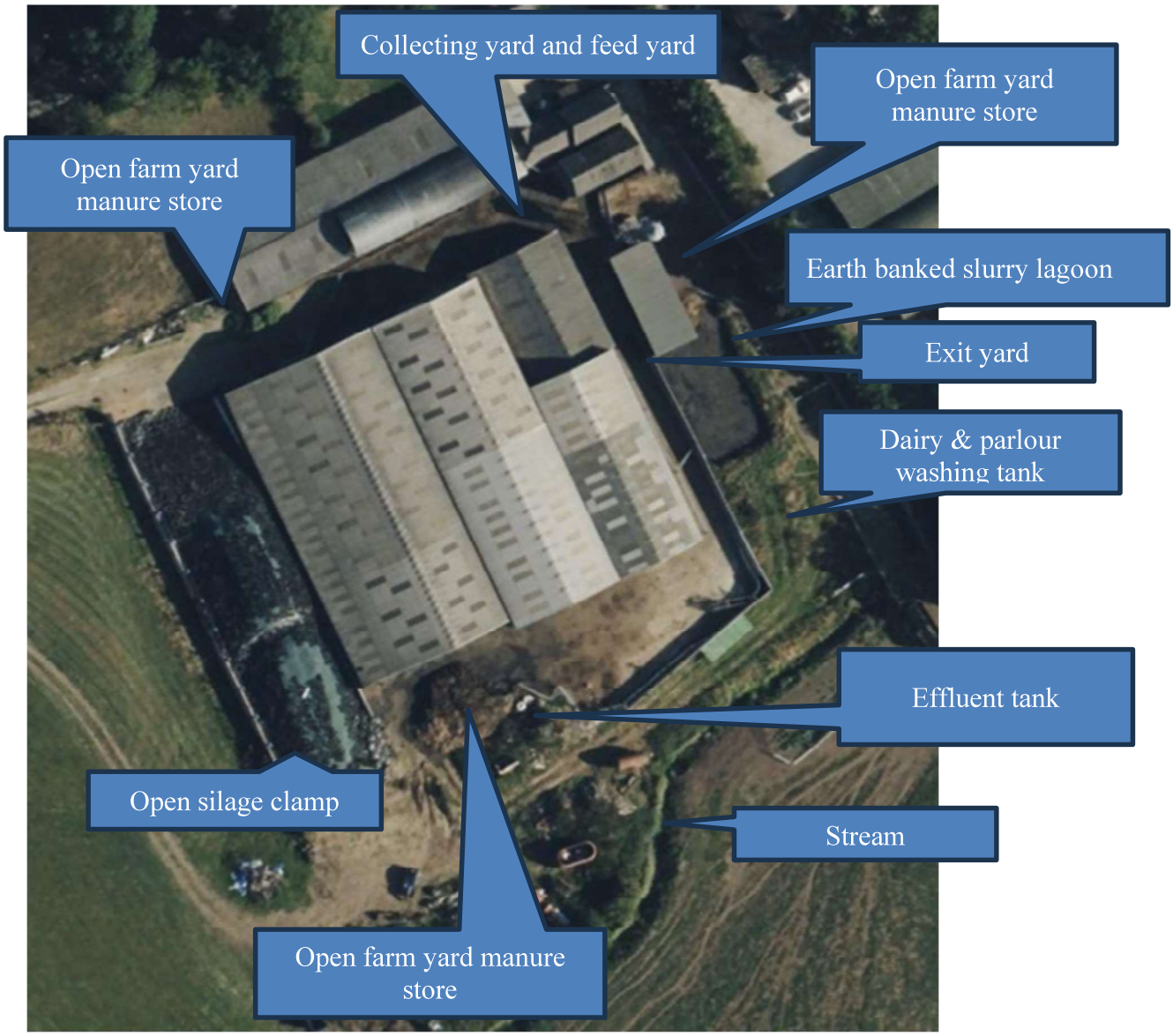


Figure 1 Aerial view of New Farm

The farm business runs a dairy herd of 200 milking cows with an average annual milk yield of 6500 litres per head. The milking herd are housed on both cubicles and loose housing. Around 156 milking cows and 60 bulling heifers are housed on cubicles, with 50 milking cows and 170 youngstock loose housed and bedded on straw.



Figure 2 Left photograph is Rear gable end of cow housing with open silage clamp and open dirty yard. Right photograph is front gable end with open dirty yard.

At New Farm, the farm building complex is cantered around 3 modern portal framed buildings placed adjacent and parallel to one another, with open dirty yards that run the length of the front and rear gable ends (see fig 2).

An open slurry pit is to the east side elevation and a large open silage clamp on the west side elevation. The loose housing for the calves and the milking parlour is at right angles to the 3 modern portal framed buildings.



Figure 3 Earth banked slurry lagoon with open exit yard with transfer channel

Prior to milking the cows access on open collecting yard and return to the cubicles via an open exit yard that runs between the slurry store and the loose housing for the milking cows. Slurry from the open collecting yard and the open exit yard is pushed into a box drain and contained in an earth banked slurry lagoon (see fig 3).



Figure 4 Covered feed stance for dairy cows

The milking herd are fed undercover with some youngstock fed on the open dirty yard between the cubicle housing and the loose housing for the youngstock (see fig 4)

Slurry from the cubicle housing is either scraped across the open dirty yard or collected in a transfer channel within the cubicle housing. The slurry is contained in an earth banked slurry lagoon 30 m long by 26 m wide with an average depth of 2.43 m.



Figure 5 dairy and parlour washing tank with stream approx. 30 m away

Dairy and parlour washings are stored separate from slurry, in a below ground tank that is said to have 52 m^3 storage capacity. The dairy and parlour washings tank is located at the furthest end of the slurry lagoon from the access ramp to the lagoon and approximately 30 m from the stream (see fig 5).



Figure 6 Three open FYM storage areas

Farm yard manure (FYM) from the loose housing is stored at three locations; along the side of the loose housing for youngstock, on an open concrete area near the access lane for the slurry store and on an open yard near the front face of the open silage clamp (see fig 6).

Rain that falls onto the FYM is contaminated with slurry and urine held in the soiled bedding. The clean rain, contaminated with slurry, is classed as slurry and must be collected and contained in a slurry store that complied with CoAPR.

The largest volume of FYM is stored near the silage clamp. Slurry from this open FYM store is not collected but flows onto the open yard and onto the surrounding grassed area and within close proximity of the stream. The lack of control of the slurry from the open FYM stores presents a high risk of causing pollution of the nearby stream. The lack of containment of slurry from the open FYM stores is not compliant with CoAPR. The farm acknowledges that the storage of FYM needs to improve and is looking to address this as soon as possible.



Figure 7 Open silage clamp with no external perimeter channel

The livestock are fed on a cut and cart basis from an open silage clamp (see fig 7). The silage clamp is approximately 61 m long, 15.24 m wide with silage ensiled to an average height of 4.2 m. The silage clamp was built in 2011 and should have been constructed to comply with the Silage Slurry and Agricultural Fuel Oil regulations (SSAFO) that were in force at the time of construction. The silage clamp has a concrete party wall with the livestock housing and a shuttered concrete wall on the other side.

Effluent from a silage clamp is acid and highly polluting and can lead to corrosion of concrete walls and floors, and in particular the floor-wall joint of a silo. To minimise the risk of causing pollution the SSAFO regulations, that were in force at the time of construction, stipulated that a silo must have an external perimeter channel around the outside of silo and below the floor wall joint. The purpose of the channel is to collect any effluent that may seep through the floor wall joint, if the structural integrity of the joint was to fail. This regulatory requirement, for an external perimeter effluent channel, has been carried through to the CoAPR that are in place today.

The silage clamp at New Farm does not have an external perimeter channel in place along the side walls of the clamp and as such the open silage clamp does not comply with CoAPR.

The open silage clamp is open at the front and rear of the clamp there by enabling the farm business to fill the clamp from either end of the clamp. The effluent from the front face of the clamp is said to be collected and contained in an effluent tank. At the time of my visit the effluent collection channel was blocked with silage and effluent was flowing on to the concrete apron towards the FYM storage area. The lack of control of effluent does present a risk of causing pollution to the stream and I recommend that the effluent channel is kept clear at all times.

At the rear of the clamp, the concrete has been graded to ensure that runoff flow to a drain located at the low point nearest the cow housing and directed to the effluent tank. Further guidance on how to improve the effluent channels is provided in Section 4 of this report.

Effluent from the silage clamp should be collected in channels at the front and rear face of the clamp and collected in a below ground effluent tank. The effluent tank is said to have a storage capacity of 36 m^3. At the time of my visit, the effluent tank could not be accessed due to the large volume of FYM stored close by (see fig 8). I recommend that the access to the effluent tank is cleared as soon as possible so that the level of effluent held in the tank can be checked on a daily basis. This will ensure that effluent tank does not overflow with effluent and enter the nearby stream. This is a pollution prevention measure to protect the water quality of the stream.



Figure 8 Effluent tank for clamp

The CoAPR regulations specify the design and storage capacity of the effluent tank.

A regulatory compliant effluent tank needs to have sufficient volume based on the amount of silage stored. This volume is based on an effluent tank with a minimum storage capacity able to hold at least 20 litres of effluent for each cubic metre of silo space if the silo holds less than 1,500 cubic metres. Silos with a capacity of more than 1,500 cubic metres should have an effluent tank of not less than 30 cubic metres plus 6.7 litres for each cubic metre of silo capacity in excess of 1,500 cubic metres.

For a silage clamp with a storage capacity of 3904 m^3 of silage, the minimum storage capacity of the effluent tank should be 46 m^3. It is advised that additional effluent storage capacity is provided to address the 10 m^3 shortfall in effluent storage capacity.

Further advice on the design specification for a silo is provided in Section 4 of this report.

The farm building complex is bordered by a farm boundary on the east side and a stream on the south side. In addition, agricultural machinery access is required to both ends of the clamp during the silage making season. These factors, along with the location of the existing effluent tank, does restrict the location and design of a new slurry store.

3.2 Livestock Numbers

Livestock type and number - 200 dairy cows housed on cubicles producing 6500 litres of milk per annum.

Type of livestock				
Cattle	Category	Number of livestock	Daily excreta/water volume (litres per head per day)	Volume produced in storage period (m^3 per winter month period)
Milking cows housed on cubicles	Annual Av. milk yield 7500 litres	156	53	248
Bulling heifers housed on cubicles		60	40	72
Milking cows loose housed and bedded on straw	Farm Yard Manure only	50		0
Youngstock loose housed and bedded on straw	Farm Yard Manure only	170		0

Figure 9 Current Volume of slurry for cubicle housed livestock at New Farm

The volume of slurry from 156 milking cows and 60 bulling heifers is 320 m^3 per month or 1600 m^3 over the 5 month winter period (see fig 9).

3.3 Volume of slurry from open dirty yards and FYM storage areas



Figure 10 Open FYM store near front face of silage clamp

At New Farm the area of open dirty yards and open FYM stores are generating a significant volume of slurry that has to be collected and contained. The table below illustrates that approximately 79 m^3 of slurry per month is derived from clean rain falling on dirty open yards and onto open FYM storage areas, where it is contaminated with slurry held on the yards (see fig 11). Over a 5 month winter period this equates to 395 m^3 of slurry.

Before considering the design specification of the new slurry store it is important to minimise the volume of slurry, that has to be contained, and this can be achieved by reducing the area of open dirty yards and open FYM storage. Further guidance on this is provided in Section 4 of this report.

Open dirty yard	**Surface area (m^2)**	**Monthly rainfall (mm)**	**Volume of slurry per month (m^3).**
Open collecting yard	182	84	15
Open feed yard	182	84	15
Open FYM store by youngstock loose housing	81	84	7
Open exit yard	253	84	21
Open FYM store and open dirty yard	248	84	21
	Total volume of slurry per month from open dirty yards		**79**

Figure 11 Estimated volume of slurry from open dirty yard per month

3.4 Existing slurry storage capacity

The slurry store is an earth banked slurry lagoon built prior to 1991, with a concrete sloping floor. A slurry storage facility that has been in use since before 1991 is regarded as exempt structures in accordance with CoAPR.

This exempt status means that a structure that has been in place since before March 1991 is not required to comply with the structural design specification of BS 5502 as stated in CoAPR. The exempt status will remain in place. If it is deemed by NRW that the structure causes or present a risk of causing pollution of controlled water, NRW are empowered to bring a structure into compliance with CoAPR, and require the structure to meet the design and construction specification of CoAPR. In this instance NRW can serve a 'Notice' requiring works to be undertaken to bring the structure into compliance and the exempt status is forfeited.

The earth banked slurry lagoon is approximately 30 m long 26 m wide with a slurry transfer channel located on the right hand side of the slurry lagoon. The floor of the earth banked slurry lagoon was not visible as the lagoon was full of slurry. The lagoon is said to be 2.4 m deep.

The CoAPR state that a slurry store must have a freeboard maintained at all times. The freeboard is the distance from the surface of the slurry held in the store and the top of the retaining walls or embankments. The required freeboard of an earth banked slurry lagoon is 750 mm and 300 mm for all other stores.

The estimated available slurry storage capacity of the earth banked slurry lagoon is approximately 657 m^3 with an allowance for 750 mm freeboard, 420 mm of rain that will fall onto the surface of the lagoon over a 5 month winter period and the slope of the internal embankment.

3.5 Total Volume of slurry

Based on current farm practice the total volume of slurry that has to be stored over a 5 month winter period is 1995 m^3.

The existing slurry storage capacity at New Farm is 657 m^3

The shortfall in slurry storage capacity is 1338 m^3.

To comply with CoAPR the farm must have 5 month slurry storage capacity by 1st of August 2024. The farm business has applied for a grant for financial support for additional slurry storage capacity on the farm, with the aim to bring the farm into compliance with CoAPR.

4. FARM ADVICE AND RECOMMENDATIONS.

To minimise the cost of a new slurry store, several measures can be done to reduce the volume of slurry produced on the farm.

This next section offers opportunities to reduce the volume of slurry before considering the design specification of a new slurry store.

Closed period

One of the controls of CoAPR that came into force on the 1st of August 2024 is the restriction for when slurry can be applied to land, and these are cited in these regulations. **The period of time, at which slurry is not permitted to be applied to land, is called the Closed Period.**

The closed period is determined by the soil type and land use and there are exemptions in place, but as a general guide, the closed period, shown in Fig 12, applies to organic manures with high readily available nitrogen i.e., organic manures with more than 30% of the total nitrogen content is available to the crop at the time of spreading. **The readily available nitrogen content of Farm Yard Manure (FYM) is generally below 30% and, as such, the closed period does not apply to FYM, but does apply to slurry.**

Table to show the "closed period" of slurry application to land The Water Resources (Control of Agricultural Pollution Regulations) (Wales) 2021 (see fig 12).

Soil Type	Grassland	Tillage land
Sandy or shallow soil	1st September to 31st December	1st August to 31 December
All other soils	15th October to 15th January	1st October to 31st January

Figure 12 Closed period for application of organic manures with high readily available nitrogen to land

- **Reduce the volume of slurry by storing FYM as temporary field heaps**

During my visit to the farm, we discussed the options of the storage of Farm Yard Manure (FYM). As mentioned earlier in this report, FYM can be applied to land during the closed period.

CoAPR permit the storage of FYM, from the loose housing, as temporary field heaps and specifies how the FYM should be stored in order to minimise the risk of causing pollution.

FYM stored in temporary field heaps should not be sited in the same place each year as they tend to form hotspots of leachate into the soil profile.

The regulations specify that solid FYM field heaps should not be located:

- Within 10m of a surface water or land drain
- Within 50m of a spring or borehole
- On land that is likely to become waterlogged
- On land likely to flood
- On any single position for more than 12 successive months
- On land that is not steeply sloping i.e., not more than a 20^0 slope

There should be a two-year gap before returning to the same site. FYM should be able to be stacked in a freestanding heap without slumping. FYM cleaned out from the livestock housing accommodation could be carried to the FYM temporary field heaps and stored until the land conditions and weather are suitable for spreading.

FYM can also be stored under cover within an impermeable FYM store. A new covered FYM store could be a simple portal framed building on the site of the existing FYM storage area at the side elevation of the loose housing for youngstock.

A covered FYM store needs an impermeable concrete floor and 3 walls to form an enclosure. Ideally the floor needs to slope slightly to the rear of the building. The wall floor joint needs to be sealed to prevent leaking or seepage. The facility must be roofed to prevent any contamination of rainfall. A covered FYM store does not need any collection tank however it is important to prevent any ingress of clean water runoff into the facility via the open front elevation.

The storage capacity of the FYM store could be reduced if a proportion of the FYM is stored as temporary field heaps in the early winter period and the remaining FYM

stored in a covered FYM store during the wetter months, particularly for the time when access to the fields can be difficult.

The volume of FYM produced in the farm will depend on the age and size of the animal.

Livestock	Number of livestock	Estimated Total volume of FYM per month (m^3)
Milking cows loose housed @ 1.83 m^3 of FYM per head month	50	92
Youngstock 3-13 months @ 0.7 m^3 of FYM per head month	85	60
Youngstock up to 3 months @ 0.24 m^3 of FYM per head month	85	20
	Total volume of FYM per month	**172**

Figure 9 estimated volume of FYM per month for livestock that are loose housed

As a guide the estimated volume of FYM for livestock loosed housed and bedded on straw is 172 m^3 produced per month (see fig 13).

A covered FYM store 13.7 m long (3*15 foot bays) by 9.144 (2*15 foot bays) with 3.6 m walls will have approximately 78 days storage capacity for the FYM.

The storage capacity of the FYM store could be reduced if a greater proportion of the FYM is stored as temporary field heaps in the early winter period and the remaining FYM stored in a covered FYM store during the wetter months, particularly for the time when access to the fields can be difficult.

Clean water from the roof must be diverted to a clean water drain or rainwater harvesting system (see Sustainable Urban Drainage Systems) below.

- **Sustainable Urban Drainage Systems (SUDS)**

  If it is decided that the best option for the storage of FYM is to store it in a covered store, it is likely that you will need to contact the Local Authority with regards to Sustainable Urban Drainage Systems (SUDS).

  Sustainable Urban Drainage Systems (SuDS) is a process by which the speed of water from developed sites is slowed down sufficiently to minimise the risk of flooding downstream. In Wales new legislation under the Schedule 3 of the Flood and Water Management Act (FWMA) 2010 requires surface water drainage for new developments to comply with mandatory National Standards for sustainable urban drainage (SuDS). This new legislation that came into force on the 7th January 2019 and is **most relevant for agricultural developments and construction that have a surface area of 100 m^2**. If the surface area of the new covered FYM store is below 100 m^2, then SUDS will not apply

  The County Council, as the Local Authority, is the approval body and is referred to as the Sustainable Urban Drainage Systems Approval Body (SAB). There is a duty under the legislation for the SAB to adopt and maintain the SuDS scheme. It is advised that the Local Authority is contacted to obtain a better understanding of this adoption and maintenance duty as it may impact on land ownership, ownership of asset and rights for access etc.

- **Reduce area of open dirty yard**

  At the front gable end of the cubicles housing is an open yard. To minimise the area over which slurry must be scraped it is suggested that transfer channels are placed across the gable end of the cubicle housing. Slurry scraped from the cubicle passages can be pushed in to the transfer channels. Slurry collected in the transfer channels should be directed to the reception pit of the new slurry store.

- **Additional slurry storage**

  There are three main slurry storage options; a concrete slurry store, a cylindrical slurry store often referred to as a tin tank and an earth banked slurry lagoon. The favoured option for the farm business is an above ground cylindrical slurry store.

  The size of the above ground cylindrical slurry store will vary in height in accordance with the number of rings.

  If the above recommendations are implemented the volume of slurry that must be contained over the winter period is reduced from 1995 m^3 to 1855 m^3 (see fig 14 & 15)

  The shortfall in slurry storage capacity on the farm reduced from 1338 m^3 to 1198 m^3 over the 5 month winter period.

Type of livestock				
Cattle	Category	Number of livestock	Daily excreta/water volume (litres per head per day)	Volume produced in storage period (m^3 per winter month period)
Milking cows housed on cubicles	Annual Av. milk yield 7500 litres	156	53	248
Bulling heifers housed on cubicles		60	40	72
	Estimated volume of slurry from cubicle housing per month			320

Figure 14 Estimated volume of slurry at New Farm

Open dirty yard	Surface area (m^2)	Monthly rainfall (mm)	Volume of slurry per month (m^3).
Open collecting yard	182	84	15
Open feed yard	182	84	15
Open FYM store by youngstock loose housing FYM to be stored as temp. field heaps	81	84	0
Open exit yard	253	84	21
Open FYM store and open dirty yard FYM to be stored as temp. field heaps	248	84	0
	Total volume of slurry per month from open dirty yards		**51**

Figure 10 Estimated volume of slurry after recommendations are implemented

To comply with CoAPR the additional slurry store must have at least 1198 m^3 of available capacity (plus an allowance for the freeboard and the rainfall).

The freeboard is 300 mm and the volume of rain that falls onto the surface of the slurry store is 420 mm .

As a guide

A cylindrical slurry store 21.3 m in diameter and 4.23 m high will provide sufficient slurry storage capacity with an allowance of 300 mm freeboard and 420 mm of rain that will fall onto the surface of the slurry store if it remains open.

A cylindrical slurry store 17.93 m in diameter and 5.63 m high will provide sufficient slurry storage capacity with an allowance of 300 mm freeboard and 420 mm of rain that will fall onto the surface of the slurry store if it remains open.

Slurry from the cubicles of the milking cows can be collected in the transfer channels are directed to a below ground reception pit. Slurry collected in the reception pit is pumped into the above ground cylindrical slurry store.

CoAPR states that the minimum capacity of the reception pit must be 2 days of slurry production plus a freeboard of 300 mm plus 2 days of rain that falls onto the reception pit if it remains open.

I recommend that the reception pit for the cylindrical slurry store has 25 m^3 of storage capacity, plus an allowance for a 300 mm freeboard plus an allowance for 6mm of rain that may fall onto the surface of the reception pit over a 2 day winter period if the reception pit remains open.

Slurry held in the existing slurry lagoon can be transferred to the cylindrical slurry store for storage over the winter period.



Figure 16 proposed location of new slurry store

To minimise the risk of causing pollution, CoAPR states that a new slurry store must not be within 10 m of watercourse. It is also advised that the slurry store does not interfere with the structural integrity of the existing effluent tank. It is important to place the new slurry store away from vehicle traffic and livestock as this can damage the integrity of the slurry store. The proposed location for the new slurry store is shown in fig 16.

The additional slurry store will enable the farm business to comply with the CoAPR and allow the farm to access all land thereby maximising the nutrients held in the slurry. Slurry can be applied to land at optimum times of crop growth and nutrient uptake, thereby reducing the need for inorganic fertilisers.

The proposed slurry store will improve nutrient value of the material produced by the stock and allowing greater control of application to maximise the effect on the land of the stored nutrients. This will significantly reduce the pollution risk of runoff during wet weather periods, reduce the frequency of slurry mixing/spreading and associated ammonia emissions, improving the viability of the farm as a business.

Importantly, there will be a significant reduction in stirring/agitating of the slurry in the existing slurry stores thereby reducing current ammonia emission caused by the constant need to empty the existing storage facility. The slurry will form a crust when not agitated over the winter period, reducing ammonia emissions. Currently the slurry must be mixed and spread on a regular basis, throughout the winter period, each time releasing ammonia emissions into the atmosphere. The slurry stores will only be emptied at the end of the winter closed period, at a time of optimum growth and nutrient uptake.

- **Install an external perimeter channel of silage clamp**

To minimise the risk of causing pollution the silage clamp must have an external perimeter channel around the outside of silo and below the floor wall joint. The purpose of the channel is to collect any effluent that may seep through the floor wall joint (see fig 17, 18 & 19).

At present the silage clamp, which has been in use since 2011, does not have an external perimeter effluent channel and does not comply with the CoAPR regulations. To bring the silage clamp into compliance an external perimeter channel must be installed below the floor wall joint of the silage clamp. If the work is not carried out, then the farm business is at risk of appropriate enforcement action by NRW.

When the clamp is next empty install a concrete kerb along the outside of the clamp floor. Place freestanding panels along the two sides of the clamp. The panels will create an external perimeter channel between the concrete panel and the kerb thereby creating an effluent channel.



Figure 11 Example of a perimeter effluent channel

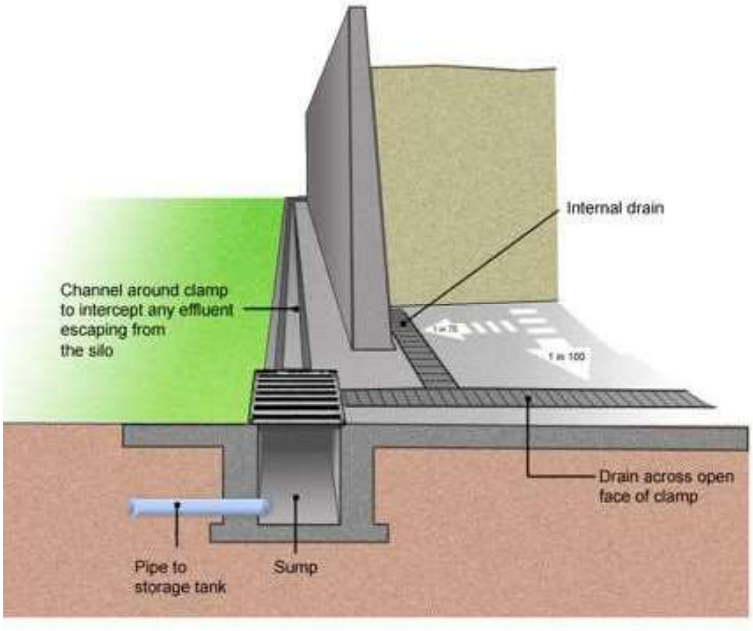


Figure 18 Example of an effluent collection channel in cross section



Figure 19 example of external effluent channels with freestanding panels

I also recommend clearly defining the perimeter of the clamp by placing effluent collection channels at the front and rear face of the clamp. This will separate the open clean yard areas from the clamp. The clean yard can be defined from the clamp by a channel or a concrete shoulder (see fig 20).



Figure 12 Example of a channel and concrete shoulder

- **Install additional effluent storage.**



Figure 21 Example of a prefabricated effluent tank

The effluent from the silage clamp is acid and highly polluting. For this reason, the tanks must have a 20-year durability life without maintenance and require certification to Natural Resources Wales requirements.

Effluent tanks constructed on site using in-situ reinforced concrete, masonry or other structural materials must be impermeable. I suggest that further professional advice on the appropriate design is sought if the tank is to be constructed on site.

Proprietary silage effluent tanks are common such as the Glass Reinforced Plastic (GRP) tank shown in fig 21. Tanks and any associated drainage should be installed strictly in accordance with the manufacturer's specification. To address the shortfall in slurry storage capacity a tank of 10 m3 is required to meet the CoAPR regulations

5 Action Plan

Objective	Action required	Responsible Person	Time Frame	Outcome
Reduce the volume of slurry to be collected and contained.	Store FYM as temporary field heaps.	Anne Morris	ASAP	Reduce capital costs of additional slurry storage facility.
Reduce the volume of slurry to be collected and contained.	Install transfer channels at front gable end of cow housing.	Anne Morris	ASAP	Reduce capital costs of additional slurry storage facility.
Ensure compliance with Local Planning Regulations.	Contact Wrexham County Council Planning Department before constructing new slurry store.	Anne Morris	ASAP	Ensures regulatory compliance.
Complete notification form.	Contact NRW 14 days before construction of new slurry store commences.	Anne Morris	ASAP	Ensures regulatory compliance.
Ensure adequate slurry storage capacity is provided.	Construct new slurry storage facility.	Anne Morris	NMIS grant submission will govern schedule of works.	Ensures regulatory compliance.
Pollution prevention.	Install external perimeter channels for silage clamp.	Anne Morris	When the silage clamp is empty.	Ensures regulatory compliance.

6 Further Guidance

Natural Resources Wales Guidance

Guidance for Farming

General guidance for the Farming sector

Notification of the improvement works can be submitted to NRW via the following link.

Preconstruction notification of new slurry store and silage store

Farming Connect Guidance

Farming Connect home page.
Farming Connect home page

Control of agricultural pollution slurry storage fact sheet

Slurry storage Fact sheet

Control of agricultural pollution storage of silage

Silage storage Fact sheet

Farm Nutrient workbook guidance

Farm nutrient workbook guidance

Risk map guidance

Producing a risk map guidance

Construction Guidance for Livestock manure and silage storage

Ciria: Livestock Manure and Silage storage infrastructure for agriculture – this guidance is available in 2 parts – part 1 is a selection guidance and part 2 is design and construction**. The documents are free to download.**

Construction guidance for manure and silage store

Statutory Guidance

The Water Resources (Control of Agricultural Pollution Regulations) (Wales) (2021)

Control of Agricultural Pollution Regulations