Appendix 13: Drainage Review – Cedarwood Farm, Dated 27/05/20

Questionnaire

Receptors - where does the drainage end up - the outfall or destination of liquids

On the site drainage plan a **receptor** may be identified as either an engineered structure for the storage and subsequent managed disposal or a point of unmanaged discharge to controlled waters:

Engineered structures – lagoons, above-ground tanks, below ground tanks, reception pits – usually receive only contaminated water and slurries

Controlled waters - ponds, rivers and ditches – these may only receive uncontaminated water

Swales and soakaways – may only receive uncontaminated or lightly contaminated water

Question		Guidance	Comments
1	**Is (are) the receptor(s) clearly identified on the plan?**	Show the location and boundary of engineered structures. Ensure that the plans also shows the location of controlled waters, swales and soakaways	Man-holes and septic tank indicated on the plan.
2	**Is it (are they) accessible at all times?**	Access paths should be kept clear of nettles/thistles etc. to allow inspection by both the operator and the Environment Agency at all times. Answer for each receptor identified if more than one. Observe site health and safety issues when dealing with slurry stores.	Man-hole covers are easily accessible
3	**Are all sources identified that discharge to your receptors?**	Where are the discharge points into ponds and ditches? As this water must be clean sources must be identified. Have you identified the source of all of the pipes discharging to your engineered structures and other receptors?	Contaminated water discharges into dirty water tanks. Toilet waste discharges into Klargester treatment plant which then runs into land drains. Yard run off water discharges into land drains which run into ditches. These are indicated on the Drainage Plan.
4(a)	**Are inlet points known?**	The inlet and outlet points to dirty water stores should be identified The inlet points to swales and soakaways should be identified. How is water level maintained in ponds? Is there an outflow, where is it and to what does it discharge and is it controlled? Where there is no outflow and the pond does not overflow, is the pond leaking to groundwater?	The inlet and outlet points to dirty water tanks are identified on the plan.
4(b)	**Are outlet points known?**		
5	**Are structures appropriately sized and constructed?**	Engineered structures should be of sound design and maintained to ensure their integrity. They should be of sufficient size to meet both the operational requirements of the individual installation and to meet statutory long-term storage requirements. These are the Control of Pollution (Silage, Slurry and Fuel Oil) Regulations at all installations (and the Nitrate Vulnerable Zones Regulations where appropriate). Structures should be managed to ensure that the correct freeboard is	Man-holes are well constructed and meet requirements.

		maintained and that overfilling does not occur. Good construction, management, maintenance and appropriate sizing also applies to swales	
Question		**Guidance**	**Comments**
6	**Can receptors be managed to protect the environment?**	Can all of the receptors be protected? Can all discharges to them be contained, blocked, by-passed or isolated if necessary (this should be established in the accident management plan)? Can they be monitored in an emergency? How do you know when they are full or empty?	The man-holes and outlets are designed to facilitate flash storm weather.
7	**Is the quality of run-off consistent in all cases even though the quantity may fluctuate?**	The quality of run-off can change? Clean water flows can become temporarily dirty (i.e. concrete driveways during shed cleanouts) If this is the case then a diversion system will need to be in place. If there is no diversion system installed then the run-off will need to be permanently treated as dirty water and directed to a suitable receptor. This may place a large storage burden on an engineered structure. There may also be subsequent disposal costs. This may be an area where operators can make cost effective improvements to their site drainage.	Houses are washed out after the manure has been removed and the houses have been cleared of all excess debris. All roadways are concreted and regularly brush swept to avoid contamination of surface water receptors. Any sweepings are disposed of by being spread on the fields.

Pathways – how does the drainage get there – the route that liquids take

On the site drainage plan the pathway should be identified by arrows showing the direction of flows, the location of drain inlets and access points (manhole covers and inspection chambers). The pathways are likely to be one of the following three categories:

Gutters, downpipes and drains – may be piped pathways fixed or temporary (rigid or flexible), above ground or buried, gravity fed or pumped

Overland flow – may be planned and marshalled (yards and slopes)

Channels, gullies and drain inlets – may be directing flow or intercepting it (to protect buildings and structures)

Question		**Guidance**	**Comments**
8	**Are all pathways shown on the plan?**	The route should be shown in its entirety including direction of flow.	n/a no pathways – concrete apron identified on plan.
9	**Are all manholes and inspection covers shown on the plan?**	Use the standard symbols to describe these. The key to symbols to use is in the 'Introduction' to this document.	Man-holes are shown on the plan.
10	**Are they identified as either clean, dirty or lightly contaminated on the plan?**	This refers to their identification and designation on the plan. Where a diverter is in place to deal with flows of variable quality then the plan should show this and identify all of the categories that may use the pathway	Clean, contaminated and lightly contaminated water is identified on the plan.

11	**Are they identified on site as clean or dirty by coloured paints?**	Are all manholes, inspection chambers, drain inlets etc. identified by paint marks of the appropriate colour to signify their contents - red for dirty, blue for clean? Mark the direction of flow in the appropriate colour.	All manhole covers are identified.
12	**Are all gutters downpipes and drains in good condition?**	Are they entire (are there missing and broken gutters)? Do they connect to a satisfactory downpipe? Does it discharge to a drain and does the drain exclusively service the gutter (is the water clean and will it remain uncontaminated)? Are they adequately sized (downpipe frequency, diameter etc.)? Are they fitted with filters? Are they maintained and do they work?	All man-holes and gutters are in good condition.
13	**Are sleeping policemen, diverters or interceptors identified on the plan?**	Overland flow is a major feature of all farm installations. For each surface flow pathway the following points should be considered and documented: Is it concrete and is it impermeable (not cracked or potholed)? Are there any deviation devices – sleeping policemen, interceptors? Is there any sectioning for clean and dirty water separation and is this permanent or temporary. If so does it change during the year at peak times such as mucking out or stock movement? Is the flow ever impeded or contaminated by temporary storage of manures, straw, feedstuffs etc. if so is it diverted if it was previously clean?	Houses are washed out after manure has been removed from the houses. Wash out water is classed as contaminated and discharged into dirty water tanks.
14	**Does the plan show the limits of both concreted and grassed areas?**	Some clean water/rainfall may be disposed of on grassed areas or soakaways. Some run-off may initiate from grassed and unconcreted areas. Some areas may have surfaces made from tarmac, bitmac or compacted road planings. They should be shown on the plan as either a source, pathway or a receptor (or a combination).	Rainfall water from grassed areas flows into ditches. This is located on the plan.
15	**Are all drain inlets, channels and gullies identified on the plan?**	Channels, gullies and drain inlets: Where are they? Are they part of an integrated system with junctions and inspection chambers? What is near them and are there high risk activities upslope of them? If so are safeguards in place (kerbs installed, emergency drain covers etc) Do they take clean or potentially clean water?	French drainage channels take roof water. Contaminated water is routed into the dirty water tanks.

16	**Do they take clean or contaminated water and does the plan show this?**	Are they identified by either red or blue colouring on the plan as appropriate? If there are flows of variable quality then use more than one colour as appropriate	Roof water discharges into French drains (identified in purple) Yard water is identified as green Contaminated water i.e from washing out houses as red.

Sources and pollutants – where does the drainage come from and what is it

On the site drainage plan a source will be shown as a physical structure. This may include: buildings, tanks, hoppers, raceways, yards, reception pits, clamps, incinerators, wheel washes etc. Depending on what the structure is, it will generate a range of liquids and possible contaminants.

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17	**Are all sources included on the plan and are they clearly identified?**	Are all the buildings included on the plan?	All buildings are included on the plan
18	**Is the roof water from the structure uncontaminated?**	The collection of rainwater from roofs is the most obvious source of potentially uncontaminated liquid (clean water). This, and run-off from clean yard surfaces is the only material that can be directed straight to a watercourse. However, where there are roof vents, roof water is assumed to be contaminated and should be intercepted.	Roof water is shown as clean water on the Drainage Plan as the roof vents are facilitated to allow air in and not to extract contaminated air from.
19	**Is the rainfall collected from yard areas uncontaminated?**	Provided that they are kept clean, run-off from yards can be classed as uncontaminated. Yard cleanliness may be periodic. During shed emptying or livestock removal they may be dirty and some form of drainage diversion will be necessary.	Rainwater is uncontaminated.
20	**Are all contaminated liquids directed to a managed receptor?**	Other materials that may be generated from buildings may include: Slurry (from manure stores, seepage from buildings and passageways, scraping routes etc.). Fuels and oils, pesticides, disinfectants. Feedstuffs – spillages and dust from milled products. Pressure washing areas can also be a source of contaminated water.	Contaminated water from the washing out process is diverted into the dirty water tanks
21	**Are any lightly contaminated sources directed to swales or soakaways?**	Dust from buildings with side-wall ventilation systems and rainfall from roof-vented sheds may create contaminated water. This may be disposed of via a swale or a soakaway taking account of groundwater vulnerability. Soakaways may not be appropriate if the site is on a major aquifer.	No swales or soakaways on site.

22	**Has the release of all contaminants been minimised where possible?**	The risk from contaminants may occur continuously from rainfall, scraping down, seepage, ventilation fans etc. Other contaminants may be only occasionally released from delivery of fuels, pesticides, feedstuffs, shed clearance and cleaning at the end of rearing cycles. Rarer risks arise from accident and emergency situations. Most sources and risks can be minimised by bunding stores, kerbing muck pads, installing sleeping policemen in muck passage doorways etc.	Yes the release of contaminants has been minimised through the diversion system which is used during washing out.

Checklist – are the following included on your drainage plan? Points to be shown on plan	**Tick Included on Plan**
The location of all receptors	Yes
All buildings, structures and other sources of drainage	Yes
Points where clean water discharges to ditches, rivers and watercourses	Yes
Outfall points into dirty water lagoons and their emptying points	n/a
Boundaries of grassed areas, swales and soakaways	n/a
Pathways using blue where the flows are clean water	Green
Pathways using purple where the flows are lightly contaminated water	n/a
Pathways using red where the flows are dirty water	Red
Access points into the pathways and coloured accordingly	Yes
Inspection points and manholes and coloured accordingly	Yes
Diverters, interceptors and sleeping policemen	n/a

Drainage action plan – with examples in italics Issue	**Action**	**Proposed timescale for completion**	**Estimated cost £**	**Timescale agreed with Environment Agency**
Sources of drainage (Q3)	*Identify the source of the drainage to ditch using dye tracing down manholes*	*12 months*	20	
Access to receptors and inspection points (Q2)	*Weed clearing around soakaways and ditches added to grass-cutting programme*	*Immediate*	0	
Size of structures, alarms etc. (Q5 & 6)	*Review slurry storage capacity in light of NVZ revisions. Input from EA needed*	*3 months*	0	
Overflow management (Q6)	*Broiler house washing procedures to be modified to include manning of wash water tanks to oversee filling and raise alarm if level reaches to within xm3 capacity*	*Immediate*	500	
Installation and safe operation of diversion features (Q7 &13)	*Maintain and improve existing features – lift and clean gratings from dirty water drainage channel in front of sheds*	***Immediate***	0	
Old wash water tank	*Replace old wash water tank located at house 3 with new underground tank*	*6 months*	*5000*	
	NO ACTIONS AT THIS TIME			