Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

LIQUID MANURE STORAGE: Earthen manure storage (EMS): Naturally occurring protective layer

*(complete a copy of this section for **EACH** proposed earthen liquid manure storage facility with a naturally occurring protective layer)*

Facility description / name *(as indicated on site plan)*

1. _____

2. _____

Manure storage capacity *(complete a separate row of this table for each cell of the EMS)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY	
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (m^3) (excl. 0.5 m freeboard)	Filled in lower ¼? Y/N
1.									
2.									
							TOTAL CAPACITY		

Surface water control systems

Describe the run-on and runoff control system

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____ (m)	Provide details (as required)	
Soil texture	_____% sand	_____% silt	_____% clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested	Hydraulic conductivity (cm/s)	Describe test standard used

Additional information *(attach copies of soil test reports)*

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

LIQUID MANURE STORAGE: Earthen manure storage (EMS): Compacted soil liner

*(complete a copy of this section for **EACH** proposed earthen liquid manure storage facility with a compacted soil liner)*

Facility description / name *(as indicated on site plan)* **1.** _____

2. _____

Manure storage capacity *(complete a separate row of this table for each cell of the EMS)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY	
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (excl. 0.5 m freeboard) (m^3)	Filled in lower ¼? Y/N
1.									
2.									
							TOTAL CAPACITY		

Surface water control systems

Describe the run-on and runoff control system

Sealing

Describe sealing practices for piping, etc. that penetrates the liner

NRCB USE ONLY
Requirements met: ☐ YES ☐ NO

Liner protection

Describe how the inside walls, bottom and outside walls are protected from erosion

Describe how the physical integrity of the liner will be maintained from other damage

NRCB USE ONLY
Requirements met: ☐ YES ☐ NO

LIQUID MANURE STORAGE: Earthen manure storage (EMS): Compacted soil liner (cont.)

Compacted soil liner details

Thickness of compacted liner _____(m)		Provide compacted liner details (as required)	
Soil texture	_____% sand	_____% silt	_____% clay
Atterberg limits	Plastic limit _____	Liquid limit _____	Plasticity index _____
Hydraulic conductivity	Hydraulic conductivity (cm/s)		
	Describe test standard used		

Additional information *(attach copies of soil test reports)*

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource:_____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Compacted soil liner details

Liner specification comments (e.g. compaction, moisture content, thickness):

Leakage detection system required: ☐ YES ☐ NO If yes, please explain why.

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner

*(complete a copy of this section for **EACH** proposed in-barn liquid manure storage facility with a concrete liner)*

Facility description / name *(as indicated on site plan)*

1. _____

2. _____

3. _____

Manure storage capacity *(use one row in the table for **EACH** in-barn storage. Attach additional pages if you require more rows)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	**NRCB USE ONLY** Calculated storage capacity (m^3)
1.					
2.					
3.					
				TOTAL CAPACITY	

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness		Method of sulphate protection
	Concrete strength		Concrete reinforcement size and spacing
In-barn manure pit floors	Concrete thickness		Method of sulphate protection
	Concrete strength		Concrete reinforcement size and spacing
In-barn manure pit walls	Concrete thickness		Method of sulphate protection
	Concrete strength	Horizontal reinforcement size and spacing	Vertical reinforcement size and spacing

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner (cont.)

Describe how the joints at the junction of the pit walls, pit floors and any other joints will be sealed

Describe sealing practices for piping, etc. that penetrates the liner

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Liquid manure: 32MPa (B)
Category A is required to be engineered
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Additional information

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource:_____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Concrete liner requirements

Leakage detection system required: ☐ YES ☐ NO If yes, please explain why

LIQUID MANURE STORAGE: Synthetic liner

*(complete a copy of this section for **EACH** proposed liquid manure storage facility with a synthetic liner)*

Facility description / name *(as indicated on site plan)* **1.** _____

2. _____

Manure storage capacity *(use one row in the table for **EACH** cell of the synthetic lined storage, attach additional pages if you require more rows)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY	
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (excl. 0.5 m freeboard) (m^3)	Filled in lower ¼? Y/N
1.									
2.									
							TOTAL CAPACITY		

Surface water control systems

Describe the run-on and runoff control system

Sealing

Describe sealing practices for piping, etc. that penetrates the liner

NRCB USE ONLY
Requirements met: ☐ YES ☐ NO

Liner protection

Describe how the inside walls, bottom and outside walls are protected from erosion

Describe how the physical integrity of the liner will be maintained from other damage

NRCB USE ONLY
Requirements met: ☐ YES ☐ NO

LIQUID MANURE STORAGE: Synthetic liner (cont.)

Synthetic liner details

Provide synthetic liner material details

Additional information *(attach copies of design/engineering reports)*

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource:_____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Synthetic liner requirements

Leakage detection system required: ☐ YES ☐ NO If yes, please explain why.

Construction plans approved by professional engineer: ☐ YES ☐ NO

Will liner be installed by manufacturer approved contractor and qualified third party?: ☐ YES ☐ NO

Preparation of liner bed (comments):

Condition required: ☐ YES ☐ NO

Part 2 — Technical Requirements

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

LIQUID MANURE STORAGE: Concrete or steel tank (required to be engineered)

*(complete a copy of this section for **EACH** proposed concrete or steel tank for liquid manure)*

Facility description / name *(as indicated on site plan)* **1.** _____

2. _____

Manure storage capacity

	Dimensions (or length and width / diameter) (m)	Depth (m)	Depth below ground level (m)	NRCB USE ONLY	
				Calculated storage capacity (excl. 0.3 m freeboard) (m^3)	Filled in lower ¼? Y/N
1.					
2.					

Surface water control systems

Describe the run-on and runoff control system

Concrete or steel tank details

Manure tank floor	Concrete thickness	Method of sulphate protection
	Concrete strength	Concrete reinforcement size and spacing
Manure storage tank walls: provide details on the construction of the proposed manure storage tank walls		

LIQUID MANURE STORAGE: Concrete or steel tank (cont.)

Describe sealing practices for piping, etc. that penetrates the liner
Describe how the joints at the junction of the tank walls, tank floors and any other joints will be sealed

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource:_____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Concrete or steel tank requirements

Leakage detection system required: ☐ YES ☐ NO If yes, please explain why.

Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

Application under the *Agricultural Operation Practices Act* for a confined feeding operation, manure collection area and/or manure storage facility(ies)

LIQUID MANURE STORAGE: Alternative liner

*(complete a copy of this section for **EACH proposed** liquid manure storage facility with an alternative liner)*

Please contact an approval officer to identify the AOPA requirements which need to be met and identify whether a qualified professional is required. Note that ongoing monitoring may be required.

Facility description / name *(as indicated on site plan)* **1.** _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY	
				Calculated storage capacity (excl. 0.5 m freeboard) (m^3)	Filled in lower ¼? Y/N
1.					

Surface water control systems

Describe the run-on and runoff control system

Groundwater control

Describe the proposed alternative liner

Provide information and calculations used to show equivalency with AOPA requirements

Additional information *(attach copies of design/engineering reports)*

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO