

## 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)

<b>NRCB USE ONLY</b>	Application number	Legal land description
<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Registration <input type="checkbox"/> Authorization <input type="checkbox"/> Amendment	<b>LA23044</b>	<b>NE 19-12-19 W4M</b>

### APPLICATION DISCLOSURE

This information is collected under the authority of the *Agricultural Operation Practices Act (AOPA)*, and is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*. This information is public unless the NRCB grants a written request that certain sections remain private.

**Any construction prior to obtaining an NRCB permit is an offence and is subject to enforcement action, including prosecution.**

I, the applicant, or applicant's agent, have read and understand the statements and that the information provided in this application is true to the best of my knowledge.

Aug - 8, 2024

Date of signing

Hutterian Brethren Church of Turin

Corporate name (if applicable)

Signature

Martin Waldner

Print name

### GENERAL INFORMATION REQUIREMENTS

**Proposed facilities:** list all proposed confined feeding operation facilities and their dimensions. Indicate whether any of the proposed facilities are additions to existing facilities. (attach additional pages if needed)

Proposed facilities	Dimensions (m) (length, width, and depth)
Pens C1, C2, C3, C4 (already constructed)	236 m x 83 m
Pens E1, E2, E3 (already constructed)	55 m x 34 m
Pens E4, E5, E6 (already constructed)	125 m x 55 m
Pens D1, D2, D3, D4, D5	275 m x 69 m
SE Catch Basin <span style="color:red">partially constructed (54 m x20 m, unknown depth)</span> <span style="color:red">(Catch basin south)</span>	161 m x 26 m x 4m

**Existing facilities:** list ALL existing confined feeding operation facilities and their dimensions

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Feedlot pens - A & H Alley	269 m x 54 m	confirmed
Feedlot Pens - B Alley	244 m x 54 m	confirmed
Feedlotpens-S1 & S2	24 m x 30 m	confirmed
<b>NRCB USE ONLY</b>		



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If a new facility is replacing an old facility, please explain what will happen to the old facility and when.  N/A

Construction completion date for proposed facilities Spring 2025

**Additional information**

A & B alley to place RCC  
 A, D, and E alley will have RCC

AO comment: As per email from Mr. Lobbezoo on September 11:RCC is already in place in pens C1-C4 and E1 to E6, except for the space for straw storage in the middle of row C. RCC is already in place in the historical feedlot as well, which would be rows A and B. D will also have RCC once the permit is in place.

**Livestock numbers:** Complete only if livestock numbers are different from what was identified in the Part 1 application. Note: if livestock numbers increase in your Part 2 application, a new Part 1 application must be submitted which may result in a loss of priority for minimum distance separation (MDS).

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	Permitted number	Proposed increase or decrease in number (if applicable)	Total
Hogs Farrow to Finish	600	0	600
Dairy	110	100	10
Layer	1900	1600	300
Broilers	14500	0	14500
Feedlot Finishers	3000	3000 <del>2500</del>	6000 <del>5500</del>
Ducks	1200	0	1200



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## **DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING WATER ACT LICENCE** issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO) *Date and sign one of the following four options*

### **OPTION 1: Applying through the NRCB for both the AOPA permit and the Water Act licence**

I **DO** want my water licence application coupled to my AOPA permit application.

Signed this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
*Signature of Applicant or Agent*

### **OPTION 2: Processing the AOPA permit and Water Act licence separately**

1. I (we) acknowledge that the CFO will need a new water licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. I (we) request that the NRCB process the AOPA application **independently** of EPA’s processing of the CFO’s application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB’s decision will not be considered by EPA as improving or enhancing the CFO’s eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to EPA’s consideration of whether to grant the *Water Act* licence application.
5. I (we) acknowledge that any such construction or livestock populating will be at the CFO’s sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove “works” or “undertakings” (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.
7. **Provide:** Water licence application number(s) \_\_\_\_\_

Signed this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
*Signature of Applicant or Agent*

### **OPTION 3: Additional water licence not required**

1. I (we) declare that the CFO will not need a new licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. **Provide:** Water license number(s) or water conveyance agreement details \_\_\_\_\_

Signed this 3 day of Sept, 2024.

\_\_\_\_\_  
*Signature of Applicant or Agent*

# Part 2 – Technical Requirements

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## OPTION 4: Uncertain if *Water Act* licence is needed; acknowledgement of risk (for existing CFOs only)

1. At this time, I (we) do not know whether a new water licence is needed from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. If a new *Water Act* licence is needed, I (we) request that the NRCB process the AOPA application **independently of** EPA's processing of the CFO's application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB's decision will not be considered by EPA as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with additional livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to EPA's consideration of whether to grant my *Water Act* licence application, if a new water licence is needed.
5. I (we) acknowledge that any such construction or livestock increase will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.
7. **Provide:** Water license number(s) or water conveyance agreement details \_\_\_\_\_  
\_\_\_\_\_

Signed this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
*Signature of Applicant or Agent*





Figure 1: Site Location Plan





Figure 2: Detailed Site Layout Plan



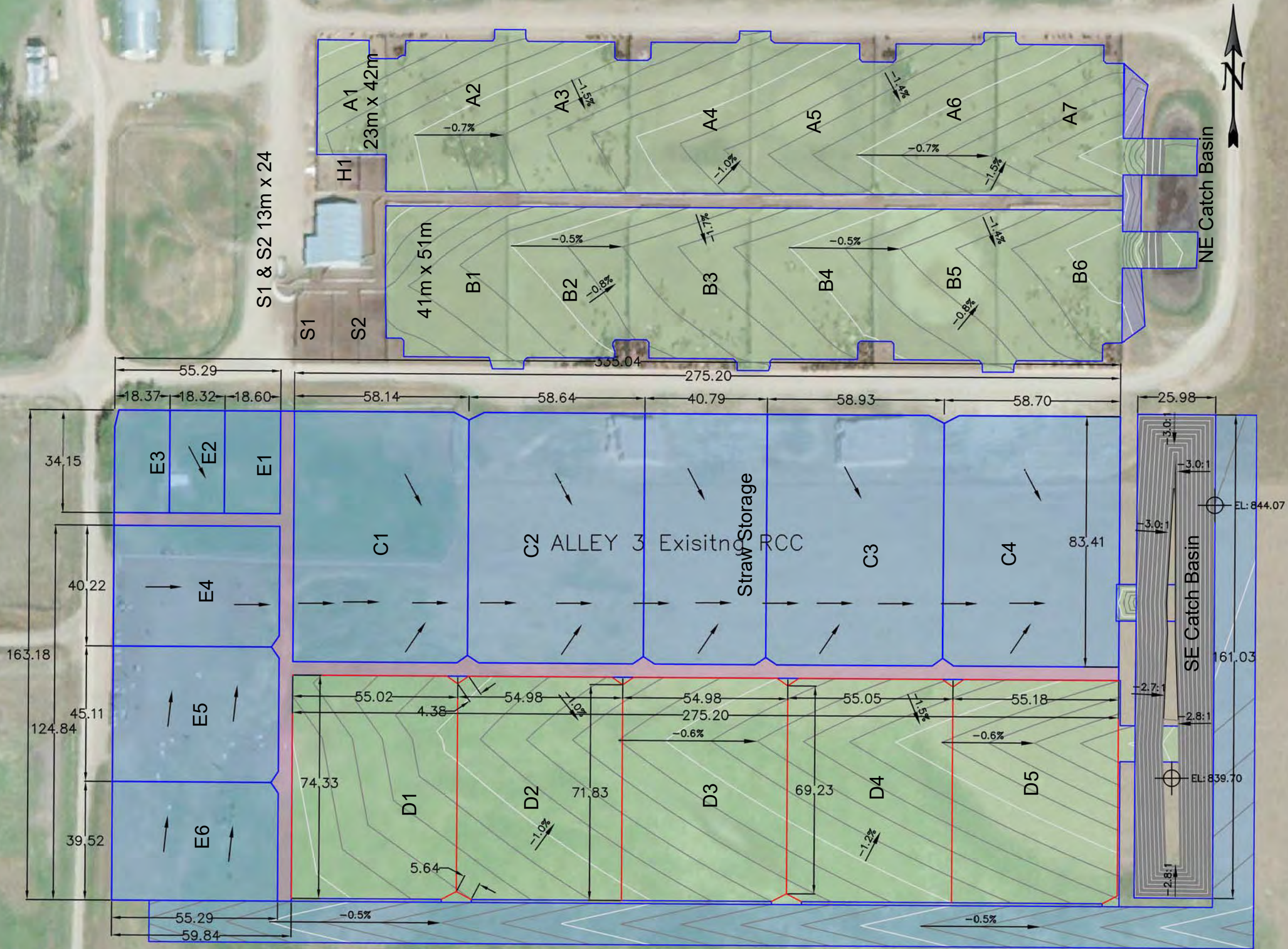


Figure 3: Detailed Pen & Catch Basin Plan



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## GENERAL ENVIRONMENTAL INFORMATION

*(complete this section for the worst case of the existing facility which is the closest to water bodies or water wells and for each of the proposed facilities)*

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

Existing: Hog Manure Slurry Tank (SE30-12-19-W4)

Proposed 1: Proposed Feedlot Pens C1-C4, D1-D5, E1-E6

Proposed 2: Proposed SE Catch Basin

Proposed 3:

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input type="checkbox"/> > 1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	not located in known flood plain
	Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0	0	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	482 m west of slurry tank
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	none observed during site visit or listed in EPA database	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	920 (Little Bow)	1,600 (Little Bow)	1,600 (Little Bow)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	128 m from hog barn to ephemeral drain (part of Little Bow drainage area)	
Groundwater information	What is the depth to the water table?	>5m	>10m	>10m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Below drilling depth (1.5 m). Condition required for the new catch basin (see Appendix B)	
	What is the depth to the groundwater resource/aquifer you draw water from?	~10m	~15m	~15m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	No UGR identified within a 1 km radius. Spring is significantly lower in elevation than the CFO	

Additional information (attach supporting information, e.g. borehole logs, records, etc. you consider relevant to your application)

Groundwater resource includes a spring located approximately half way down the coulee slope, approximately 1km from the proposed facilities.

# Part 2 – Technical Requirements

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**NRCB USE ONLY**  
**ENVIRONMENTAL RISK SCREENING INFORMATION**

ERST for proposed facilities      **See Decision Summary LA23044 for details**

Facility	Groundwater score	Surface water score	File number

ERST for existing facilities

Facility	Groundwater score	Surface water score	File number
<b>feedlot (existing pens)</b>	<b>low</b>	<b>low</b>	<b>LA23044</b>
<b>catch basin</b>	<b>low</b>	<b>low</b>	<b>LA23044</b>
<b>hog barn</b>	<b>low</b>	<b>low</b>	<b>LA23044</b>

ERST related comments:



# Part 2 – Technical Requirements

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**NRCB USE ONLY**

**WATER WELL AND SURFACE WATER INFORMATION**

Well IDs: no wells within 1 km radius \_\_\_\_\_  
 \_\_\_\_\_

Surface water related concerns from directly affected parties or referral agencies:  YES  NO

Groundwater related concerns from directly affected parties or referral agencies:  YES  NO

**Water wells**  N/A

If applicable, exemption for 100 m distance requirements applied:  YES  NO Condition required:  YES  NO

**Surface water**  N/A

If applicable, exemption for 30 m distance requirements applied:  YES  NO Condition required:  YES  NO

**Water Well Exemption Screening Tool**  N/A

Water Well ID	Preliminary Screening Score	Secondary Screening Score	Facility

**Groundwater or surface water related comments:**

## Part 2 – Technical Requirements

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### DISTANCE OF ANY MANURE STORAGE FACILITY (EXISTING OR PROPOSED) TO NEIGHBOURING RESIDENCES

Neighbour name(s)	Legal land description	Distance (m)	NRCB USE ONLY				
			Zoning (LUB) category	MDS category (1-4)	Distance (m)	Waiver attached (if required)	Meets regulations
Hank Van Essen	NW-18-12-19 W4	1,950	RG	1	2003 m		yes
Bill Tucker	SW-13-13-20 W4	2,950	RG	1	>2,800 m		yes

### LAND BASE FOR MANURE AND COMPOST APPLICATION (complete only if an increase in livestock or manure production will occur)

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	NRCB USE ONLY	
				Usable area (ha)	Agreement attached (if required)
See Attached					see below
Total					

\* If you are **not** the registered landowner, you must attach copies of land use agreements signed by all landowners.

\*\* Available manure spreading area (excluding setback areas from residences, common bodies of water, water wells, etc. as identified in Agdex 096-5 [Manure Spreading Regulations](#))

\*\*\* Brown, dark brown, black, grey wooded, or irrigated

**Additional information (attach any additional information as required)**



Goldridge Colony Land Base for Feedlot Manure Dispersion

Land Type	Owner	Reference	Legal Description					Area (ac)
Irrigation	HBC of Turin	L-W1	SE	34	13	20	W4	135
Irrigation	HBC of Turin	L-W3	NE	27	13	20	W4	135
Irrigation	HBC of Turin	L-W5	SE	27	13	20	W4	135
Irrigation	HBC of Turin	L-W2	NW	27	13	20	W4	135
Irrigation	HBC of Turin	L-W4	SW	27	13	20	W4	135
Irrigation	HBC of Turin	L-W7	NE	22	13	20	W4	135
Irrigation	HBC of Turin	L-W9	SE	22	13	20	W4	157
Irrigation	HBC of Turin	L-W6	NW	22	13	20	W4	135
Irrigation	HBC of Turin	L-W8	SW	22	13	20	W4	135
Irrigation	HBC of Turin	L-W11	NE	15	13	20	W4	135
Irrigation	HBC of Turin	L-W13	SE	15	13	20	W4	135
							Total Land Base	1507

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## NRCB USE ONLY

### MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): google earth

Margin of error (if applicable): +/- 4 m

Requirements (m): Category 1: 924 m Category 2: 1232 m Category 3: 1540 m Category 4: 2464 m

Technology factor:  YES  NO

Expansion factor:  YES  NO

MDS related concerns from directly affected parties or referral agencies:  YES  NO

### LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 1496 acres irrigated

Land base listed: 1507 acres irrigated

Area not suitable: already subtracted

Available area: 1507 acres irrigated

Requirement met:  YES  NO

Land spreading agreements required:  YES  NO

Manure management plan:  YES  NO

If yes, plan is attached:

### PLANS

Submitted and attached construction plans:  YES  NO

Submitted aerial photos:  YES  NO

Submitted photos:  YES  NO

### GRANDFATHERING

Already completed:  YES  NO  N/A

If already completed, see Approval LA08033



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**NRCB USE ONLY**

**ALL SIGNATURES IN FILE**  YES  NO

**DATES OF APPROVAL OFFICER SITE VISITS**

November 7, 2024 (different AO)	

**CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES**

Date deeming letters sent: September 24, 2024

Municipality: Lethbridge County

letter sent       response received       written/email       verbal       no comments received

**Alberta Health Services:** NA

letter sent       response received       written/email       verbal       no comments received

**Alberta Environment and Parks:**  N/A

letter sent       response received       written/email       verbal       no comments received

**Alberta Transportation:**  N/A

letter sent       response received       written/email       verbal       no comments received

**Alberta Regulatory Services:**  N/A

letter sent       response received       written/email       verbal       no comments received

**Other:** LNID  N/A

letter sent       response received       written/email       verbal       no comments received

**Other:** Atco Gas, Hunt oil, Lethbridge North County Water Coop, Fortis Alberta  N/A

letter sent       response received       written/email       verbal       no comments received

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## SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Naturally occurring protective layer

*(complete a copy of this section for EACH barn, feedlot, and storage facility for solid manure, composting materials, or compost with a naturally occurring protective layer for the liner)*

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

1. Proposed Pens C1-C4, D1-D5, E1-E6
2. \_\_\_\_\_

### Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	<b>NRCB USE ONLY</b> Estimated storage capacity (m <sup>3</sup> )
1.	275	163	--	
2.				
TOTAL CAPACITY				short term manure storage

I plan to use a short-term solid manure storage (STMS) as part of my manure storage and handling plan for this CFO. (The AOPA requirements for STMS are set out in the NRCB [Short-Term Solid Manure Storage Requirements Fact Sheet](#).)

### Surface water control systems

Describe the run-on and runoff control system

Site grading will be shaped to shed water away from the pens. Run-off from the pens will be captured into a new HDPE-lined catch basin to be constructed along the east side of the pens.

AO comment: runoff will be capture in a catch basin lined with compacted clay. (see below)

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	Provide details (as required) Clay soils are present from ~1.0 to 1.5m depth in existing and proposed pen area See JLECS report P24034 dated 28 August 2024		
	1 (m)		
Soil texture	34 % sand	20 % silt	46 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 0.5m - clay	Hydraulic conductivity (cm/s) 3.88 x 10 <sup>(-7)</sup> cm/s	Describe test standard used In Situ - Single Ring Infiltrometer

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

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## SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Naturally occurring protective layer (cont.)

### NRCB USE ONLY

Nine month manure storage volume requirements met:  YES  YES With STMS  NO

Depth to water table: below 1.5 m (drilling zone) Requirements met:  YES  NO

Depth to uppermost groundwater resource: no UGR identified Requirements met:  YES  NO

ERST completed:  see ERST page for details

### Surface water control systems

Requirements met:  YES  NO Details/comments: **Calculation below**

### Naturally occurring protective layer details

Layer specification comments (e.g. sand lenses; layering uniform or irregular; number and location of boreholes):

**Uniform layering of clay fill overlaying and sandy silt**

28 August 2024

**J Lobbezoo Engineering & Consulting Services Ltd.**

PO Box 96, Monarch, AB T0L1M0

JLECS File: P24034

**Goldridge Farming Company Ltd.**

PO Box 207

Turin, Alberta T0K 2H0

Attention: Mr. Martin Waldner

**Re: Geotechnical Review and Evaluation  
NRCB Permitting of Existing & Proposed Feedlot Pens  
NE-19-012-19-W4M, near Turin, Alberta**

As requested, J Lobbezoo Engineering & Consulting Services Ltd. (JLECS) has carried out a geotechnical review and evaluation of the above-captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA"). This letter describes site soil conditions to support a permit application related to a series of existing and proposed feedlot pens in the southwest of NE-19-012-19-W4M (refer to Figure 1, attached).

In order to demonstrate the suitability of the existing soils for consideration as a naturally occurring protective layer to the groundwater, five test pits were advanced at the site on August 12, 2024. The test pits were advanced at the approximate locations denoted as TP1 to TP5 on Figure 1, attached.

The test pits were advanced by a track excavator operated by Goldridge Colony, and extended to depths ranging between 1.5 m and 1.8 m below existing grades. The test pits were logged by the JLECS engineer.

In general, clay fill was encountered at each of the test pits, extending to depth ranging between approximately 1.0 m and 1.5 m depth. The natural mineral soil encountered below the fill was comprised of sandy silt with traces of gravel. The test pits were each open and dry upon completion of the excavation.

Samples of the near surface clay fill were collected from each of the test pits, and were all subjected to analysis of soil texture, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The results indicate a soil texture breakdown as outlined in the following Table 1. The laboratory report is attached, for reference.

**Table 1: Soil Textural Analyses**

Test Pit / Depth	% Sand	% Silt	% Clay
TP1 / 1.0 m	42	18	40
TP2 / 1.0 m	27	23	50
TP3 / 1.0 m	38	18	44
TP4 / 1.0 m	35	20	45
TP5 / 1.0 m	30	21	49



To assess the permeability of the near surface clay fill associated with the clay subgrade for the existing and proposed pens, permeability testing was carried out using a Single Sealed Ring Infiltrometer (SSRI). This testing was carried out at a depth of about 0.5 m below existing grade. The permeability testing apparatus was provided, set up, and monitored by JLECS. Tests were carried out at the locations TP1 and TP3 (see Figure 1). Details and results of the testing are summarized on the following Table 2. The associated calculations are appended.

**Table 2: Details of *In Situ* SSRI Permeability Testing**

Test # / Location	Diameter of Ring (cm)	Depth of Ring (cm)	Depth of Wetting Front (cm)	Standpipe Details (25mm diameter)			<i>In Situ</i> Permeability, $k$ (cm/s)
				Initial Height of Water, $h_1$ (cm)	Final Height of Water, $h_2$ (cm)	Elapsed Time, $t$ (hrs)	
TP1, Existing North Pen Area	32.0	13	~10	40	36	2	$3.88 \times 10^{-7}$
TP3, Proposed South Pen Area	32.0	13	~10	41	38.5	2	$2.32 \times 10^{-7}$

As indicated in Table 2, the results of the *in situ* testing indicated a coefficient of permeability,  $k$ , of about  $2.3$  to  $3.9 \times 10^{-7}$  cm/s. Based on the measured *in situ* permeability and a thickness of about 1.0 m of the near surface clay fill (as observed in the test pits), the existing near surface clay fill in the existing and proposed pen area represents an equivalent thickness of approximately 2.5 m of material having a permeability of  $1 \times 10^{-6}$  cm/s. This represents material protection in excess of the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-c).

**Conclusion**

Based on the results of the current investigation and permeability testing, it is JLECS’s opinion that the existing near surface clay at the site satisfies the AOPA requirements for permitting the proposed pens (solid manure storage).

We trust that this report satisfies your present requirements. Should you have any questions, please contact the undersigned at your convenience.

Yours truly,

**J Lobbezoo Engineering & Consulting Services Ltd.**



John Lobbezoo, P.Eng.  
Principal Geotechnical Engineer

<b>PERMIT TO PRACTICE</b> <b>J LOBBEZOO ENGINEERING &amp; CONSULTING SERVICES LTD.</b>	
RM SIGNATURE:	_____
RM APEGA ID #:	_____ 110450 _____
DATE:	_____ 28 Aug 2024 _____
<b>PERMIT NUMBER: P016456</b> The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

**Attachments**

- Figure 1 Site Plan & Test Pit Locations
- In Situ Permeability Test (SSRI) Calculations
- Down to Earth Labs Soil Texture Report
- Test Pit Summary Table





Image Credit: Government of Alberta

**Figure 1: Site Plan and Test Pit Locations  
Existing & Proposed Feedlot Pens**

## In situ Permeability Test (SSRI)

Test TP1 - north/existing pen area

Test TP3 - south/proposed pen area

Single Sealed Ring Infiltrometer

Single Sealed Ring Infiltrometer

diameter of ring	0.32 m	
diameter of standpipe	0.025 m	
Initial water column height, $h_1$	0.400 m	
Final water column height, $h_2$	0.360 m	
elapsed time	2 hrs	
depth of ring	0.13	= "l"
depth of wetting front	0.10 m	
area of ring, $A$ :	0.080 m <sup>2</sup>	
area of standpipe, $a$ :	0.00049 m <sup>2</sup>	
volume of water displaced:	1.9625E-05 m <sup>3</sup>	

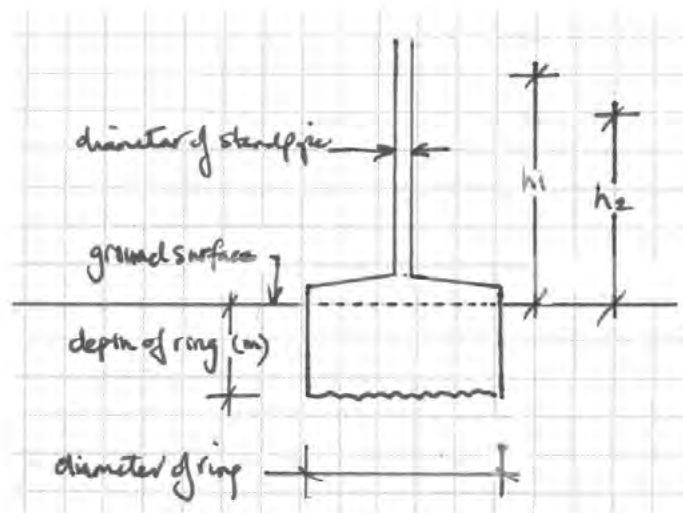
diameter of ring	0.32 m
diameter of standpipe	0.025 m
Initial water column height, $h_1$	0.410 m
Final water column height, $h_2$	0.385 m
elapsed time	2 hrs
depth of ring	0.13
depth of wetting front	0.10 m
area of ring, $A$ :	0.080 m <sup>2</sup>
area of standpipe, $a$ :	0.00049 m <sup>2</sup>
volume of water displaced:	1.23E-05 m <sup>3</sup>

Falling head calculation:  $k = 2.3 (a \cdot l / A \cdot t) \log (h_1 / h_2)$

$k = 3.88E-09$  m/s  
 $3.88E-07$  cm/s

Falling head calculation:  $k = 2.3 (a \cdot l / A \cdot t) \log (h_1 / h_2)$

$k = 2.32E-09$  m/s  
 $2.32E-07$  cm/s



Standard Single Sealed Ring Infiltrometer Setup



# Down To Earth Labs Inc.

The Science of Higher Yields

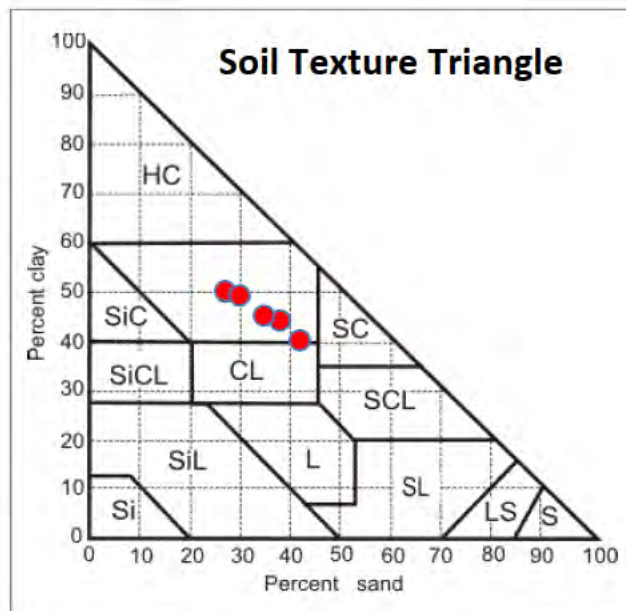
J. Lobbezoo Engineering +  
Consulting Services  
Box 96  
Monarch, Alberta T0L 1M0

**Report #:** 184849  
**Report Date:** 2024-08-14  
**Received:** 2024-08-12  
**Completed:** 2024-08-14  
**Test Done:** ST

**Project :**  
Goldridge Colony  
**PO:**

3510 6th Ave North  
Lethbridge, AB T1H 5C3  
403-328-1133  
www.downtoearthlabs.com  
info@downtoearthlabs.com

	Sample ID:	240812M009	240812M010	240812M011	240812M012	240812M013
	<b>Cust. Sample ID:</b>	TP - 1	TP - 2	TP - 3	TP - 4	TP - 5
	<b>Analyte</b>	<b>Units</b>	1.0	1.0	1.0	1.0
Sand	%	42.1	27.2	38.1	34.9	30.1
Silt	%	17.8	22.8	17.8	20.0	20.8
Clay	%	40.1	50.1	44.1	45.1	49.2
Soil Texture	-	Clay	Clay	Clay	Clay	Clay



**Raygan Boyce - Chemist**



## Test Pit Summary Table

JLECS File: P24034

Project: Goldridge Colony, Existing & Proposed Feedlot Pens, NW-19-012-19-W4M

Date of Excavation: August 12, 2024

<b>TP1</b>		
<i>Depth (m):</i> 0.0 – 1.0	<b>CLAY FILL</b> –medium plastic, brown, stiff, moist	Single Ring <i>in situ</i> permeability test
1.0 – 1.5	<b>SANDY SILT</b> – low to non-plastic, compact, brown, damp	
1.5	<b>End of Test Pit at 1.5 m depth</b> <i>-test pit open and dry upon completion</i>	

<b>TP2</b>		
<i>Depth (m):</i> 0 – 1.2	<b>CLAY FILL</b> –medium plastic, brown, stiff, moist	
1.0 – 1.5	<b>SANDY SILT</b> – low to non-plastic, trace gravel, compact, brown, damp	
1.5	<b>End of Test Pit at 1.5 m depth</b> <i>-test pit open and dry upon completion</i>	

<b>TP3</b>		
<i>Depth (m):</i> 0 – 1.5	<b>CLAY FILL</b> –medium plastic, brown, stiff, moist	Single Ring <i>in situ</i> permeability test
1.5 – 1.8	<b>SANDY SILT</b> – low to non-plastic, compact, brown, damp	
1.8	<b>End of Test Pit at 1.8 m depth</b> <i>-test pit open and dry upon completion</i>	

<b>TP4</b>		
<i>Depth (m):</i> 0 – 1.2	<b>CLAY FILL</b> –medium plastic, brown, stiff, moist	
1.2 – 1.5	<b>SANDY SILT</b> – low to non-plastic, compact, brown, damp	
1.5	<b>End of Test Pit at 1.5 m depth</b> <i>-test pit open and dry upon completion</i>	

<b>TP5</b>		
<i>Depth (m):</i> 0 – 1.0	<b>CLAY FILL</b> –medium plastic, brown, stiff, moist	
1.0 – 1.5	<b>SANDY SILT</b> – low to non-plastic, compact, brown, damp	
1.5	<b>End of Test Pit at 1.5 m depth</b> <i>-test pit open and dry upon completion</i>	

Table Notes:

- test pit information to be read in conjunction with JLECS report P24012.
- test pits excavated on August 12, 2024, using a track excavator operated by Goldridge Colony
- see Figure 1 for test pit locations

# 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)

## RUNOFF CONTROL CATCH BASIN: Compacted soil liner

*(complete a copy of this section for EACH proposed runoff control catch basin with a compacted soil liner)*

- Facility description / name *(as indicated on site plan)*
1. Proposed SE Catch Basin
  2. \_\_\_\_\_
  3. \_\_\_\_\_

### Determination of runoff area

Provide a plan and show how you calculated the area contributing to runoff for each catch basin

Total proposed pen & catch basin area is 375 m by 170 m = 63,750 m<sup>2</sup>  
 Design Rainfall = 85mm; Assume 1.0 runoff coefficient for RCC  
 Min. required capacity = 63,750 m<sup>2</sup> x 85 mm x 1.0 = 5,420 m<sup>3</sup>  
 Freeboard = 0.5 m

### Catch basin capacity

	Length (m)	Width (m)	Depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY Calculated storage capacity (excl. 0.5 m freeboard) (m <sup>3</sup> )
					Inside end walls	Inside side walls	Outside walls	
1.	160	26	4.3	4.3	3:1	3:1	n/a	6,583 m <sup>3</sup>
2.								
3.								
TOTAL CAPACITY								6,583 m <sup>3</sup>

### Compacted soil liner details

Thickness of compacted soil liner	0.5 (m)		Provide details (as required)	
Soil texture	24 % sand	24 % silt	52 % clay	
Atterberg limits	Plastic limit 21	Liquid limit 52	Plasticity index 31	
Hydraulic conductivity	Hydraulic conductivity (cm/s) 8.35 x 10(-9) cm/s (JLECS test report attached for reference)			
	Describe test standard used laboratory fixed wall falling head permeability test			

Catch Basin – Design and management requirements can be found in Technical Guideline Agdex 096-101

NRCB USE ONLY	
Requirements met:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Condition required:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Report attached:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> 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)

## RUNOFF CONTROL CATCH BASIN: Compacted soil liner (cont.)

### NRCB USE ONLY

Catch basin calculator (calculation attached). Total volume @ freeboard: 6,583 m<sup>3</sup>

Runoff capacity requirements met: **Required for paved areas is 4,021 m<sup>3</sup>**  YES  NO

Calculation of the volume attached: **see below**  YES  NO

Depth to water table: indicated to be below 5 m below ground level Requirements met:  YES  NO  
**with condition**

Depth to Uppermost Groundwater Resource: no UGR identified Requirements met:  YES  NO

ERST completed:  see ERST page for details

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

**Final compaction test required to prove that AOPA requirements are met. Report should be prepared by prof. engineer. A condition is required that construction shall cease immediately if the water table is within 1 m of the construction zone and the NRCB has to be notified.**

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

# Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin	
* Only cells in blue can be changed.	
Overall Dimensions of Catch Basin	
Total Length* <sub>4</sub>	160.0 m
Total Width* <sub>4</sub>	26.0 m
Total Depth* <sub>4</sub>	4.3 m
Design Capacity Depth	3.80 m
End Slope* <sub>4</sub>	3 run:rise
Side Slope* <sub>4</sub>	3 run:rise
Length of Bottom	134.2 m
Width of Bottom	0.2 m
Capacity @ top of Bank	8,525 m <sup>3</sup>
Design Capacity of Catch Basin (freeboard level)	
Length (design capacity depth)	157.0 m
Width (design capacity depth)	23.0 m
Total Depth	4.3 m
Design Capacity Depth	3.80 m
End Slope	3 run:rise
Side Slope	3 run:rise
Design Capacity (freeboard level)	6,583 m <sup>3</sup>
level)	3,611 m <sup>2</sup>
Catch Basin Dimensions	
	525 ft
	85 ft
	14 ft
	12 ft
	3 run:rise
	3 run:rise
	3 run:rise
	440 ft
	1 ft
Capacity (@top)	301,046 ft <sup>3</sup>
	1,875,163 Imp. Gal.
Design Capacity (freeboard level)	
	515 ft
	75 ft
	14 ft
	12 ft
	3 run:rise
	3 run:rise
	232,465 ft <sup>3</sup>
	1,447,983 Imp. Gal.
	38,868 ft <sup>2</sup>

CFO Name <sub>1</sub>	(Enter CFO Name Here)
Land Location <sub>1</sub>	1-1-4-W5

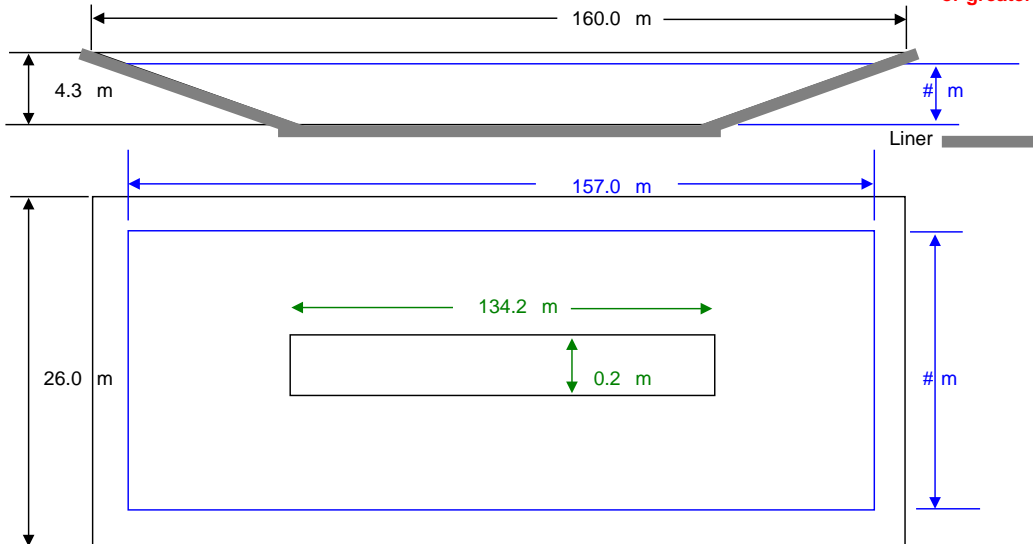
Paved Runoff Catchment Area(s)			
Area <sub>2</sub>	Length (m)	Width (m)	Area (m <sup>2</sup> )
1	236	83	19,588.0
2	55	34	1,870.0
3	125	55	6,875.0
4	275	69	18,975.0
5			0.0
Total Area (m <sup>2</sup> )			47,308

Unpaved Runoff Catchment Area(s)			
Area <sub>2</sub>	Length (m)	Width (m)	Area (m <sup>2</sup> )
6			0.0
7			0.0
8			0.0
9			0.0
10			0.0
Total Area (m <sup>2</sup> )			0

Rainfall (Select Town <sub>3</sub> )	
Bassano 85	
AOPA Design Rainfall	85 mm

Minimum Catchbasin Storage Volume Required	
4,021 m <sup>3</sup> **	142006.63 ft <sup>3</sup>
	884535.59 Imp. Gal.

\*\* Design capacity of catch basin should be equal to or greater than, minimum storage volume required.



— Lines in Black - Overall catch basin dimensions  
 — Lines in Blue - Design capacity depth dimensions (excludes freeboard)

NTS - Not To Scale

# 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)

NRCB USE ONLY	
RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)	
<b>Facility 1</b>	
Name / description <b>Existing catch basin (north)</b>	Capacity <b>4,011 m<sup>3</sup></b>
<b>Facility 2</b>	
Name / description <b>new catch basin (south)</b>	Capacity <b>6,583 m<sup>3</sup></b>
<b>Facility 3</b>	
Name / description	Capacity
<b>Facility 4</b>	
Name / description	Capacity
<b>TOTAL CAPACITY</b>	<b>10,594 m<sup>3</sup></b>
<b>RUNOFF VOLUME FROM CONTRIBUTING AREAS</b>	<b>2,416 m<sup>3</sup> + 4,021 m<sup>3</sup> = 6,437 m<sup>3</sup> (paved)</b>
<b>MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS</b>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO







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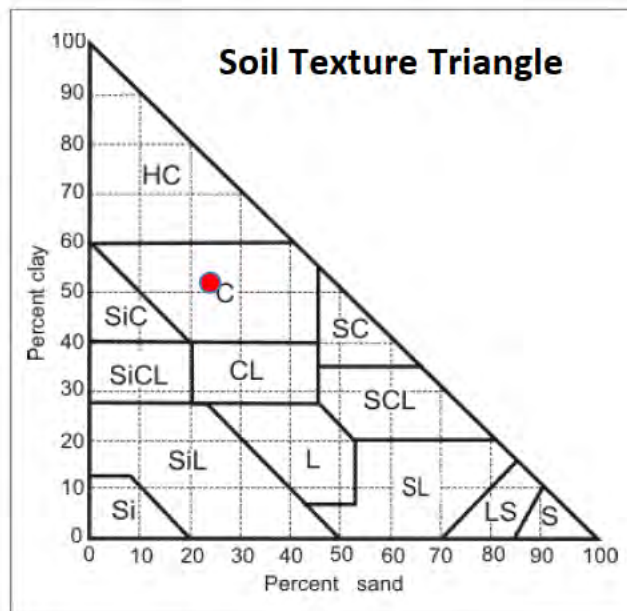
**Report #:** 179789  
**Report Date:** 2024-06-24  
**Received:** 2024-06-20  
**Completed:** 2024-06-24  
**Test Done:** ST

**Project :**  
MISC  
**PO:**

3510 6th Ave North  
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403-328-1133  
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**Sample ID:** 240620M033  
**Cust. Sample ID:** Goldridge

Analyte	Units	
Sand	%	24.2
Silt	%	24.0
Clay	%	51.8
Soil Texture	-	Clay



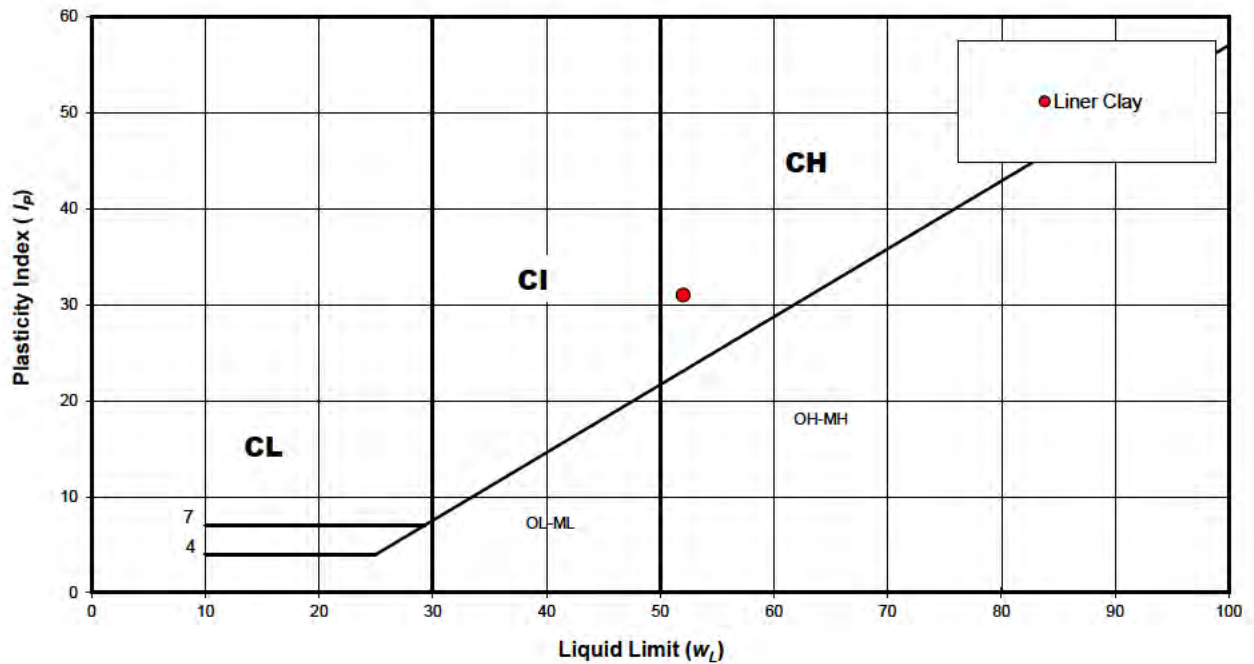
**Raygan Boyce - Chemist**

**ATTERBERG LIMITS TEST RESULTS**

**Hutterian Brethren Church of Turin  
Proposed Catch Basin Liner  
NE-19-12-19-W4M, near Turin, AB**

**Project No:** P24034

**Date:** 3-Sep-24



Borehole/ Sample No.	Sample Depth (m)	Plasticity Index, $I_p$	Liquid Limit, $w_L$
Liner Clay	n/a	31	52



The following calculator may be used to design a catch basin based on catchment area and potential surface water runoff.

Name

Land Location

Units to be used for calculation:

**Estimating Runoff Potential**

1. Estimate the total area impacted with manure that will contribute to water runoff and any additional uplands that will drain to the catch basin. It may be easier to calculate the area in small pieces. Click the + to add more areas.

Area	Length (m)	Width (m)	Paved?	Area (m <sup>2</sup> )
1	<input type="text" value="375"/>	<input type="text" value="170"/>	<input type="text" value="YES"/>	63750.00 +
<b>Total Area</b>				63750.00

2. Select the nearest city/town to obtain local rainfall data for a one day rainfall event with 1 in 30 year probability. A portion of the rainfall amount will be multiplied by the runoff area (above) to determine runoff volume.

Select Town

**Estimation of water runoff to be collected in the catch basin:**

<input type="text" value="5418.75"/>	m <sup>3</sup>
<input type="text" value="191361"/>	ft <sup>3</sup>
<input type="text" value="1191958"/>	Imp. Gal

**Calculating Catch Basin Volume:**

3. Enter the dimensions of the proposed catch basin including length, width and total depth (0.5m will be subtracted for freeboard level). Side slopes and end slopes are set to 3 to 1 (run:rise). Berm width can be added for additional information.

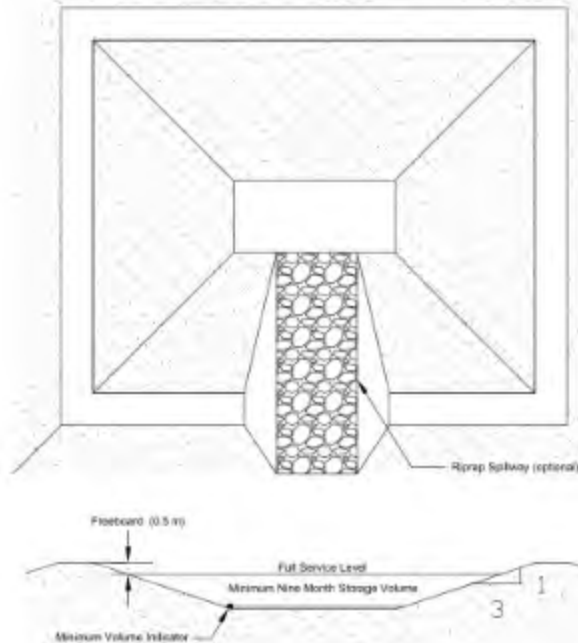
Construction Dimensions	Storage Dimensions
Length (m): <input type="text" value="180"/>	167.0
Width (m): <input type="text" value="26"/>	23.0
Depth (m): <input type="text" value="4.3"/>	3.8

**Evacuation Capacity:**

<input type="text" value="8525"/>	m <sup>3</sup>
<input type="text" value="301058"/>	ft <sup>3</sup>
<input type="text" value="1875240"/>	Imp. Gal

**Catch basin volume (minus freeboard):**

<input type="text" value="6583"/>	m <sup>3</sup>
<input type="text" value="232476"/>	ft <sup>3</sup>
<input type="text" value="1448054"/>	Imp. Gal



**Comparing Catch Basin Volume versus Runoff Potential:**

Runoff potential:	<input type="text" value="5418.75"/>	m <sup>3</sup>
Catch basin volume:	<input type="text" value="6583"/>	m <sup>3</sup>

The catch basin dimensions meet the design requirements in AOPA