

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	Application number	Legal land description
<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Registration <input type="checkbox"/> Authorization <input type="checkbox"/> Amendment	LA24030	SW 8-22-20 W4M, SE 12-22-21 W4 N½ 7-22-20 W4M

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 above, and I acknowledge that the information provided in this application is true to the best of my knowledge.

July 10 2024 _____
 Date of signing _____ Signature
 Hutterian Brethren Church of Chng. _____
 Corporate name (if applicable) _____ 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)
6 pens 200'	200' x 180' Each pen
Catch Basin	
<div style="background-color: #e0f2f1; padding: 10px; border: 1px solid #ccc;"> <p><u>AO comment:</u> As per text, catch basin ① : 35 x 22 x 2.5 (for west pens) ② catch basin # 2 (east) 45 x 32 x 2.5</p> </div>	
Existing facilities: list ALL existing confined feeding operation facilities	
Existing facilities	
See last permit	
NRCB USE ONLY	

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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 December 2026.

Additional information

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
see part 2			

Existing facilities

Layer barns (4): 13.7 m x 35 m

Calf shelter: 91 m x 29 m + 46 m x 54 m

Poultry barn: 63 m x 9 m

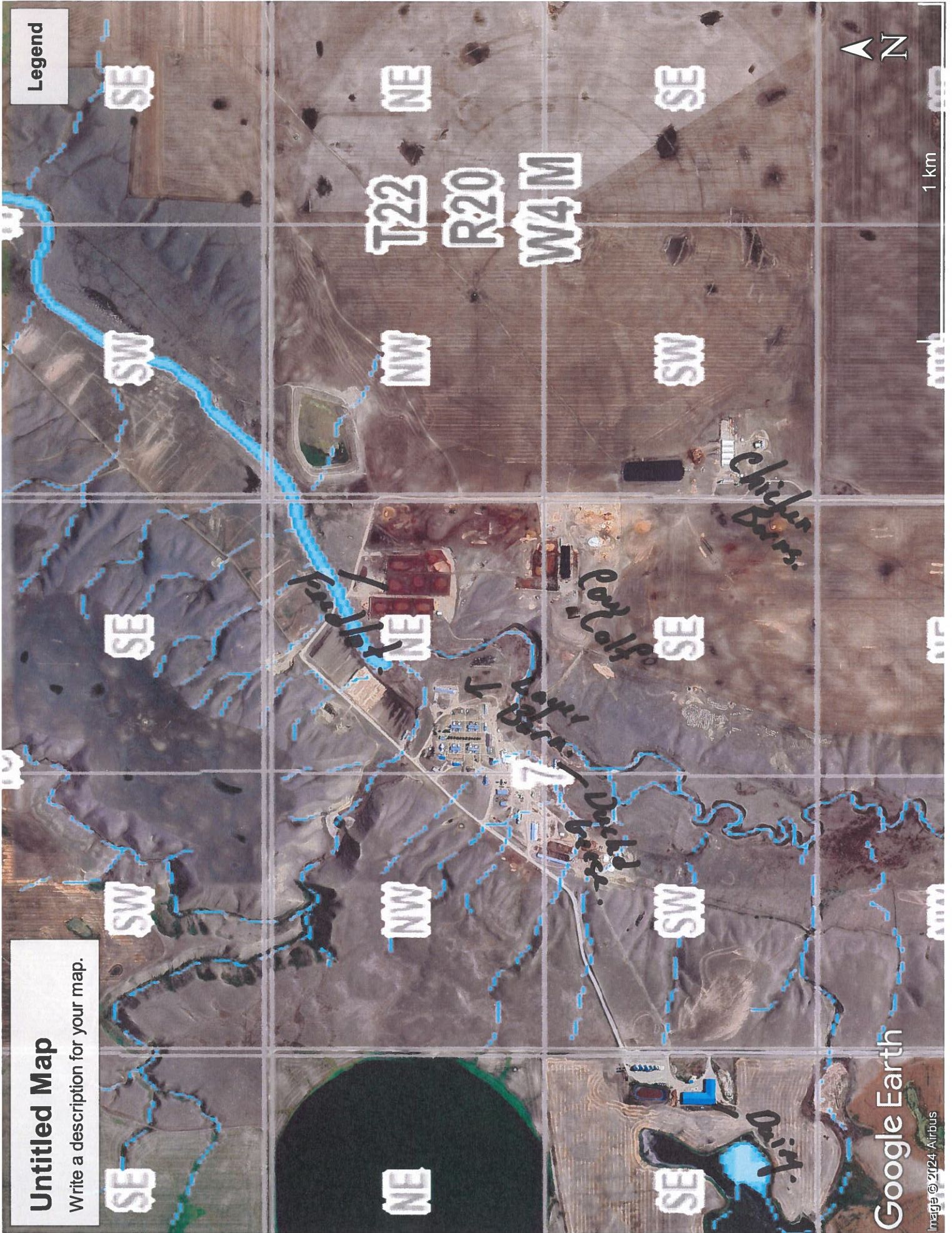
Dairy barn (L shape): Long arm: 96 m long 35 m wide, short arm: 73 m long 27 m wide

EMS: 97 m x 40 m x unknown depth

Legend

Untitled Map

Write a description for your map.



Google Earth

Image © 2024 Airbus

Legend



200 m

Lynn Energy
#1 well → South.

#1
Catal Basin

Drain

Drain

#2
Catal Basin

Crowfoot
Creek

Untitled Map

Write a description for your map.

Google Earth

Image © 2024 Airbus

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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 No 27633-1
(21919)

Signed this 10 day of July, 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

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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: _____

Proposed 1: feed lot

Proposed 2: 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 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 type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
Surface water information How many springs are within 100 m of the manure storage facility or manure collection area?		<u>None</u>	<u>None</u>		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
Surface water information How many water wells are within 100 m of the manure storage facility or manure collection area?		<u>1</u>	<u>1</u>		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
Surface water information What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		<u>31m</u>	<u>31m</u>		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
Groundwater information What is the depth to the water table?		<u>3m</u>	<u>3m</u>		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
Groundwater information What is the depth to the groundwater resource/aquifer you draw water from?		<u>10.97</u>	<u>10.97</u>		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	

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

Well ID : 285127



Water Well Drilling Report

View in Imperial Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GIC Well ID 285127
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1996/05/14

GOWN ID

Well Identification and Location							Measurement in Metric	
Owner Name CLUNY VALLEY COLONY (DUCKWELL)	Address P.O. BOX 70 CLUNY		Town		Province	Country	Postal Code T0J 0S0	
Location 1/4 or LSD NE	SEC 7	TWP 22	RGE 20	W of MER 4	Lot	Block	Plan	Additional Description
Measured from Boundary of _____ m from _____ m from				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>50.859674</u> Longitude <u>-112.757000</u> How Location Obtained Map			Elevation _____ m How Elevation Obtained Not Obtained	

Drilling Information	
Method of Drilling Rotary Proposed Well Use Domestic	Type of Work New Well

Formation Log		Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description
2.44		Brown Clay
3.05		Gravel
10.97		Blue Clay
11.58	Yes	Water Bearing Gravel
18.29		Gray Shale & Coal

Yield Test Summary			Measurement in Metric
Recommended Pump Rate		36.37 L/min	
Test Date	Water Removal Rate (L/min)	Static Water Level (m)	
1996/04/12	36.37	3.81	

Well Completion				Measurement in Metric
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
18.29 m		1996/04/10	1996/04/11	
Borehole				
Diameter (cm)	From (m)	To (m)		
0.00	0.00	18.29		
Surface Casing (if applicable)		Well Casing/Liner		
		Steel		
Size OD :	0.00 cm	Size OD :	14.12 cm	
Wall Thickness :	0.000 cm	Wall Thickness :	0.478 cm	
Bottom at :	0.00 m	Top at :	0.00 m	
		Bottom at :	18.29 m	
Perforations				
From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval (cm)
10.06	11.58	0.318		25.40
Perforated by Torch				
Annular Seal Bentonite Chips/Tablets				
Placed from		0.00 m	to	7.62 m
Amount _____				
Other Seals				
Type		At (m)		
Screen Type				
Size OD :		0.00 cm		
From (m)	To (m)	Slot Size (cm)		
Attachment _____				
Top Fittings _____		Bottom Fittings _____		
Pack				
Type _____		Grain Size _____		
Amount _____				

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name M&M DRILLING CO. LTD.	Copy of Well report provided to owner Date approval holder signed



Water Well Drilling Report

[View in Imperial](#) [Export to Excel](#)

GIC Well ID 285127
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1996/05/14

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GOWN ID

Well Identification and Location						Measurement in Metric			
Owner Name CLUNY VALLEY COLONY (DUCKWELL)	Address P.O. BOX 70 CLUNY		Town	Province	Country	Postal Code T0J 0S0			
Location	1/4 or LSD NE	SEC 7	TWP 22	RGE 20	W of MER 4	Lot	Block	Plan	Additional Description
Measured from Boundary of			GPS Coordinates in Decimal Degrees (NAD 83)			Elevation			
_____ m from			Latitude 50.859674 Longitude -112.757000			_____ m			
_____ m from			How Location Obtained			How Elevation Obtained			
			Map			Not Obtained			

Drilling Information	
Method of Drilling Rotary	Type of Work New Well
Proposed Well Use Domestic	

Formation Log		Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description
2.44		Brown Clay
3.05		Gravel
10.97		Blue Clay
11.58	Yes	Water Bearing Gravel
18.29		Gray Shale & Coal

(This area is currently blank in the image)

Yield Test Summary		Measurement in Metric
Recommended Pump Rate	36.37 L/min	
Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1996/04/12	36.37	3.81

Well Completion				Measurement in Metric
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
18.29 m		1996/04/10	1996/04/11	
Borehole				
Diameter (cm)	From (m)	To (m)		
0.00	0.00	18.29		
Surface Casing (if applicable)		Well Casing/Liner		
		Steel		
Size OD :	0.00 cm	Size OD :	14.12 cm	
Wall Thickness :	0.000 cm	Wall Thickness :	0.478 cm	
Bottom at :	0.00 m	Top at :	0.00 m	
		Bottom at :	18.29 m	
Perforations				
From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)
10.06	11.58	0.318		25.40
Perforated by Torch				
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Placed from 0.00 m to 7.62 m				
Amount _____				
Other Seals				
Type		At (m)		
Screen Type				
Size OD : 0.00 cm				
From (m)	To (m)	Slot Size (cm)		
Attachment _____				
Top Fittings _____		Bottom Fittings _____		
Pack				
Type _____		Grain Size _____		
Amount _____				

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name M&M DRILLING CO. LTD.	Copy of Well report provided to owner Date approval holder signed

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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
Aldon & Oriella Kureha	22-20 S3 W9	2420 m					

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)
As per text:					
Section 10 - 22-20	Dry				
8 - 22 - 20	irr				
15 - 22 - 20	dry				
16 - 22 - 20	dry				
22 - 22 - 20	irr				
Total					

* If you are **not** the

** Available manure (Regulations)

*** Brown, dark brown

Additional information

As per text:
 Section 10 - 22-20 Dry
 8 - 22 - 20 irr
 15 - 22 - 20 dry
 16 - 22 - 20 dry
 22 - 22 - 20 irr
 => 1920 acres dry
 1120 acres irr

se agreements signed by all landowners.

as, common bodies of water, water wells, etc. as identified in Agdex 096-5 [Manure Spreading](#)

Name
Address
Legal Land
Location

MDS Spreadsheet based on 2006 AOPA Regulations

Category of Livestock	Type of Livestock	Factor A	Technology Factor	MU	LSU Factor	Number of Animals	LSU
Beef	Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.446		-
	Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.245		612.5
	Feeder Calves (<550 lbs)	0.700	0.700	0.275	0.135		-
Dairy (*count lactating cows only)	*Free Stall - Lactating Cows with all associated dries, heifers, and calves	0.800	1.100	2.000	1.760		440.0
	*Free Stall - Lactating cows with Dry Cows only	0.800	1.100	1.640	1.443		-
	Free Stall - Lactating Cows only	0.800	1.100	1.400	1.232		-
	Tie Stall - Lactating cows only	0.800	1.000	1.400	1.120		-
	Loose Housing - Lactating cows only	0.800	1.000	1.400	1.120		-
	Dry Cow (Solid manure)	0.800	0.700	1.000	0.560		-
	Dry Cow (Liquid manure)						-
	Replacements - Brod Heifers (Breeding to Calving)	0.800	0.700	0.875	0.490		-
	Replacements - Growing Heifers (350 lbs to breeding)	0.800	0.700	0.525	0.294		-
Calves (< 350 lbs)	0.800	0.700	0.200	0.112		-	
Swine Liquid (*count sows only)	Farrow to finish *	2.000	1.100	1.780	3.916		-
	Farrow to wean *	2.000	1.100	0.670	1.474		-
	Farrow only *	2.000	1.100	0.530	1.166		-
	Feeders/Boars	2.000	1.100	0.200	0.440		-
	Growers/Roasters	2.000	1.100	0.118	0.260		-
	Weaners	2.000	1.100	0.055	0.121		-
Swine Solid (*Count sows only)	Farrow to finish *	2.000	0.800	1.780	2.848		-
	Farrow to wean *	2.000	0.800	0.670	1.072		-
	Farrow only *	2.000	0.800	0.530	0.848		-
	Feeders/Boars	2.000	0.800	0.200	0.320		-
	Growers/Roasters	2.000	0.800	0.118	0.189		-
	Weaners	2.000	0.800	0.055	0.088		-
Poultry	Chicken - Breeders - Solid	1.000	0.700	0.010	0.007		-
	Chicken - Layers - Liquid (includes associated pullets)	2.000	1.100	0.008	0.018		158.4
	Chicken - Layers - (Belt Cage)	2.000	0.700	0.008	0.011		-
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.011		-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.001		26.9
	Turkey - Toms/Breeders	1.000	0.700	0.020	0.014		-
	Turkey - Hens (light)	1.000	0.700	0.013	0.009		-
	Turkey - Broilers	1.000	0.700	0.010	0.007		4.2
	Ducks	1.000	0.700	0.010	0.007		10.5
Geese	1.000	0.700	0.020	0.014		7.0	
Horses	PMU	0.650	0.700	1.000	0.455		-
	Feeders > 750 lbs	0.650	0.700	1.000	0.455		-
	Foals < 750 lbs	0.650	0.700	0.300	0.137		-
	Mules	0.600	0.700	1.000	0.420		-
	Donkeys	0.600	0.700	0.670	0.281		-
Sheep	Ewes/Rams	0.600	0.700	0.200	0.084		-
	Ewes with lambs	0.600	0.700	0.250	0.105		-
	Lambs	0.600	0.700	0.050	0.021		-
	Feeders	0.600	0.700	0.100	0.042		-
Goats	Meat/Milk (per Ewe)	0.700	0.700	0.170	0.083		-
	Nannies/Billies	0.700	0.700	0.140	0.069		-
	Feeders	0.700	0.700	0.077	0.038		-
Bison	Bison	0.600	0.700	1.000	0.420		-
Cervid	Elk	0.600	0.700	0.600	0.252		-
	Deer	0.600	0.700	0.200	0.084		-
Wild Boar	Feeders	2.000	0.800	0.140	0.224		-
	Sow (farrowing)	2.000	0.800	0.371	0.594		-
Total							1,259.5

For New Operations

Dispersion Factor **1**

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,823	556
2	54.72	2,431	741
3	68.4	3,038	926
4	109.44	4,861	1,482

For Expanding Operations

Dispersion Factor **1**
Expansion Factor **0.77**

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,404	428
2	54.72	1,872	570
3	68.40	2,339	713
4	109.44	3,743	1,141

Name 0
 Address 0
 Legal Land
 Location 0

Landbase Requirements (hectares) based on 2006 AOPA requirements

Category of Livestock	Type of Livestock	Number of Animals	Dark Brown & Brown (ha)	Grey Wooded (ha)	Black (ha)	Irrigated (ha)
Beef	Cows/Finishers (900+ lbs)	0	0	0	0	0
	Feeders (450 - 900 lbs)	2500	200	167.5	125	100
	Feeder Calves (<550 lbs)	0	-	-	-	-
Dairy (*count lactating cows only)	*Free Stall - Lactating Cows with all associated dries, heifers, and calves	250	371.25	309.25	232	185.5
	*Free Stall - Lactating cows with Dry Cows only	0	-	-	-	-
	Free Stall - Lactating Cows only	0	-	-	-	-
	Tie Stall - Lactating cows only	0	-	-	0	0
	Loose Housing - Lactating cows only	0	-	-	-	-
	Dry Cow (Solid manure)	0	-	-	-	-
	Dry Cow (Liquid manure)	0	-	-	-	-
	Replacements - Bred Heifers (Breeding to Calving)	0	-	-	-	-
	Replacements - Growing Heifers (350 lbs to breeding)	0	-	-	-	-
	Calves (< 350 lbs)	0	-	-	-	-
	Swine Liquid (*count sows only)	Farrow to finish *	0	-	0	-
Farrow to wean *		0	-	-	-	-
Farrow only *		0	-	-	-	-
Feeders/Boars		0	-	0	0	0
Growers/Roasters		0	-	-	-	-
Weaners		0	-	-	-	-
Swine Solid (*Count sows only)	Farrow to finish *	0	-	-	-	-
	Farrow to wean *	0	-	-	-	-
	Farrow only *	0	-	-	-	-
	Feeders/Boars	0	-	-	-	-
	Growers/Roasters	0	-	-	-	-
	Weaners	0	-	-	-	-
Poultry	Chicken - Breeders - Solid	0	-	-	-	-
	Chicken - Layers - Liquid (includes associated pullets)	9000	59.4000	49.5	36.9	29.7
	Chicken - Layers - (Belt Cage)	0	-	-	-	-
	Chicken - Layers - (Deep Pit)	0	-	-	-	-
	Chicken - Pullets/Broilers	19200	62.40000	52.032	38.976	31.296
	Turkey - Toms/Breeders	0	0	0	0	0
	Turkey - Hens (light)	0	-	-	-	-
	Turkey - Broilers	600	3.1800	2.6400	1.9800	1.5600
	Ducks	1500	2.4	1.95	1.5	1.2
	Geese	500	1.6	1.35	1	0.8
Horses	PMU	0	0	0	0	0
	Feeders > 750 lbs	0	-	0	-	-
	Foals < 750 lbs	0	-	-	-	-
	Mules	0	-	-	-	-
	Donkeys	0	-	-	-	-
		0	-	-	-	-
Sheep	Ewes/Rams	0	-	0	0	0
	Ewes with lambs	0	-	-	-	-
	Lambs	0	-	-	-	-
	Feeders	0	-	-	-	-
Goats	Meat/Milk (per Ewe)	0	0	0	0	0
	Nannies/Billies	0	-	-	-	-
	Feeders	0	-	-	-	-
Bison	Bison	0	0	0	0	0
		0	-	-	-	-
Cervid	Elk	0	0	0	0	0
	Deer	0	0	0	0	0
Wild Boar		0	-	0	0	0
	Feeders	0	-	-	-	-
	Sow (farrowing)	0	-	-	-	-
	0	-	-	-	-	
Total Hectares			700.2	584.2	437.4	350.1
Total Acres			1730.3	1443.6	1080.7	865.0

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)

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. West Pens
2. East Pens

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.	61	182		
2.	118	186		
TOTAL CAPACITY				

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

Catch Basins

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____ (m)	Provide details (as required)		
		<u>see report</u>		
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

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: Naturally occurring protective layer

(complete a copy of this section for EACH proposed runoff control catch basin with a naturally occurring protective layer)

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

1. Catch Basin East
2. West
3. _____

Determination of runoff area

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

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY Calculated storage capacity (excl. 0.5 m freeboard) (m ³)
					Inside end walls	Inside side walls	Outside walls	
1.	45	32	2.5	2.5	3:1	3:1		
2.	35	22	2.5	2.5	3:1	3:1		
3.								
TOTAL CAPACITY								

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

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

If soil info differs per facility include additional soils page.

NRCB USE ONLY

- Requirements met: YES NO
 Condition required: YES NO
 Report attached: YES NO

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

Only cells in blue can be changed.

Overall Dimensions of Catch Basin

Total Length*	45.0 m
Total Width*	32.0 m
Total Depth*	2.5 m
Design Capacity Depth	2.00 m
End Slope*	run:rise
Side Slope*	run:rise
Length of Bottom	30.0 m
Width of Bottom	17.0 m

Capacity @ Top of Bank 2,344 m³

Catch Basin Dimensions

148 ft
106 ft
8 ft
7 ft
3 run:rise
3 run:rise
3 run:rise
98 ft
56 ft

Capacity (@top)

82,769 ft³
515,563 Imp. Gal.

Design Capacity of Catch Basin (freeboard level)

Length (design capacity depth)	42.0 m
Width (design capacity depth)	29.0 m
Total Depth	2.5 m
Design Capacity Depth	2.00 m
End Slope	3 run:rise
Side Slope	3 run:rise

Design Capacity (freeboard level) 1,680 m³

level) 1,210 m³

Design Capacity (freeboard level)

138 ft
95 ft
8 ft
7 ft
3 run:rise
3 run:rise
3 run:rise

59,329 ft³
369,548 Imp. Gal.
13,110 ft²

CFO Name : Clony Colony - East Penn
Land Location : NS-722-25-W4

Paved Runoff Catchment Area(s)

Area #	Length (m)	Width (m)	Area (m ²)
1			0.0
2			0.0
3			0.0
4			0.0
5			0.0
Total Area (m ²)			0

Unpaved Runoff Catchment Area(s)

Area #	Length (m)	Width (m)	Area (m ²)
6	259	125	32,375.0
7			0.0
8			0.0
9			0.0
10			0.0
Total Area (m ²)			32,375

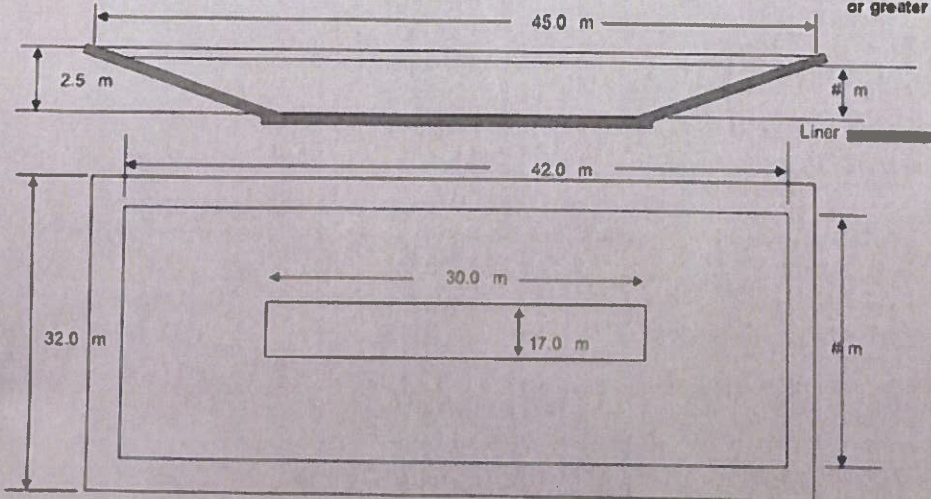
Rainfall (Select Town...)

AOPA Design Rainfall 85 mm

Minimum Catchbasin Storage Volume Required

1,651 m³** 58308.929 ft³
363196.58 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

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin	
Only cells in blue can be changed.	
Overall Dimensions of Catch Basin	
Total Length*	35.0 m
Total Width*	22.0 m
Total Depth*	2.5 m
Design Capacity Depth	2.00 m
End Slope*	run:rise
Side Slope*	run:rise
Length of Bottom	20.0 m
Width of Bottom	7.0 m
Capacity @ top of Bank	1,044 m ³
Design Capacity of Catch Basin (freeboard level)	
Length (design capacity depth)	32.0 m
Width (design capacity depth)	19.0 m
Total Depth	2.5 m
Design Capacity Depth	2.00 m
End Slope	3 run:rise
Side Slope	3 run:rise
Design Capacity (freeboard level)	700 m ³
Level	608 m ²

CFO Name, **Cluny Colony - West Park**
 Land Location, **NE 1/22 30 A1**

Catch Basin Dimensions
115 ft
72 ft
8 ft
7 ft
3 run:rise
3 run:rise
86 ft
23 ft
Capacity @Job
36,800 ft ³
229,593 Imp. Gal.

Paved Runoff Catchment Area(s)			
Area #	Length (m)	Width (m)	Area (m ²)
1			0.0
2			0.0
3			0.0
4			0.0
5			0.0
Total Area (m ²)			0

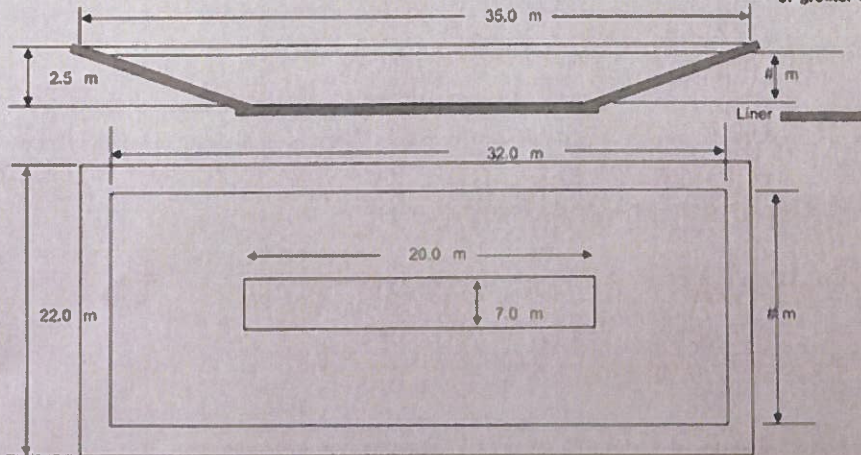
Unpaved Runoff Catchment Area(s)			
Area #	Length (m)	Width (m)	Area (m ²)
6	100	117	11,700.0
7	85	22	1,850.0
8			0.0
9			0.0
10			0.0
Total Area (m ²)			13,650

Rainfall (Select Town...)

 AOPA Design Rainfall **85 mm**

Minimum Catchbasin Storage Volume Required		
696 m ³ **	24584.305 ft ³	
	153131.53 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

18 October 2024

J Lobbezoo Engineering & Consulting Services Ltd.

PO Box 96, Monarch, AB T0L1M0

JLECS File: P24037

Hutterian Brethren Church of Cluny

PO Box 70

Cluny, Alberta T0J 0S0

Attention: Mr. Joel Tschetter

**Re: Geotechnical Review and Evaluation
 NRCB Permitting of Pens and Catch Basins
 NE-07-022-20-W4M, near Cluny, 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 pens and a catch basin within NE-07-022-20-W4M, located along the east side of Crowfoot Creek (refer to Figure 1, attached). The letter also encompasses a proposed catch basin to be located near the northwest corner of the pens, which would capture surface runoff from the west three pens.

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater, eleven boreholes were advanced at the site on July 30, 2024. The boreholes were advanced at the approximate locations denoted as CC1-24 to CC11-24 on Figure 1, attached. Borehole CC2-24 was redrilled on September 23, 2024, at which time a permeability test well was installed.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of 3.9 m to 6.0 m below the existing grade. The boreholes were logged by Larry DeLong of Chilako Drilling Services.

In general, the natural mineral soils encountered in the boreholes consisted of a layer of minor clay fill (with localized gravel fill), overlying clay till, with bedrock (predominately mudstone) below 1.5 m to 2.7 m below existing grades. While perched water was noted in gravelly clay till at about 2.5 depth at borehole CC1-24, no groundwater resource (as defined by the AOPA) was identified within the 6.0 m investigation depth at the feedlot site.

Samples of soil collected from the screened zones of boreholes CC3-24, CC7-24, and CC10-24 as well as samples from similar depths at the other boreholes were all subjected to grain size analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The results indicate a soil texture breakdown of:

Table 1: Soil Texture Analyses

Borehole/Depth	% Sand	% Silt	% Clay
CC1-24 / 3.0 – 4.5 m	34	26	40
CC2-24 / 2.0 – 2.5 m	29	32	39
CC3-24 / 1.5 – 3.0 m	56	13	31
CC3-24 / 4.5 – 6.0 m	16	32	52
CC5-24 / 4.5 – 5.5 m	42	19	39
CC6-24 / 1.7 – 2.2 m	42	20	38
CC7-24 / 1.5 – 2.0 m	27	32	41
CC8-24 / 1.5 – 2.0 m	28	39	33
CC9-24 / 1.5 – 2.0 m	14	31	55
CC10-24 / 1.5 – 2.0 m	39	26	35
Average:	33	27	40

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes CC2-23, CC3-24, CC7-24 and CC10-24. Test well CC2-24 (existing north catch basin) was screened from 2.9 m to 4.9 m depth, CC3-24 (proposed NW catch basin) was screened from 2.8 m to 6.0 m depth, and test wells CC7-24 and CC10-24 (pen area) were screened from 0.9 m to 2.0 m (CC7-24) and 1.4 m to 3.0 m (CC10-24). Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring wells to the top for several consecutive days. After several days of testing, 24-hour water drops of 0.10 m was determined at CC2-24 and CC3-24, 0.43 m at CC7-24, and a 24-hr drop of 0.91 at CC10-24.

To calculate the permeability of the screened portion of the clay till strata at the test well locations, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test reports. The results of the permeability testing indicate an *in situ* hydraulic conductivity, k_s , of 9.9×10^{-9} cm/s at CC2-24, 5.3×10^{-9} cm/s at CC3-24, 1.6×10^{-7} cm/s at CC7-24, and 1.9×10^{-7} cm/s at CC10-24.

Using the measured permeability of the clay stratum, the 1.6 m of clay screened at CC2-24 and the 3.2 m of clay screened at CC3-24 are estimated to represent the equivalent of over 100 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA). At CC7-10, the 1.1 m of clay screened is estimated to represent the equivalent of about 7 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s, and at CC10-24, the 1.6 m of clay screened estimated to represent the equivalent of about 8 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s. This represents natural material protection in excess of the minimum requirements outlined by the AOPA for catch basins (minimum 5 m, Section 9.5-b) and solid manure storage (minimum 2 m, Section 9.5-c).

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and proposed development at the site, it is JLECS's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for permitting the proposed pens and catch basin at this location.

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

PERMIT TO PRACTICE	
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.	
RM SIGNATURE: _____	<i>[Handwritten Signature]</i>
RM APEGA ID #: _____	<i>110150</i>
DATE: _____	<i>18 Oct 2024</i>
PERMIT NUMBER: P016456	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

Attachments

- Figure 1 Borehole Locations
- In Situ Permeability Test Calculations
- Down to Earth Soil Texture Results
- Soil Profile and Parent Material Description, Chilako Drilling Services



Figure 1: Site Layout & Borehole Locations

Image Credit: Google

CC2-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

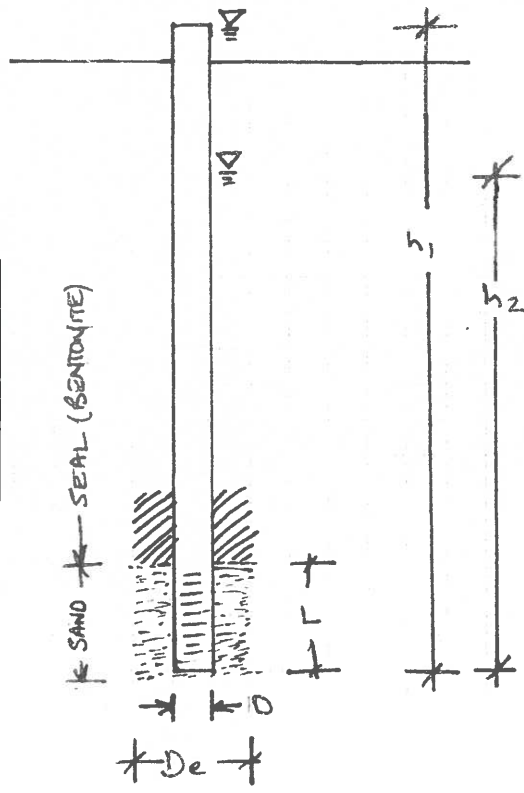
$$K_s = \frac{r^2}{2\ell\Delta t} \left[\frac{\sinh^{-1} \frac{\ell}{r_e}}{2} \ln \left[\frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[\frac{2H_1H_2 - \ell H_2}{2H_1H_2 - \ell H_1} \right] \right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)

CC2-24 - Cluny Colony
JLECS File: P24037

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.60	length of sand section (m)
	h1	5.10	initial height of water above base of hole (m)
	h2	5.00	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s = 9.9E-09$ cm/sec



CC3-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t} \left[\frac{\sinh^{-1} \frac{\ell}{r_e}}{2} \ln \left[\frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[\frac{2H_1H_2 - \ell H_2}{2H_1H_2 - \ell H_1} \right] \right]$$

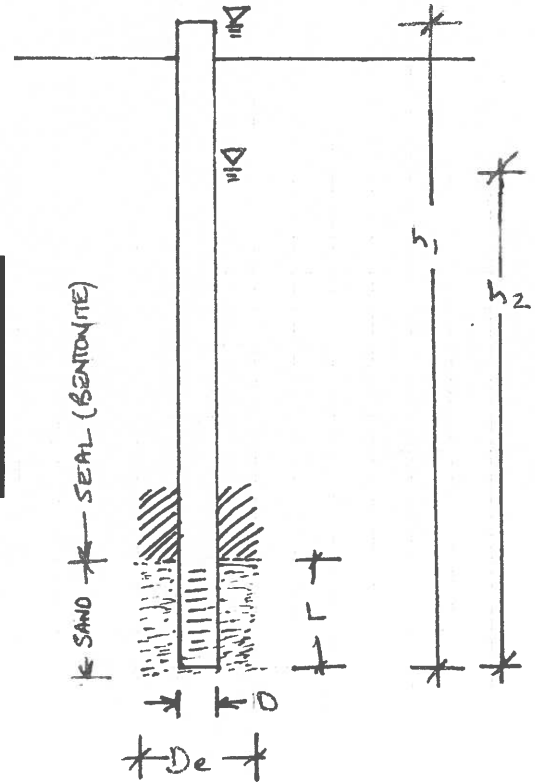
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

CC3-24 - Cluny Colony

JLECS File: P24037

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	3.20	length of sand section (m)
	h1	6.15	initial height of water above base of hole (m)
	h2	6.05	final height of water above base of hole (m)
	t	24.0	time of test (h)

$k_s = 5.3E-09$ cm/sec



CC7-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

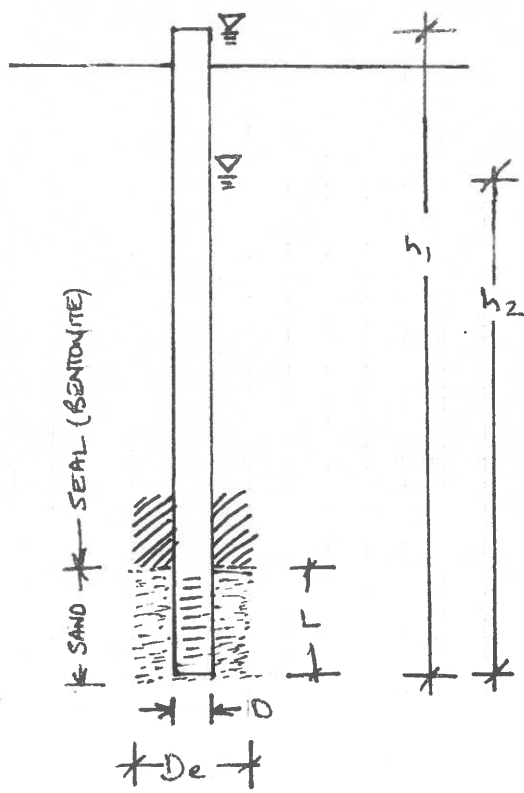
$$K_s = \frac{r^2}{2\ell\Delta t} \left[\frac{\sinh^{-1} \frac{\ell}{r_e}}{2} \ln \left[\frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[\frac{2H_1H_2 - \ell H_2}{2H_1H_2 - \ell H_1} \right] \right]$$

taken from USBR Engineering Geology Field Manual Volume 2 (2001)

CC7-24 - Cluny Colony
JLECS File: P24037

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.10	length of sand section (m)
	h1	2.15	initial height of water above base of hole (m)
	h2	1.72	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s = 1.6E-07$ cm/sec



CC10-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

$$K_s = \frac{r^2}{2\ell\Delta t} \left[\frac{\sinh^{-1} \frac{\ell}{r_e}}{2} \ln \left[\frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[\frac{2H_1H_2 - \ell H_2}{2H_1H_2 - \ell H_1} \right] \right]$$

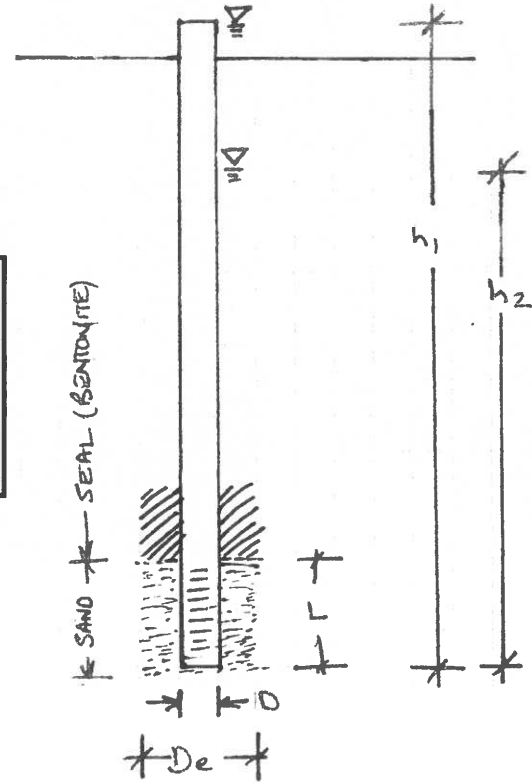
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

CC10-24 - Cluny Colony

JLECS File: P24037

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.60	length of sand section (m)
	h1	3.15	initial height of water above base of hole (m)
	h2	2.24	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s = 1.9E-07$ cm/sec





Down To Earth Labs Inc.

The Science of Higher Yields

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

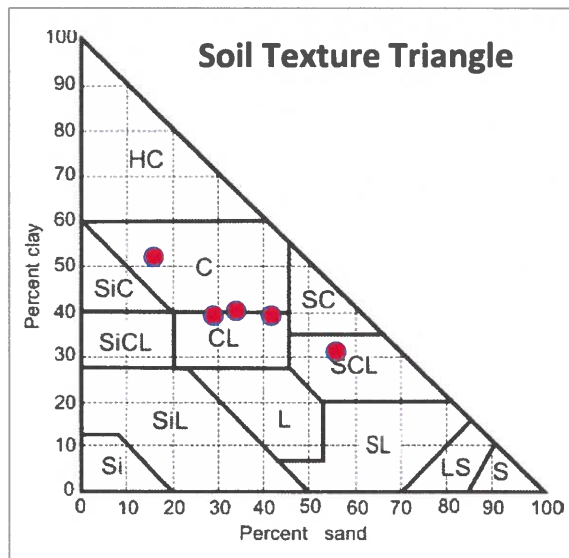
Report #: 184775
Report Date: 2024-08-13
Received: 2024-08-09
Completed: 2024-08-13
Test Done: ST

Project :
Cluny Colony

PO:

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

		Sample ID: 2408091017	2408091018	2408091019	2408091020	2408091021
	Cust. Sample ID:	CC1	CC2	CC3	CC3	CC5
Analyte	Units	3-3.6m	2-2.5m	4.5-6m	1.5-3m	4.5-5.5m
Sand	%	34.1	29.1	55.9	16.0	41.8
Silt	%	25.9	31.9	13.1	32.0	19.2
Clay	%	40.0	39.0	31.0	52.0	39.0
Soil Texture	-	Clay	Clay Loam	Sandy Clay Loam	Clay	Clay Loam





Down To Earth Labs Inc.

The Science of Higher Yields

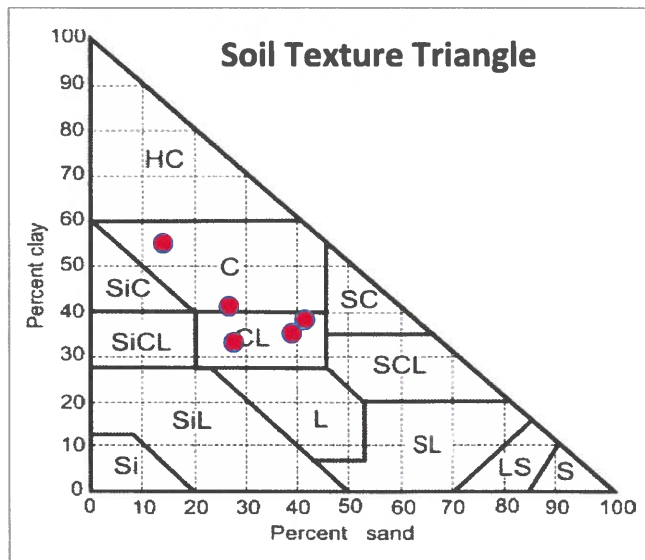
J. Lobbezoo Engineering +
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Lethbridge, AB T1H 5C3
403-328-1133
www.downtoearthlabs.com
info@downtoearthlabs.com

		Sample ID:	2408091022	2408091023	2408091024	2408091025	2408091026
		Cust. Sample ID:	CC6	CC7	CC8	CC9	CC10
	Analyte Units		1.7-2.2m	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0
Sand	%		41.6	26.9	27.8	14.1	39.1
Silt	%		20.4	32.1	39.2	30.9	25.9
Clay	%		38.0	41.0	33.0	55.0	35.0
Soil Texture	-		Clay Loam	Clay	Clay Loam	Clay	Clay Loam



Raygan Boyce - Chemist

CHILAKO DRILLING SERVICES LTD

Box 942 Coaldale, Alberta, T1M 1M8
(403) 345-3710

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NE7-22-20W4, Cluny Colony

Date: 30-Jul-24

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
CC1-24	0376564 5635809	0-0.9	CL	SM	Till		
		0.9-1.5	CL	M	Till		
		1.5-2.1	CL+Gr	M	Till		Clay mixed with gravel
		2.1-2.7	CL+Gr	Sat	Till		Clay mixed with gravel
		2.7-3.0	Sandstone	D	Bedrock		Soft bedrock, light gray
		3.0-3.6	Mudstone	SM	Bedrock		Soft bedrock, dark gray
		3.6-3.9	Siltstone	D	Bedrock		Hard bedrock, gray Auger refusal, free water @ 2.55m
CC2-24	0376506 5635825	0-1.2	CL-SCL	D	Fill		
		1.2-1.9	CL	SM	Till		
		1.9-4.5	Mudstone	SM	Bedrock	2.0-2.5	Layers of siltstone, mudstone, and sandstone, hard drilling
		4.5-4.7	Siltstone	D	Bedrock		Well Installed 23-Sep-24
		4.7-6.0	Coal	Sat	Bedrock		50mm H.C. Well installed to 4.5m BGS Screen: 4.5-3.0m Sand: 4.5-2.9m Bentonite: 2.0-0.0m Stickup: 0.6m Hole Diameter: 0.15m
CC3-24	0376376 5635793	0-0.8	CL	D	Till		
		0.8-1.0	CL+Gr	SM	Till		
		1.0-1.2	CL	SM	Till		
		1.2-3.0	Mudstone	SM	Bedrock	1.5-3.0	Soft bedrock, dark brown
		3.0-4.6	Mudstone	M	Bedrock		Soft bedrock, layers of siltstone, and mustone, olive brown
		4.6-6.0	Siltstone	M	Bedrock	4.5-6.0	Hard bedrock @ 6.0m, bentonite layers 50mm H.C. Well installed to 6.0m BGS Screen: 6.0-3.0m Sand: 6.0-2.8m Bentonite: 2.8-0.0m Stickup: 0.6m Hole Diameter: 0.15m
CC4-24	0376385 5635749	0-1.0	Gravel	D	Fill		Gravel and rock backfill Auger refusal @ 1.0m
CC5-24	0376389 5635757	0-0.7	CL-SiCL	SM	Till		V. Firm, med plastic
		0.7-1.5	CL	M	Till		V. Firm, med plastic, some gravel
		1.5-6.0	Mudstone	M	Bedrock	4.5-5.5	Soft, bedrock, dark brown, layered mudstone, siltstone, bentonitic layers No free water

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION (Continued)

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
CC6-24	0376385 5635651	0-1.2	CL	M	Fill	1.7-2.2	Very oxidized
		1.2-1.6	CL	M	Till		
		1.6-2.5	Mudstone	M	Bedrock		
		2.5-3.3	Mudstone	VM-Sat	Bedrock		
		3.3-4.0	Coal	D	Bedrock		
CC7-24	0376445 5635608	0-1.0	CL	M	Till	1.5-2.0	Stiff, med plastic, grayish brown Stiff, med plastic, dark brown 50mm H.C. Well installed to 2.0m BGS Screen: 2.0-1.0m Sand: 2.0-0.9m Bentonite: 0.9-0.0m Stickup: 0.6m Hole Diameter: 0.15m
		1.0-2.0	CL-C	M	Till		
CC8-24	0376451 5635821	0-2.1	CL	SM	Till	1.5-2.0	Stiff, med plastic, brown Stiff, med plastic, dark brown, trace coal
		2.1-3.0	Mudstone	SM	Till		
CC9-24	0376504 5635774	0-0.7	CL	D	Till	1.5-2.0	Stiff, med plastic, dark brown Soft bedrock, dark brown Soft bedrock, olive brown
		0.7-2.3	CL-C	SM	Till		
		2.3-2.6	Mudstone	SM	Bedrock		
		2.6-3.0	Siltstone	SM	Bedrock		
CC10-24	0376588 5635684	0-0.3	CL	SM	Fill	1.5-2.0	V. Firm-stiff, med plastic, sand streaks 50mm H.C. Well installed to 3.0m BGS Screen: 3.0-1.5m Sand: 3.0-1.4m Bentonite: 1.4-0.0m Stickup: 0.6m Hole Diameter: 0.15m
		0.3-3.0	CL	M-VM	Till		
CC11-24	0376587 5635596 On hill	0-1.2	CL	D	Till		Stiff, med plastic, brown Stiff, med plastic, dark brown
		1.2-1.6	CL-SiCL	D	Till		
		1.6-4.5	CL-C	SM	Till		

Legend: L Loam
C Clay
S Sand
Gr. Gravel
Si Silt
F Fine (sand)
VF Very Fine (sand)

Eg. VFSCl = Very Fine Sandy Clay Loam