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)

NRCB USE ONLY	Application number	Legal land description
☒ Approval ☐ Registration ☐ Authorization ☐ Amendment	LA25060	SW 14-14-24 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.

August 5 2025
Date of signing

[redacted]
Signature

Richard VanDriesten
Print name

Corporate name (if applicable)

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)
Catch Basin	*21 x 50 x 3
Manure Storage Pad.	15.3 x 91.5
Corrals #1	*44 x 20
Corrals #2	*25.25 x 51
Corrals #3 (2 rows plus shelter)	*48.5 x 117 + 18.3 m x 36.6 m
Corrals #4 (2 rows)	48.5 x [redacted] 134

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY

NRCB USE ONLY

SW-14-14-24-W4

AO Comment: Barns labeled on site plan are proposed to be used as shelters for livestock in corrals #3.

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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 October 30 2028

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**
Lamb Feeders	0	10,200	10,200

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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 _____
   5 gallons / minute – Champion Little Bow Water Co-op.

Signed this 5 day of August, 2025. [redacted]
Signature of Applicant or Agent

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.

GOWN ID

GIC Well ID 189355
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1975/02/07

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ADLER, KEITH	CARMANGAY				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SW	14	14	24	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 50.168203 Longitude -113.182973
How Location Obtained
Map

Elevation m
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Type of Work
Unknown

Proposed Well Use
Unknown

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
0.30		Topsoil
6.10		Brown Clay
42.67		Blue Clay
103.63		Sandstone
109.73		Fractured Sandstone & Coal

Yield Test Summary

Measurement in Metric

Recommended Pump Rate L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
109.73 m		1975/01/16	1975/01/19

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	109.73

Surface Casing (if applicable)
Steel
Size OD : 11.43 cm
Wall Thickness : 0.478 cm
Bottom at : 109.73 m

Well Casing/Liner
Size OD : 0.00 cm
Wall Thickness : 0.000 cm
Top at : 0.00 m
Bottom at : 0.00 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by

Annular Seal
Placed from 0.00 m to 0.00 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 Pea Gravel
Grain Size
Amount 4.00 Yards

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
UNKNOWN DRILLER

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Imperial | Export to Excel

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GOWN ID

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ADLER, KEITH	CARMANGAY				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SW	14	14	24	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 50.168203 Longitude -113.182973
How Location Obtained: Map

Elevation m
How Elevation Obtained: Not Obtained

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate L/min
Recommended Pump Intake Depth (From TOC) m
Pump Installed
Type
Depth m
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth m
Gas
Depth m
Remedial Action Taken
Well Disinfected Upon Completion
Geophysical Log Taken
Submitted to ESRD

Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well
OWNER STATES MEDIUM HARD WATER.

Yield Test

Taken From Ground Level | Measurement in Metric

Test Date	Start Time	Static Water Level
		m

Method of Water Removal
Type
Removal Rate L/min
Depth Withdrawn From m

If water removal period was < 2 hours, explain why

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
UNKNOWN DRILLER

Copy of Well report provided to owner
Date approval holder signed

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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:** Corrals

Proposed 2: Catch Basin **Proposed 3:** Manure Pad

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?	☐ >1 m ☐ ≤ 1 m	☒ >1 m ☐ ≤ 1 m	☒ >1 m ☐ ≤ 1 m	☒ > 1 m ☐ ≤ 1 m	☐ YES ☐ NO ☐ YES with exemption	
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?		0	0	0	☐ YES ☐ NO ☐ YES with exemption	
	How many water wells are within 100 m of the manure storage facility or manure collection area?		1	0	0	☐ YES ☐ NO ☐ YES with exemption	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)		3 miles	3 miles	3 miles	☐ YES ☐ NO ☐ YES with exemption	
Groundwater information	What is the depth to the water table?		>10.5 m	>10.5 m	>10.5 m	☐ YES ☐ NO ☐ YES with exemption	
	What is the depth to the groundwater resource/aquifer you draw water from?		42m	42m	42m	☐ YES ☐ NO ☐ YES with exemption	

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

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

			NRCB USE ONLY				
Neighbour name(s)	**Legal land description**	**Distance (m)**	**Zoning (LUB) category**	**MDS category (1-4)**	**Distance (m)**	**Waiver attached (if required)**	**Meets regulations**
Ian/Sena Beliat	SE-15-14-24-W4	1050m					

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

				NRCB USE ONLY	
Name of land owner(s)*	**Legal land description**	**Usable area** (ha)**	**Soil zone ***	**Usable area (ha)**	**Agreement attached (if required)**
Richard VanDriesten	SW-14-14-24-W4	8	Brown		
Albertus Vande Bruinhorst	NE-15-14-24-W4	65	Brown		
Albertus Vande Bruinhorst	SE-28-14-24-W4	65	Brown		
Albertus Vande Bruinhorst	SW-28-14-24-W4	65	Brown		
			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)

Manure Spreading Agreement

This agreement is between Richard Van Driesten, manure producer, and Albertus Vande Bruinhorst manure receiver.

Length of agreement: This agreement is valid for a time period of one year (minimum of one year)

Legal land location	Soil type[1]	Acres suitable for manure spreading[2]
NE-15-14-24-W4	Brown	160
SE-28-14-24-W4	Brown	160
SW-28-14-24-W4	Brown	160

[1] Soil type choices: Dark brown and brown, Grey wooded, Black, Irrigated.

[2] Land within required setbacks from water bodies, water wells, residences, etc. is not to be included.

Other comments:

Manure producer (Confined Feeding Operation) Legal Land Location SW-14-14-24-W4

Date of signing	Signature	Print name	Corporate name(if appl)
Aug 5/25	[redacted]	Richard Van Driesten	

Manure Receiver – Landowner(s)[3]

Date of signing	Signature	Print name	Corporate name(if appl)
Aug 5/25	[redacted]	Bert VandeBruinhorst	
			ewenique farms

[3] All registered owners of land, or authorized signing authorities must sign.

Name	Richard Van Driesten
Address	
Legal Land Location	SW 14-14-24 W4

MDS Spreadsheet based on 2006 AOPA Regulations

Category of Livestock	Type of Livestock	Factor A	Technology Factor	MU	LSU Factor	Number of Animals	LSU
Feedlot Animals	Beef Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.4459		-
	Beef Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.2450		-
	Beef Feeder Calves (<550 lbs)	0.700	0.700	0.275	0.1348		-
	Horses - PMU	0.650	0.700	1.000	0.4550		-
	Horses - Feeders > 750 lbs	0.650	0.700	1.000	0.4550		-
	Horses - Foals < 750 lbs	0.650	0.700	0.300	0.1365		-
	Mules	0.600	0.700	1.000	0.4200		-
	Donkeys	0.600	0.700	0.670	0.2814	-	-
	Bison	0.600	0.700	1.000	0.4200		-
	Other						-
Dairy (*count lactating cows only)	Free Stall – Lactating Cows with all associated dries, heifers, and calves*	0.800	1.100	2.000	1.7600		-
	Free Stall – Lactating Cows with Dry Cows only*	0.800	1.100	1.640	1.4432		-
	Free Stall – Lactating Cows only	0.800	1.100	1.400	1.2320		-
	Tie Stall – Lactating Cows only	0.800	1.000	1.400	1.1200		-
	Loose Housing – Lactating Cows only	0.800	1.000	1.400	1.1200		-
	Dry Cow	0.800	0.700	1.000	0.5600		-
	Replacements – Bred Heifers (Breeding to Calving)	0.800	0.700	0.875	0.4900		-
	Replacements - Growing Heifers (350 lbs to breeding)	0.800	0.700	0.525	0.2940		-
	Calves (< 350 lbs)	0.800	0.700	0.200	0.1120		-
	Other						-
Swine Liquid (*count sows only)	Farrow to finish *	2.000	1.100	1.780	3.9160		-
	Farrow to wean *	2.000	1.100	0.670	1.4740		-
	Farrow only *	2.000	1.100	0.530	1.1660		-
	Feeders/Boars	2.000	1.100	0.200	0.4400		-
	Growers/Roasters	2.000	1.100	0.118	0.2600		-
	Weaners	2.000	1.100	0.055	0.1210		-
	Other						-
Swine Solid (*Count sows only)	Farrow to finish *	2.000	0.800	1.780	2.8480		-
	Farrow to wean *	2.000	0.800	0.670	1.0720		-
	Farrow only *	2.000	0.800	0.530	0.8480		-
	Feeders/Boars	2.000	0.800	0.200	0.3200		-
	Growers/Roasters	2.000	0.800	0.118	0.1888		-
	Weaners	2.000	0.800	0.055	0.0880		-
	Other						-
Poultry	Chicken - Breeders - Solid	1.000	0.700	0.010	0.0070		-
	Chicken - Layers - Liquid (includes associated pullets)	2.000	1.100	0.008	0.0176		-
	Chicken - Layers - (Belt Cage)	2.000	0.700	0.008	0.0112		-
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.0112		-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.0014		-
	Turkey - Toms/Breeders	1.000	0.700	0.020	0.0140		-
	Turkey - Hens (light)	1.000	0.700	0.013	0.0091		-
	Turkey - Broilers	1.000	0.700	0.010	0.0070		-
	Ducks	1.000	0.700	0.010	0.0070		-
	Geese	1.000	0.700	0.020	0.0140		-
	Other						-
Sheep and Goats	Sheep - Ewes/Rams	0.600	0.700	0.200	0.0840		-
	Sheep - Ewes with lambs	0.600	0.700	0.250	0.1050		-
	Sheep - Lambs	0.600	0.700	0.050	0.0210		-
	Sheep - Feeders	0.600	0.700	0.100	0.0420	10,200	428.4
	Goats - Meat/Milk (per Ewe)	0.700	0.700	0.170	0.0833		-
	Goats - Nannies/Billies	0.700	0.700	0.140	0.0686		-
	Goats - Feeders	0.700	0.700	0.077	0.0377		-
	Other						-
Cervid	Elk	0.600	0.700	0.600	0.2520		-
	Deer	0.600	0.700	0.200	0.0840		-
	Other						-
Wild Boar	Feeders	2.000	0.800	0.140	0.2240	-	-
	Sow (farrowing)	2.000	0.800	0.371	0.5936		-
	Other						-
					Total		428.4

For New Operations

Dispersion Factor: 1

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	1,230	375
2	54.72	1,640	500
3	68.4	2,050	625
4	109.44	3,279	1,000

For Expanding Operations

Dispersion Factor: 1

Expansion Factor: 0.77

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	947	289
2	54.72	1,263	385
3	68.40	1,578	481
4	109.44	2,525	770

Name Richard Van Driesten
Address 0
Legal Land
Location SW 14-14-24 W4

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)
Feedlot Animals	Cows/Finishers (900+ lbs)	0.0	0.0	0.0	0.0	0.0
	Feeders (450 - 900 lbs)	0.0	0.0	0.0	0.0	0.0
	Feeder Calves (<550 lbs)	0.0	0.0	0.0	0.0	0.0
	Horses - PMU	0.0	0.0	0.0	0.0	0.0
	Horses - Feeders > 750 lbs	0.0	0.0	0.0	0.0	0.0
	Horses - Foals < 750 lbs	0.0	0.0	0.0	0.0	0.0
	Mules	0.0	0.0	0.0	0.0	0.0
	Donkeys	0.0	0.0	0.0	0.0	0.0
	Bison	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Dairy (*count lactating cows only)	Free Stall – Lactating Cows with all associated dries, heifers, and calves*	0.0	0.0	0.0	0.0	0.0
	Free Stall – Lactating Cows with Dry Cows only *	0.0	0.0	0.0	0.0	0.0
	Free Stall – Lactating Cows only*	0.0	0.0	0.0	0.0	0.0
	Tie Stall – Lactating Cows only	0.0	0.0	0.0	0.0	0.0
	Loose Housing – Lactating Cows only	0.0	0.0	0.0	0.0	0.0
	Dry Cow (Solid manure)	0.0	0.0	0.0	0.0	0.0
	Dry Cow (Liquid manure)	0.0	0.0	0.0	0.0	0.0
	Replacements – Bred Heifers (Breeding to Calving)	0.0	0.0	0.0	0.0	0.0
	Replacements - Growing Heifers (350 lbs to breeding)	0.0	0.0	0.0	0.0	0.0
	Calves (< 350 lbs)	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Swine Liquid (*count sows only)	Farrow to finish *	0.0	0.0	0.0	0.0	0.0
	Farrow to wean *	0.0	0.0	0.0	0.0	0.0
	Farrow only *	0.0	0.0	0.0	0.0	0.0
	Feeders/Boars	0.0	0.0	0.0	0.0	0.0
	Growers/Roasters	0.0	0.0	0.0	0.0	0.0
	Weaners	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Swine Solid (*Count sows only)	Farrow to finish *	0.0	0.0	0.0	0.0	0.0
	Farrow to wean *	0.0	0.0	0.0	0.0	0.0
	Farrow only *	0.0	0.0	0.0	0.0	0.0
	Feeders/Boars	0.0	0.0	0.0	0.0	0.0
	Growers/Roasters	0.0	0.0	0.0	0.0	0.0
	Weaners	0.0	0.0	0.0	0.0	0.0
		0.0				
Poultry	Chicken - Breeders - Solid	0.0	0.0	0.0	0.0	0.0
	Chicken - Layers - Liquid (includes associated pullets)	0.0	0.0	0.0	0.0	0.0
	Chicken - Layers - (Belt Cage)	0.0	0.0	0.0	0.0	0.0
	Chicken - Layers - (Deep Pit)	0.0	0.0	0.0	0.0	0.0
	Chicken - Pullets/Broilers	0.0	0.0	0.0	0.0	0.0
	Turkey - Toms/Breeders	0.0	0.0	0.0	0.0	0.0
	Turkey - Hens (light)	0.0	0.0	0.0	0.0	0.0
	Turkey - Broilers	0.0	0.0	0.0	0.0	0.0
	Ducks	0.0	0.0	0.0	0.0	0.0
	Geese	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Goats and Sheep	Sheep - Ewes/Rams	0.0	0.0	0.0	0.0	0.0
	Sheep - Ewes with lambs	0.0	0.0	0.0	0.0	0.0
	Sheep - Lambs	0.0	0.0	0.0	0.0	0.0
	Sheep - Feeders	10200.0	164.2	136.7	102.0	81.6
	Goats - Meat/Milk (per Ewe)	0.0	0.0	0.0	0.0	0.0
	Goats - Nannies/Billies	0.0	0.0	0.0	0.0	0.0
	Goats - Feeders	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Cervid	Elk	0.0	0.0	0.0	0.0	0.0
	Deer	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
Wild Boar	Feeders	0.0	0.0	0.0	0.0	0.0
	Sow (farrowing)	0.0	0.0	0.0	0.0	0.0
	Other	0.0				
	Total Hectares		164	136.7	102.0	81.6
	Total Acres		406	337.7	252.0	201.6

Part 2 – Technical Requirements

NRCB Natural Resources Conservation Board

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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
2. _____
3. _____

Determination of runoff area

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

Areas of pens and Manure pad.

Catch basin capacity

	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)
1.	50	21	3	3	3:1	3:1	0	
2.								
3.								
							TOTAL CAPACITY	

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____(m)	Provide details (as required)	
Soil texture	24 % sand	29 % silt	47 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 3.5 m silty clay	Hydraulic conductivity (cm/s): 1.8×10^{-8}	Describe test standard used: in situ

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

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. Manure Pad.
2. Corrals #1

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m^3)
1.	* 15.3	* 91.5	0	
2.	* 44	* 20	0	
			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

Run off goes to catch basin.

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4 (m)	Provide details (as required)	
Soil texture	24 % sand	29 % silt	47 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 4m silty clay	Hydraulic conductivity (cm/s): 3.2×10^{-7}	Describe test standard used: in situ

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)

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. Corrals #2
2. Corrals #3

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	25.25	51	0	
2.	48.5	117	0	
			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

Run off goes to catch basin

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4 (m)	Provide details (as required)	
Soil texture	24 % sand	29 % silt	47 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 4m silty clay	Hydraulic conductivity (cm/s): 3.2×10^{-7}	Describe test standard used: in situ

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)

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. Corrals #4
2.

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	48.5	134	0	
2.			0	
			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

Run off goes to catch basin.

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4 (m)	Provide details (as required)	
Soil texture	24 % sand	29 % silt	47 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 4m silty clay	Hydraulic conductivity (cm/s): 3.2×10^{-7}	Describe test standard used: in situ

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

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

17 July 2025

J Lobbezoo Engineering & Consulting Services Ltd.
PO Box 96, Monarch, AB T0L1M0

JLECS File: P25070

Richard Van Driesten
PO Box 119
Champion, Alberta T0L 0R0

Re: Geotechnical Review and Evaluation
NRCB Permitting of Pens and Catch Basin
SW-14-014-24-W4M, near Champion, 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 the site soil conditions to support a permit application related to a series of proposed pens and a catch basin at the above-captioned quarter section (refer to Figure 1, attached).

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater resource, 12 boreholes were advanced at the site on June 4, 2025. The boreholes were advanced at the approximate locations denoted as RV1-25 to RV12-25 on Figure 1, attached.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of 3.0 m to 10.5 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 1.4 m to 4.8 m of lacustrine clay and silty clay (with minor near surface occurrences of sandy loam) overlying medium plastic clay till. Neither groundwater seepage nor a groundwater resource (as defined by the AOPA) was encountered within the 10.5 m investigation depth at this site.

Samples of soil collected from the screened zones of boreholes RV4-25, RV7-25 and RV11-25 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 lab report is attached, for reference. The results indicate a soil texture breakdown of:

Table 1: Soil Texture Analyses

Borehole/Depth	% Sand	% Silt	% Clay
RV1-25 / 2.0 – 3.0 m	16	34	50
RV2-25 / 6.0 – 8.0 m	46	30	24
RV3-25 / 2.0 – 3.0 m	22	36	42
RV4-25 / 8.0 – 9.0 m	36	28	36
RV5-25 / 8.0 – 9.0 m	38	26	36
RV6-25 / 2.5 – 3.0 m	11	42	47
RV6-25 / 8.0 – 9.0 m	40	24	36
RV7-25 / 1.5 – 3.0 m	10	22	68
RV8-25 / 2.0 – 3.0 m	14	32	54
RV9-25 / 1.5 – 2.8 m	18	10	72
RV10-25 / 1.5 – 3.0 m	28	30	42
RV11-25 / 1.5 – 2.9 m	17	31	52
RV12-25 / 1.5 – 3.0 m	10	34	56
Average:	*24*	*29*	*47*

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes RV4-25 (catch basin), RV7-25 (east pen area), and RV11-25 (west pen area). Test well RV4-25 was screened from 7.4 m to 10.5 m depth, RV7-25 was screened from 1.9 m to 3.5 m depth, and RV11-25 was screened from 1.2 m to 2.4 m depth. 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, the following 24-hour water drops were determined: 0.65 m drop at RV4-25; 0.25 m at RV7-25; and a 24-hour water drop of 0.15 m was determined at RV11-25.

To calculate the permeability of the screened portion of the clay 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 the following *in situ* hydraulic conductivity (k_s) values:

k_s = $\underline{1.8 \times 10^{-8}\ cm/s}$ at RV4-25 (catch basin);
k_s = $\underline{3.2 \times 10^{-7}\ cm/s}$ at RV7-25 (east pen area); and
k_s = $\underline{3.2 \times 10^{-8}\ cm/s}$ at RV11-25 (west pen area).

Using the measured permeability of the clay at this site, the 3.1 m of clay screened at test hole RV4-25 is estimated to represent the equivalent of over 100 m of naturally occurring materials having a hydraulic conductivity of 1 x 10^{-6} cm/s (the reference standard in AOPA). At RV7-25, the 1.6 m of clay screened is estimated to represent the equivalent of approximately 50 m of naturally occurring materials having a hydraulic conductivity of 1 x 10^{-6} cm/s. Finally, at RV11-25, the 1.2 m of clay screened is estimated to represent the equivalent of approximately 38 m of naturally occurring materials having a hydraulic conductivity of 1 x 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).

----JLECS----

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and 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 catch basin and pens at this location.

Notwithstanding, for the proposed catch basin it is noted that the upper lacustrine fine sand and loam soils would require removal from the side slope areas at the time of construction, and reconstruction of the upper catch basin side slopes using low permeable clay soils would be required. The existing clay and clay till soils encountered below the upper fine sand and loam soils are considered suitable for the upper side slope construction.

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.

[redacted] 17 July 2025

John Lobbezoo, P.Eng.
Principal Geotechnical Engineer

PERMIT [redacted] PRACTICE
J LOBBEZ [redacted] GINEERING &
CONSULT [redacted] RVICES LTD.
RM SIGNATURE: [redacted]
RM APEGA ID #: [redacted] 0150
DATE: [redacted] July 2025
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

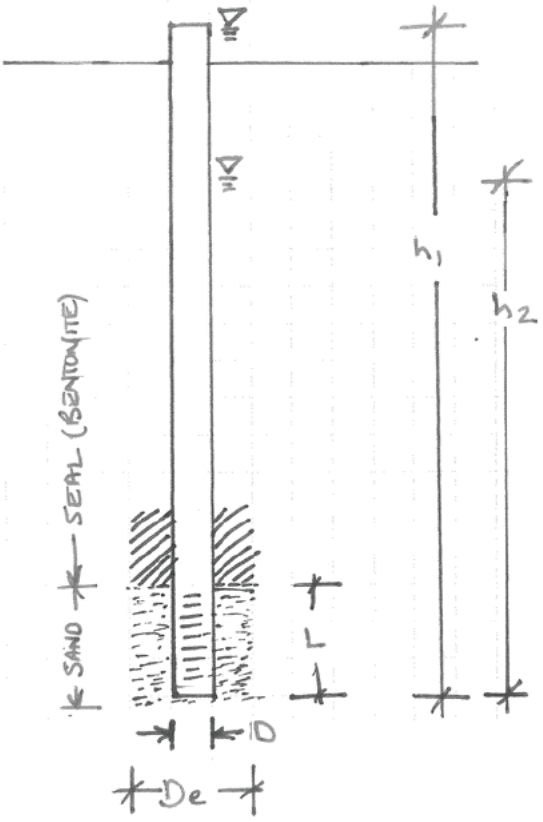
RV4-25

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)



RV4-25 - Richard Van Driesten

JLECS File: P25070

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	3.10	length of sand section (m)
h1	11.10	initial height of water above base of hole (m)
h2	10.45	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 1.8E-08 cm/sec

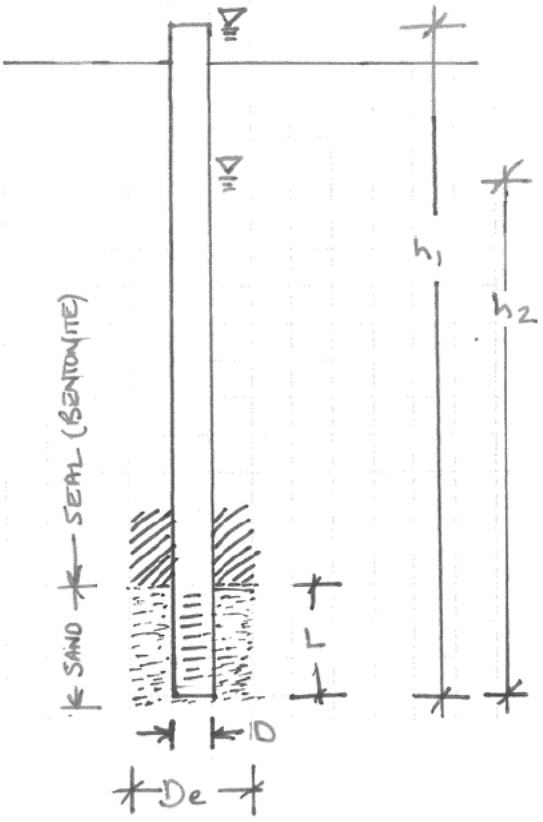
RV7-25

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)



RV7-25 - Richard Van Driesten

JLECS File: P25070

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	4.10	initial height of water above base of hole (m)
h2	3.85	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 3.2E-08 cm/sec

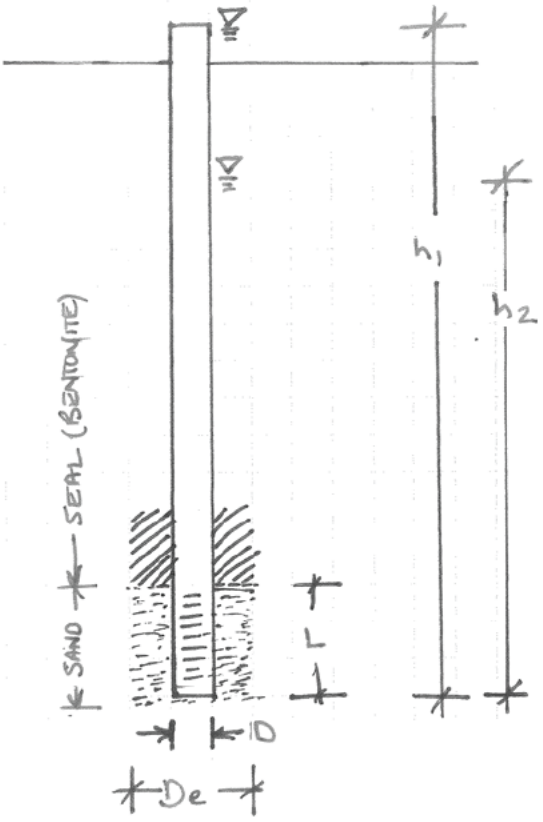
RV11-25

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)



RV7-25 - Richard Van Driesten

JLECS File: P25070

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.20	length of sand section (m)
h1	3.00	initial height of water above base of hole (m)
h2	2.85	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 3.2E-08 cm/sec

Down To Earth Labs Inc.

The Science of Higher Yields

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

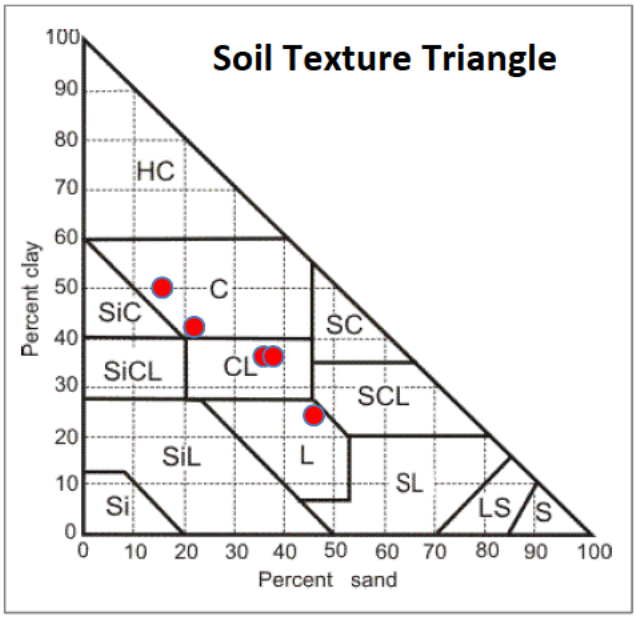
Report #: 209831
Report Date: 2025-07-08
Received: 2025-07-04
Completed: 2025-07-08
Test Done: ST

Project : Van Driesten

PO:

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

Analyte	Units	Sample ID: 250704O011	250704O012	250704O013	250704O014	250704O015
		Cust. Sample ID: RV 1-25	RV 2-25	RV 3-25	RV 4-25	RV 5-25
		2.0-3.0	6.0-8.0	2.0-3.0	8.0-9.0	8.0-9.0
Sand	%	15.8	46.1	22.2	36.1	38.0
Silt	%	34.2	29.9	35.8	27.9	26.0
Clay	%	50.0	24.0	42.0	36.0	36.0
Soil Texture	-	Clay	Loam	Clay	Clay Loam	Clay Loam



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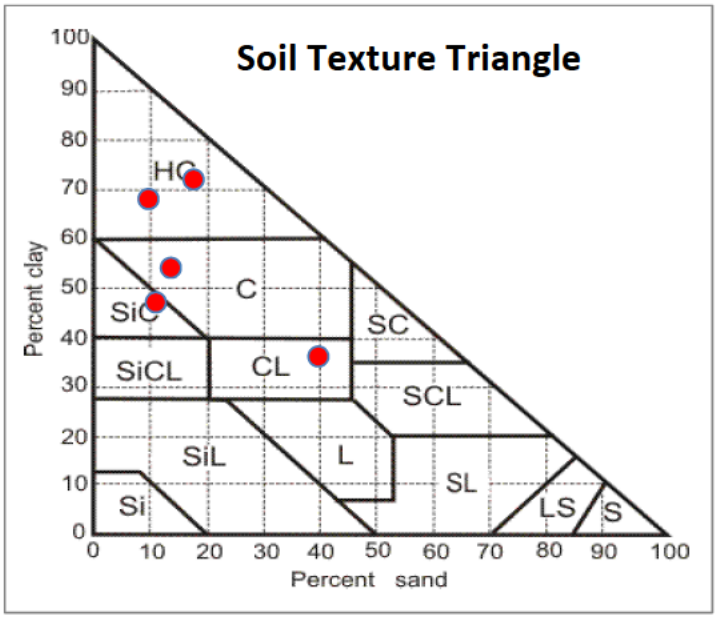
Lethbridge, AB T1H 5C3
403-328-1133
www.downtoearthlabs.com
info@downtoearthlabs.com

		Sample ID:	250704O016	250704O017	250704O018	250704O019	250704O020
		Cust. Sample ID:	RV 6-25	RV 6-25	RV 7-25	RV 8-25	RV 9-25
Analyte	Units		2.5-3.0	8.0-9.0	1.5-3.0	2.0-3.0	1.5-2.8
Sand	%		11.1	39.9	9.8	13.8	17.8
Silt	%		41.9	24.1	22.2	32.2	10.2
Clay	%		47.0	36.0	68.0	54.0	72.0
Soil Texture	-		Silty Clay	Clay Loam	Heavy Clay	Clay	Heavy Clay



Down To Earth Labs Inc.
The Science of Higher Yields

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

Report #: 209831
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Test Done: ST

Project : Van Driesten

PO:

3510 6th Ave North
Lethbridge, AB T1H 5C3
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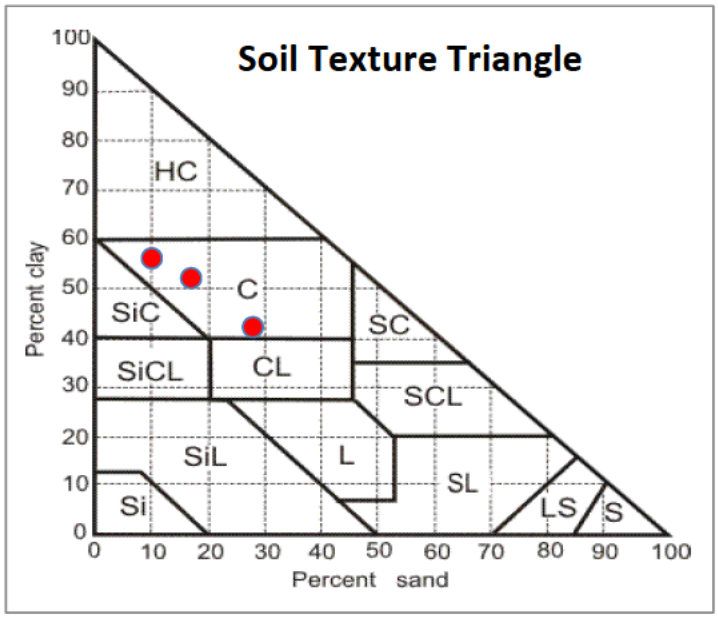
info@downtoearthlabs.com

		Sample ID:	250704O021	250704O022	250704O023
		Cust. Sample ID:	RV 10-25	RV 11-25	RV 12-25
Analyte	Units		1.5-3.0	1.5-2.9	1.5-3.0
Sand	%		28.1	17.2	10.2
Silt	%		29.9	30.8	33.8
Clay	%		42.0	52.0	56.0
Soil Texture	-		Clay	Clay	Clay



Raygan Boyce - Chemist

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: SW14-14-24W4, Richard VanDriesten Date: 04-Jun-25

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
RV1-25	0344248	0-1.5	FSL	M	Lac		
	5559306	1.5-2.0	SiCL	M	Lac		V. Firm, med plastic, olive
		2.0-3.3	SiCL	M	Lac	2.0-3.0	Stiff, med plastic, olive
		3.3-4.5	SiC	M	Lac		Stiff, med-high plastic, olive, varved
RV2-25	0344293	0-0.9	FSL	M	Lac		
	5559411	0.9-3.0	SiCL	D	Lac		V. Firm, med plastic, olive
		3.0-3.4	SiC	SM	Lac		Stiff, med-high plastic, olive
		3.4-5.7	CL	SM	Till		Stiff, med plastic, brown
		5.7-6.0	SCL	SM	Till	5.0-6.0	Sand pocket
		6.0-8.0	C	SM	Till	6.0-8.0	Stiff, med plastic, brown
		8.0-9.0	SCL	SM	Till		Stiff, med plastic, brown, some gravel
RV3-25	0344254	0-0.6	FSL	M	Lac		
	5559411	0.6-4.0	SiCL	D	Lac	2.0-3.0	V. Firm, med plastic, olive
RV4-25	0344367	0-0.7	FSL	M	Lac		
	5559407	0.7-1.0	SiCL	SM	Lac		
		1.0-1.7	SiCL	VM	Lac		Soft, med plastic, olive
		1.7-3.9	SiC	M	Lac		Stiff, med-high plastic, olive, varved
		3.9-5.0	CL-C	SM	Till		Stiff, med plastic, brown
		5.0-6.0	SiCL	SM	Till		Stiff, med plastic, olive brown
		6.0-10.5	C	SM	Till	8.0-9.0	V. Stiff, med plastic, dark brown
							sand pocket (6.5-6.6, dry)
							50mm H.C. Well installed to 10.5m BGS
							Screen: 10.5-7.5m
							Sand: 10.5-7.4m
							Bentonite: 7.4-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
RV5-25	0344335	0-0.7	FSL	D	Lac		
	5559407	0.7-1.5	SiCL	SM	Lac		V. Firm, med plastic, olive
		1.5-2.7	SiCL	SM	Lac		Stiff, med plastic, olive, varved with SiC
		2.7-4.2	SiC	SM	Lac		Stiff, med-high plastic, varved
		4.2-4.7	CL	SM	Till		Stiff, med plastic, brown
		4.7-5.7	FSCL-SiCL	SM	Till		V. Firm, low-med plastic, brown, layered SCL/SiCL
		5.7-6.5	CL-C	SM	Till		V. Stiff, med plastic, dark brown, sand pockets
		6.5-9.0	C	SM	Till	8.0-9.0	V. Stiff, med plastic, dark brown
RV6-25	0344412	0-0.8	FSL	M	Lac		
	5559407	0.8-1.5	SiCL	SM	Lac		
		1.5-4.1	SiCL-SiC	M	Lac	2.5-3.0	Stiff, med plastic, olive brown
		4.1-4.8	SiCL-SiC	SM	Lac		Stiff, med plastic, olive brown
		4.8-6.6	CL-C	SM	Till		Stiff, med plastic, brown, silt pockets
		6.6-9.0	C	SM	Till	8.0-9.0	Stiff, med plastic, dark brown

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION (CONTINUED)

Site Location: SW14-14-24W4, Richard VanDriesten Date: 04-Jun-25

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
RV7-25	0344438	0-0.7	FSL	M	Lac		
	5559297	0.7-3.6	SiCL	D	Lac	1.5-3.0	V. Firm, med plastic, olive brown, varved with SiC
							50mm H.C. Well installed to 3.5m BGS
							Screen: 3.5-2.0m
							Sand: 3.5-1.9m
							Bentonite: 1.9-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
RV8-25	;0344333	0-0.6	FSL	M	Lac		
	5559298	0.6-1.4	FSL	D	Lac		
		1.4-2.1	SiL-SiCL	D	Lac		
		2.1-4.0	SiCL	D	Lac	2.0-3.0	V. Firm, med plastic, olive brown, sand lensing
		4.0-4.5	CL	SM	Till		Stiff, med plastic, brown, sand lensing
RV9-25	0344125	0-0.4	FSL	M	Lac		
	5559319	0.4-1.1	SiCL	M	Lac		Firm, med plastic, light gray
		1.1-2.8	SiCL-SiC	M	Lac	1.5-2.8	Stiff, med plastic, olive brown
		2.8-3.0	CL	M	Till		Stiff, med plastic, brown
RV10-25	0344023	0-0.3	FSCL	M	Lac		
	5559334	0.3-1.4	SiCL	M	Lac		Stiff, med plastic, olive brown
		1.4-3.0	CL	M	Till	1.5-3.0	Stiff, med plastic, brown, sand lensing
RV11-25	0343922	0-0.9	FSL	M	Lac		
	5559327	0.9-2.9	SiCL	M	Lac		Stiff, med plastic, olive brown
		2.9-3.0	CL	M	Till		Stiff, med plastic, olive brown
							50mm H.C. Well installed to 2.4m BGS
							Screen: 2.4-1.3m
							Sand: 2.4-1.2m
							Bentonite: 1.2-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
RV12-25	0343824	0-1.0	FSL	M	Lac		
	5559348	1.0-1.4	FSCL	M	Lac		
		1.4-3.0	SiCL	M	Lac		Stiff, med plastic, olive brown, varved

Legend:

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