

# 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	LA25013	N½ 6-11-7 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.

March 18 2025

Date of signing

Signature

Kody Traxel

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)
Feed Pens North (NE6-11) Area of 13,555.51 M2 Pens& Roads	(Odd Shape, attached)
Feed Pens South (NE6-11) Area of 4401.63 M2 #1	(Odd Shape, attached)
Feed Pens South (NW6-11) Area of 2177.43 M2 #2	(Odd Shape, attached)
New Catch Basin (NE6-11)	34M X 22M X 2.7M
Catch Basin (NW6-11) Increased to 1017 M3 from 725 M3	82M X 15.8M X 2.5M

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Feed Pens (Area of 13100M2)	155M X 90M (Approx )	
Catch Basin 725M3	15.5M X 82M X 1.5M Depth	

**NRCB USE ONLY**

AO Comment: See next page for dimensions of proposed feed pens.

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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**

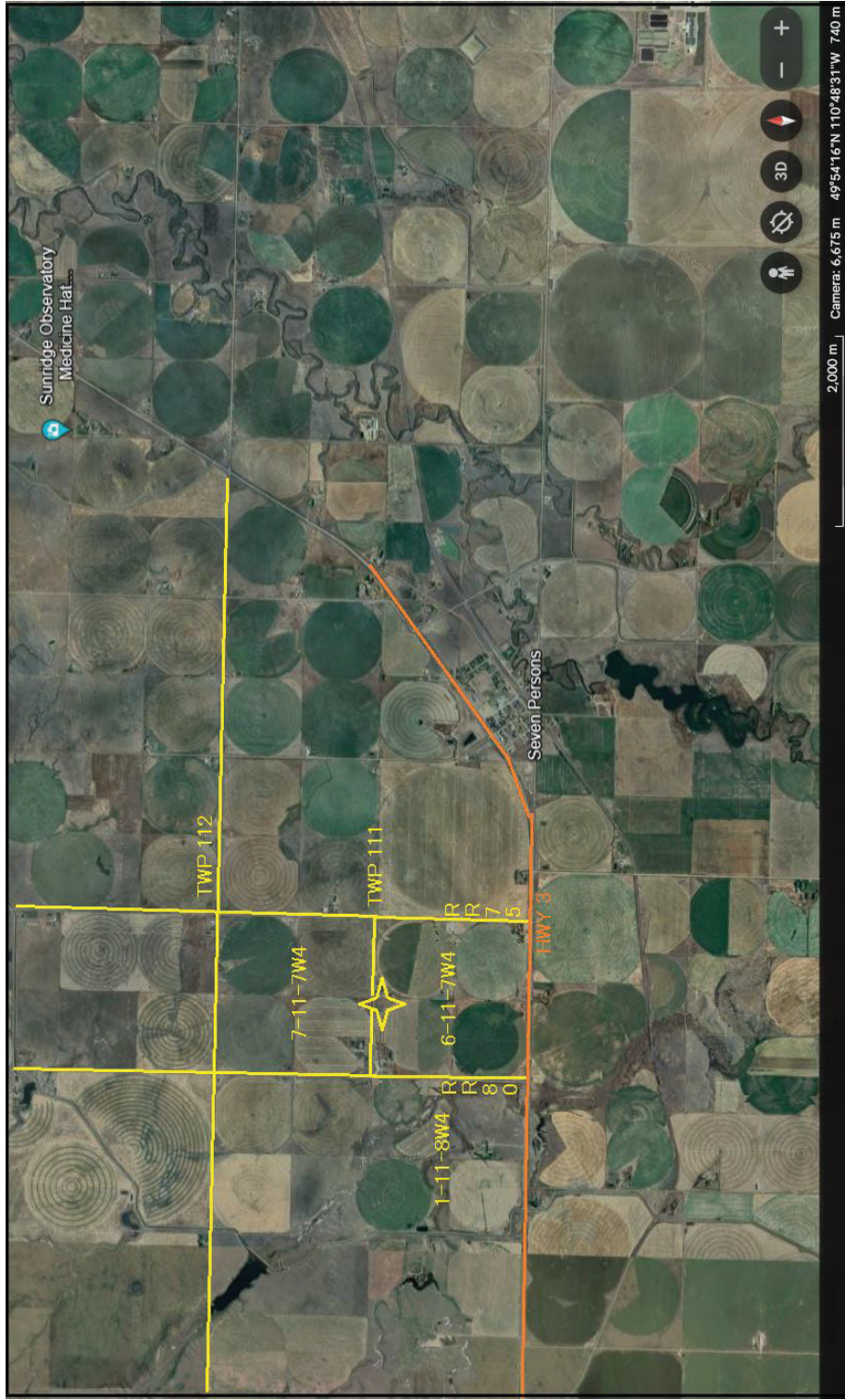
AO Comment: Feed pens north proposed to be 136 m x 100 m, irregular shape. Feed pens south #1 proposed to be 81 m x 76.8 m, irregular shape. Feed pens south #2 proposed to be 32.5 m x 77 m, irregular shape.

**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
Beef Feeders	1000	800	1800
AO Comment: Applicant has indicated that they are applying to increase livestock numbers at this site by 800 beef feeders, rather than 1,000 beef feeders proposed in Part 1. Total livestock proposed for this site is 1,800 beef feeders.			

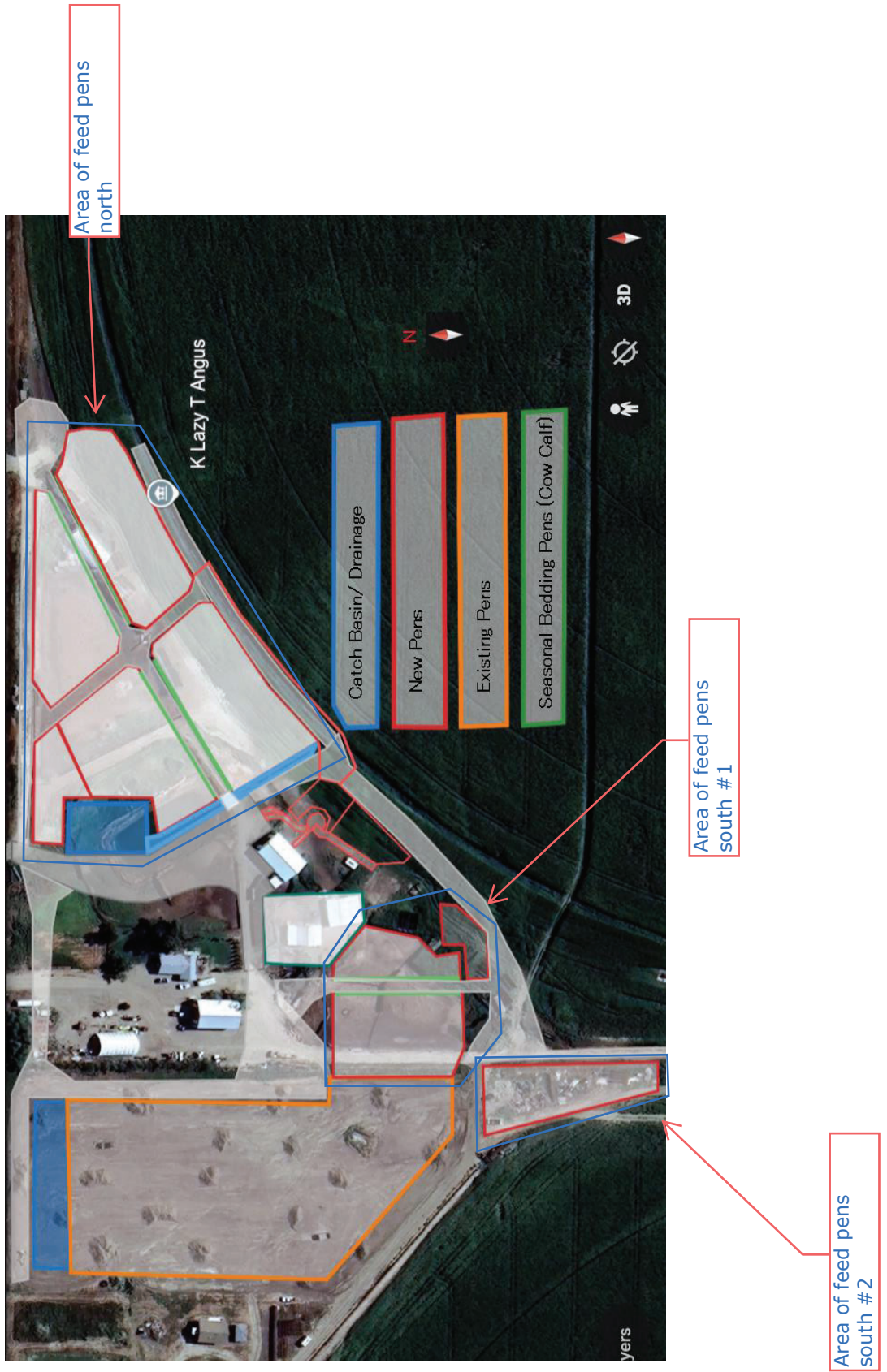
Kody Traxel Proposed CFO Figure 1

(NE CORNER) NW 6-11-7W4  
NE 6-11-7W4  
2.8KM West of Seven Persons, AB  
Cypress County, Alberta  
1800 HD Beef Feeders



Kody Traxel Proposed CFO Figure 2

NW 6-11-7W4 / NE 6-11-7W4 Overview Plans

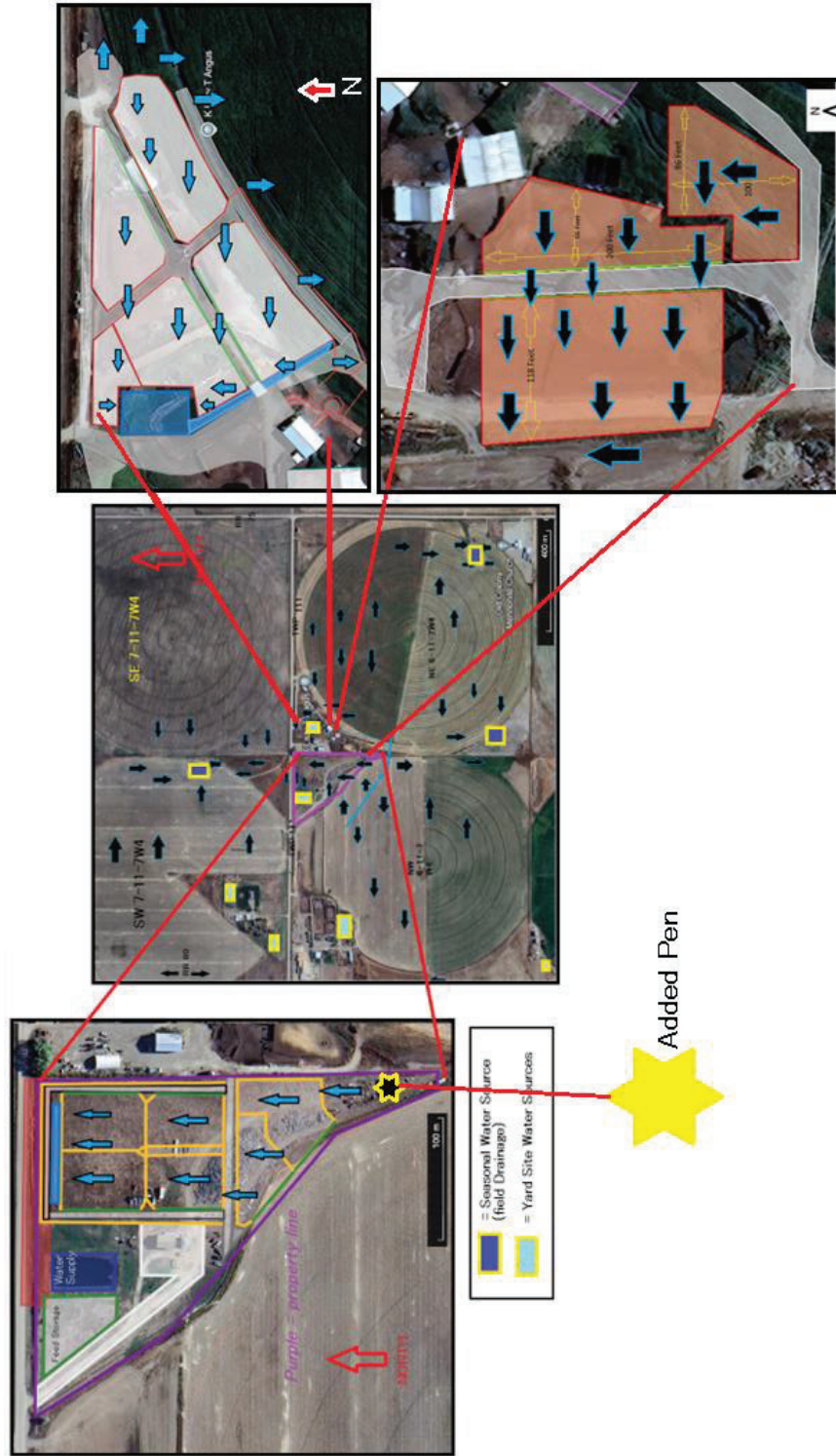


Manure Collection Areas Map



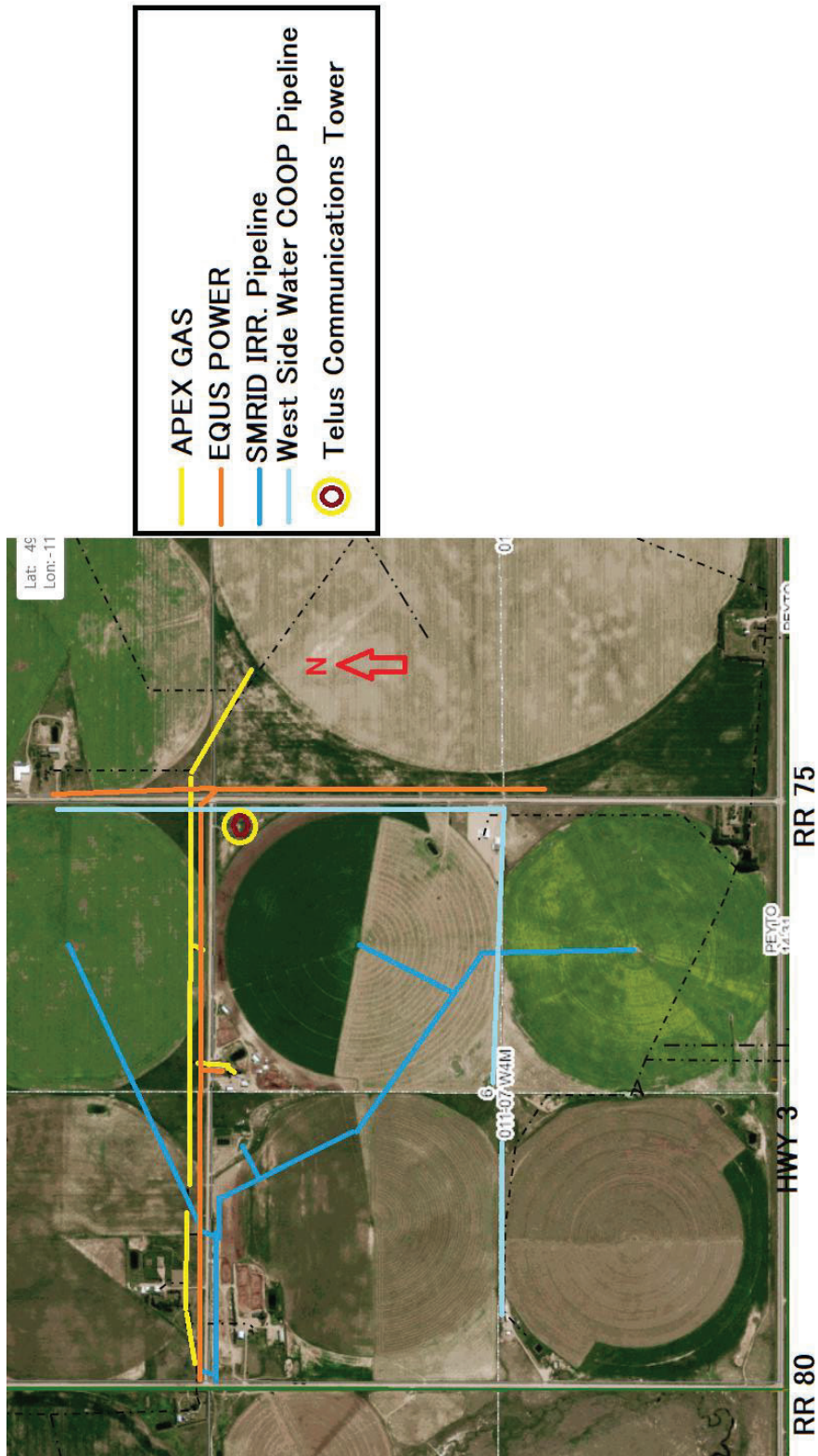
Kody Traxel Proposed CFO Figure 1

Run off patterns of area and site and surrounding water sources.



Kody Traxel Proposed CFO Figure 2

Utilities Map of Property and area.



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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 \_\_\_\_\_  
Water conveyance agreement acquired and will be increased with SMRID

Signed this 18 day of March, 2025.

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



**WATER CONVEYANCE AGREEMENT - OTHER USES  
(New Users)**

IRRIGATION DISTRICTS ACT section 21(2) (a.1)

This Agreement dated the 10 day of September 2024

Between:

**TRAXEL, KODY EMIL & RACHEL DEMAN  
7515 TOWNSHIP ROAD 111  
CYPRESS COUNTY, AB  
T0K 1Z0**

(the "Applicant")

-and-

**ST. MARY RIVER IRRIGATION DISTRICT  
525 – 40<sup>TH</sup> STREET SOUTH  
LETHBRIDGE, AB  
T1J 4M1**

(the "District")

**BACKGROUND:**

1. The Applicant has applied to the District under section 21(2)(a.1) of the *Irrigation Districts Act* R.S.A. 2000, c. I-11 (the "Act"), to enter into a water conveyance agreement with the District to receive the delivery of water from the District for a purpose other than the use on irrigation acres, for use under an alternate parcel delivery agreement, rural water use, or household purposes.
2. The District is the holder of several Licences that authorize the District to deliver water for any of the purposes specified in the Licences.
3. Section 6 of the Act authorizes the District to deliver water in accordance with the terms and conditions of the Licences.
4. The Applicant proposes that the water will be used on the lands legally described as:

**NW-06-11-07-W4<sup>TH</sup>**  
(the "Lands")

0. The Applicant has applied for the following volume of water: **4 acre-feet**.  
(the "Annual Volume")

6. The Applicant proposes to use the water for the following purpose: **Agriculture Water**  
(the “Purpose”)
7. The District is prepared to deliver the Annual Volume to the Applicant on the Lands subject to the terms and conditions contained in this Agreement.

**AGREEMENT:**

The parties agree as follows:

1. **DEFINITIONS** - In this Agreement:
  - a. “Agreement” means this Agreement including the Background;
  - b. “Annual Fee” means the fee applicable to this Agreement established by the District by a fee bylaw pursuant to section 115 of the Act;
  - c. “Capital Fee” means the fee applicable to this Agreement identified as such in a fee bylaw of the District pursuant to section 115 of the Act;
  - d. “Default” includes the happening of any of the following events:
    - i. failure of the Applicant to pay the Annual Fee by the due date;
    - ii. use of any portion of the Annual Volume for other than the Purpose;
    - iii. use of any portion of the Annual Volume on a parcel of land other than the Lands;
    - iv. failure of the Applicant to pay the Capital Charge;
    - v. the Applicant has used or is using any portion of the Annual Volume in a manner that is causing or may cause loss or damage to property or loss of injury to any person;
    - vi. waste all or any portion of the Annual Volume or permit all or any portion of the Annual Volume to escape from the Lands;
    - vii. the Applicant contravenes any provision of the Act or this Agreement; or
    - viii. the Applicant files an assignment in Bankruptcy;
  - e. “Delivery” means the delivery by the District of the Annual Volume to the Applicant;
  - f. “Irrigation Works” means Irrigation Works as defined in the Act;

- g. "Licence" means the total of all the licences held by the District pursuant to the provisions of the *Water Act*, R.S.A. 2000 c. W-3;
- h. "Point of Delivery" means that location on the Irrigation Works of the District at which the Annual Volume is delivered to the Applicant; and
- i. "Turn out Structure" means such structure or works as are required by the District at the Point of Delivery to affect a conveyance the Annual Volume from the Point of Delivery to the Lands.

2. DELIVERY

- a. The District agrees to deliver to the Applicant at the Point of Delivery the Annual Volume.
- b. The Annual Volume shall be delivered at times, rates and amounts as the District may have water available and capacity in its Irrigation Works for such delivery.
- c. The total volume of water delivered in each year under this agreement shall not exceed the Annual Volume.

3. PURPOSE - The Applicant will use the Annual Volume only for the Purpose and only on the Lands.

4. TERM - This Agreement shall continue in full force and effect until terminated by either party in accordance with its terms.

5. CONSIDERATION - In consideration for the Delivery the Applicant agrees to pay to the District fees as established by By-Law pursuant to section 115 of the Act as follows:

- a. A one time fee in the sum of [REDACTED] (the "Capital Fees") to be paid by the Applicant at the time of the execution of this Agreement; and
- b. An Annual Fee, due and payable on or before the 31st day of December in each year during the currency of this Agreement,

6. POINT OF DELIVERY - The District shall deliver the Annual Volume to the Point of Delivery. The water shall be removed from the Irrigation Works of the District at the Point of Delivery through the Turnout Structure. The Turnout Structure shall comply with the Districts standard specifications for such Irrigation Works, and shall be installed by the District, at the expense of the Applicant, and at all times material hereto shall be operated and maintained by the District.

7. WORKS - All turnout structures, equipment or works installed on the Irrigation Works of the District by the Applicant pursuant to this Agreement, shall become the property of the District.
8. METERING - The District may require the Applicant to supply, install and maintain a water measurement device approved by the District at the Point of Delivery or such other place as may be designated by the District for the purpose of measuring the amount of the Annual Volume delivered from time to time to the Applicant. The Applicant grants to the District the right and license during the currency of this Agreement to enter upon the Lands and to monitor the use of and record the data collected by the measurement device.
9. ORDERING WATER – The Applicant shall order the delivery of water and call for the termination of such delivery in accordance with the applicable bylaws and policies of the District.
10. INDEMNITY - The Applicant shall indemnify and keep indemnified the District against any liability for losses and expenses of whatever kind or nature, including the establishment or increase of a reserve to cover any possible liability and the fees and disbursements of counsel, and against any losses and expenses, which the District may incur in connection with any one or more of the following events or circumstances (the “Events”):
  - a. by reason of having delivered to the Applicant all or any portion of the Annual Volume;
  - b. by reason of the inability of the District to deliver to the Applicant all or any portion of the Annual Volume;
  - c. by reason of the failure of the Applicant to perform or comply with the terms and conditions of this Agreement; and
  - d. in enforcing any of the terms and conditions of this Agreement.
11. The District may pay or compromise any claim, demand, suit, judgment or expense arising out of the Events and any such payment or compromise shall be binding upon the Applicant and included as a liability, loss or expense covered by this indemnity, provided the same was made by the District in the reasonable belief that it was liable for the amount disbursed, or that such payment or compromise was reasonable under all the circumstances.
12. In the event of any such payment or compromise by the District, an itemized statement of it prepared and certified by the manager or assistant manager of the District, itemizing of such payment or compromise shall be prima facie evidence of the fact and amount of the liability of the Applicant under this Agreement, in respect of the payment or compromise

13. The District shall not be liable for any claim either direct, indirect or consequential, for loss, injury or damage whatsoever arising out of the failure or inability of the District to deliver all or any portion of the Annual Volume.
14. COMPLIANCE WITH LAWS - The Applicant shall comply with and be bound by the provisions of all statutes and regulations applicable to the privileges hereby granted, and with all by-laws of the District regulating the supply and distribution of water.
15. DEFAULT - In the event the Applicant is in Default of any of the provisions of this Agreement the District may forthwith stop delivery of water or terminate this agreement and in such case there shall be no abatement or refund of the Annual Fee paid by the Applicant to the District during the term of this Agreement prior to the stoppage or termination.
16. TERMINATION - The Applicant may terminate this Agreement upon providing 30 days written notice to the District of its intention to do so, and following the expiry of the 30 day notice period this Agreement shall be terminated and at an end and from that point forward the Applicant shall have no further right or entitlement to or claim to the delivery of the Annual Volume.
17. REFUND OF CAPITAL FEES - Upon termination of this Agreement pursuant to Clause 15 - Default, or Clause 16 - Termination, and provided the Applicant has paid all amounts due under this Agreement for Capital Fees and for Annual Fees, the District may pay to the Applicant such portion of the Capital Fees paid herein by the Applicant as the District may set out in a bylaw passed from time to time.
18. WATER QUALITY - The Applicant acknowledges that the Irrigation Works of the District is an open ditch system subjecting the water therein to contamination from all manner of environmental, human and animal factors and that the District does not regulate, control or monitor the quality of water in its Irrigation Works.
19. The Applicant acknowledges and agrees that the water in the Irrigation Works of the District may not be potable or may not be suitable for the Purpose, and that the District makes no representation, warranty or guarantee, express or implied that the water delivered under this Agreement is potable and fit for human or livestock consumption or suitable for the Purpose for use by the Applicant.
20. The Applicant agrees to accept the water delivered in the condition in which it may be found at the Point of Delivery from time to time and to provide such testing, treatment or filtering as the Applicant considers necessary for the use by the Applicant for the Purpose.
21. SEASONAL DELIVERY - The Applicant acknowledges that the District can deliver the Annual Volume only during the irrigation season and that the water conveyance capacity of the Irrigation Works of the District is limited and the District will deliver, from time to time, so much of the Annual Volume as it, in its exclusive discretion, deems advisable.

22. NON-ASSIGNMENT OR TRANSFER - Neither this Agreement nor any of the rights and privileges contained in this Agreement is assignable or transferable by the Applicant, in whole or in part, without prior written consent of the District.

IN WITNESS WHEREOF the District has by its proper officers signed this Agreement and has affixed the seal of the District hereto, and the Applicant has hereunto set his hand and seal on the day and year first above written.

**ST. MARY RIVER IRRIGATION DISTRICT**



St. Mary River Irrigation District



St. Mary River Irrigation District



Applicant

Witness to Signature of the Applicant

Witness to Signature of the Applicant

Applicant

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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:** Feed Pens /Catch Basin **Proposed 1:** Catch Basin  
**Proposed 2:** Feed Pens NE 6-11-7W4 **Proposed 3:** Feed Pen NW 6-11-7W4

Facility and environmental risk information	Facilities				NRCB USE ONLY	
	Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
<b>Flood plain information</b> 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 type="checkbox"/> >1 m <input type="checkbox"/> 1 m	<input 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	
<b>Surface water information</b> How many springs are within 100 m of the manure storage facility or manure collection area?	0	0	0	0	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
<b>Surface water information</b> How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0	0	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
<b>Surface water information</b> What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	293M	347M	345M	498M	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
<b>Groundwater information</b> What is the depth to the water table?	9.2M +	9.2M +	9.2M +	9.2M +	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
<b>Groundwater information</b> What is the depth to the groundwater resource/aquifer you draw water from?	9.2M +	9.2M +	9.2M +	9.2M +	<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)**

Attached is a well report from 1978 on NW 6-11-7W4 and more info on Soils report attached.





# Water Well Drilling Report

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

GIC Well ID 203542  
GoA Well Tag No.  
Drilling Company Well ID  
Date Report Received

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

Well Identification and Location										Measurement in Imperial	
<b>Owner Name</b> SEITZ, LINDA M.		<b>Address</b> SEVEN PERSONS			<b>Town</b>		<b>Province</b>		<b>Country</b>		<b>Postal Code</b>
<b>Location</b>	<b>1/4 or LSD</b>	<b>SEC</b>	<b>TWP</b>	<b>RGE</b>	<b>W of MER</b>	<b>Lot</b>	<b>Block</b>	<b>Plan</b>	<b>Additional Description</b>		
	NW	6	11	7	4						
<b>Measured from Boundary of</b>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>						
_____ ft from _____					Latitude <u>49.884008</u>		Longitude <u>-110.954282</u>		Elevation <u>2550.00</u> ft		
_____ ft from _____					How Location Obtained					How Elevation Obtained	
					Not Verified					Estimated	

Drilling Information	
<b>Method of Drilling</b> Rotary	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Domestic	

Formation Log			Measurement in Imperial
Depth from ground level (ft)	Water Bearing	Lithology Description	
10.00		Topsoil	
32.00		Brown Sandy Clay	
54.00		Gray Hard Clay	
68.00		Sandy Clay	
80.00		Gravel	

Yield Test Summary			Measurement in Imperial
<b>Recommended Pump Rate</b> <u>0.00</u> igpm			
<b>Test Date</b>	<b>Water Removal Rate (igpm)</b>	<b>Static Water Level (ft)</b>	
1974/12/28	20.00	28.00	

Well Completion				Measurement in Imperial
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>	
80.00 ft		1974/12/27	1974/12/28	
<b>Borehole</b>				
<b>Diameter (in)</b>	<b>From (ft)</b>	<b>To (ft)</b>		
0.00	0.00	80.00		
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>		
Steel				
Size OD : <u>4.50</u> in		Size OD : <u>0.00</u> in		
Wall Thickness : <u>0.225</u> in		Wall Thickness : <u>0.000</u> in		
Bottom at : <u>75.00</u> ft		Top at : <u>0.00</u> ft		
		Bottom at : <u>0.00</u> ft		
<b>Perforations</b>				
<b>From (ft)</b>	<b>To (ft)</b>	<b>Diameter or Slot Width (in)</b>	<b>Slot Length (in)</b>	<b>Hole or Slot Interval (in)</b>
Perforated by				
<b>Annular Seal</b> Cement/Grout				
Placed from <u>0.00</u> ft to <u>0.00</u> ft				
Amount _____				
Other Seals				
Type		At (ft)		
<b>Screen Type</b> Stainless Steel				
Size OD : <u>4.50</u> in				
<b>From (ft)</b>	<b>To (ft)</b>	<b>Slot Size (in)</b>		
75.00	80.00	0.020		
Attachment <u>Attached To Casing</u>				
Top Fittings _____		Bottom Fittings _____		
<b>Pack</b>				
Type <u>Natural</u>		Grain Size _____		
Amount _____				

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SCHLAGL GAS & OIL	Copy of Well report provided to owner Date approval holder signed



# Water Well Drilling Report

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

GIC Well ID 203542  
GoA Well Tag No.  
Drilling Company Well ID  
Date Report Received

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

Well Identification and Location										Measurement in Imperial	
<b>Owner Name</b> SEITZ, LINDA M.		<b>Address</b> SEVEN PERSONS			<b>Town</b>		<b>Province</b>		<b>Country</b>		<b>Postal Code</b>
<b>Location</b>	<i>1/4 or LSD</i> NW	<i>SEC</i> 6	<i>TWP</i> 11	<i>RGE</i> 7	<i>W of MER</i> 4	<i>Lot</i>	<i>Block</i>	<i>Plan</i>	<i>Additional Description</i>		
<b>Measured from Boundary of</b> _____ ft from _____ _____ ft from _____					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b> Latitude <u>49.884008</u> Longitude <u>-110.954282</u> How Location Obtained Not Verified			Elevation <u>2550.00</u> ft How Elevation Obtained Estimated			

Additional Information										Measurement in Imperial	
Distance From Top of Casing to Ground Level _____ in					Is Artesian Flow _____						Is Flow Control Installed _____
Rate _____ igpm					Describe _____						
Recommended Pump Rate _____ 0.00 igpm					Pump Installed _____		Depth _____ ft				
Recommended Pump Intake Depth (From TOC) _____ 0.00 ft					Type _____		Make _____		H.P. _____		Model (Output Rating) _____
Did you Encounter Saline Water (>4000 ppm TDS) _____					Depth _____ ft		Well Disinfected Upon Completion _____				
Remedial Action Taken _____					Gas _____		Depth _____ ft		Geophysical Log Taken _____		
									Submitted to ESRD _____		
Additional Comments on Well DRILER REPORTS HARD WATER					Sample Collected for Potability _____		Submitted to ESRD _____				

Yield Test			Taken From Ground Level	Measurement in Imperial	
			Depth to water level		
Test Date 1974/12/28	Start Time 12:00 AM	Static Water Level 28.00 ft	Pumping (ft)	Elapsed Time Minutes:Sec	Recovery (ft)
<b>Method of Water Removal</b> Type <u>Bailer</u> Removal Rate <u>20.00</u> igpm Depth Withdrawn From <u>0.00</u> ft					
If water removal period was < 2 hours, explain why					

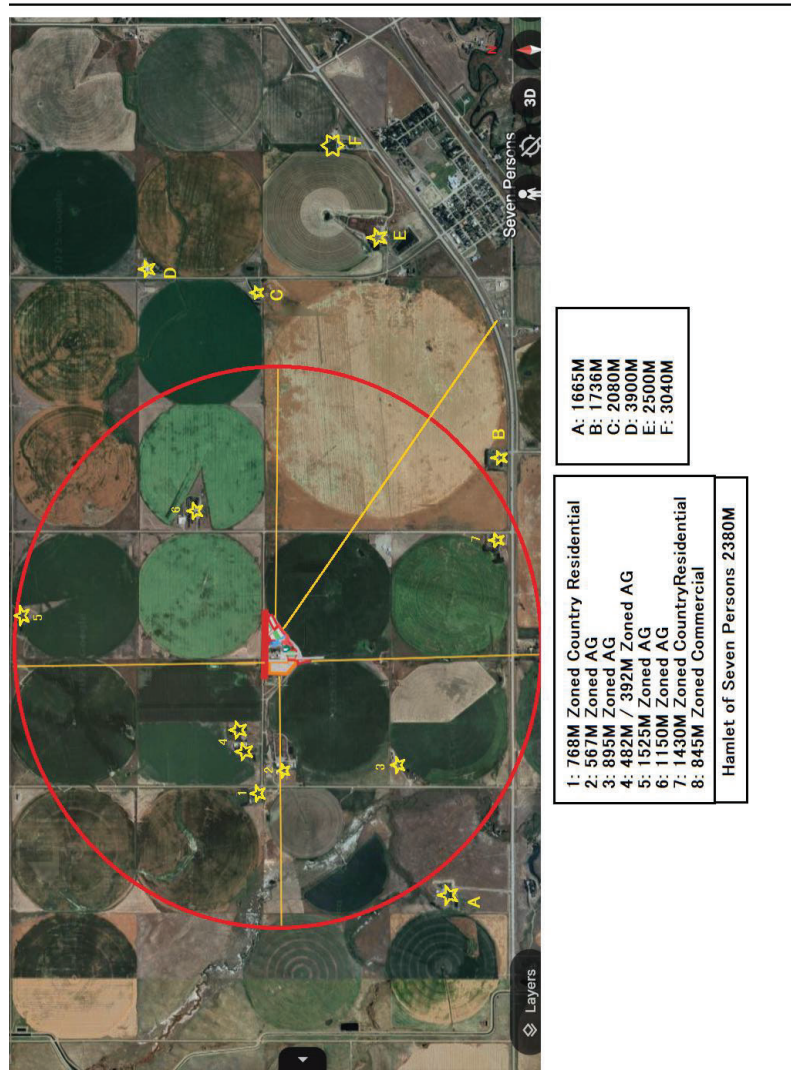
Water Diverted for Drilling		
Water Source	Amount Taken ig	Diversion Date & Time

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SCHLAGL GAS & OIL	Copy of Well report provided to owner Date approval holder signed



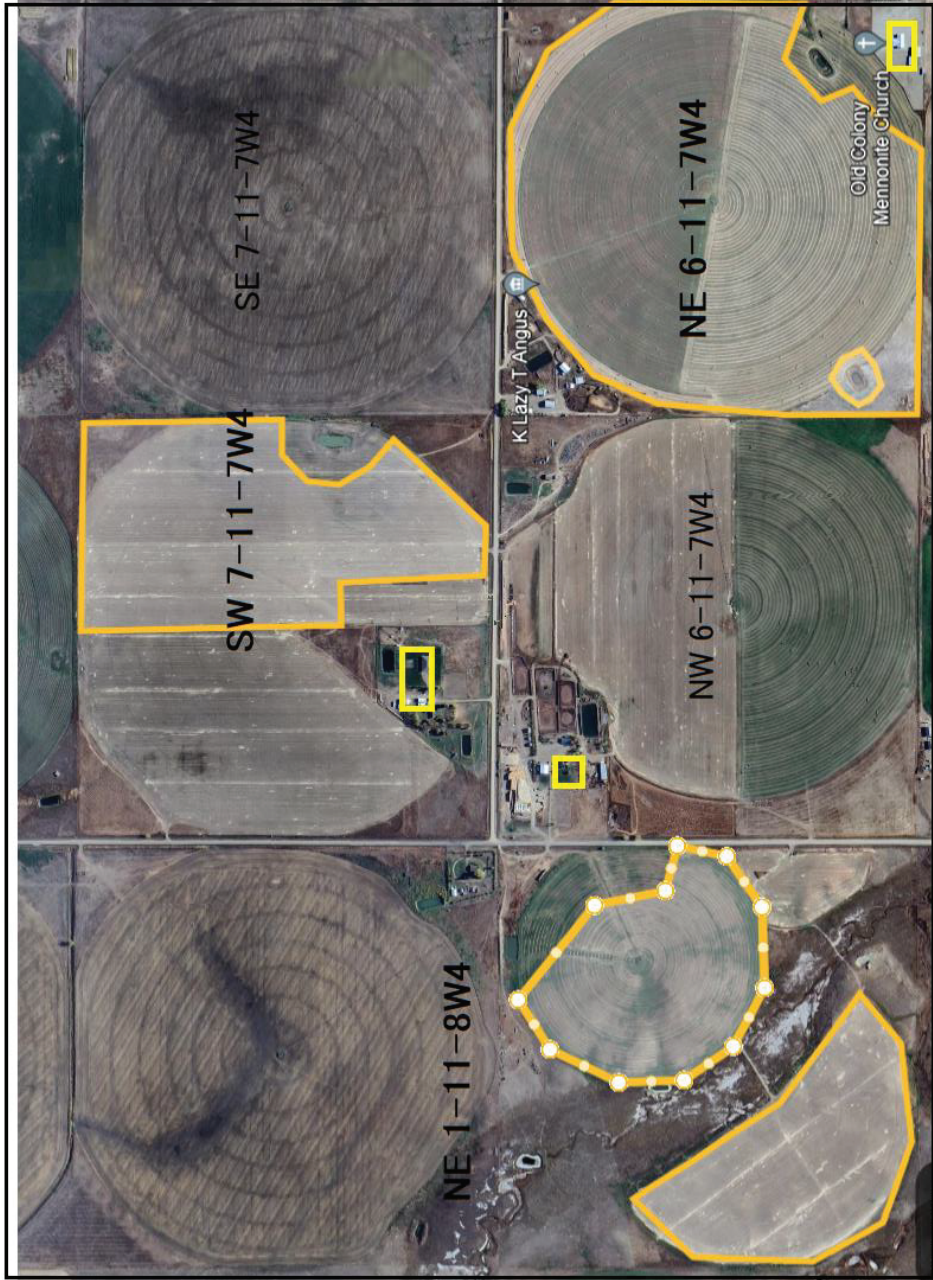
Kody Traxel Proposed CFO Figure 1

**MDS Separation.**



Kody Traxel Proposed CFO Figure 2

Manure Application Lands Map  
250+ Acres owned by Kody Traxel



Name Kody Traxel  
 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
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	1,800	441.0
	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		-
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		-
		0.800	1.000	1.400	1.1200		-
	Loose Housing – Lactating Cows only	0.800	0.700	1.000	0.5600		-
	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		-	
							-
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		-
							-
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		-
							-
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		-
							-
							-
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		-
	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		-
							-
Cervid	Elk	0.600	0.700	0.600	0.2520		-
	Deer	0.600	0.700	0.200	0.0840		-
							-
Wild Boar	Feeders	2.000	0.800	0.140	0.2240		-
	Sow (farrowing)	2.000	0.800	0.371	0.5936		-
							-

Total 441.0

**For New Operations**

Dispersion Factor 1

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,243	379
2	54.72	1,657	505
3	68.4	2,071	631
4	109.44	3,314	1,010

**For Expanding Operations**

Dispersion Factor 1  
 Expansion Factor 0.77

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	957	292
2	54.72	1,276	389
3	68.40	1,595	486
4	109.44	2,552	778

Name Kody Traxel  
 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)
Feedlot Animals	Cows/Finishers (900+ lbs)	0.0	0.0	0.0	0.0	0.0
	Feeders (450 - 900 lbs)	1800.0	144.0	120.6	90.0	72.0
	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
			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
		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
		0.0				
			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
		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
		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	0.0	0.0	0.0	0.0	0.0
	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
		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
		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
		0.0				
Total Hectares			144	120.6	90.0	72.0
Total Acres			356	298.0	222.4	177.9

# 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. East Run Area KT 10-25
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.	Odd Shaped	Total Run area	of 13,555.51m <sup>2</sup>	
2.				
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 control into catch basin

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	4.4 (m)	Provide details (as required) Attached Report		
Soil texture	48 % sand	28 % silt	24 % clay	
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 3	Hydraulic conductivity (cm/s) 3.8 x 10 <sup>-7</sup>	Describe test standard used Attached Report	

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

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

## 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 Run Area KT 9-25 KT 12-25
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.	Odd Shaped	Total Run area	of 19654.11m <sup>2</sup>	
2.				
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 control into catch basin

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	Provide details (as required) Attached Report		
	4.4 (m)		
Soil texture	45 % sand	30 % silt	25 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 3	Hydraulic conductivity (cm/s) 3.0 x 10 <sup>-7</sup> / 3.5 X 10 <sup>-7</sup>	Describe test standard used Attached Report

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

<b>NRCB USE ONLY</b>	
Requirements met:	<input type="checkbox"/> YES <input type="checkbox"/> NO
Condition required:	<input type="checkbox"/> YES <input type="checkbox"/> NO
Report attached:	<input 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: 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 KT 6-25
2. \_\_\_\_\_
3. \_\_\_\_\_

### Determination of runoff area

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

I calculated the area using provided calculator. This calculates the area and regions Rainfall as per AOPA "Medicine Hat" of 85MM. This calculator designed the size of catch basin. I rounded up the area as well for more capacity than less.

### 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 <sup>3</sup> )
					Inside end walls	Inside side walls	Outside walls	
1.	34	22	2.7	2.7	3	3	-	
2.								
3.								
TOTAL CAPACITY								

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	94M (m)	Provide details (as required) See Report attached		
Soil texture	47 % sand	29 % silt	24 % clay	
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 7.5	Hydraulic conductivity (cm/s) 6.6 X-8 CM /S	Describe test standard used See Report attached	

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

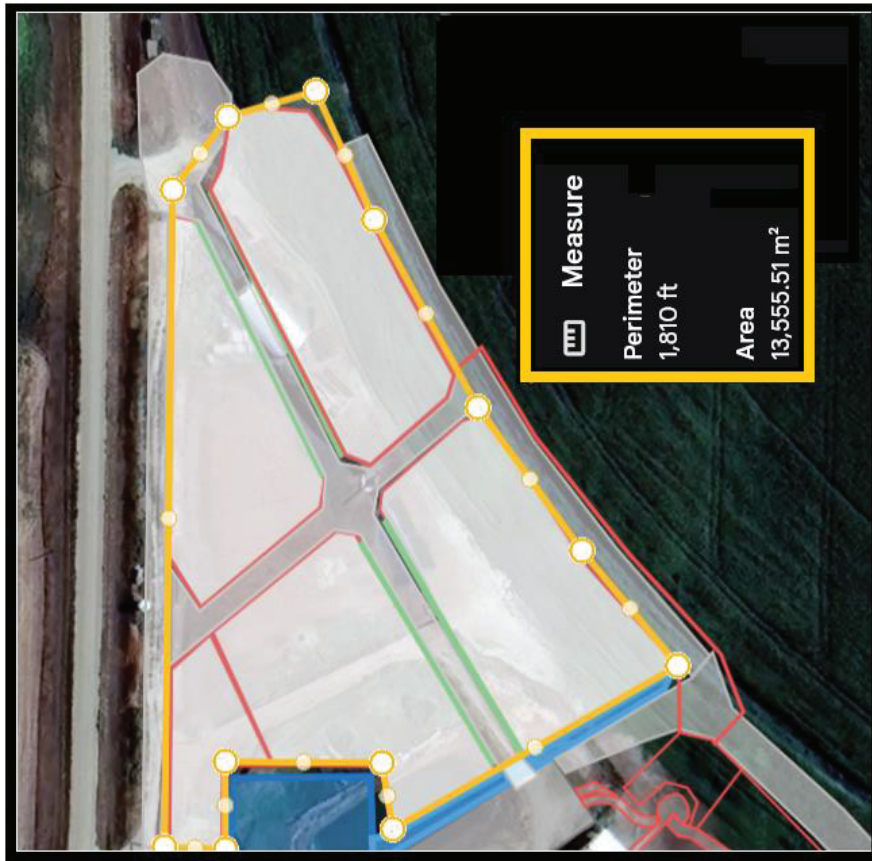
If soil info differs per facility include additional soils page.

#### NRCB USE ONLY

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

Kody Traxel Proposed CFO Figure 2

Catch Basin Size – Total Run Off Area (East)



**Total Area Run Off to East Catch Basin  
13555.5M2**

Catch Basin Size – New (East)

### Catch Basin Storage Volume Calculator

<b>Construction Dimensions of Catch Basin</b>		<b>Catch Basin Dimensions</b>	
* Only cells in blue can be changed.			
<b>Overall Dimensions of Catch Basin</b>			
Total Length* <sup>4</sup>	34.0 m	112 ft	
Total Width* <sup>4</sup>	22.0 m	72 ft	
Total Depth* <sup>4</sup>	2.7 m	9 ft	
Design Capacity Depth	2.20 m	7 ft	
End Slope* <sup>4</sup>	3 run:rise	3 run:rise	
Side Slope* <sup>4</sup>	3 run:rise	3 run:rise	
Length of Bottom	17.8 m	58 ft	
Width of Bottom	5.8 m	19 ft	
Capacity @ top of Bank	1,031 m <sup>3</sup>	Capacity (@top)	36,412 Imp. Gal.
			226,805 Imp. Gal.
<b>Design Capacity of Catch Basin (freeboard level)</b>		<b>Design Capacity (freeboard level)</b>	
Length (design capacity depth)	31.0 m	102 ft	
Width (design capacity depth)	19.0 m	62 ft	
Total Depth	2.7 m	9 ft	
Design Capacity Depth	2.20 m	7 ft	
End Slope	3 run:rise	3 run:rise	
Side Slope	3 run:rise	3 run:rise	
Design Capacity (freeboard level)	698 m <sup>3</sup>	24,635 ft <sup>3</sup>	
(level)	589 m <sup>2</sup>	153,445 Imp. Gal.	
		6,340 ft <sup>2</sup>	
<b>CFO Name 1</b> Traxel		<b>Paved Runoff Catchment Area(s)</b>	
<b>Land Location 1</b>		Area 2	Length (m) Width (m) Area (m <sup>2</sup> )
		1	0.0 0.0 0.0
		2	0.0 0.0 0.0
		3	0.0 0.0 0.0
		4	0.0 0.0 0.0
		5	0.0 0.0 0.0
		<b>Total Area (m<sup>2</sup>) 0</b>	
		<b>Unpaved Runoff Catchment Area(s)</b>	
		Area 2	Length (m) Width (m) Area (m <sup>2</sup> )
		6	136 100 13,600.0
		7	0 0 0.0
		8	0 0 0.0
		9	0 0 0.0
		10	0 0 0.0
		<b>Total Area (m<sup>2</sup>) 13,600</b>	
<b>Rainfall (Select Town<sub>3</sub>)</b>		<b>Minimum Catchbasin Storage Volume Required</b>	
Medicine Hat 85		694 m <sup>3</sup> **	
AOPA Design Rainfall 85 mm		24494.2528 ft <sup>3</sup>	
		152570.61 Imp. Gal.	

# 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 West KT 4-24
2. \_\_\_\_\_
3. \_\_\_\_\_

### Determination of runoff area

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

I calculated the area using provided calculator. This calculates the area and regions Rainfall as per AOPA "Medicine Hat" of 85MM. This calculator designed the size of catch basin. I rounded up the area as well for more capacity than less.

### 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 <sup>3</sup> )
					Inside end walls	Inside side walls	Outside walls	
1.	82	15.8	2.5	2.5	3	3	-	
2.								
3.								
TOTAL CAPACITY								

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	100+ (m)	Provide details (as required) See Report attached		
Soil texture	46 % sand	28 % silt	26 % clay	
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 7.5	Hydraulic conductivity (cm/s) 2.7X-8 CM /S	Describe test standard used See Report attached	

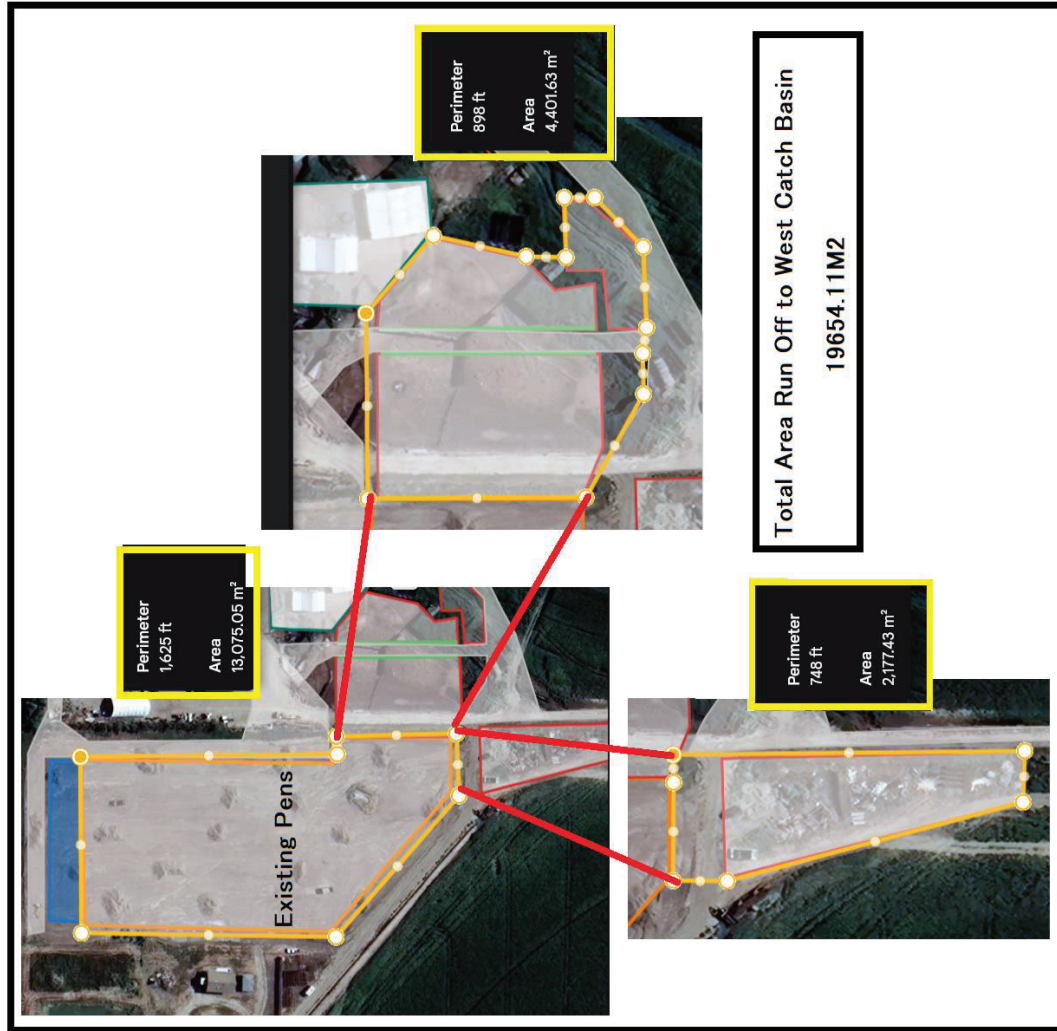
Catch Basin – Design and management requirements can be found in Technical Guideline Agdex 096-101

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 Size – Total Area Run Off (West)



Kody Traxel Proposed CFO Figure 2

Catch Basin Size – Existing Increased (West)

CFO Name 1		Traxel	
Land Location 1			
<b>Catch Basin Storage Volume Calculator</b>			
<b>Construction Dimensions of Catch Basin</b> Only cells in blue can be changed.			
<b>Overall Dimensions of Catch Basin</b>		<b>Catch Basin Dimensions</b>	
Total Length*4	82.0 m	269 ft	
Total Width*4	15.5 m	51 ft	
Total Depth*4	1.5 m	5 ft	
Design Capacity Depth	1.00 m	3 ft	
End Slope*4	3 run/rise	3 run/rise	
Side Slope*4	3 run/rise	3 run/rise	
Length of Bottom	73.0 m	240 ft	
Width of Bottom	6.5 m	21 ft	
Capacity @ top of Bank		45,516 ft <sup>3</sup>	
		283,213 Imp. Gal.	
<b>Design Capacity of Catch Basin (freeboard level)</b>			
Length (design capacity depth)	79.0 m	259 ft	
Width (design capacity depth)	12.5 m	41 ft	
Total Depth	1.5 m	5 ft	
Design Capacity Depth	1.00 m	3 ft	
End Slope	3 run/rise	3 run/rise	
Side Slope	3 run/rise	3 run/rise	
Design Capacity (freeboard level)	726 m <sup>3</sup>	25,603 ft <sup>3</sup>	
	868 m <sup>3</sup>	159,478 Imp. Gal.	
		10,639 ft <sup>3</sup>	
<b>Minimum Catchbasin Storage Volume Required</b>			
	680 m <sup>3</sup> **	24029,3825 ft <sup>3</sup>	
		149676,256 Imp. Gal.	
<b>Paved Runoff Catchment Areas</b>			
Area 1	Length (m)	Width (m)	Area (m <sup>2</sup> )
1	133	0.0	13,342.0
2	0	0	0.0
3	0	0	0.0
4	0	0	0.0
5	0	0	0.0
Total Area (m <sup>2</sup> )			
13,342			
<b>Unpaved Runoff Catchment Areas</b>			
Area 2	Length (m)	Width (m)	Area (m <sup>2</sup> )
6	0	0	0.0
7	0	0	0.0
8	0	0	0.0
9	0	0	0.0
10	0	0	0.0
Total Area (m <sup>2</sup> )			
0			
<b>Rainfall (Select Town,)</b>			
Medicine Hat - B5	85 mm		
AOPA Design Rainfall	85 mm		

Current Facilities: Catch Basin NW6-11-7w4

CFO Name 1		Traxel	
Land Location 1			
<b>Catch Basin Storage Volume Calculator</b>			
<b>Construction Dimensions of Catch Basin</b> Only cells in blue can be changed.			
<b>Overall Dimensions of Catch Basin</b>		<b>Catch Basin Dimensions</b>	
Total Length*4	82.0 m	269 ft	
Total Width*4	15.8 m	52 ft	
Total Depth*4	2.5 m	8 ft	
Design Capacity Depth	2.00 m	7 ft	
End Slope*4	3 run/rise	3 run/rise	
Side Slope*4	3 run/rise	3 run/rise	
Length of Bottom	67.0 m	220 ft	
Width of Bottom	0.8 m	3 ft	
Capacity @ top of Bank		56,247 ft <sup>3</sup>	
		330,336 Imp. Gal.	
<b>Design Capacity of Catch Basin (freeboard level)</b>			
Length (design capacity depth)	79.0 m	259 ft	
Width (design capacity depth)	12.8 m	42 ft	
Total Depth	2.5 m	8 ft	
Design Capacity Depth	2.00 m	7 ft	
End Slope	3 run/rise	3 run/rise	
Side Slope	3 run/rise	3 run/rise	
Design Capacity (freeboard level)	1,017 m <sup>3</sup>	35,908 ft <sup>3</sup>	
		223,665 Imp. Gal.	
		10,684 ft <sup>3</sup>	
<b>Minimum Catchbasin Storage Volume Required</b>			
	1,005 m <sup>3</sup> **	35480,6457 ft <sup>3</sup>	
		221003,017 Imp. Gal.	
<b>Paved Runoff Catchment Areas</b>			
Area 2	Length (m)	Width (m)	Area (m <sup>2</sup> )
6	197	100	19,700.0
7	0	0	0.0
8	0	0	0.0
9	0	0	0.0
10	0	0	0.0
Total Area (m <sup>2</sup> )			
19,700			
<b>Unpaved Runoff Catchment Areas</b>			
Area 2	Length (m)	Width (m)	Area (m <sup>2</sup> )
6	0	0	0.0
7	0	0	0.0
8	0	0	0.0
9	0	0	0.0
10	0	0	0.0
Total Area (m <sup>2</sup> )			
0			
<b>Rainfall (Select Town,)</b>			
Medicine Hat - B5	85 mm		
AOPA Design Rainfall	85 mm		

Proposed Facilities: Catch Basin Increased Size NE 6-11-7w4

18 April 2024

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

Box 96, Monarch, AB T0L 1M0

JLECS File: P24006

Kody Traxel  
7515 TWP 111  
Cypress County, Alberta T0K 1Z0

Attention: Kody Traxel

**Re:                   Geotechnical Review and Evaluation  
                          NRCB Permitting of Proposed Feedlot Pens and Catch Basin  
                          NW-06-011-07-W4M, near Seven Persons, 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 proposed feedlot pens and a catch basin to be located in the northeast corner area of NW-06-011-07-W4M (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, five boreholes were advanced at the site on March 5, 2024. The boreholes were advanced at the approximate locations denoted as KT1-24 to KT5-24 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 ranging between 3.0 m and 9.2 m below existing grades. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered within the boreholes consisted of a thin layer of topsoil underlain by stiff medium plastic clay till to the termination depth of the boreholes. No evidence of free groundwater or a groundwater resource (as defined by the AOPA) was identified within the 9.2 m investigation depth at the proposed lagoon site.

Samples of soil collected from the screened zone of boreholes KT1-24 to KT5-24 were subjected to textural analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The results indicate a textural breakdown of:

**Table 1: Soil Textural Analyses**

<b>Borehole/Depth</b>	<b>% Sand</b>	<b>% Silt</b>	<b>% Clay</b>
KT1-24 / 1.5-3.0m	43	28	30
KT2-24 / 1.5-3.0m	34	36	30
KT3-24 / 2.3-3.0m	26	34	40
KT4-24 / 6.5-7.5m	46	28	26
KT4-24 / 6.5-7.5m	44	29	27



To measure the *in situ* permeability of the subsurface soils, a 50 mm diameter PVC monitoring well was constructed in boreholes KT3-24 (pen area) and KT4 (catch basin area). Test Well KT3-24 was screened from 2.2 m to 3.8 m depth, while Test Well KT4-24 was screened from 4.4 m to 7.5 m depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring well to the top for several consecutive days. After several days of testing, a 24-hour water drop of 0.43 m was determined at KT3-24, and a 24-hour water drop of 0.66 m was determined at KT4-24.

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 report. The results of the permeability testing indicate an *in situ* hydraulic conductivity,  $k_s$ , of  $5.5 \times 10^{-8}$  cm/s at KT3-24, and an *in situ* hydraulic conductivity,  $k_s$ , of  $2.7 \times 10^{-8}$  cm/s at KT4-24.

Using the measured permeability of the clay stratum, the 1.6 m of clay screened at KT3-24 is estimated to represent the equivalent of approximately 29 m of naturally occurring materials having a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s (the reference standard in AOPA), while the 3.1 m of clay screened at KT3-24 is estimated to represent the equivalent of over 100 m of naturally occurring materials having a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s. This represents natural material protection in excess of the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-c), and catch basins (minimum 5 m, Section 9.5-b).

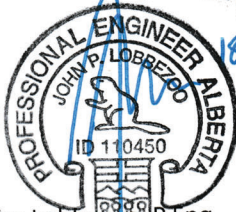
**Conclusion**

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 solid manure storage lagoon 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

**Attachments**

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

<b>PERMIT TO PRACTICE</b>	
<b>J LOBBEZOO ENGINEERING &amp; CONSULTING SERVICES LTD.</b>	
RM SIGNATURE:	
RM APEGA ID #:	110450
DATE:	18 April 2024
<b>PERMIT NUMBER: P016456</b>	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

Figure 1  
Borehole Locations  
Proposed Pens & Catch Basin  
Kody Traxel  
JLECS File: P24006  
April, 2024



**KT3-24**

**In Situ Permeability Test**

Modified Falling Head Permeability Equation

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

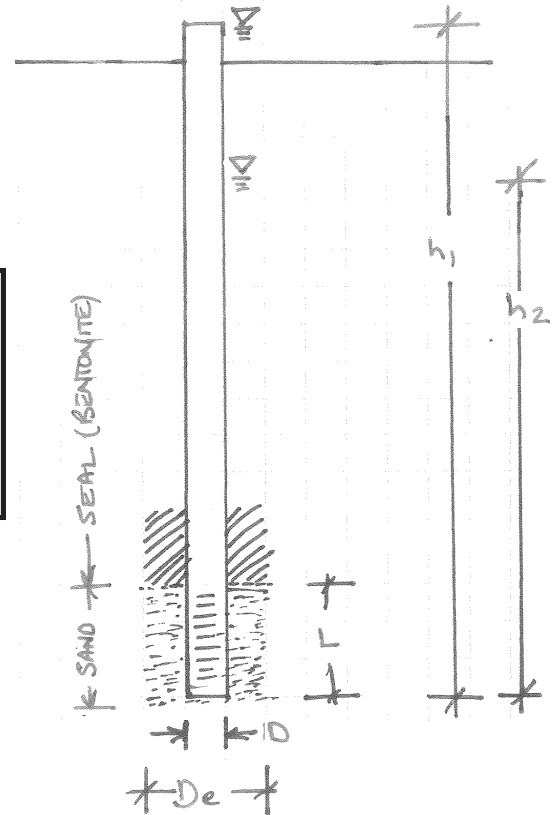
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

**KT3-24 - Kody Traxel**

JLECS File: P24006

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	4.20	initial height of water above base of hole (m)
h2	3.77	final height of water above base of hole (m)	
t	24.0	time of test (h)	

**$k_s = 5.5E-08$  cm/sec**



**KT4-24**

**In Situ Permeability Test**

Modified Falling Head Permeability Equation

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

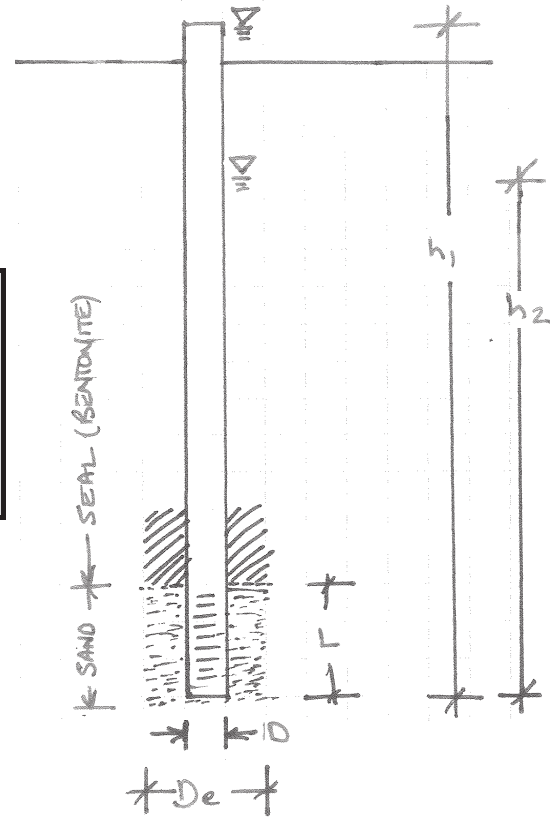
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

**KT4-24 - Kody Traxel**

JLECS File: P24006

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	8.10	initial height of water above base of hole (m)
	h2	7.44	final height of water above base of hole (m)
t	24.0	time of test (h)	

**$k_s = 2.7E-08$  cm/sec**



# CHILAKO DRILLING SERVICES LTD

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

## SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NW6-11-7W4, Kody Traxel

Date: 05-Mar-24

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
KT1-24	0503644	0-0.15	CL	F	Topsoil		
	5525978	0.15-0.8	CL	M	Till	1.5-3.0	Stiff, med plastic, brown, sand streaks
		0.8-3.0	CL	M	Till		
KT2-24	0503629	0-0.15	CL	F	Topsoil		
	5526059	0.15-3.0	CL	M	Till		
KT3-24	0503654	0-0.15	CL	F	Topsoil	2.3-3.0	Stiff, med plastic, brown, sand streaks Stiff, med plastic, brown 50mm H.C. Well installed to 3.8m BGS Screen: 3.8-2.3m Sand: 3.8-2.2m Bentonite: 2.2-0.0m Stickup: 0.4m Hole Diameter: 0.15m
	5526019	0.15-2.1	CL	M	Till		
		2.1-3.8	CL	M	Till		
KT4-24	0503615	0-0.15	CL	F	Topsoil	6.5-7.5	Stiff, med plastic, brown Stiff, med plastic, brown, iron staining 50mm H.C. Well installed to 7.5m BGS Screen: 7.5-4.5m Sand: 7.5-4.4m Bentonite: 4.4-0.0m Stickup: 0.6m Hole Diameter: 0.15m
	5526142	0.15-3.8	CL	M	Till		
		3.8-7.5	CL-C	M	Till		
KT5-24	0503658	0-0.15	CL	F	Topsoil	6.5-7.5	Stiff, med plastic Sand lensing Stiff, med plastic, brown, iron staining
	5526121	0.15-2.4	CL	M	Till		
		2.4-2.5	CL	M	Till		
		2.5-9.2	CL-C	M	Till		

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

Eg. VFSCS = Very Fine Sandy Clay Loam

20 March 2025

**J Lobbezoo Engineering & Consulting Services Ltd.**  
Box 96, Monarch, AB T0L 1M0

JLECS File: P24006

Kody Traxel  
7515 TWP 111  
Cypress County, Alberta T0K 1Z0

Attention: Kody Traxel

**Re: Geotechnical Review and Evaluation  
NRCB Permitting of Proposed Feedlot Pens and Catch Basin  
NE-06-011-07-W4M, near Seven Persons, 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 proposed feedlot pens and a catch basin to be located in the northwest corner area of NE-06-011-07-W4M (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, ten boreholes were advanced at the site on February 24, 2025. The boreholes were advanced at the approximate locations denoted as TK1-25 and TK2-25, and TK5-25 to TK12-25 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 ranging between 3.0 m and 9.4 m below existing grades. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered within the boreholes consisted of stiff medium plastic clay till to the termination depth of the boreholes. No free groundwater or evidence of a groundwater resource (as defined by the AOPA) was identified within the 9.4 m investigation depth at the proposed pen and catch basin site.

Samples of soil collected from the screened zone of boreholes TK6-25, TK9-25, TK10-25 and TK12-25 as well as samples recovered from similar depths at the other boreholes were subjected to textural analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The results indicate a textural breakdown of:

**Table 1: Soil Textural Analyses**

<b>Borehole/Depth</b>	<b>% Sand</b>	<b>% Silt</b>	<b>% Clay</b>
TK1-25 / 6.5-7.5m	48	26	26
TK2-25 / 1.5-3.0m	46	32	22
TK5-25 / 6.5-7.5m	46	30	24
TK6-25 / 6.5-7.5m	47	29	24
TK7-25 / 6.5-7.5m	44	32	24
TK8-25 / 1.5-3.0m	45	30	25
TK9-25 / 1.5-3.0m	48	30	22
TK10-25 / 2.0-3.0m	48	28	24
TK11-25 / 2.0-3.0m	42	30	28
TK12-25 / 2.0-3.0m	37	37	26
<i>Average:</i>	45	30	25

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes TK6-25 (proposed catch basin area), TK9-25 (pen area), TK10-25 (pen area) and TK12-25 (pen area). Test Well KT6-24 was screened from 6.0 m to 9.4 m depth, while the other test wells were screened from approximately 1.5 m to 1.4 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 recorded:

- 1.15 m drop at TK6-25;
- 1.50 m drop at TK9-25;
- 2.11 m drop at TK10-25; and
- 1.70 m drop at TK12-25.

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:

- $k_s = 6.6 \times 10^{-8} \text{ cm/s}$  at KT6-25 (catch basin);
- $k_s = 3.5 \times 10^{-7} \text{ cm/s}$  at TK9-25 (southwest pen area);
- $k_s = 3.8 \times 10^{-7} \text{ cm/s}$  at TK10-25 (northeast pen area); and
- $k_s = 3.0 \times 10^{-7} \text{ cm/s}$  at TK12-25 (west pen area);

Using the measured permeability of the clay stratum, the 3.4 m of clay screened at TK6-25 is estimated to represent the equivalent of approximately 94 m of naturally occurring materials having a hydraulic conductivity of  $1 \times 10^{-6} \text{ cm/s}$  (the reference standard in AOPA). 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).

The 1.2 m to 1.6 m clay screened at the other boreholes (proposed pen areas) represent the equivalent of 4.0 to 4.4 m of naturally occurring materials having a hydraulic conductivity of  $1 \times 10^{-6} \text{ cm/s}$ . This represents natural material protection in excess of the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-c).

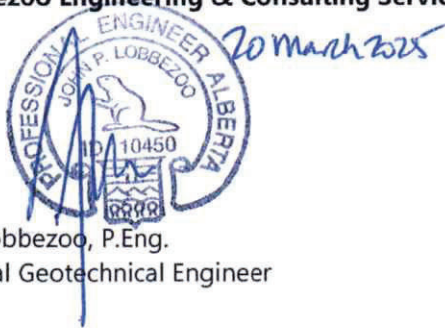
**Conclusion**

Based on the results of the current investigation, 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

<b>PERMIT TO PRACTICE</b> <b>J LOBBEZOO ENGINEERING &amp; CONSULTING SERVICES LTD.</b>	
RM SIGNATURE:	<u>[Signature]</u>
RM APEGA ID #:	<u>110450</u>
DATE:	<u>20 March 2025</u>
<b>PERMIT NUMBER: P016456</b> 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





Image Credit: Google

Figure 1: Borehole Locations

TK6-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

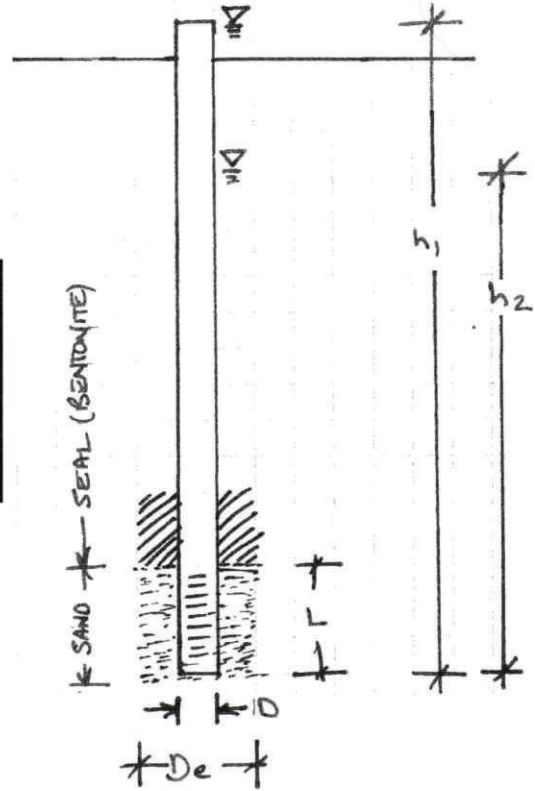
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

TK6-25 - Kody Traxel

JLECS File: P24006

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	3.40	length of sand section (m)
	h1	10.00	initial height of water above base of hole (m)
	h2	8.85	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s =$	$3.6E-08$ cm/sec
---------	------------------



**TK9-25**

**In Situ Permeability Test**

Modified Falling Head Permeability Equation

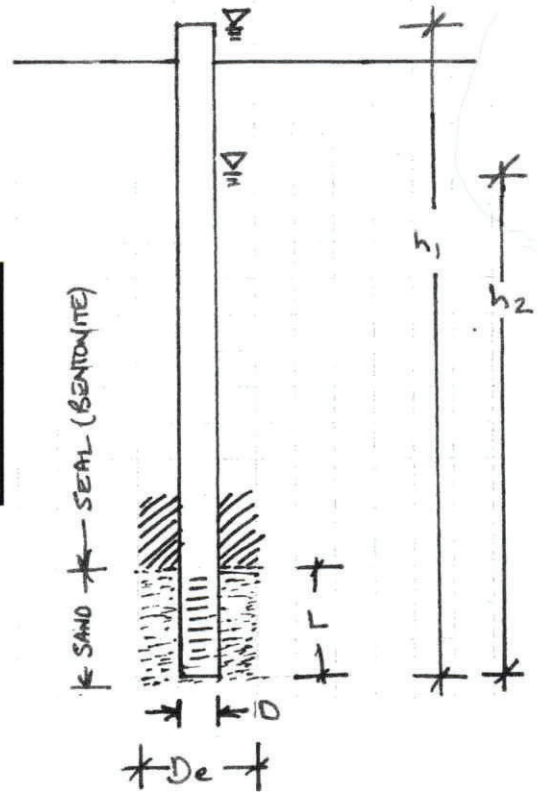
$$K_s = \frac{r^2}{2l\Delta t} \left[ \frac{\sinh^{-1} \frac{l}{r_e}}{2} \ln \left[ \frac{2H_1 - l}{2H_2 - l} \right] - \ln \left[ \frac{2H_1H_2 - lH_2}{2H_1H_2 - lH_1} \right] \right]$$

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

TK9-25 - Kody Traxel

JLECS File: P24006

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.55	length of sand section (m)
	h1	3.30	initial height of water above base of hole (m)
	h2	1.80	final height of water above base of hole (m)
	t	24.0	time of test (h)



$k_s = 3.5E-07$  cm/sec

TK10-25

### In Situ Permeability Test

Modified Falling Head Permeability Equation

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

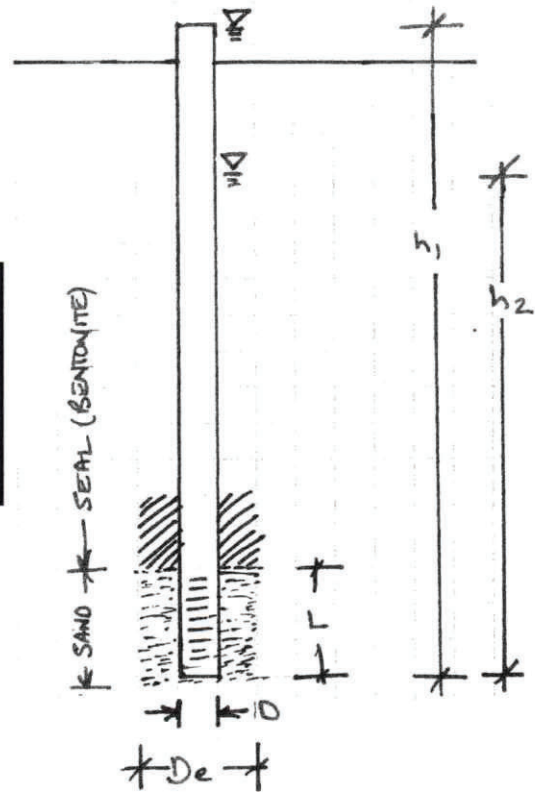
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

TK10-25 - Kody Traxel

JLECS File: P24006

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	4.20	initial height of water above base of hole (m)
	h2	2.09	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s = 3.8E-07$  cm/sec



TK12-25

### In Situ Permeability Test

Modified Falling Head Permeability Equation

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

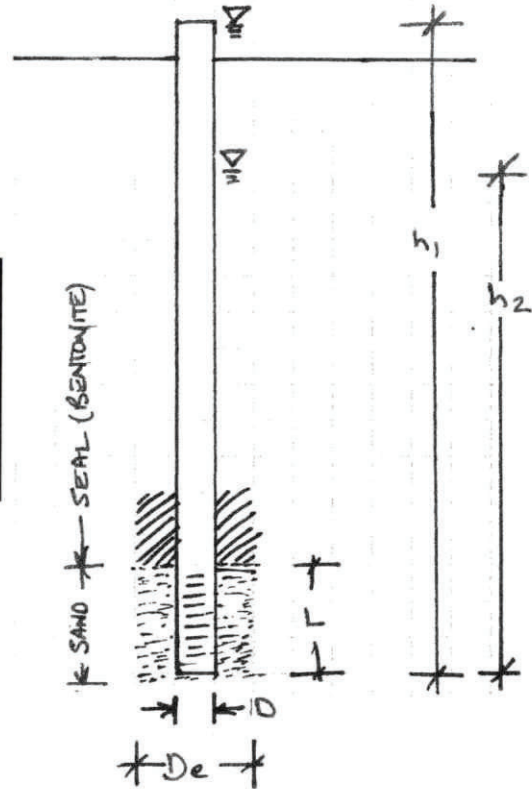
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

TK12-25 - Kody Traxel

JLECS File: P24006

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	4.40	initial height of water above base of hole (m)
	h2	2.70	final height of water above base of hole (m)
t	24.0	time of test (h)	

$k_s = 3.0E-07$  cm/sec





# Down To Earth Labs Inc.

The Science of Higher Yields

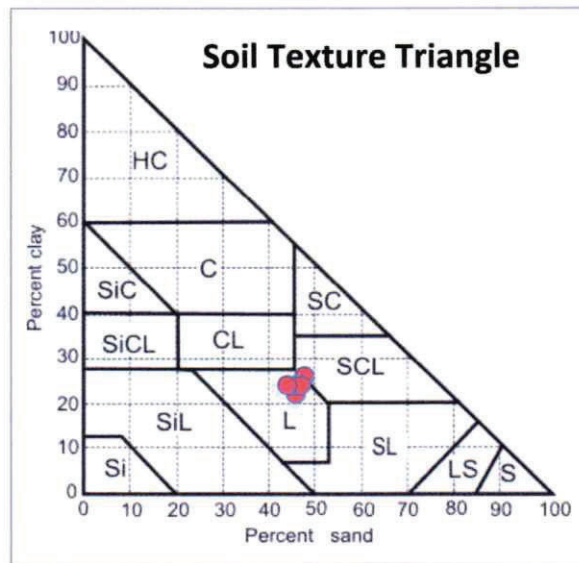
J. Lobbezoo Engineering +  
Consulting Services  
Box 96  
Monarch, Alberta T0L 1M0

**Report #:** 202729  
**Report Date:** 2025-03-06  
**Received:** 2025-03-04  
**Completed:** 2025-03-06  
**Test Done:** ST

**Project :**  
Traxel  
**PO:**

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

	Sample ID:	250304L005	250304L006	250304L007	250304L008	250304L009
<b>Cust. Sample ID:</b>		TK1-25	TK2-25	TK5-25	TK6-25	TK7-25
<b>Analyte Units</b>		6.5-7.5	1.5-3.0	6.5-7.5	6.5-7.5	6.5-7.5
Sand %		48.0	46.1	46.2	47.2	44.2
Silt %		26.0	31.9	29.8	28.8	31.8
Clay %		26.0	22.0	24.0	24.0	24.0
Soil Texture	-	Sandy Clay Loam	Loam	Loam	Loam	Loam





# Down To Earth Labs Inc.

The Science of Higher Yields

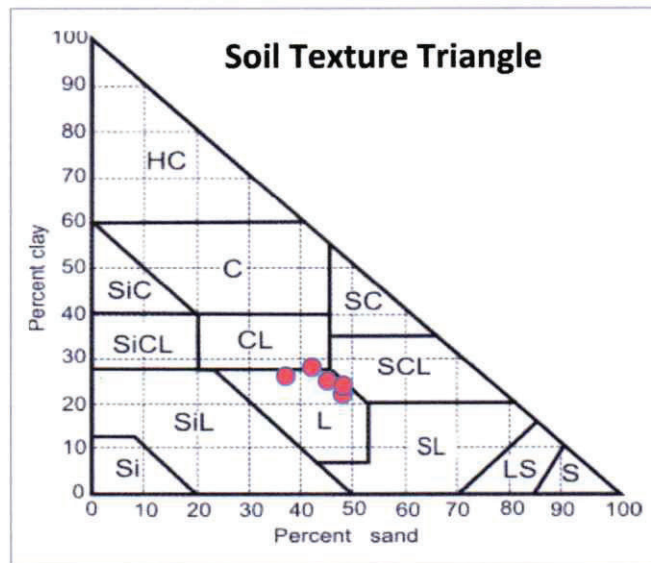
J. Lobbezoo Engineering +  
Consulting Services  
Box 96  
Monarch, Alberta T0L 1M0

**Report #:** 202729  
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**Project :**  
Traxel  
**PO:**

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

	Sample ID:	250304L010	250304L011	250304L012	250304L013	250304L014
	<b>Cust. Sample ID:</b>	TK8-25	TK9-25	TK10-25	TK11-25	TK12-25
	<b>Analyte Units</b>	1.5-3.0	1.5-3.0	2.0-3.0	2.0-3.0	2.0-3.0
Sand	%	45.2	48.1	48.2	42.2	37.2
Silt	%	29.8	29.9	27.8	29.8	36.8
Clay	%	25.0	22.0	24.0	28.0	26.0
Soil Texture	-	Loam	Loam	Sandy Clay Loam	Clay Loam	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: NW6-7-11W4, Kody Traxel

Date: 24-Feb-25

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
TK1-25	0503807 5526046	0-0.4	CL	F	Fill		
		0.4-1.5	CL	M	Till		Stiff, med plastic, grayish brown
		1.5-6.0	CL-C	M	Till	1.5-3.0	Stiff, med plastic, brown
		6.0-9.2	CL-C	M	Till	6.5-7.5	Stiff, med plastic, brown, iron staining
TK2-25	0503851 5526060	0-1.0	CL	F	Till		
		1.0-3.0	CL	M	Till		Stiff, med plastic, brown
TK5-25	0503802 5526124	0-1.7	CL	F	Till		Stiff, med plastic, olive brown
		1.7-9.2	CL-C	M	Till	6.5-7.5	Stiff, med plastic, brown
TK6-25	0503814 5526096	0-1.5	CL	F	Till		Stiff, med plastic, brown
		1.5-6.3	CL-C	M	Till		Stiff, med plastic, brown
		6.3-9.4	CL-C	M	Till	6.5-7.5	Stiff, med plastic, brown, iron staining 50mm H.C. Well installed to 9.4m BGS Screen: 9.4-6.4m Sand: 9.4-6.0m Bentonite: 6.0-0.0m Stickup: 0.6m Hole Diameter: 0.15m
TK7-25	0503764 5526059	0-0.5	CL	M	Fill		
		0.5-3.9	CL	M-VM	Till		Soft-firm, med plastic, grayish brown
		3.9-4.1	CL	M	Till		V. Firm, med plastic, brown, some silt (CL-SicL)
		4.1-6.6	CL-C	M	Till		Stiff, med plastic, brown
TK8-25	0503731 5525954	0-0.6	CL	F	Till		
		0.6-3.0	CL	M	Till	1.5-3.0	V. Firm, med plastic, brown
TK9-25	0503702 5525930	0-0.6	CL	F	Till		Stiff, med plastic, brown
		0.6-3.0	CL	M	Till	1.5-3.0	Stiff, med plastic, brown 50mm H.C. Well installed to 3.0m BGS Screen: 3.0-1.5m Sand: 3.0-1.45m Bentonite: 1.45-0.0m Stickup: 0.3m Hole Diameter: 0.15m
TK10-25	0503903 5526134	0-0.9	CL	D	Till		
		0.9-1.5	CL-C	M	Till		Stiff, med plastic, brown
		1.5-1.55	SCL	M	Till		Sand lensing
		1.55-3.6	CL	M	Till		50mm H.C. Well installed to 3.6m BGS Screen: 3.6-2.1m Sand: 3.6-2.0m Bentonite: 2.0-0.0m Stickup: 0.6m Hole Diameter: 0.15m
TK11-25	0503903 5526093	0-0.7	CL	F	Till		
		0.7-3.0	CL	M	Till		Stiff, med plastic, brown
TK12-25	0503705 5526015	0-0.6	CL	F	Till		
		0.6-1.6	CL	M	Till		Stiff, med plastic, brown
		1.6-1.8	CL-FSCL	M	Till		V. Firm, low-medium plastic, brown
		1.8-4.5	CL	M	Till		50mm H.C. Well installed to 4.4m BGS Screen: 4.4-2.9m Sand: 4.0-2.8m Bentonite: 2.8-0.0m Stickup: 0.4m Hole Diameter: 0.15m