

## 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 <b>LA24032</b>	Legal land description <b>SW 32-8-24 W4M</b>
<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Registration <input type="checkbox"/> Authorization <input type="checkbox"/> Amendment		

### 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.

OCT 1 2024  
Date of signing

Signature

BULLS RIVER VALLEY RANCH  
Corporate name (if applicable)

HARRY BULLS  
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)	NRCB USE ONLY
<u>ROW 3</u> (152.4 m x 42.7 m)	<u>500' x 140'</u>	
<u>CATCH BASIN</u> (34.0 m x 23.0 m x 2.0 m deep)	<del><u>264 x 15 m x 1.5 m</u></del>	

AO Comment: Initial proposed dimensions of new catch basin did not meet AOPA 9 month storage requirements for run-off. Applicant has proposed new dimensions to meet AOPA requirements.

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
<u>ROW 1</u>	<u>225 x 40</u>	
<u>ROW 2</u> (152.4 m x 42.7 m)	<u>500' x 140'</u>	
<u>CATCH BASIN</u>	<u>300' x 120' x 5'</u>	

**NRCB USE ONLY** (91.4 m x 36.6m x 1.5 m deep)

AO Comment: CFO currently permitted under NRCB Approval LA18009.

Last updated September 11, 2023

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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

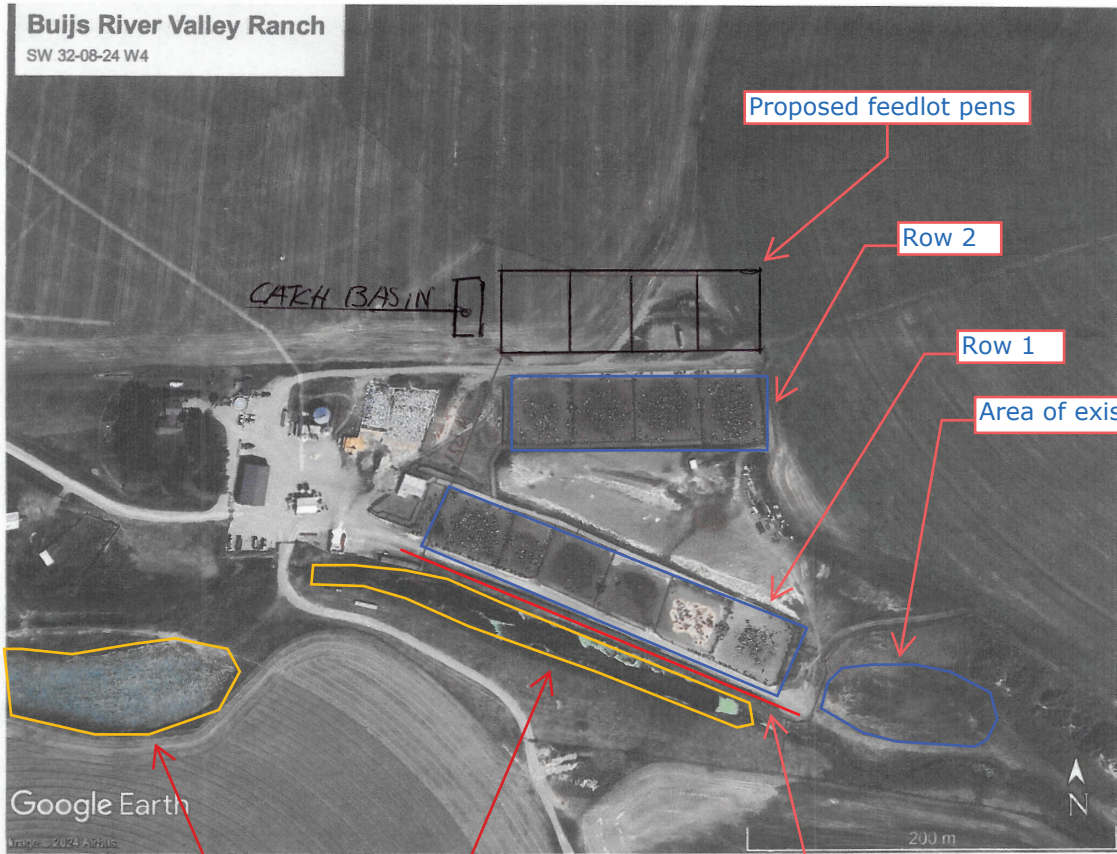
Construction completion date for proposed facilities July 2027

**Additional information**

AO Comment: The applicant is applying for a naturally occurring protective layer to meet AOPA's groundwater protection requirements for the new feedlot pens. The applicant has indicated they may install roller compacted concrete (RCC) as a secondary liner in the new feedlot pens in the future. Because RCC is known to increase run-off volume, the new proposed catch basin is designed to meet the requirements for a paved run-off area.

**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 FINISHING	1460	1540	3000



Unnamed tributary to Belly River

Existing berm/diversion ditch



## 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)

### 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 WELL ID 1250095

Signed this 30 day of SEP, 2024.

SW 33 00 24 W4  
\_\_\_\_\_  
*Signature of Applicant or Agent*

Last updated September 11, 2023

AO Comment: According to report for WW ID# 1250095, it is owned by Boot Farms Ltd. Applicant indicated in an email they bought the rights for WW ID# 1250095 from Boot Farms approximately 10 years ago and have been working with EPA to change the ownership over to them.





# Water Well Drilling Report

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

GIC Well ID 1250095  
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 Metric	
<b>Owner Name</b> BOOT FARMS LTD		<b>Address</b> P.O. BOX 1046			<b>Town</b> FORT MACLEOD		<b>Province</b> AB	<b>Country</b> CA	<b>Postal Code</b> T0L 0Z0		
<b>Location</b>	<i>1/4 or LSD</i> SW	<i>SEC</i> 33	<i>TWP</i> 8	<i>RGE</i> 24	<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>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>						
_____ m from _____					Latitude <u>49.687800</u>		Longitude <u>-113.202000</u>		Elevation _____ m		
_____ m from _____					How Location Obtained					How Elevation Obtained	
					Not Verified					Not Obtained	

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 Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
4.27		Sand & Gravel	
16.76		Clay	
22.25		Sand & Gravel	
23.16		Tan Sandstone	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b>		<u>90.92 L/min</u>	
<b>Test Date</b>	<b>Water Removal Rate (L/min)</b>	<b>Static Water Level (m)</b>	
2003/06/24	454.61	2.01	

Well Completion				Measurement in Metric
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>	
23.16 m		2003/06/18	2003/06/24	
<b>Borehole</b>				
<b>Diameter (cm)</b>	<b>From (m)</b>	<b>To (m)</b>		
15.56	0.00	23.16		
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>		
Steel		Unknown		
Size OD : <u>16.83 cm</u>		Size OD : _____ cm		
Wall Thickness : <u>0.478 cm</u>		Wall Thickness : _____ cm		
Bottom at : <u>18.90 m</u>		Top at : _____ m		
		Bottom at : _____ m		
<b>Perforations</b>				
<b>From (m)</b>	<b>To (m)</b>	<b>Diameter or Slot Width (cm)</b>	<b>Slot Length (cm)</b>	<b>Hole or Slot Interval (cm)</b>
Perforated by Unknown				
<b>Annular Seal</b> Driven & Bentonite				
Placed from <u>0.00 m</u> to <u>18.90 m</u>				
Amount _____				
<b>Other Seals</b>				
Type		At (m)		
<b>Screen Type</b> Stainless Steel				
Size OD : <u>13.97 cm</u>				
<b>From (m)</b>	<b>To (m)</b>	<b>Slot Size (cm)</b>		
18.90	21.95	0.051		
Attachment <u>Telescoped</u>				
Top Fittings <u>Packer</u>		Bottom Fittings <u>Plug</u>		
<b>Pack</b>				
Type <u>Natural</u>		Grain Size _____		
Amount _____		Unknown		

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well SHELDON DOLLMAN	Certification No 5500A
Company Name DOLLMAN'S WATER WELL DRILLING INC.	Copy of Well report provided to owner Date approval holder signed



Name Bujs River Valley Ranch  
 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	3,000	1,337.7
	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		-
	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 1,337.7

**For New Operations**

Dispersion Factor 1

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,863	568
2	54.72	2,485	757
3	68.4	3,106	947
4	109.44	4,969	1,515

**For Expanding Operations**

Dispersion Factor 1  
 Expansion Factor 0.77

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,435	437
2	54.72	1,913	583
3	68.40	2,391	729
4	109.44	3,826	1,166





This agreement is made October 7, 2024 between

HENRIK deKOK

(landowner) and

Buijs River Valley Ranch, Harry and Janet Buijs

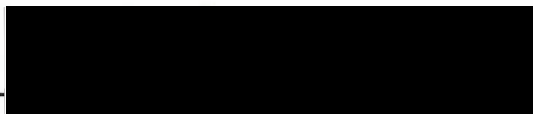
( applicant).

We do agree that if Buijs River Valley Ranch has excessive manure, we will take it and put it on our field.

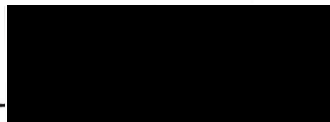
The field mentioned is on Land location

NW-32-08-24-W4, 140 ACRES irrigated acres

This agreement will end in 5 years



Hank de Kok



Harry Buijs

Fort Macleod, October 07, 2024

Name Bujs River Valley Ranch  
 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)	3000.0	375.0	312.0	234.0	186.0
	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
	Other	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	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
	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			375	312.0	234.0	186.0
Total Acres			927	771.0	578.2	459.6



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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)

Existing: FEEDLOT PENS

Proposed 1: NEW PENS

Proposed 2: CATCH BASIN

Proposed 3:

Facility and environmental risk information	Facilities			Meets requirements	Comments
	Existing	Proposed 1	Proposed 2		
<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 checked="" type="checkbox"/> > 1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> > 1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> > 1 m <input type="checkbox"/> ≤ 1 m	<input type="checkbox"/> 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?  How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
	0	0	0	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
<b>Groundwater 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)  What is the depth to the water table?  What is the depth to the groundwater resource/aquifer you draw water from?	5 M	200 M	200 M	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
		4 1/2 M		<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	
	14 M	14 M	14 M	<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)

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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

### 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.	<del>26</del>	<del>15</del>	<del>1.5</del>	<del>2.0</del>				
2.	34	23	2.0	2.0	3:1	3:1	N/A	
3.								
TOTAL CAPACITY								<u>505 m<sup>3</sup></u>

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	<u>13</u> (m)	Provide details (as required)	
Soil texture	<u>40</u> % sand	<u>25</u> % silt	<u>35</u> % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested <u>7.5 M CLAY LOAM</u>	Hydraulic conductivity (cm/s) <u>1.2 X 10<sup>-7</sup> cm/s</u>	Describe test standard used <u>50MM PVC MONITORING WELL FILLING SEVERAL DAYS 24-HOUR WATER DROP WAS 0.6 M</u>

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

If soil info differs per facility include additional soils page.

#### NRCB USE ONLY

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

# Catch Basin Storage Volume Calculator

## Construction Dimensions of Catch Basin

\* Only cells in blue can be changed.

### Overall Dimensions of Catch Basin

Total Length* <sub>4</sub>	34.0 m
Total Width* <sub>4</sub>	23.0 m
Total Depth* <sub>4</sub>	2.0 m
Design Capacity Depth	1.50 m
End Slope* <sub>4</sub>	3 run:rise
Side Slope* <sub>4</sub>	3 run:rise
Length of Bottom	22.0 m
Width of Bottom	11.0 m

Capacity @ top of Bank 976 m<sup>3</sup>

### Design Capacity of Catch Basin (freeboard level)

Length (design capacity depth)	31.0 m
Width (design capacity depth)	20.0 m
Total Depth	2.0 m
Design Capacity Depth	1.50 m
End Slope	3 run:rise
Side Slope	3 run:rise

Design Capacity (freeboard level) 626 m<sup>3</sup>

level) 620 m<sup>2</sup>

### Catch Basin Dimensions

112 ft
75 ft
7 ft
5 ft
3 run:rise
3 run:rise
3 run:rise
72 ft
36 ft

Capacity (@top) 34,467 ft<sup>3</sup>  
214,690 Imp. Gal.

### Design Capacity (freeboard level)

102 ft
66 ft
7 ft
5 ft
3 run:rise
3 run:rise

22,116 ft<sup>3</sup>  
137,756 Imp. Gal.  
6,674 ft<sup>2</sup>

CFO Name <sub>1</sub> Buijs River Valley Ranch  
Land Location <sub>1</sub>

### Paved Runoff Catchment Area(s)

Area <sub>2</sub>	Length (m)	Width (m)	Area (m <sup>2</sup> )
1	152	43	6,536.0
2			0.0
3			0.0
4			0.0
5			0.0
Total Area (m <sup>2</sup> )			6,536

### Unpaved Runoff Catchment Area(s)

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

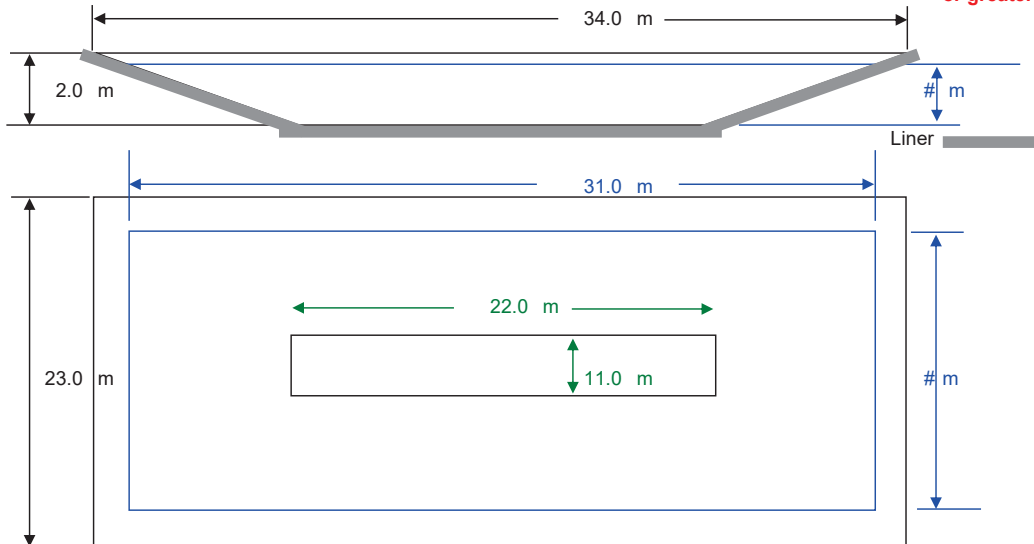
### Rainfall (Select Town <sub>3</sub>)

Fort Macleod 90  
AOPA Design Rainfall 90 mm

### Minimum Catchbasin Storage Volume Required

588 m<sup>3</sup> \*\* 20773.5 ft<sup>3</sup>  
129394.66 Imp. Gal.

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



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

NTS - Not To Scale



# Part 2 – Technical Requirements

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

## 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. NEW FEEDLOT PENS
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.	<u>500' x 140'</u>			
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

RUNOFF TO CATCH BASIN

### Naturally occurring protective layer details

Thickness of naturally occurring protective layer	<u>&gt; 1.5</u> (m)		
Soil texture	_____ % sand	_____ % silt	_____ % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested <u>4.5 M SILTY CLAY</u>	Hydraulic conductivity (cm/s) <u>2.0 x 10<sup>-7</sup> cm/s</u>	Describe test standard used <u>IN SITU</u>

Additional information (attach copies of soil test reports)

#### NRCB USE ONLY

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

27 September 2024

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

JLECS File: P24050

**Buijs River Valley Ranch**  
PO Box 993  
Fort Macleod, Alberta T0L 0Z0

Attention: Mr. Harry Buijs

**Re:                   Geotechnical Review and Evaluation  
                      NRCB Permitting of Proposed Catch Basins  
                      SW-32-008-24-W4M, near Fort Macleod, Alberta**

As requested, J Lobbezoo Engineering & Consulting Services Ltd. (JLECS) has carried out a geotechnical review and evaluation of the above-captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA"). This letter describes site soil conditions to support a permit application related to a proposed catch basin to be constructed north of the existing pens and farmyard at the above-captioned site (refer to Figure 1, attached). It is understood that the proposed catch basin would be approximately 15 m by 24 m by 1.5 m deep, and would accommodate runoff from the existing pens immediately south of the proposed catch basin.

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater, three boreholes were advanced at the site on August 13, 2024. The boreholes were advanced at the approximate locations denoted as BR1-24 to BR3-24 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 of 3.0 m to 7.5 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 lacustrine clay loam to silt-clay loam to the termination depths of all three boreholes, with saturated sand occurrences in boreholes BR1-24 and BR2-24 between about 3.3 m and 4.1 m depth below grade at the proposed catch basin.

Samples of soil collected from the screened zones of boreholes BR3-24 as well as samples from similar depths at the other boreholes were all subjected to grain size analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The lab report is attached, for reference. The results indicate a soil texture breakdown of:

**Table 1: Soil Texture Analyses**

Borehole/Depth	% Sand	% Silt	% Clay
BR1-24 / 1.0 – 2.0 m	48	20	32
BR2-24 / 2.5 – 3.0 m	20	54	26
BR3-24 / 1.0 – 2.0 m	40	25	35
Average:	36	33	31

To measure the *in situ* permeability of the subsurface soils, a 50 mm diameter PVC monitoring well was constructed in borehole BR3-24. The test well was screened from 1.35 m to 2.9 m depth. Well saturation of the 50 mm diameter monitoring well 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 0.61 m was determined at BR3-24.

To calculate the permeability of the screened portion of the clay till strata at the test well location, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test reports. The results of the permeability testing indicate an *in situ* hydraulic conductivity,  $k_s$ , of  $1.2 \times 10^{-7}$  cm/s at BR3-24.

Using the measured permeability of the clay stratum, the 1.55 m of clay screened at BR3-24 is estimated to represent the equivalent of approximately 13 m of naturally occurring materials having a hydraulic conductivity of  $1 \times 10^{-6}$  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).

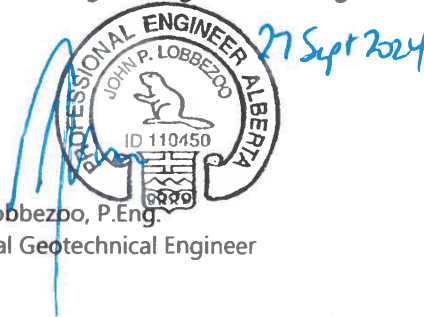
### Conclusion

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 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
- Down to Earth Soil Texture Results
- 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: _____	27 Sept 2024
<b>PERMIT NUMBER: P016456</b>	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	



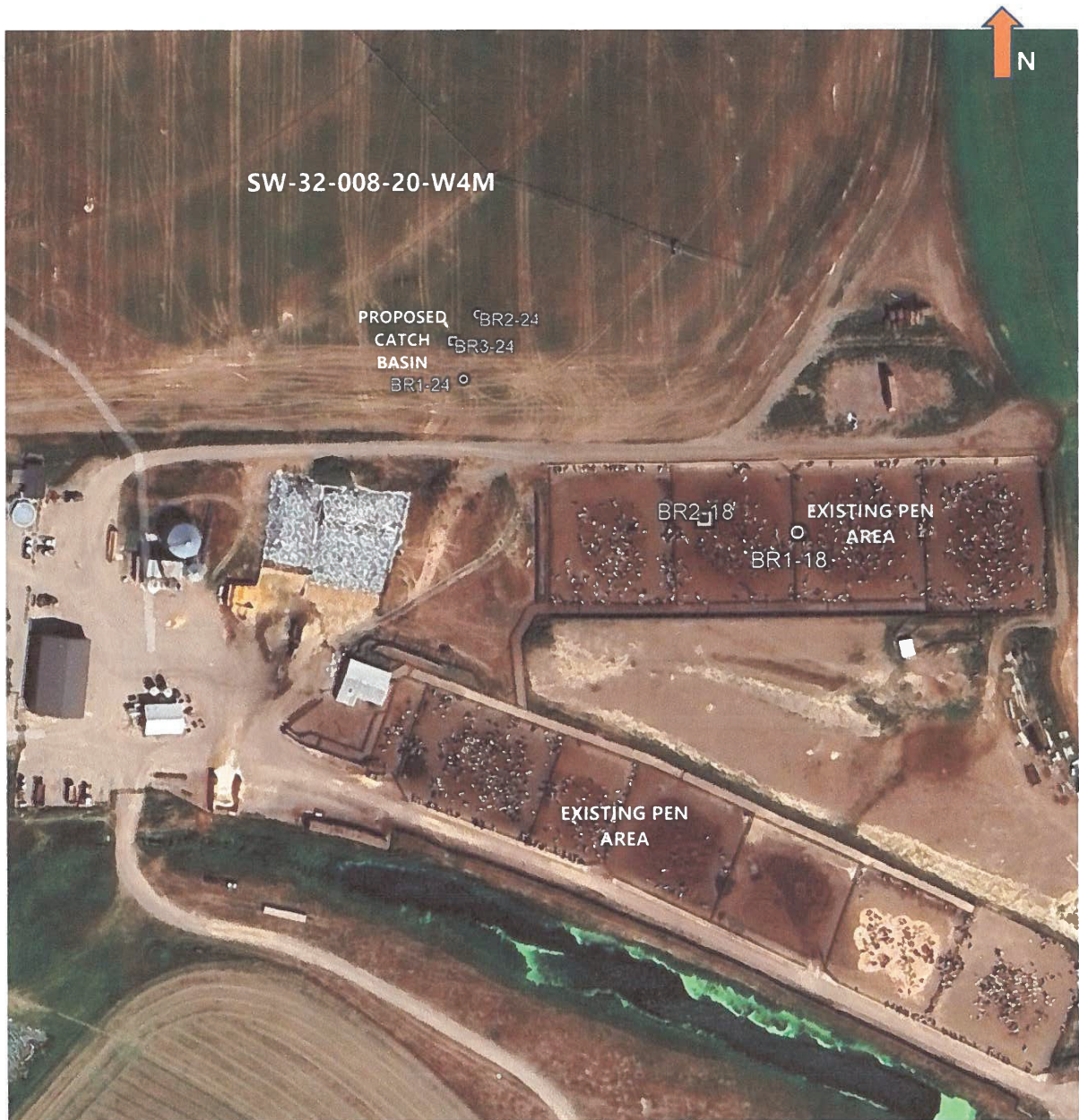


Figure 1: Site Layout & Borehole Locations

Image Credit: Google

BR3-24

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

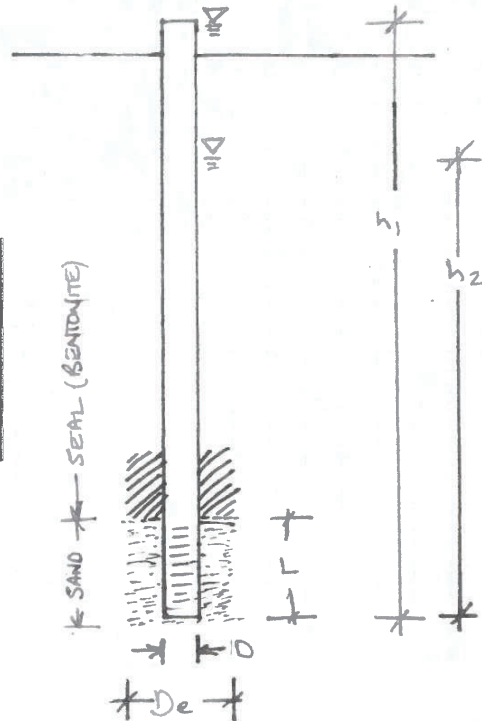
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

BR3-24 - Buijs River Valley Ranch

JLECS File: P24050

INPUT VARIABLES	Terms	Value	Definition
	D		0.0520
De		0.1500	diameter of borehole (m)
L		1.55	length of sand section (m)
h1		3.05	initial height of water above base of hole (m)
h2		2.44	final height of water above base of hole (m)
t		24.0	time of test (h)

$k_s = 1.2E-07$  cm/sec







# Down To Earth Labs Inc.

The Science of Higher Yields

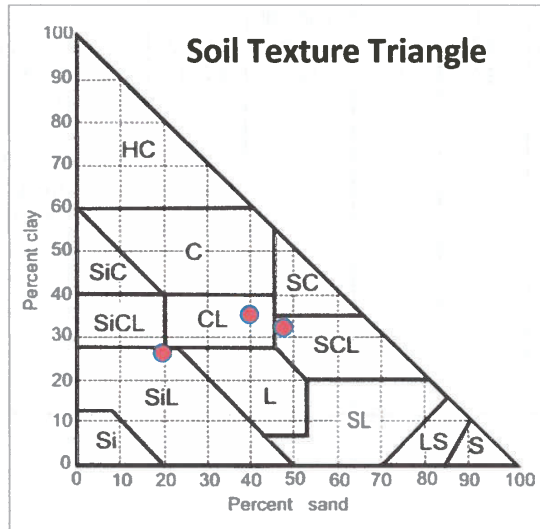
J. Lobbezoo Engineering +  
Consulting Services  
Box 96  
Monarch, Alberta T0L 1M0

**Report #:** 187035  
**Report Date:** 2024-09-26  
**Received:** 2024-09-24  
**Completed:** 2024-09-26  
**Test Done:** ST

**Project:**  
Buij's  
**PO:**

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

		Sample ID: 240924P008	240924P009	240924P010
	Cust. Sample ID:	BB24-01	BB24-02	BB24-03
Analyte	Units	1.0-2.0	2.5-3.0	1.0-2.0
Sand	%	47.8	19.8	39.9
Silt	%	20.2	54.2	25.1
Clay	%	32.0	26.0	35.0
Soil Texture	-	Sandy Clay Loam	Silt Loam	Clay Loam



Raygan Boyce - Chemist

# CHILAKO DRILLING SERVICES LTD

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

## SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: SW32-8-24W4, Buijs River Valley Ranch

Date: 13-Aug-24

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
50'x80' Catch Basin ~ 5ft deep							
BR1-24	0339639 5506177	0-0.15	CL	M	Topsoil		
		0.15-0.5	CL	M	Lac		V firm, med plastic, brown
		0.5-2.1	CL	M	Lac	1.0-2.0	V firm, med plastic, brown, sand streaks
		2.1-3.5	SiC	M	Lac	2.5-3.5	Stiff, med-high plastic, olive brown
		3.5-4.1	Sand	Sat	Lac	3.5-4.0	Free water @ 4.1m
		4.1-4.6	SiC	M	Lac		Stiff, med-high plastic, olive brown
		4.6-7.5	SiC	M	Lac		Stiff, med plastic, brown, iron staining
BR2-24	0339644 5506198	0-0.15	CL	D	Topsoil		
		0.15-1.6	CL	D	Lac		V firm, med plastic, brown, sand streaks
		1.6-2.4	CL-SCL	M	Lac		V firm, low-med plastic, brown
		2.4-3.3	SiCL	M	Lac	2.5-3.0	Stiff, med plastic, olive brown
		3.3-4.1	Sand	M	Lac		
		4.1-4.9	SiC	M	Lac		Stiff, med-high plastic, olive brown
		4.9-6.0	SiL	M	Lac	5.0-6.0	V firm, low plastic, yellow brown
6.0-7.5	SiC	M	Lac		Stiff, med plastic, yellow brown No free water		
BR3-24	0339636 5506190	0-0.15	CL	D	Topsoil		
		0.15-2.1	SiCL	M	Lac	1.0-2.0	V firm, med plastic, brown
		2.1-3.0	SiC	M	Lac	2.2-3.0	Stiff, med-high plastic, olive brown
							50mm H.C. Well installed to 2.9m BGS Screen: 2.9-1.4m Sand: 2.0-1.35m Bentonite: 1.35-0.0m Stickup: 0.25m Hole Diameter: 0.15m

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

Eg. VFSCl = Very Fine Sandy Clay Loam



469 – 40 Street S  
Lethbridge, Alberta T1J 4M1  
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F: +1 403 327-7682  
www.woodplc.com

May 1, 2018  
Wood File: BX30536

Mr. Harry Buijs  
River Valley Ranch  
P.O. Box 993  
Fort Macleod, Alberta T0L 0Z0

Dear Mr. Buijs:

**Re: Geotechnical Review and Evaluation  
Proposed Pen Expansion  
SW-32-8-24-W4, near Fort Macleod, Alberta**

As requested, Wood Environment and Infrastructure Solutions (Wood) 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 encompasses the soil conditions associated with a proposed pen expansion in the north of the site (see Figure 1).

In order to demonstrate the suitability of the natural clay soils for consideration as a naturally occurring protective layer, two boreholes were advanced at the site on March 29, 2018, at the approximate locations illustrated on Figure 1. The boreholes were advanced by a truck-mounted drill rig owned and operated by Chiliako Drilling Services Ltd., and extended to depths ranging between about 3.2 m and 4.5 m below existing grades. These boreholes were logged by Mr. Larry DeLong of Chiliako Drilling Services Ltd. (see attachments).

In general, the soils encountered within the current test holes included lacustrine clay to the termination depths of the boreholes, with occasional silt lensing.

In order to demonstrate the permeability of the subsurface soils, a 50 mm diameter PVC monitoring well was constructed in borehole BR2-18. Borehole BR2-18 was screened from 1.4 m to 3.0 m depth. Well saturation of the 50 mm diameter monitoring well was carried out by filling the monitoring well to the top of the well for several consecutive days. After several days, the 24 hour water drop in the standpipe was about 0.99 m.

In order to calculate the permeability of the screened portion of the clay stratum, 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 *In Situ Permeability Test* reports, attached. As outlined on the report, the results of the *in situ* permeability testing indicate a hydraulic conductivity,  $k_s$ , of  $2.0 \times 10^{-7}$  cm/s.



Using the measured permeability of the clay stratum, the 1.6 m portion of clay which has been screened at borehole BR2-18 has been estimated to represent an equivalent of about 8 m of naturally occurring materials having a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s. This represents natural material protection above the minimum requirements outlined by the AOPA for solid manure storage (minimum 2 m, Section 9.5-c).

**Conclusion**

Based on the results of the current investigation and permeability testing, and our understanding of the site and proposed development at the site, it is Wood's opinion that the naturally occurring materials at the site satisfy the requirements for a naturally occurring 'protective layer' at the location of the proposed pen expansion, as outlined in the AOPA.

We trust this satisfies your present requirements. If you have questions or require further information or clarification, please don't hesitate to contact the undersigned.

Yours truly,

**Wood Environment & Infrastructure Solutions  
A Division of Wood Canada Limited**



John Lobbezoo, P.Eng.  
Associate Geotechnical Engineer  
Branch Manager, Lethbridge & Medicine Hat

Attach.

Figure 1 – Borehole Location Plan  
In Situ Permeability Test Calculations – BR2-18  
Soil Profile and Parent Material Description, Chilako Drilling Services

**Permit to Practice No. P-4546**



SW -32-8-24-W4

BR2-18  
BR1-18  
Proposed Pens

Figure 1  
Borehole Locations  
Proposed Pens  
River Valley Ranch  
Wood File: BX30536  
April, 2018

Image S. Alberta M.D.s and Counties  
© 2018 Google

Google Earth  
Application ID: A24080 Page 23 of 25



BR2-18

In Situ Permeability Test

WOOD.

Modified Falling Head Permeability Equation

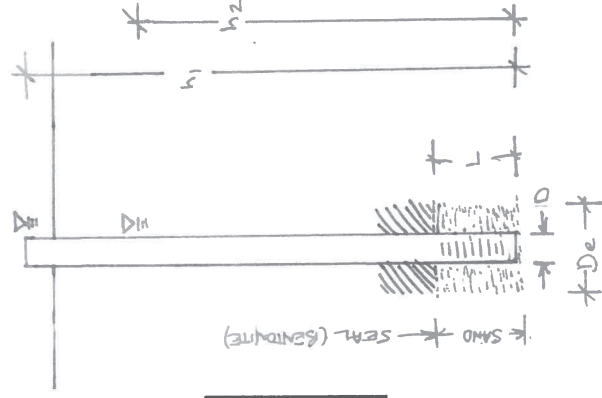
$$K_s = \frac{r^2}{2L\Delta t} \left[ \frac{\sinh^{-1} \frac{\ell}{r_s} \ln \left[ \frac{2H_1 - \ell}{2H_2 - \ell} \right] - \ln \left[ \frac{2H_1 H_2 - \ell H_2}{2H_1 H_2 - \ell H_1} \right]}{2} \right]$$

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

BR2-18 - Buijs River Valley Ranch, SW-32-8-24-W4  
 Amec Foster Wheeler File: BX30536

INPUT VARIABLES	
Terms	Value Definition
D	0.0520 diameter of standpipe (m)
De	0.1500 diameter of borehole (m)
L	1.60 length of sand section (m)
h1	3.30 initial height of water above base of hole (m)
h2	2.31 final height of water above base of hole (m)
t	24.0 time of test (h)

Ks = 2.0E-07 cm/sec



# CHILAKO DRILLING SERVICES LTD

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

## SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: Buijs River Valley Ranch, SW32-8-24W4 Date: 29-Mar-18

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
BR1-18	0339742 5506126	0-0.15	CL	D	Topsoil		Med plastic, high plastic clay layers Stiff, med-high plastic Stiff, med-high plastic, silt lensing, layering
		0.13-0.7	SCL	D	Lac		
		0.7-1.1	SL	D	Lac		
		1.1-1.4	CL-SCL	D	Lac		
		1.4-2.0	SiCL	D	Lac		
		2.0-3.2	SiC	M	Lac		
3.2-4.5	SiCL-SiC	M	Lac				
BR2-18	0339714 5506131	0-0.15	CL	D	Topsoil		Low-med plastic, some sand Stiff, med plastic, yellow brown Stiff, med plastic, silt lensing, layering Sloughing from 3.2-3.0m 50mm H.C. well installed to 3.0m Screen: 3.0-1.5m Sand: 3.0-1.4m Bentonite: 1.4-0.0m Stickup: 0.3m Hole diameter: 0.15m
		0.15-1.1	SiCL	D	Lac		
		1.1-2.0	SiCL	D	Lac		
		2.0-3.2	SiCL-SiC	M	Lac		