# Technical Document LA24032

## Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

| NRCB USE ONLY | Application number | Legal land description |
|---|---|---|
| ☒ Approval ☐ Registration ☐ Authorization ☐ Amendment | LA24032 | SW 32-8-24 W4M |

**APPLICATION DISCLOSURE**

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

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

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

OCT 1 2024
Date of signing

[redacted]
Signature

BUYS RIVER VALLEY RANCH
Corporate name (if applicable)

HARRY BUYS
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) |
|---|---|
| ROW 3 (152.4 m x 42.7 m) | 500' x 140' |
| #2 CATCH BASIN (34.0 m x 23.0 m x 2.0 m deep) | ~~26 M X 15 M X 1.5M~~ |
| | |
| | |

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 |
|---|---|---|
| ROW 1 | 225 x 40 | Confirmed |
| ROW 2 (152.4 m x 42.7 m) | 500' x 140' | |
| CATCH BASIN #1 | 300' x 120' x 5' | |
| 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. The existing catch basin has sufficient storage if the applicant installs RCC in the existing feedlot pens in the future.

**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 |
| | | | |
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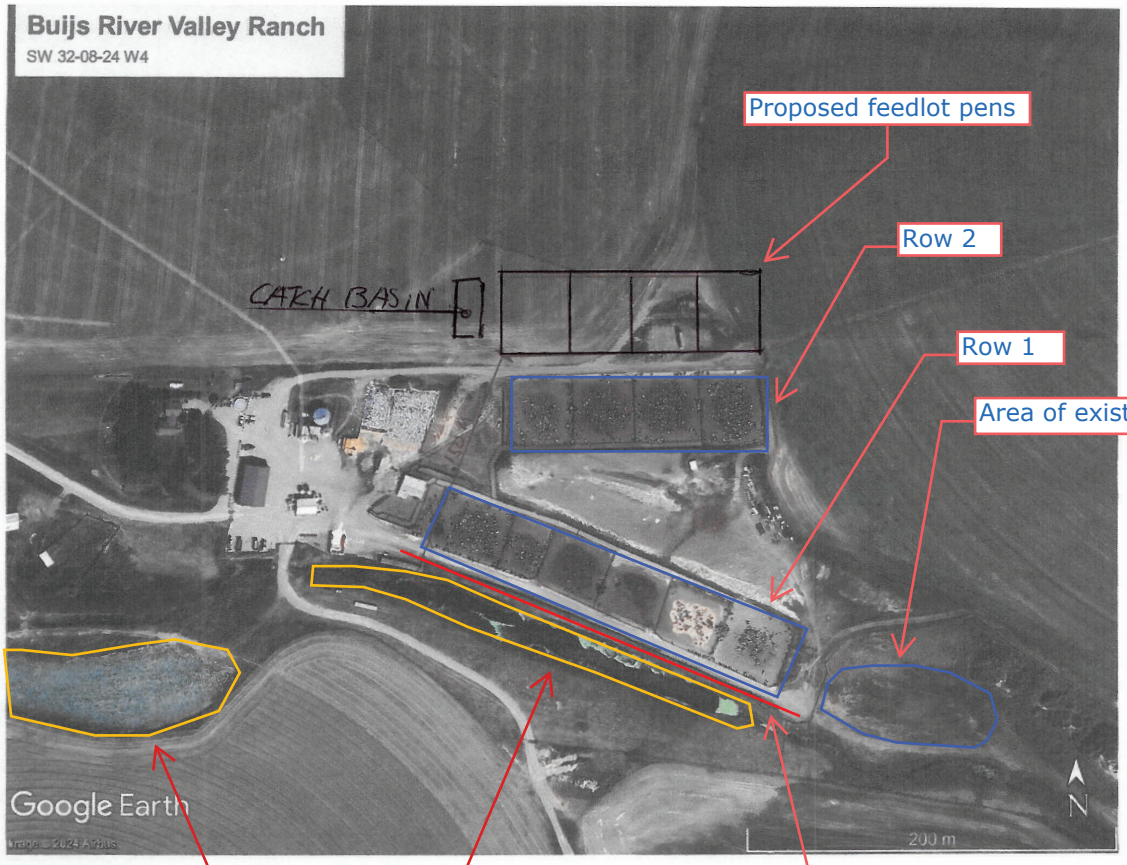


Proposed feedlot pens

Row 2

Row 1

Area of existing catch basin

Unnamed tributary to Belly River

Existing berm/diversion ditch (red line)

# Part 2 — Technical Requirements

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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*

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**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*

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**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*

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**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 SW 33 00 24 W4

Signed this 30 day of SEP, 2024 [redacted]
*Signature of Applicant or Agent*

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AO Comment: According to report for WW ID# 1250095, it is owned by Boot Farms Ltd. Applicant indicated in an email they bought the license 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

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

GIC Well ID 1250095
GOWN ID
GoA Well Tag No.
Drilling Company Well ID
Date Report Received

## Well Identification and Location

Measurement in Metric

| Owner Name | Address | Town | Province | Country | Postal Code |
|---|---|---|---|---|---|
| BOOT FARMS LTD | P.O. BOX 1046 | FORT MACLEOD | AB | CA | T0L 0Z0 |

| Location | 1/4 or LSD | SEC | TWP | RGE | W of MER | Lot | Block | Plan | Additional Description |
|---|---|---|---|---|---|---|---|---|---|
| | SW | 33 | 8 | 24 | 4 | | | | |

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.687800 Longitude -113.202000
How Location Obtained: Not Verified

Elevation m
How Elevation Obtained: Not Obtained

## Drilling Information

**Method of Drilling**: Rotary

**Proposed Well Use**: Domestic

**Type of Work**: New Well

## Formation Log

Measurement in Metric

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

## Yield Test Summary

Measurement in Metric

Recommended Pump Rate 90.92 L/min

| Test Date | Water Removal Rate (L/min) | Static Water Level (m) |
|---|---|---|
| 2003/06/24 | 454.61 | 2.01 |

## Well Completion

Measurement in Metric

| Total Depth Drilled | Finished Well Depth | Start Date | End Date |
|---|---|---|---|
| 23.16 m | | 2003/06/18 | 2003/06/24 |

**Borehole**

| Diameter (cm) | From (m) | To (m) |
|---|---|---|
| 15.56 | 0.00 | 23.16 |

**Surface Casing (if applicable)**
Steel
Size OD : 16.83 cm
Wall Thickness : 0.478 cm
Bottom at : 18.90 m

**Well Casing/Liner**
Unknown
Size OD : cm
Wall Thickness : cm
Top at : m
Bottom at : m

**Perforations**

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

Perforated by: Unknown

**Annular Seal**: Driven & Bentonite
Placed from 0.00 m to 18.90 m
Amount

Other Seals

| Type | At (m) |
|---|---|
| | |

**Screen Type**: Stainless Steel
Size OD : 13.97 cm

| From (m) | To (m) | Slot Size (cm) |
|---|---|---|
| 18.90 | 21.95 | 0.051 |

Attachment: Telescoped
Top Fittings: Packer
Bottom Fittings: Plug

**Pack**
Type: Natural
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

# Water Well Drilling Report

View in Imperial | Export to Excel

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

GOWN ID

GIC Well ID 1250095
GoA Well Tag No.
Drilling Company Well ID
Date Report Received

## Well Identification and Location

Measurement in Metric

| Owner Name | Address | Town | Province | Country | Postal Code |
|---|---|---|---|---|---|
| BOOT FARMS LTD | P.O. BOX 1046 | FORT MACLEOD | AB | CA | T0L 0Z0 |

| Location | 1/4 or LSD | SEC | TWP | RGE | W of MER | Lot | Block | Plan | Additional Description |
|---|---|---|---|---|---|---|---|---|---|
| | SW | 33 | 8 | 24 | 4 | | | | |

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.687800 Longitude -113.202000
How Location Obtained: Not Verified

Elevation m
How Elevation Obtained: Not Obtained

## Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level: 76.20 cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate: 90.92 L/min
Recommended Pump Intake Depth (From TOC): 15.24 m
Pump Installed
Depth m
Type
Make
H.P.
Model (Output Rating)

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

Additional Comments on Well

NOTE: 3' BACKFILLED
NOTE: 4' EXTENSION ON TOP 1' EXTENSION ON BOTTOM

## Yield Test

Taken From Ground Level
Measurement in Metric

| Test Date | Start Time | Static Water Level |
|---|---|---|
| 2003/06/24 | 7:12 AM | 2.01 m |

**Method of Water Removal**

Type: Air
Removal Rate: 454.61 L/min
Depth Withdrawn From: m

If water removal period was < 2 hours, explain why

Depth to water level

| Pumping (m) | Elapsed Time Minutes:Sec | Recovery (m) |
|---|---|---|
| 2.01 | 0:00 | 21.34 |
| | 1:00 | 3.35 |
| | 2:00 | 3.22 |
| | 3:00 | 3.15 |
| 21.34 | 4:00 | 3.11 |
| | 5:00 | 3.05 |
| | 6:00 | 3.02 |
| | 7:00 | 3.00 |
| | 8:00 | 2.97 |
| | 9:00 | 2.95 |
| | 10:00 | 2.93 |
| | 30:00 | 2.67 |
| 21.34 | 120:00 | |

## Water Diverted for Drilling

| Water Source | Amount Taken | Diversion Date & Time |
|---|---|---|
| | L | |

## 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

# Part 2 — Technical Requirements

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

**NRCB USE ONLY**

## WATER WELL AND SURFACE WATER INFORMATION

Well IDs: 256128 (only used to determine UGR)

103423, 103424, & 103425 (chemistry)

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

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

**Water wells** ☑ N/A

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

**Surface water** ☑ N/A

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

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

| Water Well ID | Preliminary Screening Score | Secondary Screening Score | Facility |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |

**Groundwater or surface water related comments**:

AO Comment: In Approval LA18009, the grandfathered row #1 pens and existing catch basin were within the 30 m setback to a common body of water. An exemption to the setback was granted (see LA18009 TD). In this application, no changes are proposed to these existing facilities and the new facilities are proposed to be built outside of the setback. Therefore, the exemption that was granted for Approval LA18009 remains and the condition requiring maintenance of berms, slopes, and drainage ditches in Approval LA18009 will be carried forward into this approval (see Appendix B of Decision Summary LA24032).

# Part 2 — Technical Requirements

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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:** FEEDLOT PENS (row #'s 1 & 2) **Proposed 1:** NEW PENS (row #3 pens)

**Proposed 2:** CATCH BASIN #2 **Proposed 3:**

| Facility and environmental risk information | | Facilities | | | | NRCB USE ONLY | |
|---|---|---|---|---|---|---|---|
| | | Existing | Proposed 1 | Proposed 2 | Proposed 3 | Meets requirements | Comments |
| Flood plain information | What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level? | ☒ >1 m ☐ ≤ 1 m | ☒ >1 m ☐ ≤ 1 m | ☒ >1 m ☐ ≤ 1 m | ☐ > 1 m ☐ ≤ 1 m | ☑ YES ☐ NO ☐ YES with exemption | Not in flood plain; confirmed |
| Surface water information | How many springs are within 100 m of the manure storage facility or manure collection area? | 0 | 0 | 0 | | ☑ YES ☐ NO ☐ YES with exemption | Confirmed |
| | How many water wells are within 100 m of the manure storage facility or manure collection area? | 0 | 0 | 0 | | ☑ YES ☐ NO ☐ YES with exemption | Confirmed; Wells in Alberta Water Wells database are chemistry wells |
| | What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal) | 5 M | 200 M | 200 M | | ☑ YES ☐ NO ☐ YES with exemption | Existing catch basin 6 m from tributary. Proposed facilities 160 m from tributary. |
| Groundwater information | What is the depth to the water table? | | 4½ M | | | ☑ YES ☐ NO ☐ YES with exemption | Free water encountered at 4.1 m below grade |
| | What is the depth to the groundwater resource/aquifer you draw water from? | 14 M | 14 M | 14 M | | ☑ YES ☐ NO ☐ YES with exemption | Screened portion of Well ID# 256128 starts at 14 m below grade |

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

AO Comment: Water well ID# 256128 is located on SE 5-9-24 W4 and was used solely for the purposed of determining the uppermost groundwater resource (UGR).

AO Comment: Well log only used to determine UGR for environmental information.

# Water Well Drilling Report

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.

View in Imperial | Export to Excel

GOWN ID

GIC Well ID 256128
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1981/03/25

## Well Identification and Location

Measurement in Metric

| Owner Name | Address | Town | Province | Country | Postal Code |
|---|---|---|---|---|---|
| DEKOK, PETER | FT MACLEOD | | | | |

| Location | 1/4 or LSD | SEC | TWP | RGE | W of MER | Lot | Block | Plan | Additional Description |
|---|---|---|---|---|---|---|---|---|---|
| | SE | 5 | 9 | 24 | 4 | | | | |

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.702424 Longitude -113.213691

How Location Obtained
Map

Elevation 929.64 m

How Elevation Obtained
Estimated

## Drilling Information

**Method of Drilling**
Rotary

**Proposed Well Use**
Domestic & Stock

**Type of Work**
New Well

## Formation Log

Measurement in Metric

| Depth from ground level (m) | Water Bearing | Lithology Description |
|---|---|---|
| 4.57 | | Brown Clay |
| 6.10 | | Dry Gravel |
| 12.19 | | Blue Clay |
| 14.33 | | Gravel |

## Yield Test Summary

Measurement in Metric

Recommended Pump Rate 0.00 L/min

| Test Date | Water Removal Rate (L/min) | Static Water Level (m) |
|---|---|---|
| 1980/11/26 | 113.65 | 9.14 |

## Well Completion

Measurement in Metric

| Total Depth Drilled | Finished Well Depth | Start Date | End Date |
|---|---|---|---|
| 14.33 m | | 1980/11/25 | 1980/11/26 |

**Borehole**

| Diameter (cm) | From (m) | To (m) |
|---|---|---|
| 0.00 | 0.00 | 14.33 |

**Surface Casing (if applicable)**
Unknown
Size OD : 13.97 cm
Wall Thickness : 0.874 cm
Bottom at : 14.33 m

**Well Casing/Liner**
Unknown
Size OD : 13.97 cm
Wall Thickness : 0.874 cm
Top at : 0.00 m
Bottom at : 14.33 m

**Perforations**

| From (m) | To (m) | Diameter or Slot Width (cm) | Slot Length (cm) | Hole or Slot Interval(cm) |
|---|---|---|---|---|
| 14.02 | 14.33 | 0.165 | | 15.24 |

Perforated by Torch

**Annular Seal** Driven
Placed from 0.00 m to 0.00 m
Amount

Other Seals

| Type | At (m) |
|---|---|
| | |

**Screen Type**
Size OD : 0.00 cm

| From (m) | To (m) | Slot Size (cm) |
|---|---|---|
| | | |

Attachment
Top Fittings
Bottom Fittings

**Pack**
Type
Grain Size
Amount

## Contractor Certification

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

Certification No
1

Company Name
VANDRIESTEN WM

Copy of Well report provided to owner

Date approval holder signed

# Water Well Drilling Report

View in Imperial | Export to Excel

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

GOWN ID

GIC Well ID 256128
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1981/03/25

## Well Identification and Location

Measurement in Metric

| Owner Name | Address | Town | Province | Country | Postal Code |
|---|---|---|---|---|---|
| DEKOK, PETER | FT MACLEOD | | | | |

| Location | 1/4 or LSD | SEC | TWP | RGE | W of MER | Lot | Block | Plan | Additional Description |
|---|---|---|---|---|---|---|---|---|---|
| | SE | 5 | 9 | 24 | 4 | | | | |

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 49.702424 Longitude -113.213691
How Location Obtained: Map

Elevation 929.64 m
How Elevation Obtained: Estimated

## Additional Information

Measurement in Metric

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

Recommended Pump Rate 0.00 L/min
Recommended Pump Intake Depth (From TOC) 12.19 m
Pump Installed
Depth m
Type
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth m
Gas
Depth m
Well Disinfected Upon Completion
Geophysical Log Taken
Remedial Action Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD
Additional Comments on Well

## Yield Test

Taken From Ground Level
Measurement in Metric

| Test Date | Start Time | Static Water Level |
|---|---|---|
| 1980/11/26 | 12:00 AM | 9.14 m |

Depth to water level

| Pumping (m) | Elapsed Time Minutes:Sec | Recovery (m) |
|---|---|---|
| | | |

**Method of Water Removal**

Type Bailer
Removal Rate 113.65 L/min
Depth Withdrawn From 0.00 m

If water removal period was < 2 hours, explain why

## Water Diverted for Drilling

| Water Source | Amount Taken | Diversion Date & Time |
|---|---|---|
| | L | |

## Contractor Certification

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

Certification No
1

Company Name
VANDRIESTEN WM

Copy of Well report provided to owner
Date approval holder signed

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**NRCB USE ONLY**

## ENVIRONMENTAL RISK SCREENING INFORMATION

**ERST** for **proposed** facilities

| Facility | Groundwater score | Surface water score | File number |
|---|---|---|---|
| Row 3 pens | Low | Low | LA24032 |
| Catch Basin | Low | Low | LA24032 |
| | | | |
| | | | |
| | | | |
| | | | |

**ERST** for **existing** facilities

| Facility | Groundwater score | Surface water score | File number |
|---|---|---|---|
| Feedlot Pens (Row 1) | Low | Low | LA18009 |
| Feedlot Pens (Row 2) | Low | Low | LA18009 |
| Catch Basin | Low | Low | LA18009 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**ERST related comments**:

# Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

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

| Neighbour name(s) | Legal land description | Distance (m) | NRCB USE ONLY | | | | |
|---|---|---|---|---|---|---|---|
| | | | Zoning (LUB) category | MDS category (1-4) | Distance (m) | Waiver attached (if required) | Meets regulations |
| FOOTE | SW 31 08 24 W4 | 2 KM | RG | 1 | 1,985 m | N/A | Yes |
| BOOT FARMS | SE 31 08 24 W4 | 675 M | RG | 1 | 643 m | N/A | Yes |
| D NOORDEGRAAF | SE 05 09 24 W4 | 1.5 KM | RG | 1 | 1,420 m | N/A | Yes |
| H. DE KOK | NW 33 08 24 W4 | 1 KM | RG | 1 | 1,020 m | N/A | Yes |
| | | | | | | | |

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

| Name of land owner(s)* | Legal land description | Usable area** (ha) | Soil zone *** | NRCB USE ONLY | |
|---|---|---|---|---|---|
| | | | | Usable area (ha) | Agreement attached (if required) |
| BUYS RIVER VALLEY RANCH | SW/SE 32 08 24 W4 | 240 ACRE | IRRIGATED | 222 acres | N/A |
| HANK DEKOK | NW 32 08 24 W4 | 140 ACRE | IRRIGATED | 140 acres | Yes |
| Buys River Valley Ranch | NW/SW 29-08-24-W4 | 160 acre | IRRIGATED | 121.5 acres | N/A |
| | | | | | |
| | | | | | |
| | | | Total | 483.5 acres | |

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

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

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

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

AO Comment: RG is land zoned as "Rural General" as outlined in MD of Willow Creek Land Use Bylaw, which is considered agricultural land.

| | |
|---|---|
| Name | Buijs 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 | Distance 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 | Distance 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 |

| | | |
|---|---|---|
| Name | Buijs 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 |
| | | 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 |

This agreement is made October 7, 2024 between

HENDRIK 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

[redacted] [redacted]

Hank de Kok Harry Buijs

Fort Macleod, October 07, 2024

# Part 2 — Technical Requirements

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

**NRCB USE ONLY**

## MINIMUM DISTANCE SEPARATION

Methods used to determine distance (if applicable): Google Earth

Margin of error (if applicable): +/- 2 m

Requirements (m): Category 1: 568 Category 2: 757 Category 3: 947 Category 4: 1,515

Technology factor: ☐ YES ☑ NO

Expansion factor: ☐ YES ☑ NO

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

## LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: 459.6 acres (irrigated)

Land base listed: 540 acres (irrigated)

Area not suitable: 56.5 acres

Available area 483.5 acres (irrigated) Requirement met: ☑ YES ☐ NO

Land spreading agreements required: ☑ YES ☐ NO

Manure management plan: ☐ YES ☑ NO If yes, plan is attached: ☐

## PLANS

Submitted and attached construction plans: ☑ YES ☐ NO

Submitted aerial photos: ☑ YES ☐ NO

Submitted photos: ☐ YES ☑ NO

## GRANDFATHERING

Already completed: ☑ YES ☐ NO ☐ N/A

If already completed, see LA18009

# Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

## 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 |
|---|---|---|---|---|---|---|---|---|
| | | | | | Inside end walls | Inside side walls | Outside walls | Calculated storage capacity (excl. 0.5 m freeboard) ($m^3$) |
| 1. | ~~26~~ | ~~15~~ | ~~1.5~~ | ~~2.0~~ | | | | |
| 2. | 34 | 23 | 2.0 | 2.0 | 3:1 | 3:1 | N/A | 626 $m^3$ |
| 3. | | | | | | | | |
| | | | | | | | TOTAL CAPACITY | ~~585 $m^3$~~ 626 $m^3$ |

**Naturally occurring protective layer details**

| | | | |
|---|---|---|---|
| Thickness of naturally occurring protective layer | 1.3 (m) | Provide details (as required) AO Comment: See attached JLECS report dated September 27, 2024, on pages 24-29 of this document. | |
| Soil texture | 40 % sand | 25 % silt | 35 % clay |
| Hydraulic conductivity - naturally occurring protective layer | Depth and type of soil tested: 7.5 M CLAY LOAM | Hydraulic conductivity (cm/s): $1.2 \times 10^{-7}$ cm/s | Describe test standard used: 50 MM PVC MONITORING WELL FILLING SEVERAL DAYS 24-HOUR WATERDROP WAS 0.6 M |

**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 | | | Catch Basin Dimensions | |
|---|---|---|---|---|
| Total Length*[4] | 34.0 | m | 112 | ft |
| Total Width*[4] | 23.0 | m | 75 | ft |
| Total Depth*[4] | 2.0 | m | 7 | ft |
| *Design Capacity Depth* | *1.50* | m | 5 | ft |
| End Slope*[4] | 3 | run:rise | 3 | run:rise |
| Side Slope*[4] | 3 | run:rise | 3 | run:rise |
| Length of Bottom | 22.0 | m | 72 | ft |
| Width of Bottom | 11.0 | m | 36 | ft |
| *Capacity @ top of Bank* | *976* | $m^3$ | *Capacity (@tob) 34,467* | $ft^3$ |
| | | | *214,690* | *Imp. Gal.* |

| Design Capacity of Catch Basin (freeboard level) | | | Design Capacity (freeboard level) | |
|---|---|---|---|---|
| Length (design capacity depth) | 31.0 | m | 102 | ft |
| Width (design capacity depth) | 20.0 | m | 66 | ft |
| *Total Depth* | *2.0* | m | 7 | ft |
| Design Capacity Depth | 1.50 | m | 5 | ft |
| End Slope | 3 | run:rise | 3 | run:rise |
| Side Slope | 3 | run:rise | 3 | run:rise |
| **Design Capacity (freeboard level)** | **626** | $m^3$ | 22,116 | $ft^3$ |
| | | | 137,756 | Imp. Gal. |
| *level)* | *620* | $m^2$ | *6,674* | $ft^2$ |

CFO Name [1]: Buijs River Valley Ranch
Land Location [1]:

**Paved Runoff Catchment Area(s)**

| Area [2] | Length (m) | Width (m) | Area ($m^2$) |
|---|---|---|---|
| 1 | 152 | 43 | 6,536.0 |
| 2 | | | 0.0 |
| 3 | | | 0.0 |
| 4 | | | 0.0 |
| 5 | | | 0.0 |
| | | **Total Area ($m^2$)** | **6,536** |

**Unpaved Runoff Catchment Area(s)**

| Area [2] | Length (m) | Width (m) | Area ($m^2$) |
|---|---|---|---|
| 6 | | | 0.0 |
| 7 | | | 0.0 |
| 8 | | | 0.0 |
| 9 | | | 0.0 |
| 10 | | | 0.0 |
| | | **Total Area ($m^2$)** | **0** |

**Rainfall (Select Town [3])**

Fort Macleod 90

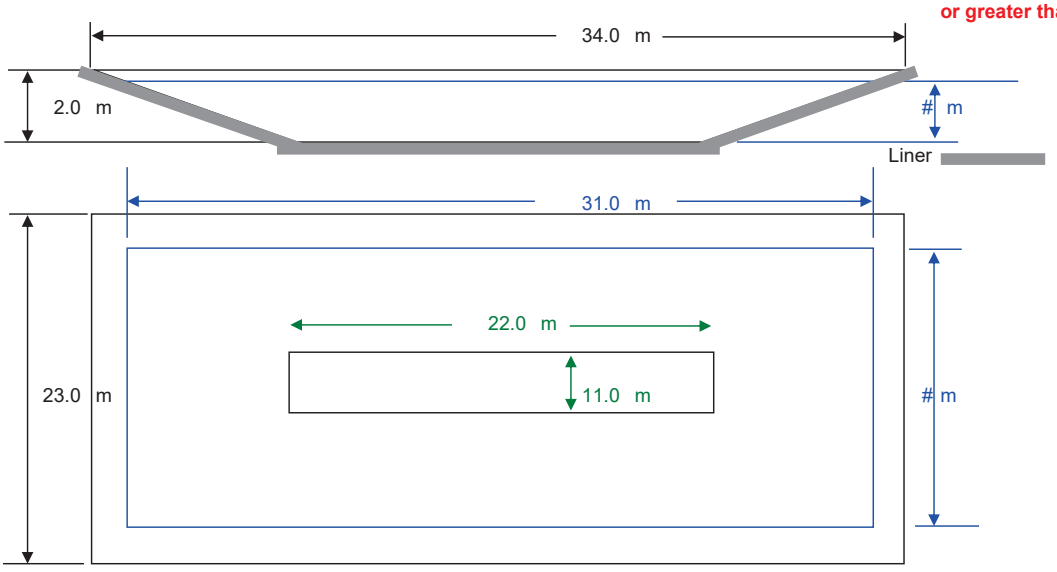
**AOPA Design Rainfall** 90 mm

**Minimum Catchbasin Storage Volume Required**

**588 $m^3$ **** 20773.5 $ft^3$

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

## RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer (cont.)

**NRCB USE ONLY**

Catch basin calculator. Total volume @ freeboard level: 626 $m^3$ Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table: 4.1 m Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: 14 m Requirements met: ☑ YES ☐ NO

ERST completed: ☑ See ERST page for details

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

AO Comment: Using the equivalency equation for single layer systems as outlined in Technical Guideline Agdex 096-61 "Determining Equivalent Protective Layers and Constructed Liners", the proposed 0.9 m thick naturally occurring protective layer with hydraulic conductivity of 1.2 x $10^{-7}$ cm/s, is equivalent to 7.5 m of naturally occurring protective material with a hydraulic conductivity of 1 x $10^{-6}$ cm/s. This exceeds the minimum 5 m of naturally occurring protective material as required by AOPA.

Leakage detection system required**:** ☐ YES ☑ NO If yes, please explain.

# Part 2 — Technical Requirements

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

| NRCB USE ONLY<br>**RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)** | |
|---|---|
| **Facility 1** | |
| Name / description Catch Basin #2 | Capacity 626 $m^3$ |
| **Facility 2** | |
| Name / description | Capacity |
| **Facility 3** | |
| Name / description | Capacity |
| **Facility 4** | |
| Name / description | Capacity |
| **TOTAL CAPACITY** | 626 $m^3$ |
| **RUNOFF VOLUME FROM CONTRIBUTING AREAS** | 588 $m^3$ |
| **MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS** | ☑ YES ☐ NO |

# Part 2 — Technical Requirements

NRCB Natural Resources Conservation Board

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

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

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

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

1. NEW FEEDLOT PENS
2. _____

**Manure storage capacity**

| | Length (m) | Width (m) | Depth below ground level (m) | NRCB USE ONLY Estimated storage capacity ($m^3$) |
|---|---|---|---|---|
| 1. | 500' x 140' | | | Feedlot pens assumed to have 9 month storage capacity. |
| 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 | > 1.5 (m) | Provide details (as required) | |
| Soil texture | _____% sand | _____% silt | _____% clay |
| Hydraulic conductivity - naturally occurring protective layer | Depth and type of soil tested: 4.5 M SILTY CLAY | Hydraulic conductivity (cm/s): $2.0 \times 10^{-7}$ cm/s | Describe test standard used: IN SITU |

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

AO Comment: See attached Wood report dated May 1, 2018, on pages 30-34 of this document.

**NRCB USE ONLY**

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

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

**NRCB USE ONLY**

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

Depth to water table: 4.1 m Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: 14 m Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

**Surface water control systems**

Requirements met: ☑ YES ☐ NO Details/comments:

AO Comment: All run-off is directed to proposed catch basin.

**Naturally occurring protective layer details**

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

AO Comment: According to Wood report, soil profile located between 1.4 m and 3.0 m below grade meets AOPA requirements for a naturally occurring protective layer.

# Part 2 — Technical Requirements

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

**NRCB USE ONLY**

**ALL SIGNATURES IN FILE** ☑ YES ☐ NO

**DATES OF APPROVAL OFFICER SITE VISITS**

| | |
|---|---|
| July 2, 2024 | |
| | |
| | |

## CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: October 30, 2024

**Municipality:** MD of Willow Creek

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

**Alberta Health Services:** ☑ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

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

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

**Alberta Transportation:** ☐ N/A

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

**Alberta Regulatory Services:** ☑ N/A

☐ letter sent ☐ response received ☐ written/email ☐ verbal ☐ no comments received

**Other:** Atco Gas & Pipelines ☐ N/A

☑ letter sent ☑ response received ☑ written/email ☐ verbal ☐ no comments received

**Other:** Blood Tribe Kainaiwa ☐ N/A

☑ letter sent ☐ response received ☐ written/email ☐ verbal ☑ no comments received

----JLECS----

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

27 September 2024

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 |

----JLECS----

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.**

PROFESSIONAL ENGINEER ALBERTA
JOHN P. LOBBEZOO
ID 110450
27 Sept 2024

John Lobbezoo, P.Eng.
Principal Geotechnical Engineer

PERMIT TO PRACTICE
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.
RM SIGNATURE: _____
RM APEGA ID #: 110450
DATE: 27 Sept 2024
PERMIT NUMBER: P016456
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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

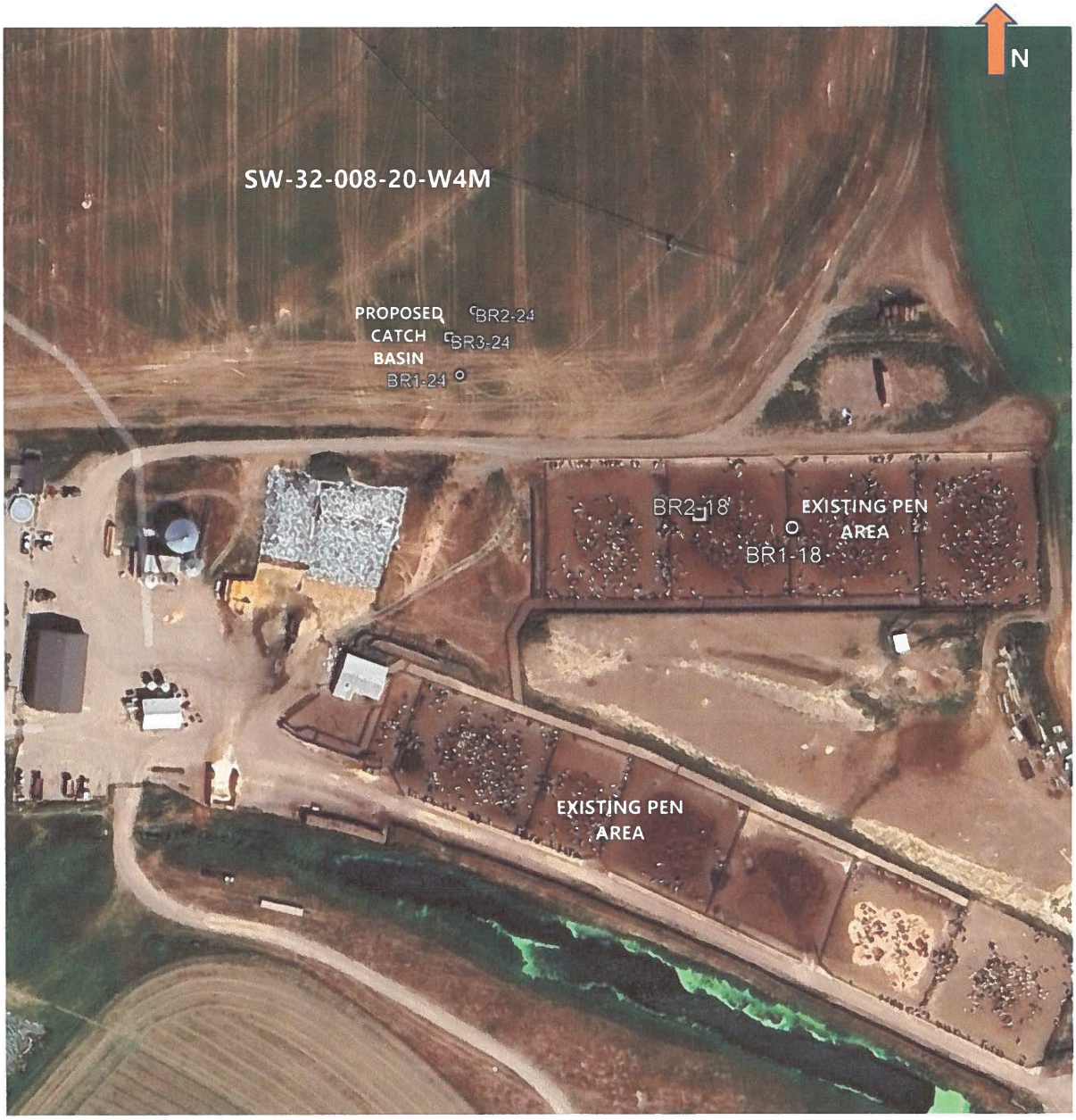



**Figure 1: Site Layout & Borehole Locations**

*Image Credit: Google*

## BR3-24

# In Situ Permeability Test

Modified Falling Head Permeability Equation

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

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

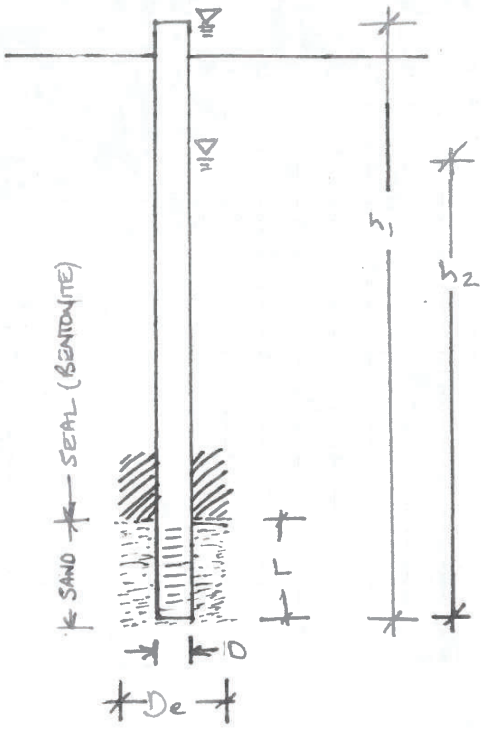
**BR3-24 - Buijs River Valley Ranch**

**JLECS File: P24050**

**INPUT VARIABLES**

| Terms | Value | Definition |
|---|---|---|
| D | 0.0520 | diameter of standpipe (m) |
| 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

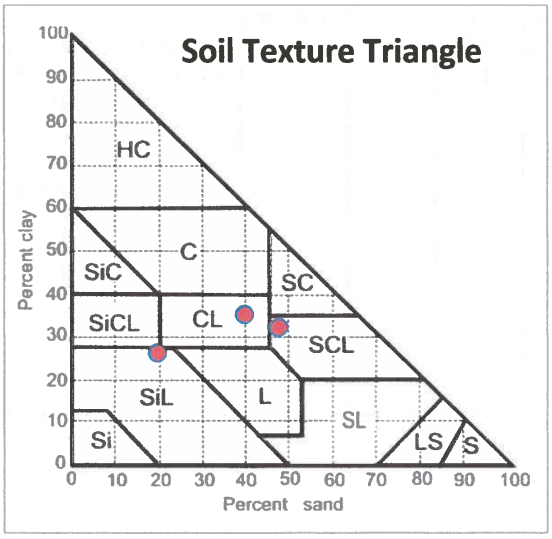

**Report #:** 187035
**Report Date:** 2024-09-26
**Received:** 2024-09-24
**Completed:** 2024-09-26
**Test Done:** ST

**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 | 0-0.15 | CL | M | Topsoil | | |
| | 5506177 | 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 | 0-0.15 | CL | D | Topsoil | | |
| | 5506198 | 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 | 0-0.15 | CL | D | Topsoil | | |
| | 5506190 | 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

wood.

469 – 40 Street S
Lethbridge, Alberta T1J 4M1
T: +1 403 327-7474
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 Chilako 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 Chilako 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**.

wood.

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 x $10^{-6}$ 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.**

PROFESSIONAL ENGINEER ALBERTA JOHN LOBBEZOO 68959

May 1, 2018

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**

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

## BR2-18

## In Situ Permeability Test

wood.

Modified Falling Head Permeability Equation

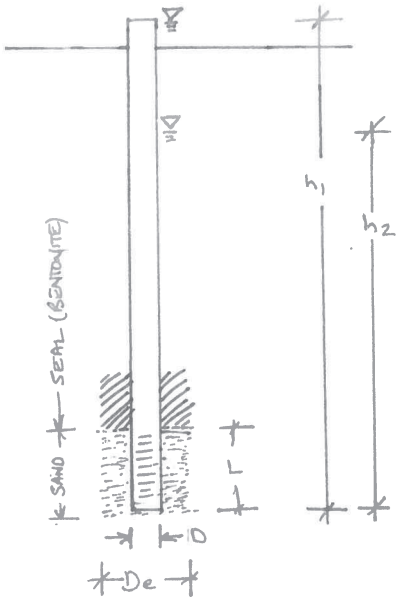
$$K_s = \frac{r^2}{2\ell\Delta t}\left[\frac{\sinh^{-1}\frac{\ell}{r_e}}{2}\ln\left[\frac{2H_1-\ell}{2H_2-\ell}\right]-\ln\left[\frac{2H_1H_2-\ell H_2}{2H_1H_2-\ell H_1}\right]\right]$$

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

**BR2-18 - Bujs 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 | 0-0.15 | CL | D | Topsoil | | |
| | 5506126 | 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 | | Med plastic, high plastic clay layers |
| | | 2.0-3.2 | SiC | M | Lac | | Stiff, med-high plastic |
| | | 3.2-4.5 | SiCL-SiC | M | Lac | | Stiff, med-high plastic, silt lensing, layering |
| BR2-18 | 0339714 | 0-0.15 | CL | D | Topsoil | | |
| | 5506131 | 0.15-1.1 | SiCL | D | Lac | | Low-med plastic, some sand |
| | | 1.1-2.0 | SiCL | D | Lac | | Stiff, med plastic, yellow brown |
| | | 2.0-3.2 | SiCL-SiC | M | Lac | | Stiff, med plastic, silt lensing, layering<br>Sloughing from 3.2-3.0m<br>50mm H.C. well installed to 3.0m<br>Screen: 3.0-1.5m<br>Sand: 3.0-1.4m<br>Bentonite: 1.4-0.0m<br>Stickup: 0.3m<br>Hole diameter: 0.15m |