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	RA24018	NE 19-42-26 W4M

APPLICATION DISCLOSURE

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

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

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

August 30/2024 — Date of signing

[redacted] — Signature

Van Aken Farms Ltd. — Corporate name (if applicable)

Martin Van Aken — 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)
Solid manure storage pens — Most of pen area was previously permitted; pen 4 in this row was constructed without a permit	175 m x 30 m x 0.5 Total dimensions
Solid manure storage pens — Pens 5-7 in this row previously constructed without a permit	177 m x 35 m x 0.5 Total dimensions
Solid manure storage pens — Proposed; not constructed	177 m x 35 m x 0.5 Total dimensions
Catch basin — Proposed; not constructed	29 m x 29 m x 3.5 m

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Permitted pens	108 m x 30 m	Pre-2002
Liquid earthen manure storage	70 m x 50 m x 5 m	RA02029A
Dairy barn	84 m x 25 m	Pre-2002; expanded under RA02029A

NRCB USE ONLY

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)

If a new facility is replacing an old facility, please explain what will happen to the old facility and when. ☐ **N/A**

Dairy facility will be changed into a beef operation

Construction completion date for proposed facilities AO Note, no date provided by applicant

Additional information

Livestock numbers: Complete only if livestock numbers are different from what was identified in the Part 1 application. Note: if livestock numbers increase in your Part 2 application, a new Part 1 application must be submitted which may result in a loss of priority for minimum distance separation (MDS).

Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**
Dairy cows	190	-190	0
Beef finishers	0	2500	2500

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING *WATER ACT* LICENCE

issued by Alberta Environment and Parks (AEP) 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 AEP 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** AEP'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 AEP 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 AEP'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.

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 AEP under the *Water Act* for the development or activity proposed in this AOPA application.

Signed this _____ day of _____, 20____. _____

Signature of Applicant or Agent

OPTION 4: Uncertain if *Water Act* licence is needed; acknowledgement of risk (for existing CFOs only)

1. At this time, I (we) do not know whether a new water licence is needed from AEP under the *Water Act* for the development or activity proposed in this AOPA application.
2. If a new *Water Act* licence is needed, I (we) request that the NRCB process the AOPA application **independently of** AEP'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 AEP as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with additional livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to AEP's consideration of whether to grant my *Water Act* licence application, if a new water licence is needed.
5. I (we) acknowledge that any such construction or livestock increase will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.

Signed this 30 day of August, 20 24. [redacted]

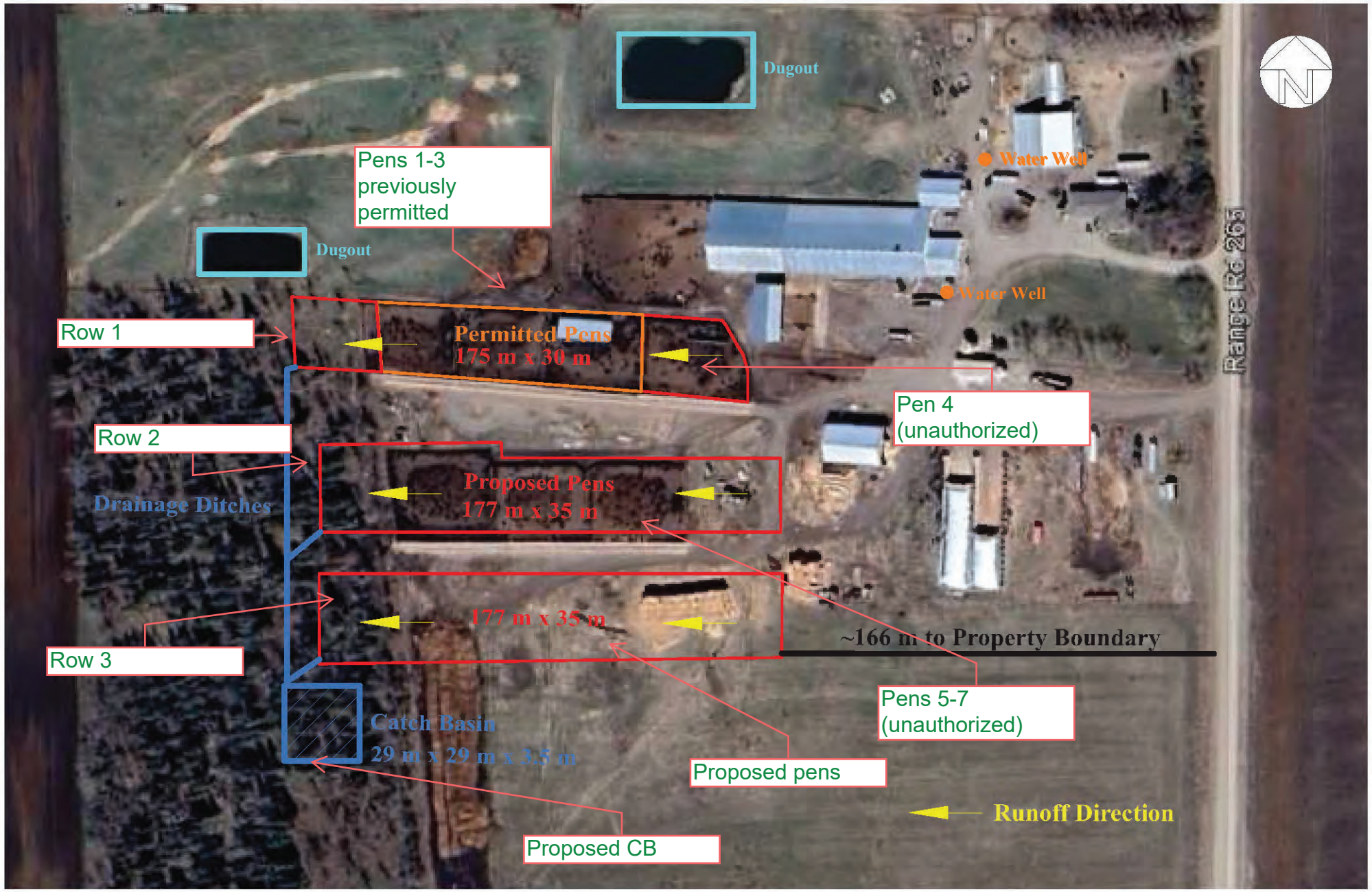
Signature of Applicant or Agent

ENVIROWEST ENGINEERING

Title:

Area/Large Scale Plan
Part II Technical Requirements
Van Aken
NE-19-42-26-W4M
Ponoka County, Alberta

Project No: 43056	**Date:** August 29, 2024	**Figure No.:** 1.0
Scale: 1:2500	**Prepared By:** L. Predy	
Image Source: Google Earth Pro (2024)		



ENVIROWEST ENGINEERING

Title:

Detailed Site Layout Plan
Martin Van Aken
NE-19-49-26-W4M
Ponoka County, Alberta

Project No: 2401-43056	**Date:** August 6, 2024	**Figure No.:** 2.0
Scale: 1:2500	**Prepared By:** L. Predy	
Image Source: Google Earth Pro (February 22, 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)

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: Permitted pens/dairy barn **Proposed 1:** Proposed pens

Proposed 2: Catch basin **Proposed 3:**

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	X ☐ YES ☐ NO ☐ YES with exemption	Not in a flood plain
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0	0		X ☐ YES ☐ NO ☐ YES with exemption	No springs observed at site
	How many water wells are within 100 m of the manure storage facility or manure collection area?	2	1	0		☐ YES ☐ NO X ☐ YES with exemption	One water well located within 100 m of proposed facilities
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	20	7	160		X ☐ YES ☐ NO ☐ YES with exemption	Existing pen 30 m from dugout (Not CBW).
Groundwater information	What is the depth to the water table?		6	6		X ☐ YES ☐ NO ☐ YES with exemption	Confirmed
	What is the depth to the groundwater resource/aquifer you draw water from?	42.67	42.67	42.67		X ☐ YES ☐ NO ☐ YES with exemption	WW 277270 perf at 42.67; layer starts at 42.06 m below grade

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

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)

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

			NRCB USE ONLY				
Neighbour name(s)	**Legal land description**	**Distance (m)**	**Zoning (LUB) category**	**MDS category (1-4)**	**Distance (m)**	**Waiver attached (if required)**	**Meets regulations**
W. Oosterhof	NE-19-42-26-W4	390	Agriculture	1	427 m	Yes	Yes with waiver
Mela Buruma	SW-20-42-26-W4	680	Agriculture	1	695		Yes
M P L & B Hirschkorn	SW-29-42-26-W4	720	Agriculture	1	630 m		Yes
G & F Degier	SW-30-42-26-W4	760	Agriculture	1	655 m		Yes
A & G Wassink	SW-29-42-26-W4	770	Agriculture	1	669 m		Yes

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

				NRCB USE ONLY	
Name of land owner(s)*	**Legal land description**	**Usable area** (ha)**	**Soil zone *****	**Usable area (ha)**	**Agreement attached (if required)**
See attached					
See attached; applicant has	provided 511 ha		black soil	511 ha	yes
			Total		

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

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

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

Additional information (attach any additional information as required)

Minimum Distance Separation (MDS) Waiver (declaration)

Applicant information NRCB application number: RA24018

Operator/operation name: Van Akren Farms LTD

Address: RR#3 Postal Code: T4J 1R3

Legal land location of confined feeding operation: NE 19-42-26-W4th

I have requested the residence owner(s) named below to waive the required minimum distance separation (MDS) to their residence for the *Agricultural Operation Practices Act* (AOPA) permit application identified above. In making this request, I have provided the owner(s) with an opportunity to review my permit application and a copy of the Natural Resources Conservation Board (NRCB) Fact Sheet "Minimum Distance Separation (MDS) Waivers" available on the NRCB website at www.nrcb.ca. I have also explained:

- The MDS requirement set out in section 3 of the Standards and Administration Regulation of AOPA. I have advised the owner(s) that section 3(6)(a) of the Standards and Administration Regulation allows this requirement to be waived by the owners of residences, if they agree in writing to grant a waiver;
- That my proposed development does not meet the required MDS to the owner's residence; and,
- That this waiver applies only to this application as described. An increase in livestock capacity, annual manure production, level of odour production, change to the site plan or change to a facility that would increase the MDS would require a new waiver.

Following is a summary of the proposed development:

- The current scope of my confined feeding operation (CFO), including the type, number, and category of livestock, if any, is:

  2500 head Beef Finishers

- My application for a new AOPA permit proposes the following changes to the existing livestock category, type and/or capacity at my CFO:

  From 190 Dairy cows to 2500 head beef finishers

- The proposed new CFO facility(ies), or changes to the existing CFO facilities, including manure storage, manure storage volume and any other pertinent details, if any, are (attach a site layout plan if available):

  see part 2 of application for site plan layout

I the applicant understand that the waiver is not valid unless ALL registered owners of the residence sign this document.

Permit Applicant: [redacted] Signature Date: August 27/24

Residence owner(s) to initial:

Minimum Distance Separation (MDS) Waiver (declaration)

Residence owner(s) information

ALL Names on land title: W. Oosterhof

Legal land location of residence(s): NE-19-42-26-W4.

Telephone number(s)[1]: [redacted] Email address(es)[1]: _____

Address(es)[1] and Postal code(s)[1]: [redacted]

[1] ***Please note that personal contact information is for NRCB use ONLY and not publicly released***

I am/we are the legal landowner(s) of a residence(s) located at the above noted legal land location/address:

- I/we have read the NRCB Fact Sheet "Minimum Distance Separation (MDS) Waivers";
- I/we have discussed this application with the applicant and understand its potential impacts to our residence(s);
- I/we understand that the application **does not** meet the MDS requirement to my/our residence(s), under the *Agricultural Operation Practices Act* (AOPA);
- **I/we understand that this waiver is not valid unless signed by ALL parties identified on the land title as owners;**
- **I/we are not obligated to waive the MDS requirement to our residence(s)**;
- I/we understand that if I/we choose to waive the MDS requirement, I/we can revoke the waiver, by providing written notice to the NRCB approval officer, as set out in the "Minimum Distance Separation (MDS) Waivers" Fact Sheet; and
- I/we understand that this waiver is a public document.

Having considered my/our rights, I/we hereby waive the MDS requirement to my/our residence, with respect to .

Application number RA24018.

[redacted]

Signatures of **all** residence owner(s) on title

W. Oosterhof

Printed names of **all** residence owner(s) on title

Date: Aug 27 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): Aerial photography

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

Requirements (m): Category 1: 531 m Category 2: 709 m Category 3: 886 m Category 4: 1417 m

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: 195 ha

Land base listed: 511 ha

Area not suitable: already accounted for

Available area 511 ha 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 RA02029A

Land Base for Manure and Compost Application
Part II: Technical Requirements
Martin Van Aken

				NRCB USE ONLY	
Landowner	**Legal Land Description**	**Usable Area (ha)**	**Soil Zone**	**Usable Area (ha)**	**Agreement attached (if required)**
Van Aken Farms	NW-20-42-26-W4	65	Black		
Hendrik and Jeneke Van Aken	NE-19-42-26-W4	57	Black		Attached
Hendrik and Jeneke Van Aken	SW-19-42-26-W4	61	Black		Attached
Van Aken Farms	N½-18-42-26-W4	77	Black		
Van Aken Farms	SW-18-42-26-W4	65	Black		
Van Aken Farms	S½-24-42-26-W4	121	Black		
Van Aken Farms	SE-19-42-26-W4	65	Black		
			Total	511 ha	

Spreading Agreement.

Van Alsen Farms can use the land on NE-19-42-26-w5th and SW 19-42-26-w5th to spread manure on.

Hendrik Van Alsen. [redacted]

Sept 9/2024.

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

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
Catch basin	Low	Low	RA24018
New 2024 pens	Low	Low	RA24018

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
Earthen Manure Storage	Low	Low	2008, Leak Detection Program
Dairy barn	Low	Low	RA24018
Existing pens	Low	Low	RA24018

ERST related comments:

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

May 7, 2024	
October 30, 2024	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: September 18, 2024

Municipality: Ponoka County

☑ 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 and Pipeline ☐ N/A

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

Other: _____ ☐ N/A

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

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

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: 277270 | 276127 (not used) | 1065720

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
277270	11; Continue next section	7; exemption more likely	Feedlot pen 4

Groundwater or surface water related comments:

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Compacted soil liner

*(complete a copy of this section for **EACH** barn, feedlot, and storage facility for solid manure, composting materials, or compost with a compacted soil liner)*

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

1. Proposed Pens - North Row
2. Proposed Pens - Middle and South Row

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	**NRCB USE ONLY** Estimated storage capacity (m^3)
1.	175	30	0.5	Adequate capacity
2.	177	35	0.5	Adequate capacity
			TOTAL CAPACITY	

AO note, the applicant is proposing two rows of 177m x 35 m x 0.5 m

☐ 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 from each row of pens will be directed to the west, where it will enter drainage ditches that lead to the catch basin

Above-ground dykes will be constructed on the east, south, and west walls to ensure unimpacted runoff does not enter the catch basin.

Liner protection

Describe how the physical integrity of the liner will be maintained

Care will be taken when scraping manure to ensure that the compacted clay liner is not compromised.

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Compacted soil liner (cont.)

Compacted soil liner details

Thickness of compacted liner	0.5 (m)	Provide compacted liner details (as required) Soils suitable for a compacted clay liner are Clay Loam or Sandy Clay Loam, found from 1.5 to 4.5 mbgs.	
Soil texture	46.8 % sand	24.8 % silt	28.5 % clay
Atterberg limits	Plastic limit	Liquid limit	Plasticity index
Hydraulic conductivity	Hydraulic conductivity (cm/s) 6.6x10^-9 cm/sec AO Note, this is after the safety factor has been applied		
	Describe test standard used		

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

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO
Condition required: ☑ YES ☐ NO
Report attached: ☑ YES ☐ NO

NRCB USE ONLY

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

Depth to water table: 6 m — Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: 42.06 m — Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

Compacted soil liner details

Hydraulic conductivity after adjustment: 6.6 x10-9 cm/sec

Liner specification comments (e.g. compaction, moisture content, thickness):

0.15 m lifts, min 97% SPDD, 0.5

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

RUNOFF CONTROL CATCH BASIN: Compacted soil liner

*(complete a copy of this section for **EACH proposed** runoff control catch basin with a compacted soil liner)*

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

See Section 5.2 in "Site and Soil Assessment" (Envirowest, 2024).

Engineer report suggests 17,500 square metres of contributing area.
AO calculated 17,640 square metres contributing based on pen size; assessment made on the larger required capacity

Catch basin capacity

	Length (m)	Width (m)	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.	29	29	3.5	3.5	3:1	3:1	4:1	948 cubic metres
2.								
3.								
							TOTAL CAPACITY	948 cubic metres

Compacted soil liner details

Thickness of compacted soil liner	0.5 (m)	Provide details (as required): Soils suitable for a compacted clay liner are Clay Loam or Sandy Clay Loam, found from 1.5 to 4.5 mbgs	
Soil texture	46.8 % sand	24.8 % silt	28.5 % clay
Atterberg limits	Plastic limit:	Liquid limit:	Plasticity index:
Hydraulic conductivity	Hydraulic conductivity (cm/s): 6.6X10^-9		
	Describe test standard used:		

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

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

RUNOFF CONTROL CATCH BASIN: Compacted soil liner (cont.)

NRCB USE ONLY

Catch basin calculator (calculation attached). Total volume @ freeboard: 948 cubic metres

Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table: 6 m Requirements met: ☑ YES ☐ NO

Depth to Uppermost Groundwater Resource: 42.06 m Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

Liner specification comments (e.g. compaction required, moisture content, thickness):

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

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 **RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)**	
Facility 1	
Name / description Proposed catch basin	Capacity 948 cubic metres
Facility 2	
Name / description	Capacity
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	948 cubic metres
RUNOFF VOLUME FROM CONTRIBUTING AREAS	847 cubic metres
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	☑ YES ☐ NO

ENVIROWEST
ENGINEERING

SITE AND SOIL ASSESSMENT

Proposed Solid Manure Storage and Catch Basin
NE-19-042-26 W4M

Ponoka County, Alberta

Site and Soil Assessment
Proposed Solid Manure Storage and Catch Basin
NE-19-042-26 W4M
Ponoka County, Alberta

Prepared For: Martin Van Aken

Prepared By: Envirowest Engineering
Box 4248, Ponoka, AB, T4J 1R6
(403) 783-8229

Report Date: August 29, 2024

Project Number: 2401-43056

Private and Confidential

Table of Contents

List of Tables

Appendices

1.0 Introduction and Scope of Work

Envirowest Engineering (Envirowest) was retained by Martin Van Aken to conduct a Site and Soil Assessment for the proposed expansion of pens for 2500 beef finishers. The assessment included proposed solid manure storage within pens, and a catch basin.

The assessment was completed to determine conditions beneath the proposed construction area and assess soil properties for construction of proposed facilities. The operation, herein referred to as "the Site," is located on NE¼-19-042-26 W4M in Ponoka County.

The assessment has been completed in accordance with the standards and regulations associated with the amended Agricultural Operation Practices Act and associated regulations which govern all new and modified confined feeding operations.

Scope of Work

Five investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 10.5 m below ground surface (mbgs) on February 22, 2024. The boreholes were completed in the area proposed for manure storage (solid) and a catch basin. The borehole locations are shown on Figure 1.0 (attached).

2.0 Assessment Results

The Site is generally flat with topography across the section sloping to the east southeast. The Site is currently a former dairy operation. A portion of the property is grandfathered as solid manure storage. Assessment of this area was not completed.

Five investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 10.5 mbgs on February 22, 2024. The [sandy] clay loam was found beneath surface to depths between 1.5 and 4.5 mbgs and compared to previous material assessed on Site for compacted liner properties.

Boreholes were backfilled with the material removed by back spinning the solid stem auger and compacting to depth of the borehole.

A saturated water table was noted at approximately 6.0 mbgs in boreholes 24BH01, 24BH04 and 24BH05. Weathered bedrock was noted at 9.25 mbgs in borehole 24BH01.

The results of the soil analysis completed by a third-party laboratory are presented in Table 1 below. The soil sample locations are presented on Figure 1.0, and borehole logs are attached.

Table 1: Soil Properties Results

Sample	Depth (mbgs)	Sand (%)	Silt (%)	Clay (%)	Soil Texture
24BH01-01	0.5	47	22	31	Sandy Clay Loam
24BH01-02	1.8	57	20	23	Sandy Clay Loam
24BH01-03	4.5	43	18	39	Clay Loam
24BH01-04	6.75	13	52	35	Silt Clay Loam
24BH02-01	0.5	47	26	27	Sandy Clay Loam
24BH02-02	2.25	55	22	23	Sandy Clay Loam
24BH02-03	3.9	39	28	33	Clay Loam
24BH03-01	0.5	39	30	31	Clay Loam
24BH03-02	2.5	17	40	43	Clay
24BH03-03	3.8	13	50	37	Silt Clay Loam
24BH04-01	0.5	45	24	31	Sandy Clay Loam
24BH04-02	1.5-3.25	35	16	49	Clay
24BH04-03	3.5	5	42	53	Silt Clay
24BH05-01	0.75	45	26	29	Sandy Clay Loam
24BH05-02	2.25	9	42	49	Silt Clay
#42150 (6-1) *Envirowest, 2002	*1.0-1.5*	*38*	*37*	*25*	*Clay Loam*

The soils identified as a potential compacted clay liner are highlighted above. The samples were found to be a sandy clay loam or clay loam. Suspected compacted clay liner material had an average clay content of 28.5% ranging from 23-33%. The clay was found beneath surface to depths between 1.5 and 4.5 mbgs.

A previous assessment (Envirowest, 2002) completed materials testing on a clay loam sample collected north of the current pens [#42150 (6-1)].

The hydraulic conductivity was determined to be 6.6 x 10^{-10} cm/sec. Conservatively a safety factor of 10 is to be applied to the hydraulic conductivity based on the NRCB Approvals Policy (2016-7), Section 8.7.2, stating "lab measurements of a sample of material taken from the field are not considered an accurate representation of the actual field hydraulic conductivity values. This is because of the potential variability of soils, differences in compaction methods and variances in compaction." The field hydraulic conductivity of the material tested is 6.6 x 10^{-9} cm/sec.

3.0 Liner Assessments

3.1 Compacted Liner Assessment (Solid Manure Storage)

Based on the information obtained it was determined that the native clay within the proposed area of construction for solid manure storage was found to have a minimum thickness of 1.5 meters.

Minimum Required Liner Thickness for solid manure storage:

$$\frac{0.5 \text{ m}}{5 \times 10^{-7} \text{ cm/sec}} = \frac{\mathbf{X} \text{ m}}{6.6 \times 10^{-9} \text{ cm/sec}}$$

$$\mathbf{X} = 0.01 \text{ m}$$

A minimum of ***0.5 meters*** of compacted clay is required to provide a sufficient protective liner. The minimum 0.5 meters is required to account for erosion, freeze thaw, and operations. It is the responsibility of the operator to maintain the 0.5 meters of liner.

3.2 Compacted Liner Assessment (Catch Basin)

Based on the information obtained it was determined that the native clay within the proposed area of construction for a catch basin was found to have a minimum thickness of 1.5 meters.

Minimum Required Liner Thickness for Catch Basin:

$$\frac{1 \text{ m}}{5 \times 10^{-7} \text{ cm/sec}} = \frac{\mathbf{X} \text{ m}}{6.6 \times 10^{-9} \text{ cm/sec}}$$

$$\mathbf{X} = 0.01 \text{ m}$$

A minimum of ***0.5 meters*** of compacted clay is required to provide a sufficient protective liner. The minimum 0.5 meters is required to account for erosion, freeze thaw, and operations. It is the responsibility of the operator to maintain the 0.5 meters of liner.

4.0 Conclusions

The following conclusions are based on the discussed scope of the construction.

The soils beneath the proposed area of construction were determined to be appropriate for a compacted liner for both solid manure storage and as a catch basin.

5.0 Design and Construction Considerations

5.1 Solid Manure Storage

The proposed solid manure storage area is three rectangular sets of pens, one measuring 175 m x 30 m, and the other two measuring 177 m x 35 m, as shown on Figure 2.0. A portion of the north pens is permitted under the previous Approval. These pens may remain grandfathered if they are not altered. It should be noted that if the pens are altered, they are required to meet the current AOPA standards. It is recommended to put this into consideration while completing the construction of the other pens.

Runoff from the pens will be directed to the west to a drainage ditch which flows to a catch basin. The drainage ditch must also be lined with a 0.5 m compacted liner. The proposed pens should slope at a minimum 1.0% towards the ditch.

5.2 Catch Basin Sizing

Surface Run-off Area

The proposed area of contributing run-off (within the pens) is 17,500 m^2. The runoff coefficient for the contributing area will be calculated assuming the pens remain unpaved.

The volume of the catch basin is recommended to have a total storage capacity of 948 m^3, based on Ponoka precipitation data.

- To provide the required capacity the catch basin should be 29 m in length x 29 m in width. The overall depth has been designed as 3.5 m. The overall capacity will be 1,326 cubic metres (1.3 million imperial gallons) which accounts for the required 0.5 m of freeboard, a storage capacity of 948 cubic metres. The sizing is based on an inside end and side wall slope of 3:1 (run/rise).
- The overall depth of 3.5 m will be achieved through a below-grade depth of 3.5 m. Above-grade dykes will be required on the east, south and west walls to ensure unimpacted runoff does not enter the catch basin.
- The below-grade depth of the catch basin must maintain a minimum of a 1.0 m separation above the water table at the time of construction.

6.0 Earthen Liner Construction

- Construction of the clay liner should be completed in approximately 0.15 m lifts. Preferably, compaction of each lift will be undertaken with a padfoot roller, or the like. The equipment being used for soil compaction must fully penetrate each lift. Each lift should be compacted to not less than 97 percent Standard Proctor Dry Density prior to addition of the subsequent lift.
- The soil should be within 2 percent of the optimum moisture as determined by a Standard Proctor Maximum Dry Density to ensure the lowest possible hydraulic conductivity for the completed liner.
- Lifts should continue to be added until the recommended liner thickness is achieved. Particular attention should be paid to ensuring that the liner is integrally connected to the lower soil strata and that the soil around the inlet pipe is compacted to the same standard as the remainder of the liner.
- Sand pockets that may be encountered during construction should be removed prior to liner installation.
- Control of liner moisture content is critical during the construction process. Liner material should not be allowed to become saturated or to become dry. Should a lift surface become dry, the lift should be scarified prior to the placement of the next lift. Lifts which are above the required moisture content due to precipitation etc. should be removed or allowed to dry and re-compacted. The liner should not be allowed to freeze during construction.
- Topsoil, frozen soil, or rocks larger than 6 inches should not be included in the liner material.
- Construction of the liner should be supervised by a professional engineer.
- The outside dyke walls should be covered with 0.1-0.2 m of topsoil and seeded to prevent soil erosion.

The following general construction procedures are recommended, though some modifications may be required based on actual site conditions encountered during construction:

- The topsoil should be stripped from the area for construction. The topsoil can be reused on the freeboard area after construction completion.
- Sand and gravel seams, if encountered, should be excavated during construction and should be removed.
- If a sand or gravel seam is encountered that is large enough to alter the location of the facility, the NRCB approval officer and engineer should be contacted.
- Construction should be supervised by a professional engineer.

Following completion of the lagoon the operator should:

- Ensure that shrubs, trees, and deep-rooted plants are not allowed to grow on or near the walls of the facility.

7.0 Closure

Envirowest Engineering is pleased to submit the report to Martin Van Aken. The information and conclusions contained in this report are for their sole use. No other party is to rely upon the information contained within the report without the express written authorization of Envirowest Engineering.

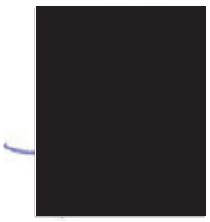
Envirowest Engineering is not responsible for any damages that may be suffered as the result of any unauthorized use of, or reliance on, this report. Envirowest Engineering has performed the work and made the findings and conclusions set out in the report in a manner consistent with the level of care and skill normally exercised by members of the environmental engineer profession practicing under similar conditions at the time the work was performed. Envirowest Engineering accepts no responsibility for any deficiency, misstatement or inaccuracy in this report resulting from misinformation from any individuals or parties that provided information as part of this report.

We trust that this report meets your present needs. Please feel free to contact the undersigned with any questions or should you require additional information.

Respectfully submitted,

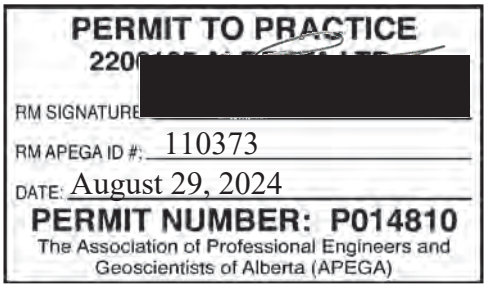
2024-08-29

Prepared by:
Emily J. Low, P.Eng.
Envirowest Engineering



August 29, 2024

Reviewed by:
Leah Predy, P.Ag.
Envirowest Engineering



2206165 Alberta Ltd. o/a Envirowest Engineering
Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice No. P14810

8.0 Qualifications of Assessors

Ms. Emily Low, B.Sc., P.Eng, is an Environmental Engineer with Envirowest Engineering and has approximately 15 years of environmental assessment, monitoring, and remediation experience in the agricultural, industrial, real estate and development, and oil and gas sectors. Ms. Low has a Bachelor of Science in Chemical Engineering from the University of Alberta and is a certified Professional Engineer in Alberta (Association of Professional Engineers and Geoscientists of Alberta).

Leah Predy, B.A., B.Sc., P.Ag., is a Professional Agrologist with Envirowest Engineering and has approximately 5 years of experience in the environmental field, both in field data collection and report preparation for environmental assessments, monitoring, and remediation, as well as agricultural projects. Prior to her employment with Envirowest Engineering, Leah had five years of experience managing rangelands and navigating legislation and regulations as a Rangeland Agrologist with the Government of Alberta. She is a Professional Agrologist in Alberta (Alberta Institute of Agrologists).

9.0 References

GOA (Government of Alberta). (November 2022). Agricultural Operation Practices Act and Regulations. Edmonton, AB: Author.

GOA (Government of Alberta). (December 2020). Agricultural Operation Practices Act: Standards and Administration Regulation. Edmonton, AB: Author.

Appendix A

Figures

ENVIROWEST ENGINEERING

Title:

Site Location
Site and Soil Assessment
NE¼-Sec.19-Twp.042-Rge.26-W4M
Ponoka County, Alberta

Project No: 2401-43056	**Date:** August 1, 2024	**Figure No.:** 1.0
Scale:	**Prepared By:** E.Low	
Image Source: Google Earth Pro (April 28, 2023)		

ENVIROWEST ENGINEERING

Title:

Site Layout
Site and Soil Assessment
NE¼-Sec.19-Twp.042-Rge.26-W4M
Ponoka County, Alberta

Project No: 2401-43056	**Date:** August 1, 2024	**Figure No.:** 2.0
Scale:	**Prepared By:** E.Low	
Image Source: Google Earth Pro (April 28, 2023)		

Appendix B

Borehole Logs

ENVIROWEST ENGINEERING

LOG OF BORING 24BH01

Site and Soil Assessment
NE-19-042-26-W4M
Ponoka County, Alberta

Project Number: 2401-43056

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 22, 2024
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, trace gravel, frozen, firm, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5	Type text here				
1.8					
2.0				SAND, trace clay	
2.3					
2.5					
2.8					
3.0					
3.3					
3.5					
3.8					
4.0					
4.3					
4.5				SILTY CLAY, orange, firm, damp	
4.8					
5.0				SILT, grey, dry	
5.3					
5.5					
5.8				saturated lens	
6.0					
6.3					
6.5					
6.8					
7.0					
7.3					
7.5					
7.8					
8.0					
8.3					
8.5					
8.8				stiff	
9.0					
9.3				weathered bedrock	
9.5					
9.8					
10.0					
10.3					
10.5					

08-29-2024 Z:\Operations\Client Data\43056 Martin Van Aken\24BH01.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH02

Site and Soil Assessment
NE-19-042-26-W4M
Ponoka County, Alberta

Project Number: 2401-43056

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 22, 2024
Logged By: : Emily Low P.Eng.

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Well: 24MW01 Elev.:	Water Level
0.0				SANDY CLAY, firm, low plasticity, damp		
0.3						
0.5						
0.8						
1.0						
1.3						
1.5					Bentonite	
1.8				CLAYEY SAND	Solid	
2.0				SANDY CLAY		
2.3						
2.5						
2.8						
3.0						
3.3						
3.5					Sand	
3.8					Slotted	
4.0						
4.3					Bentonite	
4.5						

Additional residential well (possibly 436868?)

08-29-2024 Z:\Operations\Client Data\43056 Martin Van Aken\24BH02.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH03

Site and Soil Assessment
NE-19-042-26-W4M
Ponoka County, Alberta

Project Number: 2401-43056

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 22, 2024
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, firm, low plasticity, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8				CLAYEY SAND	
2.0				SANDY CLAY	
2.3					
2.5					
2.8					
3.0					
3.3					
3.5					
3.8					
4.0					
4.3					
4.5					

08-29-2024 Z:\Operations\Client Data\43056 Martin Van Aken\24BH03.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH04

Site and Soil Assessment
NE-19-042-26-W4M
Ponoka County, Alberta

Project Number: 2401-43056

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 22, 2024
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, firm, low plasticity, damp	
0.3					
0.5					
0.8					
1.0					
1.3					
1.5					
1.8				CLAYEY SAND	
2.0				SANDY CLAY	
2.3					
2.5					
2.8					
3.0					
3.3				SILTY CLAY	
3.5					
3.8					
4.0					
4.3					
4.5					
4.8					
5.0					
5.3					
5.5					
5.8					
6.0				saturated	

08-29-2024 Z:\Operations\Client Data\43056 Martin Van Aken\24BH04.bor

ENVIROWEST ENGINEERING

LOG OF BORING 24BH05

Site and Soil Assessment
NE-19-042-26-W4M
Ponoka County, Alberta

Project Number: 2401-43056

Driller: : Evergreen Drilling
Drilling Method: : Truck Mounted Auger
Drill Date : February 22, 2024
Logged By: : Emily Low P.Eng.

Well:
Elev.:

Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 500	VOC Reading	GRAPHIC	DESCRIPTION	Water Level
0.0				SANDY CLAY, firm, low plasticity, damp	
1.8				CLAYEY SAND	
2.0				SANDY CLAY	
3.5				SILTY CLAY	
6.0					

08-29-2024 Z:\Operations\Client Data\43056 Martin Van Aken\24BH05.bor

Appendix C

Certificate of Analysis

AGAT Laboratories

6310 ROPER ROAD
EDMON ON, ALBER A
CANADA 6B 3P9
EL (780)395-2525
FAX (780)462-2490
http://www.agatlabs.com

CLIENT NAME: ENVIROWEST
BOX 4248, 5118-50th STREET
PONOKA, AB T4J1R6
(403) 783-8229
ATTENTION TO: Emily Low
PROJECT:
AGAT WORK ORDER: 24E128121
SOIL ANALYSIS REVIEWED BY: Melinda Guay, Technical Reviewer
DATE REPORTED: Mar 18, 2024
PAGES (INCLUDING COVER): 7
VERSION*: 1

Should you re uire any information regarding this analysis please contact your client services representative at (780) 395-2525

Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

AGAT Laboratories

6310 ROPER ROAD
EDMON ON, ALBER A
CANADA 6B 3P9
EL (780)395-2525
FAX (780)462-2490
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 24E128121

PROJECT:

CLIENT NAME: ENVIROWEST

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

Particle Size by Hydrometer

DATE RECEIVED: 2024-03-08 **DATE REPORTED: 2024-03-16**

		SAMPLE DESCRIPTION:		24BH01-01	24BH01-02	24BH01-03	24BH01-04	24BH02-01	24BH02-02	24BH02-03	24BH03-01
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22
Parameter	Unit	G / S	RDL	5714837	5714838	5714839	5714840	5714841	5714842	5714843	5714844
Particle Si e Distribution (Sand)			2	47	57	43	13	47	55	39	39
Particle Si e Distribution (Silt)			NA	22	20	18	52	26	22	28	30
Particle Si e Distribution (Clay)			NA	31	23	39	35	27	23	33	31
Soil exture				Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Silt Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Clay Loam

		SAMPLE DESCRIPTION:		24BH03-02	24BH03-03	24BH04-01	24BH04-02	24BH04-03	24BH05-01	24BH05-02
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22	2024-02-22
Parameter	Unit	G / S	RDL	5714845	5714846	5714847	5714848	5714849	5714850	5714851
Particle Si e Distribution (Sand)			2	17	13	45	35	5	45	9
Particle Si e Distribution (Silt)			NA	40	50	24	16	42	26	42
Particle Si e Distribution (Clay)			NA	43	37	31	49	53	29	49
Soil exture				Clay	Silt Clay Loam	Sandy Clay Loam	Clay	Silt Clay	Sandy Clay Loam	Silt Clay

Comments: RDL - Reported Detection Limit G / S - Guideline / Standard

5714837-5714851 Silt is a calculated parameter. he calculated value is determined by subtracting the percent sand and clay values from 100 percent.

Analysis performed at AGA Edmonton (unless marked by)

Certified By:

6310 ROPER ROAD
EDMON ON, ALBER A
CANADA 6B 3P9
EL (780)395-2525
FAX (780)462-2490
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ENVIROWEST

AGAT WORK ORDER: 24E128121

PROJECT:

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Particle Size by Hydrometer															
Particle Si e Distribution (Sand)	76	5714837	47	47	0.0	2	98	80	120	NA			NA		
Particle Si e Distribution (Silt)	76	5714837	22	22	0.0		107	80	120	NA			NA		
Particle Si e Distribution (Clay)	76	5714837	31	31	0.0		97	80	120	NA			NA		

Certified By:

Results relate only to the items tested. Results apply to samples as received.

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EDMON ON, ALBER A
CANADA 6B 3P9
EL (780)395-2525
FAX (780)462-2490
http://www.agatlabs.com

Method Summary

CLIENT NAME: ENVIROWEST

AGAT WORK ORDER: 24E128121

PROJECT:

ATTENTION TO: Emily Low

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Particle Si e Distribution (Sand)	NOR-171-6010	ONES 2001 SHEPPARD 2007	H DROME ER
Particle Si e Distribution (Silt)	NOR-171-6010	ONES 2001 SHEPPARD 2007	H DROME ER
Particle Si e Distribution (Clay)	SO L 0520 SO L 0110 SO L 0120	ONES 2001 SHEPPARD 2007	H DROME ER

AGAT Laboratories
2910 12 Street NE
Calgary, Alberta T2E 7P7
P: 403-735-2005 • F: 403-735-2771
webearth.agatlabs.com

Laboratory Use Only
Arrival Temperature: N/A
Cooler Quantity: 0
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
AGAT Job Number: 24E128121

Chain of Custody Record

Emergency Support Services Hotline 1-855-AGAT 245 (1-855-242-8245)

Report Information
Company: Enviroest Engineering
Contact: Emily Low
Address:
Phone:

Project Information
Client Project #:
Site Location:
Sample By: Elow
AGAT Quote #:
If a quotation number is not provided, client will be billed at standard rates. See terms and conditions of quote for full details.

Invoice To Same as Report to ☒
Company:
Contact:
Email:
Address
Phone:
PO/CC #:

Report Information
1. Name: Emily Low
Email: elow@enviroestengineering.ca
2. Name:
Email:
3. Name:
Email:

Requirements (Selection may impact detection limits)

CCME	AB Tier 1	Alberta Surface Water
☐ Agricultural	☐ Agricultural	☐ Chronic
☐ Industrial	☐ Industrial	☐ Acute
☐ Residential/Park	☐ Residential/Park	☐ SK Notice of Site Cond.
☐ Commercial	☐ Commercial	☐ Drinking Water
☐ FWAL	☐ Natural Area	☐ Other:

Is this part of the Alberta SRP program? ☐ YES ☐ NO (If yes, please fill below)
Application Number:
Grant Amount:
Well/Facility/Location ID:
UWI:

Turnaround Time Required (TAT)
Regular TAT: ☑ 5 to 7 Business Days
Rush TAT: ☐ <24 Hours (200%) ☐ Next Business Day (100%) ☐ 2 Business Days (50%) ☐ 3 Business Days(25%)
Date Required:

'24 MAR 8 10:43 AM

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	DEPTH	DATE/TIME SAMPLED	SAMPLE MATRIX	COMMENTS	# OF CONTAINERS: VIALS / JARS	# OF CONTAINERS: BAGS	# OF CONTAINERS: BOTTLES	Field Filtered (Y/N)	Preserved (Y/N)	Detailed Salinity: ☐ AB ☐ SK ☐ BC ☐ D50	☐ CCME/AB : BTEX/F1-F4 ☐ CCME/AB : BTEX /F1-F2	☐ BC: BTEXS/VPH/EPH ☐ BC: LEPH/HEPH	SK: BTEX/TVH/C11-C22, C23-C60	Soil Metals: ☐ HWS-B ☐ SP-B ☐ Hg ☐ Cr^{6+}	Water Metals: ☐ Dissolved ☐ Total ☐ Hg ☐ Cr^{6+}	Routine Water Chemistry	Landfill: ☐ AB Class 2 ☐ BC ☐ SK	Coliforms: ☐ Total ☐ Fecal ☐ E.coli	Particle Size: ☐ Sieve (75µm) ☒ Texture		Hold For 30 Days No Analysis (Additional Fee)	Long Term Storage - 6 Months	Long Term Storage - 1 Year	Hazardous (Y/N)
1	24BH01-01		Feb22/24	Soil			1													X					
2	24BH01-02						1													X					
3	24BH01-03						1													X					
4	24BH01-04						1													X					
5	24BH02-01						1													X					
6	24BH02-02						1													X					
7	24BH02-03						1													X					
8	24BH03-01						1													X					
9	24BH03-02						1													X					
10	24BH03-03						1													X					

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name and Sign)	Date/Time
Emily Low [redacted]	Mar 8/24 10:30	[redacted]	08/08/24
Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name and Sign)	Date/Time
Samples Relinquished By (Print Name and Sign)	Date/Time	Samples Received By (Print Name and Sign)	Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

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No: AB 172461

AGAT Laboratories

2910 12 Street NE
Calgary, Alberta T2E 7P7
P: 403-735-2005 • F: 403-735-2771
webearth.agatlabs.com

Laboratory Use Only N/A
Arrival Temperature:
Cooler Quantity: C
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
AGAT Job Number:

Chain of Custody Record

Emergency Support Services Hotline 1-855-AGAT 245 (1-855-242-8245)

Report Information
Company: Enviroest Engineering
Contact: Emily Low
Address:
Phone:

Project Information
Client Project #:
Site Location:
Sample By: Elow
AGAT Quote #:
If a quotation number is not provided, client will be billed at standard rates. See terms and conditions of quote for full details.

Invoice To Same as Report to ☒
Company:
Contact:
Email:
Address
Phone:
PO/CC #:

Report Information
1. Name: Emily Low
Email: elow@enviroestengineering.ca
2. Name:
Email:
3. Name:
Email:

Requirements *(Selection may impact detection limits)*

CCME	AB Tier 1	Alberta Surface Water
☐ Agricultural	☐ Agricultural	☐ Chronic
☐ Industrial	☐ Industrial	☐ Acute
☐ Residential/Park	☐ Residential/Park	☐ SK Notice of Site Cond.
☐ Commercial	☐ Commercial	☐ Drinking Water
☐ FWAL	☐ Natural Area	☐ Other:

Is this part of the Alberta SRP program? ☐ YES ☐ NO (If yes, please fill below)
Application Number:
Grant Amount:
Well/Facility/Location ID:
UWI:

Turnaround Time Required (TAT)

Regular TAT ☑ 5 to 7 Business Days

Rush TAT
☐ <24 Hours (200%)
☐ Next Business Day (100%)
☐ 2 Business Days (50%)
☐ 3 Business Days(25%)

Date Required:

'24 MAR 8 10:4 AM

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	DEPTH	DATE/TIME SAMPLED	SAMPLE MATRIX	COMMENTS	# OF CONTAINERS: VIALS / JARS	# OF CONTAINERS: BAGS	# OF CONTAINERS: BOTTLES	Field Filtered (Y/N)	Preserved (Y/N)	Detailed Salinity: ☐ AB ☐ SK ☐ BC ☐ D50	☐ CCME/AB : BTEX/F1-F4 ☐ CCME/AB : BTEX /F1-F2	☐ BC: BTEXS/VPH/EPH ☐ BC: LEPH/HEPH	SK: BTEX/TVH/C11-C22, C23-C60	Soil Metals: ☐ HWS-B ☐ SP-B ☐ Hg ☐ Cr^{6+}	Water Metals: ☐ Dissolved ☐ Total ☐ Hg ☐ Cr^{6+}	Routine Water Chemistry	Landfill: ☐ AB Class 2 ☐ BC ☐ SK	Coliforms: ☐ Total ☐ Fecal ☐ E.coli	Particle Size: ☐ Sieve (75µm) ☐ Texture			Hold For 30 Days No Analysis (Additional Fee)	Long Term Storage - 6 Months	Long Term Storage - 1 Year	Hazardous (Y/N)
1	24BH04-01		Feb 22/24	Soil			1	4												X							
2	24BH04-02						1													X							
3	24BH04-03						1													X							
4	24BH05-01						1													X							
5	24BH05-02						1													X							
6																											
7																											
8																											
9																											
10																											

Samples Relinquished By (Print Name and Sig	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Emily Low [redacted]	Mar 8/24 10:30	[redacted]	08/03/24
Samples Relinquished By (Print Name and Sig	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

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N°: AB 172462

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Enviroweb

Courier: UPC Prepaid Collect

Waybill#: ✓

Branch: EDM GP FN FM RD VAN LYD FSJ EST SASK Other:

If multiple sites were submitted at once: Yes No

Custody Seal Intact: Yes No NA

TAT: <24hr 24-48hr 48-72hr Reg Other

Cooler Quantity: 0

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:

Hydrocarbons: Earliest Expiry

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken:

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) Soil ___+___+___=____°C 2(Bottle/Jar)___+___+___=____°C

3 (Bottle/Jar)___+___+___=____°C 4 (Bottle/Jar)___+___+___=____°C

5 (Bottle/Jar)___+___+___=____°C 6 (Bottle/Jar)___+___+___=____°C

7 (Bottle/Jar)___+___+___=____°C 8 (Bottle/Jar)___+___+___=____°C

9 (Bottle/Jar)___+___+___=____°C 10 (Bottle/Jar)___+___+___=____°C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 24E128121

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other:

Account Project Manager: have they been notified of the above issues: Yes No

Whom spoken to: Date/Time:

CPM Initial

General Comments:

* Subcontracted Analysis (See CPM)

Date issued: March 11, 2020
Document ID: SR-9505.004