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	LA23050	Sec. 31-14-26 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.

May 3 2024
Date of signing

[redacted]
Signature

Hutterian Brethren of Ivy Ridge
Corporate name (if applicable)

Paul Wipf
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)
Chicken & Pullet Barn	111.56 m x 30.48 m By 3.7 Dep
Dairy Barn	111.56m X 36.58m
Calf Shed & Dry Cows	111.56m x 45.72m
Broiler Barn	111.56m X 36.58m
Goose Barn / Mixed Poultry	76.20m x 18.29m

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

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

NRCB USE ONLY

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		

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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.

Date of signing

[redacted]
Signature

Hutterian Brethren of Ivy Ridge
Corporate name (if applicable)

Paul Wipf
Print name

GENERAL INFORMATION REQUIREMENTS

Proposed facilities: list all proposed confined feeding operation facilities and their dimensions. Indicate whether any of the proposed facilities are additions to existing facilities. (attach additional pages if needed)

Proposed facilities	Dimensions (m) (length, width, and depth)
Feed Mill	29 m x 31
Hay Shed	111.56m x 36.58m
Manure Storage for Liquid for Dairy	5 m high, 46.3 m inside dia
Catch Basin	13m lenght 25m width, 2.31m dep
Manure Storage Pad,	40 x 60 meters

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

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

NRCB USE ONLY

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)

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 5 years February 2029

Additional information

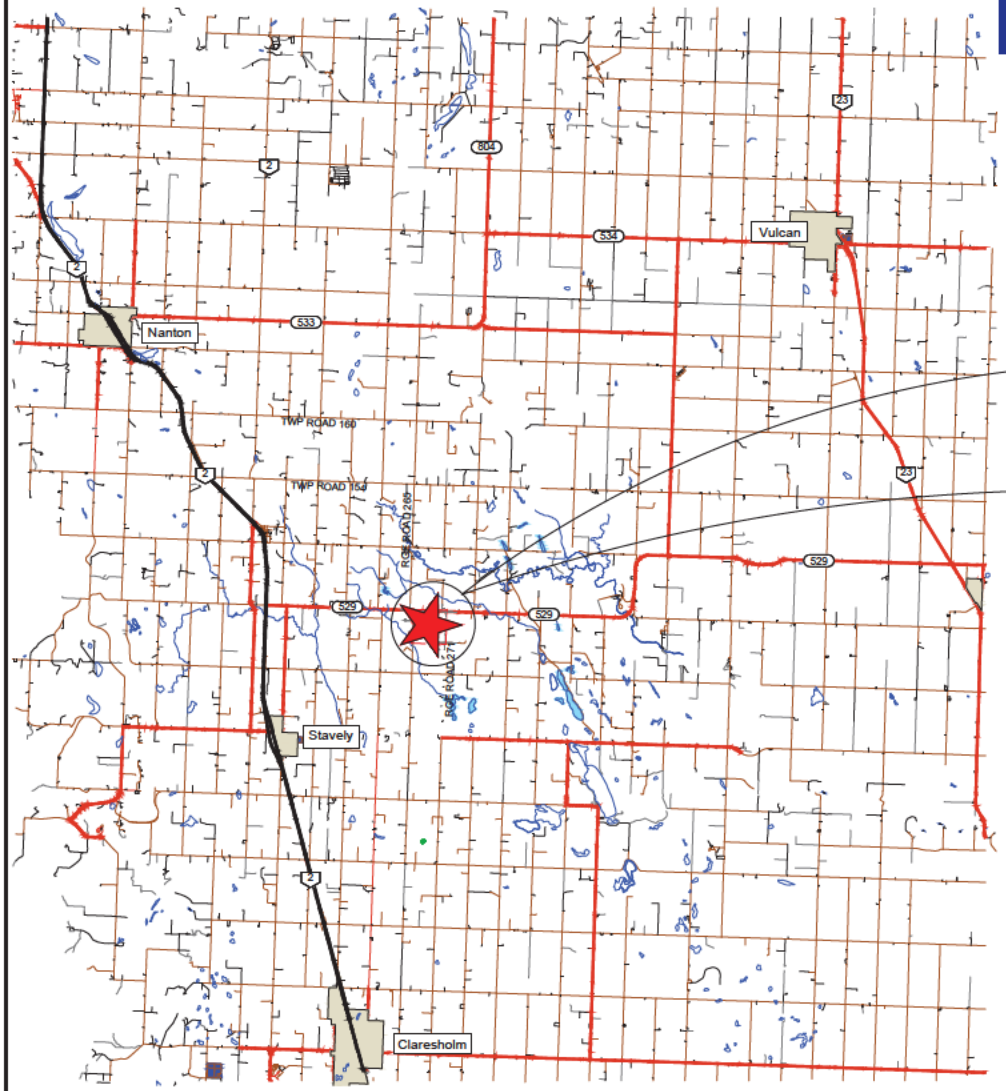
Livestock numbers: Complete only if livestock numbers are different from what was identified in the Part 1 application. Note: if livestock numbers increase in your Part 2 application, a new Part 1 application must be submitted which may result in a loss of priority for minimum distance separation (MDS).

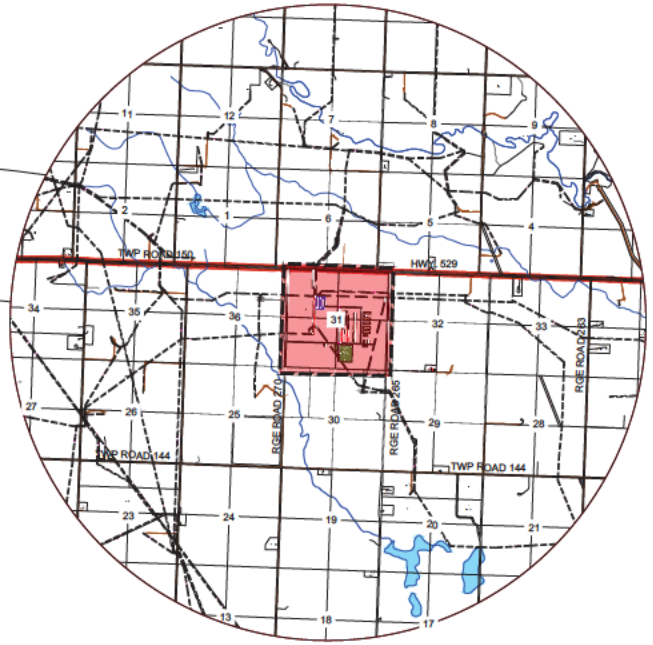
Livestock category and type (Available in the Schedule 2 of the Part 2 Matters Regulation)	**Permitted number**	**Proposed increase or decrease in number (if applicable)**	**Total**
Laying Hens		18,000	18,000
Pullets / Broilers		34,000	34,000
Dairy Cows, associated dry cow replace		150	150
Ducks		1000	1000
Geese		100	100
AO Comment: Livestock numbers have not changed from Part 1 application.			

Last updated September 11, 2023

IVY RIDGE Hutterite Colony

New Colony Design





PROJECT LOCATION

MD of Willow Creek

SW¼ Sec. 32, Twp.15, Rge.26, W4M

REVISIONS	BY	Y	M	D

Consulting Engineers, Planners, and Land Surveyors
255-31st Street North Lethbridge, Alberta T1H 3Z4
Ph: (403) 329-0050 E-mail: geomart@mgcl.ca Fax: (403) 329-6594

Job Number: 230351CE

Saved Date: November 21, 2023 3:41:37 PM — By: [robin]

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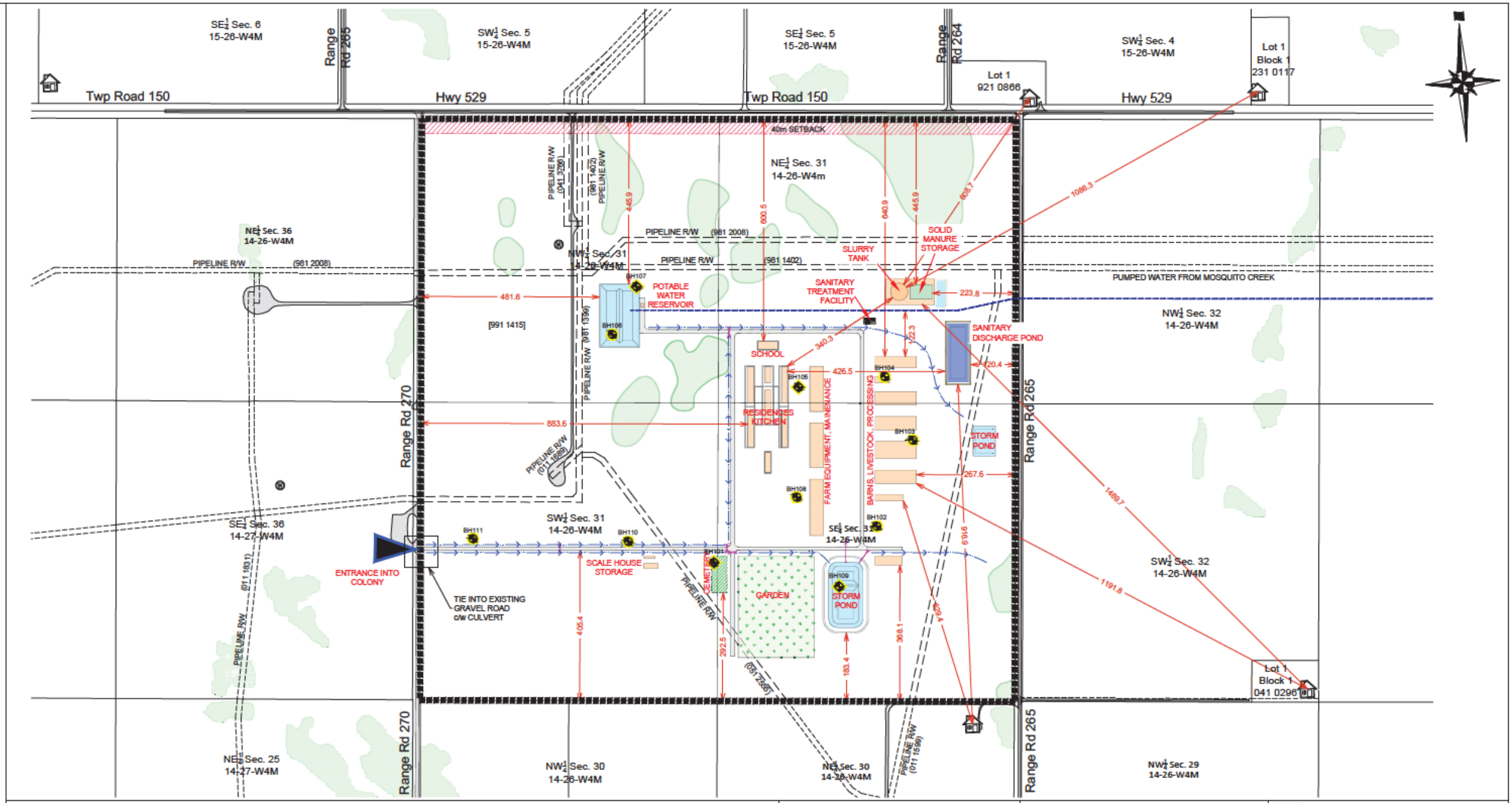

LEGEND

- DEVELOPMENT BOUNDARY
- PROPOSED COLONY BUILDINGS
- EXISTING FARMS
- ABANDONED WATER WELL
- EXISTING WETLANDS
- PROPOSED DITCH
- PROPOSED CULVERT

SCALE 100 0 50 100 200 300
1:10000
(METRES)

REVISIONS	BY	Y	M	D
FOR DEVELOPMENT PERMIT	RJM	2024	05	23

PERMIT TO PRACTICE
Martin Geomatic Consultants Ltd.
Signature
Date 2024-06-10
PERMIT NUMBER: P 5852
The Association of Professional Engineers and Geoscientists of Alberta
2024-05-10

MARTIN GEOMATIC CONSULTANTS
Consulting Engineers, Planners, and Land Surveyors
265-31st Street North Lethbridge, Alberta T1H 3Z4
Ph: (403) 329-0050 E-mail: geomart@mgc.ca Fax: (403) 329-6594

PROJECT	COLONY DESIGN
TITLE	LOCATION PLAN
OWNER	IVY RIDGE HUTTERITE COLONY
SCALE	1:10000
DRAWN: RJM	APPROVED: RJM
DESIGN: RJM	DATE: MAY 21, 2024
PROJECT NUMBER	230351CE
DRAWING NUMBER	C1.0

Saved Date: June 10, 2024 3:54:48 PM – By: [robin]
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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)

DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING *WATER ACT* LICENCE
issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO)
Date and sign one of the following four options

OPTION 1: Applying through the NRCB for both the AOPA permit and the *Water Act* licence

I **DO** want my water licence application coupled to my AOPA permit application.

Signed this ____day of _____, 20____. _____
Signature of Applicant or Agent

OPTION 2: Processing the AOPA permit and *Water Act* licence separately

1. I (we) acknowledge that the CFO will need a new water licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. I (we) request that the NRCB process the AOPA application **independently of** EPA's processing of the CFO's application for a water licence.
3. In making this request, I (we) recognize that, if this AOPA application is granted by the NRCB, the NRCB's decision will not be considered by EPA as improving or enhancing the CFO's eligibility for a water licence under the *Water Act*.
4. I (we) acknowledge that any construction or actions to populate the CFO with livestock pursuant to an AOPA permit in the absence of a *Water Act* licence will **not** be relevant to EPA's consideration of whether to grant the *Water Act* licence application.
5. I (we) acknowledge that any such construction or livestock populating will be at the CFO's sole risk if the *Water Act* licence application is denied or if the operation of the CFO is otherwise deemed to be in violation of the *Water Act*. This risk includes being required to depopulate the CFO and/or to cease further construction, or to remove "works" or "undertakings" (as defined in the *Water Act*).
6. **AS RELEVANT:** I (we) acknowledge that the CFO is located in the South Saskatchewan River Basin and that, pursuant to the *Bow, Oldman and South Saskatchewan River Basin Water Allocation Order* [Alta. Reg. 171/2007], this basin is currently closed to new surface water allocations.
7. **Provide:** Water licence application number(s) 00033215-00-00 & 00034968-00-00 Transfer 39 Dc-ft Transfer 21 - ac ft

Signed this 3 day of May, 2024. [redacted]
Signature of Applicant or Agent

OPTION 3: Additional water licence not required

1. I (we) declare that the CFO will not need a new licence from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. **Provide**: Water license number(s) or water conveyance agreement details _____

Signed this ____ day of _____, 20___. _____
Signature of Applicant or Agent

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)

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: N/A **Proposed 1:** Chicken & Pullet Barn

Proposed 2: Hay Shed **Proposed 3:** Dairy Barn

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☐ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ > 1 m ☐ ≤ 1 m	☐ YES ☐ NO ☐ YES with exemption	
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	NA	none	none	none	☐ YES ☐ NO ☐ YES with exemption	
	How many water wells are within 100 m of the manure storage facility or manure collection area?	NA	none	none	none	☐ YES ☐ NO ☐ YES with exemption	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	NA	greater then 30 meters	greater then 30 meters	greater then 30 meters	☐ YES ☐ NO ☐ YES with exemption	
Groundwater information	What is the depth to the water table?	NA	conservative 2.01	2.01	2.01	☐ YES ☐ NO ☐ YES with exemption	
	What is the depth to the groundwater resource/aquifer you draw water from?	NA	coming from mosquito creek	mosquito creek	mosquito creek	☐ YES ☐ NO ☐ YES with exemption	

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

AO Comment: There are no water wells on Sec 31-14-26 W4. However, water well reports from NE 30-14-26 W4 indicate the uppermost groundwater resource to be between 9.14 m - 12.19 m (see attached water well drilling reports).

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 | Natural Resources Conservation Board

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: N/A **Proposed 1:** Manure Storage

Proposed 2: Feed mill **Proposed 3:** Catch Basin

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☐ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ > 1 m ☐ ≤ 1 m	☐ YES ☐ NO ☐ YES with exemption	
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	NA	none	none	None	☐ YES ☐ NO ☐ YES with exemption	
	How many water wells are within 100 m of the manure storage facility or manure collection area?	NA	none	none	None	☐ YES ☐ NO ☐ YES with exemption	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	NA	greater then 30 meters			☐ YES ☐ NO ☐ YES with exemption	
Groundwater information	What is the depth to the water table?	NA	2.01	2.01	2.01	☐ YES ☐ NO ☐ YES with exemption	
	What is the depth to the groundwater resource/aquifer you draw water from?	NA	coming from Mosquito Creek	mosquito Creek		☐ YES ☐ NO ☐ YES with exemption	

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

AO Comment: There are no water wells on Sec 31-14-26 W4. However, water well reports from NE 30-14-26 W4 indicate the uppermost groundwater resource to be between 9.14 m - 12.19 m (see attached water well drilling reports).

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: N/A **Proposed 1:** Calf Shed and Dry Cows

Proposed 2: Broiler Room **Proposed 3:** Goose Barn

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☐ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ >1 m ☐ ≤ 1 m	☑ > 1 m ☐ ≤ 1 m	☐ YES ☐ NO ☐ YES with exemption	
Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	NA	none	none	none	☐ YES ☐ NO ☐ YES with exemption	
	How many water wells are within 100 m of the manure storage facility or manure collection area?	NA	none	none	none	☐ YES ☐ NO ☐ YES with exemption	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	NA	greater then 30 meters	greater than 30 metres	greater then 30 meters	☐ YES ☐ NO ☐ YES with exemption	
Groundwater information	What is the depth to the water table?	NA	2.01	2.01	2.01	☐ YES ☐ NO ☐ YES with exemption	
	What is the depth to the groundwater resource/aquifer you draw water from?	NA	coming from miquisto Creek	misquito Creek	misquito Creek	☐ YES ☐ NO ☐ YES with exemption	

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

AO Comment: There are no water wells on Sec 31-14-26 W4. However, water well reports from NE 30-14-26 W4 indicate the uppermost groundwater resource to be between 9.14 m - 12.19 m (see attached water well drilling reports).

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 223444
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1964/01/01

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
OLSON		STAVELY			

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	30	14	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 50.204900 Longitude -113.532699
How Location Obtained
Field

Elevation 986.03 m
How Elevation Obtained
Survey-Air

Drilling Information

Method of Drilling
Unknown

Proposed Well Use
Domestic & Stock

Type of Work
Well Inventory

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
12.19		Clay & Sand
15.24		Shale
18.29	Yes	Gray Water Bearing Sandstone
23.16		Shale
26.82		Gray See Comments Shale
27.43		Sandstone
30.18	Yes	Water Bearing Sandstone
30.48		Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1958/01/01	72.74	7.32

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
30.48 m			1958/01/01

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	30.48

Surface Casing (if applicable)
Unknown
Size OD : 15.24 cm
Wall Thickness : cm
Bottom at : 23.77 m

Well Casing/Liner
Unknown
Size OD : 12.70 cm
Wall Thickness : cm
Top at : 0.00 m
Bottom at : 30.48 m

Perforations

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

Perforated by

Annular Seal Driven
Placed from 0.00 m to 0.00 m
Amount

Other Seals

Type	At (m)

Screen Type
Size OD : 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
PREGODA GEORGE

Copy of Well report provided to owner | Date approval holder signed

Water Well Drilling Report

View in Imperial | Export to Excel

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GOWN ID

GIC Well ID 223444
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1964/01/01

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
OLSON		STAVELY			

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	30	14	26	4				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 50.204900 Longitude -113.532699
How Location Obtained
Field

Elevation 986.03 m
How Elevation Obtained
Survey-Air

Additional Information

Measurement in Metric

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

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

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

Sample Collected for Potability
Submitted to ESRD Yes

Additional Comments on Well

DRILLER CALLS INTERVAL 76-88 FT "GREY STONE AND SHALE", REPORTS WATER AT 60 FT CONTAINING TO MUCH ALKALI TO BE USED. THE FOLLOWING INFORMATION WAS TAKEN FROM DROUGHT EMERGENCY GROUNDWATER TESTING PROGRAM APPLICATION RECEIVED ON MARCH 7, 1985. OWNER (TERRY OLSEN) REPORTS THAT FOR THE LAST 3 YEARS THE YIELD OF THIS WELL DOES NOT MEET HOUSE AND STOCK NEEDS. OWNER ALSO REPORTS WELL IS APPROXIMATELY 100 FEET DEEP AND WAS CONSTRUCTED APPROXIMATELY IN 1955.

Yield Test

Taken From Ground Level
Measurement in Metric

Test Date	Start Time	Static Water Level
1958/01/01	12:00 AM	7.32 m

Depth to water level

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

Method of Water Removal

Type Unknown
Removal Rate 72.74 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
PREGODA GEORGE

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 1770218
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2014/07/29

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
OLSEN, TERRY	P.O. BOX 302	STAVELY	ALBERTA	CANADA	T0L 1Z0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	30	14	26	4				

Measured from Boundary of Quarter
240.00 m from North
93.00 m from East

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 50.204901 Longitude -113.532688
How Location Obtained: Not Verified

Elevation 989.08 m
How Elevation Obtained: Hand held autonomous GPS 20-30m

Drilling Information

Method of Drilling: Combination

Proposed Well Use: Domestic & Stock

Type of Work: New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
9.14		Brown Clay & Rocks
13.11		Gray Soft Shale
14.63		Light Gray Sandstone
19.81		Gray Soft Shale
26.82		Brown Sandstone
28.04		Gray Sandstone
41.45		Light Gray Hard Sandstone
45.11		Gray Shale
49.38	Yes	Salt & Pepper Sandstone
53.95	Yes	Fractured Sandstone
54.86		Dark Gray Shale
57.91		Gray Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 13.64 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
2014/06/24	13.64	3.66

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
57.91 m	54.86 m	2014/06/12	2014/06/24

Borehole

Diameter (cm)	From (m)	To (m)
26.04	0.00	11.58
15.88	11.58	54.86

Surface Casing (if applicable): Steel
Size OD : 16.83 cm
Wall Thickness : 0.478 cm
Bottom at : 11.58 m

Well Casing/Liner: Plastic
Size OD : 12.55 cm
Wall Thickness : 0.478 cm
Top at : 3.05 m
Bottom at : 48.77 m

Perforations

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

Perforated by

Annular Seal Bentonite Chips/Tablets
Placed from 0.00 m to 11.58 m
Amount 200.00 Pounds

Other Seals

Type	At (m)

Screen Type Plastic
Size OD : 12.55 cm

From (m)	To (m)	Slot Size (cm)
48.77	54.86	0.051

Attachment
Top Fittings Coupler
Bottom Fittings Plug

Pack
Type
Grain Size
Amount

Contractor Certification

Name of Journeyman responsible for drilling/construction of well: DAN UHL
Certification No: 8361Q
Company Name: UHL DRILLING LTD.
Copy of Well report provided to owner: Yes
Date approval holder signed: 2014/06/24

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 1770218
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2014/07/29

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
OLSEN, TERRY	P.O. BOX 302	STAVELY	ALBERTA	CANADA	T0L 1Z0

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	NE	30	14	26	4				

Measured from Boundary of Quarter
240.00 m from North
93.00 m from East

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 50.204901 Longitude -113.532688
How Location Obtained
Not Verified

Elevation 989.08 m
How Elevation Obtained
Hand held autonomous GPS 20-30m

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level 30.48 cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 13.64 L/min
Recommended Pump Intake Depth (From TOC) 42.67 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
Remedial Action Taken
Well Disinfected Upon Completion Yes
Geophysical Log Taken
Submitted to ESRD

Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well
DRILLING METHOD ROTARY AIR AND ROTARY MUD. TDS - 1865

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Metric

Test Date 2014/06/24
Start Time 1:00 PM
Static Water Level 3.66 m

Method of Water Removal
Type Pump
Removal Rate 13.64 L/min
Depth Withdrawn From m

If water removal period was < 2 hours, explain why

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
3.66	0:00	22.25
4.27	1:00	21.03
5.49	2:00	20.12
5.79	3:00	19.51
6.10	4:00	18.59
6.40	5:00	17.98
6.71	6:00	17.07
7.01	7:00	16.76
7.32	8:00	16.31
7.62	9:00	15.85
7.92	10:00	15.54
8.69	12:00	14.63
9.14	14:00	13.72
10.06	16:00	13.11
10.67	18:00	12.19
10.97	20:00	11.58
12.19	25:00	10.36
13.11	30:00	9.14
13.72	35:00	8.23
14.48	40:00	7.62
15.90	50:00	6.71
16.51	60:00	6.10
18.14	75:00	5.49
19.20	90:00	4.88
21.03	105:00	4.27
22.25	120:00	3.66

Water Diverted for Drilling

Water Source	Amount Taken		Diversion Date & Time
STAVELY WELL	6819.14	L	2014/06/12 10:00 AM

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
DAN UHL

Certification No
8361Q

Company Name
UHL DRILLING LTD.

Copy of Well report provided to owner
Yes

Date approval holder signed
2014/06/24

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
1	Dora Margaret Coreman	SE 6-15-26-W5	2,305m					
2	Stacey Lee Irwin & Dallas Irwin	Lot 1 Plan 9210866	763m					
3	Francis William Heidmiller	Lot 1, Block 1; Plan 2310117	1,167m					
4	Dale Albert & Katrina Albert	Lot 1, Block 1: Plan 0410296	1,096m					
5	Terry L Olsern & Beverly J Olsen	NE 30-14-26-W4	516m/1,230m					

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)
H.B Ivy Ridge	NW 4-26-15-32	65.2	Brown, Brown		
H.B Ivy Ridge	NE 4-26-15-32	65.2	Brown, Brown		
H.B Ivy Ridge	SW 4-26-15-32	65.2	Brown, Brown		
H.B Ivy Ridge	SE 4-26-15-4	63.1	Brown, Brown		
H.B Ivy Ridge	NW 4-26-14-31	62.7	Brown, Brown		
			Total		

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

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

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

Additional information (attach any additional information as required)

2: SW 4-15-26 W4
3: SE 4-15-26 W4
4: SW 32-14-26 W4

See attached list for additional manure spreading lands.

Name	Hutterian Brethren of Ivy Ridge
Address	
Legal Land Location	

MDS Spreadsheet based on 2006 AOPA Regulations

Category of Livestock	Type of Livestock	Factor A	Technology Factor	MU	LSU Factor	Number of Animals	LSU
Feedlot Animals	Beef Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.4459		-
	Beef Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.2450		-
	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	150	264.0
	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	18,000	201.6
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.0112		-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.0014	34,000	47.6
	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	1,000	7.0
	Geese	1.000	0.700	0.020	0.0140	100	1.4
	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		521.6

For New Operations

Dispersion Factor 1

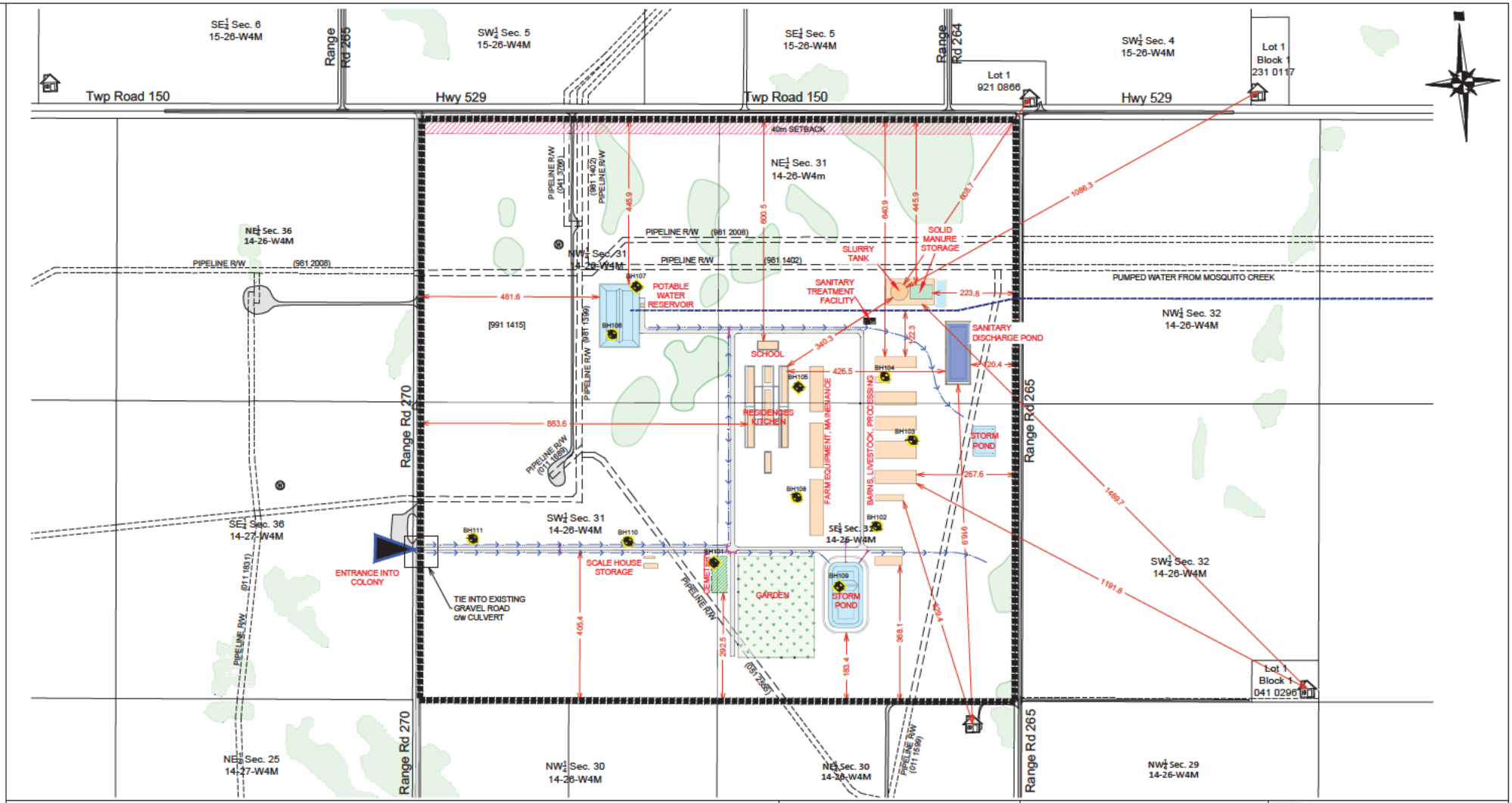
Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	1,321	403
2	54.72	1,762	537
3	68.4	2,202	671
4	109.44	3,524	1,074

For Expanding Operations

Dispersion Factor 1

Expansion Factor 0.77

Category	Odour Objective	Distance Feet	Distance Metres
1	41.04	1,017	310
2	54.72	1,357	413
3	68.40	1,696	517
4	109.44	2,713	827



LEGEND

- DEVELOPMENT BOUNDARY
- PROPOSED COLONY BUILDINGS
- EXISTING FARMS
- ABANDONED WATER WELL
- EXISTING WETLANDS
- PROPOSED DITCH
- PROPOSED CULVERT

SCALE 100 0 50 100 200 300
1:10000
(METRES)

REVISIONS	BY	Y	M	D
FOR DEVELOPMENT PERMIT	RJM	2024	05	23

PERMIT TO PRACTICE
Martin Geomatic Consultants Ltd.
Signature
Date 2024-05-10
PERMIT NUMBER: P 5852
The Association of Professional Engineers and Geoscientists of Alberta
2024-05-10

MARTIN GEOMATIC CONSULTANTS
Consulting Engineers, Planners, and Land Surveyors
265-31st Street North Lethbridge, Alberta T1H 3Z4
Ph: (403) 329-0050 E-mail: geomart@mgc.ca Fax: (403) 329-6594

PROJECT	COLONY DESIGN
TITLE	LOCATION PLAN
OWNER	IVY RIDGE HUTTERITE COLONY
SCALE	1:10000
DRAWN: RJM	APPROVED: RJM
DESIGN: RJM	DATE: MAY 21, 2024
PROJECT NUMBER	230351CE
DRAWING NUMBER	C1.0

Saved Date: June 10, 2024 3:54:48 PM – By: [robin]
z:\data\active projects\230351 ivy ridge colony co parkland– new colony design\cadd\design\230351ce–jun10–2024.dwg

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	Usable area (ha)	Agreement attached (if required)
H.B. Ivy Ridge	S.W. 4-26-14-31	64.7	Dark Brown, Brown		
H.B. Ivy Ridge	N.E. 4-26-14-31	62.7	Dark Brown, Brown		
H.B. Ivy Ridge	S.E. 4-26-14-31	64.7	Dark Brown, Brown		
H.B. Ivy Ridge	N.W. 4-26-14-32	62.7	Dark Brown, Brown		
H.B Ivy Ridge	S.W. 4-26-14-32	64.7	Dark Brown, Brown		

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	Usable area (ha)	Agreement attached (if required)
H.B. Ivy Ridge	N.E 4-26-14-32	64.7	Dark Brown, Brown		
H.B Ivy Ridge	N.W. 4-26-15-11	65.2	Dark Brown, Brown		
H.B Ivy Ridge	S.W. 4-26-14-34	64.7	Dark Brown, Brown		
H.B. Ivy Ridge	N.W 4-26-15-3	64.7	Dark Brown, Brown		
	These listed below is irrigated				
H.B Ivy Ridge	N.W. 4-26-15-2		Dark Brown, Brown		
H.B Ivy Ridge	SW. 4-26-15-2	76.8.	Dark Brown, Brown		
H.B Ivy Ridge	SE 4-26-15-3		Dark Brown, Brown		
H.B Ivy Ridge	NE 4-26-15-3	64.7	Dark Brown, Brown		

Name	Hutterian Brethren of Ivy Ridge
Address	0
Legal Land Location	0

Landbase Requirements (hectares) based on 2006 AOPA requirements

Category of Livestock	Type of Livestock	Number of Animals	Dark Brown & Brown (ha)	Grey Wooded (ha)	Black (ha)	Irrigated (ha)
Feedlot Animals	Cows/Finishers (900+ lbs)	0.0	0.0	0.0	0.0	0.0
	Feeders (450 - 900 lbs)	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*	150.0	222.8	185.6	139.2	111.3
	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)	18000.0	99.0	82.8	61.2	50.4
	Chicken - Layers - (Deep Pit)	0.0	0.0	0.0	0.0	0.0
	Chicken - Pullets/Broilers	34000.0	110.5	92.1	69.0	55.4
	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	1000.0	1.6	1.3	1.0	0.8
	Geese	100.0	0.3	0.3	0.2	0.2
	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		434	362.1	270.6	218.1
	Total Acres		1,073	894.7	668.7	538.9

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner

*(complete a copy of this section for **EACH** proposed in-barn liquid manure storage facility with a concrete liner)*

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

1. Dairy Barn
2.
3.

Manure storage capacity *(use one row in the table for **EACH** in-barn storage. Attach additional pages if you require more rows)*

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	**NRCB USE ONLY** Calculated storage capacity (m^3)
1.	111.56M	36.58M	3.7	3.7M	
2.					
3.					
				TOTAL CAPACITY	

AO Comment: Dairy barn is 111.56 m x 36.58 m. The barn is designed to have two in barn pits. The first pit measures 30.6 m x 1 m x 1.6 m deep that flows into a second pit that measures 3.7 m x 3.3 m x 3.7 m deep.

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness: 6"	Method of sulphate protection: Type 50	
	Concrete strength: 32 MPA	Concrete reinforcement size and spacing: 10m at 12" on centre	
In-barn manure pit floors	Concrete thickness: 6"	Method of sulphate protection: Type 50	
	Concrete strength: 32 MPA	Concrete reinforcement size and spacing: 15m and 8" on centre	
In-barn manure pit walls	Concrete thickness: 12" wall	Method of sulphate protection: Type 50	
	Concrete strength: 32 MPA	Horizontal reinforcement size and spacing: 10 mm Rebar 12" on centre	Vertical reinforcement size and spacing: 15mm Rebar 18" on centre

LIQUID MANURE COLLECTION AND/OR STORAGE: In-barn - Concrete liner (cont.)

Describe how the joints at the junction of the pit walls, pit floors and any other joints will be sealed

with a Volclay Water Stop - RX

Describe sealing practices for piping, etc. that penetrates the liner

8" pipe
Pipe will be connected with flange fittings to Pump and, DR9 HDPE Poly pipe will be used all pipe connections will be fused, and flange fittings at the tank

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Liquid manure: 32MPa (B)
Category A is required to be engineered
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Additional information

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

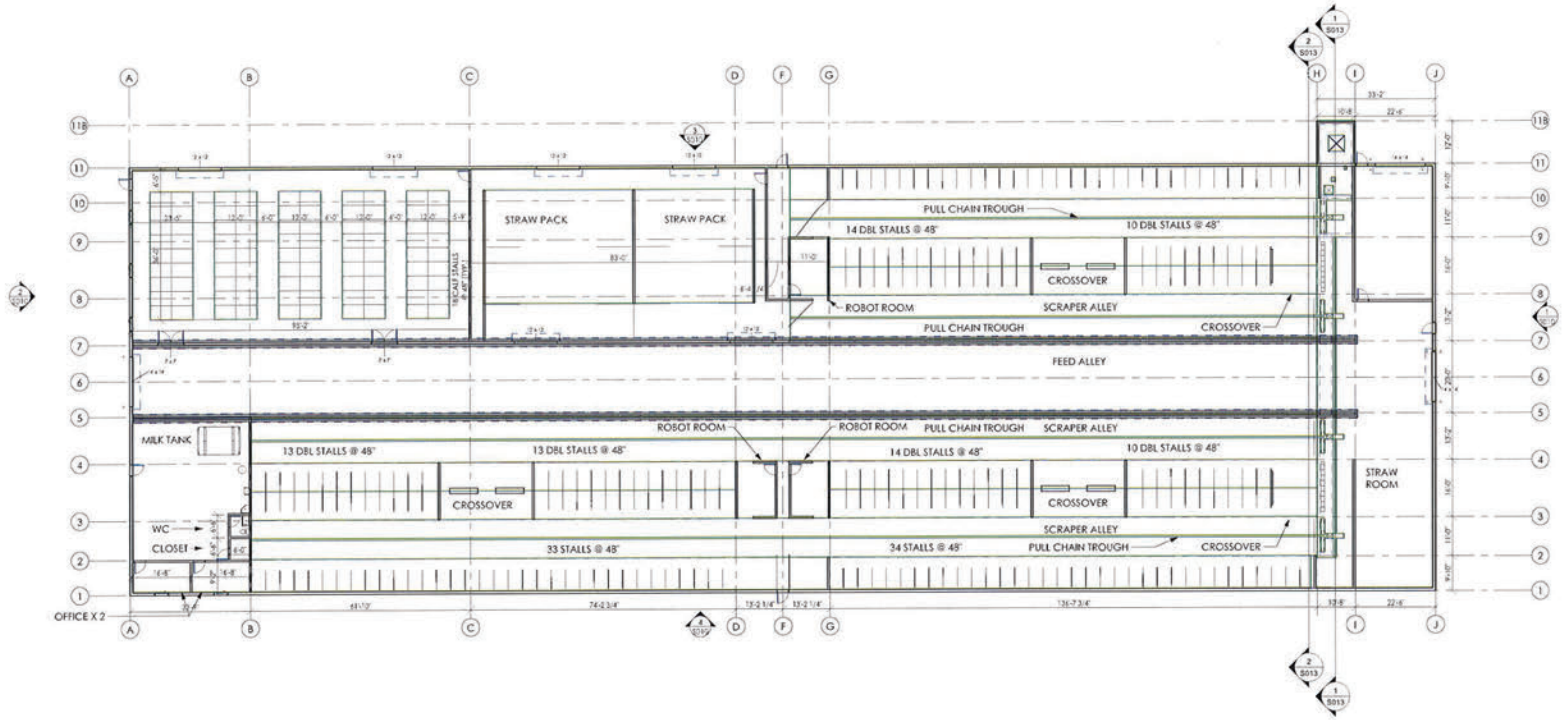
Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource: _____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Concrete liner requirements

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



PERMIT TO PRACTICE
SIGMA RHO SQUARED ENGINEERING
PERMIT NUMBER: P12905

SIGMA Rho² ENGINEERING
DESIGN BUILD COMMUNITY
260-104 13 Street North
Lethbridge, Alberta T1H 2R4
403-942-0981
sam@sr2eng.ca

NOTES

Contractor to check and verify all the dimensions before construction, any errors and omissions shall be reported to the engineer immediately

Drawing shall not be used for construction until approved and issued for construction by the engineer

Do not scale the drawing

All construction shall be in accordance with latest codes.

#	DATE	DRAWING STATUS	DSN	DRW	CHK	APP
0	24/02/14	ISSUE FOR APPROVAL	SJNR	MWH	SJNR	

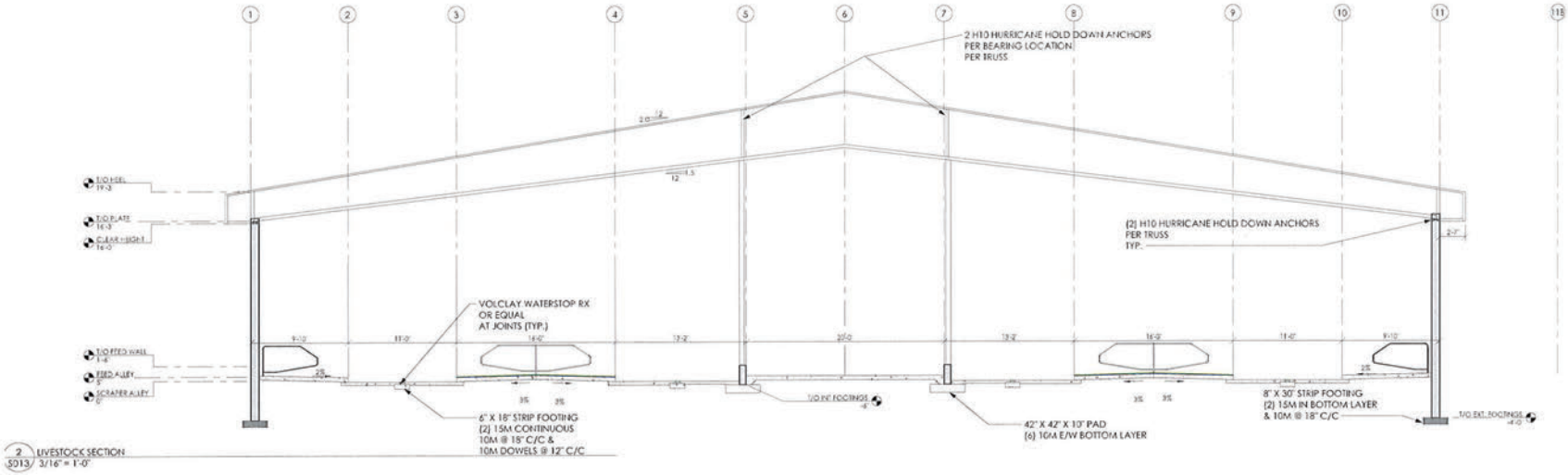
SHEET SIZE: 24" x 36"
SCALE: 1/16" = 1'-0"

IVY RIDGE COLONY

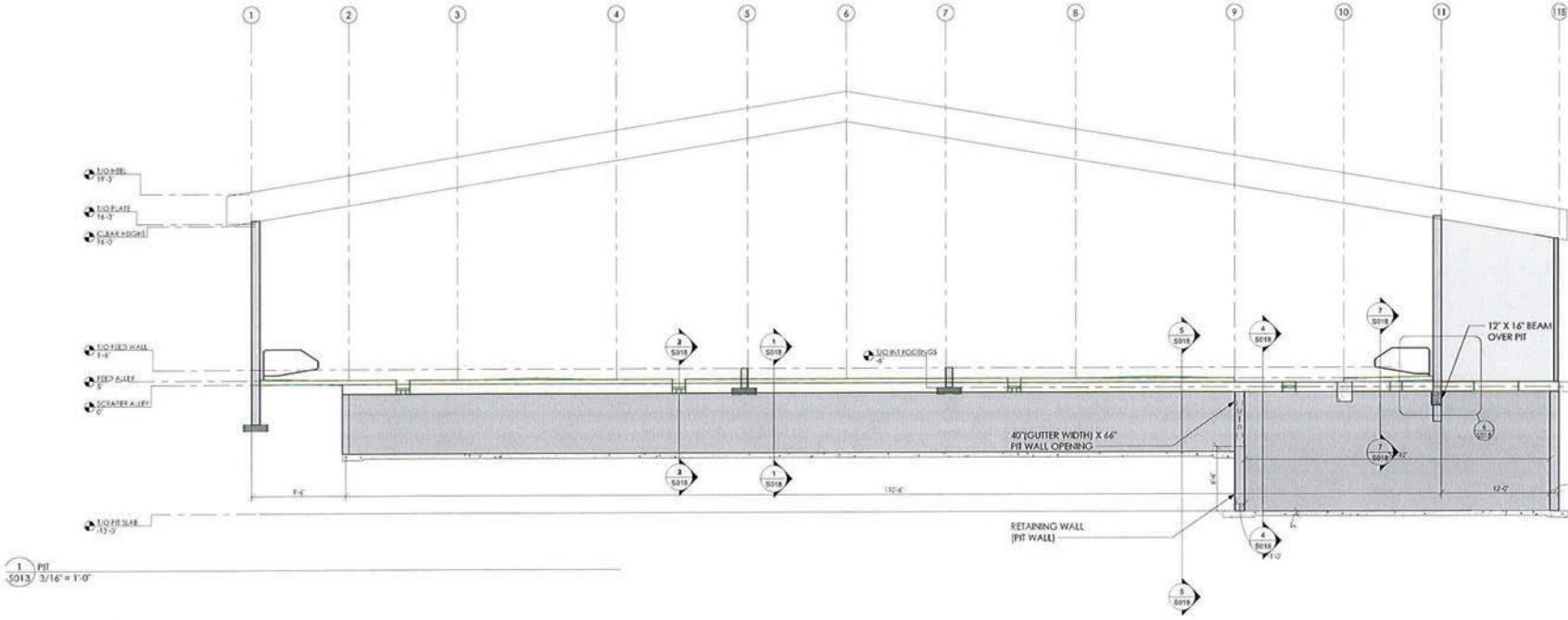
DAIRY BARN

FLOORPLAN

24-011 | S012



2 LIVESTOCK SECTION
S013 3/16" = 1'-0"



1 PIT
S013 3/16" = 1'-0"

Professional Seal
24/02/14
PERMIT TO PRACTICE
SIGMA RHO SQUARED ENGINEERING
PERMIT NUMBER: P12566

Sub-consultant

SIGMA Rho2 ENGINEERING
DESIGN. BUILD. COMMUNITY
260-104 13 Street North
Lethbridge, Alberta T1H 2R4
403-942-0981
sam@sr2eng.ca

NOTES

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Drawing shall not be used for construction until approved and issued for construction by the engineer

Do not scale the drawing

All construction shall be in accordance with latest codes.

SHEET SIZE: 24" x 36"
SCALE: 3/16" = 1'-0"

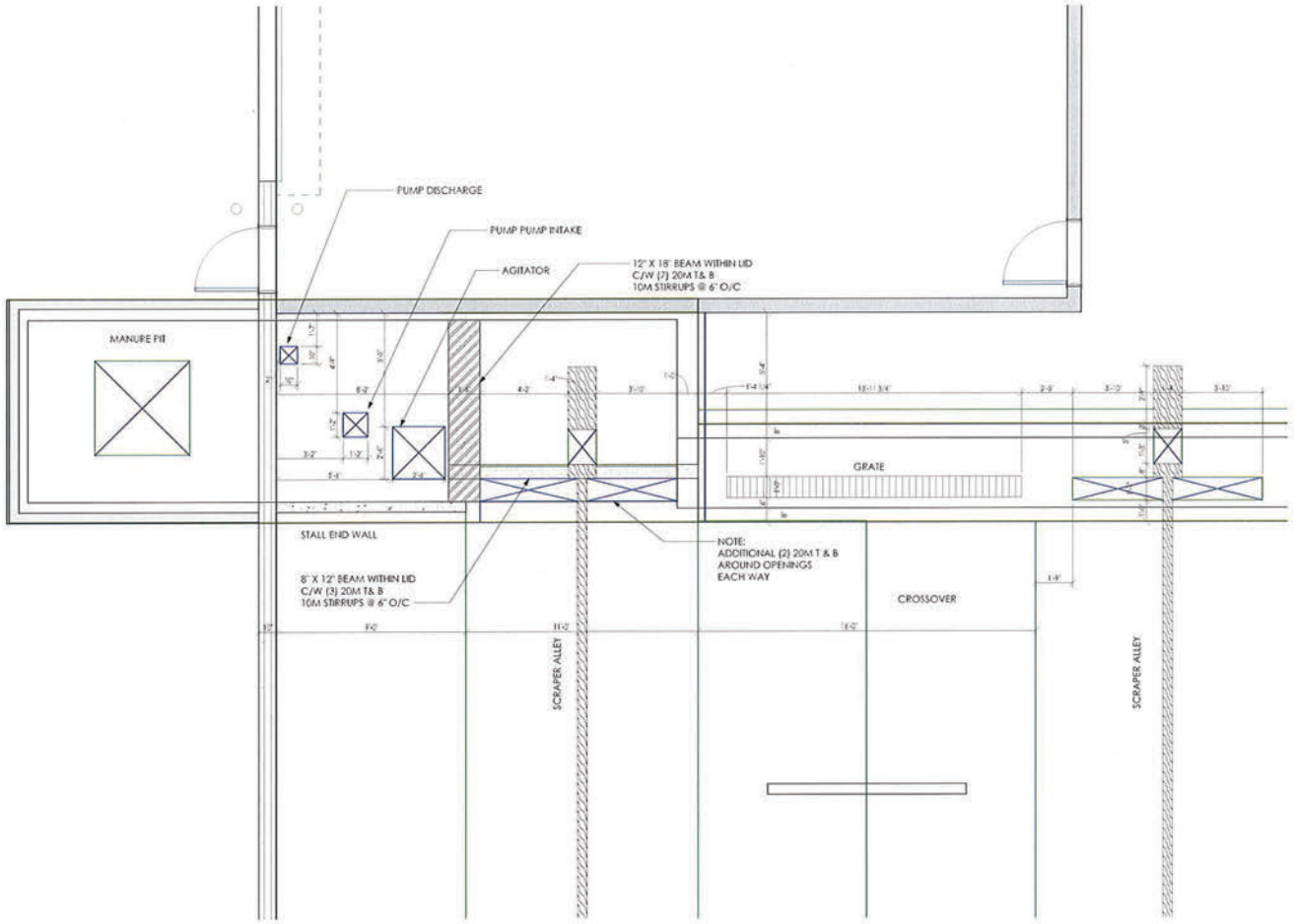
#	DATE	DRAWING STATUS	DSN	DRW	CHK	APP
0	24/02/14	ISSUE FOR APPROVAL	SJNR	AP	SJNR	

CLIENT
IVY RIDGE COLONY

PROJECT TITLE
DAIRY BARN

DRAWING TITLE
INTERIOR ELEVATIONS

PROJECT NUMBER 24-011
SHEET NUMBER S013



1 / S017 MANURE CONTAINMENT PLAN
3/8" = 1'-0"

Professional Seal

24/02/14

PERMIT TO PRACTICE
SIGMA RHO SQUARED ENGINEERING
PERMIT NUMBER: P12966

Subconsultant

SIGMA Rho 2 ENGINEERING
DESIGN BUILD COMMUNITY
260-104 13 Street North
Lethbridge, Alberta T1H 2R4
403-942-0981
sam@sr2eng.ca

NOTES

Contractor to check and verify all the dimensions before construction, any errors and omissions shall be reported to the engineer immediately

Drawing shall not be used for construction until approved and issued for construction by the engineer

Do not scale the drawing

All construction shall be in accordance with latest codes.

#	DATE	DRAWING STATUS	DSN	DRW	CHK	APP
0	24/02/14	ISSUE FOR APPROVAL	SJNR	AP	SJNR	

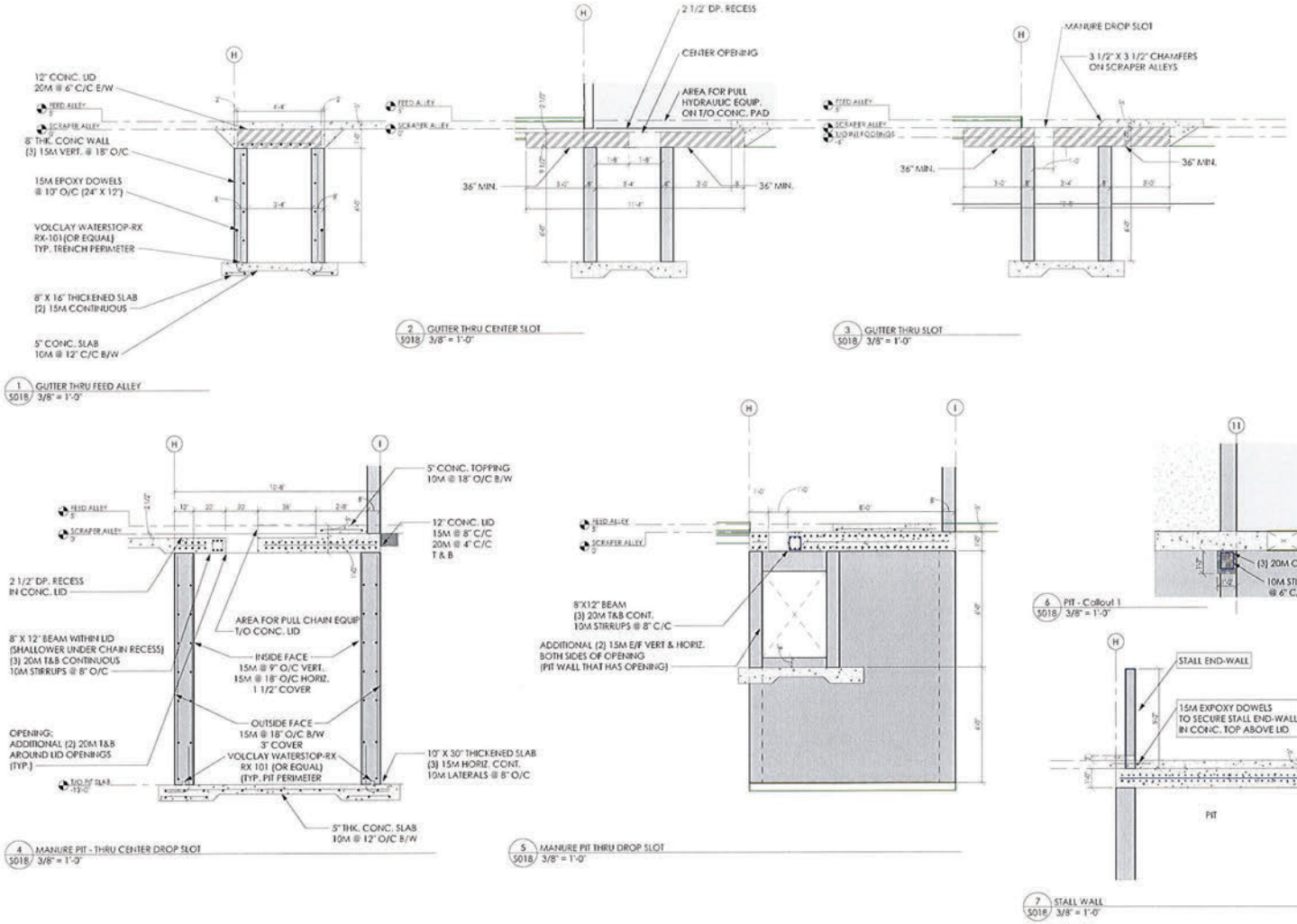
SHEET SIZE: 24" x 36"
SCALE: 3/8" = 1'-0"

IVY RIDGE COLONY

DAIRY BARN

MANURE SLOTS PLAN

24-011 | S017



Professional Seal

24/02/14

PERMIT TO PRACTICE
SIGMA RHO SQUARED ENGINEERING
PERMIT NUMBER: P12969

Sub-consultant

SIGMA Rho 2 ENGINEERING
DESIGN BUILD COMMUNITY
260-104 13 Street North
Lethbridge, Alberta T1H 2R4
403-942-0981
sam@sr2eng.ca

NOTES

This is a copyright drawing and shall not be reproduced in any form without written permission of the engineer

Contractor to check and verify all the dimensions before construction, any errors and omissions shall be reported to the engineer immediately

Drawing shall not be used for construction until approved and issued for construction by the engineer

Do not scale the drawing

All construction shall be in accordance with latest codes.

SHEET SIZE: 24" x 36"
SCALE: 3/8" = 1'-0"

#	DATE	DRAWING STATUS	DSN	DRW	CHK	APP
0	24/02/14	ISSUE FOR APPROVAL	SJNR	AP	SJNR	

IVY RIDGE COLONY

DAIRY BARN

MANURE CONTAINMENT

24-011 | S018

LIQUID MANURE STORAGE: Concrete or steel tank (required to be engineered)

*(complete a copy of this section for **EACH** proposed concrete or steel tank for liquid manure)*

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

1. Manure Storage tank (Concrete) in plastic walls
2. _____

Manure storage capacity

	Dimensions (or length and width / diameter) (m)	Depth (m)	Depth below ground level (m)	NRCB USE ONLY	
				Calculated storage capacity (excl. 0.3 m freeboard) (m^3)	Filled in lower ¼? Y/N
	46.6 m	4.8 m	0		
1.					
2.					

Surface water control systems

Describe the run-on and runoff control system

Will be sloped and drained to a catch basin

AO Comment: Area surrounding manure storage tank will be sloped towards a catch basin.

Concrete or steel tank details

Manure tank floor	Concrete thickness: 6"	Method of sulphate protection: Type 50
	Concrete strength: 32 MPA	Concrete reinforcement size and spacing: 10m at 12" on centre

Manure storage tank walls: provide details on the construction of the proposed manure storage tank walls

12" thick walls

LIQUID MANURE STORAGE: Concrete or steel tank (cont.)

Describe sealing practices for piping, etc. that penetrates the liner

All pipes are coming in through the concrete floor and will be in before pouring concrete, and after Sika flex

Describe how the joints at the junction of the tank walls, tank floors and any other joints will be sealed

PVC water stop to seal between walls and floor & Sika top seal

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

NRCB USE ONLY

Liquid manure storage volume calculator attached: ☐ YES ☐ NO

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to uppermost groundwater resource: _____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Concrete or steel tank requirements

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

Liquid Manure Storage Tank Volume Calculator

Construction Dimensions of Liquid Manure Storage

*** Only cells in blue can be changed.**

Overall Dimensions of Liquid Manure Storage Tank			Liquid MS Tank Dimensions
Internal Diameter*[4]	46.3	m	152 ft
Maximum Depth*4	4.8	m	16 ft
Design Capacity Depth	*4.50*	m	15 ft
Total Capacity @ top of Tank	*8,085*	m^3	*Total Capacity @ tot* *285,511* ft^3 *1,778,401 Imp. Gal.*

Design Capacity of Liquid Manure Storage (freeboard level)			Design Capacity (freeboard level)
Design Capacity (freeboard level)	**7,579**	**m^3**	**267,667 ft^3** **1,667,251 Imp. Gal.**
Surface Area of Liquid Manure	*1,684*	m^2	*18,130* ft^2

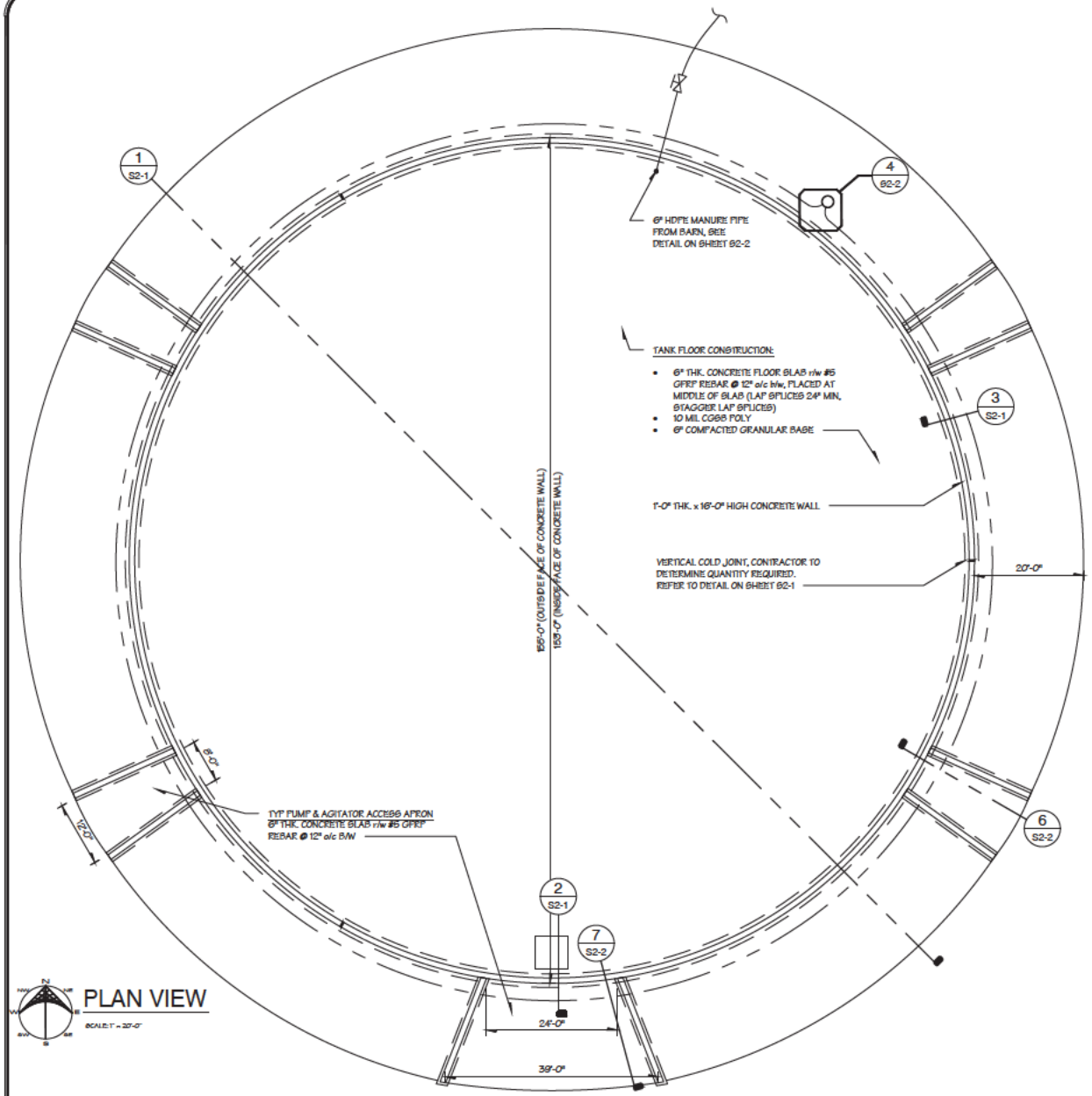
CFO Name [1]	**Hutterian Brethren of Ivy Ridge**
Land Location [1]	

Type(s) of Livestock [2]	Number of Livestock	Annual Manure Production (m^3/hd)
Free Stall: Lactating with Dry Cows	150	42.6
N/A		0.0
N/A	0	0.0
N/A	0	0.0
		Total manure Production (m^3/yr)

Minimum 9 Month Liquid Manure Storage Volume Required			
4,793	**m^3 ****	**169,246**	**ft^3**
		1,054,202	**Imp. Gal.**

Instructions

1. Enter CFO name and legal land location. (Section-Township-Range-Meridian)
2. Select type(s) of Livestock to automatically upload annual liquid manure production data.
3. Enter number of livestock for each type of livestock
4. Adjust dimensions of liquid manure storage tank to ensure that minimum 9 month liquid manure storage volume requirement is met or exceeded.



PLAN VIEW

SCALE: 1" = 20'-0"

STRUCTURAL NOTES

1. Concrete Manure Storage Design Loads

1.1. Climatic loads referenced from ABC 2019 edition, Stavely, Alberta

Wind load q50 12.5 psf

1.2. Soil, manure and ice loads provided in Tank Wall Load Profile detail on sheet S2-1.

2. General Construction Notes
2.1. Tank Use: Liquid Manure Storage
2.2. Tank and foundation designed in accordance with the ABC 2019 edition.
2.3. The contractor is required to review the complete set of contract documents and co-ordinate all trades. The work must be a complete, functioning facility, as explicitly & implicitly described by the contract documents.
2.4. The contractor is to verify all dimensions prior to commencing with the work. The contractor is to notify the engineer of any discrepancy or deviation in the existing condition prior to commencing with the work for further instructions.
2.5. Drawings are not to be scaled but must be used to determine the general layout. All dimension discrepancies are to be reported to the engineer.
2.6. Verify finished slab elevation relative to site with engineer prior to commencement of work.
2.7. All new grade work is to be sloped away from the tank as per slopes indicated in sealed drawings.

3. Concrete General Notes
3.1. The national building code latest edition and all pertinent recommendations of CSA standard A23.1 and A23.3 shall be the basis for the design and construction of all work on this project.
3.2. All concrete, unless otherwise stated, shall be designed as follows

unit:	Floor & Footing:	Walls:
A) Min. Compressive Strength (28 days):	4640 psi (32 MPa)	4640 psi (32 MPa)
B) Aggregate Size (maximum):	¾"	½"
C) Air entrainment:	Natural	5%-8%
D) Exposure Class:	A2	A2
E) W/C ratio:	0.45	0.45
F) Cement:	HS	HS

3.3. Design based on the following conditions as referenced from geotechnical investigation report no. USG1809 dated February 2, 2024 provided by Union Street Geotechnical Ltd.:
- Soil bearing pressure of 2976 psf (ULS) for a raft foundation on dense compact gravel.
- Owner or contractor shall notify engineer if local conditions differ from those listed above.

3.4. Typical thickened edge slab subgrade preparation as referenced from geotechnical investigation report no. USG1809 dated February 2, 2024 provided by Union Street Geotechnical Ltd.:
- Strip site minimum 8" underneath footprint of manure storage tank foundation. Remove all topsoil, organics, and deleterious materials to their full depths. Excavate further as required to reach design subgrade elevation. Exposed subgrade should consist of native sand or till.
- Proof roll site to identify any soft areas. If any soft areas are encountered, excavate an additional 12" and replace with suitable granular material and compact to 98% standard proctor density.
- Scarify and compact the exposed subgrade to a minimum 98% standard proctor density.
- Exposed subgrade to be inspected by Union Street Geotechnical Ltd. prior to backfilling or placing granular sub-base/base materials. Subgrade is not to be left exposed for an extended period of time to avoid excess wetting, softening or drying of the subgrade.
- If backfill is required to reach the desired tank floor elevation, a non-expansive, low to medium plastic soil is to be placed in maximum 12" lifts and compacted to 98% standard proctor density. Backfill material to be approved by Union Street Geotechnical Ltd. prior to use.
- Install 6" granular base underneath tank floor in a single lift and compact to 100% standard proctor density. Install a layer of 10 mil CGSB poly on top of the granular material prior to placing slab reinforcement.

3.5. Concrete cover for reinforcing steel to be as follows (U.N.O.):

Unit:	Measurement:
A) concrete deposited against soil:	3"
B) concrete exposed to weather, water, or soil after removal of forms:	1½"
C) slabs and walls, except as noted in (a) and (b):	¾"

3.6. All reinforcing steel shall be high bond deformed bars conforming to CSA G30.18 grade 400 for 10m, 15m or larger; or GFRP bars conforming to CSA S806-12 and CSA S07-19 for #3, #4, #5, #6 or larger bars.
3.7. All bending details, dimensions, anchorage, cut-off lengths, bar supports, spacers, and location of reinforcing splices shall be in accordance with CSA A23.3 latest edition, unless otherwise shown.
3.8. Construction joint details are provided on sheet S2-1 intended to allow contractor to pour walls in separate pours. Contractor to determine number of intended pours and notify engineer.
3.9. Raft foundation is designed to be one continuous pour. Construction joints are not allowed in the floor.
3.10. In lieu of cone shaped snap ties, standard flat bar ties may be used. Seal all snap ties on the interior face of the tank walls with SikaTop Seal-107CA; or equivalent.

NOTE TO PERMIT AUTHORITY:

NEITHER DGH ENGINEERING LTD. NOR THE ENGINEER WHO HAS SEALED THESE DRAWINGS HAS BEEN ENGAGED FOR FIELD REVIEW SERVICES. FIELD REVIEW SERVICES TO BE PROVIDED BY OTHERS.

ISSUED FOR CONSTRUCTION

ISSUE (AND REVISION)			
0	2024-04-03	ISSUED FOR CONSTRUCTION	BR

ENGINEER'S SEAL

DGH ENGINEERING LTD.
CIVIL | STRUCTURAL | MECHANICAL | ELECTRICAL | INDUSTRIAL
12 Ashton Boulevard
St. Andrews MB R1A 3W5 Canada
T: 204-334-8046
www.dghengineering.com

NOTE TO CONTRACTOR:

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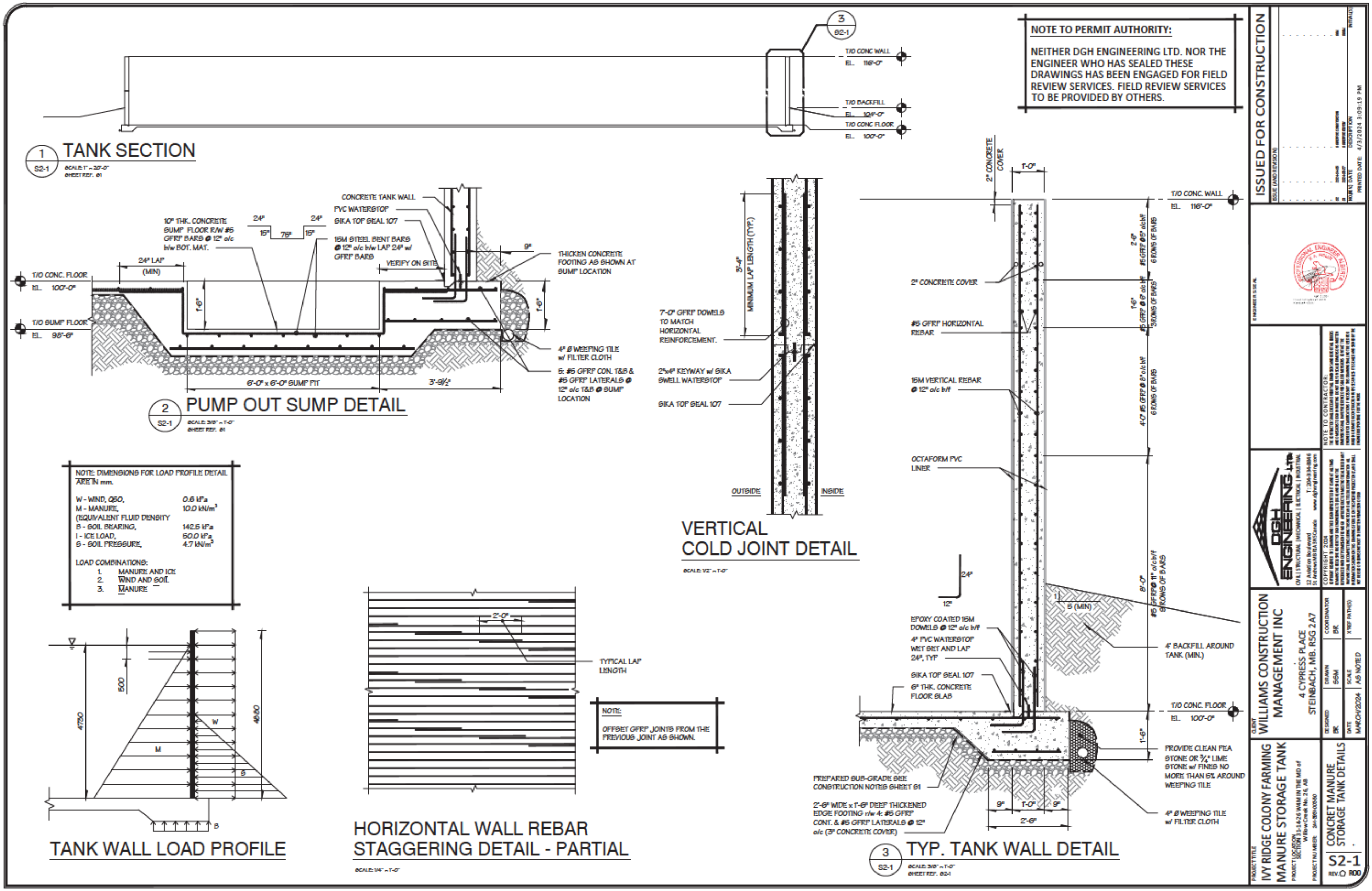
CLIENT: WILLIAMS CONSTRUCTION MANAGEMENT INC
4 CYPRESS PLACE
STEINBACH, MB, R5G 2A7

DESIGNED: BR | DRAWN: SSM | COORDINATOR: BR
DATE: MARCH/2024 | SCALE: AS NOTED | X-REF PATH(S):

PROJECT TITLE: IVY RIDGE COLONY FARMING MANURE STORAGE TANK
PROJECT LOCATION: SE 31-34-26 W1M IN THE MD of Willow Creek No. 26, AB
PROJECT NUMBER: 24-069-00560

CONCRETE TANK - PLAN VIEW SECTION & NOTES

S1 REV. 0 R00


TANK SECTION
SCALE: 1" = 20'-0"
T/O CONC WALL
EL. 116'-0"
T/O BACKFILL
EL. 104'-0"
T/O CONC FLOOR
EL. 100'-0"
NOTE TO PERMIT AUTHORITY:
NEITHER DGH ENGINEERING LTD. NOR THE ENGINEER WHO HAS SEALED THESE DRAWINGS HAS BEEN ENGAGED FOR FIELD REVIEW SERVICES. FIELD REVIEW SERVICES TO BE PROVIDED BY OTHERS.
PUMP OUT SUMP DETAIL
SCALE: 3/8" = 1'-0"
CONCRETE TANK WALL
PVC WATERSTOP
SIKA TOP SEAL 107
10" THK. CONCRETE SUMP FLOOR R/W #5 GFRP BARS @ 12" o/c b/w BOT. MAT.
15M STEEL BENT BARS @ 12" o/c b/w LAP 24" w/ GFRP BARS
VERIFY ON SITE
THICKEN CONCRETE FOOTING AS SHOWN AT SUMP LOCATION
T/O CONC. FLOOR
EL. 100'-0"
T/O SUMP FLOOR
EL. 98'-6"
24" LAP (MIN)
4" Ø WEEPING TILE w/ FILTER CLOTH
5: #5 GFRP CON. T&B & #5 GFRP LATERALS @ 12" o/c T&B @ SUMP LOCATION
6'-0" x 6'-0" SUMP PIT
3'-9½"
VERTICAL COLD JOINT DETAIL
SCALE: 1/2" = 1'-0"
7'-0" GFRP DOWELS TO MATCH HORIZONTAL REINFORCEMENT.
MINIMUM LAP LENGTH (TYP.)
2"x4" KEYWAY w/ SIKA SWELL WATERSTOP
SIKA TOP SEAL 107
OUTSIDE
INSIDE
TYP. TANK WALL DETAIL
SCALE: 3/8" = 1'-0"
2" CONCRETE COVER
#5 GFRP HORIZONTAL REBAR
15M VERTICAL REBAR @ 12" o/c b/f
OCTAFORM PVC LINER
T/O CONC. WALL
EL. 116'-0"
2'-6" #5 GFRP @ 5" o/c b/f 6 ROWS OF BARS
1'-6" #5 GFRP @ 6" o/c b/f 3 ROWS OF BARS
4'-0" #5 GFRP @ 8" o/c b/f 6 ROWS OF BARS
8'-0" #5 GFRP @ 11" o/c b/f 9 ROWS OF BARS
EPOXY COATED 15M DOWELS @ 12" o/c b/f
4" PVC WATERSTOP WET SET AND LAP 24", TYP
SIKA TOP SEAL 107
6" THK. CONCRETE FLOOR SLAB
4' BACKFILL AROUND TANK (MIN.)
T/O CONC. FLOOR
EL. 100'-0"
PROVIDE CLEAN PEA STONE OR ¾" LIME STONE w/ FINES NO MORE THAN 5% AROUND WEEPING TILE
4" Ø WEEPING TILE w/ FILTER CLOTH
PREPARED SUB-GRADE SEE CONSTRUCTION NOTES SHEET S1
2'-6" WIDE x 1'-6" DEEP THICKENED EDGE FOOTING r/w 4: #5 GFRP CONT. & #5 GFRP LATERALS @ 12" o/c (3" CONCRETE COVER)
NOTE: DIMENSIONS FOR LOAD PROFILE DETAIL ARE IN mm.
W - WIND, Q50, 0.6 kPa
M - MANURE, 10.0 kN/m³ (EQUIVALENT FLUID DENSITY
B - SOIL BEARING, 142.5 kPa
I - ICE LOAD, 50.0 kPa
S - SOIL PRESSURE, 4.7 kN/m³
LOAD COMBINATIONS:
1. MANURE AND ICE
2. WIND AND SOIL
3. MANURE
TANK WALL LOAD PROFILE
HORIZONTAL WALL REBAR STAGGERING DETAIL - PARTIAL
SCALE: 1/4" = 1'-0"
TYPICAL LAP LENGTH
NOTE:
OFFSET GFRP JOINTS FROM THE PREVIOUS JOINT AS SHOWN.
ISSUED FOR CONSTRUCTION
PRINTED DATE: 4/3/2024 3:09:19 PM
DGH ENGINEERING LTD.
CLIENT
WILLIAMS CONSTRUCTION MANAGEMENT INC
4 CYPRESS PLACE
STEINBACH, MB. R5G 2A7
PROJECT TITLE
IVY RIDGE COLONY FARMING MANURE STORAGE TANK
CONCRET MANURE STORAGE TANK DETAILS
DATE MARCH/2024
SCALE AS NOTED
S2-1
REV. R00

NOTE TO PERMIT AUTHORITY:

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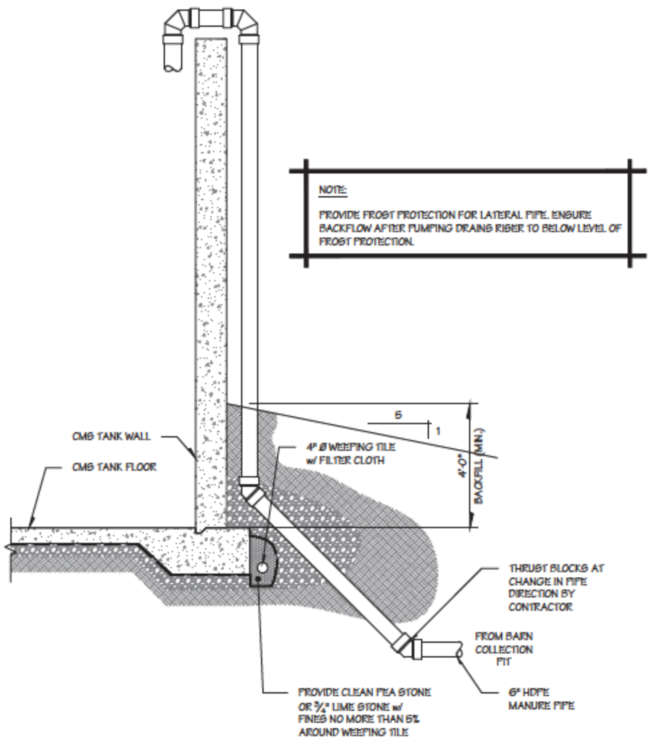
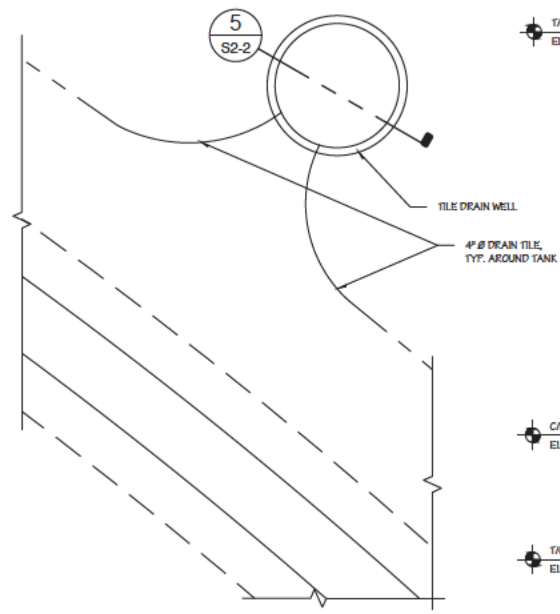


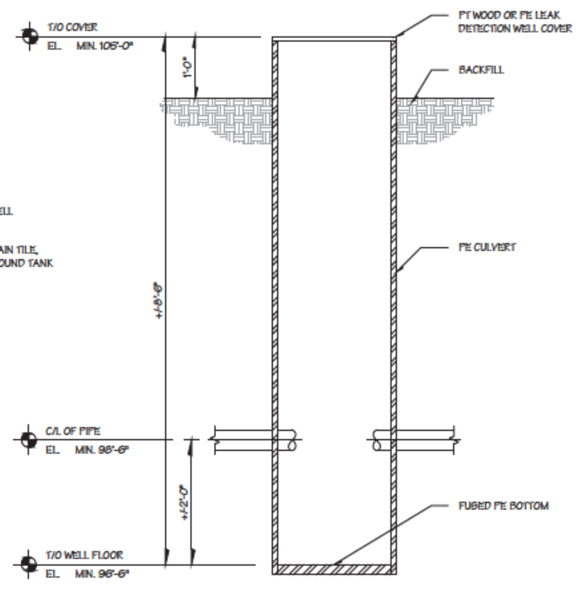
INFLUENT PIPE DETAIL

SCALE: NOT TO SCALE



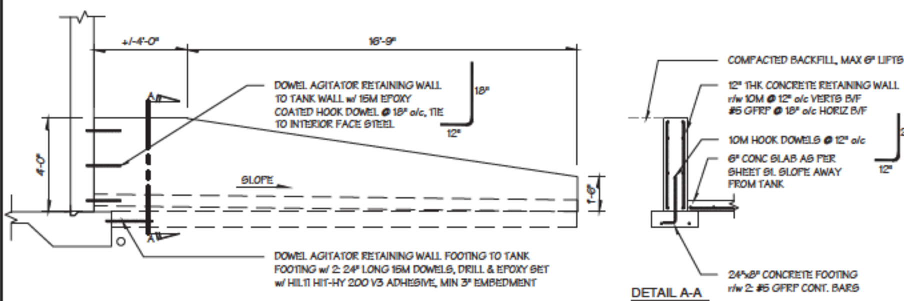
4 S2-2 TILE DRAIN WELL - PLAN

SCALE: 1/2" = 1'-0"
SHEET REF. S1



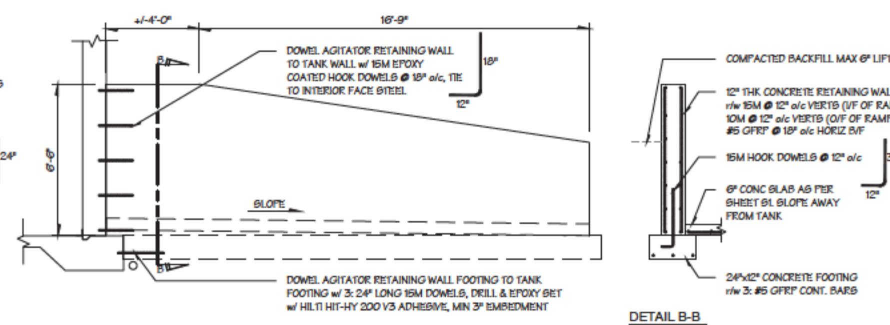
5 S2-2 TILE DRAIN WELL DETAIL

SCALE: 1/2" = 1'-0"
SHEET REF. S2-2



6 S2-2 TYP AGITATOR RETAINING WALL

SCALE: 1/2" = 1'-0"
SHEET REF. S1



7 S2-2 TYP PUMP & AGITATOR RETAINING WALL

SCALE: 1/2" = 1'-0"
SHEET REF. S1

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PRINTED DATE: 4/3/2024 3:09:22 PM

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www.dghengineering.com

CLIENT: WILLIAMS CONSTRUCTION MANAGEMENT INC
4 CYPRESS PLACE
STEINBACH, MB, R5G 2A7

DESIGNED: BR | DRAWN: SSM | COORDINATOR: BR
DATE: MARCH/2024 | SCALE: AS NOTED

PROJECT TITLE: IVY RIDGE COLONY FARMING MANURE STORAGE TANK

LEAK DETECTION WELL & INFLUENT PIPE DETAILS

S2-2
REV. 0 R00

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 - Concrete liner

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

Facility description / name *(as indicated on site plan)* **1.** Chicken & Pullet Barn

2. Calf Shed and Dry Cows

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.	111.56	30.48	AO Comment: Both facilities above grade.	
2.	111.56	45.72		
			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

All barns under Roof

Liner protection

Describe how the physical integrity of the liner will be maintained

Will visuly inspect for crack, and seal as needed

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Last updated February 26, 2021

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 - Concrete liner (cont.)

Concrete liner details

Concrete thickness 6-8"	Method of sulphate protection: Type 50
Concrete strength 25 MPA	Concrete reinforcement size and spacing 10-15m rebar, 12" spacing

Concrete requirements can be found in Technical Gu ·line Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY

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

Additional information *(attach as required)*

NRCB USE ONLY

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

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to Uppermost groundwater resource: _____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Concrete liner details

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

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 - Concrete liner

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

Facility description / name *(as indicated on site plan)* **1.** Broiler Barn

2. Mixed Poultry

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.	111.56 m	36.58	AO Comment: Both facilities above grade.	
2.	76.20 m	18.29		
			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

All barns under Roof

Liner protection

Describe how the physical integrity of the liner will be maintained

Will visuly inspect for cracks, and seal as needed

NRCB USE ONLY

Requirements met: ☐ 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 - Concrete liner (cont.)

Concrete liner details

Concrete thickness	Method of sulphate protection:
6-8"	Type 50
Concrete strength	**Concrete reinforcement size and spacing**
25 MPA	10-15 mm rebar, 12" spacing

Concrete requirements can be found in Technical Guideline Agdex 096-93
Guideline minimums:
Solid manure: 25MPa (D)
Solid manure (wet): 30MPa (C)
Method of sulphate protection:
Type 50 or Type 10 with fly ash or equivalent

NRCB USE ONLY
Requirements met: ☐ YES ☐ NO
Condition required: ☐ YES ☐ NO
Report attached: ☐ YES ☐ NO

Additional information *(attach as required)*

NRCB USE ONLY

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

Depth to water table: _____ Requirements met: ☐ YES ☐ NO

Depth to Uppermost groundwater resource: _____ Requirements met: ☐ YES ☐ NO

ERST completed: ☐ see ERST page for details

Surface water control systems

Requirements met: ☐ YES ☐ NO Details/comments:

Concrete liner details

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

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 - 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. Compacted Soil Liner, Under Manure Storage Pad

2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	NRCB USE ONLY Estimated storage capacity (m³)
1.	40	60	1.01	
2.				
			TOTAL CAPACITY	

☐ I plan to use a short-term solid manure storage (STMS) as part of my manure storage and handling plan for this CFO. (The AOPA requirements for STMS are set out in the NRCB Short-Term Solid Manure Storage Requirements Fact Sheet.

Surface water control systems

Describe the run-on and runoff control system

Run off water will be diverted to a catch basin

Liner protection

Describe how the physical integrity of the liner will be maintained

Pad will be clay lined, will get inspected on a regular base, will get repaired if needed.

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	1.01 (m)	Provide compacted liner details (as required) Recompacted clay liner must be composed of clay till recompacted to at least 1,904 kg/m3 (98% of 1,952 kg/m3).	
Soil texture	21.8 % sand	23.3* % silt	46.6* % clay
Atterberg limits	Plastic limit 15.2	Liquid limit 38.3	Plasticity index 23.1
Hydraulic conductivity	Hydraulic conductivity (cm/s) 5.07x10-8 cm/s		
	Describe test standard used Flexible Wall Permeameter, ASTM D5084-10		

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

* Silt and clay component estimated from total fines.

AO Comment: See attached geotechnical report.

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: _____ Requirements met: ☐ YES ☒ NO

Depth to uppermost groundwater resource: _____ 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: _____

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

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

Volume Calculator

AO Comment: See attached volume calculator and area contributing to runoff.

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.	73	25	2.31	2.31	3-1	3-1	0	
2.								
3.								
							TOTAL CAPACITY	

Compacted soil liner details

Thickness of compacted soil liner	1.01 (m)	Provide details (as required) Recompacted clay liner must be composed of clay till recompacted, to at least1,904 kg / m3 (98 % of 1952 kg / m3	
Soil texture	21.8 % sand	23.3 % silt	46.6 % clay
Atterberg limits	Plastic limit 15.2	Liquid limit 38.3	Plasticity Index 23.1
Hydraulic conductivity	Hydraulic conductivity (cm/s) 5.07x10-8 cm/s		
	Describe test standard used Flexible Wall Permeameter ASTM D5084-10		

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

AO Comment: See attached geotechnical report.

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]	73.0	m	240 ft
Total Width*[4]	25.0	m	82 ft
Total Depth*[4]	2.3	m	8 ft
Design Capacity Depth	*1.80*	m	6 ft
End Slope*[4]	3	run:rise	3 run:rise
Side Slope*[4]	3	run:rise	3 run:rise
Length of Bottom	59.2	m	194 ft
Width of Bottom	11.2	m	37 ft
Capacity @ top of Bank	*2,788*	m^3	*Capacity (@tob)* *98,466* ft^3 *613,328 Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)
Length (design capacity depth)	70.0	m	230 ft
Width (design capacity depth)	22.0	m	72 ft
Total Depth	*2.3*	m	*8* ft
Design Capacity Depth	1.80	m	6 ft
End Slope	3	run:rise	3 run:rise
Side Slope	3	run:rise	3 run:rise
Design Capacity (freeboard level)	**1,948**	m^3	68,784 ft^3
			428,444 Imp. Gal.
level)	*1,540*	m^2	*16,576* ft^2

CFO Name [1] Hutterian Brethren of Ivy Ridge
Land Location [1]

Paved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
1			0.0
2			0.0
3			0.0
4			0.0
5			0.0
		Total Area (m^2)	**0**

Unpaved Runoff Catchment Area(s)

Area [2]	Length (m)	Width (m)	Area (m^2)
6	282	83	23,406.0
7			0.0
8			0.0
9			0.0
10			0.0
		Total Area (m^2)	**23,406**

Rainfall (Select Town [3])

Stavely 95

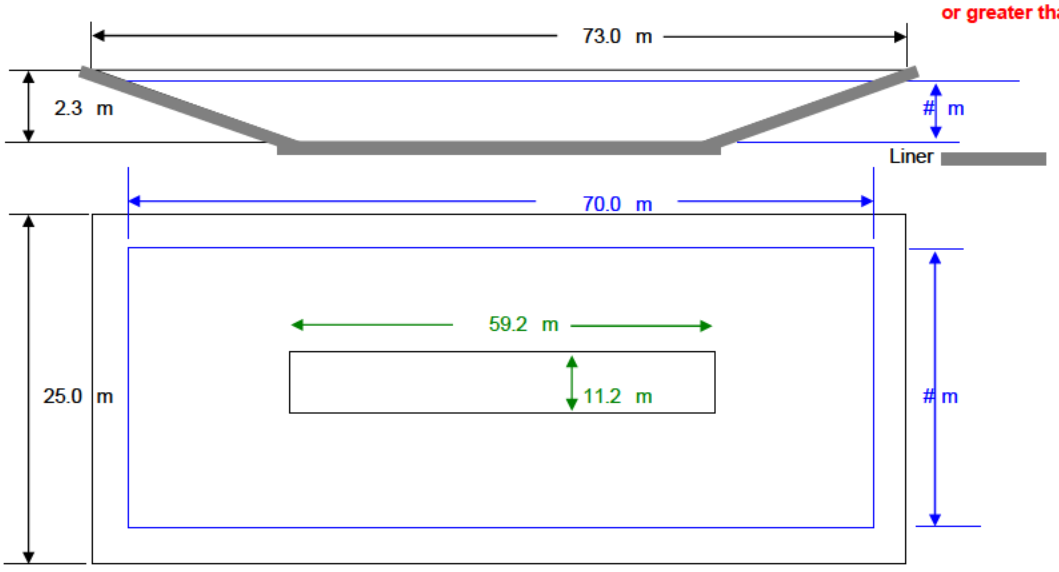
AOPA Design Rainfall **95 mm**

Minimum Catchbasin Storage Volume Required

1,445 m^3 ** 51041.012 ft^3

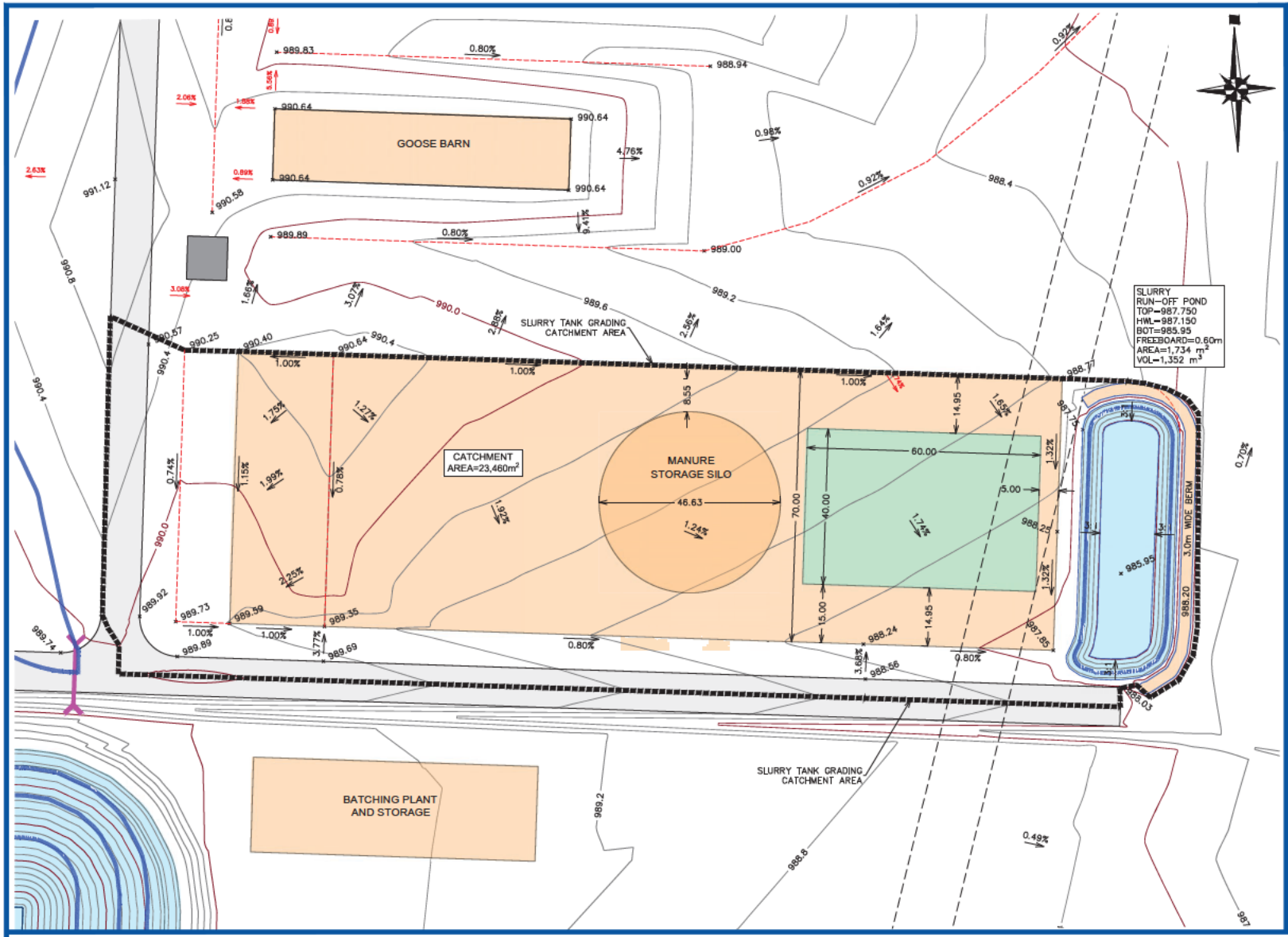
317925.94 Imp. Gal.

**** 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



LEGEND:

1:1000

IVY RIDGE HUTTERITE COLONY

Apr 23, 2024

SLURRY TANK GRADING
FIGURE 1

229729LS

MARTIN GEOMATIC CONSULTANTS
Consulting Engineers, Planners, and Land Surveyors
255-31st Street North Lethbridge, Alberta T1H 3Z4
Ph: (403) 329-0550 E-mail: geomart@mrgc.ca Fax: (403) 329-0594

Atterberg Limit (AL) and Mechanical Wash Sieve (MWS) analyses were performed on a mudstone sample obtained from Borehole BH107. The AL result is summarized in Table 4.4.

TABLE 4.4: SUMMARY OF MUDSTONE ATTERBERG LIMIT TEST RESULT

Sample No. and Depth	Borehole No.	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Moisture Content (%)	MUSC - Soil Type
MW39 - 3.81 m	BH107	46.7	14.6	32.1	15.7	CI

Based on the result in Table 4.3, the mudstone has a MUSC of "CI" - Clays or Silts of medium plasticity. The MWS result also indicated that the mudstone contained, by mass, 0.0% gravel, 2.5% sand, and 97.5% clay and silt.

4.2 GROUNDWATER

Seepage was not encountered during drilling. Following drilling, piezometers were installed in Boreholes BH101, BH105, BH107, and BH109 which were monitored fifty days following drilling, on 30th January, 2024. The monitoring results are summarized in Table 4.5.

TABLE 4.5: SUMMARY OF GROUNDWATER MONITORING

Borehole No.	Borehole Depth[1] (m)	Borehole Elevation[2] (m)	Water Level[1] (m), 30th January, 2024	Groundwater Elevation[1] (m)
BH101	3.81	992.37	Dry[3]	Below 988.56[3]
BH105	5.18	991.24	4.34	986.90
BH107	5.49	994.39	Dry[3]	Below 988.90[3]
BH109	3.81	990.87	2.01	988.86
Average:			**3.91**	**988.31**

Notes:
1 - Below existing grade.
2 - Elevations based on survey performed by others.
3 - Maximum borehole depth utilized as the water level in average result.

Based on the lack of seepage observed during drilling and the water level observed in the piezometer, the groundwater level at the site varies, but is likely between 2.0 to 4.0 m below ground surface across the site at an approximate elevation of 988.31 m.

compaction testing, monitoring, and proper documentation, will be required to minimize potential impacts regarding settlement;

3. Based on the AL and MWS results, the sand had a MUSC of "CL" - Lean Clay to "ML" - Silty or Clayey Sand of low plasticity and is not expected to experience volume changes with fluctuating moisture conditions. However, the sand is frost active and will experience volume changes during freezing/thawing cycles. Construction of unheated on-grade structures, where movement would be detrimental, is not recommended on the sand unless the bearing surface extends past the frost depth;

4. Based on the AL and MWS results, the till had an average MUSC of "CI" - Clays or Silts of medium plasticity and is expected to experience minor to moderate volume changes with fluctuating moisture conditions. However, the till is frost active and will experience volume changes during freezing/thawing cycles. Construction of unheated on-grade structures, where movement would be detrimental, is not recommended unless the bearing surface extends past the frost depth;

5. The low plastic sand and medium plastic till offers moderate to good bearing support for shallow foundations;

6. The till and mudstone offer good to excellent skin friction resistance and end bearing support for deep foundations;

7. A flexible wall permeameter analyses was performed on an undisturbed till sample obtained 3.05 m below grade in Borehole BH109 to aid in the stormwater retention pond design. The result indicated a laboratory soil hydraulic conductivity of 5.07×10^{-10} m/s;

8. For large, heavy structures, a building specific geotechnical investigation is recommended to hone the design once the building footprint is known;

9. Information obtained from installed piezometers indicates that the depth to groundwater table varies, but is likely at an approximate elevation of 988.31 m. Excavations beyond this elevation may likely start seeping and filling with water if they are left open for extended periods of time; and,

11 CLOSURE

Union Street Geotechnical Ltd. prepared this report for the use of Martin Geomatic Consultants Ltd., and their agents, for the design and construction of the Ivy Ridge Hutterite Colony located within Section 31-14-26 W4M in the M.D. of Willow Creek No. 26, Alberta.

Samples obtained from this geotechnical investigation will be retained in our laboratory for 30 days following the date of the final report. Should no instructions be received to the contrary, these samples will then be discarded.

Yours truly,

Union Street Geotechnical Ltd.

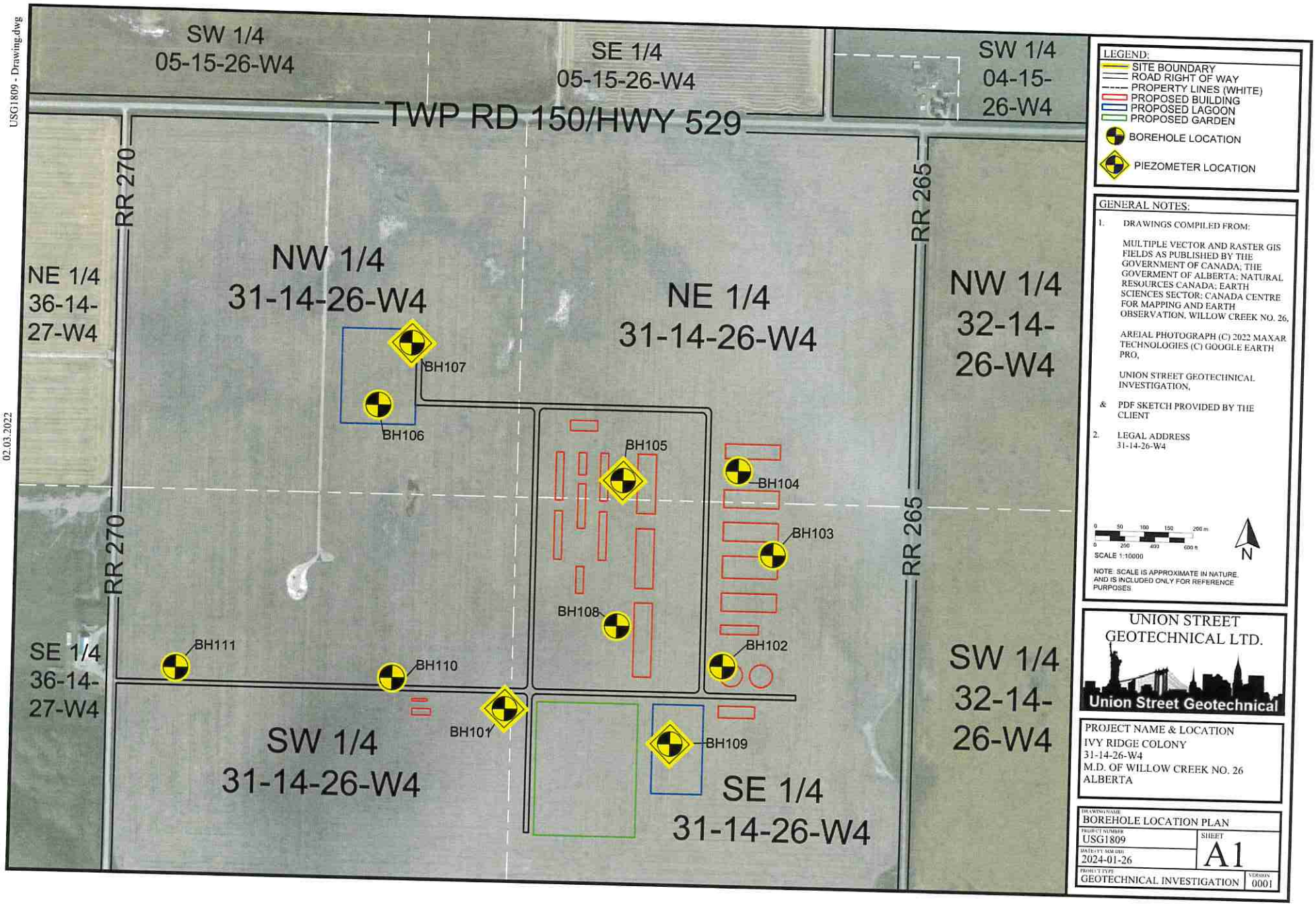
Prepared By:

Neil Tomaszewski, P.Eng.
Project Engineer

Reviewed By:

Joshua Wilson, P.Eng.
Geotechnical Manager

PERMIT TO PRACTICE
Union Street Geotechnical Ltd.
RM SIGNATURE:
RM APEGA ID#: 80317
DATE: 2nd Feb, 2024
PERMIT NUMBER: P12644
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)


USG1809 - Drawing.dwg
02.03.2022
SW 1/4
05-15-26-W4
SE 1/4
05-15-26-W4
SW 1/4
04-15-
26-W4
TWP RD 150/HWY 529
RR 270
RR 265
NE 1/4
36-14-
27-W4
NW 1/4
31-14-26-W4
NE 1/4
31-14-26-W4
NW 1/4
32-14-
26-W4
BH107
BH106
BH105
BH104
BH103
BH108
BH102
BH111
BH110
BH101
BH109
SE 1/4
36-14-
27-W4
SW 1/4
31-14-26-W4
SE 1/4
31-14-26-W4
SW 1/4
32-14-
26-W4
LEGEND:
SITE BOUNDARY
ROAD RIGHT OF WAY
PROPERTY LINES (WHITE)
PROPOSED BUILDING
PROPOSED LAGOON
PROPOSED GARDEN
BOREHOLE LOCATION
PIEZOMETER LOCATION
GENERAL NOTES:
1. DRAWINGS COMPILED FROM:
MULTIPLE VECTOR AND RASTER GIS FIELDS AS PUBLISHED BY THE GOVERNMENT OF CANADA; THE GOVERMENT OF ALBERTA; NATURAL RESOURCES CANADA; EARTH SCIENCES SECTOR; CANADA CENTRE FOR MAPPING AND EARTH OBSERVATION, WILLOW CREEK NO. 26,
AREIAL PHOTOGRAPH (C) 2022 MAXAR TECHNOLOGIES (C) GOOGLE EARTH PRO,
UNION STREET GEOTECHNICAL INVESTIGATION,
& PDF SKETCH PROVIDED BY THE CLIENT
2. LEGAL ADDRESS
31-14-26-W4
0 50 100 150 200 m
0 200 400 600 ft
SCALE 1:10000
N
NOTE: SCALE IS APPROXIMATE IN NATURE, AND IS INCLUDED ONLY FOR REFERENCE PURPOSES.
UNION STREET GEOTECHNICAL LTD.
Union Street Geotechnical
PROJECT NAME & LOCATION
IVY RIDGE COLONY
31-14-26-W4
M.D. OF WILLOW CREEK NO. 26
ALBERTA
DRAWING NAME
BOREHOLE LOCATION PLAN
PROJECT NUMBER
USG1809
SHEET
A1
DATE (YY-MM-DD)
2024-01-26
PRODUCT TYPE
GEOTECHNICAL INVESTIGATION
VERSION
0001