LA25022 Technical Document

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	LA25022	NE 8-11-21 W4M

APPLICATION DISCLOSURE

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

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

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

March 21/25
Date of signing

[redacted]
Signature

J-Bar Farms
Corporate name (if applicable)

Jamie Vandenberg
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)
barn lambing barn		50 x 60 15 m x 18 m
~~processing area~~ non-CFO facility		
corrals	① pen 1	120 x 120 37 m x 37 m 14,400 sq ft
	② pen 2	80 x 180 24 m x 55 m 16800 ft²
	③ pen 3	37 m x 37 m x 52 m (triangular) 9600 ft²

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

~~Existing facilities~~ Proposed facilities continued	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
shelter	160 x 60	
pen 4 with shelter 30.5 m x 55 m + 18 m x 49 m corral	100 x 180	
catch basin (facility proposed by applicant and included throughout application - forgotten here)	30 m x 30 m x 2 m deep	

NRCB USE ONLY

Application for a new CFO

Last updated September 11, 2023

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

corral # 1 is mostly a rebuild with a small piece added

Construction completion date for proposed facilities Dec. 2025

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
300 feeders beef	0	300	300
250 ewes with lambs	0	250	250
Application for a new CFO. Reduced proposed livestock numbers from the part 1 application.			

Last updated September 11, 2023

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

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

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

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

Signed this ____day of _____, 20____. _____

Signature of Applicant or Agent

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

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

Signed this 21 day of March, 2025. [redacted]

Signature of Applicant or Agent

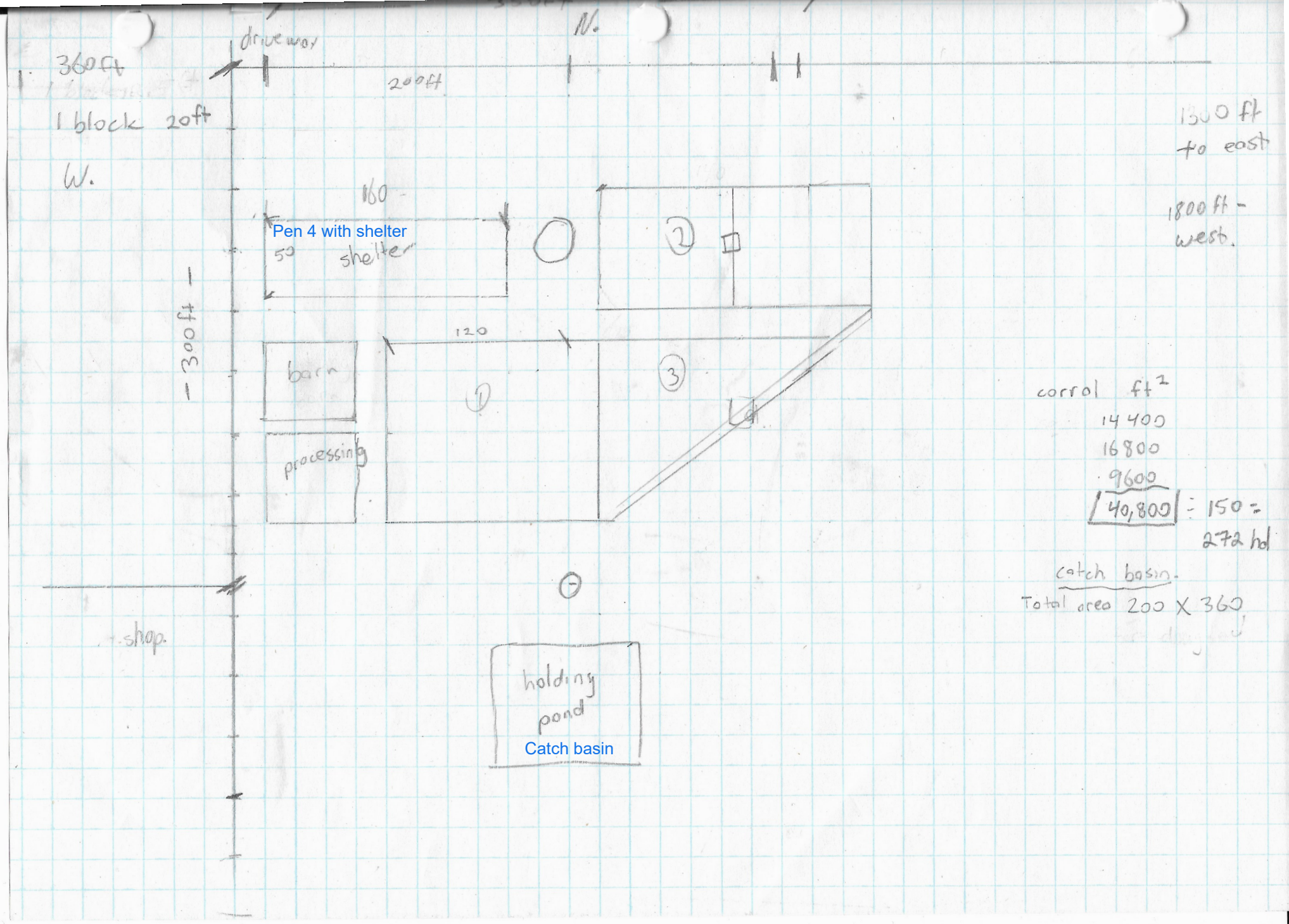
OPTION 3: Additional water licence not required

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


360ft
1 block 20ft
W.
driveway
N.
200ft
1800 ft to east
1800 ft - west.
160
Pen 4 with shelter
50
shelter
2
300 ft
barn
processing
120
1
3
shop
holding pond
Catch basin
corrol ft²
14 400
16 800
9600
40,800 ÷ 150 =
272 hd
catch basin.
Total area 200 X 360

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GENERAL ENVIRONMENTAL INFORMATION

(complete this section for the worst case of the existing facility which is the closest to water bodies or water wells and for each of the proposed facilities)

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

Existing: No existing permitted facilties - application for a new CFO **Proposed 1:** shelter & corrals 1-3 and existing

Proposed 2: Barn **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	Confirmed 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	0	☑ YES ☐ NO ☐ YES with exemption	None observed during site visit
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0	0	☑ YES ☐ NO ☐ YES with exemption	None registered to LLD and none observed during site visit
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	canal	2 miles	N		☑ YES ☐ NO ☐ YES with exemption	Irrigation canal 1.8 km east of proposed CFO
Groundwater information	What is the depth to the water table?	2.2	2	2	2	☐ YES ☐ NO ☑ YES with exemption condition	Approx 1 mbgs (see attached report). Condition required to address 1 m requirement
	What is the depth to the groundwater resource/aquifer you draw water from?	0	0	0	0	☑ YES ☐ NO ☐ YES with exemption	WW ID 221690: water drawn from 49 mbgs to 52 mbgs on neighboring quarter section

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

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NRCB USE ONLY

ENVIRONMENTAL RISK SCREENING INFORMATION

ERST for **proposed** facilities

Facility	Groundwater score	Surface water score	File number
Lambing barn	Low	Low	LA25022
Pen 1			LA25022
Pen 2			LA25022
Pen 3			LA25022
Pen 4 with shelter			LA25022
Catch basin			LA25022

ERST for **existing** facilities

Facility	Groundwater score	Surface water score	File number
No existing facilities			

ERST related comments:

See Decision LA25022

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NRCB USE ONLY

WATER WELL AND SURFACE WATER INFORMATION

Well IDs: WW ID 221690 (on SW quarter, for purposes of identifying UGR only)

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

Groundwater or surface water related comments:

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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**
Case Dunsbergen	SW-16-11-21	1300 ft	Rural Ag	1	364 m	NA	Yes
Art Vande Bruinhorst	NW-8-11-21	1850	Rural Ag	1	355 m	NA	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)**
J-Bar Farms	NE 8-11-21	70 acres	Irrigated	70 ac	
			Total	70 ac	

* 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)

20'

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MINIMUM DISTANCE SEPARATION

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

Margin of error (if applicable): +/- 3m

Requirements (m): Category 1: 220 Category 2: 294 Category 3: 367 Category 4: 587

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: 42.4 ac irrigated

Land base listed: 70 ac

Area not suitable: Already subtracted

Available area 70 ac 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 _____

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NRCB USE ONLY

ALL SIGNATURES IN FILE ☑ YES ☐ NO

DATES OF APPROVAL OFFICER SITE VISITS

May 13, 2025	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: May 27, 2025

Municipality: Lethbridge 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: Lethbridge Northern Irrigation District ☐ N/A

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

Other: Lethbridge North County Potable Water Coop Ltd., ATCO Gas and Pipelines ☐ N/A

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

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

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

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

1. corral 1-3 pens 1-3
2. ~~shelter~~

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m^3)
1.	80 120	180 24 m x 55 m 120 37 m x 37 m	0	
2.	~~160~~	~~60~~	0	
	120 x 120 ÷2	37 m x 37 m x 52 m (triangular)	0 TOTAL CAPACITY	Pens are considered 9 months of solid manure storage

☐ 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

catch basin.

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	2 (m)	Provide details (as required)	
Soil texture	35.4 % sand	26.6 % silt	38 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 3 m. clay loam	Hydraulic conductivity (cm/s): 1.1 x 10-8 -7 2.5 x 10	Describe test standard used: modified falling head test

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

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

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

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

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

1. barn.
2. corral existing pen 4 with shelter

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m^3)
1.	50	60 15 m x 18 m	0	
2.	100	180 30.5 m x 55 m	0	
			TOTAL CAPACITY	Adequate storage

☐ 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

catch basin

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	2 (m)	Provide details (as required)	
Soil texture	35.4 % sand	26.6 % silt	38 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 3m. clay loam	Hydraulic conductivity (cm/s): 1.1 x 10-8 2.5 x 10 -7	Describe test standard used: modified falling head test

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

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

Last updated February 26, 2021

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

NRCB USE ONLY

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

Depth to water table: 1 mbgs Requirements met: ☑ YES ☐ NO

Depth to uppermost groundwater resource: 49 mbgs Requirements met: ☑ YES ☐ NO

ERST completed: ☑ see ERST page for details

Surface water control systems

Requirements met: ☑ YES ☐ NO Details/comments:

A catch basin will collect manure contaminted runoff

Naturally occurring protective layer details

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

Sand lens at 4.5 mbgs

RUNOFF CONTROL CATCH BASIN: Naturally occurring protective layer

*(complete a copy of this section for **EACH proposed** runoff control catch basin with a naturally occurring protective layer)*

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

1. catch basin-
2. _____
3. _____

Determination of runoff area

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

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY
					Inside end walls	Inside side walls	Outside walls	Calculated storage capacity (excl. 0.5 m freeboard) (m^3)
1.	30 ~~70~~	30 ~~70~~	2m.	2m	3:1	3:1		770 m3
2.								
3.								
							TOTAL CAPACITY	770 m3

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	2 (m)	Provide details (as required)	
Soil texture	39.2 % sand	26.8 % silt	34 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested: 6m clay loam	Hydraulic conductivity (cm/s): 8.0×10^{-9} 1.1 x 10-8	Describe test standard used: modified falling head

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

If soil info differs per facility include additional soils page.

NRCB USE ONLY

Requirements met: ☑ YES ☐ NO

Condition required: ☑ YES ☐ NO

Report attached: ☑ YES ☐ NO

Condition required to address the shallow water table

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]	30.0	m	98	ft
Total Width*[4]	30.0	m	98	ft
Total Depth*[4]	2.0	m	7	ft
Design Capacity Depth	*1.50*	m	5	ft
End Slope*[4]	3	run:rise	3	run:rise
Side Slope*[4]	3	run:rise	3	run:rise
Length of Bottom	18.0	m	59	ft
Width of Bottom	18.0	m	59	ft
Capacity @ top of Bank	*1,176*	m^3	*Capacity (@tob)* *41,530*	ft^3
			258,684	*Imp. Gal.*

Design Capacity of Catch Basin (freeboard level)			Design Capacity (freeboard level)	
Length (design capacity depth)	27.0	m	89	ft
Width (design capacity depth)	27.0	m	89	ft
Total Depth	*2.0*	m	7	ft
Design Capacity Depth	1.50	m	5	ft
End Slope	3	run:rise	3	run:rise
Side Slope	3	run:rise	3	run:rise
Design Capacity (freeboard level)	**770**	m^3	27,175	ft^3
			169,266	Imp. Gal.
level)	*729*	m^2	*7,847*	ft^2

CFO Name [1]

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	37	37	1,369.0
7	24	55	1,320.0
8	6	18	108.0
9	19	55	1,045.0
10			0.0
		Total Area (m^2)	**3,842**

Area 8: uncovered area of pen 4 with shelter
Area 9: pen 3 (triangular)

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

Picture Butte 85

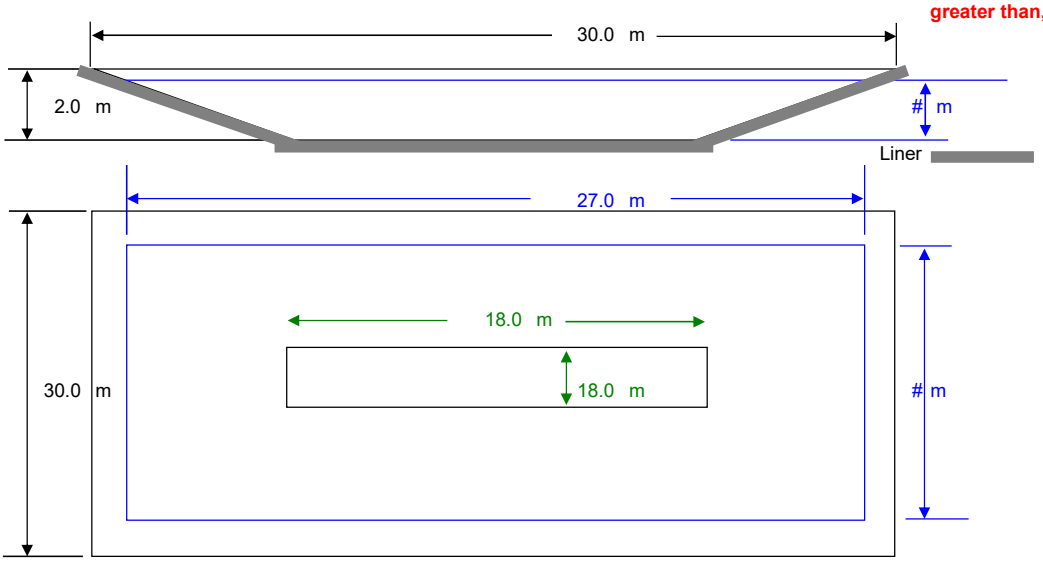
AOPA Design Rainfall **85 mm**

Minimum Catchbasin Storage Volume Required

196 m^3 ** **6919.626427 ft^3**

43101.19743 Imp. Gal.

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



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

NTS - Not To Scale

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

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 770 m3 Runoff capacity requirements met: ☑ YES ☐ NO

Calculation of the volume attached: ☑ YES ☐ NO

Depth to water table: 1 m Requirements met: ☐ YES ☐ NO

Dependent at the time of construction if requirement is met - see below.

Depth to uppermost groundwater resource: 49 mbgs Requirements met: ☑ YES ☐ NO

ERST completed: ☑ See ERST page for details

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

AOPA required that there is 1 metre between the bottom of a MCA/MSF and the water table at the time of construction. The catch basin is proposed to be 2 m deep. As the water table fluctuates, the catch basin may meet this requirement. A condition is included in this registration that the construction of the catch basin be supervised by an engineer and provide written confirmation that the water table was not encountered nor observed to be within 1 m of the bottom of the catch basin at the time of construction.

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

23 July 2025

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

JLECS File: P25037

J-Bar Farms
PO Box 951
Picture Butte, AB T0K 1V0

Attention: Mr. Jamie Vandenberg

Re: Geotechnical Review and Evaluation
NRCB Permitting of Pens & Catch Basin
NE-08-011-21-W4M, near Picture Butte, Alberta

As requested, J Lobbezoo Engineering & Consulting Services Ltd. (JLECS) has carried out a geotechnical review and evaluation of the above-captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA"). This letter describes the site soil conditions to support a permit application related to a proposed pens and a catch basin at the above captioned site (refer to Figure 1, attached).

In order to demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater resource, six boreholes were advanced at the site on April 1, 2025. The boreholes were advanced at the approximate locations denoted as JB1-25 to JB6-25 on Figure 1, attached.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of 3.0 m to 7.8 m below the existing grade. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered in the boreholes consisted of lacustrine clay and silty clay loam overlying stiff, medium plastic clay till below about 1.2 m to 1.5 m. While perched groundwater was identified in three of the boreholes, no groundwater resource (as defined by the AOPA) was encountered within the 7.8 m investigation depth at this site.

Samples of soil collected from the screened zones of boreholes JB2-25 and JB5-25, as well as samples from similar depths at the other boreholes were all subjected to grain size analyses, which was carried out by Down to Earth Laboratories in Lethbridge, Alberta. The lab report is attached, for reference. The results indicate a soil texture breakdown of:

Table 1: Soil Texture Analyses

Borehole/Depth	% Sand	% Silt	% Clay
JB1-25 / 2.5 – 3.0 m	35	27	38
JB2-25 / 2.5 – 3.0 m	38	32	30
JB3-25 / 2.5 – 3.0m	37	33	30
JB4-25 / 7.0 – 7.5m	40	31	29
JB5-25 / 5.0 – 6.0m	39	27	34
JB6-25 / 5.0 – 6.0m	38	29	33
Average:	*38*	*30*	*32*

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes JB2-25 and JB5-25. Test well JB2-25 (proposed pen area) was screened from 2.2 m to 3.8 m depth while test well JB5-25 (proposed catch basin area) was screened from 3.0 m to 6.2 m depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring well to the top for several consecutive days. After several days of testing, a 24-hour water drop of 0.1 m was determined at JB2-25, and a 24-hour water drop of 0.56 m was determined at JB5-25.

To calculate the permeability of the screened portion of the clay strata at the test well location, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test reports. The results of the permeability testing indicated an *in situ* hydraulic conductivity (k_s) of 1.1×10^{-8} cm/s at JB2-25, and an *in situ* hydraulic conductivity (k_s) of 2.8×10^{-9} cm/s at JB5-25.

Using the measured permeability of the clay at this site, the 1.6 m of clay screened at test hole JB2-25 and the 3.2 m of clay screened at test hole JB5-25 are both estimated to represent the equivalent of more than 100 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA). This represents natural material protection in excess of the minimum requirements outlined by the AOPA for catch basins (minimum 5 m, Section 9.5-b) and solid manure storage (minimum 2 m, Section 9.5-c).

Conclusion

Based on the results of the current investigation, permeability testing, and our understanding of the site and development at the site, it is JLECS's opinion that the naturally occurring materials at the site satisfy the AOPA requirements for permitting the proposed pens and catch basin at this location.

We trust that this report satisfies your present requirements. Should you have any questions, please contact the undersigned at your convenience.

Yours truly,

J Lobbezoo Engineering & Consulting Services Ltd.

PROFESSIONAL ENGINEER ALBERTA
JOHN R. LOBBEZOO
ID 110450
23 July 2025

John Lobbezoo, P.Eng.
Principal Geotechnical Engineer

PERMIT TO PRACTICE
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.
RM SIGNATURE:
RM APEGA ID #: 110450
DATE: 23 July 2025
PERMIT NUMBER: P016456
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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

Figure 1: Site Layout & Borehole Locations

Image Credit: Google

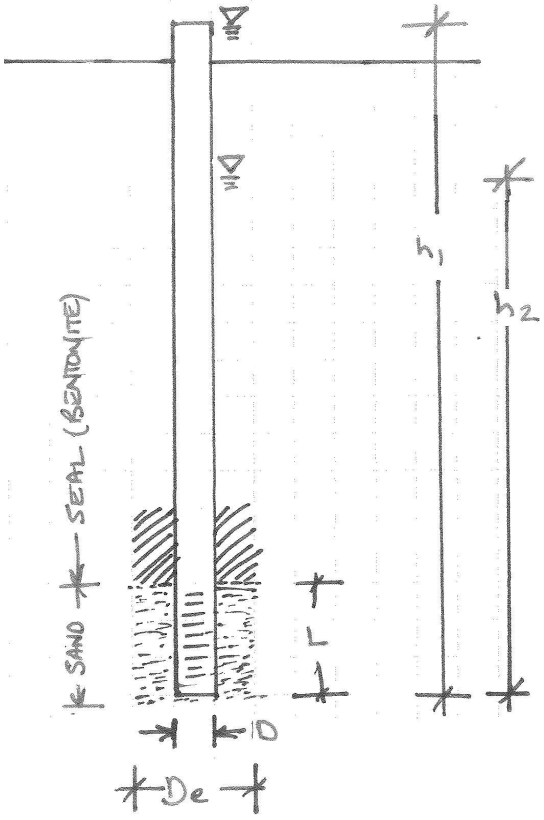
JB2-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

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



JB2-25 - J-Bar Farms

JLECS File: P25037

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	1.60	length of sand section (m)
h1	4.50	initial height of water above base of hole (m)
h2	4.40	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 1.1E-08 cm/sec

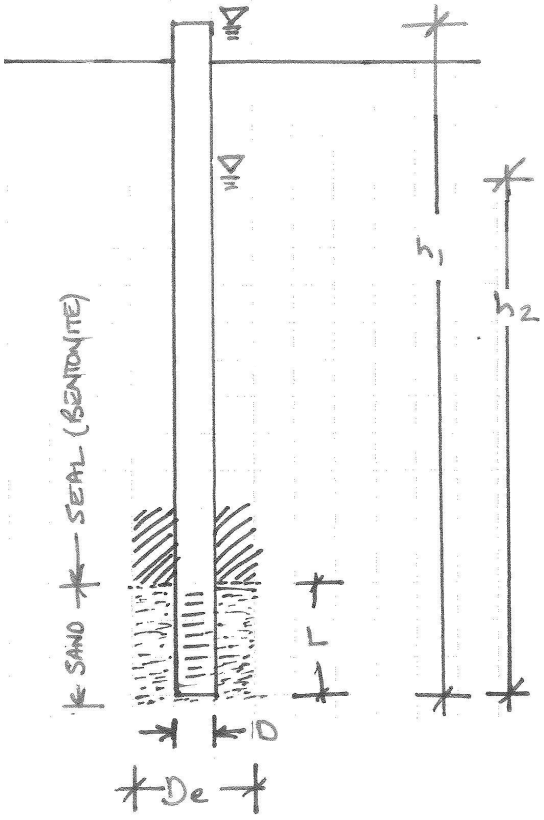
JB5-25

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

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



JB5-25 - J-Bar Farms

JLECS File: P25037

INPUT VARIABLES

Terms	Value	Definition
D	0.0520	diameter of standpipe (m)
De	0.1500	diameter of borehole (m)
L	3.20	length of sand section (m)
h1	6.80	initial height of water above base of hole (m)
h2	6.24	final height of water above base of hole (m)
t	24.0	time of test (h)

k_s = 2.8E-08 cm/sec

Down To Earth Labs Inc.

The Science of Higher Yields

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

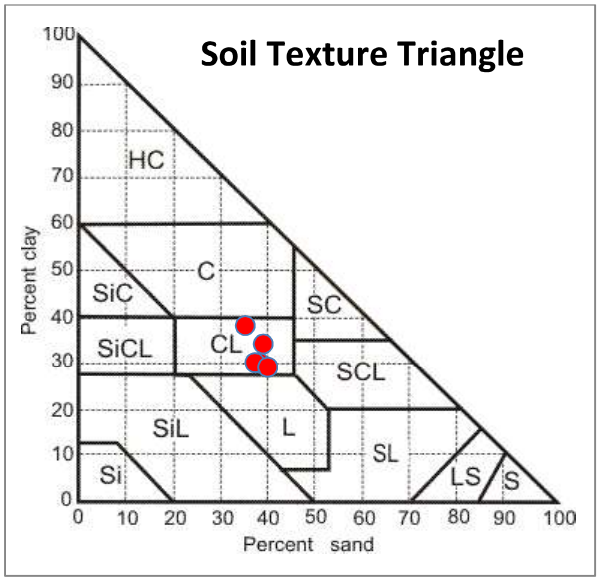
Report #: 205154
Report Date: 2025-04-25
Received: 2025-04-23
Completed: 2025-04-25
Test Done: ST

Project : J.Bar Farms

PO:

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

Analyte	Units	250423L001	250423L002	250423L003	250423L004	250423L005
Sample ID:		250423L001	250423L002	250423L003	250423L004	250423L005
Cust. Sample ID:		JB 1-25	JB 2-25	JB 3-25	JB 4-25	JB 5-25
Analyte	**Units**	2.5-3.0	2.5-3.0	2.5-3.0	7.0-7.5	5.0-6.0
Sand	%	35.4	38.4	37.4	40.2	39.2
Silt	%	26.6	31.6	32.6	30.8	26.8
Clay	%	38.0	30.0	30.0	29.0	34.0
Soil Texture	-	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam



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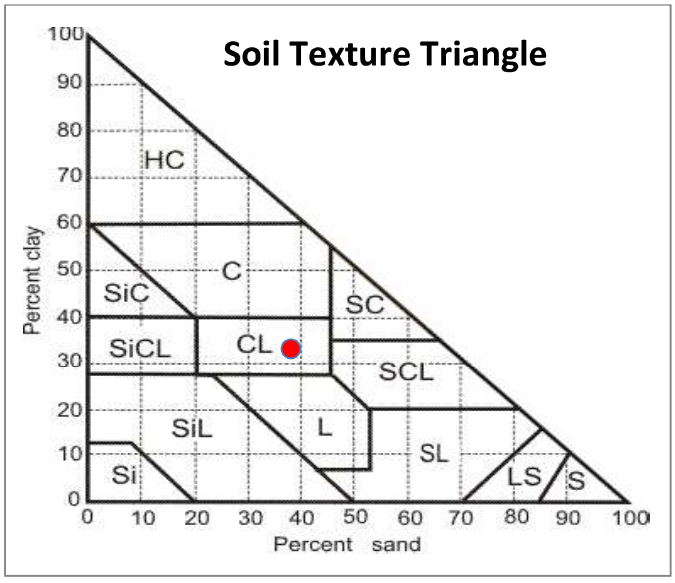
Analyte	Units	Sample ID: 250423L006 Cust. Sample ID: JB 6-25 5.0-6.0
Sand	%	38.2
Silt	%	28.8
Clay	%	33.0
Soil Texture	-	Clay Loam



Raygan Boyce - Chemist

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NE-8-11-21-W4, J-Bar Farms Date: 01-Apr-25

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
JB1-25	0368658	0-0.3	C	M	Lac		Stiff, med plastic, grey
	5529287	0.3-0.7	C	M	Lac		Stiff, med plastic, brown
		0.7-1.2	SiCL	VM	Lac		Soft, med plastic, olive brown
		1.2-3.0	CL-C	M	Till	2.5-3.0	Stiff, med plastic, brown
JB2-25	0368700	0-1.2	C	M	Lac		Stiff, med plastic, olive brown
	5529290	1.2-1.5	CL-SiCL	VM	Lac		Soft, med plastic, olive brown
		1.5-3.8	CL-C	M	Till	2.5-3.0	Stiff, med plastic, brown
							50mm H.C. Well installed to 3.8m BGS
							Screen: 3.8-2.3m
							Sand: 3.8-2.2m
							Bentonite: 2.2-0.0m
							Stickup: 0.7m
							Hole Diameter: 0.15m
JB3-25	0368670	0-0.9	CL	M	Lac		Stiff, med plastic, brown
	5529338	0.9-1.0	SiCL	VM-Sat	Lac		Soft, med plastic, olive brown
		1.0-1.6	CL	M	Till		Stiff, med plastic, brown
		1.6-3.0	CL-C	M	Till	2.5-3.0	Stiff, med plastic, brown
JB4-25	0368708	0-0.15	CL	M	Topsoil		
	5529270	0.15-1.0	CL	M	Lac	0.5-1.0	Stiff, med plastic, brown
		1.0-1.6	SiCL	Sat	Lac		Soft, med plastic, olive brown
		1.6-7.8	CL-C	M	Till	7.0-7.5	Stiff, med plastic, brown
							Free water @ 2.1m, Sat sand lens @ 4,5m
							1" WTW installed to 7.8m BGS
JB5-25	0368689	0-0.15	CL	M	Topsoil		
	5529235	0.15-0.7	SiCL	M	Lac		Firm, med plastic, olive brown
		0.7-1.5	SiCL	Sat	Lac	0.7-1.0	Soft, med plastic, olive brown
		1.5-7.5	C	M	Till	3.0-4.5	Stiff, med plastic, brown
						5.0-6.0	Irrigation water sitting on top of clay @ 1.5m
							50mm H.C. Well installed to 6.2m BGS
							Screen: 6.2-3.2m
							Sand: 6.2-3.0m
							Bentonite: 3.0-0.0m
							Stickup: 0.6m
							Hole Diameter: 0.15m
JB6-25	0368688	0-0.15	CL	M	Topsoil		
	5529266	0.15-0.7	SiCL	M	Lac		
		0.7-1.5	SiCL	Sat	Lac		Soft, med plastic, olive brown
		1.5-3.1	CL-C	M	Till		Stiff, med plastic, brown
		3.1-3.7	CL	M	Till		V. Firm, med plastic, brown
		3.7-7.5	C	M	Till		Stiff, med plastic, brown
							Irrigation water sitting on top of clay @ 1.5m

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