

Part 2 – Technical Requirements



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

NRCB USE ONLY

☒ Approval ☐ Registration ☐ Authorization

☐ Amendment

Application number

LA26017

Legal land description

NE 16-19-1 W5M

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 20 2026
Date of signing

Bosch Feederco
Corporate name (if applicable)

[Redacted Signature]
Signature

Tom Indenbosch
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)
Feedlot 16 pens	250 ^{ft} x 250 ^{ft} each
Ketch boiser	updated dimensions
	18 pens 200 x 250' each
	(61m x 76.2m)

Dimensions:
90m x 35m x 4m deep

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

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

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

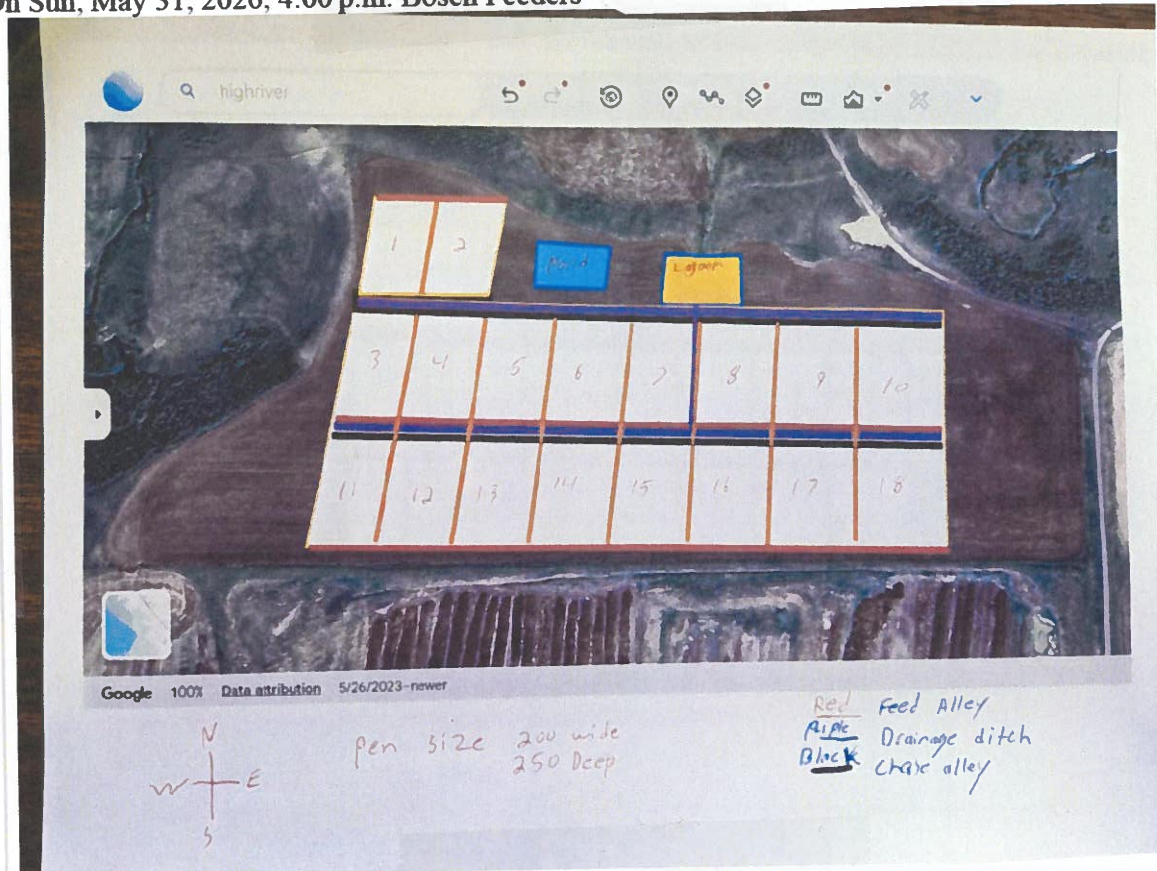
Construction completion date for proposed facilities _____

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).

[illegible]

On Sun, May 31, 2026, 4:00 p.m. Bosch Feeders



Part 2 — Technical Requirements

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



DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING WATER ACT LICENCE

issued by Alberta Environment and Protected Areas (EPA) for a confined feeding operation (CFO)

Date and sign one of the following four options

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

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

Signed this ____ day of _____, 20____.

Signature of Applicant or Agent

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

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

Signed this ____ day of _____, 20____.

Signature of Applicant or Agent

OPTION 3: Additional water licence not required

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

Signed this ____ day of _____, 20____.

Signature of Applicant or Agent

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)

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

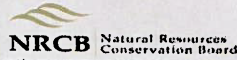
1. At this time, I (we) do not know whether a new water licence is needed from EPA under the *Water Act* for the development or activity proposed in this AOPA application.
2. If a new *Water Act* licence is needed, I (we) request that the NRCB process the AOPA application **independently of** EPA's processing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

Signed this 20 day of march, 2026.

Signature of Applicant or Agent

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)



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

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

Signed this 15 day of June, 2026.

Signature of applicant or agent

Information about related proceedings (MANDATORY)

☐ I am aware of proceedings (applications, appeals, amendments, etc.) with Environment and Protected Areas or the Environmental Appeals Board in relation to this land location:

- ☐ under the *Environmental Protection and Enhancement Act*
- ☐ under the *Water Act*
- ☐ with the Environmental Appeals Board

☒ No proceedings

If yes, these proceedings are ☐ ongoing or ☐ past _____ (year). ☐ N/A

Signed this 15 day of June, 2026.

Signature of Applicant or Agent

Last updated April 1, 2026

Caution! This message was sent from outside your organization.

Allow sender | Block sender | Report

From: Bosch Electric
To: Carina Weisbach
Subject: Re: Please sign
Date: June 16, 2026 12:53:17 PM

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:

Proposed 1: Feedlot

Proposed 2: Ketch basin

Proposed 3:

Facility and environmental risk information		Facilities				NRCB USE ONLY	
		Existing	Proposed 1	Proposed 2	Proposed 3	Meets requirements	Comments
Flood plain information	What is the elevation of the floor of the lowest manure storage or collection facility above the 1:25 year flood plain or the highest known flood level?	☒ > 1 m ☐ ≤ 1 m	☒ > 1 m ☐ ≤ 1 m	☒ > 1 m ☐ ≤ 1 m	☐ > 1 m ☐ ≤ 1 m	☐ YES ☐ NO ☐ YES with exemption	
	How many springs are within 100 m of the manure storage facility or manure collection area?		0	0		☐ YES ☐ NO ☐ YES with exemption	
Surface water information	How many water wells are within 100 m of the manure storage facility or manure collection area?		700 FT	600 FT		☐ 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)		1 km	1 km		☐ YES ☐ NO ☐ YES with exemption	
Groundwater information	What is the depth to the water table?		None	None		☐ YES ☐ NO ☐ YES with exemption	
	What is the depth to the groundwater resource/aquifer you draw water from?		None	None		☐ YES ☐ NO ☐ YES with exemption	

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

Part 2 — Technical Requirements

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

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

Neighbour name(s)	Legal land description	Distance (m)	NRCB USE ONLY			
			Zoning (LUB) category	MDS category (1-4)	Distance (m)	Waiver attached (if required)
Macey Bawn	NW 16 19 1 w5	500				
Cole web	SW 22 19 1 w5					
Jessie Hargi	SW 23 19 1 w5					

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)
Legal land					
Se 21 19 1 w5	SE 21 = ~120ac				
NW 26 19 1 w5	NW 26 = ~100ac				
SW 35 19 1 w5	SW 35 = ~80ac 1/2 quarter section				
SW se 15 19 1 w5	S 1/2 15 = 320ac				
NW ne 10 19 1 w5	N 1/2 10 = 233ac				
Se 17 19 1 w5	SE 17 = 124ac				
		Total			

* If you are **not** the registered landowner,

** Available manure spreading area (exclud
[Regulations](#))

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

Additional information (attach any additional information as required)

as identified in Agdex 096-5 [Manure Spreading](#)



Legend

Untitled Map

Write a description for your map.

Google Earth

Part 2 – Technical Requirements

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

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

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

Facility description / name (as indicated on site plan)

1. Feedlot pens (16)
2. 2

Manure storage capacity

		Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.	<u>update</u> 18 pens: 61m x 76.2m (each)	<u>61 to 76.2</u>	
2.			
		TOTAL CAPACITY	

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

Surface water control systems

Describe the run-on and runoff control system

catch basin

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____ (m)	Provide details	<u>see report attached</u>	
Soil texture	_____ % sand	_____ % silt		
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested	Hydraulic conductivity (cm/s)	Describe test standard used	

Additional information (attach copies of soil test reports)

NRCB USE ONLY

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

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)

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. CB

2. _____

3. _____

Determination of runoff area

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

Catch basin capacity

	Length (m)	Width (m)	Total depth (m)	Depth below ground level (m)	Slope run:rise			NRCB USE ONLY Calculated storage capacity (excl. 0.5 m freeboard) (m ³)
					Inside end walls	Inside side walls	Outside walls	
1.	<u>90</u>	<u>35</u>	<u>4</u>	<u>4</u>				
2.								
3.								
TOTAL CAPACITY								

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____ (m)	Provide details (as required)	
Soil texture	_____ % sand	_____ % silt	_____ % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested	Hydraulic conductivity (cm/s)	Describe test standard used

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

If soil info differs per facility include additional soils page.

NRCB USE ONLY

Requirements met: ☐ YES ☐ NO

Condition required: ☐ YES ☐ NO

Report attached: ☐ YES ☐ NO

Catch Basin Storage Volume Calculator

Construction Dimensions of Catch Basin

* Only cells in blue can be changed.

Overall Dimensions of Catch Basin

Total Length* ₄	90.0	m
Total Width* ₄	35.0	m
Total Depth* ₄	4.0	m
Design Capacity Depth	3.50	m
End Slope* ₄	3	run:rise
Side Slope* ₄	3	run:rise
Length of Bottom	66.0	m
Width of Bottom	11.0	m

Capacity @ top of Bank 7,368 m³

Design Capacity of Catch Basin (freeboard level)

Length (design capacity depth)	87.0	m
Width (design capacity depth)	32.0	m
Total Depth	4.0	m
Design Capacity Depth	3.50	m
End Slope	3	run:rise
Side Slope	3	run:rise

Design Capacity (freeboard level) 5,885 m³

level) 2,784 m²

Catch Basin Dimensions

295	ft
115	ft
13	ft
11	ft
3	run:rise
3	run:rise
217	ft
36	ft

Capacity (@top)

260,198 ft³
1,620,733 Imp. Gal.

Design Capacity (freeboard level)

285	ft
105	ft
13	ft
11	ft
3	run:rise
3	run:rise

207,836 ft³
1,294,574 Imp. Gal.
29,967 ft²

CFO Name ₁ (Enter CFO Name Here)

Land Location ₁ 1-1-4-W5

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	1,098	76	83,667.6
7			0.0
8			0.0
9			0.0
10			0.0
Total Area (m ²)			83,668

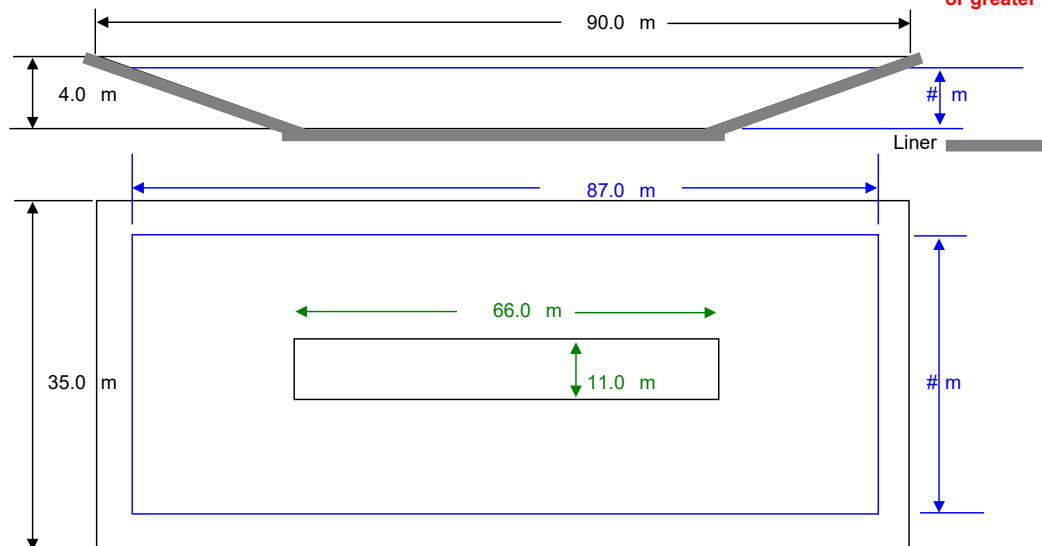
Rainfall (Select Town ₃)

High River 95
AOPA Design Rainfall 95 mm

Minimum Catchbasin Storage Volume Required

5,166 m³ ** 182452.32 ft³
1136465 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



20 May 2026

J Lobbezoo Engineering & Consulting Services Ltd.

PO Box 96, Monarch, AB T0L1M0

JLECS File: P26031

Bosch Feeder Co. Ltd.

Site 1, Box 9, RR#1

High River, AB T1V1N1

Attention: Tom Indenbosch

**Re: Geotechnical Review and Evaluation
 NRCB Permitting of Proposed Pens and Catch Basin
 NE-16-019-01-W5M, near High River, 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 the permitting of a series of proposed pens and a proposed catch basin (refer to Figure 1, attached).

To demonstrate the suitability of the naturally existing soils for consideration as a naturally occurring protective layer to the groundwater resource, 12 boreholes were advanced at the site on April 22, 2026. The boreholes were advanced at the approximate locations denoted as BF1-26 to BF12-26 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 8.0 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 predominantly consisted medium plastic lacustrine clay and clay till, which transitioned to sandstone below depths of about 5 m to 7.5 m. While groundwater was encountered in the sandstone at borehole BF1-26 below about 7 m depth, groundwater was not encountered in any of the other boreholes.

Samples of soil collected from the screened zones of boreholes BF2-26, BF7-26 and BF11-26 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
BF1-26 / 5.5 – 6.9 m	28	44	29
BF2-26 / 3.0 – 3.9 m	28	45	28
BF3-26 / 5.0 – 6.0 m	32	43	25
BF4-26 / 3.5 – 4.6 m	31	36	33
BF5-26 / 3.0 – 4.0 m	28	46	26
BF7-26 / 2.6 – 3.6 m	30	41	29
BF8-26 / 2.0 – 3.0 m	25	48	28
BF9-26 / 2.0 – 3.0 m	28	45	28
BF11-26 / 2.0 – 3.0 m	27	46	28
BF12-26 / 2.0 – 3.0 m	23	44	33
Average:	28	44	28

To measure the *in situ* permeability of the subsurface soils, 50 mm diameter PVC monitoring wells were constructed in boreholes BF2-26 (proposed catch basin area), BF7-26 (proposed pen area), and BF11-26 (proposed pen area). The test wells were screened at depths ranging between about 1.4 m and 4.2 m below the existing grades.

Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring wells to the top for several consecutive days. After several days of testing a 24-hour water drop of 1.40 m was determined at BF2-26, a 24-hour water drop of 1.68 m was determined at BF7-26, and a 24-hr water drop of 1.52 m was determined at BF11-26.

To calculate the permeability of the screened portion of the clay strata at the test well locations, a modified falling head test (as outlined in the USBR Engineering Geology Field Manual Volume 2 [2001]) was used. The input variables and output data are outlined on the attached In Situ Permeability Test reports. The results of the permeability testing indicate the *in situ* hydraulic conductivity (k_s) values of 1.9×10^{-7} cm/s at BF2-26 (proposed catch basin area), 2.2×10^{-7} cm/s at BF7-26 (proposed pen area), and 3.0×10^{-7} cm/s at BF11-26 (proposed pen area).

Using the measured permeability of the clay at this site, the 1.6 m of clay screened at test hole BF2-26 is estimated to represent the equivalent of approximately 8 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA). At BF7-26, the 1.6 m of clay screened is estimated to represent the equivalent of approximately 7 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s, and at BF11-26, the 1.6 m of clay screened is estimated to represent the equivalent of approximately 5 m of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s. 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).

Bosch Feeder Co. Ltd.
 Geotechnical Review & Evaluation, NE-16-019-01-W5M, near High River, Alberta
 20 May 2026
 Page 3

-----JLECS-----

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.

It is noted that the intent is to construct the proposed catch basin within a low lying area (coulee draw) along the north side of the site. For berm construction around the proposed catch basin, the onsite medium plastic clay soil is generally considered suitable for the proposed berm construction. Notwithstanding, prior to placement of the berm material, the subgrade should be stripped of all topsoil and any sandy clay soil encountered prior to the placement of the proposed berm material. JLECS can provide onsite review and construction support in this regard, upon request.

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

Yours truly,

J Lobbezoo Engineering & Consulting Services Ltd.



John Lobbezoo, P.Eng.
 Principal Geotechnical Engineer

Reviewed by:
 Christopher Allard, C.E.T.
 Geotechnical Services

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

PERMIT TO PRACTICE	
J LOBBEZOO ENGINEERING & CONSULTING SERVICES LTD.	
RM SIGNATURE: _____	_____
RM APEGA ID #: _____	0450
DATE: _____	21 May 2026
PERMIT NUMBER: P016456	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

Bosch Feeder Co. Ltd.
 Geotechnical Review & Evaluation, NE-16-019-01-W5M, near High River, Alberta
 20 May 2026
 Page 4

-----JLECS-----

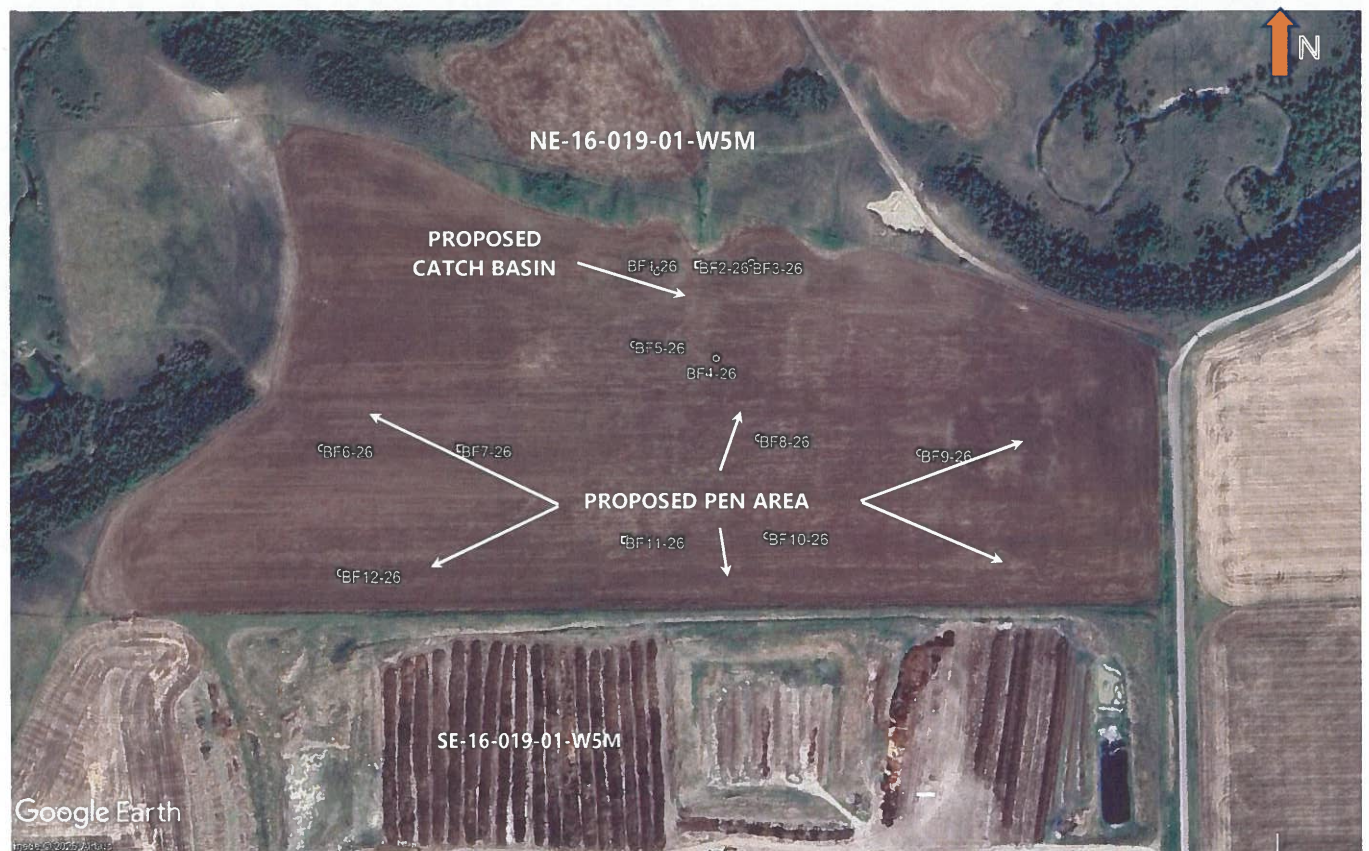


Figure 1: Site Layout & Borehole Locations

BF2-26

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

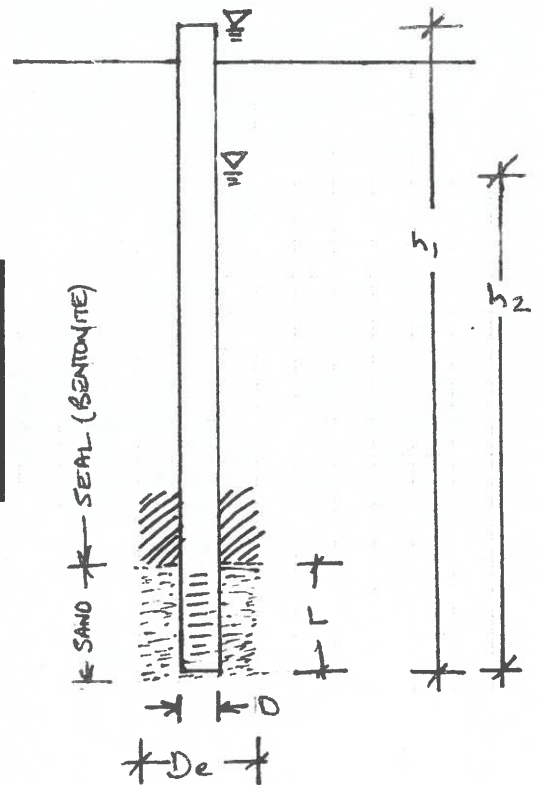
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

BF2-26 - Bosch Feeder Co Ltd.

JLECS File: P26031

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	4.60	initial height of water above base of hole (m)
	h2	3.20	final height of water above base of hole (m)
	t	24.0	time of test (h)

$$k_s = 1.9E-07 \text{ cm/sec}$$



-----JLECS-----

BF7-26

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

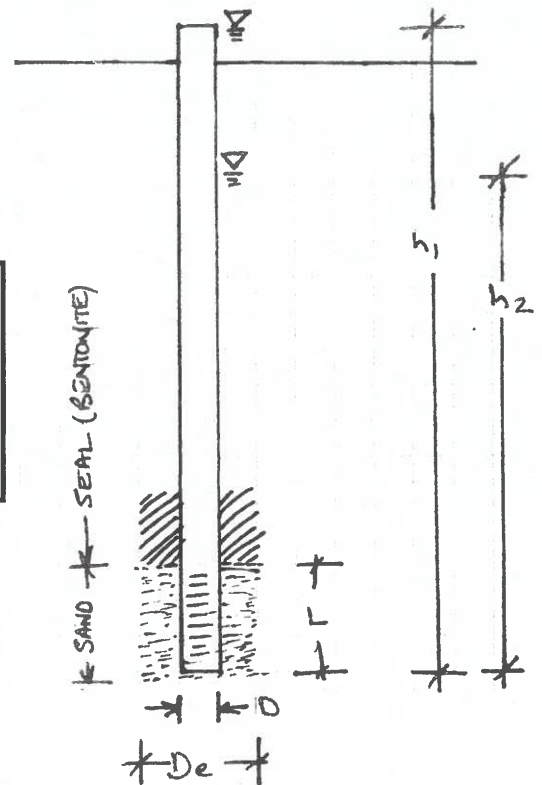
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

BF7-26 - Bosch Feeder Co Ltd.

JLECS File: P26031

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	4.80	initial height of water above base of hole (m)
	h2	3.12	final height of water above base of hole (m)
	t	24.0	time of test (h)

$$k_s = 2.2E-07 \text{ cm/sec}$$



BF11-26

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

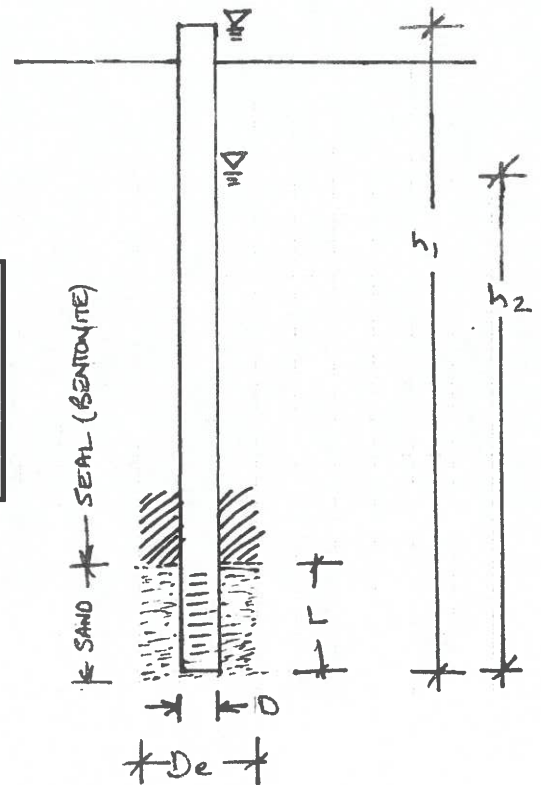
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

BF11-26 - Bosch Feeder Co Ltd.

JLECS File: P26031

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.60	length of sand section (m)
	h1	3.60	initial height of water above base of hole (m)
	h2	2.08	final height of water above base of hole (m)
	t	24.0	time of test (h)

$$k_s = 3.0E-07 \text{ cm/sec}$$





Down To Earth Labs Inc.

The Science of Higher Yields

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

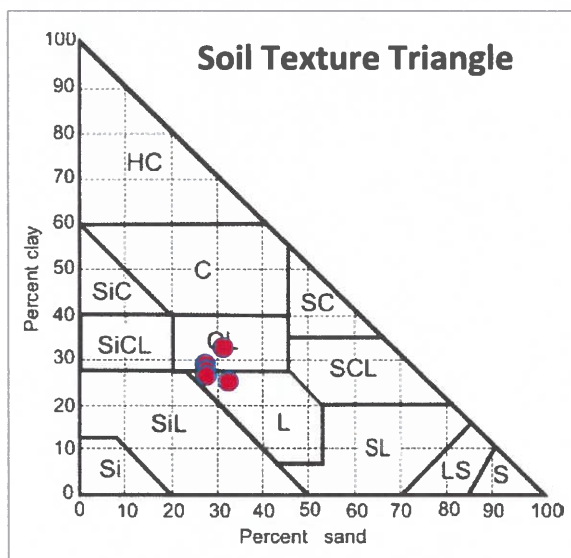
Report #: 237599
Report Date: 2026-05-11
Received: 2026-05-06
Completed: 2026-05-11
Test Done: ST

Project :
Bosch Feeders

PO:

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

		Sample ID:	260506P001	260506P002	260506P003	260506P004	260506P005
		Cust. Sample ID:	BF1-26	BF2-26	BF3-26	BF4-26	BF5-26
Analyte	Units	5.5-6.9	3.0-3.9	5.0-6.0	3.5-4.6	3.0-4.0	
Sand	%	27.5	27.6	32.4	31.4	27.6	
Silt	%	43.8	44.9	42.6	36.2	46.2	
Clay	%	28.8	27.5	25.0	32.5	26.3	
Soil Texture	-	Clay Loam	Clay Loam	Loam	Clay Loam	Loam	





Down To Earth Labs Inc.

The Science of Higher Yields

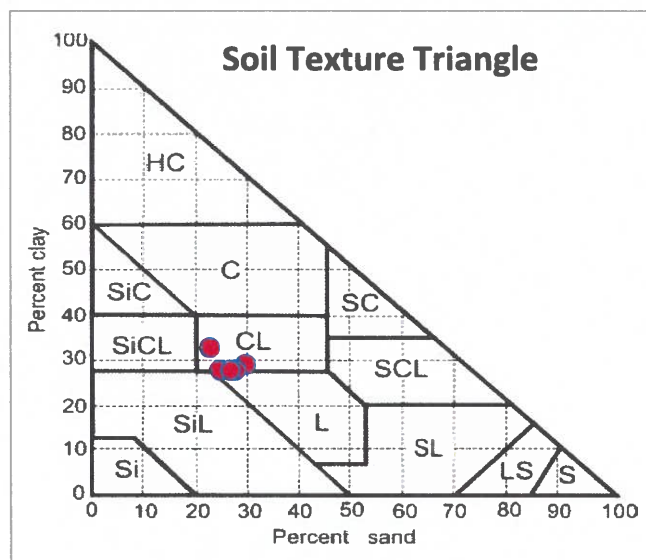
J. Lobbezoo Engineering +
Consulting Services
Box 96
Monarch, Alberta T0L 1M0

Report #: 237599
Report Date: 2026-05-11
Received: 2026-05-06
Completed: 2026-05-11
Test Done: ST

Project :
Bosch Feeders
PO:

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

		Sample ID:	260506P006	260506P007	260506P008	260506P009	260506P010	
		Cust. Sample ID:	BF7-26	BF8-26	BF9-26	BF11-26	BF12-26	
		Analyte	Units	2.6-3.6	2.0-3.0	2.0-3.0	2.0-3.0	2.5-3.0
	Sand	%	29.9	24.9	28.0	26.9	23.0	
	Silt	%	41.4	47.6	44.5	45.7	44.5	
	Clay	%	28.8	27.5	27.5	27.5	32.5	
	Soil Texture	-	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	



Raygan Boyce - Chemist

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NE16-19-1W5, Bosch Feeders

Date: 22-Apr-26

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
BF1-26	0706868 5610582	0-0.15	CL	M	Topsoil		
		0.15-2.1	CL-VFSL	M	Lac		V. Firm, med plastic, yellow brown
		2.1-2.7	SiCL	M	Lac	2.1-3.0	Stiff, med plastic, yellow brown
		2.7-6.9	CL-C	M	Till	5.5-6.9	Stiff, med plastic, brown
		6.9-7.6	SiC	SM	Till		Med-high plastic, olive brown
		7.6-8.0	Sandstone	Sat	Bedrock		Sat @ 7.9m (free water), artesian pressure water @ 7.0m, auger refusal @ 8.0m
BF2-26	0706895 5610590 in draw ~3m lower than BF1	0-0.15	CL	M	Topsoil		
		0.15-1.1	CL	M	Lac		Organics (topsoil washed into draw)
		1.1-3.9	CL-C	M	Lac	3.0-3.9	Stiff, med plastic, brown
		3.9-4.8	C-SiC	SM	Till		Stiff, med plastic, dark brown, residual bedrock
		4.8-5.0	Sandstone	SM	Bedrock		Hard bedrock, olive brown
							50mm H.C. Well installed to 4.0m BGS Screen: 4.0-2.5m Sand: 4.0-2.4m Bentonite: 2.4-0.0m Stickup: 0.6m Hole Diameter: 0.15m
BF3-26	0706933 5610591 upper slope	0-0.15	CL	M	Topsoil		
		0.15-3.0	CL-VFSL	M	Lac	2.5-3.0	V. Firm, low-med plastic yellow brown, layers of med-high plastic SiCL
		3.0-4.5	SiCL	SM	Lac		Sandy areas
		4.5-7.2	CL	M	Till	5.0-6.0	Stiff, med plastic, brown
		7.2-	Sandstone	SM	Bedrock		
BF4-26	0706910 5610525	0-0.15	CL	SM	Topsoil		
		0.15-2.8	CL	SM	Lac		
		2.8-3.4	SiCL	M	Lac		Stiff, med plastic, olive brown
		3.4-4.6	CL	M	Till		Stiff, med plastic, brown
		4.6-5.4	Sandstone	D	Bedrock		Auger refusal @ 5.4m
BF5-26	0706854 5610532	0-0.15	CL	M	Topsoil		
		0.15-2.1	SiCL	SM	Lac		V. Firm, med plastic, olive brown
		2.1-4.9	CL	SM	Till	3.0-4.0	Stiff, med plastic, brown
		4.9-5.3	Sandstone	D	Bedrock		Auger refusal @ 5.3m
BF6-26	0706640 5610455	0-0.15	CL	M	Topsoil		
		0.15-1.5	CL-C	SM	Lac		Stiff, med plastic
		1.5-2.2	SiCL	M	Lac		V. Firm, med plastic, olive brown
		2.2-3.0	SiC	SM	Lac	2.2-3.0	Stiff, med-high plastic, olive brown
BF7-26	0706735 5610458	0-0.15	CL	M	Topsoil		
		0.15-1.0	CL	SM	Lac		V. Firm, med plastic, brown
		1.0-2.6	SiCL	SM	Lac		V. Firm, med plastic, yellow brown
		2.6-4.2	CL	SM	Till	2.6-3.6	Stiff, med plastic, yellow brown 50mm H.C. Well installed to 4.2m BGS Screen: 4.2-2.7m Sand: 4.2-2.6m Bentonite: 2.6-0.0m Stickup: 0.3m Hole Diameter: 0.15m

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION (Continued)

Site Location: NE16-19-1W5, Bosch Feeders

Date: 22-Apr-26

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
BF8-26	0706942	0-0.15	CL	M	Topsoil		
	5610469	0.15-0.25	CL	M	Lac		
		0.25-2.0	SiCL	SM	Lac		V. Firm, med plastic, olive brown
		2.0-3.0	CL	SM	Till	2.0-3.0	Stiff, med plastic, yellow brown
BF9-26	0707054	0-0.15	CL	M	Topsoil		
	5610462	0.15-1.1	SiCL	SM	Lac		
		1.1-3.0	CL	SM	Till	2.0-3.0	Stiff, med plastic, brown
BF10-26	0706957	0-0.15	CL	M	Topsoil		
	5610403	0.15-0.7	SiCL	M	Lac		Stiff, med plastic, olive brown
		0.7-2.2	CL	SM	Till		Stiff, med plastic, brown
		2.2-2.4	SiCL	SM	Till		V. Firm, med plastic, olive brown
		2.4-3.0	CL	SM	Till		Stiff, med plastic, brown
BF11-26	0706851	0-0.15	CL	M	Topsoil		
	5610398	0.15-0.7	SiCL	SM	Lac		
		0.7-3.0	CL	M	Till	2.0-3.0	Stiff, med plastic, brown 50mm H.C. Well installed to 3.0m BGS Screen: 3.0-1.5m Sand: 3.0-1.4m Bentonite: 1.4-0.0m Stickup: 0.6m Hole Diameter: 0.15m
BF12-26	0706654	0-0.15	CL	M	Topsoil		
	5610370	0.15-0.4	CL	M	Lac		
		0.4-2.5	SiCL	SM	Lac		V. Firm, med plastic, olive brown
		2.5-3.0	CL-SiCL	M	Till	2.5-3.0	Stiff, med-high plastic, olive brown

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

Eg. VFSCL = Very Fine Sandy Clay Loam