

Technical Document LA25001



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	Application number	Legal land description
<input type="checkbox"/> Approval <input type="checkbox"/> Registration <input checked="" type="checkbox"/> Authorization <input type="checkbox"/> Amendment	LA25001	SW 1-12-21 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.

January 13, 2025

Date of signing
1359546 Alberta Ltd

Signature
Ben Bloemert

Corporate name (if applicable)

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)
New Dairy Barn extension <i>(total dimensions of the dairy barn will be 22.8 m x 78.5 m)</i>	33.5 x 22.8
Milk House and Calf Barn <i>The milk house is ancillary. The dimensions of the calf barn will be 13.4 m x 20.9 m</i>	21 x 20.9
Dry cows/ Young Stock Shelter	36.6 x 18.2

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Old dairy barn (including milk house)	67 x 15	To be decommissioned
Calf Barn	36.6 x 7.6	To be decommissioned
Shelter	100 x 15	To be decommissioned

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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

As per the demolition plan, the old dairy barn, the existing milk house, the existing calf barn, the existing shelter, the existing calf shelters will all be demolished and removed.
 The demolition will occur as we are constructing the new facilities.
 The exercise pens with feedbunks will remain as is.
 See demolition plan attached

Construction completion date for proposed facilities April 2026

Additional information

This construction project will be done in 2 phases.
 Phase 1 is dairy barn extension and milkhouse/new calf barn.
 Phase 2 is the new dry cow/young stock shelter

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
N/A			
Authorization - no proposed change in livestock. Currently have a deemed permit for 120 milking cows plus associated dries and replacements			

sources
on Board

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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 ____ day of _____, 20____.

Signature of Applicant or Agent

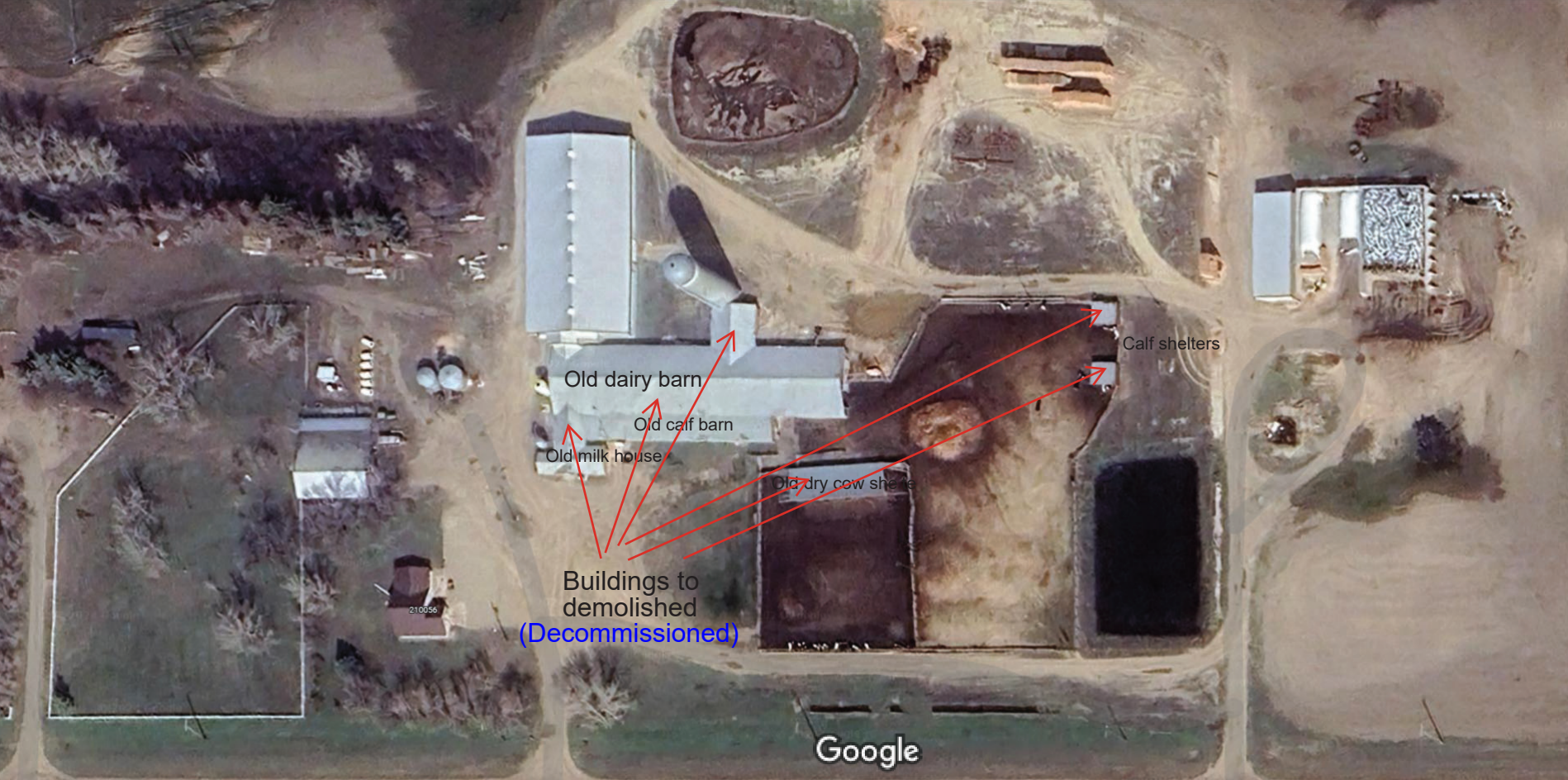
OPTION 3: Additional water licence not required

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 _____
Water Conveyance - type 3 (5 acre feet agreement with LNID) _____

Signed this 13 day of January, 2025.

Signature of Applicant or Agent

Last updated September 11, 2023



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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: Dairy Barn

Proposed 1: Dairy Barn Extension

Proposed 2: Milk house/ Calf barn

Proposed 3: Dry Cows/Young Stock Shelter

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?	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> >1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> > 1 m <input type="checkbox"/> ≤ 1 m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Not in flood plain. Confirmed during site visit
	Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	none	none	none	none	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption
	How many water wells are within 100 m of the manure storage facility or manure collection area?	None	None	None	none	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	No water wells registered to LLD
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	400m	400m	400m	400m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Piyami drain 400 m SE/S of CFO
Groundwater information	What is the depth to the water table?	>7	>7	>7	>7	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	> 9m see attached report
	What is the depth to the groundwater resource/aquifer you draw water from?	no wells in area	no wells in area	no wells in area	no wells in area	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	No registered water wells within 2 km of CFO

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
Dairy barn extension	Low	Low	LA25001
Milk house/calf barn	Low	Low	LA25001
Dry cows & young stock shelter	Low	Low	LA25001

ERST for existing facilities

Facility	Groundwater score	Surface water score	File number
Dairy barn			
EMS	All facilities were determined to be low risk to surface water and ground water in Authorization LA16020A		
Exercise pens (2)			
Manure pad			
Old dairy barn and milk house (to be decommissioned)			
Calf barn (to be decommissioned)			
Shelter and calf shelters (to be decommissioned)			

ERST related comments:

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NRCB USE ONLY
WATER WELL AND SURFACE WATER INFORMATION

Well IDs: None within 2 km of CFO _____

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

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
Allen Nieboer	SE 2-12-21 W4M	740.22	Rural Ag	1	740 m		Yes
Klooster	SE 1-12-21 W4M	876.56	Rural Ag	1	877 m		Yes
Klooster	NE 35-11-21 W4M	905.99	Rural Ag	1	906 m		Yes

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

Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	NRCB USE ONLY	
				Usable area (ha)	Agreement attached (if required)
	NA for authorizations				
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)



Imagery ©2025 Airbus, CNES / Airbus, Maxar Technologies, S. Alberta MD€31s and Counties, Map data ©2025 100 m

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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: 290 m Category 2: 386 m Category 3: 483 m Category 4: 772 m

Technology factor: YES NO

Expansion factor: YES NO

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

LAND BASE FOR MANURE AND COMPOST APPLICATION

Land base required: _____ NA for authorizations

Land base listed: _____

Area not suitable: _____

Available area: _____

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 LA16020A

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NRCB USE ONLY

ALL SIGNATURES IN FILE

YES NO

DATES OF APPROVAL OFFICER SITE VISITS

January 28, 2025	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: January 14, 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: LNID N/A

letter sent response received written/email verbal no comments received

Other: ATCO Gas N/A

letter sent response received written/email verbal no comments received

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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)

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 Extension
2. Milk House/Calf Barn the milk house is ancillary
3. ~~Dry cows/young stock shelter~~

Confirmed during site visit that the dry cows/young stock shelter Will not have a concrete liner. Instead, it will have a naturally occurring liner (see page 16)

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.	33.5	21 22.8	.15	0	
2.	21 13.4	20.9	.15	0	
3.	36.6	18.2	.15	0	
TOTAL CAPACITY					

Concrete liner details

Scrape alleys or unslatted portions of barn floors (if applicable)	Concrete thickness 6"		Method of sulphate protection Type 50 Cement		
	Concrete strength 32mpa		Concrete reinforcement size and spacing 16" O.C		
In-barn manure pit floors	Concrete thickness 6" Confirmed that there will not be pits in the proposed dairy barn extension		Method of sulphate protection Type 50 Cement		
	Concrete strength 32mpa		Concrete reinforcement size and spacing 16" O.C		
In-barn manure pit walls	Concrete thickness 6"		Method of sulphate protection Type 50 Cement		
	Concrete strength 32mpa	Horizontal reinforcement size and spacing 10m @ 16" O.C	Vertical reinforcement size and spacing 15M @ 16" O.C.		

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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

Rx 101 waterstop

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

Sika seal

Concrete requirements can be found in Technical Guideline Agdex 096-93

Guideline minimums:
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: >9m

Requirements met: YES NO

Depth to uppermost groundwater resource: no wells in area

Requirements met: YES NO

LA16020A confirmed that there is sufficient liquid manure storage. This application does not include an increase in animals or manure production, therefore there is still sufficient storage.

ERST completed: see ERST page for details

Concrete liner requirements

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

Last updated: 31 Mar 2020

Page ____ of ____

NRCB USE ONLY

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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. Dry cows/young stock shelter
2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.	36.6	18.2	0	
2.				

TOTAL CAPACITY

Sufficient storage - LA16020A permitted a solid manure storage pad

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

Roof

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	_____ 2 _____(m)	Provide details (as required) See attached report - BB5-16 and BB6-16		
Soil texture	_____ % sand	_____ % silt	_____ % clay	
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 3m	Hydraulic conductivity (cm/s) 3.6 x 10 ⁻⁸	Describe test standard used modified falling head	

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

NRCB USE ONLY

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



amec
foster
wheeler

May 17, 2016

Amec Foster Wheeler File: BX30417

1359546 Alberta Ltd.
P.O. Box 185
Iron Springs, Alberta T0K 1G0

Attention: Mr. Ben Bloemert

**Re: Geotechnical Review and Evaluation
Proposed Expansion of Lagoon, Barn and Pens
SW-1-12-21-W4, near Iron Springs, Alberta**

As requested, Amec Foster Wheeler Environment & Infrastructure has carried out a geotechnical review and evaluation of the above captioned site relative to the required protection of the groundwater resource, as required by the Agricultural Operation Practices Act, AB Reg. 267/2001 (hereinafter referred to as "AOPA").

This letter encompasses the soil conditions associated with the proposed lagoon expansion, barn expansion, and pen expansion (see Figure 1).

In order to demonstrate the suitability of the natural clay soils for consideration as a naturally occurring protective layer, a series of six boreholes were advanced at the site on May 11, 2016, at the approximate locations illustrated on Figure 1. The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services, and extended to depths ranging between of about 3 m and 9.2 m below existing grades. These boreholes were logged by Mr. Larry DeLong of Chilako Drilling Services Ltd (see attachments).

In general, the soils encountered within the current test holes generally included clay till to the termination depths of each of the boreholes.

In order to demonstrate the permeability of the subsurface soils, a 50 mm diameter PVC monitoring well was constructed in borehole BB1-16. The borehole was screened from 7.4 m to 9.2 m depth. Well saturation of the 50 mm diameter monitoring wells was carried out by filling the monitoring well to the top of the well for several consecutive days. After several days, the 24 hour water drop in the standpipe was about 0.76 m. During the testing, the well location was protected, and care was taken to ensure that the column of water being monitored in the well was not frozen during the testing.

A monitoring well was also installed at BB4-16; however, the bentonite seal did not set properly, and permeability testing of this well could not be carried out.

In order to calculate the permeability of the screened portion of the clay stratum at BB1-16, a modified falling head test (as outlined in the USBR *Engineering Geology Field Manual Volume 2* [2001]) was used. The input variables and output data are outlined on the *In Situ Permeability*

Amec Foster Wheeler
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Test report, attached. As outlined on the report, the results of the *in situ* permeability testing indicate a hydraulic conductivity, k_s , in the order of 3.6×10^{-8} cm/s at borehole BB1-16.

Using the measured permeability of the clay stratum, the 1.8 m portion of clay which has been screened at borehole BB1-16 has been estimated to represent an equivalent of about 50 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 liquid manure storage (minimum 10 m, Section 9.5-a), 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 and permeability testing, and our understanding of the site and proposed development at the site, it is Amec Foster Wheeler's opinion that the naturally occurring materials at the site satisfy the requirements for a naturally occurring 'protective layer' for the proposed expansion of the dairy facility, as outlined in the AOPA.

Perimeter berms, if required, should have a minimum top width of 3 m, slideslopes no steeper than 3H:1V, and be constructed of low-permeable clay compacted in maximum 150 mm thick lifts to a minimum of 98 percent of Standard Proctor Maximum Dry Density (SPMDD). Full time compaction testing, including review of topsoil stripping, should be provided for berm construction.

We trust this satisfies your present requirements. If you have questions or require further information or clarification, please don't hesitate to contact the undersigned.

Respectfully submitted,

Amec Foster Wheeler Environment & Infrastructure
A division of Amec Foster Wheeler Americas Ltd.

John Lobbzoo, P.Eng.
Senior Geotechnical Engineer



APEGA Permit: P04546

- Attachments:
- Figure 1 – Borehole Location Plan
 - In Situ* Permeability Test Calculations – BB1-16
 - Soil Profile and Parent Material Description, Chilako Drilling Services



Figure 1

Borehole Location Plan

Proposed Lagoon, Barn, Corral Expansion

BB13-16

In Situ Permeability Test



Modified Falling Head Permeability Equation

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

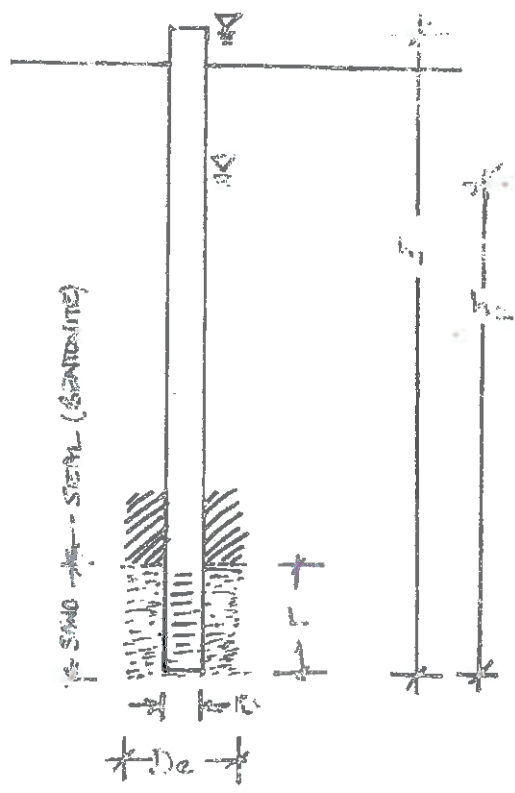
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

BB1-16 - Ben Bloemert Dairy

Amec Foster Wheeler File: BX30417

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.80	length of sand section (m)
	h1	9.80	initial height of water above base of hole (m)
	h2	9.04	final height of water above base of hole (m)
t	24.0	time of test (h)	

Ks = 3.6E-08 cm/sec



CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: SW1-12-21W4 1359546 Alberta Ltd. Ben Bloemert

Date: 11-May-16

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks	
BB1-16	East side of existing lagoon 0374588 5535877	0-1.5	CL-C	M		Till	Stiff, med plastic, olive brown	
		1.5-6.0	C	M		Till	Stiff, med plastic, brown	
		6.0-9.2	C	M		Till	Stiff, med plastic, dark brown, iron staining along fractures (no seepage from existing catch basin) 3.0m above existing catch basin water level 50mm H.C. Well installed to 9.2m Screen: 9.2-7.7m Sand: 9.2-7.4m Bentonite: 7.4-5.0m Stickup: 0.6m Hole diameter: 0.15m	
BB2-16	South side of existing lagoon 0374558 5535857	0-0.6	CL	D		Fill	2.0m above existing catch basin water level	
		0.6-0.9	C	M		Till		
		0.9-2.4	CL	VM			Till	Soft, med plastic, trace sand
		2.4-3.0	CL-C	M-VM			Till	V. Firm, med plastic, brown
		3.0-3.6	CL-C	M			Till	Stiff, med plastic, brown, trace sand
		3.6-4.5	C	M			Till	Stiff, med plastic, brown, trace sand
4.5-6.0	C	M			Till	Stiff, med plastic, brown, sat. sand streak @5.6m		
6.0-7.5	C	M			Till	Stiff, med plastic, dark brown		
BB3-16	West side of existing lagoon 0374516 5535855	0-0.15	CL	M		Topsoil	0.5m above existing catch basin water level	
		0.15-1.5	CL-C	M		Till	Stiff, med plastic, olive brown	
		1.5-4.4	C	M		Till	Stiff, med plastic, brown	
		4.4	C	M		Till	Sand lense @ 4.4m	
4.4-6.1	C	M		Till	Stiff, med plastic, brown 25mm WTW installed to 6.1m			
BB4-16	Southwest corner of proposed barn 0374525 5535833	0-0.4	CL	M		Till		
		0.4-1.1	SiCL	VM		Till	Soft, med plastic, grey brown	
		1.1-1.7	CL	VM		Till	Soft, med plastic, grey brown	
		1.7-2.0	CL	VM		Till	V. Firm-stiff, trace gravel	
		2.0-3.9	CL	M		Till	Stiff, med plastic, dark brown Surface ponding area resulting in wet soils 50mm H.C. Well installed to 3.9m Screen: 3.9-2.4m Sand: 3.9-2.3m Bentonite: 2.3-0.8m Stickup: 0.4m Hole diameter: 0.15m	
BB5-16	Proposed future pen expansion 0374661 5535768	0-0.5	CL	M		Till	Stiff, med plastic, grey brown	
		0.5-3.0	C	M		Till	Stiff, med plastic, brown	
BB6-16	Proposed future pen expansion 0374540 5535775	0-0.6	CL	M		Till		
		0.6-1.1	SiCL	VM		Till	Soft, med plastic, grey brown	
		1.1-3.0	C	M		Till	Stiff, med plastic, brown Surface ponding area	
Existing Lagoon Coordinates:								
NE Corner: 0374581 5535889								
SE Corner: 0374557 5535860								
SW Corner: 0374539 5535868								