

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 <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Registration <input type="checkbox"/> Authorization <input type="checkbox"/> Amendment	Application number <u>LA21057</u>	Legal land description <u>W½ 20-16-12 W4M</u>
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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.

<u>May 21, 2022</u> Date of signing	 Signature
<u>Tateson Ranching Ltd.</u> Corporate name (if applicable)	<u>Scott Tateson</u> 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 - Row 1	280 m x 42 m
Feedlot - Row 2	267 m x 42 m
Feedlot - Row 3	267 m x 42 m
Feedlot - Row 4	225 m x 42 m
Catch Basin 1	26m x 68m x 4m

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

Existing facilities	Dimensions (m) (length, width, and depth)	NRCB USE ONLY
Cow/Calf Facility	290 m x 50 m	

NRCB USE ONLY

Cow/calf facilities do not require a permit under AOPA. The operator is aware that these corrals must not be populated during the grazing season (July 1-September 16) and can only be used by cow/calf pairs at any time. Any other livestock (feeder cattle or finisher cattle) are not allowed in this area.

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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

Livestock pens (in the south) to be converted to feedlot pens

Livestock pens (north row) to remain as pens for cow/calf herd

Construction completion date for proposed facilities Dec 30, 2024

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 <small>(Available in the Schedule 2 of the Part 2 Matters Regulation)</small>	Permitted number	Proposed increase or decrease in number <small>(if applicable)</small>	Total
Beef - Finishers	0	3000	3000

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DECLARATION AND ACKNOWLEDGMENT OF APPLICANT CONCERNING WATER ACT LICENCE

issued by Alberta Environment and Parks (AEP) for a confined feeding operation (CFO)

Date and sign one of the following four options

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

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

Signed this _____ day of _____, 20____.

Signature of Applicant or Agent

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

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

Signed this 22 day of May, 2022.

Signature of Applicant or Agent

OPTION 3: Additional water licence not required

1. I (we) declare that the CFO will not need a new licence from AEP under the *Water Act* for the development or activity proposed in this AOPA application.

Signed this _____ day of _____, 20____.

Signature of Applicant or Agent

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

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

Signed this _____ day of _____, 20____.

Signature of Applicant or Agent

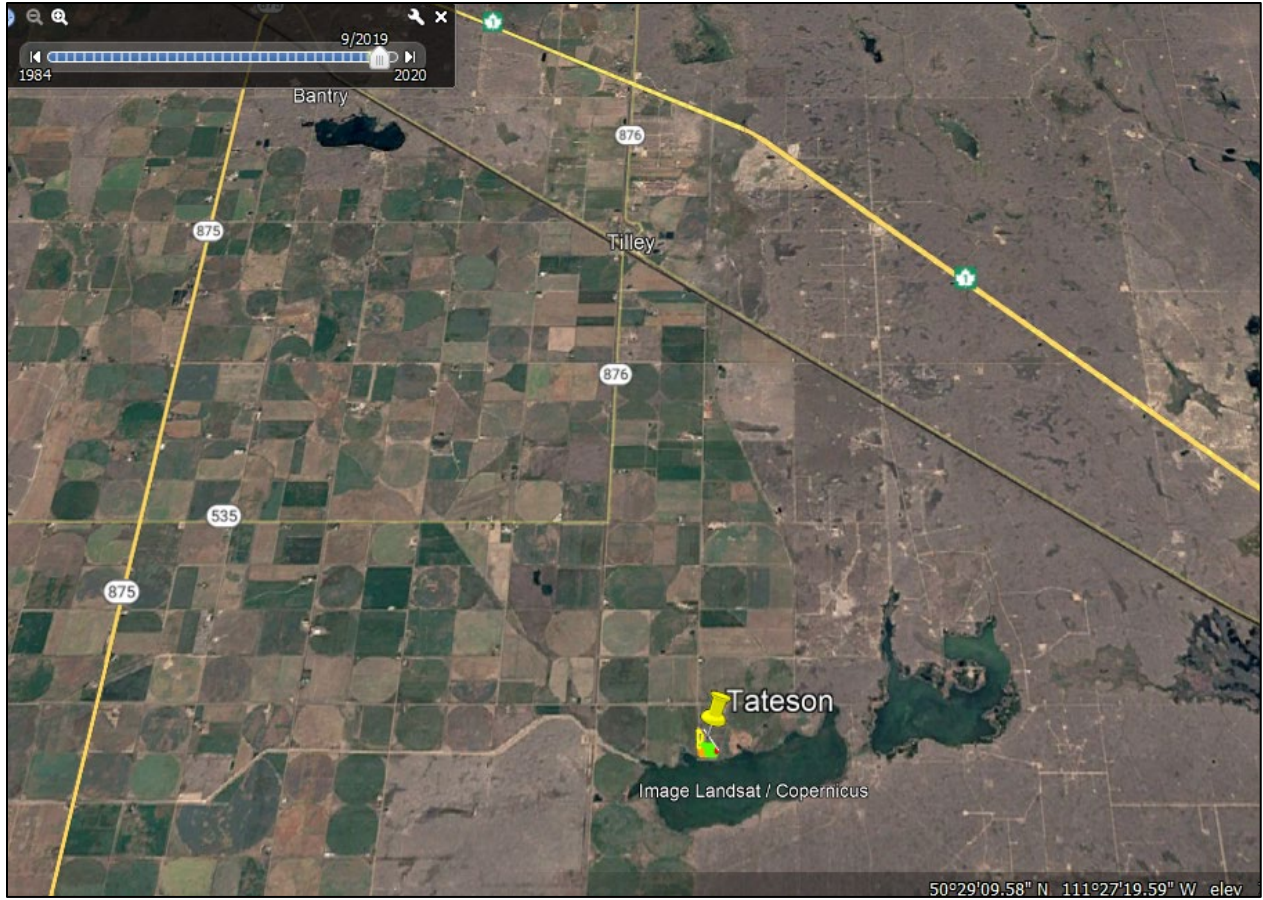


Figure 2: Tateson Ranch – Feedlot Expansion Area Map

Tateson

Additional Information

May 24, 2022



Figure 1: Tateson Ranch – Feedlot Expansion Site Map

Legend (footprint colours)

Yellow – Cow-calf Pens

Orange – Existing livestock pens converted to feedlot pens

Green – Proposed feedlot pens

Red – Catch basin

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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: Livestock Pens (Converted to Feedlot Pens in orange)

Proposed 1: Feedlot Pen Expansion (green)

Proposed 2: Catch Basin 1

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?	<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 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 located in flood plain
	Surface water information	How many springs are within 100 m of the manure storage facility or manure collection area?	0	0	0	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	None observed or in AEP database
	How many water wells are within 100 m of the manure storage facility or manure collection area?	0	0	0	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	None observed or in AEP database	
	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	50 m	50 m	100 m	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES with exemption	42.2 m to Scots Lake, 20.4 m to the drain leading to Scots Lake	
Groundwater information	What is the depth to the water table?		> 5.5m	>5.5 m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	Water table at 6.8 m borehole 6	
	What is the depth to the groundwater resource/aquifer you draw water from?	> 9 m	> 9 m	> 9 m	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES with exemption	6.8 m (worst case) borehole 6	

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
Already constructed pens	low	low (43.2)	LA21057

ERST for existing facilities

Facility	Groundwater score	Surface water score	File number
New CFO			

ERST related comments:

The risk to surface water of the already constructed pens is determined to be low. However, it is within the upper range of this category. This is related to the closeness to Scots Lake. The assumption is that 'most runoff' is controlled (> 80-99 percent) and that the runoff is channeled. A condition will be attached requiring the construction of a berm along the south and west side of the feedlot pens to ensure no runoff can reach Scots Lake and proof of positive drainage towards the catch basin from all feedlot pens to ensure all runoff from the feedlot pens will flow towards and contained in the catch basin.

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WATER WELL AND SURFACE WATER INFORMATION

Well IDs: No water well within a 1 mile radius

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

VARIANCE

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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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
Colin Tatum	SE 30-16-12W4M	870	Ag	1	865 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)
Tateson Ranching	SEC 18-16-12W4M	489 acres	Irrigated	480 acres	
Total				480 acres	

* 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)

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MINIMUM DISTANCE SEPARATION

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

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

Requirements (m): Category 1: 568 m Category 2: 757 m Category 3: 947 m Category 4: 1515 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: 45906 acres irrigated

Land base listed: 489 acres irrigated

Area not suitable: approx. 9 acres

Available area 480 acres irrigated 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: N/A

If already completed, see _____

New CFO

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NRCB USE ONLY

ALL SIGNATURES IN FILE YES NO

DATES OF APPROVAL OFFICER SITE VISITS

August 31, 2021	

CORRESPONDENCE WITH MUNICIPALITIES AND REFERRAL AGENCIES

Date deeming letters sent: June 8, 2022

Municipality: Newell county

letter sent response received written/email verbal no comments received

Alberta Health Services:

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: EID N/A

letter sent response received written/email verbal no comments received

Other: _____ N/A

letter sent response received written/email verbal

Name
Address
Legal Land
Location

MDS Spreadsheet based on 2006 AOPA Regulations

Category of Livestock	Type of Livestock	Factor A	Technology Factor	MU	LSU Factor	Number of Animals	LSU
Beef	Cows/Finishers (900+ lbs)	0.700	0.700	0.910	0.446	3,000	1,337.7
	Feeders (450 - 900 lbs)	0.700	0.700	0.500	0.245	-	-
	Feeder Calves (<550 lbs)	0.700	0.700	0.275	0.135	-	-
	Other	-	-	-	-	-	-
Dairy (*count lactating cows only)	*Free Stall - Lactating Cows with all associated dries, heifers, and calves	0.800	1.100	2.000	1.760	-	-
	*Free Stall - Lactating cows with Dry Cows only	0.800	1.100	1.640	1.443	-	-
	Free Stall - Lactating Cows only	0.800	1.100	1.400	1.232	-	-
	Tie Stall - Lactating cows only	0.800	1.000	1.400	1.120	-	-
	Loose Housing - Lactating cows only	0.800	1.000	1.400	1.120	-	-
	Dry Cow (Solid manure)	0.800	0.700	1.000	0.560	-	-
	Dry Cow (Liquid manure)	-	-	-	-	-	-
	Replacements - Bred Heifers (Breeding to Calving)	0.800	0.700	0.875	0.490	-	-
	Replacements - Growing Heifers (350 lbs to breeding)	0.800	0.700	0.525	0.294	-	-
	Calves (< 350 lbs)	0.800	0.700	0.200	0.112	-	-
Other	-	-	-	-	-	-	
Swine Liquid (*count sows only)	Farrow to finish *	2.000	1.100	1.780	3.916	-	-
	Farrow to wean *	2.000	1.100	0.670	1.474	-	-
	Farrow only *	2.000	1.100	0.530	1.166	-	-
	Feeders/Boars	2.000	1.100	0.200	0.440	-	-
	Growers/Roasters	2.000	1.100	0.118	0.260	-	-
	Weaners	2.000	1.100	0.055	0.121	-	-
Other	-	-	-	-	-	-	
Swine Solid (*Count sows only)	Farrow to finish *	2.000	0.800	1.780	2.848	-	-
	Farrow to wean *	2.000	0.800	0.670	1.072	-	-
	Farrow only *	2.000	0.800	0.530	0.848	-	-
	Feeders/Boars	2.000	0.800	0.200	0.320	-	-
	Growers/Roasters	2.000	0.800	0.118	0.189	-	-
	Weaners	2.000	0.800	0.055	0.088	-	-
Other	-	-	-	-	-	-	
Poultry	Chicken - Breeders - Solid	1.000	0.700	0.010	0.007	-	-
	Chicken - Layers - Liquid (includes associated pullets)	2.000	1.100	0.008	0.018	-	-
	Chicken - Layers - (Belt Cage)	2.000	0.700	0.008	0.011	-	-
	Chicken - Layers - (Deep Pit)	2.000	0.700	0.008	0.011	-	-
	Chicken - Pullets/Broilers	1.000	0.700	0.002	0.001	-	-
	Turkey - Toms/Breeders	1.000	0.700	0.020	0.014	-	-
	Turkey - Hens (light)	1.000	0.700	0.013	0.009	-	-
	Turkey - Broilers	1.000	0.700	0.010	0.007	-	-
	Ducks	1.000	0.700	0.010	0.007	-	-
	Geese	1.000	0.700	0.020	0.014	-	-
Other	-	-	-	-	-	-	
Horses	PMU	0.650	0.700	1.000	0.455	-	-
	Feeders > 750 lbs	0.650	0.700	1.000	0.455	-	-
	Foals < 750 lbs	0.650	0.700	0.300	0.137	-	-
	Mules	0.600	0.700	1.000	0.420	-	-
	Donkeys	0.600	0.700	0.670	0.281	-	-
	Other	-	-	-	-	-	-
Sheep	Ewes/Rams	0.600	0.700	0.200	0.084	-	-
	Ewes with lambs	0.600	0.700	0.250	0.105	-	-
	Lambs	0.600	0.700	0.050	0.021	-	-
	Feeders	0.600	0.700	0.100	0.042	-	-
Other	-	-	-	-	-	-	
Goats	Meat/Milk (per Ewe)	0.700	0.700	0.170	0.083	-	-
	Nannies/Billies	0.700	0.700	0.140	0.069	-	-
	Feeders	0.700	0.700	0.077	0.038	-	-
	Other	-	-	-	-	-	-
Bison	Bison	0.600	0.700	1.000	0.420	-	-
	Other	-	-	-	-	-	-
Cervid	Elk	0.600	0.700	0.600	0.252	-	-
	Deer	0.600	0.700	0.200	0.084	-	-
Other	-	-	-	-	-	-	
Wild Boar	Feeders	2.000	0.800	0.140	0.224	-	-
	Sow (farrowing)	2.000	0.800	0.371	0.594	-	-
Other	-	-	-	-	-	-	

Total 1,337.7

For New Operations

Dispersion Factor 1

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,863	568
2	54.72	2,485	757
3	68.4	3,106	947
4	109.44	4,969	1,515

For Expanding Operations

Dispersion Factor 1
Expansion Factor 0.77

Category	Odour Objective	Distance	
		Feet	Metres
1	41.04	1,435	437
2	54.72	1,913	583
3	68.40	2,391	729
4	109.44	3,826	1,166

Name 0
 Address 0
 Legal Land 0
 Location 0

Landbase Requirements (hectares) based on 2006 AOPA requirements

Category of Livestock	Type of Livestock	Number of Animals	Dark Brown & Brown (ha)	Grey Wooded (ha)	Black (ha)	Irrigated (ha)
Beef	Cows/Finishers (900+ lbs)	3000	375	312	234	186
	Feeders (450 - 900 lbs)	0	0	0	0	0
	Feeder Calves (<550 lbs)	0	-	-	-	-
	Other	0	-	-	-	-
Dairy (*count lactating cows only)	*Free Stall - Lactating Cows with all associated dries, heifers, and calves	0	0	0	0	0
	*Free Stall - Lactating cows with Dry Cows only	0	-	-	-	-
	Free Stall - Lactating Cows only	0	-	-	-	-
	Tie Stall - Lactating cows only	0	-	-	0	0
	Loose Housing - Lactating cows only	0	-	-	-	-
	Dry Cow (Solid manure)	0	-	-	-	-
	Dry Cow (Liquid manure)	0	-	-	-	-
	Replacements - Bred Heifers (Breeding to Calving)	0	-	-	-	-
	Replacements - Growing Heifers (350 lbs to breeding)	0	-	-	-	-
	Calves (< 350 lbs)	0	-	-	-	-
	Other	0	-	-	-	-
Swine Liquid (*count sows only)	Farrow to finish *	0	-	0	-	-
	Farrow to wean *	0	-	-	-	-
	Farrow only *	0	-	-	-	-
	Feeders/Boars	0	-	0	0	0
	Growers/Roasters	0	-	-	-	-
	Weaners	0	-	-	-	-
Swine Solid (*Count sows only)	Farrow to finish *	0	-	-	-	-
	Farrow to wean *	0	-	-	-	-
	Farrow only *	0	-	-	-	-
	Feeders/Boars	0	-	-	-	-
	Growers/Roasters	0	-	-	-	-
	Weaners	0	-	-	-	-
Poultry	Chicken - Breeders - Solid	0	-	-	-	-
	Chicken - Layers - Liquid (includes associated pullets)	0	-	0	0	0
	Chicken - Layers - (Belt Cage)	0	-	-	-	-
	Chicken - Layers - (Deep Pit)	0	-	-	-	-
	Chicken - Pullets/Broilers	0	-	0	0	0
	Turkey - Toms/Breeders	0	0	0	0	0
	Turkey - Hens (light)	0	-	-	-	-
	Turkey - Broilers	0	-	-	-	-
	Ducks	0	0	0	0	0
	Geese	0	0	0	0	0
	Other	0	-	-	-	-
Horses	PMU	0	0	0	0	0
	Feeders > 750 lbs	0	-	0	-	-
	Foals < 750 lbs	0	-	-	-	-
	Mules	0	-	-	-	-
	Donkeys	0	-	-	-	-
	Other	0	-	-	-	-
Sheep	Ewes/Rams	0	-	0	0	0
	Ewes with lambs	0	-	-	-	-
	Lambs	0	-	-	-	-
	Feeders	0	-	-	-	-
Goats	Meat/Milk (per Ewe)	0	0	0	0	0
	Nannies/Billies	0	-	-	-	-
	Feeders	0	-	-	-	-
	Other	0	-	-	-	-
Bison	Bison	0	0	0	0	0
	Other	0	-	-	-	-
Cervid	Elk	0	0	0	0	0
	Deer	0	0	0	0	0
Wild Boar	Other	0	-	-	-	-
	Feeders	0	-	0	0	0
	Sow (farrowing)	0	-	-	-	-
	Other	0	-	-	-	-
Total Hectares			375.0	312.0	234.0	186.0
Total Acres			926.6	771.0	578.2	459.6

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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

See attached catch basin calculations

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.	26	68	4	0	3:1	3:1	n/a	2,513 m ³
2.								
3.								
TOTAL CAPACITY								2,513 m ³

Naturally occurring protective layer details

Thickness of naturally occurring protective layer	1.6 (m)	Provide details (as required) See attached geotechnical report from Wood Environmental (May 6, 2022)	
Soil texture	32 % sand	38 % silt	30 % clay
Hydraulic conductivity - naturally occurring protective layer	Depth and type of soil tested 5.8 - 9.0 m	Hydraulic conductivity (cm/s) 2.2 x 10 ⁻⁸ cm/s	Describe test standard used In-situ HC test

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 Volume Calculator

Added by AO

Construction Dimensions of Catch Basin		
* Only cells in blue can be changed.		
	Metric	Imperial Units
Size of Catch Basin		
Total Length* ₄	26.0 m	85 ft
Total Width* ₄	68.0 m	223 ft
Total Depth* ₄	4.0 m	13 ft
Design Capacity Depth	3.50 m	11 ft
End Slope* ₄	3 run:rise	3 run:rise
Side Slope* ₄	3 run:rise	3 run:rise
Length of Bottom	2.0	
Width of Bottom	44.0	
Total Capacity @ top of Bank	3,328 m³	117,527 ft³ 732,057 Imp. Gal.
Design Capacity of Catch Basin (freeboard level)		
Length (design capacity depth)	23.0 m	75 ft
Width (design capacity depth)	65.0 m	213 ft
Total Depth	4.0 m	13 ft
Design Capacity Depth	3.50 m	11 ft
End Slope	3 run:rise	3 run:rise
Side Slope	3 run:rise	3 run:rise
Design Capacity (freeboard level)	2,513 m³	88,746 ft³ 552,783 Imp. Gal.
Surface Area of Liquid Manure	1,495 m ²	16,092 ft ²

CFO Name ₁
 Land Location ₁

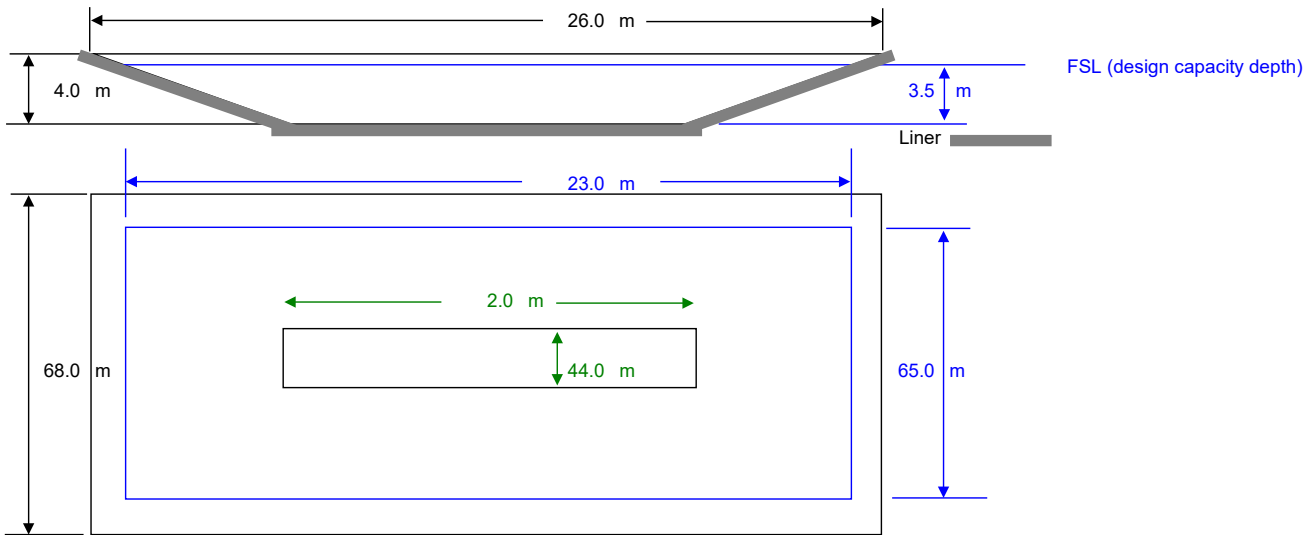
Runoff Catchment Area(s)			
Area ₂	Length (m)	Width (m)	Area (m ²)
1			0.0
2	221	221	48,841.0
3			0.0
4			0.0
5			0.0
Total Area (m²)			48,841

Rainfall (Select Town ₃)
 Brooks 80
 Design Rainfall 80 mm

Minimum Storage Volume Required for Paved Runoff Catchment Area	
3,907 m³**	137,984 ft³ 859,481 Imp. Gal.

Minimum Storage Volume Required for Unpaved Runoff Catchment Area	
2,344 m³**	82,791 ft³ 515,689 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

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 (cont.)

NRCB USE ONLY

Catch basin calculator. Total volume @ freeboard level: 2,513 m³ Runoff capacity requirements met: YES NO

Calculation of the volume attached: YES NO

Depth to water table: 6.8 m (borehole 6) Requirements met: YES NO

Depth to uppermost groundwater resource: 6.8 m (worst case) Requirements met: YES NO
No wells within 1 mile radius

ERST completed: See ERST page for details

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

Shallow bedrock in the east part of the CFO. Several sand lenses are reported that will have to be removed and refilled with compacted clay. A condition will be attached

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

Part 2 – Technical Requirements

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

NRCB USE ONLY	
RUNOFF CONTROL CATCH BASIN CAPACITY SUMMARY (if applicable)	
Facility 1	
Name / description catch basin	Capacity 2,513m³
Facility 2	
Name / description	Capacity
Facility 3	
Name / description	Capacity
Facility 4	
Name / description	Capacity
TOTAL CAPACITY	2,513m³
RUNOFF VOLUME FROM CONTRIBUTING AREAS	2,344 m³
MEETS AOPA RUNOFF CONTROL VOLUME REQUIREMENTS	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

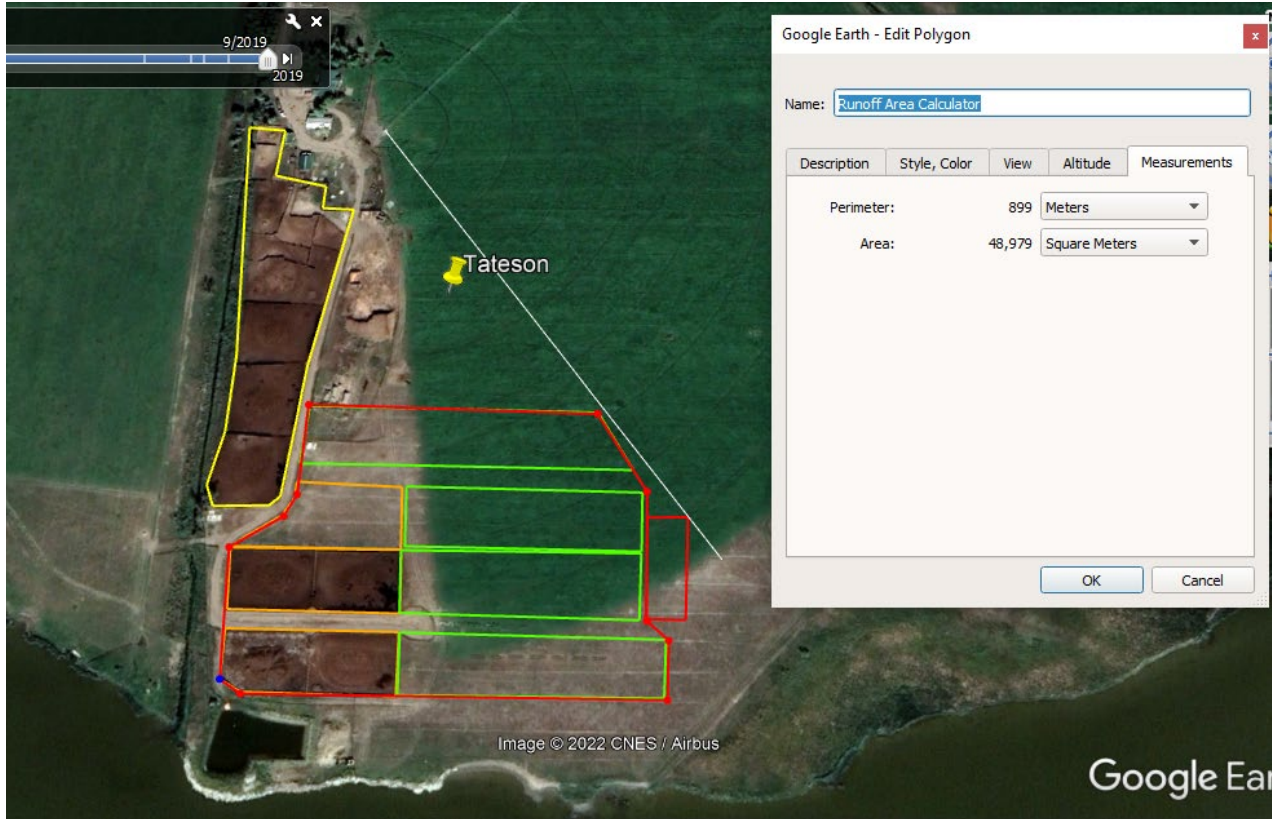


Figure 3: Runoff Area Calculation (Google Map Area Calculator)

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. _____
 2. _____

Manure storage capacity

	Length (m)	Width (m)	Depth below ground level (m)	NRCB USE ONLY Estimated storage capacity (m ³)
1.				
2.				
3.	Row 4: 225	42	0	TOTAL CAPACITY 9 month storage 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

(AO comment: feedlot pens)

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	

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

NRCB USE ONLY	
Requirements met:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Condition required:	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Report attached:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<i>2 conditions attached regarding runoff control from the feedlot pens</i>	

6 May 2022

Wood File: BX11613

Tateson Ranching Ltd.
c/o Linkage Ag Solutions
Box 1120
Coaldale, Alberta T1M 1M9

Attention: Mr. Cody Metheral:

**Re: Geotechnical Review and Evaluation
 NRCB Permitting of Feedlot Pen Expansion
 NW-20-016-12-W4M, near Brooks, Alberta**

As requested, Wood Environment & Infrastructure Solutions (Wood) 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 site soil conditions to support a permit application related to a series of proposed feedlot pens, and two proposed catch basins located within NW-20-016-12-W4M (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, eight boreholes were advanced at the site on October 13, 2021. The boreholes were advanced at the approximate locations denoted as AT1-21 to AT8-21 on Figure 1 attached. On February 7, 2022 the driller returned and deepened the test well installation at AT3-21, and installed an additional test well at location AT9-21.

The boreholes were advanced by a truck-mounted drill rig owned and operated by Chilako Drilling Services and extended to depths of approximately 3.0 m to 9.2 m below existing grades. The boreholes were logged by Larry Delong of Chilako Drilling Services.

In general, the natural mineral soils encountered within the boreholes comprised of minor near surface lacustrine soils underlain by clay till. It is noted that bedrock (siltstone and sandstone) was encountered in boreholes AT1-21 and AT3-21 below depths of approximately 2.8 m and 6.2 m below existing grade. Saturated sand layers were encountered in borehole AT6-21 below a depth of approximately 7.5 m below grade, while free groundwater was not encountered at the other borehole locations. A groundwater resource (as defined by the AOPA) was not encountered within the 9.2 m drilling depth at this site.

Three samples of soil were collected from the screen zone of the boreholes and were subjected to laboratory grain size distribution (i.e., hydrometer) analyses. The results (attached) of the textural breakdown for the screened soils are summarized in the table below.

Table 1: Hydrometer Test Results

Borehole	Sand %	Silt %	Clay %
AT3-21	36	42	22
AT7-21	28	56	16
AT9-21	32	38	30

To measure the *in situ* permeability of the subsurface soils, three 50 mm diameter PVC monitoring wells were constructed. The test wells were screened at various depths from 3.0 m to 9.0 m below existing grades (see Table 2). Well saturation of the 50 mm diameter monitoring well was carried out by filling the monitoring well to the top for several consecutive days. After several days of saturation, the 3-hour water drop ranged between 0.15 m and 0.75 m. The 3-hour water drop for each of the monitoring wells are listed in Table 2.

To calculate the permeability of the screened portion of the clay till 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 In Situ Permeability Test report sheets, attached. As outlined on the reports, the results of the *in situ* permeability testing indicate hydraulic conductivity, k_s , values ranging between 4.2×10^{-7} cm/s and 2.2×10^{-8} cm/s (see Table 2).

Using the measured permeability of the clay stratum, the equivalent natural soil thicknesses of naturally occurring materials having a hydraulic conductivity of 1×10^{-6} cm/s (the reference standard in AOPA) at the monitoring well locations has been calculated, and those thickness equivalents are presented in Table 2. As indicated, the equivalent thicknesses range between 3.8 m and more than 73 m. 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).

Table 2: Permeability Test Results

Borehole	3-hr Water Drop in Well (m)	Length of Screened Zone (m)	Depth of Screen (m)	Calculated Permeability	Calculated Equivalent 1×10^{-6} cm/s Thickness (m)
AT3-21 (Solid manure storage only)	0.61	1.60	3.7 – 5.3	4.2×10^{-7} cm/s	3.8
AT7-21	0.75	3.10	6.1 – 9.2	1.9×10^{-7} cm/s	16
AT9-21	0.15	1.60	5.8 – 9.0	2.2×10^{-8} cm/s	73

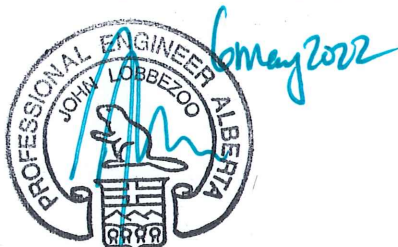
Conclusion

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

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

Yours truly,

**Wood Environment and Infrastructure Solutions,
A Division of Wood Canada Limited**



John Lobbezoo, P.Eng.
Associate Engineer, Geotechnical
Lethbridge & Medicine Hat Area Lead

Reviewed by:
Kevin Spencer, M.Eng., P.Eng.
Sr. Associate Geotechnical Engineer

PERMIT TO PRACTICE WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS
RM SIGNATURE: _____
RM APEGA ID #: <u>110450</u>
DATE: <u>6 May 2022</u>
PERMIT NUMBER: P004546 The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Attachments

- Figure 1 Borehole Locations
- In Situ Permeability Test Calculations
- Hydrometer Test Results (Soil Texture)
- Soil Profile and Parent Material Description, Chilako Drilling Services

Figure 1
Borehole Locations
Proposed Feedlot Expansion
Tateson Ranch
Wood File: BX11613
April, 2022

Legend

- Feature 1



AT3-21

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

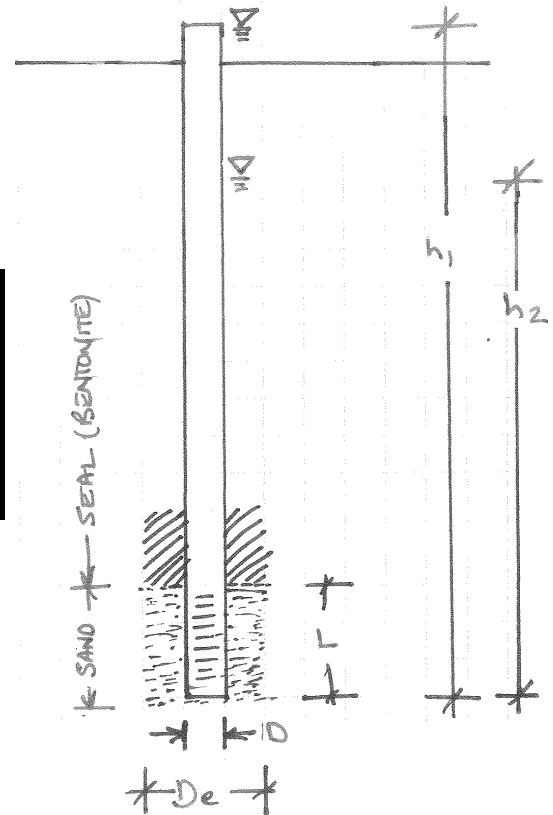
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

AT3-21 - Tateson

Wood File: BX11613

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	6.00	initial height of water above base of hole (m)
	h2	5.39	final height of water above base of hole (m)
t	3.0	time of test (h)	

$k_s = 4.2E-07$ cm/sec



AT7-21



In Situ Permeability Test

Modified Falling Head Permeability Equation

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

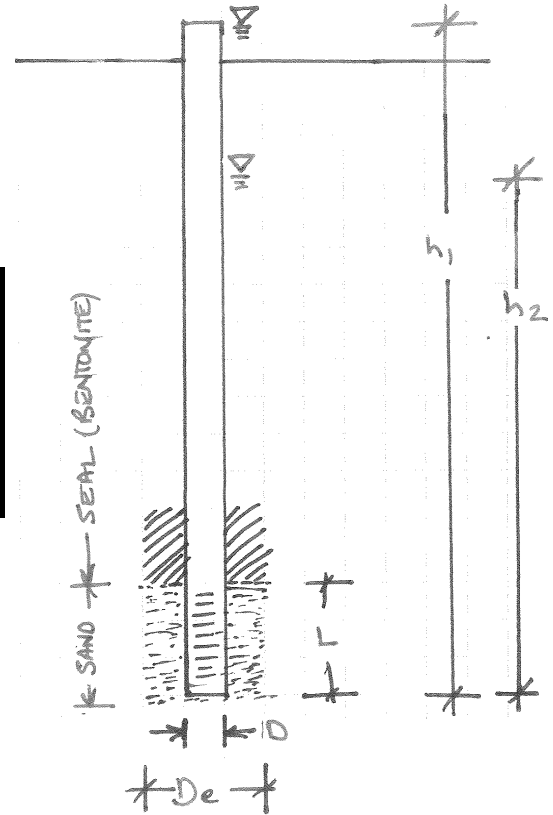
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

AT7-21 - Tateson

Wood File: BX11613

INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	3.10	length of sand section (m)
	h1	9.90	initial height of water above base of hole (m)
	h2	9.15	final height of water above base of hole (m)
t	3.0	time of test (h)	

$k_s = 1.9E-07$ cm/sec



AT9-21

In Situ Permeability Test

Modified Falling Head Permeability Equation

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

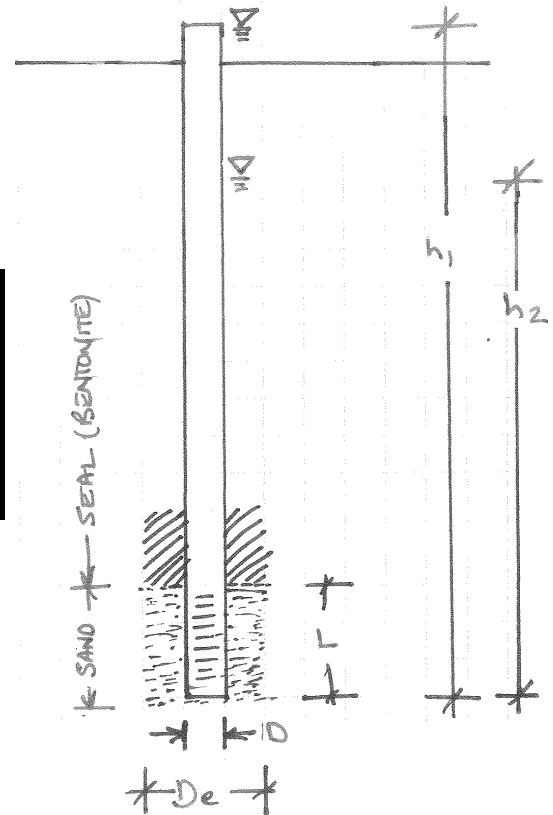
taken from USBR Engineering Geology Field Manual Volume 2 (2001)

AT9-21 - Tateson

Wood File: BX11613

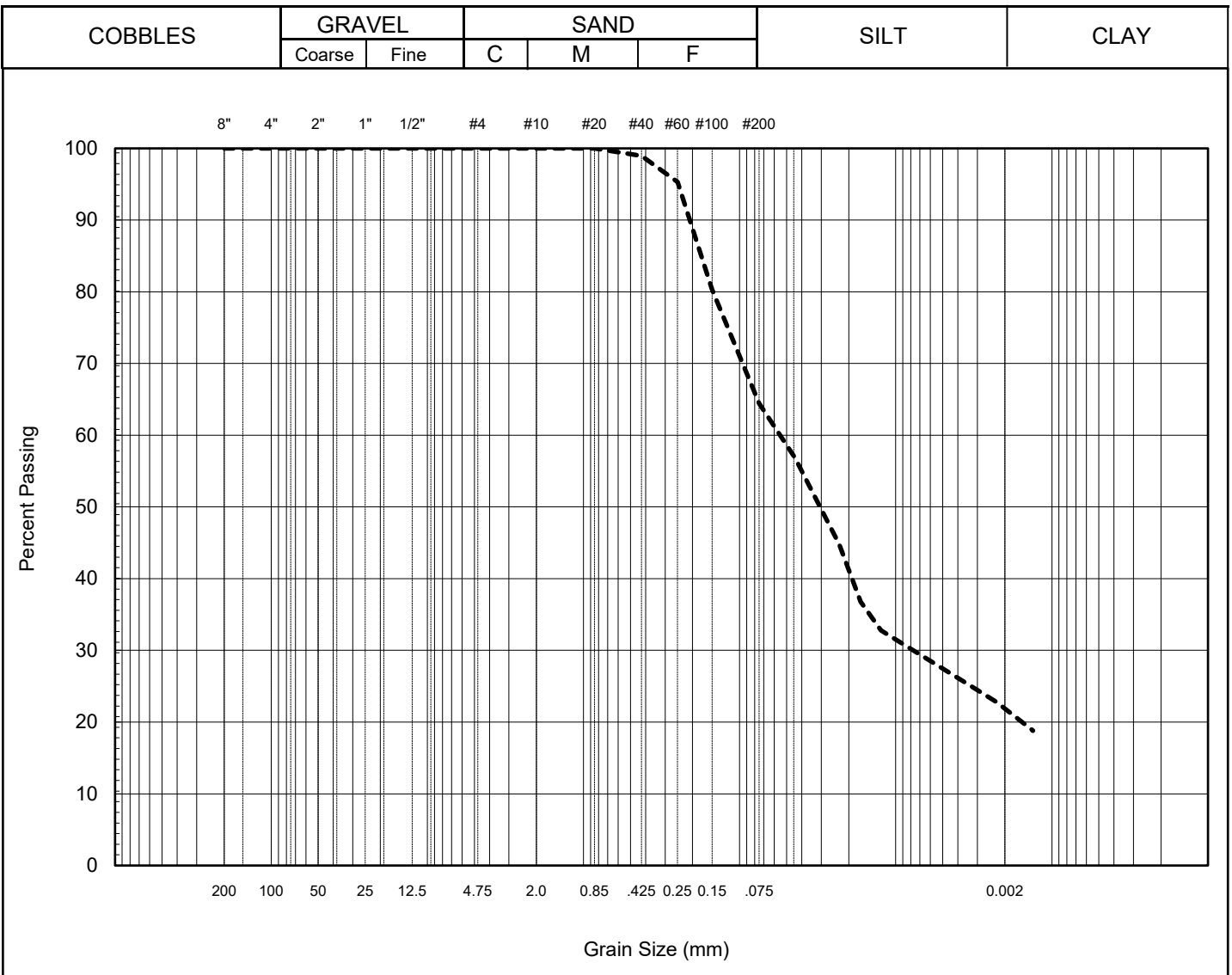
INPUT VARIABLES	Terms	Value	Definition
	D	0.0520	diameter of standpipe (m)
	De	0.1500	diameter of borehole (m)
	L	1.60	length of sand section (m)
	h1	8.70	initial height of water above base of hole (m)
	h2	8.65	final height of water above base of hole (m)
t	3.0	time of test (h)	

$k_s = 2.2E-08$ cm/sec



HYDROMETER TEST

Wood Environment & Infrastructure Solutions



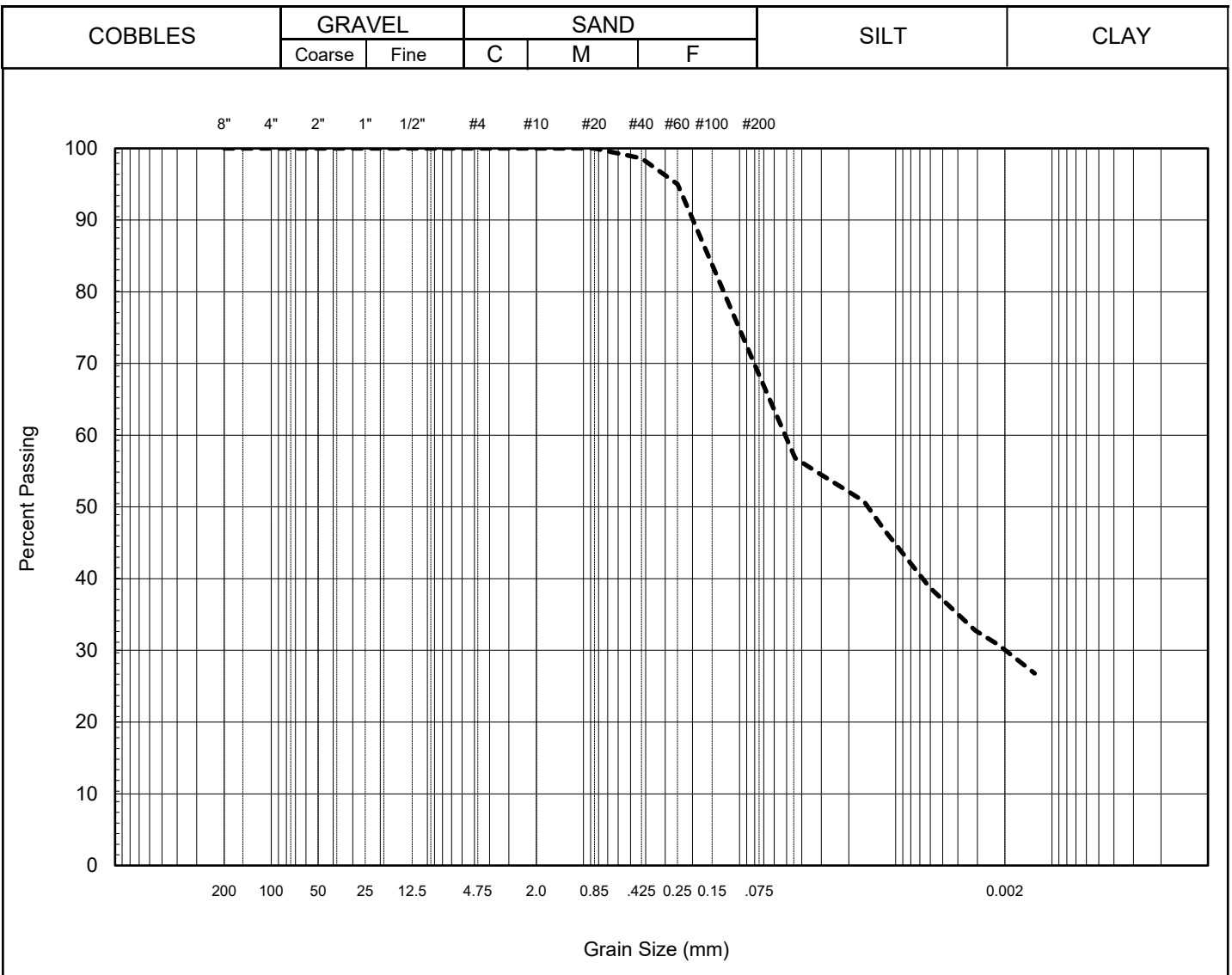
Remarks:

Summary			
D10 =	#N/A	mm	Gravel 0 %
D30 =	0.0078	mm	Sand 36 %
D60 =	0.0571	mm	Silt 42 %
Cu =	#N/A		Clay 22 %
Cc =	#N/A		

Project No: BX11613	Client: Linkage Ag Solution	
Hole No: AT3-21	Sample: --	
Depth (m): 4.0-4.5	Date: April 11, 2022	Tech: TMW/PP

HYDROMETER TEST

Wood Environment & Infrastructure Solutions



Remarks:

Summary			
D10 =	#N/A	mm	Gravel 0 %
D30 =	0.0020	mm	Sand 32 %
D60 =	0.0526	mm	Silt 38 %
Cu =	#N/A		Clay 30 %
Cc =	#N/A		

Project No: BX11613	Client: Linkage Ag Solution	
Hole No: AT9-21	Sample: --	
Depth (m): 7.0-8.0	Date: April 11, 2022	Tech: TMW/PP

CHILAKO DRILLING SERVICES LTD

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

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION

Site Location: NW-20-16-12W4, Tateson

Date: 10/13/2021, 02/07/22

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
AT1-21	0455174 5579098	0-0.4	CL	SM	Fill		
		0.4-0.7	CL	SM	Till		
		0.7-2.8	CL	M	Till		Stiff, med plastic, brown
		2.8-3.0	Siltstone	M	Bedrock		Soft bedrock, olive
AT2-21	0455165 5578969	0-0.3	CL	M	Fill		
		0.3-1.5	CL	M	Till		Stiff, med plastic, brown
		1.5-4.5	CL-C	M	Till		Stiff, med plastic, brown
		4.5-9.2	CL-C	M	Till		Stiff, med plastic, brown
AT3-21	0455276 5579000	0-0.15	CL	D	Topsoil		
		0.15-0.7	CL-SiCL	D	Lac		
		0.7-2.1	CL	M	Till		Stiff, med plastic, brown
		2.1-3.2	CL	M	Till	2.1-3.0	Stiff, med plastic, brown, iron staining
		3.2-6.2	CL-C	M	Till		Iron staining along fractures
		6.2-6.9	Siltstone	M	Bedrock		Soft bedrock, olive
		6.9-7.5	Sandstone	M	Bedrock		
							50mm H.C. well installed to 3.2m (5.3m) BGS Screen: 3.2-1.7m 5.3-3.8m Sand: 3.2-1.6m 5.3-3.7m Bentonite: 1.6-0.0m 3.7-0.0m Stickup: 0.7m 0.7m Hole Diameter: 0.15m
AT4-21	0455358 5578979	0-0.15	CL	D	Topsoil		
		0.15-0.7	SiCL	D	Lac		
		0.7-2.8	CL	M	Till		Stiff, med plastic, brown
		2.8-3.0	CL	M	Till		Stiff, med plastic, brown, iron staining
		3.0-6.4	CL-C	M	Till		Stiff, med plastic, brown, iron staining
		6.4-9.2	C	M	Till		Stiff, med plastic, brown, iron staining
AT5-21	0455425 5578905	0-0.15	SiCL	D	Topsoil		
		0.15-1.0	SiCL	D	Lac		
		1.0-2.2	C-SiL	M	Lac		
		2.2-3.1	CL	M-VM	Till		V. stiff, med-high plastic, dark brown, varved
		3.1-6.8	CL-C	M	Till		Firm, med plastic, brown
		6.8-7.5	FSL-FSCL	VM-Sat	Till		Stiff, med plastic, dark brown
AT6-21	0455430 5578950	0-0.15	SiCL	D	Topsoil		
		0.15-1.2	SiCL	D	Lac		
		1.2-2.0	SiCL	M	Lac		V. firm, med plastic, high plastic clay layers
		2.0-3.7	CL	M	Till		V. firm, med plastic, brown, some sand
		3.7-7.0	CL-C	M	Till	4.0-7.0	V. stiff, med plastic, dark brown, trace gravel
		7.0-7.4	FSL-FSCL	VM	Till		Soft
		7.4-7.5	CL	M	Till		Stiff, med plastic, brown
		7.5-9.2	CL-SCL	Sat	Till		V. firm, low plastic, brown, sat sand layers
							50mm H.C. well installed to 6.1m BGS Bentonite: 7.5-6.2m Screen: 6.1-3.1m Sand: 6.2-3.0m Bentonite: 3.0-0.0m Stickup: 0.6m Hole Diameter: 0.15m

SOIL PROFILE AND PARENT MATERIAL DESCRIPTION (CONTINUED)

Hole #	Location	Depth	Texture	Moisture	Geological	Sample	Remarks
AT7-21	0455410 5579041	0-0.15	SiCL	D	Topsoil		
		0.15-1.2	SiCL	D	Lac		
		1.2-2.6	CL	SM	Till		Stiff, med plastic, brown
		2.6-3.1	CL	M	Till		Stiff, med plastic, brown, sand lensing
		3.1-6.2	CL-C	M	Till		Stiff, med plastic, dark brown, oxidized along fractures, sand lensing @ 5.9m (VM)
		6.2-9.2	C	M	Till		V. stiff, med plastic, brown, trace gravel 50mm H.C. well installed to 9.2m BGS Screen: 9.2-6.2m Sand: 9.2-6.1m Bentonite: 6.1-0.0m Stickup: 0.7m Hole Diameter: 0.15m
AT8-21	0455330 5579055	0-0.15	CL	D	Topsoil		
		0.15-0.4	CL	D	Lac		
		0.4-1.6	C	D	Lac		Stiff, med-high plastic, dark brown
		1.6-2.3	CL	SM	Till		Stiff, med plastic, trace sand
		2.3-2.7	CL	SM	Till		Stiff, med plastic, some sand
		2.7-3.0	CL	SM	Till		Stiff, med plastic, brown
		3.0-5.0	CL-C	M	Till		Stiff, med plastic, brown, oxidized fractures
		5.0-7.6	CL-C	M	Till		Stiff, med plastic, brown, oxidized fractures
		7.6-9.2	FSCL	VM	Till		V. firm, low plastic, sand lensing
AT9-21	0455393 5578953	0-0.15	SiCL	D	Lac		
		0.15-1.8	SiCL	D	Lac		
		1.8-2.7	CL	M	Till		Stiff, med plastic, brown
		2.7-3.0	FSCL	M	Till		Firm, low plastic
		3.0-5.0	CL	M	Till		Stiff, med plastic, sand lenses
		5.0-8.6	CL-C	M	Till		Stiff, med-high plastic, dark brown
		8.6-9.2	CL-C	M	Till		Stiff, med-high plastic, dark brown, sand lensing 50mm H.C. well installed to 8.1m BGS Screen: 8.1-6.6m Sand: 8.1-6.5m Bentonite: 6.5-0.0m Stickup: 0.6m Hole Diameter: 0.15m

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

Name 0
 Address 0
 Legal Land 0
 Location 0

Animal Units to Determine Affected Party Radius

Category of Livestock	Type of Livestock	Number of Animals	Animal Unit Factor	Animal Units
Beef	Cows/Finishers (900+ lbs)	3,000	1.1	2727.3
	Feeders (450 - 900 lbs)	-	2	0.0
	Feeder Calves (<550 lbs)	-	3.6	0.0
	Other	-	-	0.0
Dairy (*count lactating cows only)	*Free Stall - Lactating Cows with all associated dries, heifers, and calves	-	0.5	0.0
	*Free Stall - Lactating cows with Dry Cows only	-	0.6	0.0
	Free Stall - Lactating Cows only	-	0.7	0.0
	Tie Stall - Lactating cows only	-	0.5	0.0
	Loose Housing - Lactating cows only	-	0.5	0.0
	Dry Cow (Solid manure)	-	1	0.0
	Dry Cow (Liquid manure)	-	1	0.0
	Replacements - Bred Heifers (Breeding to Calving)	-	1.15	0.0
	Replacements - Growing Heifers (350 lbs to breeding)	-	1.9	0.0
	Calves (< 350 lbs)	-	5	0.0
	Other	-	-	0.0
Swine Liquid (*count sows only)	Farrow to finish *	-	0.56	0.0
	Farrow to wean *	-	1.5	0.0
	Farrow only *	-	1.9	0.0
	Feeders/Boars	-	5	0.0
	Growers/Roasters	-	8.5	0.0
	Weaners	-	18.2	0.0
	Other	-	-	0.0
Swine Solid (*Count sows only)	Farrow to finish *	-	0.56	0.0
	Farrow to wean *	-	1.5	0.0
	Farrow only *	-	1.9	0.0
	Feeders/Boars	-	5	0.0
	Growers/Roasters	-	8.5	0.0
	Weaners	-	18.2	0.0
	Other	-	-	0.0
Poultry	Chicken - Breeders - Solid	-	100	0.0
	Chicken - Layers - Liquid (includes associated pullets)	-	125	0.0
	Chicken - Layers - (Belt Cage)	-	150	0.0
	Chicken - Layers - (Deep Pit)	-	150	0.0
	Chicken - Pullets/Broilers	-	500	0.0
	Turkey - Toms/Breeders	-	50	0.0
	Turkey - Hens (light)	-	75	0.0
	Turkey - Broilers	-	100	0.0
	Ducks	-	100	0.0
	Geese	-	50	0.0
	Other	-	-	0.0
Horses	PMU	-	1	0.0
	Feeders > 750 lbs	-	1	0.0
	Foals < 750 lbs	-	3.3	0.0
	Mules	-	1	0.0
	Donkeys	-	1.5	0.0
	Other	-	-	0.0
Sheep	Ewes/Rams	-	5	0.0
	Ewes with lambs	-	4	0.0
	Lambs	-	21	0.0
	Feeders	-	10	0.0
Other	-	-	0.0	
Goats	Meat/Milk (per Ewe)	-	6	0.0
	Nannies/Billies	-	10	0.0
	Feeders	-	13	0.0
	Other	-	-	0.0
Bison	Bison	-	1	0.0
	Other	-	-	0.0
Cervid	Elk	-	1.7	0.0
	Deer	-	5	0.0
	Other	-	-	0.0
Wild Boar	Feeders	-	6	0.0
	Sow (farrowing)	-	1.25	0.0
	Other	-	-	0.0

Total Animal Units 2727.3

Affected Party Radius 1.5 miles

Affected Party radius is measured from the boundary of the parcel of land where the cfo is located to land that is within the affected party radius.