

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 la	nd description
X Approval ☐ Registration ☐ Authorization _	BA24003	NE 14-	-49-2 W5M
Amendment			
PPLICATION DISCLOSURE			
nis information is collected under the authority of the Agr rovisions of the Freedom of Information and Protection of ritten request that certain sections remain private.	f <i>Privacy Act</i> . This information is p	oublic unless the	NRCB grants a
ny construction prior to obtaining an NRCB permit i	s an offence and is subject to	enforcement a	ction, including
the applicant, or applicant's agent, have read and under rovided in this application is true to the best of my knowl	edge. Emily Jocelyn Low F	P. Eng Digitally signature - APEGA	ned by Emily Jocelyn Low P. Eng.
ate of signing	APEGA Signature	Date: 2024	.07.17 16:12:33 -06'00'
Crow Farms and Ranches Ltd.	oignatare		
orporate name (if applicable)	Print name		
biporate name (ii applicable)	Time name		
ENERAL INFORMATION REQUIREMENTS Proposed facilities: list all proposed confined feeding o	poration facilities and their dime	neione Indicate	whether any of the
proposed facilities: list all proposed confined reeding of proposed facilities are additions to existing facilities. (att		isions. Indicate	whether any or the
Proposed facilities		2000	mensions (m) , width, and depth)
Current pens		4	75 m x 75 m
Proposed pens		37	5 m x 75) m
Catch Basin		54 m	x 54 m x 7.0 m
Existing facilities: list ALL existing confined feeding op	peration facilities and their dimen	sions	
Existing facilities	Dimension (length, width,		NRCB USE ONLY
NRCB USE ONLY	THE RESIDENCE OF THE PARTY OF T		



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

ase explain what will	happen to the old f	acility and when.
E 11/20 - 4		
cilities		all a companies of the
	Fall 12626	ilities Fall '2026

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
Beef Finishers	The way I shall		3500
			Arms Tollard
			SELVI SHOWN
	- 73		



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

I DO want my water licence application cou	upled to my AOPA permit application.
Signed thisday of, 20	Signature of Applicant or Agent
OPTION 2: Processing the AOPA permit an	d Water Act licence separately
I (we) acknowledge that the CFO will need development or activity proposed in this AC	a new water licence from EPA under the <i>Water Act</i> for the OPA application.
그는 그는 그렇게 하게 하게 되었다면 하게 하는 사람들이 되는 사람들이 하는 사람들이 되었다면 하는 사람들이 되었다면 하는 것이다.	AOPA application independently of EPA's processing of the
	eat, if this AOPA application is granted by the NRCB, the EPA as improving or enhancing the CFO's eligibility for a
, ,	or actions to populate the CFO with livestock pursuant to an licence will not be relevant to EPA's consideration of lication.
5. I (we) acknowledge that any such construct the <i>Water Act</i> licence application is denied violation of the <i>Water Act</i> . This risk include	ction or livestock populating will be at the CFO's sole risk if or if the operation of the CFO is otherwise deemed to be in es being required to depopulate the CFO and/or to cease
6. AS RELEVANT: I (we) acknowledge that t	or "undertakings" (as defined in the Water Act). he CFO is located in the South Saskatchewan River Basin d South Saskatchewan River Basin Water Allocation Order tly closed to new surface water allocations.
7. Provide: Water licence application number	r(s)
Signed this day of, 20	Signature of Applicant or Agent
OPTION 3: Additional water licence not re-	quired
I (we) declare that the CFO will not need a development or activity proposed in this AG	new licence from EPA under the <i>Water Act</i> for the
	r conveyance agreement details
Signed this day of, 20	
signed this day of, 20	 Signature of Applicant or Agent

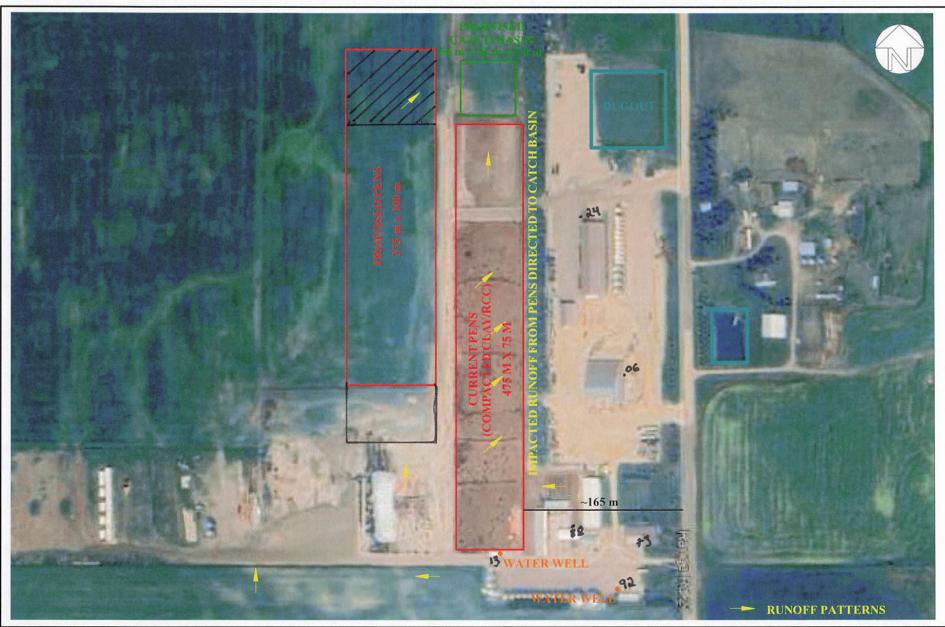


Application under the Agricultural Operation Practices Act for a confined feeding operation, manure collection area, and/or manure storage facility(ies)

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 numb	per(s) or water conveya	ance agreement details 00	177084-00-00
			Emily Jocelyn Low P. Eng	Digitally signed by Emily Jocelyn Low P. Eng.
Signed this	day of	, 20	APEGA	APEGA Date: 2024.07.17 16:21:47 -06'00'
			Signatur	e of Applicant or Agent





Title:

Detailed Site Layout Plan Warren Crow NE-14-49-2-W5M Leduc County, Alberta

Project	No:
	2401-43049

Date:

May 14, 2024

Scale:

Prepared By:

L. Predy

Image Source:

Google Earth Pro (February 22, 2024)

Figure No.:

2.0

Page 5 of 71



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	or each of the proposed facilities)
Facility description / name (as indicated on site plan)	

Existing: Current Pens Proposed 2: Catch Basin		Proposed 1: Propose	d Pens
		Proposed 3:	
Pariney, and con-	TO THE PERSON OF THE PARTY OF T	Facilities	NPCR LISE ONLY

Facili	ity and environmental risk	r and environmental risk		AND MAINTAIN	NRC	B USE ONLY	
	information	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	
ie.	How many springs are within 100 m of the manure storage facility or manure collection area?	0	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?	Carl pillin grade	0	0	54	YES NO YES with exemption	
Su ri	What is the shortest distance from the manure collection or storage facility to a surface water body? (e.g., lake, creek, slough, seasonal)	82 m	168 m	78 m		YES NO YES with exemption	
dwater	What is the depth to the water table?	>4.5 m	>4.5 m	>9.0 m		YES NO YES with exemption	
Groundwater	What is the depth to the groundwater resource/aquifer you draw water from?					YES NO YES with exemption	

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

See attached Site and Soil Assessment (Envirowest, 2024).



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

			THE REAL PROPERTY.	LY			
Neighbour name(s)	Legal land description	Distance (m)	Zoning (LUB) category	MDS category (1-4)	Distance (m)	Waiver attached (if required)	Meets regulations
R. & M. Scobie	NW-13-49-2-W5	230					
Brayden Preace	SW-24-49-2-W5	475					
P. Tomaszewski	SE-14-49-2-W5	420					
R., A., & D. Tomaszewski	SW-14-49-2-W5	1000					
M. & M. Stilet	NW-14-49-2-W5	1180					

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

				NRCB USE ONLY		
Name of land owner(s)*	Legal land description	Usable area** (ha)	Soil zone ***	Usable area (ha)	Agreement attached (if required)	
See attached						
			Total		1	

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

Additional information (attach any additional information as required)

^{**} 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



Alberta. Water Well Drilling Report

View in Imperial Export to Excel

2070005

GIC Well ID GoA Well Tag No. Drilling Company Well ID

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

SOWN ID	dodadoj. Tilo ililotilidasii o	.,			Date Report Received	d
Well Identification and L	ocation				·	Measurement in Metric
Owner Name CROWE, WARREN	Address RR 1	Town THO	n RSBY	Province AB	Country CA	Postal Code T0C 2P0
Location 1/4 or LSD NE	SEC TWP RGE 14 49 2	W of MER Lot 5	Block Plan	Addition	nal Description	
Measured from Boundary o	of m from m from	GPS Coordinates in De Latitude 53.232400 How Location Obtained Not Verified	cimal Degrees (NAD 83 Longitude114.		Elevation How Elevation Obtain	
Delling Information						
Drilling Information Method of Drilling Rotary		Type of Work New Well				
Proposed Well Use Domestic						
Formation Log	M	easurement in Metric	Yield Test Summa	ıry		Measurement in Metric
Depth from Water ground level (m) Bearing	Lithology Description		Recommended Pum Test Date W		31.82 L/min S	tatic Water Level (m)
7.92	Clay		2006/06/24	31.8	2	9.14
10.67	Sand		Well Completion			Measurement in Metric
11.28	Hard Sandstone		Total Depth Drilled 48.77 m	Finished Well	Depth Start Date 2006/08/24	End Date 2006/08/24
14.63	Silty Sandstone		Borehole		2000,0072	
16.15 17.22	Shale Coal		Diameter (cm)		From (m)	To (m)
20.27	Shale		12.70		0.00	48.77
20.57	Carbonaceous Shale		Surface Casing (if a Steel	аррисавіе)	Well Casing/L Plastic	iner
20.73	Hard Sandstone		Size OD :	14.13 cm		
22.86	Shale]	Wall Thickness :	0.655 cm	_	
27.43	Silty Shale		Bottom at :	25.30 m	Top . Bottom :	at: 18.29 m at: 48.77 m
35.05	Sandstone		Perforations		Bottom	at. 40.17 III
41.45	Hard Sandstone			Diamete		
42.37	Coal		From (m) To (n	Slot Wi n) (cm)	•	Hole or Slot Interval(cm)
46.02	Shale	1	30.48 48.7			20.32
46.94	Sandstone		Perforated by S	aw		
48.77	Shale		Annular Seal Drive Placed from Amount Other Seals	en 	o25.30 m	
			Тур	pe		At (m)
			Screen Type Size OD: From (m)		<u>n</u> To (m)	Slot Size (cm)
			Attachment			
			Top Fittings		Bottom Fitting	gs
			Pack Type Unknown		Grain Size	
		<u> </u>	Amount	Unknown	1	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

MARK SERVOLD

Company Name

CYCLONE DRILLING LTD.

Certification No

VB4273



Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No. Drilling Company Well ID 2070005

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID Date Report Received Well Identification and Location Measurement in Metric Owner Name Address Town Province Country Postal Code CROWE, WARREN RR 1 THORSBY AB CA T0C 2P0 Location 1/4 or LSD SEC **TWP** RGE W of MER Lot Block Plan Additional Description NE 49 5 14 2 GPS Coordinates in Decimal Degrees (NAD 83) Measured from Boundary of Latitude 53.232400 Longitude -114.179000 Elevation m m from How Location Obtained How Elevation Obtained m from Not Verified Not Obtained Additional Information Measurement in Metric Distance From Top of Casing to Ground Level Is Artesian Flow is Flow Control Installed Rate Describe Pump Installed Recommended Pump Rate 31.82 L/min Depth 45.72 m Recommended Pump Intake Depth (From TOC) Type_ H.P. Model (Output Rating) Did you Encounter Saline Water (>4000 ppm TDS) Depth m Well Disinfected Upon Completion Gas Depth m Geophysical Log Taken Remedial Action Taken Submitted to ESRD Sample Collected for Potability Submitted to ESRD Additional Comments on Well

Yield Test	0. 17	2	Taken	From Ground Level Depth to water level	Measurement in Metric
Test Date 2006/06/24	Start Time 12:00 AM	Static Water Level 9.14 m	Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
				3:00	45.42
Method of Water I	Removal			4:00	41.15
	Type Air			5:00	38.40
Removal		nin .		6: <u>00</u> 7:00	35.97
		<u></u>		7:00	33.53
Depth Withdrawn I	From 48.77 m	_		8:00	32,31
				9:00	30.78
If water removal pe	eriod was < 2 hours, explain	why		10:00	29.57
				12:00	26.52
				14:00	23.77
				16:00	21.03
				20:00	14.63
				25:00	13.41
				30:00	12.19
				35:00	11.28
				40:00	10.67
				50:00	10.06
				60:00	9.45 9.14
				75:00	9.14

Water Diverted for Drilling	-	
Water Source	Amount Taken L	Diversion Date & Time

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

MARK SERVOLD Company Name

CYCLONE DRILLING LTD.

Certification No



Albertan Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No.

450991

GOWN ID

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Drilling Company Well ID 1973/06/11 Date Report Received

Well Identification and Location			Measurement in Metric
Owner Name Address ZUKOWSKI, ED THORSE		wn Province	Country Postal Code
Location 1/4 or LSD SEC TWP NE 14 49	RGE W of MER Lot 2 5	Block Plan Additional Descri	iption
Measured from Boundary of m from m from	GPS Coordinates in Latitude 53.23236 How Location Obtain Map		evation Obtained
Drilling Information Method of Drilling Rotary Proposed Well Use Stock	Type of Work New Well		
Formation Log	Measurement in Metric	Yield Test Summary	Measurement in Metric
Depth from Water Lithology Descript ground level (m) Bearing	ion	I -	L/min Static Water Level (m)
3.05 Clay	j	1973/01/01 45.46	9.14
27.43 Brown Shale & Co	oal	Well Completion	Measurement in Metric
30.48 Blue Shale & San	dstone	Total Depth Drilled Finished Well Depth	
42.67 Wet Sand		44.20 m	1973/01/01
44.20 Shale & Coal		Borehole	_ / /
		Diameter (cm) From (n 0.00 0.00	
		Surface Casing (if applicable) Windows Galvanized Steel	/ell Casing/Liner
1		Size OD: 11.43 cm	Size OD: 0.00 cm
			Wall Thickness: 0.000 cm
		Bottom at : 28.35 m	Top at :0.00_m
			Bottom at : 0.00 m
		Perforations	· · · · · · · · · · · · · · · · · · ·
		Diameter or Slot Width From (m) To (m) (cm)	Slot Length Hole or Slot (cm) Interval(cm)
		Perforated by	
		Annular Seal Driven	1
		Placed from 0.00 m to	0.00 m
		Amount	
		Other Seals Type	At (m)
		Screen Type 0.00 cm From (m) To (m)) Slot Size (cm)
			,
			Bottom Fittings
		Pack Type Amount	Grain Size
Contractor Certification		On Million Ma	-

UNKNOWN NA DRILLER

Name of Journeyman responsible for drilling/construction of well

Company Name

HOSTYN DRILLING CO. LTD.

Certification No



Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID

450991

GOWN ID

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GoA Well Tag No. **Drilling Company Well ID** Date Report Received

1973/06/11

weir identification	and Location									N	ileasurement in Me
Owner Name ZUKOWSKI, ED		Address THORSBY			Town			Province	Col	untry	Postal Code
Location 1/4 or NE	LSD SEC 14	<i>TWP</i> 49	RGE 2	W of MER 5	Lot	Block	Plan	Additio	nal Description	1	
Measured from Boui	ndary of m from m from			GPS Coordin Latitude 5 How Location Map	53.232360	•	, ,		Elevation _ How Elevation Not Obtained	on Obtaine	
Additional Informa	ation									N	leasurement in Met
Distance From Top Is Artesian Flow		_			Is	s Flow Cor	ntrol Installed				
_	Coto	L/min		0.00 L/mir	- Duma	المماحالما			Depth		
Recommended Pur Recommended Pur	,	(From TOC)			_	_	· .	Make	<i>D</i> еріп _		<u>m</u> P
Troopinmended Fair	mp mano bopin	(, , o , o.o,		0.00	,,,,,				Model (Out	tput Rating	7)
1)Id Vou Encounte	er Saline Water										
Remedial Action		(Gas	Depti	ַר <u></u> _ ר			Submitted to	g Taken SESRD		
			Gas	Depti			ollected for F	Submitted to Potability Ken From C	e ESRD Ground Level	Submitte	d to ESRD
Remedial Action Additional Comm WATER IS SOFT		me		Depth		Sample C	ollected for F	Submitted to Potability Ken From C Dept	ESRD	Submitte	d to ESRD
Additional Comm WATER IS SOFT Yield Test Test Date 1973/01/01	Start Ti 12:00 A Removal Type Pump Rate	me M 45.46 L/min 0.00 m	Static	: Water Level		Sample C	rollected for F	Submitted to Potability Ken From C Dept	Ground Level h to water leve	Submitte	d to ESRD
Additional Comm WATER IS SOFT Yield Test Test Date 1973/01/01 Method of Water R Removal I Depth Withdrawn F	Start Ti. 12:00 A Removal Type Pump Rate From	me M 45.46 L/min 0.00 m	Static	: Water Level		Sample C	rollected for F	Submitted to Potability Ken From C Dept	Ground Level h to water leve	Submitte	d to ESRD

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name HOSTYN DRILLING CO. LTD. Certification No

Copy of Well report provided to owner

Date approval holder signed



Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No. 1576153

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Drilling Company Well ID

2044/04/04

SOWN ID				ate Report Received	2014/04/04
Well Identification and Location					Measurement in Metric
Owner Name Address CROW ENTERPRISES LTD RR 1	<i>Tow</i> THO	n PRSBY	Province ALBERTA	Country CANADA	Postal Code T0C 2P0
Location 1/4 or LSD SEC TWP RGE	W of MER Lot	Block Plan		l Description	
NE 14 49 2	-	ecimal Degrees (NAD 83	3)		
Measured from Boundary of m from	Latitude 53.232368	• .	·	Elevation	m
m from	How Location Obtained	<u></u>		How Elevation Obtain	
	Not Verified			Not Obtained	
Drilling Information					
Method of Drilling	Type of Work				
Combination	New Well				
Proposed Well Use Domestic & Stock					
Formation Log Me	easurement in Metric	Yield Test Summa	-		Measurement in Metric
Depth from Water Lithology Description		Recommended Pum		45.46 L/min	
ground level (m) Bearing		Test Date W	ater Removal Ra	ate (L/min) St	atic Water Level (m)
2.44 Clay	j.	2014/03/20	40.91		19.07
3.35 Coal		Well Completion			Measurement in Metric
10.06 Shale		Total Depth Drilled		•	End Date
10.67 Coal	j		57.91 m	2013/06/19	2013/06/19
22.56 Shale		Borehole			
23.16 Coal		Diameter (cm) 20.00		From (m) 0.00	To (m) 18.29
32.00 Shale		13.02		18.29	57.91
45.72 Sandstone	1	Surface Casing (if a	applicable)	Well Casing/Li	ner
46.94 Coal	j	Plastic	45.04	Plastic	
50.29 Shale	İ	· —	15.24 cm	Size Ol	
52.43 Siltstone		Wall Thickness :	0.991 cm 18.29 m	Wall Thicknes	
57.91 Shale		Bottom at : _	16.29 111	Top a Bottom a	
		Perforations		Bottom	Jr. 37.31 III
			Diameter of	or	
		5 () T - (-	Slot Widt		Hole or Slot
		From (m) To (n 33.53 51.8		(ciù)	Interval(cm) 15.24
			Saw		
		Annular Seal Beni		late	
		Placed from	•		
		Amount			
		Other Seals	-		
		Ту			At (m)
		Driv Shale			18.29 18.29
		Screen Type	·		
			cm		
	Ì	From (m)		To (m)	Slot Size (cm)
		Attachment			
		Top Fittings		Bottom Fitting	ıs
	1	Pack Type		Grain Size	
	Į.	Amount			
	,			.	
· · · · · · · · · · · · · · · · · · ·					

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

DARREN PAPLEY

Company Name PAPLEY DRILLING LTD. Certification No

5896A

Copy of Well report provided to owner

Date approval holder signed

2014/03/29



Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No.

1576153

GOWN ID

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Drilling Company Well ID Date Report Received 2014/04/04

Well Identification and Location				Measurement in Metric
Owner Name Address CROW ENTERPRISES LTD RR 1		Town THORSBY		nuntry Postal Code NADA T0C 2P0
	RGE W of MER Lo		Additional Description	
	2 5			<u>, </u>
Measured from Boundary of		in Decimal Degrees (NAD 83)	•	<u></u>
m from	Latitude 53.232 How Location Obto		· •	m ion Obtained
m from	•	amed	1	
	Not Verified		Not Obtaine	
Additional Information			-	Measurement in Metric
Distance From Top of Casing to Ground Level	45.72 cm			
Is Artesian Flow		Is Flow Control Installed	1	
Is Artesian Flow Rate L/min		Describe	·	
Recommended Pump Rate	45.46 L/min	Pump Installed Yes		48.77 m
Recommended Pump Intake Depth (From TOC)	48.77 m	Type Submersible	Make	H.P. 0.5
· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		tput Rating) 10 GPM
Did you Encounter Saline Water (>4000 ppm TDS) Depth	m Well Disir	efected Upon Completion	/as
			pphysical Log Taken	
Remedial Action Taken		<u> </u>	Submitted to ESRD	
			Cabilities to Lond	
		Sample Collected for I	Potability	Submitted to ESRD
Additional Comments on Well			· 	
COMBINATION ROTARY AIR & MUD DRILLING, I	PROPOSED WELL USE - FAI	RM,		
Yield Test		Tak	en From Top of Casing	Measurement in Metric
		Tar	Depth to water leve	
Test Date Start Time 2014/03/20 1:00 PM	Static Water Level 19.07 m	Pumping (m)	Elapsed Time	Recovery (m)
2014/03/20 1.001 W	13.07 111	_	Minutes:Sec	
Method of Water Removal		19.07 20.47	0:00 1:00	38.00 35.74
Type PUMP		21.28	2:00	34.80
Removal Rate 40.91 L/min		22.00	3:00	34.19
Depth Withdrawn From m_		22.61	4:00	33. <u>68</u>
Depth Withdrawn From		23.09 23.57	5:00 6:00	33.07 32.46
If water removal period was < 2 hours, explain why		23.98	7:00	31.88
TESTED @ 9 GPM FROM 0 TO 20 MINUTES AND	THEN @ 10 CBM TO 120	24.38	8:00	31.32
MINUTES	THEN W TO GPM TO 120	24.69	9:00	30.81
Will to 120		24.94	10:00	30.30
		25.45	12:00	29.36
		25.93	14:00	28.47
		26.37	16:00	27.66 26.92
		26.77 27.10	18:00 20:00	26.24
		30.05	25:00	24.69
		31.01	30:00	23.72
		32,21	35:00	22.38
		33.07	40:00	21.56
		34.31	50:00	20.29
1		,	co. 00	19.71
		35.15	60:00	
		35.15 35.99	75:00	19.38
		35.15 35.99 36.70	75:00 90:00	
		35.15 35.99 36.70 37.26	75:00 90:00 105:00	19.38
		35.15 35.99 36.70	75:00 90:00	19.38
Water Diverted for Drilling		35.15 35.99 36.70 37.26	75:00 90:00 105:00	19.38
Water Diverted for Drilling Water Source	Amount Taken	35.15 35.99 36.70 37.26	75:00 90:00 105:00	19.38 19.07

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

DARREN PAPLEY

Company Name PAPLEY DRILLING LTD. Certification No

5896A

Yes

Copy of Well report provided to owner

Date approval holder signed

2014/03/29



Albertan Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No.

451001

SOWN ID	accuracy. The information of	n this report will be retained in a	a public database.	פוווווווש	Company Well II Report Received) 1989/01/19
Well Identification and L	ocation					leasurement in Metric
Owner Name ZUKOWSKI, ED	Address THORSBY	Tow	vn	Province	Country	Postal Code
Location 1/4 or LSD NE	SEC TWP RGE 14 49 2	W of MER Lot 5	Block Plan	Additional Des	cription	
Measured from Boundary o	of m from m from	GPS Coordinates in De Latitude 53.232360 How Location Obtained Map		How I	tion Elevation Obtaine Obtained	md
Drilling Information Method of Drilling Rotary Proposed Well Use Stock	,	Type of Work New Well				
Formation Log Depth from Water ground level (m) 3,05	Me Lithology Description	easurement in Metric	Yield Test Summary Recommended Pump R Test Date Water 1988/08/05	Rate 36.37 r Removal Rate (L 45.46	7 L/min	leasurement in Metric ic Water Level (m) 11.58
3.66 9.14 35.05 41.15	Coal Brown Shale Blue Shale Sand & Sandstone		Well Completion Total Depth Drilled Fin. 41.15 m Borehole Diameter (cm) 0.00 Surface Casing (if app Size OD: Wall Thickness: Bottom at: Perforations From (m) To (m) 36.58 41.15 Perforated by Hand Annular Seal Other Placed from C Amount Other Seals Type Size OD: From (m) Attachment Top Fittings Pack Type	From 0.0 From 0.0 From 0.0 From 0.0 From 0.0 From 0.00 cm From 0.0	Start Date 1988/08/05 (m) 0 Well Casing/Line Plastic Size OD: Wall Thickness: Top at: Bottom at: Slot Length (cm) 36.58 m	Heasurement in Metric

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name

HOSTYN DRILLING CO. LTD.

Certification No



Water Well Drilling Report

View in Imperial Export to Excel GIC Well ID

451001

GoA Well Tag No. Drilling Company Well ID

GOWN ID

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Date Report Received 1989/01/19

Well Identification and Location				Measurement in Metric
Owner Name Address ZUKOWSKI, ED THORSBY	Town	Province	e Country	Postal Code
Location 1/4 or LSD SEC TWP Re NE 14 49 2	5		onal Description	
Measured from Boundary of m from	GPS Coordinates in Decimal L Latitude 53.232360	Degrees (NAD 83) Longitude114.178599	Elevation	m
m from	How Location Obtained		How Elevation Obtain	
	Мар		Not Obtained	
Additional Information				Measurement in Metric
Distance From Top of Casing to Ground Level	cm			
Is Artesian Flow	Is Flow	Control Installed		
RateUmin				 _
Recommended Pump Rate		lled		m
Recommended Pump Intake Depth (From TOC)	30.48 m	Make	H. Model (Output Ratin	P
				
Did you Encounter Saline Water (>4000 ppm TDS)		Well Disinfected Upo		
Gas _ Remedial Action Taken	Depth m	Geophysical Lo	og Taken	
		Submitted	to ESND	
	Samı	ole Collected for Potability	Submitte	ed to ESRD
Additional Comments on Well				
Yield Test				Measurement in Metric
Test Date Start Time	Static Water Level	Pumping (m)	oth to water level Elapsed Time	Recovery (m)
1988/08/05 12:00 AM	11.58 m	rumping (m)	Minutes:Sec	Recovery (III)
Method of Water Removal				
Type Bailer				
Removal Rate 45.46 L/min				
Depth Withdrawn From 28.96 m				
If water removal period was < 2 hours, explain why				
Water Diverted for Drilling		· · · · · ·		
Water Source	Amount Taken L	Divers	ion Date & Time	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name HOSTYŃ DRILLING CO. LTD. Certification No

Copy of Well report provided to owner

Date approval holder signed



Albertan Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No.

364749

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Drilling Company Well ID Date Report Received

1992/06/11

OWN ID		accuracy. The life	ormadon d	iii ulis report will be retained in a p	ublic database.		Date Report Received	1992/06/11
Well Identifica	tion and Loc	ation					N	Measurement in Metri
Owner Name ZUKOWSKI, ED)	Address RR1 THOR	SBY	Town		Province	Country	Postal Code T0C 2P0
Location 1/-		SEC TWP 14 49	RGE 2	W of MER Lot 5	Block Plan		nal Description	
Measured from	m	from from		GPS Coordinates in Dec Latitude 53.232360 How Location Obtained Map	imal Degrees (NAD 8 Longitude <u>-114</u>		Elevation How Elevation Obtaine Not Obtained	
Drilling Informa	ation							
Method of Drill. Rotary	ing			Type of Work New Well				
Proposed Well Domestic	Use							
Formation Log	9		M	easurement in Metric	Yield Test Summa	•		Measurement in Metr
Depth from ground level (m		Lithology Description		:	Recommended Pun Test Date V	np Rate Vater Removal		itic Water Level (m)
3.35		Clay] [1992/06/02	136	38	9.14
5.18		Coal		ĪĪ	Well Completion		<u> </u>	Measurement in Metr
7.92		Gray Shale] [Total Depth Drilled	Finished Well		End Date
8.23		Coal		, [42.67 m		1992/06/02	1992/06/02
10.97		Brown Shale			Borehole		# ()	T- ()
11.89		Coal			Diameter (cm) 0.00)	From (m) 0.00	To (m) 42.67
21.64		Shale			Surface Casing (if	applicable)	Well Casing/Lin	
23.16		Coal] [Steel		Plastic	
25.60		Shale		[]	Size OD :			
26,21		Sandstone			Wall Thickness : Bottom at :	0.478 cm 27.13 m	_	
31.70		Gray Shale] [Bollom at .	21.13 111	Top at Bottom at	
42.67		Sandstone			Perforations		Dollom at	42.07 111
					From (m) To (i 36.58 42.6		idth Slot Length) (cm)	Hole or Slot Interval(cm) 0.00
					Annular Seal Driv Placed from Amount Other Seals		o <u>26.82 m</u>	
					Ту	ре	i	At (m)
					Screen Type Size OD: From (m)	0.00 cn	n To (m)	Slot Size (cm)
					Attachment Top Fittings		Bottom Fittings	
							Bottom ritings	
					Type	0.00	Grain Size	
				-				

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name

MID-WEST WATER WELLS LTD.

Certification No



Well Identification and Location

Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No. 364749

GOWN ID

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Drilling Company Well ID

Date Report Received 1992/06/11 Measurement in Metric

ZUKOWSK			RR1 THOR	SBY		Iown			Province	Count	ry Postal Code T0C 2P0
Location	1/4 or LSD NE	SEC 14	<i>TWP</i> 49	RGE 2	W of MER 5	Lot	Block	Plan	Additio	nal Description	
Measured fi	rom Boundary o	of m from m from			GPS Coordir Latitude <u>5</u> How Location Map	3.232360				Elevation How Elevation Not Obtained	
Additional	Information							· ·		_	Measurement in Me
Distance F Is Artesia	rom Top of Cas n Flow Rate	sing to Groui	nd Level		cm	Is	s Flow Con	trol Installed			
Recommer	nded Pump Rat	e	LIMIN		136.38 L/mir	n Pump	Installed	Describe			m
	•		rom TOC)		24.38 m	Туре			Make		H.P
										Model (Output	t Rating)
	Encounter Salin I Action Taken	e Water (>4		(S) as				Geo		Completion g Taken o ESRD	
Addition	al Comments o	n Well					Sample Co	ollected for P	otability	Su	ubmitted to ESRD
Yield Test								Tak		Ground Level	Measurement in Me
Test Date 1992/06/02	!	Start Time 12:00 AM		Static	Water Level 9.14 m		Pum	iping (m)	E	lapsed Time Minutes:Sec	Recovery (m)
Method of	Water Remov	al									
_	Type <u>A</u>			.							
	emoval Rate _ hdrawn From _										
	noval period wa			- /	<u> </u>						
Water Dive	erted for Drilli	ng									
Water Source	ce			Amo	unt Taken				Diversio	n Date & Time	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name

MID-WEST WATER WELLS LTD.

Certification No

Land Base for Manure and Compost Application Part II: Technical Requirements Crow Farms and Ranches Ltd.

					NRCB U	SE ONLY
Name of Landowner(s)*	Reference	Legal Land Description	Usable Area (ha)	Soil Zone	Usable Area (ha)	Agreement attached (if required)
W. Crow	Home Farm	NE-14-49-2-W5	160	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
W. Crow	Home N Quarter	SE-23-49-2-W5	160	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
W. Crow	Bendza	SW-24-49-2-W5	130	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
CFOW		SE-24-49-2-W5	131	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
Crow		NE-24-49-2-W5	145	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
W. Crow	Warren East	SE-13-49-2-W5	155	Dark Gray Chernozemic, Dark Gray- Gray Luvisols	-	
W. Crow	E. Zukowski	NE-11-49-2-W5	160	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
W. Crow	E. Zukowski	SE-11-49-2-W5	147	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
crow		NE-16-49-2-W5	130	Dark Gray Chernozemic, Dark Gray- Gray Luvisols		
				Total		

^{*} Landowner names taken from 2021 Leduc County Land Ownership map. It is reported by the applicant that Warren Crow or Crow Farms and Ranches Ltd. currently owns all the properties.

ddress:	RR# 1, 49242	Range Rd 21, Thorsby, AB	Postal Code: T0C 2P0
gal lan	d location of cont	fined feeding operation: NE 14 49 2	
ave red IDS) to ove. In plicatio	quested the resid their residence for making this requ n and a copy of t	ence owner(s) named below to waive or the Agricultural Operation Practices lest, I have provided the owner(s) with	the required minimum distance separation s Act (AOPA) permit application identified an opportunity to review my permit soard (NRCB) Fact Sheet "Minimum Distance
have	advised the own	er(s) that section 3(6)(a) of the Standa	and Administration Regulation of AOPA. I ards and Administration Regulation allows if they agree in writing to grant a waiver;
That r	ny proposed dev	relopment does not meet the required	MDS to the owner's residence; and,
manu	re production, le	es only to this application as described vel of odour production, change to the ald require a new waiver.	. An increase in livestock capacity, annual site plan or change to a facility that would
llowing	is a summary of	the proposed development:	
The c	urrent scope of rock, if any, is:	ny confined feeding operation (CFO),	including the type, number, and category of
		Calf SFBS Facility	14.7
My ap	plication for a ne nd/or capacity a	ew AOPA permit proposes the following timy CFO:	ng changes to the existing livestock category,
manu	e storage volum	O facility(ies), or changes to the existi e and any other pertinent details, if ar lity to accomdate 3500 head Beef	ing CFO facilities, including manure storage, ny, are (attach a site layout plan if available): Finisher, proposed catch basin
60m	width x 50m le	ngth x 7 m deep	
	licant underst e sign this do		unless ALL registered owners of the

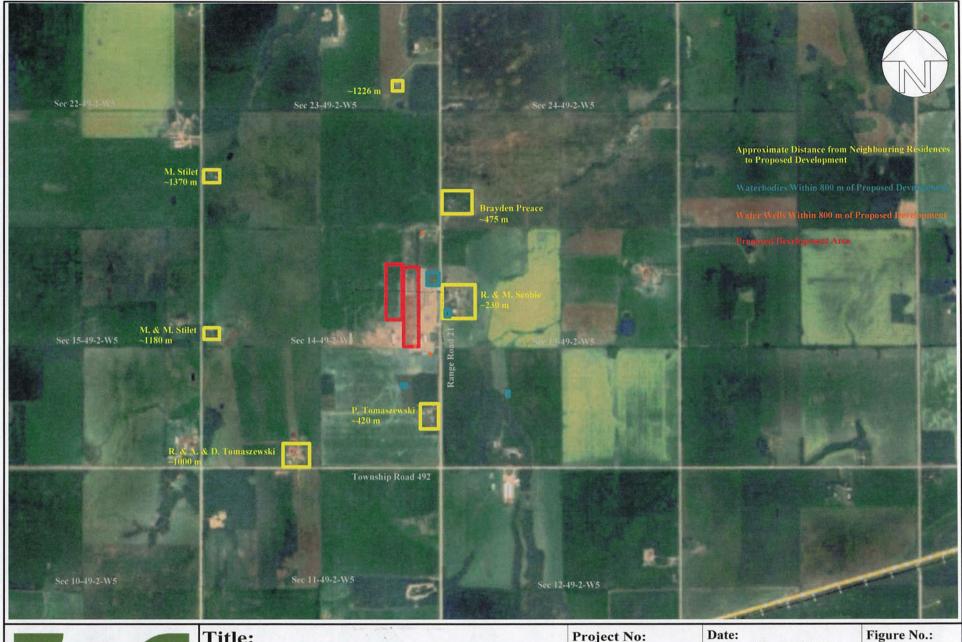
Residence owner(s) information
ALL Names on land title: Kay + Marie Scobie
Legal land location of residence(s): NW 13 49 2 5
Telephone number(s)¹: Email address(es)¹: _
Address(es)1 and Postal code(s)1: RR 1 Thorsby HB 100 2P0
¹ Please note that personal contact information is for NRCB use ONLY and not publicly released
I am/we are the legal landowner(s) of a residence(s) located at the above noted legal land location/address:
 I/we have read the NRCB Fact Sheet "Minimum Distance Separation (MDS) Waivers";
 I/we have discussed this application with the applicant and understand its potential impacts to our residence(s);
 I/we understand that the application does not meet the MDS requirement to my/our residence(s), under the Agricultural Operation Practices Act (AOPA);
 I/we understand that this waiver is not valid unless signed by ALL parties identified on the land title as owners;
 I/we are not obligated to waive the MDS requirement to our residence(s);
 I/we understand that if I/we choose to waive the MDS requirement, I/we can revoke the waiver, by providing written notice to the NRCB approval officer, as set out in the "Minimum Distance Separation (MDS) Waivers" Fact Sheet; and
I/we understand that this waiver is a public document.
Having considered my/our rights, I/we hereby waive the MDS requirement to my/our residence, with respect to
Application number BA24003
Application number
Signatures of all residence owner(s) on title
Raymend Scobie Marie Scobie Printed names of all residence owner(s) on title
Date: FEB 1, 2024

Applicant information		IPC8 servication non	BA24003	
perator/operation name	Crow Farms and Ra	nches Ltd.		
ddress: RR# 1, 49242	2 Range Rd 21, Thorsb	y, AB	_ Postal Code:	T0C 2P0
egal land location of cor	nfined feeding operation:	NE 14 49 2 W5		
have requested the residence bove. In making this requipolic forms and a copy of	dence owner(s) named b for the Agricultural Opera juest, I have provided the the Natural Resources C rs" available on the NRCI	elow to waive the req ation Practices Act (A owner(s) with an opp Conservation Board (N	OPA) permit appoortunity to review RCB) Fact She	olication identified w my permit et "Minimum Distance
have advised the owr	nt set out in section 3 of the ner(s) that section 3(6)(a) waived by the owners o	of the Standards and	d Administration	Regulation allows
That my proposed de	velopment does not mee	t the required MDS to	the owner's res	sidence; and,
manure production, le	es only to this application evel of odour production, ould require a new waiver	change to the site pla	crease in livesto an or change to	ck capacity, annual a facility that would
ollowing is a summary o	of the proposed developm	ient:		
livestock, if any, is:	my confined feeding ope	ration (CFO), includir	ng the type, num	ber, and category of
Lupi De Paul de Co	V Can of Bo 1 acmity	an State Con	yer man tipe	and the second second
My application for a n type and/or capacity a	ew AOPA permit propose at my CFO:	es the following chan	ges to the existi	ng livestock category,
manure storage volun	FO facility(ies), or change ne and any other pertiner ility to accomdate 3500	nt details, if any, are	(attach a site lay	out plan if available):
60m width x 50m le	ength x 7 m deep			
the applicant unders	tand that the waiver incument.	s not valid unless	ALL register	ed owners of the
ermit Applicant:		Datas	Fib -	01-2024
esidence owner(s) to in	Signature BR	Date.	1,00	

Res	idence owner(s) information
AL	L Names on land title: Bayden Mecce
Le	gal land location of residence(s): 49309 rg rd 21
Tel	ephone number(s) ¹ : Email address(es) ¹
Add	dress(es)¹ and Postal code(s)¹: TOP 2PO
1 0	lease note that personal contact information is for NRCB use ONLY and not publicly released
l am	/we are the legal landowner(s) of a residence(s) located at the above noted legal land location/address:
•	/we have read the NRCB Fact Sheet "Minimum Distance Separation (MDS) Waivers";
	/we have discussed this application with the applicant and understand its potential impacts to our residence(s);
•	I/we understand that the application does not meet the MDS requirement to my/our residence(s), under the Agricultural Operation Practices Act (AOPA);
	/we understand that this waiver is not valid unless signed by ALL parties identified on the land title as owners;
• 1	/we are not obligated to waive the MDS requirement to our residence(s);
-	I/we understand that if I/we choose to waive the MDS requirement, I/we can revoke the waiver, by providing written notice to the NRCB approval officer, as set out in the "Minimum Distance Separation (MDS) Waivers" Fact Sheet; and
	/we understand that this waiver is a public document.
Havi	ng considered my/our rights, I/we hereby waive the MDS requirement to my/our residence, with respect to
	DA CHES
App	lication number BA 2 900 3
2	ignatures of all residence owner(s) on title
Br	tayden Heece
F	rinted names of all residence owner(s) on title
Date	Feb 15+ 2024

	policant information NPCB agriculture pur	BA24003	
Op	perator/operation name: Crow Farms and Ranches Ltd.		
Ac	Idress: RR# 1, 49242 Range Rd 21, Thorsby, AB	_ Postal Code:	T0C 2P0
Le	gal land location of confined feeding operation: NE 14 49 2 W5		
l h (M ab ap	ave requested the residence owner(s) named below to waive the req DS) to their residence for the <i>Agricultural Operation Practices Act</i> (Alove. In making this request, I have provided the owner(s) with an oppolication and a copy of the Natural Resources Conservation Board (Natural Conservation (MDS) Waivers" available on the NRCB website at www.nrc	OPA) permit app portunity to revie NRCB) Fact She	olication identified w my permit et "Minimum Distance
•	The MDS requirement set out in section 3 of the Standards and Adhave advised the owner(s) that section 3(6)(a) of the Standards and this requirement to be waived by the owners of residences, if they are	d Administration	Regulation allows
•	That my proposed development does not meet the required MDS to	the owner's res	sidence; and,
•	That this waiver applies only to this application as described. An incommunity production, level of odour production, change to the site plaincrease the MDS would require a new waiver.	crease in livestoo an or change to a	ck capacity, annual a facility that would
Fo	llowing is a summary of the proposed development:		
	The current scope of my confined feeding operation (CFO), includir livestock, if any, is: Current scope: Cow Calf SFBS Facility	ng the type, num	ber, and category of
•	My application for a new AOPA permit proposes the following chan type and/or capacity at my CFO:	ges to the existing	ng livestock category,
•	The proposed new CFO facility(ies), or changes to the existing CFC manure storage volume and any other pertinent details, if any, are Propose a CFO facility to accomdate 3500 head Beef Finisher	(attach a site lay	out plan if available):
	60m width x 50m length x 7 m deep		
res Per	ne applicant understand that the waiver is not valid unless sidence sign this document. The provided HTML is a sidence of the provided HTML in the provided HTML is a sidence of the provided HTML in the provided HTML is a sidence of the provided HTML in the pro		30 - 2024

Residence	e owner(s) information
ALL Nam	es on land title: PAUL TOMASZEWSKI
Legal lan	d location of residence(s): SE 14 49 2 W5
Telephon	e number(s) ¹ Email address(es) ¹ :h_/G
Address(es)1 and Postal code(s)1: RRI Site 12 Box 8
	Thorsby AB TD L 2 PO ote that personal contact information is for NRCB use ONLY and not publicly released
¹ Please n	ote that personal contact information is for NRCB use ONLY and not publicly released
I am/we ar	e the legal landowner(s) of a residence(s) located at the above noted legal land location/address:
I/we ha	eve read the NRCB Fact Sheet "Minimum Distance Separation (MDS) Waivers";
I/we ha	ve discussed this application with the applicant and understand its potential impacts to our residence(s);
 I/we ur the Ag 	nderstand that the application does not meet the MDS requirement to my/our residence(s), under ricultural Operation Practices Act (AOPA);
	nderstand that this waiver is not valid unless signed by ALL parties identified on the land sowners;
 I/we ar 	re not obligated to waive the MDS requirement to our residence(s);
providi	nderstand that if I/we choose to waive the MDS requirement, I/we can revoke the waiver, by ng written notice to the NRCB approval officer, as set out in the "Minimum Distance Separation Waivers" Fact Sheet; and
 I/we ur 	nderstand that this waiver is a public document.
Having cor	sidered my/our rights, I/we hereby waive the MDS requirement to my/our residence, with respect to
Applicatio	n number 8A 24003
Signatu	res of all residence owners) on little
	PAUL TOMASZEWSK/
Printed	names of all residence owner(s) on title
Date:	JAN 30 2024





Title:

Area/Large Scale Plan Part II Technical Requirements Warren Crow NE-14-49-2-W5M Leduc County, Alberta

roject No:	Date:
2401-43049	

May 14, 2024

Scale:

Prepared By:

L. Predy

Image Source:

Google Earth Pro (2024)

Figure No.:

Page 25 of 71



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

aci	lity descri	ption /	name (as indica	ated on site plar	1. Pro	oposed Cato	ch Basin			
					2.					
					3.					
~ +/	ermination	of run	off area			\$25 \$25				
			ow how you calc	ulated the area	contributing to	runoff for ea	ach catch bas	in		
'le	ase see a	ttached	Site and Soil A	ssessment, S	ection 5.2 (E	nvirowest, 2	024).			
Cat	ch basin d	capacity	,							
	Length	Widt		Depth below	19. 37.6	Slope run:rise		NRO	CB USE ONLY	
	(m)	(m)		ground level (m)	Inside end walls	Inside side walls	Outside walls		ed storage capacity m freeboard) (m ³	
	E4	EA	7			2:1	4:1	(CACI. U.S	m neeboardy (m	_
	54	54	7	7	3:1	3:1	4:1			*
2.							,			
3.										
		- 21				TOTAL	CAPACITY			
						10171	- Critriciti			
m	pacted so	il liner	details			,	15			
	Thickness				Provide details			100		
CO	mpacted so	on imer			Native clay be compacted lir		oil to a deptr	of 3.0 was	deemed suitable	or a
	Soil textu	ıre				5555				
	Son texto		33	% sand	_	28	% silt		38%	clay
	Atterberg li	imits	Plastic limit		Liquid limit		Plasticity in	nde		
			13	13.21% 44.21% 3				31.00%		
				luctivity (cm/s)						
	Hydrauli conductiv		3.2x10^-8							
		vain e c	Describe test s	tandard used Permeameter	(ASTM D508	4-10)				
			management require			NRCB USE O	NLY			
ecl	nnical Guideli	ine Agdex	096-101				Requirem	ents met:	YES N	0
							Condition	required:	☐ YES ☐ N	0
							Report at		☐ YES ☐ N	



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

8	acted soil liner)	indicated on site n(an)	1. Current Pens			
acility description / name (as indicated on site plan)			2. Proposed Pens			
anur	e storage capacity		2.			
	Length (m)	Width (m)	Depth below grade to the bottom of the liner (m)	NRCB USE ONLY Estimated storage capacity (m³		
1.	475	75	0.3			
2.	375	75	0.3			
			TOTAL CAPACITY	Commence of the least of the le		
pac opo e pr	sed catch basin. The pro oposed catch basin.	control system ent pens will be directed oposed pens will be conto	to an alley to the east, which will be pured with a minimum 1% slope	to direct impacted runoff toward		
npac ropo ne pr	be the run-on and runoff of ted run-off from the curre sed catch basin. The pro oposed catch basin. pacted run-on and run-of	control system ent pens will be directed oposed pens will be conto		to direct impacted runoff toward		
mpac ropo ne pr Unimp Const	be the run-on and runoff of ted run-off from the curre sed catch basin. The pro oposed catch basin. pacted run-on and run-of ruction of berms around	control system ent pens will be directed oposed pens will be conto	oured with a minimum 1% slope e property (graveled area) will be ent unimpacted run-off from ente	to direct impacted runoff toward		
npac ropo ne pr nimp onst	be the run-on and runoff conted run-off from the currenced catch basin. The proposed catch basin. Deacted run-on and run-off ruction of berms around the proposed catch basin.	control system ent pens will be directed oposed pens will be conto if onto the east side of the the catch basin will prevent	oured with a minimum 1% slope e property (graveled area) will be ent unimpacted run-off from ente	to direct impacted runoff toward e directed north, to the dugout. ering.		
npac ropo ne pr nimp onst	be the run-on and runoff conted run-off from the currenced catch basin. The proposed catch basin. Deacted run-on and run-off ruction of berms around the behavior that the physical integral current pens have a roller to the deacted run-on and run-off ruction.	control system ent pens will be directed oposed pens will be conto if onto the east side of the the catch basin will prevent	oured with a minimum 1% slope e property (graveled area) will be ent unimpacted run-off from ente	to direct impacted runoff toward e directed north, to the dugout. ering.		
npac ropo e pr nimp onst	be the run-on and runoff conted run-off from the currenced catch basin. The proposed catch basin. Deacted run-on and run-off ruction of berms around the behavior that the physical integral current pens have a roller to the deacted run-on and run-off ruction.	control system ent pens will be directed oposed pens will be conto if onto the east side of the the catch basin will prevent	oured with a minimum 1% slope e property (graveled area) will be ent unimpacted run-off from ente	to direct impacted runoff towards e directed north, to the dugout. ering.		
mpac ropo ne pr Inimp const	be the run-on and runoff conted run-off from the currenced catch basin. The proposed catch basin. Deacted run-on and run-off ruction of berms around the behavior that the physical integral current pens have a roller to the deacted run-on and run-off ruction.	control system ent pens will be directed oposed pens will be conto if onto the east side of the the catch basin will prevent	oured with a minimum 1% slope e property (graveled area) will be ent unimpacted run-off from ente	to direct impacted runoff towards e directed north, to the dugout. ering.		
mpac ropo ne pr Inimp const	be the run-on and runoff conted run-off from the currenced catch basin. The proposed catch basin. Deacted run-on and run-off ruction of berms around the behavior that the physical integral current pens have a roller to the deacted run-on and run-off ruction.	control system ent pens will be directed oposed pens will be conto if onto the east side of the the catch basin will prevent	oured with a minimum 1% slope e property (graveled area) will be ent unimpacted run-off from ente	to direct impacted runoff toward e directed north, to the dugout. ering.		



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

SOLID MANURE, COMPOST, & COMPOSTING MATERIALS: Barns, feedlots, & storage facilities - Compacted soil liner (cont.)

Compacted soil liner de	tails			
		Provide compacted liner deta	ils (as required)	
Thickness of compacted liner		Native clay beneath topsoil suitable for a compacted lin average clay content of 33.	ner. This material (cl	ay loam) had an
Soil texture	% sand	% silt		% clay
Atterberg limits	Plastic limit 13.21%	Liquid limit 44.21%	3	Plasticity index 1.00%
Hydraulic conductivity	Hydraulic conductivity (cm/s) 3.2x10^-8 Describe test standard used Flexible Wall Permeameter (A	STM D5084-10)		
Additional information	(attach copies of soil test reports)	NRCB USE ONLY		
			equirements met: ondition required:	YES NO
		Re	eport attached:	YES NO
Depth to water table: Depth to uppermost grou ERST completed: Surface water control Requirements met: Y	ERST page for details	Requirements met Requirements met		
Compacted soil liner de Hydraulic conductivity afficient specification comme		ontent, thickness):		
Leakage detection system	m required: YES NO If ye	es, please explain why.		



SITE AND SOIL ASSESSMENT

Proposed Pens (Solid Manure Storage) and Catch Basin NE1/4-14-049-02-W5M

Leduc County, Alberta



Site and Soil Assessment Proposed Pens (Solid Manure Storage) and Catch Basin NE½-14-049-02-W5M Leduc County, Alberta

Prepared For: Warren Crow Crow Farms and Ranches Ltd.

Prepared By: Envirowest Engineering Box 4248, Ponoka, AB, T4J 1R6 (403) 783-8229

Report Date: July 17, 2024

Project Number: 2401-43049

Private and Confidential



Table of Contents

1.0	Introduction and Scope of Work	2
2.0	Assessment Results	3
3.0	Liner Assessments	5
3.1	Compacted Earthen Liner Assessment (Solid Manure Storage)	5
3.2	Compacted Earthen Liner Assessment (Catch Basin)	5
4.0	Conclusions	6
5.0	Design and Construction Considerations	7
5.1	Solid Manure Storage	7
5.2	Catch Basin Sizing	7
6.0	Earthen Liner Construction	8
7.0		
8.0	Qualifications of Assessors	11
9.0	References	12
List o	f Tables	
Tab	ole 1: Soil Properties Results	4
		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

-ii-

Appendices

- A. Figures
- B. Borehole Logs
- C. Certificate of Analysis



1.0 Introduction and Scope of Work

Envirowest Engineering (Envirowest) was retained by Warren Crow of Crow Farms and Ranches Ltd. to conduct a Site and Soil Assessment for the proposed construction of pens for 3600 finishers. The assessment included proposed solid manure storage and a catch basin.

The assessment was completed to determine conditions beneath the proposed construction area and assess soil properties for construction of proposed facilities. The operation, herein referred to as "the Site," is located on NE-14-049-02-W5M in Leduc County, as shown on Figure 1.0.

The assessment has been completed in accordance with the standards and regulations associated with the amended Agricultural Operation Practices Act and associated regulations which govern all new and modified confined feeding operations.

Scope of Work

Five investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 9.0 m below ground surface (mbgs) on January 23, 2024. The boreholes were completed in the area proposed for manure storage (solid) and the catch basin. Boreholes were also completed along the south and west portion of the current pens. The current pens were reportedly constructed with a compacted clay base and surfaced with roller compacted concrete. The borehole locations are shown on Figure 2.0 (attached).



2.0 Assessment Results

The Site is generally level, but slopes slightly to the north. The Site is currently in pasture or utilized as pens. The current pens are constructed with a compacted clay base and a surfaced with roller compacted concrete (RCC). Envirowest is not considering the RCC to be utilized as the protective barrier at this time. Assessment of the surfacing was not completed.

Five investigative boreholes were drilled using a truck-mounted rotary auger and completed to a maximum depth of 9.0 mbgs on January 23, 2024. Potential liner material (clay loam) was found beneath topsoil at depths between 2.5 and 9.0 mbgs (depth of investigation). Bedrock was not encountered to the maximum depth of investigation.

Boreholes were backfilled with the material removed by back spinning the solid stem auger and compacting to depth of the borehole.

-3-



The results of the soil analysis completed by a third-party laboratory are presented in Table 1 below. The soil sample locations are presented on Figure 2.0, and borehole logs are attached.

Table 1: Soil Properties Results

Parameter	Sand (%)	Silt (%)	Clay (%)	Soil Texture	Laboratory Hydraulic Conductivity (cm/sec)
24BH01-01	27	26	47	Clay	
24BH01-02	3	30	67	Heavy Clay	-
24BH01-03	13	26	61	Heavy Clay	-
24BH02-01	41	26	33	Clay Loam	
24BH02-02	41	26	33	Clay Loam	
24BH02-03	42	27	31	Clay Loam	-
24BH03	33	28	38	Clay Loam	3.2 x 10 ⁻⁸
24BH04-01	3	32	65	Heavy Clay	
24BH05-01	39	28	33	Clay Loam	-

The soils were identified as clay loam and heavy clay. The suspected compacted liner material (clay loam) had an average clay content of 33.6% ranging from 31-38%.

The soils identified as a clay loam with a clay content of 38%. The hydraulic conductivity was determined to be 3.2×10^{-8} cm/sec at 98% compaction. The maximum dry density was found to be 1.820 kg/m^3 with an optimum moisture content of 15%.

Conservatively a safety factor of 10 is to be applied to the hydraulic conductivity based on the NRCB Approvals Policy (2016-7), Section 8.7.2, stating "lab measurements of a sample of material taken from the field are not considered an accurate representation of the actual field hydraulic conductivity values. This is because of the potential variability of soils, differences in compaction methods and variances in compaction." The field hydraulic conductivity of the composite material tested is 3.2×10^{-7} cm/sec.



3.0 Liner Assessments

3.1 Compacted Earthen Liner Assessment (Solid Manure Storage)

Based on the information obtained it was determined that the native clay beneath topsoil, found to a depth of 3.0 meters, is suitable for a compacted liner.

Minimum Required Liner Thickness for Solid Manure Storage:

$$\frac{0.5 \text{ m}}{5 \text{ x } 10^{-7} \text{ cm/sec}} = \frac{\text{X m}}{3.2 \text{ x } 10^{-7} \text{ cm/sec}}$$
$$\text{X} = 0.32 \text{ m}$$

A minimum compacted liner thickness of 0.3 meters is required to provide protection. However, if RCC is not used as a surface, a compacted liner thickness of 0.5 meters is required.

3.2 Compacted Earthen Liner Assessment (Catch Basin)

Based on the information obtained it was determined that the native clay beneath topsoil, found to a depth of 3.0 meters is suitable for a compacted liner.

Minimum Required Liner Thickness for Catch Basin:

$$\frac{1 \text{ m}}{5 \text{ x } 10^{-7} \text{ cm/sec}} = \frac{\text{X m}}{3.2 \text{ x } 10^{-7} \text{ cm/sec}}$$

$$X = 0.62 \text{ m}$$

A compacted liner thickness of 0.6 meters is required within the catch basin.



4.0 Conclusions

The following conclusions are based on the discussed scope of the construction.

The soils found below topsoil, clay loam, were found to be suitable for a compacted clay liner for solid manure storage and as a catch basin.



5.0 Design and Construction Considerations

5.1 Solid Manure Storage

Pens that are currently in place are reportedly a compacted clay subgrade with a surface of roller compacted concrete. The compaction results for the clay subgrade are attached. The field density results indicate a minimum 98% compaction based on the original proctor. The results also meet a 97 to 98% compaction based on the proctor analysis for the material analyzed within this assessment.

The proposed pen areas will require a minimum 0.5 meter liner if RCC is not used. The proposed pens should slope at a minimum 1.0% towards the catch basin.

5.2 Catch Basin Sizing

Surface Run-off Area

The proposed area of contributing run-off, as shown on Figure 2.0, is 70,125 m². The runoff coefficient for the contributing area will be calculated assuming that RCC is in place.

The volume of the catch basin is recommended to have a total storage capacity of 7,015 m³, based on Calmar precipitation data.

- To provide the required capacity the catch basin should be 54 m in length x 54 m in width. The overall depth has been designed as 7.0 m. The overall capacity will be 8,652 cubic metres (1.9 million imperial gallons) which accounts for the required 0.5 m of freeboard, a storage capacity of 7,273 cubic metres. The sizing is based on an inside end and side wall slope of 3:1 (run/rise).
- The overall depth of 7.0 m will be achieved through a below grade depth of 7.0 m. Above-grade dykes will be required on the north portion of the catch basin to ensure unimpacted runoff does not enter the catch basin.
- The below-grade depth of the catch basin must maintain a minimum of a 1.0 m separation above the water table at the time of construction, should one be encountered



6.0 Earthen Liner Construction

- Construction of the clay liner should be completed in approximately 0.15 m lifts.
 Preferably, compaction of each lift will be undertaken with a padfoot roller, or the like.
 The equipment being used for soil compaction must fully penetrate each lift. Each lift should be compacted to not less than 97 percent Standard Proctor Dry Density prior to addition of the subsequent lift
- The soil should be within 2 percent of the optimum moisture (15%) as determined by a Standard Proctor Maximum Dry Density to ensure the lowest possible hydraulic conductivity for the completed liner
- Lifts should continue to be added until the recommended liner thickness is achieved.
 Particular attention should be paid to ensuring that the liner is integrally connected to the lower soil strata and that the soil around the inlet pipe is compacted to the same standard as the remainder of the liner
- Sand pockets that may be encountered during construction should be removed prior to liner installation
- Control of liner moisture content is critical during the construction process. Liner material
 should not be allowed to become saturated or to become dry. Should a lift surface become
 dry, the lift should be scarified prior to the placement of the next lift. Lifts which are
 above the required moisture content due to precipitation etc. should be removed or
 allowed to dry and re-compacted. The liner should not be allowed to freeze during
 construction
- Topsoil, frozen soil or rocks larger than 6 inches should not be included in the liner material
- Construction of the lagoon should be supervised by a professional engineer
- The outside dyke walls should be covered with 0.1-0.2 m of topsoil and seeded to prevent soil erosion.



The following general construction procedures are recommended, though some modifications may be required based on actual site conditions encountered during construction:

- The topsoil should be stripped from the area for construction. The topsoil can be reused on the freeboard area after construction completion.
- Sand and gravel seams, if encountered, should be excavated during construction and should be removed.
- If a sand or gravel seam is encountered that is large enough to alter the location of the facility, the NRCB approval officer and engineer should be contacted.
- Construction should be supervised by a professional engineer.

Following completion of the lagoon the operator should:

Ensure that shrubs, trees, and deep-rooted plants are not allowed to grow on or near the
walls of the facility.



7.0 Closure

Envirowest Engineering is pleased to submit the report to Warren Crow of Crow Farms and Ranches Ltd. The information and conclusions contained in this report are for their sole use. No other party is to rely upon the information contained within the report without the express written authorization of Envirowest Engineering.

Envirowest Engineering is not responsible for any damages that may be suffered as the result of any unauthorized use of, or reliance on, this report. Envirowest Engineering has performed the work and made the findings and conclusions set out in the report in a manner consistent with the level of care and skill normally exercised by members of the environmental engineer profession practicing under similar conditions at the time the work was performed. Envirowest Engineering accepts no responsibility for any deficiency, misstatement or inaccuracy in this report resulting from misinformation from any individuals or parties that provided information as part of this report.

We trust that this report meets your present needs. Please feel free to contact the undersigned with any questions or should you require additional information.

Respectfully submitted,

Prenared harra-17

Prepared b3/24-07-17 Emily J. Low, P.Eng. Envirowest Engineering

A

July 17, 2024

Reviewed by: Leah Predy, P.Ag. Envirowest Engineering

		TO PRA	
RM A	PEGA ID #: 11	0373 2024	
P	ERMIT N	UMBER: of Professional tists of Alberta (

2206165 Alberta Ltd. o/a Envirowest Engineering Association of Professional Engineers and Geoscientists of Alberta Permit to Practice No. P14810



8.0 Qualifications of Assessors

Ms. Emily Low, B.Sc., P.Eng, is an Environmental Engineer with Envirowest Engineering and has approximately 15 years of environmental assessment, monitoring, and remediation experience in the agricultural, industrial, real estate and development, and oil and gas sectors. Ms. Low has a Bachelor of Science in Chemical Engineering from the University of Alberta and is a certified Professional Engineer in Alberta (Association of Professional Engineers and Geoscientists of Alberta).

Leah Predy, B.A., B.Sc., P.Ag., is a Professional Agrologist with Envirowest Engineering and has approximately 5 years of experience in the environmental field, both in field data collection and report preparation for environmental assessments, monitoring, and remediation, as well as agricultural projects. Prior to her employment with Envirowest Engineering, Leah had five years of experience managing rangelands and navigating legislation and regulations as a Rangeland Agrologist with the Government of Alberta. She is a Professional Agrologist in Alberta (Alberta Institute of Agrologists).



9.0 References

- GOA (Government of Alberta). (November 2022). Agricultural Operation Practices Act and Regulations. Edmonton, AB: Author.
- GOA (Government of Alberta). (December 2020). Agricultural Operation Practices Act: Standards and Administration Regulation. Edmonton, AB: Author.

Appendix A

Figures





Title:

Site Location
Site and Soil Assessment
NE½-Sec.14-Twp.049-Rge.02-W5M
Leduc County, Alberta

Project No: Date: May 7, 2024

Scale: Prepared By:

L. Predy

350,300

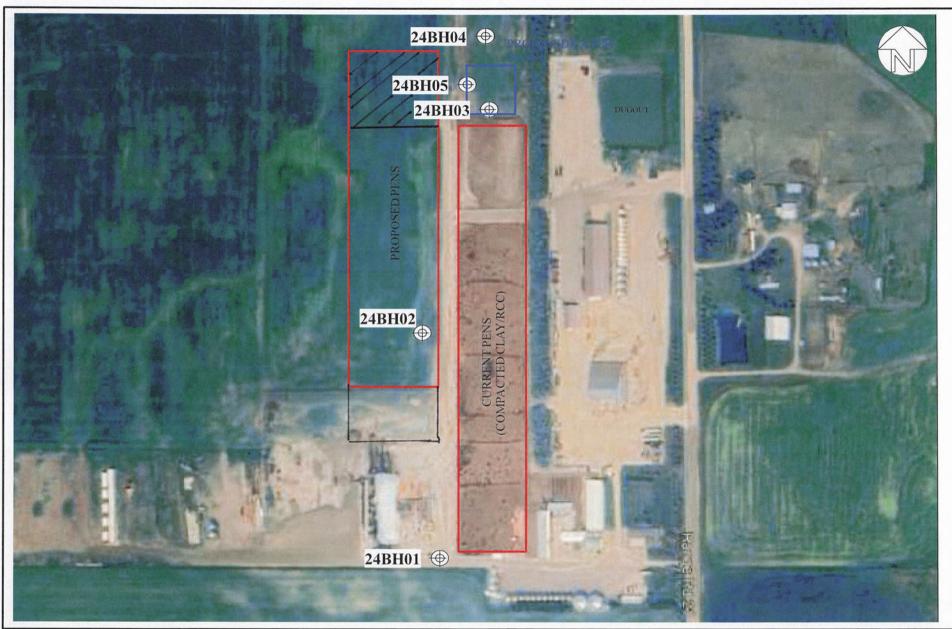
Image Source:

Google Earth Pro (February 22, 2024)

Figure No.:

1.0

Page 44 of 71





Title:

Borehole Locations Site and Soil Assessment NE½-Sec.14-Twp.049-Rge.02-W5M Leduc County, Alberta Project No: 2401-43049

Date:

May 7, 2024

Scale:

Prepared By:

L. Predy

Image Source:

Google Earth Pro (February 22, 2024)

Figure No.:

2.0

Page 45 of 71

Appendix B

Borehole Logs



(Page 1 of 1)

Site and Soil Assessment NE1/2-Sec.14-Twp.049-Rng.02-W5M Leduc County, Alberta Driller: Drilling Method: : Evergreen Drilling

Drill Date

: Truck Mounted Auger

	Project Numb	per: 2401-4		Logged E		: January 23, 2024 : Emily Low P.Eng.		
Depth in Meters	in Gastech Reading (ppm) Meters 0 100 200 300 400 500 0.0		VOC Reading	GRAPHIC	DESCRIPTION	Well: Elev.:	Water Level	
0.3					SANDY CLAY (CLAY), coal inclusions, olive brown, mottling, crumbly, medium plasticity, damp			
0.5								
1.0						24BH01-01		
1.5								
2.0								
2.5						SILTY CLAY (HEAVY CLAY), light brown, firm, damp		
3.0						24BH01-02		
3.3								
3.8						very hard 24BH02-03		
4.0								
4.5					111	1		



(Page 1 of 1)

Site and Soil Assessment NE1/2-Sec.14-Twp.049-Rng.02-W5M

07-17-2024 Z:\Operations\Client Data\43049 Warren Crow\Site and Soil Assessment\24BH02.bor

Driller:

: Evergreen Drilling

N	NE1/2-Sec.14-Twp.049-Rng.02-W5M Leduc County, Alberta Project Number: 2401-43049						Drilling M Drill Date Logged E	•	: Truck Mounted Auger : January 23, 2024 : Emily Low P.Eng.	er						
Depth in Meters	Gastech Reading (ppm)		0 300 400 50		300 400 500		GRAPHIC	DESCRIPTION	Well: Elev.:	Water Level						
0.0 - 0.3 - 0.5 - 0.5 - 1.0 - 1.3 - 1.5 -									SANDY CLAY (CLAY LOAM), coal inclusions, olive brown, mottling, medium plasticity, damp 24BH02-01 24BH02-02							



(Page 1 of 1)

Site and Soil Assessment NE1/2-Sec.14-Twp.049-Rng.02-W5M Leduc County, Alberta

Driller: Drilling Method: : Evergreen Drilling : Truck Mounted Auger

Drill Date

: January 23, 2024

	Project Number: 2401-43049					Drill Date Logged	Orill Date : January 23, 2024 .ogged By: : Emily Low P.Eng.						
Depth in Meters	in Aeters		Gastech Reading (ppm) 100 200 300 400 500				GRAPHIC	DESCRIPTION	Well: Elev.:	Water Level			
0.0 - 0.3 - 0.5 - 0.8 - 1.0 - 1.3 - 1.5 - 1.8 - 2.0 - 2.3 - 2.5 - 2.8 - 3.0 - 3.3 - 3.5 - 3.8 - 4.0 - 4.3 - 4.5 - 6.5 - 6.8 - 7.0 - 7.3 - 7.5 - 7.8 - 7.8 - 9.0 -								SANDY CLAY (CLAY LOAM), olive brown, firm, damp 24BH03 (0.25 to 2.5m) wet pockets					



(Page 1 of 1)

Site and Soil Assessment NE1/2-Sec.14-Twp.049-Rng.02-W5M Leduc County, Alberta

Driller: Drilling Method: : Evergreen Drilling : Truck Mounted Auger

Drill Date

: January 23, 2024

	Project Number: 2401-43049					Logged E	Ву:	: Emily Low P.Eng.	- San Series					
Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 50		Reading 5				DESCRIPTION	valer Level						
0.0							///	SILTY CLAY (HEAVY CLAY), firm, damp	1					
0.3								24BH04-01						
0.5								SANDY CLAY (CLAY LOAM), firm, damp, olive brown	_					
0.8														
1.0														
1.3														
1.5														
1.8-														
2.0														
2.3-														
2.5														
2.8														
3.0														



(Page 1 of 1)

Site and Soil Assessment NE1/2-Sec.14-Twp.049-Rng.02-W5M

Driller: Drilling Method:

: Evergreen Drilling : Truck Mounted Auger

	Leduc County, Project Number: 2		Drill Date Logged E	1	: January 23, 2024 : Emily Low P.Eng.					
Depth in Meters	Gastech Reading (ppm) 0 100 200 300 400 50		VOC Reading	GRAPHIC	DESCRIPTION	Well: Elev.:	Water Level			
0.0					SANDY CLAY (CLAY LOAM), firm, damp 24BH05-01					
2.0 - 2.3 - 2.5 - 2.8 - 3.0 - 3.0					sand pocket for 0.7 m					

Appendix C

Certificate of Analysis



2910 12TH STREET NE CALGARY, ALBERTA CANADA T2E 7P7 TEL (403)735-2005 FAX (403)735-2771 http://www.agatlabs.com

CLIENT NAME: ENVIROWEST

BOX 4248, 5118-50th STREET PONOKA, AB T4J1R6

(403) 783-8229

ATTENTION TO: Emily Low

PROJECT: 43039

AGAT WORK ORDER: 24R117596

SOIL ANALYSIS REVIEWED BY: Max Dou, Report Writer

DATE REPORTED: Feb 11, 2024

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

<u>Notes</u>			
Na daimar.			

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



Certificate of Analysis

AGAT WORK ORDER: 24R117596

PROJECT: 43039

2910 12TH STREET NE CALGARY, ALBERTA CANADA T2E 7P7 TEL (403)735-2005 FAX (403)735-2771 http://www.agatlabs.com

ATTENTION TO: Emily Low

SAMPLED BY:

Particle Size - Texture

DATE RECEIVED: 2024-02-03									DATE REPORTE	ED: 2024-02-11	
		SAM	MPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:		24BH01- 02 Soil	24BH01- 03 Soil	24BH02- 01 Soil	24BH02- 02 Soil	24BH02- 03 Soil	24BH04- 01 Soil	24BH05- 01 Soil
Parameter	Unit	G/S	RDL	5625379	5625380	5625381	5625382	5625383	5625384	5625385	5625386
Particle Size Distribution (Sand)	%		2	27	3	13	41	41	42	3	39
Particle Size Distribution (Silt)	%		2	26	30	26	26	26	27	32	28
Particle Size Distribution (Clay)	%		2	47	67	61	33	33	31	65	33
Soil Texture				Clay	Heavy Clay	Heavy Clay	Clay Loam	Clay Loam	Clay Loam	Heavy Clay	Clay Loam

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5625379-5625386 Soil Texture is a calculated parameter. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

% Silt is a calculated parameter. The calculated value is determined by subtracting the percent sand and clay values from 100 percent.

Analysis performed at AGAT Calgary (unless marked by *)

CLIENT NAME: ENVIROWEST

SAMPLING SITE:

Certified By:





2910 12TH STREET NE CALGARY, ALBERTA CANADA T2E 7P7 TEL (403)735-2005 FAX (403)735-2771 http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ENVIROWEST

PARAMETER

PROJECT: 43039 SAMPLING SITE:

RPT Date:

AGAT WORK ORDER: 24R117596 ATTENTION TO: Emily Low

SAMPLED BY:

Soil Analysis DUPLICATE REFERENCE MATERIAL METHOD BLANK SPIKE MATRIX SPIKE Acceptable Method Acceptable Sample Blank Limits Limits Limits Dup #2 RPD Value Lower Upper Lower Upper Lower Upper

Particle Size - Texture 80% 120% Particle Size Distribution (Sand) 5625383 5625383 40 2.5% < 2 113% 93% 80% 120% 26 0.0% < 2 Particle Size Distribution (Silt) 5625383 5625383 26 3.0% < 2 89% 80% 120% Particle Size Distribution (Clay) 5625383 5625383 33

Comments: Duplicate NA: results are less than 5X the RDL and RDP will not be calculated.

Batch

Certified By:



Page 3 of 7

2910 12TH STREET NE CALGARY, ALBERTA CANADA T2E 7P7 TEL (403)735-2005 FAX (403)735-2771 http://www.agatlabs.com

Method Summary

CLIENT NAME: ENVIROWEST

PROJECT: 43039

SAMPLING SITE:

AGAT WORK ORDER: 24R117596

ATTENTION TO: Emily Low

SAMPLED BY:

	OANI LLD DT.								
AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
0120		HYDROMETER							
0120		HYDROMETER							
SOIL 0520; SOIL 0110; SOIL 0120	JONES 2001	HYDROMETER							
	SOIL 0520; SOIL 0110; SOIL 0120 SOIL 0520; SOIL 0110; SOIL 0120 SOIL 0520; SOIL 0110; SOIL	SOIL 0520; SOIL 0110; SOIL JONES 2001							



2910 12 Street NE

Calgary, Alberta T2E 7P7 P: 403-735-2005 • F: 403-735-2771

webearth.agatlabs.com

Laboratory Use On	ly ,
Arrival Temperature:	
Cooler Quantity:	
Custody Seal Intact:	□Yes □No □N/A
AGAT Job Number:	248117596

Chain	of	Custody	Record	E
-				

mergency Support Services Hotline 1-855-AGAT 245 (1-855-242-8245)

Report Inform		R	eport Informat	ion			-	15	Turnaround Time Required (TAT)												7	
Company:	wast Engineering	1.	Name: Emil					- 1	Regular TAT 🔊 🔊 5 to 7 Business Days													
Contact:	hylow 1		Email:	Menu	rousten	ginaer	19,00	_ '	□ <24 Hours (200%)												4	
Address:	0	2.	Name:			U	U	-										(100%	6)			
Phone:	CONTRACTOR STATE		Email:					-	Rush '	TAT				Bus	ines	s Da	ays (50%)	•			
Project Inform	nation	3.	Name:					-11						Bus	ines	s Da	ays(2	(5%)				
Client Project #	:43039		Email:					- 1	Date Required:										_			
Site Location:		Re	Requirements (Selection may impact detection limits) CCME AB Tier 1 Alberta Surface Water								П											
Sample By:											F2											
AGAT Quote #:			☐ Agricultural ☐ Agricultural ☐ Chronic ☐ Industrial ☐ Acute								/F1.F2											
If a quotation numb	er is not provided, client will be billed at standard ditions of quote for full details.	rates.	Residential/Park Residential/Park SK Notice of Site Cond.							020	BTEX	Ŧ	+]Cre					1	5		
Invoice To	Same as Report		☐ Commercial	□ Comm		nking W	ater -				18:E	BC: LEPH/HEPH	- 10 L	O Hg O			=	<u>e</u>	F G			
Company:			□ FWAL this part of the All	□ Natura			alogge fill bolav	-		□ BC	CCME/AB:	EPH	ž.	0 0		□SK	□ E.coli	Exture	i			
Contact:					rogram: L 1E3 L	1 IAO (II Yes,	, piease iiii delow				JCC	i ii	C23-C60	Total			1		(844	2		
Email:			Application Number:							□SK		۵	2, C23-C			D BC	Fecal	E E	lyeic.	onthis	- E	-
Address			ant Amount:	ID:	-			-		AB	1-F4	포			stry	2	D F	Size: □ Sieve (75μm)	Ang	6 Months	- 1 Year	
Phone:			ell/Facility/Location	iib.		-		-11	9		X	4EF	11-0	Diss	Chemistry	388	_	Sieve	2	ge-	9	
PO/CC #:			VI:						3	inity	BTE	VPI	1 C	S:	er Ch	B CK	Tota		200	tora	Storage -	N N
			# OF CONTAINERS					s	ered N be	Sal	/AB	EXS	BTEX/TVH/C11-C22,	letal	Wat	A	J:St	Size	000	S E	E	Snc (
LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	DEPTH	DATE/TIME SAMPLED	SAMPLE MATRIX	COMMENTS	VIALS / JARS	BAGS	вотпев	Field Filtered (Y/N) Preserved (Y/N)	Detailed Salinity:	□ CCME/AB: BTEX/F1-F4	☐ BC: BTEXS/VPH/EPH	SK: BTEX/TVH/C11-C2	Water Metals: Dissolved	Routine Water	Landfill: □ AB Class	Coliforms: Total	Particle	Land For 20 Page No Analysis (Additional Fee)	Long Term Storage -	Long Term	Hazardous (Y/N)
1	Z4BH01-01			Soil			i											X				_
2	24BH01-02						1			-)			+	++	_
3	Z4BH01-03						1			-					-			X		-	+	-
4	248402-01						1							4						-	++	-
5	743HOZ-OZ						1							-				X		+	+	-
6	Z4BH02-03						1			_					-			X		-	1	-
7	24BHOH-01				The street,					-			-	-				X		-	+-	-
8	Z4BH05-01			V			1	10										X			-	-
9								-	101													
10																						
Samples Relinquished By (Print Name and Sign	Date/Time	124 12 ⁶⁰ Samples	Received By (Print)	Name and Sign):	on	ch		Date/fin	0	1/2	4	-	Сору - v Сору		AT		Page			_	
9		Date/Time	Samples	Received By (Print	Name and Sign):	400	A		Feb Date/IIm)) e	Oli			е Сору		A	Nº: AE	18			Oct 14,	2021



AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

DESTRUMBING DADIES ALL	
RECEIVING BASICS - Shipping	Temperature (Bottles/Jars only) N/A if only Soil Bags Received
Company/Consultant:	FROZEN (Please Circle if samples received Frozen)
Courier: 1970 Prepaid Collect	1 (Bottle/Jar)++=°C 2(Bottle/Jar)++=°C
Waybill#	3 (Bottle/Jar) + + = OC 4 (Bottle/Jar) + + = OC
2	5 (Bottle/Jar) + + = °C 6 (Bottle/Jar) + + = °C
Branch: EDM GP FN FM (RD) VAN LYD FSJ EST SASK Other:	7 (Bottle/Jar) + + = °C 8 (Bottle/Jar) + + = °C
If multiple sites were submitted at once: Yes No	9 (Bottle/Jar)++=°C 10 (Bottle/Jar)++=°C
Custody Seal Intact: Yes No NA	(If more than 10 coolers are received use another sheet of paper and attach)
TAT: <24hr 24-48hr 48-72hr Reg Other	LOGISTICS USE ONLY
Cooler Quantity:	Workorder No: 24R117596
TIME SENSITIVE ISSUES - Shipping	Samples Damaged: Yes No If YES why?
	No Bubble Wrap Frozen Courier
ALREADY EXCEEDED HOLD TIME? Yes	Other:
Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* ,	Account Project Manager:have they been notified of the above issues: Yes No
Chloroamines*	Whom spoken to: Date/Time:
Earliest Expiry:	CPM Initial
Hydrocarbons: Earliest Expiry	General Comments:
SAMPLE INTEGRITY - Shipping	
Hazardous Samples: YES 780, Precaution Taken:	
Legal Samples: Yes	
International Samples: Yes No	
Tape Sealed: Yes No	
Coolant Used: Icepack Bagged Ice Free Ice Free Water None	

* Subcontracted Analysis (See CPM)

Date issued: March 11, 2020

JAZOO EXPRESS COURIER Ltd.

			CLIENT USE ONLY		
Contact Name:	melissa	Contact Location:	AGAT RED DEER	Billed to:	AGAT
Date:	melissa	Delivery From:	Agat,#12-7471 Edgar Ind	dustrial Bend	d
Date.	Feb 2/24	Delivery To:	AGAT, 2910 12TH ST. N		
Total Items:	3+1	Item Description: envelope, sm/med/lg box, cooler, etc.	Environ)est		3000191
			Job/PO/Reference #:		
Authori	zed Shipper Signature:		Mharso	77.	
			DRIVER USE ONLY		
J Driver lame:	5/2	P/U Time:	am	D/O Time:	5-30 am
Items P/U:	4	P70 filme:	11.55 pm	D/O tilile.	pm
	Overweight	Т	DG		
	items dropped Off:	y	D/O Driver Name:	5-2	,
Authorize	ed Receiver Signature:				
	SECRETAL LIGHTERS		HOTSHOT DETAILS		
al Km:	22 - 12 - 12 to 12 46 to 16	Secure of pure proper	Or Total Charge (\$):	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	THE PERSON NAMED IN COLUMN TO THE PE
er a			OFFICE USE ONLY		
rified By:			Invoiced By:		
	Calgar Edmon	y 403-660-5 fon 780-903-3		587-645-6 587-297-8	3364 3406

Laboratory Proctor

Sample No.: W381

Sample Information

Date:

02-Feb-24

By:

E.L. of: Envirowest

Type:

Pail

Location:

Warren Crow

Natural Moisture:

18.7 %

Description:

Clay

Specfication:

ASTM D 698 - Method A

Comments:

Project No. 43049

Proctor Results:

Optimum Results:

Test Number	1	2	3	4	5
Dry Density (Kg/m³)	1740	1811	1812	1758	1695
Moisture Content (%)	11.8	13.7	15.8	18.0	19.5

Moisture Content = 15.0 %

Dry Density = 1820 Kg/m³

Oversize Correction (Calculated using assumed Specific Gravity of 2.40)

15 Oversize (%) 5 10 25 1847 1875 1902 1929 1957 Density

Corrected Density = 1823 Kg/m³

Oversize Material = 0.6 %



CLIENT:

Envirowest

FILE No.:

USG1826

PROJECT: Geotech. Inv.

DATE:

07-Feb-24

LOCATION: Red Deer, Alberta

TECH:

D.J.W.

Sample No.: W381 **Laboratory Hydrometer** Sample Information 02-Feb-24 E.L. of: Envirowest Type: Pail / Bag Date: By: Warren Crow Specification: ASTM D 422 Location: Description: Clay, Sandy, Silty, Gravel inclusions Laboratory Specifications as per ASTM D 422. Specifications: Project No. 43049 Comments: Sieve Results: By Type (%): Gravel = 0.2 Sand = 33.4 Silt = 28.3 Clay = 38.1 SAND SILT CLAY **GRAVEL** 100 90 80 70 60 Percent Passing (%) 50 40 30 20 10 0 0.1 0.01 0.001 100 10 1 Grain Size (mm) CLIENT: Envirowest FILE No.: USG1826 PROJECT: Geotech. Inv. DATE: 09-Feb-24 TECH: Union Street Geotechnical LOCATION: Red Deer, Alberta G.S.

Project Name:	2024 Geotechnical Inv.
Project Number:	USG1826
Client:	Envirowest
Testhole:	
Location:	Warren Crow
Sample Number:	W381

Depth:	
Testing Company:	Union Street Geo.
Field Technician:	E.L0
Sample Date:	2nd February, 2024
Lab Technician:	B.B.
Date Tested:	16th February, 2024
 	

Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

	Material	and Test Description	
Material Description:			
Clay			
Test Type:	Constant Head	Remoul	ding Details
Mould Size:	Flexible Wall	Max Dry Density (kg/m³):	1820
Sample Source:	Re-moulded	Proctor ID:	W381
Fluid Used:	Deaired Water	Percent Max (%):	98 to 100%
Fluid Reservoir:	Burrettes	Target Dry Density (kg/m³):	1786 to 1823

		Initial Sample Cl	haracteristic	s			
Water Con	tent			Sample Siz	e		
Wet + Tare (g):	467.3	Trial	1	2	3	4	Average
Dry + Tare (g):	403.4	Diameter (mm):	72.8	73.2	73.4	73.1	73.1
Tare (g):	12.0	Length (mm):	74	74.1	74.1	74	74.1
Water Content (%):	16.3%	Weight (g)		• · · ·	646.2	•	
Area (cm²):		42.0	Specific Gravi	ty (Note 2):		2.62	
Volume (cm³):		311.0	Void Ratio:			0.47	
Wet Density (kg/m ³):		2078	Saturation: 91.69		6		
Dry Density (kg/m³):		1786	Porosity:			31.89	6

		Final Sample C	haracteristics	\$			
Water Cont	ent			Sample Siz	е		_
Wet + Tare (g):	663.6	Trial	1	2	3	4	Average
Dry + Tare (g):	562.0	Diameter (mm):	73.3	73.2	73.7	73.1	73.3
Tare (g):	12.3	Length (mm):	73.8	73.6	73.8	73.9	73.8
Water Content (%):	18.5%	Weight (g)	651.6				
Area (cm²):		42.2	Specific Gravi	ty (Note 1):		2.62	-
Volume (cm³):		311.5	Void Ratio:			0.48	
Wet Density (kg/m ³):		2092	Saturation: 100.09		%		
Dry Density (kg/m³):		1765	Porosity:			32.6%	6

Note 1: Specific gravity for final sample characteristics calculation adjusted to result in 100.0% saturation.

Note 2: Specific gravity for initial sample characteristics calculation set equal to that of the final.

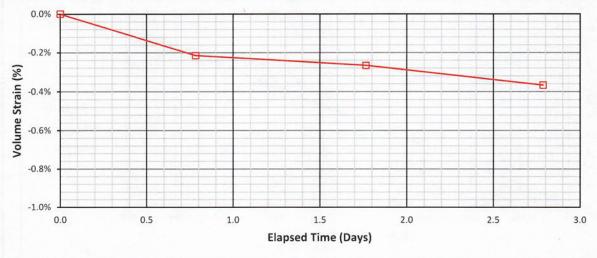
Project Name:	2024 Geotechnical Inv.	
Project Number:	USG1826	
Client:	Envirowest	
Testhole:		
Location:	Warren Crow	
Sample Number:	W381	

Union Street Geo.
E.L.
2nd February, 2024
B.B.
16th February, 2024

Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ell Pressure (kP	a):	160.0		Top Pressure (F	(Pa):	130	0.0
ottom Pressure	(kPa):	130.0		Pressure Difference (kPa):			
Date & Time	Elapsed Time (Days)	Room Temp (°C)	Top Burret (mL)	Bottom Burret (mL)	Cell (mL)	Total Vol. Change (mL)	Volume Strain (%
2/16/24 12:53	0.00	20.0	4.2	3.8	18.4	0	0.00%
2/17/24 7:40	0.78	20.0	4.2	3.7	19.2	-0.67	-0.22%
2/18/24 7:15	1.77	20.0	4.2	3.7	19.4	-0.83	-0.27%
2/19/24 7:43	2.78	20.0	4.2	3.7	19.7	-1.14	-0.37%
-	-	-	-	2002	-	-	-
-	· ·	-	(-)	-	-	-	
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	+	-		-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



Project Name:	2024 Geotechnical Inv.
Project Number:	USG1826
Client:	Envirowest
Testhole:	
Location:	Warren Crow
Sample Number:	W381

Elapsed Time (Minutes)

Union Street Geo.	
E.L.	
2nd February, 2024	
B.B.	
16th February, 2024	
	E.L. 2nd February, 2024 B.B.

Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

			Permeati	on Data					
Cell Pressure (kP	a):	160.0		Top Pressure			0.0		
Bottom Pressure (kPa):		140.0		Pressure Diffe	rence (kPa):	20	0.0		
Date & Time	Elapsed Time (Minutes)	Room Temp (°C)	Top Burret (mL)	Bottom Burret (mL)	Top Vol. Change (mL)	Bottom Vol. Change (mL)	Average Vol Change (mL		
2/19/24 7:45	0	20.0	9.82	0.12	0.00	0.00	0.00		
2/19/24 13:22	337	20.0	9.43	0.56	0.39	0.44	0.42		
2/22/24 7:24	4299	20.0	0.64	9.45	9.18	9.33	9.26		
2/22/24 8:26	4361	20.0	0.47	9.54	9.35	9.42	9.39		
2/22/24 9:59	24 8:26 4361 20.0 24 9:59 4454 20.0		0.29	9.76	9.53	9.64	9.59		
2/22/24 10:45	2/24 8:26		Name and the Control of the Control		0.20	9.87	9.62	9.75	9.69
-	-	-	-	-	-	-	-		
-	-	-	2 1	- 1	9.78	-	-		
-		-			125		-		
-	-	-	-	-	-	-	-		
-	-	-	(-	-		-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-			
11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0							—— Bottom ——— Average ———————————————————————————————————		

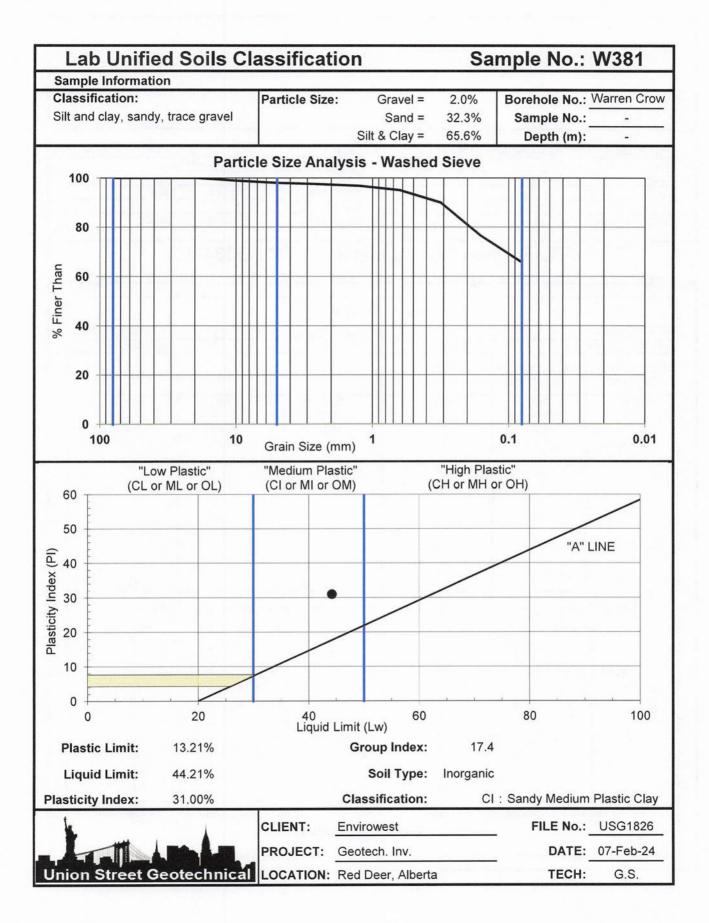
Project Name:	2024 Geotechnical Inv.	
Project Number:	USG1826	
Client:	Envirowest	
Testhole:		
Location:	Warren Crow	
Sample Number:	W381	

Depth:	
Testing Company:	Union Street Geo.
Field Technician:	E.L.
Sample Date:	2nd February, 2024
Lab Technician:	BB
Date Tested:	16th February, 2024

Flexible Wall Permeameter (ASTM D5084-10)

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

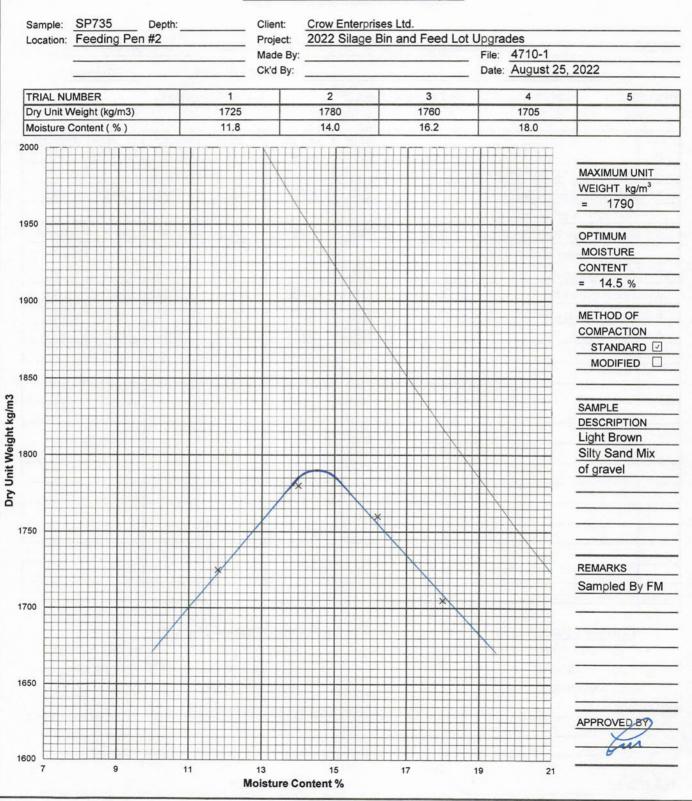
		Perme	ation Data			
Head Difference	(m):	2.0	Area of Sample (m	2)	4.211E-03	
ength of Sampl		7.391E-02	Gradient, i		2.759E+01	
Elapsed Time (Minutes)		Average Temperature (°C)	k _t (m/s)	R _T	k ₂₀ (m/s)	
4299	9.26	20.0	3.201E-10	1.000	3.201E-10	
4361	9.39	20.0	3.198E-10	1.000	3.198E-10	
4454	9.59	20.0	3.196E-10	1.000	3.196E-10	
4500	9.69	20.0	3.195E-10	1.000	3.195E-10	
-	July 199-24	-	-	3-1 3-1	-	
-	1-17	The state of	The state of	-		
-	2,140.16	HK III			Marinu -	
-	-	-	-		-	
-	-	-	-	-	-	
-	-	-	-	-	-	
- 100	-	-	-	-	-	
-	-	-	-	-	-	
=	-	-	-	-	-	
2	-	AVERAGE	3.197E-10		3.197E-10	
1.00E-08 - 1.00E-09 - (s/E) x 1.00E-10 -	Ø			53	□ kt △ k20	
1.00E-11 - 42	250 4300	4350 Elapsed	4400 4450 Time (Minutes)	4500	4550	





CONSULTING AND TESTING ENGINEERS
EDMONTON - GRANDE PRAIRIE - PEACE RIVER

MOISTURE - DENSITY RELATIONSHIP





CONSULTING AND TESTING ENGINEERS
EDMONTON - GRANDE PRAIRIE - PEACE RIVER

SUMMARY OF FIELD DENSITY TESTS

CLIEN	T Crow Enterprise	es Ltd.		JOB NO	-	4710-1		
				DATE TES	TED	25-Aug-22		
PROJI	ECT 2022 Silage Bin and Fee	d Lot Upgrades		DATE REPORTED				
TEST NO.	LOCATION	DEPTH (m)	DRY UNIT WT. kg/m ³	FIELD MOIST.%	PROCTOR DENSITY	OPTIMUM MOISTURE	PROCTOR DENSITY 9	
	Clay Subgrade							
1	East Silage Bin, 20m North	GR	1777	15.5	1790	14.5	99.3	
	and 10m West of SE Corner							
2	West Silage Bin, 15m South	GR	1797	14.9	1790	14.5	100.4	
	and 15m East of NW Corner							
3	Feeding Pen #1	GR	1792	15.0	1790	14.5	100.1	
4	Feeding Pen #2	GR	1786	15.3	1790	14.5	99.8	
5	Feeding Pen #3	GR	1767	15.0	1790	14.5	98.7	
6	Feeding Pen #4	GR	1779	14.8	1790	14.5	99.4	
REMA	CONTROL PROCTOR ONE POINT STANDARD MODIFIED RKS	Depth and locat	☐ 95 S ☐ 98 S ☐ 100	D COMPAC TANDARD TANDARD STANDARD proximate	TION (%)	97 ONE-M 100 ONE- OTHER		
TEST	ED BY FM		APPRO)	VED BY		7M		





CONSULTING AND TESTING ENGINEERS 2304 - 119 Avenue NE, Edmonton, AB, T6S 1B3

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Crow Enterprises Ltd.					.E NO.:	4	710-1
	100	20	10 F	Da	te Cast:	Augus	st 31, 2022
				Da	te Tested:		
and the					ST LOCATION	: Feeding Per	ns, 60m East of Silage
PROJECT: 2	2022 Feedlot and	Silage Expansion	1	Bin	n, 20m North of	Access Road	
-				cu	IRING LOCATI	ON: <u>J.R. Paine &</u>	Associates Ltd. Lab
Supplier: _			0.77	Tru	uck No.:		
Batch Time:		a.m. <u>3:3</u>	0 p.	m. Te	st Time:	a.m	i 3:50 p.m.
Load Amount	Load Amountm ³ Cumulativem ³				ket No.:		
Temp.: Air	30 °C	Conc.	°C				
Specified Stre	ngth 28 Days:	30	MPa	Adı	mixtures:		
		20		n Init	tial Curing Tem	p.: Min19	°C Max23°C
		m Actual:					% Actual:%
		Steel					100x200mm
							By:G.S
20 30		ers? No					By: G.S.
	eee Remarks Below)			(No. disease) where			
	TEST AGE DATE DAYS		TYPE OF FAILURE	TESTED BY	CYLINDER MASS (kgs)	CYLINDER DIA. (mm)	COMMENTS
000000000000000000000000000000000000000	Sep-22 7	28.4	1	G.S.	13.482	152.0	
	-Sep-22 28	33.4	1	J.M.H.	13.392	152.0	
1369 28-	-Sep-22 28	33.2	1	J.M.H.	13.464	152.0	
emarks/Fycent	ions to Standard	Procedures:					pulse of Mary San Mary
		NE		CERTIFIED		**Note: As Per CSA	A23.1-19 4.4.1.8 Storage and
	N M			Carnellan Cou	at all of Independent Laborations		be Provided by Contractor.
	Type 2 Type 3 Common vertical cracking through both ands, no will be supply to the ands, and	Type 4 Diagonal fracture with no existing through meditable with manner to bettom (secur common).	Type 6 Similar to Type 5 but and of cylinder is pointed		ests as listed on www.coll.com	Facility Provided:	Yes No
Type 1 Aparomaphy well-formed week of cones on both ends, lens and, yes than 35 ever (a Mo) of through color (articles of the color (a Mo) of the		dating with unbonded caps)					
Residency well-formed while is cores on both ends, less and, ve		datargush from Type 1				Cop	Dy
Approacy to well-formed wall-de- center on hother deshit, less send, ve shan 15 sew (1 m) of tracking through cala de-free de-free	reflexi cracks nerving funned comes lagh cape, no well- d cone on other and	datargush from Type 1		APPRO	VED BY (SIGNED):	D 05/	



CONSULTING AND TESTING ENGINEERS 2304 - 119 Avenue NE, Edmonton, AB, T6S 1B3



CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Crow Enterprises Ltd.					FIL	FILE NO.: 4710-1				
					Da	ite Cast:	Se	ptember 2, 202	22	
					Da	ite Tested:				
					TE	ST LOCATIO	N: Feeding	Pens, 20m Ea	st of Silage	<u> </u>
PROJE	CT: 2022 Fee	dlot and Si	lage Expansion	n	Bir	n, 15m North o	of South Acces	s Road		
	9 				cı	JRING LOCAT	TION: J.R. Pair	ne & Associate	s Ltd. Lab	
Supplier:					Tru	uck No.:				
Batch Tin	ne: <u>10:</u>	00 a.n	n	p.	m. Te	st Time:	11:30	a.m		p.m.
Load Am	ount	m³	Cumulative		m³ Tic	ket No.:				
Temp.:	Air	°C	Conc.	°C	Pro	oduct Code:		RCC		
Specified			30	MPa	Ad	mixtures:				
Max. Agg	gregate Size:		20	mn	n Init	tial Curing Ter	mp.: Min.	19°C M	ax23	°c
Slump De	esign:	mm	Actual:	mn	n Air	Content Desi	ign:	% Acti	ual:	%
Cylinder	Туре:		Steel		Су	linder Size:	150x300mm	X 100x2	200mm	_
Cast by:	G.S	Tested by:	Da	te Transp	orted: 3	-Sep-22	Time: 12:55	PM By:	G.S.	_
Concrete	samples cas	t by others'	? <u>No</u>	Date Rece	eived: 3	-Sep-22	Time:1:00 I	PM By:	G.S.	
TATE OF THE PARTY	YES see Remarks		OOMBDESSN/F	TVDE OF	TEOTED	OVI INDED	OVUNDED		MATERITO	
SAMPLE NUMBER	DATE	AGE DAYS	COMPRESSIVE STRENGTH (MPa)	TYPE OF FAILURE	BY	CYLINDER MASS (kgs)	CYLINDER DIA. (mm)	CC	MMENTS	
1629	9-Sep-22	7	20.3	1	G.S.	13.540	152.0	7		
1630	30-Sep-22	28	29.8	1	J.M.H.	13.232	152.0			
1631	30-Sep-22	28	28.9	1	J.M.H.	13.270	152.0			
						40				
emarks/Ex	xceptions to S	tandard Pr	ocedures.							
CHIAIKS/L/	Aceptions to c	tandara								
Type 1	D D	Type 3	Type 4 Figure 5 Figure 5 Sale features with max Sale features at top or	Type 6 Several to Type 5 our end		and of Independent Laboratoria.		r CSA A23.1-19 4.4. ities to be Provided	by Contractor.	nd
Resonably anti-formed cones on both male, lans than 25 new (1 iii) of crading through caps	Well-formed cone on one	rough both unds, no well cracken		THE PARTY OF THE PARTY AND PERSON.			I acinty Flovided	d: Yes	No	100
	end, verbrat cracks running through caps, no well- defined cone on other end	formed centre 520 W	g twengh entity tis name are with unbonded cost; with from Type 1	of cylinder is pointed			6			
	through caps, no well- defined cone on other and	formed centre 520 W	to summer to with unbonded cost with them Type 1	of cylinder is pointed				opy 05,2023		



CONSULTING AND TESTING ENGINEERS 2304 - 119 Avenue NE, Edmonton, AB, T6S 1B3



CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Crow Enterprises Ltd.				FI	LE NO.:		1710-1		
	1				D	ate Cast:	Septen	nber 8, 2022	
					D	ate Tested:			
						EST LOCATION	N: North Edge	of Feeding Pen 3	
PROJEC	CT: 2022 Fee	dlot and Si	lage Expansior						
					_ c	URING LOCAT	ION: J.R. Paine A	ssociates Ltd. Lab	
Supplier:		Rock S	Solid Concrete		Tr	ruck No.:			
Batch Tin	ne:	a.n	n12:2	.0 p.				1:15	
Load Am	ount	m ³	Cumulative		m³ Ti	cket No.:			
Temp.:	Air	°C	Conc.	°C		roduct Code:			
			30	MPa	A	dmixtures:			
			20		n In	itial Curing Tem	np.: Min.	°C Max	°C
Slump De	esign:	mm	Actual:	mm				% Actual:	
	Туре:	- 27	14000			ylinder Size:	150x300mm X	100x200mm	
Cast by:	A.M./C.R.	Tested by:	Dat	te Transpo	orted:	9-Sep-22_ T	ime: 3:40 PM	By: G.S.	
Concrete	samples cas	t by others'	? <u>No</u> I	Date Rece	eived:	9-Sep-22 T	ime: 3:50 PM	By: G.S.	
(If	YES see Remark	s Below)							
SAMPLE NUMBER	TEST DATE	AGE DAYS	COMPRESSIVE STRENGTH (MPa)	TYPE OF FAILURE	TESTED BY	CYLINDER MASS (kgs)	CYLINDER DIA. (mm)	COMMENTS	
1857	15-Sep-22	7	24.8	1	G.S.	13.420	152.0		
1858	6-Oct-22	28	30.2	1	G.S.	13.490	152.0		
1859	6-Oct-22	28	30.6	1	G.S.	13.442	152.0		
				4					
							 		
emarks/Ex	ceptions to S	tandard Pr	ocedures:						
	刀贝				Carnellan C	Cild		A23.1-19 4.4.1.8 Storage ar b be Provided by Contractor.	
Type I Resonably well-formed cores on both ends, less than 25 even (1 in) of	and, vertical cracks running through caps, no well-	formed conts tap w	Type 4 Besture with an graning mark; besture force commonly with submitted copy; with submitted copy;	Type 6 tensor to Type 5 but and of cylinder is pointed	For specifi	mo, has were no hotelf as a feet o	Facility Provided:	Yes NoX	(
coding through caps	defined core on other and	OF FRACTU	aut from Type 1				Сору	7	
APPROVED	BY (NAME):		Kevin Seifert		APPR	OVED BY (SIGNED)	Dec 05,202	3	
						**************************************	FM		