

Associated Engineering (Sask.) Ltd. 203 - Five Donald Street Winnipeg, MB R3L 2T4 Canada www.ae.ca

TEL: 204.942.6391

July 25, 2023 File: 2019-4231

Robert Boswick, P. Eng.
Senior Environmental Engineer
Environmental Approvals Branch
Environment and Climate
Box 35 - 14 Fultz Blvd
Winnipeg, MB R3Y 0L6

Re: R.M. OF GREY - L.U.D. OF ST. CLAUDE - EAP REVIEW
TAC COMMENTS AND REQUESTS FOR ADDITIONAL INFORMATION - FILE NO. 241.50

Dear Mr. Boswick:

Please find enclosed our responses to the TAC review questions provided. Do not hesitate to ask if more information or details are required. AE responses are provided following the questions noted.

#### WATER QUALITY SECTION

"The Proponent proposes to remove clauses 15 and 16 from license 1666 S3 with respect to sodium chloride - salinity. To help further assess the proponent's salinity reduction program with current water quality guidelines, can the proponent please provide the laboratory results (certificate of analysis) of the effluent samples collected for the most recent discharge as per clause 12, for sodium, sodium adsorption ratio and chloride?"

Please find attached most recent lagoon sampling that has included Sodium and Chloride testing. (Previous sampling has not included these parameters). The RM will also conduct further sampling to collect SAR results as that was also never collected in samples (but and old 2014 sample shows SAR at 5.11). The recent sampling shows that Sodium and Chloride levels are elevated and higher than what is in the drinking water supply that goes to sewer. As part of the next round of sampling, the RM will collect sodium, chloride and SAR at manholes with Residential wastewater and same from a manhole with the Dairy Industry contribution. This should confirm if the elevated Sodium and Chlorine levels are from the Dairy waste stream. The question that will arise is if it should be on the Industry to manage their effluent parameters levels and not the RM on behalf of the Industry with no recompense.

We will supply the updated lab sampling once completed. This will be done as soon as RM staff are back from holidays at the beginning of August.





"The Water Quality Management Section recommends maintaining 3 mg/L of dissolved oxygen at all times in the top 2.5m of the liquid in the aerated cells."

Understood. The design will be modified to provide an aeration system then maintains 3 mg/L of dissolved oxygen at all times in the top 2.5m of liquid. This parameter can be carried through into the EAL requirements.

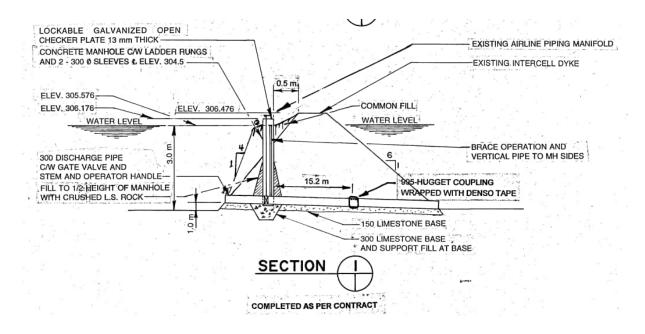
"The Water Quality Management Section is concerned with any discharges that have the potential to impact the aquatic environment and/or restrict present and future uses of the water. Therefore it is recommended that the license require the proponent to actively participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director.

The RM will be notified to actively participate in any future program as approved by the Director.

### **ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT**

"Environmental Compliance and Enforcement requests further details of the components and operations of the equipment described as "intercell manhole C/W 300 mm  $\phi$  discharge piping and gate valve". The intake of this equipment appears to have a fixed intake elevation. At what elevation is the intake relative to the crest of the primary cell? When the intercell gate is closed, is there sufficient design freeboard in the primary cells to allow a period of isolated digestion in the secondary cell prior to discharge?"

Per the following detail from the 1998 Record drawings of the facility, the intake of the pipe invert from the primary cell is shown to be 2.891m below the crest of the berm top. Assuming the cell is at the full 3.0m depth, the full freeboard could provide up to ~40 days of isolation before the primary cells are to top of berms. However, only allowing only 0.5m of water level rise in the freeboard, could provide upwards of 20 days of storage in primary cells once isolated.





July 25, 2023 Robert Boswick, P. Eng. Page 3

### MTI ENVIRONMENTAL SERVICES

"Under section 3.2.3 Surface Water of the Notice of Alteration, it indicates surface run off may be redirected and accumulated water may be pumped into adjacent ditches. We would like to see clarification on how the surface run-off will be redirected, and how this surface run-off can be managed within the property to prevent sediment flow into the adjacent ditches from the redirection and pumping of water, in addition to maximum flow rates. Also, MTI won't allow drainage/release of any contaminated fluids or solids into highway ditches."

The statement was more related to unforeseen events like a storm and the potential need to manage site water accumulation. The general project is not significantly changing the existing site drainage, but there will be some temporary stockpiles and berm construction that could temporarily change surface run off patterns. A heavy storm even could also create some localized standing water on site and prevent access for the construction. In these events some pumping may be required to dry the areas in need of access. To mitigate the impacts to MTI drainage ditches, we can re-direct these flows to other parts of the lagoon site areas owned by the RM and not directly to ditches. We would also require the contractors to install silt fencing and erosion protection in areas where it could impact the local ditches.

"With regards to the Environmental Act Proposal, any temporary piping placed in or across MTI jurisdiction will require approval from MTI prior to placement within MTI lands"

Approval will be submitted for this crossing. The RM has been discussing the crossing with MTI for the last few years as well.



Manager, Water

**KEA** 

L1477300 CONTD.... PAGE 2 of 4 Version: FINAL

## ALS ENVIRONMENTAL ANALYTICAL REPORT

L1477300-  ST CLAUDE LAGOON - DISCHARGE CELL   Sampled By:   CULENT or 25-JUN-14   \$1200	Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
Matrix   Sevage/Waste Water   Miscalianeous Parameters	L1477300-1 ST CLAUDE LAGOON - DISCHARGE C	ELL						
Miscolarenous Parameters   Selbodemical Colygen Demand   4-6.0   6.0   mg/L   22-JUN-14   R2876984   BOD Carbonaseous   6.0   6.0   mg/L   22-JUN-14   R2876984   BOD Carbonaseous   7-10   Microgen Total   132   DLA   0.050   mg/L   27-JUN-14   R2874688   R2874726   Microgen Total   Microgen Total   Microgen Total   Microgen Total   Microgen Total   Microgen Total   Microgen Total Microgen   25-6   DLA   2.0   mg/L   26-JUN-14   R2875775   R28757	Sampled By: CLIENT on 25-JUN-14 @ 12:00							
Biochemical Oxygen Demand   40.0   6.0 mg/L   28-JUN-14   R287594   Conductivity   1390   1390   20 turnhos/cm   27-JUN-14   R2875954   R287594   R287594   R2875954   R287595	Matrix: Sewage/Waste Water							
BOD Carbonaceous								
Conductivity	Biochemical Oxygen Demand	<6.0		6.0	mg/L		26-JUN-14	R2876594
Phosphorus (P)-Total   132	BOD Carbonaceous	<6.0		6.0	mg/L		26-JUN-14	R2876594
Total Suspended Solids   PH units   PH uni	Conductivity	1390		20	umhos/cm		27-JUN-14	R2874726
PH	Phosphorus (P)-Total	13.2	DLA	0.050	mg/L		27-JUN-14	R2874568
Nitrate as N by Ion Chromatography   Nitrate-N	Total Suspended Solids	6.0		5.0	mg/L		27-JUN-14	R2875948
Nitrate as N by Ion Chromatography		8.15		0.10	pH units		27-JUN-14	R2874726
Nitrate-Nitrite	<del>"</del>							
Nitrate and Nitrite as N   Volume   V		10.050		0.050			20 11111 44	D0075775
Nitrite and Nitrite as N		<0.050		0.050	mg/L		20-JUN-14	R28/5//5
Nitrite as N by Ion Chromatography   Nitrite as N by Ion Capacitated   Total Nitrogen   25.6		<0.071		0.071	ma/l		30-JUN-14	
Nitrie N		10.07 1		0.071	1119/1		00001111	
Total Kjeldahl Nitrogen		<0.050		0.050	mg/L		26-JUN-14	R2875775
Total Nitrogen Calculated   Total Nitrogen   Calculated   Total Nitrogen   Calculated   Total Nitrogen   Calculated   Ca	Total Kjeldahl Nitrogen							
Total Nitrogen	Total Kjeldahl Nitrogen	25.6	DLA	2.0	mg/L	30-JUN-14	02-JUL-14	R2876996
Un-ionized Armonia at 15C WSER Ammonia by colour Imonia, Total (as N) Un-ionized Armonia at 15C, WSER Ammonia, Un-ionized Armonia at 15C, WSER Ammonia, Un-ionized Armonia at 15C, WSER Ammonia, Un-ionized (as N), 15C, WSER Ammonia by IoP-MS Sodium Adsorption Ratio Sodium (a)-Total Sodium (b)-Total Sodium (c)-Total Sodium (d)-Total Sodium (								
Ammonia by colour   nonia, Total (as N)   19.9   DLA   1.0   mg/L   03-JUL-14   R2878454   Mamonia, total (as N), 15C, WSER   0.565   0.028   mg/L   04-JUL-14   PH in Water (at 15C)   pH at 15C, WSER   0.565   0.028   mg/L   04-JUL-14   R2875334   Mamonia, total (as N), 15C, WSER   0.565   0.008   mg/L   04-JUL-14   R2875334   R287534   R28753	<del>-</del>	25.6		2.0	mg/L		02-JUL-14	
1.0   mg/L   03-JUL-14   R2878454   monia, Total (as N)   1.0   mg/L   0.028   mg/L   0.029								
Online		(199)	DLA	1 0	ma/l		03-3111-14	R2878454
Ammonia, Un-ionized (as N), 15C, WSER pH in Water (at 15C) pH at 15C, WSER Sodium Adsorption Ratio  Sodium Adsorption Ratio  Sodium Adsorption Ratio  Sodium Adsorption Ratio  Sodium (Assertion Ratio  Sodium (Na)-Total  65.5  0.20  mg/L  04-JUL-14  04-JUL-14  R2879113  Sodium (Na)-Total  Sodium (Na)-T				1.0	mg/L		00 002 14	112010404
PH in Water (at 15C)   PH at 15C, WSER   (a.03)   0.10   PH   28-JUN-14   R2875334   R287534   R2878564   R2875334   R2875334   R2875334   R2875334   R2875344   R2878564   R2875354   R2		0.565		0.028	mg/L		04-JUL-14	
Sodium Adsorption Ratio   Sodium (Asorption Ratio   Sodium (Ca)-Total   Sodium (Ma)-Total	pH in Water (at 15C)							
Sodium Adsorption Ratio   Sodium Adsorption Ratio   Sodium Adsorption Ratio   Sodium Adsorption Ratio   Solium Adsorption Ratio   Solium Adsorption Ratio   Solium (Adsorption Ratio	pH at 15C, WSER	(8.03)		0.10	pН		28-JUN-14	R2875334
Sodium Adsorption Ratio   5.11   0,030   0,050   0,500   0,5	·							
Total Metals by ICP-MS   Calcium (Ca)-Total   65.5   0.20   mg/L   04-JUL-14   04-JUL-14   R2879113   R2879113   Sodium (Mg)-Total   196   0.050   mg/L   04-JUL-14   04-JUL-14   R2879113   R2879113   Sodium (Na)-Total   196   0.050   mg/L   04-JUL-14   R2879113		- 44					05.1111.44	
Calcium (Ca)-Total		5.11		0,030			05-JUL-14	
Magnesium (Mg)-Total         28.0         0.050         mg/L         04-JUL-14         04-JUL-14         R2879113           Sodium (Na)-Total         196         0.050         mg/L         04-JUL-14         04-JUL-14         R2879113           L1477300-2         ST CLAUDE LAGOON - NE CORNER OF DISCHARGE CELL         Sampled By:         CLIENT on 25-JUN-14 @ 12:00         Sewage/Waste Water         When the control of t		65.5		0.20	ma/l	04!!!! -14	04!!!! -14	R2879113
Sodium (Na)-Total   196				!				
L1477300-2 ST CLAUDE LAGOON - NE CORNER OF DISCHARGE CELL Sampled By: CLIENT on 25-JUN-14 @ 12:00  Matrix: Sewage/Waste Water Miscellaneous Parameters Fecal Coliforms					-			
Sampled By: CLIENT on 25-JUN-14 @ 12:00   Matrix: Sewage/Waste Water   Miscellaneous Parameters   Second Coliforms   Au	L1477300-2 ST CLAUDE LAGOON - NE CORNER O	F DISCHARGE CEL	l					
Matrix:         Sewage/Waste Water         Miscellaneous Parameters         30         MPN/100mL         03-JUL-14         R2878564           Fecal Coliforms         40         30         MPN/100mL         03-JUL-14         R2878564           L1477300-3         ST CLAUDE LAGOON - NW CORNER OF DISCHARGE CELL         Sampled By: CLIENT on 25-JUN-14 @ 12:00         WAtrix: Sewage/Waste Water         Sewage/Waste Water         WPN/100mL         03-JUL-14         R2878564           Matrix:         Sewage/Waste Water         30         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         2400         30         MPN/100mL         03-JUL-14         R2878564           L1477300-4         ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL         Sampled By: CLIENT on 25-JUN-14 @ 12:00         CLIENT on 25-JUN-14 @ 12:00         03-JUL-14         R2878564           Fecal Coliforms         <30			_					
Miscellaneous Parameters         430         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         40         30         MPN/100mL         03-JUL-14         R2878564           L1477300-3         ST CLAUDE LAGOON - NW CORNER OF DISCHARGE CE.L.         Sampled By:         CLIENT on 25-JUN-14 @ 12:00         CLIENT on 25-JUN-14 @ 12:00         03-JUL-14         R2878564           Matrix:         Sewage/Waste Water         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         2400         30         MPN/100mL         03-JUL-14         R2878564           L1477300-4         ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL         Sampled By:         CLIENT on 25-JUN-14 @ 12:00         CLIENT on 25-JUN-14 @ 12:00         03-JUL-14         R2878564           Sewage/Waste Water         Wiscellaneous Parameters         4600         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         4600         30         MPN/100mL         03-JUL-14         R2878564			ye.					
Total Coliforms			40.00					
L1477300-3 ST CLAUDE LAGOON - NW CORNER OF DISCHARGE CELL Sampled By: CLIENT on 25-JUN-14 @ 12:00  Matrix: Sewage/Waste Water Miscellaneous Parameters Fecal Coliforms	Fecal Coliforms	<30	A. S.	30	MPN/100mL		03-JUL-14	R2878564
Sampled By:         CLIENT on 25-JUN-14 @ 12:00           Matrix:         Sewage/Waste Water           Miscellaneous Parameters         30         MPN/100mL         03-JUL-14         R2878564           Fecal Coliforms         2400         30         MPN/100mL         03-JUL-14         R2878564           L1477300-4         ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL         Sampled By:         CLIENT on 25-JUN-14 @ 12:00         03-JUL-14         R2878564           Sewage/Waste Water         wiscellaneous Parameters         4600         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         4600         30         MPN/100mL         03-JUL-14         R2878564	Total Coliforms	40		30	MPN/100mL		03-JUL-14	R2878564
Sampled By:         CLIENT on 25-JUN-14 @ 12:00           Matrix:         Sewage/Waste Water           Miscellaneous Parameters         30         MPN/100mL         03-JUL-14         R2878564           Fecal Coliforms         2400         30         MPN/100mL         03-JUL-14         R2878564           L1477300-4         ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL         Sampled By:         CLIENT on 25-JUN-14 @ 12:00         03-JUL-14         R2878564           Sewage/Waste Water         wiscellaneous Parameters         4600         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         4600         30         MPN/100mL         03-JUL-14         R2878564	1 1477300-3 ST CLAUDE LAGOON - NW CORNER O	E DISCHARGE CEI					***************************************	
Matrix:         Sewage/Waste Water           Miscellaneous Parameters         400           Fecal Coliforms         30           Total Coliforms         2400           L1477300-4         ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL           Sampled By:         CLIENT on 25-JUN-14 @ 12:00           Sewage/Waste Water         Sewage/Waste Water           wiiscellaneous Parameters         4600           Total Coliforms         4600           MPN/100mL         03-JUL-14           R2878564		7. 5.5512 (52 52	-					
Miscellaneous Parameters         <30         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         2400         30         MPN/100mL         03-JUL-14         R2878564           L1477300-4         ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL         Sampled By: CLIENT on 25-JUN-14 @ 12:00         Sewage/Waste Water         Wiscellaneous Parameters           Fecal Coliforms         <30								
Total Coliforms 2400 30 MPN/100mL 03-JUL-14 R2878564  L1477300-4 ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL Sampled By: CLIENT on 25-JUN-14 @ 12:00  Sewage/Waste Water wiiscellaneous Parameters Fecal Coliforms <		,						
L1477300-4 ST CLAUDE LAGOON - SE CORNER OF DISCHARGE CELL Sampled By: CLIENT on 25-JUN-14 @ 12:00    Sewage/Waste Water	Fecal Coliforms	<30		30	MPN/100mL		03-JUL-14	R2878564
Sampled By: CLIENT on 25-JUN-14 @ 12:00  ! Sewage/Waste Water  wiscellaneous Parameters  Fecal Coliforms	Total Coliforms	I 250 100 100 1		30	MPN/100mL		03-JUL-14	1
Sampled By: CLIENT on 25-JUN-14 @ 12:00  ! Sewage/Waste Water  wiscellaneous Parameters  Fecal Coliforms	L1477300-4 ST CLAUDE LAGOON - SE CORNER O	2					***************************************	
Sewage/Waste Water								
wiscellaneous Parameters         400         30         MPN/100mL         03-JUL-14         R2878564           MPN/100mL         03-JUL-14         R2878564	_							
Fecal Coliforms         <30         30         MPN/100mL         03-JUL-14         R2878564           Total Coliforms         4600         30         MPN/100mL         03-JUL-14         R2878564	<i>y</i>							
Total Coliforms 4600 30 MPN/100mL 03-JUL-14 R2878564		<30	!	30	MPN/100mL		03-JUL-14	R2878564
	Total Coliforms				MPN/100mL			
							***************************************	

<sup>\*</sup> Refer to Referenced Information for Qualifiers (if any) and Methodology.

Page : 3 of 3

Work Order : WP2204226

Client : Rural Municipality of Grey

Project : ---



# Analytical Results

Sub-Matrix: Wastewater (Matrix: Water)	Client sample ID				ST CLAUDE LAGOON - MIDDLE	 	 
Client sampling date / time				11-Oct-2022 11:00	 	 	
Analyte	CAS Number	Method	LOR	Unit	WP2204226-001	 	 
					Result	 	 
Physical Tests							
solids, total suspended [TSS]		E160	3.0	mg/L	12.2	 	 
pH @ 15°C (WSER)		E108A	0.10	pH units	8.52	 	 
Anions and Nutrients							
ammonia, total (as N)	7664-41-7	E303	0.010	mg/L	10.3	 	 
ammonia, un-ionized (as N), 15C (WSER)	7664-41-7	EC298	0.0010	mg/L	0.853	 	 
chloride	16887-00-6	E235.CI	0.50	mg/L	109	 	 
phosphorus, total	7723-14-0	E372	0.020	mg/L	3.31	 	 
Aggregate Organics							
biochemical oxygen demand [BOD]		E550	2.0	mg/L	11.5	 	 
carbonaceous biochemical oxygen demand [CBOD]		E555	2.0	mg/L	11.5 BODP	 	 

Please refer to the General Comments section for an explanation of any qualifiers detected.

Page : 3 of 3

Work Order : WP2310412

Client : Rural Municipality of Grey
Project : ST. CLAUDE LAGOON



# Analytical Results

Sub-Matrix: Wastewater (Matrix: Water)			CI	ient sample ID	ST. CLAUDE LAGOON CELL 1	ST. CLAUDE LAGOON CELL 2	ST. CLAUDE LAGOON CELL 3 STORAGE	 
	Client sampling date / time			01-Jun-2023 09:45	01-Jun-2023 10:00	01-Jun-2023 10:15	 	
Analyte	CAS Number	Method/Lab	LOR	Unit	WP2310412-001	WP2310412-002	WP2310412-003	 
					Result	Result	Result	 
Physical Tests								
Solids, total suspended [TSS]		E160/WP	3.0	mg/L			78.3	 
pH @ 15°C (WSER)		E108A/WP	0.10	pH units	7.61	7.87	8.16	 
Anions and Nutrients								
Ammonia, total (as N)	7664-41-7	E303/WP	0.010	mg/L	39.1	33.1	40.2	 
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/WP	0.0010	mg/L	0.430	0.656	1.52	 
Chloride	16887-00-6	E235.CI/WP	0.50	mg/L	109	100	105	 
Kjeldahl nitrogen, total [TKN]		E319/WP	0.15	mg/L	52.8	49.6	39.1	 
Nitrate (as N)	14797-55-8	E235.NO3/WP	0.020	mg/L	<0.100 DLM	<0.100 DLM	<0.100 DLM	 
Nitrate + Nitrite (as N)		EC235.N+N/W P	0.0050	mg/L	<0.112	<0.112	<0.112	 
Nitrite (as N)	14797-65-0	E235.NO2/WP	0.010	mg/L	<0.050 DLM	<0.050 DLM	<0.050 DLM	 
Nitrogen, total	7727-37-9	EC368/WP	0.050	mg/L	52.8	49.6	39.1	 
Phosphorus, total	7723-14-0	E372/WP	0.020	mg/L	9.42	9.03	8.52	 
Phosphorus, total dissolved	7723-14-0	E375-H/WP	0.020	mg/L	8.31	7.34	6.93	 
Phosphorus, total reactive		E383/WP	0.0030	mg/L	8.40	7.02	7.38	 
Total Metals								
Sodium, total	7440-23-5	E420/WP	0.050	mg/L	146	138	164	 
Aggregate Organics								
Biochemical oxygen demand [BOD]		E550/WP	2.0	mg/L	339	258		 
Chemical oxygen demand [COD]		E559-L/WP	10	mg/L	438	333	548	 

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.