From:	[redacted]
[redacted]	Laura Friend
Subject:	submission
Date:	February 11, 2020 12:08:13 PM
Attachments:	Envirowest Engineering letter from Emily Low.pdf Letter of Quotation for Service.pdf Invoice from Envirowest Engineering.pdf Proposal Leak Detection.pdf

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To the NRCB Board.

KDL 1.

In response to condition #10, where our EMS "does not indicate any risks nor suggest any indication of high risks in the foreseeable future", we are not relying entirely on the ERST score in judging the environmental risk posed by our EMS. We have water well reports from 1993 until 2018 which show no major increase in levels of nitrates. Discussions with farmers, excavation contractors, and environmental engineers have told us that although non-engineered lagoons may leak in the first few years, organics and other debris will build a protective layer. This may have been proven with the initial drilling request.

- *See Envirowest Engineering letter from Emily Low*

KDL 2.

We contacted Emily at Envirowest Engineering to inquire if it was possible to indicate any sign of leakage through testing, and she replied that it was possible. Therefore we hired her to do the work, with the permission of the approval officer Jeff Froese. The initial quote was to investigate at least 4 boreholes with depths of 4.0 to 9.0m. A detailed log of the soil lithology was to be maintained; soil samples, ground water testing, and groundwater samples would be collected. The results of these tests would have given evidence of contamination if there was contamination to be found. However, the testing was revised by the officer and the soil testing was not completed as first initiated.

- *See attached letter of Quotation for Service September 12 2019, number 1 and 2*
- See attached invoice from Envirowest Engineering 16/10 2019

a) Jeff Froese advised that someone representing the NRCB be present at the drilling when it commenced. The engineer gave advanced notice to the NRCB of the day they would proceed with the testing, the 26th of September 2019, no one seemed to be available.

The Approval officer's advice for us in regard to our EMS was to call others who had previously installed liners in their EMS. Asking them how their experiences with the product went, how much it cost, and their satisfaction or dissatisfaction with the liners. He discussed how we could build up the bottom with dirt that could be screened for packing qualities and porousness. However, no matter the end result of what we did through the testing and engineer work, the Approval officer implied that the only real option we had is to invest in a fabric EMS liner or hire an excavation contractor to redo the lagoon.

Along with his recommendation in foregoing the tests, the Approval officer advised us to apply for a grant to the CAP program administered by Alberta Agriculture and Forestry which may aid in cushioning the costs of addressing the risk posed by the EMS. After applying for the first grant to assist in covering the cost for engineering, it was declined.

b) The EMS was constructed in 1991. The contractor used an excavator and dug as far and deep as the machine could reach, +12 ft. It was dry clay, and the contractor used it all for building up the barn site. It packed really well he said. The entire lagoon was dug in clay.

Because of the slope of the land (down to the North East), manure would reach the top of the lagoon on that side first when the cow number increased. In 2003 we built up the East and North side of the lagoon with clay from a nearby hill.

c) Currently, we are unable to justify that our EMS does not pose a potential risk to groundwater as this test was not completed. We have a quote from Envirowest Engineering for additional tests to detect any leakage.

- *See Leak Detection Proposal Letter from Envirowest Engineering*

d) From the discussions with the approval officer the only way to have condition #10 removed is to hand in a written plan showing how we will proceed to improve EMS with the end goal of relining or rebuilding the EMS.

e) An alternative that we are aware of, would be to proceed with the original tests proposed, along with any other procedures the engineering team would have found necessary; such as to drill into the bedrock. If proven by the completion of all tests that the groundwater and soil are not contaminated by the EMS, our EMS would be safe, and not a risk factor.

Our question for the NRCB is, if we do the new proposed engineer work, and it shows there is no leakage from our EMS, would that be sufficient to remove condition #10 Or will we need to proceed with even more tests and lawyers to show that our EMS is not at risk?

In so doing we ask for a possible extension of a month as we will not be in the country for the next 2 weeks.

Respectfully submitted,

Reinder and Hiltje Kramer

Kramerdairyltd

ENVIROWEST ENGINEERING INC.

P.O. Box 4248
Ponoka, AB.
T4J 1R6
Telephone: 403-783-8229
Facsimile: 403-783-5222

February 10, 2020

Kramer Dairy Ltd.
R.R. 1
Ponoka, Alberta
T4J 1R1
Attn: Hiltje and Reinder Kramer

Re: Leak Detection Proposal
Kramer Dairy Ltd.
SE-02-043-25 W4M
Ponoka County, Alberta

Dear Hiltje and Reinder,

The following is in response to the provided Natural Resources Conservation Board decision review. It is recommended that testing be completed to determine if the current lagoon, located at the SE-02-043-25 W4M dairy operation under authorization RA19016 (Kramer Dairy Ltd.), is currently or has historically leaked. The following scope of work is proposed;

Installation of a nested pair (2) of monitoring wells at the southwest corner of the lagoon as a upgradient (background) location. Wells to be completed within the upper groundwater strata and below the lagoon within bedrock.

Installation of a downgradient well at the north – northeast corner of the lagoon completed within the bedrock.

Collection of groundwater samples from current and newly installed groundwater monitoring wells to determine up and downgradient groundwater conditions. Sampling will follow NRCB Technical Guideline document Agdex 096-53.

Analysis of the following parameters in groundwater: ammonium-nitrogen, chloride, nitrate-nitrogen, nitrite-nitrogen, potassium, total dissolved phosphorus, Escherichia coli (e. coli), pH, and electrical conductivity.

Assessment and recommendations of the analytical results to be completed by a professional engineer to determine the current status of the manure storage lagoon.

As the exact depth of the lagoon cannot be accurately measured safely at this time, the specific soil conditions directly beneath the lagoon cannot be tested. The groundwater condition measured both up and down gradient of the lagoon may not determine the exact soil conditions however, the assessment will determine if there is a current risk to the groundwater system.

In addition, it is common in the dairy and hog industry for organic deposits from manure to settle within an earthen manure storage lagoon, decompose, and fill the pore space within surrounding soils. These organic deposits form along the base and walls of the lagoon, presumably within the first few years of use. During the decommissioning of many lagoons, Envirowest has found that it is not uncommon for these impacted deposits to be within the first 30 cm of the lagoon walls and base, with un-impacted groundwater surrounding the earthen manure storage lagoon. This characteristic may aid in providing protection against migration of impacts from manure storage into the groundwater system.

If you have any questions, please contact the undersigned.

Respectfully submitted,

Emily J. Low, P.Eng.
Envirowest Engineering

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

Envirowest Engineering Inc.
Professional Environmental Engineering Services

ENVIROWEST ENGINEERING INC.

Box 4248
Ponoka, Alberta
T4J -1R6

(403) 783-8229
Fax: (403) 783-5222

QUOTATION FOR SERVICE

Quotation No:
GST No: 886252196
Permit to Practice No: P 6458
Quotation Date: September 12, 2019

Quotation For:

Soil Assessment - Leak Detection Installation

To:
Kramer Dairy

Service Description	Amount
Completion of a soil and site assessment for a manure storage lagoon of a current dairy operation in accordance with the regulations associated with the Agricultural Operations Practices Act. Installation of leak detection wells. The site assessment will include an assessment of overall suitability for the current construction with respect to specified requirements such as depth to water table, depth to bedrock, presence of common bodies of water, potential flood plain etc.. Installation of leak detection wells will be completed if required. The soil assessment will include the completion of at least 4 investigative boreholes in the area of the facility. The boreholes will be completed to a depth of between 4.0 to 9.0 meters as required. A detailed log of the soil lithology will be maintained throughout the completion of each boreholes. As appropriate, representative soil samples will be collected for laboratory analysis for hydraulic conductivity, and grain size. Four boreholes will be completed as a piezometer to allow for groundwater testing. Groundwater samples will be collected and submitted for Baseline analysis (as per NRCB). A final report will be prepared detailing the findings of the site and soil assessment as well as results and recommendations from the groundwater analysis.	

Note: This quotation does not include G.S.T. and is effective for 30 days.

Envirowest Engineering Inc.
Professional Environmental Engineering Services

ENVIROWEST ENGINEERING INC.

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Ponoka, Alberta
T4J -1R6

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QUOTATION FOR SERVICE

Quotation No:
GST No: 886252196
Permit to Practice No: P 6458
Quotation Date: September 12, 2019

Quotation For:

Soil Assessment - Leak Detection Installation

To:
Kramer Dairy

Service Description	Amount
Onsite services including environmental drill rig for completion of investigative boreholes, material for groundwater monitoring well, professional engineer and hydraulic conductivity testing.	$ 4 769.00
Mileage and consumables	$ 160.00
Laboratory analysis as appropriate.	$ 1 000.00
Preparation of final report as detailed above.	$ 2 000.00
Total	**$ 7 929.00**

Note: This quotation does not include G.S.T. and is effective for 30 days.

Envirowest Engineering

Box 4248

Ponoka AB T4J 1R6

403-783-8229

GST/HST Registration No.: 779352731RT0001

INVOICE

INVOICE TO

Reinder Kramer

INVOICE	1007
DATE	16/10/2019
TERMS	Net 30
DUE DATE	15/11/2019

DATE	SCOPE	AMOUNT
12/09/2019	Onsite Services including environmental drill rig for completion of investigative boreholes, material for groundwater monitoring well, professional engineer and hydraulic conductivity testing	3,819.00
12/09/2019	Site Expenses Mileage, consumables	160.00
12/09/2019	Laboratory	0.00
12/09/2019	Report Preparation	1,000.00

Please make cheques payable to Envirowest Engineering. Payments due upon receipt of invoice. A surcharge of 2% per month will be charged on outstanding balances after 30 days.

SUBTOTAL	4,979.00
GST @ 5%	248.95
TOTAL	5,227.95
BALANCE DUE	**$5,227.95**