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Memo

To:	Tom Donohue Pfizer Inc. Alexia Stangherlin City of Brandon	**Date:**	29 September 2022
From:	Kevin Beechinor/ Eryn Williamson	**Project No.**:	WX17989
Re:	**2022 Brandon Cell 4 Decommissioning Preliminary Workplan 2022 Groundwater Monitoring**		

1.0 Introduction

As a part of the proposed decommissioning of the Cell 4 within City of Brandon (City) wastewater lagoon, a baseline characterization of the groundwater conditions in the vicinity of the Cell is to be conducted.

Cell 4 is a part of the City's wastewater treatment lagoon system and is located approximately 5 km west of the wastewater lagoons, at 720 – 17th Street East in Brandon, Manitoba (the Site).

The wastewater treatment lagoons, including Cell 4, were constructed in 1964 and used to treat municipal sewage and wastewater generated by the City. From 1981 to 2013, Cell 4 was dedicated for use by Pfizer's Wyeth Organics for treatment of industrial wastewater from their facility. The Wyeth Organics wastewater which was discharged into Cell 4 for treatment contained Spent Pregnant Mare's Urine (SPMU) and consisted of wash-water, and rinse-water mix, and was characterized as a high organic strength, nitrogen rich, highly saline, and alkaline waste. Additionally, equine hormones were commingled within the wastewater and, prior to 2010, the wastewater also contained a preservative compound referred to as Compound A. SPMU discharge to Cell 4 ended in 2013 when the City's industrial wastewater treatment plant was completed and the wastewater from Wyeth Organics was redirected to the new facility for disposal.

The decommissioning of Cell 4 from industrial use is being planned in fulfillment of Section 37 of the City of Brandon Environment Act Licence. The proposed decommissioning of Cell 4 and the management of the cell's lagoon water and sediment includes the following:

- Wastewater drawdown, treatment, and discharge through a discharge point associated with the Licence; and,
- Consolidation of lagoon sediment and soil from Cell 4 in an on-Site containment cell within the northeastern portion of the cell's footprint.

Upon completion of the proposed decommissioning, it is anticipated that the remnant portion of Cell 4 would be used as additional capacity for periods of excess wet weather flow and be a net benefit for the City's wastewater management.

2.0 Scope of Work - Baseline Groundwater Quality

The objective of the baseline groundwater investigation would be to assess groundwater quality within the vicinity of Cell 4 prior to the commencement of decommissioning activities and for future monitoring as well. The results of the assessment will be utilized for comparison to future groundwater monitoring events conducted during and after the decommissioning activities. Should monitoring wells required decommissioning prior to construction activities, this will be conducted prior to commencement.

Based on the objective of the investigation, the following scope is recommended:

- Arrange for the location of underground public and private utilities to be located in advance of the field investigation.
- Conduct test hole drilling and monitoring well installation at up to five locations, including two upgradient and near the containment cell and three downgradient of Cell 4. Final locations will be selected based on location of utilities, buried infrastructure, future construction areas, future containment cell, and protection of some locations for long term monitoring points.
    - Test holes will be completed using a track mounted drill rig, with 154 mm auger.
    - Given historical water level measurements from previous investigations, it is anticipated that monitoring wells will be completed with screens ranging from 2 metres below grade level in the northern portion of the Site to up to 8 m below grade level for the locations to the south of Cell 4.
    - Stratigraphic conditions will be observed and logged during drilling, as well as representative samples of soils encountered during drilling will be collected for at least every 0.8 metres of drilling, or where changes in lithology are suspected or observed.
    - Representative soil samples will be submitted for grain size analysis, with the remainder archived for potential future use,
    - All test holes will be completed as monitoring wells and will be constructed with 50 mm diameter Schedule 40 PVC, No. 10 slot well screen and 50 mm diameter Schedule 40 PVC solid riser pipe to the ground surface. Monitoring wells will be backfilled with a filter sand to approximately 0.3 metres above the top of the monitoring well screen, with the annular space above the sand sealed to surface with hydrated bentonite pellets/chips. Monitoring wells will be completed at surface with a steep protective surface casing.
    - Upon completion of installation, monitoring wells will be developed prior to leaving site.
- Conduct groundwater monitoring sampling of installed monitoring wells in fall of 2022 in order to develop a baseline assessment of groundwater conditions.
    - Groundwater levels and field measurements (dissolved oxygen levels (DO), oxidation/reduction potential (ORP), electrical conductivity (EC), pH, and temperature) will be measured from each monitoring well.
    - Groundwater samples from each monitoring well will be submitted for dissolved concentrations of Compound A, routine water chemistry parameters (Ca, Mg, Na, K, Cl, F, SO4, NO2, NO3, NO2+NO3, Hardness, Alkalinity, pH, EC, TDS), DOC, and dissolved metals inclusive of those indicative of lagoon water.
- A brief memo will be provided on the results of the investigations, including relevant analytical results, test hole location plans and logs.

2.1 Subcontractors

Several subcontractors will be utilized to conduct the baseline groundwater monitoring investigation. McCaine Electric Inc. of Winnipeg, Manitoba will locate and mark private utility lines in the work area. The completion of the test holes and groundwater monitoring wells will be carried out by Paddock Drilling of Brandon, Manitoba. Groundwater samples will be submitted for laboratory analysis to ALS Environmental in Winnipeg, Manitoba which is accredited by the Canadian Association Laboratory Accreditation Inc. (CALA) for testing in accordance with the International Standard ISO/IEC 17025.

2.2 Schedule

WSP can commence work immediately upon provision of written authorization and contingent upon availability of public utility locates, private utility locator, and drilling contractor. The following tentative schedule is provided:

- Completion of Drilling – October 2022, pending drill rig availability.
- Completion of Groundwater Sampling – One to two weeks following the completion of monitoring well installation.
- Submission of final memo report – two weeks following the receipt of groundwater lab results.

3.0 Closure

Respectfully Submitted,

WSP E&I Canada Limited

[redacted]

Eryn Williamson, M.Sc., P.Ag.
Environmental Scientist

Reviewed by:

[redacted]

Kevin Beechinor, B.Sc.
Senior Environmental Scientist

NOTES: IMAGES FROM TOPO MAPS AND MLI WEBSITE.

LEGEND:

- TEST HOLE (GEO)
- TEST HOLE WITH STANDPIPE (GEO)
- PROPOSED MONITORING WELL

REVISION	BY	DATE
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CLIENT: PFIZER INC.

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DWN BY:	MD
CHK'D BY:	KB
DATUM:	NAD83
PROJECTION:	UTM Zone 14 U
SCALE:	AS SHOWN

BRANDON LAGOONS
CELL 4 DECOMMISSIONING
SW 22-10-18 W1 & SE 22-10-18 W1
BRANDON, MANITOBA

CELL 4 LAGOON SITE PLAN

DATE:	MAY 2022
PROJECT NO:	WX17989
REV. NO.:	----
FIGURE NO:	FIGURE 1

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