drawdown will be monitored using an oil/water interface probe. Arcadis notes that these measurements will be less useful where wells have very low recharge.

Arcadis will collect one primary water sample from each well with one duplicate sample collected overall. These samples will be analyzed for the parameters set out in the NWB license Part J, Number 7 regarding the monitoring program. GPS based survey coordinates will be noted for each well location, accurate to +/- one metre.

Quality Assurance and Quality Control

The following QA/QC measures and precautions will be taken during the Soil and Groundwater Sampling Program to minimize the potential for cross contamination and to maintain sample integrity:

- Use of Arcadis standard operating procedures (SOPs) to ensure representative samples are collected;
- Using appropriately trained personnel;
- All investigation methods, sampling protocols, calibration techniques and QA/QC procedures throughout this study and any additional work that may result from this study will be clearly documented;
- Proper documentation of all aspects of the sampling program, which could potentially cause sampling bias. The documentation will include daily field summary sheets, separate filing of field notes, chain-of-custody forms and memos written when any major deviation from ideal protocol occurs (e.g., an ice-pack melts, a bottle is broken, etc.);
- Decontamination of sampling equipment. All re-usable sampling apparatus will be successively washed with Alconox or Citranox and distilled water;
- A minimum of 10% collected samples, with a minimum of one sample per parameter, submitted to the laboratory will be blind field duplicates. These duplicates are in addition to any duplicates and replicates analyzed as part of the standard lab QA/QC procedures. The blind duplicate samples will be labeled such that the laboratory does not know that the samples are duplicates;
- All samples for potential laboratory analysis will be collected in the appropriate new containers provided by the laboratory with any necessary preservatives;
- Delivery of samples directly to the laboratory, by courier, within the required sampling hold times. Samples will be immediately transferred and stored in coolers with ice packs to hold the sample temperature at approximately 4 to 10°C, as required by laboratory protocols;
- Field and laboratory QA/QC results will be reviewed to provide an indication of the reliability of laboratory analytical data. The laboratory data will be reviewed including their QA/QC and recoveries of surrogate samples; and,
- Samples submitted to the laboratory will be accompanied by the appropriate laboratory Chain of Custody documentation for tracking purposes.

Laboratory Analysis

All chemical analyses will be completed by Maxxam Analytical Services (Maxxam) in Calgary, AB. PFC analysis will be completed by Maxxam in Mississauga, ON. Maxxam is certified by the Canadian Association for Laboratory Accreditation Inc. (CALA). The proposed laboratory program will include verification that the selected analytical methods will have minimum detection limits which are less than the applicable environmental quality criteria or standard on which the numerical comparison will be based. The proposed analytical program for the FTA LTU is as shown below:

Table 1: FTA LTU Analytical Program

Task	Analysis	Number of Samples
Groundwater Monitoring Program (as per NWB License 1BR-FTA1217)	- pH - Conductivity - Total Hardness - Total Alkalinity - Nitrate-Nitrite - Ammonia Nitrogen - Oil and Grease - Total Phenols - Calcium - Magnesium - Sodium - Potassium - Chloride - Sulphate - Dissolved Metals - PHCs F1 to F4 - PAHs - BTEX - Total Suspended and Dissolved Solids	11 plus 2 duplicates
Soil Monitoring Program (as per NWB License 1BR-FTA1217)	- BTEX and PHCs F1 to F4	6 plus 1 duplicate after tilling
Dewatering	- pH - Dissolved lead - Zinc - Oil and Grease - BTEX - PFC (not required by NWB license)	2 (1 from each sump)
Soil Indicator Parameters for Natural attenuation	- total iron - total potassium - available phosphorus - total nitrogen	4 plus 1 duplicate
QA/QC	Field Blank for BTEX, F1-F4 Trip Blank for BTEX/F1	1 each

A letter of approval from Maxxam regarding consultant sampling protocols will be obtained by Arcadis to meet water license requirements prior to sampling. This letter will be forwarded by TC to the NWB.

Step 4: Monitoring Well Repair

While sampling the monitoring wells, Arcadis will note the condition of each well. If repairs are deemed necessary, Arcadis will contact the PWGSC Project Manager at once for approval to conduct the repairs, if possible. Arcadis will not to proceed with repairs without PWGSC approval. Arcadis will also consult with the airport authority to assess if snow and airport maintenance activities may damage any repair solutions.

Step 5: Dewatering Services

By the time the Soil and Groundwater Sampling program has been completed, it is expected that the analytical results from the "Rush" analyses of the sump water will have been received back from the analytical laboratory. If the results meet the effluent discharge parameters set out in NWB License 1BR-FTA1217 and the applicable PFC guidelines, the sump water will be pumped directly to the ground. If these results are delayed or exceed the effluent discharge parameters and/or applicable guidelines, then dewatering of the FTA LTU may be necessary. Arcadis will contract Kitnuna to provide these services. The sump water will be sprayed onto the soil of the LTU and into the recirculation basins, as a water risk management strategy.

Step 6: Data Interpretation and Reporting

Once the fieldwork is completed, the data reduction and interpretation will begin. Soil and groundwater sample results will be compared to environmental standards. As indicated in the TOR, these will include:

- Groundwater analytical results will be compared to the CCME Water Quality Guidelines for Protection of Aquatic Life (freshwater and marine) and any applicable effluent quality limits set out in the NWB licence (1BR-FTA1217).
- Soil samples will be compared to any applicable soil quality limits set out in the NWB licence (1BR-FTA1217), as well as, be compared to the CCME Canadian Environmental Quality Guidelines and the Canada Wide Standard for Petroleum Hydrocarbons in Soil for industrial site use and coarse-grained surface soils for reference purposes.
- All sampling procedures will be in accordance with the standards contained in the CCME Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites Volume I &II.

A Class A cost estimate will be prepared for any future proposed work.

A draft report will be provided to PWGSC, which will include figures, tables, and a discussion of the results as identified in the report outline specified in TOR Section 5.2. Applicable federal, provincial, local legislation and published guidelines used as a basis for findings or conclusions respecting the determination of contamination will be referenced.