

## Groundwater Monitoring Program

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Date Approved by Council: November 28, 2023

Resolution No.:426/23

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Mayor: "Original Signed"

Acting County Commissioner: "Original Signed"

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### 1. Purpose

This policy establishes the criteria and requirements for the Groundwater Monitoring Program.

### 2. Revision History

<i>Approval Date</i>	<i>Revision Number</i>	<i>Modification</i>
<i>November 28, 2023</i>	<i>1.0</i>	<i>New Document</i>

### 3. Persons/Areas Affected

Council

Administration

Development Applicants - Land Developers, Sand and Gravel Operators and Property Owners

Resource Extraction Advisory Committee

Public Stakeholders

### 4. Policy Statement

4.1. To ensure water quality and quantity is not materially affected by natural resource extraction operations, the following requirements will apply.

4.2. The groundwater monitoring program shall be operated by Sturgeon County Administration on behalf of the sand and gravel operators and the public interest. Associated reporting shall be done by an independent hydrogeologist registered with APEGA.

4.3. Baseline and setup program

4.3.1.Setup

4.3.1.1. Subject to the satisfaction of the County, and with the requirements outlined under 4.3.2, prior to a development permit application for a natural resource extraction and/or secondary processing operation, the developer must obtain all required authorizations under the Water Act and provide Sturgeon County with copies of associated application documents, including hydrogeological assessments, field verified water well surveys, and baseline testing as required by the province.

- 4.3.1.2. For proposed natural resource extraction operations, typically at redistricting, baseline data is required to be collected to the satisfaction of an independent hydrogeologist.
- 4.3.1.3. Monitoring locations shall be recommended by an independent hydrogeologist prior to any application for natural resource extraction. Recommendations are to describe the existing monitoring locations that may be used as well as recommended additional monitoring locations.
- 4.3.1.4. Monitoring wells shall be installed at a depth consistent with the extraction of sand and gravel deposits in the local area. All monitoring wells shall be protected from damage and locked. Access to monitoring wells will be maintained by Sturgeon County through the use of easements.
- 4.3.1.5. Monitoring wells shall include installation of a Data Logger and cable.
- 4.3.1.6. Domestic water wells within the local area may be included as monitoring locations upon recommendation from the independent hydrogeologist and landowner agreement.
- 4.3.2. Baseline Testing
- 4.3.2.1. A Baseline Testing Report or Water Act Approval is required to be provided by the developer as part of a redistricting application or development permit application ensuring all aspects of the below criteria are met, unless otherwise recommended by the independent hydrogeologist.
- 4.3.2.2. To establish monitoring well conditions prior to natural resource extraction activities baseline testing shall be conducted to the satisfaction of an independent hydrogeologist and Sturgeon County and should provide a baseline reference point should issues arise in the future.
- 4.3.2.3. Testing shall include the following and any additional baseline testing as recommended by the independent hydrogeologist:
- Aquifer Test (10 minutes pumping and 10 minutes recovery)
  - 2 years of Groundwater Sampling
  - Groundwater analysis (routine and dissolved metals)
  - Water well inspection
  - Compilation of available water well data/documents
  - Letter report
- 4.3.2.4. Domestic water wells within the local area should be field verified by the independent hydrogeologist, if the wells are within the likely hydraulic connection to the sand and gravel deposits, and if requested by residents, that will be extracted.
- 4.3.3. Financing

4.3.3.1. All costs of startup and baseline testing of the Groundwater Monitoring Program shall be at the cost of the developer. Including but not limited to:

- Baseline Testing, where required.
- Installation of any required monitoring wells and any costs to procure the easements necessary to protect them.
- Procurement and installation of the Data logger and cable
- Testing of domestic wells as per the above.

#### 4.3.4. Conversion

4.3.4.1. Upon completion of baseline testing and startup as confirmed by the independent hydrogeologist the monitoring wells and data loggers will be transferred to the Ongoing Program.

#### 4.4. Ongoing Program

##### 4.4.1. Monitoring

4.4.1.1. Groundwater samples shall be collected on a semi-annual basis, (spring and autumn) by an independent hydrogeologist using scientifically acceptable purging, sampling and preservation procedures. Sample gathering may be reduced to annually upon recommendation of the independent hydrogeologist. Water levels shall be monitored through the use of a data logger that is programmed to take a read every hour. This information is to be provided in a report to Sturgeon County within 60 days of each sampling period, as supplements to annual reporting.

4.4.1.2. Testing shall include the following and any additional testing as recommended by the independent hydrogeologist:

- Datalogger download and programming
- Groundwater Sampling
- Groundwater analysis (routine and dissolved metals)
- Water well inspection

4.4.1.3. Prior to groundwater sampling, the water levels in the monitoring well network shall be recorded and referenced to geodetic elevation.

4.4.1.4. An independent hydrogeologist shall prepare an annual groundwater monitoring report on behalf of the program including the following information:

- description of activity;
- map of groundwater monitoring network and description of monitoring program;
- summary of geodetic water levels and interpretation of groundwater flow system; and

- summary of analytical data as required and interpretation of the data collected since the monitoring program began, including:
  - plots showing trends in parameter concentration;
  - comparison of measured parameter concentration to Canadian Drinking Water Standards;
  - remedial action, if required;
  - and recommendations for changes to the groundwater monitoring program.

4.4.1.5. The annual groundwater monitoring report shall summarize data collected to evaluate any trends, and highlight areas of concern. Recommendations of improvements to the monitoring program shall be submitted to Sturgeon County on or before January 30 of each year.

4.4.1.6. All reports shall be made available to the public at the Sturgeon County office and through the County website. The Resource Extraction Advisory Committee, as established, shall review the results of the analysis, and make recommendations to Alberta Environment and Sturgeon County.

#### 4.4.2. Financing

4.4.2.1. The collected groundwater samples from the groundwater monitoring network shall be analyzed by an independent hydrogeologist at the expense of the sand and gravel operators.

4.4.2.2. The ongoing monitoring program will be rebilled to all participating sand and gravel operators on a proportionate basis based on Community Aggregate Payment (CAP) levy volumes for the year.

4.4.2.3. Maintenance of the program including replacement of monitoring wells or dataloggers will be the responsibility of the program and shall be included in rebilling as above.

#### 4.5. Emergency Response Plan

4.5.1. All sand and gravel operators shall submit an emergency response plan in the event of contaminant spills during sand and gravel extraction operations acceptable to Sturgeon County Emergency Services. This response plan is to include a common telephone number, established for complaints. The nature of the complaints will be logged, and the information be passed on to the Calahoo-Villeneuve Sand and Gravel Advisory Committee.

4.5.2. The first response to a complaint would be enacted within 24 hours of receiving the complaint.

4.5.3. The operators shall be responsible for all costs associated with enacting the Emergency Response Plan.

#### 4.6. Groundwater Management

4.6.1. To prevent permanent dewatering of the aquifer, temporary dewatering (groundwater diversion) of groundwater during sand and gravel operations shall be artificially recharged utilizing deep recharge pits (sumps) to a depth in contact with the formation and aquifer. Artificial recharge will prevent the decline of groundwater levels within the buried sand and gravel aquifer. Groundwater levels will be measured periodically in all wells to measure the performance of the artificial recharge.

4.6.2. A Water Act authorization shall be obtained prior to any groundwater being diverted or pumped anywhere except back into the deep recharge pits (sumps).

4.6.3. To prevent the run in of contaminants to a pit where gravel is being extracted adjacent to a rail line or road, surface diversion berms shall be constructed to divert contaminants in the event of a surface spill, if required.

4.6.4. Reclamation shall maintain the hydraulic continuity of the lower sand and gravel aquifer.

#### 4.7. Mitigation and Preparedness Plan

4.7.1. In the event that groundwater levels may or have been impacted at existing domestic water wells based on the gathered monitoring data or performance of a well, a plan to maintain a sufficient water supply to the impacted domestic wells is required. Prior to the extraction of sand and gravel, the sand and gravel operators shall prepare a plan satisfactory to Sturgeon County that includes the following considerations:

- short and long term mitigation measures to maintain a potable water supply to any impacted residents, including hauling water, providing storage and delivery systems, or the installation of a new well.
- conditions that will trigger a response as per the developers Mitigation and Preparedness Plan.
- 24 hour response time
- Where a well is negatively impacted all pumping operations will cease, the cause of the impact will be determined, and the Mitigation and Preparedness Plan will be initiated.
- The mitigation and preparedness plan shall apply to all water wells that are within the likely hydraulic connection to the sand and gravel deposits that will be extracted as determined by the independent hydrogeologist.

4.7.2. The Mitigation and Preparedness plan shall be reviewed as part of a Redistricting application, Development Permit Application for Natural Resource Extraction and be reviewed upon renewal applications.

## 5. Responsibilities

Administration shall:

- Ensure development permit approvals for Natural Resource Extraction developments shall include a condition that the operator participate in the Groundwater Monitoring Program and provides all monitoring wells, testing, reports and financing as required by the Land Use Bylaw and this policy.

## 6. Review Period

This policy shall be reviewed at least every four years.

## 7. Cross Reference

Sturgeon County's Land Use Bylaw

Sturgeon County's General Municipal Servicing Standards

Resource Extraction Advisory Committee Terms of Reference