

Grimshaw Gravels Aquifer Protection Plan Policy

Subject: Aquifer Protection during Development

Ref: Planning, Zoning, Development

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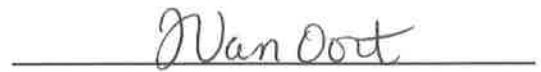
Replaces: New

The County of Northern Lights believes in the protection of the Grimshaw Gravels Aquifer.

In order to protect the Aquifer, this policy lays out the steps all companies shall take during the drilling, completion and facility construction for any drilling projects within the boundaries of the Grimshaw Gravels Aquifer.



Chief Elected Official



Chief Administrative Officer

## PROCEDURE

### 1. Pre-Drilling Assessment

Prior to drilling a number of steps will be undertaken beyond the ERCB requirements. This will help design the drilling program with an eye to protecting the aquifer.

- 1.1 While it is a requirement of the ERCB to have negotiated a land agreement with the landowner for surface access, all companies shall inquire about local knowledge of the aquifer during early contact with the landowners including:
  - (a) location of water wells in the immediate area
  - (b) location of any active springs
  - (c) any existing water quality issues with aquifer water
- 1.2 Although not an ERCB requirement, a pre-construction site assessment is an Industry Best practice. The pre-construction assessment will be expanded to include follow from the meeting with landowners and specific recommendations on lease construction, drilling waste handling and hydrological protection.
- 1.3 All Companies shall test all water wells within 500 meters of the well, pending owner approval. This is not an ERCB requirement, but will allow a baseline measurement should any water quality concerns arise.
- 1.4 All companies shall review historical drilling reports to determine if any issues arose during drilling through the aquifer, including lost circulation and hole sloughing. Historical problems in offsetting wells will influence drilling plans through the aquifer.

### 2. Drilling

Drilling practices through the aquifer will be chosen to minimize impact to the aquifer at a reasonable cost.

- 2.1 Lease construction will occur as per recommendations made in the pre-construction site assessment
- 2.2 All companies shall install a conductor pipe to a minimum depth of 40 metres or to the base of groundwater, if possible. A conductor pipe is used in drilling primarily in situations where shallow sands or gravels are suspect to sloughing and caving are encountered.
- 2.3 The surface hole to be drilled with fresh water based system. The system may be straight fresh water or a fresh water based mud system. In either case the system would be bleached to prevent any microbe contamination to the aquifer. Fresh water will be sourced from surface sources- dugouts, streams, etc.
- 2.4 The surface casing will be run in the surface hold and cemented in place. Cement volumes will be designed at 100% excess to calculated volumes. Returns will be monitored. In the unlikely event that good cement returns are not seen, remedial action will be taken. *The cemented surface casing is the prime protection for non-saline ground water.*
- 2.5 The production hole will be drilled with water based mud system to final depth. The production casing will be cemented in place with a cement volume designed to be 30% in excess of calculated volumes. Cement returns will be monitored. If good cement returns are not seen, a cement top will be identified during completion and remedial cementing would be conducted if the cement top is

not the surface casing.

- 2.6 A sumpless system will be used since the aquifer depth is quite shallow. Landspraying while drilling (LWD) will be the preferred method of handling drilling waste, subject to a Drilling Waste Assessment and landowner consent. Alternate off-lease disposal will be used if LWD is not suitable.

### **3. Completion**

- 3.1 If good returns were not obtained during cementing of the production casing, a cement bond log will be used to determine that the cement top is in the surface casing. If it is not, remedial cementing will occur.
- 3.2 All completion fluids will be disposed of at third party disposal facilities.

### **4. Facilities**

- 4.1 Any on site facilities will employ secondary containment- either a double walled tank or lined berm system. All truck loading points will use an "Enviro-box" or equivalent to catch any drips during the loading process.