

# **Lytton East Gravel Resource**

## **Investigative Permit Site Management Plan**

**Lytton, B.C.**

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**Appendix A:** Metes and Bounds

**Appendix B:** Photos

### **Maps**

	Location Map (regional)
LE0001	Proposed License of Occupation
LE0002	Proposed Exploration

## **1. Objectives**

The purpose of the proposed Lytton East Investigative Permit is to secure an interim tenure to specific Crown lands in the Lytton-Thompson River area in order to allow Lehigh Hanson Materials Limited (Lehigh) to assess the associated potential for commercial aggregate production. The investigative program will include all detailed investigations necessary to support a production decision, and to acquire both an Environmental Assessment Certificate through the Environmental Assessment Office and a Crown Lease for aggregate production through Land and Water BC.

Given a favourable outcome to these proposed activities, it is anticipated that the property could be developed into a fully operational mining operation, supplying construction materials to Lehigh's established markets in Vancouver and the BC Lower Mainland with potential for sales into Seattle WA and San Francisco CA area. The resulting operation would directly employ approximately 15 to 20 people in addition to the indirect employment required to support such an operation.

## **2. Property Description and Proposed Use**

The Lytton East property is located on the northwest side of the Thompson River approximately 13.9 km east of the town of Lytton.

The project area totals 156.2 ha. and is centered approximately, at UTM coordinates of 10U612200E, 5571250N. Relevant map sheets include NTS map sheet 92I/06W and BCGS map sheet 092I023. It is to be noted, that the entire project area also lies within a Provincial map reserve created to recognize the significant aggregate potential of the area (Land File: 3409616).

There is currently no road access to the Lytton East site and as such, the site is not readily accessible by the general public. The CN Rail transcontinental mainline is located between the project area and the west shore of the Thompson River and offers the best means of transport of site personnel, equipment and materials. Lehigh is presently in discussion with CN Rail regarding acquisition of a long term transportation agreement. Initial exploration and baseline investigations will, however, be supported by helicopter in the interests of efficiency and the minimization of initial site impacts.

The intended use of the proposed land tenure will be limited to the exploration of the underlying gravel resource potential and the undertaking of all field investigations necessary to support applications for a long term License of Occupation, a development certificate through the Environmental Assessment office and Mine Permit through the Ministry of Energy and Mines. The work program will include a seismic survey, exploration drilling, environmental baseline studies, hydrology and groundwater assessments, as well as preliminary archaeological investigations. No commercial production is to be undertaken under the framework of the current application.

Due to the size of the deposit, the extended timelines for some critical materials testing, the scope of the baseline investigations and the nature of the regulatory process, the tenure is required for a term of not less than five years.

## **Description of Investigative Work**

### **a) 2008 Reconnaissance**

A reconnaissance exploration program was completed in 2008 which identified significant aggregate potential within the subject properties. Work to date has included:

- i) aerial photo interpretation
- ii) geological traverse along the CN Rail RoW
- iii) sampling and testing of aggregate materials from existing bank exposures within the CN Rail RoW
- iv) preparation of topographic base maps
- v) preliminary resource estimations and development of a conceptual mine plan

### **b) Proposed Investigations under Proposed Tenure**

During the term of the proposed tenure, a comprehensive exploration program is proposed to define the extent, quality and variability of the aggregate resource. The program is outlined on LE0002 and shows the tentative layout for the proposed activities. It is to be noted, that the program has been designed using current information and that actual locations, extent and alignments may have to be adjusted to address actual site conditions and the evolving geological model.

#### **i) Geophysical**

The geophysical work will include a resistivity and/or seismic survey with four lines having been laid out for the preliminary investigation. As shown on Drawing LE0002, the lines are oriented approximately perpendicular to the trend of the terrace and have a combined length of approximately 2.3 km. Additional lines may be considered on the basis of the preliminary findings.

Surface disturbances associated with the geophysical program will be minimal as there is limited vegetation cover within the areas of interest. Seismic lines will be flagged and/or picketed as necessary to establish the desired alignments. The seismic does require the use of small explosive charges to initiate the necessary shock wave. Charge placements will be hand dug and backfilled upon completion of the survey. . Explosives will not be stored on site, but will be taken in on a daily basis.

The seismic will be fully supported by helicopter. Accommodations for work crews will be provided in Lytton

#### **ii) Drilling**

A drill program has been designed to provide a broad overview of the aggregate formations within the permit area. The plan establishes 15 sites to be drilled as part of the initial exploration work. Provisions will be made, however, for increasing the testhole density on the basis of the initial findings. The proposed drillhole locations are shown on Drawing LE0002.

Due to the access challenges and high relief, the program will employ a drill rig capable of being mobilized and otherwise supported by helicopter. In this manner, the choice of drillsite locations becomes more flexible and the amount of site disturbance that would be necessary to establish land based access is avoided.

Drill cuttings will be assessed visually, and logged during the course of drilling operations. Representative samples will be taken as deemed appropriate to the deposit stratigraphy and will be sent offsite for materials testing. Sample rejects will be retained at the drill location and utilized to backfill the borehole upon completion.

**iii) Environmental Assessments**

One of the primary components of the proposed work program will be to undertake the environmental baseline and impact assessments that would be necessary to allow the development of a commercial mining operation. This work will be initiated and completed within the timeframe of the proposed tenure. The terms of reference for these studies will be established through consultation with the Environmental Assessment Office, to ensure that all applicable issues are addressed. It is anticipated that this work will include such items as:

- a) Terrestrial habitat and endangered species baseline and impact assessment
- b) Surface water assessment
- c) Groundwater assessment
- d) Meteorological historical overview
- e) Noise and dust impact assessments
- f) Visual impact Assessment
- g) Slope stability assessment

**iv) Archaeology**

Several First Nations reside in the Thompson River valley and as such, there is an expectation that evidence of their occupation and activities could be found within the project area. The archaeological program will be undertaken under the direction of a qualified archaeologist and will involve representatives from the resident Band offices.

**v) Community impact assessment**

Program will also include a socio-economic impact assessment and will involve community, First Nation and local governmental consultation

**4. Surface Disturbance**

The proposed exploration program has been designed to minimize site disturbances, through the use of heli support and use of existing site clearings.

**a) Line Cutting**

Baselines will have to be established for the geophysical component of the program. Due to the minimal tree cover, most of these alignments will be marked using pickets and flagging. Lines will be adjusted to minimize the need for any cutting of trees.

**b) Road/trail Rehabilitation and Construction**

There are no roads or trails on the site and there are no plans to establish ground access as part of the current program.

**c) Drill Sites**

Drill setups will be located within existing clearings to minimize site disturbances and damage to existing vegetation. A temporary overland waterline will be installed to support the drilling operations and will be removed upon completion of the work. Excess drill cuttings will be used to backfill the boreholes.

**5. Present State of Crown Land**

The site is presently vacant crown land lying within an established Provincial map reserve recognizing the local aggregate potential. The site also lies within the boundaries of the Thompson Nicola Regional District. Lehigh will meet with the local government regarding the proposed activities, zoning and bylaw restrictions and future developments.

CN Rail's transcontinental mainline right of way lies along the eastern side of the project area.

Vegetation typically consists of sparse stands of pine surrounded by grass ground cover. Soils are minimal typically being less than 15 cm thick.

Site topography consists of a steep sided gravel terrace positioned between the Thompson River on the east and exposed bedrock formations on the west. The terrace is incised by numerous seasonal surface runoff features, although there is no evidence of any sustained water flows within the project area.

**6. Site Management**

**a) Schedule**

The first phase of the exploration program would ideally be conducted late summer 2012 and will involve primarily low impact activities such as line cutting, and geophysical investigations. Drill rig availability will dictate scheduling of this component of the work but most probably could be undertaken in the spring of 2013. Follow up drill may be considered for 2014 if deemed necessary to complete the geological model.

The environmental and archaeological assessment programs will be ongoing over the full term of the license.

It is proposed that most work will be conducted on a Monday to Friday schedule between the hours of 7am and 7pm. Drilling may, however, be undertaken on a seven day schedule due to crew logistical concerns.

In the interests of environmental and forest protection, it is to be noted, that field work will be scheduled to avoid periods of extreme fire hazard and severe weather conditions, and will be suspended during any related forest closures or projected extreme rain/wind events.

**b) Access**

The property will be accessed by helicopter or by foot from the CN Rail right of way during course of the proposed investigative work.

**c) Site Installations and Infrastructure**

No on-site installations are planned within the term of the proposed Investigative Tenure

First aid and basic fire fighting equipment and supplies will be maintained on site when activities are in progress. Cell or sat phones will be utilized to establish site communications.

An emergency plan will be prepared and posted prior to commencing site operations, outlining contact information for emergency response personnel, medical assistance, hospitals, Medevac transportation, fire department, police services and government agencies and will include detailed emergency response procedures. All mine personnel will be trained in such procedures as part of their site orientation.

**d) Environmental Management**

No drilling will be undertaken within 30 metres of the Thompson River, other flowing water or identified environmental reserves.

A spill contingency plan will be in place prior to commencing site operations and spill containment materials and supplies will be available on site whenever the site is active.

All garbage and other exploration debris will be removed from site on a daily basis.

Drillholes will be backfilled upon completion and sites will be restored to approximate pre program condition.

**e) Forestry Issues**

All exploration activities will be in accordance with the applicable sections of the Forest Practices Code. Exploration disturbances will be chosen and constructed to minimize impacts on any timber resource and slope stability.

Exploration activities will also be suspended for the duration of any fire related forest closure. Fire fighting equipment will be maintained on site as required by the Forest Fire Prevention and Abatement Regulation.

Any slash resulting from exploration activities will be bucked and scattered.

**7. Reclamation Program**

It is proposed that all disturbances associated with the exploration work will be reclaimed upon completion of the program.

Drill hole will be filled immediately upon completion, using the spoil and/or sample rejects. Drill sites will be recontoured as necessary to approximate the existing topography, When necessary, such areas will be seeded with an appropriate native ground cover

All equipment, sampling materials and related debris will be collected and removed from site upon completion.