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September 7, 2021

Prepared For: McLucas & Associates Inc.
c/o Steve Taylor
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Lacey, Wash509
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Subject: Skagit County Hearing Examiner Request for Additional Information (PL16-0556):
Proposed Hydrogeology and Groundwater Characterization Timeline

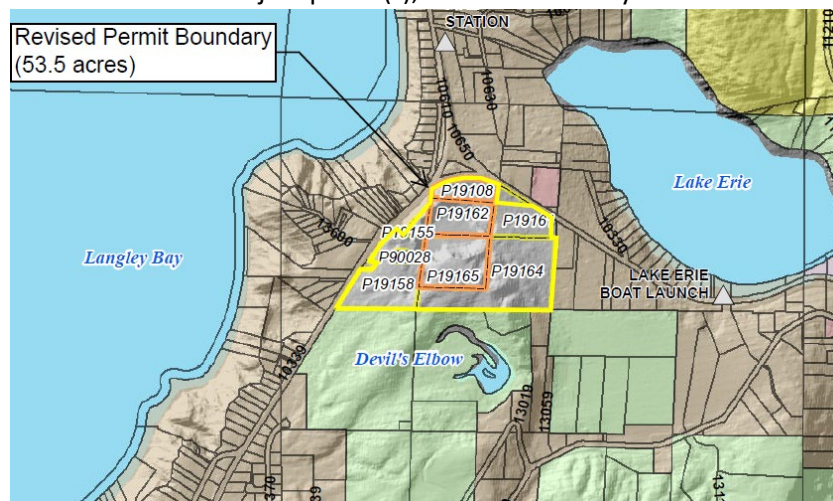
Project Locations: Skagit County Tax Parcels P19108, P19162, P19161, P19155, P90028, P19158,
P19165, and P19164.

Dear Steve Taylor,

This scope of work and time estimate have been prepared by Canyon Environmental Group LLC (Canyon) at the request of Steve Taylor and McLucas & Associates Inc. This document covers the proposed hydrogeological and groundwater characterization services the Lake Erie Gravel Mine and is meant to help inform the permit and regulatory review associated with the proposed mine expansion. Specifically, this scope is meant to help refine the understanding of groundwater and perched groundwater flow within the subject parcels and help address if changes to groundwater flow will affect the geohazard conditions in the close vicinity. This scope does not include a geohazard study, but the report generated by this scope of work will help inform the geologist that works on the geohazard study.

Study Area

The “Study Area” is defined as the subject parcel(s), shown below in yellow.



Outline of Scope of Work

Overview

The scope of services for this task are to perform hydrogeological services per the best available science and Skagit County Code to help characterize groundwater and groundwater flow directions related to existing conditions and the proposed mine expansion.

This study will include but not be limited to field visits to document existing surface conditions, extensive desktop review of existing geologic mapping and pre-existing studies and documents, topographical analysis, supervision of well installations, grainsize analysis, wet season groundwater monitoring, precipitation monitoring, wet season borehole and perched water evaluation, groundwater modeling/analysis, and report compilation. A report meeting professional standards will be provided with the study's findings and recommendations.

TASK 1: Desktop and Existing Study Evaluation

The currently available public information and previous studies conducted on and near the study area related to geologic conditions, mining operations and planning documents, groundwater movement and/well installations will be reviewed for relevant information. Information gleaned from the databases and studies will be written up in a summary memo.

Estimated:

- Desktop Review (2-3 weeks)

TASK 2: Field Investigations, Well Installations, Limited Soil Characterization, and Grain Size Analysis

This scope of work will be performed by qualified Canyon personnel, who will conduct site visits to document, describe, and characterize the conditions on-site with the intent to gather information that can be used to inform this hydrogeology study, groundwater well placement locations, and eventual geohazard study. During this task, three to four permanent groundwater monitoring wells will be installed. Canyon employees will evaluate the well boring for subsurface geology and groundwater conditions to determine groundwater and subsurface hydrological properties, including grain-size and redoximorphic features, evaluate depth to groundwater, and identify any potentially restrictive layers. Well installation should occur at the earliest possible time to gather as much of the rainy season as possible, preferably before the end of October.

Soil infiltration characteristics and site uniformity will be assessed using the Grain Size Analysis method (D422/D1140 sieve analysis to determine grain size distribution of the sample and C136/C117 method sieve analysis to correlate soil types).

Information gained from Task 2 will be used in the final Hydrogeological Report.

Estimated:

- Field investigation (3-days)

- Well installation
 - Possibly access clearing for wells (2-3 weeks)
 - Coordination with well drillers (8-weeks)
 - Clients will have to hire well drillers independently of Canyon
 - Supervision of well installation (3-4 days)
 - Survey of well location (1 day)
 - Client will have to hire professional surveyors independently of Canyon
- Grainsize Analysis (7-10 days)

TASK 3: Wet Season Water Table Monitoring

Once the monitoring wells have been installed, the depth to groundwater will be monitored both digitally and manually throughout the wet season (October to May/June). The digital monitoring will be conducted using direct read Solisnt™ pressure transducers which will collect measurements every 1-3 hours. Additionally onsite rain gauges will be installed and monitored to aid in the groundwater characterization and modeling. The digital DTW and precipitation data will be collected monthly along with manual depth to water (DTW) measurements.

Estimated:

- Wet season DTW measurements (8-9 months)

TASK 4: Wet Season Field Observation and Borehole Evaluation

During the height of the wet season (March or April), two additional temporary bore holes will be drilled along the western boundary of the Study Area. In addition to manual observation of the drilling operation, downhole geophysics well profiling probes will be used to analyze for the presence and quantity of groundwater. This data collection will be used to evaluate if perched water tables are potentially present onsite and if they are potentially a source for the seeps known to exist west of the Study Area.

Wet season field assessments and characterization will be conducted within the Study Area. Additionally field assessment will be conducted on the slopes west of the Study Area but will be limited to areas where access is granted to Canyon field staff.

Estimated:

- Borehole drilling
 - Coordination with well drillers (8-weeks)
 - Will occur in March or April
 - Clients will have to hire well drillers independent of Canyon
 - Supervision of well installation (1-2 days)
- Survey of well location (1 day)
 - Client will have to hire professional surveyors independently of Canyon
- Borehole Geophysics Well Profiling (1-2 days)
 - Client will have to hire the well profiling company independently of Canyon

TASK 5: Groundwater Modeling and Report

Once the field data has been gathered, groundwater modeling of the Study Area will be conducted to evaluate the groundwater flow direction and potential groundwater impacts and implications of the proposed gravel mine expansion. The results of the field data and groundwater evaluation will be written in a Hydrogeologic Assessment Report which will discuss our findings, results, and recommendations. This report and field data will be given to the geologist conducting the geohazard assessment to inform their study.

Estimated:

- Groundwater Modeling (2-3 months)
- Hydrogeologic Assessment Report (2 months)

Summary of Estimated Schedule and Timeline

In summary if the above proposed scope of work were started on October 1st it is estimated that the whole project would take approximately 1 year. The table below shows the timeline and schedule for each of the tasks and subtasks discussed above.

TASK	2021			2022										
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Task 1: Desktop Evaluation	■													
Task 2: Field Studies														
Site Visit	■													
Well Drilling		■	■											
Surveying		■												
Grainsize Analysis		■												
Task 3: Water Table Monitoring	■	■	■	■	■	■	■	■	■	■				
Task 4: Wet Season Evaluation														
Site Visits						■								
Borehole Evaluation						■								
Task 5: Modeling and Reports														
Groundwater Modeling										■	■	■	■	
Report Compliation											■	■	■	■

For questions, scheduling arrangements, or inquiries about additional services we may be able to provide for your or your project, please contact us at (360) 389-1693. Thank you in advance for the opportunity to work with you.

Sincerely,



Jeff Ninnemann, LHG, PWS.
 Hydrogeologist/Wetland Ecologist/Environmental Geologist - Principal
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