

DATE OF MEETING MAY 13, 2024  
AUTHORED BY CLAIRE NEGRIN, MANAGER, SUBDIVISION  
SUBJECT **GEOTECHNICAL GUIDELINES REVIEW**

## **OVERVIEW**

### **Purpose of Report**

To present to the Governance and Priorities Committee for endorsement, guidelines associated with the preparation of geotechnical reports and the assessment of mine-related geotechnical hazards in support of development applications within the City of Nanaimo.

### **Recommendation**

That the Governance and Priorities Committee recommend that Council endorse the following guidelines associated with the preparation of geotechnical reports and the assessment of mine-related geotechnical hazards in support of development applications within the City of Nanaimo:

1. Guidelines for the Preparation of Geotechnical Reports; and,
  2. Guidelines for Geotechnical Assessments Above Abandoned Mine Workings;
- as attached to the Staff Report dated 2024-MAY-13.

## **BACKGROUND**

The geography of Nanaimo includes several geological conditions such as past glaciation; historic sub-surface coal mining; seismic shaking; steep lands prone to landslide, rockfall, and erosion; and, coastal erosion resulting from tidal effects and long-term sea level change. This varied and complex landscape means that much of the development in Nanaimo relies on geotechnical reviews of the land and proposed development at multiple stages of the development process to attempt to mitigate negative impacts to health and safety, damage to land, buildings and infrastructure, and harm to the environment.

Presently, there are two sets of guidelines available to geotechnical engineering professionals to outline the City of Nanaimo's expectations for geotechnical reporting documents: '*Guidelines for the Preparation of Geotechnical Reports: Subdivision*' and '*Guidelines for the Preparation of Geotechnical Reports: Building Inspections*'. These guidelines were last updated in 2013.

Since that time, there have been changes in processes at the City, growth in the understanding of geotechnical conditions and their interactions with development, as well as updated professional guidance for Engineers and Geoscientists, that have necessitated an update to the existing guidelines and the development of new guidelines related to abandoned mine workings. The adoption of *City Plan: Nanaimo Reimagined* created a new development permit area: DPA4 – Abandoned Mine Workings Hazards. The development of an associated set of guidelines has been in process since that time to provide applicable guidance to geotechnical professionals.

## **DISCUSSION**

### **Guidelines for the Preparation of Geotechnical Reports**

The Guidelines for the Preparation of Geotechnical Reports is a consolidation and update of two existing sets of guidelines currently available for reports associated with subdivision and building permit applications. The new Guidelines provide a single source for this information and also include guidance for geotechnical reporting documents (i.e. reports, memos, etc.) prepared for other development applications, including rezonings, development permits, and development variance permits.

The use of a single set of guidelines related to the preparation of reports will help Staff, applicants, and geotechnical professionals by ensuring that parties are aware of the expectations for reporting for all types of applications. The Guidelines also include process flowcharts for each application type, which identify the typical point during an application where relevant geotechnical reporting is required, as well as the typical level of assessment required at a given point in development review.

### **Guidelines for Geotechnical Assessments Above Abandoned Mine Workings**

The Guidelines for Geotechnical Assessments Above Abandoned Mine Workings provide a consolidation of information, including historical mining background information, legislative context, and mining-induced geological hazards. The Guidelines then provide an overview of the preliminary desktop risk assessment completed by the City's geotechnical consultant based on the consolidated information, which classifies areas as high, medium, or low risk based on risk screening criteria applied to different types of hazards. Finally, the Guidelines provide an overview of what information the City would expect to see in any report related to assessments above abandoned mine workings.

From the Guidelines:

*'Abandoned mine workings underlie approximately 13 of the 93 square kilometres of land within the City limits. A further 7 square kilometres of abandoned workings are located below adjacent coastal waters. The presence of abandoned mine workings introduces geological hazards that have the potential to negatively impact development in the form of health and safety, the stability of structures or lands, and/or the natural environment. These hazards must be assessed and, if determined to constitute unacceptable risk, mitigated through the development process to provide the City with assurance that the land can be used safely for the use intended.'*

Mining was first established in Nanaimo in 1852. Mines were continuously opened and closed between then and 1964, when the last mine closed. As such, much of the development in Nanaimo has occurred during and after mining operations occurred. Information on mines has been available mostly through provincial databases, archived data, or other published works. The adoption of *City Plan: Nanaimo Reimagined* in 2022, included the creation of the Abandoned Mine Workings Hazards Development Permit Area (DPA4) prompted the need for information related to abandoned mine workings to be more readily available to the public, landowners, and developers in the city.

Development above abandoned coal mines is a unique circumstance. As such, the designation of the Development Permit Area within *City Plan: Nanaimo ReImagined* ensures that impacted landowners are aware of the presence of abandoned mine workings, and the availability of the Guidelines will ensure that all geotechnical professionals working in the area are aware of the relevant information and recommended approaches associated with assessing risks above abandoned mine workings. The City has historically required geotechnical assessments of mining hazards to be completed for development, and although information related to abandoned mine workings has previously been available through multiple data sources, the consolidation of that information should prove useful and convenient for geotechnical engineers completing the assessments.

## Process

Both the Guidelines for the Preparation of Geotechnical Reports and the Guidelines for Geotechnical Assessments Above Abandoned Mine Workings were prepared by Carl Miller, P.Eng, Senior Principal Geotechnical Engineer for WSP. The Guidelines were presented in a webinar format by Mr. Miller to Geotechnical Engineers working in the region. The session was recorded and available for watching for a month afterwards and comments and questions related to the draft Guidelines were welcomed, however, none were received. Pending Council endorsement, the Guidelines will be made available on the City's website. |

## OPTIONS

1. That the Governance and Priorities Committee recommend that Council endorse the following guidelines associated with the preparation of geotechnical reports and the assessment of mine-related geotechnical hazards in support of development applications within the City of Nanaimo:
  1. Guidelines for the Preparation of Geotechnical Reports; and,
  2. Guidelines for Geotechnical Assessments Above Abandoned Mine Workings; as attached to the Staff Report dated 2024-MAY-13.
  - The advantages of this option: The Guidelines will ensure that applicants and their Geotechnical Engineers are aware of the City's expectations for reports and ensure that all geotechnical professionals working in the area are aware of the relevant information and recommended approaches associated with assessing risks above abandoned mine workings landowners. The guidelines support implementation of *City Plan: Nanaimo ReImagined* policy objectives through protection of development from hazardous conditions.
  - The disadvantages of this option: None identified.
  - Financial Implications: None.
2. That Council withhold endorsement of the geotechnical guidelines and provide further direction to Staff.
  - The advantages of this option: None identified.
  - The disadvantages of this option: by withholding endorsement, the Guidelines will not be made public, meaning Geotechnical Reports may not meet Staff expectations for content or layout, which may unnecessarily delay development applications.
  - Financial Implications: Unknown.

### **SUMMARY POINTS**

- The City of Nanaimo has prepared an updated and consolidated set of Guidelines for the Preparation of Geotechnical Reports, for geotechnical reports prepared in support of development applications within the City of Nanaimo.
- The City of Nanaimo has prepared Guidelines for Geotechnical Assessments Above Abandoned Mine Workings, for geotechnical assessments of development proposals located within the area covered by Development Permit Area 4: Abandoned Mine Workings Hazards as designated in *City Plan: Nanaimo ReImagined*.
- The Guidelines will ensure that applicants and their Geotechnical Engineers are aware of the City's expectations for reports and ensure that all geotechnical professionals working in the area are aware of the relevant information and recommended approaches associated with assessing risks above abandoned mine workings landowners.

### **ATTACHMENTS:**

- ATTACHMENT A: Draft Guidelines for the Preparation of Geotechnical Reports  
ATTACHMENT B: Draft Guidelines for Geotechnical Assessments Above Abandoned Mine Workings  
ATTACHMENT C: Guidelines for the Preparation of Geotechnical Reports: Subdivision  
ATTACHMENT D: Guidelines for the Preparation of Geotechnical Reports: Building Inspections

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