

APPENDIX G

Detailed Development Potential Analysis Methodology

MEMORANDUM



TO: Jane Koepke,
Groundswell Planning

FROM: Forest Pearson, P.Eng.,
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PROJECT No.: 1802347

RE: Whitehorse Commercial/Industrial Land
Development Potential Mapping

DATE: 9/12/2019

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A terrain-based evaluation of broad development potential for commercial and industrial land uses is provided on the accompanying maps. The evaluation is at a high-level (1:20,000 scale) and identifies potential areas that warrant further consideration, based on terrain and landscape conditions alone, for land development. The evaluation was completed as a desktop exercise using pre-existing 1:20,000 terrain mapping of the City of Whitehorse by Mougeot GeoAnalysis (1996). No new terrain interpretation or field observations were conducted as part of this work.

The terrain mapping included identification of both observed and potential morphological process modifiers. These morphological processes represent constraints for development. These were used to create an interpretation of development potential as shown on the accompanying maps. The spatial extent of the assessment was determined by Groundswell Planning and the City of Whitehorse.

The development potential is to identify areas that warrant further consideration based on terrain conditions alone. Should the area be considered for further development, more detailed, on-site evaluation would be required to determine the site-specific suitability.

Development Potential Classification

The development potential classification is based solely on *existing* landscape conditions and does not include considerations such as ownership, access, environmental, etc. Note that areas currently interpreted to have low or limited development potential could be developed with significant landscape modification (for example, filling of wetlands, significant earthworks, etc.).

The development potential classification, as shown on the accompanying maps is as follows:

- Good Development Potential – areas with few to little physical limitations to development. Within these areas, there may be sporadic areas of adverse (steep) topography, but generally most of the area has relatively mild topography. Classification is polygons mapped with no observed or potential geomorphic process modifiers.
- Good Development Potential with Some Areas of Constraints – these are areas with relatively good development potential, but there may be areas of sporadic or intermittent steep slopes or bedrock near surface or other potential processes that may create localized challenges to development. Classification is polygons mapped with:
 - areas of bedrock within 3 m of surface (observed process modifier “R”) or
 - areas of steep slopes (observed process modifier “T”) or
 - only a single potential geomorphic process is identified.
- Moderate Development Potential – these are areas with some development potential, but likely face terrain challenges associated with steep topography and near-surface bedrock that may limit development or make development difficult and/or more costly. Within these areas there

may be localized sites that have fewer challenges, however more detailed site-specific investigations would be required to identify them. Classification is polygons containing areas of steep slopes (often steeper than 30%) with bedrock within 3 m of surface (observed process modifiers “T” and “R”)

- **Poor Development Potential** - these are areas that face multiple terrain challenges that would make development difficult and costly. Classification is any polygon mapped with:
 - observed process other than rock and steep slopes (observed process modifiers “T” and/or “R”), or
 - with more than one potential geomorphic process identified.

Observed and Potential Process

Polygons with reduced development potential are labelled with the observed and/or potential morphological process code. These processes are defined in the “Digital Surficial Mapping of the City of Whitehorse Data Design Document” (Gartner Lee Limited 1997), and are reproduced as follows:

Observed process modifiers. These represent morphological process observed in the field and include:

O_Process Code	Description
B	Beaver dams
E	Slope erosion
EA	Active slope erosion
F	Flooding, seasonal
FA	Active flooding
K	Thermokarst
R	Bedrock present within 3 m from surface
O	Organic veneer, irregular, discontinuous
S	Slow mass movement, usually related to permafrost, soil creep or solifluction.
T	Steep slope, often steeper than 30%
V	Gullied
W	Poor drainage, shallow water table
X	Permafrost probably present within 3 m from surface
Z	Permafrost present within 1.5 m from surface.



Potential process modifiers. There is potential for the following process to occur, especially if aggravated by development:

P_Process Code	Description
d	Potential wind erosion (sand dunes)
e	Surface susceptible to <u>erosion</u> if surface vegetation is disturbed.
f	<u>Flooding</u> , occasional, low frequency inundation.
k	Thermok <u>arst</u> may develop if surface vegetation is removed or surface water conditions changed.
r	Bed <u>rock</u> possibly present within 5 m of surface.
s	Solifluc <u>tion</u>
t	Moderate slope, often between <u>20%</u> and 30%
v	Gullying likely to develop if the surface <u>vegetation</u> is removed or disturbed.
w	High <u>water</u> table, poor drainage.
x	Slow mass movements.

Whitehorse Copper Area Special Considerations

Within the Whitehorse Copper study area is an area denoted for special consideration. This area is comprised of both undeveloped land with good to moderate development potential. But it also encompasses areas of former mine tailings. These tailings are un-vegetated, fine-grained sediments (silt to sand), with localized areas of drainage. These tailings are comprised primarily of ground limestone and marble rock and as such have no significant toxicity concerns associated with them. It would be possible to conduct some types of land development on the tailings, however such development would require special consideration of how such development could occur given the nature of the tailings material.