

## 1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Western Copper Corporation (WCC) and is working in coordination with M3 Engineering and Technology Corporation (M3) to update the geotechnical components of the design for the proposed Carmacks Copper Project in preparation of submission of an updated and revised Feasibility Study. The following report presents the updated geotechnical preliminary design for the proposed Heap Leach Facility (HLF), including the Events Pond, Sediment Pond, and Surface Water Control Structures, based on work conducted by Golder between November 2006 and July 2007. Subsequent work conducted by Golder including a site investigation program (2007) is not included in this report.

The scope of work for this report was limited to geotechnical services only. Environmental services that may be required as part of this project are not considered part of this evaluation. Where the design of geotechnical components are based on criteria derived from environmental aspects, such criteria have been provided to Golder and are assumed to be correct.

This report was prepared in a manner consistent with the level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing in the Yukon Territories, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made. For additional information, reference should be made to the *Important Information and Limitation of this Report* included at the end of this report.

### 1.1 Project Description

The Carmacks Copper Project is a proposed open pit copper mine located approximately 200 km north of Whitehorse and 40 km northwest of the village of Carmacks, in the Yukon Territory, as shown on Figure 1.

The mine site facilities are expected to include the open pit, heap leach facility, solvent extraction and electro-winning (SX/EW) processing facility, waste rock storage area, crushing plant, truck shop, events pond, surface water control structures, haul roads, soil stockpiles, construction camp, and miscellaneous support and maintenance facilities.

The project site is accessed via the existing Freegold Road gravel highway, and an exploration trail. As part of mine development, a new access road is planned to provide access from the Freegold Road to the site.

Portions of the mine are planned for year round operation and other portions will be shutdown for short intervals (about 60 days) during winter months. Loading of the heap leach facility will occur for about 300 days per year, while leaching will continue year round. It is expected that by warming the pregnant leachate solution (PLS) using waste heat from power generation, and from the heat generated from the reaction in the heap, freezing of the PLS in the winter will be avoided.

The mine life is expected to be 6 years, during which time the operations will produce approximately 60 million tonnes of waste rock, and 13.3 million tonnes of copper ore. The ore will be crushed to minus 25 mm (1-inch), and placed in 8 m lifts, at a rate of up to 6,132 tonnes per day, for 300 days per year (1,839,600 tonnes/year). The heap leach pad is expected to cover an area of approximately 38 hectares, and be up to 90 m high.

Additional information regarding the Project Description can be obtained in the 2006 Project Proposal (Access 2006).

## 1.2 Scope of Services

This report presents the results of the preliminary geotechnical analysis and design for the Heap Leach Facility and ancillary structures, based on the layout, general configuration and mine plan provided by WCC and M3 (Figure 2). The hydrologic aspects of the work performed by Golder for the updated Preliminary Design are described under separate cover (Golder, 2007b). The scope of this report is limited to the following:

- Heap Leach Facility foundations;
- Confining Embankment;
- Events Pond Embankment;
- Liner and Leak Detection/Recovery Systems;
- Geotechnical Instrumentation
- Post-leaching geochemical assessment; and
- Construction Considerations.

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## 1.3 Previous Work

This preliminary design was based on field work previously carried out by others: Knight and Piesold in 1992, 1995, and 1996, EBA Engineering (EBA) in 1997, Clearwater Consultants Ltd. (CCL), Access Consulting Group (Access) in 2006, and Western Copper Corporation (WCC) in 2006. The results of this work were documented in reports prepared by Knight Piesold (1993, 1995, 1996, 1996a, and 1997), Hallam Knight Piesold (1995), EBA (1997), and Access (2006). Golder has relied on the previous work and assumes there are no major omissions in the previous work. Where

available information is limited, or where additional detailed field investigation work may affect the design, attempts have been made to identify the interpretations and assumptions made. In addition, we have provided comments to allow for planning for a comprehensive investigation in support of detailed design, planned for 2007.

A full list of references reviewed as part of the updated preliminary design is included at the end of this report.

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