

CASE STUDY: LAPOINTE KIMBERLITE DISCOVERY

THE APPLICATION OF HIGH RESOLUTION HELICOPTER BORNE ELECTROMAGNETICS AND MAGNETICS IN KIMBERLITE EXPLORATION

Introduction

Exploration for diamondiferous kimberlite in Ontario has been ongoing since the 1970's. But it is in the last 15 years that most of the known kimberlite pipes have been discovered. This relatively long exploration cycle speaks to the challenges of exploration for diamonds in Ontario and particularly along the Lake Temiskaming Structural Zone. Persistence and a multi-disciplinary approach have yielded success for Tres-OR Resources Ltd. with the discovery of the Lapointe Kimberlite in May, 2005. Aeroquest Limited is proud to have contributed to the success of this discovery program.



Exploration

Analysis of public-domain airborne magnetic data provided to industry through the Discover Abitibi Initiative led Tres-OR to stake claims in the area. The airmag survey was flown in a horizontal gradiometer configuration with a 150 m line spacing. Further processing and analysis of this data yielded several target areas of which the Lapointe target was the highest priority.

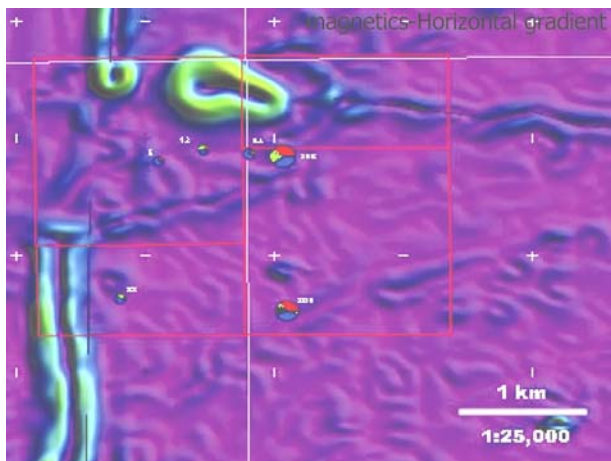


Figure 1. The Lapointe Target - original coloured Magnetic map

results clearly identify two lobes in the source and provided the impetus for further follow-up.

Tres-OR followed-up with indicator mineral sampling. Till samples collected immediately south (down-ice) of the Lapointe 1 target yielded high counts of Cr-pyropes, chromites, chrome diopsides, Mg-ilmenites, and eclogitic garnets. Microprobe analyses of these indicator minerals reveal significantly higher proportions of sub-calcic (G10) garnets than occur in any of the previously known pipes of the Kirkland Lake and New Liskeard kimberlite fields, except Contact Diamond's 95-2 pipe. This

Follow-up of this target involved a detailed airborne electromagnetic (EM) and magnetic survey utilizing Aeroquest Limited's AeroTEM II technology. The AeroTEM II system is a helicopter-borne time-domain EM (HTEM) system which offers the highest spatial resolution of any airborne EM system. AeroTEM also provides the best conductance discrimination of all HTEM systems including excellent sensitivity to weakly conductive geology and highly conductive ores.

The AeroTEM survey was flown to provide increased spatial resolution and to determine the conductive properties of the target area. The survey delineated the magnetic anomaly and mapped a perfectly coincident EM anomaly of weak to moderate conductance over the target magnetic source. The



Figure 2. The AeroTEM II HTEM System.

proved positive and subsequent microprobe results revealed good diamond chemistry. The target was then fast tracked for drill-testing.

The first hole drilled in May, 2005, into the Lapointe 1 target intersected weathered and serpentinized kimberlitic breccia. Preliminary visual observations reveal that the kimberlitic breccia is greenish-grey, mostly unconsolidated, serpentinized and calcite-rich. It has a macrocrystic texture with rare well preserved purple Cr-pyrope garnets, emerald green chrome diopsides, forsteritic olivine and black oxides (likely magnetite) with limestone xenoliths up to 2 cm in diameter.

The first four holes reported to date confirm that the entire geophysical anomaly, estimated from the magnetic signature at 21 hectares at surface, reflects kimberlite. The Lapointe Kimberlite comprises at least 3 intrusive events, each of which has returned diamonds. The encouraging diamond recovery, backed up by favourable indicator mineral chemistry (including sub-calcic [G10] pyropes and eclogite garnets with compositions similar to inclusions in diamonds) supports continued exploration and has led to the decision to undertake further delineation of the kimberlite.



Figure 5. Kimberlite polished slabs from Lapointe



Figure 6. Lapointe Kimberlite: 0.0665 carat diamond

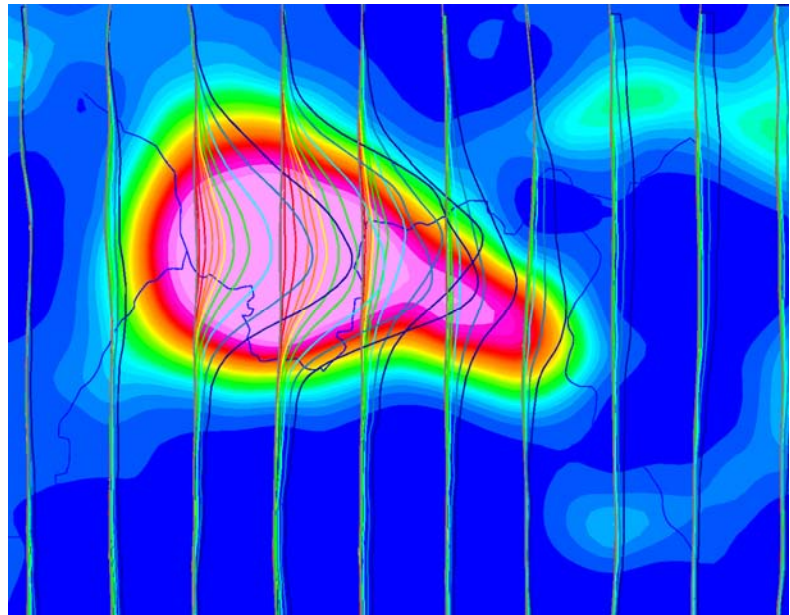


Figure 3. AeroTEM II EM Profiles with coloured magnetics of the Temagami Kimberlite discovery, the largest kimberlite discovery in Ontario.

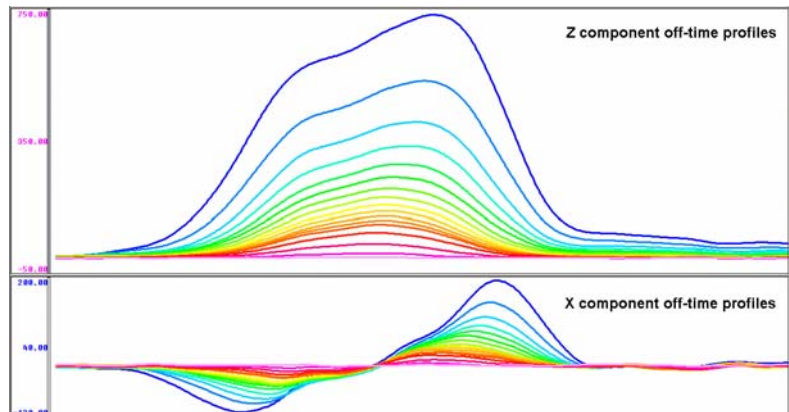


Figure 4. AeroTEM EM profiles of the Temagami Kimberlite discovery.

Aeroquest gratefully acknowledges Tres-Or Resources Ltd for the geological information and for permission to publicize the data.

