DIAS AIRBORNE CASE STUDY

PROJECT
SHATFORD LAKE LITHIUM PROJECT
ACME Lithium Inc.
Manitoba, Canada

TECHNOLOGY
DIAS QMAG^T
Airborne Full-Tensor Magnetic Gradiometry

TARGET
LITHIUM

Shatford Lake Lithium Project, Manitoba, Canada

SITUATION

ACME's 100% owned Shatford-Birse project area in southeastern Manitoba, Canada, is within the southern limb of the Bird River Greenstone Belt. The project is immediately south of Sinomine's world-class Tanco Mine property, a Lithium, Cesium and Tantalum (LCT) producer since 1969. The region hosts hundreds of individual pegmatite bodies, many of which are classified as complex rareelement LCT pegmatites – known to account for a quarter of the world's lithium production. The Shatford – Winnipeg River structure, which extends through the project area, is analogous to the Bernic Lake high strain zone that is interpreted to be related to the Tanco pegmatite. One priority area for exploration, referred to as Shatford East, is part of an approximately 7 km long curvilinear structural feature with multiple observations of pegmatites containing anomalous lithium.

The Shatford Lake property has abundant overburden, but in the broad deformation zones where most of the pegmatites occur, outcrop is virtually non-existent. In these deformation zones, overburden cover ranges up to 30 m thick.LCT pegmatites generally do not contain any ferromagnetic minerals, so do not produce an anomalous magnetic response unless they occur in host rocks that are magnetic. The host rocks are usually also non-magnetic or have very low magnetization, so provide virtually no contrast to aid detection and delineation with conventional magnetic systems.

However, it is possible that a highly sensitive gradient magnetic system could detect weak contrasts, and image structures and folding within the host rocks. Through interpretation of structure and lithology, prospective targets for pegmatite emplacement could be determined.

SOLUTION

In the summer of 2022, ACME contracted Dias Airborne to complete a helicopter-borne QMAG^T full tensor magnetic gradiometry (FTMG) survey across the property. QMAG^T is the most advanced airborne magnetic system currently commercially available. The survey comprises 1,991 line-km with a line spacing of 65 m. The FTMG survey was designed to map and characterize the variation in magnetization throughout the survey area towards interpreting structure, lithology, and alteration. The QMAG^T system measures all independent tensor components of the magnetic field using low temperature SQUID (superconducting quantum interference device) sensors. The QMAG^T system provide greater sensitivity to weakly magnetic sources, higher resolution, and the directional information that allows for accurate modeling and detailed interpretation of the data sets.

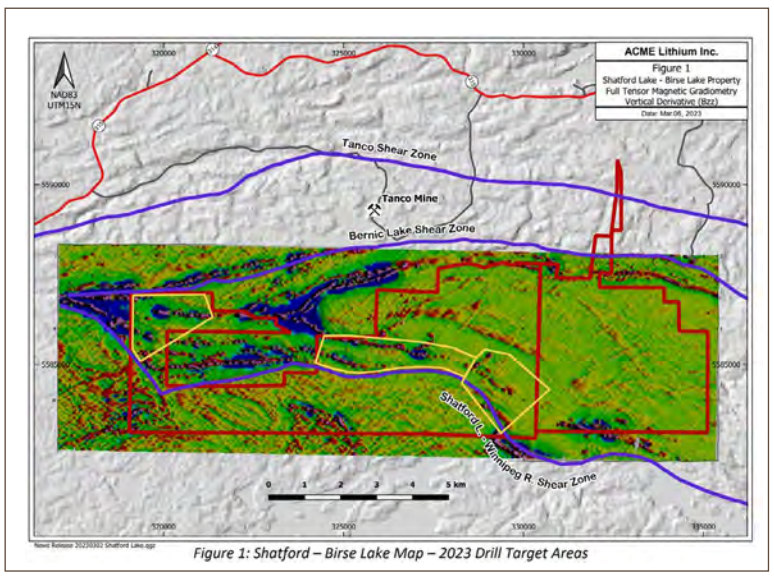

Figure 1: Shatford – Birse Lake Map – 2023 Drill Target Areas

ACME Drill Targeting

ACME designed its initial 2023 drill program using the basic responses in the vertical magnetic gradient of the vertical component (Bzz). Now, modelling confirms the initial targeting and delineates additional targets. Mira Geoscience Limited (Mira) performed modelling of the FTMG data. After a preliminary interpretation, Mira performed a computationally intense Magnetic Vector Inversion (MVI) integrated with ACME and regional geological data.

Taken together with the area geology, the priority areas for drilling are as follows (see Figure 1):

The Central Shatford area (left ellipse in the image below) is adjacent to the Tin Island pegmatite cluster. Through this area, subparallel NE trending magnetic low lineaments cross the Shatford Lake – Winnipeg Lake Shear Zone. Many prospective targets occur where NE lineaments cross the shear zone. Note the east-west, northeast and northwest trends in the batholith to the south. The Southeast Shatford area (right ellipse Fig. 2) encompasses a substantial flexure in the Shatford Lake – Winnipeg Lake Shear Zone. This area contains a broad zone of en-echelon magnetic responses, indicating splays and dilatant zones on the northeast side of the principal shear zone, representing highpriority exploration targets.

CONCLUSIONS

The extensive glacial till cover is transparent to the QMAG^T magnetic survey. The detailed FTMG data detects magnetite iron formation across the entire survey area and delineates the major G2 fold structures that envelope the Birse Lake pluton. A NE to ENE fracture set is evident across the entire span of the survey area, as detected in the Bzz tensor component in Figure 1.

Fine details in the vertical gradient (Bzz) adjacent to the Shatford Lake – Winnipeg River shear zone identify dilatant jogs and fold structures favourable for pegmatite intrusion. Magnetic low gaps in the high magnetic response of basalt and magnetite iron formation delineate probable pegmatite intrusion.

Vertical Derivative (Bzz) indicates that the path of the prolific Bernic Lake Shear Zone is more southerly than mapped in previous regional studies and more proximal to the Company's property.

Low contrast between the magnetic response of the pegmatites and their typical host lithologies limits the use of conventional magnetic surveys. ACME states that, "the sensitivity of Dias Airborne's QMAG^T system and Mira Geoscience's MVI modelling significantly alters this convention."

Drilling commenced at Shatford Lake in January 2023 based on findings from the Summer Exploration Program and the Winter 2023 Drill Program was completed in April 2023. Eight holes were completed totaling 3,280 m of diamond drilling. Drill targets from multiple sites identified include numerous pegmatites, some of which were undocumented prior to the Summer Exploration Program. 235 samples have been cut for assay, with results pending.

Pegmatites were encountered in 6 of 8 holes and previously unknown relatively fine-grained intrusive rocks indicate the possible occurrence of unexposed potential source plutons for lithium-bearing pegmatites. The drill program demonstrated QMAG^T magnetic survey mapped both stratigraphy and structure related to the LCT pegmatite targets.

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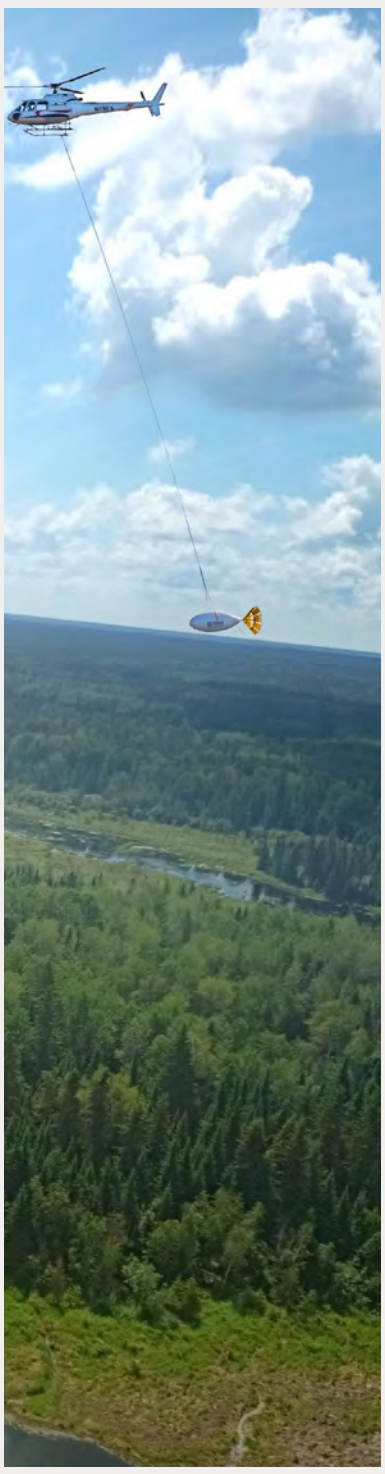

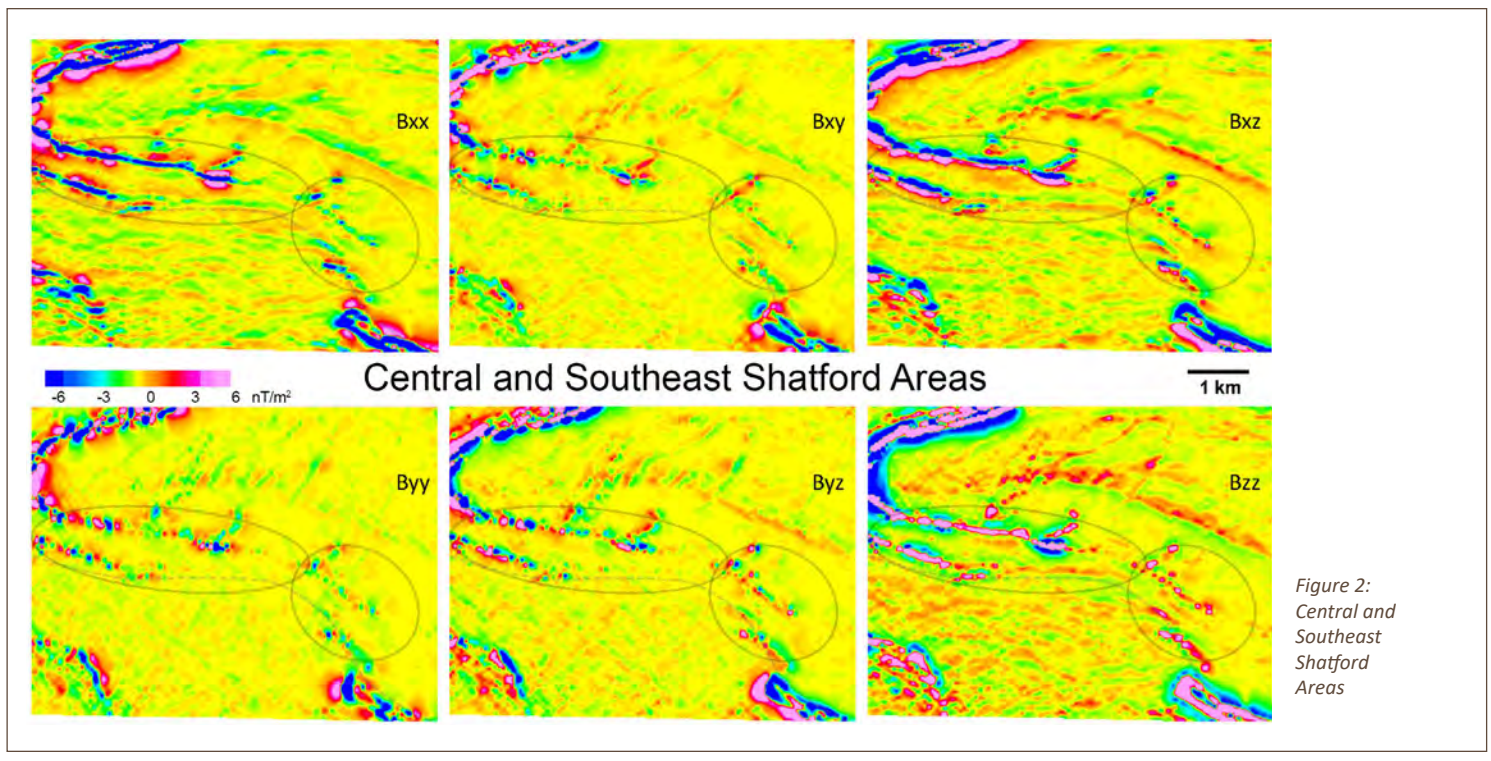

Figure 2: Central and Southeast Shatford Areas

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