

MERGING MULTIPLE SURVEYS

How to Correct and Merge a Past Survey into the Present

The majority of the time, a drone-borne survey will be collected as one block with one contractor. In November 2024, St Barbara contacted Rosor to collect drone-borne magnetic data as an extension of a previous survey to the east and northwest. Review of the previous dataset revealed that no tie-lines were flown for the survey, which meant custom levelling techniques were used to properly level the data to

remove residual line-related noise.

Reprocessing of the previous data greatly improved the quality of the survey, which led to seamless merging of all three blocks into a single cohesive survey. The merged survey – corroborated by magnetic vector inversion – reveals two large magnetic bodies associated with gold mineralization.

Project

Cochrane Lake Project

Methods

Drone-borne Magnetics

Location

Sherbrooke, Nova Scotia, Canada

Anomaly Type

Subsurface gold deposits

BACKGROUND

Located 10 km north of Sherbrooke, Nova Scotia is the Cochrane Hill Project, a project fully owned by Atlantic Mining NS Inc., a subsidiary of St. Barbara. Cochrane Hill is a legacy gold deposit within the Goldenville Group as part of a tight-to-isoclinal fold. Rosor was contracted to fly 1,000 line-km of drone-borne magnetics in two separate blocks (Figure 1). The blocks were designed around a previous drone-borne magnetic survey flown in 2019 by another contractor. Rosor was tasked collecting and processing data, to merge the data with the previous drone survey, and to delineate the magnetic bodies hosting the Cochrane Hill deposit.

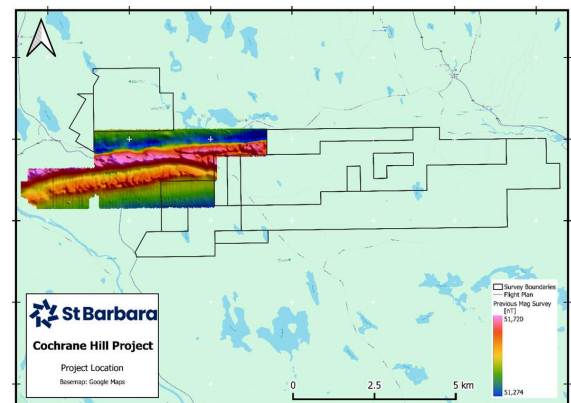


Figure 1: Coverage of the Cochrane Hill Project.

THE ROSOR SOLUTION

The Cochrane Hill survey comprise two survey blocks that total 42.17 km², and served as a northern extension and an eastern extension of the previous drone-borne survey (12.6 km²). The survey was designed using the same line orientation and spacing as the previous survey with an overlap of 100 m to ensure a seamless merge (Figure 2). Special attention was taken to ensure that traverse lines overlapped almost perfectly with the previous survey, and tie lines were extended in the overlap areas to help level the previous survey prior to merging.

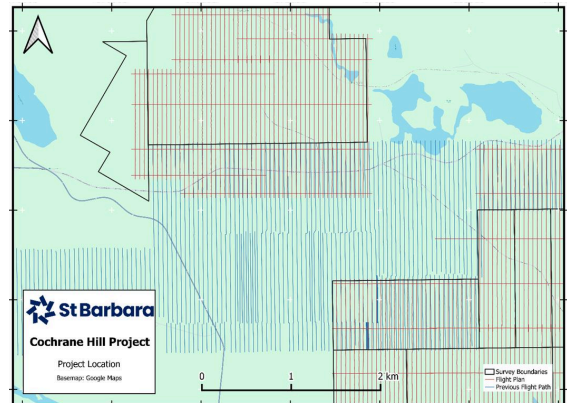


Figure 2: Flight plan including overlaps and extended tie lines.

The previous was reviewed to determine if any additional processing was needed. The provided survey deliverables were gridded using a 25 m cell size or ½ the line spacing, whereas Rosor's standard cell size for gridding magnetic data is 1/5 line spacing or 10 m in this case. When gridding the previous survey at our standard cell size, line-related noise was highly evident (Figure 3A). Thus, it was determined that additional levelling and microlevelling was needed to clean up the data. The results of the additional levelling made for a large improvement and was sufficient for knitting the survey with Rosor's processed data (Figure 3B).

The suture stitch method was used to merge the surveys together which defines a line through overlaps between the two grids, and uses the difference in grid values to adjust the grids to each other for a seamless overlap. The result was a high-resolution merged dataset that identified multiple E-W trending magnetic anomalies (Figure 4). Magnetic vector inversion (MVI) was performed on the merged grids to delineate the magnetic bodies associated with gold mineralization. The inversions proved successful, highlighting two strong steeply-dipping magnetic bodies associated with the Cochrane Hill anticline, a tight isoclinal fold within the Goldenville Group (Figure 5). The inversions assisted St. Barbara to help delineate the data.

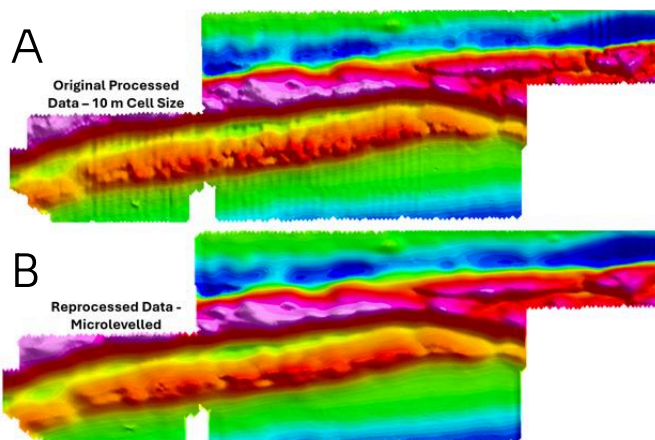


Figure 3: Magnetic intensity from the previous survey before (A) and after (B) Rosor applied their processing techniques.

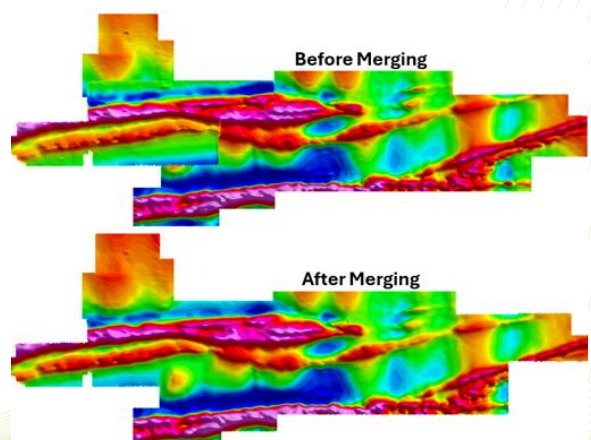


Figure 4: The previous survey and Rosor's drone-borne magnetic surveys before and after merging.

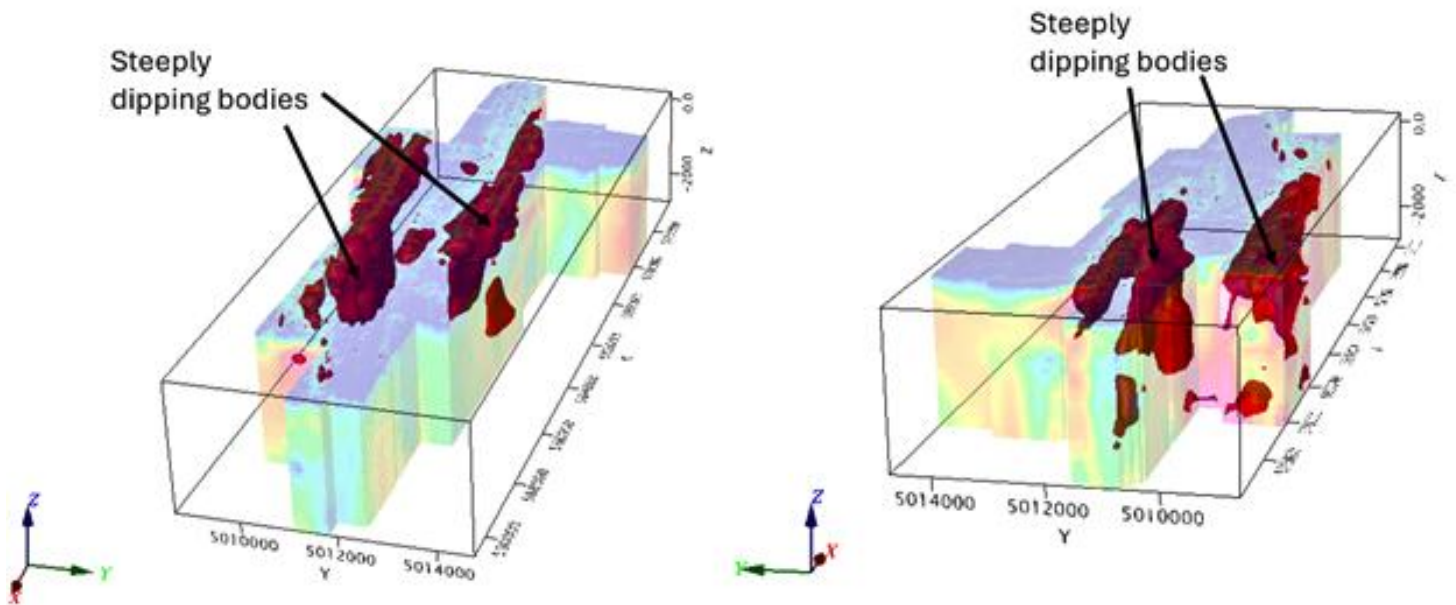


Figure 5: MVI model for the Cochrane Hill survey from various angles with 0.003 SI isosurfaces.

CONCLUSIONS

Rosor successfully collected, processed, reprocessed, and merged three separate magnetic datasets into a single cohesive survey covering the full Cochrane Hill Project. The previous contractor's dataset, which lacked tie-lines and carried significant line-related noise, was reprocessed using custom levelling and microlevelling techniques that substantially improved overall quality before merging.

The suture stitch method was applied to seamlessly integrate all three blocks into one high-resolution dataset, revealing multiple east-west trending magnetic anomalies across the project area. Magnetic vector inversion performed on the merged grids successfully delineated two strong, steeply-dipping magnetic bodies associated with the Cochrane Hill anticline.

The program was mobilized and completed within a tight timeframe, demonstrating Rosor's ability to respond quickly and deliver under schedule pressure without compromising data quality or processing standards.

Rosor managed to get a team onsite with only a few weeks' notice so that our survey could be completed within our tight timeframe. They also did a great job of merging a previous magnetic dataset with the newly captured data to create some impressive regional imagery.

– Daniel McDwyer, Manager of
Exploration – Australia & Atlantic

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