

Structural Controls on the Kimberley Gold Trend, Southeastern British Columbia (NTS 082F, G)

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Project Summary

The Kimberley Gold Trend project involves geological mapping and historical data compilation as part of Geoscience BC's Stimulating Exploration in the East Kootenays (SEEK) program. The project is focused in the Purcell Mountains west-southwest of the town of Cranbrook and covers parts of NTS map areas 082F and G. The purpose of the project is to identify important structural features that are associated with known gold occurrences and to develop a model for the emplacement of gold within the Kimberley gold trend.

The project area is underlain by rocks of the Proterozoic Belt-Purcell Supergroup that have undergone several episodes of regional tectonism (Höy, 1993; Price and Sears, 2000). The Kimberley gold trend is host to four rich placer-gold streams, discovered in the late 19th century, on which mining activities continue to present day. A significant lode-gold source for the rich placer deposits has not been discovered, although many small deposits and occurrences have been located. Most of the large-scale, publicly funded, geological research projects have focused on the synsedimentary Proterozoic base-metal occurrences in the area, due to the attraction of the Sullivan mine near Kimberley. Previous research efforts directed toward gold mineralization in the East Kootenays have suggested that gold is related to intrusive rocks of the Cretaceous Bayonne Plutonic Suite and stocks of similar age (Soloviev, 2010). Observations by the authors, as well as industry geologists, have emphasized the structural controls on gold emplacement, which is the focus of this project.

The Kimberley gold trend lies within a structural corridor bounded to the northwest and southeast by Proterozoic structures that were reactivated in the Mesozoic, namely the St. Mary's and Moyie faults (Figure 1). Between these, formations of the host Belt-Purcell Supergroup are frac-

tured, folded, altered and mineralized in complex patterns that are not well understood. The purpose of this investigation is to determine:

- the age of gold mineralization relative to intrusive events and structures;
- the relationship between gold mineralization and specific fault structures;
- the potential for certain premineralizing structures to produce either structural traps or conduits for gold mineralization; and
- and categorize the alteration style and mineralogy of structural elements, so they can be readily identified in areas of sparse bedrock.

The project includes approximately 40 days of geological mapping, concentrated mainly in three project areas within the Kimberley gold trend. (Included in the planned field-mapping days are several days spent touring known gold occurrences outside the mapping areas to compare their characteristics with those of showings in the mapping areas.) This work will be augmented by compilation of industry work, including several map programs done by the authors for industry clients between 2011 and 2013. The data from the field program will be analyzed to produce digital geology maps that include compilation of geochemistry, geophysics, geology and drill-location data. The digital database will be used to update BC MINFILE occurrences and create additional files, if required. All of the data will be available in widely used digital formats for reliable integration with other datasets.

Project Progress

Geological mapping of the Kimberley gold trend began in late 2014 and the project is expected to be completed in the spring of 2015. The project results will be published and released to the public as a Geoscience BC report. It is hoped that the release of this data will spur both grassroots exploration and development of known gold targets in an area of southeastern British Columbia that has had relatively little long-term, focused effort in developing its precious-metal potential.

Keywords: *geology, regional compilations, Belt-Purcell Supergroup, Laramide orogeny, gold deposit evaluation, Cranbrook area*

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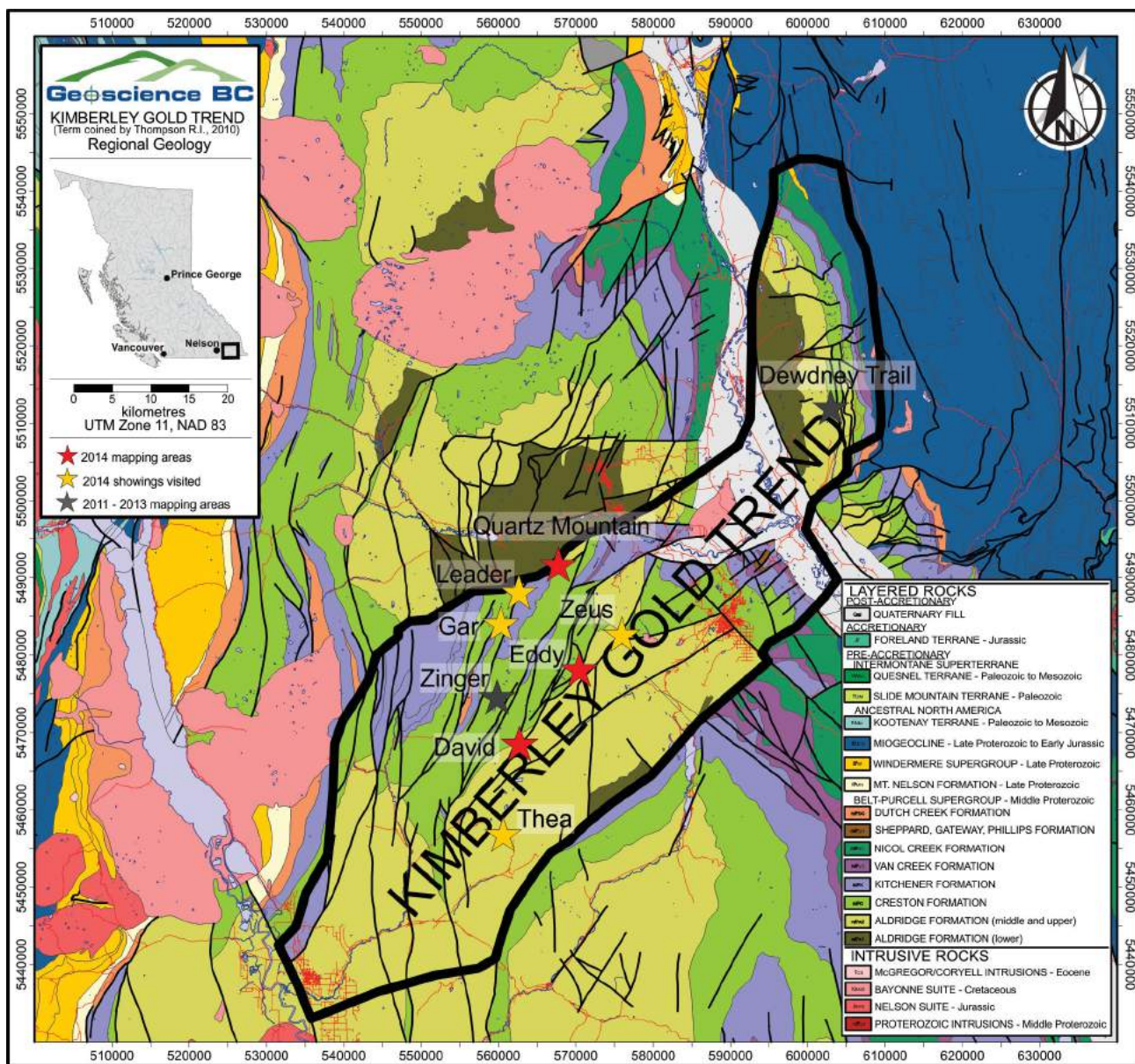


Figure 1. Kimberley gold trend, with locations of mapping projects. Base geology modified from Höy et al. (1995).

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References

Höy, T. (1993): Geology of the Purcell Supergroup in the Fernie west-half map area, SE British Columbia; BC Ministry of Energy and Mines, BC Geological Survey, Bulletin 84, 157 p., URL <<http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/BulletinInformation/BulletinsAfter1940/Documents/Bull84.pdf>> [November 2014].

Höy, T., Price, R.A., Legun, A., Grant, B. and Brown, D. (1995): Purcell Supergroup, southeastern British Columbia; BC Ministry of Energy and Mines, BC Geological Survey, Geoscience Map 1995-1, URL <<http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/Maps/GeoscienceMaps/Documents/GM1995-01.pdf>> [November 2014].

Price, R.A. and Sears, J.W. (2000): A preliminary palinspastic map of the Mesoproterozoic Belt-Purcell Supergroup, Canada and USA: implications for the tectonic setting and structural evolution of the Purcell anticlinorium and the Sullivan deposit; Chapter 5 in *The Geological Environment of the Sullivan Deposit*, British Columbia, J.W. Lydon, T. Höy, J.F. Slack and M.E. Knapp (ed.), Geological Association of Canada, Mineral Deposits Division, Special Publication 1, p. 61–81, URL <[http://geol.queensu.ca/people/price/pdf/SullivanVolCh5\(Price%26Sears\).PDF](http://geol.queensu.ca/people/price/pdf/SullivanVolCh5(Price%26Sears).PDF)> [November 2014].

Soloviev, S.G. (2010): Evaluation of reduced intrusive-related gold mineralization in the area west of Cranbrook, southeastern British Columbia (NTS 082F/08, 16); in *Geological Fieldwork 2009*, BC Ministry of Energy and Mines, BC

Geological Survey, Paper 2010-1, p. 97–111, URL <http://www.empr.gov.bc.ca/Mining/Geoscience/Publications/Catalogue/Fieldwork/Documents/2009/09_Soloviev_2009.pdf> [November 2014].

Thompson, R.I. (2011): Geology, exploration program and results from the Dewdney Trail property with recommendations for further exploration, Fort Steele Mining Division, British Co-

lumbia, NTS 82G/12; NI43-101 technical report prepared for PJX Resources Inc. and filed with SEDAR May 27, 2011, 208 p., URL <<http://www.sedar.com/GetFile.do?lang=EN&docClass=24&issuerNo=00031684&fileName=/csfsprod/data118/filings/01750922/00000001/h%3APJX2011May-OfferingTechReport.pdf>> [November 2014].

