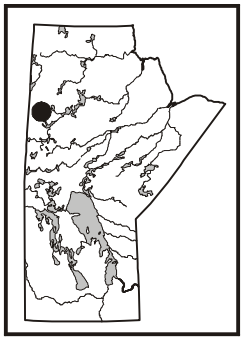
GS-10 CONTROLS ON GOLD MINERALIZATION ASSOCIATED WITH THE JOHNSON SHEAR ZONE AND AGASSIZ METALLOTECT, LYNN LAKE GREENSTONE BELT: SUMMARY OF CURRENT ACTIVITIES (PARTS OF NTS 64C/10, /11, /12, /14, /15, /16)



by C.J. Beaumont-Smith

Beaumont-Smith, C.J. 2000: Controls on gold mineralization associated with the Johnson Shear Zone and Agassiz Metallotect, Lynn Lake greenstone belt: summary of current activities (parts of NTS 64C/10, /11, /12, /14, /15, /16); *in* Report of Activities 2000, Manitoba Industry, Trade and Mines, Manitoba Geological Survey, p. 49-50.

INTRODUCTION

The goal of this multiyear, multidisciplinary program is to improve our understanding of gold-mineralization processes in the Lynn Lake greenstone belt. By providing explorationists with metallogenic models for the formation of known gold deposits, it should be possible to narrow the focus of gold exploration in the Lynn Lake greenstone belt, thereby facilitating the discovery of new deposits.

The fieldwork, begun during the 1999 field season, focused on developing an understanding of the deformation history of the Johnson Shear Zone (JSZ) and the relationship between the shear zone and the associated gold mineralization. Fieldwork during the 2000 field season continued the 1999 work and began, through thesis projects, investigations of past-producing gold deposits associated with the JSZ and Agassiz Metallotect.

The projects undertaken in this program represent a collaborative effort involving researchers from the Manitoba Geological Survey (MGS; C.J. Beaumont-Smith, H.V. Zwanzig), the University of New Brunswick (D. Lentz and graduate student G. Ma), Laurentian University (B. Lafrance and graduate student R. Jones), the University of Manitoba (N. Halden and graduate student D. Rogge), the University of Windsor (A. Turek) and Black Hawk Mining, Inc.

CURRENT ACTIVITIES

Work during the 2000 field season focused on the tectonic evolution of the Lynn Lake greenstone belt and controls on gold mineralization. The following aspects of the geological and mineralization history of the belt are reported in this volume:

1) Structural and geological investigations of gold mineralization associated with the Agassiz Metallotect (Ma et al., GS-11, this volume; area 1, Fig. GS-10-1) are following up on earlier MGS efforts to understand the gold mineralization associated with the unique stratigraphy of the Agassiz Metallotect. Initial fieldwork focused on detailed structural analysis, geochemical sampling and diamond-drill core logging of the MacLellan gold deposit and Agassiz Metallotect stratigraphy west of the deposit.
2) Structural analysis of the Johnson Shear Zone in the Gemmell Lake–Dunphy Lakes area (Beaumont-Smith, GS-12, this volume; area 2, Fig. GS-10-1) is an ongoing regional study to document the western extension of the JSZ, including newly discovered gold mineralization within the shear zone.
3) Detailed structural analysis is being carried out on this area of newly discovered gold mineralization within the JSZ west of Gemmell Lake (Beaumont-Smith and Edwards, GS-13, this volume; area 3, Fig. GS-10-1).
4) Structural analysis and gold metallogeny of the Burnt Timber gold deposit (Jones et al., GS-14, this volume; area 4, Fig. GS-10-1) focuses on the structural and geochemical controls on gold mineralization in this deposit, which is hosted within the JSZ.
5) A structural and geochemical study of the Farley Lake gold deposit (Beaumont-Smith et al., GS-15, this volume; area 5, Fig. GS-10-1) examines a style of mineralization unique to the Agassiz Metallotect.
6) Gold and base-metal anomalies generated during a GIS analysis of compiled geophysical and geochemical data from the JSZ are being checked on the ground (Rogge et al., GS-16, this volume; areas 6, Fig. GS-10-1).
7) Geochemical and tectonic studies have been carried out in the Laurie Lake–Eager Lake area, on the boundary between the southwestern Lynn Lake greenstone belt and the Kisseynew Domain (Zwanzig, GS-17, this volume; area 7, Fig. GS-10-1).
8) A geochronological study focuses on providing high-precision U-Pb zircon age determinations (Turek et al., GS-18, this volume; areas 8, Fig. GS-10-1).

Investigations during the balance of this year will include high-precision geochemistry of samples collected during the field season, to determine the chemostratigraphy and characterize the alteration associated with the gold mineralization. Petrographic and microstructural analysis will provide information on the relationship between structural fabrics and gold mineralization, furthering the mesoscopic observations already made. Stable-isotope, micro-analytical and geochronological investigations are planned but have yet to be scheduled.

The age determinations reported in this volume represent significant additions to the geoscientific database for the Lynn Lake greenstone belt. It is hoped this work will be expanded in the coming years to address a significant gap in our understanding of the tectonic evolution of the greenstone belt. This has direct application to the ongoing mineral-deposit studies and future mineral exploration.

Initial efforts have significantly expanded the known extent of the Johnson Shear Zone, thereby increasing the amount of prospective auriferous stratigraphy. The identification of new areas of gold mineralization hosted by the western JSZ demonstrates the significant exploration potential of the Lynn Lake belt. The thesis projects and regional structural studies will be completed during the next three field seasons, and the program is scheduled for completion in 2003.

ACKNOWLEDGMENTS

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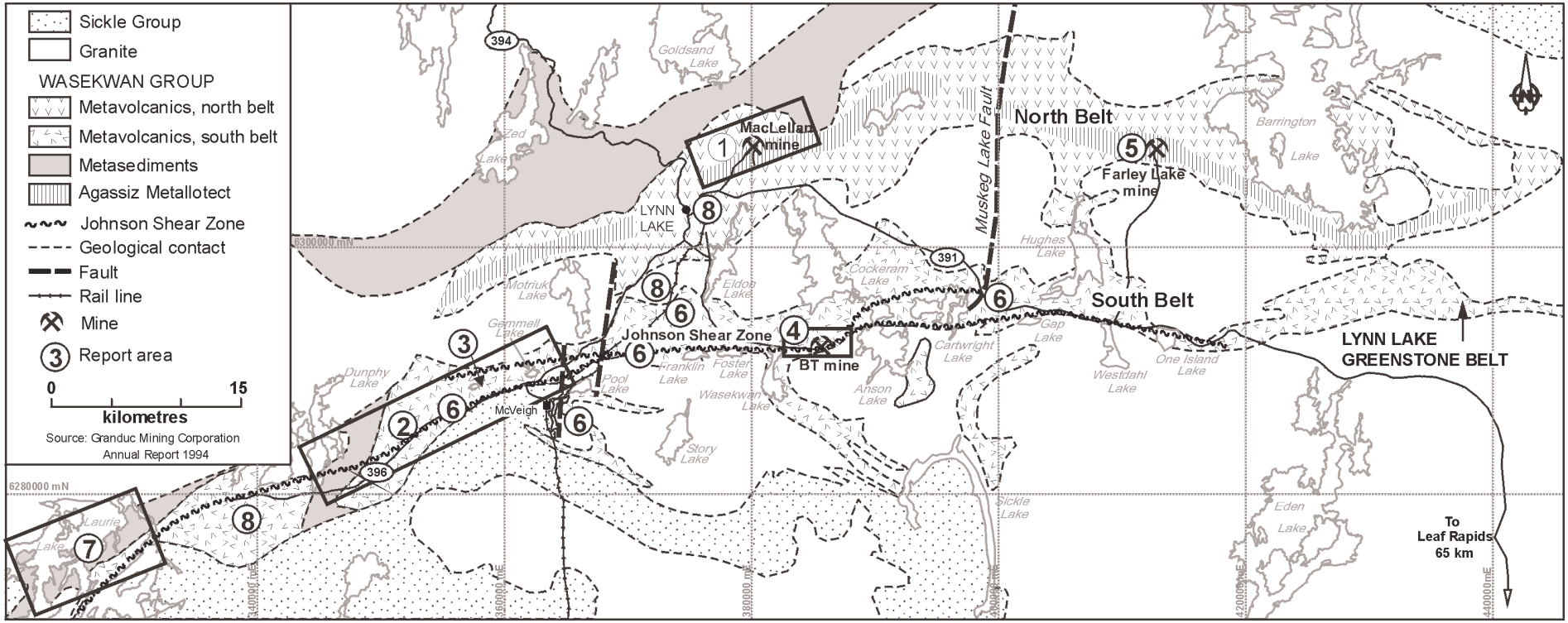

Figure GS-10-1: Geological setting of the Lynn Lake greenstone belt and the location of projects reported in this volume.