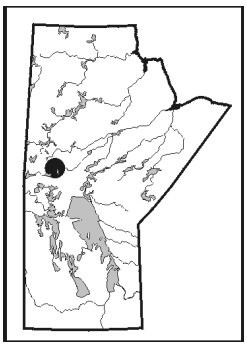
PHOTO LAKE MINE ARCHIVE PROJECT (NTS 63K/16SE)



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Heine, T.H. and Prouse, D. 1998: Photo Lake Mine archive project (NTS 63K/16SE); **in** Manitoba Energy and Mines, Geological Services, Report of Activities, 1998, p. 23-24.

SUMMARY

An archival suite of 104 underground samples and seven complete diamond drill holes have been collected from the Photo Lake deposit, and stored at the Manitoba Energy and Mines core viewing facility at the former Centennial mine site near Bakers Narrows, southeast of Flin Flon. Thin sections and polished slabs have been prepared from a selected group of the samples collected from underground. It is anticipated that this project will be the start of an ongoing data and sample documentation/archiving program of the mines in the Snow Lake-Flin Flon region. This collection will provide a reference resource for future examination and investigations once underground workings of these mines become inaccessible. Although plans to publish the descriptive archive have yet to be finalized, it is anticipated that the data set will be issued as an open file report or CD-ROM volume. In addition, a descriptive paper about the Photo Lake deposit will be published in an external journal.

INTRODUCTION

Since the early part of this century numerous gold and base metal deposits have been developed in the Flin Flon-Snow Lake region. General overviews of the geological features of some of these deposits are available in a variety of publications and journal articles. However, no information is available about the detailed distribution of units relative to the mine workings. In addition, no centrally located representative collection of the rock and ore types encountered during the exploitation of these deposits has been assembled for permanent reference and study. As a first step to remedy this situation, Photo Lake deposit samples and mine plans are being collected and its main features and characteristics documented. In the future, this type of investigation will be expanded to include the other mines in the region.

The Photo Lake deposit was discovered in 1994 following a proprietary airborne electromagnetic survey performed by SPECTREM Air Limited on behalf of Hudson Bay Exploration and Development Company Limited (HBED). Subsequent geological investigations in the Snow Lake area have focused on the assemblage that hosts the Photo Lake deposit (Bailes, 1996, 1997; Bailes et al., 1996, 1997). During 1998, the Photo Lake Mine was in operation, and most of its workings were accessible. This fact, combined with the relatively small size of the deposit, made the Photo Lake Mine an ideal starting point to establish methodologies for undertaking similar projects on the other deposits of the Snow Lake and Flin Flon region. Mining at Photo Lake was completed in mid-September 1998. Stockpiled ore will continue to supply feed for the Stall Lake mill until November 1998.

SAMPLE AND DATA COLLECTION

Geological mine plans, sections and drillhole lithologic descriptions were supplied by Hudson Bay Mining and Smelting Co., Limited (HBMS). In addition, HBED provided a suite of whole rock major and trace element geochemical analyses obtained from exploration drill core samples. Representative samples were collected from crosscuts and stopes at the Photo Lake Mine in May, June and July of this year. Sample locations were determined relative to mine survey points. Each area was washed down, examined, and representative rock and ore specimens of the units exposed in accessible headings were collected. Sample locations were added to the corresponding level plans. Samples were subsequently washed and described, and thin sections and polished slabs were prepared from selected specimens.

Exploration diamond-drill holes were also examined. Seven holes that are representative of the stratigraphic sequence of the mine area and ore lenses were selected for inclusion in the archive set.

The sample suite is stored indoors at the Manitoba Energy and Mines core viewing facility, located at the former Centennial Mine site near Bakers Narrows, southeast of Flin Flon. Thin sections are stored at the Regional Geologist's office in Flin Flon.

PHOTO LAKE DEPOSIT

On a regional scale, the Photo Lake Cu-Zn-Au-Ag-Pb volcanogenic massive sulphide deposit is located within the Photo Lake rhyodacite, which comprises part of the mature arc section of the Snow Lake assemblage (Bailes, 1997). This unit consists of a monotonous sequence of relatively uniform felsic volcanic rocks and derived gneisses (Bailes, 1996, 1997). A break in felsic volcanism represented by the massive sulphides may correspond to a 90 m thick unit of heterolithologic breccia within the Photo Lake rhyodacite, north-northwest of the deposit (Bailes, 1997). This break does not appear to be reflected by any textural or other macroscopic features preserved in the felsic sequence, as observed in surface exposure in the immediate area of the deposit, although outcrops do not expose a complete section of the stratigraphy through the deposit.

The orebody consists of 3 lenses: the #1 lens, dominated by high grade zinc mineralization at depth but becoming copper-rich in the upper levels of the mine; the zinc-rich #2 lens; and the currently uneconomic #3 lens that has not been developed. The distribution of sulphides within the lenses is complex; overall they strike east-west, dip 40-60° north and plunge 40-45° northeast. Although initially the deposit was not thought to subcrop, mineralization has been exposed at surface in a pit north of the mine portal. It was covered by approximately 10 m of sorted sand and fine gravel underlain by a <2 m layer of basal till. Mineralized float, possibly originating from the Photo Lake deposit, was found several years ago north of the Chisel Lake Mine open pit (D. Ziehlke, pers. comm., 1998).

Mapping at Photo Lake has indicated that hydrothermally altered rocks occur approximately 700 m northwest of the deposit (Bailes, 1996). These rocks were regionally metamorphosed and now contain 15-30% garnet, 5-40% amphibole porphyroblasts and 2% disseminated pyrrhotite with minor pyrite and chalcopyrite. At surface and at the 40 m level, sulphides of the #1 lens are bounded to the north by a sharply defined, intensely altered zone consisting of a strongly foliated chlorite rock with porphyroblasts of biotite, staurolite, magnetite and garnet. The porphyroblasts have a patchy and irregular distribution within this altered zone. Felsic volcanic rocks on either side of the alteration zone show a lesser degree of alteration, consisting of patchy chloritization and moderate sericitization. The chlorite patches commonly contain garnet porphyroblasts to 3 cm. The 'footwall-type' alteration north of the #1 lens is not consistent with the suggested north facing character of the volcanic strata that host the Photo Lake deposit (Bailes et al., 1997) and suggests that the Photo Lake orebody may be isoclinally folded.

Most of the fresh-looking rhyodacite associated with the deposit is featureless, fine grained and massive. In some areas, particularly adjacent to the southern part of the #2 lens on the 90 m level, the rhyodacite is well banded. This may reflect a primary depositional feature marking the break in volcanism during which the Photo Lake orebody was deposited. As this rock has not been observed at surface, it remains unclear if this banded unit has regional extent or only represents a local basin fill.

ACKNOWLEDGMENTS

Ed Yarrow, Vice-President, Exploration for HBED, provided approval and support for this project when it was first proposed. Chris Roney, mine geologist at Photo Lake, provided the geological plans and sections for the deposit that were used to determine areas that would be sampled. Gerry Kitzler, Senior Exploration Geologist for HBED in Snow Lake, provided core from the exploration holes that discovered and outlined the Photo Lake deposit. Brian Hill, the Photo Lake Mine

survey technician, provided up-to-date survey pickups for active headings during the sample collection phase of this project. Shift supervisors, including Orville Becking, John Hrenchuk, Dave Kendall, Bob Libbey and Garry Zamzow, provided assistance underground by ensuring that all headings were safe prior to sampling, and helped to transport samples to surface. The advice, discussions and suggestions made by Al Bailes are also greatly appreciated.

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