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RESULTS OF A 2017 INDICATOR MINERAL PILOT STUDY IN NTS MAP AREAS 13N AND 13M, HOPEDALE BLOCK, LABRADOR

H. Campbell and M.B. McClenaghan

Open File LAB/1743

St. John's, Newfoundland
March, 2019

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CONTENTS

FIGURE

SUMMARY

This report provides the results of the till indicator mineral pilot study carried out in 2017 in the Hopedale (NTS 13N), and Mistastin Lake (NTS 13M) map areas. This study is part of a 2-year collaborative program between the Geological Survey of Canada (GSC) under its Geomapping for Energy and Minerals (GEM) Program, the Geological Survey of Newfoundland and Labrador (GSNL), the Nunatsiavut Government and the University College of Cape Breton.

The study area is located west of the coastal community of Hopedale, which has limited access by a twin otter or a ferry. The Voisey's Bay Ni–Cu–Co mine is located 110 km north of the study area, west of Nain. Big Bay is located to the north, Ugjoktok Bay to the south and Harp Lake on the southwestern boundary (Figure 1). Sample sites were accessed using a Bell 206 LR helicopter.

Till samples for indicator mineral analysis were collected in July, 2017, along with smaller samples for till-geochemistry and pebble-lithology identification. The samples were collected as part of a pilot study to: 1) examine the feasibility of using indicator minerals in till to aid bedrock mapping and identify exploration targets, and 2) determine the magnetic and paramagnetic con-

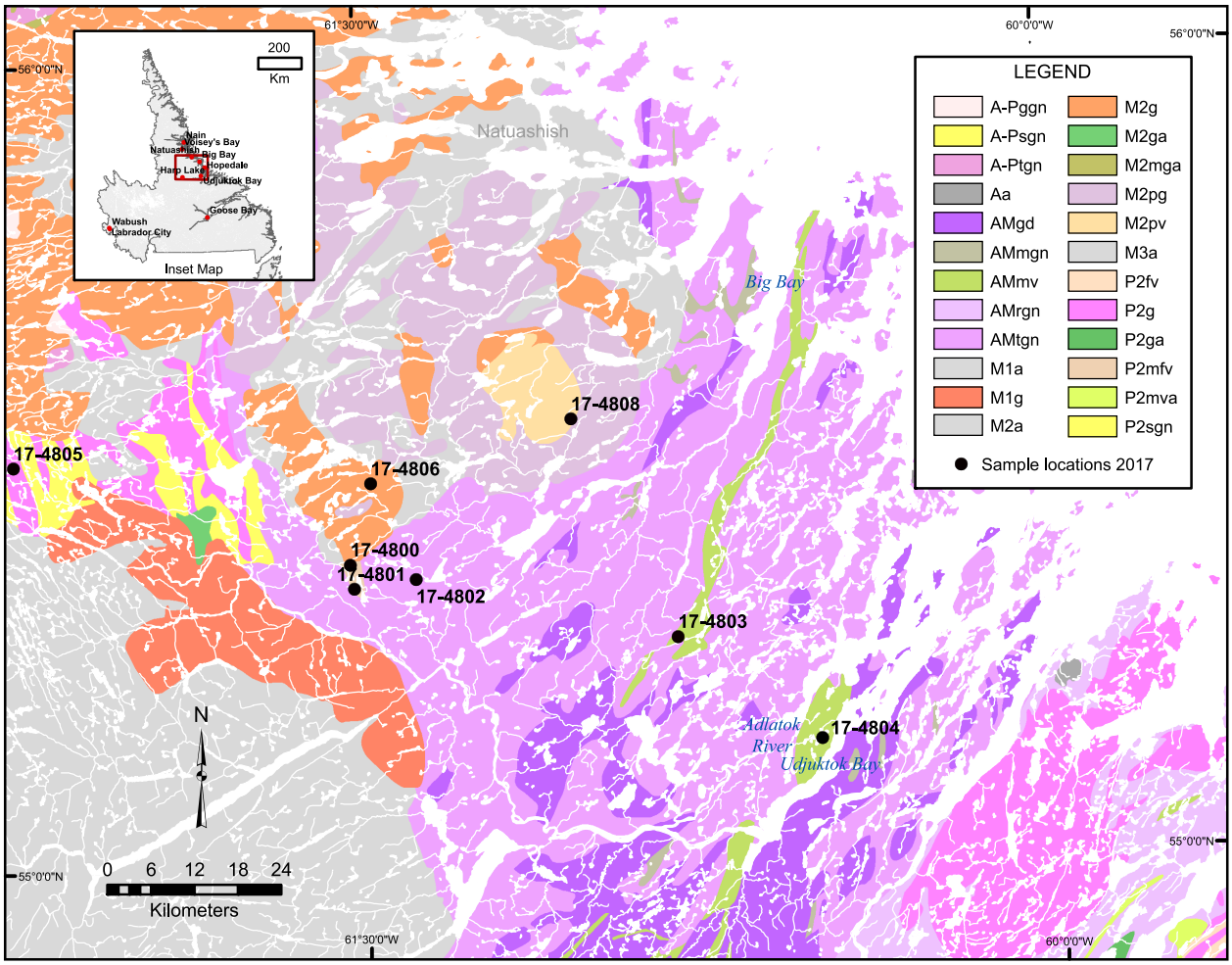

Figure 1. *Sample locations underlain by bedrock geology (*see *Wardle* et al.*, 1997). The study area is indicated by the box in the regional inset map.*

tent of till for comparison with regional aeromagnetic data. The results were used to determine optimal sampling sites for a more extensive surficial sampling and mapping program that was undertaken in July 2018.

NOTES ON THE DATASET

Till samples were collected at locations over the Ingrid Lake supracrustal belt, the Hunt River belt (Ermanovics, 1993), the Flowers River Igneous Suite (Hill, 1982), the Tasiuyak Gneiss (Wardle, 1997), southwest of Flowers River (Hill, 1982; Thomas and Morrison, 1991) and the Florence Lake belt (Ermanovics, 1993; Wardle *et al.*, 1997; Figure 1). The site locations were chosen by bedrock geologists (David Corrigan, Alana Hinchey and Deanne Van Rooyen) to investigate bedrock units, representative units of varying geochronological ages and modes of tectonic emplacement encountered in the Hopedale block. Till samples were taken in suitable locations near these bedrock units. As a result, most of the samples were collected from mudboils near bedrock outcrop, in areas classified as till veneer (till <2 m thick). This sampling was carried out in order to compare the resulting indicator mineral results with the bedrock mineralogy and lithology.

Eight bulk till samples, ranging from 16 to 21 kg, were extracted at each site from hand-dug pits using GEM Program procedures described in detail in Spirito *et al.* (2011) and McClenaghan *et al.* (2013). The samples were put in large plastic bags and taped shut using electrical tape to prevent leakage. The samples were then bagged again, taped (to ensure that the bag did not rip during transport), and put in buckets for transportation, by ferry, to St. John's. They were then shipped, by truck, to Overburden Drilling Management Limited (ODM) in Ottawa, Ontario, for indicator mineral processing. Two GSC heavy-mineral Bathurst blanks (samples17-4809 and 17-4810), containing few to no indicator minerals (Plouffe *et al.*, 2013) were inserted in the batch to monitor cross-contamination. At ODM, the samples were processed using a combination of tabling, panning and heavy liquid separation at a specific gravity of 3.2. All samples were panned for gold, Platinum Group Minerals and fine-grained metallic indicator minerals. The samples were processed following procedures described in detail in McClenaghan *et al.* (2017) and Plouffe *et al.* (2013). A schematic of the processing flow sheet is shown in Figure 2.

This report only includes: 1) Appendix A, a listing of the sample location data; and, 2) Appendices B1-12, the raw data as reported by the heavy mineral lab, with samples listed in the order that they were processed. Interpretations of the data will be presented in a subsequent report.

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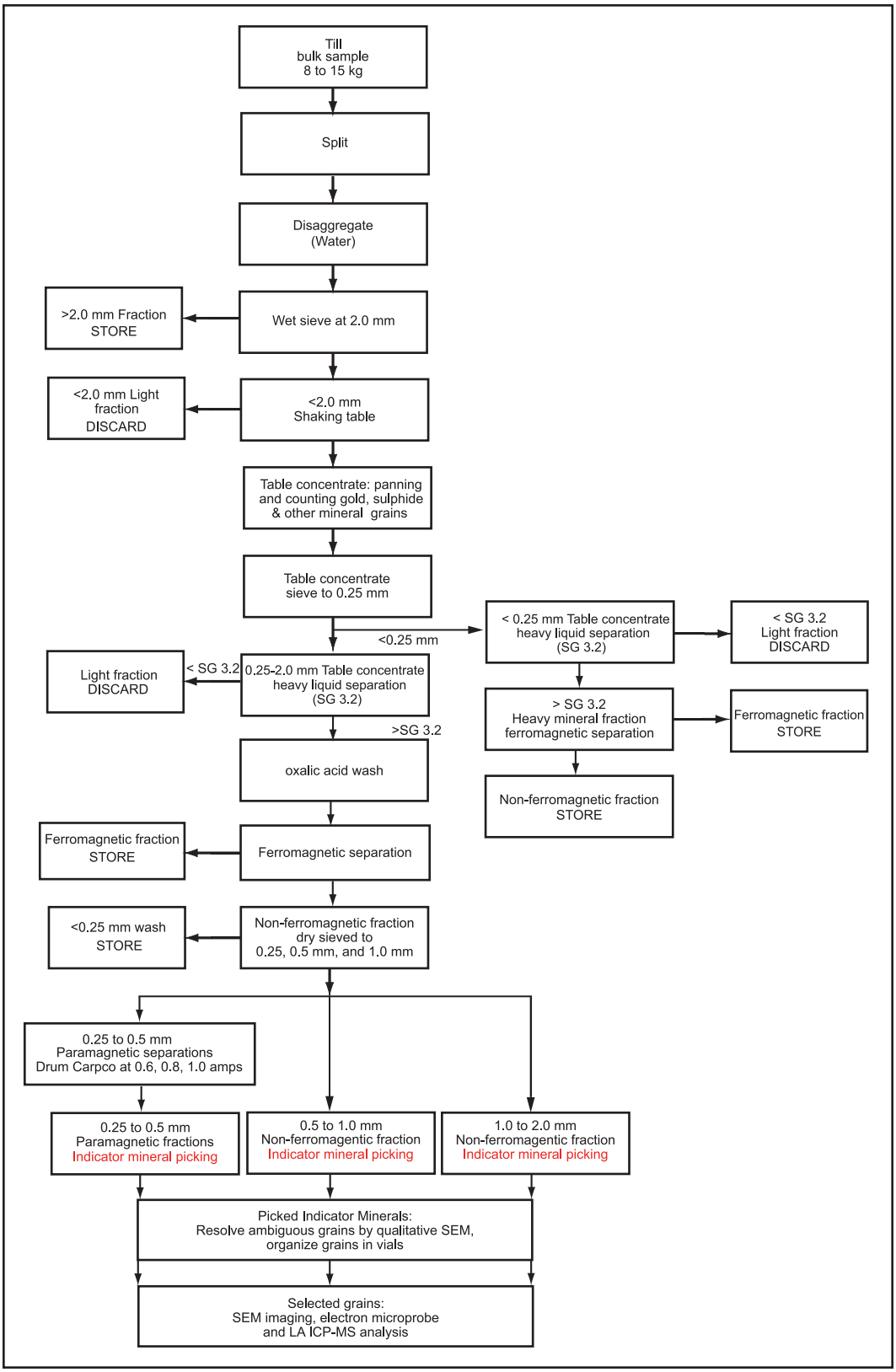

Figure 2. *Flow chart illustrating the sample processing of bulk till samples and recovery of indicator minerals at Overburden Drilling Management (ODM) Limited.*

Rooney is thanked for her excellent drafting of this paper. Martin from Universal Helicopters is thanked for his skillful piloting. Alana Hinchey, Deanne van Rooyen and David Corrigan are all thanked for their collaboration and for their support in the field. We are very grateful to Shauna Madore at the GSC and Mike Michaud at Overburden Drilling Management for their assistance and guidance with the samples. A very big thank you to Pauline Honarvar for her thoughtful review of the appendices accompanying this report and this text.

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APPENDICES

The data are available as digital excel files (.xlsx) through this link.

APPENDIX A: Sample Locations

APPENDIX B1: Abbreviations

APPENDIX B2: Gold Grain Counts

APPENDIX B3: Detailed Gold Grain Counts

APPENDIX B4: Primary Weights and Descriptions

APPENDIX B5: Laboratory Processing Weights

APPENDIX B6: Paramagnetic and Non-paramagnetic Fraction Weights

APPENDIX B7: KIM Counts

APPENDIX B8: KIM Remarks

APPENDIX B9: MMSIM Counts

APPENDIX B10: MMSIM Summary

APPENDIX B11: Heavy Mineral Processing Weights

APPENDIX B12: Pebble Weights