

Foreword

On behalf of the Manitoba Geological Survey (MGS), it is my privilege to present the *Report of Activities 2021*—the annual peer-reviewed volume of geoscience projects results by the MGS.

On April 1, 2021, the Department of Agriculture and Resource Development (ARD) was strategically restructured to focus on designing a solid framework that delivers the department's mandate and advance industry. This restructuring has created four new divisions: Corporate Services and Innovation; Industry Advancement; Ecosystem Management; and Production Stewardship. The MGS is now a section situated within the new Production Stewardship Division, within the Mining, Oil and Gas (MOG) Branch. Along with the MGS, MOG also includes the Regulatory Services and the Tenure Services sections.

The MGS currently has over 30 active geoscience projects, each one at various stages of execution, with 10 of them reported in this volume. A gradual return to “a new normal” after the pandemic last year could be seen across the mineral sector. The MGS approached its field season cautiously, but optimistic that a field season could still take place. The drought that took hold in the prairies this summer was extreme, and hundreds of forest fires raged across the province, with some of them threatening to cancel, cut short or delay our field programs. With careful planning and protocols in place, the field program was a success, despite some delays caused by the commandeering of a helicopter to fight local wildfires.

A total of seven field programs were successfully completed this year, with most field programs feeding data and information to more than one active project. Each annual volume of the *Report of Activities* along with accompanying preliminary maps and data repositories present the findings of new and advanced projects, and include important contributions to Manitoba geology and mineral potential. This summer marked the beginning of the new Geomapping for Energy and Minerals (GEM) GeoNorth program—a 7-year, federally-run geoscience program that provides collaborative and funding opportunities for geoscience in Canada's north, administered by the Geological Survey of Canada. The call for proposals for the GEM 2021/22 year was for projects with a one-year timeframe for completion. The MGS was included as collaborators in several GEM proposals, with four of those approved for funding this year. Quaternary geology investigations in the Hudson Bay Lowland in northeast Manitoba (GS2021-8 and GS2021-10, this volume) received funding from the GEM-GeoNorth program to cover indicator mineral processing and to characterize intertill nonglacial deposits. One GEM project the MGS contributed to this summer is focused on the “four corners” region, where Manitoba, Saskatchewan, Nunavut and the Northwest Territories meet. This project consisted of the preparation and

submission of archival lake sediment samples for geochemical analysis, and archival bedrock samples for geochronological, isotopic and geochemical analysis.

Critical minerals continue to be an important focus for our projects, with some of those reported herein. These include studies in lithium remobilization in the Tanco area pegmatites (GS2021-2, this volume); updated geological framework with rare metals and gold potential in the Lynn Lake belt (GS2021-5, this volume); and nickel mineralization relationships in the Thompson nickel belt (GS2021-3, this volume). The MGS also continues to work on internal initiatives such as updating the Mineral Deposits Database (GS2021-1, this volume) to add thousands of new mineral occurrences including many critical metals such as rare-earth elements, graphite, platinum-group elements, antimony, bismuth, chromium, cobalt, copper, gallium, germanium, molybdenum, nickel, niobium, tantalum, tellurium, tungsten, vanadium, and zinc. Looking beyond the classic critical metals to precious metals and diamonds, the MGS continues to be active on these important commodities including new mapping in the Snow Lake area towards a continued refinement of a geological model that can inform gold exploration (GS2021-4, this volume), and kimberlite-indicator mineral results (GS2021-9, this volume).

The maintenance, refinement and expansion of the geological knowledge infrastructure in Manitoba is the foundation of the work done by the MGS. That important work can occur in focused projects on single NTS sheets, or in regional work that includes reconnaissance mapping, data collection and archival compilations. The data collected from these projects can then be assembled to inform multi-dimensional regional maps derived from multiple layers of information. The compilation process towards the modelling of a Quaternary depth to bedrock thickness map for northeastern Manitoba is described in GS2021-7 (this volume), which will increase the effectiveness of drift prospecting in areas covered with thick sediments. Compilation and analysis of data of all kinds can also serve to identify areas that need more focused attention, or that is affected by unconscious/unintentional biases. The identification of Late Cretaceous vertebrate collection biases in southwestern Manitoba is one such example (GS2021-6, this volume). Fossils, and the insight they provide in paleogeographic and paleoenvironmental reconstructions, provide context to the sediments that host them by positioning them in time and space. Without accurate representation of the fossil assemblages, the risk of inaccurate labelling of a unit may occur, which then may lead to errors in correlation. Refinement of local geological environment interpretation ensures accuracy when extrapolating to global correlations of stratigraphic units, and ultimately inform the exploration for sedimentary-hosted commodities.

A large portion of the reports this year required the collaboration of companies, organizations, individuals and neighboring jurisdictions. This near symbiotic relationship is vital to the advancement of the scientific knowledge of the province and increases the MGS coverage and discoveries that will benefit all Manitobans today and into the future. I would like to acknowledge the support, information sharing and contributions made by external institutions and industry partners, including the Geological Survey of Canada, Saskatchewan Geological Survey, University of Manitoba, Western University, University of Waterloo, University of British Columbia, University of Calgary, University of Fraser Valley, University of Toronto, Charles University (Prague, Czech Republic), Vale, Alamos Gold, Hudbay, Sinomine, and Vanadian Energy.

The recent passing of Barry Bannatyne, the first industrial mineral geologist in the MGS, serves as a reminder to us all of the lasting impact our work at the MGS can have on the geological community, and the geoscience information we

contribute to through our publications and maps. Barry's legacy has stood the test of time, as his work continues to educate and inform us about Manitoba geology. My condolences go out to the Bannatyne family.

The dedicated and diligent work of many including the MGS Chief Geologist Christian Böhm, all the project geologists, Geoscience Data manager Greg Keller and his team of GIS professionals, and lab technicians went into the production of the *Report of Activities 2021*. I would like to acknowledge Bob Davie and his hard-working team from RnD Technical who carefully performed technical editing, and Craig Steffano who managed report production and publication layout. I would like to thank everyone at the MGS for their valuable contributions to Manitoba geology, and the dedication and enthusiasm they bring to their work and profession.

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