

In Brief:

- Aggregate maps for the Winnipeg metropolitan region are continuing to be updated with integration of historic and new data
- A new standardized database and mapping system is being developed to integrate historic and recent data
- New quantitative resource potential matrices are being developed to classify aggregate deposits for land-use planning

Citation:

Rentz, J.W., Wheadon, B. and Janssens, J. 2025: Current mapping and assessment of granular-aggregate deposits in Manitoba; in Report of Activities 2025, Manitoba Business, Mining, Trade and Job Creation, Manitoba Geological Survey, p. 191–194.

Summary

The Manitoba Geological Survey is updating the mapping and assessment of granular-aggregate resources in the province. Earlier granular-aggregate mapping efforts in Manitoba were largely completed in the 1970s to mid-1990s and provided a baseline understanding of this resource in the province. These previous data are being concatenated and organized using an updated database structure and areas are being remapped using detailed elevation models and new field-based observations. A new quantitative matrix has been assembled to classify the economic potential for granular-aggregate deposits as high, medium and low, to protect mineral-rich lands under the legal requirements of *The Planning Act* of Manitoba. Since 2023, the focus has primarily been on updating the mapping of granular-aggregate resources in the Winnipeg Metropolitan Region.

Introduction

The Manitoba Geological Survey (MGS) reinitiated the granular-aggregate program with the goal of re-evaluating and updating the previous mapping efforts (Rentz, 2023). The program focuses on identifying new potential deposits using field data, digital elevation models and high-resolution imagery. A new database structure is being developed to combine both historical and newly acquired data into a central database. Since the program's reinitiation, the focus has been on the Winnipeg Metropolitan Region, with site visits to historical and new locations (Figure GS2025-21-1), concatenating historical granular-aggregate data into a single database, as well as developing new database structures. A resource-potential framework has been developed to classify deposits as high, medium and low, in line with Section 8 of *The Planning Act* of Manitoba (Government of Manitoba, 2011), which restricts development on mineral-rich lands.

Current work***Concatenation and quality assurance—quality control of historical data***

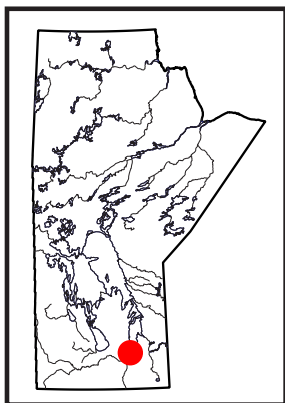
Granular-aggregate deposit and field-sediment data have been stored in various forms over time. An internal Microsoft® Access® database has been one focus of data quality assurance—quality control (QA-QC). To ensure data-point location accuracy, the points captured in this database were cross-referenced with hardcopy published maps. Once the spatial validity of the points was confirmed, each data point was given a unique identifier to differentiate exposure points with duplicate station identifiers. Lastly, a schema was generated to both account for this duplication and ensure that data within the internal database were accurate.

During cross-referencing of the points with the hardcopy maps, it was discovered that there was a substantial amount of field-station data that was not included in the original database. Approximately 3550 of these stations were identified, which resulted in a review of supporting documents including reports and field notes to compile any associated data. These data are in the process of being digitized and added to the new standardized database.

Development of a standardized point and polygon structure

To improve consistency, a standardized database structure was developed for capturing and presenting granular-aggregate exposure point and polygon data. The exposure-point structure is designed to capture field observations whereas the polygon structure is designed to summarize data at a 1:20 000 map scale.

It is important to note that granular-aggregate deposits in Manitoba often have variable sedimentology within one 'deposit'. At the same time, it is not desirable to take a sample of every single sediment type in every place. As such, a methodology is being developed to provide a consistent way



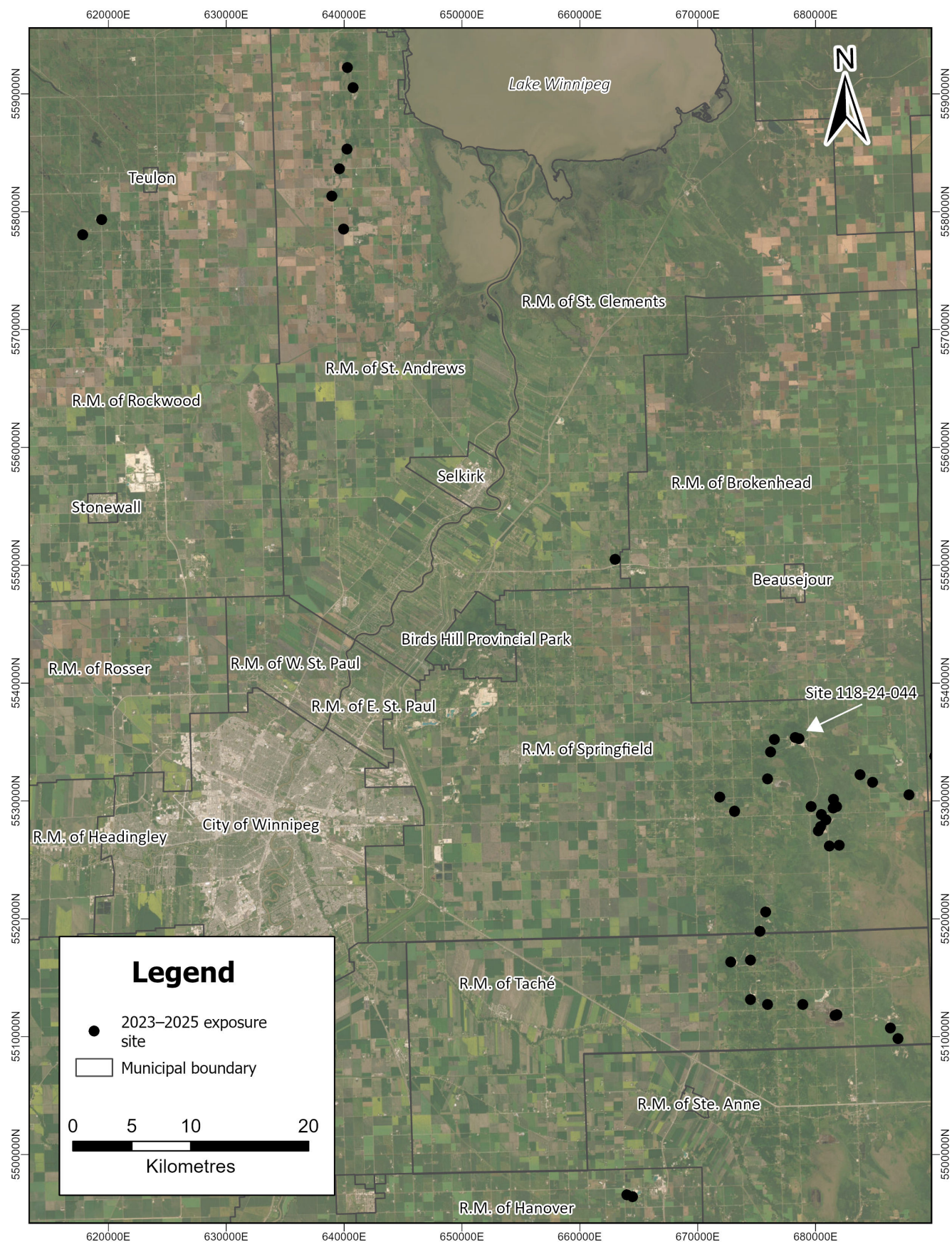


Figure GS2025-21-1: Orthomimagery of the majority of the Winnipeg Metropolitan Region showing new exposure sites visited from 2023 to 2025 (Gauthier and Rentz, 2024; M.S. Gauthier and J.W. Rentz, unpublished data, 2025). Orthomimagery provided by Esri, Maxar, Earthstar Geographics and the GIS User Community. Abbreviations: E., East; R.M., Rural Municipality; W., West.

to manage field data and create granular-aggregate maps. A full schema is planned to be released in future reports.

Resource potential evaluation

Section 8 of *The Planning Act* of Manitoba requires that economically valuable mineral resources be protected from land uses that limit exploration and development (Government of Manitoba, 2011). To meet these legal requirements, the MGS historically applied a rating of high, medium or low potential for granular aggregate. To ensure consistency moving forward, new quantitative matrices have been developed to assess the significance of both surface and buried granular-aggregate deposits using a weighted-point system. The parameters inputted into the weighted-point matrix include gravel content, fines content, shale and deleterious lithology content and deposit thickness. For buried deposits, the ease of extractability, the overburden thickness and water table depth are also included. Once completed, a full schema on the new resource potential matrices is planned to be released in future reports.

Preliminary map updates

The reinitiation of Manitoba's granular-aggregate program includes digital updating using more detailed remotely sensed imagery, namely orthophotos and publicly available light detection and ranging (LiDAR) digital elevation models (e.g., ATLAS Geomatics, 2016). Preliminary map updates are underway for the rural municipalities of Rockwood, St. Andrews, St. Clements, Springfield and Taché. Within these areas, a total of 71 exposure sites were visited in 2023–2025 (Figure GS2025-21-1; Gauthier and Rentz, 2024; M.S. Gauthier and J.W. Rentz, unpublished data, 2025). Many exposure sites were very close to each other at the ground level and overlap of some sites does exist at the scale of Figure GS2025-21-1, the aim of which is to show the overall scope of sites visited in these municipalities. The exposure sites were evaluated using the new standard field-data forms and granular-aggregate point data structure. Gravel (>4.75 mm) content, overburden information, aggregate thickness/exploration depth, groundwater depth, clast percentage, clast-size ranges, simplified clast lithology and a general field description were recorded at each site. An example of demarked stratigraphy at an exposure site is given in Figure GS2025-21-2. The intent of

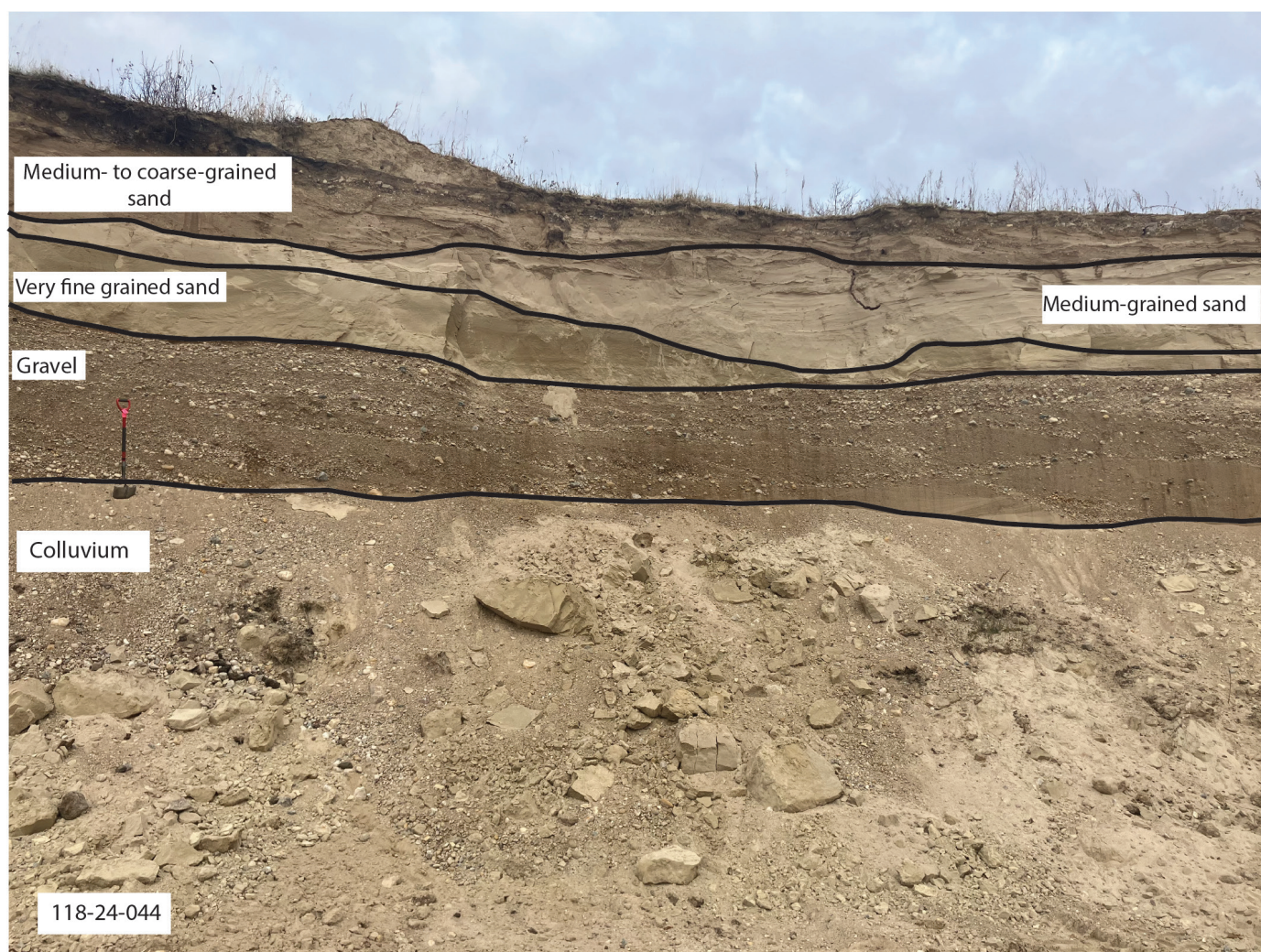


Figure GS2025-21-2: Example of a currently producing gravel pit visited in the Rural Municipality of Springfield. The different stratigraphic layers are denoted at this exposure, site 118-24-044 (see Figure GS2025-21-1 for location). Shovel for scale is 1.2 m in length.

these updates is to provide stakeholders with updated granular-aggregate information that can assist land-use planning.

Future work

Future granular-aggregate mapping will continue in the Winnipeg Metropolitan Region. Priorities will include both the implementation and finalization of the exposure point and granular-aggregate polygon standardizations, as well as finalizing the resource potential framework for land-use planning.

Economic considerations

Granular aggregate is an essential resource for road construction, foundation construction, railroad base and concrete/asphalt formation. The increasing demand for granular aggregate, especially from the Winnipeg Metropolitan Region, dictates that additional resources need to be identified.

Acknowledgments

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References

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- Rentz, J.W. 2023: Manitoba's aggregate program: past, present, future; *in* Report of Activities 2023, Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, p. 124–130.