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Appendices

- A. Hydrogeological Maps and Figures
- B. Maps and Figures on CD-ROM
- C. General Water Well Information
- D. Maps and Figures Included as Large Plots
- E. Water Wells Recommended for Field Verification including County-Operated Water Wells

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For additional copies of the report/CD-ROM, please contact the following:

- 1-800-GEO-WELL
- The Groundwater Centre/Regional Groundwater Assessment

http://www.groundwatercentre.com/m_info_rgwa.asp

1 PROJECT OVERVIEW

“Water is the lifeblood of the earth.” – Anonymous

How a County takes care of one of its most precious resources - groundwater - reflects the future wealth and health of its people. Good environmental practices are not an accident. They must include genuine foresight with knowledgeable planning. Implementation of strong practices not only commits to a better quality of life for future generations, but also creates a solid base for increased economic activity. **Though this report’s scope is regional, it is a first step for Ponoka County in managing their groundwater. It is also a guide for future groundwater-related projects.**

1.1 Purpose

This project is a regional groundwater assessment of Ponoka County prepared by Hydrogeological Consultants Ltd. (HCL) with financial and technical assistance from the Prairie Farm Rehabilitation Administration branch of Agriculture and Agri-Food Canada (AAFC-PFRA) and Ponoka County. The project study area includes Ponoka County and the Samson and Montana First Nations lands (herein referred to as Ponoka County or the County). The regional groundwater assessment provides the information to assist in the management of the groundwater resource within the County. Groundwater resource management involves determining the suitability of various areas in the County for particular activities. These activities can vary from the development of groundwater for agricultural or industrial purposes, to the siting of waste storage. **Proper management ensures protection and utilization of the groundwater resource for the maximum benefit of the people of the County.**

The regional groundwater assessment will:

- identify the aquifers¹ within the surficial deposits² and the upper bedrock
- spatially identify the main aquifers
- describe the quantity and quality of the groundwater associated with each aquifer
- identify the hydraulic relationship between aquifers
- identify possible groundwater depletion areas associated with each upper bedrock aquifer.

Under the present program, the groundwater-related data for the County have been assembled. Where practical, the data have been digitized. These data are then used in the regional groundwater assessment for Ponoka County.

¹ See glossary

² See glossary

1.2 The Project

This regional study should only be used as a guide. Detailed local studies are required to verify hydrogeological conditions at given locations.

The present project is made up of eight parts as follows:

- Task 1 - Data Collection and Review
- Task 2 - Hydrogeological Maps, Figures, Digital Data Files
- Task 3 - Hydrogeological Evaluation and Preparation of Report
- Task 4 - Groundwater Information Query Software
- Task 5 - Review of Draft Report and GIS Data Files
- Task 6 - Report Presentation and Familiarization Session
- Task 7 - Provision of Report, Maps, Data Layers and Query
- Task 8 - Provision of Compact Disk for Sale to General Public.

This report and the accompanying maps represent Tasks 2 and 3.

1.3 About This Report

This report provides an overview of (a) the groundwater resources of Ponoka County, (b) the processes used for the present project, and (c) the groundwater characteristics in the County.

Additional technical details are available from files on the CD-ROM provided with the final version of this report. The files include the geo-referenced electronic groundwater database, maps showing distribution of various hydrogeological parameters, the groundwater query, ArcView files and ArcExplorer files. Likewise, all of the illustrations and maps shown in this report, plus additional maps, figures and cross-sections, are available on the CD-ROM. In order to avoid map-edge effects, all maps are based on an analysis of hydrogeological data from townships 041 to 045, ranges 22 to 28, W4M townships 041 to 045, ranges 01 to 05, W5M, plus a buffer area of 5,000 metres; this buffer area includes parts of the Ermineskin and Louis Bull First Nations lands. For convenience, poster-size maps and cross-sections have been prepared as a visual summary of the results presented in this report. Copies of these poster-size drawings have been forwarded with this report, and are included as page-size drawings in Appendix D.

Appendix A features page-size copies of the figures within the report plus additional maps and cross-sections. An index of the page-size maps and figures is given at the beginning of Appendix A. A plastic County map outline is provided to overlay the maps, and contains information such as towns, main rivers, etc.

Appendix B provides a complete list of maps and figures included on the CD-ROM.

Appendix C includes the following:

- 1) a procedure for conducting aquifer tests with water wells³
- 2) a table of contents for the Water (Ministerial) Regulation under the *Water Act*
- 3) interpretation of chemical analysis of drinking water
- 4) additional information.

The Water (Ministerial) Regulation deals with the wellhead completion requirement (no more water-well pits), the proper procedure for abandoning unused water wells and the correct procedure for installing a pump in a water well. The *Water Act* was proclaimed 10 Jan 1999.

Appendix D includes page-size copies of the poster-size figures provided with this report.

Appendix E provides a list of water wells recommended for field verification.

³ See glossary

2 INTRODUCTION

2.1 Setting

Ponoka County is situated in south-central Alberta. The County is within the North Saskatchewan River and the South Saskatchewan River basins; the three sub-basins are the Red Deer River, the North Saskatchewan River, and the Battle River (see CD-ROM); a part of the County's northeastern boundary is the Battle River. The other County boundaries follow township or section lines, which include parts of the area bounded by townships 041 to 044, ranges 22 to 28, W4M and townships 041 to 045, ranges 01 to 05, W5M, as shown on page A-3.

Regionally, the topographic surface varies between 750 and 1,050 metres above mean sea level (AMSL). The lowest elevations occur mainly in the northeastern parts of the County in that portion of the Battle River that borders the Samson First Nation lands, and in Samson Lake and Red Deer Lake; the highest elevations are in the western parts of the County as shown on Figure 1 and page A-4. The area is well drained by the Medicine River, the Blindman River and the Battle River.

2.2 Climate

Ponoka County lies within the Dfb climate boundary. This classification is based on potential evapotranspiration⁴ values determined using the Thornthwaite method (Thornthwaite and Mather, 1957), combined with the distribution of natural ecoregions in the area. The ecoregions map (Strong and Leggat, 1981) shows that the County is located mainly in the Aspen Parkland region and the Low Boreal Mixedwood region; a small portion in the northwestern part of the County is in the Lower Boreal Cordilleran region. Increased precipitation and cooler temperatures, resulting in additional moisture availability, influence these vegetation changes.

A Dfb climate consists of long, cool summers and severe winters. The mean monthly temperature drops below -3° C in the coolest month, and exceeds 10° C in the warmest month.

The mean annual precipitation averaged from three meteorological stations within the County measured 509 millimetres (mm), based on data from 1957 to 1993. The mean annual temperature averaged 2.2° C, with the mean monthly temperature reaching a high of 15.5° C in July, and dropping to a low of -12.2° C in January. The calculated annual potential evapotranspiration is 482 millimetres.

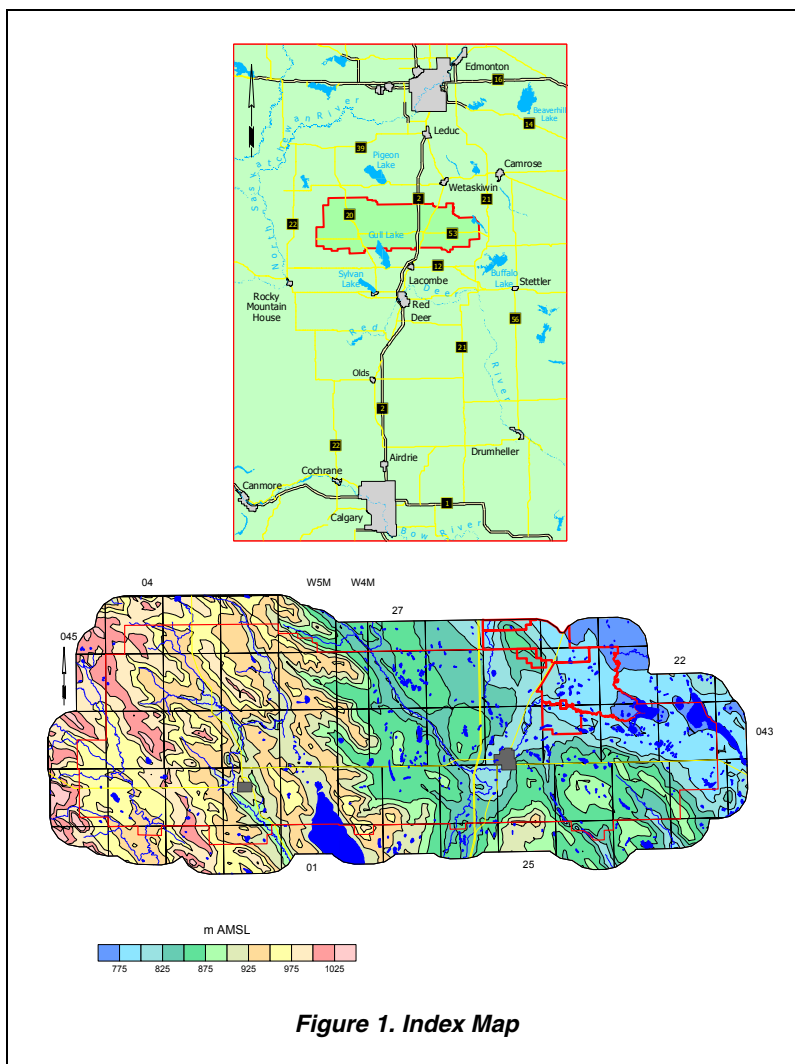


Figure 1. Index Map

⁴ See glossary