# COUNTY OF CAMROSE

## Groundwater Development Potential in the Meeting Creek / Edberg Area

In response to an historic lack of groundwater in the Meeting Creek / Edberg area of Alberta's Camrose County, and the additional adverse effects of recent drought, a Groundwater Office Study of this area was carried out using extra funding provided to the Rural Water Development Program (RWDP), an initiative administered by Agriculture and Agri-Food Canada's Prairie Farm Rehabilitation Administration (PFRA). Hydrogeological Consultants Ltd. (HCL) was contracted to carry out the study, and was directed to obtain a better understanding of site-specific groundwater development opportunities in the study area shown in Figure 1.

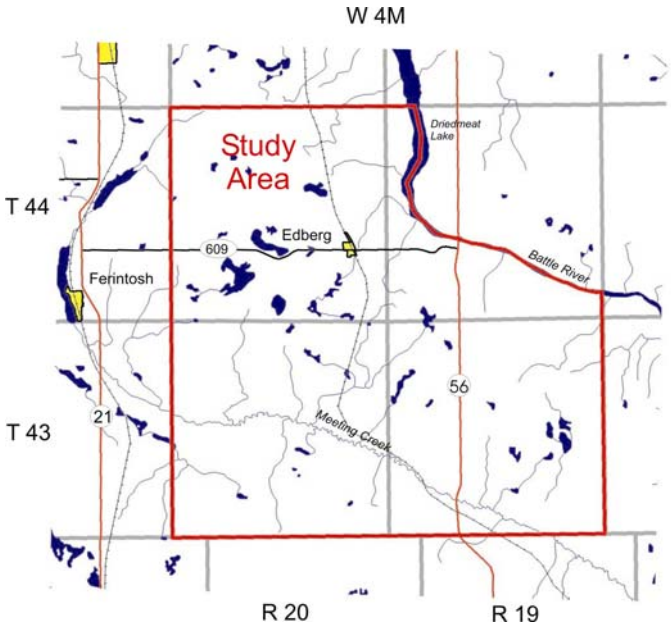



**Figure 1**

The main objective of the study was to locate groundwater sources that could yield enough water to provide for the needs of the entire rural agricultural community. In addition, the consultant identified specific site locations that were judged to have a higher probability for the development of a groundwater supply that would provide at least 35 cubic metres per day ($m^3$/day), which is approximately five imperial gallons per minute (igpm), and with water quality meeting a total dissolved solids (TDS) concentration of less than 2,000 milligrams per litre (mg/L). These locations could be suitable sources for local pasture pipelines, or if the yield was high enough, may be suitable locations for a tank loader for water hauling, or for local water distribution via pipeline. A water quality of 2000 mg/L would require in-house treatment for domestic supply, but be suitable for stock watering.

## Water Well and Water Quality Data

The study depended upon available water well and water quality data. No field work was carried out to collect new data.

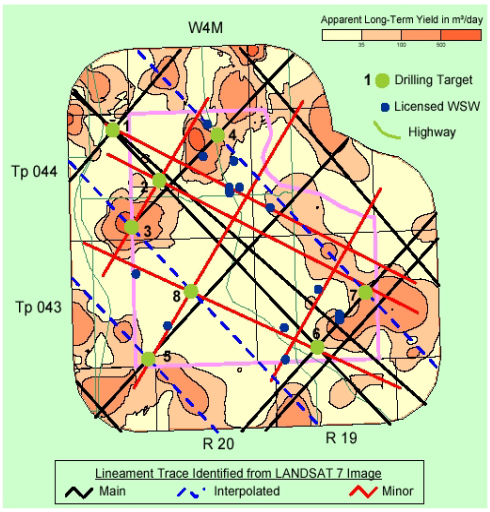
There are 673 groundwater records in the groundwater database in the study area. Nearly all water wells are completed to depths of less than 100 metres, with the average depth approximately 30 metres. Eighty per cent of water wells are completed in bedrock aquifers, and two-thirds of the completed water wells indicate an apparent long-term yield of less than 35 $m^3$/day (about 5 igpm). Approximately 10 per cent of the water test holes drilled in the study area were "dry". Groundwater quality in the study area is generally acceptable, with 94 per cent of the samples from bedrock sources and 86 per cent of the samples from surficial sediments containing a TDS concentration of less than 2,000 mg/L.

## Study Findings and Recommendations

Based on available data, it should be possible to develop a groundwater supply of 35 m³/day at selected locations in the study area. Groundwater supplies could be developed from bedrock aquifers within the Middle or Lower Horseshoe Canyon Formation, or from sand and / or gravel aquifers in the surficial deposits. Water quality from water wells developed in the study area is expected to contain TDS concentrations of less than 2,000 mg/L.

It is recommended that a water test-hole drilling program be initiated if developing a groundwater supply of at least 35 m³/day is desired. Because of the shallower depths and therefore lower costs involved, it is recommended that the first three water test holes investigate the sand and / or gravel units along the northern edge of the study area; locations are provided in the complete report (see reference below). A field survey of water wells in this area is required prior to selecting specific test-hole sites. Short-term water well yields from sand and / or gravel deposits may be in the order of 50 m³/day. Groundwater from sand and / or gravel aquifers is expected to contain less than 2,000 mg/L of total dissolved solids, although the water may be chemically hard and high in dissolved iron.

If the groundwater investigation of the surficial deposits is unsuccessful, it is recommended that water test-hole drilling of up to eight possible bedrock aquifer sites be initiated (see Figure 2 for locations). Water test-hole drilling at each site should investigate all potential aquifers between ground surface and the top of the Bearpaw Formation. Maximum test-hole depths are provided in the completed report (see reference below).




***Bedrock Water Test Hole Targets***

**Figure 2**

It may also be possible to develop an artificial aquifer recharge system similar to what was used by the City of Camrose for 30 years. However, additional data would be required to assess this option. Because of the uncertainties involved, developing an artificial recharge system should only be done if the results of a comprehensive water test-hole drilling program are unsuccessful.

## Exploration Costs

Estimates are in the main report, and range from about $7,000 to $8,000 for water test holes to evaluate the surficial aquifers, to about $20,000 to $40,000 to assess the deeper bedrock aquifers.

## For additional information, contact: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**Report** Hydrogeological Consultants Ltd., March 2002, Camrose Area Tp 043 to 044, R 19 to 20, W4M Groundwater Availability, Prepared for Agriculture and Agri-Food Canada.