

While there are a few areas where water-level data are available at different times, on the overall, there are an insufficient number of water levels to set up a groundwater budget. One method to obtain additional water-level data is to solicit the assistance of the water well owners who are stakeholders in the groundwater resource. In the M.D. of Rocky View and in Flagstaff County, water well owners were being provided with a tax credit if they accurately measured the water level in their water well once per week for a year. A pilot project indicated that approximately five years of records are required to obtain a reasonable data set. The cost of a five-year project involving 50 water wells would be less than the cost of one drilling program that may provide two or three observation water wells. Monitoring of water levels in domestic and stock water wells is a practice that is recommended by PFRA in the "Water Wells That Last for Generations" manual and accompanying videos (Buchanan, Bob (editor). Alberta Agriculture, Food and Rural Development, 1996).

A second approach to obtain water-level data would be to conduct a field survey to identify water wells not in use that could be used as part of an observation water well network. County personnel and/or local residents could measure the water levels in the water wells regularly.

Communities that are concerned about apparent water-level declines in the aquifers in which their water supply wells are completed should implement a conscientious groundwater monitoring program.

In the case of the four specific study areas, the results of the present study indicate the following conclusions and recommendations:

- Area 1

In view of the continued water-level decline in the Hamlet of Carseland observation water wells, it is recommended that the Hamlet of Carseland investigate supplementing their present groundwater supply. There are indications that an alternative groundwater supply to the Lower Sand and Gravel Aquifer may be present in the Upper Scollard Aquifer. However, a test-drilling program would be needed to evaluate the Upper Scollard Aquifer in the Carseland area.

- Area 2

Based on the available data, apparent yields are expected to be the highest in the Upper Horseshoe Canyon Aquifer, which is the Aquifer in which the Hussar WSW Nos. 1 and 2 are completed. It is recommended that an engineer be consulted, if the Village of Hussar is considering a water supply from a rural pipeline.

It is further recommended that monitoring of groundwater water levels be intensified to provide better data for assessing the long-term sustainability of the aquifers in the Hussar Area. Also, a more detailed assessment of groundwater availability in the general areas should be undertaken, using the present regional assessment as a starting point.

- Areas 3 and 4

Additional water-level monitoring data from the two Hamlet of Rosebud water supply wells is needed to determine if there has been a water-level decline.

The upper bedrock in the Redland and Rosebud areas is the upper and middle parts of the Horseshoe Canyon Formation. In the Rosebud area, the expected yield for water wells completed in the Upper Horseshoe Canyon Aquifer is less than ten m³/day. Slightly higher apparent yields are expected for water wells completed in the Upper Horseshoe Canyon Aquifer in the Redland area.

The depth to the top of the Middle Horseshoe Canyon Formation in 16-14-027-20 W4M is 96 metres below ground surface. The expected apparent yield of water wells completed in the Middle Horseshoe Canyon Aquifer is less than 30 m³/day.

A more detailed assessment of groundwater availability in the general areas should be undertaken, using the present regional assessment as a starting point. The assessment should include field-verification of water wells within the immediate area of Redland and Rosebud; verification should include obtaining meaningful horizontal coordinates for the water well(s), a present water level in the water well(s) and a confirmation of the completed depth(s).

There is also a need to provide the water well drillers with feedback on the reports they are submitting to the regulatory agencies. The feedback is necessary to allow for a greater degree of uniformity in the reporting process. This is particularly true when trying to identify the bedrock surface. One method of obtaining uniformity would be to have the water well drilling reports submitted to the AENV Resource Data Division in an electronic form. The money presently being spent by AENV to transpose the paper form to the electronic form should be used to allow for a technical review of the data and follow-up discussions with the drillers.

An effort should be made to form a partnership with the petroleum industry. The industry spends millions of dollars each year collecting information relative to water wells. Proper coordination of this effort could provide significantly better information from which future regional interpretations could be made. This could be accomplished by the County taking an active role in the activities associated with the construction of lease sites for the drilling of hydrocarbon wells and conducting of seismic programs.

In summary, for the next level of study, the database needs updating. The updating of information for existing water wells requires more details for the water wells listed in Appendix E; the additional information for new water wells is mainly better spatial control.

Groundwater is a renewable resource and it must be managed.

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