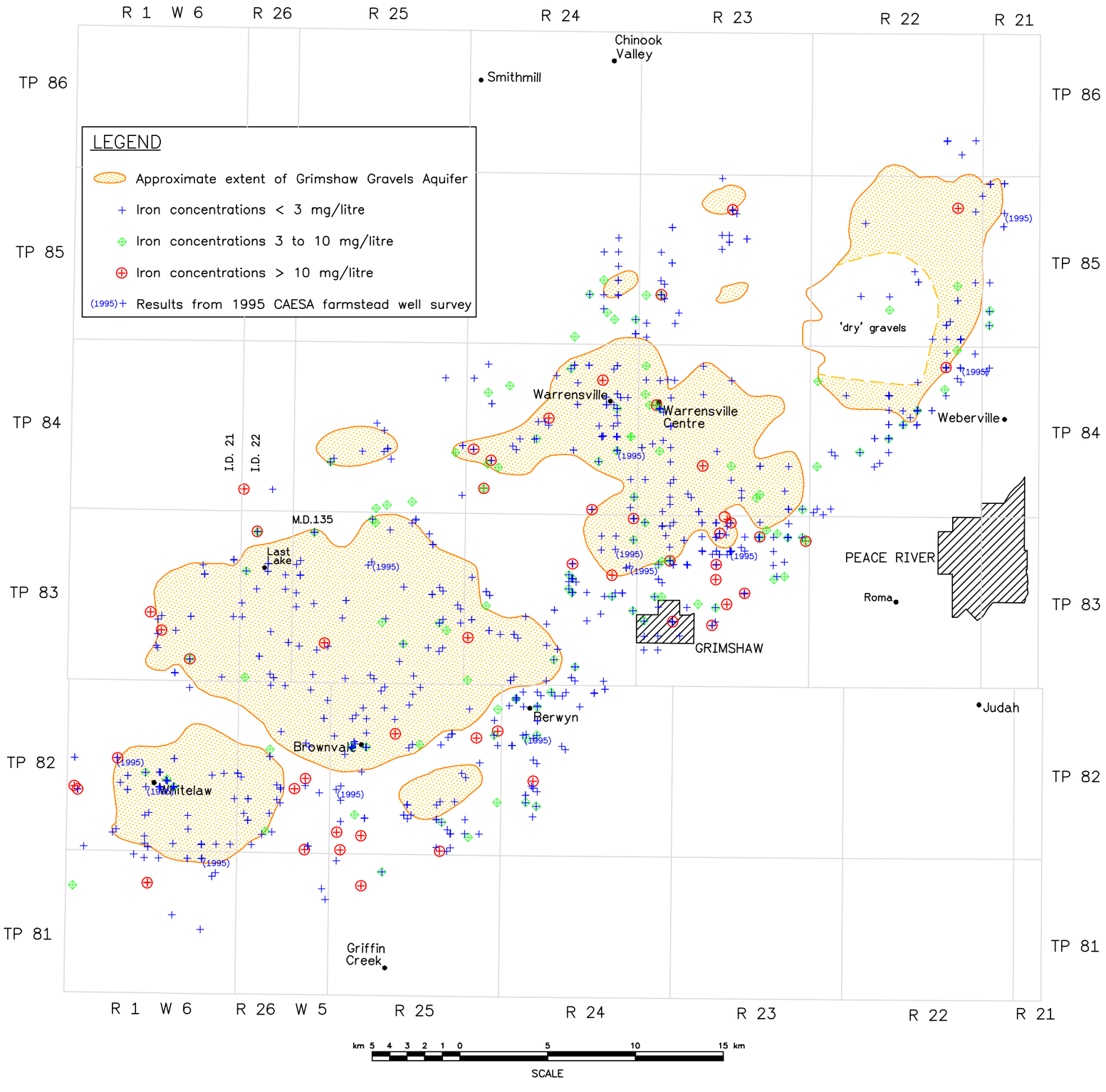

IRON

Background

Iron is one of the most common elements present in geological deposits, and almost all groundwater contains some iron. For domestic water supplies, the Canadian Drinking Water Guidelines recommend an iron concentration of no greater than 0.3 mg/L. Although iron does not constitute a health problem, iron concentrations greater than 0.3 mg/litre can stain laundry and plumbing fixtures, as well as impart an objectionable taste and colour to the water.

Iron concentrations, up to 3 mg/L, can generally be removed with conventional water softening equipment. Iron concentrations exceeding 3 mg/l require the use of special filters.

Current Situation

Assessment of iron levels is hampered by incomplete information on how the water was sampled. Water analyses carried out to date do not usually identify the precise point of sampling. A sample could have been taken directly from the well, from a tap, or after treatment.
This information is important since iron can be added to water from metal parts within the distribution system (metal casings, pump parts, piping) or be removed by treatment components.

For the Grimshaw Gravels Aquifer, over 400 tests for iron have been conducted on both untreated and treated water. Recognizing the lack of information on how and where the water was sampled, about 80% of the samples tested had iron concentrations of less than 3 mg/L. The average reported iron concentration is about 0.4 mg/L. More precise sampling techniques are required to determine whether or not this represents a "true" average. The adjacent figure shows sample sites and test results for wells located both on and off the Grimshaw Gravels Aquifer. Iron concentrations of water samples taken during the 1995 CAESA farmstead water wells survey are identified with a '(1995)' subscript.

Management Considerations

A knowledge of regional iron levels can assist in locating potential well sites which may require little or no treatment for iron removal. Improved water sampling methods will assist in collecting reliable data. In order to measure accurate aquifer iron concentrations, the sample must be taken directly from the well. Standing water in the well must first be pumped out, before collecting the sample. A small quantity of acid should be added to the water sample to lower the pH. This will ensure that the iron does not precipitate or settle out, allowing for a reliable iron measurement. The 1995 CAESA farmstead water samples were collected in accordance with this procedure.

Source of Data: Alberta Environmental Protection Groundwater Information Centre Chemistry data file (to March, 1996).

CAESA
Alberta
Alberta Agriculture, Food and Rural Development
Alberta Environmental Protection
PFRA
Agriculture Canada
Prairie Farm Rehabilitation Administration
Earth Sciences Division

GRIMSHAW GRAVELS AQUIFER

WATER QUALITY MAP: IRON CONCENTRATION

Scale	Date	PFRA No.	
AS SHOWN	JULY, 1996		FIGURE B8