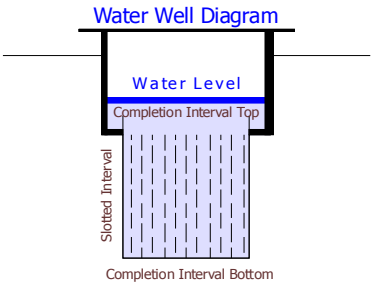
10. Glossary

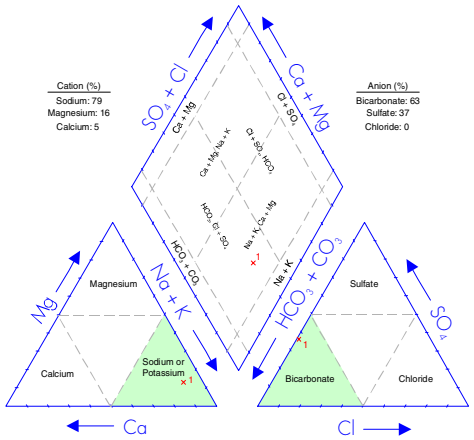
AAFC-PFRA	Prairie Farm Rehabilitation Administration arm of Agriculture and Agri-Food Canada
Aquifer	a formation, group of formations, or part of a formation that contains saturated permeable rocks capable of transmitting groundwater to water wells or springs in economical quantities
Aquitard	a confining bed that retards but does not prevent the flow of water to or from an adjacent aquifer
Available Drawdown	in a confined aquifer, the distance between the non-pumping water level and the top of the aquifer in an unconfined aquifer (water table aquifer), two thirds of the saturated thickness of the aquifer
Borehole	includes all “work types” except springs
Completion Interval	see diagram
Dewatering	the removal of groundwater from an aquifer for purposes other than use
Dfb	one of the Köppen climate classifications; 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.



Completion Interval

Evapotranspiration	a combination of evaporation from open bodies of water, evaporation from soil surfaces, and transpiration from the soil by plants (Freeze and Cherry, 1979)
Facies	the aspect or character of the sediment within beds of one and the same age (Pettijohn, 1957)
Fluvial	produced by the action of a stream or river
Hydraulic Conductivity	the rate of flow of water through a unit cross-section under a unit hydraulic gradient; units are length/time
km	kilometre
Kriging	a geo-statistical method for gridding irregularly-spaced data (Cressie, 1990)
Lacustrine	fine-grained sedimentary deposits associated with a lake environment and not including shore-line deposits
Lithology	description of rock material
Lsd	Legal Subdivision
m	metres
mm	millimetres
m^2/day	metres squared per day
m^3	cubic metres
m^3/day	cubic metres per day
mg/L	milligrams per litre

Median	the value at the center of an ordered range of numbers
Obs WW	Observation Water Well
Piper tri-linear diagram	a method that permits the major cation and anion compositions of single or multiple samples to be represented on a single graph. This presentation allows groupings or trends in the data to be identified. From the Piper tri-linear diagram, it can be seen that the groundwater from this sample water well is a sodium-bicarbonate-type. The chemical type has been determined by graphically calculating the dominant cation and anion. For a more detailed explanation, please refer to Freeze and Cherry, 1979



Piper Tri-Linear Diagram

Rock	earth material below the root zone
Surficial Deposits	includes all sediments above the bedrock
Thalweg	the line connecting the lowest points along a stream bed or valley; *longitudinal profile*
Till	a sediment deposited directly by a glacier that is unsorted and consisting of any grain size ranging from clay to boulders
Transmissivity	the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient: a measure of the ease with which groundwater can move through the aquifer Apparent Transmissivity: the value determined from a summary of aquifer test data, usually involving only two water-level readings Effective Transmissivity: the value determined from late pumping and/or late recovery water-level data from an aquifer test Aquifer Transmissivity: the value determined by multiplying the hydraulic conductivity of an aquifer by the thickness of the aquifer
Water Well	a hole in the ground for the purpose of obtaining groundwater; “work type” as defined by AENV includes test hole, chemistry, deepened, well inventory, federal well survey, reconditioned, reconstructed, new, old well-test
Yield	a regional analysis term referring to the rate a properly completed water well could be pumped, if fully penetrating the aquifer Apparent Yield: based mainly on apparent transmissivity Long-Term Yield: based on effective transmissivity
AENV	Alberta Environment
AMSL	above mean sea level
BGP	Base of Groundwater Protection

DEM	Digital Elevation Model
DST	drill stem test
EUB	Alberta Energy and Utilities Board
GCDWQ	Guidelines for Canadian Drinking Water Quality
NPWL	non-pumping water level
TDS	Total Dissolved Solids
WSW	Water Source Well or Water Supply Well

LAKELAND COUNTY STUDY AREA

Appendix B

Maps and Figures on CD-ROM

1) General

Index Map/Surface Topography
Location of Water Wells and Springs
Casing Diameter Used in Water Wells
Surface Casing Types used in Drilled Water Wells
Licensed Water Wells
Depth to Base of Groundwater Protection
Generalized Cross-Section (for terminology only)
Geologic Column
Hydrogeological Map
Depth of Existing Water Wells
Cross-Section A - A'
Cross-Section B - B'
Cross-Section C - C'
Cross-Section D - D'
Cross-Section E - E'
Cross-Section F -F'
Bedrock Topography
Surficial Geology
Estimated Water Well Use Per Section
Water Wells Recommended for Field Verification

2) Surficial Aquifers

a) Surficial Deposits

Thickness of Surficial Deposits
Non-Pumping Water-Level Surface in Surficial Deposits Based on Water Wells Less than 20 metres Deep
Total Dissolved Solids in Groundwater from Surficial Deposits
Sulfate in Groundwater from Surficial Deposits
Chloride in Groundwater from Surficial Deposits
Nitrate + Nitrite (as N) in Groundwater from Surficial Deposits
Total Hardness in Groundwater from Surficial Deposits
Piper Diagram - Surficial Deposits
Thickness of Sand and Gravel Deposits
Amount of Sand and Gravel in Surficial Deposits
Thickness of Sand and Gravel Aquifer(s)
Apparent Yield for Water Wells Completed in Sand and Gravel Aquifer(s)
Changes in Water Levels in Sand and Gravel Aquifer(s)

b) Upper Sand and Gravel

Thickness of Upper Surficial Deposits
Thickness of Upper Sand and Gravel (not all drill holes fully penetrate surficial deposits)
Apparent Yield for Water Wells Completed through Upper Sand and Gravel Aquifer
Thickness of Upper Sand and Gravel Aquifer

i) Grand Centre Formation

Thickness of Grand Centre Formation
Non-Pumping Water-Level Surface - Grand Centre Aquifer
Apparent Yield for Water Wells Completed through Grand Centre Aquifer
Total Dissolved Solids in Groundwater from Grand Centre Aquifer
Sulfate in Groundwater from Grand Centre Aquifer
Chloride in Groundwater from Grand Centre Aquifer
Nitrate + Nitrite (as N) in Groundwater from Grand Centre Aquifer
Piper Diagram - Grand Centre Aquifer

vii) Bronson Lake Formation

Depth to Top of Bronson Lake Formation
Structure-Contour Map - Bronson Lake Formation
Thickness of Bronson Lake Formation
Non-Pumping Water-Level Surface - Bronson Lake Aquifer
Apparent Yield for Water Wells Completed through Bronson Lake Aquifer

viii) Empress Formation - Unit 3

Depth to Top of Empress Formation - Unit 3
Structure-Contour Map - Empress Formation - Unit 3
Thickness of Empress Formation - Unit 3
Non-Pumping Water-Level Surface - Empress Aquifer - Unit 3
Apparent Yield for Water Wells Completed through Empress Aquifer - Unit 3
Total Dissolved Solids in Groundwater from Empress Aquifer - Unit 3
Sulfate in Groundwater from Empress Aquifer - Unit 3
Chloride in Groundwater from Empress Aquifer - Unit 3
Nitrate + Nitrite (as N) in Groundwater from Empress Aquifer - Unit 3
Piper Diagram - Empress Aquifer - Unit 3

ix) Empress Formation - Unit 2

Depth to Top of Empress Formation - Unit 2
Structure-Contour Map - Empress Formation - Unit 2
Thickness of Empress Formation - Unit 2

c) Lower Sand and Gravel (Empress Formation - Unit 1)

Depth to Top of Empress Formation - Unit 1
Structure-Contour Map - Empress Formation - Unit 1
Thickness of Empress Formation - Unit 1
Non-Pumping Water-Level Surface - Empress Aquifer - Unit 1
Apparent Yield for Water Wells Completed through Empress Aquifer - Unit 1
Total Dissolved Solids in Groundwater from Empress Aquifer - Unit 1
Sulfate in Groundwater from Empress Aquifer - Unit 1
Chloride in Groundwater from Empress Aquifer - Unit 1
Nitrate + Nitrite (as N) in Groundwater from Empress Aquifer - Unit 1
Piper Diagram - Empress Aquifer - Unit 1
Recharge/Discharge Areas in Lower Sand and Gravel Aquifer

3) Bedrock Aquifers

a) Lea Park Formation

Depth to Top of Lea Park Formation
Structure-Contour Map - Lea Park Formation

b) Milk River Formation

Depth to Top of Milk River Formation
Structure-Contour Map - Milk River Formation

c) *undivided* Colorado Group

Depth to Top of *undivided* Colorado Group
Structure-Contour Map - *undivided* Colorado Group

4) Hydrographs and Observation Water Wells

Hydrographs
AENV Obs WW No. 191
Annual Precipitation vs Water Levels in AENV Obs WW No. 190