Alberta RESEARCH COUNCIL

HYDROGEOLOGICAL MAP SAND RIVER ALBERTA

NTS 73L

METEOROLOGY

LEGEND

Isohyet, mean annual precipitation in inches (cm) — 16(41)

Boundary of discontinuous permafrost

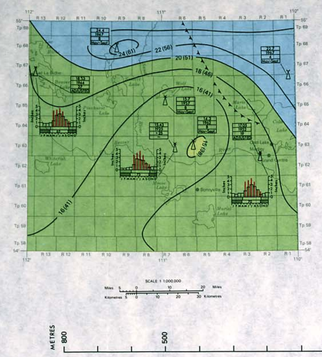
Mean annual precipitation in inches (cm)
- less than 15 inches (less than 38 cm)
- 15 to 20 inches (38 to 51 cm)
- 20 to 25 inches (51 to 64 cm)

Meteorological station

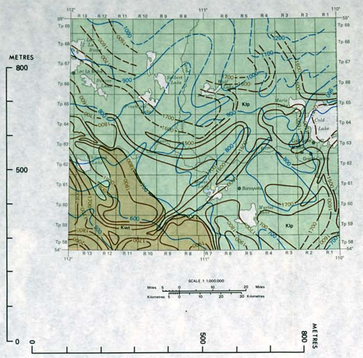
Standard rain gauge

Precipitation data:
- Mean annual precipitation in inches (cm)
- Year of commencement of observations
- Number of years of record averaged to determine mean annual precipitation figure
- Months of record
- Mean monthly potential evapotranspiration
- Mean monthly precipitation
- Period when surface is usually snow-covered
- Period when soil moisture deficiency is usually occurring
- Figure indicates percentage of mean annual precipitation falling as rain

Source: The Climate of the Prairie Provinces (R.W. Longley, 1972); Tymchyshyn and Precipitation, Prairie Provinces Environment Canada); Precipitation Means, Alberta Forestry Stations (Boakes, 1971); Provisional Evaporation Maps of Canada (Bruce and Wiesman, 1971)



GEOLOGY



LEGEND

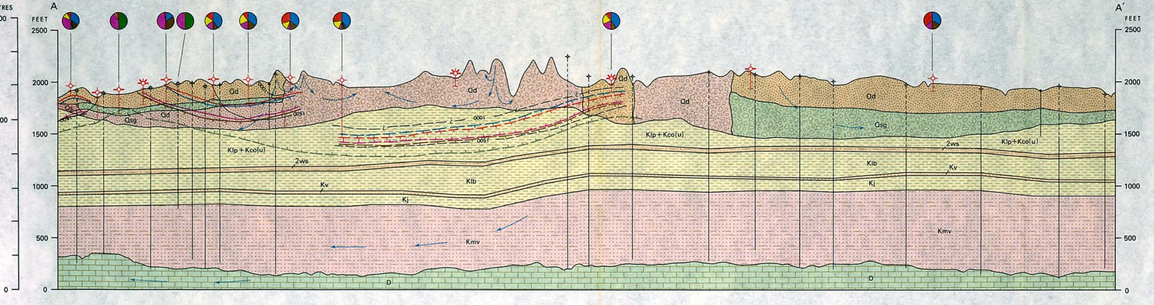
Lea Park Formation: *dark gray shale; pale gray, glauconitic silty shale with ironstone* Klp *concretions; marine*

Wapiti Formation: *gray, feldspathic clayey sandstone; gray bentonitic mudstone* Kwt *and bentonite; scattered coal beds; nonmarine*

Rock unit boundary

Bedrock topography contour — 1700

Structure contour on top of Mannville Formation — 1400



MAIN MAP LEGEND

Topography

Surface contours and elevation in feet (interval 100 feet) — 1700

Geology

Geological boundary

QUATERNARY
- Qd — Unconsolidated deposits
- Qsg — Sands and gravels
- Qs — Sands

CRETACEOUS
- Kwt — Wapiti Formation
- Klp — Lea Park Formation
- Kclu — Upper Colorado Group
- 2ws — Second White Specks Zone
- Klb — Labiche Formation
- Kv — Viking Formation
- Kj — Joli Fou Formation
- Kmv — Mannville Group

DEVONIAN
- D — Undifferentiated

Lithology

Gravel; Sand and gravel; Sand; Sandstone; Silt; Shale; Limestone

Hydrography

Lake or slough, perennial; Marsh, muskeg; Stream perennial; Stream, intermittent; Surface water divide

Hydrogeology

Water table contours in feet (followed by metres and brackets) and direction of groundwater flow — 1900 (580); Upward Flow; Downward Flow

Direction of groundwater flow

Component of groundwater flow parallel to profile

Groundwater Probability†

Range of average expected yield of wells in imperial gallons per minute (L/sec)

Probable: estimated from quantitative information (pump tests, bail tests, etc.)

Possible: estimated from qualitative information (flow regime, lithology, etc.)

100-500	(8-38)
25-100	(2-8)
5-25	(0.4-2)
1-5	(0.1-0.4)
<1	(<0.1)

Yield area boundary — 500

†The indicated average expected yields for wells are predictions based on the best data available at the time of map compilation; due to data shortcomings and special conditions, local discrepancies between predicted and actual yields are inevitable. Multiwell/interference tests may be necessary to obtain the yield indicated.

Wells and Other Artificial Works

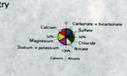
Depth Scale: FEET 0, 100, 200, 300, 400 — Depth to water; Depth of well or seismic shot hole

- Water well, nonflowing
- Water well, flowing
- Water well, shallow depth
- Water well, 20-year safe yield calculated from apparent transmissivity
- Water well, 20-year safe yield calculated from a good bail test or a short pump test
- Water well, 20-year safe yield calculated from a pump test of sufficient length to reflect regional hydraulic conditions
- Location of Research Council of Alberta test well — ARC
- Gas well*
- Suspended well drilled for oil or gas*
- Abandoned well*
- Structure testhole*
- Other exploratory testhole*
- Depth of exploratory well*

*The vertical line portion of oil, gas, or other exploratory test well symbols indicates the well depth; the dashed portion indicates the surface casing interval where available (or where known, otherwise a solid line is used.

Line of hydrogeological profile — A A'

Hydrochemistry



Note: When the yellow Mg pie sector is absent, Ca = Mg are represented as a unit by the red pie sector.

Total dissolved solids in parts per million:
- defined — 500
- approximate — 500

Isogram along which calcium + magnesium constitute 60 percent of total cations*; teeth indicate direction of lesser calcium + magnesium content:
- defined
- approximate

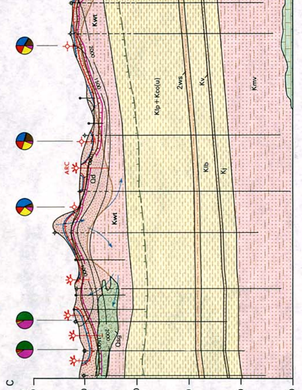
Isogram along which sodium + potassium constitute 60 percent of total cations*; teeth indicate direction of lesser sodium + potassium content:
- defined
- approximate

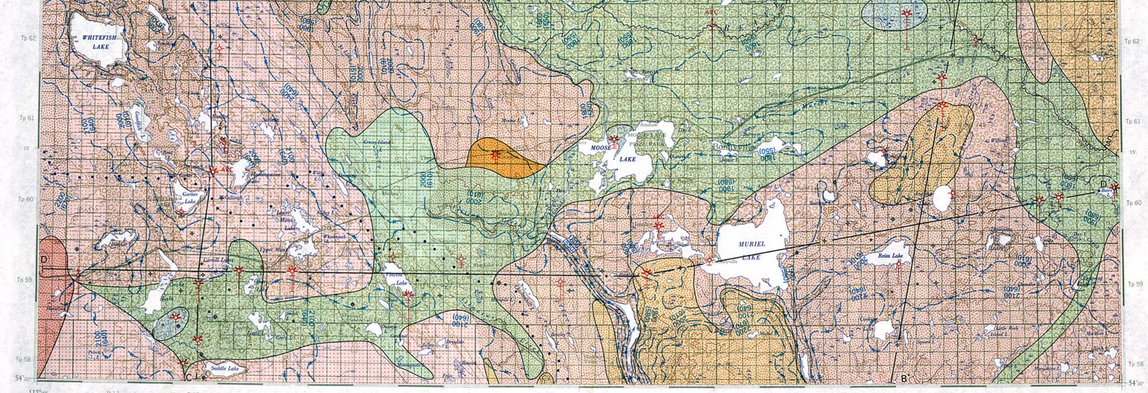
Isogram along which carbonate + bicarbonate constitute 60 percent of total anions*; teeth indicate direction of lesser carbonate + bicarbonate content:
- defined
- approximate

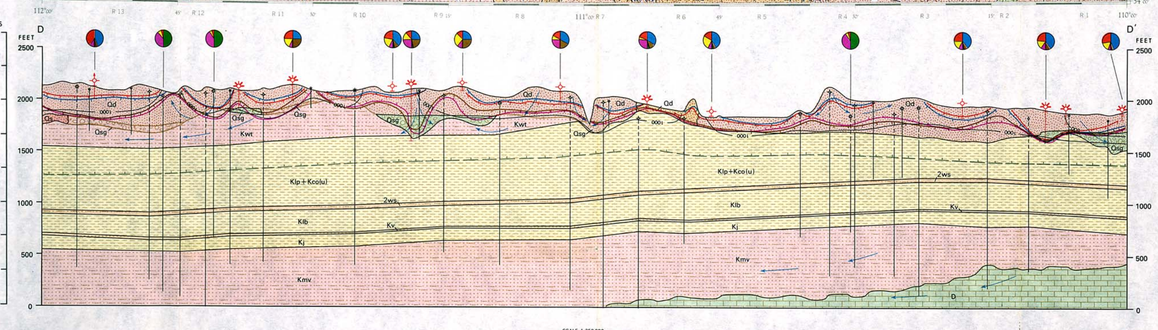
Isogram along which sulfate constitutes 60 percent of total anions*; teeth indicate direction of lesser sulfate content:
- defined
- approximate

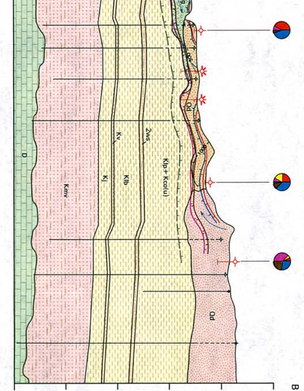
Isogram along which chloride constitutes 60 percent of total anions*; teeth indicate direction of lesser chloride content:
- approximate

*determined on equivalents per million basis

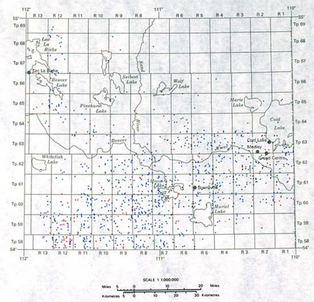








DATA DENSITY



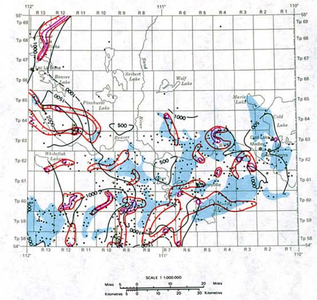
LEGEND

Data control point marking location of a well with water level information only

Data control point marking location of a well with yield information

Data control point marking location of a hydrogeological surface feature

HYDROCHEMISTRY



LEGEND

Data control point

Total dissolved solids in parts per million:
- defined — 500
- approximate — 500

Carbonate + bicarbonate constituting over 60 percent of total anions*

Sulfate constituting over 60 percent of total anions*

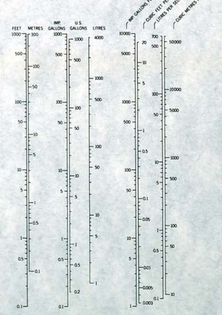
Isogram along which calcium + magnesium constitute 60 percent of total cations*; teeth indicate direction of lesser calcium + magnesium content
- defined

Isogram along which sodium + potassium constitute 60 percent of total cations*; teeth indicate direction of lesser sodium + potassium content
- defined

*determined on equivalents per million basis

CONVERSION TABLE

LOGARITHMIC SCALE



All elevations in feet above mean sea level.

Vertical exaggeration of the hydrogeological profiles is approximately 40X.

An expanded legend and explanatory notes (Report 72-12) for use with this hydrogeological map series is available from Publications, Alberta Research Council, 11315 - 87 Avenue, Edmonton, Canada T6G 2C2.

Map to accompany Report 79-1.

Hydrogeology by G.F. Ozoray, E.I. Wallick, and A.T. Lytviak.

Drafted by R.W. Swenson.

Cartographic editing by A.R. Campbell.

Base map provided by Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa.