

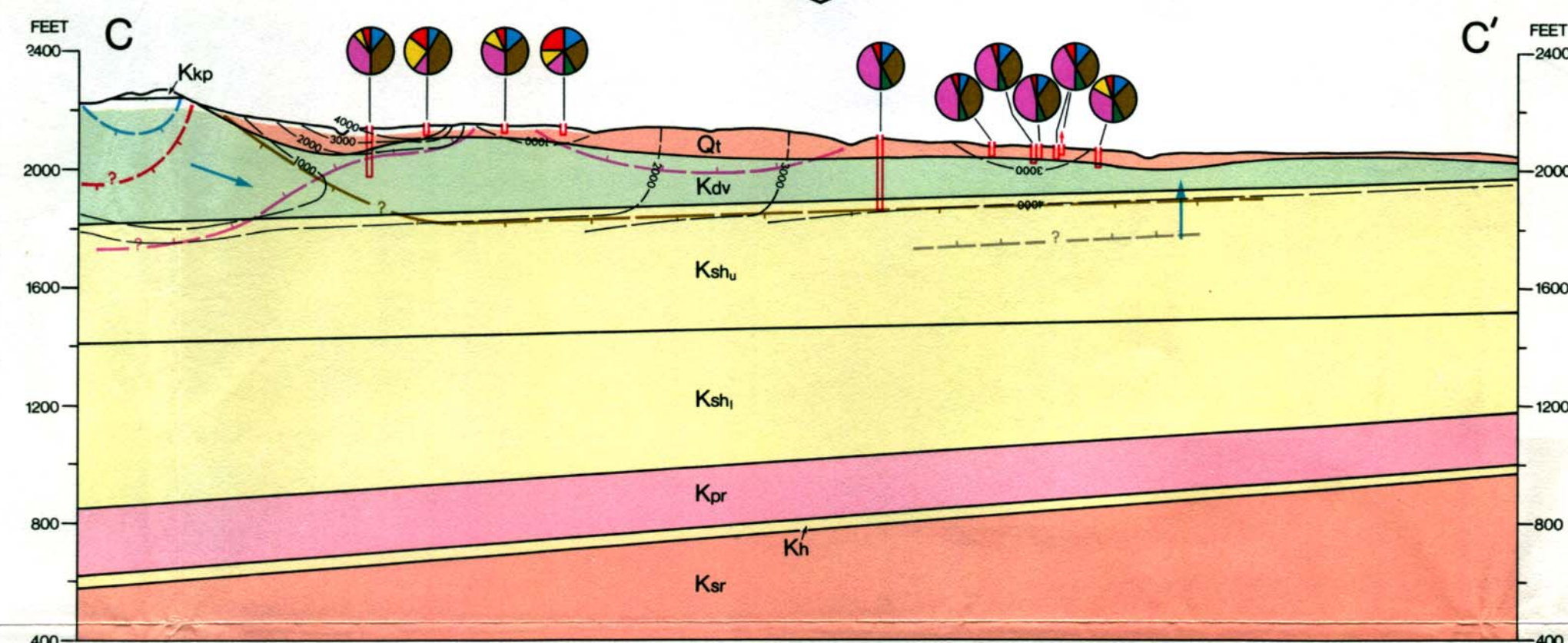
METEOROLOGY

LEGEND

- Mean annual precipitation:
  - less than 15 inches
  - 15 to 20 inches
  - more than 20 inches
- Rain gauge only
- Meteorological station
- Precipitation data
  - Mean annual rainfall + estimated (1/10) or assumed (visual equivalent of snowfall) (7 indicates snowfall not measured)
  - Mean annual precipitation, in inches (7 indicates snowfall not measured)
  - Months of record if less than full year
  - Mean monthly precipitation (estimated)
  - Month of record if less than full year
  - Mean monthly precipitation (estimated)
  - Period when surface is usually snow-covered
  - Period with mean (20°) temperature below freezing (°C)
- Figure indicating percentage of mean annual precipitation falling as rain
- Source of data: Climatic Maps for Alberta (London, 1961) and Monthly Record of Meteorological Observations (Meteorological Observations, Monthly, Canada Post, 1961)

SCALE 1:100,000

RESEARCH COUNCIL OF ALBERTA

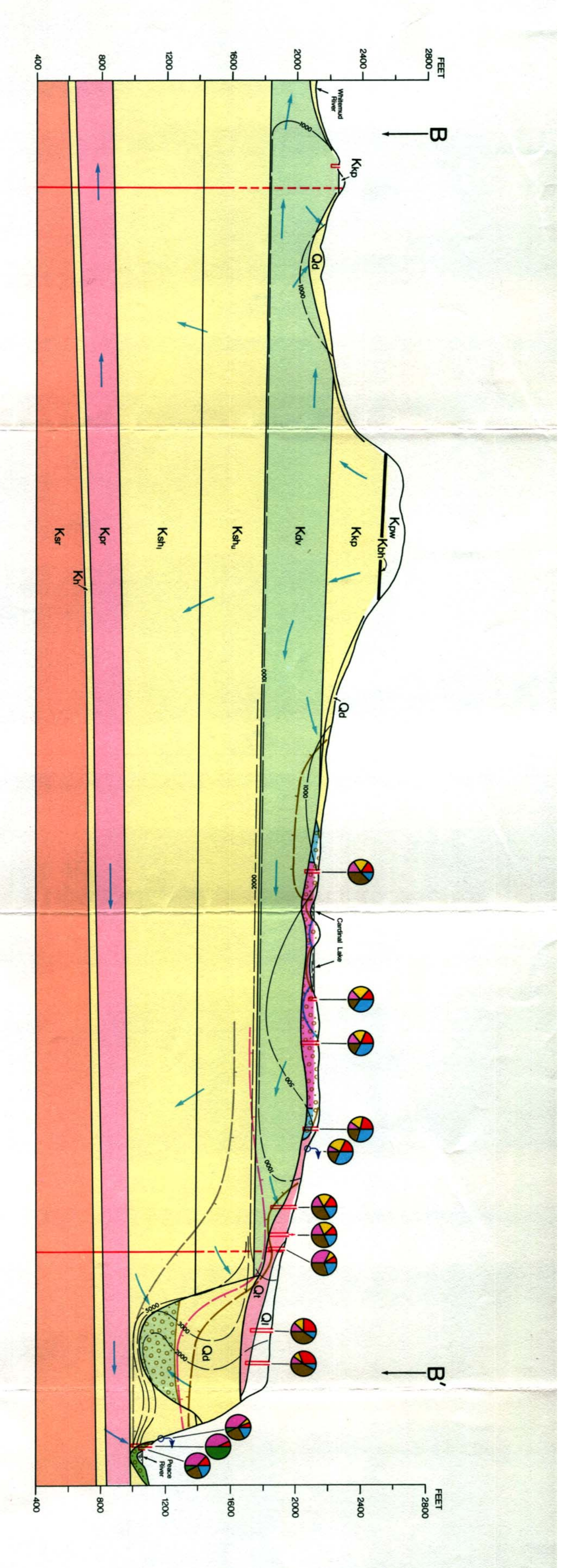
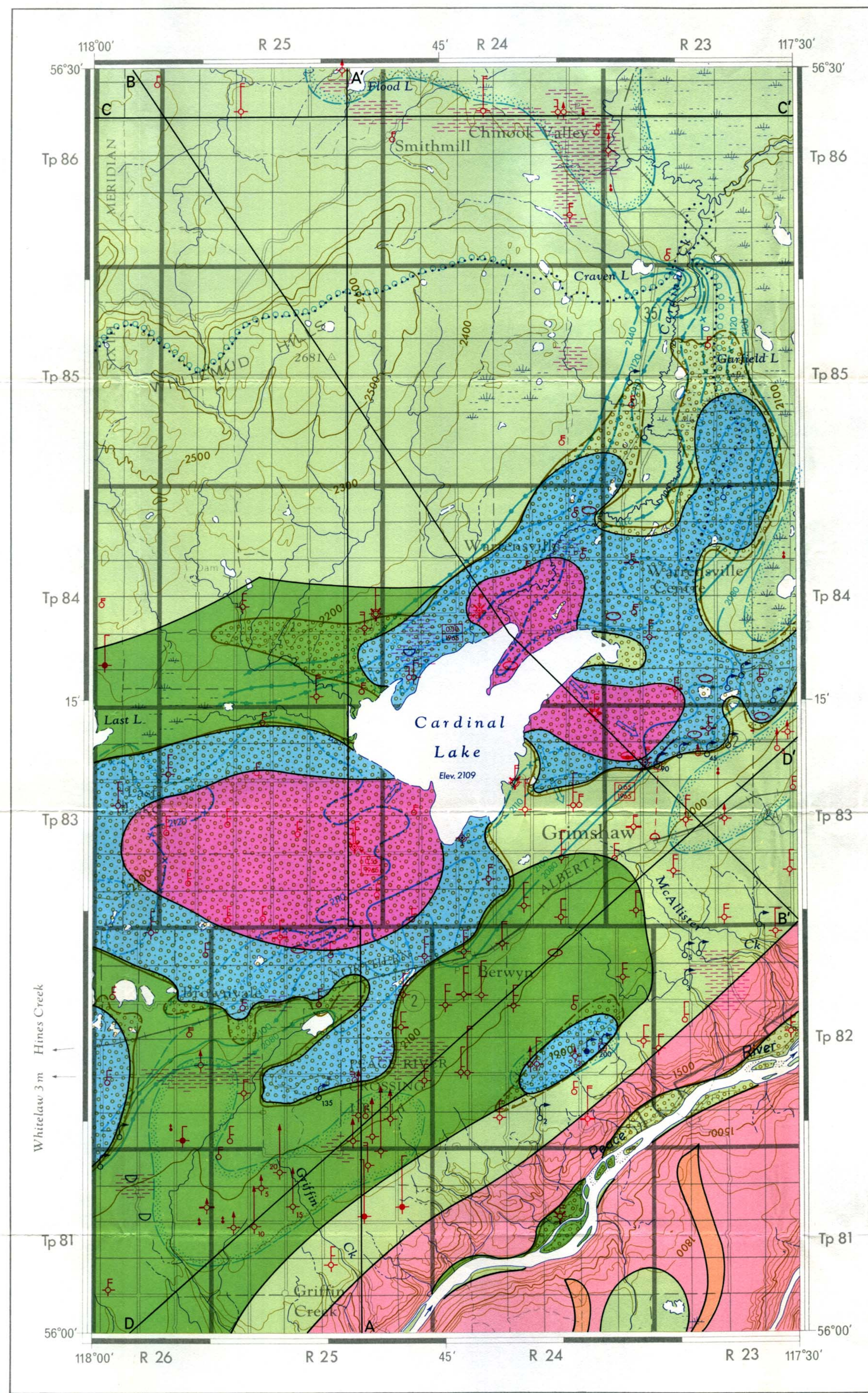
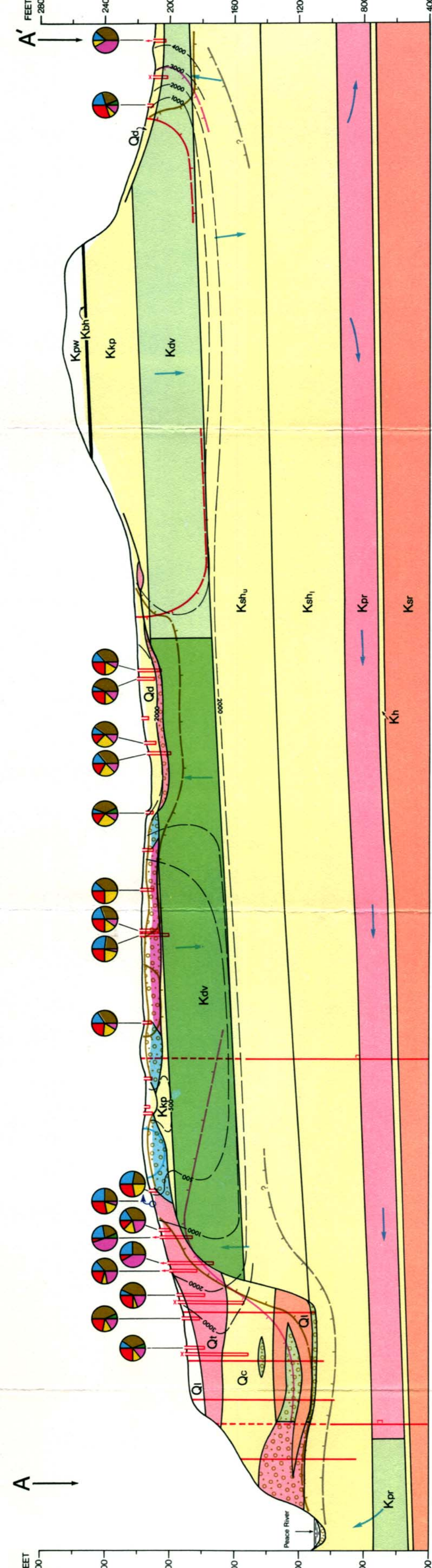


GEOLOGY

LEGEND

- Paukwausu Formation: shale
- Kaskapus Formation: shale
- Dumvegan Formation: sandstone, siltstone, shale
- Shutbury Formation, upper (u) and lower (l) members: shale
- Rock unit boundary
- Thickness of surficial deposits, in feet
- Structure contour on top of Dumvegan Formation
- Structure contour on top of lower member, Shutbury Formation

SCALE 1:100,000



MAIN MAP LEGEND

- Topography
  - Surface contours (interval 100 feet)
- Geology
  - Boundary of significant near-surface water-bearing deposits:
    - known
    - approximate
- Lithology
  - Sand and gravel
- Hydrography
  - Surface water divide
  - Spring and flow rate, in imperial gallons per minute
  - Spring, inactive
  - Natural pond or water hole with no outlet
  - Stream
  - Stream, intermittent or dry
  - Lake
  - Lake, intermittent
  - Marsh or swamp
- Groundwater hydrology
  - Water table contour (elevation in feet above mean sea level)
  - Direction and calculated velocity of groundwater flow (in feet per day)
  - Groundwater divide
  - Boundary of area of artesian flow (stippled line within the boundary)
  - Area of salt precipitates
  - Nongraining water level
- Boreholes, Wells and other works
  - Borehole, seismic shot hole, test hole, etc.
  - Location of former flowing seismic shot hole
  - Water well, dug or bored
  - Water well, deep or bored, flowing, and flow rate in imperial gallons per minute
  - Water well, drilled
  - Water well, drilled, flowing, and flow rate in imperial gallons per minute (length of arrow indicates well depth, scale 1 mm = 20 feet)
  - Water well, drilled, nonproductive
  - Test well
  - Drilled well, site of pump test (24 hours or longer), 20-year safe yield calculated
  - Drilled well, site of bail test or short pump test, 20-year safe yield calculated
  - Drilled well, safe yield estimated from apparent transmissivity
  - Observation well, provided with automatic recorder
  - Observation well, recording lake level, provided with automatic recorder
  - Mean annual water level fluctuation, in feet
  - Commencement of observations
  - Differing water levels from different depths, in same well or closely adjacent wells
  - Cistern, storage tank
  - Developed spring
  - Infiltration gallery
  - Water pipeline
  - Green pit, dry
  - Green pit, containing water
  - Line of hydrogeological profile
- Groundwater Probability\*
  - Average expected yield of wells (in imperial gallons per minute) established from pump or bail tests, etc.
  - estimated, from flow regime, lithology, etc.

HYDROCHEMISTRY

LEGEND

- Total dissolved solids, in parts per million
- Sulfate constituting over 60 per cent of total anions, on equivalents per million basis
- Bicarbonate + carbonate constituting over 60 per cent of total anions, on equivalents per million basis
- Isogram along which calcium constitutes 60 per cent of total cations; teeth indicate direction of lesser calcium content
- Isogram along which sodium + potassium constitutes 60 per cent of total cations; teeth indicate direction of lesser sodium + potassium content
- Data point

SCALE 1:100,000

IRON CONTENT

LEGEND

- Iron content in parts per million
- Iron content ranging between 1.0 and 10 parts per million
- Iron content over 10 parts per million
- Data point

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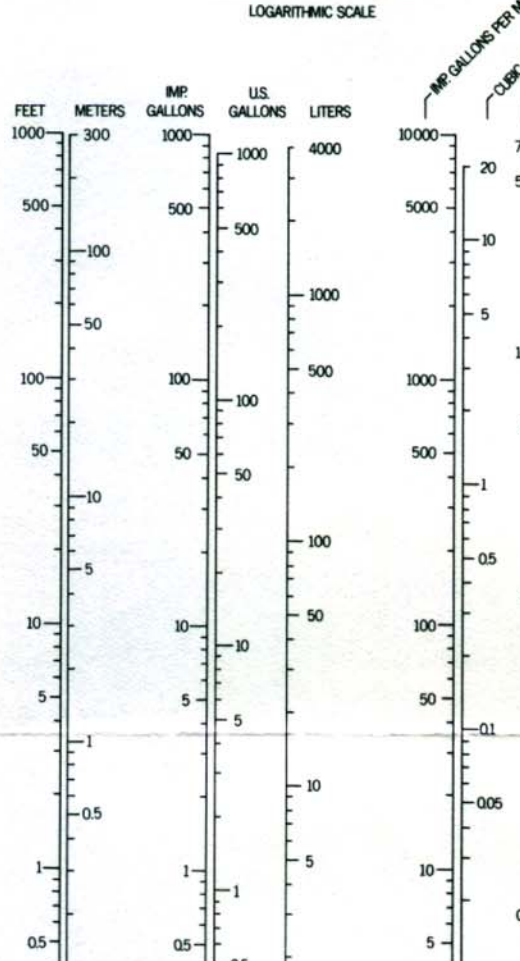
CALCIUM-MAGNESIUM RATIO

LEGEND

- < 0.5
- 0.5 to 1.0
- 1.0 to 3.0
- > 3.0
- good control
- poor control

SCALE 1:100,000

CONVERSION TABLE



HYDROGEOLOGICAL PROFILE LEGEND

(Horizontal scale same as main map scale; vertical scale: 1 cm = 200 ft; vertical exaggeration about 20x)

Geology

QUATERNARY

- Drift: unconsolidated surficial deposits
- Till: clayey; local pockets of sand and gravel
- Clay and silty clay: lacustrine and slack water deposits
- Clay, silt: lacustrine deposits

UPPER CRETACEOUS

- Kqp Paukwausu Formation: dark grey fissile shale; 0-120 feet
- Kqv Bad Heart Formation: black, orange-weathering, calcic, iron-rich sandstone
- Ksh Kaskapus Formation: dark grey fissile shale, sandy and silty shale, sandstone; 0-370 feet
- Kkr Dumvegan Formation: grey silty carbonaceous shale, beds and lenses of grey, clay-cemented sandstone; 0-493 feet
- Kk Shutbury Formation, upper member: grey silty shale, siltstone lenses; 0-480 feet

LOWER CRETACEOUS

- Kln Shutbury Formation, lower member: dark grey fissile shale; 270-490 feet
- Kpr Peace River Formation, Fudly and Cobden Members: poorly sorted, fine- to medium-grained sandstone, locally shaly; 190-165 feet
- Kk Peace River Formation, Harmon Member: dark grey shale, minor siltstone, sandstone; 40-70 feet
- Ksr Spirit River Formation: grey shale, fine-grained sandstone, local coal seams; fine- to medium-grained sandstone in upper part

Boreholes, wells and other works

- Water well or test well
- Water well, nonproductive
- Water well, flowing, and flow rate in imperial gallons per minute
- Geological test hole
- Exploratory oil or gas well; broken line indicates surface casing interval
- Interval of drill-stem test

Groundwater hydrology and chemistry

- Component of groundwater flow direction
- Total dissolved solids, in parts per million
- Isogram along which calcium constitutes 60 per cent of total cations\*
- Isogram along which sodium + potassium constitutes 60 per cent of total cations\*
- Isogram along which carbonate + bicarbonate constitutes 60 per cent of total anions\*
- Isogram along which sulfate constitutes 60 per cent of total anions\*
- Isogram along which chloride constitutes 60 per cent of total anions\*

SELECTED REFERENCES

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HYDROGEOLOGICAL MAP GRIMSHAW - CHINOOK VALLEY NTS 84C/4 AND 84C/5 ALBERTA