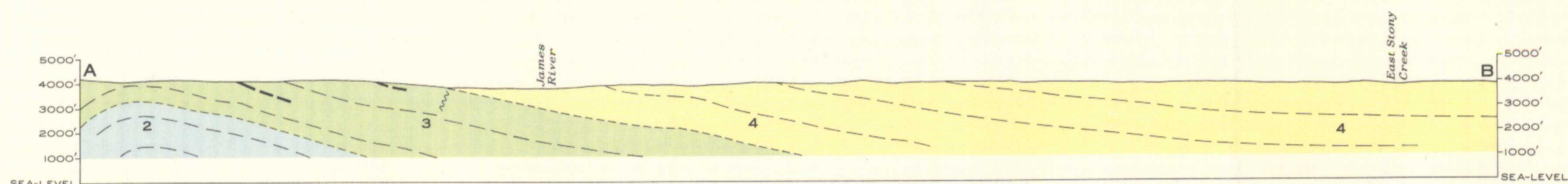


CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH
BUREAU OF GEOLOGY AND TOPOGRAPHY



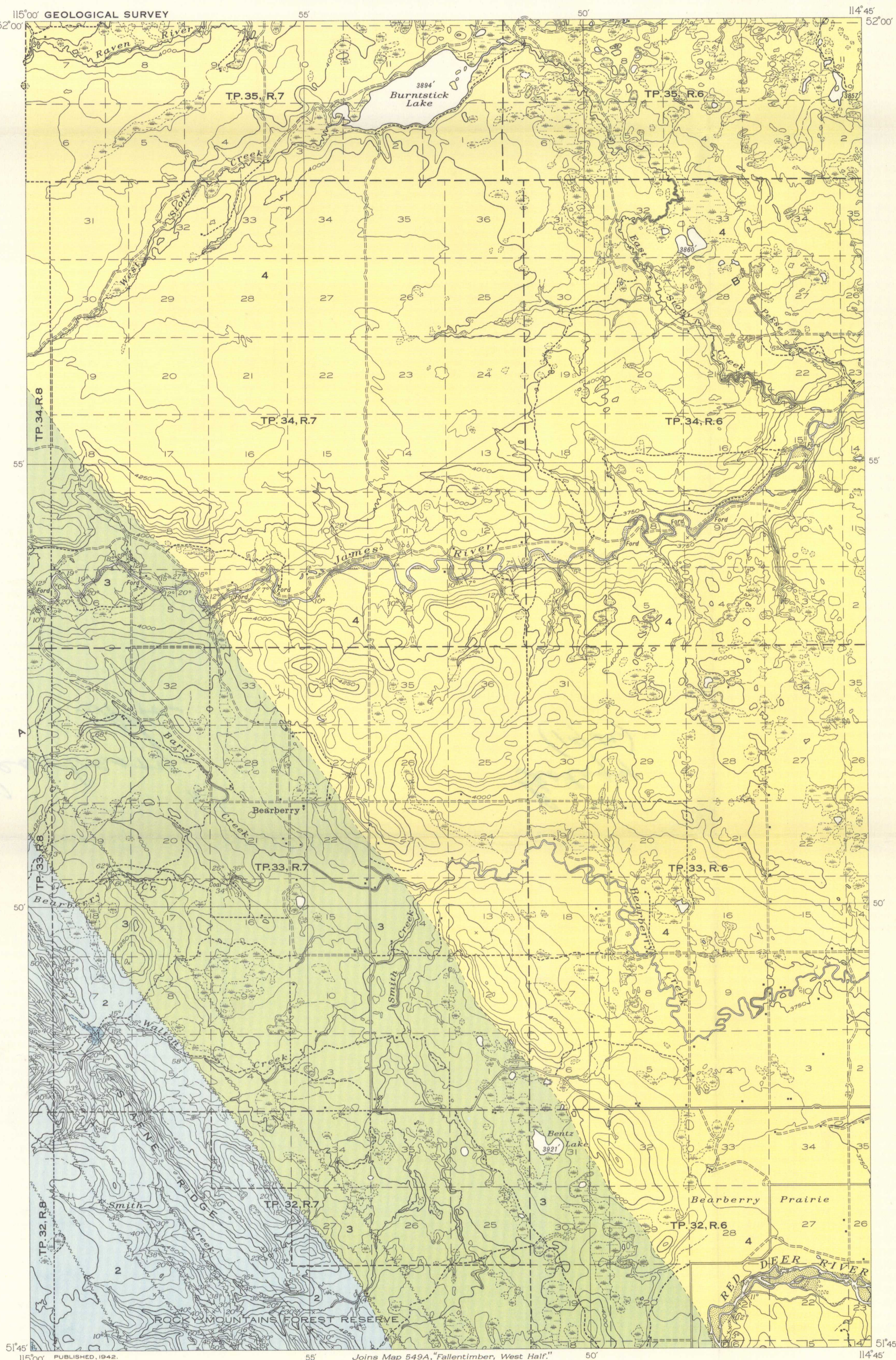
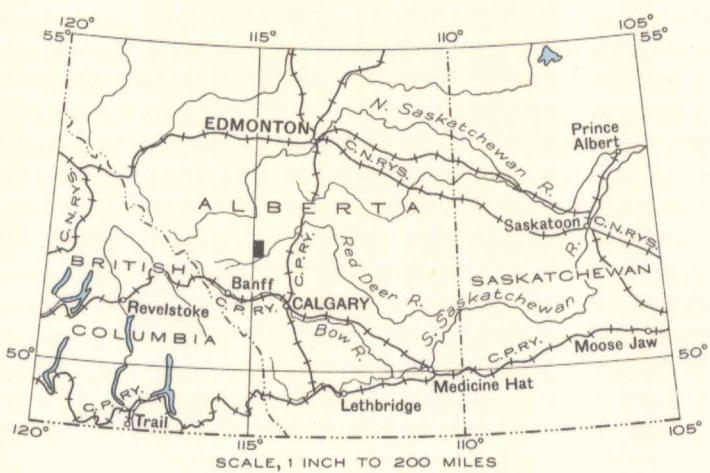
LEGEND

- CENOZOIC**
- TERTIARY**
- 4 PASKAPOO FORMATION: sandstone, shale, conglomerate
- CRETACEOUS**
- UPPER CRETACEOUS**
- 3 EDMONTON FORMATION: sandstone, shale, conglomerate, coal
- 2 BELLY RIVER FORMATION: sandstone, shale, conglomerate
- 1 WAPIABI FORMATION: shale and minor amounts of sandstone

- Bedding (inclined, horizontal) +
- Fault - - - - -
- Anticlinal axis - - - - -
- Synclinal axis - - - - -
- Rock outcrop X
- Coal seam (position approximate; shown in structure section only) - - - - -
- Fossil locality *
- Well (unproductive) *
- Road and buildings - - - - -
- Road not well travelled - - - - -
- Road along township boundary - - - - -
- Bush road or trail - - - - -
- School *
- Post Office *
- Forest Reserve boundary - - - - -
- Township boundary - - - - -
- Section line - - - - -
- Intermittent lake and stream - - - - -
- Spring *
- Marsh *
- Gravel bar *
- Contours (interval 50 feet) - - - - -
- Depression contour - - - - -
- Height in feet above Mean sea-level 3921'

Geology by H.H. Beach, 1940.

Base-map prepared from Federal Government map published in 1937. Cartography by the Drafting and Reproducing Division, 1942.



MAP 670A
BEARBRERRY
ALBERTA

Scale, 1/32000 or 1 Inch to 1 Mile
Miles

Approximate magnetic declination, 22°30' East.

DESCRIPTIVE NOTES

The map-area is accessible by motor road from Olds on the Calgary-Edmonton highway. It lies at the eastern margin of the Foothills belt, which forms the western flank of the Alberta syncline.

The region is underlain by a great thickness of Palaeozoic, Mesozoic, and younger sedimentary rocks but, within the map-area, the oldest rocks exposed or encountered in drilling, are those of the Wapiabi formation (1). Its thickness and that of the other formations between it and the top of the Palaeozoic limestones can only be inferred from information obtainable elsewhere in the Foothills belt, particularly in the adjoining area to the west. These thicknesses are believed to be about as follows: Wapiabi, 1,750 feet; Cardium (Upper Cretaceous) 175 to 200 feet; Blackstone (Upper Cretaceous) 900 feet; Blairmore (Lower Cretaceous) 1,300 feet; Kootenay (Lower Cretaceous), less than 100 feet and may be absent; Fernie (Jurassic), 150 feet or less; and, if any, not more than 100 feet of Triassic beds.

No complete section of the Belly River formation (2) is exposed in the map-area. Available information indicates that the Petroleum Structures No. 1 well commences in the Edmonton and not, as previously supposed, in Belly River beds, and that the Belly River formation is here not over 2,500 feet thick. It consists mainly of hard, grey and greenish grey sandstones interbedded with dark green weathering black shale and dark carbonaceous shale. Soft, yellow-weathering, coarse grained feldspathic sandstones, with thin chert pebble conglomerate lenses, predominate near the base of the formation and occur in lesser amounts near the top.

The Edmonton formation (3) of this map-area was formerly considered to be about 3,000 feet thick, but is now believed to include several hundred feet of the uppermost strata penetrated in Petroleum Structures No. 1 well, and, if so, may be about 3,800 feet thick. It consists of soft, light grey and light buff sandstones, commonly containing appreciable amounts of altered volcanic glass. The sandstones are interbedded with crumbly, light green shale, carbonaceous shale, and thin beds of bentonite. Thin coal seams are found at irregular intervals throughout the formation but are more numerous toward the base. Fossil leaves and fragments of tree trunks are common in the basal and upper beds and dinosaur bones are found in the lower half of the formation. The Edmonton sandstones are generally much softer and lighter coloured than those of the Belly River or the Paskapoo formations. The Belly River-Edmonton contact is not exposed within the map-area and its position as indicated on the map is indefinite.

More than 3,000 feet of Paskapoo beds (4) are present in the map-area. They are largely grey sandstones, weathering buff and yellow, and are interbedded with light green and grey-brown shales. The sandstones at the base of the formation are particularly massive and are believed to form the line of prominent hills extending from the southeast corner northwestward across the map-area. A thin conglomerate bed, containing boulders of sandstone and shale and fossil tree trunks and bone fragments, is exposed on James River and is assumed to mark the Edmonton-Paskapoo contact.

Remnants of an extensive pre-glacial erosion surface, sloping gently to the east, occur at elevations above 4,750 feet in the southwest corner of the map-area. Well rounded quartzite cobbles are scattered abundantly over this surface. They occur more sparingly over the broad plain north of James River. In Pleistocene time glaciers extending eastward from the Rocky Mountains deposited till in James River valley. In addition to the predominant material derived from formations exposed in areas to the west, the deposits include quartzite cobbles, and, locally, granitic boulders presumed to have been brought into the area from the east by the Keewatin ice sheet. Similar granitic boulders are found in the drift covering the hills throughout the area. Evidence indicates that a glacial lake extended from the eastern margin of the area some two miles up James River valley.

No drilling within this or adjoining map-areas has been carried sufficiently deep to test the oil and gas possibilities of the Lower Cretaceous and Jurassic formations or the underlying Palaeozoic limestones. Across that part of the map-area underlain by the Paskapoo formation, the James River section reveals no structures worth testing. Within the area of the Edmonton formation structural conditions are largely unknown as outcrops are few and are confined almost entirely to the valleys of James River and Bearberry Creek. It is probable that the Monarch anticline, exposed on Red Deer River in the map-area to the south, extends across Bearberry map-area with its axis parallel to, and approximately two and one-half miles west of, the Edmonton-Paskapoo contact. In line with the assumed continuation of this structure an anticline was observed on James River just west of the western boundary of the map-area. The only attempt to test this structure was by Petroleum Structures No. 1 well (L.S. 4, sec. 2, tp. 33, rge. 7). The well passed through Edmonton and Belly River strata to a depth of 2,850 feet, and through Wapiabi beds from 2,850 to 4,620 feet. At 4,620 feet a fault was encountered and below it the Belly River beds are repeated. On James River, to the northeast, some folding was observed in Edmonton strata near the Paskapoo contact. This may be the surface expression of the fault encountered in the well.

No information is available regarding the strata penetrated in the Mount Stephen No. 1 well (Sec. 25, tp. 32, rge. 7), drilled in 1914.

Wapiabi strata are exposed in the core of the Stafne Ridge anticline in the southwestern part of the map-area. The structure plunges southeastward to Red Deer River and northwestward across James River. The east limb of the structure is steeper than the west limb and is displaced by thrust faults in the vicinity of James River. It is probable that one or more of these faults extend southward, parallel to the east limb, at least as far as Red Deer River.

Small quantities of coal have been extracted for domestic use from thin seams in the lower part of the Edmonton formation in the valley of James River. A seam 6 feet thick is reported to have been penetrated in a well dug in sec. 33, tp. 33, rge. 7. The coal seams along the river are much thinner.

NOT TO BE TAKEN FROM LIBRARY
NE PAS SORTIR DE LA BIBLIOTHÈQUE

670A