LEGEND GRANDE CACHE MAP AREA (83E/14), ALBERTA

QUATERNARY

Qvf	Alluvium, colluvium, till: gravel, sand, silt (only shown where bedrock is extensively covered).

CRETACEOUS
UPPER CRETACEOUS

uKK — KASKAPAU FORMATION
Shale: dark grey to black, commonly silty, rusty weathering; with sideritic concretions and variable amounts of very thinly interbedded grey, brown weathering siltstone. Calcareous shale: dark grey, silver-grey weathering. Recessive poorly exposed unit. Commonly faulted and folded.

uKD — DUNVEGAN FORMATION
Sandstone: grey, very fine- to medium-grained, argillaceous, brown weathering, micaceous bedding planes; and mudstone: grey, brown, silty, brown weathering, commonly carbonaceous, laminated, micaceous bedding planes in fining-upward-cycles. Rare lenticular coal seams (<20 cm thick); and sandstone: grey, medium- to coarse-grained, quartzose, crossbedded, grey weathering. Relatively resistant marker unit with good topographic expression but commonly poor exposure.

UPPER AND LOWER CRETACEOUS

KS — SHAFTESBURY FORMATION
Shale: dark grey, grey or rusty weathering, with red-brown weathering, laminated siltstone interbeds common near top. Recessive, dark weathering unit.

LOWER CRETACEOUS

LUSCAR GROUP (KC-KG)

KG — GATES FORMATION
Sandstone: fine- to coarse-grained, carbonaceous, crossbedded, tan or red-brown weathering; interlayered with: Carbonaceous shale: grey, brown; carbonaceous siltstone: grey, cross-laminated; coal: beds commonly over 1 m thick; and sandy pebble conglomerate: clast supported, in beds up to 5 m thick. Sandstone: fine grained, well sorted, resistant, brown weathering unit 0 to 20 m thick forms base of succession in many areas. Ribbed weathering unit.

KM — MOOSEBAR FORMATION
Shale: dark grey with ironstone concretions. Sandstone: grey, very fine grained, laminated, very thin- to thin-bedded, brown weathering, absent in lower part of unit, more common near top. Recessive marker unit.

KGL — GLADSTONE FORMATION
Sandstone: fine- to coarse-grained, carbonaceous, crossbedded, orange-brown weathering and local sandy pebble conglomerate; interlayered with carbonaceous siltstone, carbonaceous shale and coal. Plant remains abundant throughout. Ribbed weathering unit.

KC — CADOMIN FORMATION
Conglomerate: pebble to cobble, clast supported in red-brown weathering sandy matrix, with local interbeds of sandstone and siltstone. Resistant, light grey weathering or black, lichen covered marker unit.

MINNES GROUP (JKMT-KGC)

KGC — GORMAN CREEK FORMATION
Interlayered sandstone, siltstone, mudstone, carbonaceous shale or coal in repetitive fining-upward-cycles generally 1 to 5 m thick. Sandstone: fine- to coarse-grained, carbonaceous, ripple cross-laminated or crossbedded, commonly rich in dark chert, locally conglomeratic, orange or brown weathering; -S- local, resistant mappable units up to 15 m thick. Siltstone: grey, carbonaceous, orange or grey weathering. Shale: silty, carbonaceous, grey weathering commonly grading to coal. An orange-brown weathering succession with few marker units, commonly complexly folded with minor faults.

JURASSIC AND CRETACEOUS
UPPER JURASSIC AND LOWER CRETACEOUS

JKMTs — MONTEITH FORMATION: MIXED FACIES
Sandstone: very fine- to medium-grained, dark chert rich, ripple cross-laminated, locally carbonaceous, brown weathering. Shale and siltstone: grey, interlaminated, micaceous and carbonaceous splitting surfaces, brown weathering, carbonate concretions locally. Brown weathering unit.

JKMTm — MONTEITH FORMATION: MARINE SANDSTONE FACIES
Sandstone: very fine-grained, light brown-grey, laminated, pinkish or light grey weathering with minor grey shale interbeds. Resistant marker unit.

JKN — NIKANASSIN FORMATION
Sandstone: very fine-grained, orange-brown weathering, in thin to very thick beds, interbedded with minor dark grey shale, silty shale and argillaceous sandstone (lower part). Interlayered sandstone, siltstone, mudstone, carbonaceous shale of upper part is lithologically similar to Gorman Creek Formation. Lower part is resistant weathering; upper part is a ribbed, generally orange weathering unit.

JURASSIC

JF — FERNIE FORMATION: undivided

JF2 — UPPER PART (West)
Siltstone and silty sandstone: brown-grey, very thin- to thin-bedded, red-brown weathering, micaceous splitting surfaces, large orange-brown weathering concretions locally; interbedded with shale: grey, silty, brown weathering. Brown, relatively recessive weathering unit with locally mappable resistant intervals 20 to 40 m thick dominated by silty sandstone: base of these intervals denoted by -SS- on map.

JFu — UPPER PART (East)
Shale: grey, silty, brown weathering; siltstone: brown-grey, very thin- to thin-bedded; Sandstone: light grey, quartzose, well cemented, thin-bedded, orange-brown weathering, common in upper part of unit.

JF1 — LOWER PART
Shale: dark grey, locally rusty weathering, ironstone concretions; minor quartz sandstone and glauconitic sandstone near base. A few metres of interbedded black shale and dark limestone occurs at base (Nordegg Member). Recessive unit.

TRIASSIC

SPRAY RIVER GROUP (ƮSM-ƮW)

ƮW — WHITEHORSE FORMATION
Interbedded silty dolostone, sandstone, siltstone, sandy limestone, intraformational conglomerate, solution breccia, anhydrite; limestone: light grey weathering with minor dolostone and intraformational conglomerate; cherty dolostone and limestone. A distinctive brightly weathering ribbed unit.

ƮSM — SULPHUR MOUNTAIN FORMATION
Siltstone, silty limestone: grey, red-brown platy to flaggy weathering with phosphatic fossils; minor interbedded shale, dolostone and sandstone. A distinctive, red-brown, moderately resistant weathering unit.

PERMIAN

PU — BELCOURT, RANGER CANYON AND MOWICH FORMATIONS
Limestone, and fine crystalline dolostone (Belcourt Formation); light to medium grey chert (Ranger Canyon Formation) and siliceous or calcareous sandstone with local chert and carbonate lenses (Mowich Formation). Thin pebble conglomerate commonly occurs at base of Belcourt and Mowich Formations.

CARBONIFEROUS
LOWER CARBONIFEROUS

CR — RUNDLE GROUP
Limestone: skeletal grainstone, packstone and wackestone; with locally abundant chert nodules, dolostone; minor shale. Ribbed weathering unit.

CB — BANFF FORMATION
Black Shale: brown weathering, and lime wackestone in thin rhythmic interbeds (lower part); brown weathering, black shale and skeletal lime grainstone in coarsening upward cycles (upper part). Recessive, brownish weathering marker unit.

DEVONIAN
UPPER DEVONIAN

DP — PALLISER FORMATION
Limestone: brown-grey, wavy bedded to nodular, or dolomitic and burrow mottled. Resistant, massive weathering unit.

SUBSURFACE ONLY

DFS — FAIRHOLME GROUP, SIMLA FORMATION
Stromatoporid limestone, dolostone, argillaceous limestone, shale, calcareous shale.

CAMBRIAN AND ORDOVICIAN

€O — SURVEY PEAK FORMATION
Limestone, argillaceous limestone, calcareous shale.

CAMBRIAN

€ — CAMBRIAN (undivided)
Limestone, dolostone, shale, quartzite.

SYMBOLS

Geological boundary (defined, approximate, assumed, projected under cover)

Bedding, top known (inclined, vertical, overturned) — 60, 70

Bedding, top unknown (inclined) — 60

Fault, thrust or reverse, teeth on upthrust side (defined, approximate, assumed, projected under cover)

Anticline, trace of axial plane, arrow indicates direction of plunge (upright, overturned; defined, approximate, projected under cover)

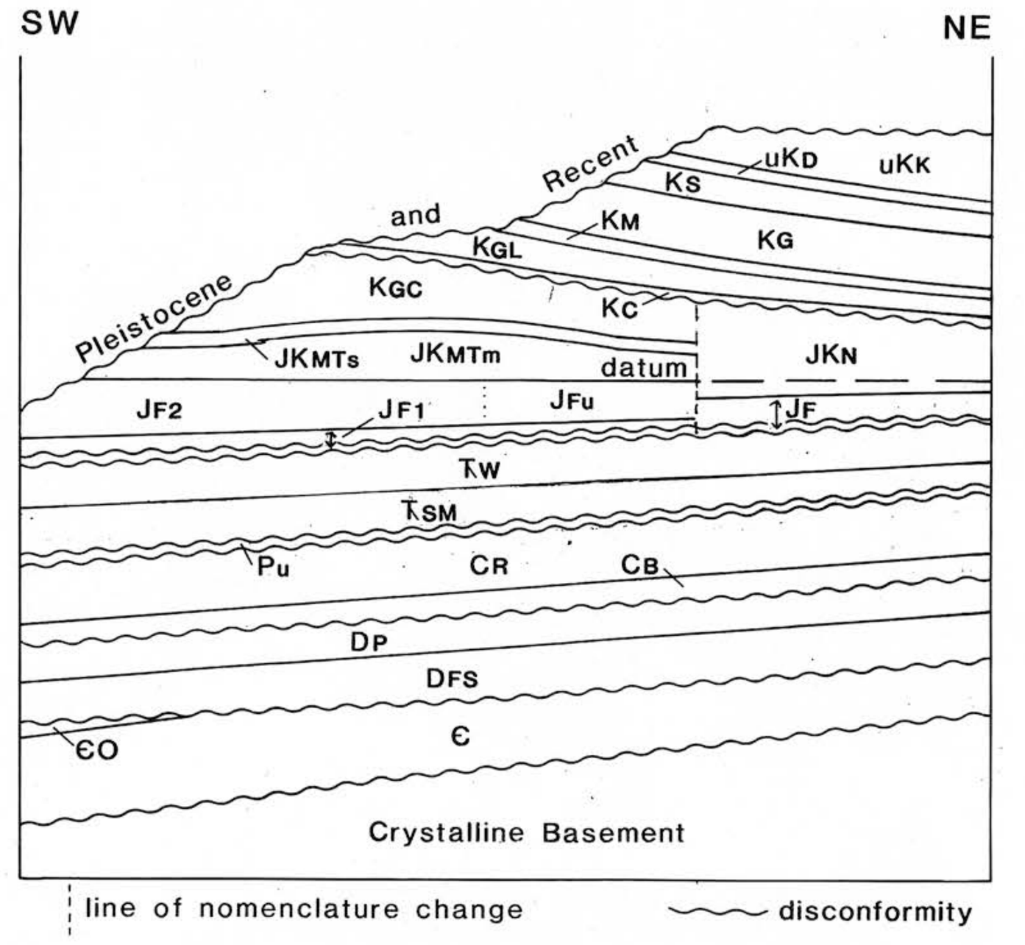
Monocline, trace of axial plane (approximate)

Syncline, trace of axial plane, arrow indicates direction of plunge (upright, overturned; defined, approximate, projected undercover)

Diagrammatic profiles of sets of minor folds (50 to 30 m wavelength) viewed to the northwest. Dotted axial trace indicates observed extent of structures.

Minor folds; axis, trend and plunge. — 10

Geological interpretation by M.E. McMechan, 1990, based on ground and air observations by M.E. McMechan (1982-83, 1990). Studies of vertical air photographs and GSC Map 1049A for Grande Cache map area (Irish and Thorsteinsson, 1956); G.S.C. Preliminary Map 52-26A for Grande Cache map area (east half, Thorsteinsson, 1952); Alberta Research Council map of the Smoky River Coal Mine area (Langenberg and Wrightson, 1986 in Alberta Research Council Bulletin 56); and an unpublished report prepared by Pearson and Associates for Union Oil of Canada Ltd. (1982) on the coal measures in the Mount Louie area.



Schematic Stratigraphic Relationships

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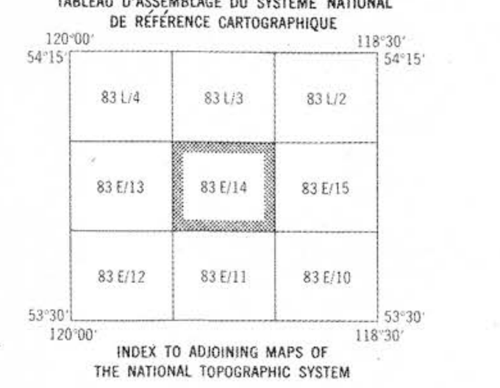
GRANDE CACHE

ALBERTA

WEST OF SIXTH MERIDIAN - OUEST DU SIXIÈME MÉRIDIEN

Scale 1:50 000 Échelle



GRANDE CACHE
83 E/14
EDITION 2