Geological contact
Defined
Approximate
Inferred
Concealed

Thin map unit, displayed in map-unit colour
Defined
Approximate
Inferred
Concealed

Fault, normal, solid circle indicates downthrown side
Approximate
Inferred
Concealed

Fault, thrust, teeth indicate upthrust side
Defined
Approximate
Inferred
Concealed

Fault, transverse
Defined
Approximate
Inferred
Concealed

Anticline, upright, overturned
Defined
Approximate
Inferred
Concealed

Syncline, upright, overturned
Defined
Approximate
Inferred
Concealed

Monocline, anticlinal bend, flat to dipping
Approximate
Inferred

Anticline, upright, homoclinic, shorter arrow on steeper limb
Approximate

Syncline, upright, homoclinic, shorter arrow on steeper limb
Approximate
Inferred

Anticline, overturned, contractinc, dipping to overturned
Approximate

Anticline or syncline
General direction of plunge

Outcrop visited, attitude not determined

Bedding
Top known, inclined
Top known, vertical, ball on younger side
Top known, overturned
Top unknown, inclined
Top unknown, vertical

Cleavage, inclined

Axial surface, minor syncline, inclined

Fault plane, inclined

Well, abandoned

Mineral locality (*see* table for type)

Change in map unit grouping at dotted line

Nomenclature change

Measured section (number refers to internal cataloguing system)
AC: J.D. Aitken, LDB: R.B. Best, LDG: R.G. Greggs, LDK: G.B. Leech, NE: B.S. Norford

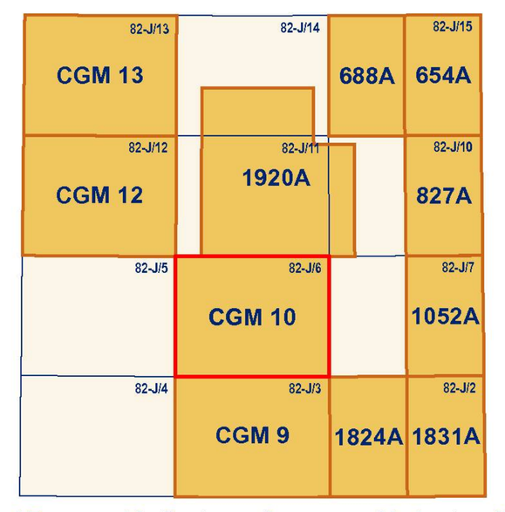
Sink hole

Abstract

Mount Abruzzi map area (NTS 82-J/06, 1:50 000 scale) straddles portions of the Front Ranges and Main Ranges subdivisions of the Southern Canadian Rocky Mountains. Folded Devonian, Mississippian, Pennsylvanian, Permian, and Triassic carbonate and clastic strata of the Bourgeau thrust sheet are thrust over Lower Cretaceous foreland basin clastic strata in the Front Ranges. Mississippi Valley–type alteration occurs locally in southwesternmost exposures of Upper Devonian Palliser carbonate. A thick basinal succession of folded and cleaved Middle Cambrian to Lower Ordovician clastic and carbonate strata, and intensely folded Middle and Upper Ordovician and Middle Devonian, predominantly carbonate strata characterize the Main Ranges. No large fault separates the Main Ranges from the Front Ranges. The Main Ranges reflect a south-plunging culmination in the underlying Bourgeau Thrust. Sixteen Late Ordovician to Early Devonian, mafic diatreme breccia pipes occur in the northeastern part of the Main Ranges in the map area.

Résumé

La région de la carte Mount Abruzzi (82-J/06 du SNRC, à l'échelle de 1/50 000) couvre des parties des subdivisions des chaînons frontaux et des chaînons principaux des Rocheuses canadiennes du Sud. Des couches carbonatées et clastiques plissées du Dévonien, du Mississippien, du Pennsylvanien, du Permien et du Trias de la nappe de charriage de Bourgeau chevauchent des couches clastiques du bassin d'avant-pays du Crétacé inférieur dans les chaînons principaux. Une altération de type Mississippi Valley est observée par endroits dans les affleurements les plus au sud des roches carbonatées de la Formation de Palliser du Dévonien supérieur. Les chaînons principaux sont caractérisés par une épaisse succession de bassin, formée de couches clastiques et carbonatées plissées et clivées du Cambrien moyen à l'Ordovicien inférieur, ainsi que par des couches à prédominance de roches carbonatées fortement plissées de l'Ordovicien moyen et supérieur et du Dévonien moyen. Aucune grande faille ne sépare les chaînons principaux des chaînons frontaux. Les chaînons principaux représentent une culmination plongeant vers le sud du chevauchement de Bourgeau sous-jacent. Seize cheminées bréchiques mafiques de diatrème datant de l'Ordovicien tardif au Dévonien précoce sont présentes dans la partie nord-est des chaînons principaux dans la région de la carte.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

Cover illustration:
Paleozoic diatreme breccia pipe intruded into Ordovician carbonate and quartzite, faulted by transverse northeast-trending faults, south arm Russell Peak, British Columbia.
Photograph by M.E. McMechan. 2011-002

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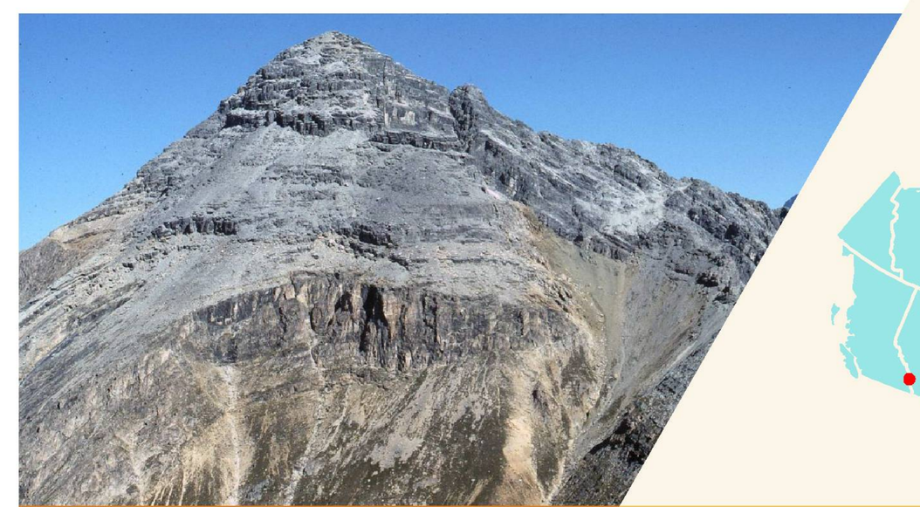
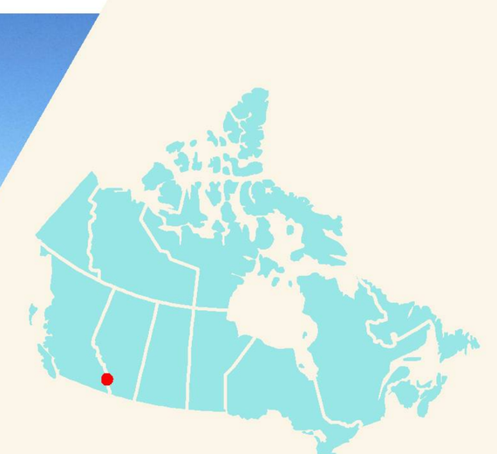
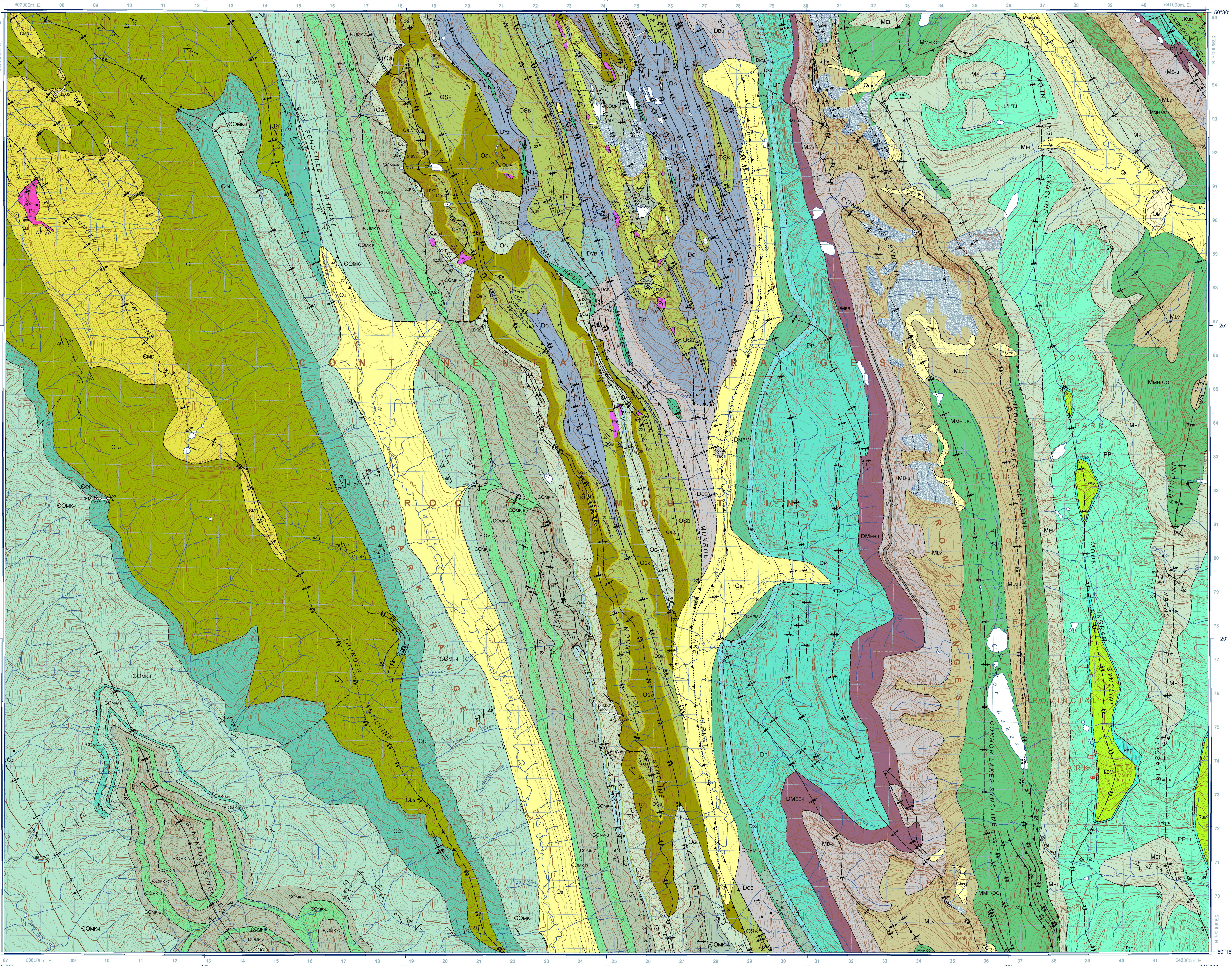
CANADIAN GEOSCIENCE MAP 10
GEOLOGY
MOUNT ABRUZZI
British Columbia
1:50 000







QUATERNARY

Qa — **Alluvium, colluvium, and till -** deposits of gravel, sand, silt. This unit is shown only where these deposits cover the bedrock extensively.

Qls — **Landslide -** blocks of nearby bedrock.

Qmr — **Neoglacial moraine -** diamicton.

Qrg — **Rock glacier -** rock debris, ice.

JURASSIC–LOWER CRETACEOUS
Kootenay Group

JKMM — **Mist Mountain Formation -** siltstone: carbonaceous; sandstone, mudstone, and shale, common carbonaceous debris; minor coal: thin to thick seams and carbonaceous, conglomeratic sandstone.

TRIASSIC
Spray River Group

TSM — **Sulphur Mountain Formation -** siltstone: calcareous, dolomitic, and siliceous, red-brown- to brown-weathering, commonly laminated, platy- to flaggy-weathering; mudstone: silty, dark grey; shale: dark grey, more common near base.

PERMIAN
Rocky Mountain Supergroup (PPTJ–PRC)

PRC — **Ranger Canyon Formation -** chert: blue, black, and grey, diagenetic, massive to thin beds; minor silicified sandstone or siltstone lenses, spiculitic chert locally at base; resistant unit.

PENNSYLVANIAN–PERMIAN

PPTJ — **Tunnel Mountain and Johnston Canyon formations -** sandstone: siliceous, calcareous, and dolomitic quartz arenite, bedded, local silicification patches (Tunnel Mountain Formation); resistant unit; siltstone: dark grey to black, argillaceous, phosphatic, interbedded with shale: dark grey, silty; chert, black, nodular and bedded; occasional dolostone (Johnston Canyon Formation); recessive unit.

MISSISSIPPIAN
Rundle Group (MLvs–MEt)

MEt — **Etherington Formation -** lime wackestone, packstone, and grainstone: light to medium grey; dolostone: light to medium grey; carbonate strata commonly cherty and sandy; sandstone: dolomitic and siliceous quartz; siltstone and shale: green, grey, waxy with calcareous nodules (caliche horizons) at base.

Mount Head Formation

MMH-OC — **Opal and Carnavon members -** lime wackestone, packstone, and grainstone: medium to dark grey; limestone and dolostone: argillaceous, commonly cherty; minor shale: grey (Opal Member), forms a distinctive dark, relatively recessive-weathering unit; packstone and wackestone: light grey, dolomitic lime; minor shale: interbeds (Carnarvon Member). Carnarvon Member forms a thin unit at the top.

MLv — **Livingstone Formation -** grainstone and packstone: light grey, resistant, skeletal, lime, and dolomitized equivalents, locally cherty; resistant-weathering unit.

MLvs — **Livingstone Formation, siltstone unit -** local brown-weathering silty dolostone; relatively recessive.

Banff Formation

MB-u — **Upper unit; Bourgeau facies -** lime wackestone and packstone: dark grey, cherty; dolostone: cherty; chert: dark, bedded with carbonate lenses; lime grainstone bands in upper part.

MB-ub — **Upper unit, brown-weathering silty unit -** local dolostone: silty, brown-weathering; minor siltstone, dolostone, lime grainstone; relatively recessive.

UPPER DEVONIAN–MISSISSIPPIAN

DMEB-l — **Exshaw and Banff (lower unit, Bourgeau facies) formations -** shale: black, rusty-weathering, recessive with subordinate black chert interbeds and laminae (Exshaw Formation, lower part); minor siltstone: brown-weathering, dolomitic and calcareous, commonly bioturbated (Exshaw Formation, upper part); shale: black, recessive, interbedded with wackestone, argillaceous to cherty; spiculitic lime wackestone, with spiculite in the upper part (Banff Formation, lower unit, lower part); interbedded chert, spiculite, and spiculitic carbonate; resistant (Banff Formation, lower unit, middle part); shale: black, siliceous, recessive; carbonate, argillaceous; chert; local minor siltstone (Banff Formation, lower unit, upper part). Recessive unit with a more resistant band near middle.

UPPER DEVONIAN

DP — **Palliser Formation -** limestone: massive-weathering, burrow-mottled, dolomitic-peloidal, resistant; limestone: argillaceous, wavy-bedded, commonly cherty with minor thin, more resistant limestone interbeds; minor bedded dolostone and limestone at top. Resistant, cliff-forming unit; a darker weathering, less resistant interval marks base of upper part in western exposures.

DSs — **Sassenach Formation -** siltstone and sandstone: quartzose, interbedded with dark shale; argillaceous limestone and silty limestone near top and base.

Fairholme Group, off-reef facies (DM–DPM)

DMPM — **Maligne, Perdrix, and Mount Hawk formations -** undivided.

DPM — **Perdrix and Mount Hawk formations -** shale: dark grey and black, calcareous; limestone: argillaceous and highly argillaceous; shale: grey and black, fissile; minor siltstone: quartzose, calcareous, laminated, interbeds near top; relatively recessive unit.

DM — **Maligne Formation -** limestone: dark grey, grey- and buff-weathering, commonly silty, more argillaceous in upper part, brachiopods locally common; relatively resistant unit.

D?M — **(?)Maligne Formation -** limestone: black, dark grey-weathering, fossiliferous; limestone and argillaceous limestone: nodular and wavy-bedded, fossiliferous; minor shale: black. Givetian; stratigraphic assignment uncertain, could be Harrogate or Maligne formation.

MIDDLE DEVONIAN

DCB — **Cedared and Burnais formations -** undivided.

DBu — **Burnais Formation -** solution-collapse breccia: evaporitic; limestone: platy; mudstone and shale: dark grey, grey, silty, calcareous; minor dolostone: tan-weathering; local gypsum; relatively recessive unit. In Mount Macdonnell area solution-collapse breccia mainly in lower half and minor dolostone in upper half.

DYB — **Yahatinda and Burnais formations -** dolostone: tan, red- and green-weathering, silty and sandy, well bedded; with mudstone and silty mudstone: red, green, and grey, interbeds and partings; sandstone: dolomitic, locally pebbly; rare conglomerate; (Yahatinda Formation); solution-collapse breccia: evaporitic; mudstone and shale: dark grey, grey, silty; gypsum; recessive (Burnais Formation).

Dc — **Cedared Formation -** dolostone: blue-grey, light grey, tan- or locally red-weathering, silty and sandy, well bedded, with uncommon mudstone partings; dolostone: varicoloured, argillaceous; minor limestone: dolomitic, bedded; quartz sandstone: commonly dolomitic with mudstone partings; rare red mudstone.

DYa — **Yahatinda Formation -** dolostone: tan, red- and green-weathering, silty and sandy, well bedded; with mudstone and silty mudstone: red, green, and grey, interbeds and partings; sandstone: dolomitic, locally pebbly; rare conglomerate.

UPPER ORDOVICIAN–LOWER DEVONIAN

Pd — **Paleozoic intrusive breccia diatreme -** breccia: tuffasitic, poorly sorted dolostone, quartzite, and shale clasts in a dark chloritic matrix, matrix-supported; less common ultramafic intrusion: medium to dark green, fine- to medium-grained, brecciated; local epiclastic and pyroclastic sandstone, conglomerate, tuff and breccia; emplaced in either Upper Ordovician or Lower Devonian.

UPPER ORDOVICIAN–LOWER SILURIAN

OSB — **Beaverfoot Formation -** dolostone: light and medium grey, light brown-grey-weathering, resistant, medium-bedded to massive, siliceous, slightly silty or sandy (quartz grains), chert nodules and silicified fossils including corals locally; minor sandstone: dolomitic, locally near base where Akanko Creek unit not present; resistant unit.

UPPER ORDOVICIAN

OB-A — **Akanko Creek unit -** sandstone: litharenite with pyroclastic fragments; sandstone: quartz arenite; clastic strata interbedded with dolostone: brown-grey, with common large solitary corals; forms basal unit to Beaverfoot Formation in northern part of map area; relatively recessive unit.

MIDDLE ORDOVICIAN

OSk — **Skoki Formation -** dolostone: light brown-grey- and light grey-weathering, resistant, very silty or sandy (quartz grains), chert nodules and siliceous partings; minor quartz sandstone or siltstone: commonly dolomitic; resistant unit.

LOWER ORDOVICIAN

OG — **Glenogle Formation -** shale: dark grey, recessive, silty laminae (basal unit, Lower Member); sandstone: grey- to orange-brown-weathering, dolomitic, cherty, thin-bedded, quartz arenite (Tipperary Quartzite Member); limestone: dark grey, more and less argillaceous, with calcareous shale interbeds, concretionary limestone mottles (middle unit, Lower Member); limestone: grey-weathering, thin-bedded with calcareous shale interbeds (limestone unit, Lower Member); dolostone and calcareous dolostone: dark brown-grey and grey, brown-grey- to yellow-brown-weathering, well bedded, silty and sandy laminae, local chert layers and blebs in upper third (Upper Member). Upper Member changes facies into Skoki Formation and Lower Member changes facies into Tipperary Formation in northeastern exposures (Russell Peak area).

OG-ml — **Middle and limestone units -** limestone: dark grey, more and less argillaceous, with calcareous shale interbeds, concretionary limestone mottles (middle unit, Lower Member); limestone: grey-weathering, thin-bedded with calcareous shale interbeds (limestone unit, Lower Member).

OG-T — **Tipperary Quartzite Member -** sandstone: grey- to orange-brown-weathering, dolomitic, cherty, thin-bedded, quartz arenite.

OG-b — **Basal unit -** shale: dark grey, graptolitic; interlaminated with siltstone: orange-brown-weathering, dolomitic; and siltstone: white-weathering; recessive unit.

OTQ — **Tipperary Quartzite -** quartzite: grey, fine-grained, thin-bedded; sandstone: grey- to orange-brown-weathering, dolomitic, common planar laminations and crossbeds; minor dolostone interbeds.

OTS — **Tipperary Quartzite and Skoki Formation -** undivided.

UPPER CAMBRIAN–LOWER ORDOVICIAN
McKay Group (ЄOMK-la–ЄOMK-A)
McKay Group, upper part

ЄOMK-A — **Unit A -** limestone and dolostone: dark grey, resistant, with irregular, resistant, siliceous or silty laminations; alternating with lesser intervals of more silty and argillaceous dolostone and limestone; chert nodules abundant in dolomitized upper part of unit; minor limestone: intraformational, flat-pebble conglomerate; chert: light blue-grey-weathering, nodular to lenticular with dolostone partings in upper 30 m of unit; resistant unit.

ЄOMK-B — **Unit B -** argillite and calcareous argillite with common silty limestone nodules; nodular argillaceous limestone; and near top of unit limestone: massive with irregular, resistant silty laminations; minor limestone: intraformational, flat-pebble conglomerate; relatively recessive unit.

ЄOMK-C — **Unit C -** limestone: silty, locally with wavy, resistant, silty laminations; limestone: nodular, argillaceous; and limestone: crystalline and bioclastic; minor limestone: intraformational, flat-pebble conglomerate; calcareous argillite: light grey-weathering, with sparse limestone nodules; resistant unit, with a shale-dominated interval near the middle in eastern exposures.

ЄOMK-D — **Unit D -** argillite: calcareous, green-grey, with silty limestone nodules and thin boudinaged interbeds that are commonly polygonally cracked on upper surface; minor limestone: intraformational, flat-pebble conglomerate, locally with bioclastic limestone matrix; and limestone: silty, lenticular to bedded, interbedded at top of unit with calcareous argillite; relatively recessive unit.

ЄOMK-E — **Unit E -** sandstone and siltstone: crosslaminated, interbedded with limestone: argillaceous with green shale partings; calcareous argillite: light green-grey, silty dolomitic and limestone: intraformational, flat-pebble conglomerate, locally oolitic; resistant unit.

McKay Group, lower part

ЄOMK-l — **Lower part -** argillite and argillaceous siltstone: grey-green, grey, and green, commonly phyllitic, calcareous or dolomitic with nodules and boudinaged interbeds; argillite: brown and green, brown-weathering, noncalcareous or slightly calcareous, pervasive cleavage; in middle and upper part of unit minor sandstone: crosslaminated with argillite partings; interbeds of lenticular, coarse bioclastic limestone, with intraclasts; and limestone: intraformational, flat-pebble conglomerate; recessive unit.

ЄOMK-lcs — **Carbonate, sandstone interval -** limestone: nodular, argillaceous; limestone: silty, bedded; sandstone: crosslaminated with argillite partings; argillite: calcareous, cleaved; minor limestone: intraformational, flat-pebble conglomerate; relatively resistant unit.

ЄOMK-la — **Argillite interval -** argillite and argillaceous siltstone: grey-green, grey, and green, grey-green-, grey-, and green-weathering, commonly phyllitic, calcareous or dolomitic with nodules and boudinaged interbeds; argillite: brown and green, brown-weathering, noncalcareous or slightly calcareous, cleaved; recessive unit.

UPPER CAMBRIAN

ЄOt — **Ottertail Formation -** limestone: micritic, dolomitic, silty, sandy, wavy- to planar-bedded, local crossbeds, common banded grey- and orange-brown-weathering; minor argillaceous limestone; calcareous shale: laminated, planar- to wavy-bedded; limestone or dolostone: light grey-weathering, sandy, calcarenite; intraclast conglomerate: pebble; sandstone: fine-grained, quartz; resistant unit.

MIDDLE CAMBRIAN–UPPER CAMBRIAN
Chancellor Group (ЄMD–ЄLa)

ЄLa — **Laussedat Formation -** argillite: grey-brown, grey-green, calcareous, silty, cleaved, forms resistant homogeneous unit at base, locally laminated in middle part; argillite: grey, green-grey, and brown-grey, commonly phyllitic, silver-weathering, laminated, limestone nodules locally, rare siltstone laminae; calcareous or dolomitic argillite: phyllitic, commonly laminated; ribbon argillite: cleaved; minor limestone: orange-brown-weathering, dolomitic, ribbon, locally nodular or massive, and dolostone: orange-brown-weathering in units up to several metres thick; argillaceous limestone: cleaved, locally phyllitic; relatively recessive unit with a few thick (5–20 m), more resistant-weathering carbonate bands in middle and upper parts.

MIDDLE CAMBRIAN

ЄMD — **Mount Docking Formation -** limestone: grey to black, grey- and brown-weathering, thin- to thick-bedded, commonly laminated, dolomitic, silty, with bioclastic debris, local intraclasts, crosslamination, ripples; argillite: dark grey with limestone nodules; argillaceous limestone: dark grey to black, cleaved, locally phyllitic, laminated, dolomitic, pyritic; argillite: black, cleaved, commonly slightly calcareous; minor dolostone: dark grey, orange-brown-weathering, thin- to thick-bedded, calcareous, commonly laminated; and argillite: dark grey to black, rusty-weathering, laminated, siliceous, with stratiform pyrite locally common; carbonate rocks form distinctive colour banded units (upper part, lower part not exposed).

PALEOZOIC

PF — **Fenwick sill -** diorite: green-grey, brown-weathering, medium-grained, extensive chlorite alteration, minor epidote alteration; locally abundant pyrite; pyrrhotite; minor chalcopyrite; common quartz veins.

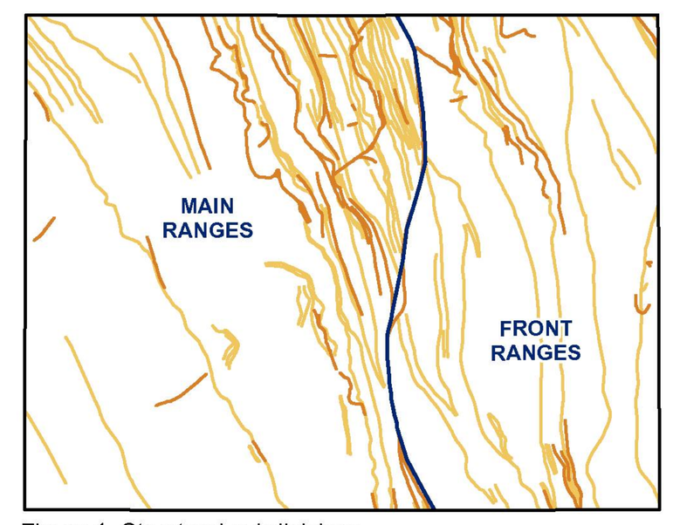


Figure 1. Structural subdivisions

MINFILE No.	NAME	STATUS	COMMODITY
082JSE014	Vincent Option	Prospect	Coal
082JSW029	Forsyth Creek North	Showing	Phosphate
082JSW030	Forsyth Creek South	Showing	Phosphate

Table 1. British Columbia MINFILE occurrences

REFERENCES

Morris, R.J. and Grieve, D.A., 1990. Geology of the Elk Valley Coalfield north half (Henrietta Creek to Elk Lakes); British Columbia Geological Survey, Ministry of Energy, Mines and Petroleum Resources, Preliminary Map 68, sheet 6, scale 1:10 000.

Mott, J.A., 1989. Structural and stratigraphic relations in the White River region, eastern Main Ranges, southern Rocky Mountains, British Columbia; Ph.D. thesis, Queen's University, Kingston, 404 p.

Recommended citation:
McMechan, M.E., 2011. Geology, Mount Abruzzi, British Columbia; Geological Survey of Canada, Canadian Geoscience Map 10, scale 1:50 000. doi:10.4095/288142

CANADIAN GEOSCIENCE MAP 10

Author: M.E. McMechan

Geology by M.E. McMechan, 2008–2011, based on ground and air observations by G.B. Leech, 1963–1965, M.E. McMechan, 1988, 2006–2008; ground observations by J.D. Aitken, 1963, R.B. Best, 1963, R.G. Greggs, 1964, R.D. McMechan, 2007, and C.K. Roberts, 1963; unpublished Ph.D. thesis by J.A. Mott, 1989; published orthophoto geological map by R.J. Morris and D.A. Grieve, 1990; and studies of vertical air photographs and high-resolution orthorectified satellite images by M.E. McMechan, 2006–2010

Geological compilation by M.E. McMechan, 2009–2010

Cartography by E. Macey

Scientific editing by E. Inglis

Conducted under the auspices of the Targeted Geoscience Initiative (TGI3)

GEOLOGY
MOUNT ABRUZZI
British Columbia
1:50 000

1 0 1 2 3 4 km

Map projection Universal Transverse Mercator, zone 11.
North American Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.
Elevations in feet above mean sea level

Mean magnetic declination 2011, 15°33'E, decreasing 12.0' annually

The Geological Survey of Canada welcomes corrections or additional information from users

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Canadian Geoscience Maps
Cartes géoscientifiques du Canada

Canada

CANADIAN GEOSCIENCE MAP 10
GEOLOGY
MOUNT ABRUZZI
British Columbia

Four trim marks around perimeter of map sheet. Trim map sheet first, then fold at folding marks.

Cover is 17cm wide when folded.

Second panel when folded is also 17cm wide.

Subsequent panels when folded are 17cm wide or less.