BRITISH COLUMBIA
Ministry of Energy, Mines and Petroleum Resources
Mining and Minerals Division

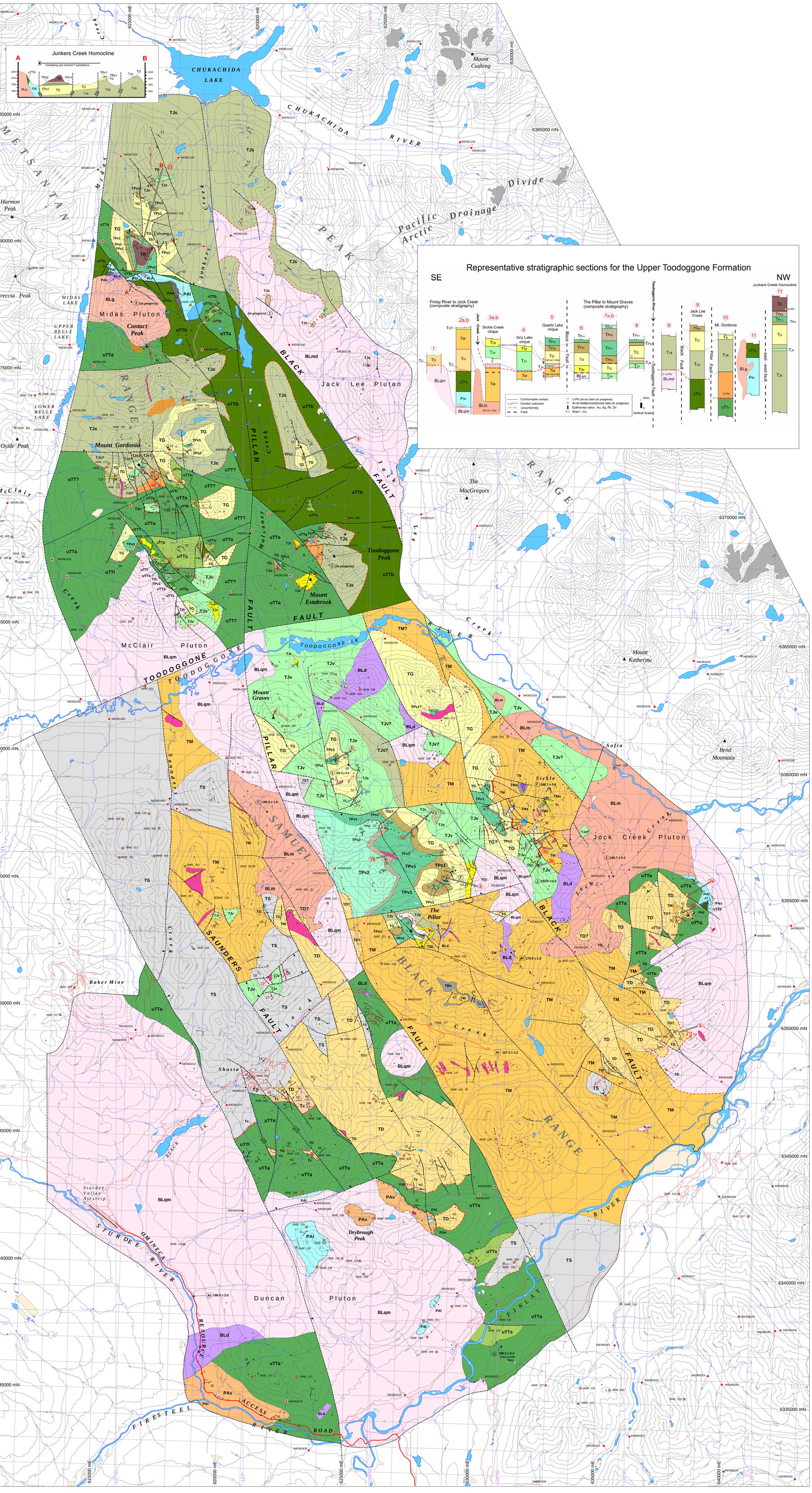
British Columbia Geological Survey
OPEN FILE MAP 2006-4

GEOLOGY BETWEEN THE FINLAY RIVER AND CHUKACHIDA LAKE, CENTRAL TOODOGGONE RIVER MAP AREA, NORTH-CENTRAL BRITISH COLUMBIA (PARTS OF NTS 94E/2, 6, 7, 10 AND 11)

Geology by Larry J. Diakow
With contributions from Ryan Rhodes and April Barrios

Scale 1:50 000

0 1 2
kilometres



Representative stratigraphic sections for the Upper Toodoggone Formation

EARLY JURASSIC

HAZELTON GROUP

UPPER TOODOGGONE FORMATION

Belle member

TB — Rhyolite ignimbrite; locally very thick (150m minimum); welded columnar jointed exposures.

Pillar member

TPv2 — Andesite porphyry lava flows containing minor chlorite-altered pyroxene, scarce laminated dacitic flows.

TPs2 — Lapilli tuff, lithic crystal tuff and minor accretionary lapilli tuff, minor tuffaceous sandstone and conglomerate; well bedded.

TPv1 — Basaltic andesite and andesite porphyry lava flows containing up to 3% subvitreous clinopyroxene phenocrysts, rare limestone lenses near the base.

TPs1 — Tuffaceous sandstone, siltstone and conglomerate; interlayered fine tuffs, lapilli tuffs and lesser tuff breccia, minor accretionary lapilli tuff; well bedded.

Graves member

TG — Dacite ash-flow tuff, light green to maroon, texturally variable including nonwelded, locally lithic rich, and thick (100-150m) welded columnar jointed zones; diagnostic accidental pyroclasts include pink quartz-biotite dacite porphyry and biotite-hornblende quartz monzonite; rare cross-laminated ground surge tuff or layered fallout ash and fine lapilli tuff at the base.

TGr — Rhyolitic flows and related monolithic flow breccias; maroon to reddish-brown; flow laminated, spherulitic crystallization widespread; thin fallout ash tuff locally at the base yields a U-Pb date of 192.0+1/-2 Ma.

Junkers member (renamed after Quartz Lake member)

Debris flow or volcanic conglomerate; subangular to rounded boulders of monolithic medium-grained andesite porphyry, reddish oxidized muddy matrix, interbeds of sandstone and siltstone; similar conglomeratic rocks west of the Pillar Fault are unconformable on unit TS.

TJv — Basalt and andesite lava flows characterized by crowded plagioclase 1mm long or less and relatively fresh pyroxene.

TJr — Dacite to rhyolite lava flows; lenticular; commonly flow-laminated deposits.

TJs — Conglomerate and sandstone dominated by fine grained basaltic detritus that is presumably derived in part from units TJv or uTTa; reworked polymict lapilli tuffs and volcanic breccias; heterolithic unit comprising diffusely layered very thick beds.

LOWER TOODOGGONE FORMATION

Unassigned; lapilli tuff, tuff breccia and lesser dacitic lava flows containing trace amounts of quartz and titanite.

Saunders member

TS — Dacite ash-flow tuff; grey-green, up to 55% crystal fragments of plagioclase, quartz, hornblende and biotite; diagnostic juvenile porphyritic vitriclasts; widespread moderate to strong welded fabric.

Metsantan member

TM — Andesite lava flows; grey-green to light purple, 15-25% plagioclase 2-5mm long; sparse chlorite-altered hornblende and pyroxene, trace amounts of biotite and rare quartz phenocrysts.

TMs — Feldspathic sandstone, minor mudstone.

Duncan member

TD — Lapilli tuffs with volcaniclastic-epiclastic interbeds; greenish with oxidized reddish sections, pyroclasts commonly consist of reddish brown andesite porphyries mixed with plagioclase and up to 2% oxidized copper coloured biotite and quartz crystal fragments, interbeds of sandstone, siltstone and maroon mudstone, rare boulder conglomerate near the base.

Tc — Conglomerate locally at the base of the Toodoggone Formation; poorly sorted rounded clasts to boulder size dominated by crowded fine-grained hornblende andesite porphyry, locally contains distinctive megacrystic basalt porphyry (unit uTTb), limestone (unit PAl) and granitoid clasts; crudely layered thick beds interlayered with subordinate sandstone and siltstone.

LATE TRIASSIC

TAKLA GROUP

uTTa — Basalt and andesite lava flows; typically fine to medium grained clinopyroxene-plagioclase porphyries and aphanitic lavas; typically massive and inherently difficult to subdivide.

uTTb — Megacrystic basalt porphyry lava flows characterized by bladed plagioclase laths between 1 and 3 cm long.

uTTs — Sandstone and siltstone; drab olive green, dominated by plagioclase and lesser pyroxene grains; bedded section between lava flows of unit uTTa; rare discontinuous grey-black laminated limestone up to 1.5 metres thick (unit uTTl).

LATE CARBONIFEROUS TO EARLY PERMIAN

ASITKA GROUP

PAs — Grey chert interbedded with black siltstone and mudstone; gradationally overlies limestone at the top of the Asitka Group.

PAl — Limestone; off white, light grey weathering; recrystallized; contains poorly preserved rugose corals.

PAv — Dacitic lapilli tuff with aphanitic greyish-white felsic fragments, grey-green to dark purple, rare accretionary lapilli tuff, porphyritic sparse quartz-phyric andesite and dacite-rhyolite lava flows.

EARLY JURASSIC

BLACK LAKE INTRUSIVE SUITE

STOCKS

BLqm — Quartz monzonite; pink, medium to coarse inequigrannular subhedral plagioclase, potassium feldspar and 10-20% anhedral quartz, and variably chlorite-altered hornblende (10-15%) and biotite (3-5%).

BLm — Monzonite; orange to pink, coarse inequigranular to porphyritic texture, subhedral plagioclase enclosed by fine grained interstitial potassium feldspar and typically less than 5% quartz, anhedral chloritized hornblende and biotite.

BLmd — Hornblende monzodiorite; medium to coarse inequigranular texture; widespread epidote-chlorite±hematite alteration; minor malachite within fractures.

BLg — Granite; pink, medium-grained equigranular texture.

BLd — Undifferentiated diorite, quartz diorite, monzodiorite and quartz monzodiorite; clinopyroxene bearing with subordinate to minor hornblende and trace biotite; biotite-rich variants occur locally. Possibly co-magmatic with clinopyroxene-bearing volcanic rocks from units TJv and TPv.

DIKES AND SILLS

Undifferentiated monzonite to quartz monzonite porphyry, quartz-feldspar porphyry dikes; typical orange-pink oxidized plagioclase and groundmass; medium to coarse plagioclase and chlorite altered hornblende and biotite. (Note: Other dike varieties that are locally numerous but too narrow to portray on this map include dark green, aphanitic to amygdaloidal basalt, and flow-laminated rhyolite.)

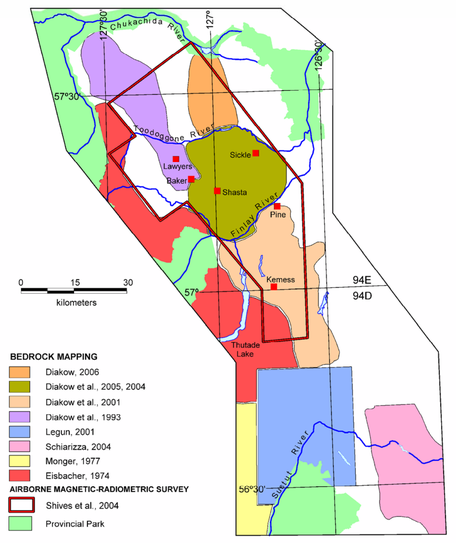
Tb — Dioritic sills.

Tr — Dacite to rhyolite sills, locally flow laminated.

SYMBOLS

- Limit of mapping
- Geological contact (defined, approximate, inferred, inferred from aeromag)
- Unconformity (defined, inferred)
- Normal Fault (ball on down-dropped side; defined, approximate, inferred)
- Reverse Fault (defined, approximate, inferred)
- Wrench Fault (defined, approximate, inferred)
- Bedding (20)
- Welded fabric (17)
- Flow lamination (33)
- Field station (x)
- Isotopic Age determination (in millions of years, Ma)
  - U/Pb (crystallization date) — Z 201.3 ± 0.5
  - Ar/Ar (cooling date) — Ar 200.3 ± 1.2
  - Unreliable date or date not obtainable — Ar Z
- Regional Geochemistry Survey site (RGS) — 94E963432
- MINFILE occurrence and reference number — 094E 131
- Quartz veining (pyrite ± chalcopyrite, galena, pyrrhotite)
- Malachite with or without chalcopyrite
- Skarn (diopside-garnet-magnetite ± chalcopyrite ± pyrrhotite)
- Gossan
- Flooded land
- Ice
- Landslide scarp
- Road (all weather, seasonal)
- Stratigraphic section location (Keyed to inset diagram) — 1

BEDROCK MAPPING STUDIES



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Map Base Information

1:50 000 scale map base produced from TRIM 1:20 000 scale topographic database supplied by LandData B.C. North American Datum (NAD) 83, Latitude/Longitude Projection, UTM Zone 9. Approximate mean magnetic declination (2004) between magnetic north and grid north is 23°4' east, decreasing about 17' annually. Elevations in metres above sea level.

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This map shows new bedrock geology north of the Toodoggone River completed during the summer months of 2005. It adjoins previously published mapping south of the Toodoggone River, incorporating new age determinations and minor updates to the geology.

Recommended Citation:

Diakow, L. J. (2006): Geology between the Finlay River and Chukachida Lake, Central Toodoggone River Map Area, North-central British Columbia (Parts of NTS 94E/2, 6, 7, 10 and 11); B.C. Ministry of Energy, Mines and Petroleum Resources, Open File Map 2006-4, 1:50 000 scale.