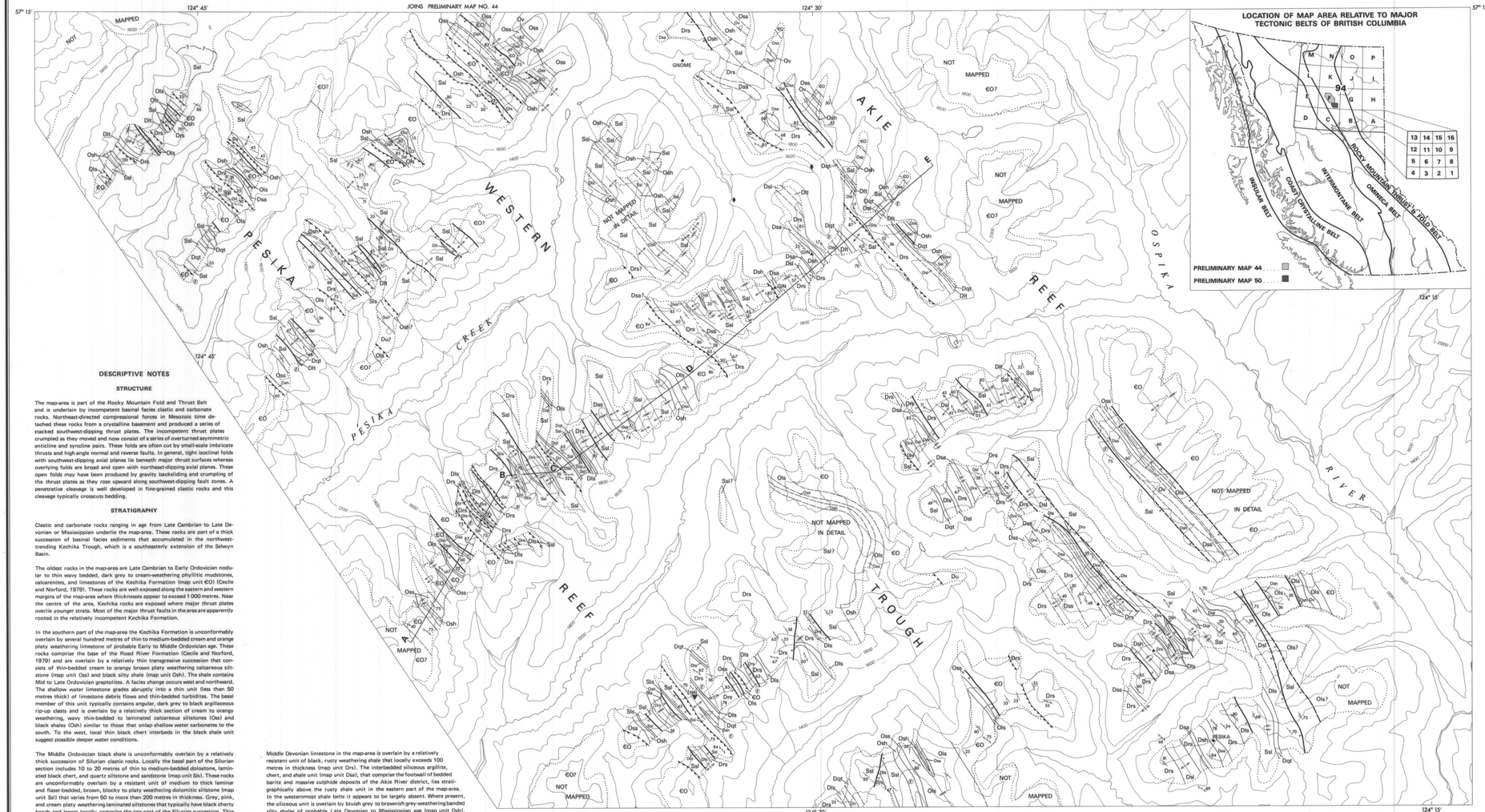

DESCRIPTIVE NOTES

STRUCTURE

The map-area is part of the Rocky Mountain Fold and Thrust Belt and is underlain by incompetent basinal facies clastic and carbonate rocks. Northeast-directed compressional forces in Mesozoic time detached these rocks from a crystalline basement and produced a series of stacked southwest-dipping thrust plates. The incompetent thrust plates crumpled as they moved and now consist of a series of overturned asymmetric anticline and syncline pairs. These folds are often cut by small-scale imbricate thrusts and high angle normal and reverse faults. In general, tight isoclinal folds with southwest-dipping axial planes lie beneath major thrust surfaces whereas overlying folds are broad and open with northeast-dipping axial planes. These open folds may have been produced by gravity backsliding and crumpling of the thrust plates as they rose upward along southwest-dipping fault zones. A penetrative cleavage is well developed in fine-grained clastic rocks and this cleavage typically crosscuts bedding.

STRATIGRAPHY

Clastic and carbonate rocks ranging in age from Late Cambrian to Late Devonian or Mississippian underlie the map-area. These rocks are part of a thick succession of basinal facies sediments that accumulated in the northwest-trending Kechika Trough, which is a southeasterly extension of the Selwyn Basin.

The oldest rocks in the map-area are Late Cambrian to Early Ordovician nodular to thin wavy bedded, dark grey to cream-weathering phyllitic mudstones, calcarenites, and limestones of the Kechika Formation (map unit €O) (Cecile and Norford, 1979). These rocks are well exposed along the eastern and western margins of the map-area where thicknesses appear to exceed 1 000 metres. Near the centre of the area, Kechika rocks are exposed where major thrust plates overlie younger strata. Most of the major thrust faults in the area are apparently rooted in the relatively incompetent Kechika Formation.

In the southern part of the map-area the Kechika Formation is unconformably overlain by several hundred metres of thin to medium-bedded cream and orange platy weathering limestone of probable Early to Middle Ordovician age. These rocks comprise the base of the Road River Formation (Cecile and Norford, 1979) and are overlain by a relatively thin transgressive succession that consists of thin-bedded cream to orangy brown platy weathering calcareous siltstone (map unit Oss) and black silty shale (map unit Osh). The shale contains Mid to Late Ordovician graptolites. A facies change occurs west and northward. The shallow water limestone grades abruptly into a thin unit (less than 50 metres thick) of limestone debris flows and thin-bedded turbidites. The basal member of this unit typically contains angular, dark grey to black argillaceous rip-up clasts and is overlain by a relatively thick section of cream to orangy weathering, wavy thin-bedded to laminated calcareous siltstones (Oss) and black shales (Osh) similar to those that onlap shallow water carbonates to the south. To the west, local thin black chert interbeds in the black shale unit suggest possible deeper water conditions.

The Middle Ordovician black shale is unconformably overlain by a relatively thick succession of Silurian clastic rocks. Locally the basal part of the Silurian section includes 10 to 20 metres of thin to medium-bedded dolostone, laminated black chert, and quartz siltstone and sandstone (map unit Sls). These rocks are unconformably overlain by a resistant unit of medium to thick laminar and flaser-bedded, brown, blocky to platy weathering dolomitic siltstone (map unit Sal) that varies from 50 to more than 200 metres in thickness. Grey, pink, and cream platy weathering laminated siltstones that typically have black cherty bands and lenses locally comprise the top part of the Silurian succession. Thin intercalations of black chert and limestone occur immediately below an Early Devonian unconformity. The composition and thickness of the Silurian succession suggest a significant increase in the amount of clastic detritus deposited in the Kechika Trough at this time. Much of this detritus was probably derived by uplift and extensive erosion of platformal rocks bounding the trough.

Stratigraphy of Devonian rocks in the map-area is a continuation of that observed to the north (MacIntyre, 1981). The lower part of the succession locally includes a unit of medium to thick-bedded quartz siltstone, sandstone, and conglomerate (map unit Dqt) that unconformably overlies Silurian siltstone. The quartzose unit grades up-section into interbedded calcarenites, limestone debris flows, and black shales with well-preserved Pragian graptolites (identification by B. Norford, Geol. Surv., Canada, Calgary) (map unit Dlt). These calcareous turbidites are presumably derived from a Lower Devonian limestone unit that was extensively eroded prior to late Early Devonian time. Basinward and up-section the calcareous turbidites grade into black calcareous siltstones (map unit Dsl) and silty shales (map unit Dss) with thin intercalations of black chert and pelagic limestone. The stratigraphic succession suggests progressively deeper water conditions with time, perhaps due to an Early Devonian episode of crustal subsidence.

A unit of medium to thick-bedded shallow water limestone (map unit Dls) unconformably overlies Early Devonian clastic rocks. This limestone varies in thickness from more than 200 metres in the core of the Pesika and Akie Reefs to less than a metre in adjacent troughs. Bioclastic beds rich in crinoid ossicles with double axial canals (two holers) typically occur near the top of the unit. Abundance of such ossicles generally indicates an early Middle Devonian age (Taylor and MacKenzie, 1970).

Middle Devonian limestone in the map-area is overlain by a relatively resistant unit of black, rusty weathering shale that locally exceeds 100 metres in thickness (map unit Drs). The interbedded siliceous argillite, chert, and shale unit (map unit Dsa), that comprise the footwall of bedded barite and massive sulphide deposits of the Akie River district, lies stratigraphically above the rusty shale unit in the eastern part of the map-area. In the westernmost shale belts it appears to be largely absent. Where present, the siliceous unit is overlain by bluish grey to brownish grey-weathering banded silty shales of probable Late Devonian to Mississippian age (map unit Dsh). In the westernmost exposures of the Devonian section beds of sandstone, siltstone, and conglomerate occur stratigraphically above the siliceous unit within the Late Devonian transgressive shale sequence (Dsh). In the same area a 1-metre-thick greenish grey to orange-weathering pyritic tuff bed occurs in unit Dss. The rusty shale (Drs) and siliceous (Dsa) units represent a period of starved basin sedimentation that preceded a period of tectonic and exhalitive activity that occurred at the beginning of a major Late Devonian episode of progressive, eastward advancing crustal subsidence. Concomitant crustal uplift and volcanism occurred to the west, shedding coarse clastics eastward into the trough.

MINERAL OCCURRENCES

Widespread Late Devonian baritic and/or pyritic siliceous exhalite, which is ubiquitous north of the Akie River, appears to be only locally present in the map-area. It is exposed on Cyprus Anvil Corporation's GIN claims and Cominco Ltd.'s PESIKA claims but surface mineralization is restricted to thin beds and laminae of nodular and massive barite. These occurrences are on strike with a long belt of barite-sulphide occurrences that extend northward to the Driftpile Creek district. The deposits appear to have formed in a linear, structurally controlled trough that was bounded by the Akie and Pesika reefs.

Cominco's ERN showing consists of stratabound massive pyrite in a brecciated quartzite host. The quartzite is interbedded with dark grey calcareous siltstones, black chert, and limestone. Similar rocks observed elsewhere in the map-area typically occur near the top of the Silurian section, immediately below the Lower Devonian quartzite unit. A similar stratigraphic position is suggested for the ERN showing.

ACKNOWLEDGMENTS

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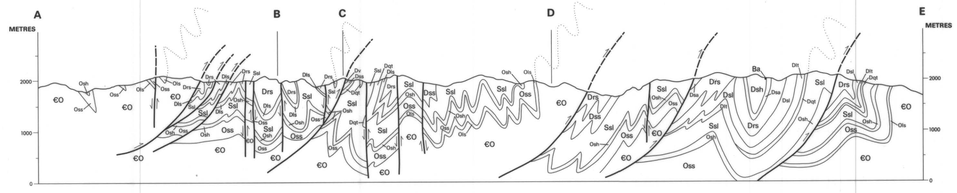
INTERPRETIVE STRUCTURAL SECTION



Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

PRELIMINARY MAP NO. 50

GEOLOGY OF THE AKIE RIVER Ba–Pb–Zn MINERAL DISTRICT

(N.T.S. 94F/1 & 2)

GEOLOGY BY D. MacINTYRE, 1981
CARTOGRAPHY BY P. CHICORELLI

SCALE 1:50 000

KILOMETRES 1 0 1 2 3 4 KILOMETRES

LEGEND

DEVONIAN

Du — UNDIFFERENTIATED; MAINLY SHALE, SILTY SHALE, AND SILTSTONE; MAY INCLUDE LIMESTONE AND SILICEOUS ARGILLITE

UPPER DEVONIAN

Dsh — BLUE–GREY TO CREAMY BROWN–WEATHERING BLACK SILTY SHALE; LOCALLY WELL LAMINATED; MINOR PYRITE AND NODULAR BARITE NEAR BASE OF UNIT; COARSE CLASTIC INTERBEDS IN WEST–ERNMOST EXPOSURES; RECESSIVE

MIDDLE/UPPER DEVONIAN

Dsa — LIGHT BLUISH GREY TO DARK GREENISH GREY BLOCKY WEATHERING, RHYTHMICALLY BEDDED, LAMINATED SILICEOUS ARGILLITE, BANDED CHERT, SILICEOUS SHALE, LAMINATED SILICEOUS SILTY SHALE, AND SILTSTONE; LOCALLY CON–TAINS BEDDED AND NODULAR BARITE NEAR TOP OF UNIT; RESISTANT

Drs — DARK GREY, RUSTY WEATHERING, BLACK SILTY SHALE; FAINT SILT LAMINAE ON FRESH SURFACE; LOCALLY PYRITIC; MODERATELY RESISTANT

MIDDLE DEVONIAN

Dls — LIGHT GREY, BLOCKY WEATHERING, MEDIUM TO THICK–BEDDED, DARK GREY ARGILLACEOUS LIMESTONE; FOSSILIFEROUS; TWO HOLE CRINOID OSSICLES OCCUR NEAR TOP OF UNIT; RESISTANT

LOWER/MIDDLE DEVONIAN

Dss — DARK GREY TO BROWN–WEATHERING, THIN–BEDDED TO LAMINATED OR CROSSLAMINATED BLACK SILTY SHALE WITH MINOR DARK GREY ARGILLACEOUS SILTSTONE AND THIN ORANGE–WEATHERING CALCARENITE INTERBEDS; GREEN PYRITIC TUFF (Dv) INTERBEDS IN WESTERNMOST EXPOSURES; RECESSIVE

Dsl — DARK GREY, BLOCKY TO SLABBY WEATHERING, THIN TO MEDIUM–BEDDED, LAMINATED AND CROSSLAMINATED SILTSTONE AND SANDSTONE WITH THIN ARGILLACEOUS INTERBEDS; MINOR BLACK CHERT; MODERATELY RESISTANT

Dlt — LIGHT GREY, BLOCKY WEATHERING, MEDIUM TO THICK–BEDDED LIMESTONE TURBIDITES AND DEBRIS FLOWS WITH INTERBEDDED QUARTZ SILTSTONE AND GRAPTOLITIC BLACK SHALE; RESISTANT

LOWER/MIDDLE DEVONIAN *(CONTINUED)*

Dqt — MEDIUM GREY, BLOCKY WEATHERING, MEDIUM TO THICK–BEDDED, QUARTZ SILTSTONE, SAND–STONE, AND PEBBLE CONGLOMERATE; MINOR INTERBEDDED ARGILLACEOUS LIMESTONE AND BLACK SHALE; RESISTANT

SILURIAN

ROAD RIVER FORMATION

Sal — BROWN TO ORANGE, PLATY TO BLOCKY WEATH–ERING, MASSIVE THICK–BEDDED TO THIN FLASER–BEDDED, DOLOMITIC SILTSTONE; MINOR GREY LAMINATED LIMESTONE AND/OR DOLOSTONE IN–TERBEDS; WORM BURROWS AND FEEDING TRAILS COMMON; RESISTANT

Sls — GREY TO ORANGY GREY, BLOCKY WEATHERING, MASSIVE THICK TO MEDIUM–BEDDED LIMESTONE AND/OR DOLOSTONE; OVERLAIN BY GREY PLATY WEATHERING THIN–BEDDED LAMINATED TO CROSSLAMINATED LIMESTONE AND DOLOSTONE WITH INTERBEDDED BLACK CHERT AND MINOR SILTY SHALE; RESISTANT

ORDOVICIAN *UPPER*

MIDDLE/ORDOVICIAN

Osh — DARK GREY TO BLUISH GREY–WEATHERING BLACK SHALE; CONTAINS MIDDLE ORDOVICIAN GRAPTOLITE ASSEMBLAGES; VERY RECESSIVE

Ov — ORANGE–WEATHERING CRYSTAL, LITHIC, AND LAPILLI TUFF; RESISTANT

LOWER TO MIDDLE ORDOVICIAN

Oss — LIGHT ORANGY BROWN TO CREAM–WEATHERING, LAMINATED, CALCAREOUS SHALE, DARK GREY ARGILLACEOUS SILTSTONE, AND THIN PLATY WEATHERING LAMINATED LIMESTONE; RECESSIVE

Ols — LIGHT GREY TO YELLOWISH WEATHERING, MED–IUM TO THIN–BEDDED OR LAMINATED TO CROSS–LAMINATED LIMESTONE; MINOR DARK GREY SILTY SHALE INTERBEDS; GRADES INTO GREY BLOCKY WEATHERING MEDIUM TO THICK–BEDDED LIMESTONE DEBRIS FLOWS WITH ANGULAR DARK GREY ARGILLACEOUS CLASTS; RESISTANT

CAMBRIAN/ORDOVICIAN

KECHIKA FORMATION

€O — DARK GREY TO BEIGE–WEATHERING, NODULAR, TALCY, PHYLLITIC MUDSTONE AND SILTSTONE; MINOR GREEN TUFF HORIZONS; RESISTANT

SYMBOLS

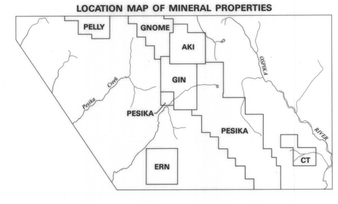
BEDDING: INCLINED, VERTICAL, OVERTURNED
CLEAVAGE: INCLINED
MINOR FOLD AXIS, PLUNGE
ANTICLINE, SYNCLINE
OVERTURNED ANTICLINE, OVERTURNED SYNCLINE
THRUST FAULT: DEFINED, ASSUMED
NORMAL FAULT: DEFINED, ASSUMED; BALL ON DOWNTHROWN SIDE
SHEAR ZONE
AREA OF ABUNDANT OUTCROP
GEOLOGICAL CONTACT: DEFINED, ASSUMED
MASSIVE PYRITE
BEDDED BARITE OCCURRENCE
NODULAR BARITE OCCURRENCE
IRON SEEP OR GOSSAN
FOSSIL LOCALITY
CONTOUR (200-METRE INTERVAL)

INDEX TO MINERAL PROPERTIES

NAME	OWNER/ OPERATOR	WORK DONE	SHOWINGS	REFERENCE
PELLY	Cominco	mapping		*A.R. 8451
GNOME	Cominco	soil and silt geochem mapping	nodular barite	A.R. 8334
AKI	Aquitaine	soil and silt geochem mapping		
GIN	Cyprus/HBOG	soil sampling	nodular barite	A.R. 8369
PESIKA	Cominco	soil sampling	bedded and nodular barite	A.R. 8329
ERN	Cominco	soil sampling; trenching	massive pyrite	
CT	Cominco	soil sampling		

*A.R. = Assessment Report

LOCATION MAP OF MINERAL PROPERTIES



PRELIMINARY MAP NO. 50
GEOLOGY OF THE AKIE RIVER Ba–Pb–Zn MINERAL DISTRICT
(N.T.S. 94F/1 & 2)
ISSUED MAY 1982