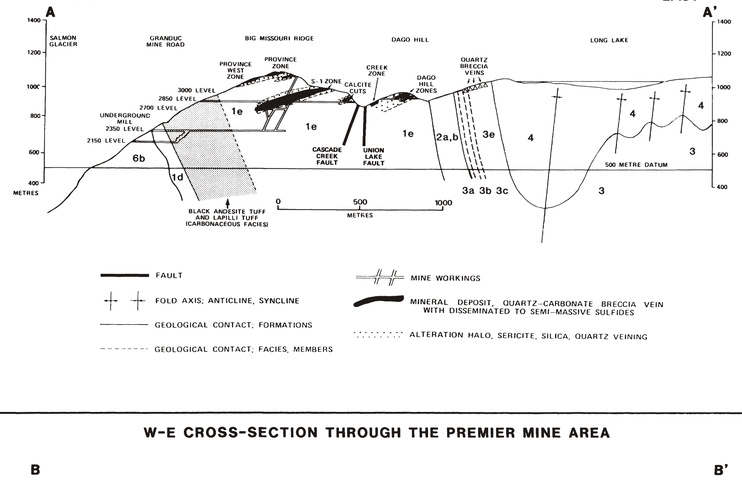
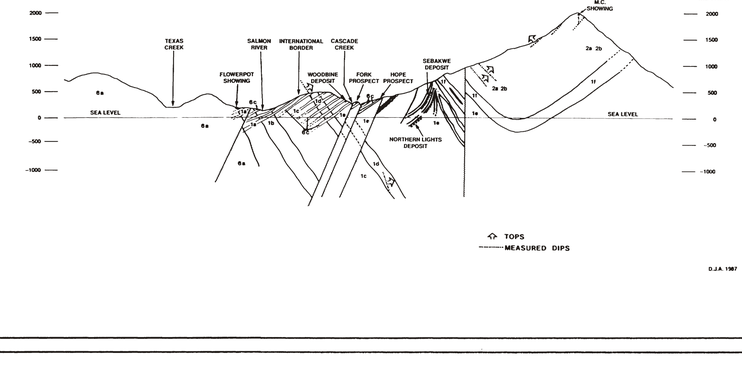
MAP 1: GEOLOGY AND MAJOR MINERAL DEPOSITS

W-E CROSS-SECTION THROUGH THE BIG MISSOURI MINE AREA



W-E CROSS-SECTION THROUGH THE PREMIER MINE AREA



BC Ministry of Energy, Mines and Petroleum Resources
GEOLOGICAL SURVEY BRANCH

OPEN FILE MAP 1987–22

GEOLOGY AND MINERAL DEPOSITS OF THE SALMON RIVER VALLEY STEWART AREA

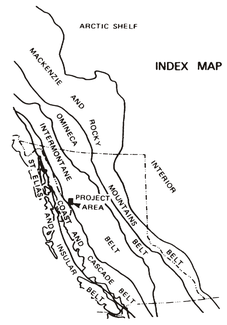
NTS 104A AND 104B

GEOLOGY AND COMPILATION BY D.J. ALLDRICK

SCALE 1:50 000

Miles 1 0 1 2 3
Metres 1000 0 1000 2000 3000 4000
Yards 1000 0 1000 2000 3000 4000

INDEX MAP



MAGNETIC DECLINATION: 29° E

LEGEND

INTRUSIVE ROCKS

TERTIARY

OLIGOCENE

9 Lamprophyre Dykes (narrow, not shown) — 25.2 ± 1 Ma K/Ar, Biotite, UBC

LATE EOCENE

8 Microdiorite Dykes (narrow, not shown)

EARLY TO MIDDLE EOCENE

HYDER QUARTZ MONZONITE SUITE

7d HYDER BATHOLITH: Biotite quartz monzonite to granodiorite, golden sphene, ± hornblende, medium to coarse-grained, locally feldspar-porphyritic. (Outcrops to southwest of map sheet) — 48.8 ± 2 Ma K/Ar, Biotite, USGS

7c BOUNDARY STOCK: Biotite granodiorite, golden sphene, ± hornblende, medium-grained — 50.8 ± 2 Ma K/Ar, Hornblende, USGS

7b MINERAL HILL STOCK: Plagioclase porphyritic, biotite + hornblende quartz monzonite

7a HYDER DYKES: Plagioclase porphyritic, biotite or biotite + hornblende granodiorite — 54.8 ± 1.3 Ma U/Pb, Zircon, GSC

JURASSIC

EARLY JURASSIC

TEXAS CREEK GRANODIORITE SUITE

6e TEXAS CREEK DYKES: Orthoclase + hornblende porphyritic granodiorite coarse-grained groundmass (narrow, not shown) — 189.2 ± 2.2 Ma U/Pb, Zircon, UBC

6d SUMMIT LAKE STOCK: Coarse-grained hornblende granodiorite — 192.8 ± 2 Ma U/Pb, Zircon, UBC

6c PREMIER PORPHYRY DYKES: Orthoclase ± hornblende porphyritic granodiorite, fine-grained chloritic groundmass. Abundant in Premier Mine area (narrow, not shown) — 194.8 ± 2 Ma U/Pb, Zircon, UBC

6b TEXAS CREEK BATHOLITH (PORPHYRY PHASE): Orthoclase ± hornblende porphyritic granodiorite, coarse-grained groundmass — 195.0 ± 2 Ma U/Pb, Zircon, UBC

6a TEXAS CREEK BATHOLITH: Coarse-grained hornblende granodiorite — 206.5 ± 6 Ma K/Ar, Hornblende, USGS

VOLCANIC AND SEDIMENTARY ROCKS

QUATERNARY

RECENT

5 Alluvium, glacial outwash and glacial lake sediments

TRIASSIC–JURASSIC

HAZELTON GROUP

MIDDLE JURASSIC (TOARCIAN TO BAJOCIAN)

SILTSTONE SEQUENCE (SALMON RIVER FORMATION)

4b Carbonaceous and calcareous thin to medium-bedded siltstone, shale, argillite and sandstone with minor conglomerate and limestone — Toarcian to Bajocian

4a BASAL MEMBER: Grey to black grits; ash-rich siltstone, sandstone, argillite and limestone, with minor fossiliferous limestone, pumice conglomerates and weakly pyritic units, ≤ 10 metres thick — Toarcian

LOWER JURASSIC (TOARCIAN)

FELSIC VOLCANIC SEQUENCE (MOUNT DILWORTH FORMATION)

3e BLACK TUFF: Lateral equivalent to 3d; felsic carbonaceous tuff, crystal tuff and lapilli tuff with limestone, pumice and pyrite clasts; minor interbedded sediments

3d PYRITIC LAPILLI TUFF: Lateral equivalent to 3e; siliceous airfall lapilli tuff to tuff breccia with 5% to 15%, disseminated pyrite. Strong gossan development (Map 2)

3c UPPER LAPILLI TUFF: Siliceous massive airfall lapilli tuff to tuff breccia, partially welded, cream to dark grey

3b MIDDLE WELDED TUFF: Variably welded felsic ash flows with lapilli, flammé to pumice gradations; single and compound cooling units, cream to maroon

3a LOWER DUST TUFF: Aphanitic felsic airfall tuff, strongly coloured cream, grey, olive-grey, turquoise, maroon and purple

LEGEND (Continued)

VOLCANIC AND SEDIMENTARY ROCKS

TRIASSIC–JURASSIC

HAZELTON GROUP

LOWER JURASSIC (PLIENSBACHIAN TO TOARCIAN)

COARSE CLASTIC SEQUENCE (BETTY CREEK FORMATION)

2b ANDESITE TO DACITE TUFFS AND FLOWS: Interbedded with 2a; ash tuffs, crystal tuffs, lapilli tuffs, tuff breccias; minor porphyritic flows and welded ash flows, green to grey

2a SEDIMENTARY ROCKS: Interbedded with 2b; hematitic conglomerate, grit, sandstone, siltstone, mudstone, minor limestone; maroon to purple

UPPER TRIASSIC TO LOWER JURASSIC (NORIAN TO PLIENSBACHIAN)

ANDESITE SEQUENCE (UNUK RIVER FORMATION)

1g AUGITE PORPHYRY FLOWS: Massive pyroxene-porphyritic andesite; dark green

1f PREMIER PORPHYRY FLOWS: Orthoclase megacrystic plagioclase + hornblende porphyritic andesite, fine-grained groundmass; green, maroon, purple, grey, black; local tuff breccia facies — 194.8 ± 2 Ma correlated with dykes

1e UPPER ANDESITE TUFFS: Dust, ash, crystal and lapilli tuff and tuff breccia, with local welded tuff, intercalated hematitic sediment lenses (1es). Basal unit is black, carbonaceous andesite ash tuff and lapilli tuff, 1ab — 210 ± 7 Ma U/Pb, Zircon, UBC

1d UPPER SILTSTONE MEMBER: Carbonaceous thin-bedded argillite, siltstone, sandstone, with local basal conglomerate, 1dc, and coralline limestone, 1dl

1c MIDDLE ANDESITE TUFFS: Mainly ash tuffs, lesser dust and lapilli tuffs, interbedded augite porphyry, 1ca, and two-feldspar porphyry flows, minor graded sandstone, 1csd, and siltstone, 1csl

1b LOWER SILTSTONE MEMBER: Carbonaceous thin-bedded argillite, siltstone

1a LOWER ANDESITE TUFFS: Ash tuffs

ALTERATION (Map 2)

SERICITE + CARBONATE + PYRITE (gossanous)

DISSEMINATED PYRITE (gossanous)

SYMBOLS

GEOLOGICAL CONTACT: Defined, approximate, assumed

BEDDING, TOP KNOWN: Inclined, vertical, overturned

BEDDING, TOP UNKNOWN: Inclined, vertical

BEDDING: Compiled from other studies

FOLD AXIAL TRACE: Syncline, anticline

Minor folds

Lineation

FOLIATION: Inclined, vertical

FOLIATION: Compiled from other studies

FAULT: Defined, approximate, assumed

Margins of major dyke swarms

Air photo linear, (assumed fault)

Fossil locality (F)

MINERAL PRODUCER: Past production >10 tonnes (Map 1, Table 1)

MINERAL OCCURRENCE: Outcropping, blind (Map 2, Table 2)

Placer workings

Topographic contour (100-metre intervals)

Surveyed elevation (metres)

ROADS: In use, abandoned

TABLE 1: PRODUCTION DATA AND RESERVES FOR MAJOR DEPOSITS (MAP 1)

PROPERTY (MINFILE NO.)	MAP NO.	DATE	PAST PRODUCTION (TONNES)	PRESENT RESERVES (TONNES)	GRADES Au gm/T	Ag gm/T	Cu %	Pb %	Zn %	WO_3 %
EAST GOLD (104B-33)	3	1939-1954	43.5		1207	3313	0.07	4.8	1.3	
SCOTTIE GOLD (104B-34)	12	1981-85 1987	197 522	120 026 (geological)	16.5 19.2	16				
SPIDER (104A-10)	28	1925, 1933-36	22.2		14.2	8238		3.5	3.9	
SILVER TIP (104B-43)	36	1915, 1950, 1951 1957	26.3	816	11.8 4.8	2610 970.3		14 4.2	19 6.2	
BIG MISSOURI (104B-46)	50	1938-42	768 943		2.37	2.13		trace	trace	
BIG MISSOURI GROUP (104B-92, -84, -147, -45)	33, 48, 53, 55	1987		1 639 065 (mineable)	3.05	40.11				
DAGO HILL (104B-45	55	1934, 1950	13.6		48	3952	0.12	0.46		
INDIAN (104B-31)	76	1925, 1952	12 870		3.04	119.7		4.4	5.5	
PREMIER GROUP	82, 87, 88, 89	1919-53, 1959-68	4 276 714		13	274	trace	0.66	0.2	
PREMIER (104B-54)	89	1987		5 788 000 (geological)	2.37	92.2				
RIVERSIDE (104B-73)	121	1925, 1927, 1941-50	26 437		2.89	102.1	0.13	3.9	trace	0.12

TABLE 2: MINERAL OCCURRENCES (MAP 2)

MAP NO.	NAME OF OCCURRENCE	MINFILE NUMBER
1	PORTLAND	104B 82
2	MITRE	104B 137
3	EAST GOLD	104B 33
4	TIDE	104B 129
5	HAPPY VALLEY	104B 135
6	GOSSAN BLUFF	104B 134
7	BEND	104B 132
8	INVINCIBLE	
9	BLUEBERRY	104B 133
10	SCOTTIE NORTH	104B 74
11	SHORELINE	
12	SCOTTIE GOLD	104B 34
13	HICK'S	104B 139
14	RAINBOW	104B 75
15	BETTY	104A 08
16	DAISY	104B 140
17	SILVER CLIFF	
18	ST. EUGENE	104B 36
19	TROY	104B 35
20	HARRY	
21	HOLLYWOOD	104B 37
22	LILA	104B 141
23	YELLOWSTONE	104B 39
24	OUTLAND SILVER BAR	104B 30
25	FORTY-NINE	104B 38
26	SILVER CROWN	104A 61
27	OXEDENTAL	104B 142
28	SPIDER	104A 10
29	LION	104B 41
30	SILVER HILL	104B 42
31	SPIDER NO.1	
32	MONTANA	104B 93
33	MARTHA ELLEN	104B 92
34	LOIS	104A 68
35	IRON CAP	104A 90
36	SILVER TIP	104B 43
37	UNICORN	104B 143
38	RAMBLER	
39	M.J.	104A 91
40	AMBER	
41	GOOD HOPE	104B 44
42	MUNRO	104B 47
43	LINDEBORG	104B 144
44	A VEIN	104B 145
45	H VEIN	
46	NORTH STAR	104B 146
47	SILVER BASIN	104B 40
48	S-1	104B 84
49	CREEK	104B 86
50	BIG MISSOURI	104B 46
51	DAY	
52	PROVINCE WEST	104B 136
53	PROVINCE	104B 147
54	CALCITE CUTS	104B 148
55	DAGO HILL	104B 45
56	GOLDEN CROWN	104B 149
57	SHORE	
58	SILVER BUTTE	104B 150
59	TERMINUS	104B 02
60	WHITE HEATHER	
61	START	104B 151
62	MAPLE LEAF	
63	SILVER LAKE	
64	BUSH NO.1	
65	MONITOR	104A 14
66	BOUNDARY	104B 49
67	LAST CHANCE	104B 48
68	LAKESHORE	104A 92
69	DALY-SULLIVAN	104A 73
70	BOUNDARY	104B 152
71	SILVER COIN	104B 95
72	EXTENUATE	
73	HOWDILL	104B 50
74	SUNSHINE	104A 93
75	CANTU	104B 57
76	INDIAN	104B 31
77	MINERAL BASIN	104B 94
78	COBALT	104B 51
79	BUSH MINES	104A 94
80	HOVELAND	
81	PREMIER EXTENSION	104B 52
82	SEBAKWE	104B 153
83	SILVER BAR	
84	WOODBINE	104B 90
85	FORK	
86	HOPE	104B 154
87	NORTHERN LIGHTS	104B 53
88	B.C. SILVER	104B 155
89	PREMIER	104B 54
90	GOLD CLIFF PREMIER	104B 58
91	PICTOU	104B 156
92	SOUTH PICTOU	104B 157
93	BORDER	104B 59
94	SIMCOE	104B 158
95	M.C.	104A 45
96	96 GROUP	104B 159
97	VIRGINIA	104B 60
98	BOUNDARY	104B 160
99	INTERNATIONAL	104B 55
100	STONER	104B 160
101	DALY-ALASKA (LOWER)	104B 61
102	STONER-CLEGG-O'ROURKE	104B 62
103	HOOSIER	
104	DALY-ALASKA (UPPER)	104B 63
105	ALASKA-PREMIER	104B 64
106	CRIPPLE CREEK	104B 67
107	PORTLAND	104B 66
108	HOBO	104B 65
109	HIGH ORE	104B 56
110	BUTTE	104B 68
111	KLINE	
112	ZEBRA	
113	BLUE RIBBON	104B 69
114	HYDER SKOOKUM	104B 70
115	TITAN	104B 71
116	NO.3 IRON	
117	NO.2 IRON	
118	MONARCH	104B 162
119	NO.4 IRON	
120	SHASTA IRON	104B 163
121	RIVERSIDE	104B 72
122	ROANAN	104B 164
123	NO.1 IRON	104B 165
124	RONNIE	
125	JUDY	

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REFERENCES

Alldrick, D.J., Brown, D.A., Harakal, J.E., Mortensen, J.K. and Armstrong, R.L. (1987): Geochronology of the Stewart Mining Camp (104B/1), B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1986, Paper 1987-1, pages 81-92.

Alldrick, D.J., Gabites, J.E., and Godwin, C.I. (1987): Lead Isotope Data from the Stewart Mining Camp (104B/1), B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1986, Paper 1987-1, pages 93-102.

Alldrick, D.J. (1985): Stratigraphy and Petrology of the Stewart Mining Camp (104B/1), B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1984, Paper 1985-1, pages 316-341.

British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Reports.

Brown, D.A. (in preparation): M.Sc. Thesis, Premier Mine Area, The University of British Columbia.

Buddington, A.F. (1929): Geology of Hyder and Vicinity, Southeastern Alaska, United States Geological Survey, Bulletin 807, 124 pages.

Dykes, S.M., Meade, H.D. and Galley, A.G. (1987): Big Missouri Precious-Base Metal Deposit, Northwest British Columbia, Canadian Institute of Mining and Metallurgy, Special Volume 37, pages 202-215.

Galley, A. (1981): Volcanic Stratigraphy and Gold-silver Occurrences on the Big Missouri Claim Group, Stewart, British Columbia, M.Sc. Thesis, University of Western Ontario, 181 pages.

Grove, E.W. (1987): Geology and Mineral Deposits of the Unuk River-Salmon River-Anyox Area, B.C. Ministry of Energy, Mines and Petroleum Resources, Bulletin 58.

.....(1971): Geology and Mineral Deposits of the Stewart area, British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Bulletin 58.

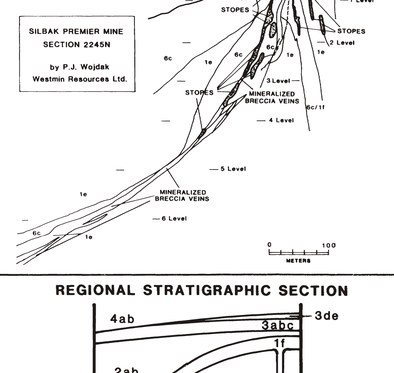
Hanson, G. (1929): Bear River and Stewart Map-areas, Cassiar District, British Columbia, Geological Survey of Canada, Memoir 159, 84 pages.

Schofield, S.J. and Hanson, G. (1922): Geology and Ore Deposits of Salmon River District, British Columbia, Geological Survey of Canada, Memoir 132, 81 pages.

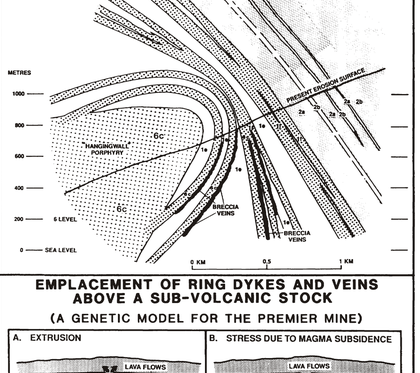
Smith, J.G. (1977): Geology of the Ketchikan D-1 and Bradfield Canal A-1 Quadrangles, Southeastern Alaska, United States Geological Survey, Bulletin 1425, 49 pages.

MAP 2: MINERAL OCCURRENCES, GOSSANS AND TOPOGRAPHIC FEATURES

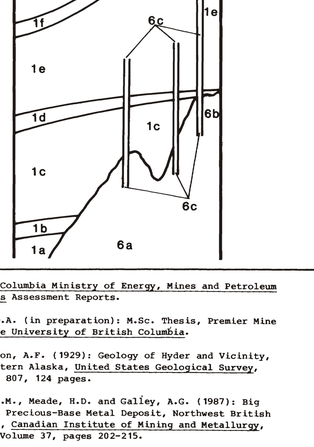
CROSS-SECTION THROUGH THE PREMIER MINE



HYPOTHETICAL PRE-EROSION SECTION THROUGH THE PREMIER MINE



REGIONAL STRATIGRAPHIC SECTION



EMPLACEMENT OF RING DYKES AND VEINS ABOVE A SUB-VOLCANIC STOCK

(A GENETIC MODEL FOR THE PREMIER MINE)