U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Mineral Resource Appraisal of the Salmon National Forest, Idaho

by
Rick Johnson[1], Terry Close[2], and Ed McHugh[3]

Open-File Report
98-478

[1] U.S. Forest Service, Salmon-Challis National Forest, Salmon, Idaho
[2] U.S. Bureau of Mines, Western Field Operations Center, Spokane, Washington
[3] National Institute for Safety and Health, Spokane Research Center, Spokane, Washington

1998

PREFACE

A January 1987 Interagency Agreement between the U.S. Bureau of Mines, U.S. Geological Survey, and U.S. Forest Service describes the purpose, authority, and operation for a program of forest-wide studies. The program was intended to assist the Forest Service in incorporating mineral resource data in forest plans as specified by the National Forest Management act (1976) and Title 36, Chapter 2, Part 219, Code of Federal Regulations and to augment the Bureau of Mines' mineral information as required by the National Materials and Minerals Policy, Research and Development Act (1980). This study was started during 1993 by the U.S. Bureau of Mines and completed during 1997 under the direction of the U.S. Forest Service. The U.S. Bureau of Mines was abolished by an act of Congress in 1996. This report is based upon available published information, field investigations, and mining company data.

ABBREVIATIONS USED IN THIS REPORT

lb	avoirdupois pound
oz	troy ounce
ft	foot
in	inch
m	meter
cm	centimeter
ppm	parts per million
ppb	parts per billion
%	percent
ton	short ton
$	U.S. dollar

Au	gold
Ag	silver
Cu	copper
Pb	lead
Zn	zinc
Co	cobalt
Mn	manganese
Fe	iron
U_3O_8	uranium oxide
P_2O_5	phosphorous pentoxide
MoS_2	molybdenum disulfide
ThO_2	Thorium dioxide

CONTENTS

ILLUSTRATIONS

Plate

TABLES

SUMMARY

The Salmon National Forest administers 1,776,994 net acres of mountainous terrain located in east-central Idaho. Most of the Forest is in Lemhi County; only a small portion falls within Idaho and Valley Counties. Approximately 426,114 acres of the Frank Church-River of No Return Wilderness extends into the western part of the Forest and mineral entry is severely restricted. Because of its location within the Salmon River drainage, the Forest also is subject to numerous issues surrounding restoration of anadromous fish runs.

Mineral production from the Salmon National Forest began during 1866 when placer gold was discovered in Leesburg Basin. Hardrock mining quickly spread throughout the Forest and many deposits containing a wide range of commodities were discovered and developed. Although early records are sketchy, production is estimated to include 940,000 ounces gold, 654,000 ounces silver, 61.9 million pounds copper, 8.9 million pounds lead, 13.9 million pounds cobalt, 208,000 pounds zinc, and 37,000 tons fluorite mill feed.

Mineral resources are large, diverse, and occur in many deposit types including exhalative, stockwork, disseminated, vein, replacement, sedimentary, skarn, breccia pipe, porphyry, and placer. The largest cobalt resource in the United States occurs in the Blackbird Mining District. Other resources include gold, silver, copper, lead, molybdenum, phosphate, manganese, iron, fluorite, uranium, thorium, rare earth oxides, and barite.

Identified resources at five deposits located along the Blackbird copper-cobalt zone are estimated to be 707 million pounds copper and 160 million pounds cobalt. The deposits are stratabound in fine-grained clastic, volcaniclastic, and tuffaceous rocks of the Middle Proterozoic Yellowjacket Formation.

Two gold deposits in the Forest are currently being mined and a third is in the permitting stage. The Beartrack deposit occurs along the fault contact between Yellowjacket quartzite and Proterozoic quartz monzonite and is being mined by conventional open pit methods. The ore is crushed, put on leachpads, and sprinkled with a dilute solution containing cyanide. Gold is recovered from the pregnant solution by carbon adsorption methods. Reserves remaining at the deposit at the end of 1996 totalled 25.6 million tons grading 0.033 ounce gold per ton.

Gold mineralization at the Yellowjacket mine occurs in quartz veins and lenses in quartzitic and slightly calcareous beds. The ore is also mined by conventional open pit methods; gold is recovered in a 350 ton per day gravity/flotation mill. Oxide ore reserves contain about 22,000 ounces gold and exploration in progress is expected to develop resources in the primary ore.

Proven and probable reserves at the Humbug deposit, currently in the permitting stage, are 16.5 million tons grading 0.037 ounce gold per ton. The gold occurs in quartz veins and siliceous zones in dark grey siltite and argillite of the Apple Creek Formation.

As a result of this study, 26 areas have been delineated that contain significant mineralization. Future exploration and development will most likely be concentrated in those areas which

contain either precious metal or copper-cobalt deposits.

INTRODUCTION

This report describes the results of an investigation of mineral resources in the Salmon National Forest. The work was undertaken at the request of the U.S. Forest Service (USFS) and includes an examination of individual mines, prospects, claims, and mineralized zones.

Results of this investigation are intended to: 1) help the USFS define areas in which to expect future mining and exploration activity, and 2) assist the USFS incorporate mineral resource data into Forest plans as specified by the National Forest Management Act (1976).

Setting

The Salmon National Forest administers 1,776,994 net acres of mountainous terrain located in east-central Idaho. It adjoins four other national forests, the Beaverhead on the east (Montana), the Bitterroot on the north (Montana), the Payette on the west, and the Challis on the south. The Challis and Salmon have been administratively combined to form the Salmon-Challis National Forest. Most of the Salmon Forest is in Lemhi County; only a small portion falls within Idaho and Valley Counties.

Evergreen trees including lodgepole pine, ponderosa pine, whitebark pine, limber pine, Douglas fir, subalpine fir, and spruce cover most of the Forest. The lower areas generally contain sage, mountain mahogany, and grasses. Winters are cold and long with snow at high elevations lasting well into June and sometimes early July. Elevations range from less than 3,000 feet along the Salmon River to more than 11,000 feet in the Lemhi Range.

The area is underlain by numerous rock types which vary greatly in age. The largest portion of the Forest is underlain by Precambrian sedimentary and metamorphic rocks including augen gneiss, quartzite, argillite, and siltite. Paleozoic sedimentary rocks are exposed in the Lemhi, Beaverhead, and Salmon River Mountains while granitic rocks of the Cretaceous Idaho Batholith extend into the west part of the Forest. Tertiary volcanic rocks, including andesite, basalt, dacite, and rhyolite are widespread. Locally, small stocks of granitic rocks intrude both the Precambrian and Paleozoic rocks. Geologic structures are complex and have played an important role in localizing the mineral deposits.

Approximately 426,114 acres of the Frank Church-River of No Return Wilderness extend into the western part of the Forest and mineral entry is severely restricted. The rest of the Forest, about 1,351,000 acres or 76 percent, is open to mineral entry.

Much of the Forest is drained by the Salmon and Middle Fork Salmon Rivers. The Lemhi River drains the eastern part of the Forest. Because of its location within the Salmon River drainage, the Forest is subject to numerous issues surrounding restoration of anadromous fish runs.

Previous Studies

Information available about the geology, mineral resources, and mining history in the Salmon National Forest is voluminous. The authors listed below are only a few of the many who have contributed.

The Idaho Bureau of Mines and Geology has conducted numerous studies in the area and has contributed much to the literature. Anderson (1943a, 1943b, 1943c, 1947, 1953, 1954, 1956, 1957, 1958a, 1958b, 1959, 1960, 1961a, 1961b, 1963, 1964) has contributed an unusually large amount. His reports include discussions of the cobalt deposits in the Blackbird District, antimony and fluorspar deposits near Meyers Cove, gold-copper-lead deposits in the Yellowjacket District, thorite and rare earth oxide deposits in the Lemhi Pass area, geology and mineral resources of several quadrangles, and much more.

Reports by Bennett (1977, 1980, 1986b) contain information on general geology, geochemistry, and structural relationships. The history of several mines in the Forest is available in Mitchell (1995a, 1995b, 1995c, 1995d, 1995e, 1995f, 1995g). A compilation of the mines and prospects in the Elk City, Dillon, and Challis quadrangles appears in Mitchell and others (1981a, 1981b, 1986), and Strowd and others (1981).

Other Idaho Bureau of Mines and Geology authors who have contributed include Shockey (1957), Wells (1983), Abbott (1954), Ross (1927, 1963b, 1963c), Austin and others (1970), Cook (1955, 1956, 1957), Peale (1982a), Rahn (1980), Reid (1959), Schmidt and others (1994), Staley (1946), Green (1972), Knowles (1975), and Savage (1969, 1970).

The U.S. Geological Survey (USGS) has also conducted numerous studies and published many reports on the geology and mineral resources in the Forest and surrounding area. Umpleby (1913) reported on the geology and ore deposits in Lemhi County and his work is an excellent source for mining history. Studies of the Idaho Primitive Area, Salmon River Breaks Primitive Area, Frank Church-River of No Return Wilderness, and proposed wilderness areas or additions were conducted by Cater and others (1973, 1975), Lund and others (1983), Skipp (1984), Skipp and others (1984), Evans and others (1993), Hopkins and others (1985), and Weis and others (1972).

Fisher (1985), Fisher and Johnson (1987, 1995), Fisher and others (1983, 1992), McIntyre (1985), Nevins and Oakman (1988), Kiilsgaard and Hall (1986), and McIntyre and Hobbs (1987) have compiled data on the geology and mineral resource potential in the Challis quadrangle in a series of maps and reports. A series of maps and reports were also published for the Dillon quadrangle. They are authored by O'Neill and Lopez (1983), Pearson and others (1990, 1991, 1992), Purdy and Rowan (1990), Ruppel and others (1983, 1993), Segal and Rowan (1989), Hanna and others (1993), and Loen and Pearson (1989). A mineral resource assessment of the Elk City quadrangle appears in Lund and other (1990).

Numerous reports on the copper-cobalt deposits in the Blackbird District have also been published by the USGS. They include Nash (1989), Nash and Hahn (1986, 1989), Nash and others (1987, 1988), Vhay (1948, 1951), Connor and others (1990), and Modreski (1983).

Discussions of the geology and phosphate resources in the Hawley Creek area are contained in Oberlindacher and Hovland (1979) and details of the fluorspar deposits near Meyers Cove appear in Cox (1954). The thorium and rare earth oxide deposits in and near the Forest have been studied by Sharp and Cavender (1962), Sharp and Hetland (1968), Staatz (1972, 1974, 1979a, 1979b), Staatz and others (1971, 1972, 1980), Trites and Tooker (1953), Weis and others (1958, 1972), Kaiser (1956), and Olson and Overstreet (1964).

Others who have contributed to the understanding of the geology in the area include Ruppel (1964, 1968, 1975, 1978, 1980, 1982, 1986, 1993), Ruppel and Lopez (1981, 1984, 1988), Ruppel and others (1970), Kiilsgaard and others (1986, 1989), Skipp (1985), Connor and Evans (1986), Evans and Connor (1993), Nelson (1969), and Ross (1925, 1934, 1961).

The U.S. Bureau of Mines (USBM) has conducted many mineral resource investigations of primitive areas, wilderness areas, wild and scenic river corridors, and RARE II areas in the Forest. Results of USBM studies of the Idaho Primitive Area, Clear Creek-Upper Big Deer Creek area, and Salmon River Breaks appear in USGS publications (Cater and others, 1973; Cater and others, 1975; Weis and others, 1972). USBM reports include Cather and Rains (1988) -- Lemhi Range study area; Lipton and others (1988) -- West Big Hole study area; Mayerle and Close (1993) -- Anderson Mountain study area; Ridenour (1985) -- part of the Frank Church-River of No Return Wilderness; and Tuchek and others -- Salmon River study area.

Other USBM publications include Lorain and Metzger (1939) -- Reconnaissance of placer mining districts in Lemhi County; Pattee and others (1968) -- Beryllium Resources of Idaho, Washington, Montana, and Oregon; and Reed and Herdlick (1947) -- Blackbird cobalt deposits.

Many theses which contain information on geology, mineral deposits, and mining history have been completed for selected areas in the Salmon Forest. Included among the authors are Biddle (1985), Carter (1981), Coppinger (1974), Davidson (1928), Dobey (1972), Gray (1927), Hansen (1983), Harrison (1985), Kirkpatrick (1974), Lucchitta (1966), MacKenzie (1949), McCandless (1982), Maley (1974), Peale (1982b), Purdue (1975), Rahn (1979), Smith (1961), Sobel (1982), Soregaroli (1961), Spence (1984), Sturm (1954), and Tietbohl (1981).

Present Studies

This study of mines, prospects, and mineral resources in the Salmon National Forest began during 1993. Preliminary work included a review of applicable published literature, mining claim and lease records, and the Bureau's MILS (Mineral Industry Location System) data base and property files. MILS is a comprehensive data base that provides locations and deposit information on mineral sites throughout the world. Owners of active, or recently active claims

identified during a search of U.S. Bureau of Land Management (BLM) mining claim records, were notified and their cooperation with the study solicited. Numerous mining and exploration companies that had conducted programs in the Forest also were contacted and data requested.

Field work, conducted during the fall of 1994 and the summer of 1995, was concentrated in areas which had not previously been studied by the USBM, and in areas which were most likely to be explored and developed. During the study, 276 samples were taken. They consisted of four types: 1) chip -- a regular series of rock chips taken in a continuous line across a mineralized zone or other exposure; 2) random chip -- an unsystematic series of chips taken from an exposure of apparently homogeneous rock; 3) grab -- rock collected unsystematically from a dump or stockpile, or float (loose rock lying on the ground); and 4) select -- an intentionally biased selection of rock taken because of a unique or unusual property.

All rock samples were prepared and analyzed by Bondar Clegg Intertek Testing Services, Vancouver, British Columbia. All samples were analyzed for 34 elements (Au, Ag, As, Ba, Br, Cd, Ce, Co, Cr, Cs, Eu, Fe, Hf, Ir, La, Lu, Mo, Na, Ni, Rb, Sb, Sc, Se, Sm, Sn, Ta, Tb, Te, Th, U, W, Tb, Zn, Zr) by neutron activation methods. Copper, lead, and mercury were analyzed by inductively coupled plasma emission spectroscopy and cold vapor/atomic absorption methods. Samples which contained more than 0.3 ppm gold were reassayed using fire assay methods. Lower detection limits vary due to digestion size and interference from other elements.

Sample descriptions and analyses appear in two tables located in Appendix A. Table A-1 contains the location in latitude and longitude, type, and description for each sample. Table A-2 contains analyses for a selected group of elements -- gold, silver, copper, lead, zinc, molybdenum, tungsten, arsenic, antimony, mercury, thorium, uranium, nickel and cobalt and were selected based on the objectives of the study. All analyses are reported in parts per million (ppm). To convert ppm to troy ounce per short ton, divide by 34.28. To convert ppm to percent, divide by 10,000.

ACKNOWLEDGEMENTS

Gratitude is extended to the many and diverse groups that have cooperated with this study by contributing their time and resources. Personnel at the U.S. Forest Service were very helpful in supplying minerals related data. Numerous claim owners provided valuable data and in some cases, accompanied Bureau geologists on their properties. Appreciation is also extended to the mining companies working in the Forest for their contributions. Personnel at American Gold Resources, Meridian Gold, U.S. Antimony, Formation Capital, and Newmont Gold were especially helpful in sharing data and familiarizing Bureau geologists with area geology and mineralization.

MINES AND PROSPECTS

A total of 633 mineral locations are described in this report. They range from small prospects

with apparently no significant mineralization to producing mines. Summarized descriptions of the geology, workings, production, resources, and sample analyses along with other data for each mineral location appears in Appendix B. The location of each site appears on one of four plates. Plate 1 contains the locations for properties in the North Fork Ranger District; Plate 2, Salmon Ranger District; Plate 3, Cobalt Ranger District; and Plate 4, Leadore Ranger District.

One hundred ninety eight mines and prospects were investigated in the North Fork Ranger District. Data gathered for each site were analyzed and mineral locations were grouped into areas based on a number of factors including deposit type, host rock, mineral assemblages, past production, and potential for resources. Eight areas were identified in the district and appear on Plate 1. The areas that contain mineral deposits with similar characteristics include: 1) gold-silver-copper bearing quartz veins in quartzite and argillite; 2) gold-silver-copper-cobalt bearing quartz veins along fault zones in quartzite, phyllite, and schist; 3) phosphate-thorium-rare earth oxide bearing zones in pegmatite dikes and marble beds; 4) silver-molybdenum-lead bearing quartz veins in augen gneiss; 5) northeast trending gold-silver-lead bearing quartz veins in augen gneiss; 6) gold-silver bearing quartz veins and breccia zones in quartzite; 7) gold-silver-copper-lead bearing breccia zones in quartzite; and 8) gold-silver-copper bearing exhalative deposits and gold bearing quartz veins in quartzite. Future exploration and mining activity will probably be concentrated in those six areas where gold is the principal commodity.

In the Salmon Ranger District, 88 mines and prospects were investigated. They appear on Plate 2 along with five areas containing deposits having similar characteristics. The areas include: 1) copper-molybdenum stockwork/disseminated deposits in quartzite and granitic stocks; 2) gold-silver-lead-copper bearing quartz veins in quartzite and granite; 3) thorium-rare earth oxide bearing veins in granite and quartzite; 4) copper-silver bearing quartz veins along faults in quartzite; and 5) copper-cobalt-iron bearing veins in phyllite and quartzite. As was the case in the North Fork District, future exploration and mining activity will probably be concentrated in those areas with gold as the principal commodity.

Locations for the 226 mines and prospects that were investigated in the Cobalt Ranger District are shown on Plate 3. After the data were analyzed, six areas were determined to contain deposits with similar characteristics. They include: 1) gold bearing vein/stockwork/disseminated deposits in granitic rock; 2) copper-cobalt-gold-silver bearing exhalative stratabound zones in micaceous quartzite; 3) gold bearing veins and breccia zones in quartzite and volcanic rock; 4) gold-silver-copper-lead bearing veins and breccia zones in quartzite intruded by granitic rock; 5) fluorite bearing veins and fracture zones in volcanic rock and granophyre; and 6) gold-silver-copper bearing veins and silicified zones in volcanic rock. Mining and exploration activity can be expected to continue into the future in each area containing gold or cobalt and copper.

One hundred twenty one mines and prospects were investigated in the Leadore Ranger District and their locations are shown on Plate 4. Six areas containing deposits with similar characteristics were identified in the district. They include: 1) gold-silver-copper-lead bearing quartz veins in Precambrian quartzite; 2) thorium-rare earth oxide-copper bearing quartz veins in Precambrian sedimentary rock; 3) lead-silver replacement deposits in Mississippian limestone; 4) phosphate bearing zones in the Phosphoria Formation; 5) copper-molybdenum-tungsten

disseminated/stockwork deposits in granodiorite and quartz monzonite; and 6) high-grade lead-silver replacement deposits in limestone and dolomite. Future exploration and mining activity is most likely to occur in the two areas containing lead-silver replacement deposits.

All of the deposit areas shown on plates 1-4 in detail are shown in summary on plate 5. The plate gives one a forest-wide perspective of the areas containing significant mineralization.

HISTORIC PRODUCTION

Mining in the Salmon National Forest began during 1866 when placer gold was discovered in Napias Creek and its tributaries (Umpleby, 1913). As the rich placer deposits were depleted, hardrock mining soon spread throughout the Forest. Early production records are nearly nonexistent and those that are available are notoriously inaccurate. Production data shown in table 1 came primarily from the literature, mining companies, and USBM production records. Documentation for the data appears with the property summaries in Appendix B. Unfortunately, some of the production data for the Cobalt and Salmon Ranger Districts and most of the production data for the Leadore Ranger District is confidential. Combined production from the 20 deposits listed as confidential in the Leadore District is approximately 8,000 ounces gold, 300,000 ounces silver, 1.6 million pounds copper, 4.9 million pounds lead, and 16,000 pounds zinc.

MINERAL RESOURCES

Mineral resources in the Salmon Nation Forest are large, diverse, and occur in many deposit types including exhalative, stockwork, disseminated, vein, replacement, sedimentary, skarn, breccia pipe, porphyry, and placer. The largest domestic resource of cobalt occurs in the Forest. Other resources include gold, silver, copper, lead, molybdenum, phosphate, manganese, iron, fluorite, and uranium. Resources also exist for thorium, rare earth oxides, and barite, but they have not been quantified. Resources listed in table 2 are from the literature, mining companies, and USBM property files. Documentation for the data appears in the property summaries in the appendices.

Table 2 is far from complete. Resources have been identified during mining company drilling projects in the past, but they remain company confidential. Additionally, several exploration programs are being conducted in the Forest and some of them will likely delineate resources. On-going exploration at the two producing mines in the Forest, the Beartrack and Yellowjacket, also may add resources to their reserve bases.

TABLE 1. RECORDED PRODUCTION, SALMON NATIONAL FOREST, IDAHO
(Production reference appears in deposit summary)

Map Number	Deposit Name	Recorded Production (* indicates data is confidential)
North Fork Ranger District		
27	Hughes Creek Placer mines	695 oz Au
52	Clara Morris	12,000 oz Au
57	A.D. and M. mine	48,000 oz Au
58	Dahlonega Creek Placer	$75,000 (equivalent to 3,750 oz Au)
62	Twin Brothers mine	$300,000 (equivalent to 15,000 oz Au)
63	North Fork Salmon River Placer	$22,000 (equivalent to 629 oz Au)
108	Boulder Creek Placer	403.3 oz Au and 76 oz Ag
115	Monolith	$400,000 (equivalent to 20,000 oz Au)
121	Kittie Burton mine	$200,000 (equivalent to 10,000 oz Au)
123	Ulysses mine	$400,000 (equivalent to 20,000 oz Au)
150	Wagonhammer Gulch prospect	90 tons grading 17.75-20.7 oz Ag/ton, 0.145-0.201 oz Au/ton, and 0.1-0.5% Pb
152	Sheep Creek Placer	142 oz Au
158	Salmon Canyon Copper mine	"several" hundred tons Cu-Co ore
173	Kentuck mine	45,000 tons at $10/ton (equivalent to 22,500 oz Au
174	Grunter mine	$75,000 (equivalent to 3,750 oz Au)
176	Brittanic mine	$25,000 (equivalent to 1,250 oz Au)
178	Clipper Bullion mine	$75,000 (equivalent to 3,750 oz Au)

Information Confidential

191	Silver Star	691 oz Au, 6,286 oz Ag, 6,791 lbs Cu, and 30,788 lbs Pb
197	Oro Cache mine	635 oz Au and 76 oz Ag
Salmon Ranger District		
207	Moose Creek Placer	$1 million (equivalent to 50,000 oz Au)
227	Shoo Fly mine	$75,000 (equivalent to 3,750 oz Au)
243	U.P. and Burlington mine	"a few thousand dollars"
249	Queen of the Hills mine	1,713 oz Au, 364 oz Ag, 188 lbs Cu, and 6,993 lbs Pb
252	Red Cross mine	* oz Au, * oz Ag, * lbs Cu, and * lbs Pb
262	Tormay mine	80,161 lbs Cu and 116 oz Ag
266	Pope Shenon mine	4,594,951 lbs Cu, 22,107 lbs Pb, 14,683 lbs Zn, 24,725 oz Ag, and 500 oz Au
269	Harmony mine	1,815,353 lbs Cu, 2,050 oz Ag, and 38 oz Au
Cobalt Ranger District		
305	Beaver Creek Placer	$100,000 (equivalent to 5,000 oz Au)
344	Italian mine	$175,000 (equivalent to 8,750 oz Au)
345	Arnett Creek Placer	$1-2 million (equivalent to 50,000-100,000 oz Au)
366	Beartrack mine	158,000 oz Au (through 12/31/96)
367	Wards Gulch Placer	$1 million (equivalent to 50,000 oz Au)
----	Leesburg Basin Placer (includes Arnett Creek and Wards Gulch)	$9.5 million (equivalent to about 475,000 oz Au)
406	Blackbird mine	53,450,171 lbs Cu, 13,865,496 lbs Co, 53,544 oz Ag, and 24,136 oz Au
409	Haynes-Stellite mine	19,514 lbs Co

Information Confidential

425	Musgrove mine	* oz Au, * oz Ag, and * lbs Cu[*]
427	Breccia Gold mine	4,600 tons
436	Blackpine mine	* lbs Cu, * oz Ag, and * oz Au
459	Yellowjacket mine	$450,000 prior to 1913 (equivalent to 22,500 oz Au) and 13,463 oz Au since 1987
465	Continental	5,829 lbs Cu, 179 oz Ag, and 66 oz Au
466	Liberty	1,413 lbs Pb, 139 lbs Cu, 133 oz Ag, and 3 oz Au
468	Steen mine	13,635 lbs Cu, 11,341 lbs Zn, 1,300 oz Ag, and 466 oz Au
469	Broken Hill	1,720 lbs Pb, 80 lbs Cu, and 75 oz Ag
470	Brough	3,551 lbs Cu, 1,541 lbs Pb, 372 oz Au, and 137 oz Ag
472	Copper Glance mine	5,297 lbs Pb, 4,015 lbs Zn, 3,685 lbs Cu, 1,595 oz Ag, and 14 oz Au
474	Tincup mine	3,977 lbs Cu, 417 lbs Pb, 111 oz Ag, and 136 oz Au
492	Red Spar mine	404 tons fluorite mill feed
500	Big Lead	29,304 tons fluorite mill feed
502	M and M	1,167 tons fluorite mill feed
506	North Vein	3,561 tons fluorite mill feed
507	Beartrap	1,304 tons fluorite mill feed
509	Anderson	1,686 tons fluorite mill feed
511	Singheiser mine	* oz Ag, * lbs Cu, and * oz Au

[*] Information Confidential

Leadore Ranger District		
518	Mendota mine	12 oz Au, 229 oz Ag, 1,755 lbs Cu, and 391 lbs Pb
520	War Eagle mine	439 oz Au and 273 oz Ag
521	Goldstone mine	* oz Au, * oz Ag, * lbs Cu, and * lbs Pb
545	Blue Bird mine	*oz Au, * oz Ag, and * lbs Cu
552	Copper Queen mine	* lbs Cu, * oz Au, and * oz Ag
556	Buckhorn mine	* lbs Pb, * oz Ag, * lbs Cu, and * lbs Zn
558	Maryland mine	* lbs Pb, * oz Ag, * lbs Cu, and * lbs Zn
559	Commodore mine	* oz Ag, * lbs Pb, * lbs Cu, * lbs Zn, and * oz Au
560	Oklahoma mine	* oz Ag and * lbs Pb
564	Grizzly Hill mine	* lbs Pb, * oz Ag, * lbs Cu, and * oz Au
566	Digmore mine	* lbs Pb, * lbs Cu, * lbs Zn, and * oz Au
567	Blue Lead mine	* lbs Pb, * oz Ag, and * lbs Cu
568	General McArthur mine	* lbs Pb, * lbs Cu, * lbs Zn, and * oz Ag
570	Bullion Apex mine	* lbs Pb and * oz Ag
572	Road Agent mine	* lbs Pb, * lbs Cu, * lbs Zn, * oz Ag, and * oz Au
586	Baby Joe Gulch mine	* lbs Pb, *oz Ag, * lbs Cu, and * oz Au
587	Leadville-Kimmel mine	*lbs Pb, *oz Ag, * lbs Cu, * oz Au, and * lbs Zn
595	Blue Jay mine	10,000 lbs Cu
597	Ray mine	150 oz Au, 294 oz Ag, and 50 lbs Pb
607	Democrat mine	974,400 lbs Pb, 294 oz Au, 31,500-46,200 oz Ag

Information Confidential

608	Hilltop mine	2,700,000 lbs Pb, 124,200 oz Ag, 162,000 lbs Zn, 1,800 oz Au, and 54,000 lbs Cu
610	Brown Bull mine	115,000 lbs Pb, 14,800 oz Ag, and 3,570 lbs Cu
613	Portland mine	40,000 lbs Pb and 10,000 oz Ag
614	Ridgeway mine	* lbs Pb, * oz Ag, * oz Au, and * lbs Cu
615	Mountain Boy mine	* lbs Pb, * oz Ag, * lbs Cu, * lbs Zn, and * oz Au
618	Carrie Cody prospect	* lbs Pb, * oz Ag, * lbs Cu, and * oz Au
619	Meadow Lake mine	$6,000-7,000 Pb-Ag ore
624	Mohawk mine	* lbs Pb, * oz Ag, * lbs Cu, and * oz Au
625	Grace Phelan mine	67,000 lbs Pb and 56,000 oz Ag
632	Lemhi Union mine	* lbs Pb, * oz Ag, * lbs Cu, * lbs Zn, and * oz Au

*

Information Confidential

TABLE 2. IDENTIFIED RESOURCES, SALMON NATIONAL FOREST, IDAHO
(Resource reference appears in deposit summary)

Map Number	Deposit Name	Identified Resources (* indicates data is confidential)
North Fork Ranger District		
18	McConn Creek	"millions" of tons grading 40% Fe
35	Surprise	100,000 tons grading 0.1% U_3O_8
39	Humbug	16.5 million tons grading 0.037 oz Au/ton (reserve) 1,056,000 oz Au (geologic resource)
111	Spring Creek mine	500,000 tons grading 2% MoS_2
150	Wagonhammer Gulch prospect	2.25 million tons grading 0.046 oz Au/ton and 0.93 oz Ag/ton
158	Salmon Canyon Copper mine	1.27 million tons grading 1.3% Cu, 0.20% Co, 0.015 oz Au/ton, and 0.3 oz Ag/ton (geologic resource)
Salmon Ranger District		
217	Bobcat	60 million tons grading 0.2-0.3% Cu
245	King Solomon	3.3 million tons grading 0.037 oz Au/ton
266	Pope Shenon mine	* tons grading * % Cu and * oz Ag/ton
273	Iron Creek Copper-Cobalt	32 million tons grading 0.52% Cu and 0.06% Co
Cobalt Ranger District		
329	Sunshine prospect area	300,000 tons grading 0.69% Co, 1% Cu, and 0.024 oz Au/ton (reserve) 2,250,000 tons averaging the same grade (resource)
340	Arnett Hardrock	6 million tons grading 0.033 oz Au/ton (reserve) 6.5 million tons grading 0.03 oz Au/ton (measured resource) 3.8 million tons grading 0.025 oz Au/ton (indicated resource)

Information Confidential

Map Number	Deposit Name	Identified Resources (* indicates data is confidential)
366	Beartrack mine	25.6 million tons grading 0.033 oz Au/ton (reserve)*
388	Johnson mine	12,000 tons grading 0.55 oz Au/ton, 1.08 oz Ag/ton, and 0.085% Cu
406	Blackbird mine	6.5 million tons grading 0.55% Co and 1.31% Cu
427	Breccia Gold mine	5 million tons grading 0.138 to 0.140 oz Au/ton
436	Blackpine mine	3 million tons grading 0.5% recoverable Cu from oxide ore 1 million tons averaging 4.5% Cu, 0.08% Co, and 0.03 oz Au/ton 400,000 tons grading 1% Co and 0.1 oz Au/ton
459	Yellowjacket mine	22,000 oz gold reserve
463	Columbia	2.7 million tons grading 0.075 oz Au/ton
465	Continental	100,000 tons grading 1.74% Cu, 0.18 oz Au/ton, and 1.6 oz Ag/ton
-----	Meyers Cove Fluorspar deposits	1 million tons grading 35% fluorite
Leadore Ranger District		
554	Bluebird Iron prospect	* tons grading * % Fe
558	Maryland mine	500,000 tons grading 22-36% Mn
590	Hawley Creek Phosphate area	56 million tons grading 24-31% P_2O_5 215 million tons grading 16-24% P_2O_5
591	Big Bear Creek Phosphate	80 million tons grading 24-31% P_2O_5 309 million tons grading 16-24% P_2O_5
604	Dry Canyon Phosphate area	18 million tons grading 24-31% P_2O_5 70 million tons grading 16-24% P_2O_5
607	Democrat mine	100,000 tons grading 7 oz Ag/ton and 10% Pb

* Information Confidential

Map Number	Deposit Name	Identified Resources (* indicates data is confidential)
624	Mohawk mine	2,000 tons grading 7.8 oz Ag/ton*
625	Grace Phelan mine	9,000 tons grading 3.5 oz Ag/ton 1,000 tons grading 4.7 oz Ag/ton*

* Information Confidential

MINING DISTRICTS

Mining district boundaries are rarely well defined and those in the Salmon National Forest are no exception. Publications by Umpleby (1913) and Ross (1941a) were drawn from to determine the boundaries for sixteen mining districts that are in or extend into the Forest. Their locations are shown on plate 6 and a short summary of each district follows.

Gibbonsville Mining District

The Gibbonsville District covers a loosely defined area generally accepted to include the north half of the North Fork Salmon River drainage. It contains the historic Hughes Creek and Dahlonega Creek Mining districts.

The first mining activity in the district occurred during 1867 when gold placer was found in Hughes Creek. Placer mining soon expanded to include the North Fork Salmon River, Dahlonega Creek, and Anderson Creek. The first lode claims were staked on gold-bearing quartz veins in 1877 near the confluence of Anderson Creek with Dahlonega Creek. The deposit, later known as the AD&M mine (American Development and Reduction Mining Company) eventually became the largest producer in the district. Other gold-bearing quartz veins were soon discovered; the most notable were at the Twin Brothers mine and the Clara Morris mine (Mayerle and Close, 1993, p. 19).

In 1895, the AD&M Company built a 30-stamp mill that treated the ore by amalgamation followed by chlorination (MacDonald, 1896, p. 319-320). According to Umpleby (1913, p. 133), the mill was destroyed by fire during 1907. A new 20-stamp mill and 20-ton cyanidation plant was built the following year (Kiilsgaard and others, 1989, p. B40). A mill was built in 1935 at the Twin Brothers mine to process its ore and ore from smaller mines. Several other smaller mills were built in the district in addition to those near Gibbonsville.

Production from the Gibbonsville District has been about 100,000 ounces of gold. The AD&M mine is credited with 48,000 ounces, the Twin Brothers with 14,500 ounces, and the Clara Morris with 12,000 ounces. The remaining production came from smaller lode mines and placer deposits (Wark, 1984, p. 10).

Mineralization generally consists of gold-, silver-, and copper-bearing quartz veins trending east-west in phyllite and micaceous quartzite. The deposits appear to be zoned around the AD&M where gold and silver are the major constituents. As one moves away from the AD&M, copper concentrations increase and eventually lead concentrations increase.

Recently, significant resources have been identified at the Humbug deposit located along Ditch Creek. Drilling programs conducted by FMC Corporation and American Gold Resources delineated minable concentrations of gold in quartz veins and silica rich zones in dark grey siltite and argillite of the Apple Creek Formation. Proven and probable reserves are 16.5 million tons grading 0.037 ounce gold per ton. The deposit contains a geological resource of 1,056,000

ounces of gold (International Gold Resources Corporation press release, 1995).

Indian Creek Mining District

In general terms, the Indian Creek District includes the area drained by Indian Creek and Squaw Creek. The district borders the state of Montana on the north, joins the Mineral Hill District on the west, and extends a short distance south of the Salmon River.

The first claims were located in the district during 1895, but little mining was done until the Kitty Burton Gold Mining Company acquired the Kitty Burton and Ulysses properties. Ore was processed in several amalgamation mills, the last being a 15-stamp mill with amalgamation plates and a Wilfley table. Between January, 1903 and July, 1907, 68,194 tons were milled. Total production for the district is a little less than $600,000; about three-fourths is attributed to the Ulysses mine and most of the rest to the Kittie Burton mine (Umpleby, 1913, p. 134-135).

Mineralization at the Ulysses and Kittie Burton consists of shear and thrust hosted gold-bearing veins along wide zones in metamorphosed quartzite (Formation Capital, November 1, 1988, p. 6). The veins, up to 12 feet thick, contained coarsely crystalline quartz with pyrite, braunite, chalcopyrite, pyrrhotite, malachite, and azurite (Umpleby, 1913, p. 136).

Just northeast of the Ulysses and Kittie Burton is a northwest trending zone containing anomalous amounts of cobalt, copper, bismuth, nickel, gold, and silver. The chemical signature of this zone is very similar to the chemical signature of the Blackbird Cu-Co zone. The zone extends from the head of Sage Creek on the southeast to the McConn Creek iron deposit on the northwest. Mineralization appears to be associated with quartz veins, veinlets, and zones of silicification, often along bedding and bedding plane faults in quartzite, phyllite and schist. Resources at the McConn Creek iron deposit are estimated to be millions of tons grading about 40 percent iron (Young, 1961).

In the southwest part of the Indian Creek District, numerous small deposits containing phosphates, rare-earth oxides, and thorium occur in a northwest trending zone. Monazite, the primary ore mineral, occurs in Precambrian marble beds and to a much lesser extent in pegmatite dikes. Monazite is a rare-earth phosphate with appreciable substitution of thorium for rare earths.

Mineral Hill Mining District

The Mineral Hill District, according to Umpleby (1913, p. 138), merges into the Mineral Point District to the north, the Indian Creek District to the east, and the Mackinaw District to the south. No definite boundary exists to the west.

The Grunter and Kentuck gold deposits, the first locations in the district, were discovered during 1882. These were followed by discoveries of the Big Lead in 1886, the Clipper Bullion in 1887, and the Monolith in 1889. In 1884, the Kentuck Company erected a 10-stamp mill and during the following few years, four more mills were built nearby (Umpleby, 1913, p. 139). A 100-ton

capacity flotation plant was erected during 1935 and operated through 1949 (Tuchek and others, unpublished USBM report).

According to Umpleby (1913, p. 139), production from those deposits near Shoup has been a little more than $750,000. Most of the production came from the Kentuck mine; smaller amounts are attributed to the Grunter, Monolith, Clipper Bullion, and Big Lead mines. Gold was valued at $20 per troy ounce during the period of production referred to by Umpleby. Other information sources, including USBM production records, indicate that total production is substantially higher.

The most important type of mineralization in the district consists of gold-, silver-, and lead-bearing quartz veins, lenses, and silicified zones that generally trend northeast and dip southeast in augen gneiss. The Kentuck vein is exposed along strike for 600 feet and along dip to a depth of 700 feet. It is from 2 to 10 feet thick, but averages about 4 feet. It contains massive blue-white quartz with pyrite, arsenopyrite, galena, and sphalerite (Gray, 1927, p. 48-56). Chalcopyrite is present in some veins, however amounts appear to be small.

An area of silver-molybdenum-lead mineralization occurs near the headwaters of Spring, Boulder, Owl, and Horse Creeks. At the Spring Creek deposit, a quartz vein striking N 50 E and dipping 55 NW in augen gneiss contains pyrite, molybdenite, and lesser amounts of galena. Accessory minerals, noted especially at the Monitor deposit, include epidote, diopside, magnetite, siderite, calcite, and small amounts of chalcopyrite and malachite. According to the owner, resources at the Spring Creek deposit are 500,000 tons averaging 2 percent molybdenum disulfide (Lowe, 1988).

Mackinaw Mining District

The Mackinaw District is located in the northeast part of the Cobalt Ranger District. It is bound by the Mineral Hill and Indian Creek Districts on the north, the Eureka District on the east and northeast, and by Panther Creek on the southwest. Most of the district is drained by Napias, Beaver and East Boulder Creeks.

Placer gold was discovered in Leesburg Basin, an area drained by Napias Creek and its tributaries, during 1866. As word spread about the rich placer deposits during the following several years, the population in the Leesburg Basin grew to 7,000. Placer gold production estimates range from $5 million (Umpleby, 1913) to $16 million (Kirkpatrick, 1934). Lorain and Metzger (1939, p. 7) estimate production from the basin to be $9.5 million. Their estimate, probably the more accurate of the three, would be equivalent to 475,000 troy ounces of gold.

The most important type of mineralization in the Mackinaw District consists of gold-bearing vein/stockwork/disseminated deposits in granitic rock. At the Italian mine, located in 1892, quartz veins and veinlets containing gold, pyrite, sphalerite, pyrolusite, and galena occur in granitic rocks of the Leesburg Stock. A 10-stamp mill, and later a 30-stamp mill, were built to process the ore. Production is estimated to be about $175,000 prior to 1904 (Umpleby, 1913, p. 153). The stockwork mineralization encountered at the Italian extends northwest to the

Haidee mine, about 1.3 miles away.

Resources in the Italian-Haidee area (Arnett Hardrock) total about 16.3 million tons; proven and probable reserves are 6 million tons grading 0.033 ounce gold per ton, measured resources are 6.5 million tons grading 0.03 ounce gold per ton, and indicated resources are 3.8 million tons grading 0.025 ounce gold per ton (personal communication, Nick Bertram, American Gold Resources, 1994).

The Beartrack deposit, a vein/stockwork/disseminated deposit, occurs near the intersection of the Panther and Jesse Creek faults. The northeast trending, steeply dipping Panther Creek fault forms the contact between Yellowjacket quartzite and Precambrian quartz monzonite. Gold mineralization occurs along a 10,000-foot-long section of sheared, fractured rock associated with the fault.

The deposit is being mined by conventional open pit methods. Two pits, one near the historic gold mining town of Leesburg and the other about 1.5 miles northeast of Leesburg, supply ore to the mill. The ore is crushed, put on leachpads, and sprinkled with a dilute solution containing cyanide. Gold is recovered from the pregnant solution by carbon adsorption methods. By the end of 1996, 9,261,600 tons containing a recoverable 281,000 ounces of gold had been mined and placed on leach pads. Mine reserves remaining at the end of 1996 totalled 25.6 million tons grading 0.033 ounce gold per ton (Meridian Gold, personal communication, March 7, 1997).

Blackbird Mining District

The Blackbird District, located in the Panther Creek drainage, is bound on the northeast by the Mackinaw District, on the southeast by the Eureka District, and on the southwest by the Yellowjacket and Gravel Range Districts. The Musgrove Creek drainage is sometimes considered to be the Musgrove Mining District; however, here it is considered to be part of the Blackbird.

The first mining claims in the district, located during 1893, were for gold. The presence of cobalt was not recognized until 1901 (Umpleby, 1913, p. 160). Precious metal mineralization appears to be concentrated in a small area near the lower part of Musgrove Creek. The Musgrove mine, located prior to 1900, developed a zone of fine-grained, brecciated quartzite containing pods of quartz, calcite, siderite, pyrite, pyrrhotite, chalcopyrite, bieberite, and malachite (Roberts, 1951). The mine produced significant amounts of gold and silver between 1913 and 1914 (USBM production records). The ore was processed in a 17 ton per day cyanide concentrator (Gerry, 1914, p. 776 and 1916, p. 624).

At the Breccia Gold mine, a gold- and silver-bearing fault breccia zone occurs along the contact between argillaceous rocks of the Yellowjacket Formation and Challis Volcanics. According to Grove (1985, p. 5), several thousand tons of ore were mined during the late 1930's and 1940's. An open pit was developed at the site during 1987 by Metro Resources and 4,600 tons of ore were shipped for test milling. Resources are 5 million tons grading 0.138 to 0.140 ounce gold per ton (Grove, 1985).

The Blackbird District is best known for its world-class copper-cobalt deposits. The deposits are stratabound in fine-grained clastic, volcaniclastic, and tuffaceous rocks of the Middle Proterozoic Yellowjacket Formation. At the Blackbird mine, five stratabound zones, the Idaho, Dandy, Chicago, Brown Bear, and Blacktail, were mined. Ore minerals in the zones consist chiefly of cobaltite, chalcopyrite, pyrite, and lesser amounts of safflorite, arsenopyrite, pyrrhotite, linnaeite, native gold and silver, enargite, sphalerite, and galena (Nash and Hahn, 1986, p. 1-10).

The Blackbird mine produced ore intermittently from both underground and surface workings between 1902 and 1968. Ore produced during the mines's heyday, the 1950's and 1960's, was processed in a 1,000 ton per day flotation mill constructed by Calera Mining Company during the early 1950's. Vhay (1964b, p. 70) and Bergendahl (1964, p. 100) reported that 63 million pounds of copper and 14,000 ounces of gold have been recovered from the Blackbird Mining District, mainly from the Blackbird mine. According to USBM files, the Blackbird mine has produced 13,865,496 pounds of cobalt, 53,450,171 pounds of copper, 24,136 ounces of gold, and 53,544 ounces of silver from 283,741 tons of ore between 1939 and 1968.

The Blackbird mine and surrounding area contains the largest known reserve of cobalt ore in the United States (Bilbrey, 1962). Published reserves total about 6.5 million tons grading 0.55 percent cobalt and 1.31 percent copper (Bennett, 1977, p. 42).

Recent drilling at the Sunshine prospect, located west of the Blackbird mine, has identified a reserve of 300,000 tons grading 0.69 percent cobalt, 1 percent copper, and 0.024 ounce gold per ton. Additional resources at the Sunshine include 2,250,000 tons at approximately the same grade (P. Nisbet, Formation Capital Corp., personal communication, 3/10/97).

At the Blackpine mine, near the southeast end of the Blackbird copper-cobalt zone, recent drilling has also identified copper-cobalt-gold resources. They contain 3 million tons grading 0.5 percent recoverable copper, 1 million tons averaging 4.5 percent copper, 0.08 percent cobalt, and 0.03 ounce gold per ton, and 400,000 tons grading 1 percent cobalt and 0.1 ounce gold per ton (P. Nisbet, Formation Capital Corp., personal communication, 3/10/97).

Wilson Creek Mining District

The Wilson Creek District is a small district located in the southwest part of the Cobalt Ranger District. Basically, it includes the area drained by Wilson Creek.

Only two lode deposits of much significance occur in the district. At the Old Johnson prospect, a quartz vein containing pyrite and malachite occurs in a northwest trending, northeast dipping shear zone in quartzite and dolomite. About 24,000 tons of low-grade gold and silver resources are present. Quartz veins containing pyrite, chalcopyrite, galena, and malachite trend northeast in argillaceous quartzite at the Johnson mine. The principal vein averages 1.2 feet thick and is exposed along strike for 300 feet. Resources are estimated to be 12,000 tons grading 0.55 ounce gold per ton, 1.08 ounce silver per ton, and 0.085 percent copper.

The two deposits are in a northwest-trending zone of gold-silver-copper-lead mineralization which extends from the Gold Bug prospect on the southeast to the Kimmel Creek prospects on the northwest.

Yellowjacket Mining District

The Yellowjacket District, in general terms, includes the area drained by Yellowjacket Creek. It is bound on the northeast by the Blackbird District, on the northwest by the Wilson Creek District, and on the southeast by the Gravel Range District.

Gold deposits were first discovered in the district during 1868. A 5-stamp mill was constructed in 1875 and expanded to 10 stamps in 1882 to process ore from the Yellowjacket, the principal mine. A 20-stamp amalgamation concentrator was built in 1894 and expanded to 60 stamps and a capacity of 100-150 tons per day in 1896 (Gerry, 1912, p. 575 and 1916, p. 625). A 350 ton per day gravity/flotation mill built in 1991 is currently at the mine site. Elsewhere in the district, a 10-stamp mill was built at the Columbia mine and a 5-stamp mill at the Black Eagle (Umpleby, 1913, p. 166).

According to Umpleby (1913, p. 166), production from the district prior to 1913 was about $450,000 when gold was about $20 per troy ounce. Most probably came from the Yellowjacket mine. Production from the Yellowjacket mine since 1987 totals 13,463 ounces of gold (John Lawrence, U.S. Antimony Corporation, personal communication, February 1997).

Production from the Continental-Columbia mineral belt, located about 1.5 miles southwest of the Yellowjacket mine, is sketchy. The mines along the belt have produced at least 618 tons of ore which yielded 466 ounces of gold, 1,300 ounces of silver, 13,635 pounds of copper, and 11,341 pounds of lead (Fisher and Johnson, 1987, p. 104-105; USBM records).

Mineralization at the Yellowjacket mine and along the Continental-Columbia belt consists of quartz veins, lenses, and veinlets in quartzitic and slightly calcareous beds of the Yellowjacket Formation. The veins favor a northeast trend and contain pyrite, chalcopyrite, galena, and tetrahedrite. The country rock has been fractured, locally brecciated, and intruded by lamprophyric, granophyric, and granitic dikes. Breccia zones along the Continental-Columbia belt consist of brecciated quartzite cemented by quartz and calcite. The breccia zones also contain pyrite, chalcopyrite, galena, and tetrahedrite.

Resources along the Continental-Columbia mineral belt include 100,000 tons grading 1.74 percent copper, 0.18 ounces gold per ton, and 1.6 ounce silver per ton (Kauffman, 1970, p. 4), and 2.7 million tons grading 0.075 ounce gold per ton. Reserves at the Yellowjacket mine are 22,000 ounces of gold in the oxide ore. Exploration is in progress to develop resources in the primary sulfide ore (John Lawrence, U.S. Antimony Corporation, personal communication, February 1997).

Gravel Range Mining District

The Gravel Range District covers a loosely defined area which includes the headwaters of Moyer Creek, Panther Creek, and Silver Creek. The district is bound on the northeast by the Blackbird District and on the northwest by the Yellowjacket District.

Mineralization in the district generally consists of two types; fluorspar-bearing veins, lenses, and replacements and precious metal-bearing veins. Both types occur in volcanic rocks. The Singheiser deposit consists of a 40-foot-wide, northeast trending shear zone which contains a 3 to 8-foot-thick quartz vein and numerous quartz veinlets. Shortly after 1896, a 50 ton per day mill was built to treat the ore. Development at the time of Umpleby's visit consisted of perhaps 3,000 feet of workings (Umpleby, 1913, p. 176). According to USBM production records, the mine produced significant amounts of silver, copper, and gold between 1907 and 1974.

At the Rabbit Foot mine, located about 3 miles northeast of the Singheiser, a 10-stamp mill operated during the early 1900's. Mineralization also consists of quartz lenses and stringers in shear zones in volcanic rock. According to Umpleby (1913, p. 177), development consisted of 5,000 feet of workings.

The Meyers Cove fluorspar deposits gained recognition during the early 1940's. During 1944, Chamac Mines completed a 100-ton flotation plant and a six-day test run was conducted in September. However, due to poor market conditions, actual mining did not start in ernest until 1951. During the next two years, 37,432 tons of fluorspar-bearing rock was mined from six deposits and delivered to the mill. From this tonnage, 10,979 tons of acid grade, 998 tons of ceramic grade, and 100 tons of metallurgical grade fluorspar was recovered. Most of this production came from the Big Lead deposit (Anderson, 1954, p. 10).

Between 1954 and 1972, the Meyers Cove deposits were worked intermittently by the Seaforth Mining Company and an additional 25,000 to 30,000 tons of metallurgical grade ore was produced (Fisher and Johnson, 1987, p. 140).

Most of the fluorspar is coarsely crystalline and occurs as veins, lenses, crusts around fragments of rocks, and replacements in shear zones in Challis volcanic rocks. The deposits developed through 1954 averaged 4 to 5 feet thick and 100 to 300 feet long. At the Big Lead deposit, the main body of fluorspar is 300 feet long and up to 18 feet wide. It trends from northwest to nearly west and dips southwest (Anderson, 1954, p.19).

Fluorspar resources in deposits held by the Seaforth Mining Company during 1985 were estimated to be 1,000,000 tons averaging approximately 35 percent fluorite. U.S. Geological Survey personnel conclude that with adequate exploration, additional resources of the same magnitude could be delineated (Fisher and Johnson, 1987, p. 144).

Eureka Mining District

In general terms, the Eureka District includes the north end of the Lemhi Range and a large area west of the Salmon River. The area west of the Salmon River extends from about Lake Creek on the south to the town of North Fork on the north. The ridge crest west of the Salmon River forms the district's western boundary with the exception of the Moose Creek drainage, which here is considered part of the Eureka District.

The first mining in the district began shortly after placer gold was discovered in the Moose Creek drainage during the 1860's. At first, mining was done by hand and hydraulic methods. Between 1899 and about 1919, several dredges were used to mine the gold-bearing gravel. By 1913, about $1 million in gold at a price of $20 per troy ounce had been recovered (Umpleby, 1913, p. 149).

In addition to the Moose Creek deposits, several lode mines in the district have produced significant amounts of metal. The Queen of the Hills deposit was located during the 1880's, but development did not start until 1898. By 1910, underground workings on five levels totalled over 9,000 feet. Mineralization consisted of three northeast striking, pyrite-, chalcopyrite-, and galena-bearing quartz veins in granite (Umpleby, 1913, p. 158). According to Mitchell (1995e, p. 8), production totalled 1,713 ounces of gold, 364 ounces of silver, 188 pounds of copper, and 6,993 pounds of lead.

The Pope Shenon, located near the north end of the Lemhi Range, developed veins along shear zones in quartzite and phyllite of the Yellowjacket Formation. The veins, generally less than 10 feet thick but up to 20 feet thick, contained quartz, chalcopyrite, pyrite, delafossite, and bornite (Anderson, 1956, p. 83). Between 1908 and 1975, recorded production totalled 4,594,951 pounds of copper, 24,725 ounces of silver, 500 ounces of gold, 22,107 pounds of lead, and 14,683 pounds of zinc (Mitchell, 1995d, p. 19). Most of the ore mined contained between 2.5 and 6 percent copper; some small bodies contained 10 to 20 percent copper (Anderson, 1956, p. 85).

The Harmony mine, located a few miles southeast of the Pope Shenon, also developed quartz veins and lenses along shear zones in quartzite. Ore minerals included chalcopyrite, chalcocite, and bornite (Anderson, 1956, p. 88; Gardner, 1930a, p. 2). Production between 1916 and 1931 totalled 47,826 tons of ore which yielded 1,815,353 pounds of copper, 2,050 ounces of silver, and 38 ounces of gold (Mitchell, 1995b).

Several distinct types of mineralization occur in the Eureka District. Near the north end of the district, a copper- and molybdenum-bearing stockwork/disseminated deposit (the Bobcat) formed where granitic stocks intruded quartzite. Ore minerals include chalcopyrite, chalcocite, and molybdenite. Resources at the Bobcat are estimated to be 60 million tons containing 0.2 to 0.3 percent copper (P. Nisbet, Formation Capital Corp., personal communication, 1994).

In a large area immediately to the south, gold-, silver-, lead-, and copper-bearing quartz veins occur in quartzite and granite. At the King Solomon deposit, quartz veins, lenses, and silicified areas in shear zones in quartzite, phyllite, and granitic rock contain an estimated 3.3 million tons grading 0.037 ounce gold per ton (P. Nisbet, Formation Capital Corp., personal communication, 1994).

An area of thorium and rare-earth oxide mineralization also occurs near the north end of the district. Monazite and thorite, the principal minerals, occur in quartz veins in quartzite and granite.

Near the south end of the district, copper- and silver-bearing quartz veins and lenses occur along faults in quartzite. The Pope Shenon and Harmony mines are in this area. Resources are present, but tonnage and grade are confidential.

Carmen Creek Mining District

The Carmen Creek District covers an area extending from the headwaters of Carmen Creek to the headwaters of Freeman Creek.

According to Umpleby (1913, p. 125), mining began in the district about 1897 when the Oro Cache mine was opened. A 10-stamp mill was built shortly thereafter and ore was processed until 1907. Between 1902 and 1914, 3,972 tons of ore were mined. During 1910, a small Ford quartz mill was installed at the Carmen mine to process gold ore discovered in 1904. The Silver Star deposit was located in 1902 and in 1938, a 150 ton per day flotation mill was constructed. Production from the Silver Star between 1925 and 1975 is estimated to be 691 ounces of gold, 6,286 ounces of silver, 6,791 pounds of copper, and 30,788 pounds of lead (Mitchell, 1995f, p. 5).

Mineralization in the district consists of several types. A copper- and gold-bearing exhalite zone, a few tens of meters thick, is located at the transition between the Middle Yellowjacket (argillite and quartzite) and the Upper Yellowjacket (quartzite) at the Carmen mine. The copper and gold are concentrated in lenses of massive quartz and magnetite. At the Oro Cache mine, quartz veins striking northeast and dipping steeply northwest in argillaceous quartzite contain pyrite, chalcopyrite, galena, sphalerite, and native gold. A fracture zone, 40 to 50 feet wide, strikes northeast and dips steeply southeast in quartzite at the Silver Star deposit. Breccia in the zone consists of angular fragments of quartzite cemented by white quartz which is locally drusy. Galena, sphalerite, tetrahedrite, chalcopyrite, and pyrite occur disseminated and as pods in the matrix (Anderson, 1959, p. 84).

Significant resources were identified by Plexis Gold during a drilling program conducted at the Silver Star. According to Nisbet (personal communication, Formation Capital Corp., 1995), the deposit contains 250,000 ounces of gold.

Eldorado Mining District

The Eldorado District extends from the Lemhi River to the Continental Divide and includes the Bohannon, West Fork Wimpey, and Geertson Creek drainages. The district is noted for its placer gold production which is outside the Forest. There are, however, several lode mines in the Forest that produced small amounts of gold, silver, copper, and lead.

The Ranger mine developed lenses, stringers, and irregular bodies of quartz which contained pyrite, chalcopyrite, a little galena, and traces of native gold. Ore was processed in a 20-stamp mill located a short distance down the canyon (Umpleby, 1913, p. 123). Small amounts of gold, silver, copper, and lead were produced during 1938 from the Mendota mine located near the headwaters of the West Fork Wimpey Creek. Like the rest of the mines and prospects in the Forest portion of the district, mineralization consists of quartz veins containing chalcopyrite, galena, malachite, and azurite in Precambrian quartzite, phyllite, and argillite.

Pratt Creek Mining District

The Pratt Creek District encompasses an area extending from the Lemhi River to the Continental Divide and from Wimpey Creek on the northwest to about Kenney Creek on the southeast (Umpleby, 1913). Ross (1941a), however, considers the headwaters of Kenney, Sandy, Pratt, and Wimpey Creeks to be in the Sandy Creek Mining District. For reasons of simplicity, Umpleby's description is accepted here.

Mineralization in the Forest portion of the district consists of quartz veins and replacement deposits in quartzite, argillite, and limestone. The Goldstone mine, probably the largest lode producer in the district, developed a gold-, silver-, copper-, and lead-bearing vein trending northwest and dipping steeply in quartzite and argillite. The ore was composed of quartz containing chalcopyrite and galena. Production between 1901 and 1939 was 139,669 pounds of lead, 4,058 pounds of copper, 3,475 ounces of gold, and 2,771 ounces of silver (Mitchell, 1995a).

At the War Eagle mine, located just outside the Forest, a northwest trending, steeply dipping quartz vein containing galena, cerussite, and sphalerite was mined. Production between 1937 and 1939 was 439 ounces of gold, 273 ounces of silver, and small amounts of lead and copper.

McDevitt Mining District

According to Umpleby (1913), the McDevitt District is located about 20 miles southeast of Salmon. It extends from Haynes Creek on the northwest to Reese Creek on the southeast and from the crest of the Lemhi Range to the Continental Divide.

Most of the mining activity in the district has been concentrated in the Lemhi Pass area along the Continental Divide. Early prospecting was for precious and base metals. In 1883, the Copper

Queen deposit was located and production began around 1893. Mineralization consists of copper-bearing quartz veins, sulfide veins, and replacement bodies which occur in a fault breccia zone trending N 40-70 E and dipping 40-70 NW in quartzite. The mine eventually produced a large amount of copper and significant amounts of gold and silver.

Thorium and rare-earth oxides were discovered in the Lemhi Pass area by Vhay (1951) during 1949, and by Trites and Tooker (1953) during 1950. Their discovery resulted in a large surge in exploration activity, claim staking, and numerous studies.

According to Staatz (1979a), thorium, rare-earth oxides, and copper occur in steeply dipping veins in Precambrian sedimentary rocks, generally quartzite and siltite. The veins range in length from a few feet to as much as 4,350 feet and in thickness from thin seams to as much as 40 feet. Of approximately 250 veins mapped, thorium veins constituted 87 percent while copper and barren quartz veins each made up 6 percent of the total.

Thorite is the predominant thorium mineral in the veins; monazite, a thorium and rare-earth mineral, is the next most common. The ratio of total rare-earth oxides to thoria in 25 veins was four to three. Many of the larger veins contain more than 0.4 percent ThO_2 (Staatz, 1979a).

Indicated thorium resources in the Lemhi Pass area are 176,500 tons ThO_2 and inferred resources are 128,900 tons ThO_2. Indicated rare-earth oxide resources are 186,000 tons and inferred resources are 122,000 tons (Staatz, 1979a, p. A1). A large portion of the resources are in the Forest.

Junction Mining District

The Junction District boundaries are loosely defined. According to Ross (1941a) and Umpleby (1913, p. 112), the district extends to the McDevitt District on the northwest, to the Continental Divide on the northeast, to the crest of the Lemhi Range on the southwest, and into country with few mineral deposits on the southeast.

Most mines in the district explore lead-silver replacement deposits in Mississippian limestone. A few small mines explore deposits of secondary copper minerals in fractures and in thrust fault breccias and disseminated mineralization occurs in granitic rocks at two locations.

The Leadville and Kimmel mines are the only major producers in the district. Two east-trending ore shoots, as much as 4 feet thick, and separated by about 40 feet of barren, crushed limestone were mined at the Leadville. Primary ore minerals consisted mainly of fine-grained galena, less common pyrite, and rare sphalerite and chalcopyrite; secondary ore minerals, although rare, consisted of cerussite and anglesite. The eastern shoot also contained appreciable amounts of antimony, arsenic, and bismuth. Smelter analyses of the richest ore from the upper levels in the mine show that it contained about 55 percent lead, 0-1 percent zinc, 0.012 percent copper, 29-35 ounces of silver per ton, and a trace of gold.

At the Kimmel mine, located just west of the Leadville mine, disseminated fine-grained pyrite

and still finer grained galena occurs in hydrothermally altered and sericitized granite and limestone breccia. Assays indicate that the lead content averages about 1 percent and the silver content ranges from 0.05 to 0.5 ounce per ton (Rupple and Lopez, 1988, p. 90-100).

According to USBM records, the two mines produced at least 13,444 tons of ore containing significant amounts of lead and silver and lesser amounts of copper, zinc, and gold. Ruppel and Lopez (1988, p. 99) reported production of 4,000 to 4,500 tons.

Granodiorite and quartz monzonite at the Blue Jay contain vein, stockwork, and disseminated mineralization. Molybdenite and scheelite occur in an irregular quartz vein developed by the Mulkey adit. About 400 feet northwest of the adit, quartz, malachite, and azurite fill fractures, and chalcopyrite, molybdenite, and pyrite are in quartz veinlets and disseminations in the altered intrusive rock. Between 1948 and 1950, more than 10,000 pounds of copper were recovered from 56 tons of ore (Cather and Rains, 1988).

Texas Mining District

The Texas Mining District is located along the east flank of the Lemhi Range near the historic mining town of Gilmore. The district is generally accepted to extend from Long Canyon on the south to Deer Creek on the north.

Mining began during the 1880's and most of the early production was shipped to the Nicholia lead smelter located southeast of Gilmore. In 1889, the smelter closed and mining slowed dramatically in the district. A rail line reached the Lemhi Valley in 1910 from Armstead, Montana and major development and production began again. Mining continued, more or less sporadically, from then until the early 1980's.

Mineralization generally consists of lead-silver replacement deposits which formed along northeast-trending, northwest dipping fractures in limestone and dolomite of the Jefferson and Saturday Mountain Formations. The ore contains chiefly cerussite, with lesser amounts of anglesite, smithsonite, hemimorphite, and cerargyrite, in a gangue of earthy hematite, limonite, and manganese oxide. Only small amounts of the primary sulfide minerals galena, sphalerite, and chalcopyrite are present, even at depth.

Gold is generally scarse with the exception of three mines. The Allie, just outside the Forest, was the only mine in the district with gold as its principal commodity. An estimated 15,720 ounces gold were produced from ore which averaged about 0.5 ounce per ton. Some small pockets contained as much as 25-30 ounces per ton. The Democrat and Hilltop mines, both inside the Forest, produced significant amounts of gold along with large amounts of lead and silver. Estimated production from the two mines is between $1 and 2 million. The Pittsburg-Idaho and Latest Out lead-silver mines, both just outside the Forest, accounted for most of the estimated district production of $17-17.5 million (Ruppel and Lopez, 1988, p. 100-108). According to Mitchell (1995c, p. 13), production from the major mines totalled 21,396 ounces gold, 3,401,117 ounces silver, 1,086,249 pounds copper, 146,857,591 pounds lead, and 1,048,685 pounds zinc.

The lead-silver replacement deposits were generally high grade. The average grade of ore mined at the Pittsburg-Idaho was about 27 percent lead, 5-10 percent zinc, 13 ounces of silver per ton, and 0.03 ounce or less of gold per ton. Representative ores from the 200-foot-level in the Latest Out mine contained 35 percent lead, 7 percent zinc, 16 ounces silver per ton, and 0.025 ounce gold per ton (Ruppel and Lopez, 1988, p. 82-108).

Spring Mountain Mining District

The Spring Mountain District is located along the east flank of the Lemhi Range just south of the Texas Mining District. Most mines in the district are in the Targhee and Challis National Forests.

Lead-silver deposits were discovered during the early 1880's at the head of Spring Mountain Canyon and in Lemhi Union Gulch. Ore mined was shipped to the Nicholia lead smelter until it closed in 1889. In the Spring of 1909, a 50-ton-capacity smelter was built at Hahn, located near the mouth of Spring Mountain Canyon, to process district ore. The smelter operated for 17 days during 1909 and for 21 days during 1910 (Umpleby, 1913, p. 85). Mining has been sporadic since. Total production from the district is estimated to be about $1 million (Ruppel and Lopez, 1988, p. 101).

Mineralization, similar to that seen in the Texas District, consists of lead-silver replacement deposits which formed along northeast trending, northwest dipping fractures in limestone and dolomite of the Jefferson and Saturday Mountain Formations. However, unlike those in the Texas District, the lenticular orebodies here are narrow, probably averaging less than 6 inches thick. The principal ore minerals are cerussite, anglesite, smithsonite, hemimorphite, galena, and probably cerargyrite in an earthy, limonitic, and jasperoidal gangue (Ruppel and Lopez, 1988, p. 109).

MINING CLAIMS

During the preliminary part of this study, BLM mining claim records were reviewed to determine where claim staking activity had occurred. Plate 7 shows those areas (by section) containing active (as of the end of 1994) and recently active lode claims. The claim density plot serves as a guide to identify areas where recent exploration activity has been concentrated. The mines and prospect symbols represent locations found on other plates.

BIBLIOGRAPHY

Abbott, A.I., 1954, Monazite deposits in calcareous rocks, northern Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 99, 22 p.

Albee, H.F., and MacLaren, D.R., 1960, Long Dike Group of claims, Lemhi County, Idaho: Defense Minerals Exploration Administration Report, 4 p.

Allen, T.J., 1991, Beartrack Gold Deposit, Lemhi County, Idaho: unpublished U.S. Bureau of Mines report, 13 p.

Alvord, 1958a, Defense Minerals Exploration Administration Report, Docket No. DMEA-4951.

_____, 1958b, Defense Minerals Exploration Administration Report, Docket No. DMEA-5034.

_____, 1958c, Defense Minerals Exploration Administration Report, Docket No. DMEA-5032.

Anderson, A.L., 1943a, Copper mineralization near Salmon, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 60, 15 p.

_____, 1943b, A preliminary report on the cobalt deposits in the Blackbird district, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 61, 34 p.

_____, 1943c, Antimony and fluorspar deposits near Meyers Cove, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 62, 20 p.

_____, 1947, Cobalt mineralization in the Blackbird district, Lemhi County, Idaho: Economic Geology, vol. 42, p. 22-46.

_____, 1953, Gold-copper-lead deposits of the Yellowjacket District, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 94, 41 p.

_____, 1954, Fluorspar deposits near Meyers Cove, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 98, 34 p.

_____, 1956, Geology and mineral resources of the Salmon Quadrangle, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 106, 102 p.

_____, 1957, Geology and mineral resources of the Baker Quadrangle, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 112, 71 p.

_____, 1958a, Thorite and rare earth deposits in the Lemhi Pass area, Lemhi County, Idaho:

Mining and Engineering Journal, v. 10, no. 12, p. 1241-1243.

_____, 1958b, Uranium, thorium, columbium, and rare earth deposits in the Salmon Region, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 115, 81 p.

_____, 1959, Geology and mineral resources of the North Fork Quadrangle, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 118, 92 p.

_____, 1960, Geology of thorite-rare earth deposits of the Lemhi Pass region, in Newton, Joseph, Lemoine, Denis, Adams, C.N., Anderson, A.L., and Shively, J.A., Study of two Idaho thorite deposits: Idaho Bureau of Mines and Geology Pamphlet 122, p. 33-39 p.

_____, 1961a, Geology and mineral resources of the Lemhi Quadrangle, Lemhi County, [Idaho]: Idaho Bureau of Mines and Geology Pamphlet 124, 111 p.

_____, 1961b, Thorium mineralization in the Lemhi Pass area, Lemhi County, Idaho: Economic Geology, vol. 56, number 1, p. 177-197.

_____, 1963, Contact syenitization in the Yellowjacket district, Lemhi County, Idaho: American Journal of Science, vol. 261, no. 9, p. 826-838.

_____, 1964, Flourspar in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 79-84.

Anderson, A.L. and Savage, C.N., Thorium and the Rare Earths in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 211-217.

Anderson, A.L., and Wagner, W.R., 1944, Lead-zinc-copper deposits of the Birch Creek district, Clark and Lemhi Counties, Idaho: Idaho Bureau of Mines and Geology Pamphlet 70, 43 p.

Anderson, R.A., 1948, Reconnaissance survey of the geology and ore deposits of the southwestern portion of the Lemhi Range, Idaho: Idaho Bureau of Mines and Geology Pamphlet 80, 18 p.

Armstrong, F.C., 1964, Uranium in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 233-241.

Armstrong, F.C., and Weis, P.L., 1955, The Garm-Lamoreaux mine, Lemhi County, Idaho: U.S. Geological Survey Open-File Report, 14 p.

Asher, R.R., 1964, Iron in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 104-110.

Austin, S.R., 1968, Thorium, yttrium, and rare-earth analyses, Lemhi Pass, Idaho and Montana: U.S. Atomic Energy Commission Technical Memorandum AEC-RID-2, 12 p.

Austin, S.R., Hetland, D.L., and Sharp, B.J., 1970, Mineralogy of the Lemhi Pass thorium and rare-earth deposits, Idaho Bureau of Mines and Geology Mineral Resources Report 11, 11 p.

Bacorn, H.C., 1905, A complicated fault system: Engineering and Mining Journal, v. 79, p. 324.

Bartels, E., Douglas, I., Van Huffel, G., and Busby, S., 1990, Beartrack Project, Abstract and Road Log; in Falma Moye, Editor, Geology and ore deposits of the trans-Challis fault systems/Great Falls Tectonic Zone, Tabacco Root Geological Society 15th Annual Field Conference Proceedings.

Bates, R.L., and Jackson, J.A., 1980, Glossary of Geology - Second edition: American Geological Institute, 749 p.

Behre, C.H., 1929, Tertiary volcanic tuffs and sandstones used as building stones in the upper Salmon River valley, Idaho: U.S. Geological Survey Bulletin 811-E, p. 237-249.

Behre Dolbear and Company, Inc., 1979, Engineering-Evaluation Report for Salmon Canyon Copper Company: available on request from the U.S. Forest Service, Salmon, Idaho, 34 p.

Bell, R.N., 1904, Report of the Mining Districts of Idaho for 1903: Report of the State Inspector of Mines, 139 p.

_____, 1907, Report on Lemhi County Mines: Ninth Annual Report of the mining industry of Idaho, pp. 115-136

_____, 1908, Ninth Annual Report of the Mining Industry of Idaho, for the year 1907: Idaho Mine Inspectors Office, 217 p.

_____, 1911, Twelveth Annual Report of the Mining Industry of Idaho for the year 1910: Report of the State Inspector of Mines.

_____, 1912, Thirteenth Annual Report of the Mining Industry of Idaho for the year 1911: Report of the State Inspector of Mines, 128 p.

_____, 1913, Fourteenth Annual Report of the Mining Industry of Idaho for the year 1912: Report of the State Inspector of Mines, 190 p.

_____, 1917, Eighteenth Annual Report of the Mining Industry of Idaho for the year 1916.

_____, 1918, Nineteenth Annual Report of the Mining Industry of Idaho for the year 1917: Report of the State Inspector of Mines, 131 p.

_____, 1920, Twenty-first Annual Report of the Mining Industry of Idaho for the year 1919: Report of the State Inspector of Mines.

_____, 1921, Twenty-second Annual Report of the Mining Industry of Idaho for the year 1920: Report of the State Inspector of Mines, 24 p.

Bennet,E.H., 1977, Reconnaissance geology and geochemistry of the Blackbird Mountain - Panther Creek region, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 167, 108 p.

_____, 1980, The identification and description of granitic rocks of Tertiary age in the Idaho batholith, and their relationship to mineralization: Economic Geology, v. 75, no. 2, p. 278-288.

_____, 1986a, Idaho: 1986 Annual Review--Exploration in Mining Engineering, May 1987, vol. 39, no. 5, p. 332-333.

_____, 1986b, Relationship of the trans-Challis fault system in central Idaho to Eocene and Basin and Range extensions: Geology, v. 14, p. 481-484.

Bergendahl, M.H., 1964, Gold in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 93-100.

Bevans, Arthur, 1982, Miners, mines, and mining, in Randolph, Julia compiler, Gibbonsville, Idaho--the Golden years: Gibbonsville Improvement Association, p. 76-101.

Biddle, J.H., 1985, The geology and mineralizatin of part of the Bird Creek quadrangle, Lemhi County, Idaho: M.S. Thesis, University of Idaho, Moscow, Idaho, 119p.

Bilbrey, J.H. Jr., 1962, Cobalt: A material Survey: U.S. Bureau of Mines Information Circular 8103.

Bliss, J.D., 1994, Mineral deposit modeling using components for complex mineral deposits: Mixed base- and precious-metal veins of the Idaho batholith, Idaho: U.S. Geological Survey Open-File report 94-690, 53 p.

Bowen, O.E., and Gray, C.H., 1973, Marketing and utilization of carbonate rocks in California in limestone and dolomite resources of California: California Division of Mines and Geology Bulletin 194, p. 35-45.

Bradford, R.H., 1921, The volatilization process at the Pope-Shenon Mine: Mining and Scientific Press, v. 123 (August 20,1921), p. 263-266.

Bradshaw, H.E., 1980, Exploration at the Ima mine: 86th annual covention, Northwest Mining Association, Spokane, Washington, 7 p.

Brooks, A.H., 1908, Gold, silver, copper, lead, and zinc in the Western States---Idaho in Mineral Resources of the United States, Calendar Year 1907, Part I--Metallic Products: U.S. Geological Survey, p. 406-410.

_____, 1909, Gold, silver, copper, lead, and zinc in the Western States---Idaho in Mineral Resources of the United States, Calendar Year 1908, Part I--Metallic Products: U.S. Geological Survey, p. 426-428.

Brown, R.W., 1940, Additions to some fossil floras of the Western United States in Shorter contributions to general geology 1936: U.S. Geological Survey Professional Paper 186, p. 163-186.

Buel, E.W., 1952, Preliminary examination of the Wells Cobalt prospect, Lemhi County, Idaho: unpublished report available at the U.S. Bureau of Mines, Spokane, Washington, 2 p.

Bunning, B.B, and Burnet, F.W., 1981, Copper-molybdenum mineralization in the Bobcat-Gulch porphry system, Lemhi County, Idaho: Unpublished paper presented at the 87th Annual Northwest Mining Association Convention, Spokane, Wash., December 5, 1981.

Callaghan, E., and Lemmon, D.M., 1941, Tungsten resources of the Blue Wing district, Lemhi County, Idaho: U.S. Geological Survey Bulletin 931-A, p. 1-21.

Camm, T.W., 1991, Simplified cost models for prefeasibility mineral evaluations: U.S. Bureau of Mines Information Circular 9298, 35 p.

Campbell, Arthur, 1936, Thirty-Eighth Annual Report of the Mining Industry of Idaho for the Year 1936: Idaho Mine Inspectors Office, 315 p.

_____, 1938, Fortieth Annual Report of the Mining Industry of Idaho for the Year 1938: Idaho Mine Inspectors Office, 275 p.

_____, 1939, Forty-first Annual Report of the Mining Industry of Idaho for the Year 1939: Idaho Mine Inspectors Office, 341 p.

Campbell, Stewart, 1923, Twenty-Fifth Annual Report of the Mining Industry of Idaho for the Year 1923: Idaho Mine Inspectors Office, 121 p.

_____, 1924, Twenty-Sixth Annual Report of the Mining Industry of Idaho for the Year

1924: Idaho Mine Inspectors Office, 249 p.

_____, 1926, Twenty-Eighth Annual Report of the Mining Industry of Idaho for the Year 1926: Idaho Mine Inspectors Office, 269 p.

_____, 1932, Thirty-Fourth Annual Report of the Mining Industry of Idaho for the Year 1932: Idaho Mine Inspectors Office, 303 p.

Canney, F.C. and others, 1953, A preliminary report of geochemical investigations in the Blackbird district: U.S. Geological Survey Open-File Report No. 221, 20p.

Carrey, Johnny, and Conley, Cort, 1980, The Middle Fork and the Sheepeater War: Backeddy Books, Cambridge, Idaho, 319 p.

Carter, R.M., 1964, Mineral and water resources of Idaho: U.S. Geological Survey, Idaho Bureau of Mines and Geology, and Idaho Department of Reclamation, 335 p.

Carter, C.H., 1981, The geology of part of the YellowJacket Mining District, Lemhi County, Idaho: University of Idaho M.S. thesis, 131 p.

Cater, F.W., Pinckney, D.M., Hamilton, W.B., Parker, R.L., Weldin, R.D., Close, T.J., and Zilka, N.T., 1973, Mineral resources of the Idaho Primitive Area and vicinity, Idaho: U.S. Geological Survey Bulletin 1304, 431 p.

Cater, F.W., and Pinckney, D.M., U.S. Geological Survey, and Stotelmeyer, R.B., U.S. Bureau of Mines, 1975, Mineral resources of the Clear Creek-Upper Big Deer Creek study area, contiguous to the Idaho Primitive Area, Lemhi County, Idaho: U.S. Geological Survey Bulletin 1391-C, 41 p.

Cather, E.E., and Rains, R.L., 1988, Mineral resources of the Lemhi Range study area, Lemhi and Custer Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA 8-88, 53 p.

Centurion Gold Ltd., 1988, Annual Report.

Chevillon, V. and Herberger, D.J., 1989, Syngenetic gold mineralization in the Proterozoic Yellowjacket Formation, Ulysses gold mine, Lemhi County, Idaho: Geological Society of America, Abstracts with Programs, vol. 21, no. 5, 65 p.

Cohenour, R.E., 1982, Wagonhammer property, North Fork area, Lemhi County, Idaho: unpublished report available at the U.S. Forest Service, Salmon, Idaho, 11 p.

Cohenour, R.E., Fox, R.C., and Robison, W.D., 1973, Geology and geophysics of the Iron Creek copper-cobalt deposit, Lemhi County, Idaho: 1973 Pacific Northwest Metals and Minerals Conference, American Instutute of Mining, Metallurgical and Petroleum Engineers, Inc., Coeur d'Alene, ID, April 12-13, 12 p.

Cole, W.C., 1956, Geology of the Blackbird mine: unpublished paper, November 1956, Calera Mining Co., 22p.

Collins, R.P., Knostman, R.W., and Petersen, N.G., 1967, The mineral industry of Idaho: U.S. Bureau of Mines Minerals Yearbook 1965, v. 3, p. 261-279.

Connor, J.J., Bartel, A.J., Brandt, E., Briggs, P.H., Danahey, S., Fey, D., Hatfield, D.B., Malcolm, M., Merritt, V., Riddle, G., Roof, S., Stewart, K., Storey, J., Taggart, J.E., and Vaughn, R.B., 1990, Geochemical stratigraphy of the Yellowjacket Formation (Middle Proterozoic) in the area of the Idaho Cobalt Belt, Lemhi County, Idaho: U.S. Geological Survey Open-File Report OF 90-0234A, 30 p.

Connor, J.J., and Evans, K.V., 1986, Geologic map of the Leesburg Quadrangle, Lemhi Counmty, Idaho: U.S. Geological Survey Miscellaneous Field Studies map MF-1880, scale 1:62,500.

_____, 1990, Cobalt mineralization in the northern Lemhi Range, Lemhi County, Idaho [abs], in Moye, F.J., ed., Geology and ore deposits of the Trans-Challis fault system/Great Falls tectonic zone: Tobacco Root Geological Society, Fifteenth Annual Field Conference Guidebook, p. 93-95.

Connor, J.J., Evans, K.V., Briggs, P.H., Crock, J.G., Hopkins, R.T., Kennedy, K.R., O'Leary, R.M., Roushey, B.H., Slaughter, K.E., and Welsch, E.P., 1991, Chemical analyses of rock samples collected in east-central Idaho during a study of mineralization in the northern Lemhi Range, Lemhi County, Idaho: U.S. Geological Survey Open-File Report OF 90-0655, 48 p.

Cook, E.F., 1955, Prospecting for uranium, thorium, and tungsten in Idaho: Idaho Bureau of Mines and Geology Pamphlet 102, 53 p.

_____, 1956, Tungsten deposits of south-central Idaho: Idaho Bureau of Mines and Geology Pamphlet 108, 40 p.

_____, 1957, Radioactive minerals in Idaho: Idaho Bureau of Mines and Geology Mineral Resources report 8, 5 p.

Coppinger, Walter, 1974, Stratigraphic and structural study of the Belt Supergroup and associated rocks in a portion of the Beaverhead Mountains, southwest Montana, and east-central Idaho: Ph.D. thesis, Miami University, Oxford, Ohio, 224 p.

Cox, D.C., 1954, Fluorspar Deposits near Meyers Cove, Lemhi County, Idaho: U.S. Geological Survey Bulletin 1015-A, 19p.

Davidson, D.M., 1928, Geology and petrology of the Mineral Hill mining district, Lemhi County, Idaho: Ph.D. Thesis, University of Minnesota, 65 p.

Desborough, G.A., Raymond, W.H., and Evans, K.V., 1990, Fine-grained gold in stream sediments of east-central Lemhi County, Idaho: U.S. Geological Survey Open-File Report 90-0332, 9 p.

Dobey, A.B., 1972, Reconnaissance Geology of the Meyers Cove Point Quadrangle, Lemhi County, Idaho: Masters Thesis, University of Idaho, 54 p.

Dow, V.T., 1960, Report of mineral examination - Lady May claim, Trey claim: U.S. Forest Service, 5 p.

ECM Inc., (Billings, Mont.), 1990, Pierce Creek property (mineral exploration report), Lemhi County, Idaho: 12 p., 2 plates, scale 1:12,000.

Eilerstein, D.E., and Lamb, F.D., 1956, A comprehensive report of exploration by the Bureau of Mines for thorium and radioactive black mineral deposits: U.S. Bureau of Mines RME 3140, 45 p.

Eldridge, G.H., 1895, A geological reconnaissance across Idaho: U.S. Geological Survey, 16th Annual Report, part 2, p. 211-276.

Earhart, R.L., 1986, Descriptive model of Blackbird Co-Cu, in Cox, D.P. and Singer, D.A., eds., Mineral Deposit Models: U.S. Geological Survey Bulletin 1693, 142 p.

Esparza, L.E., 1985, Mineral Appraisal of the Middle Bargamin Creek and Big Mallard Creek Units, Idaho County, Idaho in Ridenour, James, compiler, 1985, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-file Report MLA 64-85, p. 157-164.

_____, 1985, Mineral Appraisal of the Magruder-Blue Joint Unit, Idaho and Lemhi Counties, Idaho in Ridenour, James, compiler, 1985, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA 64-85, p. 149-156.

Esparza, L.E., Miller, M.S., and Pierce, P.A., 1985, Mineral appraisal of the Special Mining Management Zone--Clear Creek, Lemhi County, Idaho in Ridenour, James, compiler, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA 64-85, p. 77-88.

Evans, K.V. and Conner, J.J, 1993, Geologic map of the Blackbird Mountain 15-minute Quadrangle, Lemhi County, Idaho: U.S. Geological Survey MF-2234, scale 1:62,500.

Evans, K.V., Lund, K., Fairfield, R., Hopkins, R.T., Roemer, T.A., and Sutley, S.J., 1993, Analyses of rocks and stream sediment from the Special Mining Management Zone--Clear

Creek, Lemhi County, Idaho: U.S. Geological Survey Open-File Report 93-708A, 48 p.

Farwell, F.W., 1943, Preliminary report on the Mackay Standard Mining and Milling Company property, Copper Basin, Custer County, ID: U.S. Geological Survey, unpublished report, 4 p.

Farwell, F.W., and Full, R.P., 1944, Geology of the Empire Copper mine near MacKay, Idaho: U.S. Geological Survey Open-File Report 44-17, 22 p.

Fenneman, N.M., 1931, Physiography of the Western United States: McGraw -Hill Book Company, Incorporated, New York, 534 p.

Fernette, G., and Jones, W., 1983, Geology, Energy, and Mineral (GEM) Resource Assessment of the Eighteen Mile GRA, Idaho, including the Eighteen Mile (43-3) Wilderness Study Area. Prepared by WGM Inc. Mining and Geological Consultants, Anchorage, AK, 88 p.

Fisher, F.S., 1985, Summary of the geology, mineral deposits, and resource potential for selected commodities in the Challis Quadrangle, in Symposium on the geology and mineral deposits of the Challis 1◦ x 2◦ Quadrangle, Idaho: U.S. Geological Survey Bulletin 1658 A-S, p. 1-27

Fisher, F.S., and Johnson, K.M., eds., 1987, Preliminary manuscript for mineral-resource potential and geology of the Challis 1◦ x 2◦ Quadrangle, Idaho: U.S. Geological Survey Open-File Report 87-480, 251 p.

_____, 1995, Geology and mineral resource assessment of the Challis 1◦x 2◦ quadrangle, Idaho: U.S. Geological Survey Professional Paper 1525, 243 p.

Fisher, F.S., McIntyre, D.H., and Johnson, K.M., compilers, 1983, Geologic map of the Challis Quadrangle Idaho: U.S. Geological Survey Open-File Report MF-83-523, 41 p., scale 1:62,500.

Fisher, F.S., McIntyre, D.H., and Johnson, K.M. 1992, Geologic map of the Challis 1◦x 2◦ quadrangle, Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1819, scale 1:250,000.

Formation Capital Corporation Board of Directors, November 1, 1988, Public Financing Proposal for Formation Capital Corporation: unpublished report, 32 p.

Formation Capital Corporation, January 25, 1991, Exploration report on the Wallace Creek project, Eureka Mining District, Lemhi County, Idaho, U.S.A.: Unpublished Formation Capital Corporation report on an exploration project, 77 p.

Formation Capital Corporation, 1995, Annual Report

Gardner, R.D., 1930a, Milling methods and costs at the Harmony Mines, Baker, Idaho: U.S. Bureau of Mines Information Circular 6285, 18 p.

_____, 1930b, Mining practice at Harmony Mines Co., Baker, Idaho: U.S. Bureau of Mines Information Circular 6240, 8 p.

Geach, R.D., 1966, Thorium deposits of the Lemhi Pass district, Beaverhead County, Montana: Montana Bureau of Mines and Geology Special Publication 41, 22 p.

_____, 1972, Mines and mineral deposits (except fuels), Beaverhead County, Montana: Montana Bureau of Mines and Geology Bulletin 85, 194 p.

Gere, W.C., Phosphate Rock in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 152-161.

Gerry, C.N., 1912, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States Calendar Year 1911: U.S. Geological Survey.

_____, 1913, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States Calendar Year 1912: U.S. Geological Survey.

_____, 1914, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States Calendar Year 1913: U.S. Geological Survey.

_____, 1916, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States Calendar Year 1914: U.S. Geological Survey.

_____, 1919, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1916: U.S. Geological Survey.

_____, 1921, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1917: U.S. Geological Survey.

_____, 1924, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1921: U.S. Geological Survey.

_____, 1925, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1922: U.S. Geological Survey.

_____, 1927, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1924: U.S. Geological Survey.

_____, 1928, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1925: U.S. Geological Survey.

_____, 1932, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the

United States 1929: U.S. Geological Survey.

Gerry, C.N., and Miller, T.H., 1933, Gold, Silver, Copper, Lead, and Zinc in Idaho in Mineral Resources of the United States 1930: U.S. Geological Survey.

Gilbert, D.C., 1933, Report on the Maryland mine, Junction District, Lemhi County, Idaho: unpublished International Smelting and Refining Company report, 6 p.

Gillerman, V.S., and Bennett, E.H., 1994, Idaho in State Activities 1993: Mining Engineering, Vol. 46, No. 5, p. 410-412.

Godwin, L.H., and Oberlindacher, Peter, 1976, Geothermal land classification map (Idaho): U.S. Geological Survey Conservation Division map, scale 1:500,000.

Gray, Anton, 1927, Ore Deposits of the Mineral Hill District, Lemhi County, Idaho: Ph.D. Thesis, University of Minnesota, Minnesota, 95 p.

Green, W.R., 1972, Delineation of mineral belts of northern and central Idaho: Idaho Bureau of Mines and Geology Information Circular 22, 8 p.

Griner, W.C., 1972, Mining industry of Idaho for 1971: Idaho Inspector of Mines 69th Annual Report, 98 p.

_____, 1974, Mining industry of Idaho for 1973-1974: Idaho Inspector of Mines 71st Annual Report, 98 p.

Grove, W.D., 1985, Report on the Breccia Gold Property, Porphyry Ridge-Panther Creek area, Blackbird Mining District, Lemhi County, Idaho: unpublished report prepared for Metron Resources Ltd, 15 p.

Gustafson, Jon, 1987, Mining districts of the state of Idaho, redrawn version: Idaho Geological Survey Map 6, scale 1:1,000,000.

Hahn, G.A., and Hughes, G.J., 1984, Sedimentation, tectonism, and associated magmatism of the Yellowjacket Formation in the Idaho Cobalt Belt, Lemhi County, Idaho in Hobbs, S.W., ed., The Belt-Abstracts with Summaries, Belt Symposium II, 1983: Montana Bureau of Mines and Geology, Special Publication 90, p. 65-67.

Hait, M.H., 1965, Structure of the Gilmore area, Lemhi Range, Idaho: Ph.D. Thesis, Pennsylvania State University, 134 p.

Hanna, W.F., Kaufmann, H.E., Hassemer, J.H., Ruppel, B.D., Pearson, R.C., and Ruppel, E.T., 1993, Maps showing gravity and aeromagnetic anomalies in the Dillon 1∘x 2∘ quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Series Map I-1803-I, scale 1:250,000.

Hansen, P.M., 1983, Structure and stratigraphy of the Lemhi Pass area, Beaverhead Range, southwest Montana and east-central Idaho: M.S. Thesis, Pennsylvania State University, University Park, Pennsylvania, 112 p.

Harrison, S.L., 1985, Sedimentology of Tertiary sedimentary rocks near Salmon, Idaho: Ph.D. Thesis, University of Montana, Missoula, 161 p.

Hawkes, H.E., 1952, Geochemical prospecting in the Blackbird cobalt district, Idaho [abs.]: Geological Society of America bulletin, vol. 63, p. 1260.

Hedrick, J.B., 1985, Rare-earth elements and yttrium, in Mineral facts and problems, 1985 edition: U.S. Bureau of Mines Bulletin 675, p. 647-664.

Herdlick, J.A., 1945, Copper King Mine, Lemhi County, Idaho: unpublished U.S. Bureau of Mines report, 5 p.

_____, 1948, Be Van Quartz Crystal Prospect, Lemhi County, Idaho: U.S. Bureau of Mines Report of Investigations 4209, 6 p.

Hess, F.L., 1921a, Cobalt in Mineral Resources of the United States 1917, Part I--Metals: U.S. Geological Survey

_____, 1921b, Cobalt in Mineral Resources of the United States 1918, Part I--Metals: U.S. Geological Survey

Hilpert, L.S., 1965, Application examination of the Big Smokey et al. claims, Lemhi County, Idaho: Office of Mineral Exploration OME-6390, unpublished report, 6 p.

Hobbs, S.W., 1964, Tungsten in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 223-233.

Holmes, W.H., 1910, Report on the mines of the American Mining and Reduction Company in Wark, J.F., 1984, Eagle Claw Mining Co. geologic and engineering report (mineral exploration report on the Gibbonsville project): Spokane, Wash., N.A. Degerstrom, Inc., 7 p.; available on request from R.T. Mayerle, U.S. Bureau of Mines, Western Field Operations Center, Spokane, Wash.

Hopkins, R.T., Sharkey, J.D., Romine, K.A., and Nowlan, G.A., 1985, Analytical results and sample locality map of stream-sediment and panned-concentrate samples from the McEleny Addition and a part of the West Panther creek Addition to the Frank Church-River of No return Wilderness, Lemhi County, Idaho: U.S. Geological Survey Open-File report 85-702, 23 p.

Horn, M.C., Leszcykowski, A.M., Esparza, L.E., Ridenour, James, Olson, J.E., Gale, G.D., and Benjamin, D.A., 1985, Appraisal of placer deposits in part of the Frank Church-River of No Return Wilderness, Idaho, in Ridenour, James, editors, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-File Report 64-85, p. 165-188.

Howell, Roger, and Wendland, Dave, 1989, Yellowjacket progress report: unpublished Westgold and U.S. Antimony Corporation joint venture report, 17 p.

Hughes, G.J., 1983, Basinal setting of the Idaho Cobalt Belt, Blackbird Mining District, Lemhi County, Idaho in The Genesis of Rocky Mountain Ore Deposits: Changes with Time and Tectonics: Proceedings of the Denver region explortation Geologists Society Symposium, p. 21-29.

_____, 1990, The Blackbird mining district, Lemhi County, Idaho in Moye, F.J., 1990, ed., Geology and ore deposits of the trans-Challis fault system/Great Falls tectonic zone: Salmon, Idaho, Tobacco Root Geological Society Fifteenth Annual Field Conference, p. 5-29.

Hyndman, P.C., 1989, Availability of Federally owned minerals for exploration and development in Western States--Idaho, 1987: U.S. Bureau of Mines Special Report, in preparation.

Idaho Nuclear Energy Commission, 1968, Transactions of the Thorium Information Meeting, 68 p.

International Mining News, 1994, May 11, vol. 105, no. 19

Johnson, V.Z., and Nickelson, H.B., 1954, Ima mine, final report: Office of Mineral Exploration Report DMEA-1285X, unpublished data on file at U.S. Bureau of Mines Western Field Operations Center, Spokane, Washington, 26 p.

_____, 1954, J.R. Simplot Company Chamac Mine, Gravel Range Mining District, Meyers Cove, Lemhi County, Idaho: Defense Minerals Exploration Administration, Contract Idm-E347, 14 p.

Joralemon, Peter, 1973, Exploration at the Ima mine, Bradley Mining Company, Patterson, Idaho: private report available at U.S. Bureau of Mines Western Field Operations Center, Spokane, Washington.

Kaiser, E.P., 1956, Preliminary report on the geology and deposits of monazite, thorite, and niobium-bearing rutile of the Mineral Hill district, Lemhi County, Idaho: U.S. Geological Survey Open-File Report 56-69, 41 p.

Kauffman, J.D., 1970, Steen Mine, Lemhi County, Idaho: unpublished data on file at Western Field Operations Center, U.S. Bureau of Mines, Spokane, Washington, 6 p.

Kiilsgarrd, T.H., 1964, Silver, Lead, and Zinc in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 181-194.

_____, 1990, The trans-Challis fault system, its structure and relationship to Tertiary igneous activity and mineral deposits in Moye, F.J., 1990, ed., Geology and ore deposits of the trans-Challis fault system/Great Falls tectonic zone: Salmon, Idaho, Tobacco Root Geological Society Fifteenth Annual Field Conference, p 71-73.

Kiilsgaard, T.H., and Bennett, E.H., 1985, Mineral deposits in the southern part of the Atlanta lobe of the Idaho batholith and their genetic relation to Tertiary intrusive rocks and to faults, in Symposium on the geology and mineral deposits of the Challis 1◦ x 2◦ Quadrangle, Idaho: U.S. Geological Survey Bulletin 1658 A-S, p. 153-165.

Kiilsgaard, T.H., Fisher, F.S., and Bennett, E.H., 1986, The Trans-Challis fault system and associated precious metals deposits, Idaho: Economic Geology, v. 81, no. 3, p. 721-724.

_____, 1989, Gold-silver deposits associated with the trans-Challis fault system, Idaho in Shawe, D.R., Ashley, R.P., and Carter L.M.H., eds., United States gold terranes--Part 1: U.S. Geological Survey Bulletin 1857-B, p. B22-B44.

Kiilsgaard, T.H., and Hall, W.E., 1986, Radioactive black sand placer deposits of the Challis 1◦ x 2◦ Quadrangle, Idaho: U.S. Geological Survey Open-File Report 86-0633, 13 p.

King, R.U., 1964, Molybdenum in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 133-138.

Kirkpatrick, O.E., 1934, History of Leesburg Pioneers: Pyramid Press, Salt Lake City, Utah, 172 p.

Kirkpatrick, G.E., 1974, Geology and ore deposits of the Big Creek area, Idaho and Valley Counties, Idaho: M.S. Thesis, University of Idaho, Moscow, Idaho, 92 p.

Knowles, C.R., 1975, reconnaissance geochemistry of the Bighorn Crags: Idaho Bureau of Mines and Geology Information Circular No. 26, 47 p.

Knowles, R.R., 1961, Geology of the Southern Part of the Lead-Ore Quadrangle, East-Central Idaho: M.S. Thesis, Pennsylvania State University, University Park, Pennsylvania, 116 p.

La Heist, B.A., Smelter Byproducts in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers,

1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 194-199.

Lambeth, R.H., and Mayerle, R.T., 1983, Mineral investigation of the Italian Peak RARE II area (No. 1-1945), Beaverhead County, Montana, and Italian Peak Middle Rare II area (No. M-4945), Clark and Lemhi Counties, Idaho: U.S. Bureau of Mines Mineral Land Assessment Open-file Report MLA 53-83, 26 p.

Leatham-Goldfarb, S., Siems, D.F., Welsch, E.P., and Berger B.R., 1986, Analytical results and sample location map of skarn, porphyry, and vein samples from the Dillon, Butte, and Dubois 1◦x 2◦ quadrangles, Idaho-Montana: U.S. Geological Survey Open-File Report 86-37, 83 p.

Lesure, F.G., 1964, Mica and associated pegmatite minerals in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 123-133.

Leszcykowski, A.M., Ridenour, J., Willett, S.L., Miller, M.S., and Lowe, N.T., 1985, Mineral Appraisal of the Loon Creek-Warm Spring Creek Unit, Custer and Lemhi Counties, Idaho in Ridenour, James, compiler, 1985, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA 64-85, p. 35-76.

Lincoln, F.C., 1912, Gold deposits of Gibbonsville, Idaho in Mining and Scientific Press, v. 105, p. 47-49.

Lindgren, Waldemar, 1904, A geological reconnaissance across the Bitterroot Range and Clearwater Mountains in Montana and Idaho: U.S. Geological Survey Professional Paper No. 27, 90 p.

Lipton, A.D., Conyac, M.D., and Willett, S.L., 1988, Mineral resources of the West Big Hole Study Area, Beaverhead County, Montana: U.S. Bureau of Mines Mineral Land Assessment Open-File Report MLA 16-88, 158 p.

Livingston, D.C., 1919, Tungsten, cinnabar, manganese, molybdenum, and tin in Idaho: Moscow, Idaho, University of Idaho School of Mines Bulletin 2, v. XIV, 72 p.

Loen, J.S., and Pearson, R.C., 1989, Map showing locations of mines and prospects in the Dillon 1◦ x 2◦ quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Map I-1803-C, scale 1:25,000.

Lopez, D.A., 1981, Stratigraphy of the Yellowjacket Formation of east-Central, Idaho: U.S. Geological Survey Open-File Report 81-1088.

_____, 1982a, Reconnaissance geologic map of the Gibbonsville Quadrangle, Lemhi County,

Idaho and Beaverhead County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1446, scale 1:24,000.

_____, 1982b, Reconnaissance geologic map of the Ulysses Mountain quadrangle, Lemhi County, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1445, scale 1:48,000.

Lorain, S.H., 1941, Report of preliminary examination, Grunter Mine, Lemhi County, Idaho: unpublished U.S. Bureau of Mines report available at U.S. Bureau of Mines Western Field Operations Center, Spokane, Washington, 18 p.

Lorain, S.H., and Metzger, O.H., 1939, Reconnaissance of placer-mining districts in Lemhi County, Idaho: U.S. Bureau of Mines Information Circular 7082, 81 p.

Lowe, N.T., Zilka, N.T., and Brandt, T.R., 1988, Principal deposits of strategic and critical minerals in Idaho: unpublished U.S. Bureau of Mines report

Lucchitta, B.K., 1966, Structure of the Hawley Creek area, Idaho-Montana: Ph.D. Thesis, Pennsylvania State University, 204 p.

Lund, Karen, and Evans, K.V., U.S.Geological Survey and Esparza, L.E., U.S. Bureau of Mines, 1983, Mineral resource potential of the Special Mining Management Zone--Clear Creek, Lemhi County, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1576-A Pamphlet, Scale 1:50,000, 9 p.

Lund, Karen, Alminas, H.W., Kleinkopf, M.D., Ehmaun, W.J., and Bliss, J.D., 1990, Preliminary mineral resource assessment of the Elk City 1◦x 2◦ quadrangle, Idaho and Montana: U.S. Geological Survey Open-File Report 89-0016, 118 p., 14 plates, scale 1:250,000.

MacDonald, Bernard, 1896, The reduction plant for pyrite-bearing ores at Gibbonsville, Idaho: Engineering and Mining Journal, v. 62, p. 319-320.

MacKenzie, W.O., 1949, Geology and ore deposits of a section of the Beaverhead Range east of Salmon, Idaho: M.S. Thesis, University of Idaho, Moscow, 65 p.

Maley, T.S., 1974, Structure and petrology of the lower Panther Creek area, Lemhi County, Idaho: Ph.D. Thesis, University of Idaho, 130 p.

_____, 1987, Exploring Idaho geology: Boise, Idaho, Mineral Land Publications, 232 p.

Mayerle, R.T., and Close, T.J., 1993, Mineral Investigation of the Anderson Mountain study area, Lemhi County, Idaho: U.S. Bureau of Mines Mineral Land Assessment Open-File report, 103 p.

McCandless, D.O., 1982, A re-evaluation of Cambrian through middle Ordovician stratigraphy

of the southern Lemhi Range: M.S. Thesis, Pennsylvania State University, University Park, Pennsylvania, 157 p.

McHugh, J.B., Tucker, R.E., and Ficklin, W.H., 1987, Analytical results for 46 water samples from a hydrogeochemical survey of the Blackbird Mine area, Idaho: U.S. Geological Survey Open-File Report 87-260, 8 p.

McIntyre, D.H. ed., 1985, Symposium on the geology and mineral deposits of the Challis 1◦x 2◦ quadrangle, Idaho: U.S. Geological Survey Bulletin 1658, 227 p.

McIntyre, D.H., and Hobbs, S.W., 1987, Geological map of the Challis quadrangle, Custer and Lemhi Counties, Idaho: U.S. Geological Survey Geological quadrangle map GQ-1599, scale 1:62,500.

MINOBRAS, 1975, Idaho industrial minerals: MINOBRAS, 55 p.

Mitchell, J.C., and Johnson, L.L., 1978, Geothermal investigations in Idaho, part 9, Potential for direct applications of geothermal resources: Idaho Department of Water Administration, Water Information Bulletin 30, p.

Mitchell, V.E., 1995a, History of the Goldstone Mine, Lemhi County, Idaho: Idaho Geological Survey Special Report, 13 p.

_____, 1995b, History of the Harmony Mine, Lemhi County, Idaho: Idaho Geological Survey Special Report, 16 p.

_____, 1995c, History of the Mines in the Texas Mining District near Gilmore, Idaho: Idaho Geological Survey Special Report, 72 p.

_____, 1995d, History of the Pope-Shenon Mine, Lemhi County, Idaho: Idaho Geological Survey Special Report, 20 p.

_____, 1995e, History of the Queen of the Hills Mine, Lemhi County, Idaho: Idaho Geological Survey Special Report, 8 p.

_____, 1995f, History of the Silver Star Mine, Lemhi County, Idaho: Idaho Geological Survey Special Report, 6 p.

_____, 1995g, History of the Yellowjacket Mine, Lemhi County, Idaho: Idaho Geological Survey Special Report, 28 p.

Mitchell, V.E., and Bennett, E.H., 1979, Geologic map of the Elk City Quadrangle, Idaho: Idaho Bureau of Mines and Geology Geologic Map Series.

Mitchell, V.E., Strowd, W.B., Hustedde, G.S., and Bennett, E.H., compilers, 1981a, Mines and

prospects of the Challis Quadrangle, Idaho: Idaho Bureau of Mines and Geology Mines and Prospects Map Series, 47 p.

_____, 1981b, Mines and prospects of the Elk City quadrangle, Idaho: Idaho Bureau of Mines and Geology Mines and Prospects Map Series, 72 p.

_____, 1986, Mines and prospects of the Challis Quadrangle, Idaho (second edition): Idaho Geological Survey Mines and Prospects Map Series, 56 p.

Modreski, P.J., 1983, Stratabound cobalt-copper deposits in Middle Proterzoic Yellowjacket Formation in and near the Challis Quadrangle: U.S. Geological Survey Bulletin 1658 R.

Moen, W.S., 1957, Some thorium deposits in western Montana and east-central Idaho: U.S. Atomic Energy Commission RME-2061, part 1, Technical Information Service, Oak Ridge, Tennessee, 31 p.

Moye, F.J., editor, 1990, Geology and ore deposits of the trans-Challis fault system/Great Falls tectonic zone: Tobacco Root Geological Society 15th Annual Field Conference Guidebook, 121 p.

Muffler, L.J.P., ed., 1978, Assessment of geothermal resources of the United States--1978: U.S. Geological Survey Circular 790, 163 p.

Nash, J.T., 1989, Geology and geochemistry of synsedimentary cobaltiferous-pyrite deposits, Iron Creek, Lemhi County, Idaho: U.S. Geological Survey Bulletin 1882, 33 p.

Nash, J.T., Briggs, P., Bartel, A.J., and Brandt, E.L., 1988, Geochemical results for samples of ore and altered hostrocks, Blackbird mining district, Lemhi County, Idaho: U.S. Geological Survey Open-File Report 88-661, 71 p.

Nash, J.T., and Hahn, G.A., 1986, Volcanogenic Character of Sediment-Hosted Co-Cu deposits in the Blackbird Mining District, Lemhi County, Idaho---An Interim Report: U.S. Geological Survey Open-File Report 86-430, 29p.

_____, 1989, Stratabound Co-Cu deposits and mafic volcaniclastic rocks in the Blackbird mining district, Lemhi County, Idaho in Boyle, R.W., Brown, A.C., Jefferson, C.W., Jowett, E.C., and Kirkham, R.V., eds., Sediment-hosted Stratiform Copper Deposits: Geological Association of Canada, Special Paper 36, p. 339-356.

Nash, J.T., Hahn, G.A., and Saunders, J.A., 1987, The occurrence of gold in siliceous Co-Cu exhalite deposits of the Blackbird mining district, Lemhi County, Idaho: U.S. Geological Survey Open-File Report 87-410, 14 p.

Nelson, W.H., 1969, Geologic map of the Mackay quadrangle, south-central Idaho: U.S. Geological Survey Miscellaneous Geologic Investigations Series Map I-580, scale 1:125,000.

Nevins, B.B., and Oakman, M.R., compilers, 1988, Mineral resource potential of National Forest RARE II and Wilderness areas in Idaho: U.S. Geological Survey Open-File Report 88-0207, 116 p.

Nichols, R., 1914, Lead-silver mines of Gilmore, Lemhi County, Idaho: American Institute of Mining Engineers, Transactions, v. 46, p. 937-939.

Nickelson, H.B., 1955, Defense Minerals Exploration Administration Report Docket No. DMEA-3882.

Nisbet, P.C., and Scales, W.G., 1990, Descriptive Road Log, northwestern Leesburg basin; in Falma, Moye. Wilcox, editor, Geology and ore deposits of the trans-Challis fault system/Great Falls tectonic zone, TRGS 15th Annual Field Conference Proceedings.

Nisbet, P.C., Scales, W.G., and Bending, J.S., 1989, Volcanic Block Basins as hydrothermal recharge sources in the development of mega-shear hosted precious metals deposits, Leesburg gold belt, Lemhi County, Idaho in R. Wilcox, editor, Left Lateral Leaps Proceedings, 95th Annual Northwest Mining Convention.

Nisbet, P.C., Scales, W.G., Honsinger, E.H., and Bending, J.S., 1994, The Blackpine Mine, a Cu-Co-Au exhalative sulfide system, Idaho Cobalt Belt, Lemhi County, Idaho [abs.]: Mine Quest: Global Opportunities, Pacific Northwest Metals and Minerals Conference, April 6-8, 1994, Spokane, Washington, Society for Mining, Metallurgy, and Exploration, Inc., Columbia Section, p. 18.

Oberlindacher, Peter, and Hovland, R.D., 1979, Geology and phosphate resources in the Hawley Creek Area, Lemhi County, Idaho: U.S. Geological Survy Open-File Report 79-1283, 18 p.

Olson, J.C., and Overstreet, W.C., 1964, Geologic distribution and resources of thorium: U.S. Geological Survey Bulletin 1204, 61 p.

Olson, J.E., 1985, Mineral appraisal of the Yellowjacket Unit, Lemhi County, Idaho in Ridenour, James, compiler, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA 64-85, p. 107-138 p.

O'Neill, J.M., 1990, The Great Falls Tectonic Zone, east-central Idaho and west-central Montana in Moye, F. J., 1990, editor, Geology and ore deposits of the trans-Challis fault system/Great Falls tectonic zone: Salmon Idaho, Tobacco Root Geological Society Fifteenth Annual Field Conference, p. 75-76.

Parker, R.L., Niobium and Tantalum in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special

Report No. 1, p. 133-143.

Pattee, E.C., Van Noy, R.M., and Weldin, R.D., 1968, Beryllium Resources of Idaho, Washington, Montana, and Oregon: U.S. Bureau of Mines Report of Investigation 7148, 169p.

Peale, R.N., 1982a, Geologic Map of the Area Southeast of Yellowjacket, Idaho: Idaho Bureau of Mines and Geology Technical Report 82-5, 2 plates.

_____, 1982b, Geology of the Area Southeast of Yellowjacket, Lemhi County, Idaho: M.S. Thesis, University of Idaho, Moscow, Idaho, 129 p.

Pearson, R.C., Hanna, W.F., James, H.L., Loen, J.S., Moll, S.H., Ruppel, E.T., and Trautwein, C.M., 1990, Map showing mineral resource assessment for silver, cobalt, and base metals in proterozoic sedimentary rocks and for iron, chromium, nickel, talc, chlorite, gold, and graphite in Archean crystalline rocks, Dillon 1◦ x 2◦ Quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Map I-1803-D, scale 1:250,000.

Pearson, R.C., Loen, J.S., Trautwein, C.M., Ruppel, E.T., and Moll, S.H., 1991, Map showing mineral resource assessment for placer gold and silver, Dillon 1◦ x 2◦ Quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Map I-1803-F, scale 1:250,000.

Pearson, R.C., Trautwein, C.M., Moll, S.H., Berger, B.R., Hanna, W.F., Loen, J.S., Rowan, L.C., Ruppel, E.T., and Segal, D.B., 1992, Maps showing mineral resource assessment for copper and molybdenum in porphyry and stockwork deposits and for tungsten, iron, gold, copper, and silver in skarn deposits, Dillon 1◦x 2◦ quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Series Map I-1803-G, scale 1:250,000.

Peters, W.D., 1978, Description and evaluation of the Divide Planning Unit, Leadore and North Fork Rangers districts: U.S. Forest Service unpublished report.

Prater, L.S., 1943, Flotation tests on fluorite ore from Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet No. 63, 8 p.

Prinz, W.C., 1958a, Defense Minerals Exploration Administration, Docket No. DMEA-5023.

_____, 1958b, Defense Minerals Exploration Administration, Docket No. DMEA-4927.

Puffett, 1971, Defense Minerals Exploration Administration Report
Purdue, G.L., 1975, Geology and ore deposits of the Blackbird district, Lemhi County, Idaho: M.S. Thesis, University of New Mexico, Alburquerque, New Mexico, 49 p.

Purdy, T.L., and Rowan, L.C., 1990, Map showing analysis of linear features for mineral assessment in the Dillon 1◦ x 2◦ Quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Map I-1803-B, scale 1:250,000.

Rahn, J.E., 1979, The Geology of the Meyers Cove area, Lemhi County, Idaho: Masters Thesis, University of Idaho, Moscow, Idaho, 111 p.

_____, 1980, Geologic Map and Cross Sections of the Meyers Cove Area, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Technical Report 80-2, 2 plates, scale 1:12,000.

Randolph, Julia, 1982, Gibbonsville, Idaho--the Golden Years: Gibbonsville Improvement Association, 113 p.

Reed, G.C., and Herdlick, J.A., 1947, Blackbird cobalt deposits, Lemhi County, Idaho: U.S. Bureau of Mines Report of Investigations 4012, 14 p.

Reid, R.R., 1959, Reconnaissance geology of the Elk City Region, Idaho: Idaho Bureau of Mines and Geology Pamphlet 121, 26 p.

Rember, W.C., and Bennett, E.H., compilers, 1979a, Geologic map of the Challis Quadrangle, Idaho: Idaho Bureau of Mines and Geology Geologic Map Series, 1:250,000.

_____, 1979b, Geologic map of the Idaho Falls 1◦ x 2◦ Quadrangle, Idaho: Idaho Bureau of Mines and Geology, Geologic Map Series, Scale 1:250,000.

Reynolds, Lindor, author, and Radeka, Lynn, photographer, 1991, Forts and battlefields of the old west: Hong Kong, Mallard Press, p. 83-86.

Reynolds, J.R., 1954, Yellowjacket placer area: unpublished report of preliminary investigation by the U.S. department of the Interior, U.S. Bureau of Mines, for the Atomic Energy Commission, 10 p.

Reynolds, J.R., and Vernon, J.W., 1953, Preliminary examination of the Buckhorn, Maryland, and Elmira lead-zinc-manganese mines and notes on other mines in the Junction Mining District, Lemhi County, Idaho: unpublished U.S. Bureau of Mines report, 8 p.

Richardson Engineering Services, Inc., 1984, Process plant construction estimating standards, v. 4: San Marcos, CA, periodically updated.

Ridenour, James, compiler, 1985, Mineral resources and occurrences in part of the Frank Church-River of No Return Wilderness, Custer, Idaho, Lemhi, and Valley Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA 64-85, 211 p.

Roberts, W.A., 1951, Victory (Musgrove) mine, Lemhi County, Idaho: unpublished Defense Minerals Administration Memorandum, DMA docket No. 1823x, 3 p.

Roberts, W.A., 1953, Metamorphic differentiates in the Blackbird mining district, Lemhi County, Idaho: Economic Geology, vol. 48, p. 447-456.

Roberts, W.A., and Vhay, J.S., 1951, Defense Minerals Exploration Administration Report, Docket No. DMEA-1609

Robertson, A.F., 1956, Junction Mining District, Lemhi County, Idaho: unpublished U.S. Bureau of Mines Memorandum, 15 p.

Romischer, W.M., and Alvord, D.C., 1958, Gilmore mine, final report: Office of Mineral Exploration Report DMEA-2868, unpublished report available at U.S. Bureau of Mines Western Field Operations Center, Spokane, Washington, 17 p.

Romischer, W.M., and MacLaren, D.R., 1959, Tinkers Pride, et al. claims, Blackbird mining district, Lemhi County, Idaho, Final report: U.S. Department of the Interior, Office of Mineral Exploration Report DMEA-3739, unpublished data on file at Western Field Operations Center, U.S. Bureau of Mines, Spolane, Washington, 19 p.

Romischer, W.M., and Prinz, W.C., 1959, Montana Coal and Iron Company Black Pine mine, Lemhi County, Idaho: Defense Minerals Exploration Administration Report, Docket No. DMEA-2499, 24 p.

Ross, C.P., 1924, A new copper district near Salmon, Idaho: Engineering and Mining Journal, v. 118, no.6, p. 205-208.

_____, 1925, The copper deposits near Salmon Idaho: U.S. Geological Survey Bulletin 744, 44 p.

_____, 1927, Ore deposits in Tertiary lava in the Salmon River Mountains, Idaho: Idaho Bureau of Mines and Geology Pamphlet 25, 21 p.

_____, 1928, Mesozoic and Tertiary granitic rocks in Idaho: Journal of Geology, vol. 36, p. 673-693.

_____, 1934, Geology and ore deposits of the Casto Quadrangle, Idaho: U.S. Geological Survey Bulletin 854, 135 p.

_____, 1941a, Mining districts of the State of Idaho: Idaho Bureau of Mines and Geology Miscellaneous Map, scale 1:500,000.

_____, 1941b, Part 1: The metal and coal mining districts of Idaho, with notes on the nonmetallic mineral resources of the State: 119 p. Part 2: Annotated Bibliography; 263 p. Part 3: Mining Districts of the State of Idaho; (Map) Scale 1:500,000: Idaho Bureau of Mines and Geology Pamphlet 57.

_____, 1947, Geology of the Borah Peak Quadrangle, Idaho: Geological Society of America Bulletin 58, no. 12, p. 1085-1160.

_____, 1961, Geology of the southern part of the Lemhi Range Idaho: U.S. Geological Survey Bulletin 1081-F, p. 189-260

_____, 1963a, Evolution of ideas relative to the Idaho batholith: Northwest Science, vol. 37, p. 45-60.

_____, 1963b, Geology along U.S. highway 93 in Idaho: Idaho Bureau of Mines and Geology Pamphlet 130, 98 p.

_____, 1963c, Mining history of south-central Idaho: Idaho Bureau of Mines and Geology Pamphlet 131, 29 p.

Ross, J.R., and George, D.R., 1966, Metallurgical amenability tests on Idaho-Montana thorium ores: U.S. Bureau of Mines Salt Lake City Metallurgy Research Center Research Report 62-1, 34 p.

Ross, S.H., 1971, Geothermal potential of Idaho: Idaho Bureau of Mines and Geology Pamphlet 150, 72 p.

Ruppel, E.T., 1964, Strike-slip faulting and broken basin-ranges in east-central Idaho and adjacent Montana: U.S. Geological Survey Professional Paper 501-C, p. C14-C18.

_____, 1968, Geologic map of the Leadore Quadrangle, Lemhi County, Idaho: U.S. Geological Survey Geologic Quadrangle Map GQ-733, scale 1:62,500.

_____, 1975, Precambrian and Lower Ordovician Rocks in east-central: U.S. Geological Survey Professional Paper 889, 34 p.

_____, 1978, Medicine Lodge Thrust System, East-Central Idaho and Southwest Montana: U.S. Geological Survey Professional Paper 1031, 23 p.

_____, 1980, Geologic map of the Patterson Quadrangle, Lemhi County, Idaho: U.S. Geological Survey Geologic Quadrangle Map GQ-1529, Scale 1:62,500.

_____, 1982, Cenozoic block uplifts in east-central Idaho and southwest Montana: U.S. Geological Survey Professional Paper 1224, 24 p.

_____, 1986, The Lemhi Arch: A Late Proterozoic and early Paleozoic landmass in central Idaho in Peterson, J.A., ed., Paleotectonics and Sedimentation in the Rocky Mountain region, United States: American Association of Petroleum Geologists Memoir 41, p. 119-130.

_____, 1993, Cenozoic tectonic evolution of southwest Montana and east-central Idaho: Montana Bureau of Mines and Geology Memoir 65, 62 p.

Ruppel, E.T., and Lopez, D.A., 1981, Geologic map of the Gilmore Quadrangle, Lemhi and

Custer Counties, Idaho: U.S. Geological Survey Geologic Quadrangle Map GQ-1543, Scale 1:62,500.

_____, 1984, The thrust belt in southwest Montana and east-central Idaho: U.S. Geological Survey Professional Paper 1278, 41 p.

_____, 1988, Regional geology and mineral deposits in and near the central part of the Lemhi Range, Lemhi County, Idaho: U.S. Geological Survey Professional Paper 1480, 122 p.

Ruppel, E.T., O'Neil, J.M., and Lopez, D.A., 1983, Geologic map of the Dillon 1◦x 2◦ Quadrangle, Idaho and Montana: U.S. Geological Survey Open-File Report 83-168, scale 1:250,000.

_____, 1993, Geologic map of the Dillon 1◦x 2◦ quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Series Map I-1803-H, scale 1:250,000.

Ruppel, E.T., Watts, K.C., and Peterson, D.L., 1970, Geologic, geochemical, and geophysical investigations in the northern part of the Gilmore mining district, Lemhi County, Idaho: U.S. Geological Survey Open-File report 70-282, 56 p.

Russell, E.F., 1974, Geology of a Portion of the Lemhi Range Near Gilmore, Idaho: M.S. thesis, Eastern Washington University, Cheney, Washington, 58 p.

Salmon National Forest, undated, Description of the Anderson Mountain Roadless Area in Draft Environmental Impact Statement, Appendix C, p. C-78-86.

Salisbury and Dietz, Inc., 1982, National Uranium Resource Evaluation, Elk City Quadrangle, Idaho and Montana: prepared for the U.S. department of Energy, no. PGJ/F-065(82)

Savage, C.N., 1964, Titanium, Zirconium, and Hafnium in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 217-223.

_____, 1969, Distribution and economic potential of Idaho carbonate rocks: Idaho Bureau of Mines and Geology Bulletin 23, 60 p.

_____, 1970, Evaluation of Minerals and Mineral Potential of the Salmon River Drainage Basin in Idaho: Idaho Bureau of Mines and Geology Pamphlet No. 147, 26 p.

Schmidt, K.L., Lewis, R.S., Burmester, R.F., and Lang, R.A., 1994, Reconnaissance geologic map of the Shoup and Horse Creek area, Lemhi County, Idaho: Idaho Geological Survey Technical Report 94-3, 13 p., scale 1:50,000.

Segal, D.B., and Rowan, L.C., 1989, Map showing exposures of limonitic and hydrothermally

altered rocks in the Dillon 1◦x 2◦ Quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Map I-1803-A, scale 1:250,000.

Service, A.L., and Nickelson, H.B., 1957, Defense Minerals Exploration Administration Report, Docket No. DMEA-2436.

Shaffer, L.E., 1942, Mackay Standard Mining and Milling Company, Copper Basin, Custer County, Idaho: U.S. Bureau of Mines War Minerals Memorandum, 5 p.

Shaffer, L.E., and Featherstone, W.W., 1944, The Spring Creek Molybdenum Deposits, Lemhi County, Idaho: U.S. Bureau of Mines War Minerals Memorandum, 5 p.

Sharp, B.J. and Hetland, D.L., 1968, Thorium and rare-earth resources of the Lemhi Pass area, Montana and Idaho: U.S. Atomic Energy Commission Technical Memorandum AEC-RID-3, 13 p.

Sharp, W.N., 1977, Preliminary examination and appraisal of the Grand Prize claim and Saddle group in the Mackay mining area, Custer County, Idaho: Company Report for Rockel Mines Limited, Vancouver, B.C., Canada, 10 p.

Sharp, W.N., and Cavender, W.S., 1962, Geology and Thorium-Bearing Deposits of the Lemhi Pass Area Lemhi County, Idaho, and Beaverhead County, Montana: U.S. Geological Survey Bulletin 1126, 76 p.

Shaw, D.R., 1976, Geology and resources of fluorine in the United States: U.S. Geological Survey Professional Paper 933, 56 p.

Shea, M.C., 1972, Geology and Minerals Report, Salmon River Study: unpublished report prepared for the U.S. Forest Service, 108 p.

Sheldon, G.L., 1912, The Yellow Jacket Mine, Idaho: The Engineering and Mining Journal, January 27, 1912, p. 221-222.

Shenon, P.J., 1928, Geology and ore deposits of the Birch Creek district, Idaho: Idaho Bureau of Mines and Geology Pamphlet 27, 25 p.

Shenon, P.J., Full, R.P., Snyder, D.M., and Bauer, H.L. Jr., 1956, Geologic study of the Big Deer Creek area, Blackbird mining district: Unpublished report for Idaho Metallugical Industries, Inc. 150 p.

Shively, J.A., 1960, Beneficiation of low-grade thorite ore from Lemhi County, in Newton, Joseph, LeMoine, Denis, Adams, C.N., Anderson, A.L., and Shively, J.A., Study of two Idaho thorite deposits: Idaho Bureau of Mines and Geology Pamphlet 122, p. 41-51.

Shockey, P.N., 1957, Reconnaissance Geology of the Leesburg Quadrangle, Lemhi County,

Idaho: Idaho Bureau of Mines and Geology Pamphlet 113, 42 p.

Simons, W.H., 1934, Thirty-sixth annual report of the mining industry of Idaho for the year 1934: Inspector of Mines, Boise ID, 287 p.

Skipp, Betty, 1984, Geologic map and cross-sections of the Italian Peak and Italian Peak Middle roadless areas, Beaverhead County, Montana, and Clark and Lemhi Counties, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1061-B, scale 1:62,500.

_____, 1985, Contraction and extension faults in the southern Beaverhead Mountains, Idaho and Montana: U.S. Geological Survey Open-File Report 85-545, 170 p.

Skipp, Betty, Hassemer, J.R., and Detra, D.E., 1984, Geology, geochemistry, and mineral resource potential of the Eighteenmile Wilderness Study Area (ID-43-3), Lemhi County, Idaho: U.S. Geological Survey Open-File Report 84-279, 55 p.

Smith, J.G., 1961, The geology of the Clear Creek area, Montana-Idaho: M.S. Thesis, Pennsylvania State University, University Park, Pennsylvania, 75 p.

Sobel, L.S., 1982, Sedimentology of the Blackbird mining district, Lemhi County, Idaho: M.S. Thesis, University of Cincinnati, Cincinnati, Ohio, 235 p.

Soregaroli, A.E., 1961, Geology of the McKim Creek Area, Lemhi County, Idaho: M.S. Thesis, University of Idaho, Moscow, Idaho, 55 p.

Soregaroli, A.E., Anderson, A.L., and Young, D.W., 1974, Geology of the iron deposits of Idaho, in Iron resources in Washington, Idaho, and Montana: Idaho Bureau of Mines and Geology, unpublished report, 99 p.

Sorensen, G.F., 1985, Geologic report - Gibbonsville project (mineral exploration report): Spokane, Washington, Eagle Claw Mining Co., 30 p.; available on request from R.T. Mayerle, U.S. Bureau of Mines, Western Field Operations Center, Spokane, Washington.

Spence, J.G., 1984, Geology of the Mineral Hill interlayered amphibolite-augen gneiss complex, Lemhi County, Idaho: M.S. Thesis, University of Idaho, Moscow, Idaho, 241 p.

Spokesman-Review, November 29, 1988, published in Spokane, WA

Staatz, M.H., 1972, Geology and description of the thorium-bearing veins, Lemhi Pass Quadrangle, Idaho and Montana: U.S. Geological Survey Bulletin 1351, 94 p.

_____, 1973, Geologic map of the Goat Mountain Quadrangle, Lemhi County, Idaho, and Beaver County, Montana: U.S. Geological Survey Geologic Quadrangle Map GQ-1097, scale 1:24,000.

_____, 1974, Thorium veins in the United States: Economic Geology, vol. 69, number 4, p 494-507.

_____, 1979a, Geology and mineral resources of the Lemhi Pass thorium district, Idaho and Montana: U.S. Geological Survey Professional Paper 1049-A, 90 p.

_____, 1979b, Principal thorium resources of the United States: U.S. Geological Survey Information Circular 805, 42 p.

Staatz, M.H., Bunker, C.M., Bush, C.A., 1971, Geochemical prospecting for thorium veins by stream-sediment sampling, Lemhi Pass quadrangle, Idaho and Montana: U.S. Geological Survey Professional Paper 750-C, p. C136-C140.

_____, 1972, Thorium distribution in a granite stock near Bull Canyon, Lemhi County, Idaho: U.S. Geological Survey Professional Paper 800-B, p. B51-B56.

Staatz, M.H., Hall, R.B., Macke, D.L., Armbrustmacher, T.J., and Brownfield, I.K., 1980, Thorium resources of selected regions in the United States: U.S. Geological Survey Circular 824, 32 p.

Staatz, M.H., Shaw, V.E., and Wahlberg, J.S., 1972, Occurrence and distribution of rare earths in the Lemhi Pass thorium veins, Idaho and Montana: Economic Geology, vol. 67, no. 1, p. 72-82.

Staley, W.W., 1946, Gold in Idaho: Idaho Bureau of Mines and Geology Pamphlet 68, 32 p.

Stebbins, S.A., 1987, Cost estimation handbook for small placer mines: U.S. Bureau of Mines Information Circular 9170, 94 p.

_____, 1988, Underground mine design and cost estimation: U.S. Bureau of Mines, unpublished report, available at Western Field Operations Center, Spokane, WA, 161 p.

Stevens, H.J., 1908, The Copper Handbook, V. 8: Houghton, Michigan, Horace J. Stevens, p. 592.

Stoll, W.C., 1950, Mica and beryl pegmatites in Idaho and Montana: U.S. Geological Survey Professional Paper 229, 64 p.

Storch, R.H., 1952, Preliminary report, Spring Creek Monazite Lode Deposit, Lemhi County, Idaho: U.S. Bureau of Mines unpublished report available at Western Field Operations Center, Spokane, Washington, 6 p.

Storch, R.H., and Holt, D.C., 1963, Titanium placer deposits of Idaho: U.S. Bureau of Mines Report of Investigation 6319, 69 p.

Storch, R.H., and Robertson, A.F., 1957, Appraisal of mineral deposits in the upper Salmon

River drainage, Idaho (On lands proposed for withdrawal by the U. S. Fish and Wildlife Service, in their application No. Idaho 06544 and Idaho 06620): An unpublished U.S. Bureau of Mines report available for inspection at Western Field Operations Center, Spokane, Washington, 10 p.

Strowd, W.B., Mitchell, V.E., Hustedde, G.S., and Bennett, E.H.,1981, Mines and prospects of the Dillon quadrangle, Idaho: Idaho Bureau of Mines and Geology Mines and Prospects Map, scale 1:250,000, 9 p.

Sturm, F.H., 1954, General Geology of Some Replacement Monazite Deposits in Lemhi County, Idaho: M.S. Thesis, University of Idaho, Moscow, Idaho, 64 p.

Tabor, J.W., 1945, Preliminary examination of the Bevan Mica Deposit, Lemhi County, Idaho: U.S. Bureau of Mines Report of Investigations.

Taylor, H.K., 1977, Mine valuation and feasibility, in Hoskins, J.R., and Green, W.R., editors, Mineral industry costs: Northwest Mining Association, Spokane, Washington, p. 1-17.

Thornberry and Koval, 1980, Examination of the Mary Ann property: unpublished Inspiration Development Company report, 2 p.

Tietbohl, D.R., 1981, Structure and stratigraphy of the Hayden Creek area, Lemhi Range, east-central Idaho: M.S. Thesis, Pennsylvania State University, University Park, 121 p.

_____, 1986, Middle Proterozoic diamictite beds in the Lemhi Range, east-central Idaho in Roberts, S.M., ed., Belt Supergroup: A guide to Proterozoic rocks of western Montana and adjacent areas: Montana bureau of Mines and Geology Special Publication 94, p. 197-207.

Toth, G., and Hahn, G.A., 1982, Soil geochemistry and surface geology of the Blackbird mine stratigraphy, Blackbird mining district, Lemhi County, Idaho: unpublished report, Noranda Exploration, Inc., 138 p.

Tregaskis, S., 1989, Bobcat Project, Lemhi County, Idaho - year end summary: Report on exploration project by Corona Gold for Formation Capital Corp and Corona Gold.

Trites, A.F., Jr., and Tooker, E.W., 1953, Uranium and thorium deposits in east central Idaho and southwestern Montana: U.S. Geological Survey Bulletin 988-H, p. 157-209.

Tucker, D.R., 1975, Stratigraphy and Structure of Precambrian Y (Belt?) Metasedimentary and Associated rocks, Goldstone Mountain Quadrangle, Lemhi County, Idaho, and Beaverhead County, Montana: Ph.D. Thesis, Miami University, Oxford, Ohio, 221 p.

Tuchek, E.T, McMahan, A.B., and Marks, L.Y., Mineral Resources of the Salmon River Study Area, Idaho: U.S. Bureau of Mines unpublished report, 115 p.

Turner, F.B., 1897, Report on the Clara Morris Group in Wark, J.F., 1984, Eagle Claw Mining

Co. geologic and engineering report, Gibbonsville project (mineral exploration report): Spokane, Wash., N.A. Degerstrom, Inc., Appendix B, p. B8-B17.; available on request from R.T. Mayerle, U.S. Bureau of Mines, Western Field Operations Center, Spokane, Wash.

Umpleby, J. B., 1913, Geology and ore deposits of Lemhi County, Idaho: U.S. Geological Survey Bulletin 528, 182 p.

_____, 1917, Geology and ore deposits of the MacKay region, Idaho: U.S. Geological Survey Professional Paper 97, 129 p.

U.S. Bureau of Mines, 1943, Fluorite Veins Near Meyers Cove, Lemhi County, Idaho: War Minerals Report No. 145, 7 p.

U.S. Bureau of Mines, 1945, Meyers Cove Fluorspar Deposits, Gravel Range Mining District, Lemhi County, Idaho: War Minerals report No. 460, 11 p.

U.S. Bureau of Mines, 1987a, Bureau of Mines cost estimating system handbook (in two parts), part 1. Surface and Underground Mining: U.S. Bureau of Mines Information Circular 9142, 631 p.

_____, 1987b, Bureau of mines cost estimating system handbook (in two parts), part 2. Mineral processing: U.S. Bureau of Mines Information Circular 9143, 566 p.

U.S. Bureau of Mines Files--Mineral property and project files which contain miscellaneous unpublished data, available at U.S. Geological Survey, Spokane, WA

U.S. Bureau of Mines, 1990, Principal industrial minerals (excluding phosphate) in Idaho: U.S. Bureau of Mines Special Report, 302 p.

U.S. Geological Survey, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report 1, 335 p.

Vhay, J.S., 1948, Cobalt-copper deposits of the Blackbird district, Lemhi County, Idaho: U.S. Geological Survey Strategic Minerals Investigation Preliminary Report 3-219, 26 p.

_____, 1951, Reconniassance examinaton for uranium at six mines and properties in Idaho and Montana: U.S. Geological Survey Report TEM 30-A, 21 p.

_____, 1964a, Cobalt and Nickel in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 66-68.

_____, 1964b, Copper in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and

water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 69-74.

Walker, D.D., and Nickelson, H.B., 1956, Surprise Group of claims, Gibbonsville Mining District, Lemhi County, Idaho: Defense Minerals Exploration Administration Report Docket No. DMEA-3460, 6 p.

Wallace Miner, 1986, May 8: published by Shoshone County News-Press, Kellogg, Idaho.

_____, 1995, May 4: published by Shoshone County News-Press, Kellogg, Idaho.

Waring, G.A., 1965, Thermal springs of the United States and other countries of the world--a summary: U.S. Geological Survey Professional Paper 492, 385 p.

Wark, J.F., 1984, Eagle Claw Mining Co. geologic and engineering report (mineral exploration report on the Gibbonsville project): Spokane, Wash., N.A. Degerstrom, Inc., 28 p.; available on request from R.T. Mayerle, National Institute of Occupational Safety and Health, Spokane, WA

Weed, W.H., The Mines Handbook, v. 11 (1912-1913, p. 285), v. 12 (1916, p. 401), v. 17 (1926, p. 788), v. 18 (1931, p. 951): New York, N.Y., Walter H. Weed.

Weis, P.L., Armstrong, F.C., and Rosenblum, Samuel, 1958, Reconnaisssance for radioactive minerals in Washington, Idaho, and western Montana, 1952-1955: U.S. Geological Survey Bulletin 1074-B, 48 p.

Weis, P.L., Schmitt, L.J., and Tuchek, E.T., 1972, Mineral Resources of the Salmon River Breaks Primitive Area, Idaho: U.S. Geological Survey Bulletin 1353-C, 91 p.

Wells, M.W., 1983, Gold camps and silver cities: nineteenth century mining in central and southern Idaho: Idaho Bureau of Mines and Geology Bulletin 22, 165 p.

Wells, R.R., Sandell, W.G., Snedden, H.D., and Mitchell, T.F., 1948, Concentration of Copper-Cobalt Ores from the Blackbird District, Lemhi County, Idaho: U.S. Bureau of Mines Report of Investigation 4279, 21 p.

Willard, Patty, 1973, Corn Beef group: Idaho Bureau of Mines and Geology Open-File report, 4 p.

Wilson, A.B., Soulliere, S.J., Skipp, Betty, Worl, R.G., and Rhea, K.P., 1988, Geology and geochemistry of jasperoid near Mackay, Idaho, in Link, P.K. and Hackett, W.R., editors, Guidebook to the geology of Central and Southern Idaho: Idaho Geological Survey Bulletin 27, p. 183-192.

Wilson, R.A., 1937, Sedimentary gneisses of the Salmon River region near Shoup, Idaho: Journal of Geology, vol. 45, p. 193-203.

Withington, C.F., Gypsum and Anhydrite in U.S. Geological Survey, Idaho Bureau of Mines and Geology, Idaho Department of Highways, and Idaho Department of Reclamation, compilers, 1964, Mineral and water resources of Idaho: Idaho Bureau of Mines and Geology Special Report No. 1, p. 101-104.

Worl, R.G., Wilson, A.B., Smith, C.L., and Kleinkopf, M.D., and Sykes, R.C., 1989, Mineral resource potential and geology of the Challis National Forest, Idaho: U.S. Geological Survey Bulletin 1873, 101 p.

Young, D.W., 1961, Iron ore occurrences in Idaho: unpublished U.S. Bureau of Mines report, 8 p., available from N.T. Lowe, National Institute of Occupational Safety and Health, Spokane, WA

Young, F.M., 1966, Preliminary geologic report, Hawley Creek phosphate mine, Lemhi County, Idaho: unpublished United Exploration and Mining Corporation, Ltd, report, 10 p.

Young, H.W., and Mitchell, J.C., 1973, Geothermal investigations in Idaho, part 1, Geochemistry and geological setting of selected thermal waters: U.S. Geological Survey Water Information Bulletin no. 30, 43 p.

MINERAL RESOURCE APPRAISAL OF
THE SALMON NATIONAL FOREST, IDAHO

APPENDIX A

SAMPLE ANALYSES AND DESCRIPTIONS,
SALMON NATIONAL FOREST, IDAHO

APPENDIX A-1. SAMPLE LOCATIONS AND DESCRIPTIONS, SALMON NATIONAL FOREST, IDAHO

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFC 001	44 54 16.000 N	114 19 47.000 W	grab[4]	Fine-grained, banded quartzite with opal-filled vugs from dump.
SFC 002	44 53 1.000 N	114 20 16.000 W	grab	Finely-parted, welded tuff with quartz, amythest,, hematite, and pyrite along partings.
SFC 003	45 06 20.000 N	113 59 37.000 W	grab	Quartz containing malachite, pyrite, chalcopyrite, and hematite from dump.
SFC 004	45 06 21.000 N	113 59 4.000 W	grab	Quartz containing malachite, hematite, pyrite, and chalcopyrite from dump.
SFC 005	45 06 20.000 N	113 59 38.000 W	grab	Quartz containing malachite, pyrite, chalcopyrite, and bornite from dump.
SFC 006	44 58 1.000 N	114 31 55.000 W	grab	Quartz containing pyrite, chalcopyrite, galena, and limonite from dump.
SFC 007	45 01 5.000 N	115 19 41.000 W	grab	Quartzite breccia cemented by quartz, limonite, and hemitite from dump. The sample also contains pyrite casts.
SFC 008	45 01 51.000 N	114 20 18.000 W	grab	Quartzite breccia and rhyolite porphyry from dump.
SFC 009	44 57 44.000 N	114 06 54.000 W	grab	Quartz and phyllite containing pyrite and stained with erythrite.
SFC 010	44 57 7.000 N	114 06 9.000 W	chip	Across (30 ft) a copper-cobalt-bearing fracture zone in quartzite and phyllite. This is probably an easterly extension of the Iron Creek zone.
SFC 011	45 07 46.000 N	114 00 50.000 W	chip	Across (6 ft) limonite- and malachite- stained quartz with chalcocite.
SFC 012	44 25 57.000 N	113 15 39.000 W	grab	Limestone and replacement gossan from dump.
SFC 013	44 27 13.000 N	113 18 25.000 W	grab	Limestone and replacement gossan from dump.
SFC 014	44 26 54.000 N	113 18 48.000 W	grab	Limestone and replacement gossan from dump.
SFC 015	44 23 30.000 N	113 15 16.000 W	grab	Quartzite and skarn composed of hematite, actinolite, epidote, and sphalerite from dump.
SFC 016	44 23 14.000 N	113 16 4.000 W	grab	Limestone and gossan from dump.
SFC 017	44 29 22.000 N	113 18 8.000 W	grab	Limestone and gossan from dump.
SFC 018	44 29 1.000 N	113 18 41.000 W	grab	Quartz with calcite, hematite, galena, chalcopyrite, sphalerite, and malachite from ore bin.
SFC 019	44 28 4.000 N	113 18 41.000 W	grab	Limestone, quartzite, and gossan from dump.
SFC 020	44 27 25.000 N	113 18 47.000 W	grab	Limestone, quartzite, and gossan from dump.
SFC 021	44 51 30.000 N	114 23 49.000 W	chip	Across (40 ft) silicified, heavily iron-stained shear zone in tuff.
SFC 022	44 52 29.000 N	114 26 4.000 W	grab	Quartz containing limonite and pyrite casts from dump.
SFC 023	44 40 36.000 N	113 04 56.000 W	chip	Across (30 ft) a zone of chalcopyrite-, thorite-, hematite-, and malachite-bearing quartzite.
SFC 024	44 46 43.000 N	113 17 6.000 W	grab	Sheared and argillic quartzite with malachite, chalcopyrite, and hematite from dump.
SFC 025	44 58 7.000 N	113 28 31.000 W	grab	Quartz containing malachite, chalcocite, chalcopyrite, pyrite, and hematite from dump.
SFC 026	44 58 32.000 N	113 28 26.000 W	chip	Across (30 ft) silicified, hematite-bearing shear zone in quartzite.
SFC 027	44 58 19.000 N	113 27 36.000 W	grab	Quartz containing chalcocite, hematite, malachite, and azurite from dump.
SFC 028	44 58 48.000 N	113 28 38.000 W	chip	Across (3 ft) silicified shear zone in quartzite. The zone contains malachite and hematite.
SFC 029	44 59 28.000 N	113 29 37.000 W	grab	Radioactive specularite from stockpile.
SFC 030	44 47 4.000 N	113 17 17.000 W	grab	Gossan from working dumps.

[4] Samples taken consisted of four types: 1)chip—a regular series of rock chips taken in a continuous line across a mineralized zone or other exposure; 2)random chip—an unsystematic series of chips taken from an exposure of apparently homogeneous rock; 3)grab—rock collected unsystematically from a dump or stockpile, or float (loose rock lying on the ground); and 4)select—an intentionally biased selection of rock taken because of a unique or unusual property.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFC 031	44 47 18.000 N	113 18 26.000 W	grab	Gossan from dump of caved shaft.
SFC 032	44 47 4.000 N	113 19 43.000 W	grab	Gossan from large pit.
SFC 033	44 47 2.000 N	113 20 30.000 W	grab	Limestone and quartz breccia cemented with limonite and silica from the dump of a dozer pit.
SFC 034	44 45 27.000 N	113 21 56.000 W	chip	Across a 10-foot-thick zone exposed in a dozer pit wall.
SFC 035	45 09 12.000 N	114 18 24.000 W	chip	Across a 10-foot-thick zone in quartzite.
SFC 036	45 09 30.000 N	114 17 55.000 W	chip	Across a 10-foot-thick zone in quartzite.
SFC 037	45 00 33.000 N	113 30 11.000 W	chip	Across a 3-foot-thick zone in quartzite.
SFC 038	45 01 1.000 N	113 30 10.000 W	grab	Quartzite from dozer trench.
SFC 039	45 01 39.000 N	113 30 32.000 W	chip	Across a 2-foot-thick zone in quartzite.
SFC 040	45 00 31.000 N	113 31 29.000 W	chip	Across a 3-foot-thick zone in quartzite.
SFC 041	45 04 45.000 N	113 34 12.000 W	chip	Across (4 ft) a quartz vein.
SFC 042	45 06 22.000 N	113 34 55.000 W	grab	Quartz from mill floor.
SFC 043	45 06 22.000 N	113 34 55.000 W	chip	Across (1.6 ft) a vein.
SFC 044	45 11 37.000 N	113 38 6.000 W	chip	Across a 10-foot-thick quartzite bed.
SFC 045	44 58 37.000 N	113 27 14.000 W	chip	Across (10 ft) a mineralized zone in quartzite.
SFC 046	44 59 42.000 N	113 27 56.000 W	chip	Across a 4-foot-thick zone in quartzite.
SFC 047	44 59 9.000 N	113 29 12.000 W	chip	Across a 0.5-foot-thick zone in quartzite.
SFC 048	44 58 58.000 N	113 27 13.000 W	chip	Across a 1-foot-thick zone in quartzite.
SFC 049	44 58 9.000 N	113 27 51.000 W	grab	Quartzite from dump of dozer cut.
SFC 050	44 33 31.000 N	113 20 40.000 W	chip	Across (3 ft) an iron-bearing bed.
SFC 051	44 36 55.000 N	113 33 57.000 W	grab	Granitic rock and quartz containing sulfide and oxide minerals from mill dump.
SFC 052	44 43 49.000 N	113 17 9.000 W	chip	Across a 13-foot-thick zone of gossan.
SFC 053	44 46 41.000 N	113 20 46.000 W	grab	Limestone and quartz breccia cemented with silica and limonite from the dump of a large dozer pit.
SFC 054	44 46 29.000 N	113 21 1.000 W	grab	Limestone and quartz breccia from the dump of a large adit.
SFC 055	44 45 51.000 N	113 21 0.000 W	grab	Limestone and quartz breccia containing sulfide and oxide minerals from the dump of the lowest adit.
SFC 056	44 46 10.000 N	113 19 56.000 W	chip	Across a 5-foot-thick zone of gossan in limestone.
SFC 057	44 42 41.000 N	113 17 45.000 W	chip	Across a 10-foot-thick rhyolite dike.
SFC 058	44 42 51.000 N	113 19 2.000 W	chip	Across a 1.5-foot-thick zone in quartzite.
SFC 059	44 42 36.000 N	113 19 24.000 W	chip	Across a 3-foot-thick zone in quartzite.
SFC 060	44 42 41.000 N	113 19 54.000 W	grab	Mineralized rock from a dump.
SFC 061	44 42 43.000 N	113 20 15.000 W	grab	Mineralized rock from a dump.
SFC 062	44 43 53.000 N	113 21 25.000 W	chip	Across a 2-foot-thick lense in limestone.
SFC 063	44 43 31.000 N	113 21 33.000 W	chip	Across a 2-foot-thick lense in limestone.
SFC 064	44 40 19.000 N	113 10 50.000 W	chip	Across (50 ft) phosphate-bearing shale.
SFC 065	44 43 26.000 N	113 23 27.000 W	chip	Across (4 ft) calcareous sedmentary rock.
SFC 066	44 43 30.000 N	113 23 40.000 W	chip	Across (10 ft) calcareous sedimentary rock.
SFC 067	44 44 0.000 N	113 24 21.000 W	chip	Across (5 ft) fractured limestone.
SFC 068	44 44 56.000 N	113 24 7.000 W	chip	Across (3 ft) fractured limestone.
SFC 069	45 06 38.000 N	114 18 52.000 W	grab	Quartzite from a dump.
SFC 070	45 06 10.000 N	114 18 8.000 W	chip	Across (4 ft) quartzite.
SFC 071	45 04 42.000 N	114 21 42.000 W	chip	Across a 4-foot-thick gossan zone in quartzite.
SFC 072	45 04 57.000 N	114 14 55.000 W	chip	Across (0.5 ft) a quartz vein containing hematite, malachite, and galena.
SFC 073	44 59 33.000 N	114 21 33.000 W	chip	Across (10 ft) a radioactive fracture zone in granitic rock.
SFC 074	45 10 55.000 N	114 21 55.000 W	grab	Quartzite from the dump of a caved adit.
SFC 075	45 10 55.000 N	114 21 55.000 W	grab	Quartzite country rock.
SFC 076	45 09 56.000 N	114 22 3.000 W	grab	Copper sludge from leach pads.
SFC 077	45 09 47.000 N	114 22 3.000 W	grab	Quartzite from an adit dump.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFC 078	45 07 32.000 N	114 21 41.000 W	chip	Across a 4-foot-thick zone in quartzite.
SFC 079	45 07 46.000 N	114 21 44.000 W	chip	Across a 3-foot-thick zone in quartzite.
SFC 080	45 08 20.000 N	114 21 17.000 W	chip	Across a 2-foot-thick zone in quartzite.
SFC 081	45 08 11.000 N	114 21 11.000 W	chip	Across a 15-foot-thick zone in quartzite.
SFC 082	45 08 30.000 N	114 20 8.000 W	grab	Quartzite from a dump.
SFC 083	45 08 55.000 N	114 20 24.000 W	chip	Across a 2-foot-thick zone in quartzite.
SFC 084	45 08 4.000 N	114 20 39.000 W	chip	Across a 1-foot-thick zone in quartzite.
SFC 085	45 07 50.000 N	114 20 47.000 W	chip	Across a 0.7-foot-thick zone in quartzite.
SFC 086	45 07 37.000 N	114 20 41.000 W	chip	Across a 4-foot-thick zone in quartzite.
SFC 087	45 06 54.000 N	114 21 38.000 W	chip	Across an 80-foot-thick zone in quartzite.
SFC 088	45 05 36.000 N	114 18 10.000 W	chip	Across a 20-foot-thick zone in quartzite.
SFC 089	45 05 20.000 N	114 20 3.000 W	chip	Across a 3-foot-thick zone in quartzite.
SFC 090	45 05 33.000 N	114 19 31.000 W	chip	Across a 40-foot-thick zone in quartzite.
SFC 091	45 05 36.000 N	114 18 10.000 W	chip	Across a 10-foot-thick zone in quartzite.
SFC 092	44 29 7.000 N	113 18 41.000 W	chip	Across a 4-foot-thick mineralized zone exposed in haulage way.
SFC 093	44 29 7.000 N	113 18 41.000 W	chip	Across a 3-foot-thick mineralized zone exposed in a haulage way.
SFC 094	44 29 7.000 N	113 18 41.000 W	chip	Across a 3-foot-thick mineralized zone exposed in haulage way.
SFC 095	44 26 58.000 N	113 16 59.000 W	grab	Gossan and dolomite from the dump of a caved shaft.
SFC 096	44 27 27.000 N	113 17 29.000 W	grab	Rock containing oxides from a dump.
SFC 097	45 02 8.000 N	114 20 13.000 W	chip	Across (700 ft) of quartzite.
SFC 098	45 02 40.000 N	114 19 46.000 W	grab	Quartzite from dump.
SFC 099	45 03 18.000 N	114 20 42.000 W	grab	Quartzite from dump.
SFC 100	45 01 17.000 N	114 19 8.000 W	grab	Quartzite from dump.
SFC 101	45 04 5.000 N	114 22 1.000 W	chip	Across a 50-foot-thick zone in quartzite.
SFC 102	44 45 20.000 N	113 25 11.000 W	chip	Across an 8-foot-thick zone of fractured limestone.
SFC 103	44 45 41.000 N	113 25 48.000 W	chip	Across a 4-foot-thick zone of fractured limey shale.
SFJ-001	45 9 38.417 N	114 9 18.969 W	select	Silicified, limonite-stained, sheared ellipsoidal gneiss containing traces of pyrite from dump of caved adit.
SFJ-002	45 9 49.135 N	114 17 20.722 W	select	Malachite-, azurite-, and erythrite-stained quartz from dump of small pit in metavolcanic rock.
SFJ-003	45 13 15.686 N	114 10 10.336 W	select	Limonite-, hematite-, and manganese-stained quartz containing traces of pyrite from bulldozed pit in grey schist.
SFJ-004	45 13 18.022 N	114 10 13.801 W	select	Limonite-stained, brecciated quartz from dump of caved adit in quartz monzonite.
SFJ-005	45 13 20.560 N	114 10 17.851 W	select	Quartz containing abundant pyrite from dump of caved adit in altered quartz monzonite.
SFJ-006	45 14 19.200 N	114 12 53.129 W	select	Hematite- and limonite-rich, strongly altered syenite containing quartz veinlets.
SFJ-007	45 14 8.381 N	114 12 26.524 W	select	Limonite-stained quartz containing pyrite and hematite from dump of pit in altered syenite.
SFJ-008	45 14 5.348 N	114 12 28.825 W	select	Limonite-stained quartz containing abundant pyrite and hematite from stockpile at old millsite.
SFJ-009	45 18 36.154 N	114 16 53.675 W	select	Heavily malachite-stained quartz-garnet schist from stockpile at caved adit.
SFJ-010	45 21 17.818 N	114 16 32.599 W	select	Silicified gneiss containing pyrite, arsenopyrite, and traces of galena from dump of adit.
SFJ-011	45 9 6.948 N	114 11 17.079 W	select	Partially silicified, heavily limonite-stained, bleached gneiss from dump of pit.
SFJ-012	45 18 17.400 N	113 59 24.741 W	select	Limonite-stained quartz containing vugs or cavitites filled with limonite and manganese from dump of caved adit in schist.
SFJ-013	45 18 18.333 N	113 59 13.859 W	select	Quartz containing seams and blebs of limonite from bulldozer pit in schist.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFJ-014	45 18 18.777 N	113 59 4.718 W	select	Quartzite containing vugs of limonite.
SFJ-015	45 20 56.059 N	113 59 59.426 W	select	Limonite-stained quartz containing vugs filled with limonite and pyrite.
SFJ-016	45 14 4.969 N	114 0 23.876 W	select	Quartz containing pyrite, galena, and traces of chalcopyrite from dump of caved adit in quartz monzonite.
SFJ-017	45 14 11.466 N	114 0 18.955 W	select	Quartz containing vugs filled with limonite and traces of pyrite from dump of caved adit in quartz monzonite.
SFJ-018	45 15 56.804 N	114 7 28.959 W	select	Limonite-stained quartz and bleached schist from dump of caved adit.
SFJ-019	45 15 59.828 N	114 7 28.944 W	select	Limonite-stained quartz containing pyrite from dump of pit in shale and quartzite.
SFJ-020	45 26 34.816 N	114 5 53.934 W	select	Limonite- and manganese-stained, fractured schist from adit portal.
SFJ-021	45 27 6.235 N	114 5 43.319 W	select	Limonite-, manganese-, and malachite-stained quartzite and schist from outcrop at portal of partially caved adit.
SFJ-022	45 27 24.592 N	114 6 17.212 W	select	Malachite-, limonite-, and erythrite-stained quartz, quartzite, and schist from stockpile at adit.
SFJ-023	45 27 26.254 N	114 6 14.300 W	select	Limonite- and malachite-stained quartz containing pyrite and chalcopyrite from bulldozer cut in quartzite and schist.
SFJ-024	45 27 36.813 N	114 9 27.507 W	select	Limonite-stained quartz containing pyrite from dump of caved adit in schist.
SFJ-025	45 28 32.815 N	114 3 18.578 W	select	Azurite-, malachite-, and limonite-stained, sheared, bleached schist from face of open cut.
SFJ-026	45 27 13.654 N	114 8 17.557 W	select	Limonite-stained quartz from ore bin located at head of tramway.
SFJ-027	45 26 9.668 N	114 5 6.167 W	select	Limonite- and manganese-stained, brecciated, bleached quartzite and phyllite containing hairline fractures filled with silica.
SFJ-028	45 27 9.106 N	114 19 26.995 W	select	Limonite-stained quartz containing abundant molybdenite, pyrite and lesser amounts of galena from bulldozer cut in quartz monzonite.
SFJ-029	45 27 8.327 N	114 19 25.968 W	select	Limonite- and molybdate-stained, bleached quartz monzonite containing abundant molybdenite and pyrite from stockpile.
SFJ-030	45 27 18.177 N	114 19 13.434 W	select	Limonite- and molybdate-stained quartz containing abundant pyrite and molybdenite from dump of bulldozed adit in gneiss.
SFJ-031	45 27 47.805 N	114 26 46.420 W	select	Hematite- and limonite-stained, bleached, argillically altered ellipsoidal gneiss from bulldozed adit.
SFJ-032	45 27 41.831 N	114 27 13.174 W	select	Limonite- and manganese-stained, partially silicified gneiss from open cut.
SFJ-033	45 27 41.851 N	114 27 13.314 W	select	Hematite-stained quartz from open cut in altered gneiss.
SFJ-034	45 27 49.651 N	114 23 51.723 W	select	Quartz containing magnetite, epidote, diopside, and traces of malachite from dump of caved adit.
SFJ-035	45 27 53.667 N	114 24 3.611 W	select	Limonite-stained quartz and bleached ellipsoidal gneiss containing epidote, molybdenite, and pyrite from stockpile at adit.
SFJ-036	45 27 53.766 N	114 24 3.191 W	select	Quartz containing diopside, pyrite, and galena from same stockpile.
SFJ-037	45 28 0.181 N	114 22 40.785 W	select	Limonite-stained quartz containing epidote, diopside, magnetite, pyrite, chalcopyrite, galena, and molybdenite from stockpile near adit in gneiss and quartz monzonite.
SFJ-038	45 27 51.545 N	114 22 46.122 W	select	Limonite- and molybdate-stained quartz containing diopside and olybdenite from open cut in gneiss and quartz monzonite.
SFJ-039	45 29 55.346 N	114 25 3.472 W	select	Limonite-stained quartz and silicified, bleached, ellipsoidal gneiss containing traces of galena, pyrite, and molybdenite from adit dump.
SFJ-040	45 22 34.666 N	114 23 8.450 W	select	Limonite-stained quartz containing pyrite from dump of caved

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
				shaft in quartz monzonite.
SFJ-041	45 22 34.607 N	114 23 8.450 W	select	Slightly limonite-stained, bleached, partially silicified quartz monzonite with abundant pyrite from caved shaft.
SFJ-042	45 22 3.563 N	113 56 41.489 W	select	Quartzite containing pyrite from dump of caved adit.
SFJ-043	45 32 14.767 N	113 56 16.880 W	select	Quartz containing siderite and pyrite from dump of adit in decomposed diorite.
SFJ-044	45 33 22.748 N	113 57 57.837 W	select	Limonite-stained quartz from dump of adit in light colored rhyolite.
SFJ-045	45 33 14.899 N	113 57 18.696 W	select	Quartz containing pyrite from dump of adit which explores a silica-rich zone trending N 50 W and dipping 75 SW.
SFJ-046	45 18 11.449 N	114 32 58.829 W	select	Quartz-rich intrusive rock containing abundant chalcopyrite and arsenopyrite from stockpile.
SFJ-047	45 22 22.217 N	114 16 38.951 W	select	Limonite-and hematite-stained quartz containing pyrite and traces of galena from ore bin located near 5-stamp mill.
SFJ-048	45 22 17.473 N	114 17 51.433 W	select	Quartz containing pyrite, arsenopyrite, and galena from dump of adit in augen gneiss.
SFJ-049	45 23 12.026 N	114 17 14.850 W	select	Quartz containing pyrite from dump of adit in augen gneiss.
SFJ-050	45 33 57.100 N	113 59 1.094 W	select	Brecciated quartz or quartzite with limonite-rich quartz veinlets. Sample taken from stockpile near delapidated mill.
SFJ-051	45 35 13.487 N	113 58 37.094 W	select	Brecciated quartzite cemented with limonite-rich silica from bulldozer workings.
SFJ-052	45 32 26.789 N	113 55 23.221 W	select	Limonite-stained quartz containing pyrite and arsenopyrite from stockpile near adit in micaceous quartzite.
SFJ-053	45 32 47.278 N	113 55 31.141 W	select	Quartz containing abundant pyrite from adit dump.
SFJ-054	45 33 34.720 N	113 55 3.037 W	select	Quartz containing pyrite from dump of caved adit in phyllite and quartzite.
SFJ-055	45 33 48.938 N	113 54 34.752 W	select	Limonite-stained quartz containing pyrite from dump of caved adit in phyllite.
SFJ-056	45 33 38.986 N	113 54 32.414 W	select	Limonite-stained quartz containing pyrite from dump of five caved adits in phyllite.
SFJ-057	45 33 39.707 N	113 54 15.672 W	select	Limonite-stained quartz containing pyrite from dump of three caved adits in phyllite.
SFJ-058	45 32 14.727 N	113 55 57.637 W	select	Heavily limonite-stained quartz containing abundant chalcopyrite from stockpile near adit in metasedimentary rock.
SFJ-059	45 24 26.288 N	113 55 51.582 W	select	Limonite-stained, brecciated, silicified metasedimentary rock from open cut located near Challis volcanics contact.
SFJ-060	45 16 58.477 N	114 15 44.632 W	select	Limonite-stained, silicified, brecciated quartzite from fault zone trending N 05 E and dipping 60 NW.
SFJ-061	45 30 42.691 N	113 57 46.922 W	select	Heavily limonite-stained quartz from shear zone trending N 10 W and dipping 70 NE in quartzite.
SFJ-062	45 30 22.008 N	113 55 32.187 W	select	Quartzite trending N 25 E and dipping 65 NW contains fractures coated with autenite.
SFJ-063	45 31 38.527 N	113 54 46.472 W	select	Quartz containing abundant limonite from dump of caved adit in gneiss.
SFJ-064	45 32 16.119 N	113 59 48.049 W	select	Malachite-and limonite-stained quartz from quartz lenses and veins in thin bedded argillite of the Apple Creek Formation.
SFJ-065	45 32 21.581 N	113 53 16.982 W	select	Heavily limonite-stained quartz form large bulldozer cuts in quartzite.
SFJ-066	45 32 2.174 N	113 53 10.799 W	select	Heavily limonite-stained quartz from bulldozer cut in quartzite.
SFJ-067	45 31 34.025 N	113 53 0.969 W	select	Limonite-stained quartzite with quartz veinlets up to 0.25 inch thick.
SFJ-068	45 30 23.029 N	114 9 30.334 W	select	Heavily limonite-stained siderite containing numerous chalcopyrite-bearing quartz veinlets up to 0.5 in thick.
SFJ-069	45 31 49.978 N	114 0 27.432 W	select	Quartzite containing numerous crosscutting quartz veinlets.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFJ-070	45 32 50.833 N	114 1 20.656 W	select	Limonite-, malachite-, hematite-, and manganese-stained quartz from dump of partially caved shaft in quartzite.
SFJ-071	45 32 16.028 N	114 1 27.625 W	select	Partially silicified quartzite containing pyrite-bearing quartz veinlets.
SFJ-072	45 31 7.775 N	114 1 10.980 W	select	Quartz containing abundant limonite and traces of malachite from dump of three caved adits in silty quartzite.
SFJ-073	45 24 2.398 N	114 21 37.379 W	select	White quartz from placer workings.
SFJ-074	45 22 34.686 N	114 23 8.422 W	select	Quartz containing massive pyrite from vein exposed underground.
SFJ-075	45 26 12.295 N	114 22 46.813 W	select	Heavily limonite- and manganese-stained quartz containing boxwork after pyrite.
SFJ-076	45 26 45.552 N	114 23 10.246 W	select	Heavily limonite- and molybdate-stained quartz and augen gneiss containing pyrite and molybdenite.
SFJ-077	45 26 0.731 N	114 22 45.956 W	select	Massive white quartz from large boulders of float.
SFJ-078	45 23 53.399 N	114 23 7.205 W	select	Limonite-stained gneiss containing fractures filled with limonite.
SFJ-079	45 27 58.226 N	114 25 23.205 W	select	Vuggy, limonite-stained quartz containing traces of pyrite. Sample taken from dump of adit that exposed a siliceous zone in gneiss.
SFJ-080	45 28 2.493 N	114 26 41.822 W	select	Limonite-stained quartz containing pyrite from dump of adit in gneiss.
SFJ-081	45 27 47.134 N	114 26 41.848 W	select	Quartz containing abundant pyrite from stockpile above old mill.
SFJ-082	45 28 40.428 N	114 26 37.562 W	select	Vuggy, heavily limonite-, manganese-, and hematite-stained quartz from vein striking N 55 E and dipping 38 SE in Augen gneiss.
SFJ-083	45 33 43.004 N	113 55 20.481 W	select	Massive limonite and quartz from dump of caved adit in quartzite and schist.
SFJ-084	45 37 28.900 N	114 2 50.418 W	chara cter	Bedded barite in very contorted and folded quartzite generally striking N 60 W and dipping 25 SW.
SFJ-085	45 36 52.933 N	113 58 54.894 W	select	Actinolite, epidote, quartz, calcite, magnetite scarn exposed in road cut.
SFJ-086	45 13 42.320 N	114 11 15.790 W	select	Quartz and massive limonite from small pit in monzonite.
SFJ-087	45 13 42.261 N	114 11 28.987 W	select	Quartz and limonite from dump of adit in phyllite and monzonite.
SFJ-088	45 13 21.341 N	114 11 47.913 W	select	Slightly limonite-stained quartz monzonite containing numerous quartz veinlets.
SFJ-089	45 26 50.604 N	114 15 40.578 W	select	Malachite-stained Augen gneiss float from small pits and bulldozer cuts.
SFJ-090	45 20 11.336 N	113 49 54.854 W	select	Malachite-, azurite-, and chrysacola-stained quartzite breccia composed of angular fragments of quartzite cemented with white quartz.
SFJ-091	45 13 17.479 N	114 11 32.320 W	select	Quartz syenite containing quartz veinlets up to 0.25 inch wide.
SFJ-092	45 26 44.875 N	114 20 4.760 W	select	Quartz containing galena, chalcopyrite, pyrite, molybdenite, and limonite from malachite-stained vein trending N 50 E and dipping 70 SE in Augen gneiss.
SFJ-093	45 26 57.733 N	114 19 55.103 W	select	Quartz containing galena and traces of malachite from vein striking N 20 E and dipping 30 SE in Augen gneiss.
SFJ-094	45 21 24.776 N	114 16 50.081 W	select	Quartz containing galena, pyrite, and traces of visible gold from shear zone in ellipsoidal gneiss.
SFJ-095	45 21 10.838 N	114 16 45.758 W	select	Heavily limonite-stained quartz containing pyrite from shear zone trending N 35 E and dipping 60 SE in ellipsoidal gneiss.
SFJ-096	45 23 30.074 N	114 11 37.901 W	select	Limonite-stained, bleached gneiss from open cut.
SFJ-097	45 26 15.721 N	114 11 5.331 W	select	Limonite-stained rhyolite containing traces of pyrite from road cut.
SFJ-098	45 29 3.523 N	114 10 6.798 W	select	Malachite-, azurite-, limonite-rich, partially silicified phyllite and quartzite from dump of caved adit.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFJ-099	45 29 11.024 N	114 10 14.632 W	select	Limonite-rich, malachite-and azurite-stained, partially silicified, breccitated phyllite from bulldozer cut.
SFJ-100	45 28 45.435 N	114 8 47.510 W	select	Malachite-, azurite-, and limonite-stained quartz containing chalcopyrite from quartz lenses found along a bedding plane fault trending N 45 W and dipping 40 SW in quartzite.
SFJ-101	45 27 15.112 N	114 5 15.590 W	chara cter	Limonite-stained quartzite and phyllite with quartz veinlets up to 0.25 inch wide.
SFJ-102	45 26 37.025 N	114 5 21.975 W	chip	Across shear zone trending N 70 W and dipping vertically in quartzite and phyllite.
SFJ-103	45 26 29.957 N	114 5 35.534 W	select	Heavily limonite-stained, bleached, fractured phyllite containing limonite, manganese, and quartz along fractures.
SFJ-104	45 26 31.598 N	114 5 13.992 W	select	Heavily limonite- and manganese-stained, fractured quartzite and phyllite.
SFJ-105	45 31 25.181 N	114 11 0.868 W	chara cter	Magnetite-rich schist float.
SFJ-106	45 14 17.915 N	113 45 39.453 E	select	Malachite-stained schist containing quartz, epidote, diopside, sphalerite, chalcopyrite, and malachite along N 60 W trending, 60 SW dipping foliation planes.
SFJ-107	45 13 4.263 N	113 45 48.675 W	select	Malachite-stained grey quartzite containing small amounts of disseminated chalcopyrite.
SFJ-108	45 22 24.987 N	114 17 19.793 W	select	Limonite-stained quartz containing abundant pyrite and lesser amounts of galena from rubble in open pit. Rock probably came from silicified zone in gneiss.
SFJ-109	45 25 9.441 N	114 17 15.291 W	select	Limonite-stained quartz from lense in gneiss.
SFM-001	45 14 13.428 N	113 56 10.147 W	chip	Across (2.5 ft) bands of hematitic quartz along a shear zone trending N 30 W and dipping 70 SW in light green quartzite. The shear zone is subparallel to the quartzite bedding.
SFM-002	45 14 8.809 N	113 56 6.332 W	grab	Chloritized dacite, quartzite, and minor quartz from bottom of coarse ore bin.
SFM-003	45 15 12.019 N	113 56 18.522 W	grab	Heavily limonite-stained quartz containing pseudomorphs after pyrite from dump of caved adit in altered granite.
SFM-004	45 15 38.874 N	113 56 27.339 W	grab	Vuggy, limonitic quartz and altered, sheared, limonitic granite from dump of adit.
SFM-005	45 15 46.989 N	113 56 44.510 W	grab	Quartz and hematitic quartz breccia from dump of caved adit in argillic, limonite-stained granite.
SFM-006	45 15 27.631 N	113 56 41.013 W	chip	Across (2.1 ft) limonitic quartz breccia in shear zone trending N 55 W and dipping 67 SW in argillic granite.
SFM-007	45 13 53.347 N	113 59 43.454 W	select	Vuggy, pyritic, hematitic quartz from dump of workings in argillic, chloritic granite.
SFM-008	45 11 42.617 N	113 57 6.142 W	select	Limonite-stained quartz from dump of caved adit in dark grey, banded quartzite.
SFM-009	45 12 35.490 N	113 58 39.072 W	grab	Brecciated quartz recemented with limonite from mill near caved adit.
SFM-010	45 19 1.993 N	113 56 47.875 W	chip	Across (5 ft) massive, limonitic quartz vein in Yellowjacket quartzite and phyllite. The vein strikes N 20 W, dips 47 SW, and contains disseminated pyrite. Foliation in the quartzite and phyllite strikes N 12 W and dips 35 SW.
SFM-011	45 1 2.594 N	113 49 16.826 W	grab	Malachite-stained mill tailings from stream cutbank.
SFM-012	45 2 59.711 N	113 50 44.417 W	chip	Across (1.7 ft) shear zone trending N 53 W and dipping 59 SW in quartzite. The zone contains bleached, hematite-, malachite- and chrysocolla-stained, recemented quartzite breccia.
SFM-013	45 16 24.223 N	113 55 28.479 W	grab	Quartz containing vugs filled with limonite boxwork from ore stockpile. Host rock is brecciated, recemented quartzite.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFM-014	45 16 26.135 N	113 55 26.811 W	chip	Across (1.8 ft) bedding plane fault striking N 70 W and dipping 46 NE in bleached, limonitic, phyllitic quartzite.
SFM-015	45 17 42.187 N	113 55 26.185 W	chip	Across (1.2 ft) heavily limonite-stained quartz lens in sheared, bleached, limonitic, phyllitic quartzite. The shear zone trends approximately N 35 W and dips 40 SW.
SFM-016	45 17 42.207 N	113 55 26.241 W	chip	Across (2.5 ft) irregular shaped, hematite-rich quartz pod in bleached phyllitic quartzite.
SFM-017	45 17 56.453 N	113 55 47.662 W	grab	Grab from jasperoidal vein striking N 35 W, dipping vertically, and containing blebs of white quartz. The vein is at least 18 inches thick where exposed in stopes.
SFM-018	45 18 24.342 N	113 55 57.821 W	grab	Vuggy quartz from dump of caved adit.
SFM-019	45 18 34.093 N	113 56 39.922 W	select	Heavily limonite- and hematite-stained quartz from shallow pits and trenches.
SFM-020	45 17 53.736 N	113 56 48.860 W	chip	Across (3.3 ft) shear zone trending N 15 E, dipping 75 NW, and containing friable, granular limonite and a quartz vein about 5 inches thick.
SFM-021	45 17 53.755 N	113 56 48.832 W	chip	Across (5.0 ft) shear zone in quartzite striking N 70 W and dipping 45 SE.
SFM-022	45 17 57.726 N	113 56 52.924 W	grab	Mill tailings.
SFM-023	45 17 52.812 N	113 56 55.764 W	chip	Across (3.8 ft) limonite-stained breccia zone trending N 05 E and dipping 40 NW in quartzite.
SFM-024	45 17 30.705 N	113 56 52.255 W	chip	Across (5.0 ft) zone of jasperoid trending N 10 W.
SFM-025	45 18 19.750 N	113 59 4.886 W	grab	Limonitic quartz from massive pod of recrystalized quartzite.
SFM-026	45 18 19.952 N	113 59 18.036 W	grab	Limonite-stained quartz from pit.
SFM-027	45 16 3.505 N	114 0 36.013 W	grab	Quartz containing traces of fluorite from trench dump.
SFM-028	45 16 36.242 N	114 2 7.330 W	grab	Limonite-stained quartz from bulldozer trench.
SFM-029	45 17 25.451 N	114 1 4.635 W	grab	Heavily limonite-stained quartz float.
SFM-030	45 13 14.580 N	113 56 21.198 W	chip	Across (1.2 ft) vuggy, hematitic quartz vein and sheared, agrillically altered quartzite.
SFM-031	45 13 0.758 N	113 56 44.817 W	grab	Limonite-stained, vuggy quartz from vein striking N 88 E and dipping 75 SE in granite.
SFM-032	45 12 52.717 N	113 56 13.287 W	grab	Limonite- and malachite-stained quartz from stockpile. Quartz probably came from a poorly exposed vein that apparently strikes N 30 W and dips 80 NE.
SFM-033	45 13 22.367 N	113 56 44.981 W	grab	Quartz containing irregular blebs of massive limonite and slices of chloritized phyllitic quartzite from stockpile at small sloughed pit.
SFM-034	45 14 28.899 N	113 56 56.077 W	grab	Finely broken, limonitic quartz containing fragments of quartzite and granitic clasts from dump.
SFM-035	45 14 28.937 N	113 56 55.405 W	grab	Malachite- and limonite-stained quartz containing traces of chalcopyrite from dump of caved adit in gneissic granite.
SFM-036	45 13 44.190 N	114 0 26.809 W	grab	Fine-grained mafic dike rock.
SFM-037	45 6 33.721 N	113 58 55.305 W	select	Malachite-stained quartz containing chalcopyrite from stockpile. Quartz probably came from shear zone trending N 50 W and dipping vertically in phyllitic quartzite.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFM-37A	45 6 7.893 N	113 59 3.647 W	grab	Chrysocolla-stained quartz from ore bin.
SFM-038	45 16 2.348 N	113 55 49.584 W	grab	Slightly limonite-stained quartz from pit in phyllitic quartzite.
SFM-039	45 16 46.243 N	113 56 21.391 W	chip	Across (1.5 ft) shear zone trending N 64 W and dipping 37 SW in quartzite.
SFM-040	45 17 17.393 N	113 56 41.562 W	chip	Across (1.2 ft) limonitic shear zone trending N 35 E and dipping 80 NW in gneissic, argillically altered granite.
SFM-041	45 17 44.242 N	113 58 11.776 W	grab	Quartz containing bands and pods of brown jasperoid from stockpile.
SFM-042	45 17 44.830 N	113 58 21.640 W	grab	Yellow brown to brick red jasperoid from pits.
SFM-043	45 16 53.753 N	113 56 46.336 W	grab	Quartz from vein striking N 70 W and dipping 74 NE.
SFM-044	45 17 2.480 N	113 57 3.425 W	chip	Across (0.8 ft) jasperoidal breccia zone trending N 30 E and dipping 38 NW along footwall of pegmatite dike.
SFM-045	45 17 0.880 N	113 57 3.969 W	grab	Limonite-stained quartz containing bands of jasperoid from small stockpile. Quartz may have come from 4-ft-thick vein trending N 60 W and dipping 80 NE.
SFM-046	45 17 2.500 N	113 56 42.038 W	grab	Jasperoid and quartz containing blebs of pyrite from bulldozer cut in granite.
SFM-047	45 16 45.511 N	113 57 25.832 W	chip	Across (1.2 ft) quartz breccia containing bands of autunite.
SFM-048	45 16 44.804 N	113 57 32.648 W	grab	Medium-grained pegmatite.
SFM-049	45 16 40.245 N	113 57 30.019 W	chip	Across (1.8 ft) quartz vein striking N 30 E and containing a band of massive goethite.
SFM-050	44 47 20.055 N	114 10 26.596 W	select	Rhyo-dacite tuff containing vesicles filled with green opal.
SFM-051	44 45 27.288 N	114 9 12.579 W	select	Brown,gray rhyodacite tuff containing numerous stringers of agate.
SFM-052	44 57 6.346 N	114 6 14.299 W	chip	Across sheared, phyllitic, pyrite-bearing zone in quartzite. Numerous joints in the quartzite are coated with erythrite.
SFM-053	44 58 52.164 N	114 6 53.425 W	grab	Limonitic, sheared, phyllitic siltite striking N 10 W and dipping 45 SW.
SFM-054	44 57 17.660 N	114 7 7.746 W	chip	Across (2.5 ft) quartzite containing bands of magnetite up to 0.5 feet thick and isolated stringers of pyrite.
SFM-055	44 55 9.734 N	114 3 41.468 W	select	Limonite-stained phyllite and quartzite.
SFM-056	44 50 7.321 N	113 56 40.943 W	grab	Pods and bands of specular hematite and magnetite in quartzite.
SFM-057	44 50 3.691 N	113 56 33.060 W	chip	Across quartz stringers and iron-oxide pods.
SFM-058	44 56 34.070 N	114 22 13.563 W	chip	Brown and black banded jasperoid.
SFM-059	44 55 58.222 N	114 23 11.326 W	grab	Yellow to brown jasperoid float.
SFM-060	45 1 38.455 N	113 53 15.720 W	select	Gray to green phyllitic quartzite.
SFM-061	45 1 36.665 N	113 53 8.302 W	random chip	Across malachite- and limonite-filled shear zones striking N 45 W and dipping 50 NE in phyllitic, black quartzite.
SFM-062	45 12 31.353 N	113 58 49.327 W	grab	Limonitic quartz from small stockpile. Quartz probably came from shear zone striking N 85 W.

Appendix A-1 Sample descriptions, Salmon National Forest

No.	Latitude	Longitude	Type	Sample description
SFM-063	45 12 31.294 N	113 58 49.243 W	chip	Across (10 ft) limonite-stained, bleached, argillically altered quartzite.

APPENDIX A-2. ANALYTICAL DATA, IN PPM, FOR SAMPLES FROM THE SALMON NATIONAL FOREST, IDAHO

[Sample descriptions can be found in Appendix table A-1.]

[If ( )*blank*, analysis not requested, *or* no value was reported; (-), less than reported value; (+), greater than reported value. Analyses by Bondar Clegg Intertek Testing Services, Vancouver, British Columbia][1]

[1] All samples analyzed by neutron activation methods for 34 elements (Ag, Au, As, Ba, Br, Cd, Ce, Co, Cr, Cs, Eu, Fe, Hf, Ir, La, Lu, Mo, Na, Ni, Rb, Sb, Sc, Se, Sm, Sn, Ta, Tb, Te, Th, U, W, Yb, Zn, Zr). Cu, Pb, Hg were analyzed by inductively coupled plasma emission spectroscopy or cold vapor/atomic absorption methods. Samples with >.3 ppm Au were reanalyzed for Au and Ag using fire assay methods.

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFC 001	0.017	-5	3	4	-200	2	2	1	0.5	0.010	18.0	3.9	-20	-10
SFC 002	0.014	-5	4	13	-200	2	2	31	7.5	0.032	17.0	3.9	-20	-10
SFC 003	0.34	14	+20000	17	-200	43	-2	218	34.6	1.855	-0.5	93.6	-20	12
SFC 004	0.17	14	+20000	14	-200	8	-2	9	1.8	0.539	-0.5	8.8	-20	11
SFC 005	0.047	43	+20000	-2	-200	17	-2	3	0.6	0.321	-0.5	3.6	-20	-10
SFC 006	4.54	-5	5742	75	-200	8	499	5	0.6	0.015	4.7	2.2	-20	15
SFC 007	10.0	-5	177	-2	-200	6	2	351	88.9	0.438	2.0	0.8	-20	-10
SFC 008	0.14	-5	215	14	-200	19	-2	101	48.7	0.059	22.0	8.4	-20	-10
SFC 009	0.033	-5	4130	15	-200	19	3	519	0.4	0.026	4.0	2.1	85	2410
SFC 010	0.015	-5	167	18	-200	6	8	186	2.5	0.018	4.9	4.2	45	590
SFC 011	6.71	71	+20000	24	-200	-2	-2	110	4.3	0.468	0.7	2.9	-20	10
SFC 012	-.019	220	124	+10000	7900	22	19	389	448.0	1.444	-1.9	3.5	53	-10
SFC 013	0.18	100	2516	+10000	+30000	3	33	327	202.0	0.810	-1.1	3.0	81	-10
SFC 014	2.27	-15	1700	+10000	+30000	6	-2	1260	145.0	6.927	-1.5	1.7	-85	41
SFC 015	0.1	110	894	+10000	21800	18	16	321	807.0	33.800	-3.0	3.4	-66	-10
SFC 016	-.039	-17	559	+10000	+30000	17	-2	2860	737.0	0.484	4.0	-1.9	-110	-10
SFC 017	0.663	240	5117	+10000	11000	5	9	365	131.0	0.417	39.0	6.0	52	140
SFC 018	1.63	+300	5533	+10000	20000	-45	-14	1560	4350.0	2.398	-17.0	-8.2	-290	-37
SFC 019	4.0	-32	945	+10000	+30000	-19	15	8120	1360.0	1.002	-7.3	4.5	230	-20
SFC 020	7.51	24	1863	+10000	9400	5	10	790	128.0	1.340	1.9	6.9	-20	-10
SFC 021	1.26	62	65	1820	250	7	-2	16	25.5	0.038	3.2	0.8	-20	-20
SFC 022	2.99	+300	57	184	260	12	5	41	70.7	0.061	2.8	0.8	-20	-20
SFC 023	0.33	-5	13496	79	-200	6	-2	1350	1.6	-0.010	10.0	12.0	110	500
SFC 024	-0.13	+300	19212	+10000	9800	-34	-12	2490	3220.0	7.133	-13.0	63.0	530	46
SFC 025	4.62	54	+20000	1322	430	20	7	1420	6.8	1.075	14.0	4.8	49	-10
SFC 026	-.005	-5	136	70	-200	-5	12	93	12.0	0.674	2330.0	12.0	48	-10
SFC 027	6.75	160	+20000	474	-200	180	6	667	13.0	+50.000	5.6	75.5	30	-10
SFC 028	0.771	10	13223	927	-200	10	3	483	6.6	0.281	172.0	3.5	-20	120
SFC 029	-.036	-20	43	36	-1200	-25	9	7	1.1	0.070	+3000	33.0	-140	-10
SFC 030	0.005	-5			950	6	4	105	5.6		1.4	5.0	150	-10
SFC 031	-.012	-5			3100	223	-2	1360	49.1		-1.1	14.0	1500	220
SFC 032	-.011	-5			9200	209	-2	879	82.8		2.1	22.0	1500	130
SFC 033	-.061	-23	51500		1800	110	-8	8650	1030.0		-5.9	80.5	2480	1130
SFC 034	-.038	-18	67100		2200	93	-6	+10000	66.9		-3.7	134.0	20500	1320
SFC 035	0.36	-28	41400		-790	-31	13	+10000	43.4		-4.1	50.0	420	10400
SFC 036	-.005	-5			-200	-2	7	249	19.0		22.0	6.5	79	51
SFC 037	0.033	-12			-720	-16	-5	132	3.9		2010	6.7	580	83

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFC 038	-.005	-5	100		-200	-2	2	31	0.7		10.0	2.2	30	39
SFC 039	-.005	-5			-200	-2	3	21	2.5		17.0	2.2	-20	-10
SFC 040	-.005	-5			-200	-2	-2	9	1.2		29.0	2.3	-20	-10
SFC 041	-.005	-5	-100		-200	2	9	2	0.6		5.1	3.6	-20	-10
SFC 042	10.0	56			-200	17	4	3	1.2		-0.5	5.2	-20	-10
SFC 043	10.0	35	13000		-200	18	5	4	1.8		1.4	21.0	-20	14
SFC 044	9.36	6	4500		-200	5	-2	2	0.6		2.6	1.4	-20	-10
SFC 045	0.009	-5			-200	-2	4	2	0.8		68.0	1.8	-20	10
SFC 046	3.9	69	-100		-200	16	4	4	1.4		12.0	25.0	-20	-10
SFC 047	0.03	-5			-200	-2	10	112	10.0		449.0	34.0	120	79
SFC 048	3.23	200	123500		-200	14	-2	10	4.1		2.0	19.0	-20	-10
SFC 049	0.008	-5			-200	-2	5	8	1.3		14.0	3.6	-20	-10
SFC 050	-.011	-5	100		-200	10	19	576	148.0		1.6	8.7	210	19
SFC 051	0.014	-5			-200	92	5	7	1.6		33.0	14.0	29	53
SFC 052	-.005	-5			1300	350	5	765	20.0		2.4	21.0	590	19
SFC 053	-.005	-5			-200	41	3	47	10.0		1.5	2.7	35	-10
SFC 054	-.093	+300			+30000	2330	-18	+10000	1490.0		14.0	68.2	1800	630
SFC 055	-.032	230			+30000	252	21	3240	734.0		-2.5	3.3	140	130
SFC 056	-.005	-5			1400	49	5	231	75.5		17.0	8.1	-20	11
SFC 057	-.005	-5			-200	11	4	53	3.1		8.6	4.6	-20	-10
SFC 058	-0.14	+300			-930	49	-19	2610	3870.0		-11.0	-7.2	-200	-27
SFC 059	0.007	-5			-200	12	7	100	19.0		19.0	5.4	-20	39
SFC 060	-.005	-5			-200	11	6	121	12.0		11.0	3.4	-20	-10
SFC 061	0.025	-5			-200	9	15	43	7.0		19.0	5.9	39	31
SFC 062	-.005	-5			3700	285	3	517	58.6		3.4	55.3	2180	140
SFC 063	-.016	10			350	54	37	1140	242.0		-1.2	6.6	540	430
SFC 064	-.005	-5			240	10	-2	14	2.4		0.6	59.5	-20	-10
SFC 065	-005	-5			-200	-2	5	33	5.8		5.3	3.6	-20	-10
SFC 066	-023	-5	326800		1900	-23	-4	3910	364.0		-1.8	26.0	290	700
SFC 067	-.005	-5		300	4800	66	5	517	66.2		1.2	16.0	540	55
SFC 068	-.005	33			1100	28	-2	293	46.3		2.0	31.0	51	44
SFC 069	0.017	-5			-200	-3	-2	1070	1.3		14.0	8.6	-20	140
SFC 070	0.081	-5			-200	-8	-4	2960	3.4		17.0	4.3	-52	890
SFC 071	-.069	170			11000	-27	-11	449	2180.0		11.0	3.6	-110	-10
SFC 072	0.15	120		48300	9100	-16	-12	445	2350.0		-5.5	-3.8	-110	-10
SFC 073	-.005	-5			-200	-2	3	6	8.7		16.0	4.4	-20	-10
SFC 074	0.088	-5	19900		-200	-5	-2	685	7.7		5.0	1.6	41	210
SFC 075	0.027	-5			-200	4	4	6	1.1		9.2	2.8	-20	-10

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFC 076	0.063	-24	292300		-720	-31	-13	471	2.8		6.1	28.0	290	17300
SFC 077	-.005	-5			-200	-2	21	17	0.7		28.0	3.5	-20	96
SFC 078	0.018	-5			-200	-2	8	371	3.2		19.0	4.3	-20	120
SFC 079	0.024	-5	22300		-200	-2	4	130	0.8		20.0	3.6	-20	91
SFC 080	-.005	-5			-200	-2	11	24	0.8		39.0	6.4	-20	36
SFC 081	1.0	-11	65600		480	-11	-6	+10000	42.9		3.0	-1.6	160	400
SFC 082	0.009	-5			-200	-2	7	163	1.3		12.0	6.5	-20	44
SFC 083	0.023	-5			-200	-2	5	718	0.8		9.1	4.0	29	110
SFC 084	1.92	-16			880	-10	12	+10000	23.4		-3.1	7.7	-110	1900
SFC 085	4.46	-26	74400		1200	-19	-16	+10000	45.5		-5.7	7.2	280	2000
SFC 086	0.35	7	341500		-200	20	6	3160	7.9		5.7	5.0	-20	200
SFC 087	0.046	-5			-200	-2	4	365	1.7		14.0	3.1	-20	37
SFC 088	-.013	-5			-200	-6	-2	2930	1.5		9.2	3.4	-47	1270
SFC 089	0.081	-5	16500		-200	-14	-6	3630	17.0		7.7	10.0	98	2900
SFC 090	0.028	-5			-200	-2	-2	536	2.5		3.6	7.3	29	210
SFC 091	0.009	-5	800		-200	-2	4	29	1.5		12.0	2.3	-20	15
SFC 092	2.45	71		22900	5900	38	9	591	804.0		-2.1	-1.5	-50	-10
SFC 093	1.63	1231		621000	4100	-34	-26	999	3830.0		-11.0	9.1	-190	-25
SFC 094	1.97	493		114300	48600	-68	-43	2090	7890.0		-21.0	16.0	-380	-48
SFC 095	0.502	230			1800	-19	-7	281	970.0		-2.2	6.1	-51	-10
SFC 096	0.39	90			16000	28	-6	1490	695.0		-2.0	3.1	-57	24
SFC 097	0.32	8			460	27	14	272	91.9		13.0	7.5	-20	15
SFC 098	0.044	-5	100		320	-2	7	54	22.2		8.1	2.8	-20	22
SFC 099	0.005	-5			-200	-2	25	13	9.0		12.0	4.5	-20	-10
SFC 100	-.005	-5			-200	-2	4	26	13.0		11.0	4.5	-20	-10
SFC 101	0.22	64	132500		1100	-2	-2	165	15.0		2.7	2.4	110	140
SFC 102	-.005	-5			-200	3	3	15	6.9		11.0	2.8	-20	-10
SFC 103	-.005	-5			-100	19	-2	512	32.8		3.6	2.0	32	-10
SFJ-001	8.75	36	2395	+10000	690	16	100	206	245.0	8.333	5.0	8.3	-20	14
SFJ-002	0.07	-37	2707	52	-1100	-18	-6	+10000	-5.3	-0.010	-7.5	4.6	-240	4550
SFJ-003	0.022	-5	48	7	-200	2	14	31	0.4	-0.010	0.6	0.8	-20	20
SFJ-004	4.06	6	1697	864	-200	55	97	51	27.0	1.107	-0.5	49.0	21	-10
SFJ-005	5.11	-5	80	23	-200	11	11	20	0.3	0.041	1.4	1.2	160	430
SFJ-006	0.46	-5	332	23	-200	35	16	86	4.8	0.599	12.0	3.0	-20	-10
SFJ-007	58.485	11	165	58	-200	18	95	59	6.1	0.521	-1.0	11.0	38	40
SFJ-008	51.217	6	105	61	-200	21	84	36	2.9	0.386	-0.5	6.6	39	100
SFJ-009	0.25	-5	+20000	15	-200	7	17	5	1.5	0.081	4.1	1.9	20	-10
SFJ-010	240.864	77	460	+10000	7400	-16	6	127	14.0	0.145	-4.1	-3.1	-46	-10

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFJ-011	5.31	30	356	+10000	970	3	17	67	20.7	0.603	17.0	22.0	-20	-10
SFJ-012	9.01	-5	469	90	-200	-2	5	15	0.7	0.021	1.4	6.2	30	40
SFJ-013	0.036	-5	10	36	-200	7	3	2	0.5	0.013	4.9	3.5	-20	-10
SFJ-014	2.09	-5	18	78	-200	2	-2	2	0.7	0.043	-0.5	-0.5	65	76
SFJ-015	7.09	-5	21	76	-200	4	-2	4	0.9	0.014	-0.5	-0.5	-20	-10
SFJ-016	9.03	358	2003	+10000	-200	130	2410	-1	-0.2	0.150	-1.3	6.6	76	28
SFJ-017	2.83	16	59	630	-200	32	180	5	3.8	0.159	1.4	20.0	46	24
SFJ-018	0.505	-5	13	19	-200	-2	17	4	5.3	0.025	10.0	1.5	26	-10
SFJ-019	26.294	30	867	913	-200	5	15	67	156.0	2.885	-1.0	0.7	35	-10
SFJ-020	47.995	-5	273	10	-200	29	1100	131	15.0	0.192	6.1	4.1	37	-10
SFJ-021	1.16	26	+20000	75	-200	245	3	3050	17.0	0.078	3.5	3.2	-20	710
SFJ-022	2.42	-5	+20000	59	490	73	-2	5960	8.5	0.051	3.8	2.7	150	2990
SFJ-023	0.49	16	+20000	30	-200	140	-2	678	5.9	0.061	4.3	2.3	50	35
SFJ-024	36.099	-5	3535	88	-200	66	12	50	3.3	0.054	-0.5	2.3	130	56
SFJ-025	1.65	-5	+20000	60	-200	204	4	18	1.7	-0.010	17.0	9.1	4410	330
SFJ-026	6.55	-5	621	98	-200	82	4	56	2.4	0.355	1.0	1.2	28	-10
SFJ-027	3.08	6	1261	30	-200	190	560	356	50.8	0.390	22.0	3.3	-20	63
SFJ-028	0.521	49	81	4949	-200	+30000	9	-3	0.3	0.016	11.0	-1.0	-42	53
SFJ-029	0.668	12	48	1242	-420	+30000	-5	-4	2.1	0.023	33.0	-1.2	-56	-10
SFJ-030	1.06	18	16	1659	-200	9350	3	1	0.3	0.020	1.3	-0.5	-20	-10
SFJ-031	29.277	12	37	599	-200	110	40	8	0.5	0.012	6.1	6.7	-20	16
SFJ-032	250.943	140	83	226	-200	160	8	12	0.9	0.031	-2.9	-3.4	42	-10
SFJ-033	1.45	33	19	531	-200	100	-2	2	0.7	0.011	-0.5	-0.5	-20	-10
SFJ-034	0.053	22	2879	585	280	389	5	-1	0.5	0.020	1.8	13.0	-20	12
SFJ-035	0.047	120	158	9787	-200	8120	-2	-1	-0.2	0.012	18.0	13.0	-20	-10
SFJ-036	0.077	250	92	+10000	-200	221	14	-1	0.5	0.012	-0.5	2.0	-20	-10
SFJ-037	0.1	448	591	+10000	-200	1370	-2	1	0.5	0.010	1.9	4.7	-20	-10
SFJ-038	0.067	25	584	324	360	15800	4	-1	-0.2	0.045	48.0	4.5	-20	13
SFJ-039	0.027	17	28	1918	-200	3590	-2	1	0.4	0.013	1.6	0.6	-20	-10
SFJ-040	3.53	643	1237	951	-200	42	-2	58	322.0	1.213	-0.5	-0.5	-20	-10
SFJ-041	6.61	477	235	563	-200	31	7	4	15.0	0.049	1.0	0.8	-20	-10
SFJ-042	3.89	2543	16	62	-200	-2	38	304	209.0	21.245	3.9	1.1	-20	-10
SFJ-043	0.33	6	110	8	-200	15	6	3	3.2	0.146	2.4	1.6	33	32
SFJ-044	-0.005	-5	5	6	-200	5	3	23	81.8	0.065	1.9	123.0	-20	-10
SFJ-045	5.89	27	4102	251	-200	432	3	119	19.0	1.517	-0.5	167.0	-20	12
SFJ-046	7.32	-24	+20000	95	-530	-18	-16	+10000	27.2	0.102	-5.1	-4.0	740	5490
SFJ-047	64.244	18	73	1172	-200	8	-2	89	0.3	-0.010	-0.5	1.2	-20	-10
SFJ-048	61.399	-22	26	8832	4400	-27	-16	+10000	34.4	0.113	15.0	-4.9	-150	-10

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFJ-049	7.87	-5	51	278	-200	-2	27	174	1.8	-0.010	9.3	2.1	-20	-10
SFJ-050	0.079	-5	179	7	-200	89	3	20	9.3	0.799	1.4	12.0	-20	-10
SFJ-051	0.025	-5	7	12	-200	-2	-2	31	2.0	0.047	3.9	2.5	82	35
SFJ-052	3.33	9	471	112	-200	25	3	28	78.7	1.143	1.1	1.6	26	23
SFJ-053	39.87	7	1949	47	-200	-2	3	7	15.0	0.320	-0.5	-0.5	-20	-10
SFJ-054	22.832	6	208	92	-200	9	3	35	44.2	0.366	0.9	1.9	-20	26
SFJ-055	9.73	-5	12	20	-200	89	4	26	3.5	-0.010	0.9	1.1	24	25
SFJ-056	7.22	-5	133	38	-200	2	4	4	1.1	-0.010	1.0	0.7	-20	13
SFJ-057	19.198	-5	184	42	-200	7	-2	12	1.5	-0.010	-0.5	1.1	-20	17
SFJ-058	0.068	9	+20000	26	-200	2	-2	3	1.3	0.375	-0.5	2.3	46	28
SFJ-059	2.84	51	62	12	-200	7	-2	4720	361.0	3.658	8.9	2.0	33	-10
SFJ-060	4.88	21	345	2841	-200	21	11	8	3.2	0.049	8.3	1.9	-20	-10
SFJ-061	-0.005	-5	58	12	-200	3	3	5	3.8	0.172	2.1	0.9	-20	-10
SFJ-062	0.15	9	32	442	-200	-2	10	24	70.5	0.224	3.4	4.1	-20	-10
SFJ-063	1.05	18	1488	29	620	16	11	258	686.0	18.272	-1.2	7.3	130	33
SFJ-064	35.55	7	3306	68	-200	23	10	3	6.2	1.628	-0.5	2.0	-20	-10
SFJ-065	9.668	-5	38	72	-200	8	6	20	2.7	0.256	2.6	4.4	-20	-10
SFJ-066	17.655	-5	362	13	-200	41	3	13	13.0	0.315	0.6	22.0	170	630
SFJ-067	0.997	-5	191	55	-200	7	2	10	11.0	0.077	1.7	2.4	26	11
SFJ-068	0.1	-5	+20000	490	-200	3	-2	17	5.4	0.104	-0.5	0.9	-20	150
SFJ-069	0.015	-5	42	5	-200	-2	-2	3	1.6	0.045	4.8	1.6	-20	-10
SFJ-070	2.87	29	2862	15	-200	160	31	62	5.0	0.565	0.9	214.0	-20	19
SFJ-071	8.58	-5	100	73	-200	-2	25	2	1.9	0.098	11.0	7.7	-20	37
SFJ-072	5.39	-5	1439	12	-200	5	4	-1	0.5	0.133	-0.5	20.0	52	81
SFJ-073	-0.005	-5	10	-2	-200	5	-2	-1	-0.2	-0.010	-0.5	0.6	-20	-10
SFJ-074	0.816	12	10	212	-200	10	4	3	1.0	0.129	-0.5	-0.5	-20	13
SFJ-075	0.024	-5	32	12	-200	260	-2	7	0.7	0.034	0.6	0.9	-20	-10
SFJ-076	0.007	-5	57	124	-200	4360	4	3	0.5	0.029	4.5	7.5	-20	-10
SFJ-077	0.01	-5	5	3	-200	10	-2	2	0.6	-0.010	-0.5	-0.5	-20	-10
SFJ-078	0.529	-5	41	1048	230	4	16	51	0.5	0.076	19.0	7.9	-20	-10
SFJ-079	-0.005	12	29	2929	-200	201	2	2	0.3	-0.010	2.4	8.6	-20	-10
SFJ-080	0.859	12	11	236	-200	4	9	2	0.2	0.046	-0.5	2.1	-20	-10
SFJ-081	33.768	21	42	162	-200	19	20	9	0.4	0.101	-0.5	1.1	29	170
SFJ-082	131.368	18	25	103	-200	16	10	25	1.1	0.086	-1.0	5.3	-20	11
SFJ-083	77.614	30	44	214	-200	298	22	12	17.0	3.662	5.5	5.3	-20	-10
SFJ-084	-0.018	-5	3	-2	-200	-9	-4	-3	-0.2	0.033	-1.9	-1.8	-20	-10
SFJ-085	0.096	-5	1	9	-200	-2	-2	2	1.6	0.038	2.4	2.3	-20	-10
SFJ-086	0.514	5	79	43	-200	52	67	10	4.1	1.467	10.0	22.0	33	53

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFJ-087	0.43	-5	13	14	-200	27	317	15	5.7	2.149	1.1	15.0	23	18
SFJ-088	1.25	-5	19	6	-200	3	7	-1	0.3	0.117	38.0	4.1	-20	-10
SFJ-089	0.032	28	+20000	68	280	-2	5	2	1.0	0.141	42.0	7.2	-20	53
SFJ-090	1.02	434	2070	+10000	-200	12	21	265	887.0	8.111	3.4	2.5	-20	-10
SFJ-091	0.041	-5	48	90	-200	-2	6	2	1.6	0.057	38.0	5.0	-20	-10
SFJ-092	0.11	434	+20000	5020	1800	4540	30	18	0.3	0.257	12.0	10.0	-20	75
SFJ-093	0.039	170	806	+10000	-200	20	5	19	44.9	0.161	1.0	-0.5	-20	-10
SFJ-094	129.071	29	31	3238	1000	-5	7	119	2.2	0.107	-0.5	-1.3	-20	-10
SFJ-095	10.902	-5	173	158	-200	13	4	533	0.2	0.170	5.5	2.7	-20	-10
SFJ-096	46.623	15	18	+10000	-200	-2	43	7	12.0	0.057	18.0	8.8	-20	-10
SFJ-097	0.098	-5	8	50	-200	-2	-2	1	0.5	-0.010	28.0	4.3	-20	-10
SFJ-098	2.37	30	+20000	54	-200	25	-2	336	28.3	0.503	2.1	120.0	-20	82
SFJ-099	1.02	61	+20000	78	-200	508	-2	1270	267.0	5.168	-0.5	33.0	57	580
SFJ-100	4.49	110	+20000	43	210	3	-2	477	21.3	0.338	0.8	6.6	25	270
SFJ-101	0.24	-5	712	19	-200	8	-2	128	10.0	0.145	10.0	4.1	-20	12
SFJ-102	0.082	-5	760	10	-200	-2	16	40	4.3	0.076	15.0	4.2	66	12
SFJ-103	0.956	5	676	19	-200	2	34	455	88.2	1.198	9.1	2.6	23	-10
SFJ-104	0.22	6	403	27	-200	47	9	288	38.3	0.241	0.8	0.6	22	-10
SFJ-105	0.28	-5	451	14	-200	412	15	9	2.8	0.134	5.0	4.7	38	340
SFJ-106	0.27	8	6722	15	-200	90	-2	5	2.5	0.054	8.8	3.1	-20	16
SFJ-107	0.06	-5	1809	19	-200	7	11	3	2.7	0.041	14.0	6.0	45	23
SFJ-108	109.702	44	27	+10000	-200	-6	-2	609	1.2	0.138	-0.5	-1.4	-20	38
SFJ-109	0.092	-5	138	20	-200	-2	-2	-1	-0.2	0.023	14.0	2.7	-20	-10
SFM-001	0.04	-5			-200	2	4	8	1.1		4.6	1.9	-20	-10
SFM-002	0.038	-5			-200	-2	10	3	1.0		20.0	6.0	-20	-10
SFM-003	1.46	-5			-200	2	37	10	1.9		0.7	6.3	-20	14
SFM-004	0.49	-5			-200	-10	19	4	4.5		1840.0	65.6	-45	-10
SFM-005	0.36	-5			-200	5	99	4	5.0		4.6	29.0	-20	-10
SFM-006	10.0	-5			-200	5	240	-1	4.0		22.0	79.2	-20	30
SFM-007	1.21	-5	19	48	-200	22	23	3	4.1		2.0	4.7	-20	11
SFM-008	1.34	+300	600	6400	-200	-6	9	132	475.0		4.1	6.5	-20	-10
SFM-009	1.58	-5			-200	4	3	6	3.2		1.8	8.0	-20	-10
SFM-010	1.71	-5	12	7	-200	6	-2	42	13.0		1.1	7.5	35	26
SFM-011	0.025	-5	1500		-200	-2	3	32	15.0		5.7	3.0	-20	32
SFM-012	0.34	5	58700		-200	27	4	114	36.1		4.1	5.7	-20	58
SFM-013	10.0	9			-200	-2	13	15	1.2		0.9	28.0	86	23
SFM-014	0.031	-5			-200	-2	4	3	0.9		13.0	3.5	41	-10
SFM-015	0.097	-5			-200	-2	27	7	2.1		4.3	5.6	84	13

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co
SFM-016	0.34	-5			-200	-2	24	10	1.3		3.6	12.0	-20	21
SFM-017	49.71	-5			-200	-4	19	11	3.8		-0.5	9.0	150	91
SFM-018	6.02	-5			-200	-2	19	5	0.6		1.6	1.2	-20	-10
SFM-019	0.05	-5	89	303	-200	5	3	6	9.3		2.1	7.5	32	-10
SFM-020	1.23	-5	127	2360	1400	-7	14	5	1.0		380.0	16.0	530	49
SFM-021	0.934	8	57	4166	600	15	-6	3	0.5		503.0	12.0	460	35
SFM-022	0.3	9			-200	-4	-4	5	2.2		255.0	11.0	120	17
SFM-023	0.22	-5			-430	20	-8	-3	0.9		444.0	7.1	200	32
SFM-024	0.35	-15			-760	-14	22	-5	2.7		1240.0	86.1	-100	23
SFM-025	1.09	-5	4	3	-200	-2	6	3	0.2		3.9	1.5	56	110
SFM-026	0.009	-5			-200	-2	7	1	0.4		4.6	1.6	-20	-10
SFM-027	0.007	-5			-200	-2	19	-1	0.2		21.0	4.1	-20	-10
SFM-028	1.57	-5			-200	-2	14	1	0.3		11.0	1.2	-20	-10
SFM-029	0.008	-5	8	-2	-200	-2	2	3	0.3		0.9	2.9	-20	-10
SFM-030	0.006	-5			-200	3	21	11	1.6		3.2	33.0	48	13
SFM-031	0.36	-5	453	+10000	-200	6	61	14	28.1		1.2	95.9	23	-10
SFM-032	1.22	100	2007	4763	-200	-9	59	252	707.0		8.7	46.0	-46	-10
SFM-033	0.007	-5			-200	13	63	20	7.3		4.4	118.0	-20	19
SFM-034	0.12	-5			-200	-2	78	5	7.5		11.0	25.0	-20	32
SFM-035	0.011	-5	148	820	-200	5	64	5	8.0		3.2	38.0	-20	15
SFM-036	-0.005	-5	26	59	-200	-2	26	4	1.4		22.0	5.7	43	21
SFM-037	0.38	52	+20000	15	-200	6	-2	11	1.4		0.6	13.0	51	91
SFM-37A	0.11	7	+20000	26	-200	11	-2	13	3.7		6.8	34.0	-20	15
SFM-038	-0.005	-5	158	8	-200	-2	-2	1	0.8		1.4	3.8	-20	-10
SFM-039	1.46	-5			-200	-2	76	4	1.1		14.0	4.8	-20	23
SFM-040	0.092	-5			-200	-2	10	-1	0.4		20.0	2.5	-20	-10
SFM-041	0.38	-5			-200	15	10	22	5.0		0.8	85.8	-20	89
SFM-042	-0.005	-5			-200	5	8	8	4.0		22.0	48.0	52	15
SFM-043	-0.005	-5			-200	-2	5	2	0.4		1.8	3.0	-20	-10
SFM-044	0.17	-24			-1200	-35	-26	13	21.1		1660.0	38.0	-170	-20
SFM-045	1.28	-5			-200	44	180	105	11.0		8.1	44.0	59	170
SFM-046	0.059	14			-670	-22	32	17	13.0		1740.0	52.4	-88	16
SFM-047	-0.025	-17			-580	-46	130	10	8.0		88.2	1550.0	-120	-10
SFM-048	0.4	-5			-200	47	31	4	1.6		16.0	39.0	-20	18
SFM-049	0.659	-5			-200	43	37	5	1.6		17.0	42.0	-20	24
SFM-050	-0.005	-5			250	-2	3	-1	-0.2		8.4	4.0	-20	28
SFM-051	-0.005	-5			-200	-2	-2	2	0.5		12.0	2.3	-20	-10
SFM-052	-0.005	-5	200		-200	10	11	225	1.5		6.7	6.1	-20	580

Appendix A-2 Analytical data, in ppm,for samples from the Salmon National Forest, Idaho

	Au	Ag	Cu	Pb	Zn	Mo	W	As	Sb	Hg	Th	U	Ni	Co	
SFM-053	-0.005	-5	25	22	-200	-2	3	45	12.0	0.071	14.0	4.6	24	-10	
SFM-054	0.013	-5			-200	4	16	186	2.1		3.3	5.7	-20	520	
SFM-055	-0.005	-5			-200	3	-2	12	3.8		13.0	4.6	-20	17	
SFM-056	-0.005	-5			-200	-2	120	5	1.3		1.3	2.8	-20	80	
SFM-057	-0.005	-5			-200	-2	51	4	2.2		3.9	5.3	-20	180	
SFM-058	-0.005	-5			-200	-2	-2	4	0.5		22.0	4.4	-20	-10	
SFM-059	-0.005	-5			-200	3	3	7	0.8		13.0	8.0	-20	-10	
SFM-060	-0.005	-5			-200	-2	3	16	5.8		6.8	9.4	-20	16	
SFM-061	0.11	8	43700		-200	-2	-2	4	2.3		4.2	7.8	-20	150	
SFM-062	0.1	-5			-200	-2	3	7	14.0		7.0	1.1	-20	-10	
SFM-063	0.057	22			390	22	52	84	289.0		10.0	20.0	-20	29	

MINERAL RESOURCE APPRAISAL OF
THE SALMON NATIONAL FOREST, IDAHO

APPENDIX B

SUMMARY DESCRIPTIONS OF MINES AND PROSPECTS IN THE SALMON NATIONAL FOREST, IDAHO

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
1	KOPR KYUTE MINE	45 39 48 N	113 56 15 W	In calc-silicate hornfels is an iron-stained, silicified zone containing quartz, epidote, biotite, fiberous amphiboles, chlorite, and sulfide minerals—mainly pyrite, chalcopyrite, and pyrrhotite. Bands of magnetite and tourmaline occur near the footwall. The zone is at least 1,800 feet long (Mayerle and Close, 1993, p. 68).	In a 500 by 300 foot area are two dozer benches, two caved adits, an old cabin, and connecting dozer roads (Mayerle and Close, 1993, p. 68).	During a USBM examination, four samples were taken (Mayerle and Close, 1993, p. 70). They contained as much as 0.025 ounce gold per ton and 0.73 ounce silver per ton. Samples taken by a mining company also contained as much as 1.4 percent percent copper.
2	ERICKSON PROSPECT	45 39 43 N	113 55 45 W	Interbedded calc-silicate hornfels and gneissic or schistose quartzite are transected by a system of N 53 E striking, and 82 NW dipping fractures. Some fractures are filled by quartz veins as thick as 15 centimeters; others exhibit silicification, chloritic alteration, and iron oxide and copper staining (Mayerle and Close, 1993).	Workings include a cut, two prospect pits, and two soil sample holes.	Three samples were taken by USBM personnel in 1992; one chip and two grabs. They assayed as much as 0.055 ounce gold per ton and 0.62 percent copper (Mayerle and Close, 1993).
3	CHIEF JOSEPH	45 39 27 N	113 55 38 W	A fissure vein, as thick as 0.7 meter, strikes N 80 E, and dips 80 NW in banded qneiss. The vein is mainly quartz with pyrite and malachite (Mayerle and Close,1993).	Two prospect pits (Mayerle and Close, 1993).	Two samples were taken by USBM personnel in 1992. A chip sample across the vein assayed 2.8 ppm silver and 0.66 percent copper. A grab sample of quartz from a dump had 0.025 ppm gold, 13 ppm silver, and 0.37 percent copper (Mayerle and Close, 1993).
4	TALEY PROSPECT	45 39 21 N	113 54 48 W	A porphyry-type copper occurrence is in highly-fractured quartzite of the Yellowjacket Formation. The Yellowjacket is intruded by dikes of latite/quartz latite and rhyolite and is in contact with granitic rocks. The quartzite and igneous rocks are transected by veins up to a meter thick that contain quartz, malachite, and hematite pseudomorphs after	Workings in a 300-meter-diameter area include a prospect pit and seven dozer trenches; probably excavated in the 1960's or 70's (Mayerle and Close, 1993).	Seventeen samples were taken by USBM personnel in 1993; two approached ore grade. A vein chip sample assayed 0.79 percent copper, 12 ppm silver, and 0.075 ppm gold. A select sample of vein material from a dump had 0.072 ppm gold, 3.6 ppm silver, and 0.65 percent copper (Mayerle and Close, 1993).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				pyrite (Mayerle and Close, 1993).		
5	PROSPECT (AM2)	45 39 09 N	113 54 35 W	No mineralized structure is composed; country rock is chloritic, argillaceous quartzite (Mayerle and Close, 1993, p. 76).	A 30-foot-long dozer trench trends N 45 E (Mayerle and Close, 1993).	A grab sample taken by USBM personnel contained no significant metal content (Mayerle and Close, 1993, p. 76).
6	DOZER TRACK OCCURRENCE	45 39 00 N	113 54 14 W	Quartz veinlets transect quartzite (Mayerle and Close, 1993, p. 78).	There is a 30-foot-long dozer cut (Mayerle and Close, 1993).	Two grap samples taken by USBM personnel had no significant metal content (Mayerle and Close, 1993, p. 78).
7	PROSPECT (AM6)	45 38 42 N	113 53 55 W	No mineralized structure is exposed. On the dump of the shaft is vein quartz, quartzite, diorite, and granite (Mayerle and Close, 1993, p. 79).	A small caved shaft and the ruins of a cabin were found (Mayerle and Close, 1993, p. 79).	A sample taken during a USBM examination contained no significant metal content (Mayerle and Close, 1993, p. 79).
8	PROSPECT (AM7)	45 38 37 N	113 53 52 W	A 2-foot-thick quartz vein is exposed in metasedmentary rocks. The vein strikes N 55 E and dips 40 SE. Intrusive rocks are nearby (Mayerle and Close, 1993, p. 80).	No workings were found (Mayerle and Close, 1993).	A sample taken during a USBM examination contained no significant metal content (Mayerle and Close, 1993, p. 80).
9	PROSPECT (AM1)	45 39 11 N	113 55 05 W	No mineralized structure is exposed. The presence of malachite-stained quartz on the dump of a pit suggests that a quartz vein was the exploration target. Gneissic metasedimentary rocks underlie the area (Mayerle and Close, 1993, p. 75).	There is one prospect pit (Mayerle and Close, 1993).	A sample of quartz was taken from the dump by USBM personnel in 1993 (Mayerle and Close, 1993, p. 75). It assayed 0.23 percent copper, 0.012 ppm gold, and 3.1 ppm silver (Mayerle and Close, 1993).
10	PROSPECT (AM5)	45 39 06 N	113 55 01 W	Interbedded calc-silicate hornfels and quartzite are transected by quartz veins. An upper vein strikes N 20 to 25 W, dips 35 NE, is as thick as 0.6 feet, and at least 300 feet long. This vein contains hematite pseudomorphs after pyrite and iron stain. A lower vein strikes N 26 E, dips 80 SE, is about 2 feet thick, and at least 80 feet long. It is vuggy and contains malachite and limonite (Mayerle and Close, 1993, p. 77).	There are two prospect pits and a trench (Mayerle and Close, 1993).	Two samples were taken by USBM personnel during 1992. A chip sample across the upper vein had no significant metal content. A chip sample across the lower vein had 0.145 ppm gold and 0.19 percent copper (Mayerle and Close, 1993, p. 77).

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
11	FMI CLAIM GROUP	45 38 34 N	113 54 51 W	A porphry/stockwork copper deposit, 2,200 feet long and 1,300 feet wide, lies adjacent to a northeast-trending fault zone associated with the Trans-Challis fault system. The deposit is hosted by interbedded calc-silicate hornfels, quartzite, shale, and siliceous sediments of the Yellowjacket Formation. Nearby are granitic rocks. The metased-imentary rocks contain sericite, chlorite, and quartz veins as thick as 7 feet. The veins contain malachite and pseudomorphs after pyrite (Mayerle and Close, 1993, p. 79).	In an area 1,600 feet by 1,400 feet are 19 large dozer cuts and trenches, a caved adit, a 240-foot-long adit, a collapsed cabin, and connecting dozer roads and trails (Mayerle and Close, 1993, p. 79).	Twenty-two samples were taken during a USBM examination (Mayerle and Close, 1993, p. 79). They contained as much as 6.6 percent copper, 0.018 ounce gold per ton, and 1.825 ppm mercury.
12	PROSPECT (AM3)	45 39 21 N	113 56 51 W	A system of N 80 E to N 80 W striking, 80 N dipping veins in quartzite is exposed at the prospect. The veins are as thick as 36 centimeters (Mayerle and Close, 1993, p. 76).	There are two trenches and four prospect pits (Mayerle and Close, 1993).	Six samples taken by USBM personnel contained no significant metal content (Mayerle and Close, 1993, p. 76).
13	PROSPECT (AM4)	45 38 53 N	113 56 23 W	An 8-inch-thick quartz vein follows bedding in calcareous metasedimentary rock that strikes N 30 E and dips 30 NW. The vuggy, glassy, white to light-gray quartz contains limonite along fractures (Mayerle and Close, 1993, p. 76).	There is a prospect pit (Mayerle and Close, 1993).	A chip sample taken across the vein by USBM personnel contained no significant metal content (Mayerle and Close, 1993, p. 76).
14	STARCHY CLAIM GROUP	45 38 37 N	113 55 47 W	No mineralized structure is exposed. Dump material is mainly iron-stained quartzite and calc-silicate rock (Mayerle and Close, 1993, p. 77).	There is a single prospect pit (Mayerle and Close, 1993).	A sample grabbed from the dump by USBM personnel assayed 50 ppm lead and 0.245 ppm mercury (Mayerle and Close, 1993, p. 77).
15	C & F PROSPECT	45 38 31 N	113 56 22 W	Quartzite is fractured, brecciated, and kaolinized at the intersection of east-trending and north-trending faults. The quartzite strikes east, dips 30 S, and is gougy, silicified, heavily iron oxide stained, and	Workings consist of a 35-foot-long adit, a 100-foot-long adit with a stope to the surface, a trench, and a prospect pit (Mayerle and Close, 1993, p. 78).	Six grab samples of dump material taken by USBM personnel had no significant metal content (Mayerle and Close, 1993, p. 78).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				contains bands of magnetite-bearing quartz along bedding. Transecting the bedding are white, shattered quartz veins, as thick as 33 centimeters, that trend north (Mayerle and Close, 1993, p. 78).		
16	PIERCE CREEK PLACER MINES	45 38 12 N	113 56 47 W	The bench gravel along the creek consists mainly of semi-rounded metasedimentary and granitic rock. It rests on metasedimentary rock with bedding-fractures that are perpendicular to the stream flow (Mayerle and Close, 1993, p. 86).	The principal gold-bearing placer along Pierce Creek consists of a bench extending along the south side of the creek above the confluence of the creek with the North Fork Salmon River. Most of the deposit is covered by patented mining claims. The bench, about 50 feet above creek level, is about 400 feet wide and 2,600 feet long. Prior to 1939, two small pits had been excavated by ground sluicing (Lorain and Metzger, 1939, p. 40). Numerous ditches, small pits, and trenches were found during a USBM visit (Mayerle and Close, 1993, p. 85).	Five samples taken during a USBM examination contained no gold (Mayerle and Close, 1993, p. 86). Resource estimates have not been made. Additional mapping and sampling are needed.
17	HORSE CREEK HOT SPRING	45 30 11 N	114 28 47 W	Thermal water, at a temperature of 43 degrees centigrade, flows from fractures in granitic rock at a rate of 10 gallons per minute (Waring, 1965, p. 27).	The spring is used by bathers. It has been rustically developed and a campground is nearby.	No data available.
18	MCCONN CREEK	45 31 25 N	114 11 11 W	Two fracture-filling and replacement iron bodies are localized as large zones of magnetite-rich breccia in quartzite of the Belt Supergroup (Bergendahl, 1964, p. 107; Lowe, 1988). The north zone covers an area of 500 feet by 400 feet; the south zone an area of 175 feet by 100 feet.	Some surface exploration has been done at the deposit, located just south of the Montana-Idaho border and north of McConn Creek. Numerous bulldozer cuts are present.	The two zones contain millions of tons grading about 40 percent iron (Young, 1961). During 1995, USBM personnel took one select sample (SFJ 105) of massive magnetite with some silica. It assayed 0.3 ppm gold, 0.04 percent molybdenum, 0.03 percent cobalt, and more than 10 percent iron.
19	HENDERSON MINE	45 30 13 N	114 09 31 W	Three beds of siderite ranging from 14 inches to 36 inches thick	One open adit, one caved adit, and thousands of feet of bulldozer	One select sample (SFJ 068) of siderite containing numerous

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				were found occuring in quartzite. The strike and dip of the beds and quartzite ranged from N 10 W to N 10 E and from vertical to 60 W. The siderite beds were honeycombed with quartz veinlets, generally less than 0.25 inch thick. Chalcopyrite was locally abundant in the siderite zones. It was usually associated with the quartz, but chalcopyrite veins were noted. Bedded magnetite with quartz occured in several areas. Silica-rich talc was noted in one bulldozer cut.	cuts exposed the siderite beds.	quartz veins and abundant chalcopyrite was taken from a bulldozer cut. It assayed 0.1 ppm gold, 490 ppm lead, 150 ppm cobalt, and more than 2 percent copper. The amount of development work done on the property, combined with the presence of high-grade copper mineralization suggests that there has been production. Resources may be significant.
20	KELBAR BARITE	45 37 29 N	114 02 50 W	A barite vein strikes N 30 W, dips 65 NE, and is over 20 feet thick. The country rock is quartzite which strikes N 60 W and dips 25 SW. The vein crops out in very steep topography.	No workings were found.	One sample (SFJ 084) of the barite was taken by USBM personnel during 1995. The sample was submitted for whole rock analysis but, unfortunately the results were never received.
21	DEVORE MINE	45 34 57 N	114 02 58 W	A quartz vein strikes N 45 W and dips 60 NE in quartz-muscovite schist at the Devore mine. The vein averages 1.5 feet wide and contains bornite, chalcopyrite, malachite, gold, and native silver (Trites and Tooker, 1953, p. 170).	Workings consist of a 48-foot-long inclined shaft, a 400-foot-long tunnel accessible for 250 feet, and several pits and trenches (Trites and Tooker, 1953, p. 170).	No data available. During 1995, USBM personnel looked, but were unable to locate the Devore.
22	UNNAMED	45 32 51 N	114 01 21 W	A shear zone containing quartz veins and lenses is poorly exposed in altered quartzite. The veins are malachite, hematite, limonite, and manganese stained and contain traces of chalcopyrite and pyrite.	A partially caved shaft, a caved adit, and several bulldozer trenches were found.	One select sample (SFJ 070) of malachite-, hematite-, limonite-, and manganese-stained quartz from the dump of the shaft was taken in 1995 by USBM personnel. It assayed 2.87 ppm gold, 29 ppm silver, 0.29 percent copper, and 160 ppm molybdenum.
23	GARM-LAMOREAUX MINE	45 32 15 N	114 01 26 W	Country rock at the Garm-Lamoreaux is fine-grained quartzite interbedded with phyllite and argillite (Vhay, 1951, p. 10).	Armstrong and Weis (1955), Weis and others (1958, p. 11) and Anderson (1958b, p. 10) reported the workings at this old gold	Selected samples of lead ore, taken from a dump by Vhay (1951, p. 16), contained 0.11 percent uranium. Additional

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				A fracture zone striking N 80 W contains quartz, chlorite, pyrite, hemitite, galena, gold, autunite, and torbernite (Trites and Tooker, 1953, p. 167; Vhay, 1950, p. 16).	prospect to consist of one open and four caved adits aggregating 2,900 feet in length. The adits are distributed over a vertical distance of 430 feet.	samples from the dump, containing uranitite and zippeite, contained as much as 1 percent uranium (Weis and others, 1958, p. 12). One select sample (SFJ 071) of partially silicified quartzite containing pyrite-bearing quartz veinlets was taken by USBM personnel during 1995. It assayed 8.58 ppm gold, 100 ppm copper, 7.5 ppm uranium, and 73 ppm lead.
24	HUMBUG CREEK PROSPECT	45 31 50 N	114 00 25 W	Exposures are poor and the workings are badly caved. Probably a quartz vein in a shear zone was being mined. The quartzite country rock contains crosscutting quartz veinlets, probably associated with the shear zone. The workings are aligned in an east-west direction, suggesting an east-west strike for the shear zone.	Three caved adits and bulldozer cuts were found.	One select sample (SFJ 069) of quartzite containing crosscutting quartz veinlets was taken by USBM personnel during 1995. It assayed 0.015 ppm gold.
25	ALLAN BROS. PLACER	45 31 16 N	114 02 14 W	According to Lorain and Metzger (1939, p. 31-32), the bench gravel deposit is 300 to 600 feet wide and extends up Hughes Creek for about 6,000 feet. The gravel is relatively free from large boulders and the gold is coarse enough to be saved easily.	Two hydraulic pits have been worked at the lower end of the bench. The southern most pit was worked intermittently for about 18 seasons between 1885 and 1912 (Lorain and Metzger, 1939, p. 31).	Nuggets weighing as much as 1 ounce have been found. The gold is 936 fine (Lorain and Metzger, 1939, p. 32).
26	WATSON MINE	45 31 08 N	114 01 11 W	Quartz veins and lenses occur in high angle faults in closely jointed and highly contorted green to gray phyllite and black slate of the Belt series. Ore minerals include bornite, chalcopyrite, gold, and malachite (Trites and Tooker, 1953, p.171).	Two adits reported to be approximately 200 and 350 feet long are now caved (Trites and Tooker, 1953, p.171). The Watson is located north of Hughes Creek between Allan and Humbug Creeks.	One select sample (SFJ 072) of quartz containing abundant limonite and traces of malachite was taken by USBM personnel during 1995. The sample assayed 5.4 ppm gold and 0.14 percent copper.
27	HUGHES CREEK	45 30 37 N	114 00 15 W	The gravel deposits at the mouth of Hughes Creek are 200 feet wide and	Lorain and Metzger (1939, p. 31) reported that large bench deposits	Lorain and Metzger (1939, p. 31) reported that a drill-hole

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	PLACER MINES			14 feet deep (Lorain and Metzger, 1939, p. 31). Bedrock is metasedimentary rock. The stream gravels extend at least 5 miles upstream from the North Fork Salmon River.	along the creek had been hydraulicked on a moderately large scale with reportedly excellent returns. Above Allan Creek, two hydraulic pits were worked between 1885 and 1912. Lorain and Metzger (1939, p. 32) reported production of 695 ounces of gold between 1901 and 1932. In 1938, additional mining was done.	sample, taken near the mouth of Hughes Creek, indicated $0.27 in gold per cubic yard -- at a gold price of about $35 per ounce.
28	VINE CREEK PLACER	45 36 50 N	113 58 15 W	Vine Creek, a tributary of North Fork Salmon River, has a gradient of 480 feet per mile. The gravel deposits along it are 100 to 200 feet wide and 10 to 15 feet deep (Lorain and Metzger, 1939, p. 27).	Lorain and Metzger (1939, p. 28) reported old hand workings for 450 feet along upper Vine Creek. The work yielded good results. In 1938, a cut was dug to bedrock near the old workings.	No data available.
29	GOLDFIELD MINE	45 30 26 N	113 55 45 W	No data available.	Peters (1978, p. 86) reported that "The Goldfield mine was developed around 1912. Gold ore was transported by aerial tramway to a small mill at the mouth of Stein Gulch. Based on the extent of the mine workings, production, if any, was very small".	No data available.
30	RED FOX PLACER	45 36 05 N	113 57 50 W	The bottom of the North Fork Salmon River is from 75 to 150 feet wide and the gravel 6 to 8 feet deep between Quartz Creek and Twin Forks Creek. About 5 percent of the deposit consists of boulders over 1 foot in diameter. Gold is mostly on bedrock and ranges is size from very small particles to pieces as large as a pinhead (Lorain and Metzger, 1939, p. 26).	Lorain and Metzger (1939, p. 26) reported that a small ground-sluicing operation was being conducted in 1938. There is no record of production.	In places, the gravel runs as high as 15 to 20 large colors per pan (Lorain and Metzger, 1939, p. 26).
31	QUARTZ CREEK PROSPECT	45 35 14 N	113 58 37 W	Breccia veins cemented with limonite-rich silica and quartz veinlets occur in quartzite.	Several bulldozer pits and trenches were found.	One select sample (SFJ 051) of the breccia veins and quartz veinlets was taken by USBM personnel during 1995. It

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						assayed 0.03 ppm gold.
32	HAMMEREAN CREEK PLACER	45 34 34 N	113 59 00 W	The gravel consists of slightly angular to well-rounded material ranging in size from coarse sand to boulders up to 3.5 feet in diameter. The deposits are 75 to 150 feet wide (Lorain and Metzger, 1939, p. 27).	Lorain and Metzger (1939, p. 27) reported that in 1938 a little work was done -- a trench and several test pits 6 to 8 feet deep were excavated. Bedrock was not encountered.	Lorain and Metzger (1939, p. 27) reported that panning indicated a very low grade.
33	JOHNSON GULCH PROSPECT	45 33 56 N	113 59 02 W	Breccia veins cemented with limonite-rich silica and quartz veinlets, each containing traces of malachite, were found in open cuts in quartzite.	Several large bulldozer cuts, a cabin, and the remains of an old mill were found during 1995.	One select sample (SFJ 050) of limonite-rich, silica-cemented breccia and quartz stringers was taken by USBM personnel during 1995. The sample assayed 0.08 ppm gold and 179 ppm copper.
34	DOT GROUP	45 33 41 N	113 58 32 W	Uranium-bearing minerals are in a 40-feet-thick section of quartz latite resting on phyllite and quartzite. The volcanic rock has fractures coated by autunite, torbernite, and uranophane to a depth of 14 feet (Anderson, 1958b, p. 16).	The prospect was located in 1955; a large dozer cut was excavated and shallow drilling done in 1957 (Anderson, 1958b, p. 16).	Four chip samples taken in 1956 by a DMEA team assayed from 0.034 to 0.103 percent U3O8 (DMEA report, 1956, Docket No. DMEA-4202).
35	SURPRISE	45 33 23 N	113 57 58 W	In micaceous quartzite, striking N 48 W and dipping 38 SW, is a shear zone and vein as thick as 40 feet and at least 1,200 feet long (Weis and others, 1958, p. 12). The zone strikes N 45 to 60 W, dips 65 to 80 NE, and contains irregular bunches of hematite and fractured quartz with torbernite, autunite, and chalcopyrite (Weis and others, 1958, p. 12; and Anderson, 1958b, p. 12). During 1995, USBM personnel visited the property and examined a small piece of drill core. It appeared to be rhyolitic tuff containing angular fragments of other volcanic rocks.	Weis and others (1958, p. 12) and Anderson (1958b, p. 12) reported that torbernite-bearing quartz float was discovered in the early 1950's. Following the discovery, dozer trenching and underground excavation were done. A 336-foot-deep hole was drilled in 1958. Under DMEA contract Idm-E716, 1,080 feet of drifts and crosscuts, bulldozing, and a 20-by-24-foot compressor and tool house were completed (DMEA report, 1956, Docket No. DMEA-3460).	Cook (1957, p. 1) reported a resource of 100,000 tons grading 0.1 percent U3O8. One select sample (SFJ 044) of quartz containing traces of autunite was taken by USBM personnel during 1995. It assayed 123 ppm uranium.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
36	MOON	45 33 15 N	113 57 19 W	Trites and Tooker (1953, p. 168) reported that uranium-bearing Crystals are in fractures cutting a N 70 W striking, gold-bearing quartz vein in quartzite and mica schist. The vein is along a fracture zone, 50 feet thick, striking N 68 W, and dipping 70 SW. The vein contains pyrite casts, malachite, autunite, torbernite, and uranophane and is continuous for the full length of the adit (Anderson, 1958b, p. 12).	Anderson (1958b, p.11) reported that the prospect was discovered andlocated by Percy Anderson in 1924. At the time of Anderson's visit in 1957, the workings consisted of two open cuts, a 450-foot-long adit with a 60 foot deep winze and 287 feet of crosscuts. The adit was open in 1995.	Select samples taken by Trites and Tooker (1953, p. 168) had 0.14 to 0.45 percent uranium. They reported that additional uranium deposits might be discovered by further exploration. USBM personnel took one select sample (SFJ 045) of malachite- and limonite-stained quartz from the dump during 1995. It assayed 5.89 ppm gold, 27 ppm silver, 0.4 percent copper and 167 ppm uranium. The Surprise and Moon are on the same zone.
37	UNNAMED	45 33 17 N	113 59 44 W	The area is underlain by the Gunsight Formation.	One caved adit was found.	No significant mineralization was noted and no sample was taken during a 1975 USBM visit
38	BULL OF THE WOODS MINE	45 32 12 N	113 59 49 W	Quartz veins occur in east-dipping quartzite and slate (Umpleby, 1913, p. 134). The Bull of the Woods, located a couple miles up Ditch Creek from Hughes Creek, is part of the proposed Humbug mine.	Umpleby (1913, p. 134) reported that a large stamp mill had been built. In addition to hardrock mining, some of the Ditch Creek placer had been worked.	See Humbug mine for additional information.
39	HUMBUG DEPOSIT	45 32 12 N	113 59 49 W	Quartz veins and silica-rich zones occur in dark grey siltite and argillite of the Apple Creek Formation.	Gold-bearing quartz veins were mined underground and a mill built to process the ore when the deposit was known as the Bull of the Woods. More recently, FMC Gold Corp. conducted an exploration program in the area which included extensive drilling. They felt that gold mineralization was too spotty and dropped their claims. American Gold Resources picked up the claims and conducted further drilling which resulted in delineation of the deposit. The deposit is currently in the	Proven and probable reserves are 16.5 million tons grading 0.037 ounce gold per ton. The deposit contains a geological resource of 1,056,000 ounces gold (International Gold Resources Corp., press release, 1995). One select sample (SFJ 064) of malachite- and limonite-stained quartz was taken by USBM personnel during 1995. It assayed 35.6 ppm (1.04 oz/t) gold, 7 ppm silver, 0.33 percent copper, and 68 ppm zinc.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					permitting stage. An open pit and heap leach operation are planned.	
40	RANSACK CREEK PLACER	45 30 25 N	113 59 44 W	The placer consists of bench gravel deposits that are 6 to 20 feet thick (Lorain and Metzger, 1939, p. 32).	Lorain and Metzger (1939, p. 33) reported that in 1938, 1,200 cubic yards of gravel were mined by hydraulic methods and $300 worth of gold recovered -- at a gold price of $35 per ounce.	Most of the deposit has been mined (Lorain and Metzger, 1939, p. 33).
41	MAYBE LODE	45 30 43 N	113 57 46 W	Quartz veins occur in a shear zone trending N 10 W and dipping 70 NE in quartzite. There are large areas of bleaching and limonite staining present.	One adit and numerous cuts were found. The area is very steep and other workings are probably present.	One select sample (SFJ 061) of limonite-stained quartz was taken from vein exposed at adit portal by USBM personnel during 1995. It assayed only 58 ppm copper and 12 ppm lead.
42	PROSPECT (AM8)	45 37 06 N	113 54 39 W	A system of four or more quartz veins are exposed in quartzite. The veins are as thick as 1 inch, strike N 85 W, dip vertically, and contain iron oxides (Mayerle and Close, 1993, p. 80).	There is a shallow trench (Mayerle and Close, 1993, p. 80).	A sample taken during a USBM examination had no significant metal content (Mayerle and Close, 1993, p. 80).
43	SPRING MEADOW OCCURRENCE	45 37 05 N	113 54 08 W	Quart veins and veinlets occur in quartzite (Mayerle and Close, 1993, p. 81).	No workings were found (Mayerle and Close, 1993).	A sample taken during a USBM examination had no significant metals (Mayerle and Close, 1993, p. 81)
44	SMITHY CREEK OCCURRENCE	45 35 40 N	113 53 48 W	A pegmatite dike, composed mainly of quartz, transects phyllitic quartzite. The dike is 20 feet thick and 100 feet long (Mayerle and Close, 1993, p. 81).	No workings were found (Mayerle and Close, 1993).	A chip sample, taken during a USBM examination, contained no significant metals (Mayerle and Close, 1993, p. 81).
45	GOLD-IN-FLOAT OCCURRENCE	45 35 29 N	113 54 03 W	Quartz float, as thick as 0.7 foot, contains hematite pseudomorphs after pyrite. Metasedimentary rock underlies the area (Mayerle and Close, 1993, p. 81).	A logging road crosses the occurrence (Mayerle and Close, 1993).	A sample taken during a USBM examination assayed 0.035 ounce gold per ton (Mayerle and Close, 1993, p. 81).
46	DWG PROSPECT	45 35 10 N	113 54 39 W	A quartz vein occurs in a N 45 E-striking, 50 SE-dipping, 24-foot-thick, faulted contact zone between quartzite of the Big Creek Formation and quartzite and phyllite of the Yellowjacket Formation. The	There is a 72-foot-long adit (Mayerle and Close, 1993, p. 82).	Three samples were taken during a USBM examination. They contained as much as 0.13 ppm gold, 9.2 ppm silver, 0.15 percent copper, and 0.585 ppm mercury (Mayerle and Close, 1993, p. 82).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				vein quartz is drusy, white, and contains pyrite, malachite, and tetrahedrite (Mayerle and Close, 1993, p. 82).		
47	PROSPECT (AM9)	45 34 52 N	113 54 16 W	Quartz veinlets containing magnetite and specularite crop out in quartzite. Calc-silicate hornfels are nearby (Mayerle and Close, 1993, p. 82).	There are two caved prospect pits and a shallow cut (Mayerle and Close, 1993, p. 82).	Two samples, taken during a USBM examination, contained no significant metal (Mayerle and Close, 1993, p. 82).
48	UPPER ANDERSON CREEK PLACER	45 34 41 N	113 55 05 W	The placer gravels in upper Anderson Creek appear to contain little gold (Mayerle and Close, 1993, p. 86).	A few old exploration pits were found.	Two pan samples taken by USBM personnel contained no gold (Mayerle and Close, 1993, p. 86).
49	BOONE MINE	45 34 32 N	113 55 42 W	A northeast-trending vein system, about 100 feet wide, transects quartzite. The poorly-exposed veins contain quartz with malachite, azurite, chrysocolla, chalcopyrite, pyrite, hematite, and tetrahedrite (Mayerle and Close, 1993, p. 65).	In an area about 1,500 feet long and 600 feet wide are six caved adits and 10 pits and trenches. No production is recorded. However, the extent of the workings suggests that some ore was produced (Mayerle and Close, 1993, p. 64).	Eleven samples were taken during a USBM examination (Mayerle and Close, 1993, p. 67). They assayed as much as 0.088 ounce gold per ton, 9.92 ounces silver per ton, and 2.4 percent copper. Further exploration for resources would be justified.
50	MCMACKIN-LUV MINE	45 34 34 N	113 54 46 W	At least nine east-trending veins transect argillaceous quartzite and shale. The veins are as thick as 1 foot and composed mainly of brecciated quartz with iron oxides, copper stain, chalcopyrite, and bornite. The adjacent country rock exhibits quartz-sericitic and phyllic alteration (Mayerle and Close, 1993, p. 54). The rocks are transected by the trans-Challis fault system.	Characteristics of the old workings indicate that the first discoveries were made in the late 1870's. No production is recorded, however, the extent of the workings indicate that some ore was produced. In a 4,000-foot by 3,500-foot area are a caved adit, at least 14 cuts, pits, and trenches, and connecting roads and trails (Mayerle and Close, 1993, p 54).	Twenty-five samples were taken during a USBM examination (Mayerle and Close, p. 58). Nineteen contained gold. Samples across veins had as much as 0.968 ounce gold per ton. The geology combined with sample results suggests that exploration for resources at depth would be warranted.
51	ROLAND & TAYLOR MINE	45 34 12 N	113 55 22 W	Fractures containing quartz, pyrite, chalcopyrite, malachite, and tetrahedrite transect silicified and iron-stained quartzite. The fractures are associated with the Anderson Fault. Nearby is a diorite dike or sill (Mayerle and	There is no record of production. However, the extent of workings suggests that some ore was produced (Mayerle and Close, 1993, p 62). Six caved adits, one caved shaft, and five trenches occur in a 5-acre area located along	During a USBM examination, three samples were taken (Mayerle and Close, 1993, p. 63). Each contained gold and silver, as much as 0.015 ounce gold per ton, and 0.24 ounce silver per ton. Exploration might disclose

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				Close, 1993, p. 63). The principal fracture zone is about 100 feet wide, strikes N 20 E, and dips 70 SE (Livingston, 1919, p. 29).	Anderson Creek.	shoots of higher grade material at depth.
52	CLARA MORRIS	45 34 09 N	113 55 07 W	In metasedmentary rocks of the Yellowjacket Formation, transected by the trans-Challis fault system, are at least six east-trending vein systems about 650 feet apart. The gold-bearing veins are as thick as 18 feet and composed of breccia with quartz, pyrite, and limonite (Mayerle and Close, 1993, p. 32).	The Clara Morris mine, covered by 14 patented mining claims, was discovered in 1877; production began in 1888 and continued intermittently until the 1930's. Exploration, including mapping, sampling, geophysical prospecting, drilling, and the excavation of an exploration drift, was done in 1984 and 1985 (Mayerle and Close, 1993, p. 30). In a 2,000-foot-long by 1,600-foot-wide area are at least 25 open and caved adits, 10 cuts, pits and trenches, and connecting roads and trails. Wark (1984, p. 3) estimated that more than 12,000 troy ounces of gold were produced. Small amounts of silver, copper, and lead were also recovered.	Sixty-one samples were taken during a USBM examination (Mayerle and Close, 1993, p. 33). Fifty-one of the samples contained gold, as much as 1.61 ounce per ton. Several of the veins contain significant gold values.
53	DIANA	45 33 45 N	113 55 21 W	East-west trending quartz veins occur in quartzite and micaceous phyllite that generally tend N 10-20 W and dip 40-70 NE (Umpleby, 1913).	Four caved adits were found. According to Umpleby (1913), the vein on the Diana claim was later mined from the main AD&M adit.	One select sample (SFJ 083) of massive limonite with some quartz was taken by USBM personnel during 1995. It assayed 77.6 ppm (2.26 oz/t) gold, 30 ppm silver, and 214 ppm lead.
54	EDWARDS	45 33 49 N	113 54 35 W	East-trending, gold-bearing quartz veins occur in phyllite.	Five caved adits were found during 1995. There are numerous less extensive workings. According to Umpleby (1913), the vein on the Edwards claim was later mined from the main AD&M adit.	One select sample (SFJ 055) of quartz containing pyrite was taken by USBM personnel during 1995. It assayed 9.73 ppm gold.
55	ROSE	45 33 38 N	113 54 15 W	East-trending, gold-bearing quartz veins occur in phyllite.	During 1995, three caved adits were found. Numerous, less extensive workings occur in the area.	One select sample (SFJ 057) of quartz containing pyrite was taken by USBM personnel during 1995. It assayed 19.2 ppm (0.56

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						ounce per ton) gold and 184 ppm copper.
56	KEYSTONE	45 33 39 N	113 54 32 W	East-trending, gold-bearing quartz veins occur in phyllite.	Five caved adits were found during 1995. There are numerous less extensive workings. According to Umpleby (1913), the vein on the Keystone claim was later mined from the main AD&M adit.	One select sample (SFJ 056) of quartz containing pyrite was taken by USBM personnel during 1995. It assayed 7.22 ppm gold and 133ppm copper.
57	A. D. AND M. MINE	45 33 28 N	113 55 01 W	Gold occurs along a poorly exposed system of east-trending veins in quartzite and slate beds that strike N 10 to 20 W and dip 40 to 70 E (Mayerle and Close, 1993). The beds are transected by faults and intruded by a diorite sill. Umpleby (1913, p. 132) reported that six or seven veins had been encountered underground -- all trending east and dipping west. They were as thick as 1 foot, as long as 300 feet, and contained shoots of gold-bearing hematite, limonite, managanese oxide, pyrite, and chalcopyrite.	The A. D. and M. (American Development, Mining and Reduction Company) mine, the largest producer in the Gibbonsville mining district, produced about 48,000 troy ounces of gold (Mayerle and Close, 1993). Umpleby (1913, p. 131) reported 25,000 to 30,000 feet of underground development over a vertical distance of 900 feet.	Umpleby (1913, p. 132) reported that the primary ore had about $30 in gold per ton -- at a gold price of about $20 per ounce. During 1995, USBM personnel took one select sample (SFJ 054) of quartz containing pyrite from the dump of one of the upper adits. It assayed 22.8 ppm (0.67 ounce per ton) gold, 6 ppm silver, and 208 ppm copper.
58	DAHLONEGA CREEK PLACER	45 33 25 N	113 54 20 W	The gravel deposit is as wide as 300 feet and as deep as 50 feet. It contains few large boulders but many boulders up to 1 foot in diameter (Lorain and Metzger, 1939, p. 33).	Most of the deposit along Dahlonega Creek, between its confluence with the North Fork Salmon River and Thompson Gulch, is patented. There are a number of hydraulick pits and ditches along the creek. Lorain and Metzger (1939, p. 33) reported that about $75,000 in gold, at a price of $20 per ounce, had been mined.	No data available.
59	ANDERSON CREEK PLACER	45 33 21 N	113 55 23 W	Lorain and Metzger (1939, p. 37) reported that gold-bearing gravel, possibly of commerical volume, extends for about 4.4 miles along Anderson Creek.	The lower three miles of the creek are covered by patented placer claims. There is a hydraulick pit, covering about 5 acres, near the confluence of Anderson Creek with Dahlonega. The patented claims were logged in the 1970's.	A few pan samples were taken along the middle part of Anderson Creek during a USBM study. Little placer gold was contained in the near surface samples (Mayerle and Close, 1993, p. 86).

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
60	CARDIFF GIANT MINE	45 33 12 N	113 55 09 W	The Cardiff Giant probably developed an east-west trending quartz vein in micaceous slate and quartzite.	An old claim map shows two adits (Umpleby, 1913, p. 128-129).	No data available.
61	CORN BEEF MINE	45 33 05 N	113 55 43 W	The Corn Beef is located on the outskirts of Gibbonsville. Workings, now badly caved and sloughed, pobably explored a quartz vein in quartzite and phyllite.	During a USBM visit during 1995, two caved adits were found.	No data available.
62	TWIN BROTHERS MINE	45 32 48 N	113 55 32 W	Umpleby (1913, p. 133) reported that a system of pyrite-bearing quartz veins fill east trending fractures in slate, sandstone, and quartzite. The veins are as thick as 6 feet.	Umpleby (1913, p. 133) reported that development consisted of 5,000 feet of underground workings. Nearby was a 10-stamp mill. He estimated that production from the mine by 1913 had totaled about $300,000.	The ore contained $11 to $12 in gold--at a gold price of $20 per ounce (Umpleby, 1913, p. 133). During 1995, USBM personnel took a select sample (SFJ 053) of quartz containing abundant pyrite from the dump. It assayed 39.9 ppm (1.16 ounce per ton) gold, 7 ppm silver, 0.19 percent copper, and 47 ppm lead.
63	NORTH FORK SALMON RIVER PLACER	45 32 45 N	113 55 48 W	Gold-bearing gravel, in the stream channel and in benches, occurs continuously for 14 miles along the North Fork Salmon River from it's confluence with the Salmon River to Hammerean Creek. The best deposits are near Gibbonsville where most of the mining has been done. The deposits range from 50 to 900 feet in width and are as deep as 55 feet.	In 1937, a high bench opposite the mouth of Dahlonega Creek was mined by hydraulic methods. About 100,000 cubic yards was mined and $22,000 in gold recovered -- at a gold price of $35 per ounce. The gold was 950 fine (Lorain and Metzger, 1939, p. 36). Most of the North Fork Salmon River placer deposit is on private land.	Samples from 10 holes, 17 to 55 feet deep, drilled near the mouth of Dahlonega Creek, contained $0.17 to $0.40 in gold per cubic yard at a gold price of about $20 per ounce (Lorain and Metzger, 1939, p. 26). Locally, ilmenite, monazite, and magnetite are common (Savage, 1964, p. 220). Five pan samples taken by USBM personnel contained as much as $0.81 in gold per cubic yard (Mayerle and Close, 1993, p. 85).
64	SUNDOWN PLACER	45 32 35 N	113 55 57 W	A gold-bearing bench gravel deposit is about 200 feet above the North Fork and is about 0.5 mile long and 0.25 mile wide. The gravels are about 6 to 15 feet thick and contain an estimated 5 percent boulders over 1 foot in	During 1937, approximately 100,000 cubic yards were mined from which $22,000 in gold was recovered (Lorain and Metzger, 1939, p. 36). The price of gold in 1937 was $35 per troy ounce.	The gravel mined during 1937 averaged 22 cents per cubic yard. In 1958, one clean up from work on the western face of the pit translated to an average of 50 cents per cubic yard. The gold had a fineness of 950 (Lorain and

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				diameter (Lorain and Metzger, 1939, p. 36).		Metzger, 1939, p. 36). The Gibbonsville 7.5 min quadrangle shows the bench deposit to be nearly mined out.
65	CYANIDE GULCH MINES	45 32 26 N	113 55 23 W	East-trending quartz veins occur in N 10-50 E striking, 30-75 SE dipping micaceous quartzite. The veins contain pyrite and arsenopyrite.	Peters (1978) reported that "during the past several years, Merger Mines has reopened old gold prospects in Cyanide Gulch. The property was earlier named the Big Four mine. It was apparently operated in the 1930's in conjunction with the McClain mill at the mouth of Cyanide Gulch". During 1995, USBM personnel found two caved adits, three open adits, and three pits. There are probably additional workings.	One select sample (SFJ 052) of quartz containing pyrite and arsenopyrite was taken from a stockpile near the second adit from the bottom. It assayed 3.33 ppm gold, 9 ppm silver, 471 ppm copper, and 112 ppm lead.
66	NORTH STAR PROSPECT	45 32 17 N	113 56 00 W	A shear zone in metasedimentary rock and diorite contains copper-bearing quartz veins.	Two partially caved adits and several pits were found. The presence of core in a shed next to one adit suggests that at least one hole was drilled.	One select sample (SFJ 058) of malachite- and limonite-stained quartz containing abundant chalcopyrite was taken from a stockpile by USBM personnel during 1995. It assayed 0.068 ppm gold, 9 ppm silver and over 2 percent copper.
67	VOLTER CREEK	45 32 15 N	113 56 22 W	Quartz veins and silicified zones occur along the contact of a granodiorite or diorite sill with Yellowjacket Formation rocks. The gold-bearing quartz veins and veinlets occur in both the intrusive and metamorphic rock (verbal communication, Brian Brewer, American Gold Resources, 1995).	Ten holes were drilled by FMC as part of its Ponderosa Project in 1987 (FMC, written commun., August 1987). During 1995, AGR (American Gold Resources) was conducting an exploration program in the same area.	One select sample (SFJ 043) of quartz containing siderite and pyrite was taken from one of three adits in the exploration area. It assayed 0.33 ppm gold, 6 ppm silver, and 110 ppm copper.
68	TROWBRIDGE BAR	45 32 03 N	113 55 55 W	The Trowbridge bar is a bench gravel deposit about 200 feet above the North Fork Salmon River. The bar averages about 300 feet wide and is 0.4 mile long (Lorain and Metzger, 1939, p. 39)	The ground was being tested during the summer of 1938 (Lorain and Metzger, 1939, p. 40).	No data available.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
69	AJAX GAMBLER MINE	45 31 34 N	113 55 21 W	Lode deposit reported to be operating during 1972 (USBM Liaison Office Report of Mining Operations in Idaho during 1972).	No data available.	No data available.
70	POWDER GULCH MINE	45 31 24 N	113 54 49 W	The Powder Gulch area, located about 1 mile up Lick Creek from the North Fork Salmon River, is underlain by quartzite. Workings explore quartz veins in shear zones and partially silicified shear zones.	During a 1995 visit by USBM personnel, two caved adits were found, one on the north side of Lick Creek across from the mouth of Powder Gulch and one just up the Gulch from Lick Creek.	One select sample (SFJ 063) of quartz and limonite was taken from the dump of the caved adit on the north side of Lick Creek. It assayed 1.05 ppm gold, 18 ppm silver, 0.15 percent copper, and 620 ppm zinc.
71	TRAM NO.12	45 30 22 N	113 55 32 W	Traces of autunite occur along shears and fractures in quartzite which trends N 25 E and dips 65 NW.	One adit and several pits were found.	One select sample (SFJ 062) of quartzite containing autunite was taken by USBM personnel during 1995. It assayed 0.15 ppm gold, 9 ppm silver, 4.5 ppm uranium, and 0.04 percent lead.
72	IRON CAP	45 32 23 N	113 53 17 W	A shear zone containing quartz veins probably occurs in quartzite. The exposures are poor.	At least two caved adits and numerous bulldozer cuts were found.	One select sample (SFJ 065) of limonite-stained quartz was taken from the dump of a pit. It assayed 9.67 ppm gold.
73	GOLDEN REWARD MINE	45 32 00 N	113 53 12 W	Heavily sheared quartzite containing quartz lenses and veins occurs at the Golden Reward. The mine is located near the headwaters of Lick Creek.	USBM personnel visited the property during 1995 and found at least one caved adit, another adit caved 30 feet from the portal, and numerous bulldozer roads and cuts. The remains of an old mill are located along Lick Creek just below the workings.	One select sample (SFJ 066) of heavily limonite-stained quartz was taken from a bulldozer cut above the main adit. It assayed 17.7 ppm gold, 362 ppm copper, and 630 ppm cobalt.
74	RED STAR MINE	45 31 34 N	113 53 03 W	A shear zone in quartzite contains quartz veins and lenses. Based on the alignment of workings, the zone probably trends about N 80 E.	Workings consist of several caved adits and pits which are badly sloughed. The area has been clear cut and the workings arebarely distinguishable. The remains of a collapsed mill, which apparently processed ore from the Red Star, was found along Lick Creek.	One select sample (SFJ 067) of limonite-stained quartz and quartzite with hairline fractures filled with quartz was taken from a caved adit. It assayed 1.0 ppm gold, 191 ppm copper, and 55 ppm lead.
75	LITTLE SHEEP CREEK PLACER	45 30 17 N	113 53 01 W	The deposit is a small stream placer.	Dozer trenching has been done on the gravels at the confluence of Sheep and Little Sheep Creeks.	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					History and production are unknown (USBM files).	
76	THREEMILE CREEK OCCURRENCE	45 34 47 N	113 51 57 W	A system of quartz veins, blebs, and veinlets crop out in quartzite. The quartzite bedding strikes N 55 E and dips 78 NW. The veins contain hematite pseudomorphs after pyrite (Mayerle and Close, 1993, p. 83).	The occurrence is exposed along a logging road (Mayerle and Close, 1993, p. 82).	Two samples taken during a USBM examination had no significant metals (Mayerle and Close, 1993, p. 83).
77	THREEMILE CREEK PLACER MINE	45 34 07 N	113 51 54 W	The 2.5-mile-long placer is as wide as 400 feet and as deep as 15 feet (Lorain and Metzger, 1939, p. 35).	About 1/4 mile of the lower creek was worked by hand and ground-sluicing methods. A few fairly rich pockets were found (Lorain and Metzger, 1939, p. 35).	No data available.
78	NEZ PERCE CREEK PLACER	45 33 51 N	113 51 09 W	The deposits consist mainly of stream gravels.	The Gibbons Patented placer claims extend along Nez Perce Creek for about 1.5 mile above its confluence with Dahlonega Creek. However, there are no workings, only ditches to supply water to sluiced areas along Dahlonega Creek (Mayerle and Close, 1993, p. 87).	None of the eight pan samples taken along Nez Perce Creek during a USBM examination contained gold (Mayerle and Close, 1993, p. 87).
79	NEZ PERCE CREEK OCCURRENCE	45 33 49 N	113 51 03 W	Several thin quartz veins trend north and dip 50 W in phyllitic quartzite (Mayerle and Close, 1993, p. 83).	No workings were found (Mayerle and Close, 1993).	A sample taken during a USBM examination contained no significant metals (Mayerle and Close, 1993, p. 83).
80	GOLD COIN PROSPECT	45 31 37 N	113 51 24 W	Workings at the Gold Coin are on mineralized fractures in quartzite (USBM files).	There are two caved shafts, a caved adit connecting the shafts, and two prospect pits (USBM files).	Four samples (WBH 010-013) taken during a USBM examination contained as much as 0.22 ppm gold, 6.3 ppm silver, 142 ppm copper, and 190 ppm lead.
81	DUNTON MINE	45 31 35 N	113 49 49 W	Quartzite, exibiting phyllitic and sericitic alteration, is cut by a steeply-dipping shear zone trending northwest. Along the zone is a chloritized diabase dike that contains quartz with pyrite and hematite (USBM files).	An 18-foot-deep shaft and a prospect pit were found (USBM files).	Two samples (WBH 008-009), taken during a USBM examination, contained as much as 0.01 ounce gold per ton (USBM files).
82	MORGAN MOUNTAIN	45 31 11 N	113 50 07 W	Quartz veinlets with specularite and iron oxide pseudomorphs	A number of small workings are scattered over a 1-square-mile	Four samples (WBH 014-017) taken during a USBM

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	AREA			after pyrite crop out in quartzite (USBM files).	area (USBM files).	examination contained no significant amounts of metal (USBM files).
83	UPPER BRADLEY GULCH PLACER	45 31 09 N	113 48 57 W	The placer deposit is a few tens of feet wide and possibly 10 feet thick (USBM files).	The deposit was mined by an open cut and adit which is now caved (USBM files).	A pan sample contained 34.65 milligram gold or $0.314 per cubic yard (USBM files).
84	MINERAL OCCURRENCE	45 31 09 N	113 48 48 W	Northwest-trending quartzite and phyllite is cut by micro-fractures containing iron oxides (USBM files).	The mineralized structure is exposed in outcrop; no workings were found (USBM files).	Five samples (WBH 049, 604-607) taken during a USBM examination contained no significant amounts of metal (USBM files).
85	UNNAMED	45 31 21 N	113 47 12 W	Finely bedded, fine-grained muddy sandstone contains limonite-stained fractures (USBM files).	One small prospect pit was found (USBM files).	A grab sample (WBH 603) taken by USBM personnel assayed no significant metals (USBM files).
86	UNNAMED	45 30 42 N	113 49 42 W	No mineralized structure is exposed. Material on the dumps suggests that quartz veinlets are in sericitized quartzite. The quartz contains specularite and hematite pseudomorphs after pyrite (USBM files).	There are two caved adits that are estimated to total about 300 feet (USBM files).	A sample (WBH 007) taken during a USBM examination had 0.003 ounce gold per ton (USBM files).
87	BIG EAGLE PROSPECT	45 30 15 N	113 50 02 W	A system of mineralized fracture zones strikes N 5-35 W. The steeply-dipping zones contain sericitized and silicified quartzite, quartz veinlets, iron and copper stain, and hematite pseudomorphs after pyrite (USBM files).	Peters (unpublished USFS report, p. 86) reported that mining activity around Eagle Mountain dated back to the 1890's. Work was also done in the 1930's. There are two caved shafts, a 60-foot-drift, a caved adit, a dozer bench, three dozer cuts, a trench, and three prospect pits. All are connected by dozer roads (USBM files).	Six samples (WBH 001-006), taken during a USBM examination, contained as much as 0.08 ppm gold, 25 ppm silver, 0.08 percent copper, and 0.12 percent lead (USBM files).
88	OROFINO PROSPECT	45 30 11 N	113 49 08 W	Striking N 40 W and dipping 79 NE to 50 SW in quartzite is a mineralized fracture as thick as 1 foot. The fracture contains gouge, quartz, and iron-oxide pseudomorphs after pyrite. The quartzite wallrock is sericitized (USBM files).	There is an adit 340 feet long (USBM files).	Four samples (WBH 513, 050-052) taken during a USBM examination contained as much as 0.02 ppm gold (USBM files).

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
89	BURNT STUMP AND ALTA GROUPS	45 25 45 N	114 42 24 W	Three pegmatite dikes have been extensively prospected. The dikes transect gneiss, are as thick as 2.5 feet, and contain quartz and feldspar crystals as long as 3 inches (Weis and others, 1972, p. C29).	There are several small shallow pits, most caved, in a one square mile area (Weis and others, 1972, p. C29).	Twelve samples taken during a USBM examination showed no metallic value (Weis and others, 1972, p. C30).
90	HORSE CREEK PLACER	45 23 46 N	114 43 55 W	The placer deposit extends from the confluence of Horse Creek with the Salmon River to a point 4 miles up Horse Creek. A gravel bar located at the mouth of Horse Creek, covers about 6 acres (Weis and others, 1972, p. C39).	There are a few small scattered test pits (Weis and others, 1972, p. C39)	Samples taken during a USBM examination had traces of gold and averaged 1.8 pounds of recoverable black sand per cubic yard (Weis and others, 1972, p. C39).
91	BLUE PLATE	45 29 56 N	114 25 04 W	Quartz veins and partially silicified ellipsoidal gneiss contain small amounts of pyrite, molybdenite, and galena. Geologic structures were poorly exposed at the Blue Plate.	Two open adits, one caved adit, and several pits along with four old log cabins were found.	One sample (SFJ 039) containing quartz with traces of pyrite, molybdenite, and galena was taken from a dump by USBM personnel in 1994. It assayed 0.03 ppm gold, 17 ppm silver, 0.19 percent lead, and 0.36 percent molybdenum.
92	OWL MINING	45 27 42 N	114 27 13 W	Two deposits are being mined. The main deposit consists of a shear zone trending N 55 E and dipping 38 SE in augen gneiss. The shear contains quartz veins and lenses and silicified, sheared gneiss. One quartz vein exposed in a pit is vuggy, heavily limonite-, manganese-, and hematite-stained, and is as much as 5 feet thick. At the other deposit, an open cut exposes a zone of limonite- and manganese-stained, partially silicified gneiss and quartz veins.	A small mill is located on site. The ore is crushed in a jaw crusher, ground in a ball mill, and concentrated on a table. The concentrate is shipped to East Helena where the Anaconda Smelter is located.	Two select samples (SFJ 032-033) were taken by USBM personnel during 1994 from an open cut near the mill. Sample SFJ 032 contained partially silicified gneiss and assayed 250.9 ppm (7.32 ounce per ton) gold, 140 ppm (4.1 ounce per ton) silver, and 0.02 percent lead. Sample SFJ 033 contained hematite-stained quartz and assayed 1.45 ppm gold, 33 ppm silver, and 0.05 percent lead. During 1995, USBM personnel sampled the quartz vein exposed in the other deposit. The select sample (SFJ 082) contained vuggy, heavily limonite- and manganese-stained quartz. It

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						assayed 131.4 ppm (3.83 ounce per ton) gold, 18 ppm silver, and 103 ppm lead.
93	ST CLAIR MINE	45 27 48 N	114 26 45 W	Mineralization at the St Clair is apparently associated with a shear zone in ellipsoidal gneiss. The gneiss has been argillically altered. According to Walt Walton (personal commun., 1995), gold-bearing quartz veins in the shear zones were mined.	Underground workings, which included at least five adits, have been destroyed by subsequent bulldozer workings. The ruins of an old mill and several cabins are still present. The St Clair Mine is located near the headwaters of Wallace Creek.	During the summer of 1994, USBM personnel took one select sample (SFJ 031) of hematite- and limonite-stained, bleached, argillically altered ellipsoidal gneiss from a bulldozed area. The sample assayed 29.3 ppm gold, 12 ppm silver, and 0.06 percent lead. During 1995, Bureau personnel took another select sample (SFJ 081). It contained quartz with abundant pyrite from a stockpile above the old mill. The sample assayed 33.8 ppm gold and 21 ppm silver.
94	UNNAMED	45 28 02 N	114 26 42 W	Probable quartz vein in gneiss. No exposures were noted.	Two caved adits were found.	One select sample (SFJ 080) of limonite-stained quartz containing pyrite was taken from the dump of one of the caved adits during 1995 by USBM personnel. It assayed 0.86 ppm gold and 12 ppm silver.
95	UNNAMED	45 27 58 N	114 25 22 W	A shear zone, apparently trending NE (based on alignment of workings) occurs in gneiss. Quartz veins and siliceous zones containing pyrite and vugs filled with limonite occur randomly in the shear zone.	One adit and several bulldozer cuts were found.	One select sample (SFJ 079) of vuggy, limonite-stained quartz with traces of pyrite was taken from the adit dump by USBM personnel during 1995. It assayed 12 ppm silver and 0.29 percent lead.
96	MONITOR MINE	45 27 53 N	114 24 03 W	A quartz vein or quartz-rich zone containing epidote, diopside, magnetite, pyrite, galena, molybdenite, and malachite appears to trend N 70 W and dips 45 NE in ellipsoidal gneiss.	The zone is developed by several old workings including a shaft, caved adit, and numerous pits. More recent activity includes mining from a large adit sized to handle rubber-tired equipment. A fairly large ore stockpile is located near the newest adit.	Three samples were taken by USBM personnel during 1994. One select sample (SFJ 034) of quartz containing magnetite, epidote, diopside, and malachite from the dump of a caved adit assayed 22 ppm silver, 0.29 percent copper, 0.06 percent

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						lead, and 0.04 percent molybdenum. The other two select samples (SFJ 035-036) were taken from the stockpile. They contained quartz with epidote, molybdenite, pyrite, and galena and assayed as much as 250 ppm (7.3 ounce per ton) silver, 0.81 percent molybdenum, and more than 1 percent lead.
97	UNNAMED	45 27 51 N	114 22 42 W	Quartz veins and silicified zones occur in quartz monzonite and ellipsoidal gneiss. Skarn or metasomatic replacement mineralization is suggested by the presence of epidote, diopside, magnetite, pyrite, chalcopyrite, galena, and molybdenite.	Several old workings, including adits, have been destroyed by more recent bulldozer cuts.	Two select samples (SFJ 037-038) of quartz containing epidote, diopside, magnetite, pyrite, chalcopyrite, galena, and molybdenite were taken by USBM personnel during 1994. They assayed as much as 0.1 ppm gold, 448 ppm (13.1 ounce per ton) silver, 1.58 percent molybdenum, and more than 1 percent lead.
98	UPPER OWL CREEK	45 27 04 N	114 23 33 W	The placer deposit is about 2 miles long and ranges in width from 25 to 200 feet; the average is about 100 feet. The gravels appear to be shallow, probably not over 10 feet deep (Lorain and Metzger, 1939, p. 72-73).	No data available.	No data available.
99	LUCKY LLAMA	45 26 46 N	114 23 10 W	Partially silicified shear zone in augen gneiss contains pyrite and molybdenite.	One open adit and four cuts or pits were found.	One select sample (SFJ 076) of quartz and augen gneiss containing pyrite and molybdenite was taken from the adit dump by USBM personnel during 1995. The rock was heavily limonite- and molybdate-stained. The sample assayed 0.44 percent molybdenum.
100	UNNAMED	45 26 12 N	114 22 46 W	Quartz was found on the dump of a large bulldozer cut in schist. The quartz probably came from a	One large bulldozer cut and many smaller bulldozer cuts were found in the area.	One select sample (SFJ 075) of heavily limonite- and manganese-stained quartz

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				vein now covered by the bulldozer workings.		containing vugs filled with limonite was taken by USBM personnel during 1995. It assayed 0.024 ppm gold and 260 ppm molybdenum.
101	UNNAMED	45 26 02 N	114 22 47 W	Massive white quartz boulders were found on the surface near caved workings in micaceous schist. No outcrops of the quartz were in the area. The two adits found in the area were probably driven to intersect a quartz vein at depth.	Two caved adits and several pits.	One select sample (SFJ 077) of the white quartz boulders was taken by USBM personnel during 1995. No visible sulfide minerals were noted. The sample assayed 0.01 ppm gold.
102	MILLER'S MINE	45 23 55 N	114 23 06 W	Partially silicified, limonite-stained shear zone occurs in augen gneiss. The gneiss contains fractures which are filled with a combination of quartz and limonite.	One caved adit, several cuts and pits, and a bulldozer cut were found. A 5-stamp mill is still standing just below the caved adit.	One select sample (SFJ 078) of limonite-stained gneiss with fractures containing abundant quartz and limonite was taken from one of the pits by USBM personnel during 1995. It assayed 0.43 ppm gold and 0.1 percent lead.
103	NABOB MINE	45 22 33 N	114 23 16 W	A fault zone trending N-NE in quartz monzonite contains quartz veins and silicified zones.	One caved shaft and one open adit were found. According to Miller (personal commun., 1994), the underground workings are over 1,800 feet long.	Two samples were taken by USBM personnel during 1994. One select sample (SFJ 040) contained quartz with pyrite and assayed 3.53 ppm gold, 643 ppm (18.8 ounce per ton) silver, 0.12 percent copper, and 0.1 percent lead. The other select sample (SFJ 041) contained bleached, partially silicified quartz monzonite with abundant pyrite. It assayed 6.61 ppm gold and 477 ppm (13.0 ounce per ton) silver. During 1995, USBM personnel took another select sample (SFJ 074) of quartz containing massive pyrite. It assayed 0.82 ppm gold and 12 ppm silver.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
104	OWL CREEK MEADOWS PLACER	45 23 29 N	114 27 55 W	Based on the Tincup Hill quadrangle, the stream gadient is about 200 feet per mile. The volume of gravel appears to be significant.	No data available.	No data available.
105	FOOL HEN GULCH PLACER	45 24 03 N	114 21 38 W	Stream gravels extend about 3,000 feet downstream from where work began in 1938. The gravel is 3 to 6 feet deep with 1 to 1.5 feet of topsoil (Lorain and Metzger, 1939, p. 72).	Much of the deposit has been worked. Pits, ponds, ditches, and trenches are numerous.	Several recon pan samples were taken during 1995. The gold is semi-angular and as large as one millimeter.
106	DISCOVERY GULCH PLACER	45 25 20 N	114 21 43 W	Placer deposits are 10 to 30 feet wide and less than 10 feet deep (Lorain and Metzger, 1939, p. 72).	Extensive placer workings.	No data available.
107	BOWEN CREEK PLACER	45 25 43 N	114 21 58 W	Bowen Creek has been mined for 0.5 mile upstream from its mouth. The stream gravels are from 10 to 30 feet wide and less than 10 feet deep (Lorain and Metzger, 1939, p. 72).	Extensive hydraulic workings are present (Lorain and Metzger, 1939, p. 72).	The gold is about 600 to 660 fine (Lorain and Metzger, 1939, p. 72).
108	BOULDER CREEK PLACER	45 25 46 N	114 21 44 W	Mined were stream channel deposits as wide as 30 feet and as deep as 10 feet. The gravel contains no rocks over 0.5 feet in diameter (Lorain and Metzger, 1939, p. 71).	Lorain and Metzger (1939, p. 71) reported the production of 403.3 ounces of gold and 76 ounces of silver from the Boulder Creek placers between 1904 and 1907. Part came from extensive hydraulic workings along Bowen Creek, a tributary. Boulder Creek was extensively worked for 0.25 mile above Discovery Gulch.	No data available.
109	EAGLE MINE	45 25 43 N	114 19 43 W	A flat lying fracture zone in granite contains pods of quartz with molybdenite.	Three short adits.	No data available.
110	STEVENS GROUP	45 26 49 N	114 19 58 W	Two types of quartz veins are exposed on the Stevens claim group. Veins striking N 20-50 E and dipping 30-70 SE in gneiss contain galena, pyrite, chalcopyrite, and molybdenite. The others, consisting of massive white quartz	Five caved adits, a caved shaft, numerous pits, and bulldozer cuts were found.	Two select samples (SFJ 092-093) were taken by USBM personnel during 1995. One taken from the dump of a caved adit exploring a 6-foot-thick quartz vein contained chalcopyrite, pyrite, galena,

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and often well over 6 feet thick, appear barren.		molybdenite, and quartz. The other, taken from the dump of a caved shaft, contained quartz and galena. They assayed as much as 0.11 ppm gold, 434 ppm (12.7 ounce per ton) silver, over 2 percent copper, over 1 percent lead, and 0.45 percent molybdenum.
111	SPRING CREEK MINE	45 27 08 N	114 19 26 W	The main adit at the Spring Creek deposit explores a quartz vein striking N 50 E and dipping 55 NW in augen gneiss. The vein contains pyrite, molybdenite, and lesser amounts of galena.	The site was extensively explored by B&B Mining of Prescott, AZ during the 1970's. There is one production-sized adit 1,500 feet long (Lowe, 1988) and numerous bulldozer cuts and caved adits.	The owner reported 500,000 tons averaging 2 percent MoS2 (Lowe, 1988). A sample taken by USFS personnel assayed 2 ounce silver per ton and 1.21 percent molybdenum bisulfide (Maestretti, personal commun., 1987). Three select samples (SFJ 028-030) of quartz containing molybdenite, pyrite, and galena were taken by the USBM during 1994. They assayed as much as 0.49 percent lead, 0.67 ppm gold, 49 ppm silver, and more than 3 percent molybdenum.
112	MONAZITE QUEEN	45 27 49 N	114 17 00 W	Abbott (1954, p. 13) reported that monazite occurs in marble and calcareous schist that strike N 35 W and dip 60 NE. The monazite is associated with white quartz, calcite, and pyrite.	Anderson (1958b, p. 33) reported two prospect pits 300 feet apart. The Monazite Queen is located near the head of the East Fork Spring Creek.	Abbott (1954, p. 13) took three samples. They contained between 1.50 and 21 percent rare earth plus thorium oxides and between 1.01 and 8.5 percent phosphate.
113	BLUE JAY	45 26 49 N	114 15 41 W	According to Sturm (1954, p. 48), a disseminated copper deposit in augen gneiss occurs along a low saddle on a long, narrow ridge southeast of the Monazite Queen area. The green, malachite-speckled gneiss is limonite stained and contains disseminated chalcopyrite and pyrite.	Two small pits and numerous bulldozer cuts were found.	One select sample (SFJ 089) of malachite-stained augen gneiss containing tenorite was taken by USBM personnel during 1995. It assayed 0.03 ppm gold, 28 ppm silver, 280 ppm zinc, and more than 2 percent copper.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
114	FAULKERSON RANCH PEGMATITE	45 25 30 N	114 16 24 W	A pegmatite dike over 12 feet wide is exposed in porphyritic granite. The dike trends N 15 E, dips 85 NW, and is exposed along strike for more than 300 feet. Where exposed in a pit, the pegmatite contains a number of zones of quartz-feldspar and iron-stained quartz. A radio-active zone containing feldspar, quartz, partially altered allanite, biotite, and small amounts of mag-netite and limonite is also present.	One 12-foot-wide pit is located between the East Fork Spring Creek and Spring Creek.	No data available.
115	MONOLITH	45 23 12 N	114 17 14 W	The Monolith quartz vein, exposed for over 3,000 feet, occurs in quartzite, slate, and gneiss. Nearby are granitic and basaltic dikes. The vein is as thick as 4 feet, strikes N 12 E, dips 10 to 30 SE, and is mainly coarse quartz with pyrite, galena, sphalerite, and arsenopyrite (Umpleby, 1913, p. 143).	Workings on the Gregor patented claims, on which the Monolith deposit is located, include several open cuts and adits. The principal adit is over 1,000 feet long and contains numerous drifts, crosscuts, stopes, raises, and declines (Umpleby, 1913, p. 143). The mine produced about $175,000 from ore grading $10 in gold per ton at a gold price of about $20 per ounce. A 1948 Gregor Mines, Inc. prospectus listed production from the Monolith at approximately $400,000 (gold price of $20 per ounce). The remains of a mill are located along Boulder Creek.	One select sample (SFJ 049) of quartz containing pyrite was taken from adit dump at the head of a collapsed tram by USBM personnel during 1995. It assayed 7.87 ppm gold, 51 ppm copper, and 278 ppm lead.
116	DUG OUT MINE	45 22 55 N	114 16 54 W	Silicified shear zones and quartz veins occur in micaceous ortho-quartzite. Most appear to strike NE and dip SE. One prominent zone trends NW and dips NE (Tuchek and others, unpub-lished USBM report, p. 50-51).	Workings consist of 14 adits and 5 pits (Tuchek and others, unpublished USBM report, p. 50).	Samples taken by USBM personnel assayed as much as 0.34 oz gold per ton (Tuchek and others, unpublished USBM report, p. 50-52).
117	SILVER KING	45 27 08 N	114 14 37 W	Abbott (1954, p. 13) reported that monazite-bearing marble crops out near the head of east fork Spring Creek north of Dutcher	Abbott (1954, p. 14) reported an adit and dozer trenches that were excavated by J.R. Simplot Company in 1952. All are	Three samples taken by Abbott (1954, p. 14) had 4.46 to 17.7 percent combined rare earth and thorium oxides and from 1.90 to

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				Peak. The marble strikes N 45 E, dips 65 SE, and hosts replacements of quartz and actinolite containing ilmenite and monazite with allanite, barite, garnet, magnetite, and pyrite. The principal replacement is as thick as 8 feet and over 500 feet long.	connected by a dozer trail. These workings and trail cover about 1 square mile.	8.8 percent phosphate.
118	LEE BUCK	45 27 02 N	114 13 40 W	Anderson (1958b, p. 36) reported that there were several niobium-bearing, rutile-monazite zones within an extensive belt of deformation and amphibolitic alteration in marble and schistose or siliceous rocks. The zones conform to foliation trending northwest and dipping southwest. The zones extend over a south-east-trending area several thousand feet long and are composed mainly of actinolite, calcite, and rutile with allanite, monazite, apatite, barite, magnetite, pyrite, pyrrhotite, and chalcopyrite.	In a one square mile area are an adit with about 200 feet of underground workings, several dozer cuts and drillholes, and connecting roads and trails. The prospect was discovered in the early 1950's and explored by Molybdenum Corporation of America and Union Carbide Corporation between 1953 and 1956. The Lee Buck is located on the west side of Squaw Creek.	Two samples were taken by Abbott (1954, p. 16). One sample, 10 feet long, contained 0.28 percent combined rare earth and thorium oxides and 1.07 percent phosphate. The other, across 6 inches of marble, contained 1.06 percent combined rare earth oxide plus thoria and 1.34 percent phosphate.
119	WEST FORK GOLD	45 29 10 N	114 10 15 W	Numerous workings explore a shear zone trending approximately N 40 W in quartzite and phyllite. Based on rock seen on dumps, the zone must contain quartz veins or lenses and areas of silicification. Malachite and azurite were abundant in the silica-rich, brecciated phyllite and quartzite.	At least five caved adits occur along the zone. More recently, bulldozer cuts and trenches were excavated to expose the zone. Some drilling may have been completed (drill steel was present).	Two select samples (SFJ 098-099) of malachite-, azurite-, and limonite-rich, partially silicified phyllite and quartzite were taken from adit dumps by USBM personnel during 1995. They assayed as much as 2.37 ppm gold, 61 ppm (1.8 ounce per ton) silver, 508 ppm molybdenum, 580 ppm cobalt, and more than 2 percent copper.
120	UNNAMED	45 28 45 N	114 08 47 W	A bedding plane fault trending N 45 W and dipping 40 SW in quartzite and phyllite contains quartz lenses. The quartz contains chalcopyrite and much of	One caved adit and bulldozer cuts were found.	One select sample (SFJ 100) of malachite-, azurite-, and limonite-stained quartz containing abundant chalcopyrite was taken from the dump by

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				the enclosing sheared rock is heavily limonite-, malachite-, and azurite-stained.		USBM personnel during 1995. It assayed 4.49 ppm gold, 110 ppm (3.2 ounce per ton) silver, 270 ppm cobalt, and more than 2 percent copper.
121	KITTIE BURTON MINE	45 27 33 N	114 09 40 W	Thrust and shear hosted gold veins are along wide zones in metamorphosed quartzites (Formation Capital, November 1, 1988, p. 6). The primary vein that was mined strikes N 20 to 30 W, dips 40 SW and averages 3 to 4 feet thick. The vein contains mainly coarse crystalline quartz with pyrite, braunite, chalcopyrite, pyrrhotite, rhodochrosite, malachite, and azurite (Umpleby, 1913, p. 136).	In a 4,000-foot-long, 2,000-foot-wide area, there are at least five underground workings and a dismantled tram. A 15-stamp mill processed ore from both the Kittie Burton and Ulysses Mines. Combined production from both mines is estimated to be a little less than $600,000. The Kittie Burton is credited with about one-third of the total (Umpleby, 1913, p.135). Tenneco Minerals drilled the area around the Kittie Burton and Ulysses mines in 1987 (Mining Engineering, May 1987, p. 333). The Kittie Burton Mine, located in the Indian Creek drainage, is on a hillside west from the old townsite of Ulysses.	One sample (SFJ 024) containing limonite-stained quartz with pyrite was taken by USBM personnel during 1994. The sample assayed more than 10 ppm gold, 0.35 percent copper, and 0.006 percent cobalt.
122	MORMON	45 27 15 N	114 09 19 W	The area is underlain by quartzite.	According to Bell (1904, p.104), three men were doing development work in an area below the Kittie Burton Mine during 1903.	No data available.
123	ULYSSES MINE	45 27 13 N	114 08 17 W	Thrust and shear hosted gold veins occupy wide zones in meta-morphosed quartzite (Formation Capital, November 1, 1988, p.6). Most production came from a coarsely crystalline quartz vein trending east and dipping 10 to 25 S. The vein is as much as 12 feet thick and contains calcite, pyrite, chalcopyrite, and braunite (Umpleby, 1913, p. 136).	In a 7,000-foot-long, 2,000-foot-wide area there are at least 14 underground workings, a dismantled tram, and connecting roads and trails. Ore mined at the Ulysses was processed at a 15-stamp mill located on Indian Creek. The same mill, credited with $600,000 production, also processed ore from the Kittie Burton Mine. The Ulysses Mine accounted for two-thirds of the	Umpleby (1913, p. 137) reported that the ore averaged $7 or $8 in gold per ton at a gold price of about $20 per ounce. One sample (SFJ 026) containing limonite-stained quartz was taken from the ore bin at the head of the tram by USBM personnel during 1994. The sample assayed 6.55 ppm gold, 0.06 percent copper, and 0.008 percent molybdenym.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					production (Umpleby, 1913, p.135). Tenneco Minerals drilled around the Kittie Burton and Ulysses mine in 1987 (Mining Engineering, May 1987, p. 333).	
124	BEVAN QUARTZ CRYSTAL MINE	45 25 05 N	114 09 37 W	Pockets and bands of flaky, iron-rich chlorite in gneiss occasionally contain clear quartz crystals. The largest crystal found during a 1944 USBM examination weighed 38.2 lbs.	One short adit and numerous cuts and pits occur in Crystal Gulch, a tributary to Indian Creek.	Most of the quartz crystals are pitted, striated, and stained (Herdlick, 1948).
125	EVANS-ESKER	45 25 29 N	114 10 18 W	Anderson (1958b, p.41) reported that there are at least six monazite-bearing zones at the prospect. Some are in crystalline limestone and others in amphibolized gabbro, schist, and gneiss. All trend in a northwesterly direction. The principal zone is a limestone bed, one to two feet thick, enclosed in mica schist. The limestone and zone strike N 60 W and dip 45 SW. Along the zone the limestone is largely replaced by actinolite and clacite with allanite, monazite, barite, rutile, magnetite, and pyrite.	The deposit, located on a hillside west of Indian Creek, was discovered in the early 1950's. During 1957, Union Pacific Mining Corp. excavated a few cuts and drilled a few holes (Anderson, 1958b, p.40).	No data available.
126	WHITE-HUTCHINSON	45 25 15 N	114 11 53 W	A N 30 W trending, 40 SW dipping marble zone is exposed Intermit-tently for nearly one-half mile. The marble, coarsely crystalline and locally completely replaced by actinolite with scattered spots of barite, contains monazite both as disseminated grains and as solid, massive clusters (Abbott, 1954, p.17).	Numerous pits, trenches, and cuts are located along a ridge between Papoose and Squaw Creeks.	One three-foot-long sample across marble assayed 0.0 percent combined rare earth oxides plus thoria and 1.42 percent phosphate. Another sample across 13 inches of marble assayed 3.84 percent combined rare earth oxides plus thoria and 1.71 percent phosphate (Abbott, 1954, p.17).
127	ROBERTS	45 24 46 N	114 12 44 W	Replacement zones in marble, biotite schist, and augen gneiss contain monazite, calcite, ilmenite,	The prospect was claimed in 1948; there are a number of cuts and several deposits (Anderson, 1958b,	A 2.5-foot-long sample taken across marble by Abbott (1954, p. 18) contained 21.5 percent

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and actinolite with apatite, barite, allanite, magentite, pyrite, and chalcopyrite. The main zone strikes N 50 W, dips 50 NE, and can be traced for nearly a thousand feet (Abbott, 1954, p. 18).	p. 37).	combined rare earth plus thorium oxides and 11.6 percent phosphate.
128	GLENAN PROSPECT	45 24 37 N	114 12 25 W	Mica books, as large as 5 inches, occur in a pegmatite dike cutting gneiss (Stoll, 1950, p. 54). The pegmatite consists of quartz, feldspar, and mica. The muscovite mica is largely associated with the predominately quartz phase of the dike and is poor quality (USBM files).	Two pits explore the pegmatite dike which is located on the south side of a ridge between the Salmon River and Squaw Creek (Stoll, 1950, p.54).	No data available.
129	SNOWDRIFT MINE	45 24 27 N	114 13 18 W	A pegmatite dike striking N 75 W and dipping 70 NE cuts Cambrian porphyroblastic gneiss. The dike is 5 to 10 feet thick and is reported by the owner to be more than 3,000 feet long. In addition to scrap mica, monazite crystals as much as 0.75 inch across were found in the pegmatite (Trites and Tooker, 1953, p.169-170).	Two pits were found by Trites and Tooker (1953, p.169). The prospect is located in a steep area which is north of the Salmon River and about 3.4 mile downstream from the mouth of Squaw Creek.	No data available.
130	BEVAN MICA DEPOSIT	45 24 00 N	114 13 17 W	A pegmatite dike trending northwest is exposed on both the north and south sides of the Salmon River near the Bevan Ranch. Mica occurs in the pegmatite as dissem-inations and segregations which average 3 to 4 inches across and up to one inch thick. The mica is very poor quality. Defects include cracks, warping, twinning, stria-tions, and herringbone (Tabor, 1945).	No data available.	No data available.
131	TWILIGHT MINE	45 23 30 N	114 11 38 W	A gold-bearing pegmatite intrudes augen gneiss and closely foliated schist at the Twilight Mine	The mine, located 0.5 mile up Sawlog Gulch, was operating when Sturm visited it in the early 1950's.	During 1995, USBM personnel took one select sample (SFJ 096) of limonite-stained, bleached

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				according to Sturm (1954, p.50). The pegmatite contains principally quartz, orthoclase, and serecite and is deeply weathered. The main ore mineral is auriferous pyrite; galena and magnetite are also present.	About 200 feet of tunneling had been recently completed (Sturm, 1954, p.50). The ore was ground in a 5-ton ball mill and gold was collected using corduroy and amalgam.	gneiss containing vugs after pyrite from the open cut. It assayed 46.6 ppm (1.36 ounce per ton) gold, 15 ppm silver and more than 1 percent lead.
132	WINGDING	45 23 17 N	114 11 42 W	A muscovite-bearing pegmatite dike, 10 feet wide, strikes northeast at the Wingding claim (Sturm, 1954, p. 47). Muscovite occurs in books 4 inches by 2 inches by 0.5 inches, but most is imper-fect. Black tourmaline is abundant.	No data available.	No data available.
133	CRAZY CREEK PROSPECT	45 23 04 N	114 10 17 W	Monazite occurs in many small vugs in a massive para amphibolite zone in gneiss. Epidote veinlets containing some monazite intrude the gneissic rocks adjacent to the amphibolite zone. The amphibolite zone trends N 57 W, dips about 50 NE, and is exposed for about 30 feet along the hillside (Sturm, 1954, p. 43-45). A quartz vein striking N 65 W and dipping 47 NE is also exposed near the massive amphibolite. The vein is 5 feet wide, is exposed along strike for 15 feet, and contains traces of chalcopyrite and pyrite (Sturm, 1954, p. 48-49).	One pit.	Three samples taken by Sturm (1954, fig. IV) assayed from 6.2-14.9 percent combined rare earth oxide and thorium oxide.
134	SAGE CREEK	45 26 10 N	114 05 09 W	The area is underlain by brecciated, bleached quartzite and phyllite which contains numerous hairline fractures filled with silica.	Numerous old pits and trenches and more recent bulldozer pits and cuts were found. FMC Gold has conducted a drilling program in the area.	One sample (SFJ 027) of limonite- and manganese-stained, brecciated, bleached quartzite and phyllite with hairline fractures filled with silica was taken by USBM personnel in 1994. It assayed 3.08 ppm gold, 6 ppm silver, 0.13 percent copper, 0.02 percent molyb-

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						denum, and 0.06 percent tungsten.
135	SPRINGFIELD CONSOLIDAT-ED	45 26 30 N	114 05 35 W	The Springfield Consolidated prospect area is underlain by limonite- and manganese-stained, fractured schist, phyllite, and quartzite.	Numerous adits (most caved), pits, trenches, and bulldozer workings were found.	One grab sample (SFJ 020) of schist from an adit portal was taken by USBM personnel during 1994. It assayed 48 ppm (1.4 ounce per ton) gold, 0.03 percent copper, and 0.11 percent tungsten. During 1995, USBM personnel took three more samples. Sample SFJ 102 was chipped across 2.5 feet of sheared phyllite in a zone trending N 70 W and dipping vertically. It assayed 0.08 ppm gold, 0.08 percent copper, and 16 ppm tungsten. Two other select samples (SFJ 103-104) of heavily limonite-stained, bleached, fractured phyllite containing manganese, limonite, and quartz along fractures were taken from other workings. They assayed as much as 0.96 ppm gold, 0.07 percent copper, and 34 ppm tungsten.
136	UNNAMED	45 27 06 N	114 05 43 W	The area is underlain by altered quartzite and schist.	One caved adit and one partially caved adit were found.	One select sample (SFJ 021) of limonite-, manganese-, and malachite-stained quartzite and schist was taken by USBM personnel during 1994. The sample assayed 1.16 ppm gold, 26 ppm silver, 0.07 percent cobalt, and more than 2 percent copper.
137	JEWETT	45 27 25 N	114 06 16 W	Vhay (1964a, p. 68) reported that cobalt minerals are present in a few discontinuous veins. The country rock consists of schist and quartzite.	The Jewett claims cover a small part of a large area explored under a DMEA contract by Gramlich Minerals, Inc. and Idaho Copper Mines, Inc. One open adit and a	Two select samples (SFJ 022-023) of malachite-, limonite-, and erythrite-stained quartz and schist containing chalcopyrite and pyrite were taken by USBM

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					large open cut were found in 1994 by USBM personnel.	personnel during 1994. The samples assayed as much as 2.4 ppm gold, 16 ppm silver, 0.30 percent cobalt, 150 ppm nickel, 490 ppm zinc and more than 2 percent copper.
138	CUMMINGS LAKE PROSPECT	45 28 32 N	114 03 17 W	The area is underlain by sheared, bleached schist.	An open cut and adit were found.	One select sample (SFJ 025) of azurite-, malachite-, and limonite-stained, sheared, bleached schist was taken by USBM personnel during 1994. The sample assayed 1.65 ppm gold, 0.03 percent cobalt, and more than 2 percent copper.
139	SHAM GROUP	45 28 16 N	114 00 14 W	A quartz vein in quartzite strikes north-south and contains siderite, specularite, malachite, pyrite, chalcopyrite, and guanojuantite (USBM files).	One pit and one 70-foot-long adit (USBM files).	No data available.
140	COPPER KING PROSPECT	45 27 07 N	114 00 28 W	An incline and short adit explore copper mineralization in flat lying schist. The copper-bearing zone contains limonite- and manganese-stained, fractured schist, talc, and some gouge. Copper minerals include malachite, chalcopyrite, bornite, and some cuprite (Herdlick, 1945).	One 100-foot-long adit and a 37-foot-long incline (Herdlick, 1945).	Three chip samples were taken by USBM personnel in 1945 form the incline. They averaged 2.9 feet long and assayed 3.02 percent copper, 0.05 ounce gold per ton, and 0.3 ounce silver per ton (Herdlick, 1945).
141	LAST CHANCE	45 23 24 N	114 04 30 W	A number of mineralized pegmatite dikes and shear zones, containing monazite and allanite, transect amphibolized gabbroic-, schistose-, and gneissic-rocks (Anderson, 1958 b, p. 42). The dikes and zones trend northwest, dip southwest, and extend over a length of hundreds of feet.	Anderson (1958b, p. 42) reported a number of dozer cuts were excavated in 1957.	USBM personnel found radioactivity above background at only two places (Tuchek and others, unpublished USBM report).
142	SALMON RIVER DEVELOP-	45 23 08 N	114 04 04 W	A mineralized zone, striking N 30 W and dipping 55 SW, is in schistose, quartzitic, and calcareous	The main workings consist of three adits. The main adit is 173 feet long and contains raises and stopes.	Several samples taken by USBM personnel assayed as much as 1.69 percent titanium and 1.30

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	MENT CO			rocks. Two small calcite veins lie along the zone. Parts of the zone give high radioactive readings (Anderson, 1958b, p. 44).	Another adit, 350 feet long, was used only for exploration. A third is caved 25 feet from the portal. At the time of the USBM visit, a mill in good condition was located on the property. It con-tained a crusher, ball mill, classifier, flotation cells, concen-trating tables, and a rotary kiln (Tuchek, unpublished USBM report, p. 27-30).	percent thorium (Tuchek, unpublished USBM report, p. 28).
143	BUSTER GULCH PLACER	45 23 04 N	114 03 47 W	The deposit is located on the north side of the Salmon River at the mouth of Buster Gulch. A significant amount of alluvium appears to cover the gravels.	No data available.	No data available.
144	DUMP CREEK PLACER	45 22 56 N	114 03 48 W	A significant gold placer deposit (Hughes, personal commun., 1987). The gold-bearing gravels appear to be covered by a large amount of alluvium.	None noted.	No data available.
145	RADIANT	45 22 43 N	114 04 35 W	Sandy biotite schist interbedded in banded gneiss and augen gneiss contains slightly radioactive zones and pegmatite veins (Abbott, 1954, p.20).	Several pits occur below Buster Gulch on the north side of the Salmon River.	Samples of the radioactive material assayed nothing in rare earth and thorium oxides (Abbott, 1954, p.20).
146	PAMELA ROSE	45 22 39 N	114 04 20 W	Shear zones trending N 65-80 W and dipping 50-85 SW are exposed in augen gneiss and rhyolite (Tuchek, unpublished USBM report, p. 31-32).	Two adits, 70 and 23 feet long were found (Tuchek, unpublished USBM report, p. 31-32).	Five samples were taken across the shear zones. They assayed only traces of gold, silver, and uranium (Tuchek, unpublished USBM report, p. 31-32).
147	FOURTH OF JULY MINE	45 29 15 N	113 55 54 W	A system of mineralized fractures and quartz layers are in quartzite. The fractures and quartz contain pyrite, and iron and copper oxides (USBM files).	Mineralized float and surface and underground workings cover an area of several acres. Principal workings consist of a 170-foot-long adit, six caved adits, and a caved shaft. In 1970, a small shipment of ore yielded $110 (USBM files).	Fourteen samples (WBH 027-038,040) were collected during a USBM examination (USBM files). They assayed as much as 0.819 ounce gold per ton, 11.8 ounce silver per ton, 5.1 percent copper, and 1.5 percent lead. The significant metal content of the samples indicates that

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						exploration for resources is warranted.
148	RS PROSPECT	45 24 26 N	113 55 50 W	Silicified metasedimentary breccia occurs in a fault zone near its contact with Challis volcanic rocks.	One open cut was found.	One select sample (SFJ 059) of silicified metasedimentary rock (quartzite) was taken by USBM personnel during 1995. It assayed 2.84 ppm gold and 51 ppm (1.5 ounce per ton) silver.
149	LITTLE THOMPSON GULCH PROSPECT	45 24 13 N	113 56 15 W	A shear zone in Challis Volcanics is exposed in a small open cut.	One small open cut was found.	No data available.
150	WAGONHAM-MER GULCH PROSPECT	45 23 09 N	113 56 23 W	The area is generallly underlain by east-dipping metasedimentary Belt Series rocks that have been intruded by a quartz latite porphyry or rhyolite dike. The dike trends N 19-20 E and is as much as 900 feet wide near the northeast corner of sec. 23, but narrows to only a few feet at O'Neill Gulch. A brecia zone dipping 70-85 westerly, and extend-ing at least 3,400 feet along strike, accompanies and intermingles with the dike. At least four ore shoots are known to occur along the trend of the breccia zone (Cohenour, 1982).	The prospect was discovered in 1880. It was mined by underground and open pit methods between 1975 and 1981. In 1981, 90 tons grading 17.75-20.7 ounce silver per ton, 0.145-0.201 ounce gold per ton, and 0.1-0.5 percent lead were shipped to a mill at Leadore (Lowe, 1988).	The zone reportedly contains about 2.25 million tons grading 0.046 ounce gold per ton and 0.93 ounce silver per ton (personal commun., Phil Nisbet, Formation Capital, 1987).
151	FOURTH OF JULY CREEK PLACER	45 22 38 N	113 55 00 W	Above the mouth of Little Fourth of July Creek, stream gavels along Fourth of July Creek are several hundred feet wide in the widest part, but average less than 100 feet (Lorain and Metzger, 1939, p. 36).	Old placer workings occur along a 3-mile-long stretch above the mouth of Little Fourth of July Creek (Lorain and Metzger, 1939, p. 36).	No data available.
152	SHEEP CREEK PLACER	45 29 56 N	113 49 08 W	Gold-bearing low bench gravels up to 300 feet wide and stream gravels extend for over 1 mile along the upper reaches of Sheep Creek.	A hydraulic pit 450 feet long and 150 feet wide plus numerous smaller trenches and pits were found on the deposit. According to USBM records, 142 ounces of gold were produced from 1901	A large volume of gold-bearing gravel exists. Recon pan samples contained very fine gold (flower gold).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					through 1903 (Lorain and Metzger, 1939, p. 30).	
153	SUNRISE MINE	45 27 12 N	113 51 01 W	The property was explored by Quartz Mountain Gold Corporation (QMG) during 1989 and 1990. They delineated a N 80 E-trending, gold-bearing breccia zone, over 16 feet thick and at least 1,500 feet long, cutting quartzite of the Big Creek Formation. The zone is associated with a thrust fault that separates the Big Creek quartzite from metasiltites, mafic lavas, and metaquartzites of the underlying Yellowjacket Formation. The breccia zone contains hydrothermal pebble breccias, quartz sulfide stockwork zones, replaced tectonic breccias, disseminated pyrite, iron oxide boxworks, and traces of galena (written commun., George Gorzynski, QMG, 1990),	There are two caved adits, a shaft, three dozed benches, fourteen prospect pits, and a few drill holes in a 100-acre area (USBM files). Quartz Mountain Gold (QMG) Corporation reported that the area had been explored for gold in the 1890's and 1930's and for uranium in the 1970's (written commun., George Gorzynski, QMG, 1990).	QMG took 99 lode and 103 soil samples during their exploration program. Their samples assayed as much as 11.6 ppm gold. Six samples (WBH 043-045, 504-506) taken during a USBM examination assayed as much as 4.8 ppm gold, 9.3 ppm silver, 152 ppm copper, and 0.24 percent lead (USBM files).
154	SHEEP CREEK LODE	45 27 03 N	113 49 21 W	The Sheep Creek mine area is underlain by fine-grained quartzite and medium-grained arkosic quartzite (USBM files). Alignment of caved workings and rock on the dumps suggest that a quartz vein, trending N 80 W and a foot or less thick, was mined (Anderson, 1959, p. 80). The Sheep Creek mine was part of the Blacktail Project exploration area.	Numerous caved workings and a collapsed mill are on the property.	See Blacktail Project for sample data.
155	BLACKTAIL PROJECT	45 26 55 N	113 49 47 W	The project area is underlain by the Proterozoic Big Creek Formation composed of thick beds of fine-grained quartzite with relatively minor beds of medium-grained, arkosic quartzite. The beds generally strike north or east	Numerous old pits, trenches, caved adits, a collapsed mill, and several collapsed cabins were found during a USBM visit. Most workings are connected by roads and trails. Little is known of the early history. The ruins of old	FMC collected 425 samples from the project area. Eight had greater than 0.03 ounce gold per ton. The best assayed 1.142 ounce gold per ton. Anomalous areas, detected by soil sampling, have yet to be tested. The

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and dip shallowly northeast. The quartzite is transected by a northwest-striking thrust fault. Silicification, chloritization, pyritization, fracturing, and mineralization are associated with the faulting. Quartz veins containing gold occur along fractures. Secondary enrichment has produced gossan pods and increased the gold content of some of the veins (USBM files). The Blacktail Project area includes the historic Smith mine and Sheep Creek mine.	cabins indicate activity in the late 1800's. Some production probably occurred in the 1930's. Meridian Gold Co. and FMC Corp. explored the area during the late 1980's. About 4,000 feet of drilling has been done (USBM files).	USBM took 34 samples (WBH 039, 071-075, 080-103, 547-550). They assayed as much as 24.75 ppm (0.72 ounce per ton) gold, 105 ppm (3.1 ounce per ton) silver, 0.075 percent copper, and 0.86 percent lead. FMC abandoned the project in 1992. They did so because their data indicated the gold to be confined to narrow structures, precluding a deposit of the size necessary to meet their goals. They believed that small to moderate sized gold deposits exist in the area.
156	NINETEEN-HUNDRED MINE	45 25 46 N	113 48 56 W	Two types of faults, shallow-dipping imbricate faults and steeply-dipping faults, cut flat-lying, ripple-marked quartzite. Mineralization appears to be concentrated at the intersection of the two types of faults. One open adit follows a fault zone striking N 70 W and dipping 55 to 70 SW that contains silicified breccia and quartz shoots at thick as 60 centimeters. The shoots contain galena, malachite, azurite, iron oxides, and pyrite. Additional parallel mineralized faults are indicated at the caved adits (USBM files).	Peters (1978, p. 89) reported that the original location was made in 1900. In 1905, two lode and one millsite claims were surveyed for patent; the claims cover about 36.7 acres. In an area 0.5 mile long and 0.3 mile wide are the three patented claims, a dismantled mill, and three collapsed cabins. To the north are two caved adits totaling at least 250 feet and one 134-foot-long adit. A tram (dismantled) connected the adits and mill (USBM files).	Four samples (WBH 107, 610-612) were taken during a USBM examination. Three chip samples across quartz in the open adit assayed 0.048 to 0.353 ounce gold per ton. A sample of quartz from the dumps of the caved adits contained 0.109 ounce gold per ton. The samples also contained as much as 78 ppm (2.3 ounce per ton) silver, 0.04 percent copper, 1.8 percent lead, and 7.5 ppm mercury (USBM files).
157	BLUE MINE PLACER	45 17 47 N	114 35 06 W	Most of this shallow placer is covered by talus (Cater and others, 1975, p. C37).	Mining was conducted along parts of a narrow beach about 100 feet long and 10 to 20 feet wide (Cater and others, 1975, p. C37)	Three pan samples were taken during a USBM examination (Cater and others, 1975, p. C37). They had $0.08 to $1.12 in gold per cubic yard at a gold price of $100 per ounce. About 1,000 cubic yards of auriferous gravel remain.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
158	SALMON CANYON COPPER MINE	45 18 05 N	114 33 20 W	Pierce (written commun., USBM employee) reported that stratabound cobalt-copper mineralization is confined to the lower metased-imentary formation of the Pre-cambrian Yellowjacket Forma-tion. The Yellowjacket is a quartz-biotite schist which is very hard, dense, and fine-grained. The rocks are in a north-plunging syncline. The strike of the formation is approximately east and the dip 20 N. Faults and foliation have also controlled emplacement of minerals, mainly chalcopyrite, chalcocite, pyrite, arsenopyrite, galena, quartz, and garnet. The mineralized zone is 3,000 feet long and 800 feet wide. The Salmon Canyon deposit occurs at the northwest end of the belt.	Development work includes about 3,000 feet of underground workings from which drilling was done. Several hundred tons of copper-cobalt ore were shipped to a custom smelter in the early 1960's (Behre Dolbear & Company, 1979). The mine was acquired by Formation Capital Corp. in 1993 (Gillerman and Bennett, 1994, p. 411).	Behre Dolbear and company report (1979) probable-geologic resources of about 1.27 million tons grading 1.3 percent copper, 0.20 percent cobalt, 0.015 ounce gold per ton, and 0.3 ounce silver per ton. During 1995, USBM personnel took a select sample (SFJ 046) of siliceous rock containing abundant chalcopyrite and arsenopyrite from stockpile near the Salmon River. It assayed 7.32 ppm gold, more than 2 percent copper, and 0.55 percent cobalt.
159	GOLDEN EAGLE PLACER MINE	45 18 01 N	114 33 10 W	Rounded bench gravel, at thick as 25 feet, is partially covered by a fan as thick as 50 feet. The bench and fan cover about 7.2 acres (Cater and others, 1975, p. C37).	On the narrow bench are some small hydraulic workings (Cater and others, 1975, p. C36).	Three sites were sampled during a USBM examination (Cater and others, 1975, p. C37). Samples from workings had $0.11 to $1.39 in gold per cubic yard, at a price of $100 per troy ounce. The average gold value was $0.67 per cubic yard. The placer is estimated to contain 290,000 cubic yards of gravel.
160	SHELL CREEK PLACER MINE	45 18 08 N	114 32 15 W	River and bench gravel, covering an area of about 11 acres, is partially overlain by an alluvial fan. The gravel is about 37 feet thick (Cater and others, 1975, p. C35).	The placer is on private land (Homestead Entry Survey 624). Workings consist of three small hydraulic pits (Cater and others, 1975, p. C35).	Samples were taken at ten sites during a USBM examination (Cater and others, 1975, p. C35). Samples taken near the workings had as much as $1.42 in gold per cubic yard at a price of $100 per ounce. The placer is estimated to contain 590,000 cubic yards of gravel.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
161	COLSON CREEK PLACER MINE	45 18 00 N	114 31 36 W	The placer consists of a stream bar covering about 8 acres to a depth of at least 30 feet (Cater and others, 1975, p. C34).	The placer extends for about 0.3 mile along the south side of the Salmon River near Colson Creek (Cater and others, 1975, p. C34).	Samples were taken from nine sites during a USBM examination (Cater and others, 1975, p.C34). The samples values were more than $0.06 per cubic yard at a price of $100 per ounce. The placer contains about 387,000 cubic yards of gravel.
162	LAKE CREEK PLACER MINE	45 18 08 N	114 31 02 W	Gold-bearing gravel covers benches 100 feet above the Salmon River. The gravel has an area of 25 acres and a depth of at least 100 feet; part is covered by barren alluvium (Cater and others, 1975, p. C31).	The Lake Creek placer is on private land (Cater and others, 1975, p. C31).	Samples were taken at eight sites during a USBM examination (Cater and others, 1975). The gold-bearing samples had $0.05 to $0.46 in gold per cubic yard, at a price of $100 per ounce. The placer contains about 3.5 million cubic yards of gravel.
163	EBENEEZER PLACER MINE	45 18 28 N	114 30 32 W	The Ebeneezer deposit, located along the Salmon River just upstream from Ebeneezer Creek, is at stream-level and covers 4 acres to a depth of about 14 feet (Cater and others, 1975, p. C30).	A caved shaft and several pieces of equipment are evidence of placer activity (Cater and others, 1975, p. C30).	The placer was examined by the USBM in 1974 (Cater and others, 1975, p. C30). The samples taken had $0.02 to $0.50 in gold per cubic yard at a price of $100 per ounce. The deposit is estimated to contain about 68,000 cubic yards of gold-bearing gravel.
164	OWL CREEK HOT SPRINGS	45 20 40 N	114 27 47 W	Waring (1965, p. 27) reported that warm water flows from five springs, fed by fractures in granitic rock, at a rate of 25 gallons per minute.	The site is patented. A cabin with a partially collapsed hot tub is located just downstream from the springs.	No data available.
165	POVERTY FLAT PLACER	45 18 34 N	114 29 11 W	The Poverty Flat deposit occurs on both sides of the Salmon River. However, only the 16 acres south of the river were studied during a 1972 visit by USBM personnel. Most of the deposit is covered by barren fan alluvium. Seismic surveys showed the alluvium to be 4 to 20 feet thick and the gravel to be 30 feet thick (Cater	The deposit on the north side of the Salmon River is covered by the patented Daisy placer claim (MS 2794) (Cater and others, 1975, p. C29). A few small workings were found on the south side of the river.	During a 1972 USBM examination (Cater and others, 1975, p. C31), samples were taken at six sites. Samples of gravel contained as much as $1.80 and averaged $0.18 in gold per cubic yard at a price of $100 per ounce. Gold-bearing gravel resources total about 520,000 cubic yards.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and others, 1975, p. C29).		
166	HOMESTAKE PLACER MINE	45 18 49 N	114 28 28 W	The deposit consists of bench and steam gravel. The bench, covered by barren alluvial fan material, is 30 to 35 feet thick. The gravel is a mixture of angular and rounded gravel on schist bedrock (Cater and others, 1975, p. C27).	Hydraulic mining was done in the early 1940's (Cater and others, 1975, p. C27).	During a USBM examination (Cater and others, 1975) samples were taken at 12 locations. The samples of gravel averaged $0.31 to $0.44 in gold per cubic yard at a gold price of $100 per ounce. The gold-bearing gravel is estimated to total about 2.3 million cubic yards (Cater and others, 1975, p. C20).
167	LOWER OWL CREEK PLACER	45 18 54 N	114 27 19 W	Bench gravel, 25 feet above the river, covers about 29 acres to a depth of 35 to 40 feet. The deposit is covered by over 11 feet of alluvial-fan detritus. There is also a deposit of bench gravel, 100 feet above the river, that covers about 11.7 acres (Cater and others, 1975, p. C26). The Lower Owl Creek deposit is located along the Salmon River just below and opposite the mouth of Owl Creek.	There are a few prospect pits.	During a USBM examination (Cater and others, 1975, p. C26) samples were taken at nine sites; none reached gold-bearing gravel. The placer is estimated to contain 1.6 million cubic yards of gravel averaging $0.38 in gold per cubic yard at a gold price of $100 per ounce. No samples were taken from the stream gravels because the overburden was deeper than the pits used for sampling. The average grade found at the Upper Owl Creek deposits was assumed for this deposit.
168	UPPER OWL CREEK PLACER	45 19 11 N	114 26 39 W	The Upper Owl Creek deposit, located along the Salmon River, is opposite the mouth of Owl Creek. The deposit consists of bench gravel covered by alluvial fans. The gravel is 20 to 100 feet above the river and covers about 10.5 acres to a depth of 30 to 75 feet (Cater and others, 1975, p. C25).	There are several prospect pits on the placer (Cater and others, 1975, p. C25).	During a USBM examination (Cater and others, 1975, p. C24), samples were taken at eight sites. Samples of gravel averaged $0.38 in gold per cubic yard at a price of $100 per ounce. The placer is estimated to contain 852,000 cubic yards of gold-bearing gravel.
169	GOLDEN QUEEN PLACER MINE	45 19 38 N	114 24 42 W	The Golden Queen placer deposit is mainly a stream gravel deposit.	The placer was mined by Wm. McCafferty in 1938 and 1939; booming and ground sluicing	Three samples taken during a USBM examination (Cater and others, 1975, p. C24) contained

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					methods were used. The gravel mined contained up to $14 in gold per cubic yard at a gold price of $100 per troy ounce. Most of the gravel mined was on the north side of the Salmon River, downstream from the mouth of Cove Creek (Lorain and Metzger, 1939, p. 79; Cater and others, 1975, p. C24).	$0.11 to $0.23 in gold per cubic yard at a gold price of $100 per troy ounce. Several thousand cubic yards of gravel remain in the deposit.
170	JAMEISON	45 21 07 N	114 20 48 W	Quartz stringers and lenses, up to 3 or 4 inches thick, occur along joint fractures in granite. The joint planes strike N 75-80 E and dip about 60 SE. The quartz stringers contain traces of sulfide minerals and free gold (Gray, 1927, p. 86).	Several drifts have been driven on the seams, the longest being something over a hundred feet (Gray, 1927, p. 87).	No data available.
171	COAN MINE	45 21 18 N	114 19 40 W	The area is underlain by leucocratic granite containing pegmatitic lenses and inclusions of schist, quartzite, and gneiss. There are two sets of joints in the granite; one strikes N 32-39 E and dips 43 SE, the other also strikes N 32-39 E but dips 50 SE. Quartz veins and lenses containing pyrite and galena occur in the steeper dipping joints (Gray, 1927, p. 88-89).	A 350-foot-long adit has been driven along one of the veins (Gray, 1927, p. 89).	Gold can be panned from the quartz vein (Gray, 1927, p. 89).
172	ROWE MINE	45 21 34 N	114 19 16 W	A quartz vein, up to 8 inches thick, strikes N 30 E and dips 55 SE in granite. The limonite- and hema-tite-stained vein contains pyrite and galena (Gray, 1927, p. 90).	Two adits, one of unknown length, the other 125 feet long, and a winze explore the vein (Gray, 1927, p. 90).	No data available.
173	KENTUCK MINE	45 22 18 N	114 17 48 W	The quartz vein at the Kentuck is a tabular body striking N 78 E and dipping 60 SE. It is from two to ten feet wide, but averages about four feet. The vein is exposed along strike for 600 feet and along dip to a depth of 700 feet. The massive, blue-white quartz vein contains	The Kentuck deposit, located on patented mining claims, was discovered in 1882 and mining commenced soon there after. During the first two years of production, the ore was processed by a mill with a single stamp and two arrastre beds. In 1884, a 10-	USBM personnel took 57 samples during 1972 in the Kentuck-Gold Hill-Grunter mine area. They contained as nuch as 0.51 ounce gold per ton, 0.7 ounce silver per ton, 0.03 percent copper, and 0.36 percent lead (Tuchek and others, unpublished

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				pyrite, arsenopyrite, galena, and sphalerite. Country rock is gneiss and the vein has been cut by rhyolite-porphyry and lamprophyre dikes (Gray, 1927, p. 48-56).	stamp mill was erected, and from that time until 1893, the mine experienced its greatest period of production. The mine yielded about 45,000 tons of ore from which was recovered about $10 in gold per ton -- at a gold price of about $20 per ounce (Umpleby, 1913, p. 142-143). In 1931, the mine was sold and incorporated as Gold Hill mines. A 100-ton-capacity flotation plant was erected in 1935 and operated through 1949. The mine has been idle since 1949 (Tuchek and others, unpublished USBM report). Development work consists of seven adits over a horizontal distance of about 2,400 feet and over a vertical distance of 1,000 feet (Umpleby, 1913, p. 142).	USBM report, p. 41-45). One select sample (SFJ 048) of quartz containing pyrite, arsenopyrite, and galena was taken from the dump of one of the upper Kentuck adits by USBM personnel during 1995. It assayed 61.4 ppm (1.79 ounce per ton) gold, 0.88 percent lead, and 0.44 percent zinc.
174	GRUNTER MINE	45 22 25 N	114 17 20 W	The Grunter vein is a forked, tabular body; the main branch strikes N 85 E and dips 60-70 SE in gneiss. It is massive, varies from 2 to 40 feet thick (Umpleby, 1913, p.144), and has numerous vugs lined with well shaped crystals. Galena, pyrite, sphalerite, arsenopyrite, and gold occur in the quartz (Gray, 1927, p.57-63). According to Hobbs (1964, p.220), fine-grained scheelite occurs in shears and is disseminated in fractured, coarse-grained gneiss through a zone up to 100 feet wide. Other minerals noted include pyrrhotite and chalcopyrite.	The Grunter claim, staked in 1882, was the first located in the district. A 10-stamp mill was erected shortly thereafter and production during the next few years was $75,000 (Gray, 1927, p.57). The primary metals recovered were gold and silver. Some tungsten may also have been recovered as a by-product (Umpleby, 1913, p. 143, Hobbs, 1964, p. 230). Workings consist of several adits and a large glory hole. The Grunter mine area stands out as a bleached, limonite-stained zone above the Salmon River just below Shoup.	USBM personnel took 57 samples during 1972 in the Kentuck-Gold Hill-Grunter mine area. They contained as much as 0.51 oz gold per ton, 0.7 oz silver per ton, 0.03 percent copper, and 0.36 percent lead (Tuchek, unpublished USBM report, p.41-45). During 1995, USBM personnel took one select sample (SFJ 108) of quartz containing abundant pyrite and lesser amounts of galena from the glory hole. The sample assayed 110 ppm (3.2 ounce per ton) gold, 44 ppm (1.3 ounce per ton) silver, and more than 1 percent copper.
175	LOST MINER	45 22 23 N	114 17 24 W	The quartz vein at the Lost Miner strikes N 55 E, dips 50-60 SE,	One adit opens the vein for 140 feet (Gray, 1927, p. 82).	USBM personnel took 57 samples during 1972 in the

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and is a continuation of the vein mined at the Grunter. The vein, as much as five feet thick, contains arsenopyrite, pyrite, and galena (Gray, 1927, p. 82).		Kentuck-Gold Hill-Grunter mine area. They contained as much as 0.51 ounce gold per ton, 0.7 ounce silver per ton, 003 percent copper, and 0.36 percent lead (Tuchek and others, unpublished USBM report, p. 41-45).
176	BRITTANIC MINE	45 22 20 N	114 17 21 W	A granite dike, not over two feet wide, contains a quartz vein never over a few inches wide at the Brittannic. Both the dike and vein strike N 60 E and dip 65 SE. At the Speculation (part of the Brittannic group), a 6-inch-thick quartz vein strikes N 75 E and dips 73 SE in gneiss. At the Margaret (also part of the Brittannic group), a quartz vein as much as one foot wide strikes N 19 E and dips 60 SE in granite and gneiss. The quartz veins in each case are bluish, massive, and contain pyrite (Gray, 1927, p. 83-85).	A ball mill was erected along the Salmon River about 500 feet below the Grunter mill. A tram connected the Margaret workings (part of the Brittannic group) with the mill. Production is estimated to be $25,000 (Gray, 1927, p. 83).	USBM personnel took 57 samples during 1972 in the Kentuck-Gold Hill-Grunter mine area. They assayed as much as 0.51 ounce gold per ton, 0.7 ounce silver per ton, 0.03 percent copper, and 0.36 percent lead (Tuchek and others, unpublished USBM report, p. 41-45).
177	GOLD HILL MINE	45 22 14 N	114 17 23 W	The Gold Hill mine developed the lower end of the shear zone originally mined at the Kentuck. The zones strike N 40-50 E, dip 40-80 SE, and range from 2.5 to over 20 feet thick. The shears contain quartz veins with various amounts of gold, silver, copper, lead, and Tungsten (Tuchek and others, unpublished USBM report, p. 36-40).	A 100-ton-capacity mill was erected in 1935 and operated through 1949. At least one adit exposed the mineralization (Tuchek and others, unpublished USBM report).	USBM personnel took 57 samples during 1972 in the Kentuck-Gold Hill-Grunter mine area. They contained as much as 0.51 ounce gold per ton, 0.7 ounce silver per ton, 0.03 percent copper, and 0.36 percent lead (Tuchek and others, unpublished USBM report, p. 41-45).
178	CLIPPER BULLION MINE	45 22 08 N	114 16 37 W	Three quartz veins, the Tramway, Hennessey, and Clipper Bullion occur in ellipsoidal gneiss. The Tramway vein averages 3 feet thick, strikes N 70 E, dips 80 SE, and	The Clipper Bullion mine was located in 1887. Some 2,500 feet of underground development work has been done and $75,000 in gold (at a gold price of about $20 per	One 1,000 ton lot of ore averaged $43 in gold per ton -- at a gold price of about $20 per ounce (Umpleby, 1913, p. 145). Four samples were taken by USBM

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				contains free gold, pyrite, and galena. The Hennnessey vein averages 1.7 feet thick, strikes N 20 E, dips 85 SE, and is composed of clear, coarse quartz containing pyrite and free gold. The Clipper Bullion vein, the most productive, averages 3 feet thick, strikes N 42 E, dips 65 to 85 SE and is composed of pyritic quartz (Umpleby, 1913, p. 144).	ounce) produced (Umpleby, 1913, p. 144).	personnel during 1972. They assayed as much as 0.28 oz gold per ton (Tuchek and others, unpublished USBM report). One select sample (SFJ 047) of quartz containing pyrite and traces of galena was taken from an ore bin at the mill by USBM personnel during 1995. It assayed 64.2 ppm (1.87 ounce per ton) gold, 18 ppm silver, and 0.12 percent lead.
179	HEGSTEAD	45 21 53 N	114 17 07 W	The area is underlain by gneiss with 6-inch-thick bands of biotite schist. Flat lying pegmatite and aplite dikes and iron-oxide stained fractures in the gneiss were the exploration targets (Tuchek and others, unpublished USBM report, p. 59).	Workings consist of four caved or partially caved adits and numerous pits. The open adits total 520 feet in length (Tuchek and others, unpublished USBM report, p. 59).	Samples of decomposed gneiss, pegmatite, and aplite from seven localities contained only traces of gold and silver (Tuchek and others, unpublished USBM report, p. 59).
180	GRUBSTAKE NO. 1 MINE	45 21 42 N	114 17 39 W	A quartz vein trending N 75 E and dipping 70 SE occurs in a narrow granite dike. The vein, never over a few inches wide, contains gold in pockets (Gray, 1927, p. 90).	Workings consist of about 350 feet of drift along the vein (Gray, 1927 p. 90).	No data available.
181	GRUBSTAKE NO. 2 MINE	45 21 40 N	114 17 27 W	A quartz vein, up to 2 feet thick, strikes N 79 E and dips 72 SE in a granite dike. The quartz is bluish and contains pyrite and lesser amounts of sphalerite (Gray, 1927, p. 91).	A drift follows the vein for about 250 feet (Gray, 1927, p. 91).	No data available.
182	READY CASH MINE	45 21 21 N	114 17 09 W	A quartz vein, up to a foot wide, strikes N 79 E and dips 70 SE in granite. The vein, massive and bluish, contains pyrite, sphalerite, and a little galena. Some gold has been extracted (Gray, 1927, p.93).	Two adits, one 75 feet long and the other 30 feet long, develop the vein (Gray, 1927, p. 93).	A select sample of white milky quartz with disseminated pyrite and galena was taken by USBM personnel during 1972. It assayed a trace of gold, 0.1 ounce silver per ton, and 0.65 percent lead (Tuchek and others, unpublished USBM report, p. 57).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
183	PINE CREEK MINE	45 21 25 N	114 16 52 W	Two quartz veins crop out in granite dikes that are in gneiss. One vein strikes N 19 E, dips 60 SE, and contains pyrite, sphalerite, and small amounts of galena. The other vein, up to one foot wide, strikes N 67-77 E and dips 65-70 SE. It is bluish, massive, and contains some sulfides. A trap rock dike cuts this vein off (Gray, 1927, p. 92).	Two adits totalling about 200 feet, a ten stamp mill with leach tanks, and an assay office were located at the property in the early 1920's (Gray, 1927, p. 92).	During 1995, USBM personnel took one select sample (SFJ 094) of quartz containing pyrite, galena, and traces of visible gold from the dump of the upper workings. The sample assayed 129 ppm (3.77ounce per ton) gold, 29 ppm (0.85 ounce per ton) silver, 0.32 percent lead, and 0.1 percent zinc.
184	BIG LEAD MINE	45 21 18 N	114 16 35 W	Quartz veins occur in gneiss and slate intruded by granitic (aplitic) dikes. The principal vein strikes N 65 E, dips 80 SE, and is as thick as 3.5 feet. It contains pyrite and lesser amounts of galena, sphalerite, and chalcopyrite (Umpleby, 1913, p. 145).	Development consists of 1,500 feet of underground workings (Umpleby, 1913, p. 145). During an investigation by USBM personnel in 1994, seven adits and 5 pits were located. According to USBM production records, a small amount of gold and silver was produced between 1904 and 1923.	The ore contained $6 to $8 in gold per ton -- at a gold price of about $20 per ounce (Umpleby, 1913, p. 145). One select sample (SFJ 010) of silicified gneiss containing pyrite, arsenopyrite, and galena was taken by USBM personnel during 1994. It assayed 240.9 ppm (7.03 ounce per ton) gold, 77 ppm (2.2 ounce per ton) silver, .046 percent copper, over 1 percent lead, and 0.74 percent zinc.
185	WALL STREET DEPOSIT	45 21 11 N	114 16 45 W	A quartz vein strikes N 35-40 E and dips 55-60 SE in granite and gneiss. The vein contains sulfide minerals, mostly pyrite, and traces of gold (Gray, 1927, p. 94).	Two adits, each open the vein from 50 to 75 feet (Gray, 1927, p. 93).	During 1995, USBM personnel took one select sample (SFJ 095) of limonite-stained quartz containing pyrite from the dump of one of the adits. It assayed 10.9 ppm gold, 173 ppm copper, and 158 ppm lead.
186	LOWER PINE CREEK PLACER	45 20 43 N	114 16 00 W	Lorain and Metzger (1939, p. 68) reported that in the deep, steep-walled canyon of lower Pine Creek, stream gravel is buried deeply under alluvial material from the side hills. The stream placers begin about 2 miles above the confluence of Pine Creek with the Salmon River and extend for about 2.75 miles upstream. The placer deposit is up	There are a few small prospect pits. The lower end of the stream gravel deposit was worked around the turn of the century (Lorain and Metzger, 1939, p. 69).	The volume of stream and bench gravel is large. No data available on grade.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				to 750 feet wide. There also are two bench deposits between McNabb Ranch and Virginia Gulch -- one about 1 mile long and the other about 1.25 mile long. Little prospecting has been done on the benches.		
187	PINE CREEK PROJECT	45 19 08 N	114 15 08 W	The Pine Creek Project exploration area is underlain by fine-grained quartzite and lies along the trans Challis fault system.	In 1989, Sovereign Exploration, Inc. filed a plan of operations to conduct surface exploration on claims held by EMC Corp -- Ponderosa Gold. The claims cover a 4 square mile area on the south side of Pine Creek in the Smith and Arrastre Creek drainages. The work planned included geologic mapping, geochemical sampling, and a geophysical survey. At the end of the same year, a plan of operations to drill 14 holes was filed. The drilling was to be done in 1989. Logging roads provided access to most of the drill sites.	No data available.
188	UPPER PINE CREEK PLACER	45 18 17 N	114 10 05 W	The valley of Pine Creek contains large deposits of stream and bench gravel. The gravel is largely buried by alluvium from the side hills. Two stream channel deposits mined near the stream source are as long as 1.0 mile, as wide as 400 feet, and 6 to 8 feet deep (Lorain and Metzger, 1939, p. 69).	Lorain and Metzger (1939, p. 69) reported that several pits had been excavated on deposits near the source of Pine Creek.	No data available.
189	SMITH PROSPECT	45 22 07 N	114 06 30 W	A contact metamorphic zone striking N 25 E and dipping nearly vertically is exposed for more than 400 feet and averages 12 feet wide. The zone is composed of altered gneiss containing pyrite and chalcopyrite and is cut by small	The deposit is located somewhere along a west fork of Moose Creek. No data is available about workings.	A grab sample of the most radioactive material at the north end of the zone contained 0.016 percent equivalent uranium and 0.003 percent uranium (Trites and Tooker, 1953, p.169).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				quartz lenses and stringers (Trites and Tooker, 1953, p.169).		
190	WHITE AZALEA MINE	45 22 08 N	113 56 40 W	Two adits are in quartzite beds striking northwest and dipping 40 NE. The beds are bleached, brecciated, and silicified along fractures related to the trans-Challis Fault system. Pyrite and arsenopyrite are disseminated in fine-grained quartz (Anderson, 1959, p. 80).	Anderson (1959, p. 80) reported that the workings consist of two adits, the upper one about 160 feet long and the lower one as much as 1,000 feet long.	During 1995, USBM personnel took one sample (SFJ 042) of heavily limonite-stained quartzite containing pyrite from the dump of the lower, now caved, adit. It assayed 3.89 ppm gold and 2543 ppm (74.2 ounce per ton) silver.
191	SILVER STAR	45 20 11 N	113 49 52 W	A fracture zone, 40 to 50 feet wide, strikes N 70-80 E, and dips steeply southeast in quartzite. Breccia in the zone is composed of limonite-stained, angular fragments of quartzite cemented by white quartz which is locally drusy. Galena, sphalerite, tetrahedrite, chalcopyrite, and pyrite occur disseminated and as pods in the matrix (Anderson, 1959, p. 84).	Located in 1902, development consists of a series of short adits and one small shaft (Anderson, 1959, p. 84). Numerous drill roads were constructed during a drilling program conducted by Plexis Gold. In 1938, a 150 ton per day flotation mill, which included a 7-foot-diameter ball mill and 10 flotation cells, was constructed. Recorded production between 1925 and 1975 is 691 ounce gold, 6,286 ounces silver, 6,791 pounds copper, and 30,788 pounds lead (Mitchell, 1995f, p. 5).	The material in the fracture zone averages about $8 per ton in gold at a gold price of about $35 per ounce (USBM files). USBM personnel took one select sample (WBH 509) of the breccia during 1991. It assayed 1.28 ppm gold, 610 ppm (17.8 oz/t) silver, 0.32 percent copper, and 2.3 percent lead. During 1995, USBM took another select sample (SFJ 090) of the sulfide-bearing breccia. It assayed 1.02 ppm gold, 434 ppm (12.7 oz/t) silver, 0.21 percent copper, and more than 1 percent lead. Plexis Gold reportedly found resources containing 250,000 ounces gold during their drilling program (Phil Nisbet, Formation Capital, personal communication, 1995).
192	UNNAMED PROSPECT	45 20 10 N	113 49 18 W	A calcareous copper-stained bed, about 15 centimeters thick, strikes N 80 E and dips 20-40 NW in quartzite. The mineralized zone is exposed for at least a few hundred feet (USBM files).	The deposit has not been developed.	One chip sample (WBH 508) taken across 0.4 foot of the copper-bearing bed assayed 0.71 ppm gold, 16 ppm silver, and 0.45 percent copper (USBM files).

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
193	TWIN CABIN MINE	45 19 45 N	113 44 32 W	Quartzite is transected by a 4.6-foot-thick shear zone striking N 50 E and dipping 85 SE. The shear zone contains quartz lenses up to 2 feet thick and more than 100 feet long. Locally, the iron- and copper-stained lenses contain galena, iron-oxide pseudomorphs after pyrite, and specularite (USBM files).	There are two caved adits and an open adit 85 feet long (USBM files).	Three samples (WBH 048, 510-511) collected during a USBM examination contained as much as 0.449 ounce gold per ton, 1.9 ounce silver per ton, 0.89 percent copper, and 2.7 percent lead (USBM files).
194	HIGH PROSPECT	45 19 19 N	113 43 56 W	A diabase dike, 15 feet thick, striking N 28 W, and dipping 25 NE in quartzite has been replaced by massive, white, limonite-stained quartz. The quartz contains iron-oxide pseudomorphs after pyrite, specularite, and sphalerite. The dike extends easterly across the Continental Divide into Montana and the Ajax mine (Lipton and others, 1988, p. 131).	The workings consist of a 45-foot-long adit, a prospect pit, and a trench (Lipton and others, 1988, p. 131).	Four samples, three chip and one grab, were taken during a USBM examination (Lipton and others, 1988, p. 131). One assayed 0.01 ounce gold per ton and another had 0.01 percent zinc.
195	CARMEN	45 17 02 N	113 44 00 W	A gold- and copper-bearing exhalite zone, a few tens of meters thick, is located at about the transition zone between the Middle Yellowjacket (primarily argillite and quartzite) and the Upper Yellowjacket (primarily quartzite). At the mine, gold and copper are concentrated in lenses of massive quartz and magnetite. The exhalite zone has been traced along the surface for more than 8 kilometers.	Seven cuts or trenches up to 6 meters long and three open adits were found. The ruins of an old mill are located below the workings on Golway Gulch (Mayerle, unpublished USBM report).	Twenty-nine samples (WBH 060-061, 517-543) were taken by USBM personnel during 1993. They assayed as much as 14.15 ppm gold, 63 ppm (1.8 ounce per ton) silver, and 1.2 percent copper (Mayerle, unpublished USBM report).
196	BELL PLACER	45 16 15 N	113 43 52 W	The gold-bearing gravel deposit is about 600 meters long, 200 meters wide, and possibly 10 meters thick (Mayerle, unpublished USBM report).	Several small holes are present.	Three pan samples taken by USBM personnel contained as much as $0.034 per cubic yard.
197	ORO CACHE MINE	45 17 01 N	113 41 32 W	Two fissure-veins, about 1/4 mile apart, were mined at the Oro Chache (Lipton and others, 1988, p. 102).	Two principal groups of workings, a number of scattered workings, and the ruins of a mill are in an area	During a USBM examination, 34 samples were taken (Lipton and others, 1988, p 105). Twelve

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				The main gold-bearing vein averages 4 feet thick, strikes N 65 E, and dips 67 NW in argillaceous quartzite of the Belt supergroup. It is composed of quartz containing pyrite, chalcopyrite, galena, sphalerite and where oxidized, native gold. The other vein is 12 feet thick, strikes N 45 E, dips 76 NW, and is also in quartizite.	measuring 2,000 by 3,000 feet. The largest group of workings, which includes nine caved adits, are located on the southeastern side of the property. These adits, on the main vein, reportedly contain about 3,500 feet of drifts and crosscuts (Mackenzie, 1949, p. 39). The second group of workings, on the vein about 1/4 mile to the west, consist of two caved adits and two pits. Between the two groups of workings is a caved shaft. At the dismantled concentrator is a steam-powered ten-stamp mill. The Oro Cache deposit was discovered in 1897. Between 1902 and 1914, 3,972 tons of ore that yielded 635 ounces of gold and 76 ounces of silver were produced from the mine (Lipton and others, 1988, p. 102).	samples were from along the main vein. Seven of the twelve contained gold, as much as 0.94 ounce per ton. Two samples from the vein 1/4 mile away also had gold, as much as 0.10 ounce per ton. The samples also contained significant amounts of silver and lead.
198	VICTORY NO. 1 PROSPECT	45 16 32 N	113 41 06 W	No mineralized structure is exposed. Quartz vein material on working dumps is vuggy and contains pyrite and limonite (Lipton and others, 1988, p. 135). Alignment of the workings suggests the quartz vein had a northeast trend.	Workings consist of four caved adits, a caved shaft, and a prospect pit.	Eight samples were taken during a USBM examination (Lipton, 1988, p. 135). They contained as much as 0.94 ounce gold per ton, 0.4 ounce silver per ton, 0.076 percent tungsten trioxide, and 0.011 percent molybdenum disulfide.
199	EAST BOULDER MEADOWS PLACER	45 20 54 N	114 08 31 W	Lorain and Metzger (1939, p. 70) reported that the meadow placers are as wide as 300 feet and 15 feet deep. The gravel contains many large granite boulders.	Lorain and Metzger (1939, p. 69) reported that the placers in East Boulder Meadow are gold-bearing. Four prospects are shown along East Fork Boulder Creek in and west of East Boulder Meadows.	Pan samples from the deposit contained $0.11 in gold per cubic yard at a price of $35 per ounce (Lorain and Metzger, 1939, p. 70).
200	BOBCAT WEST ZONE	45 21 54 N	114 01 04 W	A mostly buried copper-molybdenum porphyry system consists of a 30-foot-thick chalcocite enrichment shell overlying a primary	Geochemical (soil, rock) and geophysical surveys (IP, resistivity, EM) have been used to outline mineralization; at least three holes were drilled to depths of 500 to	Geochemistry suggests a mineralized zone 2,500 feet wide and 4,500 feet long (Formation Capital, 1995, p. 9). Parts of the copper enrichment shell

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				chalcopyrite/molybdenite zone more than 400 feet thick. The system and an enclosing pyritic zone is in a 49 million year old granodiorite intrusive complex (Bunning and Burnet, 1981) at the intersection of northwesterly and northeasterly structural trends.	1,600 feet.	contain 1 percent copper. A north limit of mineralization at 0.2 percent copper was found in 1994; additional drilling is planned to delineate the south limit (Phil Nisbet, Formation Capital Corp., personal commun., 1995). Molybdenum is in the range of 50 to 150 ppm.
201	EL TORO	45 21 12 N	114 01 50 W	A thick flow of quartz latite of the Challis volcanics is exposed between metamorphosed granite and gneiss on the west and quartzitic rocks on the east. Fracture zones as thick as 16 feet transect the latite, striking N 60 W and dipping 48 NE. The fractures contain patches of hematite and secondary uranium minerals - autunite and torbernite (Anderson, 1958b, p. 18). Declared abandoned (September 1979) by Interior Board of Land Appeals.	Uranium was discovered at the site in 1954; Oranium Corporation excavated two large and two small bulldozer cuts (Anderson, 1958b, p. 17).	Anderson (1958b, p. 18) reported that a 17-foot-long channel sample averaged 0.5 percent U3O8 and samples over shorter lengths had higher uranium contents, but "deeper work is needed before any considerable amounts of ore can be blocked out." A scintillometer traverse in 1995 showed radiation (100 counts/second) along hematitic fissures in quartz latite. Readings were only slightly elevated above background levels (60 counts/second) in the trenches.
202	EDWARDS	45 20 31 N	114 03 26 W	The deposit consist of the dry channel of Moose Creek. It is 100 to 300 feet wide and 11 to 40 feet deep. Many boulders are present (Lorain and Metzger, 1939, p. 58).	Lorain and Metzger (1939, p. 58) reported that development consisted of a few old workings and a shaft, excavated to bedrock in 1938. The deposit has been dredged since.	Samples from the shaft, dug to bedrock in 1938, averaged $0.50 in gold per cubic yard -- at a gold price of $35 per ounce (Lorain and Metzger, 1939, p. 58).
203	BIG BOULDER MEADOWS	45 18 26 N	114 06 41 W	Sand and gravel deposit.	Sand and gravel has been mined.	A resource of 20,000 cubic yards exists.
204	FREE GOLD	45 15 59 N	114 07 29 W	A shear zone in quartzite and shale trends about N 80 E. Based on float, quartz veins, lenses and blebs probably occur in the shear. The Free Gold claim was located in 1897 and later patented.	At least 3 pits and a caved adit explore the zone.	During 1994, USBM personnel took two samples (SFJ 018-019) of quartz from the dumps of the workings. They assayed as much as 26.294 ppm gold (0.77 ounce per ton), 30 ppm silver, 867 ppm copper, and 913 ppm lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
205	MOOSE CREEK BORROW AREA	45 15 24 N	114 06 06 W	Sand and gravel deposit.	Sand and gravel has been mined.	Sand and gravel resources are in an area of about 5 acres.
206	WEBFOOT CREEK PLACER	45 16 44 N	114 04 31 W	Although prospected from mouth to source, only the lower end of Webfoot creek has a gradient that is conducive to placer accumulation.	Lorain and Metzger (1939, p. 59) reported placer workings about 1.0 mile up Webfoot Creek from its mouth. A cut 150 feet long, 6 feet wide, and 6 feet deep reportedly yielded good wages.	The largest volume of potentially gold-bearing gravel occurs in a swampy area extending from Moose Creek south for about 0.5 mile.
207	MOOSE CREEK PLACER	45 18 25 N	114 02 39 W	Bedrock is decomposed granite and Miocene lake bed deposits. The overlying gravel is at thick as 30 feet, and composed of water-worn granite and quartzite up to 8 inches in diameter. Gold occurs as coarse and fine grains within 1 foot of bedrock. Most is found in joints and depressions in the bedrock (Umpleby, 1913, p. 149). The gravel along the part mined by dredge, between Daly and Little Moose Creeks, is as wide as 1,200 feet (Lorain and Metzger, 1939, p. 57).	The placers along Moose Creek were discovered shortly after those along Napias Creek -- in the late 1860's. Between the time of discovery and 1913, about $1 million in gold was recovered from 200 acres of ground at the McNutt placer, located between Daly Creek and Diamond Gulch. At first, the mining was by hand and hydraulicking. In 1899, the placer was purchased by the Pacific Dredging Company. They and succeeding owners operated a series of dredges between 1898 and about 1919. The last dredge mined at the rate of about 2,000 cubic yards of gravel per day. In 1913, $15,000 to $20,000 in gold was recovered (Umpleby, 1913, p. 52, and Lorain and Metzger, 1939, p. 57). The gold price at the time was about $20 per ounce. According to Lorain and Metzger (1939, p. 57), Moose Creek produced 6,755 ounces of gold and 385 ounces of silver between 1901 and 1933 -- the gold was 930 fine.	Extensive gold-bearing gravel remains.
208	DALY CREEK PLACER	45 18 39 N	114 02 18 W	Daly Creek is about 4 miles long and 700 feet wide at its lower end. The creek has a gradient of	Lorain and Metzger (1939, p. 59) reported that Daly Creek had been extensively worked. Dredging	A considerable amount of dredgable ground remains near the lower end of the creek.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				125 to 350 feet per mile. For about 0.5 mile above its confluence with Moose Creek, Daly Creek has been dredged.	had been done near the mouth.	Gravel mined near Sierra Gulch in 1938 ran about $0.50 in gold per cubic yard -- at a price of about $35 per ounce (Lorain and Metzger, 1939, p. 59).
209	DIAMOND CREEK PLACER	45 19 10 N	114 01 53 W	Three-mile-long Diamond Creek has a gradient of from 190 to 350 feet per mile. Stream-gravel deposits extend from the mouth to the source. They are 25 to 200 feet wide and as deep as 30 feet (Lorain and Metzger, 1939, p. 63).	Only a limited amount of placering has been done along Diamond Creek. Gravel from a 400 foot long, 75 foot wide part of the creek and residual placer material from the Shoofly mine were treated by flotation and amalgamation at the Shoofly mill. As much as $6 in gold per ton was recovered -- at a gold price of $35 per ounce (Lorain and Metzger, 1939, p. 63).	No data available.
210	LUCKY MYRNA	45 17 25 N	114 01 04 W	White vein quartz in chloritized quartzite is heavily stained with limonite; jasperoidal limonite blebs suggest the former presence of sulfide minerals.	No workings were found in 1995.	One sample (SFM 029) taken in 1995 by USBM personnel contained only a trace of gold.
211	RACETRACK CREEK PLACER	45 17 12 N	114 02 13 W	The stream gravel deposit is 350 to 1,000 feet wide and about a mile long. Depth averages 8 to 12 feet (Lorain and Metzger, 1939, p. 61).	Lorain and Metzger (1939, p. 61) reported that the lower part had been placered.	Most of the placer has not been mined.
212	GOLDEN NUGGET	45 16 37 N	114 02 06 W	Vuggy, limonitic quartz vein in quartzite.	One 40-foot-long trench was found. Cuttings along the access road show that exploration drilling has been done.	During 1995, USBM personnel took one sample (SFM 028) of limonite-stained quartz from the bulldozer cut. It assayed 1.57 ppm gold.
213	COFFEE GULCH PLACER	45 16 12 N	114 03 09 W	Coffee Gulch is a tributary to Daly Creek.	Three-mile-long Coffee Gulch has been mined from end to end (Lorain and Metzger, 1939, p. 62).	A cut 100 feet long, 10 feet wide, and 6 to 10 feet deep was being mined in 1938. Reportedly, the placer was yielding $0.50 per cubic yard at a gold price of $35 per oz (Lorain and Metzger, 1939, p. 62).
214	SIERRA GULCH PLACER	45 15 52 N	114 02 25 W	The stream gravel is as wide as 200 feet and as thick as 3 feet. It consists of angular fragments	The 1 mile length of Sierra Gulch has been placered. In 1938, mining with a rocker yielded $1.25	Some unworked gravel remains near Daly Creek and along the sides of the gulch (Lorain and

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				(Lorain and Metzger, 1939, p. 61).	to $1.50 in gold per cubic yard -- at a price $35 per ounce. The gold was 940 fine (Lorain and Metzger, 1939, p. 61).	Metzger, 1939, p. 61).
215	WALLACE LAKE ROAD PROSPECT	45 16 04 N	114 00 36 W	Quartzite is intensely crushed, sheared, and impregnated with green fluorite.	One 50-foot long bulldozer trench was found.	One sample (SFM 027), taken by USBM personnel during 1995, assayed 0.007 ppm gold.
216	LANG MINE	45 20 56 N	113 59 59 W	A north to northwest trending zone of mineralized shearing, 6 feet wide and at least 430 feet long, is in quartzite that strikes N 40 to 50 W and dips 58 SW. The zone dips about 56 SW in well mineralized segments but is flatter where weakly mineralized. Quartz seams to 8 inches thick and altered quartzite form veins as much as 3 feet thick. The quartz contains sparse, spotty pyrite (Anderson, 1959, p. 76).	Development consists of an adit with 600 feet of workings. Mined in the late 1930's, little work has been done since 1951. The claim was patented in 1953 (Anderson, 1959, p. 76).	One sample (SFJ 015) of quartz containing pyrite was taken by USBM personnel during 1994. It assayed 7.09 ppm gold and 76 ppm lead.
217	BOBCAT	45 21 05 N	113 59 08 W	Associated with quartzite and intruding granitic stocks is a stockwork-disseminated deposit. The deposit contains the ore minerals chalcocite, chalcopyrite, and molybdenite in altered zones composed of quartz, chlorite, epidote-clinozoisite, calcite, and biotite.	Geophysical exploration and drilling have been done by a Cominco American Inc. and Bear Creek Mining Co. Joint Venture in the 1970's. Corona Gold and Formation Capital later took over the deposit and located 1000 claims over 29 square miles. Formation Capital and Gold Fields explored in 1991.	The drilling done in the 1970's intersected a thick interval in granodiorite porpyhry containing 0.2 to 0.3 percent copper. Formation Capital reports a 60 million ton resource from drilling under a joint venture with BHP (written commun., 1994).
218	RED BIRD	45 20 41 N	113 57 18 W	Bedrock in the vicinity is shown as quartzite of the Precambrian Yellowjacket Formation; deposits are listed as precious metal veins or replacements (Loen and Pearson, 1989, p. 11).	Located between 1892 (ammended) and 1900, the Red Bird, Annie, and Katie claims are the northern part of the Red Bird group of patented claims. The group extends from Napolean Gulch almost a mile and a half south across Comet Creek to the Comet claim. Patent plats show five adits on the Red Bird claim aggregating about 860 feet in length; three adits are each	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					less than 70 feet long and two are about 330 and 380 feet long. An adit about 60 feet long is shown on the Annie claim south of the Red Bird, and an adit about 190 feet long is on the Katie claim, south of Annie.	
219	COMET	45 19 46 N	113 56 53 W	Bedrock in the vicinity is shown as quartzite of the Precambrian Yellowjacket Formation; deposits are listed as precious metal veins or replacements (Loen and Pearson, 1989, p.11).	Located in 1900, the Comet, Junebug, and Katie Fraction claims are the southern part of the Red Bird patented claim group. The group extends almost a mile and a half to the north into Napolean Gulch. Patent plats show four adits on the Comet claim that range from about 90 feet to 230 feet long, aggregating about 740 feet. Only discovery cuts are shown on the Junebug and Katie Fraction claims.	No data available.
220	PROSPECT	45 19 02 N	113 56 43 W	A massive, 3.5 foot thick quartz vein strikes N 20 W and dips 47 SW in quartzite of the Yellowjacket Formation. The vein contains sparse disseminated euhedral pyrite crystals, mostly oxidized. The host quartzite is chloritically altered and phyllitic in texture near the vein.	An 18-foot-long adit follows the vein; two prospect pits are just to the northeast (Biddle, 1985, p. 95).	During 1995, USBM personnel took one chip sample (SFM 010) across the quartz vein. It assayed 1.71 ppm gold.
221	FORGET-ME-NOT	45 18 36 N	113 56 36 W	Coarse-grained vein quartz and quartzite are breciated, recemented, and stained with hematite. Breccia matrix is jasperoidal in places. No veins are exposed but fragments suggest thickness of at least 8 inches.	Only minor surface workings along the ridge crest were found in a 1995 search; they include a small pit and several trenches aggregating about 90 feet in length. Cuttings near one trench suggest recent drilling.	A select sample (SFM 019) of quartz taken by USBM personnel during 1995 assayed 0.05 ppm gold, 89 ppm copper, and 303 ppm lead.
222	ROCKET-DOLLY	45 18 24 N	113 55 58 W	The claims cover the contact between a window of north-northeast-trending phyllitic and quartzitic beds and southwest-dipping, northeast-striking quartzitic	Anderson (1959, p. 79) reported that the work on the four patented claims (Rocket, Seloma, Little Mud, and Dolly) is old and much of the underground	During 1995, USBM personnel took one sample (SFM 018) of vuggy quartz from the dump of a caved adit. It assayed 6.02 ppm gold.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				beds. The principal workings are along a 3-foot-thick zone of shearing in quartzite that strikes N 10 W and dips 35 SW.	workings inaccessible. The workings are in two groups, several hundred feet apart. One group in a tributary from the west includes four adits; the longest near the valley bottom is more that 100 feet long and includes some stoping. Three more adits in the group are less than 100 feet above the lowest, some with evidence of stoping. A fifth adit, at least 30 feet long, and several cuts and pits comprise the second group and are in the main drainage (Anderson, 1959).	
223	WICKHAM MINE	45 17 53 N	113 55 46 W	The main workings, in a window of phyllite in quartzite, are on a system of northwest-trending, steeply northeast dipping veins. The principal vein is 2 to 3 feet thick and composed of quartz and jasperoid with pyrite (Anderson, 1959, p. 78).	Anderson (1959, p. 78) reported the mine to have been worked until the 1950's, and to be equipped with a mill. Workings included at least four adits in the main camp, all now caved. The longest adit extended at least 350 feet and was stoped to the surface at several places; stopes remain open and present some physical hazard. Other short adits and surface cuts are in an area that extends at least 1,000 feet to the northwest and 1,800 feet to the southeast.	Three samples (SFM 015-017) were taken by USBM personnel during 1995. SFM 017, a grab from a jasperoidal vein containing blebs of white quartz, assayed 49.71 ppm gold (1.45 ounce per ton).
224	CONTACT	45 17 53 N	113 56 52 W	Folded and faulted quartzite of the Yellowjacket Formation occurs just east of a contact with granite. The quartzite strikes N 35 E, dips 45 NW, and is transected by faults which trend N 10 E and dip 33-70 NW. The fault zones are as thick as 10 feet and consist of quartz, iron oxides, and jasperoid with specularite, apatite, barite, microcline, monazite, and thorite	The prospect is an old quartz-gold location relocated after the discovery of radioactive and rare earth minerals (Anderson, 1958b, p. 77). Bulldozer cuts extend south from a saddle in the ridge; several short caved adits are both east and west of the saddle. Anderson (1958b, p. 77) reported an adit 44 feet long and a shallow shaft. Older, sloughed trenches are	Anderson (1958b, p. 77) reported that a 3-foot-long sample contained 0.31 percent U3O8, 0.75 percent ThO2, and 4.0 percent rare earth oxides. Samples across another vein, 4 feet thick, had 0.07 percent U3O8, 0.38 percent ThO2, and 2.1 percent rare earth oxides. During 1995, USBM personnel took four samples (SFM 020-

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				(Anderson, 1958b, p. 77).	on the north side of the saddle along with a small mill building and 8-foot diameter vat.	023). They assayed as much as 1.23 ppm gold, 9 ppm silver, 127 ppm copper, 4166 ppm lead, 1400 ppm zinc, 503 ppm thorium, and 16 ppm uranium.
225	LOG CABIN	45 17 45 N	113 58 13 W	West to northwest trending quartz veins are in granite near a contact with quartzite of the Yellowjacket Formation. Vein material contains bands and pods of jasperoid and sparse pyrite and arsenopyrite; blocks suggest a thickness of at least 10 inches in places.	At least seven short collapsed adits and several trenches explored the veins over a distance of about 2,100 feet.	Two samples (SFM 041-042) of jasperoid were taken by USBM personnel during 1995. They assayed as much as 0.38 ppm gold.
226	STORMY PEAK BORROW PIT	45 18 04 N	113 58 57 W	A 10-foot-thick layer of mixed granite and quartzite has been mined.	Sand and gravel are mined for use as base and surfacing on Salmon National Forest roads. At least 20,000 cubic yards of gravel have been used (1983).	Resources remain at the site, which has been recontoured to limit erosion.
227	SHOO FLY MINE	45 18 18 N	113 59 13 W	Gold occurs in west-trending quartz veins in phyllitic quartzite of the Yellowjacket Formation; the veins are apparently offset by two northwest-trending faults (Biddle, 1985, p. 89). Production was principally from residual quartz boulders exposed at the surface. White quartzite occurs in massive, sparsely mineralized knobs near the top of the divide.	Reportedly the first mining location on the district, about $75,000 in gold was produced (Umpleby, 1913, p. 154), principally from highgrade boulders. Numerous pits and trenches are on the north slope of the divide; one caved adit was likely at least 1,000 feet long. Two old log cabins remain standing (1995). Several pits, surface stopes, and at least one shaft are near the quartzite knobs near the top of the divide.	Five samples (SFJ 012-014, SFM 025-026) were taken by USBM personnel during 1994 and 1995. They assayed as much as 9.01 ppm gold, 469 ppm copper, and 110 ppm cobalt.
228	PROSPECT	45 17 18 N	113 56 43 W	A limonitic shear zone strikes N 35 E and dips 80 NW in granite. Quartz veins crop out upslope from the adit (Biddle, 1985, p. 97).	One collapsed adit is partly open for about 30 feet; two small pits are on the ridge above the adit.	One sample (SFM 040) of sheared, gneissic granite was taken by USBM personnel during 1995. It assayed 0.092 ppm gold.
229	LUCKY GEM 13	45 17 03 N	113 56 43 W	Shear zones in granite contain quartz veins 10-inches to more than 3 feet thick; strikes are from west to N 70 W and dips are	At least three pits expose quartz veins along roads in the upper part of the prospect; one bulldozer trench exposes jasperoid just	Scintillometer counts are at least four times background in the vicinity of jasperoid pods. Biddle (1985, p. 109) reports

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				steep to both north and south. Jasperoidal limonite pods and stringers along segments of some shears contain blebs of pyrite in quartz stringers.	above the main road.	radiometric spectrometer indications of thorium, rare earth elements (cerium, praesodymium, neodymium, lanthanum), and niobium; no uranium was detected. USBM personnel took two samples (SFM 043, 046) during 1994. They assayed as much as 0.059 ppm gold, 14 ppm silver, 1740 ppm thorium, and 52.4 ppm uranium.
230	BELL	45 17 01 N	113 56 53 W	A jasperoidal zone trends N 10 E in quartzite of the Yellowjacket Formation. The jasperoidal material consists chiefly of goethite with variable amounts of monazite, thorite, apatite, specularite, and barite with thin stringers of quartz. The zone is at least 5 feet thick where exposed in the road bed.	Several bulldozer trenches are on both sides of a shallow ridge; the best exposures are in the roadbed that transects the site.	During 1995, USBM personnel took one sample (SFM 024) of Jasperoid. It assayed 0.350 ppm gold, 1240 ppm thorium, and 86.1 ppm uranium.
231	SIMER MINE	45 17 01 N	113 57 03 W	Thorium is concentrated in veins along breccia and shear zones in granite. The veins consist principally of jasperoidal limonite that contains abundant monazite, and variable amounts of fluorite, barite, and quartz. Three veins strike N 10-50 E and dip 38-60 NW. They range from 8 inches to 3 feet thick in sheared zones as much as 5 feet thick (Anderson, 1959, p. 89). The granite contains pegmatite lenses with quartz pods to 8 feet across.	Workings include one shallow sloughed shaft, several pits, at least 5 bulldozer trenches 90 to 120 feet long, and a stripped area 70 feet by 100 feet.	USBM personnel took two samples (SFM 044-045) during 1995. They assayed as much as 1.28 ppm gold, 1660 ppm thorium, and 44.0 ppm uranium.
232	LUCKY PROSPECT	45 16 46 N	113 57 33 W	Gold- and thorium-bearing veins are along fractures in granitic rock. A gold vein, about 3 feet thick with a strike of N 25-40 E and dip 65-84 NW, is composed of quartz with pyrite (Anderson, 1958, p. 79). Brecciated zones in granite contain	Workings, originally excavated while exploring for gold, consist of an 8-foot-deep shaft and a number of dozer cuts (Anderson, 1958b, p. 78). Bulldozer stripped areas to 100 feet by 200 feet expose radioactive breccia zones.	USBM personnel took three samples during 1995. SFM 047, from green veinlets a in breccia zone (Scintillometer count 3,200 cps or about 30 times background) contained 88.2 ppm thorium and 1550 ppm uranium.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				green to black veinlets consisting of monazite, thorite, epidote, apatite, barite, specular hematite, ilmeno-rutile, and limonite (Biddle, 1985, p. 107). One such zone is 12 inches thick, strikes N 05 E and dips 40-60 NW.		Biddle (1985, p. 108) reported radiometric spectrometer indications of abundant uranium, thorium, niobium, ytterium, strontium, barium, and rare elements lanthanum, neodymium, praseodymium, and cerium. SFM 048-049, from quartz and jasperoid veins, contained as much as 0.66 ppm gold, 17 ppm thorium, and 42 ppm uranium.
233	STORMY PEAK ROAD BOR-ROW AREA	45 16 54 N	113 58 28 W	Rock is mined for use on USFS roads.	No data available.	No data available.
234	MCKINLEY MINE	45 16 46 N	113 56 20 W	Shear zones near a contact of Yellowjacket Formation quartzite with granite contain vuggy, limonitic quartz veins. One 18-inch-thick shear in quartzite strikes N 64 W and dips 37 SW. Shears in granite are intensely hematitic.	Patent survey plats show two adits about 225 and 140 feet long on the claim. The lower adit is caved; the upper adit is partially open but flooded (1995). Several pits are also on the claim.	One grab sample (SFM 035) of quartz containing traces of chalcopyrite was taken by USBM personnel during 1995. It assayed 0.011 ppm gold, 148 ppm copper, and 820 ppm lead.
235	PROSPECT	45 16 26 N	113 55 29 W	Two shear zones about 140 feet apart parallel foliation in bleached, limonitic, locally phyllitic quartzite. Brecciated, recemented quartzite and gouge fill the zones to a thickness of about 2 feet. The zones strike N 70 W and dip 46-68 NE.	Two prospect adits are about 20 and 25 feet long.	During 1995, USBM personnel took two samples (SFM 013-014). SFM 013, quartz containing vugs filled with limonite from the stockpile, assayed more than 10 ppm gold and 9 ppm silver. SFM 014, a chip across a bedding plane fault, assayed 0.031 ppm gold.
236	PROSPECT	45 16 02 N	113 55 40 W	Narrow quartz veins occur in breccia zones along bedding in phyllitic quartzite. The veins and bedding strike N 25 W and dip 60 SW.	One caved adit was about 50 feet long.	During 1995, USBM personnel took one sample (SFM 038) of limonite-stained quartz from a pit in phyllitic quartzite. It assayed only 158 ppm copper.
237	WALLACE CREEK BOR-ROW AREA	45 15 54 N	113 55 31 W	The deposit contains dark gray quartzite.	Talus slopes serve as a source of broken rock.	Resource estimated at more than 19,000 cubic yards (U.S. Forest Service files).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
238	TENDOY MINE	45 15 25 N	113 56 13 W	According to Umpleby (1913, p. 159), the deposit consists of two parallel veins trending northeast and dipping southeast in granitic rock. The veins are mainly quartz with shoots of sulfides and their oxidation products (Umpleby, 1913, p. 158, and Anderson, 1956, p. 62).	Umpleby (1913, p. 159) reported there to be two adits totaling 400 feet in length and a 2-stamp Nissen mill. A small amount of bullion had been recovered.	The Tendoy No. 1 vein has been traced for 1,400 feet. In the No. 1 adit, a 115-foot-long segment of the vein ranges from 2.0 to 4.0 feet thick and contains less than 1.0 ppm to more than 1.0 ounce gold per ton (USBM files). One sample (SFM 003) of limonite-stained quartz taken by USBM personnel during 1995 contained 1.46 ppm gold.
239	CASTLE ROCK	45 15 39 N	113 56 27 W	A shear zone trending N 13 E in granitic rock contains quartz veins. In places, quartz is breccited by post-deposition movement along the shear. Galena is reported in the vicinity, along with minor amounts of other sulfide minerals (USBM files).	A northern adit 75 feet long (Biddle, 1985, p. 110), driven on the shear zone, is partly sloughed. Several trenches and caved adits are along the trend of the vein to the southwest. USBM records show small amounts of gold, silver, and lead were produced from 19 tons of ore in 1947-1948.	Two samples were taken by USBM personnel during 1995. SFM-004, vein quartz and limonitic granitic host rock from the northern adit, contained 0.49 ppm gold. SFM-006, across quartz breccia in a shear zone exposed in a trench at the southern end of the prospect, contained more than 10 ppm gold.
240	BLONDIE	45 15 44 N	113 56 40 W	At least two sets of northeast trending shear zones in Precambrian granite contain gold-bearing quartz veins. Chalcopyrite and small amounts of other sulfides have been reported in the area (USBM files).	At least six adits and several trenches are along the shear zones. USBM records show that small amounts of gold, silver, and copper were produced from 222 tons of ore between 1937 and 1940.	USBM personnel took one sample (SFM 005) of quartz and hematitic quartz breccia from the dump of a caved adit. It assayed 0.360 ppm gold.
241	GILT EDGE MINE	45 15 43 N	113 57 40 W	A gold-bearing, porphyry-type hydrothermal system occurs in altered quartz monzonite and quartzite of the Yellowjacket Formation. Mineralization and alteration are concentrated along high-angle faults and associated shear and breccia zones. The principal structure, the Sharkey shear zone, trends N 15-30 E and averages about 150 feet thick; several cross-cutting and	Although no records of early work are available, the deposit was likely discovered in the 1890's. Ore was shipped in the 1940's that yielded small amounts of gold and silver (USBM files). At least 11 adits (mostly caved) and 20 bulldozer cuts and pits are present. Most production was from a shaft that was 70 feet deep in 1984 and with more than 70 feet of drifting on two veins (Ralstan Adams,	Quartz veins sampled for a patent application averaged 1.54 ounce gold per ton and 0.4 ounce silver per ton over a thickness of 4.8 inches; samples ranged to 4.27 ounce gold per ton. Two primary gold porphyry-type targets and several additional targets were identified during exploration in the early 1990's. One target is a 600-foot-wide by 800-foot-long, northeast trending zone,

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				subparallel zones transect the property. Silica flooding and quartz stockworks and veins along and between the zones contain pyrite, chalcopyrite, specular hematite, and tourmaline (Gordon Hughes, consulting geologist, written commun., 1992).	Patent Application); work in the 1950's was from a 450-foot-long adit (Anderson, 1959, p. 77). Formation Capital Corporation and Pathfinder Gold Corporation conducted extensive exploration on and near the site in the 1990's.	600 feet west of the Giltedge shaft where alteration and mineralization are most intense; the second target is along the Sharkey shear zone. Although no resource has been quantified, each target is large enough to host a deposit of more that 15 million tons.
242	WALLACE CREEK PLACER	45 15 22 N	113 57 27 W	Loraine and Metzger (1939, p. 22) reported the placer deposit to be 1 mile long, as wide as 400 feet, and as thick as 25 feet. The gravel consists of well rounded granite ranging in size from pebbles to boulders 2 feet in diameter; it rests on decomposed granite bedrock. From 15 to 25 percent of the total consists of boulders 1 foot in diameter or larger.	Lorain and Metzger (1939, p. 22) reported that the lower end of the deposit had been tested by the Golden Dawn Mining Co. Shafts were excavated to bedrock. Later a pipe line and hydraulic equipment were installed and mining started. Mining was done along a tributary stream in 1938. Seventy-five yards of gravel, processed by a combination of hydraulic and ground-sluicing methods, yielded 4 ounces of gold or about $1.20 per yard (Lorain and Metzger, 1939, p. 22). Anderson (1959, p. 81) reported that some small scale placer mining had also been done on upper Wallace Creek in the vicinity of the Delmar mine.	Lorain and Metzger (1939, p. 22) reported that samples from near bedrock contained $0.25 in gold per cubic yard -- at a gold price of about $35 per ounce.
243	U.P. AND BURLINGTON MINE	45 14 06 N	114 00 23 W	A vein strikes N 42 E and dips 80-87 NW in granite near a contact with quartzite. The vein is in a gouge-filled shear zone 5 feet thick and consists of coarsely crystalline quartz, generally 10 inches but as much as 2 feet thick, and accompanied by pyrite, galena, and chalcopyrite (Umpleby, 1913, p. 158).	Umpleby (1913, p. 158) reported that development consisted of seven underground workings totaling about 2,000 feet in length. He also reported a 10-stamp mill and a total production of a few thousand dollars; $800 being derived from the last mill run of 40 tons. The workings are in a 3,500-feet-long, 1,000-feet-wide area. The area was included in a 1990 joint venture exploration program	A number of samples taken by the joint venture contained gold. During 1994 and 1995, USBM personnel took three samples (SFJ 016-017, SFM 036). They assayed as much as 9.03 ppm gold, 358 ppm silver (10.4 ounce per ton), 0.20 percent copper, 130 ppm molybdenum, 0.241 percent tungsten, and more than 1.0 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					comprising Formation Capital Corporation and Teck Resources. Exploration extended to the northeast to the nearby King Solomon and Gilt Edge mines.	
244	BOWMAN MINE	45 07 46 N	114 00 50 W	A system of N 60 E trending fissure veins is in quartzite. The veins exposed are as thick as 6 feet and are composed of quartz with limonite, malachite, chrysocalla, chalcocite, chalcopyrite, and pyrite.	In a 3,500-foot-long, 1,000-foot-wide area, covered by patented mining claims, are at least 5 caved adits, 10 pits and trenches, a collapsed cabin, and a connecting jeep road. The prospect was explored by a Formation Capital/ Hecla joint venture in 1991.	A 6-foot-long chip sample (SFC-011) across a vein, taken during a 1994 USBM visit, assayed 0.025 ppm gold and 1500 ppm copper.
245	KING SOLOMON	45 13 53 N	113 59 44 W	Gold occurs in sheared zones and other structures related to the northeast-trending Sharkey Creek fault. Host rocks consist of both metasedimentary rocks (quartzite and phyllite) of the Proterozoic Yellowjacket Formation and intrusive dikes, sills, and stocks ranging in age from Proterozoic to middle Tertiary. Fissure-filling and replacement quartz veins strike N 30 E and dip 55 SE in a zone 60 to 100 feet wide and 1,000 feet long. Host rocks are argillically altered.	The deposit was likely discovered in the 1870's and mined for high-grade gold ore between 1890 and 1910. Two adits driven in the early development of the deposit, about 680 and 330 feet long, were rehabilitated between 1991 and 1993.	Drilling in 1990 by Teck Resources intersected 160 feet of rock averaging 0.049 ounce gold per ton, including a higher grade zone of more than 55 feet with 0.11 ounce gold per ton. Additional holes drilled by Pathfinder Gold through 1993 suggest a preliminary resource of 3.3 million tons grading 0.037 ounce gold per ton (Formation Capital Corporation, written commun., 1994). USBM personnel took one sample (SFM 007) of vuggy, pyritic, hematitic quartz from the dump of one of the workings during 1995. It assayed 1.21 ppm gold, 19 ppm copper, and 48 ppm lead.
246	BOB MOORE CREEK PROSPECT	45 12 31 N	113 58 49 W	South of a small mass of gneissic granitic rock is a system of veins in quartzite. Workings and material on the dumps suggest the veins strike northwest, are as	A number of caved and partially collapsed adits extend from near Bob Moore Creek southward along a low ridge (Anderson, 1956, p. 63).	USBM personnel took two samples from the prospect during 1995. SFM 062, consisting of quartz vein material from the dump of one adit, contained

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				thick as several feet, and are mainly quartz with iron stain (Anderson, 1956, p. 63).		0.100 ppm gold. Sample SFM 063, across a vein at the adit portal, contained 0.057 ppm gold, 22 ppm silver, 390 ppm zinc, and elevated levels of arsenic (84 ppm), antimony (289 ppm), and barium (960 ppm).
247	GOLDEN RULE MINE	45 12 36 N	113 58 39 W	Quartzite is breciated and recemented with quartz and jasperoidal bands; the mineralized structure is not exposed but fragments suggest veins less than 6 inches thick.	One caved adit, one collapsed cabin, and one small (5 foot diameter) arrastre-type grinding mill were found.	One sample (SFM 009) of brecciated quartz recemented with limonite was taken by USBM personnel during 1995. It assayed 1.58 ppm gold.
248	SILVERTON MINE	45 12 36 N	113 58 24 W	A lead-bearing shear zone cuts quartzite near a quartz monzonite contact. The zone strikes N 80-85 E and dips steeply north. The rock along this zone is argillically altered and contains calcite and quartz seams with galena, cerussite, and secondary copper minerals (Anderson, 1956, p. 94).	Anderson (1956, p. 94) reported several cuts and adits. The principal working, caved in 1995, is an adit about 450 feet long with a raise to the surface.	Formation Capital reported samples ranging from 335 ppb to 0.102 ounce gold per ton (Formation Capital, 1991, p. 6).
249	QUEEN OF THE HILLS MINE	45 14 35 N	113 56 40 W	Three steeply dipping, nearly parallel veins in granite strike N 27 E. The veins are along breccia zones 5 to 12 feet thick and consist of quartz bands 8 to 14 inches thick and quartz-filled zones to 6 feet thick. The veins are mainly coarsely crystalline quartz with irregularly scattered crystals of pyrite, chalcopyrite, galena, and their oxidation products; gold is apparently associated principally with the pyrite (Umpleby, 1913, p. 158; Anderson, 1956, p. 62).	The workings, also called Golden Queen, Last Chance, Amagosa, and Queen and Crescent, cover a northeast trending area 2,500 feet long and 1,000 feet wide. The mine was discovered in the 1880's but was not developed until 1898. By 1910, underground workings on five levels totalled about 9,000 feet over a vertical distance of 400 feet, and a 50-ton per day stamp and amalgamation mill were on the property; production totalled about $80,000 (Umpleby, 1913, p. 158). Development resumed for a short time in 1926 and the work-ings and mill were rehabilitated; by 1954 the workings were inaccessible and the	Ore in some stopes contained nearly 1 ounce gold per ton but averaged less than 0.2 ounce per ton (Anderson, 1956, p. 62). Four Formation Capital samples ranged between 128 and 1883 ppb gold over 20 to 40 foot vein widths (Formation Capital, 1991, p. 4). Two grab samples (SFM 034-035) were taken from dumps by USBM personnel during 1995. They assayed as much as 0.12 ppm gold, 148 ppm copper, and 820 ppm lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					mill dismantled (Anderson, 1956, p. 62). Recorded production totals 1,713 ounce gold, 364 ounce silver, 188 pounds copper, and 6,993 pounds lead (Mitchell, 1995e, p.8).	
250	BROMITE SILVER	45 14 12 N	113 56 09 W	Bands of hematitic quartz are along a shear zone subparallel to bedding in light green quartzite. The bands of quartz strike about N 30 W and dip 70 SW. A north trending fault separates the quartzite from granitic rock just to the west (Loen and Pearson, 1989).	Two adits and at least two prospect pits are at the site; drilling and hauling equipment are just inside the portal of the main, eastern adit. The western adit is closed by a locked wooden door labeled "Explosives." A mill building in good condition below the main adit is mostly bare of equipment. A large cabin near the creek is only partially complete.	Two samples were collected by USBM personnel during 1995. A sample of quartz bands and sheared quartzite from a pit above the main adit portal (SFM 001) contained 0.04 ppm gold. A sample of weakly limonite-stained quartz and chloritized granitic rock from a coarse ore bin in the mill building (SFM 002) contained 0.038 ppm gold. Both samples assayed less than 5 ppm silver.
251	BERT'S BEST	45 13 15 N	113 56 22 W	A vuggy, hematitic quartz vein is along foliation in phyllitic quartzite about 200 feet downslope from a granite contact. At one exposure, the 14-inch-thick vein strikes N 50 W, dips 85 SW, and is enclosed in at least 6 inches of sheared quartzite and gouge. A second exposure, possibly on the same vein about 2,000 feet to the northwest, contains pods up to 2 inches thick of massive goethite.	Several shallow pits are on the vein and at least three bulldozer trenches have been cut across the trend of the vein between exposures.	Two samples (SFM 030, 033) were taken by USBM personnel during 1995. They assayed as much as 0.007 ppm gold.
252	RED CROSS MINE	45 13 02 N	113 56 41 W	A quartz filled fissure vein strikes N 70 W and dips 45-60 SW in granite. The vein contains lead (as cerussite), silver, and gold along with tin and vanadium. The zone is about 9 feet thick where exposed at the surface and is reported to be 6 to 7 feet thick underground at the face of the main adit (Enoch Stewart, written	The deposit was first exposed in a surface trench over a width of about 9 feet; a short crosscut allowed drifting and stoping to produce two small shipments of ore reported to return $25/ton in gold. In 1904, a lower crosscut was begun that eventually exceeded 380 feet in length and exposed the vein for about 100 feet, the last 40 feet	A shipment of ore to the the ASARCO smelter in Salt Lake City, UT in 1926 contained 0.645 ounce gold per ton, 19.26 ounce silver per ton, 15.4 percent lead, and 0.52 percent copper (Enoch Stewart, written commun., 1928). One sample (SFM 031) of limonite-stained, vuggy quartz was taken by USBM personnel

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				commun., 1928).	of which was mineralized to a width of 7 feet. Three other adits, including one 160 feet long, are on the property (Enoch Stewart, written commun., 1928). According to USBM records, significant amounts of lead and small amounts of gold and silver were produced between 1911 and 1930.	during 1995. It assayed 0.36 ppm gold, 453 ppm copper and more than 1.0 percent lead.
253	SOUTH FENSTER PROSPECT	45 12 52 N	113 56 14 W	Vuggy quartz veins in granite contain malachite and blebs of limonite. The veins generally strike N 30 W and dip 80 NE.	One 30-foot long adit.	During 1995, USBM personnel took one sample (SFM 032) of malachite- and limonite-stained quartz from a stockpile. It assayed 1.22 ppm gold, 100 ppm silver, 2007 ppm copper, 4763 ppm lead, and 707 ppm antimony.
254	PROSPECT	45 12 01 N	113 55 55 W	Shown as a thorium and rare-earth element prospect by Loen and Pearson,(1989, No. 51).	No data available.	No data available.
255	MORNING GLORY PROSPECT	45 11 43 N	113 57 07 W	In a steeply dipping shear zone that trends N 05 W, quartz bands in dark gray quartzite contain stringers and pods of calcite and barite. Euhedral wulfenite crystals line vugs in the quartz.	One caved adit is likely less than 100 feet long; several prospect pits are both above and below the adit.	During 1995, USBM personnel took one sample (SFM 008) of quartz from the dump of a caved adit. It assayed 1.34 ppm gold, more than 300 ppm silver, 600 ppm copper, 6400 ppm lead, and 475 ppm antimony.
256	G. W. OLIVER MINE	45 11 03 N	113 56 23 W	Lignite is interlayered with Tertiary lakebeds (Brown, 1940, p. 164)	Abundant plant fossils are reported (Brown, 1940, p. 164).	No data available.
257	POLLARD MINE	45 10 52 N	113 56 28 W	Lignite beds to 18 feet thick are in Tertiary sandstone and shale (Bell, 1904, p. 102).	One thousand tons of lignite were reportedly sold to local consumers in 1903 (Bell, 1904, p. 103)	The lignite is relatively low in ash and moisture content (Bell, 1904, p.103).
258	ANDREWS MINE	45 10 41 N	113 56 01 W	Quartzite of the Yellowjacket Formation is shown in the vicinity by Loen and Pearson (1989)	Two carloads of smelting ore carrying gold, silver, and lead were shipped during 1911 (Bell, 1912, p. 89)	No data available.
259	EDWARDS MINE	45 10 29 N	113 57 09 W	Lignite in a bed 18 feet thick occurs in Tertiary sandstone and shale (Bell, 1904, p.102)	The lignite was sold in local markets (Bell, 1904, p. 103).	The lignite is relatively low in ash and moisture content (Bell, 1904, p.103).
260	WILLIAMS CREEK	45 05 43 N	114 05 11 W	Alluvium consisting of poorly-sorted quartzite with small amounts	The pit at Williams summit covers about 10 acres and is 5 feet	Resource estimated at more than 40,000 cubic yards (U.S. Forest

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	SUMMIT BORROW AREA			of granitic and metasedimentary rock is used for construction material.	deep.	Service files).
261	COPPER MOUNTAIN MINE AREA	45 06 20 N	113 59 38 W	On the flank of an east-plunging anticline in quartzite is a system of mineralized bedding plane fractures. The system trends north, dips vertically, and contains quartz with hematite, pyrite, chalcopyrite, pyrite, malachite, and bornite.	In a 1,000-foot-long, 100-foot-wide area, are a dozer cut 100 feet long, 50 feet wide, and 80 feet high, three adits, a decline, and connecting dozer roads. The underground workings, including stopes to the surface, probably total about 1,000 feet. Some of the dozer roads probably were made to access drill sites. Production may have been included with that from the nearby Tormay mine. Part of the mine area is patented.	Two samples were taken during a USBM visit in 1994. The first sample (SFC 003), a grab sample of mineralized quartz from the dump of the adit at the south end of the system, assayed 0.340 ppm gold, 14 ppm silver, and more than 2.0 percent copper. The second sample (SFC 005), a grab sample from the dump of the decline on the north end, contained 0.047 ppm gold, 43 ppm silver, and more than 2.0 percent copper.
262	TORMAY MINE	45 06 21 N	113 59 04 W	A system of mineralized bedding plane fractures in quartzite is along the flank of an east-plunging anticline (Anderson, 1956, p. 91). The quartz- and hematite-filled fractures strike N 30-70 W and dip about 55 NE; ore shoots several feet thick contain chalcopyrite, pyrite, chalcocite, and malachite.	The Tormay mine, also called John Tormey group, is covered by four patented mining claims. Anderson (1956, p. 90) reported that the mine was located by John Tormey prior to the 1920's. First shipments of handsorted ore were made between 1918 and 1922. A mill was constructed on Perreau Creek in 1923 and connected to the mine by an aerial tram; no remains of the mill were found during a USBM visit in 1994. Workings cover an east-trending area about 1 mile long and a quarter mile wide. Ross (1925, p. 32) described two principal adits: the Greenhorn about 385 feet long and the Rattl-esnake about 300 feet long, each with additional crosscuts and stoping. Several shorter adits are across the shallow drainage to the north. Shipment of concentrates	A sample (SFC 004) of mineralized material, taken during a visit in 1994 by USBM personnel, assayed 0.17 ppm gold, 14 ppm silver, and more than 2.0 percent copper. One sample (SFM 037) from the upper workings on the north side of Tormey Gulch contained 0.380 ppm gold, 52 ppm silver, and more than 2.0 percent copper.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					began in 1924 and continued until 1925. Production of hand-sorted ore totaled 213 tons that yielded 80,161 pounds of copper, 0.69 ounce of gold, and 116 ounces of silver (Anderson, 1956, p. 90). Concentrate production was not recorded.	
263	PERREAU CREEK BORROW AREA	45 06 07 N	113 58 27 W	Dark gray quartzite.	Talus slopes serve as a source of broken rock.	Resource estimated at more than 130,000 cubic yards (U.S. Forest Service files).
264	TENMILE CREEK PROSPECTS	45 01 37 N	113 53 09 W	Precambrian quartzite of the Yellowjacket Formation is traversed by northwest-trending faults (Loen and Pearson, 1989). Malachite and limonite-filled shears, roughly parallel to bedding in the quartzite, strike N 45 W and dip 50 NE.	Anderson (1956, p. 91) describes a "number of old cuts" about which little is known. About 20 bulldozer trenches and pits are in an area of about 80 acres; at least four trenches 90 to 165 feet long are inside the forest boundary.	During 1995, USBM personnel took two samples (SFM 060-061) from the prospect. They assayed as much as 0.110 ppm gold, 8 ppm silver, 150 ppm cobalt, and 4.37 percent copper.
265	TWELVEMILE CREEK	45 00 44 N	113 53 55 W	Dark gray, locally phyllitic quartzite is used for road surfacing.	Mostly undeveloped talus along Twelvmile Creek road.	Resource estimated at more than 29,000 cubic yards (U.S. Forest Service files).
266	POPE SHENON MINE	45 04 32 N	113 51 22 W	Veins along at least three shear zones transect quartzite and argillite of the Yellowjacket Formation. The veins strike generally N 75 E but trend more to the east and southeast in places; dips are steeply north. Veins are mostly less than 10 feet thick but range to 20 feet. The main or south vein is exposed for about 600 feet along strike and more than 700 feet along dip (Anderson, 1956; USBM files). Primary ore minerals are chalcopyrite, pyrite, delafossite, and bornite; oxidized segments contain malachite, azurite, and chalcocite. The veins contain small amounts of quartz (Anderson, 1956, p. 83).	Discovered in the early 1890's, the mine began production in 1908 and continued intermittently through 1975. Through 1955, at least 2.7 million pounds copper along with some silver, gold, lead, and zinc were produced (Anderson, 1956, p. 79). Underground development consisted of workings on seven levels totalling more than 4,200 feet in length, the longest at the mill or 600 level. A 50 ton per day chloridizing mill, built in 1919 to treat the oxidized copper ore, was soon replaced by a flotation mill to concentrate the sulfide ore; by 1945, all milling equipment had been removed (Anderson, 1956, p.	Between 1908 and 1975, recorded production totalled 500 ounce gold, 24,725 ounce silver, 4,594,951 pounds copper, 22,107 pounds lead, and 14,683 pounds zinc (Mitchell, 1995d, p.19). Most of the ore mined carried from 2.5 to 6 percent copper with some small bodies containing 10 to 20 percent; mill concentrates contained about 25 percent copper. Crude ore generally contained less than 1 ounce silver and 0.01 ounce gold per ton (Anderson, 1956, p. 85).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					79). Development was renewed with an Office of Minerals Exploration project in 1969-70 when 1,658 feet of drifting and crosscutting was done on a new level 212 feet below the 600 level (USBM files). More than 10,000 tons of ore was mined after 1955 and shipped directly for smelting. The last recorded mining took place during the late 1970's (Mitchell, 1995d, p.19).	
267	PORTERFIELD PROSPECT	45 03 00 N	113 50 45 W	The prospect is in Precambrian quartzite near a contact with rocks of the Challis Volcanics. A sheared, brecciated zone that strikes N 65 W and dips 55 SW, contains malachite and limonite (Anderson, 1956, p. 91).	An adit is about 190 feet long; less extensive workings are above the adit (Ross, 1925, p. 37). Later work is reported, but extent is unknown (Anderson, 1956, p. 91).	USBM personnel visited the prospect during 1995 and took one sample (SFM 012). It assayed 0.340 ppm gold, 5 ppm silver, 58 ppm cobalt, and 5.87 percent copper.
268	PROSPECT	45 02 17 N	113 50 00 W	Quartzite of the Precambrian Yellowjacket Formation is in contact with rocks of the Challis Volcanics (Loen and Pearson, 1989). Nearby deposits are mainly vein-type, copper-bearing zones along shears and faults.	A mine is shown on U.S. Forest Service maps of the area. One small prospect pit was found in 1995.	No data available.
269	HARMONY MINE	45 00 56 N	113 49 41 W	Anderson (1956, p. 88) reported more than six mineralized shear zones in quartzite. Bedding in the quartzite strikes N 30 W and dips less than 15 SW. Mineralized zones trend northwesterly and dip southwesterly but show considerable variation in both strike and dip. In the main workings, the shear zone is split into two mineralized zones that diverge to the northwest, stiking N 30 W and N 40 W with an average dip of 65 SW. These zones have	The deposit was discovered about 1870, but significant development didn't begin until 1916 (Mitchell, 1995b, p.1). Crude ore was shipped until 1919 when a gravity mill was installed (Anderson, 1956, p. 87). The mill was converted to flotation in 1922 (Gardner, 1930a, p. 3); an aerial tram connected the mill to the workings. Four mining claims and a millsite are patented. The principal workings consist of more than 10,485 feet of underground workings on seven	Recovery from ore produced suggests a grade of 1.9 percent copper. During 1995, USBM personnel took one sample (SFM 011) of tailings from the impoundment below the mill. It assayed 0.025 ppm gold, 0.15 percent copper, and 32 ppm cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				yielded the bulk of production; they extend at least 800 feet vertically and were mined for 230 feet along strike where thickness ranged from 6 feet to more than 10 feet. Chalcopyrite is the main ore mineral although chalcocite and bornite were found in the upper levels (Gardner, 1930a, p. 2). Pyrite is present throughout the mineralized zones.	levels (Mitchell, 1995b, p.11). Upper adits to the west and southeast contain 500 and 900 feet of development respectively; several pits and trenches are also on the claims. Production continued intermittently through 1931. Between 1916 and 1931, production totalled 47,826 tons of ore which yielded 38 ounces gold, 2,050 ounces silver, and 1,815,353 pounds copper (Mitchell, 1995b).	
270	TWELVEMILE CREEK QUARRY	45 00 01 N	113 52 20 W	Dark gray, locally phyllitic quartzite.	Multi-level rip rap and stone quarry.	Resource estimated at 123,600 cubic yards (U.S. Forest Service files).
271	HAYNES CREEK BORROW AREA	45 00 11 N	113 43 54 W	Rock source for sand and gravel.	Borrow pit	Resource estimated at more than 63,000 cubic yards (U.S. Forest Service files).
272	CLIMAX PROSPECT	44 58 50 N	114 07 13 W	Arsenopyrite veins as much as 6 feet thick transect bedding in phyllite in a zone 500 feet wide.	A series of bulldozer roads expose the mineralized zone; at least two holes were drilled to test the subsurface.	High-grade samples from the veins contained as much as 1 ounce gold per ton, 0.4 percent cobalt, 0.4 percent bismuth, and minor silver (Cohenour and others, 1973, p. 4). Modreski (1983, p. 211) reported 159 ppm nickel. A sample (SFM 053) taken by USBM personnel during 1995 assayed only 25 ppm copper and 22 ppm lead.
273	IRON CREEK COPPER-COBALT DEPOSIT	44 57 44 N	114 06 54 W	In phyllite and quartzite of the Yellowjacket formation, is a system of four exhalative fissure-veins striking N 40-50 W and dipping 60 to 90 NE; nearly parallel to the bedding. The system is 5,000 feet long, over 200 feet thick, and over 800 feet deep. The veins in the system contain quartz, chalcopyrite, pyrite,	The prospect was discovered in 1967 and by 1972, 700 feet of underground excavation and 2,000 feet of drilling had been done (Lowe, 1988; Centurion Gold Ltd, Annual Report, 1988, p. 8). In 1968, 10 tons of ore were shipped to the Anaconda Smelter; further shipments were refused due to high alumina content. The three adits	Centurion Gold Ltd. (1988, p. 8) reported 32 million tons grading 0.52 percent copper and 0.06 percent cobalt. A grab sample (SFC-009) taken during a USBM visit in 1994 contained 0.413 percent copper and 0.241 percent cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				arsenopyrite, and secondary copper and cobalt minerals (Lowe, 1988).	along Iron Creek road are open.	
274	RIPPER PROSPECT	44 57 17 N	114 07 08 W	Magnetite bands are in quartzite along the southern margin of the Iron Creek copper-cobalt zone. The bands are swirled and folded and contain isolated stringers of fine-grained pyrite and arsenopyrite. The magnetite zone trends about east-west, crossing the road which exposes its thickness of about 45 feet.	No excavations were found during a 1995 USBM examination; claim posts mark the site.	One sample (SFM 054) taken by USBM personnel during 1995 contained 0.013 ppm gold, 410 ppm cobalt, and 186 ppm arsenic.
275	JACKASS CREEK PROSPECT	44 57 07 N	114 06 09 W	In sericitic and silicified quartzite and phyllite of the Yellowjacket Formation is a system of mineralized fractures trending N 40 E and dipping 20-30 NW and SE. The system is more than 30 feet thick, 300 feet wide, and contains limonite-pyrite, cobaltite and arsenopyrite masses and disseminations along bedding plane fractures.	The mineralized structure is exposed in a road cut; there are no obvious workings.	A 30-foot-long chip sample (SFC-010) was taken by USBM personnel during 1994. It assayed 590 ppm cobalt and 167 ppm copper. Another sample (SFM 052) was taken in 1995. It assayed 200 ppm copper and 580 ppm cobalt.
276	BADGER BASIN NORTH	44 56 03 N	114 02 20 W	The stratiform copper deposit is along the same horizons that host the Blackpine mine. Chalcopyrite, the principal ore mineral, occurs as massive, exhalative, fissure-fillings and replacements along fracture zones in quartzite, phyllite, and volcanic rocks. Three northeast-trending zones, ranging in width from 10 to 60 feet have been exposed (Nisbet, Formation Capital Corporation., personal communication, 1992). The zones also contain quartz, glaucondot, pyrite, and arsenopyrite.	There are few prospect pits and trenches. Part of 65 Formation Capital claims (1,300 acres) cover the prospect.	Nisbet (Formation Capital Corporation, personal communication, 1994) reported that the three zones exposed average 1 percent copper. He also reported that chip samples, 3.5 to 7 feet in length, assayed as much as 16.2 percent copper, 7.0 ounces silver per ton, and 0.02 ounces gold per ton. Resources appear to be significant.
277	BADGER BASIN SOUTH	44 55 40 N	114 01 58 W	The stratiform copper deposit is along the same horizons that	There are two adits and a few prospect pits and trenches. Part	Nisbet (Formation Capital Corporation, personal

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				host the Blackpine mine. Chalcopyrite, the principal ore mineral, occurs as massive, exhalative, fissure-fillings and replacements along fracture zones in quartzite, phyllite, and volcanic rocks. Three northeast-trending zones, ranging in width from 10 to 60 feet have been exposed (Nisbet, Formation Capital Corp., personal communication, 1992). The zones also contain quartz, glaucondot, pyrite, and arsenopyrite.	of 65 Formation Capital claims (1,300 acres) cover the prospect.	communication, 1994) reported that the three zones exposed average 1 percent copper. He also reported that chip samples, 3.5 to 7 feet in length, assayed as much as 16.2 percent copper, 7.0 ounces silver per ton, and 0.02 ounces gold per ton. Resources appear to be signigicant.
278	RAMBLING ROSE	44 55 09 N	114 03 41 W	Narrow quartz veins in phyllite contain sparse, mostly oxidized pyrite.	A bulldozer cut cuts diagonally up the slope from the main access road for about 2,000 feet.	One sample (SFM 055) taken during 1995 by USBM personnel contained no appreciable metal content.
279	BUSTED JEEP	44 47 20 N	114 10 27 W	Pea-green opal fills irregular vesicles and fissures in gray-brown andesitic basalt. Vesicles are angular and flattened into planar flow lamellae; some, especially toward the top of the flow, are filled with banded white to colorless agate. The basalt also contains rounded mafic xenoliths.	The opal has been used in jewelry and other lapidary products (John Cantlin, personal communication, 1995).	Green opal for additional production is available, mostly in pieces less than 1 inch thick.
280	TINCUP	44 45 27 N	114 09 12 W	Fractures in brown to gray dacite tuff are filled with agate. Fine veinlets are numerous; one vein is as thick as 1.4 feet. Most agate is colorless to white, but parts of larger veins are pink, red (sparse), and green (very sparse). The thickest vein is exposed for at least 50 feet along a N 70 E trend.	Agate has been produced for lapidary products.	The larger fissures are sources of agate for lapidary products or small-scale raw stone sales.
281	BLACK ANGUS IRON	44 50 01 N	113 57 44 W	Several irregular specularite replacements are in siltite and quartzite. Chlorite and quartz veinlets accompany the specularite. The replacements are exposed	Several small pits, trenches, and cuts were found during a USBM visit (Cather and Rains, 1988, p. 42). Soregaroli (1961, p. 47) reported that diamond drilling had	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				intermittently over a one-square-mile area. The largest measures 50 by 150 feet (Cather and Rains, 1988, p. 42).	been done.	
282	BESSEMER	44 50 11 N	113 57 02 W	Several irregularly shaped replacement masses of specular hematite occur in siltite and fine-grained quartzite. Chlorite and veinlets of quartz occur with the hematite. The masses are exposed intermittently over an area of about one square mile. The largest is about 50 feet thick and is exposed for about 150 feet along strike (Cather and Rains, 1988, p.42). The Black Angus Iron and East McKim Iron may be part of the Bessemer.	Several pits, trenches, and open cuts (Cather and Rains, 1988, p.42).	No data available.
283	EAST MCKIM IRON	44 50 05 N	113 56 37 W	Specular hematite and magnetite fill shear zones in phyllitic quartzite. Fine-grained specular hematite predominates; magnetite is coarsely crystalline in isolated pods and bands. The zones are exposed for as much as 30 feet in length and 7 feet in width. Quartzite is chloritized and bleached along the margins of the shears. Some shears consist of as much as 50 percent quartz.	At least 3 shallow bulldozer trenches are inside the Salmon National Forest boundary; trenches just outside the forest are mostly reclaimed.	During 1995, USBM personnel took two samples (SFM 056-057). They assayed as much as 180 ppm cobalt and 120 ppm tungsten.
284	BIRTHDAY PROSPECT	44 52 18 N	113 53 37 W	Quartz veins, as thick as 0.5 inch, follow the bedding and cleavage in phyllitic quartzite. The bedding strikes N 15 W and dips 50 NE; the cleavege strikes N 60 W and dips 59 SW. The veins contain chalcopyrite and chrysocolla. Magnetite occurs in the host rock as well as in the quartz veins (Soregaroli, 1961, p. 48).	Soregaroli (1961, p. 48) reported that the Birthday claim was located by William Corbett in 1952 and the working consisted of a trench.	No data available.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
285	BASIN-MCKIM CREEK	44 49 51 N	113 51 47 W	No mineralized structure is exposed. However, the presence of quartz float in a trench and on the surface suggests that a quartz vein was the target. The vein, as much as 2 feet thick and composed of magnetite and hematite, probably had a trend of N 50 W (Anderson, 1961a).	The Snowshoe group of 10 claims, located in 1958 by Alvin Vezina, is near the head of the most southerly branch of Basin Creek about a mile southeast of the eastern end of Basin-McKim Creek iron zone. A bulldozer cut is at the Snowshoe property (Anderson, 1961a).	No data available.
286	H AND R MINE	44 47 06 N	113 52 16 W	No mineralized structure is exposed. Quartz veins aparently are along the contact between quartzite and an altered basaltic dike. Quartz on working dumps contains chalcopyrite, malachite, and chrysocolla (Cather and Rains, 1988, p. 42).	An open cut is 20 by 100 feet; six caved adits are each estimated to be less than 100 feet long. About 15 tons of gold-copper ore were produced in 1890 (Cather and Rains, 1988, p. 42).	Two quartz samples taken during a USBM examination contained copper--as much as 7.8 percent. A third sample contained 0.11 percent thorium (Cather and Rains, 1988, p. 42).
287	COTTON-WOOD BUTTE PROSPECTS	45 17 49 N	114 46 24 W	Numerous quartz veins transect gneissic granite. The veins trend northwest, dip northeast and southwest, are as thick as 5 feet, and contain pyrite (Cater and others, 1973, p. 326).	Local residents, packers, and prospectors have reported occurrences of galena and molybdenum on talus slopes in the vicinity of Cottonwood Butte. Claims have been recorded; however, no economic minerals or evidence of claims were seen (Cater and others, 1973, p. 326).	Samples of vein and wallrock, taken during a USBM examination (Cater and others, 1973, p. 328), had as much as 0.4 ounce silver per ton.
288	TED'S GROUP PROSPECT AREA	45 15 39 N	114 47 38 W	Three quartz veins transect gneissic intrusive rocks and tactites. One vein, trending N 48 E and dipping 60 NW in a tactite zone, is as thick as 2.5 feet, at least 500 feet long, and 200 feet deep. It is mainly massive quartz with hematite. The second vein, in tactite and intrusive rocks, strikes N 78 E, dips vertically, is as thick as 1.5 feet, more than 90 feet long, and 50 feet deep. This vein is mainly quartz with iron- and manganese-stain, and hematite and limonite pseudomorphs after pyrite. The third quartz vein, sim-	The Ted's Group prospect area is about 1.25 mile due west of Stoddard Lake. Fourteen mining claims were located in 1963. There are no workings. The area was examined by the USBM in 1969 in conjunction with an investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 275).	Three samples were taken from weathered surface exposures during the USBM examination (Cater and others, 1973, p. 276). They had as much as trace gold, 0.4 ounce silver per ton, 0.11 percent lead, and 0.04 percent tungsten trioxide.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				ilar to the other two, is in quartz monzonite. It is as thick as 2 feet, more than 60 feet long, and 60 feet deep (Cater and others, 1973, p. 276).		
289	PROCTOR BAR PLACER	45 20 20 N	114 39 46 W	A terrace and stream level placer deposit is partially covered by talus and alluvium.	The placer has been claimed. There are a few small workings on the deposit which is located at the mouth of Proctor Creek.	The placer has an area of about 4 acres and a volume of 145,000 cubic yards. Samples were excavated from three sites during a USBM examination (Cater and others, 1973, p. 328). The samples had trace to $0.014 in gold (at the price of $47.85 per ounce) and 2 pounds of black sand per cubic yard.
290	KITCHEN CREEK BAR PLACER	45 19 29 N	114 38 47 W	Gravel is overlain by alluvial fan material.	The placer has been claimed. There are a few small workings on the deposit which is located at the mouth of Kitchen Creek.	The placer has an area of about 2 acres and a volume of 25,000 cubic yards. Samples were excavated from four sites during a USBM examination (Cater and others, 1973, p. 328). The samples had trace gold and 0.9 pound black sand per cubic yard.
291	MIDDLE FORK PLACER	45 17 52 N	114 35 41 W	Tailings and a little terrace gravel remain.	The placer is located at the mouth of the Middle Fork Salmon River. Although there is no record of production, the deposit is nearly depleted.	The placer has an area of about 6 acres and a volume of 500,000 cubic yards. Four sites were sampled during a USBM examination (Cater and others, 1973, p. 328). The samples had trace to $0.684 in gold (at a price of $47.85 per ounce) and 1.5 pounds of black sand per cubic yard.
292	GARDEN CREEK PLACER	45 18 54 N	114 24 20 W	The Garden Creek deposit consists of about 35 feet of stream gravel and overlying alluvium. The gravel lies on gneissic bedrock (Cater and others, 1975, p. C23).	The deposit, located near the mouth of Garden Creek, is on the 26.9-acre Bear patented placer claim (Cater and others, 1975, p. C23).	Samples were taken from two trenches dug during a USBM examination (Cater and others, 1975, p. C24). The samples contained less than $0.02 in gold per cubic yard at a price of $100 per troy ounce. A pan

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						sample had less than $0.06. The placer contains at least 430,000 cubic yards of gravel.
293	PRETTY PLACER	45 18 26 N	114 23 30 W	The gravel at the mouth of Pretty Creek is as thick as 10 feet and consists mainly of quartzite and granitic rock. It rests on quartzite with foliation perpendicular to the stream flow.	Pretty placer is within the Panther Creek placer area (Salmon River to Leacocks) described by Lorain and Metzger (1939, p. 63). The placer was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest. Some small overgrown placer workings were found.	No data available.
294	BEAR GULCH PLACER	45 18 20 N	114 23 32 W	At Bear Gulch is an alluvial fan covering 12.4 acres (Cater and others, 1975, p. C37).	There is some evidence of past mining activity.	Two sites were sampled during a USBM examination (Cater and others, 1975, p. C37). Both were in alluvium and contained traces of gold. The deposit is estimated to contain nearly 390,000 cubic yards.
295	SAGEBRUSH PROSPECT	45 16 36 N	114 26 22 W	A prospect pit is on a limonitic fracture in granitic gneiss (Esparza and others, 1985).	The Sagebrush prospect is about 1/4 to 1/2 mile north of Sagebrush Lookout. Workings consist of a prospect pit which was examined by the USBM in 1982 in conjunc-tion with the investigation of the mineral resources of the Frank Church River of No Return Wild-erness (Esparza and others, 1985).	A grab sample (E10) of limonite-stained, fractured granite contained 7 ppm cobalt and 8 ppm nickel (Esparza and others, 1985).
296	DOME RIDGE PROSPECT	45 15 53 N	114 27 00 W	A system of limonitic fractures and veins transect biotite schist. A vein exposed near a prospect pit is 3.2 feet thick, strikes N 20 E, dips vertically and is composed of quartz with limonite and copper staining (Esparza and others, 1985).	One prospect pit was found about 1/2 mile southwest of Sagebrush Lookout. The prospect was exam-ined by the USBM in 1982 incon-junction with the investigation of the mineral resources of the Frank Church River of No Return Wild-erness (Esparza and others, 1985).	Four samples (E 11-14) were taken during the USBM examination. They contained minor amounts of copper, silver, lead, zinc, cobalt, nickel, and molybdenum.
297	RANCHERIO CREEK PROSPECT	45 15 48 N	114 24 52 W	In schistose quartzite, intruded by pink and gneissic granite, are carbonate veinlets that are	The prospect area extends from the confluence of Rancherio and Clear Creeks north into the headwaters of	Seven samples (E 23-29), taken during the USBM examination, contained as much as 50 ppm

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	AREA			slightly radioactive. The granitic rocks are malachite stained.	Dry Gulch. The area was examined by the USBM in 1982 in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Esparza and others, 1985).	copper, 195 ppm zinc, and anomalous amounts of thorium.
298	CLEAR CREEK NO. 1 PLACER	45 15 02 N	114 24 52 W	The placer deposit is probably located near the confluence of Rancherio Creek with Clear Creek (Cater and others, 1975, p. C39).	The Clear Creek No.1 placer claim was located in 1961. At the claim is a sluice box and the ruins of a shed (Cater and others, 1975, p. C39).	A sample, taken of the material in the sluice box during a USBM examination (Cater and others, 1975, p. C39), contained two small flakes of gold. Reconnassiance panning in the vicinity failed to reveal the source of the gold.
299	COUGAR CREEK PROSPECT	45 15 48 N	114 23 08 W	Limonite is along the sheared and brecciated contact between granitic rocks and biotite schist.	The Cougar prospect is on the north side of Clear Creek about 3,000 feet downstream from Cougar Creek. It was examined by the USBM in 1982 in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Esparza and others, 1985).	Two samples (E 32 and 33), taken during the USBM examination, contained as much as 100 ppm copper, 38 ppm nickel, and 17 ppm cobalt.
300	BIG CREEK HOT SPRINGS	45 18 25 N	114 20 17 W	At least three hot springs occur at about the 4,250 foot elevation on Big Creek. Deposits of travertine have built up around the vents.	A small earth dam has been built to create a pond used by bathers.	According to Young and Mitchell (1973), the springs have a flow of 75 gallons per minute and a temperature of 93 degrees Centigrade. Other data include dissolved solids (calculated), 727 mg per liter; pH, 7.5; and specific conductance, 1,010.
301	COPPER KING MINE	45 18 36 N	114 16 54 W	The mine is on a 40-foot-wide zone of replacement quartz veins in quartzite (Umpleby, 1913, p. 155). The principal vein strikes N 45 E, dips 75 NW, averages 2 feet thick, and contains pyrite, chalcopyrite, chalcocite, and magnetite. The quartzite strikes N 25 W, dips 45 NE, and contains	Umpleby (1913, p. 155) reported that the Copper King Mine, located at the head of Copper Canyon, had 500 feet of workings. According to USBM records, a small amount of copper-bearing ore was shipped to Butte, MT.	A select sample (SFJ 009) taken by USBM personnel during 1994 assayed 0.25 ppm gold and more than 2 percent copper. The sample consisted of heavily malachite-stained, quartz-garnet schist with chalcopyrite and chalcocite and was taken from a small stockpile.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				garnet, epidote, and magnetite.		
302	LOWER PANTHER CREEK PLACER	45 17 45 N	114 21 25 W	There are moderately large deposits of both stream and bench gravels along the lower part of Panther Creek. The largest deposits of stream gravel begin about 1.25 miles above the confluence of Panther Creek with the Salmon River and occur at intervals for about 5 miles upstream. The stream gravel deposits are as wide as 500 feet and as long as 2.5 miles. The most important bench gravel deposits along the creek are between Hot Springs and Beaver Creeks (Lorain and Metzger, 1939, p. 63-64).	The bench gravels along lower Panther Creek have been worked to some extent at two places, but no production has been recorded from the stream gravels (Lorain and Metzger, 1939, p. 63). In 1938, a small-scale hand mining operation was conducted on a bench near the mouth of Hot prings Creek. Rich material was encountered. The bench deposit on the east side of Panther Creek and just north of Beaver Creek is the only one worked to any extent on Panther Creek. A total of 4,500 cubic yards was mined by hydraulic methods (Lorain and Metzger, 1939, p. 64).	No data available.
303	CLEAR CREEK PLACER	45 17 36 N	114 20 59 W	The deposit consists of bench gravel, about 50 feet thick, and extensive stream gravel (Cater and others, 1975, p. C39).	Part of the placer is privately owned (Homestead Entry Survey 371) (Cater and others, 1975, p. C39). There are no workings.	Samples from two sites, excavated on the bench during a USBM examination (Cater and others, 1975, p. C39), had as much as $2.69 in gold per cubic yard at a price of $100 per ounce. The bench contains more than 1 million cubic yards and the stream deposits contain several million cubic yards of gravel.
304	MEAN GREEN PROSPECT	45 16 53 N	114 19 13 W	The claim group is underlain by augen gneiss containing lenses and veins of quartz.	Two pits were found.	No data available.
305	BEAVER CREEK PLACER	45 16 39 N	114 19 14 W	Gravel, as thick as 80 feet, occurs along the stream channel and in benches along Beaver Creek. Depressions in the gneiss bedrock contain pay streaks (Umpleby, 1913, p. 149). The gravel deposits mined near Rood Camp, located about 5.5 miles upstream from Panther Creek, are as wide as 150	Umpleby (1913, p. 149) reported that the placers, near the confluence of Beaver Creek with Panther Creek, had been worked intermittently for a number of years, producing somewhat less than $100,000. Most of the production came from a terrace, worked by drift mining methods.	Gravel deposits are large along the lower 2 to 3 miles of Beaver Creek.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				feet and as deep as 8 feet. The gravel at the Rood mine contained a few boulders over 1 foot in diameter. The gold recovered was coarse, up to 0.5 ounce in size (Lorain and Metzger, 1939, p. 68).	The ground along lower Beaver Creek is patented. Lorain and Metzger (1939, p. 67) reported that in 1928 and 1937, pay streaks in the Beaver Creek stream gravel deposits were mined at the McLaughlin and Rood mines, located along the upper part of the creek. Also, a test shaft was excavated to bedrock near the mouth of the creek. At the McLaughlin, small benches along the south side of the creek were worked by small-scale methods. At the Rood mine, 7,200 feet of bedrock was ground sluiced.	
306	SUNBEAM PLACER	45 17 05 N	114 17 18 W	The Sunbeam placer deposit is located on Beaver Creek, about 2.5 miles upstream from its confluence with Panther Creek.	A 30-foot-deep shaft and a partially caved adit were found. During 1995, the adit was being renovated.	No data available.
307	MAYFLOWER	45 16 43 N	114 17 10 W	The prospect consists of replacements in breccia zones in siliceous schists (Bennett, 1977, p. 45). The zones trend N 30 W and the replacements contain quartz, garnet, epidote, magnetite, pyrite and chalcopyrite (Umpleby, 1913, p. 155).	The Mayflower is covered by three patented mining claims. Umpleby (1913, p. 155) reported that little work had been done.	No data available.
308	OUR MOTHER'S DAY	45 17 00 N	114 15 43 W	A silicified fault zone trends N 05 E and dips 60 NW in quartzite. The quartz veins and lenses in the zone contain pyrite. Limonite staining is prevalent.	Two adits explore the fault zone.	One select sample (SFJ 060) of quartz containing pyrite was taken by USBM personnel during 1995. It assayed 4.88 ppm gold, 21 ppm silver, 345 ppm copper, and 0.28 percent zinc.
309	STODDARD CREEK PLACER	45 14 09 N	114 40 01 W	The placer consists of alluvium-covered stream gravel.	The fan and terrace at the mouth of Stoddard Creek was claimed in 1956. Workings consist of a few small pits. No doubt somemining was done along the river edge and the resulting workings obliterated by high water. The placer was	The placer has an area of about 2 acres and contains 65,000 cubic yards of gravel. Samples taken from a pit, excavated during the USBM examination, had trace gold and 1 pound blacksand per cubic yard (Cater and others,

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	1973, p. 287).
310	NUGGET CREEK BAR PLACER	45 12 38 N	114 41 02 W	The deposit consists of stream gravel that is overlain by alluvium and talus. The stream gravel contains sparce lenses of black sand and flood gold.	The placer deposit, located at the junction of Nugget Creek and Middle Fork Salmon River, was claimed in the past and a few prospect pits excavated. No doubt some mining has been done along the river edge and the workings obliterated during high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 2 acres and contains 16,000 cubic yards of gravel. Samples from a site excavated during the USBM examination had as much as $0.007 in gold per cubic yard (at a gold price of $47.85 per ounce) and 1.2 pounds black sand per cubic yard (Cater and others, 1973, p. 287).
311	PARROT CAMP PLACER	45 11 25 N	114 41 49 W	The deposit consists of a stream bar composed of sand and gravel. The gravel making up the bar contains sparce lenses of flood gold and black sand.	The deposit, located on the east side of the Middle Fork Salmon River between Ship Island and Parrot Creek, was claimed in the past and mined on a small scale. USBM records list production of a small amount of gold in 1945. The workings that resulted from the mining were obliterated by high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about an acre and contains 8,000 cubic yards of gravel. Samples, taken from a site excavated during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.027 in gold per cubic yard (at a price of $47.85 per ounce) and 2.1 pounds black sand per cubic yard.
312	ELKHORN DIVIDE PROSPECT	45 14 11 N	114 27 38 W	An 8-foot-wide quartz vein strikes N 10 W in biotite schist (Esparza and others, 1985).	The Elkhorn Divide prospect is along the ridge between Elkhorn and Clear Creeks, about one mile west of the junction of the two creeks. A prospect pit was examined by the USBM in 1982 in conjunction with the investigation of the mineral resources of the	An 80-foot-long chip sample (E 15), taken during the USBM examination, contained no significant amounts of metal.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Frank Church River of No Return Wilderness (Esparza and others, 1985).	
313	CLEAR CREEK-ELKHORN CREEK PROSPECT	45 14 18 N	114 26 07 W	The prospect area is along the northeast extension of the Blackbird cobalt-copper zone. At Elkhorn Creek, layers of biotite schist, quartzite, and gneiss are intensely folded and fractured. East of Elkhorn Creek, the fractured rocks trend northwest, dip northeast, and are erythrite, azurite, and malachite stained. Fresh rock contains tourmaline and cobaltite (Esparza and others, 1985, p. 15; Olson, 1985, p. 86).	The prospect is on Elkhorn Creek near its confluence with Clear Creek. Discovered in the late 1800's, the most recent exploration was conducted by Noranda Exploration in 1987. Prospect pits and trenches are scattered for about a mile along a northwest trend, extending from Deadhorse Creek up Elkhorn Creek. The prospect was examined by the USBM in 1982 in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Esparza and others, 1985, p. 14; Olson, 1985, p. 86).	Six samples (E 16,17 and 19-22), taken from weathered outcrops during the USBM examination, contained as much as 0.16 percent cobalt and 0.175 percent copper. The samples were from three outcrops which are representative of a northwest-trending zone that appears to encompass an area about 0.5 mile long and 0.25 mile wide.
314	LICK CREEK RIDGE PROSPECT	45 11 43 N	114 25 16 W	The area is underlain by limonitic biotite schist.	The prospect is near the summit of the divide between Lick and Deadhorse Creeks. It was examined by the USBM in 1982 in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Esparza and others, 1985).	A sample (E 39), taken during the USBM examination, contained anomalous amounts of copper, cobalt and nickel.
315	MARY ANN MINE	45 10 34 N	114 24 22 W	An adit exposes a zone of malachite-, erythrite-, cobaltite-, arsenopyrite-, and quartz-bearing rock that is 4 feet thick. The zone trends N 15 W and dips 45 NE along the contact between a quartz biotite schist hangingwall and quartzite footwall (Thornberry and Koval, 1980, 1980).	The Mary Ann mine is a few hundred feet north of the junction of Big Deer and Lick Creeks. The principal working is a 55-foot-long adit that trends N 15 E. The mine was examined by the USBM in 1982 in conjunction with the mineral investigation of the Frank Church River of No Return Wild-erness (Esparza and others, 1985). It was also examined by the	Five samples (4001-4007) were taken by Inspiration evelopment Company during their examination (Thornberry and Koval, 1980). The mine lies along the northwest extension of the Blackbird cobalt-copper zone.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Inspiration Development Company (Thornberry and Koval, 1980). USBM records list the production of small amounts of gold and silver in 1940.	
316	BONANZA COPPER PROSPECT AREA	45 10 55 N	114 21 55 W	The Bonanza Copper prospect is along the Blackbird cobalt-copper zone which has a general strike of north-northeast near the Blackbird mine, but swings toward the northwest north of Deer Creek. The prospect area is underlain by finely parted, fine-grained, phyllitic quartzite. The mineralized part of the quartzite is at least 1,000 feet long, 250 feet thick, strikes N 30 W, and dips 70-85 NE. The quartzite is gossany at the surface; at depth are shoots of cobaltite, chalcopyrite, pyrite, pyrrhotite, erythrite, and malachite (Shenon and others, 1956, p. 28; Romischer and MacLaren, 1959, Pls 4, and 10-12; Bennett, 1977, p. 44; Esparza and others, 1985).	The Bonanza Copper prospect area is along Indian Creek about a mile upstream from Big Deer Creek. It lies along the northerly extension of the Blackbird cobalt-copper zone. The area was discovered prior to 1900 and prospected for gold and copper. In 1955, a 640-acre area, extending from the Bonanza Copper prospect through the Tinkers Pride prospect to the Gray Copper prospect, was explored for cobalt and copper by underground and surface methods by Idaho Metallurgical Industries, Inc. under DMEA contract (Romischer and MacLaren, 1959). The USBM examined the northern part of the area in 1982 in conjunction with the mineral investigation of the Frank Church River of No Return Wilderness (Esparza and others, 1985). It was visited again in conjunction with the mineral investigation of the Salmon National Forest. Work has also been done by the Black Bird Mining Company and Noranda Exploration. Workings in the Bonanza Copper prospect area (in 1955) included several prospect pits, trenches, adits, three diamond drill holes totaling about 1,800 feet, and connecting dozer roads and trails (Romischer and MacLaren,	Shenon and others (1956, p. 32) reported that two of three diamond drill holes had intersected mineralized shoots. One hole intercepted two shoots, each grading 0.4 percent cobalt and low copper. The shoots were as much as 16 feet thick. The second hole, also with two intercepts representing shoots as thick as 15 feet, assayed as much as 0.58 percent cobalt and 0.8 percent copper. Five samples (E 40-42, 44, and 45), taken during a USBM examination in 1982, had as much as 0.14 ounce gold per ton along with anomalous amounts of copper, cobalt, and nickel. A sample (SFC-74) of quartzite from an adit dump was taken by USBM personnel during 1995. It assayed 1.99 percent copper, 88 ppb gold, and 210 ppm cobalt. A sample (SFC-75) of country rock, taken during the same visit, had no significant metal content.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					1959, Pls 1 and 4).	
317	PAPOOSE PROSPECT	45 10 43 N	114 20 10 W	The adit is in augen gneiss (Bennett, 1977, PL. 2).	The Papoose #1-7 claims, on the divide between Big Deer and Panther Creeks, were located by James L. Swallow in 1966. Bennett (1977, PL 2) shows a north trending adit. The prospect was not visited during the USBM investigation of the mineral resources of the Salmon National Forest.	No data available.
318	TINKERS PRIDE EAST PROSPECT	45 10 12 N	114 20 25 W	The prospect, in phyllitic quartzite, is along the east side of the Blackbird cobalt-copper zone (Romischer and MacLaren, 1959, Pl. 1).	The prospect is about a mile east of the Tinkers pride workings. The area was prospected for gold and copper prior to 1900. In 1955, the Tinkers Pride prospect area, including Tinkers Pride east, was explored for cobalt and copper by Metallurgical Industries, Inc. under DMEA contract (Romischer and MacLaren, 1959). Development consists of a dozer cut and jeep trail. The prospect was not visited by the USBM during the investi-gation of the mineral resources of the Salmon National Forest.	No data available.
319	TINKERS PRIDE PROSPECT AREA	45 10 17 N	114 21 21 W	The prospect area is along the White Ledge shear zone and Blackbird cobalt-copper zone. The cobalt-copper zone has a general strike of north-northeast near the Blackbird mine, but swings toward the northwest north of Deer Creek. It parallels the gradational contact between garnet schist and augen gneiss on the east side and schist, phyllite, and quartzite of the Yellowjacket formation on the west side. The shear zone contains large quartz latite dikes. At the Tinker's Pride the shear zone	The Tinkers Pride prospect area extends over a large area (sections 2-4, 9, and 10, Township 21 North, Range 18 East) along Big Deer Creek near Indian Creek. The prospect area was discovered prior to 1900 and prospected for gold and copper. In 1955, a 640-acre area, extending from the Bonanza Copper prospect through the Tinkers Pride prospect to the Gray Copper prospect, was explored for cobalt and copper by underground and surface methods by Idaho Metallurgical Industries, Inc. under	Diamond drilling at the Tinker's Pride intersected several ore zones. A 5-foot-long drill intercept assayed 5.15 percent copper and 0.76 percent cobalt (Shenon and others, 1956, p. 27; Bennett, 1977, p. 44).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				is over 1,000 feet wide, is gossany at the surface, and has shoots containing cobaltite, chalcopyrite, pyrite, pyrrhotite, cobalt-calcanthite, and erythrite at depth (Bennett, 1977, p. 44).	DMEA contract (Romischer and MacLaren, 1959). Work was subsequently done by the Black Bird mining company and Noranda Exploration Company. Workings are extensive in the prospect area. There are six adits, several dozer roads and excavatons and at least seven diamond drill holes totaling 3,821 feet.	
320	BLACKROCK MILLSITE	45 09 56 N	114 22 03 W	The Blackrock mill is at the junction of Big Deer and South Fork Big Deer Creeks, about 2.3 miles north of the Blackbird mine. Copper and cobalt were precipitated from water percolating through fractures transecting the Blackbird copper-cobalt zone.	At the mill, copper and cobalt were recovered from water flowing from the Blacktail Creek drainage. The water was piped 1.5 miles through 8-inch diameter PVC pipe to the mill. The copper and cobalt were chemically precipitated and collected as a sludge in the bottom of four pits lined with plastic. In addition to the pits, there are two log buildings. During a USBM visit in 1995, made in conjunction with the mineral investigation of the Salmon National Forest, the water piping system was found to have been disconnected during the reclamation work at the Blackbird mine.	A sample (SFC-76) of the sludge in the pits was taken during the USBM visit. The sample assayed 29.23 percent copper and 1.73 percent cobalt.
321	BLACKROCK PROSPECT	45 09 47 N	114 22 03 W	The prospect is in finely parted, argillaceous, phyllitic quartzite along the Blackbird cobalt-copper zone (Romischer and MacLaren, 1959, Pl. 1). The quartzite contains quartz, tourmaline, limonite, sericite, and malachite.	The Blackrock prospect is on the east side of the South Fork Big Deer Creek, about 0.25 mile south of its confluence with Big Deer Creek. The area was prospected for gold and copper prior to 1900. In 1955, the Tinkers Pride prospect area, including the Blackrock, was explored for cobalt and copper by Metallurgical Industries, Inc. under DMEA contract (Romischer and MacLaren, 1959). During a USBM	A grab sample (SFC-77) of quartzite from the adit dump had 96 ppm cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					visit, in conjunction with the investigation of mineral resources of the Salmon National Forest, a 100-foot-long adit was inspected.	
322	GRAY COPPER PROSPECT AREA	45 09 25 N	114 21 12 W	The prospect is in phyllitic quartzite on the east side of the Blackbird cobalt-copper zone. The quartzite trends N 80 W, dips 72 NE, and contains secondary copper minerals (Shenon and others, 1956, p. 28; Romischer and MacLaren, 1959, Pl. 1).	The Gray Copper prospect is about a mile south of the Tinkers Pride workings. The area was prospected for gold and copper prior to 1900. In 1955, the Tinkers Pride prospect area, including the Gray Copper, was explored for cobalt and copper by Metallurgical Industries, Inc. under DMEA contract (Romischer and MacLaren, 1959). Workings at the Gray Copper prospect consist of a few prospect pits and trenches (Shenon and others, 1956, p. 28).	In 1955, a geophysical and geochemical exploration program was conducted (Shenon and others, 1956, p. 28). A self-potential survey disclosed anomalies at depth. Soil samples rarely exceeded 30 ppm combined cobalt and copper.
323	BLACKTAIL CREEK PROSPECT	45 09 15 N	114 21 44 W	In phyllitic quartzite are shoots of cobaltite, chalcopyrite, pyrite, pyrrhotite, cobalt-calcanthite, and erythrite (Romischer and MacLaren, 1959, Pl. 1; Bennett, 1977, p. 44). The deposit lies along the northerly extension of the Blackbird cobalt-copper zone.	The prospect is on a northwest flowing tributary of Blacktail Creek, about 1.2 miles north of the Blackbird mine. It was discovered prior to 1900 and prospected for gold and copper. In 1955, the area was explored for cobalt and copper by Idaho Metallurgical Industries, Inc. (Romischer and MacLaren, 1959). Work has also been done by the Black Bird Mining Company and Noranda Exploration. Workings consist of two north-trending adits. In 1995, as part of the reclamation of the Blackbird mine area, ponds to catch the runoff from the Blackbird mine were installed.	The prospect was not visited during the USBM investigation of the mineral resources of the Salmon National Forest.
324	NICKEL POINT NORTH PROSPECT	45 08 55 N	114 20 24 W	In finely parted, phyllitic quartzite is a poorly exposed zone at least 4 feet thick which contains limonite, erythrite, and quartz. Tourmaline garnet schist crops out nearby.	The Nickel Point north prospect is on the divide between Big and Little Deer Creeks. There is a northeast-trending dozer cut 800 feet long and a jeep road. The prospect was examined in	A 4-foot-long chip sample (SFC-83) was taken across the zone during the USBM visit. The sample had 0.023 ppm gold and 110 ppm cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					conjunction with the investigation of the mineral resources of the Salmon National Forest.	
325	NICKEL POINT PROSPECT	45 08 30 N	114 20 08 W	In finely parted, phyllitic quartzite is a poorly exposed zone of limonite, tourmaline, and quartz at least 2 feet thick.	The Nickel Point prospect is on the divide between Big and Little Deer Creeks. In a 5-acre area are at least five dozer trenches connected by a jeep road. The prospect was examined in conjunction with the investigation of the mineral resources of the Salmon National Forest.	A 2-foot-long chip sample (SFC-82) was taken across the zone during the USBM visit. The sample contained 44 ppm cobalt.
326	DUSTY NORTH PROSPECT	45 08 20 N	114 21 17 W	In phyllitic quartzite, near garnet schist, is a 2-foot-thick zone containing limonite, quartz, and tourmaline. The quartzite and zone trend north and dip 10 W.	The Dusty North prospect is about 0.5 mile north of the Brown Bear open pit at the Blackbird mine. There is a dozer cut 30 feet long. The prospect was examined in conjunction with the investigation of the mineral resources of the Salmon National Forest.	A chip sample (SFC-80), taken across the zone during the USBM visit, contained 36 ppm cobalt.
327	DUSTY PROSPECT	45 08 11 N	114 21 11 W	In finely parted, phyllitic quartzite is a poorly exposed zone containing chalcocite, malachite, erythrite, limonite, tourmaline, and quartz. The zone is at least 15 feet thick, strikes N 10 E and dips 80 SE. Nearby is garnet and tourmaline schist.	The Dusty prospect is about 0.3 mile northeast of the Brown Bear open pit at the Blackbird mine. Development, in a northwest-trending, 1,000-foot-long area, consists of at least 15 dozer cuts, two caved shafts 15 feet apart and probably containing 100 feet of workings, and a connecting jeep road. The prospect was examined in conjunction with the nvestigation of the mineral resources of the Salmon National Forest.	A chip sample (SFC-81), taken across the zone during the USBM visit, assayed 6.56 percent copper, 400 ppm cobalt, and 1.0 ppm gold.
328	ANACONDA	45 08 04 N	114 20 39 W	Poorly exposed is a mineralized zone in tightly-folded phyllitic quartzite trending north and dipping steeply east. Nearby is garnet tourmaline schist. The zone is at	Prospecting and development began between 1900 and 1910. In 1937, F.S. Stevenson relocated claims in the area. In the 1940's, an access road was dozed	A 1-foot-long chip sample (SFC-84), taken across the zone during the USBM visit, had 1.920 ppm gold, 0.19 percent cobalt, and 880 ppm zinc.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				least 1 foot thick and contains stringers of quartz, calcite, iron oxide, malachite, cobaltite, chalcopyrite, chalcocite, and pyrite.	from the Blackbird mine to the prospect. During 1951, Northfield Mines, Inc. acquired the Stevenson prospect and in 1952, conducted exploration under a Defense Minerals Exploration Administration contract. The prospect was explored by Formation Capital Corporation in 1995. Development includes a jeep trail, a collapsed cabin, and north-trending adit that has been obliterated by a dozer cut 90 feet long. The adit may have been 100 feet long. The prospect was visited by the USBM in conjunction with the mineral resource investigation of the Salmon National Forest.	
329	SUNSHINE PROSPECT	45 07 48 N	114 21 46 W	Copper and cobalt mineralization occurs in tuffaceous rocks metamorphosed to biotite, garnet, and chloritoid (Nash and Hahn, 1986, p. 10). A zone trending N 20 W is about 1,000 feet long, 200 feet wide, and contains shoots of quartz, gossan, pyrite, arsenopyrite, chalcocite, cobaltite, malachite, and erythrite.	The Sunshine prospect area, on a ridge between Blackbird and Big Deer Creeks, is along the northwest extension of the Blackbird cobalt-copper zone. Roberts and Vhay (1951) reported that in 1951, application was made by the claim owners to obtain DMEA assistance to deepen a shaft. As a result of the application, a brief examination was made (DMEA Docket No. 1609). According to Nash and Hahn (1986, p. 10-11), one hole was drilled in the 1950's and 31 more holes were drilled between 1979 and 1981. In 1951, the area was covered by three unpatented mining claims, the Sunshine, Sunshine No. 1, and Sunshine No. 2. Workings consisted of the shaft and a number of dozer excavations. The claims	Grab samples from the dump contained 11.4 percent cobalt and 0.03 ounce gold per ton (Anderson, 1943b, p. 28). A 3-foot-long chip sample (SFC-79) of quartzite, taken during the USBM visit, had 2.23 percent copper, 24 ppb gold, and 91 ppm cobalt. According to Nesbitt (Capital Formation Corp., personal communication, March 10, 1997), reserves are 300,000 tons grading 0.69 percent cobalt, 0.10 percent copper, and 0.024 ounce gold per ton. Additional resources include 2,250,000 tons at approximately the same grade.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					were relocated in 1994 by Formation Capital Corporation and drilling done in 1995. The area was visited by the USBM in 1995 in conjunction with the mineral resource investigation of the Slmon National Forest.	
330	KATHERINE PROSPECT	45 07 49 N	114 21 24 W	Schist on the dump contains iron oxides, sulfides, and quartz (Anderson, 1943b, p. 27).	A caved shaft is on the divide between Meadow and Big Deer Creeks (Anderson, 1943b, p. 27). It was not visited by the USBM during the investigation of the mineral resources of the Salmon National Forest.	No data available.
331	HORSESHOE PROSPECT	45 07 50 N	114 20 47 W	A mineralized zone is poorly exposed in tightly-folded, phyllitic quartzite trending northwest and dipping steeply east. The zone is at least 0.7 feet thick and contains stringers of quartz, calcite, limonite, malachite, cobaltite, chalcopyrite, and pyrite.	The Horseshoe prospect is on the divide between Meadow and Little Deer Creeks about 0.7 mile southeast of the Blackbird mine's Brown Bear open pit. Workings consist of two parallel, N 65 E trending, 110-foot-long dozer pits. The prospect was visited by the USBM in 1995 in conjunction with the mineral resource investigation of the Salmon National Forest.	A 0.8-foot-long chip sample (SFC-85), taken across the zone during the USBM visit, contained 4.460 ppm gold, 7.44 percent copper, 0.20 percent cobalt, 0.12 percent zinc and more than 1 perent arsenic.
332	DEWEY PROSPECT	45 07 54 N	114 19 45 W	Service and Nickelson (1957) reported that in tightly-folded schist and quartzite is a system of deeply-oxidized mineralized zones. At the surface, the zones contain iron-oxide, jarosite, malachite, and gouge. At depth are shoots containing cobaltite, chalcopyrite, chalcocite, and pyrite.	The Dewey prospect was included in the Stevenson prospect area that comprised 45 historic mining claims covering three square miles (sections 22, 26, and 27, Township 21 North, Range 18 East) along upper Little Deer Creek. rospecting and development began between 1900 and 1910. The Dewey claim, covering 20.661 acres, was patented (MS 2851) by John Bellill in 1917. In 1937 F.S. Stevenson relocated claims in the area. In the 1940's, an access road was dozed from the Blackbird mine to the area. In	The mineralized zones contain significant amounts of copper and cobalt (Service and Nickelson, 1957, p. 2).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					1951, Northfield Mines, Inc. acquired the Stevenson prospect and in 1952, conducted exploration under Defense Minerals xploration Administration contract. The work consisted of geochemical sampling, additional dozing, underground development, and drilling (Service and Nickelson, 1957, p. 1). The principal working consists of a 150-foot-long adit with a drift.	
333	SUNSHINE EAST PROSPECT	45 07 32 N	114 21 42 W	A 4-foot-thick zone of limonite-stained quartzite and tourmaline occurs in finely parted quartzite.	The Sunshine East prospect is about 0.6 mile southwest of the Brown Bear open pit at the Blackbird mine. Workings consist of at least 10 prospect pits connected by a jeep trail. The prospect was explored by Formation Capital Corporation during 1995. It was visited by the USBM in conjunction with the mineral resource investigation of the Salmon National Forest.	A sample (SFC-78) chipped across the zone during the USBM visit had 18 ppb gold and 120 ppm cobalt.
334	COBALT MOUNTAIN	45 07 37 N	114 20 41 W	A poorly exposed mineralized zone occurs in tightly-folded phyllitic quartzite striking N 20 W and dipping 20 NE. The zone is at least 4 feet thick and contains stringers of quartz, calcite, limonite, erythrite, chalcocite, malachite, and cobaltite.	Cobalt Mountain prospect is on the divide between Meadow and Little Deer Creeks. Workings consist of dozer cuts scattered over a 1,000-foot-long area. All are connect by jeep roads. The prospect was visited by the USBM in 1995 in conjunction with the mineral resource investigation of the Salmon National Forest.	A 4-foot-long chip sample (SFC-86) taken across the zone during the USBM visit had 350 ppb gold, 34.15 percent copper, and 200 ppm cobalt.
335	STEVENSON PROSPECT AREA	45 07 38 N	114 19 51 W	Service and Nickelson reported (1957) that DMEA work outlined three deeply-oxidized mineralized zones, the Queen, Merle 3, and Merle 5. The Queen zone consists of a series of weak, discontinuous gossans. The Merle 3 zone is a northwest-trending gossan at least	The Stevenson prospect area comprised 45 historic mining claims covering three square miles (sections 22, 26, and 27, Township 21 North, Range 18 East) along upper Little Deer Creek. Prospecting and development began between 1900 and 1910. In 1937,	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				1,100 feet long. The Merle 5 zone is a northwest-trending gossan at least 1,200 feet long. The zones are as thick as 160 feet and at the surface contain iron oxide, jarosite, malachite, and gouge; at depth are shoots containing cobaltite, chalcopyrite, chalcocite, and pyrite. The zones are in a sequence of schist and quartzite beds intruded by basic dikes. The beds are tightly folded and overturned to the east. They trend north to northeast; folds plunge 20-40 N. Nash and Hahn (1986, p. 1) reported that the Merle zone contains eight vertically stacked mineralized zones that are within tuffaceous units as thick as 90 feet. Co-Cu minerals are consistently in biotite-rich beds and do not extend into enclosing schist and quartzite beds. The zones are filled by a swirled matrix of transported sand and clastic fragments cemented by quartz, siderite, biotite, muscovite, cobaltite, chalcopyrite, and pyrite. The zones appear to have formed by explosive geothermal eruptions.	F.S. Stevenson relocated claims in the area. In the 1940's, an access road was dozed from the Blackbird mine to the area. In 1951, Northfield Mines, Inc. acquired the Stevenson prospect and in 1952, conducted exploration under Defense Minerals Exploration Administration contract (Service and Nickelson, 1957). The work consisted of geochemical sampling, additional dozing, underground development, and drilling. In 1983, workings consisted of a pit covering 0.8 acre, a number of prospect pits and trenches, some short adits, a number of drill sites, an adit containing 840 feet of workings, and a number of connecting dozer roads and trails (Service and Nickelson, 1957, p. 1). In 1995, exploration was conducted by Formation Capital Corporation.	
336	LITTLE DEER CREEK PROSPECT	45 09 12 N	114 18 24 W	In fine-grained, phyllitic quartzite, striking east and dipping 45N, is a 10-foot-thick shoot containing quartz, cobaltite, chalcocite, and malachite. The phyllitic quartzite is underlain by massive quartzite.	On the northwest side of Little Deer Creek, about 900 feet from the creek, is a switchbacking dozer road to at least five caved underground workings totaling less than 100 feet in length, and a number of drilling stations. The prospect was visited by the USBM during the investigation of the mineral resources of the Salmon National Forest.	During the USBM visit, a sample (SFC 35) was chipped across the shoot. It assayed 0.360 ppm gold, 1.04 percent cobalt, and more than 1 percent arsenic.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
337	LONG DIKE PROSPECT	45 09 30 N	114 17 55 W	Albee and MacLaren (1960, p. 3) reported the prospect to be underlain by interbedded quartz-biotite schist and fine-grained quartzite which is sheared along northeast trending foliation. Along a shear zone, that is about 4.5 feet thick, is chalcopyrite, cobaltite, pyrite, pyrrhotite, safflorite, chalcocite, covellite, quartz, biotite, and siderite. During a USBM visit in 1995, fine grained phyllitic quartzite with cobaltite and erythrite-bearing fractures was observed. The quartzite has a strike of N 70 E and a dip of 70 NW.	The Long Dike prospect area is on the west side of Little Deer Creek about 0.5 mile upstream from Panther Creek. The area is covered by the Edmund Group (MS 2667) of two patented mining claims, the Edmund and Wisconsin. The two claims, covering 41.297 acres, were patented by Arthur C. Ludwig in 1913. On the claims are two cuts, a shaft, and one long and six short adits. The underground workings total at least 500 feet. The area was explored by the Office of Minerals Exploration in 1958 (Albee and MacLaren, 1960, p. 1).	A total of 200 soil samples were taken in a 450 by 2,000 foot area in 1958 (Albee and MacLaren, 1960, p. 2). During the USBM visit, a sample (SFC 36) of quartzite was taken. It assayed no significant amounts of metal.
338	SWEET REPOSE PROSPECT	45 09 49 N	114 17 21 W	The prospect is along the Proterozoic-age copper-cobalt-gold belt, hosted in quartzites and siltites of the Yellowjacket Formation. Bennett (1977, p. 44) reported that erytherite occurs in the upper workings.	The prospect was acquired by Formation Capital Corp. in 1993 (Gillerman and Bennett, 1994, p. 411). One adit and several cuts and pits explore the deposit.	USBM personnel took one sample (SFJ 002) of malachite-, azurite-, and erythrite-stained quartz from the dump of the upper workings during 1994. The sample assayed 0.27 percent copper and 0.46 percent cobalt.
339	LITTLE CHIEF	45 14 19 N	114 12 53 W	Several workings explore strongly altered syenite containing numerous quartz veinlets.	Several caved adits and trenches.	One select sample (SFJ 006) of hematite- and limonite-rich, strongly altered syenite containing quartz veinlets was taken by USBM personnel during 1994. The sample assayed 0.46 ppm gold.
340	ARNETT HARDROCK	45 14 10 N	114 12 30 W	Syenites host quartz vein and disseminated gold in wide zones (Formation Capital, 1988, p. 6). The Haidee, Italian, Thompson and Hibbs, and Little Chief mines and prospects are within the Arnett exploration area.	BP Minerals drilled for three years in and around the Italian mine area (Formation Capital, 1988, p. 6). American Gold Resources (AGR), a subsidiary of International Gold Resources Corporation, drilled 216 holes, and performed baseline water quality, archaeological, and cultural	Proven and probable reserves (based on $350 per ounce gold) are 6 million tons grading 0.033 ounce gold per ton, measured resources are 6.5 million tons grading 0.03 ounce gold per ton, and indicated resources are 3.8 million tons grading 0.025 ounce gold per ton (personal commun.,

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					studies (personal commun., AGR, 1994).	Nick Bertram, AGR, 1994).
341	HAIDEE MINE	45 14 05 N	114 12 33 W	The Haidee and nearby Italian prospects are on a mineralized zone in granitic rocks of the Leesburg Stock. The zone is 5,000 feet long, 300 feet wide, and contains coarse textured quartz fissure fillings with bands of pyrite and lesser amounts of sphalerite and galena. The principal fissure filling vein strikes north, dips 57 W, and is as thick as 4 feet (Umpleby, 1913, p. 153; Bennett, 1977, p. 46).	Umpleby (1913, p. 148) reported that on the hill near the Haidee mine, gold weathering out of arkosic mantle was washed for wages. He also reported that underground workings totalled about 4,000 feet. Two holes were drilled during 1987 and another was planned during 1988 as part of a joint venture between AMSELCO and American Gold Resources (personal communication, Tom Buchta, Salmon National Forest).	Umpleby (1913, p. 154) reported an ore grade of $7 per ton in gold -- at a gold price of about $20 per ounce. Two samples (SFJ 007-008) were taken of quartz containing abundant pyrite during 1994 by USBM personnel. They assayed 58.5 ppm (1.7 ounce per ton) and 51.2 ppm (1.5 ounce per ton) gold respectively.
342	GOFF BROTHERS PLACER	45 13 25 N	114 12 30 W	Bench deposits, as thick as 20 feet but averaging 12 feet, were mined at the Goff Brothers placer (Lorain and Metzger, 1939, p. 46).	The Goff brothers conducted hydraulic mining operations along upper Arnett Creek and adjoining ground between 1917 and 1938 (Lorain and Metzger, 1939, p. 46).	The gold from Arnett Creek is 900 fine (Lorain and Metzger, 1939, p. 46).
343	THOMPSON AND HIBBS PROSPECT	45 13 21 N	114 11 48 W	A gold-bearing zone 60 feet wide occurs in granite near the Italian Mine (Bell, 1908, p. 119-120).	In 1907, an open pit and a small Huntington mill were being operated (Bell, 1908, p. 119-120).	According to Bell (1908, p. 119-120), the rock averaged $4 to $6 per ton in free gold at $20 per ounce. During 1995, USBM personnel took one sample (SFJ 088) of granitic rock containing numerous quartz veinlets from the open cut. It assayed 1.3 ppm gold.
344	ITALIAN MINE	45 13 17 N	114 11 26 W	The Italian, and nearby Haidee, are on a mineralized zone that is 5,000 feet long and 300 feet wide (Umpleby, 1913, p. 153). The zone trends north, dips 45 W, and contains fissure fillings, as thick as 3 feet, of coarse textured quartz with bands of pyrite and lesser amounts of sphalerite, specularite, and galena. The zone is in granitic rocks of the	The mine was located in 1892 and operated by the claimants until 1904 when purchased by the Leesburg Mining Company. That company erected a 30-stamp mill and electric plant. Development consists of about 4,000 feet of underground workings, a great many open cuts, and 80 acres of placer workings. Umpleby (1913, p. 151) reported that a test run of	During 1995, USBM personnel took two select samples (SFJ 086-087) of quartz and massive limonite from old mine workings just north of the Italian mine. They assayed 0.5 and 0.4 ppm gold respectively. Another select sample (SFJ 091) of syenite with quartz veinlets up to 0.25 inch wide was taken from the dump at the Italian mine. It assayed 0.04

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				Leesburg Stock (Bennett, 1977, p. 46).	4,000 tons of ore yielded $2.25 in gold per ton -- at a gold price of about $20 per ounce. Production for the mine prior to 1904 totaled about $175,000. In 1993, American Gold Resources (AGR), a subsidary of Gold Resources Corporation, drilled 17 holes. Baseline water quality studies and archaeological and cultural studies were also performed (Gillerman and Bennett, 1994, p. 411).	ppm gold.
345	ARNETT CREEK PLACER	45 13 03 N	114 11 21 W	Arnett Creek placer deposits extend from its confluence with Napias creek to its headwaters, a distance of 6 miles.	Extensive mining has taken place. Estimates of early production vary widely; the amount of ground worked indicates a possible production of 1 to 2 million dollars (Lorain and Metzger, 1939, p. 45).	No data available.
346	UNNAMED	45 13 18 N	114 10 13 W	A limonite-, hematite-, and manganese-stained quartz vein, as much as 2 feet thick, trends about N 45 W in quartz monzonite and schist. The vein is poorly exposed and contains various amounts of pyrite.	Two caved adits and at least 6 pits were found.	Three samples (SFJ 003-005) containing quartz with pyrite were taken by USBM personnel during 1994. The samples assayed as much as 5.11 ppm gold, 0.17 percent copper, and 0.09 percent lead.
347	RAPPS CREEK PLACER	45 12 58 N	114 10 14 W	Stream gravel is continuous for 2 miles along Rapps Creek. The deposit is as wide as 200 feet and as deep as 12 feet. The stream has a gradient of 250 feet per mile. Bench deposits, averaging 300 feet in width, are almost continuous along the northeast side of the creek. The benchs are more than 30 feet deep (Lorain and Metzger, 1939, p. 48).	Several attemps have been made to work the gravel along Rapps Creek (Lorain and Metzger, 1939, p. 47). Hydraulic mining was done 0.2 mile above the mouth of the creek.	No data available.
348	BUTCHKE PLACER	45 10 54 N	114 14 03 W	Lorain and Metzger (1939, p. 65) reported that the upper 2 to 3 miles of Big Jureano Creek	The Butchke placer deposit was mined for several years in the mid 1930's. A no. 1 giant, with a 2-inch	A block of ground, estimated to have contained about 2,700 cubic yards, was said to have yielded

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				contained deposits of gold-bearing gravel that had been mined successfully by hydraulic methods. In that part of the creek worked, the gravel was as deep as 12 feet, 50 feet wide, and 2 miles long. Granite boulders, 1 foot or more in diameter, constitute nearly 50 percent of the volume of the gravel.	nozzle operating under a static head of about 100 feet, was used to move the gravel. The gravel was processed in sluice boxes 96 feet long and 18 inches wide (Lorain and Metzger, 1939, p. 66).	$1,100, or about $0.40 per cubic yard -- at a gold price of $35 per ounce. The gold was 965 fine (Lorain and Metzger, 1939, p. 66).
349	TOOLSON ALLANITE PROSPECT	45 09 40 N	114 14 56 W	Radioactive allanite, a thorium- and rare earth-bearing epidote, occurs as seams and masses, up to several inches long, scattered along vein-like pegmatite dikes up to 2 feet thick. The dikes are in granitic gneiss (Shockey, 1957, p. 36).	These radioactive deposits were discovered by R.N. Toolson in 1925 (Shockey, 1957, p. 36).	No data available.
350	EAST FORK JUREANO CREEK	45 10 39 N	114 13 23 W	Gold-bearing gravel extends for about 0.75 mile along the upper end of the East Fork Jureano Creek. At the lower end, the deposit is 100 to 200 feet wide; farther upstream it narrows to 20 to 100 feet wide. The deposit averages 6 to 10 feet deep in the main channel (Lorain and Metzger, 1939, p. 66).	In 1938, a fire hose was being used for cutting the gravel; a small boom dam was used for ground-sluicing (Lorain and Metzger, 1939, p. 66).	The deposit was reported to run 50 cents per cubic yard at $35 per ounce gold. One ounce of wolframite per 6 to 8 cubic yards of gravel was also reported (Lorain and Metzger, 1939, p. 67).
351	UPPER MACKINAW CREEK PLACER	45 10 40 N	114 11 27 W	Gold-bearing gravel is associated with a clay layer on bedrock (Lorain and Metzger, 1939, p. 45).	Lorain and Metzger (1939, p. 45) reported that the placer had been mined on a small scale. There were a few cuts and ditches.	According to Lorain and Metzger (1939, p. 45), gold-bearing gravel underlies the upper 1.5 miles of Mackinaw Creek. The gravel has a gold value of about $0.25 per cubic yard -- at a gold price of $35 per ounce.
352	CUTLER OPAL MINE	45 10 33 N	114 11 07 W	The opalized butt of a Sequoia tree, 62 feet in circumference, occured in tuffaceous volcanic rocks along Mackinaw Creek according to Shockey (1957, p.39).	During a 1995 examination by the USBM, a bulldozer pit along with numerous chips of petrified wood were found. The opalized tree described by Shockey (1957, p. 39) has probably been removed.	Shockey (1957, p. 39) valued the tree at $500,000 -- at $1.00 per pound.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
353	LOWER MACKINAW CREEK PLACER	45 10 12 N	114 10 28 W	The Lower Mackinaw Creek placer deposit extends downstream for 0.5 mile from the forks of the creek. The deposit is 50 to 100 feet wide and occurs in the bottom of a deep V canyon (Lorain and Metzger, 1939, p. 45).	No data available.	No data available.
354	CALIFORNIA BAR	45 11 12 N	114 08 37 W	California Bar extends along a 3.25 mile long segment of Napias Creek beginning about 0.25 mile below Phelan Creek and extending up stream. The bar averages 350 to 400 feet wide and has an average depth of 10 to 40 feet. Maximum width of the bar is 700 feet (Lorain and Metzger, 1939, p. 42).	Lorain and Metzger (1939, p. 43) reported that at several places on the bar there is evidence of the gravel having been worked by hand methods. Drilling was done in the 1930's. Some dredging has been done since.	Lorain and Metzger (1939, p. 43) reported that drilling indicated a total of 2.5 million cubic yards of dredgeable ground.
355	BLUE JAY MINE	45 09 08 N	114 11 16 W	Small pods and lenses of quartz and galena occur along a shear zone trending E-W and dipping 45 N in ellipsoidal gneiss. The sheared rock is bleached, limonite-stained, and partially silicified.	Five pits, one trench, and one 100-foot-long adit explore the shear zone. Stoping in the adit is minimal, suggesting that production was small.	One select sample (SFJ-011) of quartz and galena was taken by USBM personnel during 1994. The sample assayed 5.3 ppm gold, 30 ppm silver, 356 ppm copper, 970 ppm zinc, and over 1.0 percent lead. The potential for signigicant resources appears to be low.
356	RINGBONE CAYUSE MINE	45 09 39 N	114 09 20 W	Pods and lenses of quartz and galena occur in a shear zone trending N 85 E and dipping 85 NW in ellipsoidal gneiss. The sheared rock is bleached, limonite-stained, and partially silicified.	One 15-foot-deep shaft, one stope to the surface, one caved adit, and one partially caved adit explore the shear zone. Two collapsed cabins were found near the workings. According to Shockey (1957, p. 39), the mine produced significant amounts of lead and silver beginning in 1920.	One select sample (SFJ 001) of limonite-rich, silicified gneiss was taken from a dump at the lower adit by USBM personnel in 1994. It assayed 8.75 ppm gold, 36 ppm silver, 0.24 percent copper, and over 1.0 percent lead.
357	PHELAN CREEK PLACER	45 09 12 N	114 08 25 W	Stream channel gravel deposits extend for about 2 miles and bench deposits extend for about 2.5 miles along Phelan Creek from its confluence with Napias Creek. The far larger and more extensively	Much of the Phelan Creek deposit is privately owned (covered by Homesteads). There are a few workings on the stream channel deposits. In 1937 and 1938, 8,000 to 8,500 cubic yards of gravel	Lorain and Metzger (1939, p. 55) reported that better-grade material yielded about $0.50 in gold per cubic yard at a gold price of about $20 per ounce.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				worked benches are as wide as 0.5 mile and about 15 feet deep. Boulders, 1 foot in diameter or larger, consitute 5 to 10 percent of the volume of the gravel. There is a clay layer on bedrock (Lorain and Metzger, 1939, p. 55).	were mined from bench deposits near James Gulch by Grant Rood (Lorain and Metzger, 1939, p. 55).	
358	UNNAMED PLACER DEPOSIT	45 07 41 N	114 07 59 W	Active placer mining site according to Shockey (1957, plate I).	No data available.	No data available.
359	GOLD FLINT	45 14 35 N	114 06 18 W	According to Umpleby (1913, p. 151), replacement veins are along gougy fault contacts between metasedimentary and granitic rocks. The veins contain quartz and pyrite. Including the veins, a zone about 20 feet wide is visibly mineralized. This deposit is part of the Beartrack deposit currently being mined.	Umpleby (1913, p. 154) reported that the Gold Flint was located in 1880 and some ore blocked out in 1,200 feet of underground workings, but no bullion produced.	Umpleby (1913, p. 154) reported an ore grade of about $5 in gold per ton -- at a gold price of about $20 per ounce.
360	GOLD DUST	45 14 20 N	114 06 30 W	Umpleby (1913, p. 151) reported that replacement veins are along gougy fault contacts between metasedimentary and granitic rocks. The ore bodies are considerably broken and mineralization is not intense. This deposit may be part of the Beartrack deposit currently being mined.	Umpleby (1913, p. 154) reported that there was a 10-stamp mill located on the property.	No data available.
361	SMITH GULCH PLACER	45 14 16 N	114 05 47 W	Steam gravel deposits in Smith Gulch range from 25 to 150 feet wide. The gradient of the main creek is 100 to 150 feet per mile (Lorain and Metzger, 1939, p. 50).	The stream gravel in Smith Gulch and all of its tributaries have been worked thoroughly (Lorain and Metzger, 1939, p. 50).	No data available.
362	WRIGHTS GULCH PLACER	45 14 33 N	114 04 45 W	Creek gravels, 50 to 100 feet wide and as deep as 10 feet, are continuous from the forks of Wrights Gulch to the head of the branches. The gravel contains large boulders (Lorain and Metzger, 1939, p. 51).	Small-scale mining by hand was being done in 1938 -- wages were being made. The gold is 950 fine (Lorain and Metzger, 1939, p. 51).	Lorain and Metzger (1939, p. 51) reported that pan samples from bedrock contained $0.10 to $1.00 in gold -- at a gold price of $35 per ounce.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
363	UPPER NAPIAS CREEK PLACER	45 14 35 N	114 04 05 W	The stream deposits, beginning at Smith Gulch and extending upstream for 3 miles, range in width from 100 to 500 feet (Lorain and Metzger, 1939).	The deposit had been worked extensively.	No data available.
364	CAMP CREEK PLACER	45 13 58 N	114 07 02 W	Stream deposits are 50 to 100 feet wide along a 1.5-mile-long stretch of Camp Creek beginning 0.5 mile above Leesburg. Bench gravel deposits are 50 to 100 yards wide and parallel the stream deposits (Lorain and Metzger, 1939, p. 48-49).	Narrow bedrock cuts and some old hydraulic workings were found during Lorain and Metzger's visit (1939, p. 48).	Lorain and Metzger (1939, p. 48) reported that 450 cubic yards of gravel mined from a drift averaged $0.50 in gold per cubic yard at a gold price of $35 per ounce.
365	GOLD RIDGE	45 13 52 N	114 06 56 W	The Gold Ridge Mine is on the same fault zone as the Gold Flint and Gold Dust Mines. The zone trends N 18 E, dips 45 NW, and separates sedimentary rocks from Cretaceous granitic rocks (Umpleby, 1913, p.155). This deposit is part of the Beartrack deposit currently being mined.	According to Umpleby (1913, p.155), the deposit is developed by 1,000 feet of tunnel and raises. A 10-stamp mill and 50-ton cyanide plant, which operated for parts of two years, was situated near the principal portal.	The ore is reported to be low grade, running $2 to $3 per ton (Umpleby, 1913, p.155).
366	BEARTRACK MINE	45 13 53 N	114 06 46 W	The Beartrack deposit, classified as a base and precious metal vein, veinlet, and disseminated deposit by Bookstrom (USGS, personal communication, 1994), occurs near the intersection of the Panther and Jesse Creek faults (Formation Capital, 1988, p. 6). The northeast trending, steeply dipping Panther Creek fault forms the contact between the Yellowjacket quartzites and quartz monzonite. Significant gold mineralization occurs along a 10,000-foot-long section of sheared, fractured rock associated with the fault. Drilling shows gold-bearing rock occurs from the surface to at least 500 foot depths (Formation	The Beartrack gold deposit is being mined by conventional open pit methods. There are two pits. The south pit is located immediately north of the historic gold mining town of Leesburg. The north pit is located between the head of Wards Gulch and Smith Gulch, about 1.5 miles northeast of Leesburg. Ore is transported by truck to a crusher near the south pit. The crushed ore is then moved by a series of conveyor belts and placed on a dedicated leach pad. A dilute solution containing cyanide is sprinkled on the heap and, after percolating through the crushed ore, collects in the pregnant solution	Published resource tonnage and grade estimates are numerous. Geologic resources reported by Meridian Gold, a subsidiary of Burlington Resources Inc., in 1988 (Spokesman Review, November 29, 1988, p. 49) totaled 36.9 million tons averaging 0.055 ounce gold per ton -- equivalent to 2.03 million ounces. In 1990, Bartels and others (1990) reported a resource of 45 million tons containing 1.0 to 2.1 million ounces of gold. Gillerman and Bennett (1994, p. 411) reported 27.6 million tons averaging 1.2 g/mt (0.035 ounce per ton) gold.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				Capital, 1988, p. 6).	pond. A series of countercurrent-decantation carbon adsorption tanks are used to separate the gold from the pregnant solution (Allen, 1991). By the end of 1996, 9,261,600 tons containing a recoverable 281,000 ounces of gold had been mined and placed on leach pads (Meridian Gold, personal communication, March 7, 1997).	International Mining News (May 11, 1994, vol 105, no. 19, p. 1) reported two ore bodies contain 30 million tons of leachable ore grading 0.034 ounce gold per ton. At the end of 1996, mine reserves were 25.6 million tons grading 0.033 ounce gold per ton (Meridian Gold, personal communication, March 7, 1997).
367	WARDS GULCH PLACER	45 13 39 N	114 06 18 W	The deposit is 100 to 300 feet wide, covered by thick alluvium, and contains large boulders. The creek gradient is about 300 feet per mile. The placer was worked by surface and drift methods and nearly all the gold was found within a foot of bedrock (Lorain and Metzger, 1939, p. 50).	Lorain and Metzger (1939, p. 49) reported that the original gold discovery in the Leesburg Basin was made at the mouth of Wards Gulch. The stream gravels of Wards Gulch have been worked extensively from the mouth to about 1/2 mile above the road crossing. There are also extensive bench workings on both sides of the gulch. Umpleby (1913, p. 154) reported the production of about $1 million in gold -- at a gold price of about $20 per ounce.	Samples from a hydraulic pit averaged $0.25 in gold per cubic yard at a gold price of $20.67. The gold is 680 fine (Lorain and Metzger, 1939, p. 50).
368	RED ROCK	45 13 52 N	114 04 50 W	Possible stockwork/disseminated gold deposit in granitic rocks.	Formation Capital, in a joint venture with Goldfields, conducted an exploration program, including drilling, at the Red Rock claim group (personal communication, Phil Nisbet, Formation Capital Corp., 1995).	One drill hole intercept assayed 0.08 ounce gold per ton over a distance of 300 feet. A resource was delineated, but was too small to mine economically (personal communication, Phil Nisbet, Formation capital Corp., 1995).
369	SAWPIT CREEK PLACER	45 13 42 N	114 02 26 W	Placer deposit near the source of Sawpit Creek.	Lorain and Metzger (1939, p. 51) reported that the upper mile of Sawpit Creek had been mined at one or two places on a small scale. Also, some gold was produced by hand methods from small side gulches. The placer was being worked in 1938. F.A. Krause	The placer is a meadow deposit 300 feet wide, 0.5 mile long, and as deep as 12 feet. It is dotted with large boulders (Lorain and Metzger, 1939, p. 51).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					collected one quartz crystal, 6 inches long, from his placer diggings at the head of Sawpit Creek (Shockey, 1957, p. 39).	
370	LEESBURG PLACER	45 13 10 N	114 07 10 W	The Leesburg placer deposit occurs along Napias Creek beginning at the mouth of Arnett Creek and extending upstream to Leesburg. The deposit ranges from 150 feet to nearly 0.25 mile wide (Lorain and Metzger, 1939, p. 40-45).	The deposit has been worked extensively.	The placer contains significant quantities of ilmenite, zircon, monazite, and magnetite (Savage, 1964, p. 220) in addition to gold.
371	SHARKEY CREEK PLACER	45 12 51 N	114 06 01 W	Stream gravel carpets Sharkey Creek for 2 miles upstream from Napias Creek. The gravel contains boulders up to 6 feet in diameter (Lorain and Metzger, 1939, p. 49).	Lorain and Metzger (1939, p. 49) reported a pit 0.5 mile up Sharkey Creek.	No data available.
372	PRINCE PLACER	45 09 07 N	114 07 28 W	The Prince bench placer deposit is located on the north side of the North Fork Phelan Creek. The gravel is 6 to 8 feet deep, contains boulders 1 to 2 feet in diameter, and rests on a clay layer (Lorain and Metzger, 1939, p. 55).	Lorain and Metzger (1939, p. 55) reported that Lorton Prince worked the placer from about 1914 to 1918. There are several pits, the largest 150 feet long, 100 feet wide, and 10 feet deep. Mining was done by ground-sluicing.	Lorain and Metzger (1939, p. 55) reported that the better-grade material yielded $0.50 in gold per cubic yard at a gold price of about $20 per ounce.
373	KIMMEL CREEK PROSPECT	45 04 30 N	114 45 20 W	Limonitic quartz veins and silicified zones transect quartzite intruded by granitic rock. Individual veins and silicified zones are 0.4 to 6 feet thick and commonly over 100 feet long (Cater and others, 1973, p. 270).	More than 10 veins and silicified zones crop out over a distance of more than one mile. The veins and silicified zones, located along the divide between Kimmel and Breeching Creeks, are explored by several prospect pits. They were examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 270).	Samples taken during the USBM examination assayed as much as 1 ounce silver per ton and trace gold (Cater and others, 1973, p. 270).
374	TUCKAWAY PROSPECT	45 03 35 N	114 45 19 W	Small quartz- and calcite-filled fractures and breccia are along a northwest-trending fault in argillaceous quartzite (Cater and others, 1973, p. 271).	A trench and 100-foot-long adit are 2.5 miles up Kimmel Creek from the Middle Fork Salmon River. The site was examined in conjunction with the USBM	Samples taken during a USBM examination contained no significant amounts of metal.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 271).	
375	UPPER KIMMEL CREEK PROSPECT	45 03 16 N	114 46 07 W	A system of quartz-sulfide fissure veins transects metasedimentary rocks (Cater and others, 1973, p. 270). The veins contain small amounts of chalcopyrite, bornite, azurite, and malachite.	On the divide between Kimmel and Soldier Creeks are a few prospect pits. They were examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 270).	Eight samples were taken during a USBM examination (Cater and others, 1973, p. 271). They contained as much as 0.45 percent copper and traces of gold and silver.
376	LOWER KIMMEL CREEK PROSPECT	45 04 03 N	114 43 33 W	A northeast-trending quartz fissure vein, as thick as 0.7 feet, transects quartzite of the Yellowjacket Formation (Cater and others, 1973, p. 270). Containing hematite, chalcopyrite, and malachite, the vein is exposed for 45 feet.	A few prospect pits are just northwest of the confluence of Kimmel Creek with the Middle Fork Salmon River. They were examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 270).	A sample taken during the USBM examination (Cater and others, 1973, p. 270) assayed trace gold, 0.36 ounce silver per ton and 0.06 percent copper.
377	WOOLARD CREEK BAR PLACER	45 03 36 N	114 43 31 W	The deposit consists of alluvial fan material intercolated with stream gravel containing sparce lenses of blacksand and flood gold (Cater and others, 1973, p. 287).	The placer, near the junction of Woolard Creek and the Middle Fork Salmon River, was claimed in the past and probably mined on a small scale near the river bank. The resulting mine workings were obliterated by high water.	A channel sample, taken during a USBM examination (Cater and others, 1973, p. 287), had as much as $0.014 in gold and 2.1 pounds of blacksand per cubic yard. The examination was part of the investigation of the mineral resources of the Idaho Primitive Area. The placer has a volume of about 160,000 cubic yards and covers about 5 acres.
378	LOWER SURVEY CREEK PROSPECT	45 03 27 N	114 43 29 W	Two parallel quartz veins with malachite, each 2 to 4 feet thick, trend N 64 W and dip 83 SW in rocks of the Yellowjacket Formation (Cater and others, 1973, p. 270).	Just north of the confluence of Survey Creek and Middle Fork Salmon River are two prospect pits. They were examined in conjunc-tion with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and	A sample taken during a USBM examination (Cater and others, 1973, p. 270) assayed 0.67 percent copper and a trace gold and silver.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					others, 1973, p. 270).	
379	SURVEY CREEK PLACER	45 03 22 N	114 43 21 W	The deposit, with an area of about 7 acres, consists of stream gravel with sparce lenses of black sand and flood gold.	A few excavations were found. No doubt some mining was done along the stream edge and the resulting workings obliterated during high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	Samples taken from a trench during the USBM examination (Cater and others, 1973, p. 287) contained as much as $0.014 in gold per cubic yard and 2.5 pounds black sand per cubic yard. The placer has a volume of about 101,000 cubic yards.
380	SURVEY CREEK BAR PLACER	45 03 05 N	114 43 25 W	The deposit consists of a 3-acre river bar south of the mouth of Survey Creek.	A few small excavations were found.	The placer was examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area. Samples taken from a trench (Cater and others, 1973, p. 287) had as much as trace gold and 1.8 pounds black sand per cubic yard. The placer has a volume of about 44,000 cubic yards.
381	RATTLESNAKE RIDGE PROSPECT	45 03 06 N	114 43 19 W	A system of fissure veins trends northwest along bedding in metasedimentary rocks. The veins are 2 to 4 feet thick and are composed of quartz containing pyrite, malachite, and iron oxides (Cater and others, 1973, p. 271).	Two caved adits are northeast of the confluence of Rattlesnake Creek with the Middle Fork Salmon River. They were examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 271).	A sample taken during the USBM examination (Cater and others, 1973, p. 271) contained 0.16 ounce silver per ton and traces of gold and copper.
382	BIG HORN PROSPECT	45 02 41 N	114 44 05 W	In metasedimentary rocks, intruded by granite, are fault and shear zones containing quartz veins. The veins are narrow and composed of quartz and calcite containing pyrite, limonite, hematite, and malachite (Cater and others, 1973, p. 264). Some veins trend NW and dip SW, others trend NE and dip SE.	The Big Horn prospect is on Sammy Gulch above the Middle Fork Salmon River. Workings consist of six adits and numerous pits and trenches. The site was examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	During the USBM examination (Cater and others, 1973, p. 267), 22 samples were taken. They had as much as 0.80 ounce gold per ton, 0.50 ounce silver per ton, and 0.18 percent copper.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
383	RATTLE-SNAKE CAMP PROSPECT	45 02 38 N	114 43 22 W	A fissure vein trends northwest in quartz monzonite. The vein is less than a foot thick and consists of quartz with limonite (Cater and others, 1973, p. 271).	About 0.5 mile south of the confluence of Rattlesnake Creek and the Middle Fork Salmon River are two prospect pits. They were examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 271).	A sample taken during a USBM examination (Cater and others, 1973, p. 271) contained no significant amounts of metal.
384	GRASSY FLAT PLACER	45 02 16 N	114 43 30 W	The placer consists of alluvium covered stream gravel covering about 5 acres (Cater and others, 1973, p. 287). In the stream gravel are sparce lenses of blacksand and flood gold.	Although no workings were found, no doubt some mining was done and the workings obliterated during high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	A sample, taken during the USBM examination (Cater and others, 1973, p. 287), contained trace gold and 1.7 pounds black sand per cubic yard. The placer contains about 80,000 cubic yards.
385	DECKIE PROSPECT	45 01 55 N	114 43 41 W	A system of northwest-trending quartz veins fills fractures in quartzite. Individual veins, containing pyrite, are less than 0.3 feet thick (Cater and others, 1973, p. 271).	About 1/4 mile northwest of the confluence of Soldier Creek and the Middle Fork Salmon River are three prospect pits. They were examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 271).	A sample, taken during the USBM examination (Cater and others, 1973, p. 271), assayed 0.10 ounce silver per ton and trace gold and copper.
386	WILSON CREEK BAR PLACER	45 02 02 N	114 43 21 W	The placer consists mainly of river gravel intercolated with the gravel deposited by Wilson Creek as it enters the Middle Fork Salmon River. The river gravel contains sparse lenses of black sand and flood gold.	The placer, at the junction of Wilson Creek with the Middle Fork Salmon River, was claimed in the past; now it is a U.S. Forest Service Campground. The placer no doubt was mined in the past, mainly along the river edge. The small workings resulting from the mining were obliterated by high water and the construction of the campground. The placer was examined by the USBM in conjunction with the investigation	Samples taken from two trenches excavated during the USBM examination (Cater and others, 1973, p. 287) had trace gold and 1.3 pounds black sand per cubic yard. The deposit is estimated to contain 162,000 cubic yards gravel.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	
387	OLD JOHNSON LODE PROSPECT	45 03 14 N	114 38 58 W	A quartz vein fills a shear zone trending N 17 W and dipping 50 NE in quartzite and dolomite transected by felsic dikes (Cater and others, 1973, p. 264). The zone is exposed for 130 feet and is about 5 feet wide. The vein is 1 to 3 feet thick and contains pyrite, iron stain, and malachite.	Near Alpine Creek are a caved adit and a prospect pit. The site was examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 264).	Five samples were taken during a USBM examination (Cater and others, 1973, p. 264). All contained gold and silver -- as much as 0.78 ounce gold per ton and 1.38 ounce silver per ton. The samples also had minor amounts of copper and lead. At least 24,000 tons of low-grade resources are present.
388	JOHNSON MINE	45 02 44 N	114 39 05 W	In argillaceous quartzite are rhyolite dikes and quartz veins trending N 87 E and dipping 65-79 N (Cater and others, 1973, p. 262). The principal vein averages 1.2 feet thick, is exposed for 300 feet horizontally and 200 feet vertically, and is composed of quartz ontaining pyrite, chalcopyrite, galena, iron stain, and malachite.	Along Alpine Creek, about 1 mile above Wilson Creek, are a 150-foot-long caved adit driven by Johnson and the remains of a 1 stamp mill. Two claims, held by James W. Caples, were located in the 1940's. Under the name Clark and Murray, the Johnson mine yielded 7 tons of ore between 1904 and 1926 (Fisher and Johnson, 1987, p. 104; and USBM files).	Twelve samples were taken during a USBM examination (Cater, 1973, p. 263). The examination was made in conjunction with the investigation of the Idaho Primative Area. The vein is estimated to contain 12,000 tons grading 0.55 ounce gold per ton, 1.08 ounce silver per ton, and 0.085 percent copper.
389	WILSON CREEK MIDDLE PLACER	45 02 07 N	114 38 01 W	The deposit, consisting of poorly-rounded and -sorted stream gravel, is covered to a large extent by glacial outwash.	Claimed in 1952, development at the placer consist of several collapsed cabins, several prospect pits, a ditch and a water wheel. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	Pan samples taken during the USBM examination in 1969 contained trace amounts of black sand.
390	TWIN COVE-RAMSHORN LAKES PROSPECT	45 05 19 N	114 36 36 W	Quartzite and argillaceous rocks are metamorphosed, folded, fractured, cut by basic and acidic dikes, and intruded by granite. Iron-stained quartzite beds contain magnetite and pyrite. Three iron-stained beds, 1-40 feet thick, crop	The Twin Cove-Ramshorn Lakes prospect area extends from Twin Cove to Ramshorn Lake. Anomalous amounts of metal were detected in sediment samples taken from streams draining the area. There are no workings or mining	Sixteen samples were taken during the USBM examination (Cater and others, 1973, p. 270). They had as much as 0.02 ppm gold, 0.2 ppm silver, 40 ppm copper, 100 ppm lead, and 100 ppm zinc.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				out for 3 miles along their contact with granitic rocks (Cater and others, 1973, p. 268).	claims. The anomaly was examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 268).	
391	EXPLORER PROSPECT	45 06 49 N	114 32 28 W	A mineralized area with well defined boundaries, averages less than 100 feet wide and extends for about 1,000 feet. Country rock is granite, transected by mafic and aplitic dikes. Sparce aquamarine and green beryl occurs in pegmatitic stringers along fractures and as disseminations in the mineralized area. Also, float containing quartz, fluorite, hematite, limonite, managanese oxides, and pyrite, is scattered near the intersection of mafic and aplitic dikes (Cater and others, 1973, p. 383).	The Explorer prospect, on the divide between Wilson Creek and Golden Trout Lake, was located in 1961. It was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 383). One trench was found.	A sample, taken during the USBM examination (Cater and others, 1973, p. 383), had 0.17 ounce silver per ton, 0.01 percent copper, 0.05 percent lead, and 0.30 percent zinc.
392	RAINBOW MINE	45 06 30 N	114 31 00 W	The area is underlain by porphyritic quartz monzonite containing widely-spaced pegmatite dikes.	The Rainbow mine is between Golden Trout Lake and Crags Campground. The mine is covered by the Blue Emerald and Rainbow claims held by Billy B. King (1994). Between 1916 and 1958, the Rainbow mine yielded significant amounts of gold, silver, copper, lead, and zinc (USBM production records). The mine was not visited by the USBM during the mineral investigation of the Salmon National Forest.	No data available.
393	OLSON PROSPECT	45 05 51 N	114 31 44 W	Exposed in the pit is a shear zone in quartz monzonite. The zone is 0.7 feet thick, strikes N 15 W, dips 52 N, and is composed of breccia that is slightly radioactive. Thorite is probably present.	The Olson prospect is on a trail about 1/2 mile southwest of and above the Crags Campground. Workings consist of a prospect pit. It was examined by the USBM in 1982 in conjunction with the investigation of the mineral	A sample (WRO 71) taken across the zone during the USBM examination contained no significant amounts of metal.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					resources of the Frank Church River of No Return Wilderness (Olson, 1985).	
394	CRAGS BERYLLIUM PROSPECT AREA	45 05 09 N	114 30 32 W	A system of widely spaced pegmatite dikes is in porphyritic quartz monzonite. The system is as wide as 250 feet, as long as 2,400 feet, and trends N 60 E. Aquamarine and green beryl occur predominantly in pegmatite dikes, but also are disseminated in the quartz monzonite. A typical beryl-bearing dike is as thick as 0.3 feet, a few feet long, and composed of orthoclase, quartz, mica, fluorite, and trace to 15 percent beryl/aquamarine (Pattee and others, 1968, p. 87).	The Crags Beryllium prospect area is on the divide between Yellowjacket and Big Deer Creeks, about 2 miles southeast of the Crags Campground. Pattee and others (1968, p. 87) reported that there were no workings.	No data available.
395	LANGLEY PLACER	45 02 28 N	114 37 09 W	The placer deposit consists of poorly-sorted and -rounded stream gravel.	The Langley placer, on Wilson Creek about 6 miles from it's junction with the Middle Fork Salmon River, was claimed in 1952. There are a few pits and a dismantled cabin. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 3 acres and contains 50,000 cubic yards of gravel. Samples, from a site excavated during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.007 in gold per ton (at a price of $47.85 per ounce) and 1.3 pounds black sand per cubic yard.
396	LUCKY HUNTER PROSPECT	45 01 30 N	114 35 24 W	A gossan occurs above iron-stained quartzite beds. The beds trend N 56 W, dip 41 NE, are 115 feet thick, and are overlain by white quartzite. The iron-stained quartzite contains quartz veinlets along bedding and fractures (Cater and others, 1973, p. 272). Instrusive rocks are nearby.	The Lucky Hunter claims, located in 1965 by John O'Conner and Fred S. Bidwell, are on the divide between Wilson and Hoodoo Creeks about 3.5 miles south of the Hoodoo Airstrip. Workings consist of a caved adit, sloughed shaft, and four small trenches and pits. There also is a collapsed cabin. The prospect was examined by the USBM in conjunction with the	Thirteen samples (DHV 6B-8B, WRO 55-60, WRO 121-124) were taken during USBM examinations (Cater and others, 1973, p. 272; Olson, 1985, p. 122). They had as much as 1.14 ounce gold per ton, 0.09 percent copper, 0.07 percent lead, and traces of silver and zinc.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 271), and again during the Investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985, p. 23).	
397	MCELENY MOUNTAIN PROSPECT	45 01 39 N	114 32 38 W	Brown, vuggy gossan and silicified gossan containing pyrite occurs in brecciated and altered quartzite (Olson, 1985, p. 122).	The prospect is on the south side of the summit of McEleny Mountain at the head of Blackeagle Creek. It is covered by the Mayfield and Blackhawk mining claims (1995). Three prospect pits were examined during a USBM investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985, p. 122).	Four samples were taken during the USBM examination (Olson, 1985, p. 122). They had between 0.2 and 0.3 ounce silver per ton.
398	BLACK EAGLE MINE	45 00 47 N	114 32 49 W	Quartzite at the Black Eagle is transected by a broad zone of fracturing. The zone trends N 65 E and the quartzitic beds strike N 30 W and dip 85 NE. A quartz vein in the fault zone averages 0.5 feet thick and can be traced in workings for hundreds of feet. The vein contains white quartz with pseudomorphs after pyrite, siderite, pyrite, specularite, calcite, chalcopyrite, and sphalerite (Anderson, 1953, p. 38).	Several mining claims are located in the area. The Black Eagle and C.C. patented mining claims (MS 2208), covering about 42 acres, were patented in 1912 by the Black Eagle Gold Mining Company. A third mining claim, the Black Eagle No. 2, was surveyed but not patented. To the north are the Mayfield, Mayfield No. 2, and Blackhawk claims, held by location in 1994 by Clyde J. Sampson. Workings on the patented claims consist of several open cuts and six caved adits; five are short and one is long. A 5-stamp mill with a capacity of 3 tons per day was erected and adits excavated in 1908 by the Black Eagle Gold Mining Company (Brooks, 1909, p. 428; Ross, 1934, p. 108; Gerry, 1912, p. 575; Gerry, 1925, p. 237). Twenty-	Three samples (WRO 10-12) were taken during a USBM visit in 1983 in conjunction with the mineral investigation of the Frank Church River of No Return Wilderness. The three samples had as much as 0.19 ounce gold per ton and 0.5 ounce silver per ton.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					two tons of ore shipped in 1922 yielded 43 ounces gold and 87 ounces silver (Anderson, 1953, p. 38).	
399	PARK MINE	45 00 47 N	114 32 33 W	Quartzite is cut by fault zones trending N 50-80 W and dipping 57 SW to 45 NE. Sericitic alteration is prevalent along the poorly-exposed fractures which contain quartz veins and breccia. The veins, less than one foot thick, are composed of honey-combed quartz with pyrite casts, limonite, and malachite (Anderson, 1953, p. 38; Olson, 1985).	The Park mine is in a gully on the east side Black Eagle Creek, opposite the Black Eagle mine. At the Park mine there are some short adits, several cuts, and a cabin (Anderson, 1953, p. 38). The area is covered by the Blackkawk, Mayfield, and Mayfield No.2 claims held by Clyde J. Sampson (1994).	Two samples (WRO 13 and 14), taken during the 1983 USBM visit, contained as much as 0.05 ounce silver per ton (USBM files--Olson,1982). The visit was made in conjuction with the USBM mineral investigation of the Frank Church River of No Return Wilderness.
400	HOODOO-YELLOWJACK-ET UPPER PLACERS	45 03 22 N	114 29 23 W	Horn and others (1985, p. 183) reported that along upper Hoodoo, Yellowjacket, and West Fork Yellowjacket Creeks are broad, flat, alluvial benches ranging from 5 to 20 feet above creek level. The alluvium at Hoodoo and Frog Meadows is less than 5 feet thick. Black sand at the deposits contains the radioactive minerals allanite, cyrtolite, thorite, columbite, samarskite, and monazite. The principal radioactive mineral is samarskite (Reynolds, 1954, p. 2 and 8). The minerals are of economic interest because of their thorium, niobium, uranium, and rare earth content. Comprising the far greater portion of the alluvium and black sand are quartz, feldspar, fergunsonite, thalenite, zircon, and ferberite.	A few old placer workings, consisting of caved, hand dug pits and trenches were found. The black sand placers were examined by the USBM in 1982 in conjunction with the investigation of the mineral resouces of the Frank Church River of No Return Wilderness (Horn and others, 1985).	Twenty-six pan and bulk samples were taken during the USBM examination (Horn and others, 1985, p. 183). The samples contained black sand minerals. Reynolds (1954) reported that the placers contain a total of 10 million cubic yards of material grading 0.29 to 1 pound monazite equivalent per cubic yard. Locally, ilmenite is common (Savage, 1964, p. 220).
401	BLIND STRIKE PROSPECT	45 02 30 N	114 27 40 W	No mineralized structure is exposed. Brecciated, manganese-stained quartzite is on a pit dump.	The Blind strike prospect is up a west-flowing tributary that enters Yellowjacket Creek about 1.5 miles	Two samples (WRO 5 and 6) were taken by the USBM during its examination. One of the

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					upstream from its West Fork. The working, consisting of a prospect pit, was examined by the USBM in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985).	samples, consisting of a grab of brecciated quartzite (WRO 5), assayed 0.11 ounce gold per ton and 0.08 ounce silver per ton.
402	BIG BUCK PROSPECT	45 03 13 N	114 26 29 W	A 50- to 100-foot-wide zone of altered quartzite contains small amounts of gold, silver, lead, and molybdenum (Olson, 1985, p. 122).	The prospect is on the divide between Porphyry and Yellowjacket Creeks about 1/4 mile south of Quartzite Mountain. A claim notice, but no workings, was found during a USBM examination made in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985, p. 122).	Seven samples were taken during the USBM examination (Olson, 1985, p. 122). They assayed as much as 0.004 ounce gold per ton, 0.22 ounce silver per ton, 0.55 percent lead, and 0.022 percent molybdenum.
403	BLACKBIRD CREEK UPPER PROSPECT	45 06 54 N	114 21 38 W	Quartzite beds with limonite and quartz strike north and dip 85 E.	On the north side of Blackbird Creek, about 1 mile above the Blackbird mine, are a collapsed cabin and six overgrown prospect pits. Above the pits are two dozer cuts each over 200 feet long. The prospect was visited by the USBM in 1995 in conjunction with the mineral resource investigation of the Salmon National Forest.	An 80-foot-long chip sample (SFC-87) taken across quartzite during the USBM visit had 46 ppb gold.
404	BLACKBIRD CREEK SOUTH PROSPECT	45 06 35 N	114 21 33 W	The prospect is along the Blackbird copper-cobalt zone. The country rock is probably quartzite.	Also called West Fork Cobalt prospect, Blackbird Creek south prospect is about 1,400 feet south of Blackbird Creek and about 1 mile southwest of the Blackbird mine. The Blackbird Creek south prospect is covered by the FG claim group held by Cominco American (1994). Development, shown on the U.S. Geological Survey topo-graphic map of the Blackbird Creek quadrangle, consists of two	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					prospect pits. They were not visited by the USBM during the mineral investigation of the Salmon National Forest.	
405	BLACKBIRD CREEK SOUTHEAST	45 06 47 N	114 21 00 W	The prospect is along the Blackbird copper-cobalt zone. The country rock is probably quartzite.	The Blackbird Creek Southeast prospect is about 1,200 feet south of Blackbird Creek and 0.5 mile southwest of the Blackbird mine. The prospect is covered by the FR claim group which is held by Cominco American (1994). Development, shown on the U.S. Geological Survey topographic map of the Blackbird Creek quadrangle, consists of two prospect pits. They were not visited by the USBM during the mineral investigation of the Salmon National Forest.	No data available.
406	BLACKBIRD MINE	45 07 00 N	114 20 26 W	Within the Blackbird structural block are at least five tabular and podiform exhalative stratabound mineralized zones. From south to north they are named Idaho, Dandy, Chicago, Brown Bear, and Blacktail. The zones are associated with fractures in micaceous quartzite beds. The beds have a general strike of northeast to east-west and a dip of 45 N (Cole, 1956). The zones lie end to end and strike N 30 W and dip 50-75 NE. They have a combined length of at least 11,000 feet, an average thickness of 7 feet, and a vertical extent of 6,600 feet. They contain cobaltite, chalcopyrite, safflorite, pyrite, pyrrhotite, arsenopyrite, and their secondary products in a gangue of quartz, mica, calcite, tourmaline,	The Blackbird mine area is developed by a number of mine workings named Blackbird, Anaconda, Brown Bear, Bryan-Columbus, Calera, Chicago, Dandy, Dewey, High Five, Howe Sound Adit, Idaho, Indian Adit, Northfield, and Uncle Sam. The mine area is covered by 29 patented mining claims (Umpleby, 1913, p. 69) encompassing about 830 acres. Workings and structures include the 10.3-acre Brown Bear open pit, more that 10 miles of underground workings, a partially dismantled mill and mine camp, and a $10 million water treatment facility built and operated by Noranda Mining Company. In 1995, four mining companies, previous and current owners of the Blackbird mine, agreed to a	The mine area contains the largest known reserve of cobalt ore in the United States (Bilbrey, 1962, p. 25; Wallace Miner, May 8, 1986). Published reserves total about 6.5 million tons grading 0.55 percent cobalt (35,782 tons) and 1.31 percent copper (85,225 tons) (Bennett, 1977, p. 42). The Blackbird ore is complex. It is difficult to produce both a clean cobalt concentrate and a clean copper concentrate because of the intimate association of the copper and cobalt minerals. A combination of tabling and flotation treatment yields a 90 percent recovery of the copper and 75-85 percent of the cobalt in separate marketable concentrates.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				epidote, and apatite. The majority of the cobaltite is associated with chalcopyrite (Wells and others, 1948, p. 5).	multi-million-dollar pact with the state and federal government to clean up the mine (Wallace Miner, May 4, 1995). Discovered between 1893 and 1900, ore was produced from both underground and surface workings intermittently between 1902 and 1968. Vhay (1964a, p. 70) and Bergendahl (1964, p. 100) reported that 63 million pounds copper and 14,000 ounces gold have been recovered from the Blackbird mining district--mainly from the Blackbird mine. Accord-ing to USBM files, the Blackbird mine yielded 13,865,496 pounds cobalt, 53,450,171 pounds copper, 24,136 ounces gold, and 53,544 ounces silver from 283,741 short tons of ore between 1939 and 1968.	
407	BLACKBIRD MILLSITE	45 06 57 N	114 20 26 W	Ore milled contained cobaltite, chalcopyrite, safflorite, pyrite, pyrrhotite, arsenopyrite, and their secondary products, in a gangue of quartz, mica, calcite, tourmaline, epidote, and apatite. The majority of the cobaltite is associated with chalcopyrite (Wells and others, 1948, p. 5).	The Blackbird mill, now ismantled, is on Blackbird Creek. Discovered between 1893 and 1900, ore was produced from both underground and surface workings intermittently between 1902 and 1968. Ore produced during the mine's heyday, in the 1950's and 1960's, was processed in the 1,000 ton/day flotation mill constructed by the Calera Mining Company in the early 1950's.	The Blackbird ore is complex. A combination of tabling and flotation treatment yields a 90 percent recovery of the copper and 75-85 percent of the cobalt in separate marketable concentrates.
408	COPPER QUEEN PROSPECT	45 07 20 N	114 19 25 W	Along bedding in schistose quartzite are gossan and oxidized copper minerals (Vhay, 1948a, p. 26). Reed and Herdlick (USBM files) reported possible cobalt mineralization. U.S. Geological Survey MRDS records indicate that malachite, chalcocite, bornite,	The Copper Queen prospect is in the headwaters of Little Deer Creek. It is covered by a patented lode claim. Vhay (1948a, p. 26) reported that the workings consisted of two adits. The prospect was not visited during the USBM investigation of the	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				gold, pyrite, quartz, and magnetite are present.	mineral resources of the Salmon National Forest.	
409	HAYNES-STELLITE MINE	45 06 38 N	114 18 52 W	The mine is along the southeasterly projection of the Blackbird cobalt-copper zone. The Haynes-Stellite mine is hosted by rocks of the upper unit of the Yellowjacket Formation--massive, laminated quartzite. Fine-grained cobaltite is associated with a tourmaline breccia pipe in the quartzite. The quartzite strikes N 40 E and dips 50 NW.	The Haynes-Stellite mine is on the north side of Blackbird Creek about 1.6 mile upstream from the West Fork. Also called Cobalt mine or Beliel, the Haynes-Stellite mine was reported by Anderson (1943b, p. 7) and Alvord (1958, p. 5) to be on the Big Nickel group of 30 claims, located in the early 1900's. The claims were acquired by the Haynes-Stellite Company in 1915 and the deposit was mined between 1917 and 1921 when the price of cobalt was $6 per pound. A mill operated in 1918 and produced 55 tons of concentrates containing 19,514 pounds cobalt from 4,000 tons of ore. The grade of the concentrates was 17.74 percent cobalt and 0.63 percent copper (Hess, 1921b, p. 791). Most of the 2,900 feet of underground workings are in three adits which are open. There is a dozer trail from the Blackbird Creek road to the mine. The Haynes-Stellite Company was taken over by Union Carbide Corp. and exploration and a little mining continued. The Big Nickel claims were taken over by Penn-Idaho mine Inc. in 1957. That company applied for Defense Minerals Exploration dministration aid, and a DMEA examination was made (by Alvord) in 1958. The mine was visited by the USBM during 1995 in conjunction with the mineral investigation of the Salmon	One sample (SFC-69) of quartzite, taken during the USBM visit, contained 140 ppm cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					National Forest.	
410	HAYNES-STELLITE MILLSITE	45 06 38 N	114 18 49 W	Ore milled consisted of fine-grained cobaltite in massive, laminated quartzite.	The Haynes-Stellite mill no longer exists. It is assumed to have been near the mine. According to Hess (1921a, p. 899), a 10-stamp mill equipped with Wilfley slime tables, and flotation cells was erected in 1917. An 800-foot-long tram was employed to transport the ore from the mine to the mill (Bell, 1917, p. 96) In 1918, the mill treated 4,000 tons of ore yielding 19,514 pounds cobalt.	Hess (1921b, p.791) reported that a typical partial analysis of the concentrates produced from the Haynes-Stellite mine was 16.73 percent insolubles, 15.32 percent iron, 23.75 percent sulfur, 14.15 percent arsenic, 17.74 percent cobalt, and 0.63 percent copper.
411	BLACKBIRD CREEK CROSSCUT PROSPECT	45 06 09 N	114 18 07 W	The prospect is along the trend of the Blackbird cobalt-copper zone. The adit crosscuts massive, laminated quartzite striking N 60 W and dipping 20 SW. The rock contains quartz stringers and erythrite.	On the northeast side of Blackbird Creek, about 1.4 miles upstream from the west fork, is a crosscut adit trending N 15 E that is 80 feet long. The adit was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A 4-foot-long chip sample (SFC-70), down the crosscut wall, assayed 890 ppm cobalt. The sample was taken during the USBM visit.
412	ANDERSON COBALT WEST PROSPECT	45 05 38 N	114 21 28 W	Anderson (1943b, p. 31) reported that the prospect is in quartzose rock containing cobalt bloom and chalcopyrite.	The prospect is covered by the FG claim group which is held by Cominco American (1994). Anderson (1943b, p. 31) reported that 2.75 miles up the West Fork of Blackbird Creek from the Patty B prospect is an adit 400 feet long. It was not visited by the USBM during the mineral investigation of the Salmon National Forest.	No data available.
413	ANDERSON COBALT PROSPECT	45 05 25 N	114 20 59 W	On the dump of the adit is fine-grained black rock containing finely disseminated cobaltite and stained with erythrite (Anderson, 1943b, p. 31). U.S. Geological Survey MRDS files list the presence of magnetite.	The Anderson prospect is on the West Fork Blackbird Creek about 2.2 miles upstream from Blackbird Creek. Anderson (1943b, p. 31) reported that at the prospect, 1.75 miles above the Ludwig prospect, is a caved adit at least 150 feet long. The FR claim group, held (1995) by	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Cominco American, covers the area. The prospect was not visited during the USBM mineral investigation of the Salmon National Forest.	
414	EDITH B. PROSPECT	45 05 20 N	114 20 03 W	A stringer of quartz containing magnetite, malachite, cobaltite, and chalcopyrite is as thick as 3 feet. It occurs along bedding in finely-parted, phyllitic quartzite striking N 20 W and dipping vertically.	The Edith B prospect is on the north side of West Fork Blackbird Creek about 1.6 miles upstream from Blackbird Creek. The FR claim group, held (1995) by Cominco American, covers the area. The prospect was visited by the USBM in conjunction with the investigation of the mineral resources of the Salmon National Forest.	A 3-foot-long chip sample (SFC-89), taken across quartzite during the USBM visit, assayed 1.65 percent copper, 0.289 percent cobalt, and 81 ppb gold.
415	LUDWIG PROSPECT	45 05 33 N	114 19 31 W	A tourmaline breccia pipe is in finely parted, phyllitic quartzite, striking N 70 W and dipping 45 SW. The pipe forms a spire conspicuously stained by pink cobalt bloom. The pipe is as thick as 40 feet and as long as 50 feet. Stringers containing quartz and limonite extend from the pipe out into the surrounding quartzite. Anderson (1943b, p. 31) reported that cobaltite and chalcopyrite were also present.	The Ludwig prospect area, also called Beliel, Conicu, and Abby, is on the north side of the West Fork Blackbird Creek about 1.2 miles upstream from Blackbird Creek. Anderson (1943b, p. 31) reported that the Ludwig was a relocation of some of the Beliel claims described by Umpleby (1913, p. 164). Most of the exploration work was done by Noranda in the 1980's. The Abby claims were staked by Cominco in the 1990's. Development includes a dozer road from West Fork Blackbird Creek north to the prospect, at least 0.5 mile of dozer trenching, and at least 5 drill stations. The prospect was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	Umpleby (1913, p. 165) reported that 20 feet of the zone had slightly less than 2 percent cobalt. A sample (SFC 90), chipped across the pipe during the USBM visit, had 28 ppb gold and 210 ppm cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
416	PATTY B PROSPECT	45 05 36 N	114 18 10 W	In phyllitic quartzite, striking N 70 E and dipping 45 NW, are numerous exposures of tourmalinized breccia containing tourmaline, cobaltite, chalcopyrite, magnetite, quartz, malachite, and limonite.	The Patty B, a relocation of one of the old Beliel claims described by Umpleby (1913, p.164), is located on the north side of the West Fork Blackbird Creek near its confluence with Blackbird Creek. Tailings from the Blackbird mine are stored on part of the claim. Two adits, 60 and 70 feet long, along with most of the other workings at the Patty B. prospect, are covered.	A 20-foot-long chip sample (SFC-88) across a breccia zone at the west end of the Patty B. area had 0.13 percent cobalt. A 10-foot-long chip sample (SFC-91) across a breccia zone at the east end contained 0.08 percent copper and 9 ppb gold.
417	DUMMY CREEK COPPER PROSPECT	45 04 38 N	114 17 22 W	Bennett (1977, PL. 2) reported copper stain along the contact between quartzite and phyllite.	The plate accompanying Bennett's report (1977) shows a prospect on the divide between Dummy and Blackbird Creek, about 1.1 miles west of Panther Creek. It was not visited by the USBM during the mineral investigation of the Salmon National Forest.	No data available.
418	WEST FORK ZINC PROSPECT	45 04 42 N	114 21 42 W	A gossan, 4 feet thick, is along quartzite and felsite beds striking N 40 E and dipping 10 SE. The gossan contains limonite, sericite, and quartz with zinc and silver oxides.	The prospect is by a logging road along the northeast side of the divide between West Fork Blackbird Creek and French Gulch. Workings consist of a few old prospect pits. The prospect was visited by the USBM in 1995 in conjunction with the mineral resource investigation of the Salmon National Forest.	A 4-foot-long chip sample (SFC-71), taken across the gossan during the USBM visit, had 1.1 percent zinc, 5 ounce silver per ton, and 0.21 percent antimony.
419	FRENCH GULCH PROSPECT	45 04 05 N	114 22 01 W	Along the bedding in finely-parted, phyllitic quartzite, is a poorly-exposed, malchite-stained zone containing quartz, pyrite, chalcopyrite, and limonite. The malachite staining occurs across a zone 50 feet thick. The quartzite strikes north and dips 65 east.	The French Gulch prospect, covered by the Musgrove claims held by Newmont (1995), is in the headwaters of French Gulch about 1.3 miles northeast of Musgrove Creek. Development consists of two crosscut adits totaling less than 500 feet. The adits are 100 feet vertically and 400 feet horizontally apart. There also are a number of small pits, a collapsed cabin, jeep	A 50-foot-long chip sample (SFC-101), taken across the zone during the USBM visit, had 13.25 percent copper, 220 ppb gold, 1.87 ounce silver per ton, 0.11 percent zinc, and 110 ppm cobalt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					road, a single 1-foot-diameter cylinder Fairbank-Morse gasoline engine, a compressor, and a 100 gallon surge tank. The adit was cleaned out in 1986 by Harold Bolstad. The mountain above the prospect was logged in the 1970's. The prospect was visited by the USBM during 1995 in conjunction with the mineral investigation of the Salmon National Forest.	
420	STEEN PROSPECT	45 03 18 N	114 20 42 W	Along bedding in phyllitic quartzite is a poorly-exposed, limonitic, silicified zone. The zone strikes N 65 W, dips 20 NE, and is at least 500 feet long.	The Steen prospect, covered by Newmont Exploration Company's PR mining claims, is at the headwaters of Indian Gulch. Workings consist of two short adits and a few pits and trenches. The prospect was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	A 500-foot-long chip sample (SFC-99), taken along the zone during the USBM visit, had 5 ppb gold.
421	OSTANDER CREEK PROSPECT	45 02 40 N	114 19 46 W	Poorly exposed in phyllitic quartzite is an iron-stained zone.	Covered by Newmont Exploration Company's OC claims, the prospect is in the headwaters of Ostrander Creek. Workings consist of one short caved adit, less than 50 feet long, that has been obliterated by a dozer pit covering 2 acres.	A grab sample (SFC-98) of iron-stained quartzite, taken from the dump of the dozer pit during a USBM visit in 1995, assayed 44 ppb gold and 22 ppm cobalt. The USBM visit was made in conjunction with the mineral investigation of the Salmon National Forest.
422	NEWMONT MUSGROVE PROJECT AREA	45 02 08 N	114 20 13 W	Along bedding in phyllitic quartzite is a 700-foot-wide zone that strikes N 22 W and dips 40 NE. It is iron stained and contains quartz, jasperoid, and alunite.	Newmont's extensive Musgrove project area extends over a 4-square-mile area between Blackbird and Porphyry Creeks. The area is (1995) covered by the Atlas, Lee, Grove, Musgrove, PR, OC, and Belt groups of mining claims. The work, begun in 1991 by Altas mining company and continued by Newmont, was concentrated	A 700-foot-long sample (SFC-97), chipped across the zone during the USBM visit, had 320 ppb gold. Five deep holes, drilled by Newmont Exploration in 1993 (Gillerman and Bennett, 1994, p. 411), intersected ore-grade gold mineralization at depths of between 300 and 800 feet.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					along the divide between Musgrove and Blackbird Creeks, between the Musgrove mine and French Gulch. Dozer trenching, mapping, sampling, and the drilling of at least 40 sites was accomplished by 1994. Workings, no longer being explored, have been reclaimed. In 1994, the company was given an award for their reclaimation work by the state of Idaho. A visit was made to the area by the USBM in conjunction with the mineral resource investigation of the Salmon National Forest.	
423	GIBSON URANIUM PROSPECT	45 01 55 N	114 20 45 W	The area is underlain by volcanic tuffs, sedimentary rocks, and flows of the Challis formation which are anomalously radioactive (Salisbury & Dietz, Inc., 1982, p. 8). The radioactivity is associated with a 100-foot-wide, 300-foot-long zone of fractures in lignite, carbonaceous felsic tuffs, and limonitic and hematitic eruptive breccia. Autunite and uranophane are disseminated in lignite and carbonaceous tuffs.	The Gibson prospect is about 0.4 mile south of Musgrove Creek and about 2 miles upstream from Panther Creek. The prospect, also called Steen Group, Musgrove Uranium, Volcano, and Pitchblende was located in 1955 and was held in 1994 by William H. Steen. The claims extend over five sections. In the 1960's, the Pitchblende No. 2 was drilled at four locations by the Idaho Power Resource Company. The prospect was examined in 1982 by Salisbury and Dietz, Inc. during their investigation of the uranium potential of the Elk City quadrangle. The investigation was part of the National Uranium Resource Evaluation (NURE) program conducted by the U.S. Department of Energy.	Eighteen samples of the radioactive volcanic rocks taken by Salisbury and Dietz, Inc. (1982, p. 8), averaged 0.18 percent U3O8.
424	LEE PROSPECT	45 01 51 N	114 20 18 W	No mineralized structure is exposed. An adit crosscuts iron-stained, sercitized, and brecciated quartzite and volcanic rock striking N 80 E	There is a dry, inaccessible adit, about 80 feet long, on the northeast side of Musgrove Creek about 1.5 miles downstream from	A sample (SFC-8) taken from the dump during a 1994 USBM examination assayed 140 ppb gold.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and dipping 25 SE. On the dump is volcanic breccia containing limonite. It is similar to the rock exposed at the Breccia Gold mine, located about a mile to the south.	Ostrander Creek. The adit is covered by OC claims of the Newmont Musgrove project. The adit was visited by the USBM in conjunction with the mineral resource investigation of the Salmon National Forest.	
425	MUSGROVE MINE	45 01 48 N	114 19 48 W	A N 30-35 W trending, 50-56 NE dipping stratibound zone follows bedding in gossany, schistose quartzite. The zone is as thick as 20 feet and composed of fine-grained, brecciated, quartzite containing pods of quartz, calcite, siderite, pyrite, pyrrhotite, chalcopyrite, bieberite, and malachite (Roberts, 1951).	The Musgrove mine is about 1,100 feet northeast of Musgrove Creek and about 1.7 miles northwest of the junction of the creek with Panther Creek. The Musgrove was located prior to 1900 and the Musgrove Group (MS 2569) of mining claims were patented by the Musgrove Mining Company. In the mine are three adits and a number of prospect pits. The adits, within a 6-acre area, are 110 feet apart vertically. In 1936, Campbell (1936, p. 211) reported that the underground workings totaled 722 feet. Along Musgrove Creek and connected to the mine by tram was the mill, located on the patented Musgrove No. 2 claim (MS 3072). A Defense Minerals Administration exploration loan was sought, but denied, in 1951 (Roberts, 1951). USBM records list production of significant amounts of gold, silver, and copper. Around the patented claims are OC and Belt Group claims held (1995) by Newmont.	Umpleby (1913, p. 165) reported that the ore averaged $20 in gold per ton at a gold price of about $20 per ounce. Six 1.8- to 5-foot-long samples, taken from the underground workings by Vhay (1948), had as much 7.75 percent copper and 0.09 percent cobalt. A sample of dump material, taken during a USGS visit (Modreski, 1983, p. 212), had 30 ppm copper and 10 ppm cobalt. Five deep holes drilled by Newmont Exploration in 1993 (Gillerman and Bennett, 1994, p. 411) intersected ore-grade gold mineralization at depth. Newmont's exploration program continued in 1994.
426	MUSGROVE MILLSITE	45 01 36 N	114 19 53 W	The ore processed consisted of fine-grained, brecciated, quartzite containing pods of quartz, calcite, siderite, pyrite, pyrrhotite, chalcopyrite, bieberite, and malachite (Roberts, 1951).	The Musgrove millsite is on Musgrove Creek about 1/4 mile southwest of the mine and about 1.2 miles upstream from Panther Creek. The millsite is covered by the Major Musgrove patented (MS	Umpleby (1913, p. 165) reported that the ore averaged $20 in gold per ton at a gold price of about $20 per ounce.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					3072) lode claim, patented in 1924 by Arthur L. Green and others, and totaling 20.641 acres. Ore was moved from the mine to mill by tram. The mine, also called Victory and Meadow, produced from 1913 through 1940. Gerry (1914, p. 776 and 1916, p. 624) reported that the mill consisted of a 17 ton/day cyanide concentrator equipped with a Dodge crusher, one-foot Lane mill, cone classifer, and two Trent agitation tanks. The equipment has been removed. The mill site and mine were visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	
427	BRECCIA GOLD MINE AREA	45 01 05 N	114 19 41 W	A gold- and electrum-bearing material is in a brecciated fault zone along the contact between argillic rocks of the Yellowjacket Formation and Challis Volcanics (Lowe, 1988). The zone strikes N 45 W, dips 50-65 SW, and is at leat 10 feet thick, 1,500 feet long, and 500 feet deep.	The Breccia Gold mine area is on the summit of the divide between Musgrove and Porphyry Creeks about 0.8 mile northwest of Panther Creek. Grove (1985, p. 5) reported that the mine was discovered in 1934 and operated in the late 1930's and 1940's under the name Gahsmith mine. Several thousand tons of ore were mined; some was handcobbed and shipped by pack mule. An open pit was developed in 1987 by Metro Resources and 4,600 tons of ore for test milling was shipped. Newmont Exploration conducted trenching and drilling in 1993 and 1994. These tests sites have also been reclaimed. In 1994, the area was covered by current lode, placer, and millsite claims. In late 1994, the principal workings consisted of an	Grove (1985) reported geologic reserves of 5 million tons grading 0.138 to 0.140 ounce gold per ton. A sample (SFC-7) of vein material taken during the 1994 USBM examination had over 10 ppm gold.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					adit next to a 200-foot-long, 100-foot-wide, 40-foot-high dozer cut. The adit is probably about 100 feet long. The area was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	
428	AMAC PROSPECT	45 01 17 N	114 19 08 W	An adit crosscuts phyllitic quartzite striking N 80 E and dipping 10 NW. The quartzite is finely parted, silicified, and iron stained.	The AMAC prospect is covered by claims held (1994) by Newmont. Workings consist of a north-trending, 40-foot-long adit north of Musgrove Creek and about 1,800 feet from Panther Creek. The prospect was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	A grab sample (SFC-100), taken from the adit dump during the USBM visit, had 28 ppm lanthanum and 51 ppm cesium.
429	BORROW PIT	45 01 20 N	114 18 46 W	The material mined consists of angular, quartzite talus.	Riprap, for use as base and surfacing on the nearby Panther Creek road No. 055, is mined as needed from talus on the north side of the junction of Musgrove and Panther Creeks. Two shallow pits cover about 1/2 acres.	There is a 10 year supply (USFS files).
430	JUNCTION PLACER MINE	45 00 41 N	114 19 11 W	From just below Moyer Creek, upstream to Porphyry Creek, the Panther Creek Valley contains continuous gravel deposits 200-300 feet wide and as deep as 12 feet. Interbedded with the gravel near Forney is bentonite clay. The deposits opposite the mouth of Musgrove Creek contain gold and tin (Lorain and Metzger, 1939, p. 73). The tin occurs as cassiterite in pieces from small rounded grains to pebbles a half-inch in diameter. The cassiterite is sparsely distributed through the lower portion of a bed of	A pit was excavated in the channel of Panther Creek near Moyer Creek to test the gold and tin content. Ross (1927, p. 19) reported that these are the only placers in the district in which recovery of tin was attempted. Several hundred cubic yards of gravel were washed (Livingston, 1919, p. 43). Lorain and Metzger (1939, p. 73) reported that at one time, a small dredge was on the flats opposite the mouth of Musgrove Creek. It was never operated. Bentonite clay, used to line leach pads at the Beartrack	Test mining of forty square feet of stream channel bedrock yielded $20 in coarse gold (at a price of $20 per ounce) and 130 pounds of cassiterite. The cassiterite assayed 30 percent tin (Bell, 1918, p. 104). According to Lorain and Metzger (1939, p. 73), samples run by Allen Merrit contained $.20 in gold per cubic yard (at $35 per ounce) and 1 pound of tin per cubic yard.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				limonitic gravel 4-20 feet thick (Umpleby, 1913, p. 74). Bedrock consists of finely-parted, argillaceous quartzite.	mine, was mined near Forney in 1994 and 1995. The upper end of the placer is covered by the O'Conner Homestead (H.E.S. 174). The lower end is the site of a U.S. Forest Service helicopter base. The placer was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	
431	FORNEY CLAY DEPOSIT	45 00 11 N	114 19 55 W	Bentonitic clay is intercalated with glacial outwash and limonitic stream gravel.	Bentonite clay, used to line the leach pads at the Beartrack mine, is mined as needed from a deposit on Panther Creek. The workings, located on private land covering the lower part of the Forney/Junction placer, have been reclaimed.	No data available.
432	DOUBLE EAGLE PLACER	45 06 55 N	114 13 01 W	The placer consists of a bench deposit which covers about 4 acres and is about 10 feet above the stream channel, and a stream channel deposit. The deposits consist mainly of quartzite that is poorly sorted and rounded.	The Double Eagle placer is on an oxbow in Panther Creek about 1.5 miles downstream from the Cobalt townsite. The placer was held by location in 1994 by John E. Moore. It was not visited by the USBM during the investigation of the mineral resources of the Salmon National Forest.	No data available.
433	DESERT PROSPECT	45 05 43 N	114 13 25 W	The area is underlain by heavily fractured quartzite striking north-northwest and dipping steeply. Along fractures are quartz and cobalt bloom, probably bieberite (CoSo4.7H2O). The cobalt bloom is associated with tourmalinized quartzite, similar to that exposed at the Haynes-Stellite mine. The cobalt bloom is a result of the oxidation of primary cobalt sulfide introduced into the country rock (Alvord, 1958, p.	The Desert prospect is in the first gully north of Spring Creek and about 0.5 mile northeast of the Cobalt townsite. Alvord (1958, p. 2) reported that the Desert group of mining claims, consisting of Sahara 1-13 and Mojave 1-12 claims, was recorded in 1957 by Penn-Idaho mines, Incorporated. The claims were located in conjunction with the location and exploration of the Big Nickel claims, covering the Haynes-Stellite mine. DMEA	Four chip samples, 1.2 to 4.0 feet long, taken by Alvord (1958, p. 11). The cobalt- and copper-bearing zone is along the southeasterly projection of the Blackbird cobalt-copper belt.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				10).	aid was sought and an examination was made by Alvord (1958). At the time of the DMEA examination, there were no workings, only mineralized outcrops.	
434	FAWN PROSPECT	45 04 57 N	114 14 55 W	Poorly exposed along bedding in finely-parted, argillaceous, schistose quartzite, is drusy quartz with hematite, malachite, and galena. The quartzite strikes N 70 E, dips 65 NW, and where mineralized, is as thick as 0.5 feet.	The Fawn prospect is on the east side of Panther Creek about 0.7 mile downstream from Fawn Creek. Workings consist of two caved adits along a N 70 E trend. The adits, estimated to total about 120 feet, are 40 feet vertically and 50 feet horizontally apart. There is a 100-foot-long dozer cut from Panther Creek to the adits. The prospect was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	A 0.5-foot-long chip sample (SFC 72) was taken during the USBM visit. It contained 150 ppb gold, 3.5 ounce silver per ton, 0.91 percent zinc, and 0.235 percent arsenic.
435	BLACKPINE MILLSITE	45 02 23 N	114 14 10 W	The mill was built to treat ore consisting of chalcocite, bornite, malachite, azurite, glaucondot, pyrite, and arsenopyrite.	The Blackpine mill is along Copper Creek about 1.2 miles downstream from the mine. A gravity and later flotation mill was constructed in the early 1950's to treat the ore from the Blackpine mine (Shockey, 1957, p. 30). A few tons of ore were treated by the Montana Coal and Iron Company and some copper concentrates produced. The mill, now partially dismantled, had a capacity of 100 tons per day. It is equipped with a crusher, hopper, feeder, 5- by 5-foot-diameter ball mill, 4-foot-wide rake, agitator-reagent tank (that is 4 feet across), two banks of flotation cells, (each bank has six 32- by 32-inch cells), a 10-foot-high, 8-foot-wide cyanide tank, a 4-foot-wide, 6-foot-long filter press, and a screw feeder.	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					There are about 500 cubic yards of mill tailings along Copper Creek near the mill).	
436	BLACKPINE MINE AREA	45 02 49 N	114 12 08 W	The Blackpine mine is along the southeast extension of Blackbird cobalt-copper zone. The mine is underlain primarily by tightly folded phyllite, argillite, and quartzite beds. The beds strike N 20-80 W, dip 42-71 NE, and are transected by mafic dikes (Romischer and Prinz, 1959, p. 6). Sedimentary-exhalative mineralized zones, composed of quartz, and copper- and cobalt-bearing minerals, are along the beds (Gillerman and Bennett, 1994, p. 411). There are at least two distinct zone types--zones that are predominently copper bearing and zones that are predominately cobalt bearing. The principal copper zone is reported by Shockey (1957, p. 35) to contain chalcopyrite as the principal ore mineral. The chalcopyrite is in massive ore shoots extending irregularly for over 500 feet. The shoots also contain chalcocite, bornite, malachite, azurite, glaucondot, pyrite, and arsenopyrite. Nisbet and others (1994, p. 18) reported that drilling transected semi-massive chalcopyrite horizons as thick as 5.6 feet. A cobalt zone, 100 to 140 feet northeast of the principal copper zone, contains quartz, cobaltian arsenopyrite, and small amounts of chalcopyrite	The Blackpine mine area is the divide between Copper, Fawn, and Deep Creeks. The mine was discovered prior to 1904 and mined, by underground methods, between 1952 and 1969. During the 1950's, exploration and development was conducted under DMEA/OME contract--Docket DMEA-2499, Contract Idm-E329. In 1952, 89 tons of ore yielded 24,200 pounds copper. In the early 1950's, a flotation mill was constructed below the mine (Shockey, 1957, p. 30). USBM records list production of significant amounts of gold, silver and copper between 1955 and 1969. Formation Capital Corporation acquired the mine in 1993 and began exploration. The exploration included geophysical and geochemical surveys, trenching, and the drilling of 45 holes totaling 15,000 feet (Gillerman and Bennett, 1994, p. 411). Surface and underground workings, the mill, and connecting roads and trails are scattered over a four square mile area. The underground workings total at least 5,000 feet. The mine area is covered by three patented claims totaling about 61 acres--Cross Cut Copper, No. 1 Fraction, and Black Pine (MS 1700).	The 1993-94 work conducted by Formation Capital Corporation shows that the mineralized zone, and possibly additional shoots, extends for more than 17,000 feet along strike. Their drilling intersected high grade material; a 7-foot-thick zone assayed 7.26 percent copper and 0.006 ounce gold per ton. According to Nisbet (Formation Capital, personal communication, March 10, 1997), resources include 3 million tons containing 0.5 percent recoverable copper from oxide ore, 1 million tons averaging 4.5 percent copper, 0.08 percent cobalt, and 0.03 ounce gold per ton, and 400,000 tons grading 1 percent cobalt and 0.1 ounce gold per ton.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				and other copper minerals. The zone is as thick as 4 feet.		
437	COBALT PROSPECT AREA	45 02 36 N	114 11 30 W	The Cobalt prospect area is underlain by phyllite, argillite, and quartzite beds that are tightly folded. The bedding strikes N 20-80 W, dips 42-71 NE, and is transected by mafic dikes (Romischer and Prinz, 1959, p. 6). Mineralized zones, containing quartz, and copper- and cobalt-bearing minerals, parallel the bedding. There are at least two distinct zone types--zones that are predominently copper bearing and zones that are predominately cobalt bearing. The copper zones contain chalcopyrite as the principal ore mineral, along with chalcocite, bornite, malachite, azurite, glaucondot, pyrite, and arsenopyrite. Cobalt zones contain quartz, cobaltian arsenopyrite, and small amounts of chalcopyrite and other copper minerals.	Located east of the Blackpine mine, along the southeasterly extension of the Blackbird copper-cobalt zone, the Cobalt prospect area workings consist of a number small adits, shafts, dozer cuts, and drill sites all connected by dozer roads. The Blackpine mine area and adjoining Cobalt prospect were discovered prior to 1904 and explored intermittently until the present (1995). Formation Capital Corporation acquired the prospect in 1993 and began an exploration program. The program included geophysical and geochemical surveys, trenching, and drilling.	The 1993-94 work conducted by Formation Capital Corp demonstrated that the mineralized zone extends for more than 17,000 feet along strike from the Blackpine mine through the Cobalt prospect area. Their drilling intersected high grade material. A 7-foot-thick zone assayed 7.26 percent copper and 0.006 ounce gold per ton. Cobalt-rich horizons locally carry 0.25 percent cobalt (Gillerman and Bennett, 1994, p. 411).
438	BORROW PIT	45 06 22 N	114 06 10 W	Quartzite talus is quarried as needed.	The Moccasin Creek borrow pit is along Moccasin Creek about 1.2 miles northwest of Williams Creek Summit. Sand and gravel are mined for use as base and surfacing on Salmon National Forest and Lemhi County roads.	There is a 20 year supply.
439	SHELLROCK PEAK PROSPECT	44 57 20 N	114 55 42 W	Rhyolite and andesite flows and pyroclastics are transected, altered, and mineralized by a swarm of andesitic to rhyolitic dikes. Five dikes examined strike N 60-75 E, dip 70-90 SE, are iron stained, and contain pyrite. They are as thick as	The prospect is at the headwaters of South Fork Brush Creek on the east flank of Shellrock Peak. Stream-sediment sampling in the area by the U.S. Geological Survey disclosed anomalous metal content. The anomaly was	Seven samples were taken from weathered outcrops during the USBM examination (Cater and others, 1973, p. 278). They contained as much as trace gold, 0.01 percent copper, and 0.01 percent lead. They averaged

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				30 feet and as much as 500 feet long. Alteration extends for as much as 15 feet from the dikes into the country rock (Cater and others, 1973, p. 278).	examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 278).	0.30 ounce silver per ton.
440	BERNARD LANDING FIELD PLACER	44 58 41 N	114 44 04 W	The placer is a terrace stream gravel deposit covering 16 acres (Cater, 1973, p. 287). In the stream gravel are sparce lenses of black sand and flood gold.	The Bernard Landing field, on the west side of the Middle Fork Salmon River between Bernard and Short Creeks, was claimed in the past. There are a few small workings. No doubt some mining was done along the river edge and those workings obliterated by high water and the construction of the landing field. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer contains about 309,000 cubic yards of gravel. Samples from three sites, excavated during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.021 in gold per cubic yard (at a gold price of $47.85 per ounce) and 2.5 pounds black sand per cubic yard.
441	POLE CREEK PLACER	44 58 27 N	114 43 59 W	The placer consists of stream gravel covered by an alluvial fan. In the stream gravel are sparce lenses of black sand and flood gold.	The placer, on the east side of the Middle Fork Salmon River at Pole Creek, was claimed in the past. Workings consist of a few small prospect pits. No doubt some small scale placer mining was done along the stream edge. The mine orkings have been obliterated by high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer covers 17 acres and contains 550,000 cubic yards. Samples taken at three sites during the USBM examination (Cater and others, 1973, p. 287) had trace gold and 1 pound black sand per cubic yard.
442	RESERVOIR CREEK PLACER	44 57 46 N	114 43 49 W	The placer consists of a terrace stream gravel deposit partially covered by talus. The gravel contains sparce blacksand lenses with flood gold.	The placer, on the east side of the Middle Fork Salmon River at Reservoir Creek, is a homestead claimed as a placer in the past. No doubt some small scale mining was attempted along the river edge. Resultant workings have	The placer has an area of about 69 acres and contains 2,250,000 cubic yards of gravel. Samples, taken at four sites during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.027 in gold per cubic

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					been obliterated by high water.	yard (at a gold price of $47.85 per ounce) and 1.1 pounds black sand per cubic yard.
443	MORMON RANCH PLACER	44 57 02 N	114 43 55 W	Stream gravel is covered by a little talus and overburden. The gravel contains sparse lenses of black sand and flood gold.	The Mormon placer is on the east side of the Middle Fork Salmon River at the mouth of Warm Springs Creek. It was claimed as a placer in the past and eventually homesteaded. It is now controlled by the Idaho Fish and Game Department. On the placer are a few prospect pits. No doubt some placer mining was done along the edge of the river. However, the resulting small workings were obliterated by high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 36 acres and a volume of 1,184,000 cubic yards. Samples, taken at six sites during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.068 in gold per cubic yard (at a gold price of $47.85 per ounce) and 1.4 pounds black sand per cubic yard.
444	SHEEP CREEK RANCH PLACER	44 56 27 N	114 43 42 W	The placer consists of stream gravel overlain by an alluvial fan.	Sheep Creek Ranch, at the junction of Sheep Creek and Middle Fork Salmon River, was claimed in the past. Workings consist of a few prospect pits. They were examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 60 acres and a volume of 1,946,000 cubic yards. Seven sites were sampled during the USBM examination (Cater and others, 1973, p. 287). The samples had as much as $0.014 in gold per cubic yard (at a gold price of $47.85 per ounce) and 0.6 pound black sand per cubic yard.
445	APAREJO CREEK FLUORITE PROSPECT	44 56 10 N	114 43 17 W	A poorly-exposed fissure vein of quartz, calcite, and fluorite trends N 50 E and dips 70-90 SE in granite. The vein is exposed over a horizontal distance of 500 feet and over a vertical distance of 50 feet; it is 1 foot thick (Cater and others,	There is a small exploration pit a few hundred feet north of Aparejo Point. It was examined in conjunction with the USBM investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p.	The vein contains about 33 percent fluorite (Cater and others, 1973, p. 278).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				1973, p. 278).	278).	
446	APAREJO POINT PLACER	44 55 44 N	114 43 38 W	The placer consists of a shallow stream gravel containing a sparce lenses of flood gold and black sand.	The placer, on the east side of the Middle Fork Salmon River between Aparejo Point and Sheep Creek, consists of a river bar that was claimed in the past. USBM records list the production of a small amount of gold from 75 cubic yards of gravel in 1940. The resulting workings were obliterated long ago by the action of water during periods of high water. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of 2 acres and a volume of 48,000 cubic yards. Samples, excavated from three sites during the USBM examination (Cater and others, 1973, p. 287), had as much as $1.709 in gold per cubic yard (at a gold price of $47.85 per ounce) and 2.4 pounds black sand per cubic yard.
447	BROKEN OAR PLACER	44 54 36 N	114 43 53 W	Elevated stream gravel forms a terrace that is partially covered by talus and alluvium. The buried gravel contains sparce lenses of gold and black sand, similar to the flood gold deposits in the nearby stream channel.	The Broken Oar placer was also claimed as the Blue Bird and Black Bird. Consisting of a terrace on the Middle Fork Salmon River opposite the mouth of Big Bear Creek, workings consist of a few caved prospect pits. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 36 acres and a volume of 1,170,000 cubic yards. Samples, taken at five sites during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.027 in gold per cubic yard (at a price of $47.85 per ounce) and 1.3 pounds black sand per cubic yard.
448	BEAR CREEK PLACER	44 54 04 N	114 43 38 W	Stream gravel is covered by talus and an alluvial fan. In the stream gravel are sparce lenses of black sand and flood gold.	The placer, 1/4 mile south of the junction of Bear Creek and the Middle Fork Salmon River, was claimed in the past; there are a few prospect pits. Mining may have been done along the river's edge in the past and the resulting workings obliterated by high water. The placer was examined by the USBM in conjunction with the investigation of the mineral	The placer has an area of about 15 acres and a volume of 486,000 cubic yards. Samples, excavated at seven sites during the USBM examination (Cater and others, 1973, p. 287), had as much as $0.021 in gold per cubic yard (at a price of $47.85/oz) and 1.1 pounds black sand per cubic yard.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					resources of the Idaho Primitive Area (Cater and others, 1973).	
449	POOL PLACER	44 53 51 N	114 43 45 W	The placer consists of a stream bar deposit of sand and gravel.	The stream level placer, on the east side of the Middle Fork Salmon River between Camas and Big Bear Creeks, was claimed in the past.	The placer has an area of about 11 acres and a volume of 1,225,000 cubic yards. Samples, excavated from five sites during the USBM examination (Cater and others, 1973, p. 287), contained as much as $0.068 in gold per cubic yard (at a price of $47.85 per ounce) and 1.3 pounds black sand per cubic yard.
450	HEATHERING-TON PLACER	44 53 37 N	114 43 46 W	A terrace gravel deposit is covered by a little talus and alluvium.	The placer, consisting of a terrace on the north side of the Middle Fork Salmon River about 1/4 mile east of Camas Creek, was claimed in the past. There are a few prospect pits. The placer was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 12 acres and a volume of 755,000 cubic yards. Four sites were sampled during the USBM examination (Cater and others, 1973, p. 287). The samples had as much as $0.164 in gold per cubic yard (at $47.85 per ounce) and 2.5 pounds black sand per cubic yard.
451	CAMAS CREEK PLACER	44 53 30 N	114 43 17 W	A stream bar and terrace placer is partially covered by talus and alluvium.	The placer, located at the junction of Camas Creek and Middle Fork Salmon River, was claimed in the past. Workings consist of a few prospect pits. The deposit was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973).	The placer has an area of about 14 acres and a volume of 450,000 cubic yards. Five sites were sampled during the USBM examination (Cater and others, 1973, p. 287). The samples contained as much as $0.014 in gold per cubic yard (at $47.85 per ounce) and 1.6 pounds black sand per cubic yard.
452	WARM SPRING CREEK GEOTHERMAL AREA	44 57 05 N	114 42 15 W	Waring (1965, p. 27) reported that hot water flows from the spring area at a rate of 40 gallons per minute. The springs are fed by fractures in Tertiary-age granite.	The geothermal area, located on Warm Springs Creek about 1.5 miles east of the Middle Fork Salmon River, is undeveloped.	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
453	JAYBIRD PROSPECT	44 59 12 N	114 37 25 W	A poorly-exposed gossan zone, 25 feet long and 2 feet thick, strikes N 70 E and dips 30 NW in quartzite. The zone contains secondary copper minerals (Olson, 1985, p. 119).	Also called Diamond Queen, Mayflower, and Iron Lode, the Jay Bird prospect is situated about 2 miles from the junction of the Lake Creek and Middle Fork Peak roads. Workings consist of a 35-ft-long trench (Olson, 1985, p. 119). Fisher and Johnson (1987, p. 104) reported that in 1903, 30 tons of ore from the Diamond Queen and Mayflower yielded 2 ounces gold and 3 ounces silver.	Seven samples (WRO 35, 36 and 90-94) were taken during a USBM examination (Olson, 1985, p. 121). The examination was part of the USBM investigation of the Frank Church River of No Return Wilderness. The samples had as much as 18.5 ounce silver per ton, 1.37 percent copper, 0.28 percent lead, and 0.17 percent zinc.
454	HOOT OWL PROSPECT	44 58 46 N	114 37 18 W	Quartz float and silicified shear zones containing oxidized sulfides are in quartzite (Olson, 1985, p. 122).	A trench and 4-foot-long adit were examined by the USBM in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985, p. 122).	Six samples (WRO 32-34 and 85-87) were taken during the USBM exam (Olson, 1985, p. 122). They contained as much as 0.001 ounce gold per ton and 0.012 ounce silver per ton.
455	MIDDLE FORK PEAK PROSPECT	44 58 02 N	114 36 41 W	The prospect consists of the sheared contact zone between quartz monzonite and quartzite. The zone is transected by dikes and shear zones that trend N 35-60 W, dip 65-90 NE, and consists of brecciated, silicified, chloritic, and limonitic breccia.	The prospect is along the Middle Fork Peak road 2 to 3 miles east of the summit of the peak. Exposed mainly in the road cut, the prospect extends for about 1.5 miles in a northwesterly direction. It was examined by the USBM in 1982 in conjunction with the mineral investigation of the River of No Return Wilderness (USBM files).	During the USBM examination, four samples (WRO 26-28, 89) were taken. One of the samples had 2.7 ppm silver. The rest contained no significant amounts of metal (USBM files).
456	BLACKEAGLE CREEK PROSPECT	44 59 40 N	114 33 56 W	The area is underlain by limonite-stained, slightly brecciated quartzite (Olson, 1985. p. 122).	The prospect is on the north side of Blackeagle Creek about 500 feet upstream from Hoodoo Creek. A small cabin was found during the USBM examination which was made in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985, p. 122).	One select sample, taken during the USBM examination, assayed 0.001 ounce gold per ton and 0.005 ounce silver per ton (Olson, 1985, p. 122).
457	RED JACKET MINE	44 59 39 N	114 32 00 W	A poorly-exposed system of quartz veins transects quartz- and	The Red Jacket mine is at the head of Van Horn Gulch about 1.4	Ten of 16 rock chip samples, taken by the WestGold/U.S.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				calcite-cemented breccia and quartzite-siltite (Howell and Wendland, 1989, p. 4). Alignment of underground workings suggests the system trends north and dips steeply. Quartz on the dumps contains chalcopyrite, chalcocite, bornite, pyrite, galena, and sphalerite (Umpleby, 1913, p. 172).	miles northwest of the Yellowjacket townsite. Ross (1934, p. 113) reported that the Red Jacket mine was discovered around 1866 and considerable development work done in the 1890's. Operations ceased in 1903, before production records were kept. The mine area was explored by the WestGold/U.S. Antimony Corporation joint venture during their development of the Yellowjacket mine in the late 1980's (Howell and Wendland, 1989, p. 15). The Red Jacket is covered by four claims patented in 1911 by the Red Jacket Gold Mining Company (MS 2303--Red Jacket, Red Jacket No. 2, Magpie, and Sunflower). The claims cover 82.3 acres. Workings shown on the survey plat consist of four adits, two shafts, five small cuts, and connecting trails. The underground workings, aligned along a north trend, total over 1,000 feet.	Antimony Corporation joint venture, had over 10 ppb gold. Select samples of vein material had as much as 249 ppb gold (Howell and Wendland, 1989, p. 16).
458	HIGH BAR PLACER	44 59 38 N	114 31 01 W	A residual placer overlies a system of gold-bearing fissure veins in a quartz-and calcite-cemented shatter zone in quartzite beds trending northwest and dipping northeast. The deposit is up to 1,500 feet long, 300 feet wide, and 20 feet deep (Lowe, 1988).	Anderson (1953, p. 17) reported that the High Bar placer, also called Slaughterhouse placer, yielded 37 ounces gold and 4 ounces silver between 1932 and 1937. The placer is in Slaughterhouse Gulch about 1 mile from Yellowjacket Creek. In 1994 the area was covered by current lode mining claims.	No data available.
459	YELLOWJACK-ET MINE	44 59 15 N	114 31 10 W	A system of gold-bearing fissure veins, with overlying residual placers, is in a quartz- and calcite-cemented shatter zone in quartzite beds that trend northwest and dip	The Yellowjacket mine, on the divide between Van Horn and Slaughterhouse Gulches, is about 1 mile northeast of the Yellowjacket townsite. The mine, presently	Remaining reserves at the Yellowjacket mine are 22,000 ounces of gold in the oxide ore. Exploration is in progress to develop resources in the primary

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				northeast. The veins are displaced by faults. The shatter zone trends N 65-75 E and dips steeply northwest (Ross, 1934, p. 110). Veins along the zone are as thick as 40 feet, as long as 1,200 feet, and as deep as 200 feet. They consist of calcite, quartz, siderite, and barite with gold, pyrite, specularite, chalcopyrite, tetrahedrite, and galena. The residual placers are up to 1,500 feet long, 300 feet wide, and 20 feet deep (Lowe, 1988). Nearby is a small body of feldspar-rich igneous rock (Anderson, 1953, p. 9; Lesure, 1964, p. 132). The rock, called an albite pulaskite, consists mainly of albite, the sodium-rich plagioclase, minor orthoclase, and accessory quartz, hematite, apatite, magnetite, and sericite.	(1995) operating, sits on part of four patented lode mining claims which cover about 120 acres. The claims are the North America (Lot 37A), South America (Lot 38A), North America No. 2 (Lot 39A), and South America No. 2 (Lot 40A). The deposit was discovered in 1868, operated fairly steadily until 1897, operated sporadically from 1900 until 1981, was taken over by U.S. Antimony Corporation in 1987, and began producing again in 1987. Production for the Yellowjacket mining district prior to 1913 was $450,000. Most was from the Yellowjacket mine (Umpleby, 1913, p. 170). In 1981, 109.26 ounces gold and 70.8 ounces silver were produced (Ridenour, 1985). Since 1987, U.S. Antimony Corporation has produced 13,463 ounces of gold from the open pit operation (John Lawrence, U.S. Antimony Corporation, personal communication, February 1997). In 1875, a 5-stamp mill was constructed to treat ore from the Yellowjacket mine. Ore was sent by tram from the mine to mill located in the Yellowjacket townsite. The mill, expanded to 10 stamps in 1882, was destroyed by fire in 1894. A 20-stamp amalgamation concentrator was built in 1894 and expanded to 60 stamps (each stamp weighing 850 lb) and a capacity of 100-150 tons per day in 1896. Later, Blake	sulfide ore (John Lawrence, U.S. Antimony Corporation, personal communication, February 1997).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					and Gates crushers and six cyanide vats were added (Gerry, 1912, p. 575 and 1916, p. 625). In the 1930's, flotation equipment was installed. Milling ceased during World War II as the result of War Order L-205 which terminated all gold mining in the United States. Renewed exploration in 1970 led to the discovery of the ore currently being mined and the construction of a 350 ton per day gravity/flotation mill near the mine in 1991. Both the mine and mill are operated by U.S. Antimony Corp.	
460	COMEBACK MINE	44 59 02 N	114 30 05 W	A mineralized fracture zone, striking N 70 W and dipping 70 NE, transects beds of argillite and micaceous quartzite striking N 55 W and dipping 45 SW. Nearby is a granophyre dike. The fracture zone is as thick as 40 feet and contains shoots of quartz with galena, chalcopyrite, tetrahedrite, azurite, and malachite that are as thick as 0.7 feet (Anderson, 1953, p. 40).	The Comeback, also called Lead Star, is on the east side of Slaughterhouse Gulch about 0.6 mile north of its junction with Yellowjacket Creek. In a 600-foot-long, 350-foot-wide area are at least two caved adits, one caved glory hole, many dozer cuts, and connecting roads and trails (Olson, 1985, p. 116). Anderson (1953, p. 39) reported that underground development totaled at least 150 feet in the lower adit. The mine was examined by the WestGold/U.S. Antimony Corporation Joint Venture in the late 1980's (Howell and Wendland, 1989, p. 15). Between 1946 and 1955, 22 tons of ore were mined; recovered were 3 ounces gold, 826 ounces silver, 760 pounds copper, and 10,100 pounds lead (Anderson, 1953, p. 39; Fisher and Johnson, 1987, p. 104).	Seven samples were taken during a USBM examination made in conjunction with the USBM investigation of the mineral resources of Frank Church River of No Return Wilderness (Olson, 1985, p. 118). The samples had as much as 0.12 ounce gold per ton, 100.4 ounce silver per ton, 4.2 percent copper, 15.9 percent lead, and 0.092 percent zinc. Samples taken during the WestGold/U.S. Antimony Corporation examination had as much as 0.064 ounce gold per ton.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
461	CRACKER JACK PROSPECT	44 58 37 N	114 33 58 W	A poorly-exposed, silificied, sericitic, and argillic shear zone trends east and dips vertically in quartz monzonite. Along the zone is quartz with chalcopyrite, limonite, and malachite (Olson, 1985, p. 122).	The Crackerjack prospect is on the east side of Hoodoo Creek about 2 miles above its junction with Yellowjacket Creek. At the prospect are two pits, an adit, and a cabin. The prospect was examined by the USBM in 1983 in conjunction with the investigation of the mineral resources of the Frank Church River of No Return Wilderness (Olson, 1985, p. 122).	Nine samples (WRO 20, 44-47, and 114-117) were taken during the USBM examination (Olson, 1985, p. 122). The samples had as much as 0.04 ounce gold per ton, 0.01 ounce silver per ton, and 1.64 percent copper.
462	MAMMOTH MINE	44 58 31 N	114 33 44 W	In diorite is a poorly exposed fissure vein striking N 45-60 W and dipping 55 SW. The vein, as much as 8 feet thick, is composed of white, massive quartz containing iron oxides. It is offset by faults that trend N 50 E and dip 80 NW (Anderson, 1953, p. 37; USBM files).	The Mammoth (Hisey or Ohio) is about 1,700 feet east of Hoodoo Creek about 2 miles above the creek's confluence with Yellowjacket Creek. The 14.346-acre Mammoth claim was located in 1893 and patented (MS 1453) in 1900 by F.W. Hunt. Development consists of two short adits that contain about 125 feet of workings. In 1951, a small dam and 5-ton per day amalgamation mill were installed (Anderson, 1953, p. 37).	The Mammoth was examined by the USBM during 1982 in conjunction with the mineral investigation of the Frank Church River of No Return Wilderness. At the time of the examination, 12 samples (WRO 17-19, 38-40, 98-100, 102, and 118), were taken. The chip samples across the vein had as much as 0.09 ounce gold per ton and 0.1 ounce silver per ton.
463	COLUMBIA	44 58 55 N	114 32 51 W	The Columbia is on the northwest end of the Columbia-Continental mineral belt. The area is underlain by brecciated, deformed quartzite of the Yellowjacket Formation which has been intruded by gabbroic dikes and a composite body of granophyre and granite porphyry. Gold-, silver-, copper-, and lead-bearing ore shoots occur in brecciated zones which range from a few feet up to 50 feet wide. Most trend N 60 E and dip 30-70 NW, but a subordinate set of mineralized zones trend N 15-25 W (Anderson, 1953, p. 33).	According to Anderson (1953, p. 33), underground workings at the Columbia total more than 2,000 feet. Figure 3 in Anderson's report (1953) shows the location of 2 shafts and 9 adits. Numerous cuts and bulldozer workings also exist. According to Campbell (1936, p. 207), a 10-stamp mill was constructed to process ore from the mine. Reportedly, the average ore in the early days was worth $30 per ton and some went as high as $150 per ton (Eldridge, 1895). Early production records are not available but, Anderson (1953, p.	In the late 1980's, an exploration program was conducted along the Continental-Columbia mineralized belt by WestGold and U.S. Antimony Corporation. Their work outlined a resource of 2.7 million tons grading 0.075 ounce gold per ton near the Columbia Mine.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					33) reports that in 1923, 4 tons of ore contained 1 ounce gold, 367 ounces silver, and 641 pounds copper. In more recent years, the Columbia was considered to be part of the Steen Mine.	
464	DANIEL	44 58 38 N	114 32 58 W	Based on the presence of quartz on dumps of closely spaced cuts and caved adits, a quartz vein apparently strikes N 50-60 W, has a length of not less than 100 feet, and width of more than 2 feet (Anderson, 1953, p. 32). The area is underlain by quartzite.	Development consists of a series of closely spaced shallow cuts and short adits aligned in a S 50 E direction (Anderson, 1953, p.32).	The quartz body at the Daniel is reported to contain good gold values (Anderson, 1953, p. 32).
465	CONTINENTAL	44 58 38 N	114 32 19 W	The Continental is near the southeast end of the Continental-Columbia mineralized belt. Gold, silver, copper, and lead mineralization occurs in northeast trending breccia zones in quartzite of the Yellowjacket Formation. The breccia zones are calcite and quartz cemented and contain shoots of pyrite-, chalcopyrite-, tetrahedrite-, and galena-bearing material. The longest zone, exposed in the main adit, is at least 120 feet long in a northeasterly direction and possibly more than 200 feet long in a westerly direction (Anderson, 1953, p. 28).	The main workings at the Continental consist of two adits, one is 70 feet long and the other is 1,300 feet long. Between 1929 and 1939, 180 tons of ore was mined that contained 66 ounces gold, 179 ounces silver, and 5,829 pounds copper (Anderson, 1953, p.28). The area was explored in the late 1980's during a joint venture between WestGold and U.S. Antimony Corporation. At that time, the Continental was considered to be part of the Steen Mine complex.	According to Anderson (1953, p. 28), sampling records indicate that the ore at the Continental probably averaged between 0.10 and 0.20 ounce gold per ton and between 1 and 2 percent copper. Kauffmann (1970, p. 4) reported a resource of about 100,000 tons grading 1.74 percent copper, 0.18 ounce gold per ton, and 1.6 ounce silver per ton to occur in the southeast part of the Steen Mine area (probably at the Continental).
466	LIBERTY	44 58 43 N	114 32 36 W	Mineralization at the Liberty is similar to that at other mines along the Continental-Columbia mineral belt. Hornblende diorite intrudes brecciated, deformed quartzite and granite porphyry is near by. Gold, silver, copper, and lead mineralization occurs as	According to Anderson (1953, p. 31-32), workings include at least 6 adits and several cuts, most are caved. Production records are sketchy but, 10 tons containing 3 ounces gold, 133 ounces silver, 139 pounds copper, and 1,413 pounds lead were probably	No specific data available. See Steen Mine for general data.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				shoots in quartz- and calcite-cemented breccia zones in quartzite of the Yellowjacket Formation. The zones trend primarily northeast (Anderson, 1953, p. 31-32).	produced between 1936 and 1937 (Anderson, 1953, p. 30). The area was explored in the late 1980's during a joint venture between WestGold and U.S. Antimony Corporation. At that time, the Liberty was considered to be part of the Steen Mine complex.	
467	LINCOLN	44 58 40 N	114 32 32 W	The Lincoln is near the southeast end of the Continental-Columbia mineralized belt. Gold, silver, copper, and lead mineralization occurs as shoots in calcite- and quartz-cemented breccia zones that trend primarily northeast. The zones occur in quartzite of the Yellowjacket Formation which locally is intruded by lamprophyre dikes (Anderson, 1953, p. 29).	According to Anderson (1953, p. 28), workings consist of a now caved 90-foot-deep shaft, numerous cuts, and at least 3 adits. The longest adit contained 310 feet of workings. The area was explored in the late 1980's during a joint venture between WestGold and U.S. Anitmony Corporation. At that time, the Lincoln was considered part of the Steen Mine complex.	No specific data available. See Steen Mine for general data.
468	STEEN MINE AREA	44 58 38 N	114 32 24 W	The ore mined in the Steen mine area came from pipe-like shoots in quartz- and calcite-cemented breccia at the intersections of shear zones and transecting veins. Minor replacements extend into surrounding wallrock. The two shear zones developed (Columbia and Yellowjacket) trend N 60-70 W in beds of argillaceous quartzite. These rocks locally are calcareous and interfinger with limestone. Nearby is a diorite stock and numerous acidic and mafic dikes. The shear zones are several hundred feet wide and can be traced for over 1,100 feet. Pyrite and chalcopyrite are the principal sulfides but minor amounts of galena and tetrahedrite are also	The Steen mine area, also called Steen Group, Lincoln, Liberty, Brough, Continental, Columbia, Daniel, and Broken Hill, lies along the southern side of Columbia Gulch. The area is covered by two groups of patented mining claims. The Continental group (MS 2544) includes the Continental, Lincoln Fraction, and Broken Hill claims which were patented in 1913 by Harriet F. Steen. The Columbia group includes five claims, the Alice and Mary (MS 1426 A), George S. (MS 1427), Junior (MS 1428), and Bessie B. (MS 1429). All were patented by the Idaho Chemical Gold Mining Company in 1900. The claims, extending for about a	Kauffmann (1970, p. 4) reported a resource of about 100,000 tons grading 1.74 percent copper, 0.18 ounce gold per ton, and 1.6 ounce silver per ton to lie along the zone in the southeastern part of the Steen mine area. A total of 78 rock-chip samples were collected from the Continental-Columbia zone in the late 1980's by the WestGold/U.S. Antimony Corporation Joint Venture. Sixty-two of the samples contained between 10 and 65123 ppb (1.9 ounce per ton) gold. During the joint venture, five exploration holes (three at the Continental and two as the Columbia claim) were drilled.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				present. Secondary copper minerals are common along fractures (Kauffman, 1970, p. 4; Howell and Wendland, 1989, p. 5).	mile along a northwest trend, cover an area of about 140 acres. The Steen family has held the claims for over 70 years. Development consists of numerous adits, shafts, open cuts, and connecting dozer and jeep roads. Production between 1915 and 1974 totals 618 tons of ore that yielded 466 ounces gold, 1,300 ounces silver, 13,635 pounds copper, and 11,341 pounds zinc (Fisher and Johnson, 1987, p. 104-105; and USBM records). The mining potential of the Steen mine area was evaluated by the USBM in 1970 (USBM files--Kauffman, 1970).	Intersected was a 15- to 25-foot-thick vein grading 0.02 to 0.096 ounce gold per ton. Based on this work, a resource of 2.7 million tons grading 0.075 ounce gold per ton was delineated near the old Columbia mine located at the northwestern end of the Steen mine area. Ten samples (WRO 15, 16, 21-25 and 47-50), taken during a USBM visit 1982 as part of the investigation of the Frank Church River of No Return Wilderness, contained as much as 0.12 ounce gold per ton, 12.4 ounce silver per ton, 1.43 percent copper, and 2.3 percent lead.
469	BROKEN HILL	44 58 33 N	114 32 32 W	Gold, silver, copper, and lead mineralization occurs in a zone of brecciated, quartz-cemented quartzite of the Yellowjacket Formation. The zone generally strikes N 60-70 E and dips 70 NW but, where mineralized, strikes N 30 E. The mineralized zone is 6 to 8 feet wide and contains, in addition to scattered quartz and calcite stringers, a quartz vein 2 inches to 3 feet wide. The zone is exposed for 50 feet and locally contains malachite, azurite, chrysocolla, and lesser amounts of galena, cerussite, and anglesite (Anderson, 1953, p. 30).	Workings consist of a 25-foot-long adit which has been destroyed by bulldozing and a 150-foot-long bulldozer trench. A 5-ton smelter shipment is reported to have contained 0.045 ounce gold per ton, 14.9 ounce silver per ton, 0.8 percent copper, and 17.2 percent lead (Anderson, 1953, p. 30).	No data available.
470	BROUGH	44 58 35 N	114 32 12 W	The Brough property is located at the southeast end of the Continental-Columbia mineralized belt. Lenses, pods, and short veins of quartz contain chalcopyrite,	Workings at the Brough property consist of several large open cuts and adits with stopes to the surface. The Snowstorm adit, located at the base of the slope at	No specific data is available for the Brough. General data is available for the Steen Mine.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				pyrite, and lesser amounts of galena. The mineralization occurs in a northwest-trending zone of complexly fractured, brecciated, quartz- and calcite-cemented quartzite. The quartzite generally strikes northwest, dips southwest, and has been intruded by vitrophyre dikes, hornblende-biotite diorite, and granophyre (Anderson, 1953, p. 35-36).	the edge of town, is 480 feet long and also contains a 45-foot-long crosscut. Several caved adits and large open cuts occur farther up the slope. Production for the years 1935-1941 totalled 460 tons containing 372 ounces gold, 137 ounces silver, 3,551 pounds copper, and 1,541 pounds lead (Anderson, 1953, p. 35-36). Campbell (1939, p. 231) reported that the mill at the Brough was diesel powered and had a capacity of 50 tons per day. The area was explored in the late 1980's during a joint venture between WestGold and U.S. Antimony Corporation. At that time, the Brough was considered to be part of the Steen Mine complex.	
471	EASY TAILINGS PROSPECT	44 58 35 N	114 31 41 W	Peale (1982b, PL. 2) indicates that the prospect area is underlain by granitic and volcanic rocks.	The Easy Tailings prospect is on the north side of Trail Creek about 600 feet east of its junction with Yellowjacket Creek. An east-trending adit is shown by Peale (1982b, PL. 1). The prospect was covered by a current (1994) mining claim.	No data available.
472	COPPER GLANCE MINE	44 58 21 N	114 30 18 W	In quartzite, transected by lamprophyric dikes, is a zone of mineralized fractures and quartz-calcite-cemented breccia at least 2,000 feet long. The zone strikes N 25 W and contains shoots of quartz and siderite with chalcopyrite, tetrahedrite, pyrite, and galena (Anderson, 1953, p. 40; Howell and Wendland, 1989, p. 5 and 15).	The Copper Glance mine, also called Grubstake, Diamond Queen, Silver Moon, and Idaho, is along the divide between Yellowjacket and Trail Creeks about 1.5 miles southeast from the Yellowjacket townsite. The deposit was discovered in 1901. The principal workings consist of a 305-foot-long adit with drifts, raises, and stopes (Ross, 1934, p. 113). In a 1,500-foot-long, 1,400-foot-wide area	The hand-sorted ore contained 0.66 ounce gold per ton, 33 ounce silver per ton, 19 percent copper, and 8 percent lead (Anderson, 1953, p. 40). Small-scale mining during 1979 yielded samples with 200 ounce silver per ton (Carter, 1981, p. xii). A total of 165 chip samples were taken in the vicinity of the mine during the WestGold/U.S. Antimony Corporation joint

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					around the adit are two additional adits, a number of pits and trenches along with connecting jeep trails and dozer roads. The mine was examined in the late 1980's by the WestGold/U.S. Antimony Corporation joint venture (Howell and Wendland, 1989, p. 15). Shipped between 1929 and 1979 were 71 tons of ore that yielded 14 ounces gold, 1,595 ounces silver, 3,685 pounds copper, 5,297 pounds lead, and 4,015 pounds zinc (Anderson, 1953, p. 17; Fisher and Johnson, 1987, p. 104).	venture examination. They contained as much as 140 ppb gold. A grab sample of vein material from a dump had 0.417 ounce gold per ton (Howell and Wendland, 1989, p. 15).
473	WHITE RABBIT PROSPECT	44 58 08 N	114 32 38 W	In diorite and quartzite roof pendants is a vein striking N 30 W and dipping 65 SW that is as thick as 1 foot. The vein is mainly quartz with limonite pseudomorphs after pyrite (Anderson, 1953, p. 32).	The White Rabbit prospect is about 0.6 miles northwest of Yellowjacket Creek and 0.7 miles southwest of the junction of Yellowjacket and Trail Creeks. Anderson (1953, p. 32) reported that development consists of four or five caved adits, an open adit, and some caved stopes and opencuts.	No data available.
474	TINCUP MINE	44 58 02 N	114 31 55 W	In northeast trending, steeply southeast dipping quartzite and shale, intruded and altered by diorite, is a poorly-exposed fracture zone striking N 15 W and dipping 55 SW. Along the zone are quartz- and calcite-cemented breccia and a system of veins (Howell and Wendland, 1989, p. 4). The vein mined is as thick as 1.5 feet and is composed of quartz with siderite, pyrite, chalcopyrite, and galena (Anderson, 1953, p. 37).	The Tincup mine and adjacent mill are on the west side of Yellowjacket Creek, less than a mile downstream from the Yellowjacket townsite. Development consists of several cuts, an adit with 390 feet of workings on three levels, and a mill. In 1995, the mill was partially dismantled and contained a jaw crusher, roll mill, six 1-by-1-foot flotation cells, and a gravity table. In the late 1980's, the mine was explored by the WestGold/U.S. Antimony Corporation Joint Venture (Howell and Wendland,	The ore graded 1.85 ounce gold per ton and 0.8 percent copper (Anderson, 1953, p. 36). Three rock chip samples, collected by the WestGold/U.S. Antimony Corporation Joint Venture, had as much as 13 ppb gold (Howell and Wendland, 1989, p. 16). Three samples of vein material, taken during USBM visits made in conjunction with the investigation of the Frank Church River of No Return Wilderness in 1983 (WRO-1 and -2) and Salmon Forest study in 1994 (SFC-6), contained as much as

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					1989, p. 5). At least 26 tons of ore and concentrates were shipped between 1934 and 1949. Recovered were 136 ounces gold, 111 ounces silver, 3,977 pounds copper and 417 pounds lead (Anderson, 1953, p. 36; Fisher and Johnson, 1987, p. 105).	0.17 ounce gold per ton, 0.08 ounce silver per ton, and 0.6 percent lead.
475	YELLOWJACK-ET CREEK MIDDLE PLACER	44 57 54 N	114 31 56 W	Placer, extending for about 3 miles along Yellowjacket Creek, is 50-150 feet wide and 10-20 feet thick. Both stream and bench gravel deposits have been worked. The gravel is comprised of well-rounded quartzite and volcanic rock resting on quartzite bedrock. Bedding in the quartzite is perpendicular to the stream flow. The bench deposits are perched on bedrock 20-30 feet above the stream.	The placer extends along Yellowjacket Creek from the Yellowjacket townsite downstream to the mouth of Lake Creek. Along this part of creek are extensive placer workings, both stream channel and bench. Individual sites along the creek, listed in USBM production files as having recorded production, include the Ace-In-The-Hole, Ajax, Burkhardt, Gibson, O'Conner, Reed, Soleberg, Topham, and Yellow Jacket placer mines. The placer is covered by the Paydirt, Pauls, Mikes, Phils, DD, and Michelles placer claims held (1994) by Paul J. Desfosses. The placer was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	No data available.
476	YELLOWJACK ET PLACER	44 53 06 N	114 36 45 W	The claims cover several 2,200 to 9,250 cubic yard alluvial deposits along Camas Creek. The deposits consist of sandy gravel weathered from volcanic rocks. None of the alluvium exceeds 1 foot in diameter (Cater and others, 1973, p. 382).	The Yellowjacket Group of placer claims was located along Camas Creek in 1892. The deposit was examined by the USBM in conjunction with the investigation of the mineral resources of the Idaho Primitive Area (Cater and others, 1973, p. 382).	Five samples were excavated during the USBM examination (Cater and others, 1973, p. 382). The samples contained as much as $0.68 and averaged $0.013 in gold per cubic yard (at $47.85 per ounce). The black sand content of the samples ranged up to 10.2 pounds per cubic yard.
477	FORGE CREEK GEOTHERMAL	44 53 45 N	114 33 50 W	Geothermal springs occur in tuff.	The geothermal area is along Forge Creek about 1.2 miles from Camas	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	AREA				Creek. The Yellowjacket topographic map shows three vents.	
478	GOLD BUG PROSPECT	44 57 49 N	114 29 49 W	Anderson (1958b, p.40) and Howell and Wendland (1989, p.5 and 15) reported the prospect to be along a prominent zone of fracturing and brecciation in quartzite. The zone contains areas of quartz- and calcite-cemented breccia and is the southeasterly continuation of the Copper Glance structure. The zone at the Gold Bug prospect is about 150 feet wide, at least 0.5 mile long, and trends N 5 E. It crosscuts quartzite bedding that strikes N 8 W and dips vertically. The zone is cut by granophyric dikes. Filling fractures along the zone are quartz, siderite, pyrite, and limonite.	The Gold Bug prospect area, also called Ohio and Trail Creek, is along the north side of Trail Creek about 1.5 miles from Yellowjacket Creek. The principal workings consist of a series of short adits and a small shaft--all caved (Anderson, 1958b, p. 40). The prospect was examined in the late 1980's by a WestGold/U.S. Antimony Corporation joint venture. The area is covered by the Trails End claim group held in 1988 by Albert Lamper. Nearby is the Tram group of claims located by Formation Capital Corporation in 1991.	Ross (1934, p. 115) reported that the vein material assayed 0.4 ounce gold per ton.
479	TAMMY	44 55 58 N	114 23 10 W	Sparse residual pieces of brown jasperoid are weathering out of underlying dacitic tuff.	An area about 115 feet by 180 feet was stripped by bulldozer and has since been reclaimed and replanted.	USBM personnel took one sample (SFM 059) of jasperoid float during 1995. It assayed no significant amounts of metal.
480	GREEN GLOW PROSPECT	44 59 33 N	114 21 33 W	North-trending fracture zones, transecting a granitic intrusion into quartzite and tuff, are more radioactive than the surrounding rocks. The most radioactive zone is silicified, kaolinized, and contains limonite and manganese oxide.	The Green Glow prospect extends along Fourth of July Creek from 0.5 to 1.5 miles above Panther Creek. The Washington Public Supply Company mapped the geology and conducted a gamma radiation survey on the Green Glow 1-30 claims in 1981. Workings consist of a dozer trail along the north side of the creek. Along the trail are at least five drill sites and three dozer cuts. The prospect was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC 73) was chipped from the most intensely explored zone during the USBM visit. It contained no significant metal content.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
481	BORROW PIT	44 59 23 N	114 20 39 W	Quartzite talus is mined as needed to maintain the Panther Creek road.	A small overgrown borrow pit is along the Panther Creek road about 1/4 mile north of Fourth of July Creek. The pit was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	Large quantities of quartzite talus remain.
482	IRON KING PROSPECT	44 58 34 N	114 17 58 W	Specularite and limonite are in N 25 E striking, 75 NW dipping, silicified, phyllitic quartzite beds that are overlain by volcanic rocks. The beds are 5 feet thick.	The Ironside 1-48 claims were located by Mackay Exploration Co. in 1939. The Iron King group of 17 claims was located in the 1950's by John O'Conner. Workings consist of several dozer cuts over a 20-acre area. All are connected by a dozer road. The prospect was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	Samples indicate a grade of about 38 percent iron. The beds are too small to be considered an iron resource.
483	RAMEY	44 56 34 N	114 22 13 W	A small lens of brown and black banded jasperoid is in deeply weathered dacitic tuff.	One 60-foot-long opencut and two shallow, sloughed pits were found.	One chip sample (SFM 058) of jasperoid was taken by USBM personnel during 1995. It assayed no significant metal content.
484	SILVER CREEK MIDDLE PLACER	44 55 32 N	114 21 37 W	A low gravel bench on the east side of Silver Creek has been worked on a small scale; gravels are 5 to 10 feet thick (Lorain and Metzger, 1939, p. 75).	No data available.	Considerable amounts of unworked gravel remain along the stream (Lorain and Metzger, 1939, p. 75).
485	OPALINE-HOMESTEAD PROSPECT	44 54 17 N	114 19 48 W	A poorly-exposed system of fractures in quartzite contains opal and quartz. According to Umpleby (1913, p. 174), opal occurs as linings and fillings in vesicles in dark grey rhyolite. The rhyolite host rock occurs as boulders in stream gravel (Ross, 1927, p. 20).	The Opaline prospect is covered by the Opaline and Homestead claims held (1994) by Leane Russell and Phillip Desselbrett. An adit was driven, by hand, at least 20 feet in 1992. There also are a few scattered pits and trenches, all overgrown by vegetation. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC-1) of quartzite, opal, and quartz assayed 17 ppb gold.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
486	SILVER CREEK UPPER PLACER	44 53 38 N	114 20 15 W	Umpleby (1913, p. 74) reported placer tin along Silver Creek below the Rabbit Foot mine. The tin occurs as cassiterite in pieces from small rounded grains to pebbles a half-inch in diameter. The placers mined consist of gulch gravels 30 to 100 feet wide and 10 feet deep that contain very few large boulders and very fine gold. The gravel is coarse and mostly lava and tuff with boulders of quartzite and granite. The heavy sand consists of lava, vein quartz, chalcedony, augite, magnetite, ilmenite, hematite, feldspar, zircon, pyrite, limonite pseudomorphs after pyrite, cassiterite, garnet, olivine, and native copper. (Ross, 1927, p. 18).	From the Rabbit Foot mine road crossing, downstream for 1/4 mile, the narrow stream channel deposits have been mined by diverting the stream and ground sluicing. Probably not more than 20,000 cubic yards have been mined. Most mining was done before records were kept.	A small volume of unworked gravel remains.
487	RABBIT FOOT MINE	44 53 02 N	114 20 16 W	A limonite-stained fracture zone, as wide as 30 feet, trends northeast in silicified tuff containing quartz stringers and disseminated quartz-lined vugs.	Although located in 1872, active exploration of the Rabbit Foot mine did not begin until 1905. Development consists of 5,000 feet of underground workings and a 10-stamp amalgamation mill (Umpleby, 1913, p. 177). The mill operated from 1907 through 1912 and had a capacity of about 50 tons per day (Brooks, 1908; Gerry, 1912, p. 575; and Gerry, 1913, p. 728). Most of the mineralized material above the haulage level was mined and little remains of the mill. A number of dozer pits and trenches were excavated later. The working cover about 40 acres. Echo Bay Mines purchased the mine from Tenneco Minerals in 1987 (Bennett, 1986a, p. 333).	A sample (SFC-2) taken from the dump during a USBM examination in 1994 contained 14 ppb gold.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
488	RED SPAR EXTENSION	44 51 10 N	114 32 27 W	A fracture zone trending N 55 E and dipping from 60 NW to vertical is exposed for almost 200 feet in bulldozer cuts in granophyre. One cut shows 22 feet of mostly high-grade material estimated to contain 80 percent or more fluorite. Three other fluorite-bearing veins are exposed in cuts but are smaller and low grade (Cox, 1954, p. 16).	Numerous bulldozer cuts (Cox, 1954, p. 16).	With the exception of a 22-foot-long high-grade section, most of the veins exposed contain less than 30 percent fluorite (Cox, 1954, p. 16).
489	PURPLE SPAR EXTENSION	44 51 10 N	114 32 20 W	A fluorite-bearing vein, exposed by bulldozer cuts in granophyre, strikes N 20 E and dips steeply. The vein is about 8 feet wide and grades about 40 percent fluorite (Cox, 1954, p. 17).	Bulldozer cuts.	No additional data available.
490	PURPLE SPAR	44 51 10 N	114 32 15 W	A fluorite-bearing vein, exposed by cuts in granophyre, strikes N 30 E and dips 45 NW. It is exposed for about 300 feet but material containing more than 50 percent fluorite is limited to two lenslike shoots. One shoot is about 30 feet long and 3 feet thick. (Anderson, 1954, p. 32; Cox, 1954, p. 17).	Bulldozer cuts and trenches (Anderson, 1954, p. 32).	According to Anderson (1954, p. 32), the ore shoots grade up to about 60 percent fluorite.
491	RED SPAR NO. 2	44 51 19 N	114 32 22 W	Two fluorite-bearing veins are exposed in bulldozer cuts in Challis volcanic rocks and Tertiary granophyre. One of the veins strikes N 30 E, dips 40 NW, and is 3 feet thick. The other strikes N 30 W, dips 40 SW, is exposed for 25 feet, and is about 5 feet wide (Cox, 1954, p. 16-17).	Bulldozer cuts and trenches (Anderson, 1954, p. 32).	Samples taken across the veins by the U.S. Bureau of Mines during the 1940's assayed from 5 to 27 percent fluorite (Anderson, 1954, p. 32).
492	RED SPAR MINE	44 51 20 N	114 32 10 W	A fracture zone, in part along the contact between Challis volcanic rock and rhyolite porphyry and in part wholly within the porphyry, strikes N 55-60 E, dips 55-70 NW, and contains four fluorite veins or	Workings include one adit, 149 feet long with stopes 50 feet above the main level. During 1952-1953, 404 tons were mined (Anderson, 1954, p. 29-30).	A sample taken across 5.7 feet of fluorite in the adit assayed 88.9 percent fluorite. Samples taken from the three other veins assayed as much as 80.8 percent fluorite. The samples

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				lenses. The fluorite occurs both as a filling of open fractures and breccias and as a replacement of the altered porphyry and volcanics. The main fluorite vein, exposed for 140 feet on the surface and for 120 feet in the adit, averages 6 to 7 feet thick. The upper most vein can be traced for about 100 feet and is generally 3 to 4 feet thick The other veins are much smaller (Anderson, 1954, p. 29-31).		were taken by the U.S. Bureau of Mines during the 1940's. The upper vein contains a 20-foot-long segment that contains more than 50 percent fluorite (Anderson, 1954, p. 30-31).
493	SWITCHBACK	44 51 33 N	114 31 41 W	A silicified zone, exposed for about 400 feet, strikes N 45 E and dips 60 NW in Challis volcanic rocks. A fluorite-bearing segment exposed in a cut is 14 feet wide and 30 feet long. The fluorite generally occurs as veinlets and botryoidal coatings on fragments of tuff (Cox, 1954, p. 18).	One cut (Cox, 1954, p. 18).	A sample across 14 feet of fluorspar exposed in the cut assayed 44 percent fluorite (Cox, 1954, p. 18).
494	EAST FLUORSPAR	44 51 42 N	114 31 21 W	A breccia zone, exposed for at least 200 feet, strikes N 20-45 E, dips 30 NW, and contains volcanic fragments cemented by fluorite and silica. The highest grade section is about 70 feet long and 3.5-5 feet wide (Cox, 1954, p. 18; Anderson, 1954, p. 33).	At least one pit.	Samples taken by the U.S. Bureau of Mines across the main fluorite-bearing zone assayed 50 to 70 percent fluorite (Anderson, 1954, p. 33).
495	ANTLER	44 51 42 N	114 30 29 W	Two fluorite-bearing veins crop out in rhyolitic flows and tuffs of the Challis volcanics. One vein is conspicuously erosion resistant and stands as much as 20 feet above the surface. It strikes N 30-60 E and dips steeply. A 200-foot-long, fluorite-bearing segment is as much as 5 feet thick. The second vein is exposed for about 100 feet, strikes	Three adits (USBM files).	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				N 60 E, dips 80 SE, and contains about 3 feet of fluorite (Anderson, 1954, p. 34).		
496	PURPLE SPAR NO. 2	44 51 03 N	114 32 05 W	A fluorite-bearing vein, exposed in volcanic rocks and granophyre, strikes N 20 E and is about 5 feet thick (Cox, 1954, p. 17).	Bulldozer trenches (Anderson,1954, p. 32).	The average grade of a 20-foot length of the vein ranges from 40 to 50 percent fluorite (Cox, 1954, p. 17).
497	PURPLE SPAR NO. 4	44 50 48 N	114 32 02 W	Two fluorite-bearing veins occur at the Purple Spar No. 4. One is 5 feet wide, follows a breccia zone in granophyre, strikes N 40 E and dips vertically. A 40-foot-long segment of the vein is good grade (Cox, 1954, p. 18).	Several prospect trenches (Cox, 1954, p. 18).	No data available.
498	LUCKY HERB	44 50 47 N	114 31 45 W	Crystalline fluorite occurs in fractures up to four inches thick in rhyolite porphyry. Outcrop is highly silicified and forms a prominent spine (USBM files).	No workings were found.	One chip sample taken by USBM personnel during a study of the Loon Creek-Warm Spring Creek Unit assayed 84.3 percent fluorite and 0.03 percent barite.
499	MORNING SUN	44 51 03 N	114 31 11 W	Six short veins, about 300 feet apart, are along a fracture zone in volcanic rocks. The largest vein strikes N 60 E, dips 50 SE, can be traced for 90 feet, and is as thick as 5 feet. It is composed of white, coarsely crystalline, banded fluorite (Anderson, 1954, p. 34).	The Morning Sun fluorspar veins are exposed in outcrop, cuts, and a 10-foot-long adit (Anderson, 1954, p. 34).	According to Cox (1954, p. 15), the lenses and veins contain about 40 to 60 percent fluorite.
500	BIG LEAD	44 51 14 N	114 30 13 W	The fluorspar deposits are along a broad, west-trending, 40 SW dipping zone of fractures in tuffaceous volcanic rocks. The deposits mined were about 300 feet long and as thick as 18 feet. The fluorspar in the deposits is interbanded with chalcedony (Anderson, 1954, p. 10,20).	Anderson (1954, p. 19) reported that the deposit was discovered in 1942. It was mined between 1943 and 1944 then again between 1951 and 1953. The ore was processed in a 100-ton flotation mill built by Chamac Mines in 1944. Fire destroyed the mill in 1953. Workings consist of an open pit and several hundred feet of nderground workings with stopes. Production, up to the time the mill was destroyed, totalled 29,304 tons.	Resources exist but tonnage and grade are company confidential.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Exploration programs were conducted in 1944 by the U.S. Bureau of Mines and in 1947 by the Aluminum Company of America. ALCOA drilled eight holes totalling 2,226 feet. Spar, Inc. also conducted an exploration program in the area during 1971.	
501	POWDER-HOUSE	44 51 09 N	114 30 19 W	Fluorspar is along a fracture zone striking N 50 E and dipping 35 NW in volcanic rocks. The zone is tracable for more than 500 feet and is as thick as 5 feet. The zone contains both coarsely crystalline and cryptocrystalline fluorite which is accompanied by barite (Anderson, 1954, p. 28).	Some dozer trenching has been done (Anderson, 1954, p. 28).	According to Anderson (1954, p. 28), the minable portion of the Powderhouse deposit is 150 feet long and 3 to 5 feet wide. Cox (1954, p. 12) estimated the grade to be between 20 and 40 percent fluorite. During 1971, Spar, Inc. conducted an exploration program in the area. Their work delineated significant resources but tonnage and grade are company confidential.
502	M AND M	44 50 56 N	114 30 07 W	The fluorspar deposit is along a fracture zone striking N 55-60 E and dipping 35-40 NW in volcanic rocks. The zone can be traced for hundreds of feet; the deposit mined was 140 feet long and as thick as 8 feet. The fluorspar is purple and coarsely crystalline. Considerable amounts of barite accompany the fluorite in the east part of the deposit (Anderson, 1954, p. 26).	The M and M was explored, starting in 1951, and an adit was begun in 1952. The adit contains over 500 feet of workings, including stopes. About 1,167 tons of high-grade ore were produced (Anderson, 1954, p. 26). Spar, Inc. conducted an exploration program in the area during 1971.	Resources are present but tonnage and grade are company confidential.
503	CRYSTLE #1 LODE	44 50 47 N	114 30 25 W	A silicified zone in volcanic rock contains two fluorspar veins 6 inches to 1 foot thick. The zone strikes N 10 E, dips 45 NW, and is about 12 feet wide (Cox, 1954, p. 11).	Two cuts and a road cut expose the silicified zone (Cox, 1954, p. 11).	No data available.
504	CHAMAC CAMP LODE	44 50 33 N	114 30 39 W	A fluorspar vein exposed in a cut in volcanic rock is 1-1.5 feet thick, strikes N 60 E, and dips 35 NW.	The veins are exposed in two open cuts and a road cut (Cox, 1954, p. 11).	The 1-1.5 foot thick vein grades 60 to 80 percent fluorite (Cox, 1954, p. 11).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				Another vein of coarse barite and fluorspar, further uphill, strikes N 25 E and dips 45 NW (Cox, 1954, p. 11).		
505	MEYERS COVE ANTIMONY	44 49 58 N	114 30 54 W	A mineralized shear zone strikes N 70 E and dips 40-45 NW in light-colored tuff (Ross, 1927; Ross, 1934, p. 131-132;Anderson, 1943c, p. 15-16). The shear zone, exposed for about 500 feet, contains chalcedony, barite, stibnite, and fluorite.	Cox (1954, P. 19) reported four cuts.	Five chip samples were taken by USBM personnel during a study of the Loon Creek-Warm Spring Creek Unit. They assayed as much as 41.1 percent fluorite, 8.2 percent antimony, 17.09 percent barite, 0.08 ounce gold per ton, and 0.6 ounce silver per ton.
506	NORTH VEIN	44 51 22 N	114 29 56 W	The north vein strikes between northwest and southeast as it wraps around the nose of a steeply plunging anticline in volcanic rock. It is tracable for more than 300 feet and is as thick as 4 feet. The fluorspar is coarsely crystalline and is accompanied by barite (Anderson, 1954, p. 22).	The deposit was mined by open pit methods beginning in 1951. Later, underground mining was done. In 1951, 3,561 tons of mill feed were produced (Anderson, 1954, p. 22).	No data available.
507	BEARTRAP	44 51 18 N	114 29 42 W	The Beartrap fluorspar deposit is along a fracture zone trending N 30-50 E and dipping 35-40 NW in volcanic rocks. The zone can be traced for more than a 1,000 feet; fluorspar extends for 600 feet and is as thick as 8 feet. The fluorite is coarsely crystalline and is accompanied by barite and chalcedony (Anderson, 1954, p. 24).	Beartrap was one of the first of the Meyers Cove fluorspar desposits to be discovered and developed. The Aluminum Company of America drilled 8 holes, totalling 4,240 feet, in the deposit during 1947. Mining began in an open cut during 1952, moved under ground in late 1952, and ceased in 1953 when fire destroyed the mill. At that time, underground workings contained over 1,500 feet of drifts and crosscuts. Most of the development work was done under Defense Minerals Exploration dministration contract Idm-E347. An exploration program, including drilling, was conducted in the area by Spar Inc.	The best part of the zone, 5.5 feet wide and 235 feet long, probably averaged about 40 percent fluorite (Cox, 1954, p. 12). Significant resources remain but tonnage and grade are company confidential.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					during the early 1970's. According to Anderson (1954, p. 24), production during the early 1950's was about 1,304 tons of fluorite mill feed.	
508	SOUTH VEIN	44 51 17 N	114 29 32 W	Fluorspar occurs along a fracture zone striking N 20-30 E and dipping 35-38 NW in volcanic rocks. The zone, South Vein, is tracable for more than 1,000 feet. The fluorspar-bearing part is 140 feet long and as thick as 8 feet. The coarsely crystalline fluorspar occurs in a band bordered on both sides by chalcedonic rock (Anderson, 1954, p. 25).	An exploration program, which included extensive bulldozing, was conducted by the U.S. Bureau of Mines in 1947. The Aluminum Company of America conducted an exploration program also during 1947 and 8 holes, totalling 4,240 feet, were drilled in the Bear Trap-South Vein area. An exploration program, which also included drilling, was conducted by Spar, Inc. in 1971. Only a few truck loads of fluorspar have been produced (Anderson, 1954, p. 25).	Fluorspar resources exist but tonnage and grade are company confidential.
509	ANDERSON	44 51 05 N	114 29 58 W	Fluorspar was mined from two bodies along a fracture zone striking N 30 E and dipping 25 to 30 NW in volcanic rocks. The bodies could be traced for as much as 300 feet and were as thick as 13 feet (Anderson, 1954, p. 28).	Hand trenching was begun in 1951 and two adits were excavated in 1952. About 1,686 tons of fluorspar mill feed were mined from stopes in the adits (Anderson, 1954, p. 27). An exploration program, which included drilling, was conducted by Spar, Inc., during the early 1970's.	Significant resources remain but tonnage and grade are company confidential.
510	ALLISON MINE	44 52 28 N	114 26 05 W	A fissure vein occurs in andesite.	Two adits are shown on Meyers Cove Point quadrangle.	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
511	SINGHEISER MINE	44 51 30 N	114 23 49 W	A system of fissure veins is along a N 35-40 E striking, 65 NW dipping shear zone in volcanic rocks of the Twin Peaks Caldera. The shear zone contains brecciated quartz vein clasts, is about 40 feet thick, heavily iron stained, and silicified. The veins, 3 to 8 feet thick, consist of drusy quartz containing pyrite (Umpleby, 1913, p. 176).	The Singheiser mine is on Arrastra Creek about 2 miles from Silver Creek. The mine has been called Monument, Arrastra, Meyers Cove, and Silver Creek project in the past. The area is covered by four patented mining claims, the Watch Tower (Lot 37/MS 45), True Blue (Lot 38/MS 48), Monument (Lot39/MS 49), and Pivot (MS 1529), together covering about 77 acres. Surrounding the patented claims are a number of unpatented ones held in 1994 by the Singheiser Mining Company. The Monument mine was discovered in 1866 (Gold Flotation Development Company Report, 1934). For 40 years arrastres were used to treat the oxidized ore. In 1896, a 50 ton per day mill was built to treat the sulfide ore which proved to be refractory. The mill, now partially dismantled, was equiped with a jaw crusher, roaster, and two separate circuits each consisting of a six-stamp mill and Chili mill which were about 6 feet in diameter. Underground workings total at least 3,000 feet (Umpleby, 1913, p. 176). The principal underground working, about 1/8 mile upstream from the mill, consists of a number of interconnected portals and stopes in the mineralized structure. Exploration has been conducted over the years by a number of major mining companies--Houston Oil and Gas Company in the mid	A sample (SFC-21), taken during a 1994 USBM visit, assayed 0.036 ounce gold per ton, 1.98 ounce silver per ton, and 0.18 percent copper.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					1980's and Echo Bay Mines who purchased the mine in 1987 (Bennett, 1986a, p. 333). Recorded production for the Singeheiser mine between 1907 and 1974 includes significant amounts of gold, silver, and copper (Fisher and Johnson, 1987, p. 104; USBM files).	
512	BORROW PIT	44 50 26 N	114 16 08 W	Poorly-sorted stream and fan material was excavated from the site. Covering at least 10 acres, the deposit's coarse material is mainly volcanic rock and quartzite.	The pit (USFS #SL-89-596) is at Morgan Summit. The pit covers About an acre and is about 5 feet deep. Material was removed with a front-end loader for use on the nearby Panther Creek forest road (USFS 055).	Large supplies of material, similar to that excavated, remain.
513	RANGER MINE	45 14 26 N	113 39 44 W	Umpleby (1913, p. 123) described a gougy, mineralized shear zone in brecciated quartzite and schist. The zone is 5 feet thick and contains shoots of quartz with pyrite, chalcopyrite, galena, and gold with oxide products of the sulfides.	The Ranger mine is on the northeast side of a lake at the head of Geertson Creek. Umpleby (1913, p. 123) reported that mining was done in conjunction with the nearby Eldorado mine and the ore treated in a common mill located on Geertson Creek.	No data available.
514	SUNDOG PROSPECT	45 13 00 N	113 38 20 W	In quartzite is a system of quartz veins containing limonite and malachite (Lipton and others, 1988, p. 138).	The Sundog prospect, near the Continental Divide, is on the ridge that separates the headwaters of Bohannon Creek from Berry Creek. The prospect is covered by the five patented lode claims (MS 1949A--Sun Dog and Sun Dog No. 1-5) totalling about 101.8 acres that were patented in 1905. Nearby is the patented Gem millsite. Workings consist of a caved trench 50 feet long, a caved adit at least 350 feet long, and four prospect pits. It was examined by the USBM in conjunction with the	Two samples of quartz, taken during the 1988 USBM examination, contained as much as 0.20 ounce gold per ton, 0.2 ounce silver per ton, 0.26 percent lead, and 0.002 percent copper (Lipton and others, 1988, p. 138).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					investigation of the mineral resources of the West Big Hole study area (Lipton and others, 1988, p. 138).	
515	HOSE DOG PROSPECT	45 12 50 N	113 38 11 W	Quartz veins occur along the sheared contact between phyllite and quartzite beds. The shear zone and quartzite both strike N 20 W and dip 59 SW. The veins contain malachite, chalcopyrite, azurite, and galena (Lipton and others, 1988, p. 138).	The Hose Dog prospect is on the southwest side of the Continental Divide. Workings consist of a caved shaft, 30-foot-deep decline, and a trench. A few hundred pounds of quartz vein material are stockpiled near the workings. The prospect was examined in 1982 by the USBM in conjuction with the mineral investigation of the West Big Hole study area (Lipton and others, 1988, p. 138).	Three samples of quartz were taken during the USBM examination (Lipton and others, 1988, p. 138). The samples contained as much as 0.58 ounce gold per ton, 2 ounce silver per ton, 1.6 percent copper, and 0.84 percent lead.
516	EAST BOHANNON PROSPECT	45 11 37 N	113 38 06 W	A drift follows a fine-grained, finely-parted, quartzite bed striking N 20 E and dipping 25 NW that is about 4 feet thick and contains coarse grained chalcopyrite, galena, and pyrite. The quartzite and adjacent fractures are coated with malachite, azurite, bornite, and limonite.	The prospect is on the south side of the headwaters of East Bohannon Creek about 1 mile west of the continental divide. A jeep trail ends at a drift that is about 150 feet long and dozer cut. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC 44) was chipped across an exposure of the quartzite bed at the portal of the drift during the USBM visit. It contained 9.36 ppm gold, 6 ppm silver, and 0.45 percent copper.
517	INDEPEN-DENCE MINE	45 10 55 N	113 37 06 W	In phyllitic and argillitic rock are quartz veins containing chalcopyrite, malachite, galena, and hematite (Lipton and others, 1988, p. 139).	The Independence mine is on the south side of the headwaters Of West Fork Wimpey Creek about 1.5 miles west of the Continental Divide. Workings at the mine, begun in 1900, consist of two caved adits estimated to be 30 and 50 feet long (Lipton and others, 1988, p. 139). Two small pits are nearby. A 3-stamp mill, is a mile down Wimpey Creek. Also called Gold Bug and Dutch, the area was most recently explored in the early 1990's as the Jupiter project by	Three select samples of quartz were taken from dumps during the USBM examination (Lipton and others, 1988, p. 38). They contained as much as 0.3 ounce gold per ton, 0.4 ounce silver per ton, 0.15 percent copper, and 0.43 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					American Gold Resources. The area was examined by the USBM in conjunction with the investigation of the mineral resources of the West Big Hole study area (Lipton and others, 1988).	
518	MENDOTA MINE	45 11 13 N	113 36 34 W	Quartz veins containing galena, malachite, chalcopyrite, azurite, and hematite occur in phyllite and argillite. Nearby is a diabase dike (Lipton and others, 1988, p. 139).	The Mendota mine is at the head of West Fork Wimpey Creek. Development consists of a dozer cut and a caved shaft with about 2,500 tons of material on the dump. In 1938, 60 tons of ore that yielded 12 ounces of gold, 229 ounces of silver, 1,755 pounds of copper, and 391 pounds of lead were produced (Lipton and others, 1988, p. 139).	Two select samples (M1 and M2) of quartz were taken during a USBM examination (Lipton and others, 1988, p. 139). The examination was part of a mineral investigation of the West Big Hole study area. The samples had as much as 0.1 ounce gold per ton, 1.8 ounce silver per ton, 9.6 percent copper, and 28.9 percent lead.
519	HRS PROSPECT	45 10 46 N	113 35 27 W	Phyllite and quartzite striking N 25 W and dip 65 SW are intruded by a mafic dike 100 feet thick and at least 6,000 feet long. Associated with the dike are quartz veins containing chalcopyrite, argentiferous galena, malachite, azurite, bornite, cuprite, chrysocolla, hematite, magnetite, and native gold and copper. The dike and veins extend across the Continental Divide into Montana (Lipton and others, 1988, p. 71).	The HRS prospect is comprised of a 37-claim group located between 1968 and 1970 over an area of about a square mile at the headwaters of Wimpey Creek. The principal workings consist of an 88-foot-long adit, a 40-foot-deep decline, a 1,038-foot-long adit, and two caved adits each probably less than 100 feet long. In addition, there are several prospect pits and trenches. The prospect was examined by the USBM in conjunction with the investigation of the mineral resources of the West Big Hole study area (Lipton and others, 1988, p. 72).	A total of 18 samples (HS 33, 33 and 218-233) were taken during the USBM examination (Lipton and others, 1988, p. 72). The samples contained as much as 0.03 ounce gold per ton, 4.2 ounce silver per ton, 0.52 percent copper, and 3.3 percent lead.
520	WAR EAGLE MINE	45 08 50 N	113 36 56 W	Quartzite at the War Eagle contains a quartz vein that strikes N 30 W, dips 80 SW, and ranges from 2 inches to as much as 3.5 feet wide (Anderson, 1957, p. 61). The quartz is limonite- and malachite-	Development consists of two adits, two shafts, and several pits and trenches. All are now caved. A tram once connected the mine to a mill. Production between 1937 and 1939 was 86 tons of ore which	One select sample of quartz taken by USBM personnel assayed 0.07 ounce gold per ton, 1.4 ounce silver per ton, 0.05 percent copper, and 8.5 percent lead (Lipton and others, 1988, p.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				stained, and contains galena and sphalerite. According to Tucker (1975, p. 194), exposed galena has altered to cerussite and pyromorphite. The mine was visited by the USBM during a study of the mineral resources of the West Big Hole study area.	yielded 439 ounces gold, 273 ounces silver, and small amounts of lead and copper (Lipton and others, 1988, p. 140).	140). Anderson (1957, p. 61) reported that the vein carried up to 1 ounce gold per ton.
521	GOLDSTONE MINE	45 08 35 N	113 34 55 W	Quartz veins, striking N 62 W and dipping 75-85 NE, transect argillite and quartzite beds striking N 30 W and dipping 60-70 NE. The principal vein is as thick as 4 feet, can be traced for at least 3,000 feet along strike, and is composed of quartz containing shoots of chalcopyrite, galena, copper stain, and limonite. An ore shoot mined had a length of about 700 feet (Anderson, 1957, p. 60).	The Goldstone mine is about 1,000 feet north of Pratt Creek and 0.7 mile west of Goldstone Pass. The site was visited during a USBM investigation of the mineral resources of the West Big Hole study area (Lipton and others, 1988, p. 140). At that time, the underground workings were caved. Anderson (1957, p. 59) reported that mine development, which began in the 1890's, comprised more than 6,000 feet of underground workings on seven levels and included five adits and a 300-foot-deep shaft. During the USBM examination, a dismantled gravity mill with 10-stamps and crusher were found; all other equipment had been removed. Reportedly, (Bell, 1907, p. 105; Brooks, 1908, p. 303; Gerry, 1912, p. 575; Gerry, 1913, p. 728; Gerry, 1919, p. 589; Gerry and Miller, 1933, p. 642) the mill was equipped with a Blake crusher and Frue Vanners and was in operation from 1907 through 1930. A Dorr classifier, Card table, and Wifley table were added in 1917 (Gerry, 1921, p. 480). The mill had a processing capacity of about 25	Two samples were taken of the mill feed during the USBM examination (Lipton and Miller, 1988, p. 140). One, a sample of quartz, assayed 0.55 ounce gold per ton, 0.6 ounce silver per ton, 0.11 percent copper, and 1.99 percent lead. The other, a sample of crushed mill feed, contained 0.42 ounce gold per ton, 0.9 ounce silver per ton, 0.1 percent copper, and 2.03 percent lead. A sample of vein material, taken by the USGS and analyzed by spectrographic and atomic absorptiom methods, had 29 ppm gold, 20 ppm silver, 700 ppm copper, and 15000 ppm lead (Leatham-Goldfarb and others, 1986, p. 38).

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					tons per day. In 1928-29, a hydroelectic powerplant and additional milling equipment were added, bringing the concentrator up to a capacity of 100 tons per day (Gerry, 1932. p. 394). The mill, including crushers, ball mill, classifier, jig, flotation cells, and filter, was operating in 1938 (Campbell, 1938, p. 180). Total recorded production between 1901 and 1939 was 21,056 tons which yielded 3,475 ounces gold, 2,771 ounces silver, 4,058 pounds copper, and 139,669 pounds lead. A detailed acount of mine history is available in Mitchell (1995a).	
522	VIRGINIA MINE	45 06 22 N	113 34 55 W	An adit follows a vein along bedding in fine-grained argillaceous quartzite. The vein strikes north, dips 10 E, is as thick as 1.6 feet, and composed of quartz with malachite, azurite, chalcocite, and hematite. Galena was seen in stockpiled ore but was not seen in place.	The Virgina mine is on the northwest side of Sandy Creek about 1 miles south of Goldstone Mountain. In 1925, the mine was acquired by Virginia Gold Mining Company. A small amount of ore was shipped for mill testing in 1930 and a gravity mill built along Sandy Creek below the mine. Between 1936 and 1937, some concentrates were produced by T.D. Picard. Workings at the mine consist of seven adits, the longest is 400 feet, a tram between mine and mill, and the mill. The workings were caved and the tram and mill in ruins in 1957 (Anderson, 1957, p. 61). The mine is covered by three groups of patented mining claims. They include three claims of the Lone Star group (MS 1591--Lone Star, Lone Star Extension, Walcott) totalling 61.98 acres; three claims	A 1.6-foot-long sample (SFC 43) was chipped across an exposure of the vein in the haulage adit during the USBM visit. The sample had 1.3 percent copper, more than 10 ppm (0.3 ounce per ton) gold, and 35 ppb (1 ounce per ton) silver. A sample (SFC 42) of the mill feed contained 0.3 ounce gold per ton and 1.6 ounce silver per ton.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					of the Grizzly Bear group (MS 2473--Grizzly Bear, Grizzly Bear #1 and Grizzly Bear #2) totalling 60.82 acres; and five claims of the Gem group (MS 2531--Gem, Gem #1, Gem #2, Gem # 3, and Midway) covering 103.2 acres. About 1 mile down Sandy Creek (outside the Salmon National Forest) is the patented (MS 2473B) Grizzly Bear millsite. A visit was made by the USBM during the mineral investigation of the Salmon National Forest.	
523	LUCKY STRIKE MINE	45 04 45 N	113 34 12 W	A system of quartz veins parallels bedding in fine-grained, intensly folded, argillaceous quartzite (Anderson, 1957, p. 64). The veins and bedding strike N 70 W and dip 30 NE to 30 SW. The most accessible vein can be traced for hundreds of feet and is as thick as 4 feet. It is composed of white, coarsely crystalline quartz with pyrite.	The Lucky Strike mine is on a south flowing tributary of Kenney Creek about 0.5 mile northeast of the Salmon Forest Boundary. Anderson (1957, p. 64) reported that some ore was mined from a 50-foot-long drift. There is also a 90-foot-long adit. During a USBM visit, made in conjunction with the mineral investigation of the Salmon National Forest, four dozer and prospect pits were found scattered for about 0.5 mile along a northeast trend. The workings are connected by a dozer trail which has oblite-rated the underground workings. There also is a collapsed cabin.	A chip sample (SFC 41), taken across the principal vein during the USBM visit, had no significant metal content.
524	WADE CREEK POLE PROSPECT	45 01 39 N	113 30 32 W	Quartz-, and hematite-bearing stringers are along foliation in fine-grained argillaceous quartzite. The mineralized foliation is at least 2 feet thick and is nearly horizontal.	The Wade Creek Pole prospect extends for 1 mile along the divide between Wade and Flume Creeks. In the area are at least five dozer trenches; most are overgrown by vegetation. The prospect was visited in conjunction with the USBM mineral investigation of the Salmon National Forest.	A sample (SFC 39), chipped for 2 feet across the quartzite during the USBM visit, had no significant metal content.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
525	WADE-FLUME CREEK DIVIDE PROSPECT	45 01 01 N	113 30 10 W	Poorly exposed quartz and azurite stringers occur along foliation in fine-grained argillaceous quartzite.	On the divide between High and Flume Creeks, about 0.5 mile north of the Apex prospect, is a dozer trench 20 feet long that is overgrown by vegetation. The Wade-Flume Creek divide prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A grab sample (SFC 38) taken of quartzite during the USBM visit contained 0.01 percent copper.
526	HIGH CREEK NORTH PROSPECT	45 00 31 N	113 31 29 W	Quartz-, and hematite-bearing stringers are along foliation in fine-grained argillaceous quartzite. The quartzite is nearly horizontal and crops out over a horizontal distance of about 5,600 feet and a vertical distance of 900 feet.	At least 20 dozer trenches occur in a 2-mile-long, 1-mile-wide area at the headwaters of High Creek. Most are overgrown by vegetation. The prospect was visited in conjunction with the USBM mineral investigation of the Salmon National Forest.	A sample (SFC 40) of mineralized quartzite was taken during the USBM visit. It contained 29 ppm thorium.
527	INDEPEN-DENCE THORIUM PROSPECT	45 00 22 N	113 30 56 W	A 5- to 6-foot-wide zone of discontinuous specularite seams is associated with the faulted contact between quartzite/phyllite and volcanic rocks. The zone trends almost east and dips 20-30 NE (Anderson, 1958b, p. 64).	The Independence prospect is at the headwaters of High Creek. The 44 Independence claims were located by Fred Guderjohn in 1956. They straddle the Forest boundary. Anderson (1958b, p. 64) reported that workings consisted of a large dozer cut. In the claim area now are a number of pits and trenches, along with connecting dozer roads.	No data available.
528	APEX PROSPECT	45 00 33 N	113 30 11 W	Quartz-hematite stringers are in fine grained argillaceous quartzite. Staatz (1979a, p. 74) reported that the mineralized quartzite is at least 135 feet long, is as thick as 3 feet, strikes N 75 W, and dips 55-60 NE. The stringers are mainly quartz with fluorite, limonite, specularite, magnetite, rare-earth minerals (synchisite--CeFCO3.CaCO3) and thorite.	The Apex prospect is on the divide between High, Wade, and Flume Creeks. The principal workings consist of three parallel trenches (Staatz, 1979a, p. A73). The trenches, covering about 0.25 acre, are overgrown. They were visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	Samples taken from the vein by Staatz (1979a, p. A74) contained as much as 0.32 percent ThO2 and 1.67 percent rare-earth oxides. Samples analyzed by Austin (1968, p. 12) for individual rare earths had as much as 0.09 percent Y2O3, 0.01 percent La2O3, 0.23 percent Ce2O3, 0.09 percent Pr6O11, 0.50 percent Nd2O3, 0.09

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				Minor amounts of barite, rutile, manganese oxide, and apatite are also present.		percent Sm2O3, 0.06 percent Eu2O3, 0.04 percent Gd2O3, 0.01 percent Tb4O7, 0.01 percent Dy2O3, 0.004 percent Er2O3, 0.02 percent Tm2O3, and 0.006 percent Yb2O3. Two samples analyzed for base and precious metals contained only minor amounts. A sample (SFC 37), chipped across 3 feet of the most radioactive part of the quartzite during the USBM visit, had 0.2 percent thorium, 210 ppm lanthanum, 0.15 percent cesium, 640 ppm samarskite, and 110 ppm europium.
529	GHOUL BASIN SPRING PROSPECT	44 59 39 N	113 30 06 W	Although no mineralized structure is exposed, the prospect is along the westerly projection of the Lucky Horseshoe vein system. This system of poorly-exposed branching veins is along quartzite bedding striking N 70 W to N 60 E and dipping gently to the north. The veins are composed of brecciated feldspar and quartz containing hematite, specularite, magnetite, and thorium- and rare earth-bearing minerals (Staatz, 1979a, p. A54).	The prospect area, near the Salmon National Forest boundary in upper Ghoul Basin, was located in the early 1950's. The workings consist of several large dozer cuts connected by dozer roads. All of the workings are caved.	No samples were taken due to the lack of exposed mineralized material.
530	LUCKY HORSESHOE MINE	44 59 28 N	113 29 37 W	A rare-earth-oxide and thorium-bearing quartz vein occurs in siltite which strikes N 70 W to N 60 E and dips gently to the north. The principal vein is exposed for 1,400 feet and is as thick as 20 feet. It contains quartz, hematite, specularite, magnetite, and thorium- and rare-earth-bearing minerals (Staatz, 1979a, p. A54).	The Lucky Horseshoe mine area crosses Flume Creek about 1 mile northeast of its junction with Agency Creek. The 12 Lucky Horseshoe claims were located in 1954 by Clyde L. Goodwin and others (Staatz, 1979a, p. A53). One of the principal mineralized sites in the Lemhi Pass area, the workings in the Lucky Horseshoe mine area, located under a large powerline, are	Samples taken by Staatz (1979a, p. A55) contained as much as 1.0 percent ThO2 and 10.95 percent rare-earth oxides. Samples analyzed also had as much as 0.6 percent Y2O3, 0.59 percent LaO3, 2.57 percent Ce2O3, 0.95 percent Pr6O11, 5.18 percent Nd2O3, 0.76 percent Sm2O3, 0.26 percent Eu2O3, 0.24 percent Gd2O3,

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					scattered over a 100-acre-area. Development consists of a cabin, several large dozer cuts, and two adits; the longest is 440 feet. All are connected by dozer roads. The workings straddle the Salmon National Forest boundary. The mine was visited by the USBM in conjunction with the investigation of the mineral resources of the Salmon National Forest (Close, 1994).	0.09 percent Tb2O3, 0.3 percent Dy2O3, 0.01 percent Ho2O3, 0.04 percent Er2O3, 0.02 percent Tm2O3, 0.001 percent Lu2O3, and 0.004 percent Yb2O3 (Austin, 1968, p. 9). A sample (SFC-29), taken during the USBM visit of highly radioactive specularite from three stockpiles totaling about 1,000 tons, assayed 3000 ppm thorium and 33 ppm uranium.
531	SKYLARK PROSPECT	44 59 44 N	113 28 27 W	A mineralized zone, 0.7 feet thick and exposed for 100 feet, is along quartzite bedding striking N 30 W and dipping 25 NE. The zone cotains specularite, quartz, and iron oxides (Anderson, 1958b, p. 65).	The Skylark prospect on the divide between Flume and Horseshoe Bend Creeks about 1.2 miles northwest from the junction of Agency and Horseshoe Bend Creeks. Workings consist of a number of dozer cuts (Anderson, 1958b, p. 65).	No data available.
532	NO PAY MINE	44 59 42 N	113 27 56 W	A fault zone trends N 43 W and dips 33 SW in fine-grained, argillaceous quartzite which strikes N 70-75 E and dips 20-30 NW. A quartz vein in the fault zone is as thick as 10 feet and contains quartz, chalcocite, bornite, chrysocolla, malachite, azurite, and hematite. The zone is not radioactive (Sharp and Cavender, 1962, p. 54).	The No Pay mine is at the end of the jeep road along the west side of upper Horseshoe Bend Creek. At the mine is a 100-foot-long drift trending N 40 W, a dozer cut, and two collapsed long cabins. The mine was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC 46) chipped across the zone during the USBM visit had 0.11 ounce gold per ton and 2 ounce silver per ton.
533	STAATZ NO. 14 THORIUM PROSPECT	44 59 09 N	113 29 12 W	A vein, over 0.5 feet thick, containing iron oxide and thorium-bearing minerals is in fine-grained quartzite that is nearly horizontal (Staatz, 1979a, p. A36).	The Staatz No. 14 thorium prospect is on the divide between Horseshoe Bend and Agency Creeks about 0.7 mile from their junction. It is along the jeep trail that follows the upper-north electric transmission lime. There are at least 10 dozer trenches connect by a jeep trail. The prospect was visited by the USBM in conjunction with the mineral	A 0.5-foot-long chip sample (SFC 47) taken across the vein during the USBM visit had 30 ppb gold and 449 ppm thorium.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					investigation of the Salmon National Forest.	
534	STAATZ NO. 06 THORIUM PROSPECT	44 59 23 N	113 28 26 W	A vein in quartzite is 0.5 feet thick and exposed for 6 feet. The vein strikes N 16 E, dips 29 NW, and contains iron oxides and thorium-bearing minerals (Staatz, 1979a, p. A36).	The Staatz No. 6 thorium prospect is on the west side of the divide between Horseshoe Bend and Flume Creeks about 1.1 miles northwest of the junction of Horseshoe Bend and Agency Creeks. Staatz (1979a, PL. 1) shows a number of prospect pits along a northeasterly trend.	No data available.
535	BETTY JOE PROSPECT	44 59 27 N	113 28 10 W	A mineralized zone in quartzite is 1 foot thick, 425 feet long, strikes N 35 E, dips 20 NW, and contains iron oxides and copper-bearing minerals (Staatz, 1979a, p. A36 and PL. 1).	The Betty Joe prospect is about 0.25 mile east of Horseshoe Bend Creek, and 0.6 mile north of the creek's junction with Agency Creek. Workings consist of a dozer road and east-trending adit (Anderson, 1958, p. 66; Staatz, 1979a, PL. 1).	No data available.
536	BIG DEAN PROSPECT	44 59 18 N	113 27 50 W	In quartzite is a mineralized zone, 0.5 feet thick and 100 feet long, containing iron oxides and thorium-bearing minerals (Staatz, 1979a, p. A36).	The Big Dean prospect is on the northeast side of Horseshoe Bend Creek about 0.7 mile from Agency Creek. Staatz (1979a, PL. 1) shows prospect pits.	No data available.
537	STAATZ NO. 13 THORIUM PROSPECT	44 59 09 N	113 28 22 W	A 0.3-foot-thick vein containing iron oxides and thorium-bearing minerals is in quartzite (Staatz, 1979a, p. A36).	The Staatz No. 13 thorium prospect is on the west side of the divide between Flume and Agency Creeks about 0.8 mile northwest of the junction of Horseshoe Bend and Agency Creeks. Staatz (1979a, PL. 1) shows some prospect pits along a northeasterly trend.	No data available.
538	STAATZ NO. 12 THORIUM PROSPECT	44 59 02 N	113 28 24 W	Quartzite contains iron oxides and thorium- and rare earth-bearing minerals (Staatz, 1979a, p. A36).	The Staatz No. 12 thorium prospect is about 0.3 miles northeast of the Buffalo mine. Staatz (1979a, PL. 1) shows some prospect pits along a northeasterly trend.	No data available.
539	STAATZ NO. 11 THORIUM	44 58 59 N	113 28 35 W	A vein containing iron oxides and thorium-bearing minerals is in	The Staatz No. 11 thorium prospect is about 0.3 mile northeast of	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	PROSPECT			quartzite (Staatz, 1979a, p. A36).	the Buffalo mine. Staatz (1979a, PL. 1) shows some prospect pits along a northeasterly trend.	
540	BUFFALO MINE	44 58 47 N	113 28 39 W	Veins occur in a zone of fine-grained, brecciated, shattered, micaceous quartzite at the Buffalo (Staatz, 1979a, p. A36 and A55). The zone is about 75 feet thick and can be traced for 7,500 feet (Alvord, 1958, p. 1). The principal vein, exposed at the mouth of an adit, strikes N 5 W, dips 60 SW, can be traced for 550 feet, and is as thick as 11 feet. It contains quartz, limonite, pyrite, malachite, magnetite, thorite, and monazite. West of the principal vein is a second vein striking N 80 E to N 70 W and dipping steeply south. This vein is as long as 430 feet, as thick as 2.5 feet, and contains quartz, calcite, specularite, magnetite, and pyrite. Farther to the northwest are two other thorium-bearing veins striking N 80 W and dipping steeply southwest. They are exposed for as much as 20 feet and are as thick as 2 feet. Both contain quartz with iron oxides.	One of the principal mineralized sites in the Lemhi Pass area, the Buffalo workings extend over a 1,300-foot-long, 400-foot-wide area. Development consists of a caved shaft, a 90-foot-long adit, and several dozer trenches that obliterated underground workings. Originally prospected for copper and gold in the 1880's and 1890's, 100 tons of copper ore are reported to have been mined (Trites and Tooker, 1953, p. 195). Radioactive material was discovered on the dumps in 1950; 15 claims were then staked and exploration work begun. Drilling and most of the dozer trenching was done by Empire Explorations, Inc. in 1958. A DMEA examination was made by Alvord in 1958. The prospect was visited by the USBM in conjunction with the investigation of the mineral resources of the Salmon National Forest.	Ten samples (EEL 1-10) were taken by Alvord (1958, p. 6) during the DMEA examination. Four of the nine chip samples, 1.8 to 8.0 feet long, contained 0.6 percent or more combined rare earth oxides and thorium, two exceeded 1 percent. Five samples, taken by Sharp and Cavender (1962, p. 38), assayed 0.04 to 1.0 percent ThO2. Three samples, taken from the principal vein by Staatz (1979a, p. A55) and Austin (1968, p. 3), had as much as 1.05 percent ThO2 and 0.46 percent rare earth oxides. Three samples, from the west vein, had 0.13 to 0.61 percent ThO2 (Staatz, 1979a, p. A56). During the USBM visit, a 3-foot-long sample (SFC-28) was chipped across the principal vein. It assayed 0.022 ounce gold per ton and 1.3 percent copper.
541	RUFUS PROSPECT	44 58 53 N	113 27 42 W	Veins at the Rufus prospect contain quartz and secondary copper and iron minerals. On the surface are malachite, chrysocolla, and azurite. At depth may be bornite and chalcopyrite. Also present are specularite, limonite, calcite, and pyrite.	The Rufus prospect is under the electric transmission line about 1/3 mile northwest of the junction of Agency and Horseshoe Creeks (Staatz, 1979a, Pl. 1). Principal workings consist of two paralleling, northwest-trending drifts.	No data available.
542	IDAHO PRIDE MINE	44 58 58 N	113 27 13 W	Quartz stringers containing chalcocite, malachite, azurite, hematite, and limonite are along	The Idaho Pride mine area extends for 0.4 mile, paralleling the electric transmission line easterly from the	A sample (SFC 48) chipped across a 1-foot-thick vein during the USBM visit assayed 12.35

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				bedding in fine-grained, argillaceous quartzite. The veins strike east, dip 30 N, and are 0.5 to 1.5 feet thick. None are radioactive.	junction of Agency and Horseshoe Bend Creeks. There are several short adits, cuts, and pits (Peters, 1978, p. 110). The underground workings are caved. Ore produced was treated at the Copper Queen mill and combined with production recorded for that mine. The mine area was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	percent copper, 0.09 ounce gold per ton, and 5.8 ounce silver per ton.
543	STAATZ NO. 16 THORIUM PROSPECT	44 59 03 N	113 27 02 W	In quartzite is a vein, 0.1 to 0.2 feet thick and 150 feet long, striking N 40 W, and dipping 60 SW. The vein contains iron oxides and thorium-bearing minerals (Staatz, 1979a, p. A36).	The Staatz No. 16 thorium prospect is under the electric transmission line on the divide between Agency and Trail Creeks about 0.8 mile northwest of Lemhi Pass. Staatz (1979a, PL. 1) shows some prospect pits on a northeasterly trend.	No data available.
544	STAATZ NO. 29 THORIUM PROSPECT	44 58 37 N	113 27 14 W	In fine-grained argillaceous quartzite, striking N 40 W and dipping 30 NE, is a 10-foot-thick zone of quartz and specularite stringers that is slightly radioactive. The stingers follow and transect the bedding.	The Staatz No. 29 thorium prospect, consisting of a 40-foot-long dozer trench, is a few feet below the Lemhi Pass road about 0.5 mile northwest of the pass. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC 45) was chipped across the zone during the USBM visit. It contained 9 ppb gold.
545	BLUE BIRD MINE	44 58 19 N	113 27 36 W	Sharp and Cavender (1962, p. 52) reported that three or four quartz veins occur in quartzite. The principal vein is 3 feet thick, trends N 45 E, and dips vertically. The vein is now poorly exposed but quartz on the dump of a caved shaft contains chalcocite, hematite, malachite, and azurite. The veins are not radioactive.	The Blue Bird mine is about 0.8 mile west of Lemhi Pass. Sharp and Cavender (1962, p. 52) reported that between 1911 and 1922, 8 tons of ore were produced from a 50-foot-deep shaft with a 30- to 40-foot-long drift. The ore yielded 1,432 pounds of copper, 68 ounces of silver, and 3.6 ounces of gold (Weed, 1926, p. 788). USBM files list the production of significant amounts of gold,	A sample (SFC-27) of quartz was taken from the dump during a 1994 USBM examination. It assayed 0.2 ounce gold per ton, 4.7 ounce silver per ton, and 2 percent copper. The veins at the Blue Bird may be in the same zone that is developed at the Copper Queen.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					silver, and copper between 1899 and 1951. The Blue Bird claim (MS 993), covering 19.535 acres, was located in 1883 and patented in 1892 by H.D. Pickman. Found in a 10-acre-area during a USBM visit in 1994 were several dozer trenches around a caved, hand-dug shaft at least 80 feet deep. The USBM visited the mine in conjunction with an investigation of the mineral resources of the Salmon National Forest.	
546	BADGER PROSPECT	44 58 09 N	113 27 51 W	Along bedding, in fine-grained argillaceous quartzite, is a poorly exposed vein of quartz, specularite, and malachite as thick as 3 feet. The vein strikes N 30-40 W, dips 60 NE, and is slightly radioactive.	The Badger prospect, also called Staatz #31 and #32, is about 400 feet southwest of the shaft at the Bluebird mine. The Badger workings consist of at least four dozer cuts connected by a jeep trail. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A grab sample (SFC 49) taken from the largest dump during the USBM visit had 8 ppm gold.
547	DEER NO. 22 THORIUM PROSPECT	44 58 34 N	113 28 13 W	A 1-ft-thick quartz vein striking N 76 W and dipping 65 SW is exposed for 6 feet in quartzite. It is compos-ed of iron oxides, and thorium- and rare earth-bearing minerals (Staatz, 1979a, p. A36).	The Deer No. 22 thorium prospect is on the southeast side of Agency Creek about 0.75 mile above the Copper Queen mine road. Staatz (1979a, PL. 1) shows a prospect pit.	No data available.
548	DEER FRACTION 1A PROSPECT	44 58 32 N	113 28 26 W	Several quartz veins occur in a broad shear zone in of micaceous quartzite. The principal vein is as thick as 10 feet, strikes N 87 W, dips 45-70 SW, and is at least 1,200 feet long. It contains quartz, goethite, specularite, thorite, calcite, rutile, feldspar, barite, and pyrite (Staatz, 1979a, p. A36 and A58).	The Deer claims lie along the south side of Agency Creek north of the Copper Queen mine. They were located in 1955 by Nuclear Fuels and Rare Metals Corp. On the claims are several long inclined roads and dozer cuts. The largest cut is on the Deer Fraction 1A claim and is 120 feet long, 30 feet wide, and 50 feet high.	Samples taken by Staatz (1979a, p. A59) contained as much as 2.0 percent ThO2. Samples taken by Sharp and Hetland (1968) during 1964-1965 contained as much as 0.4 percent Y2O3, 0.07 percent LaO3, 0.09 percent Ce2O3, 0.02 percent Pr6O11, 0.12 percent Nd2O3, 0.05 percent Sm2O3, 0.03 percent Eu2O3, 0.04% Gd2O3,

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
						trace Tb2O3, 0.03 percent Dy2O3, trace Ho2O3, trace Er2O3, trace Ta2O3, 0.002 percent Lu2O3, and 0.001 percent Yb2O3 (Austin, 1968, p. 5). A sample (SFC-26), chipped across the Fraction 1A zone during a USBM visit, contained 0.23 percent thorium and 12 ppm uranium.
549	BLACK BULL PROSPECT	44 58 22 N	113 28 47 W	A fault breccia zone in micaceous quartzite is as thick as 100 feet and as long as several hundred feet (Sharp and Cavender, 1962, p. 42). Mineralized zones on the Black Bull No. 2 claim strike N 70-80 W, dip vertically, and contain quartz, chalcopyrite, bornite, covellite, and thorite. Another vein on the claim strikes N 70-80 W, dips 64 SE, and contains siderite and barite with thorite and iron oxides. This vein is at least 200 feet long. A vein, on the Black Bull No. 3 (Staatz (1979a, p. A57) is at least 60 feet long, as thick as 1.3 feet, strikes N 77 W, and dips 75-80 NE. It contains calcite, quartz, specularite, magnetite, and thorite.	The principal Black Bull workings are on the Black Bull No.3 claim located south of Agency Creek and just west of the road leading to the Copper Queen mine. The workings, consisting of several prospect pits and trenches, three short adits, and connecting dozer trails, are aligned along a northwesterly trend. The area was first claimed in 1952 (Sharp and Cavender, 1962, p. 49; Staatz, 1979a, p. A57).	A sample, taken at the Black Bull #3 and Black Bull Fraction by the USBM in 1953, had 4.13 percent copper. Samples taken from various veins on the Black Bull No. 2 by Sharp and Cavender (1962, p. 50) had as much as 0.29 percent thorium oxide. Samples taken from the vein on the Black Bull No. 3 by Staatz (1979a, p. A58) contained as much as 0.80 percent ThO2. One sample analyzed for rare earths had 0.005 percent Y2O3, 0.002 percent Eu2O3, and 0.008 percent Gd2O3 (Austin, 1968, p. 2).
550	DEER NO. 23 THORIUM PROSPECT	44 58 26 N	113 28 21 W	In quartzite is a 50-foot-long quartz vein striking N 67 W. It is composed of iron oxides, quartz, and thorium- and rare earth-bearing minerals (Staatz, 1979a, p. A36).	The Deer No. 23 thorium prospect is about 1,500 feet northeast of the Copper Queen mine. Staatz (1979a, PL. 1) shows a prospect pit.	No data available.
551	DEER NO. 24 THORIUM PROSPECT	44 58 20 N	113 28 17 W	In quartzite is a 2-foot-thick, 250-foot-long quartz vein striking N 68 W and dipping steeply. It contains iron oxides, and thorium- and rare earth-bearing minerals (Staatz, 1979a, p. A36).	The Deer No. 24 thorium prospect is about 1,000 feet northeast of the Copper Queen mine. Staatz (1979a, PL. 1) shows a prospect pit.	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
552	COPPER QUEEN MINE	44 58 07 N	113 28 31 W	At the Copper Queen, quartz veins, copper-bearing sulfide veins, and replacement bodies occur in a fault breccia zone that trends N 40-70 E and dips 40-70 NW in quartzite (Sharp and Cavender, 1962, p. 51). The quartzite strikes N 50 E, dips 70 S, and is transected by a number of large dioritic dikes. The major vein (Main Queen Lead or Cookhouse) is as thick as 10 feet, averages 3.5 feet, has been worked underground for 900 feet horizontally, 250 feet vertically, and contains quartz, bornite, chalcopyrite, chalcocite, pyrite, gold, hematite, covellite, malachite, limonite, and calcite. Several subsidiary veins parallel the major one. A crosscutting vein is radioactive.	The Copper Queen mine area includes the Copper Queen and Gold Flint claims (MS 993), totaling about 39.115 acres, which were located in 1883 and patented in 1892 by H.D. Pickman. Mining began in 1893. The most recent period of activity was between 1958 and 1963 when the mine was operated by the Golden Copper Queen Corporation. An examination was made by the DMEA in 1958 (Alvord, 1958c). Umpleby (1913, p. 120) reported the production of about $100,000 between 1893 and 1910. USBM records show production of large amounts of copper and significant amounts of gold and silver. The ore came from extensive underground workings, including six adits and two shafts on five levels, that total about a mile. In 1911, a 15 stamp amalgamation mill was in operation. It was rehabilitated and two Wifley tables added in 1928 (Gerry, 1912, p. 575 and 1928, p. 671). In 1938, a 50 ton per day ball-flotation mill was erected, and operated until 1942. In 1958, the mine and mill were rehabilitated by the Golden Copper Queen Corporation and operated until 1963. Since then, the mine has flooded and the mill has been dismantled. Most of the mill tailings have been washed down Agency Creek (Peters, 1978, p. 109).	A grab sample (CQ 1) from a stope on the Cookhouse vein, taken during a 1958 examination (Alvord, 1958c, p. 9), contained 0.04 ounce gold per ton, 0.55 ounce silver per ton, and 3.5 percent copper. Five 1.0- to 2.0-foot-long chip samples (CQ 1 and 5-8), taken across the Princess Pat vein during the same examination, had as much as 3.62 ounce gold per ton, 7.9 ounce silver per ton, and 15.65 percent copper. A sample across the radioactive vein assayed 0.17 percent ThO2 (Sharp and Cavender, 1962, p. 52). A grab sample taken by the USBM in 1963, as part of a tellurium study, contained 17 ppm tellurium, 180 ppm selenium, 0.08 ounce gold per ton, 1.8 ounce silver per ton, and 6.8 percent copper. A sample (SFC-25), taken from the 1,000 ton dump during a 1994 USBM visit, had 0.13 ounce gold per ton, more than 2 percent copper, and 0.13 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
553	LUCKY BOY IRON PROSPECT	44 46 26 N	113 41 11 W	Magnetite, specularite, hematite, and quartz are in a zone of sheared, silicified phyllitic quartzite of the Apple Creek Phyllite. The phyllite strikes N 60 W and dips 45-60 NE. The iron-bearing shear zone trends N 60-70 E and dips 70-80 SE. Nearby are andesitic flows. The iron-bearing zone is as thick as 40 feet and can be traced along strike for 400 feet (Anderson, 1961a, p. 102).	The Lucky Boy group of 36 claims was located in 1955 and straddles the Salmon Forest boundary on the divide between Hayden and Meadow Creek. There are three dozer cuts.	The prospect was examined by the USBM in 1962 (Holt, unpublished USBM data). During that examination, three samples were taken. They contained as much as 54.1 percent iron.
554	BLUEBIRD IRON PROSPECT	44 46 09 N	113 38 49 W	Two iron-bearing veins occur in Apple Creek Phyllite which strikes N 60 W and dips steeply northeast. The veins strike about N 75 W, dip steeply north, are as thick as 10 feet, and can be traced by float for 2,000 feet (Anderson, 1961a, p. 103).	The Bluebird prospect is at the headwaters of Little Sawmill Creek. Workings consist of a few caved shafts, the deepest 50 feet, and pits all excavated in 1912 for lead. An additional five dozer cuts and eight drill holes, 12-80 feet deep, were excavated after 1949 for iron (Anderson, 1961a, p. 103). The most recent work was dozing done in the mid 1980's.	The prospect was examined by the USBM in 1962. During that examination, four samples were taken. They contained as much as 60.82 percent iron, 0.28 percent P2O5, 31.32 percent SiO2, and 0.05 percent copper (Holt, unpublished USBM data).
555	RUBY RED PROSPECT	44 49 55 N	113 27 26 W	Alvord (1958a, p. 1) reported that quartzite, phyllite, and argillite interbeds, striking N 10-35 E and dipping 10-25 NW, host a system of quartz veins. The veins are as thick as 1 foot, as long as 100 feet, strike N 60 W, dip 65-80 NE, and contain magnetite, goethite, and abundant iron oxides, chiefly hematite, and radioactive minerals.	The Ruby Red prospect area is on the divide between the Right and Left Forks of Peterson Creek. Alvord (1958a, p. 2), who conducted a DMEA investigation of the prospect for thorium and rare earth resources, reported that there were a few prospect pits and dozer trenches. The workings were covered by 24 claims located in 1957.	Four samples, taken of radioactive material by Alvord (1958a, p. 2), contained trace amounts of rare-earth elements and thorium.
556	BUCKHORN MINE	44 47 21 N	113 27 43 W	Reynolds and Vernon (1953, p. 4) reported that the Buckhorn mine, located along the western front of the Beaverhead Range, is in limestone, quartzite, and limey-shale beds striking east-west and	The Buckhorn mine is at the headwaters of Cedar Creek, straddling the Salmon Forest Boundary. Small-scale mining, by leasors, was done at the Buckhorn mine in 1921 (Gerry, 1924, p. 413).	Samples of vein material, taken from underground workings by Reynolds and Vernon (1953, p. 4), averaged about 1.5 percent lead, 2.1 percent zinc, and 0.96-14.8 percent manganese.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				dipping 35-70 south. These rocks are folded, crumpled, faulted and intruded by sills. Overlying all are as much as 2,000 feet of lake-bed deposited sedimentary rocks. The principal mineralized zone, located near the contact between the calcareous rocks and limestone, strikes N 80 E and dips 50-60 S. The zone contains mainly quartz, limonite, and pyrolusite with lenses of galena, sphalerite, and their oxides. In addition to the main vein, there are three mineralized fractures in the footwall quartzite which contain quartz, galena, and limonite.	USBM records list the production of significant amounts of silver, copper, lead, and zinc between 1921 and 1968. Workings at the Buckhorn consist of several surface cuts and a crosscut adit 725 feet long. The adit has three winzes--75 feet, 50 feet, and a few feet deep (Reynolds and Vernon, 1953, p. 2).	
557	BULLION GULCH MINE	44 47 32 N	113 27 16 W	Reynolds and Vernon (1953, p. 5) reported the Bullion Gulch mine to be in limestone, quartzite, and shale beds striking N 30-70 E and dipping 30-60 SE. These rocks are intruded by acidic and basic dikes and sills. Overlying all are as much as 2,000 feet of lake-bed deposited sedimentary rocks. The most prominant structural feature is the strong Basin and Range fault zone marking the western front of the Beaverhead Mountains. This fault zone, referred to as the Junction fault, strikes N 50 W to S 70 W, dips 35-50 SE, and persists along strike for 8 miles. In most places, the zone consists of several feet of gouge, and crushed and sheared rock. Mineralization along the zone consists of iron and managanese oxides along with lenses of galena, lead oxides, and	The Bullion Gulch mine is about 0.4 mile northeast of the Buckhorn mine. Development in the area began with the discovery of the nearby Buckhorn and Maryland mines in 1902 and continued intermittently until 1952. Working consist of a shaft and an adit.	No data available.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				silver.		
558	MARYLAND MINE	44 47 16 N	113 26 35 W	According to Reynolds and Vernon (1953, p. 5), the Maryland mine is in limestone, quartzite, and shale beds striking N 30-70 E and dipping 30-60 SE. These rocks are intruded by acidic and basic dikes and sills. Overlying all are as much as 2,000 feet of lake deposited sedimentary rocks. The most prominant structural feature is the Basin and Range fault zone marking the western front of the Beaverhead Mountains. This fault zone, referred to as the Junction fault, strikes N 50 W to N 70 E, dips 35-50 SE, and presists along strike for 8 miles. In most places the zone consists of several feet of gouge, and crushed and sheared rock. Mineralization is localized along two horizons. The lower horizon, between limey shale and quartzite beds, consists of a bed of iron and managanese oxides as thick as 10 feet. The upper horizon (the Galena vein) is in sandstone, limestone, and shale, and is also composed mainly of iron and managanes oxides. Lenses of galena, lead oxides, and silver occur in both horizons.	Development began at the Maryland mine, located at the headwaters of the West Fork Little Eightmile Creek, in 1902. In 1953, the potential for manganese resources was investigated by the USBM. Between 1926 and 1979, USBM records list the production of significant amounts of silver, copper, lead, and zinc from small high grade lenses of galena. The principal development is an adit with more than one-half mile of crosscuts, drifts, raises, stopes, and winzes (Reynolds and Vernon, 1953, p. 2). Drilling was done in 1990.	Four samples (AFR 8-11) taken during the USBM manganese investigation had as much as 35.3 percent iron, 13.9 percent manganese, and 0.61 percent zinc. A two-foot-long sample from an underground exposure of the Galena vein (Gilbert, 1933, p. 4) assayed 6.4 percent lead, 8.4 ounce silver per ton, and 0.01 ounce gold per ton. Two samples of vein material were taken during a USGS visit (Leatham-Goldfarb and others, 1986, p. 38). They were analyzed by spectrographic and atomic absorption methods. The two samples contained as much as 30 ppm silver, 500 ppm copper, 10000 ppm lead, 3000 ppm zinc and 200 ppm arsenic. Campbell, (1939, p. 231) reported a resource of 500,000 tons grading 22-36 percent manganese.
559	COMMODORE MINE	44 47 03 N	113 25 35 W	Reynolds and Vernon (1953) reported the area to be underlain by limestone, quartzite, and shale beds striking N 30-70 E and dipping 30-60 SE. These rocks are intruded by acidic and basic dikes and sills. The rocks are transected by the Junction Basin and Range fault zone, which marks the western front	The Commodore mine is on the northwest side of Little Eightmile Creek about 1.3 miles above the junction of the West Fork. The mine, patented as the Homestake claim (MS 3452) in 1954, covers 20.67 acres. Workings consist of four adits, trenches and pits, along with connecting jeep roads and	A sample of vein material taken during a USGS visit (Leatham-Goldfarb and others, 1986, p. 38) and analyzed by spectrograpic and atomic absorption methods contained 5 ppm silver, 100 ppm copper, 100 ppm zinc, and 500 ppm vanadium.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				of the Beaverhead Mountains. This fault zone strikes N 50 W to S 70 W, dips 35-50 SE, and presists along strike for 8 miles. In most places, the fault zone consists of several feet of gouge, and crushed and sheared rock. At the Commodore mine, mineralization is composed mainly of iron and managanes oxides along with lenses of galena, lead oxides, and silver.	trails. The principal adit, including drifts and winzes, contains at least 500 feet of workings. USBM records list the recovery of significant amounts of silver, copper, lead, and zinc between 1911 and 1965.	
560	OKLAHOMA MINE	44 46 41 N	113 26 17 W	Reynolds and Vernon (1953, p. 5) reported that the Oklahoma is in limestone, quartzite, and shale beds striking N 30-70 E and dipping 30-60 SE. These rocks are intruded by acidic and basic dikes and sills. Overlying all are as much as 2,000 feet of lake deposited sedimentary rocks. The most prominant structural feature is the Basin and Range fault zone marking the western front of the Beaverhead Mountains. This fault zone, referred to as the Junction fault, strikes N 50 W to N 70 E, dips 35-50 SE, and presists along strike for 8 miles. In most places the zone consists of several feet of gouge, and crushed and sheared rock. Mineralization along the zone consists of lenses of iron and managanese oxides containing shoots of galena, lead oxides, and silver.	The Oklahoma mine is about 0.7 mile southeast of the Maryland mine. Exploration began in the area with the discovery of the Maryland mine in 1902 and continued intermittently until 1952. Development consists of dozer cuts and roads. In 1909, the Oklahoma mine produced a small amount of silver and lead (USBM records).	No data available.
561	EIGHTMILE CREEK EAST PROSPECT	44 45 41 N	113 25 49 W	The prospect is underlain by limey shale that is transected by coarse-grained gabbroic dikes. The shale trends northwest and dips 45 northeast. The only structure exposed is in the headwall of the	The Little Eightmile Creek East prospect is on the divide between Little Eightmile Creek and Mollie Gulch about 2 miles northeast of the Lemhi River. For about 2,000 feet along the northeasterly	A sample (SFC 103) was chipped across the brecciated zone during the USBM visit. It had no significant metal content.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				lowest dozer cut. It consists of brecciated country rock cemented by gougy gossan containing manganese oxide, limonite, cerrusite, and galena. The structure is at least 4 feet thick, 50 feet wide, and 150 feet long.	trending divide are three dozer trenches and a jeep trail. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	
562	DETTON PROSPECT	44 45 19 N	113 25 12 W	The Detton prospect is on a N 45 W striking, 45 NE dipping zone of cherty limestone deformed by movement along the northwest-trending Junction Basin and Range fault. Along the fault zone is a poorly-exposed collapse structure consisting of limestone and quartz breccia cemented by hematitic gossan.	The Detton prospect is on the northwest side of Molly Gulch about 1.5 miles north of Mineral Hill. Along the jeep road parallel-ing the front of the mountain range is a partially slumped dozer pit that is 150 feet long, 100 feet wide, and 20 feet deep. The prospect was visited by the USBM in conjunction with the investigation of the mineral resources of the Salmon National Forest.	An 8-foot-long chip sample (SFC 102) was taken across the gossan during a 1995 USBM visit. The sample had no significant metal content.
563	IRISH BOY MINE	44 45 27 N	113 21 56 W	Along bedding in shaly, calcareous quartzite is a 10-foot-thick zone containing malachite, azurite, and chalcocite. The zone strikes N 50 E and dips 45 SE.	The mine is about 4,000 feet south of Irish Springs. It was visited in 1995 by the USBM in conjunction with the mineral investigation of the Salmon National Forest. At the time of the USBM study, workings consisted of a southwest-trending adit at least 100 feet long with a dozer pit over the top of it. The pit is 500 feet long, 300 feet wide, and has a 40 foot highwall. The mine is covered by the Irish Boy 2-6 claims held (1994) by Barrett Estates.	A chip sample (SFC 34) was taken across the zone during the USBM visit. It assayed 0.22 percent zinc, 2.05 percent nickel, 0.132 percent cobalt, and more than 1 percent arsenic.
564	GRIZZLY HILL MINE	44 45 51 N	113 21 00 W	Although no mineralized structure is exposed at the Grizzly Hill mine, float and material on dumps indicate that limestone and quartz breccia cemented with sulfide minerals and their oxide products were mined. The breccia contains abundant galena and	The mine area was covered by the Plymouth group of mining claims in 1994. Campbell (1926, p. 152) reported that in 1926 there were three short adits. Gerry (1927, p. 671) reported that in 1927, the mine, being worked by the Continental Standard mining	A sample (SFC 55) was taken of material on the dump during the USBM visit. The sample assayed 6.7 ounce silver per ton, more than 3 percent zinc, and 0.32 percent arsenic.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				lesser amounts of cerrusite, anglesite, limonite, calcite. Mine workings appear to be along a fault zone that transects the breccia zone. The fault strikes N 80 E and dips steeply.	company, yielded a car load of oxidized lead ore that was shipped to Utah. The ore came from an underground working about 250 feet long. USBM records list the production of significant amounts of silver, copper, and lead between 1925 and 1930. Scattered for about 2,000 feet along a N 80 E trend are three caved and one open adit, together totalling at least 1,000 feet, at least 10 dozer trenches and prospect pits, three log cabins, all in poor repair, and connecting jeep trails. The mine was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	
565	PLYMOUTH SOUTH PROSPECT	44 46 10 N	113 19 56 W	A limonite gossan is in massive limestone that is nearly horizontal.	The Plymouth south prospect, consisting of a 40-foot-long dozer trench, is about 0.75 miles southeast of the Digmore mine. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC 56), chipped for 5 feet across the gossan during the USBM visit, contained 0.14 percent zinc.
566	DIGMORE MINE	44 46 29 N	113 21 01 W	Sulfide minerals and their oxidation products occur in the matrix cementing limestone and quartzite breccia in cherty limestone. Reynolds and Vernon (1953, p. 7) reported that quartzite, limey shale, and intrusive sills are also in the mine area. The mineralized breccia contains shoots of galena along with with cerussite, anglesite, quartz, calcite, jasperoid, and limonite. The limestone strikes N 40 E and dips 20 SE. It and the mineralized breccia are	The Digmore mine extends over a northeast-trending 1,000-foot-long, 200-foot-wide area. The area lies along the east side of Jakes Canyon about 0.9 mile south of the Continental Divide. The mine was examined by the USBM in 1945 (USBM files). It was visited again in 1995 by the USBM in conjunction with the mineral investigation of the Salmon National Forest. The principal working is a 150-foot-long, 150-foot-wide dozer pit. Underground	Three dump samples (90-93) taken during 1945 had as much as 10.3 percent lead, 3.75 ounce silver per ton, 0.5 percent zinc, and trace gold (USBM files). During the 1995 USBM visit, a sample (SFC 54) of gossan was taken from the dumps. It contained more than 8.7 ounce silver per ton, more than 3 percent zinc, 0.233 percent molybdenun, 0.18 percent nickel, more than 1 percent arsenic, and 0.149

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				transected by a fault zone striking N 80 E, dipping 85 SE. This normal fault has brought massive quartzite into contact with the breccia on the hanging wall side. Most of the workings are along this fault (USBM files).	workings, consisting of four adits with drifts, stopes, and raises totaling over 1,000 feet, have been obliterated by dozer workings. In addition to the underground workings, there are numerous pits and trenches along with connecting dozer trails and jeep roads. Between 1921 and 1969, 522 tons of ore were produced which contained significant amounts of gold, silver, copper, lead, and zinc (Reynolds and Vernon, 1953, p. 7 and USBM records). The mine is (1994) covered by the Plymouth 1, 2, and 4 claims held by Dave Hawley.	percent antimony.
567	BLUE LEAD MINE	44 46 42 N	113 20 46 W	Exposed in a large dozer pit is gossan cementing limestone and quartz breccia in cherty limestone. Below the limestone is quartzite; fetid shale also fills the structure. The limestone strikes east and dips 10 S. Robertson (1956, p. 9) reported that at depth the gossan contains shoots of galena, pyrite, and chalcopyrite along with their oxidation productions.	The Blue Lead mine is on the east side of Jakes Canyon about 0.6 mile south of the Continental Divide. For about 1,000 feet along a northeasterly trend are a cabin, three adits (one caved and two open) all containing at least 500 feet of workings, a dozer pit 300 feet long and 50 feet wide with a 30-foot-high headwall, at least four prospect pits and trenches, and a connecting jeep road. USBM files list the production of significant amounts of silver, copper, and lead between 1947 and 1949. A DMEA examination was made in 1956 (Robertson, 1956, p. 9). A visit was made by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	Two samples (AFR 3 and 4) taken by Robertson (1956, p. 10) assayed as much as 0.64 percent lead, 35.6 percent iron, 0.53 percent manganese, and 88.0 percent silica. A grab sample (SFC 53) of gossan taken during the 1995 USBM visit had no significant metal content.
568	GENERAL MCARTHUR	44 47 02 N	113 20 30 W	Workings at the General McArthur develop a gossan striking east	The General McArthur mine was discovered in 1942. It is on the	A sample (SFC 33) of gossan taken from the dump during the

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	MINE			and dipping 35-45 south (Robertson, 1956, p. 10). The gossan appears to cement limestone and quartz breccia in cherty limestone. Below the limestone is massive quartzite. Gossan on the dumps is mainly limonite, malachite, and hematite pseudomorphs after pyrite and chalcocite.	divide near the head of Jakes Canyon and only a few hundred feet south of the Continental Divide. The mine was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest. In 1994, it was covered by the Grizzly 1-6 claims held by Don Detton. The mine was visited by the USBM in 1956 to investigate the potential for manganese resources. In 1956, workings consisted of several open cuts and a caved decline trending N 20 E at an angle of 50 degrees (Robertson, 1956, p. 10). By 1995, a 1 acre area around the shaft had been extensively dozed. USBM records list the production of significant amounts of silver, copper, lead, and zinc between 1949 and 1952.	1995 USBM visit had 0.18 percent zinc, 0.248 percent nickel, 0.113 percent cobalt, 0.865 percent arsenic, and 0.1 percent antimony. Two samples (AFR 5 and 6) taken by Robertson (1956, p. 10) contained as much as 32.6 percent iron, 0.445 percent manganese, 0.28 percent lead, 1.5 percent zinc, and 28.4 percent silica. A sample of vein material was taken during a USGS visit (Leatham-Goldfarb and others, 1986, p. 38). Analyzed by spectrographic and atomic absorption methods, the sample contained 1 ppm silver, 2000 ppm copper, 1500 ppm lead, 2000 ppm zinc, 1000 ppm arsenic, and 1000 ppm vanadium.
569	GENERAL MCARTHUR EAST PROSPECT	44 47 04 N	113 19 43 W	No mineralized structure is exposed. However, workings at the prospect were probably dug trying to find the continuation of the replacement zone that runs along Hood Gulch between the Road Agent mine on the east and the General McArthur mine on the west. Country rock at the General McArthur East prospect is quartzite, calcareous quartzite, and possibly limestone. Replacement material on the dumps in mainly gossan consisting of specularite and hematite.	Along Hood Gulch, about 0.5 mile east of the summit, are two dozer trenches, the smaller about 400 feet east of the larger. The large pit is 300 feet wide, 250 feet long and has a headwall 25 feet high. The small pit is 40 feet across.	Sample (SFC 32) was grabbed from the gossan on the dump of the large pit during the USBM visit. It contained 0.92 percent zinc and 0.15 percent nickel.
570	BULLION APEX MINE	44 47 18 N	113 18 26 W	The mine area is along the easterly extension of the General MacArthur mineralized zone. The zone contains gossan- and	The Bullion Apex mine area is in Hood Gulch. The prospect was visited by the USBM in 1995 in conjunction with the mineral	During the USBM visit, a sample (SFC 31) of gossan with sulfides was taken from the dump of a caved shaft. The sample

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				sulfide-cemented limestone and quartz breccia in limestone. Below the nearly horizontal limestone is massive quartzite. The gossan and sulfides are in shoots as thick as 1 foot that are composed of limonite, specularite, galena, chalcocite, and bornite.	investigation of the Salmon National Forest. At least ten caved shafts, prospect pits and trenches, along with connecting jeep and dozer trails, are scattered for 5,000 feet along an eastly trend. The underground workings, mostly obliterated by dozer workings, probably totaled less than 1,000 feet. USBM files list production of significant amounts of silver and lead between 1943 and 1947.	asssayed 0.31 percent zinc and 0.15 percent nickel.
571	NORTH ROAD AGENT PROSPECT	44 47 04 N	113 17 17 W	Based on float and alignment of workings, two north-trending replacement zones probably occur in finely bedded, calcareous quartzite that trends N 45 E and dips 35 SE. Gossan with calcite, barite, and limonite pseudomorphs after pyrite and galena was found on dumps.	The prospect is on the divide between Hood Gulch and Canyon Creek about 0.25 mile north of the principal workings at the Road Agent mine. Workings consist of three caved shafts, totalling less than 100 feet of underground workings, and a number of prospect pits. The east workings consist of a shaft and three prospect pits that are scattered for 300 feet along the northerly trend and the west workings consist of two shafts that are 500 feet apart. The prospect was visited in 1995 by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC 30) was grabbed of gossan from the dumps during the USBM visit. The sample contained 950 ppm zinc.
572	ROAD AGENT MINE	44 46 43 N	113 17 06 W	Based on float and material on dumps, brecciated quartzite cemented with quartz, malachite, limonite, hematite, and chalcopyrite was probably mined. The mineralized structure is poorly exposed.	The area is along Hood Gulch about 1.5 miles west of Railroad Canyon. It is covered by the Road Agent claims located by Henry L. Blacha in 1994. For about 0.6 mile along Hood Gulch are two shafts, two adits, a number of prospect pits and trenches, and connecting jeep roads and trails. The underground workings are caved. However,	A sample (SFC-24) of vein material from the dump of the shafts had 8.75 ounce silver per ton, 0.98 percent zinc, 2490 ppm arsenic, 3220 ppm antimony, 1.92 percent copper, and more than 1.0 percent lead. Vein material makes up about 10 percent of the 500 ton dump.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Gerry (1932, p. 394) reported that in 1929, the principal working consisted of a 220-foot-deep shaft with 225 feet of drifts and crosscuts. USBM records list the production of significant amounts of silver, copper, lead, and zinc between 1912 and 1971. A small amount of gold was also recovered. The area was visited by the USBM in conjunction with the investigation of the mineral resources of the Salmon National Forest.	
573	BORROW PIT	44 45 31 N	113 15 14 W	The pit is in stream gravel composed mainly of poorly-sorted and -rounded quartzite. The deposit is as thick as 10 feet and extends over at least 5 acres.	A small, overgrown borrow pit, covering about an acre, is on the north side of Cruikshank Creek about 0.25 mile from it junction with Railroad Canyon Creek. It was visited by the USBM in conjunction with the investigation of the mineral resources of the Salmon National Forest.	The deposit contains a significant amount of sand and gravel.
574	SECOND CHANCE PROSPECT	44 43 55 N	113 40 04 W	A vein as much as 2 feet thick and about 500 feet long, strikes east and dips vertically in fine-grained quartzite. The vein is mainly quartz with siderite, limonite, specularite, chalcopyrite, and copper oxides (Cather and Rains, 1988, p. 42).	The Second Chance prospect, also called Idaho 1-6, Bull Trout, Old Dad, Copper Cliff, and Poor Boy, is on the East Fork Hayden Creek 3 miles above its junction with Hayden Creek. Workings at the prospect consist of two pits and two adits, each 100 feet long. It was examined by the USBM in conjunction with the investigation of the Lemhi Range study area (Cather and Rains, 1988, p. 42).	Thirteen samples, taken during the USBM examination (Cather and Rains, 1988, p. 42), had as much as 0.022 ounce gold per ton, 0.07 ounce silver per ton, and 0.91 percent copper.
575	SUNNY SLOPE PROSPECT	44 43 20 N	113 37 58 W	Although no mineralized structure is exposed, float indicates a vein, at thick as 0.8 feet, is in fine-grained quartzite. The float is mainly vuggy and brecciated quartz with limonite	One prospect pit was found near the headwaters of Alder Creek. It was examined by the USBM in conjunction with the investigation of the mineral resources of the	A sample taken during the USBM examination (Cather and Rains, 1988, p. 43) had no significant metal content.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				(Cather and Rains, 1988, p. 43).	Lemhi Range study area (Cather and Rains, 1988, p. 42).	
576	JACK SMITH GULCH PROSPECT	44 42 33 N	113 36 16 W	Sporadic veins, as thick as 0.2 feet and consisting mainly of quartz and specularite, trend east and dip vertically in fine-grained quartzite (Cather and Rains, 1988, p. 43).	The prospect is on the south side of Jack Smith Gulch about 2 miles above Alder Creek. There is one prospect pit (Cather and Rains, 1988, p. 43). It was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area.	A sample of vein quartz, taken during the USBM examination (Cather and Rains, 1988, p. 43), contained no significant amounts of metal.
577	L.O. PROSPECT	44 44 56 N	113 24 07 W	Along cherty limestone that is nearly horizontal, is a gossany structure containing quartz, chalcocite, malachite, limonite, and hematite. Nearby are massive limestone and quartzite. All of the rocks are deformed by movement along the northwest-trending Junction Basin and Range fault zone. The gossan is as thick as 3 feet.	The L.O. prospect is about 0.9 mile north of Mineral Hill. The L.O. group of claims was located and explored by Exxon Minerals Corporation in the 1980's. At the end of a jeep road up the gully are two adits, at least 5 dozer trenches, and two log structures. No doubt there also are some drill stations. All of the workings are scattered for about 800 feet along a northerly trend. The adits and cabins are within a 1 acre area on the north end of the trend. One of the adits is open and 200 feet long, the other is caved and estimated to be 150 feet long. The prospect was visited by the USBM during the investigation of the mineral resources of the Salmon National Forest.	A sample (SFC 68) chipped across the gossan during the USBM visit had 0.11 percent zinc.
578	ELDORADO #7 PROSPECT	44 44 00 N	113 24 21 W	Bulldozer workings expose a northwest-trending bed of cherty limestone that dips steeply northeast. Nearby are massive limestone and quartzite. All of the rocks are deformed by movement along the northwest-trending Junction Basin and Range fault zone. Along the limestone bed	The Eldorado #7 claim was located by Don Detton in 1974. In a northeast trending, 3,000-foot-long area are at least 10 dozer trenches. Some of the trenches may be over old underground workings. The excavations are connected by dozer roads. No doubt some drilling was done. Most of the workings expose	A 5-foot-long chip sample (SFC 67) was taken during a 1995 USBM visit made in conjunction with the mineral resource investigation of the Salmon National Forest. It assayed 0.48 percent zinc.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				are at least two poorly-exposed structures, consisting of limestone and quartz breccia cement by hematitic gossan.	only barren rock.	
579	IRON DYKE PROSPECT	44 43 30 N	113 23 40 W	A mineralized zone occurs along bedding in calcareous mudstone. Nearby are cherty limestone, shale, and quartzite. The rocks and zone trend northwest, dip steeply northeast, and are deformed by the movement along the northwest-trending Junction Basin and Range fault zone. The mineralized zone is silicified, kaolinized, and contains massive quartz, limonite, malachite, azurite, pyrite, and chalcocite. It is as thick as 10 feet and can be traced 1,000 feet to the east where it is overlain by quartzite.	The Iron Dyke prospect, situated 1,000 feet east from the mouth of Stroud Gulch, was first located in 1949 by M.F. Barrett. It was relocated as the Eldorado #1 claim by Don Detton in 1974. In a east-trending, 1,000-foot-long area are extensive dozer excavations and connecting dozer roads. An adit, now obliterated by dozer workings, probably contained over 1,000 feet of workings. No doubt some drilling was done. A large dozer excavation, stradding the boundary of the Salmon National Forest, has three levels and covers at least 2 acres. Four smaller dozer trenches are to the east. Along the ridge to the northeast are additional dozed and hand dug workings. The extensive workings suggest production, however, none is recorded. The prospect's potential for manganese resources was investigated by the USBM in 1956 (Robertson, 1956, p. 10). The prospect was revisited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	A sample (AFR-15) of the gossan taken by Robertson (1956, p. 11) had as much as 24.0 percent iron, 0.31 percent manganese, trace lead, 0.07 percent copper, and 38.8 percent silica. During the USBM visit in 1995, two samples were taken. A 10-foot-long chip sample (SFC 66), taken across the zone exposure in the large dozer working, had 32.68 percent copper, 0.19 percent zinc, 700 ppm cobalt, and 0.39 percent arsenic. A 4-foot-thick sample (SFC 65) taken across a zone exposured in a dozer trench 1,000 feet to the east, had no significant metal content.
580	JAKES CREEK COPPER PROSPECT	44 43 53 N	113 21 25 W	Along the Junction fault zone, in brecciated shale filling a structure in limestone, is a lense of quartz containing chalcopyrite and pyrite. Malachite, azurite, and	The copper prospect is on the east side of Jakes Canyon about 2.3 miles above its mouth. Workings consist of an adit that trends east for about 100 feet, a couple of prospect	During the USBM visit, a sample (SFC 62) was chipped for 2 feet across the lense. The sample assayed 0.37 percent zinc, 0.218 percent nickel, and 140 ppm

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				limonite stain the sulfides and fractures in the shale. The lense is as thick as 2 feet.	pits, and a jeep trail. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	cobalt.
581	COPPER CARBONATE MINE	44 43 30 N	113 21 33 W	Along the Junction fault zone, in brecciated shale filling a structure in limestone, is a lense of quartz containing chalcopyrite, and pyrite. Malachite, azurite, and limonite stain the lense and fractures in the shale. The lense is as thick as 2 feet. The limestone beds strike north and dip 25-30 east.	The Copper Carbonate mine is in Jakes Canyon 0.5 mile above its mouth. The principal workings include three east-trending adits totalling at least 500 feet, at least five pits and trenches, and a connecting jeep trail. The mine was visited by the USBM in 1956 (Robertson, 1956, p. 11) to investigate the potential for manganese resources. The mine was again visited by the USBM during 1995 in conjunction with the mineral investigation of the Salmon National Forest. USBM records list the production of small amounts of silver and copper during 1929.	Two samples (AFR 13 and 14) of gossan, taken by Robertson (1956, p. 11), contained as much as 0.87 percent copper, trace lead, 0.07 percent zinc, 0.35 percent manganese, 43.8 percent iron, and 26.8 percent silcia. A 2-foot-long chip sample (SFC 63), taken across the lense during the 1995 USBM visit, had 0.29 ounce silver per ton and 350 ppm zinc.
582	RAILROAD CANYON PROSPECT	44 43 49 N	113 17 09 W	Along bedding in cherty limestone is a jasperoidal gossan as thick as 4 feet. The gossan is mainly iron oxides. The limeston bedding strikes N 70 E and dips 45 NW.	The prospect is about 0.5 mile west of Railroad Canyon in a gully opposite and south of Salt Creek. For about 500 feet along a northwest trend are three dozer pits, two prospect pits, and a claim monument. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	During the USBM visit, a sample (SFC 52) was chipped for 13 feet across the gossan. The sample assayed 0.13 percent zinc.
583	LEAD QUEEN PROSPECT	44 42 44 N	113 20 16 W	The prospect is along the the east-trending Junction fault zone described by Rupple and Lopez (1988, p. 100). At the Lead Queen, silicified gossan cements brecciated quartzite in the west wall of the fault zone.	The Lead Queen is in the first gully to the west of the mouth of Thompson Gulch. Workings consist of a north-trending, 90-foot-long adit, and 1,000 feet farther west, a prospect pit. The prospect was visited by the USBM during 1995 in conjunction with the	A grab sample (SFC-61) of gossan from the adit dump, taken during the USBM visit, had 25 ppb gold.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					mineral investigation of the Salmon National Forest.	
584	LAST CHANCE PROSPECT	44 42 41 N	113 19 54 W	The prospect is along the east-trending Junction fault zone discribed by Rupple and Lopez (1988, p. 100). The zone is filled with bleached, hydrothermally altered fragments of limestone, quartzite, sericitized granite, broken fragments of ore minerals, and clay gouge. Ore minerals consist mainly of galena with minor pyrite, sphalerite, and chalcopyrite. At the surface, the sulfide minerals have been replaced by oxide minerals.	The Last Chance prospect is located along the front of the Beaverhead Moutains east of Thompson Gulch. Workings, extending from the gulch for 0.3 mile to the east, consist of four northeast-trending adits and two dozer cuts. One adit is open for 80 feet, the rest are caved. The area was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	During a USGS visit, a sample of vein material was taken and analyzed by spectrographic and atomic absorption methods (Leatham-Goldfarb and others, 1986, p. 38). The sample had 559 ppm copper, more than 10000 ppm lead, more than 30000 ppm zinc, and 2860 ppm arsenic. A sample (SFC-60) of gossan, grabbed from the dump during the USBM visit, contained no significant metal content.
585	LEADHILL #44 PROSPECT	44 42 35 N	113 19 24 W	The workings are in brecciated and limonitic quartzite forming the hanging wall of the Junction fault zone. The quartzite and zone strike N 40 E and dip 10 SE. Limonite and manganese oxide are along fractures in the quartzite.	The Leadhill #44 prospect, named on a claim notice, is about 1,000 feet west of the mouth of Baby Joe Gulch. Workings consist of a prospect pit and an east-trending, 100-foot-long adit that are about 600 feet apart. The two workings are connected by a jeep road. The prospect was visited by the USBM in 1995 in conjunction with the mineral resource investigation of the Salmon National Forest.	A 3-foot-long chip sample (SFC 59) of quartzite, taken during the USBM visit, had 7 ppb gold.
586	BABY JOE GULCH MINE	44 42 51 N	113 19 02 W	Bell (1920, p. 61) reported that the adit cross cut ashy lime, porphyry breccia, and gossan ore with disseminated galena. Robertson (1956, p. 11) reported that a gossan zone, 0.5-feet-thick, was cut by the short adit. Reportedly (personal communication, Detton, 1/12/95), a large system of quartz veins containing secondary silver- and lead-bearing minerals occurs in	The Baby Joe Gulch mine is on lower Baby Joe Gulch northwest of the Leadville mine. Bell (1920, p. 61) reported that the workings consisted of a cross-cut adit several hundred feet long. The Brown Bull was examined by the USBM in 1956 (Robertson, 1956, p. 11) to determine its potential for manganese resources. At the time of the USBM visit in 1956, a short	Bell (1920, p. 61) reported that the gossan ore contained 3 to 10 percent lead. A sample (AFR 12) of the gossan, taken by Robertson (1956, p. 11), had 0.97 percent lead, 0.07 percent zinc, 0.53 percent managanese, 32.1 percent iron, and 30.05 percent silica. Detton (personal communication, 1/12/95) reported making a new discovery

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				limestone.	adit was examined. Don Detton, owner of the claims covering the area in 1994 (Leadhill #52 and #53), reported that the prospect had been drilled by Utah International Corp (personal communication, 1/12/95). There had been a mill. USBM records list the production of 125 tons of ore in 1923 and 1925. The ore yielded significant amounts of silver and lead. Small amounts of copper and gold were also recovered. The prospect was visited by the USBM again in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	assaying 10 ounce silver per ton and 8 percent lead. A grab sample (SFC-58) of quartz taken during the 1995 USBM visit had over 8.7 ounce silver per ton.
587	LEADVILLE-KIMMEL MINE	44 42 23 N	113 18 17 W	According to Rupple and Lopez (1988, p. 100), the ore at the Leadville mine occurrs in shoots along the east-trending Junction fault zone. The fault zone is filled with bleached, hydrothermally altered fragments of limestone, sericitized granite, broken fragments of ore minerals, and clay gouge. The tuffaceous sandstone that is faulted against the ore shoots. The footwall is brecciated, complexly faulted limestone and granite. The ore shoots mined were as long as 180 feet, as deep as 200 feet, and as thick as 4 feet. The ore consisted mainly of fine-grained galena with minor pyrite, sphalerite, and chalcopyrite. Appreciable amounts of antimony, arsenic, and bismuth were also present in the ore. At the Kimmel mine, just west of the Leadville, pyrite and galena are	The Leadville-Kimmel mine area extends from the mouth of Italian Gulch west for about 0.75 mile. Eleven of the 22 Leadville patented mining claims (MS 2850A), along with the portal to the principal underground working, are south of the Salmon National Forest. Reynolds and Vernon (1953, p. 6) and Robertson (1956, p. 13) examined the mine area for the USBM to determine its potential for manganese resources. They reported that the two mines, the Leadville and Kimmel, were connected underground by raises, crosscuts, and branching drifts totaling thousands of feet. There also are a number of smaller adits, shafts, pits, and trenches, and connecting roads and trails. Over the old stopes are small open pits and extensive dozer workings. The	Reynold and Vernon (1953, p. 6) reported that USBM samples from the mineralized zone at the Kimmel mine averaged 1.15 percent lead and 0.65 ounce silver per ton. A sample taken by Robertson (1956, p. 13) had 0.08 percent zinc, 0.35 percent manganese, 34.9 percent iron, and 31.6 percent silica. Three samples of vein material, taken by the USGS and analyzed by spectrographic and atomic absorption methods, had as much 150 ppm silver, 559 ppm copper, more than 2 percent lead, more than 2000 ppm zinc, and 2860 ppm arsenic (Leatham-Goldfarb and others, 1986, p. 38). During the mines hayday, following the arrival of the Gilmore and Pittsburg Railway in the district, the ore shipped

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				disseminated in hydrothermally altered and sericitized granite and limestone. The material is much lower grade than that at the Leadville mine.	Leadville mine, located in 1904, commenced shipping ore in 1907 and continued intermittent production through 1954. A 25 ton per day gravity mill was installed in 1918, flotation equipment was added in 1923. Between 1907 and 1954, the Leadville mine produced significant amounts lead and silver and lesser amounts of copper, zinc and gold (USBM records). Between 1917 and 1929, the Kimmel mine produced 4,077 tons of ore that also contained significant amounts of lead and silver and smaller amounts of copper and gold (USBM records). A total production of 4,000-4,500 tons of ore worth about $100,000 was reported by Rupple and Lopez (1988, p. 99).	graded 11 percent lead and 7 ounce silver per ton (Bell, 1917, p. 45).
588	ITALIAN GULCH PROSPECT	44 42 41 N	113 17 45 W	An adit follows the hanging wall of a rhyolite sill in limestone. The sill trends northeast, dips 30 SE, and is as thick as 10 feet. The sill is kaolinized, iron stained, and contains pyrite.	The adit is on the east side of Italian Gulch about 0.5 mile above its mouth. The caved adit trends northeast for about 300 feet. It was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A 10-foot-long chip sample (SFC 57), taken across the sill during the USBM visit, contained no significant metal content.
589	BORROW PIT	44 42 32 N	113 17 00 W	Talus quarried is weathered from the limestone and quartzite forming the cliffs along the front of the Beaverhead Mountain Range.	The borrow pit at the mouth of Railroad Canyon straddles the Salmon Forest boundary. Talus is mined as needed from a small pit. The material is used by the Idaho State Department of Highways, commerical contractors, and the U.S. Forest Service.	The material has a LA wear index of 24 and 23. There is a 20 year supply at current use rates.
590	HAWLEY CREEK PHOSPHATE AREA	44 40 19 N	113 10 50 W	Exposed are north striking, 40 E dipping beds of the Phosphoria Formation containing shaley phosphate-bearing zones. Here the	The extensive Hawley Creek phosphate area is along the north side of Hawley Creek downstream from Reservoir Creek. The	Oberlindacher and Hovland (1979) reported indicated resources of about 56 million tons grading 24-31 percent P2O5

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				formation is as much as 30,000 feet long, 3,000 feet deep, and 42 feet thick (Lowe, 1988).	principal workings, consisting of three dozer cuts, are on the north side of the Hawley Creek. The prospect was discovered about 1900 and sporatic surface exploration done until the 1980's. In 1966, a 1,728-acre area was under lease (from the government) to Edward E. Bolin, Ronald MacDonald, and Michael Barrett (Young, 1966, p. 2). In 1995, the deposits was covered by the Big Hill placer claims held by Pete Wells. The area was visited by the USBM in 1995 in conjunction with the mineral investigation of the Salmon National Forest.	and an additional 215 million tons grading 16-24 percent P2O5. During the USBM visit, a sample (SFC 64) of phosphate-bearing rock was taken to determine which by-products may be present. The 50-foot-long chip sample had no significant metal content.
591	BIG BEAR CREEK PHOSPHATE	44 40 08 N	113 08 05 W	Phosphate resources occur within the Retort Phosphatic Shale Member of the Phosphoria Formation (Oberlindacher and Hoveland, 1979, p. 1). Here the member averages 73 feet thick and crops out for 12.9 miles.	The Big Bear phosphate area extends along the divide between Big and Little Bear Creeks near their junction. There are a few prospect pits and trenches.	Oberlindacher and Hovland (1979) reported that in the Hawley Creek area, the Retort Phosphatic Shale Member underlies a 12 square mile area. Along Bear Creek, the Retort Member is 73 feet thick and 12.9 miles long. From the surface to a depth of 600 feet, resources are estimated to be 80.42 million tons grading 24-31 percent P2O5 and 308.76 million tons grading 16-24 percent P2O5.
592	KAY THORIUM PROSPECT	44 38 40 N	113 09 18 W	Fernette and Jones (1983, p. 42) reported the prospect to cover an anomalously radioactive granitic stock located between Bull and Hawley Creeks (Staatz and others, 1972). The stock intrudes Ordovician Kinnickinic Quartzite and Precambrian rocks in a thrust plate over Permian rocks (Lucchitta, 1966). The stock is composed of	The Kay prospect is at the summit of the divide between Bull and Hawley Creeks. A radioactive anomaly was recognized in the 1970's (Staatz and others, 1972) and investigated by Fernette and Jones (1983, p. 42) for the Atomic Energy Comission. Five prospect pits are scattered over an area of about 1/4 square mile.	Fernette and Jones (1983, p. 42) reported that the granite has an average thorium content of 35 ppm and the fractured granite over 100 ppm.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				medium-grained granite. Anomalous radioactivity is associated with altered, limonitic, fracture zones containing fine-grained thorite (Staatz and others, 1972).		
593	MEADOW CREEK PROSPECT	44 40 36 N	113 04 55 W	A 10-foot-thick quartzite bed, exposed in a dozer cut, strikes east, dips 30 N, and contains shoots of quartz, chalcopyrite, and hematite. Limonite and malachite stain a transecting shear zone striking N 60 W and dipping 85 NE.	The prospect is at the headwaters of Meadow Creek about 0.4 mile southwest of the Continental Divide. The Meadow Creek prospect was last claimed by Pete Wells and Jack Palesant in 1992. At the prospect is a dozer cut 120 feet long, 40 feet wide, and 50 feet deep. It is connected to the unmaintained Meadow Creek road by a dozer trail. It was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC-23), chipped across the bed during the USBM visit, had 330 ppb gold and 1.35 percent copper.
594	DAIRY LAKE PROSPECT	44 36 56 N	113 35 22 W	A zone of brecciated quartzite is cemented by quartz and limonite (Cather and Rains, 1988, p. 43).	The prospect, also called Blue Jay Extension 181, is at the summit of the divide between Dairy and Big Eightmile Creeks about 0.5 miles southeast of Dairy Lake. Examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area, Cather and Rains (1988, p. 43) reported that there was a caved prospect pit.	One sample taken during the USBM examination (Cather and Rains, 1988, p. 43) had 0.01 ounce gold per ton and minor silver.
595	BLUE JAY MINE	44 36 42 N	113 33 26 W	At the Blue Jay mine, the Mulkey adit follows an irregular quartz vein that contains a shoot of molybdenite and scheelite (Livingston, 1919, p. 41). About 400 feet to the northwest of the adit is a circular exposure of granodiorite and quartz monzonite. Quartz, malachite, and azurite fill fractures, and	The Blue Jay mine area is on the southeast side of Big Eightmile Creek about 1 mile northwest of Devils Lake. The mine was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988). Livingston (1919, p. 40) reported that the Blue	Eleven samples were taken during the USBM visit (Cather and Rains, 1988, p. 40). A sample of quartz vein material from the the dump of the caved Mulkey adit had 0.32 percent molybdenum. Ten samples from the intrusive rock had as much as 0.38 percent copper and 0.32 percent molybdenum.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				chalcopyrite, molybdenite, and pyrite are in quartz veinlets and disseminations in the intrusive rock. Several alteration assemblages occur in the mine area; argillic alteration occurs locally, especially near shear zones, phyllic alteration is associated with a small area of molybdenite mineralization, and potassic alteration is pervasive (Cather and Rains, 1988, p. 40).	Jay was described in the mining literature in 1910. In the early days, the mine consisted of the south-trending Mulkey adit, 300 feet long with a winze 20 feet deep, and an aerial tram to a mill on Eightmile Creek. Bell (1920, p. 64) reported that a 50-ton per day pilot mill was under construction in 1920. The mill was designed to concentrate sulphides. In 1922, Bell (1921, p. 76) reported that the New Departure Copper Mining Company was operating a 3,000-foot-long tram and 100-ton per day, steam-driven copper leaching plant. Cather and Rains (1988, p. 40) reported that in addition to the adit there is a dozer excavation 500 feet wide and 800 feet long. Exploratory drilling was done during the 1980's. Between 1948 and 1950, over 10,000 pounds of copper were recovered from 56 tons of ore. In 1988, the mine area was covered by 183 claims.	
596	SILVER QUEEN PROSPECT	44 35 46 N	113 33 03 W	Mineralized fracture zones are associated with the southeastern contact between quartzite and the Big Eightmile granitic stock (Cather and Rains, 1988, p. 43). The fractures are filled by limonite and 0.1-foot-thick quartz veinlets. Argillic alteration is intense near the veinlets. The zones strike N 10 E and dip 45 NW.	The Silver Queen prospect is near the divide between Devils Canyon and Big Eightmile Creek. The prospect was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains (1988, p. 43). At the prospect are a decline about 20 feet deep, a caved adit about 50 feet long, and four dozer cuts. In 1988, the prospect was covered by 83 mining claims.	Three samples were taken during the USBM examination (Cather and Rains, 1988, p. 43). Two chip samples, 1.0 and 1.3 feet long, were taken across veinlets and altered intrusive rock. They assayed as much as 0.03 ounce gold per ton, 1.05 ounce silver per ton, and 0.5 percent lead. The third, a select sample of brecciated and limonitic quartz, had 0.002 ounce gold per ton and 4.61 ounce silver per ton.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
597	RAY MINE	44 35 19 N	113 33 42 W	A poorly exposed quartz vein, trending N 45 W and dipping steeply southwest, appears to be as much as 0.7 feet thick at the Ray mine. The limonite- and hematite-bearing vein occurs in a zone of sheared and brecciated quartzite of the Gunsight Formation (Cather and Rains, 1988, p. 44; Rupple and Lopez, 1988, p. 111).	On the east wall of Big Eightmile Creek about 1.3 miles southwest of Devils Lake are three short east-trending adits and a shallow vertical shaft. These workings probably total less than 200 feet. The Ray claim, covering 20.7 acres, is patented (MS 1779). The mine was examined by the USBM in conjunction with the mineral investigation of the Lemhi Range study area (Cather and Rains, 1988). During 1923, 1932, and 1936, the mine produced 58 tons of ore, that yielded 150 ounces of gold, 294 ounces of silver, and 50 pounds of lead (Cather and Rains, 1988, p. 44; Rupple and Lopez, 1988, p. 111).	Five samples were taken during the USBM investigation (Cather and Rains, 1988, p. 43). They contained as much as 1.9 ounce silver per ton and 2.24 ounce gold per ton.
598	YELLOW PEAK PROSPECT	44 32 13 N	113 30 54 W	Quartzite, near a granitic stock, is transected by small veins. The veins are composed of vuggy quartz with limonite (Cather and Rains, 1988, p. 44).	Also called the Beck Canyon prospect, workings at the Yellow Peak are at the summit of the divide between Rocky and Park Fork Big Creek. Workings, consisting of two prospect pits, were examined by the USBM in conjunction with the mineral resource investigation of the Lemhi Range study area (Cather and Rains, 1988, p. 44).	Two samples, taken during the USBM examination (Cather and Rains, 1988, p. 44), had as much as 0.5 ounce silver per ton.
599	IRON FLUX PROSPECT	44 33 43 N	113 21 33 W	Two zones of friable limonite and minor jasperoid, each about 1 foot thick, strike of N 8-25 E and dip 23-35 SE in dark gray dolomite. Along the zones are silver-, lead-, copper-, and zinc-bearing minerals (Cather and Rains, 1988, p. 46).	The Iron Flux prospect is about 0.6 miles west of Cold Spring. Workings at the prospect consist of two prospect pits, five trenches, and two adits 20 and 130 feet long. The prospect was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988).	Five samples were taken during the USBM examination (Cather and Rains, 1988, p. 46). They assayed as much as 0.31 ounce silver per ton, 1.50 percent lead, 0.50 percent copper, and 0.11 percent zinc.

Appendix B. – Summary descriptions of mines and prospects in the Salmon National Forest, Idaho

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
600	BORROW PIT	44 33 24 N	113 21 09 W	Alluvium, consisting of semi-rounded, poorly-sorted fan material, was excavated. The coarse material is mainly quartzite with a little limestone and etasedimentary rock mixed in.	A borrow pit, about 10 feet deep, is 1/5 mile north of Purcell Spring. Material was removed with a front-end loader to fill the muddy spots in the nearby forest road USFS 212.	The deposit contains significant amounts of material similar to that excavated.
601	JASPER JOE PROSPECT	44 33 31 N	113 20 41 W	A jasper- and limonite-bearing bed, as thick as 3 feet thick and as long as 500 feet, occurs in calcareous shale striking N 20 W and dipping 60 NE.	The Jasper Joe prospect is about 0.4 mile south of Cold Spring. The prospect was covered by the Jasper Joe 1 through 3 claims in 1989. Workings consist of four prospect pits scattered for about 500 feet along a northwest trend. A small amount of jasper was probably produced for sale to rockhounds and lapidaries. The prospect was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A chip sample (SFC 50), taken across the bed during the USBM visit, had no significant metal content. Lapidary quality jasper is present.
602	LARKSPUR PROSPECT	44 32 23 N	113 21 36 W	A fracture zone in dolomite is exposed for 120 feet along strike. The zone is as thick as 7 feet, strikes N 80 W, dips steeply, and contains jasperoid, galena, and zinc minerals (Cather and Rains, 1988, p. 46).	The Larkspur prospect is on a small east-flowing tributary of Nez Perce Creek about 1.7 miles south of Cold Springs. The workings consist of a prospect pit and two adits 22 and 50 feet long. They were examined by the USBM during the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988).	Five samples, taken during the USBM examination (Cather and Rains, 1988, p. 46), contained as much as 0.006 ounce gold per ton and 0.58 ounce silver per ton.
603	NEZ PERCE CREEK PROSPECT	44 32 15 N	113 21 20 W	The sheared contact zone between an altered biotite porphyry dike and dolomite contains limonite (Cather and Rains, 1988, p. 46). The zone is about 0.5 feet thick, is exposed along strike for 95 feet, strikes N 35-80 W, and dips 55-80 SW.	The Nez Perce prospect is on a small east flowing tributary of Nez Perce Creek. There is a single adit 95 feet long. It was examined by the USBM in conjunction with the mineral investigation of the Lemhi Range study area (Cather and Rains, 1988).	Four samples were taken during the USBM examination (Cather and Rains, 1988, p. 46). One assayed 0.06 ounce silver per ton.
604	DRY CANYON PHOSPHATE	44 36 22 N	113 08 30 W	Phosphate resources occur within the Retort Shale Member of the	The Dry Canyon phosphate area is a southerly extension of the Hawley	Oberlindacher and Hovland (1979) reported that in the Dry

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
	AREA			Phosphoria Formation Oberlindacher and Hoveland, 1979, p. 1).	Creek phosphate area. The deposit crosses the ridge between Park and Dry Canyons about 2 miles northeast of their junction. The workings consist of a few prospect pits and trenches (Oberlindarcher and Hoveland, 1979, PL. 1).	Creek drainage, the Retort Phosphatic Shale Member averages 70 feet thick to a depth of 600 feet. Resources are at least 18.15 million tons grading 24-31 percent P2O5 and 70.16 million tons grading 16-25 percent P2O5.
605	SUNSHINE PROSPECT	44 29 52 N	113 28 17 W	Limonite, magnetite, serpentine, and malachite occur in a metasomatic zone at the contact between dolomite and porphyritic felsite (Cather and Rains, 1988, p. 44).	The Sunshine prospect is about 1,000 feet northwest of Big Timber Creek and about 0.5 mile northeast of the its junction with Cabin Creek. There are three trenches, a prospect pit, and three caved adits. Each adit is probably less than 100 feet long. They were examined by the USBM in conjunction with an investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 44).	Five samples were taken during the USBM examination (Cather and Rains, 1988, p. 44). They assayed as much as 0.05 ounce gold per ton and 7.6 ounce silver per ton.
606	GROOMS DEMOCRAT MINE	44 29 22 N	113 18 08 W	Prinz (1958b, p. 1) reported that the area is underlain by quartzite and limestone intruded by quartz monzonite and quartz diorite porphyry. A limonite-stained, pyrolusite-, and quartz-bearing gouge zone is in the quartz monzonite. The zone is 20 inches wide, strikes N 37 W, and dips vertically. Nearby limestone contains epidote. Skarn material on the dumps contains hematite, quartz, malachite, chalcocite, and cerrusite. Galena and sphalerite probably are at depth.	The mine is on the south side of Sourdough Gulch near its mouth. The names Highs mine, Athaleen, Highes, and Snowshoe have been applied to the area over the years. The Idaho mine inspecter (Bell, 1912, p. 128) reported that in 1912, a carload of silver-lead ore was shipped from the Highes mine. In 1958, a Defense Minerals Exploration Administration examination was made (Prinz, 1958b). In a 50-acre area are four caved adits and shafts with over 500 feet of workings, at least 10 pits and trenches, and a cabin. The prospect was visited by the USBM in conjunction with the mineral resource investigation of the	Three samples, taken by Prinz in 1958, had as much as 0.02 ounce gold per ton, 0.4 ounce silver per ton, trace lead, and 0.022 percent U3O8. A sample (SFC-17) of skarn, taken during the USBM visit, assayed 0.019 ounce gold per ton, 7 ounce silver per ton, 1.1 percent zinc, 0.51 percent copper, and more than 1 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Salmon National Forest.	
607	DEMOCRAT MINE	44 29 07 N	113 18 41 W	The Democrat mine, started in 1963, was developed in order to explore a group of lead-silver replacement veins east of the Hilltop mine and the Hilltop vein at depth. From an elevation of about 7,600 feet, the adit was driven 3,000 feet on a bearing of S 50 W. High-grade lead-silver-gold ore was intersected about 300 feet below the lowest level of the Hilltop mine during 1978. Additional workings from the adit, drifts, stopes, a raise to the Hilltop 500-level, a shallow winze, and drill holes explore and develop the main ore zone. In all, nine northwest-trending veins were identified. Primary ore consists of rgentiferous galena, sphalerite, and very minor pyrite and chalcopyrite. Secondary ore minerals, also abundant at the deeper levels explored by the Democrat, include cerussite, anglesite, smithsonite, and malachite (Ruppel and Lopez, 1988, p. 105-106).	There are at least 3,500 feet of workings at the Democrat. The mine has produced about 2,100 tons of direct shipping ore that contained about 13.2 percent lead, 0.14 ounce gold per ton, and 15-22 ounce silver per ton. Most of the ore was mined during 1979-1981 from stopes above the adit level (Ruppel and Lopez, 1988, p. 105).	A sample (SFC-18) of stockpiled ore, taken during a 1994 USBM visit, contained 0.047 ounce gold per ton, 8.75 ouncesilver per ton, 2 percent zinc, 1560 ppm arsenic, 4350 ppm antimony, 5533 ppm copper, and more than 1 percent lead. Three samples (SFC 92-94) taken from underground exposures of the mineralized structure by USBM personnel during 1995 had as much as 35.91 ounce silver per ton, 62.1 percent lead, 4.86 percent zinc, 2.45 ppm (0.07 ounce per ton) gold, and 0.79 percent antimony. Resources of at least 100,000 tons grading 7 ounce silver per ton and 10 percent lead have been reported (Nisbet, Formation Capital Corp., personal communication, 5/13/95).
608	HILLTOP MINE	44 28 49 N	113 19 10 W	According to Ruppel and Lopez (1988, p. 106), the principal lead-silver-gold vein at the Hilltop trends northwest and dips steeply southwest in dolomite. Locally, the vein bulges out to form replacement deposits along the bedding. Both the vein and replacements are in the steeply overturned west limb of a syncline in the lower part of the Jefferson Formation. The	The surface exposure of the Hilltop vein was discovered in the 1880's and some ore was shipped to the Nicholia smelter. Small shipments of ore were also made during 1901, 1918, and 1921. Major evelopment of the orebodies began about 1942 and by 1955, the shaft had reached a depth of 510 feet and drifts and crosscuts from the shaft totalled 3,300 feet. After being idle for several years, several small	During 1986, USBM personnel mapped and sampled many of the workings at the Hilltop. The work was done as part of a study of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988). Twenty-two samples were taken from both surface and underground workings. They assayed as much as 0.17 ounce gold per ton, 56.8 ounce silver per ton, 39.9 percent

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				typical primary ore consisted of argentiferous galena, sphalerite, and very minor pyrite and chalcopyrite in a gangue of jasperoidal hematite and white quartz. Secondary ore minerals included cerussite, anglesite, smithsonite, and malachite in a gangue of earthy limonite and manganese oxide.	shipments were made during 1961 and 1962. The mine has produced about 9,000 tons averaging 15 percent lead, 13.8 ounce silver per ton, 0.2 ounce gold per ton, 0.3 percent copper, and 0.9 percent zinc (Ruppel and Lopez, 1988, p. 105). In addition to the main shaft, there are numerous other workings including adits, trenches, shafts, and open cuts; many are now caved.	lead, 11.5 percent zinc, and 0.97 percent copper (Cather and Rains, 1988, p. 34-35).
609	DEER CREEK LOWER PROSPECT	44 28 47 N	113 19 53 W	A quartz fissure vein, containing secondary lead minerals and limonite, occurs along a fracture zone in quartzite (Cather and Rains, 1988, p. 46).	The Deer Creek Lower prospect is on the southeast side of Deer Creek about 0.7 mile west of the Hilltop mine. The workings consist of a caved adit about 150 feet long. It was examined by the USBM during the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 46).	A sample of quartz, taken from the dump during the USBM examination (Cather and Rains, 1988, p. 46), assayed 9.48 ounce silver per ton and 2.56 percent lead.
610	BROWN BULL MINE	44 28 20 N	113 19 39 W	According to Rupple and Lopez (1988, p. 107), the mine explores two quartz veins that trend east and dip 60-80 N in granitic rock near quartzite. The veins, 1 to 6 inches thick, are heavily limonite- and manganese-stained and are enclosed in fractured and hydrothermally altered granodiorite. The veins probably contain shoots of galena and cerussite (Cather and Rains, 1988, p. 36).	The Brown Bull mine, located on the divide between Deer Creek and the middle branch of Texas Gulch, was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988). Cather and Rains (1988, p. 36) reported that the mine was prospected in the 1880's; production, not recorded until 1912, continued intermittently until 1949. Between 1916 and 1949, the mine yielded 180 tons of ore that contained minor gold, 14,800 ounces of silver, 3,570 pounds of copper, and 115,000 pounds of lead. Workings,	Eleven samples were taken during the USBM examination (Cather and Rains, 1988, p. 37). They assayed as much as 0.122 ounce gold per ton, 9.33 ounce silver per ton, 6.25 percent lead, 8.86 percent zinc, and 0.42 percent copper.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					including a shaft, two open and five caved adits, about 20 trenches and pits, and connecting roads and trails, have been excavated over a 2,000-foot-long, 1,000-foot-wide area. The longest adit, now caved, was 575 feet long. The open adits are 105 and 70 feet long. In 1986, the mine was covered by three mining claims.	
611	DEER CREEK MIDDLE PROSPECT	44 28 06 N	113 20 08 W	Vein quartz banded with limonite and dolomite occurs along a shear zone in granodiorite. The zone trends N 75 E and dips 60 SE. (Cather and Rains, 1988, p. 46).	The Deer Creek middle prospect is on the east side of Deer Creek about 0.5 mile southwest of the Brown Bull mine. At the prospect are two caved adits estimated to be 500 and 50 feet long. They were examined by the USBM during the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 46).	Two samples, taken during the USBM examination (Cather and Rains, 1988, p. 46), had no significant metal content.
612	DEER CREEK UPPER PROSPECT	44 27 50 N	113 20 16 W	Brecciated vein quartz containing secondary lead minerals occurs in altered granitic rock. Workings are alligned along a N 45 W trend (Cather and Rains, 1988, p. 47).	The Deer Creek upper prospect is on the east side of Deer Creek about 1.7 miles north of Portland Mountain. Workings consist of three caved pits examined by the USBM during the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 47).	A sample of quartz, taken during the USBM examination (Cather and Rains, 1988, p. 47), assayed 1.22 ounce silver per ton. Minor amounts of lead and zinc were also detected.
613	PORTLAND MINE	44 27 55 N	113 19 40 W	Rupple and Lopez (1988, p. 107) reported the Portland mine to be along the irregular contact between granodiorite and quartzite near a northwest-trending fault zone. No mineralized structure is exposed. Material on dumps probably came from shear zones containing quartz, gouge, limonite, manganese oxides, malachite, azurite, and barite.	The Portland mine is on the divide between Deer Creek and Texas Gulch. The mine was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 36). Three mining claims of the Portland Group (MS 2904--Portland 1, 2, and 3), covering 58.44 acres, were patented by W.S.	Two samples of material from dumps, were taken during a USBM examination (Cather and Rains, 1988, p. 40). The samples contained as much as 52.10 ounce silver per ton, 1.54 percent copper, and 5.57 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					Shaw and others in 1920. In 1994, the area also included seven unpatented claims held by Leigh H. Pratt. Bell (1911, P. 84) reported the production of a single carload of 50 tons or less, in 1910, that contained 40 percent lead and 200 ounces silver per ton. In a 4,000-foot-long, 2,000-foot-wide area are at least three underground orkings, five pits and trenches, and connecting roads and trails. The principal working, an adit reported to be 2,000 feet long (Campbell, 1932, p. 173), is caved at the portal.	
614	RIDGEWAY MINE	44 28 04 N	113 18 41 W	No mineralized structure is exposed. The workings apparently developed replacement deposits in limestone. Replacement material on dumps is mainly hematite, calcite, and quartz containing cerrusite, galena, chalcopyrite, and pyrite.	The Ridgeway mine is on the divide between the middle and east branches of Texas Gulch. For about 1,500 feet above and below a northerly trending limestone cliff, there are at least three caved adits, 10 pits and trenches, and connecting jeep trails. The underground workings probably total at least 1,000 feet. USBM records list the production of significant amounts of lead and silver and lesser amounts of copper and gold in 1921 and 1922.	A sample (SFC-19) of replacement material, taken during a 1994 USBM visit, contained 0.12 ounce gold per ton, more than 3 percent zinc, 0.81 percent arsenic, 0.14 percent antimony, and more than 1 percent lead.
615	MOUNTAIN BOY MINE	44 27 25 N	113 18 47 W	According to Rupple and Lopez (1988, p. 108), the mine develops two replacement veins in dolomite of the Saturday Mountain Formation. One vein trends north and dips 65 west; the other trends east and dips 60 south. Shoot mined were composed mainly of cerussite, anglesite, smithsonite, hemimorphite, and sparce galena in a gangue of limonite and manganese	Rupple and Lopez (1988, p. 108) reported that the Mountain Boy mine opened between 1905 and 1910 and was developed extensively between 1910 and 1916. The main adit trends southwest at least 1,000 feet to interconnect with an adit and dozer pit on the ridge 300 feet above. The underground workings total about 2,500 feet. There also are at	A sample (SFC-20) of replacement material, taken during a 1994 USBM visit, had 0.19 ounce gold per ton, 2.1 ounce silver per ton, 0.87 percent zinc, 1543 ppm copper, and more than 1 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				oxides. On the dump is a gossany replacement material composed of hematite, quartz, and calcite containing galena, chalcopyrite, and pyrite which indicates the sulfide-bearing zone was reached.	least 20 smaller workings, a cabin, dismantled shop, and connecting dozer and jeep roads. Near the portal of the main adit is the remains of a small gravity mill and Wilfley table. In 1995, the Mountain Boy workings were covered by seven unpatented mining claims held by Clements Zook. Most production came between 1916 and 1918. This ore graded 24 percent lead, 6.5 ounce silver per ton, and 0.1 ounce gold per ton.	
616	LATEST OUT MINE	44 27 28 N	113 17 32 W	The lead-silver replacement veins and ore bodies in the Latest Out mine trend N 10-15 W and dip from 40 W to nearly vertically in dolomite of the Jefferson Formation. Nine veins were encountered and three major ore bodies were developed. The ore consisted almost entirely of cerussite, and lesser amounts of anglesite, smithsonite, hemimorphite, and cerargyrite, in a gangue of earthy hematite, limonite, and manganese oxides. Only small amounts of primary sulfide minerals were present, chiefly small fragments of galena rimmed with anglesite. Two of the ore bodies were as thick as 40 feet (Ruppel and Lopez, 1988, p., 104).	The Latest Out vein was discovered in 1880 and soon was developed by two inclined shafts with drifts. By 1889, 1,200-1,500 tons had been shipped to the Nicholia smelter. By 1911, a haulage adit had been driven, the mine had been deepened to 410 feet, and three levels had been developed from an inclined winze. By 1917, a new inclined shaft with levels to the 700 foot level had been constructed. The mine finally included eight major levels and four sublevels. Production was probably about 90,000 tons (Ruppel and Lopez, 1988, p. 104).	Representative ore from the 200-level and above contained 35 percent lead, 7 percent zinc, 16 ounce silver per ton, and 0.025 ounce gold per ton. With increasing depth, the lead, zinc and silver content of the ore appears to decrease; however, the copper and gold content appears to increase (Ruppel and Lopez, 1988, p. 104).
617	MURPHY MINE	44 27 13 N	113 18 25 W	The Murphy mine is at the base of a nearly vertical dolomite cliff. Bedding in the dolomite strikes north and dips 40 E. According to Rupple and Lopez (1988, p. 108), the lead-silver replacement deposit	At the Murphy mine are two caved adits 30 feet apart, at least six prospects pits, a cabin, and a jeep trail. The mine is on the northwest side of Meadow Lake Creek about 1.5 miles north of Meadow Lake. It	A sample (SFC-13) was taken of replacement material during a 1994 USBM examination. The sample contained 180 ppb gold, 2.9 ounce silver per ton, moe than 3 percent zinc, 2516 ppm

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				consists of vein fillings and bedding replacements that contain cerussite, sparce galena, and pyrite in well-formed crystals in an oxidized, siliceous gangue of earthy limonite, manganese oxides, quartz, jasperoidal and chalcedonic silica, and barite.	was visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest. According to USBM production records, small amounts of gold and copper and significant amounts of silver and lead were produced during 1912, 1938, and 1948.	copper, and more than 1 percent lead.
618	CARRIE CODY PROSPECT	44 26 54 N	113 18 48 W	No mineralized structure is exposed. According to Rupple and Lopez (1988, p. 108), the mine probably explores a northwest to nearly east trending, nearly vertical, lead-silver replacement deposit in dolomite of the Saturday Mountain Formation. The deposit consists of vein fillings and bedding replacements that contain cerussite, sparse galena, and pyrite in well-formed crystals, in an oxidized, siliceous gangue of earthy limonite, manganese oxides, quartz, jasperoidal and chalcedonic silica, and barite.	The Carrie is on the northwest side of Meadow Lake Creek about 1 mile north of Meadow Lake. For about 500 feet along a N 45 E trend are two caved adits, a decline, and a connecting dozer road. The workings probably total about 300 feet. They were visited by the USBM in conjunction with the mineral investigation of the Salmon National Forest.	A sample (SFC-14) of limestone, quartz, and gossan, taken during a 1994 USBM visit, had as much as 0.066 ounce gold per ton, 3 percent zinc, 0.17 percent opper, and more than 1 percent lead.
619	MEADOW LAKE MINE	44 26 50 N	113 18 05 W	Several N 20 W trending, 45-70 E dipping fracture zones in dolomite occur at the mine. The zones are as thick as 25 feet and contain isolated shoots of cerussite and galena with pyrite, limonite, manganese oxide, quartz, jasperoid, and barite (Rupple and Lopez, 1988, p. 108).	One 300-foot-long adit with a 50-foot-high raise is located on the south side of Meadow Lake Creek. Lead-silver ore worth $6,000 to $7,000 was shipped to the Nicholia smelter (Rupple and Lopez, 1988, p. 108). USBM records list the production of significant amounts of silver, copper, and zinc in 1948.	No data available.
620	ORION PROSPECT	44 26 59 N	113 16 59 W	Poorly exposed limestone and dolomite are fractured and contain minor limonite and barite (Cather and Rains, 1988, p. 47).	In the 200-acre Orion prospect area are seven adits, two shafts, and several prospect pits. The underground workings, most caved, are estimated to total about 600 feet. The site was examined by the USBM in conjunction with the	Ten samples were taken during the USBM examination (Cather and Rains, 1988, p. 47). They had as much as 0.28 ounce silver per ton along with small amounts of lead and zinc. Another sample (SFC 95) was taken from a shaft

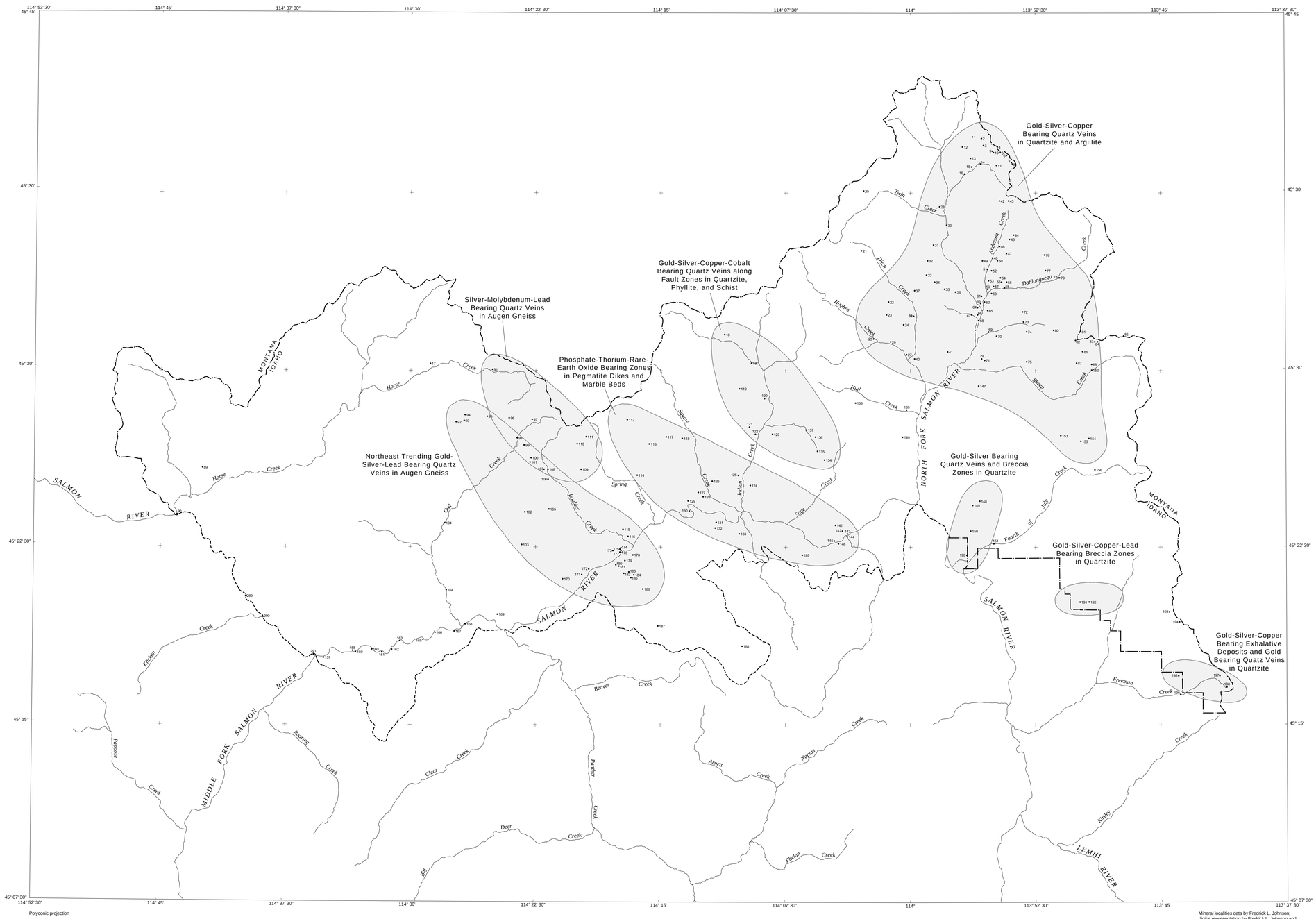
Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 47).	dump by the USBM during 1995. It assayed 0.502 ppm gold, 230 ppm (6.7 ounce per ton) silver, and 0.18 percent zinc.
621	FOURTH TERM PROSPECT	44 26 40 N	113 17 08 W	Several fracture zones transect dolomitic limestone; others occur along the gougy contact between a granitic dike and the dolomitic limestone. Galena, secondary lead and zinc minerals, limonite, barite, and managanese oxide occur along the sheared margins of the dike (Cather and Rains, 1988, p. 47).	The workings at the Fourth Term prospect consist of eight adits and a prospect pit. Four adits are caved; four open adits total 500 feet. The workings are on the southeast side of Liberty Gulch about 0.7 mile from the mouth. The site was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 47).	During the USBM examination, 23 samples were taken (Cather and Rains, 1988, p. 47). A sample from a 200 pound stockpile assayed 22.20 ounce silver per ton and 55.10 percent lead.
622	BUCKHORN PROSPECT	44 26 35 N	113 17 35 W	Several small limonitic shear zones transect dolomite. The zones commonly are along shale interbeds (Cather and Rains, 1988, p. 47).	Workings at the Buckhorn prospect consist of three partially inaccessible underground workings and a prospect pit. The underground workings are estimated to total about 300 feet. The prospect is on the northwest side of Liberty Gulch about 1 mile from the mouth. The site was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 47).	Eleven samples were taken during the USBM examination (Cather and Rains, 1988, p. 47). They contained as much as 0.012 ounce gold per ton and 0.61 ounce silver per ton.
623	AG 522 PROSPECT	44 26 10 N	113 17 15 W	No mineralized structure is exposed. Vuggy, fine-grained quartz, representative of a vein up to 0.7 feet thick, contains limonite, goethite, and galena with secondary lead, zinc, and copper minerals (Cather and Rains, 1988, p. 48).	Also named the Skyline, workings at the AG 522 prospect consist of a short caved adit and prospect pit. They were examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 48). The prospect is on the	Two samples of vein material were taken during the USBM examination (Cather and Rains, 1988, p. 48). They assayed as much as 21.30 ounces silver per ton, 6.48 percent lead, and 2.12 percent zinc.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
					divide between Liberty Gulch and the north branch of Silver Moon Gulch.	
624	MOHAWK MINE	44 26 04 N	113 15 49 W	Rupple and Lopez (1988, p. 106) reported the mine to be on four parallel veins trending north and dipping 65-75 west. The replacement veins parallel bedding in dolomite and limestone. Nearby is the Gilmore granitic stock. Most of the ore came from one or two shoots principally cerargyrite along with lesser amounts of cerussite, smithsonite, hemimorphite. Some galena, limonite, managanese oxide, gouge, and barite were also present. A vein examined by the USBM, in conjunction with the investigation of the Lemhi Range study area (Cather and Rains, 1988, p. 13), averaged 2.3 feet thick, and was exposed for about 230 feet along strike and for 60 feet down dip.	The Mokawk mine is near the mouth of Silver Moon Gulch. The Silver Moon claim, located in 1881 and restaked as the Mohawk in 1881, was one of the first mines in the Texas district. By 1900, the Mohawk had produced 80,000 ounces of silver from ore shipped to the Nicholia smelter (Umpleby, 1913, p. 108). The Calumet Group (MS 1932) of mining claims, overlying the Mohawk, was patented in 1904 by W.W. Chisholm. The claim group, consisting of the Calumet, Hecla, and Isabel claims, covers 61.859 acres. In 1994, the surrounding area was covered by 14 unpatented mining claims. USBM records show production of significant amounts of copper and lead between 1890 and 1940 in addition to silver. The ore was produced from shallow underground and surface workings covering an area 600 feet long and 200 feet wide (Cather and Rains, 1988, p. 13). Numerous adits, shafts, pits, and trenches, along with connecting roads and trails, are scattered around Silver Moon Gulch.	Sixteen samples were taken during the USBM examination. They contained as much as 20.7 ounce silver per ton, 1.51 percent lead, and 1.86 percent zinc. Resources in one zone are estimated to be about 2,000 tons averaging 7.8 ounce silver per ton (Cather and Rains, 1988, p. 13 and 28).
625	GRACE PHELAN MINE	44 25 57 N	113 15 39 W	A fracture-controlled silver-bearing zone exposed in the Grace Phelan shaft averages 10 feet thick, is 70 feet long, and 113 feet deep. The zone strikes north to northeast, dips vertically, and contains secondary	The Grace Phelan mine is on the south side of Silver Moon Gulch near its mouth. The mine was examined by the USBM in conjunction with the investigation of the minerals resources of the	Sixteen samples were taken during the USBM examination (Cather and Rains, 1988, p 28). The silver-bearing zone exposed at the Grace Phelan shaft contains at least 9,000 tons

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				lead and zinc minerals, cerargyrite, manganese oxide, limonite, jasperoid, and barite. Southwest of the shaft is a concordant eplacement zone in dolomite striking north and dipping 47 east (Cather and Rains, 1988, p. 32). This zone averages 3.2 feet thick and is exposed for about 100 feet.	Lemhi Range study area (Cather and Rains, 1988). The Grace Phelan claim was located in 1885. After 1935, most of the production from Silver Moon Gulch came from the Grace Phelan and adjacent Showbird claims. Between 1936 and 1940, 478 tons of ore were shipped that yielded 56,000 ounces of silver, about 67,000 pounds of lead, and minor amounts of zinc and copper. The Grace Phelan shaft was 113 feet deep and contained three levels. The nearby Snowbird shaft is caved (Cather and Rains, 1988, p. 26).	averaging 3.5 ounce silver per ton. A nearby replacement zone contains about 1,000 tons averaging 4.7 ounce silver per ton. Both mineralized zones appear to extend beyond the area sampled (Cather and Rains, 1988, p. 18). A sample (SFC-12) of gossany dump material taken during a 1994 USBM examination contained 6.4 ounce silver per ton, 0.79 percent zinc, and more than 1 percent lead.
626	AG 261 PROSPECT	44 25 25 N	113 15 26 W	Several north-trending, steeply dipping fracture zones occur near the top of the Jefferson Formation in dolomite, limestone, and calcareous siltstone. The zones contain limonite-calcite veinlets, barite, jasperoid, and manganese oxides (Cather and Rains, 1988, p. 48).	Workings at the Ag 261 prospect, on the divide between Silver Moon Gulch and Long Canyon, consist of four prospect pits and two caved adits estimated to total 150 feet in length. The site was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 48).	Five samples were taken during the USBM examination (Cather and Rains, 1988, p. 48). They contained as much as 5.25 ounce silver per ton. Small amounts of lead and zinc were also detected.
627	AG 416 PROSPECT	44 25 42 N	113 16 23 W	Shear zones that transect dolomite, limestone, and shale are within 1,000 feet of a felsite dike. The shears contain limonitic gouge (Cather and Rains, 1988, p. 48).	The Ag 416 prospect is on the north side of Silver Moon Gulch about 0.7 mile above the mouth of the gulch. A 700-foot-long adit was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 48).	Ten samples were taken during the USBM examination (Cather and Rains, 1988, p. 48). None assayed more than 0.07 ounce silver per ton.
628	AG 417 PROSPECT	44 25 47 N	113 16 33 W	Siliceous dolomite, along with limonite and manganese oxides, occurs in a 0.9-foot-thick shear zone	A caved adit at the Ag 417 prospect was found on the north side of Silver Moon Gulch. The adit,	Three samples, taken during the USBM investigation (Cather and Rains, 1988, p. 48), had no

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				striking N 10 W and dipping vertically in dolomite (Cather and Rains, 1988, p. 48).	estimated to be less than 100 feet long, was examined by the USBM in conjunction with the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 48).	significant metal content.
629	AG 419 PROSPECT	44 25 41 N	113 16 44 W	No mineralized structure is exposed. A zone of jasperoid is near a fault in dolomite (Cather and Rains, 1988, p. 48).	A caved adit at the Ag 419 rospect, estimated to be less than 100 feet long, is in the headwaters of Silver Moon Gulch. It was examined by the USBM during the investigation of the mineral resources of the Lemhi Range study area (Cather and Rains, 1988, p. 48).	A sample, taken during the USBM examination (Cather and Rains, 1988, p. 48), had no significant metal content.
630	AG 315 PROSPECT	44 25 19 N	113 16 33 W	A system of fracture zones trending north to northwest in dolomite and limestone contain small amounts of limonite. One zone is associated with an altered dike (Cather and Rains, 1988, p. 48).	The Ag 315 prospect is on the divide between Silver Moon Gulch and Long Canyon. Workings consist of three prospect pits (Cather and Rains, 1988, p. 48).	Three samples were taken at the prospect during the USBM study of the Lemhi Range study area. They assayed as much as 0.08 ounce silver per ton (Cather and Rains, 1988, p. 48).
631	LONG CANYON PROSPECT	44 25 01 N	113 16 47 W	No mineralized structure is exposed. On the dump of a N 10 W trending caved adit are dolomite and fragments of siliceous limonite as thick as 1 foot (Cather and Rains, 1988, p. 49).	The caved adit, located on the north side of Long Canyon and estimated to be about 100 feet long, was examined by the USBM in conjunction with the investigation of the mineral resources ofthe Lemhi Range study area (Cather and Rains, 1988, p. 49).	No significant metal content was contained in the sample taken during the USBM examination (Cather and Rains, 1988, p. 49).
632	LEMHI UNION MINE	44 23 30 N	113 15 16 W	According to Rupple and Lopez (1988, p. 109), the Lemhi Union mine developed a lead-silver replacement deposit in dolominte of the Saturday Mountain Formation. The replacement veins trend N 0-25 E, dip 40-80 W, and typically are 1 to 6 inches thick but locally are as thick as 5 feet. They contain cerussite, anglesite, smithsonite, hemimorphite, and	Rupple and Lopez (1988, p. 109) reported that the mine was opened through a vertical shaft in the 1880's and about $100,000 worth of ore was shipped to the Nicholia smelter. By 1909, the shaft was deepened to 150 feet and several carloads of ore were shipped to the Hahn smelter. In the 1920's, a west-trending adit was driven 1,800 feet to access the shaft at	A 57-ton lot of ore, sent to the Hahn smelter, contained 39 percent lead and 12 ounces silver per ton (Umpleby, 1913, p. 88). A sample (SFC-15) of skarn material, taken from the dump of the shaft during a 1994 USBM visit, contained 100 ppb gold, 3.2 ounce silver per ton, 2.18 percent zinc, and more than 1 percent lead.

Map No.	Name	Lat.	Long.	Geology	Development	Sampling , Resources
				possibly cerargyrite with iron and manganese oxides.	depth. The underground workings total at least 2,600 feet (Campbell, 1924, p. 136). The shaft and adit, now caved, are in a group of workings including at least 10 pits and trenches that trend northerly. Rupple and Lopez (1988, p. 109) reported that between 1906 and 1951, no more than 150-200 tons grading 23-39 percent lead and 7-20 ounce silver per ton were produced. USBM records list production of much larger amounts of silver, lead, copper, zinc, and gold.	
633	COLORADO PROSPECT	44 23 14 N	113 16 04 W	A vein, which is eclosed in limestone, strikes north and dips 45 west. The vein contains argentiferous galena, manganese oxide, pyrite, and chalcopyrite in quartz. A quartz diorite dikes transects the vein (Umpleby, 1913, p. 88). The limestone is metamorphosed for 1,000 to 2,000 feet on either side of the dike.	The Colorado prospect is near the headwaters of Lemhi Union Gulch. Workings consist of a caved adit, 500 feet long, that is 300 feet below and 400 feet north of a dozer pit covering a 300-foot-wide, 300-foot-long area. To the south are at least 10 pits and trenches and connecting dozer roads.	A sample (SFC-16) taken of replacement material during a 1994 USBM visit contained more than 1 percent lead, more than 3 percent zinc. and 559 ppm copper.



Polyconic projection

Explanation

- Mine or prospect
- Salmon National Forest boundary
- Ranger District boundary
- Areas containing significant mineralization

List of Mineral Localities

1	Kopr Kyute Mine	100	Unnamed
2	Erickson Prospect	101	Unnamed
3	Chief Joseph	102	Miller's Mine
4	Taley Prospect	103	Nabob Mine
5	Prospect (Am2)	104	Owl Creek Meadows Placer
6	Dozer Track Occurrence	105	Fool Hen Gulch Placer
7	Prospect (Am6)	106	Discovery Gulch Placer
8	Prospect (Am7)	107	Bowen Creek Placer
9	Prospect (Am1)	108	Boulder Creek Placer
10	Prospect (Am5)	109	Eagle Mine
11	Fmi Claim Group	110	Stevens Group
12	Prospect (Am3)	111	Spring Creek Mine
13	Prospect (Am4)	112	Monazite Queen
14	Starchy Claim Group	113	Blue Jay
15	C & F Prospect	114	Faulkerson Ranch Pegmatite
16	Pierce Creek Placer Mines	115	Monolith
17	Horse Creek Hot Spring	116	Dug Out Mine
18	Mcconn Creek	117	Silver King
19	Henderson Mine	118	Lee Buck
20	Kelbar Barite	119	West Fork Gold
21	Devore Mine	120	Unnamed
22	Unnamed	121	Kittie Burton Mine
23	Garm-Lamoreaux Mine	122	Mormon
24	Humbug Creek Prospect	123	Ulysses Mine
25	Allan Bros. Placer	124	Bevan Quartz Crystal Mine
26	Watson Mine	125	Evans-Esker
27	Hughes Creek Placer Mines	126	White-Hutchinson
28	Vine Creek Placer	127	Roberts
29	Goldfield Mine	128	Glenan Prospect
30	Red Fox Placer	129	Snowdrift Mine
31	Quartz Creek Prospect	130	Bevan Mica Deposit
32	Hammerean Creek Placer	131	Twilight Mine
33	Johnson Gulch Prospect	132	Wingding
34	Dot Group	133	Crazy Creek Prospect
35	Surprise	134	Sage Creek
36	Moon	135	Springfield Consolidated
37	Unnamed	136	Unnamed
38	Bull Of The Woods Mine	137	Jewett
39	Humbug Deposit	138	Cummings Lake Prospect
40	Ramsack Creek Placer	139	Sham Group
41	Maybe Lode	140	Copper King Prospect
42	Prospect (Am8)	141	Last Chance
43	Spring Meadow Occurrence	142	Salmon River Development Co
44	Smithy Creek Occurrence	143	Buster Gulch Placer
45	Gold-In-Float Occurrence	144	Dump Creek Placer
46	Dwg Prospect	145	Radiant
47	Prospect (Am9)	146	Pamela Rose
48	Upper Anderson Creek Placer	147	Fourth Of July Mine
49	Boone Mine	148	Rs Prospect
50	Mcmackin-Luv Mine	149	Little Thompson Gulch Prospect
51	Roland & Taylor Mine	150	Wagonhammer Gulch Prospect
52	Clara Morris	151	Fourth Of July Creek Placer
53	Diana	152	Sheep Creek Placer
54	Edwards	153	Sunrise Mine
55	Rose	154	Sheep Creek Lode
56	Keystone	155	Blacktail Prospect
57	A. D. And M. Mine	156	Nineteen-Hundred Mine
58	Dahlonega Creek Placer	157	Blue Mine Placer
59	Anderson Creek Placer	158	Salmon Canyon Copper Mine
60	Cardiff Giant Mine	159	Golden Eagle Placer Mine
61	Corn Beef Mine	160	Shell Creek Placer Mine
62	Twin Brothers Mine	161	Colson Creek Placer Mine
63	North Fork Salmon River Placer	162	Lake Creek Placer Mine
64	Sundown Placer	163	Ebeneezer Placer Mine
65	Cyanide Gulch Mines	164	Owl Creek Hot Springs
66	North Star Prospect	165	Poverty Flat Placer
67	Volter Creek	166	Homestake Placer Mine
68	Trowbridge Bar	167	Lower Owl Creek Placer
69	Ajax Gambler Mine	168	Upper Owl Creek Placer
70	Powder Gulch Mine	169	Golden Queen Placer Mine
71	Tram No.12	170	Jameison
72	Iron Cap	171	Coan Mine
73	Golden Reward Mine	172	Rowe Mine
74	Red Star Mine	173	Kentuck Mine
75	Little Sheep Creek Placer	174	Grunter Mine
76	Threemile Creek Occurrence	175	Lost Miner
77	Threemile Creek Placer Mine	176	Brittanic Mine
78	Nez Perce Creek Placer	177	Gold Hill Mine
79	Nez Perce Creek Occurrence	178	Clipper Bullion Mine
80	Gold Coin Prospect	179	Hegstead
81	Dunton Mine	180	Grubstake No. 1 Mine
82	Morgan Mountain Area	181	Grubstake No. 2 Mine
83	Upper Bradley Gulch Placer	182	Ready Cash Mine
84	Mineral Occurrence	183	Pine Creek Mine
85	Unnamed	184	Big Lead Mine
86	Unnamed	185	Wall Street Deposit
87	Big Eagle Prospect	186	Lower Pine Creek Placer
88	Orofino Prospect	187	Pine Creek Project
89	Burnt Stump And Alta Groups	188	Upper Pine Creek Placer
90	Horse Creek Placer	189	Smith Prospect
91	Blue Plate	190	White Azalea Mine
92	Owl Mining	191	Silver Star
93	St Clair Mine	192	Unnamed Prospect
94	Unnamed	193	Twin Cabin Mine
95	Unnamed	194	High Prospect
96	Monitor Mine	195	Carmen
97	Unnamed	196	Bell Placer
98	Upper Owl Creek	197	Oro Cache Mine
99	Lucky Llama	198	Victory No. 1 Prospect

Mineral localities data by Fredrick L. Johnson; digital representation by Fredrick L. Johnson and Theodore R. Brandt; assisted by Gregory K. Lee.

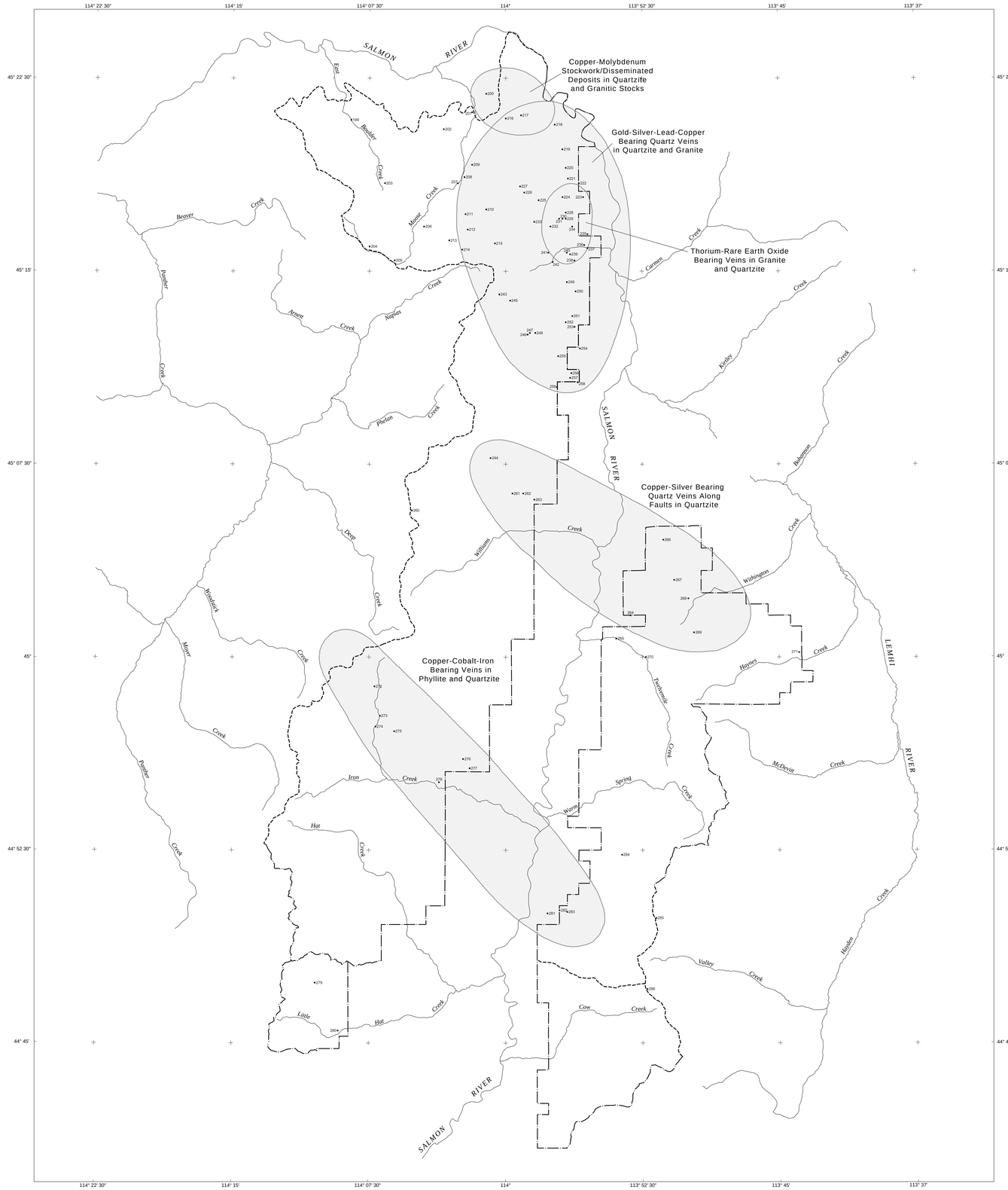
Scale: 1:125,000
Polyconic Projection

0 5 10 15 20 25 30 35 40
KILOMETERS
0 5 10 15 20
MILES

Mines and Prospects in and near the North Fork Ranger District, Salmon National Forest, Idaho

By
Frederick L. Johnson and Theodore R. Brandt

1998



Polyconic projection

Scale: 1:125,000

0 5 10 15 20 25 30 35 40
KILOMETERS

0 5 10 15 20
MILES

Mineral localities data by Fredrick L. Johnson; digital representation by Fredrick L. Johnson and Theodore R. Brandt; assisted by Gregory K. Lee.

Explanation

- Mine or prospect
- Salmon National Forest boundary
- Ranger District boundary
- Areas containing significant mineralization

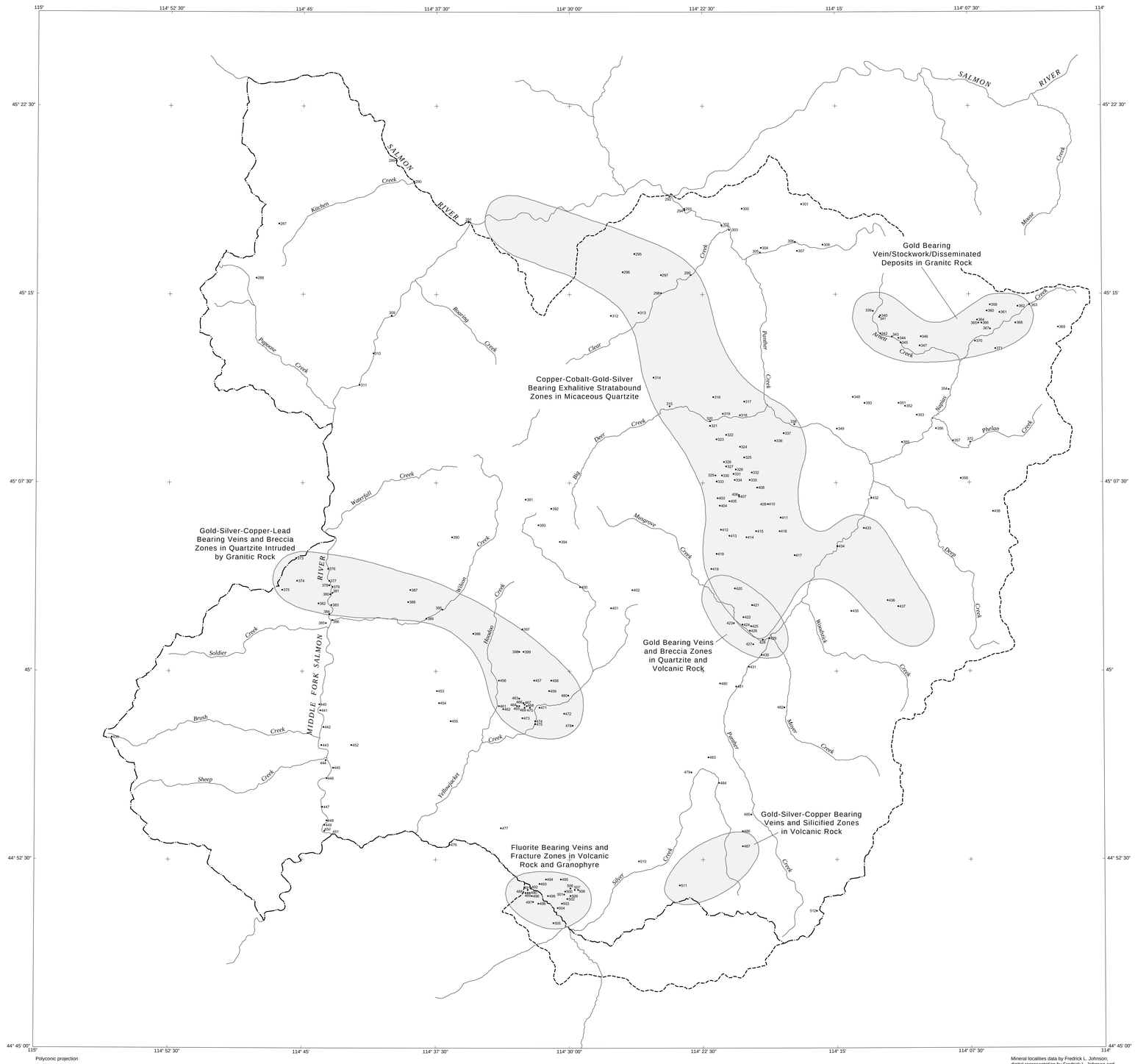
List of Mineral Localities

199	East Boulder Meadows Placer
200	Bobcat West Zone
201	El Toro
202	Edwards
203	Big Boulder Meadows
204	Free Gold
205	Moose Creek Borrow Area
206	Webfoot Creek Placer
207	Moose Creek Placer
208	Daly Creek Placer
209	Diamond Creek Placer
210	Lucky Myrna
211	Racetrack Creek Placer
212	Golden Nugget
213	Coffee Gulch Placer
214	Sierra Gulch Placer
215	Wallace Lake Road Prospect
216	Lang Mine
217	Bobcat
218	Red Bird
219	Comet
220	Prospect
221	Forget-Me-Not
222	Rocket-Dolly
223	Wickham Mine
224	Contact
225	Log Cabin
226	Stormy Peak Borrow Pit
227	Shoo Fly Mine
228	Prospect
229	Lucky Gem 13
230	Bell
231	Simer Mine
232	Lucky Prospect
233	Stormy Peak Road Borrow Area
234	Mckinley Mine
235	Prospect
236	Prospect
237	Wallace Creek Borrow Area
238	Tendoy Mine
239	Castle Rock
240	Blondie
241	Gilt Edge Mine
242	Wallace Creek Placer
243	U.P. And Burlington Mine
244	Bowman Mine
245	King Solomon
246	Bob Moore Creek Prospect
247	Golden Rule Mine
248	Silverton Mine
249	Queen Of The Hills Mine
250	Bromite Silver
251	Bert's Best
252	Red Cross Mine
253	South Fenster Prospect
254	Prospect
255	Morning Glory Prospect
256	G. W. Oliver Mine
257	Pollard Mine
258	Andrews Mine
259	Edwards Mine
260	Williams Creek Summit Borrow Area
261	Copper Mountain Mine Area
262	Tormay Mine
263	Perreau Creek Borrow Area
264	Tenmile Creek Prospects
265	Twelvemile Creek
266	Pope Shenon Mine
267	Porterfield Prospect
268	Prospect
269	Harmony Mine
270	Twelvemile Creek Quarry
271	Haynes Creek Borrow Area
272	Climax Prospect
273	Iron Creek Copper-Cobalt Deposit
274	Ripper Prospect
275	Jackass Creek Prospect
276	Badger Basin North
277	Badger Basin South
278	Rambling Rose
279	Busted Jeep
280	Tincup
281	Black Angus Iron
282	Bessemer
283	East Mckim Iron
284	Birthday Prospect
285	Basin-Mckim Creek
286	H And R Mine

Mines and Prospects in and near the Salmon Ranger District, Salmon National Forest, Idaho

By
Fredrick L. Johnson and Theodore R. Brandt

1998



Explanation

- Mine or prospect (•288)
- Salmon National Forest boundary
- Ranger District boundary
- Areas containing significant mineralization

List of Mineral Localities

287	Cottonwood Butte Prospects	400	Hoodoo-Yellowjacket Upper Placers
288	Ted's Group Prospect Area	401	Blind Strike Prospect
289	Proctor Bar Placer	402	Big Buck Prospect
290	Kitchen Creek Bar Placer	403	Blackbird Creek Upper Prospect
291	Middle Fork Placer	404	Blackbird Creek South Prospect
292	Garden Creek Placer	405	Blackbird Creek Southeast
293	Pretty Placer	406	Blackbird Mine
294	Bear Gulch Placer	407	Blackbird Millsite
295	Sagebrush Prospect	408	Copper Queen Prospect
296	Dome Ridge Prospect	409	Haynes-Stellite Mine
297	Rancherio Creek Prospect Area	410	Haynes-Stellite Millsite
298	Clear Creek No. 1 Placer	411	Blackbird Creek Crosscut Prospect
299	Cougar Creek Prospect	412	Anderson Cobalt West Prospect
300	Big Creek Hot Springs	413	Anderson Cobalt Prospect
301	Copper King Mine	414	Edith B. Prospect
302	Lower Panther Creek Placer	415	Ludwig Prospect
303	Clear Creek Placer	416	Patty B Prospect
304	Mean Green Prospect	417	Dummy Creek Copper Prospect
305	Beaver Creek Placer	418	West Fork Zinc Prospect
306	Sunbeam Placer	419	French Gulch Prospect
307	Mayflower	420	Steen Prospect
308	Our Mother's Day	421	Ostander Creek Prospect
309	Stoddard Creek Placer	422	Newmont Musgrove Project Area
310	Nugget Creek Bar Placer	423	Gibson Uranium Prospect
311	Parrot Camp Placer	424	Lee Prospect
312	Elkhorn Divide Prospect	425	Musgrove Mine
313	Clear Creek-Elkhorn Creek Prospect	426	Musgrove Millsite
314	Lick Creek Ridge Prospect	427	Breccia Gold Mine Area
315	Mary Ann Mine	428	Amac Prospect
316	Bonanza Copper Prospect Area	429	Borrow Pit
317	Papoose Prospect	430	Junction Placer Mine
318	Tinkers Pride East Prospect	431	Forney Clay Deposit
319	Tinkers Pride Prospect Area	432	Double Eagle Placer
320	Blackrock Millsite	433	Desert Prospect
321	Blackrock Prospect	434	Fawn Prospect
322	Gray Copper Prospect Area	435	Blackpine Millsite
323	Blacktail Creek Prospect	436	Blackpine Mine Area
324	Nickel Point North Prospect	437	Cobalt Prospect Area
325	Nickel Point Prospect	438	Borrow Pit
326	Dusty North Prospect	439	Shellrock Peak Prospect
327	Dusty Prospect	440	Bernard Landing Field Placer
328	Anaconda	441	Pole Creek Placer
329	Sunshine Prospect	442	Reservoir Creek Placer
330	Katherine Prospect	443	Mormon Ranch Placer
331	Horseshoe Prospect	444	Sheep Creek Ranch Placer
332	Dewey Prospect	445	Aparejo Creek Fluorite Prospect
333	Sunshine East Prospect	446	Aparejo Point Placer
334	Cobalt Mountain	447	Broken Oar Placer
335	Stevenson Prospect Area	448	Bear Creek Placer
336	Little Deer Creek Prospect	449	Pool Placer
337	Long Dike Prospect	450	Heatherington Placer
338	Sweet Repose Prospect	451	Camas Creek Placer
339	Little Chief	452	Warm Spring Creek Geothermal Area
340	Arnett Hardrock	453	Jaybird Prospect
341	Haidee Mine	454	Hoot Owl Prospect
342	Goff Brothers Placer	455	Middle Fork Peak Prospect
343	Thompson And Hibbs Prospect	456	Blackeagle Creek Prospect
344	Italian Mine	457	Red Jacket Mine
345	Arnett Creek Placer	458	High Bar Placer
346	Unnamed	459	Yellowjacket Mine
347	Rapps Creek Placer	460	Comeback Mine
348	Butchke Placer	461	Cracker Jack Prospect
349	Toolson Allanite Prospect	462	Mammoth Mine
350	East Fork Jureano Creek	463	Columbia
351	Upper Mackinaw Creek Placer	464	Daniel
352	Cutler Opal Mine	465	Continental
353	Lower Mackinaw Creek Placer	466	Liberty
354	California Bar	467	Lincoln
355	Blue Jay Mine	468	Steen Mine Area
356	Ringbone Cayuse Mine	469	Broken Hill
357	Phelan Creek Placer	470	Brough
358	Unnamed Placer Deposit	471	Easy Tailings Prospect
359	Gold Flint	472	Copper Glance Mine
360	Gold Dust	473	White Rabbit Prospect
361	Smith Gulch Placer	474	Tincup Mine
362	Wrights Gulch Placer	475	Yellowjacket Creek Middle Placer
363	Upper Napias Creek Placer	476	Yellowjacket Placer
364	Camp Creek Placer	477	Forge Creek Geothermal Area
365	Gold Ridge	478	Gold Bug Prospect
366	Beartrack Mine	479	Tammy
367	Wards Gulch Placer	480	Green Glow Prospect
368	Red Rock	481	Borrow Pit
369	Sawpit Creek Placer	482	Iron King Prospect
370	Leesburg Placer	483	Ramey
371	Sharkey Creek Placer	484	Silver Creek Middle Placer
372	Prince Placer	485	Opaline-Homestead Prospect
373	Kimmel Creek Prospect	486	Silver Creek Upper Placer
374	Tuckaway Prospect	487	Rabbit Foot Mine
375	Upper Kimmel Creek Prospect	488	Red Spar Extension
376	Lower Kimmel Creek Prospect	489	Purple Spar Extension
377	Woolard Creek Bar Placer	490	Purple Spar
378	Lower Survey Creek Prospect	491	Red Spar No. 2
379	Survey Creek Placer	492	Red Spar Mine
380	Survey Creek Bar Placer	493	Switchback
381	Rattlesnake Ridge Prospect	494	East Fluorspar
382	Big Horn Prospect	495	Antler
383	Rattlesnake Camp Prospect	496	Purple Spar No. 2
384	Grassy Flat Placer	497	Purple Spar No. 4
385	Deckie Prospect	498	Lucky Herb
386	Wilson Creek Bar Placer	499	Morning Sun
387	Old Johnson Lode Prospect	500	Big Lead
388	Johnson Mine	501	Powderhouse
389	Wilson Creek Middle Placer	502	M And M
390	Twin Cove-Ramshorn Lakes Prospect	503	Crystle #1 Lode
391	Explorer Prospect	504	Chamac Camp Lode
392	Rainbow Mine	505	Meyers Cove Antimony
393	Olson Prospect	506	North Vein
394	Crags Beryllium Prospect Area	507	Beartrap
395	Langley Placer	508	South Vein
396	Lucky Hunter Prospect	509	Anderson
397	Mcelerny Mountain Prospect	510	Allison Mine
398	Black Eagle Mine	511	Singheiser Mine
399	Park Mine	512	Borrow Pit

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with North American Stratigraphic Code. Any use of trade, product or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Polyconic projection

Mineral localities data by Fredrick L. Johnson; digital representation by Fredrick L. Johnson and Theodore R. Brandt; assisted by Gregory K. Lee.

Scale: 1:125,000

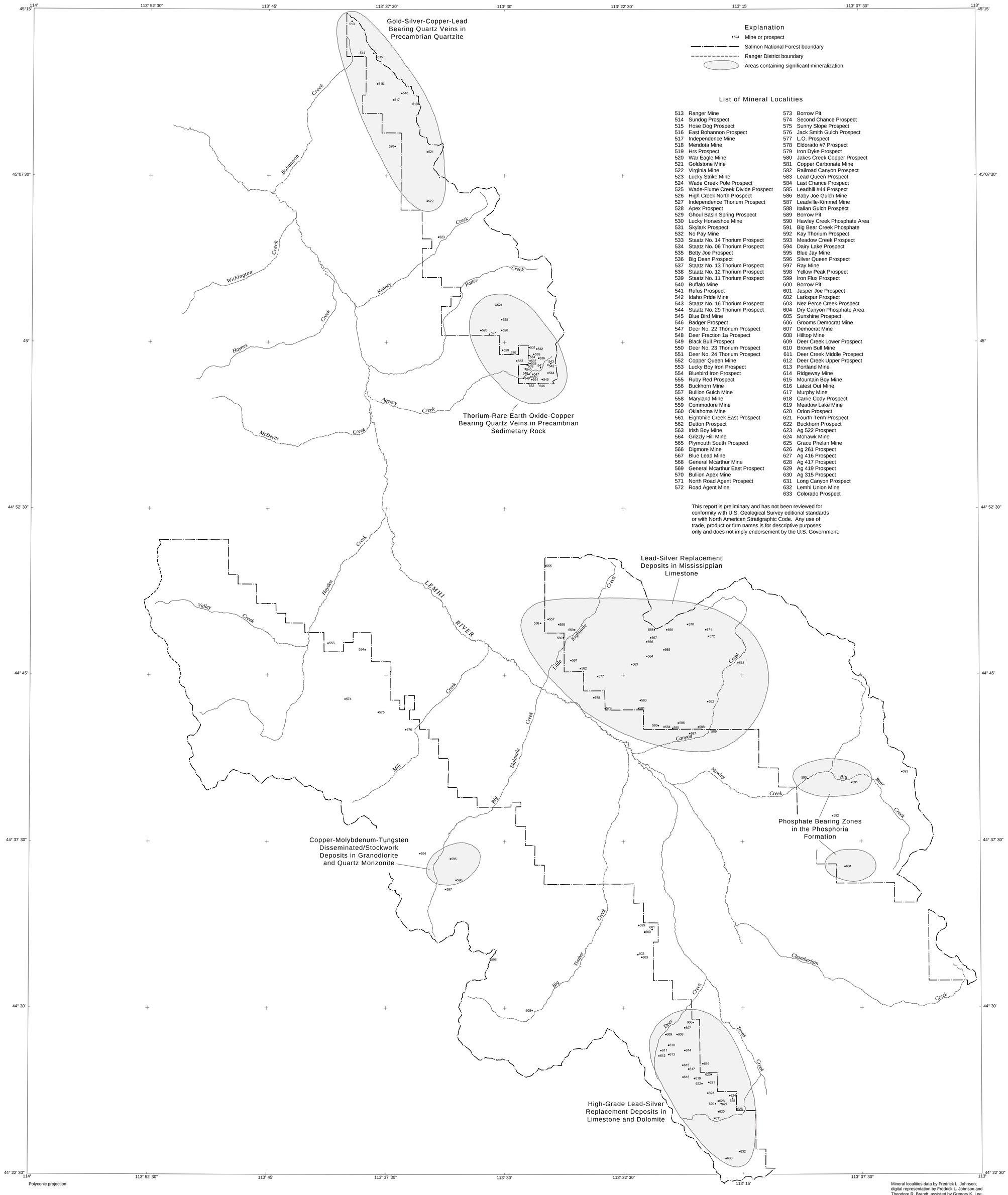
0 5 10 15 20 25 30 35 40
KILOMETERS

0 5 10 15 20
MILES

Mines and Prospects in and near the Cobalt Ranger District, Salmon National Forest, Idaho

By
Fredrick L. Johnson and Theodore R. Brandt

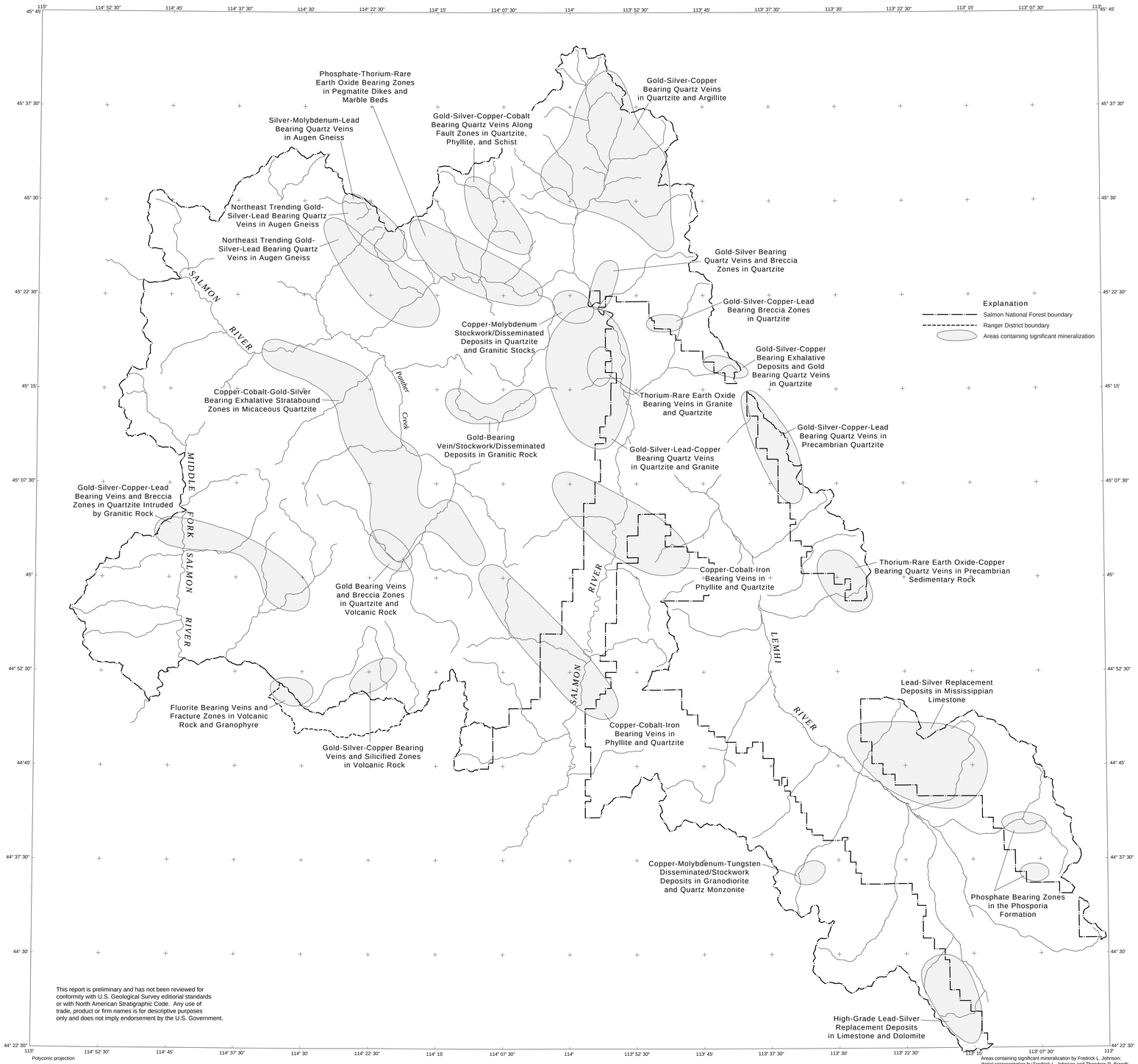
1998



Mines and Prospects in and near the Leodore District, Salmon National Forest, Idaho

By
Fredrick L. Johnson and Theodore R. Brandt

1998



This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with North American Stratigraphic Code. Any use of trade, product or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Polyconic projection

Areas containing significant mineralization by Fredrick L. Johnson; digital representation by Fredrick L. Johnson and Theodore R. Brandt; assisted by Gregory K. Lee.

Scale: 1:250,000

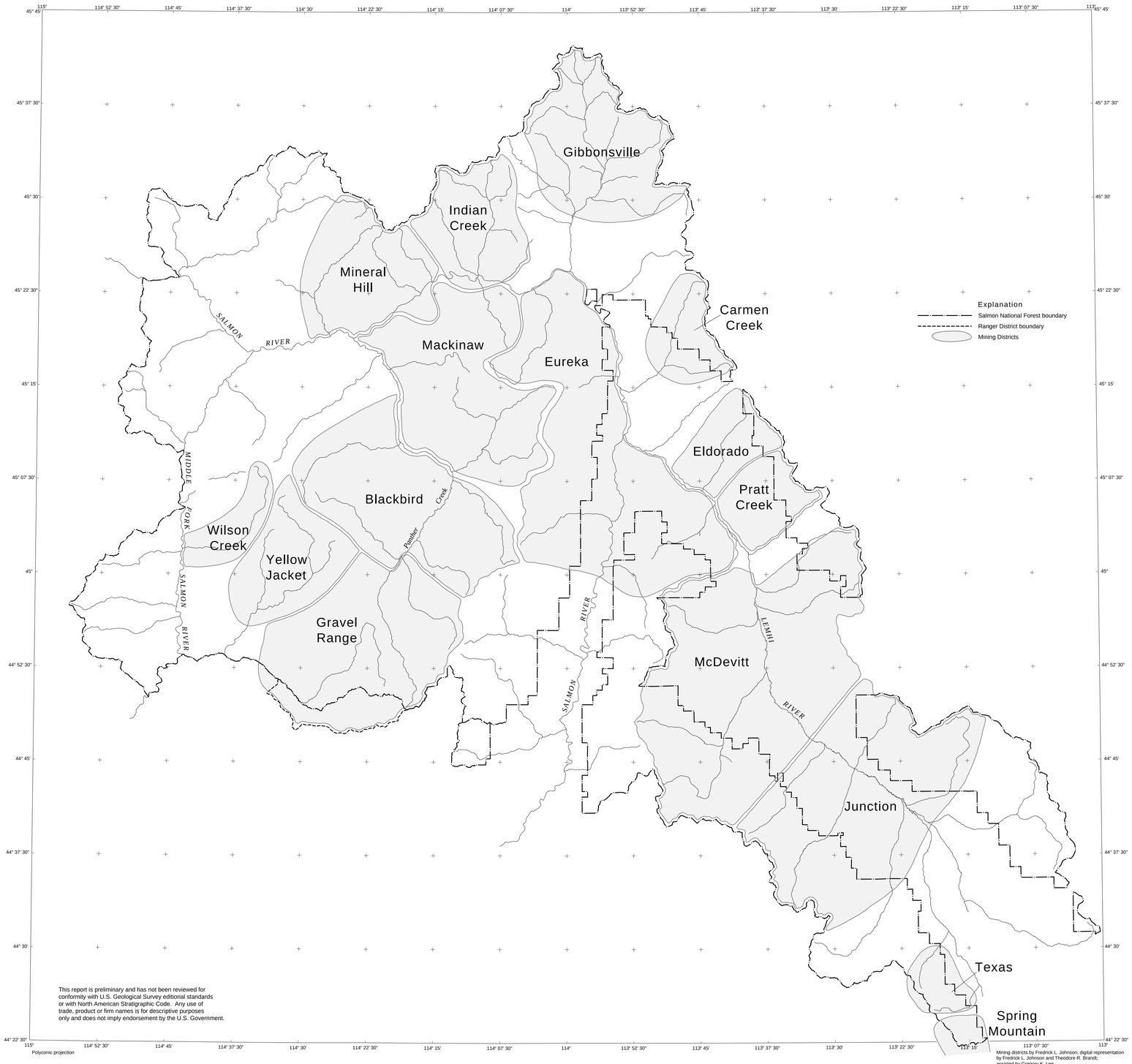
0 5 10 15 20 25 30 35 40
KILOMETERS

0 5 10 15 20
MILES

Areas Containing Significant Mineralization in and near the Salmon National Forest, Idaho

By
Fredrick L. Johnson and Theodore R. Brandt

1998



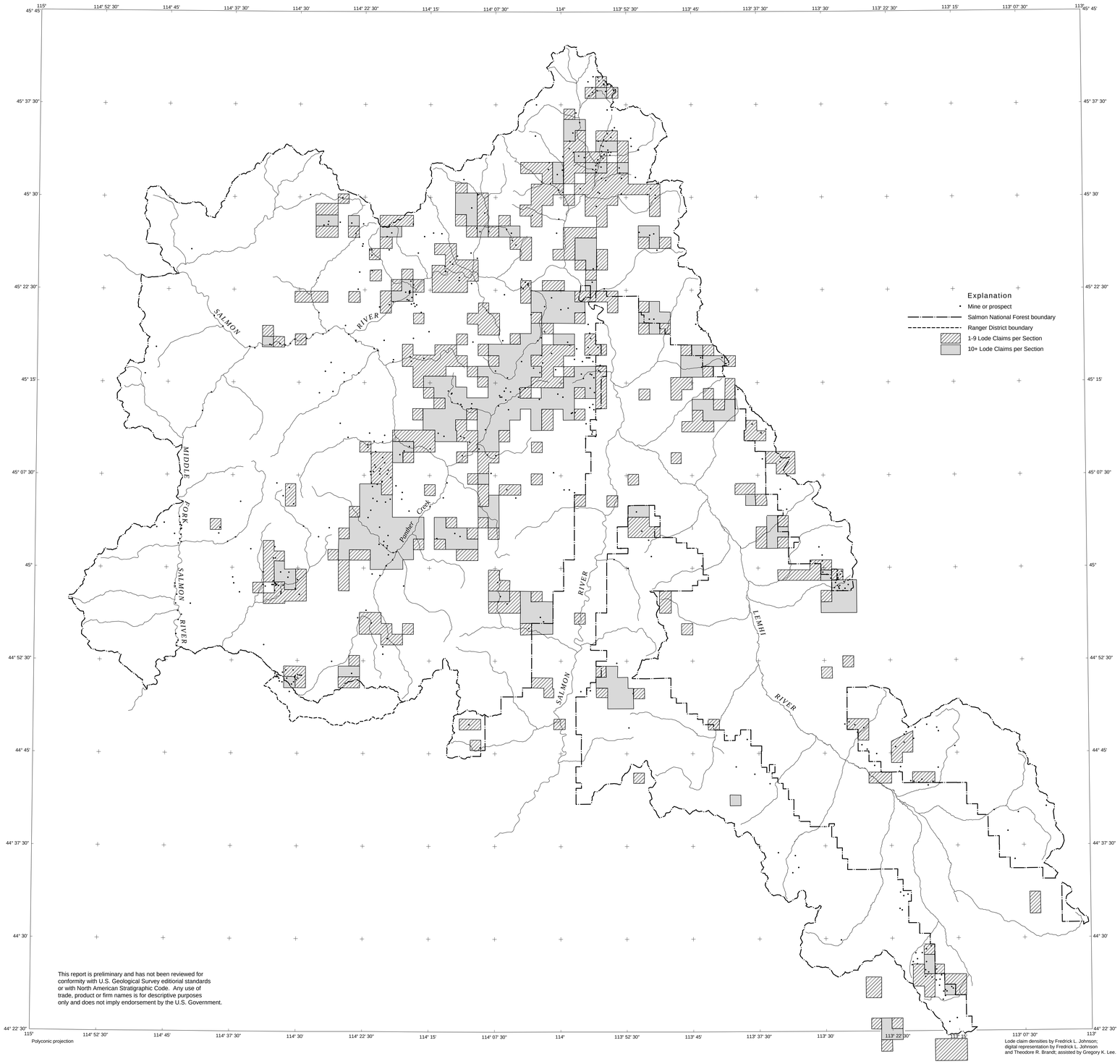
Scale: 1:250,000

0 5 10 15 20 25 30 35 40
KILOMETERS
0 5 10 15 20
MILES

Mining Districts in the Salmon National Forest, Idaho

By
Fredrick L. Johnson and Theodore R. Brandt

1998



This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with North American Stratigraphic Code. Any use of trade, product or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Polyconic projection

Lode claim densities by Fredrick L. Johnson; digital representation by Fredrick L. Johnson and Theodore R. Brandt; assisted by Gregory K. Lee.

Scale: 1:250,000

0 5 10 15 20 25 30 35 40
KILOMETERS

0 5 10 15 20
MILES

Lode Claims in and near the Salmon National Forest, Idaho

By
Fredrick L. Johnson and Theodore R. Brandt

1998