Special Publication

Bureau of Mines Mineral Investigations in the Juneau Mining District, Alaska, 1984–1988

Volume 2.–Detailed Mine, Prospect, and Mineral Occurrence Descriptions

Section E

Coast Range Subarea

UNITED STATES DEPARTMENT OF THE INTERIOR

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Coast Range Subarea

By Albert H. Clough

UNITED STATES DEPARTMENT OF THE INTERIOR
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BUREAU OF MINES
T S Ary, Director

COAST RANGE SUBAREA

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COAST RANGE SUBAREA

by Albert H. Clough[1]

INTRODUCTION

LOCATION, ACCESS, AND LAND STATUS

The Coast Range subarea of the Juneau Mining District (JMD) extends from the Canadian border north of the community of Skagway, southerly to Tracy Arm. It is bounded by the international boundary on the north and eastern edges. The Ferebee Glacier and Lynn Canal mark the western boundary, extending south to the Berners Bay region. From Berners Bay south, the western boundary is the eastern boundary of the Juneau Gold Belt (fig. E–1).

The city of Skagway (fig. E–2) is the only developed community within the confines of the subarea. Skagway was originally established as a port for the Klondike gold rush of 1898. Recently, Skagway has gained prominence as a port for shipping goods into and mineral products out of Yukon Territory (fig. E–3). Skagway has also developed a thriving tourist industry based on its Alaskan traditions. The community of Skagway maintains a paved airstrip which is suitable for use by small multi-engine aircraft. Several regional air carriers serve Skagway with frequent scheduled flights, especially during the summer months. Helicopter charter services are available from Skagway during the summer months.

The only other permanent settlement in the subarea is at the Snettisham hydroelectric powerplant site, located near the head of Speel Arm. A hydroelectric project and fish hatchery are operated year round in this area. The Snettisham area is located in the southern portion of the Coast Range subarea (figs. E–1 and E–11).

Parts of the northern Coast Range subarea are accessible from roads in the vicinity of Skagway or from the Klondike Highway which connects Skagway with Yukon Territory. Areas along the White Pass and Yukon Route (narrow-gauge railroad which connects Skagway with Whitehorse, Yukon) right-of-way may be accessed from the rail line. Currently, the White Pass and Yukon Route is being operated during the summer months, as a tourist attraction. The rail line is maintained only between Skagway and the international boundary.

The southern portion of the Coast Range subarea contains no roads or trails, except near the Snettisham hydroelectric site. The roads there are only for local access to the power project and the fish hatchery. An all-weather gravel airstrip is maintained at the Snettisham site. This strip could be of limited use as a staging area for mineral activities in the vicinity.

Coastal regions along Taiya Inlet, the Katzehin River, and east Lynn Canal may be reached by small boat in selected areas. However, good anchorages are rare, and much of the coastline is too precipitous to offer any reasonable interior access. The remainder of the northern part of the Coast Range subarea, especially the Meade Glacier region, is best reached by helicopter; though in selected areas ski-equipped light aircraft could prove adequate.

The southern portion of the Coast Range subarea is dissected by three main drainages. These river systems, which trend obliquely through the Coast Mountains, are the Taku, Speel, and Whiting Rivers (figs. E–1 and E–11). Tributary canyons to these main valleys provide air corridors into the interior portions of the southern Coast Range area. Dense vegetation and muskeg make surface travel in these valleys extremely difficult. The upper elevations are precipitous and remote, with helicopters being the only practical means of access. In these more remote areas, airborne access is feasible only on clear days due to the danger from "whiteout" conditions during adverse weather.

The lower elevations of the southern Coast Range area may be reached by using float planes or shallow-draft vessels. Also, some of the alpine lakes may be utilized by float-equipped aircraft on a seasonal basis. Finally, some of the gravel bars and areas of glacial outwash are smooth enough to support landings by wheel-equipped aircraft. However, due to the ruggedness of the topography these methods of conveyance would afford only limited mobility for the explorationist once the initial access was made. These more standard methods of travel are suitable for establishment of a base camp, but

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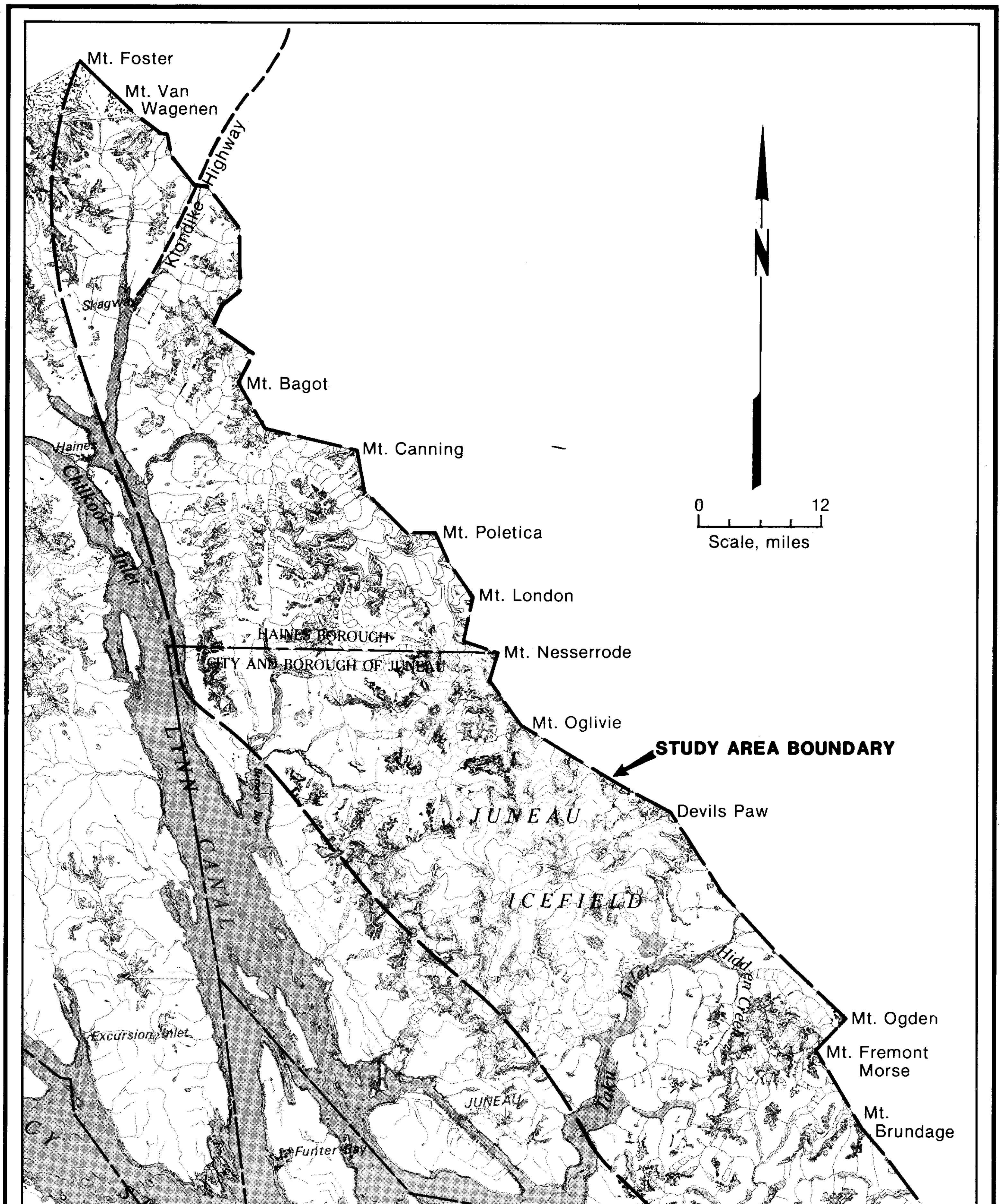

Figure E-1. — Map showing location of the Coast Range subarea of the Juneau Mining District.

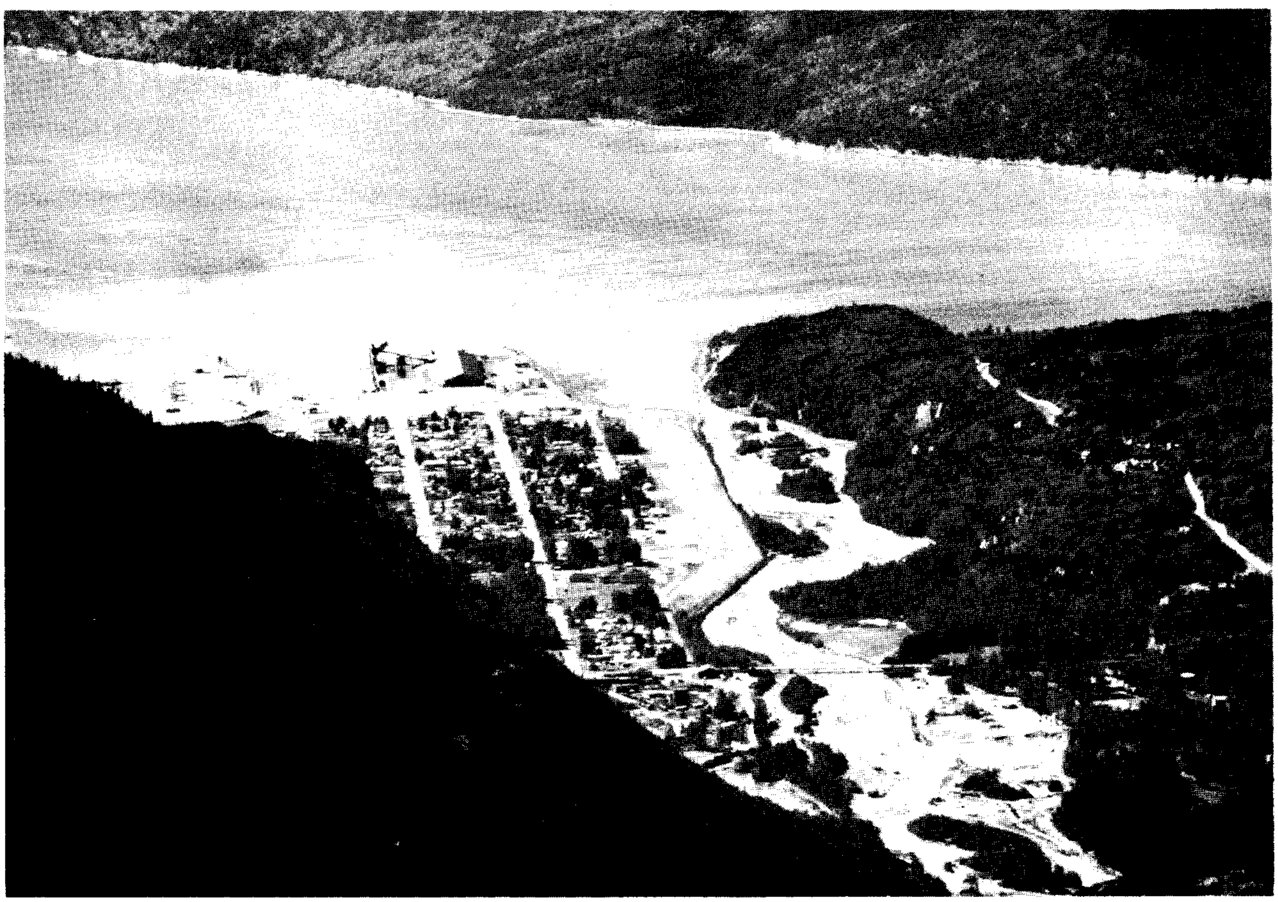

Figure E-2.—Photograph showing port city of Skagway, northern portion of the Coast Range subarea.

would be ineffective for wide ranging programs of field investigations.

Most of the Coast Range subarea lies within the Tongass National Forest and is managed by the U.S. Department of Agriculture, Forest Service. Private land in the northern portion of the subarea is concentrated in and around the city of Skagway. Private land in the southern portion consists of an old homestead which is currently used as a seasonal tourist lodge, located along Taku River (Taku Lodge). Additionally, numerous recreational cabins are located on small private parcels along the Taku River, upstream from Taku Lodge toward the international boundary.

Current land status designation for most of the Tongass National Forest in this subarea is "roadless", though open to mineral entry under the mining law of 1872 (as amended). Much of Chilkoot and White passes, near Skagway, are enclosed within parts of the Klondike Gold Rush Historic Park. This park is managed by the U.S. Department of Interior, Park Service, and is closed to mineral entry. State lands to the north and west of Skagway are open to mineral location and entry.

The region defined by the Katzehin River and Meade Glacier portions of the Juneau Icefield lies within the Haines Borough (fig. E-1). Any mineral activity within this boundary would fall under the jurisdiction of the Haines Borough government. The central and southern portions of the subarea (Berners Bay region south) fall within the City and Borough of Juneau (CBJ). Mineral activity within the CBJ fall under municipal control, as defined and described by the CBJ mining ordinance.

The area from Speel River north to the Juneau Icefield (figs. E-1 and E-11) is currently managed as "roadless". This land classification allows for mineral entry, and does not prohibit mine development. The area between Speel River and Tracy Arm is currently designated as being managed for "multiple use". This includes mineral entry and mine development. The Tracy Arm-Fords Terror Wilderness is closed to mineral entry and mine development.

Current land management plans for the Tongass National Forest are undergoing revision, and the land use designations are subject to change.

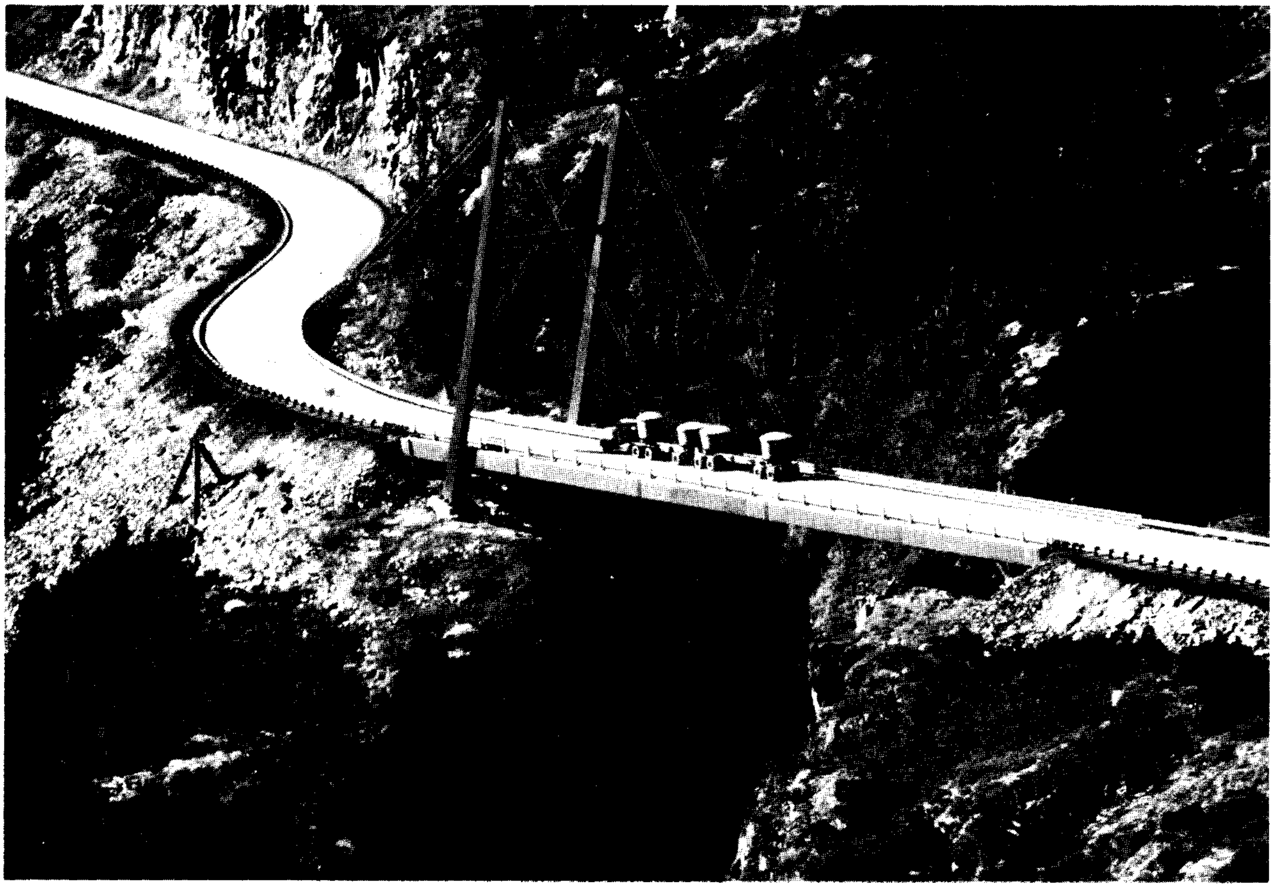

Figure E-3.—Photograph showing mineral concentrates from Faro, Yukon, being trucked down Klondike Highway to port of Skagway.

BUREAU INVESTIGATIONS

Bureau investigations in the Coast Range subarea of the JMD began in the summer of 1985, and continued on a seasonal basis through the summer of 1987. All Bureau work was helicopter supported. Investigations in the northern portion of the Coast Range subarea were based out of Skagway. Investigations in the southern portion of the Coast Range subarea were staged from Juneau.

The first priority was to examine the known mines, prospects, and mineral occurrences within the subarea. Other areas with known favorable geology for hosting mineral deposits were also examined. Geochemical data developed by the U.S. Geological Survey (USGS) and others were used as an important tool to guide Bureau investigations in areas with favorable geology and other indicators of mineralization. Finally, selected reconnaissance-scale mineral investigations were undertaken in the Coast Range subarea. This was because large parts of the area are unmapped (*E-4*)[2] and it was deemed important for the Bureau to at least make a cursory examination in order to see if these unmapped areas warranted additional mineral investigations.

The majority of field activities conducted by the Bureau involved brief geologic investigations, supplemented by the collection of rock chip, stream sediment, and pan concentrate samples. Mine and prospect workings (where accessible) were selectively mapped and sampled. The areas investigated (fig. E-1) occupy parts of the Skagway, Atlin, Juneau, Taku River, and Sumdum 1:250,000-scale USGS quadrangle maps.

Bureau investigators were assisted in 1986 by geologists of the Alaska State Division of Geological and Geophysical Surveys (ADGGS). These geologists re-

[2] Italic numbers in parentheses refer to list of references preceding the appendixes.

corded regional geologic data and collected stream sediment and pan concentrate samples. The results of ADGGS geochemical sampling are presented in appendix E-1 of this report. Work done by the ADGGS was concentrated to the northwest of the city of Skagway. State geologists also gathered stream sediment and pan concentrate samples from the Skagway River and its major tributaries (East Fork and Warm Pass) (fig. E-5).

During this study, the Bureau examined 15 discrete areas which contained mines, prospects, or mineral occurrences. Through these examinations Bureau investigators collected 259 rock, stream sediment, and pan concentrate samples for analyses. Complete sample results, a description of analytical techniques used, and the various detection limits, are provided in the appendix.

ACKNOWLEDGEMENTS

Bureau field investigations in the Coast Range subarea were assisted by seasonal employees Edmund Fogels (1986 and 1987), Terry Hayden (1986 and 1987), Lance Miller (1985 through 1987), Dennis Southworth (1986), and Richard Giraud (1985). These employees contributed much to this report, and their efforts are gratefully acknowledged. William Roberts, previous Bureau staff geologist, conducted the early literature search and initial field investigation in the southern parts of the Coast Range subarea. His efforts were helpful in getting the project started.

State ADGGS geologists Robert Forbes, Wyatt Gilbert, and Jeffrey Kline assisted in field investigations in the northern part of the subarea.

GENERAL GEOLOGY AND MINERALIZATION

The Coast Range subarea is dominated by rocks of the Coast Range Plutonic complex. This complex is a belt of granitic rocks which extend along coastal British Columbia and Southeast Alaska. Most of the granitic rocks in this belt are Cretaceous in age, though Tertiary and younger plutons are present. Gneisses, high-grade schists, and migmatites are ubiquitous throughout this region. The Coast Range subarea contains one mafic-ultramafic complex, which crops out in the vicinity of Mount Leland (fig. E-8), in the northern portion of the subarea. Paleozoic and Mesozoic metasedimentary and metavolcanic rocks crop out intermittently throughout the Coast Range subarea, especially on its eastern flank. Scattered roof pendants located throughout the area locally preserve pre-Coast Range Plutonic complex stratigraphy.

Most of the Coast Range subarea lies within the Alexander tectonostratigraphic terrane. Smaller portions of the subarea, near the international boundary, are within the Stikine tectonostratigraphic terrane. In general terms, the Alexander terrane contains mostly plutonic and high-grade metamorphic rocks. The Stikine terrane contains predominantly lower-grade metasedimentary and metavolcanic rocks.

Structurally, the subarea is characterized by northwesterly, northerly, and northeasterly striking linears of regional extent.

A variety of mineral deposit types are possible given the varied geology of the Coast Range subarea. These deposit types include: 1) porphyry molybdenum, 2) precious metal and tungsten skarns, 3) magmatic uranium-thorium, 4) magmatic oxide or sulfide copper, nickel, chromium, and platinum-group-metals (PGM) deposits, 5) volcanogenic massive sulfide deposits, and 6) vein gold deposits.

Porphyry molybdenum mineralization is perhaps the most important and permissive mineral deposit type for the Coast Range subarea. Although not in this study area, the undeveloped Quartz Hill molybdenum deposit near Ketchikan is the most important deposit currently known in the Coast Range Plutonic complex. Significant molybdenum occurrences are also known near Wrangell and at Mount Ogden. Other lesser occurrences are known and were investigated in the Coast Range subarea.

In general terms, molybdenum deposits in the northern portions of the Coast Range Plutonic complex are characterized by stockwork molybdenite mineralization. These deposit types are conspicuous for their lack of subordinate precious or base metal mineralization. Furthermore, the better deposits of this type are associated with Tertiary or younger plutons. The Cretaceous plutons commonly have, at best, scattered molybdenite occurrences, without alteration envelopes or stockwork development.

Skarn mineralization is significant in parts of the Coast Range, especially in the Stewart area of British Columbia. Both precious metal and tungsten skarns have been mined at Stewart for many years. One skarn deposit (the Inspiration Mine) occurs within the Coast Range subarea.

Uranium and thorium mineralization is associated with rhyolitic rocks near the city of Skagway. Though no significant occurrences have been recognized in this area, potential for radioactive mineralization exists.

Magmatic oxide and sulfide associated mineralization occurs throughout Southeast Alaska. Some of the more important deposits are the iron mineralization at Snettisham and Klukwan. The Brady Glacier copper-nickel deposit in Glacier Bay is also of great importance. Other occurrences are in the Ketchikan and Wrangell areas. A mafic-ultramafic complex has been identified in the northern portion of the Coast Range subarea, near Mount Leland. No significant mineralization has been identified associated with this complex.

Volcanogenic massive sulfide deposits occur in Stikine terrane rocks near Tulsequah in British Columbia (fig. E-1). This is immediately to the east of the southern portion of the Coast Range subarea. The Tulsequah area hosts the past producing volcanogenic massive sulfide polymetallic Tulsequah Chief mine. The Tulsequah Chief Mine occurs in a northwesterly-striking package of intermediate volcanic, volcaniclastic, and sedimentary rocks. This deposit is currently under active exploration by Cominco Ltd. and Redfern Resources (*E-17*). The Paleozoic rocks which host the mineralization in the Tulsequah area may extend into the Coast Range subarea, and if so would be an interesting exploration target.

Vein gold mineralization is known at several localities in the Coast Range subarea. The Kakuhan Range, to the north of the Jualin and Kensington Mines, is perhaps the most important. The overall geology of the Coast Range subarea is not favorable for vein gold mineralization, however; the likelihood to preserve Juneau Gold Belt equivalent rocks as roof pendants should not be overlooked. Roof pendants of this type could prove to be significant targets for precious metal mineralization. Small, discrete vein gold occurrences are identified in the Klondike Highway area, near Skagway (fig. E-5). Vein gold mineralization also occurs at the Polaris-Taku mine in the Tulsequah area of British Columbia. This mine is currently under active exploration by the Suntac Mining Company (*E-18*).

In summary, the Coast Range subarea is characterized by Alexander terrane intrusive granitic rocks of the Coast Range Plutonic complex. Additionally, metasedimentary and metavolcanic rocks crop out along the eastern and western flanks of the area. The rocks on the eastern flank are within the Stikine terrane. Furthermore, country rocks are locally preserved in roof pendants within the plutonic complex.

The most important type of mineralization for the subarea is porphyry molybdenum. Subordinate to the molybdenum occurrences are skarn, magmatic uranium-thorium, magmatic oxide and sulfide deposits, volcanogenic, and vein type deposits.

The Coast Range subarea is not completely mapped or explored. Many large areas are shown as unmapped on recent regional geologic maps (*E-4*). The unmapped and unexplored nature of much of this subarea prohibits detailing the area's mineralization. In most cases, the terms "unknown" and "uncertain" are the most appropriate for describing mineralization in the Coast Range subarea.

MINES, PROSPECTS AND MINERAL OCCURRENCES

This section of the report is presented in geographic order, from north to south. This is because several different deposit types are permissive for many of the areas investigated. Following this portion of the report, a summary and conclusion section is presented which deals with all of the mineral deposit types investigated within the Coast Range subarea.

The Coast Range subarea has been subdivided into a northern and southern portion for ease of field investigation and discussion. The northern portion of the subarea includes all the area north of Berners Bay. The southern portion of the Coast Range area includes all the area south of Berners Bay. No investigations were undertaken in the central portion of the Juneau Icefield, so this area is omitted from discussion.

Locations investigated during this study have been grouped for ease of reporting. These groups, referred to as areas, include the more significant mineral deposits, prospects, and occurrences within the Coast Range subarea. This section of the text reports on each of these areas. The report is organized by the area investigated, with either the mine, prospect, or mineral occurrences in that individual area detailed. The format used includes a short introduction and discussion of any previous work in the area. Geology and mineralization are also discussed. Bureau investigations undertaken as part of this study are detailed. Recommendations are offered to give the reader the benefit of the Bureau's thoughts concerning any further work in the area under consideration. In some areas where little is known about the nature of the geology and mineralization, no separate discussion is offered.

Resource estimates are not made for any of the mines, prospects, or mineral occurrences. This is because the amount of development along with the data available for all the mines, prospects, and mineral occurrences in the Coast Range subarea is insufficient to make any reasonable quantitative resource estimates. Areas investigated by the Bureau which do not contain significant mineralization, or of which very little is known are not discussed in the text. Data available for these types of areas commonly consist of only the analyses for one or two rock samples. Results of Bureau investigations for these areas are reported in the appendix. Locations of the various mines, prospects, and mineral occurrences are shown on the accompanying figures. Where Bureau samples are referred to in the text, the convention followed is to list the figure number, followed by the map number with the sample number listed last. Figures commonly only have samples indexed by their respective map number. The appendices are organized by map number, but also give the sample number and a brief description. Analytical results for samples collected in the northern portion of the Coast Range subarea are shown in Appendix E-1. Analytical results for samples collected in the southern portion of the Coast Range subarea are shown in Appendix E-2. Where multiple samples were collected from the same site the same sample location number is used.

NORTHERN PORTION OF THE COAST RANGE SUBAREA

Mount Van Wagenen Area

Introduction and Previous Work

Mount Van Wagenen is an international boundary peak, located in the far northwest part of the Coast Range subarea (fig. E-4). No geologic or mineral deposit information is known to have been published for this area, with the exception of regional scale geologic maps. No previous mineral investigations are known for this remote area.

Geology and Mineralization

The Mount Van Wagenen area lies in the Coast Range Plutonic complex. The region has been only recently deglaciated, and numerous active valley and cirque glaciers are nearby. Bedrock in the area is predominantly massive, equigranular quartz monzonite.

Rocks of interest in this area were confined to discontinuous zones of iron-stained quartz monzonite which may contain minor fuchsite. No ore minerals were noted in these zones. The fuchsite bearing quartz monzonite assayed high in silver. This precious metal enrichment is thought to represent shear-controlled vein mineralization, even though no distinct continuous shear zones were identified.

Bureau Investigations

The quartz monzonite in the vicinity of Mount Van Wagenen was briefly investigated by the Bureau in 1986. A 1-foot chip sample taken of quartz monzonite, which contained small amounts of a green micaceous mineral presumed to be fuchsite, contained significant silver values. This sample (fig. E-4, No. 1, sample 7700) assayed 11 ppm silver, 11 ppm arsenic, 110 ppm lead, and 100 ppm tin. No additional mineralization was noted in this vicinity. Appendix E-1 gives the complete analytical results for samples collected in the Mount Van Wagenen area.

Recommendations

No previous exploration or prospecting activity is known for the area, and the Bureau did not do any field follow-up on the results of the 1986 sampling. Additional field work is warranted in the fuchsite-bearing quartz monzonite rocks in order to fully explain and understand the significant metal values shown by sample 7700.

Klondike Highway Area

Introduction and Previous Work

This area is defined by the Alaska portion of the Klondike Highway corridor (figs. E-1, E-4, and E-5). The Klondike Highway connects Skagway with British Columbia, Canada. The road follows the Skagway River, paralleling the White Pass and Yukon Route for much of the railway's path to the border. This transportation corridor was likely prospected during the gold rush days of the region; however no significant mineral activity is known to have taken place. No known workings are present in this area.

Geology and Mineralization

This area consists of Cretaceous or older migmatitic orthogneiss, late Cretaceous or older nonmigmatitic orthogneiss, late Cretaceous porphyritic granite and Eocene granodiorite and granite (*E-2*). These rocks are part of the Coast Range Plutonic complex. Bands of paragneiss and schist crop out with the orthogneiss but are volumetrically of minor importance. These metasedimentary rocks are likely preserved as roof pendants. Narrow gold-bearing quartz-calcite veins were located in a road cut near the international boundary. These veins are emplaced in shear joints in unaltered granodiorite. Examinations of outcrops along the Klondike Highway showed no alteration or porphyry-type mineralization to be present in the granitic rocks in this part of the Coast Range Plutonic complex.

Bureau Investigations

Bureau work along the Klondike Highway consisted of examining the readily accessible outcrops of the various plutonic and metamorphic rock units. These investigations were undertaken along the highway corridor from the international boundary, south toward the city of Skagway.

Several quartz veins were noted which are emplaced along shear joints in unaltered granodiorite. These veins crop out in a road cut along the western side of the Klondike Highway, near the international boundary. The veins are narrow (0.5–4.0 inches thick) and composed of quartz and calcite. Sulfide minerals present in the veins include galena, chalcopyrite, and trace pyrite. A sample (fig. E–5, No. 12, sample 7742) collected from the more prominent quartz-calcite vein (4 inches thick) assayed 200 ppm silver, 23.0 ppm gold, 180 ppm lead, and 310 ppm zinc. Another sample (fig. E–5, No. 9, sample 8442), from a similar vein, assayed 70 ppm silver, 2.6 ppm gold, 33 ppm lead and 40 ppm zinc. No visible gold was noted under binocular microscope examination of the vein material. Vein morphology and sulfide mineral texture suggest that mineralization is from open space filling.

A traverse through the area to the west of the outcropping veins yielded little information. A thick mantle of alpine vegetation covers much of the granodiorite outcrops. Several narrow quartz veins which follow similar trends to the mineralized one exposed along the highway were noted and sampled. However these veins contained no sulfide mineralization and sampling yielded no significant metal values. No additional significant veining or mineralization was noted by the Bureau in this area.

Recommendations

The gold-bearing quartz veins are of interest. However, their small size and variable grade make them difficult exploration targets. Furthermore, the general geology of the Klondike Highway area is unfavorable for hosting precious metal deposits of significant size. Therefore, this area should not be a high priority for further mineral investigations.

Inspiration Mine

Introduction and Previous Work

The Inspiration Mine is located on the east side of a north-trending ridge at an elevation of approximately 3,300 feet. This north-trending ridge separates the Klondike Highway from the White Pass and Yukon Route, several miles south of the international boundary (figs. E–4 and E–6).

The discovery date of the Inspiration Mine is uncertain. Most likely the mine was discovered in the mid 1920's. The property was intermittently worked until the late 1930's, when it was abandoned. A trial shipment of 18 tons was reportedly shipped to a smelter on the west coast of the contiguous United States. This shipment assayed 3.05 ounces/ton silver, 7.65% lead, and 6.2% zinc (*E–21*). It is likely that this shipment was hand-cobbed and not representative of the grade of the overall mine. Except for property examinations no work is known to have taken place on the property after abandonment in 1938. However, in 1988 several local prospectors were reported to have restaked the area.

Upper workings at the property consist of one inclined shaft, one vertical shaft, an open-cut, and a 165-foot adit. The inclined shaft is reported to be 52 feet deep and the vertical shaft 20 feet deep (*E–15*). The adit has one 25-foot-long drift. The shafts are flooded. A lower adit, approximately 200 feet below the main workings, is reported to be 35 feet long (*E–21*). This adit was not accessible when the Bureau investigated the area. Numerous small prospect pits and trenches are present along the strike of the main zone of mineralization (at the mine). None of these excavations seem to have intersected any significant mineralization.

Geology and Mineralization

Mineralization at the Inspiration Mine is contained within several skarn zones in sheared Clifton Granite (compositionally a diorite at this location). The Clifton Granite is the youngest granitic rock in the Skagway area (U-Pb zircon age of 48 Ma), fine grained, leucocratic, and pink to buff in color (*E–2*). The granite locally contains miarolitic cavities, which likely indicate shallow emplacement (*E–2*). The skarn zones are developed along sheared limestone within the Clifton Granite. This limestone has been preserved in the Clifton Granite as a narrow, shear-controlled roof pendant. Three main splays of this shear zone occur at the Inspiration. These strike from 360° to 040° and dip steeply to the east to vertical. All of the skarn mineralization at the old workings is spatially related to the various shear zones. No mineralization is noted in the diorite.

Bureau Investigations

Bureau work at the Inspiration Mine consisted of mapping and sampling the one open adit on the property.

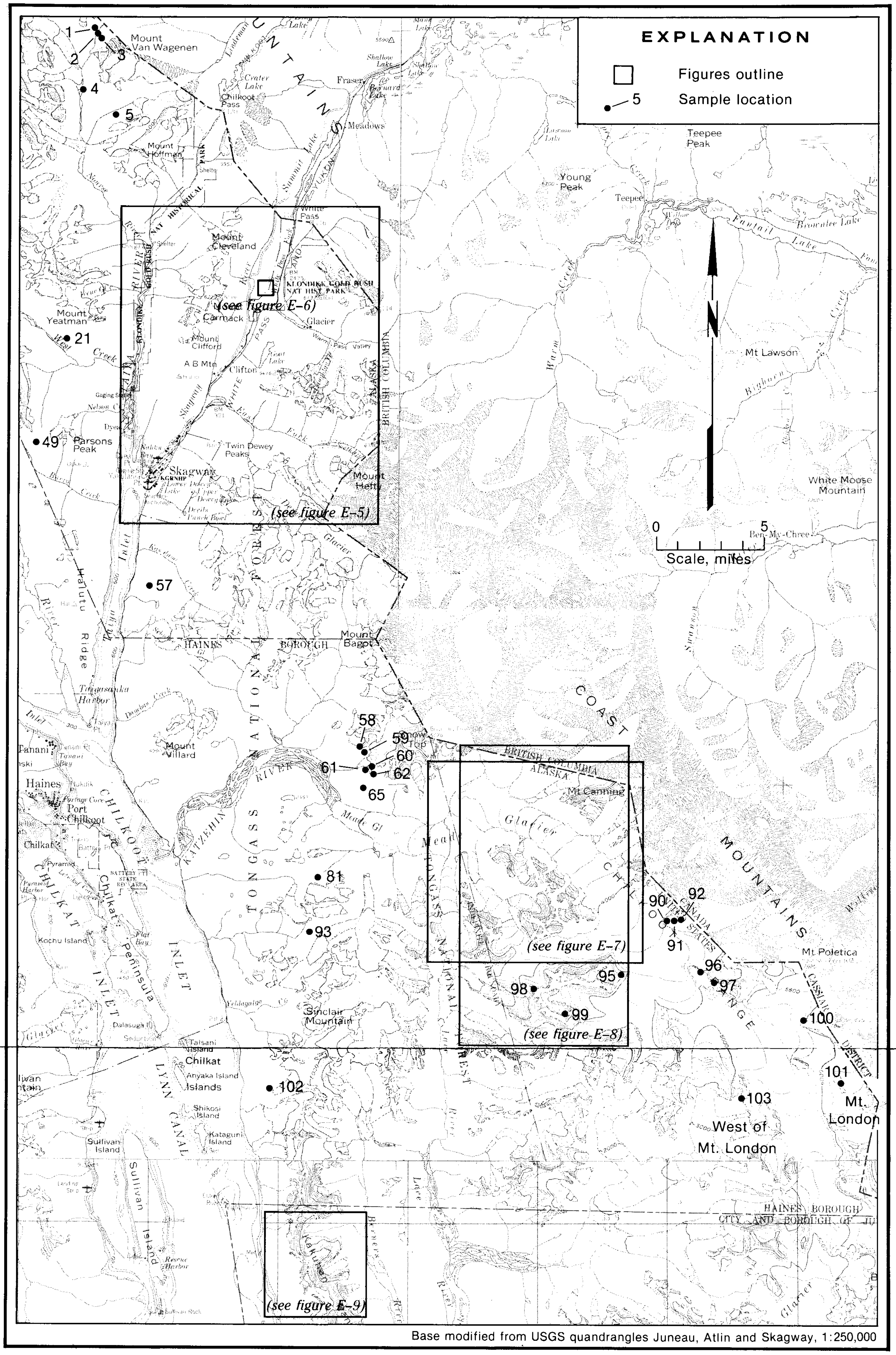

Figure E-4. — Northern portion of Coast Range subarea, sample location map.

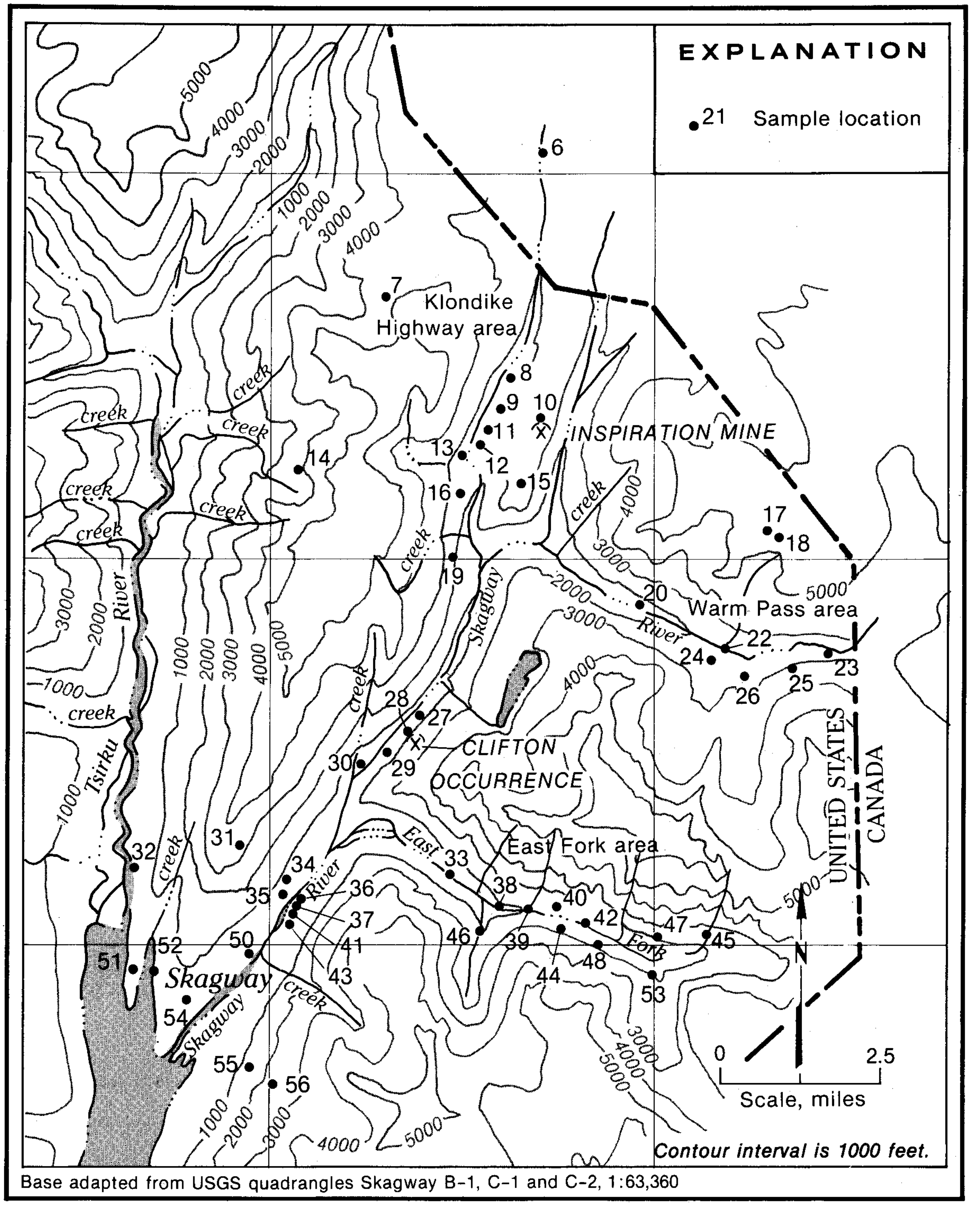

Figure E-5.—Sample locations for Klondike Highway, Warm Pass, Clifton, Skagway River, and East Fork areas.

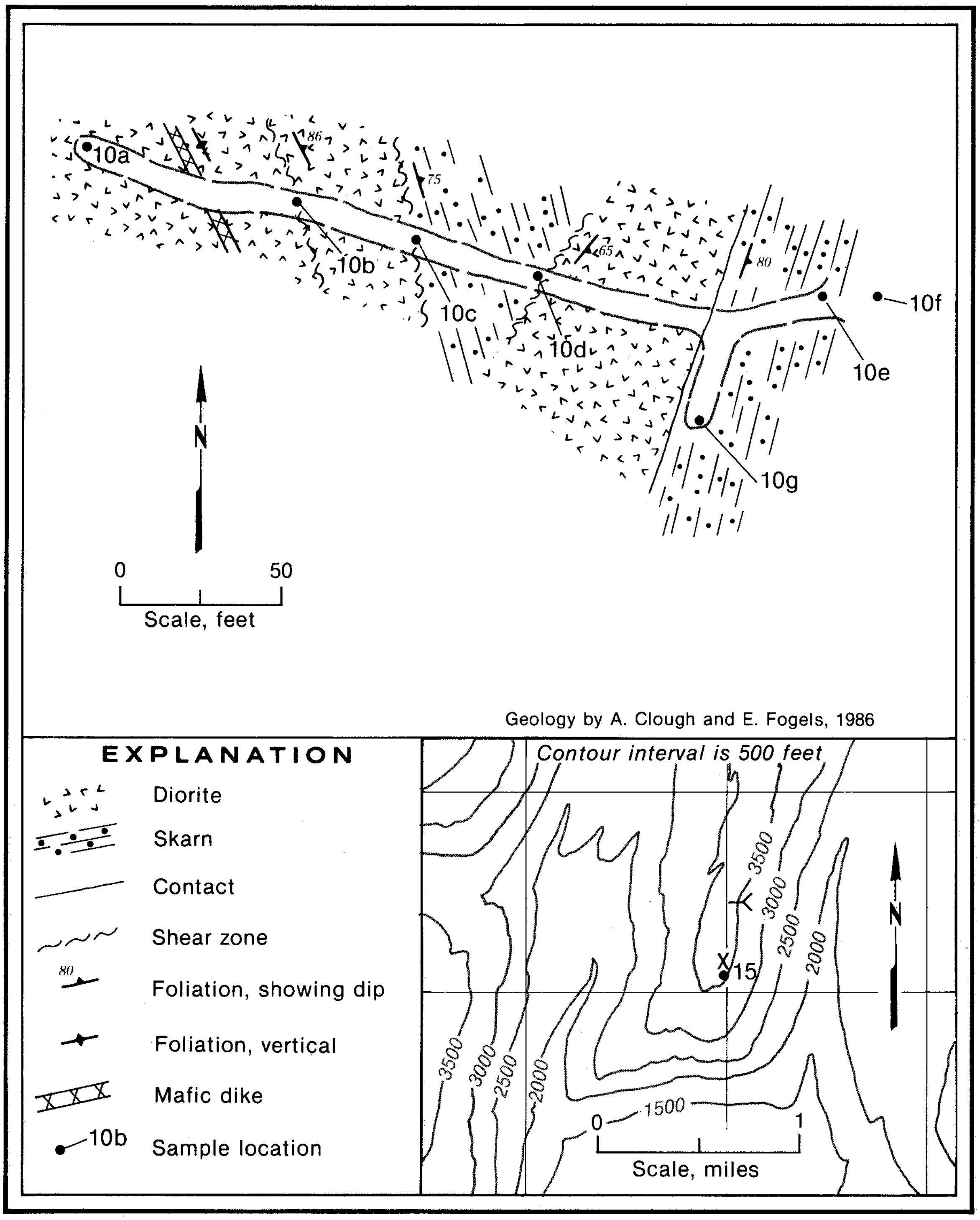

Figure E-6.—Inspiration Mine, showing geology and sample locations.

Traverses were also conducted on the surface along and across the strike of the main workings. Sample locations are shown on the adit map, (provided in figure E-6) and on figure E-5. Bureau sample results showed all of the mineralization to be confined to the skarn zones, with no enrichment in the unaltered diorite. Specimens collected from the dumps at the main workings were better mineralized than anything sampled in the main adit. Sample 7662, the best one collected by the Bureau (fig. E-6, No. 10f), a composite sample from the mine dump, assayed 27 ppm silver, 1,500 ppm copper, >0.4% lead, 660 ppm tin, and 2.4% zinc. Other Bureau samples collected in the mine assayed with values of interest. Sample 7663, a 4-foot chip, (fig. E-6, No. 10e) assayed 280 ppm lead, 82 ppm tin, 270 ppm tungsten and 550 ppm zinc. Sample 7683, a 6-foot chip, (fig. E-6, No. 10c) assayed 300 ppm lead, 38 ppm tin, and 350 ppm zinc. Sample 7684, a 5-foot chip, (fig. E-6, No. 10d) assayed 1,000 ppm lead, 46 ppm tin, and 1,100 ppm zinc. Sample 7685, a 5-foot chip, (fig. E-6, No. 10g) assayed 75 ppm copper, 7,200 ppm lead, 360 ppm tin, and 2,400 ppm zinc.

It is interesting that the sample collected from the mine dump assayed higher grade than any rocks sampled underground. One explanation for the higher-grade dump values is that the better mineralization had been encountered in the shafts (currently water filled). Bureau workers also examined the main Inspiration shear along and across strike. No additional skarn zones were located aside from the one at the main workings. Several prospect pits were sampled at the south end of the shear exposure (figs. E-5 and E-6). These pits are located in sheared diorite. Results of this sampling at the pits were discouraging.

Recommendations

The likelihood of developing significant tonnages of mineralization at the Inspiration Mine is low. This is because no mineralized skarn was located along strike. Similarly, the back of the 165-foot adit is in barren diorite, showing that no additional mineralization was found across strike either.

Potential may exist for a small-tonnage, high-grade, precious metal skarn deposit at the Inspiration Mine. Dewatering and entering the shafts, as well as opening the lower adit would be necessary in order to test this potential. Unless sufficient grade could be developed in silver and gold credits the deposit is not likely worthy of further attention. Potential does exist for additional skarn zones in the vicinity of the mine, along similar shear trends. Searching for these types of deposits would be difficult due to their likely small size (using the Inspiration Mine as the local model), and lack of associated alteration to guide exploration efforts.

Unless a roof pendant exists with sufficient size to contain large tonnages, or high-grade silver-gold chutes can be located, the area is not recommended for further investigations.

Warm Pass, East Fork, and Clifton Areas

Introduction and Previous Work

The Warm Pass, East Fork, and Clifton areas are located north of the city of Skagway, along the Skagway River and its tributaries (figs. E-4 and E-5). These areas were undoubtedly prospected during the early gold rush days of Skagway. Furthermore, the immediate Skagway region was prospected for uranium-thorium mineralization during the 1950's. The scattered exploration and prospecting activity resulted in the discovery and location of both molybdenite and uranium-thorium mineral occurrences.

The mineral potential of the Warm Pass and East Fork areas (fig. E-5) was totally unknown at the start of this investigation. Therefore the ADGGS collected stream sediment and pan concentrate samples from both areas to develop some background data for use in mineral investigations.

The Clifton molybdenite occurrence (fig. E-5) was initially discovered in 1915, with the latest assessment work being filed in 1969. Early work on the Clifton occurrence, completed by 1916, consisted of sinking a 10-foot shaft and developing a 25-foot adit (*E-6*). Additional development work in 1917 extended the shaft to 15 feet and the adit to 30 feet (*E-20*). No other development work seems to have been done in the area since 1917.

Numerous uranium-thorium claims were staked in the vicinity of Skagway during the 1950's. The only development work associated with these prospects consists of trenches, pits and several short adits.

Geology and Mineralization

The Clifton Granite is the youngest in the Skagway region, dated at 48 Ma at Clifton (*E-2*). Molybdenite mineralization is patchy in the Clifton Granite, whose composition ranges from alaskite to granite with diorite also being a common phase (at the Inspiration Mine). Veinlets of aplite and pegmatite are sparsely distributed in the Clifton Granite near the Clifton railroad siding (*E-2*), (figs. E-4 and E-5). Furthermore, miarolitic cavities occur within the rock near the Clifton railway siding and are interpreted as indicating shallow depth of emplacement (*E-2*). In addition to the mineralization at

Clifton, an extensive area of anomalous molybdenite enrichment has been identified surrounding the Clifton occurrence (*E-9, E-10*).

The uranium-thorium occurrences in and near Skagway are reported to be associated with altered rhyolite, which has been sheared to allow uranium-bearing solutions avenues of emplacement and migration (*E-7*). No age dates are known for these rhyolites, though they certainly postdate the youngest plutonic rocks in the area (Clifton granite, 48 Ma).

Bureau Investigations

Bureau investigations in the Clifton area were brief. Three rock samples were taken, the best mineralized, a select sample, (fig. E-5, No. 27, sample 7695) that assayed 210 ppm molybdenum. The Bureau, assisted by the ADGGS, also collected stream sediment and pan concentrate samples from the East Fork and Warm Pass Creeks. Many of these pan concentrate samples returned with high values of both uranium and thorium. Sample 7726 (fig. E-5, No. 23), from Warm Pass Creek, assayed 510 ppm thorium and 133 ppm uranium. It is likely the uranium and thorium are being weathered from rhyolite dikes in the region and concentrated in the alluvial environment, thus accounting for the significant pan concentrate values.

Recommendations

The widespread nature of molybdenum enrichment in the Warm Pass, Clifton and East Fork areas indicate these areas have potential for hosting significant molybdenum deposits. Therefore, continued molybdenum exploration is warranted in these areas. Though high uranium-thorium values were reported for these areas, the occurrences are most likely not significant due to their small size.

Mount Canning Area

Introduction and Previous Work

The Mount Canning area lies in the upper Meade Glacier drainage (figs. E-4 and E-7). No detailed geologic mapping exists for this area. It is listed as "unmapped" in the most recent regional geologic compilation for the area (*E-4*). Bureau investigators were drawn to this area by highly visible color anomalies noted from the air. This area was investigated by the Bureau in 1986. No previous work is known for this area.

Geology and Mineralization

Bedrock geology of the Mount Canning area consists of high-grade schist and gneisses with local quartzite, chert, and quartz veins. Sulfide-rich lenses and pods of skarn material were noted in many of the metamorphic rocks in the Mount Canning area. These skarn zones were infolded into the schist of the area. A regionally extensive gray-weathering marble also crops out in the Mount Canning area, along with granitic rocks. The contact relations between the gray marble and the granitic rocks are unknown. However, the presence of the intrusive and carbonate rocks in the Mount Canning area make the region favorable for skarn mineralization.

Bureau Investigations

Because much of the area is very steep and snow covered Bureau work in the Mount Canning area consisted of a brief examination of the geology, augmented by the collection of rock samples. Bureau sampling produced significant values in gold, silver, and tungsten. Sample 7651 (fig. E-7, No. 71) a 5-foot chip sample from an epidote skarn, assayed 0.660 ppm gold, 52 ppm copper, 530 ppm tungsten, and 130 ppm zinc. Sample 7749 (fig. E-7, No. 72) a 4-foot chip sample of biotite gneiss, assayed 0.840 ppm gold, 250 ppm copper, 400 ppm tungsten, and 110 ppm zinc. Sample 8407 (fig. E-7, No. 74) a 20-foot composite chip sample from a quartzite, assayed 14 ppm silver, and 1.0 ppm gold. Sample 7690 (fig. E-7, No. 75) a 2-foot select sample of chert, assayed 0.110 ppm gold and 32 ppm lead. Sample 8408, a 5-foot chip, (fig. E-7, No. 76) assayed 38 ppm silver, 0.430 ppm gold, and 18 ppm lead.

Recommendations

Bureau investigations in the Mount Canning area were confined to the more accessible areas. Due to the high metals values found in the samples additional mapping and detailed sampling for precious metal skarn deposits is warranted in this little-explored area. Regional scale geologic mapping should be undertaken to accurately locate the intrusive and carbonate rock contacts in order to define possible areas of potential skarn mineralization.

Mount Leland Area

Introduction and Previous Work

The Mount Leland area is located in the upper Meade Glacier, approximately 10 miles east of the terminus of the glacier (figs. E-4 and E-7). This area contains

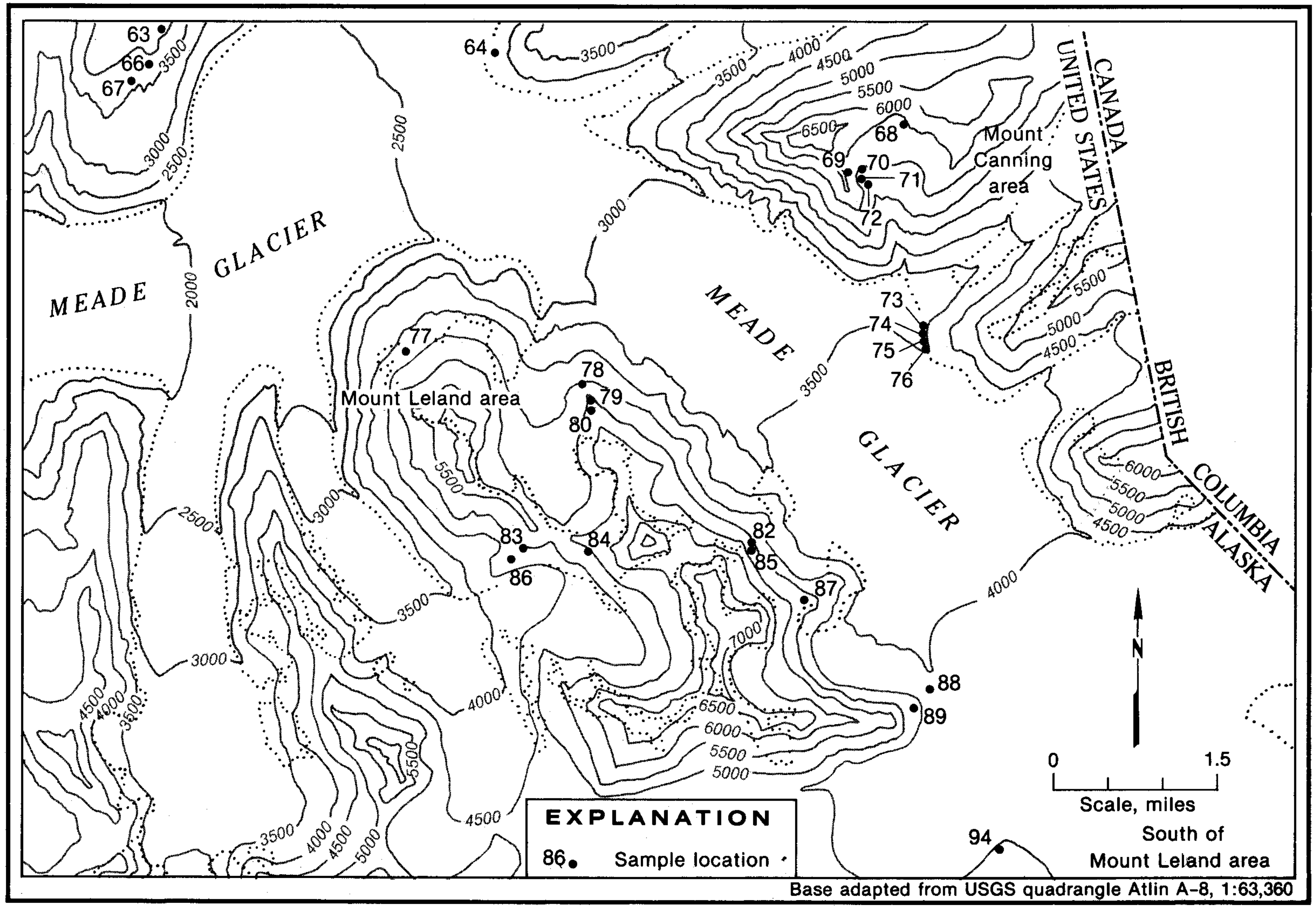

Figure E-7.—Sample locations for Mount Leland, Mount Canning, and south of Mount Leland.

ultramafic and mafic rocks which crop out in three distinct zones, the largest of which is located on the Mount Leland massif (fig. E-8).

No exploration activity is recorded for this region. However, several cairns and shallow pits are present at the northern exposure, north of the Meade Glacier, which suggest at least some previous activity in the area. These pits, now sloughed, but likely initially several feet deep, were dug in serpentinized peridotite and expose no mineralization. Also, at the main exposure of ultramafic rocks on the western flank of Mount Leland, a survey station was noted that likely dates to the Boundary Survey in the 1940's.

Geology and Mineralization

The mafic-ultramafic rocks which crop out in this area were first described by the USGS in 1984 (*E-12*). Himmelberg and others located exposures of peridotite which crop out discontinuously along an approximately 16-mile by 5-mile northwest-trending belt (fig. E-8) (*E-12*). Himmelberg and others describe both tectonized and nontectonized ultramafic rocks along this discontinuous tend.

During the JMD study Bureau investigators mapped the outcrop exposures of this discontinuous belt (fig. E-8). The age of this mafic-ultramafic body is most likely constrained between late Triassic and 65 Ma. Rock types present in the body include layered peridotite, layered dunite, and layered wehrlite. Hornblende-plagioclase-clinopyroxene and hornblende-clinopyroxene-magnetite veins along with pegmatite dikes cut the peridotite (*E-11*). The tectonized and nontectonized mafic and ultramafic rocks are thought to be part of the same intrusion (*E-11*).

Mineralization noted in the mafic-ultramafic body consists of discontinuous chromitite bands up to several inches thick along with blebs of pyrrhotite and rare chalcopyrite. Malachite staining was locally noted along overhanging ledges.

Bureau Investigations

Bureau of Mines investigations in the Mount Leland area consisted of mapping the boundaries of the mafic-ultramafic complex and taking selected rock samples throughout the complex. A substantial amount of the mapping was done from the air due to the inaccessible nature of the terrain in the Mount Leland area.

Samples were collected from various sites throughout the area, with special attention being given to areas of chromitite bands. A group of selected samples were also analyzed for PGM with negative results. These PGM samples were analyzed using instrumental neutron activation analysis techniques. Bureau work was conducted in the 1986 and 1987 seasons, and scheduled for late in the year to minimize the effects of snow cover.

Rock samples collected by the Bureau in the Mount Leland area show the mafic-ultramafic complex to be enriched in cobalt, copper, chrome, and nickel. Sample 7780, a 5-foot chip, (fig. E-7, No. 82), from a serpentinite, assayed 110 ppm cobalt, 3,000 ppm chrome, and 1,300 ppm nickel. Sample 8087, a 6-foot chip, (fig. E-7, No. 86) from a pyroxenite, assayed 110 ppm cobalt, 3,700 ppm chrome, and 1,700 ppm nickel. Sample 8433, a 10-foot chip, (fig. E-7, No. 88), from a pyroxenite, assayed 100 ppm cobalt, 3,100 ppm chrome, and 1,600 ppm nickel. Sample 7692, a 4-foot chip, (fig. E-7, No. 85), from a pyroxenite assayed 100 ppm cobalt, 860 ppm chrome, 3,200 ppm copper and 800 ppm nickel.

In general terms, Bureau work did not locate any significant mineralization. However, as shown, several samples contained significant metal values. It is important to note that the terrain in the Mount Leland area is severe and also that most of the mafic-ultramafic rocks in the area are intensely serpentinized. The terrain and serpentinized nature of the mafic-ultramafic rocks make field examinations very difficult.

Recommendations

Noteworthy is that elsewhere in Southeast Alaska mafic-ultramafic complexes host significant PGM, gold, and copper-nickel mineralization. The mafic-ultramafic rocks in the Mount Leland area have similar potential.

Geologic mapping and detailed sampling needs to be done across the mafic-ultramafic complex along several lines. Data from these transects would be part of a systematic study to accurately investigate the potential for any mineralization associated with the mafic-ultramafic complex. Due to the possibility of this complex containing deposits of high unit value along with critical and strategic commodities (chrome and PGM) such studies are warranted.

South of Mount Leland Area

Introduction and Previous Work

This area is located along the northern flank of a small nunatak exposed on the southern flank of the unnamed glacier south of Mount Leland (figs. E-2, E-4, and E-7). Outcrops exposed in this area were investigated due to a subtle color anomaly observed from the air while working in the Mount Leland area. The South of Mount Leland area is probably not exposed during each ablation season. No previous work is known for this area.

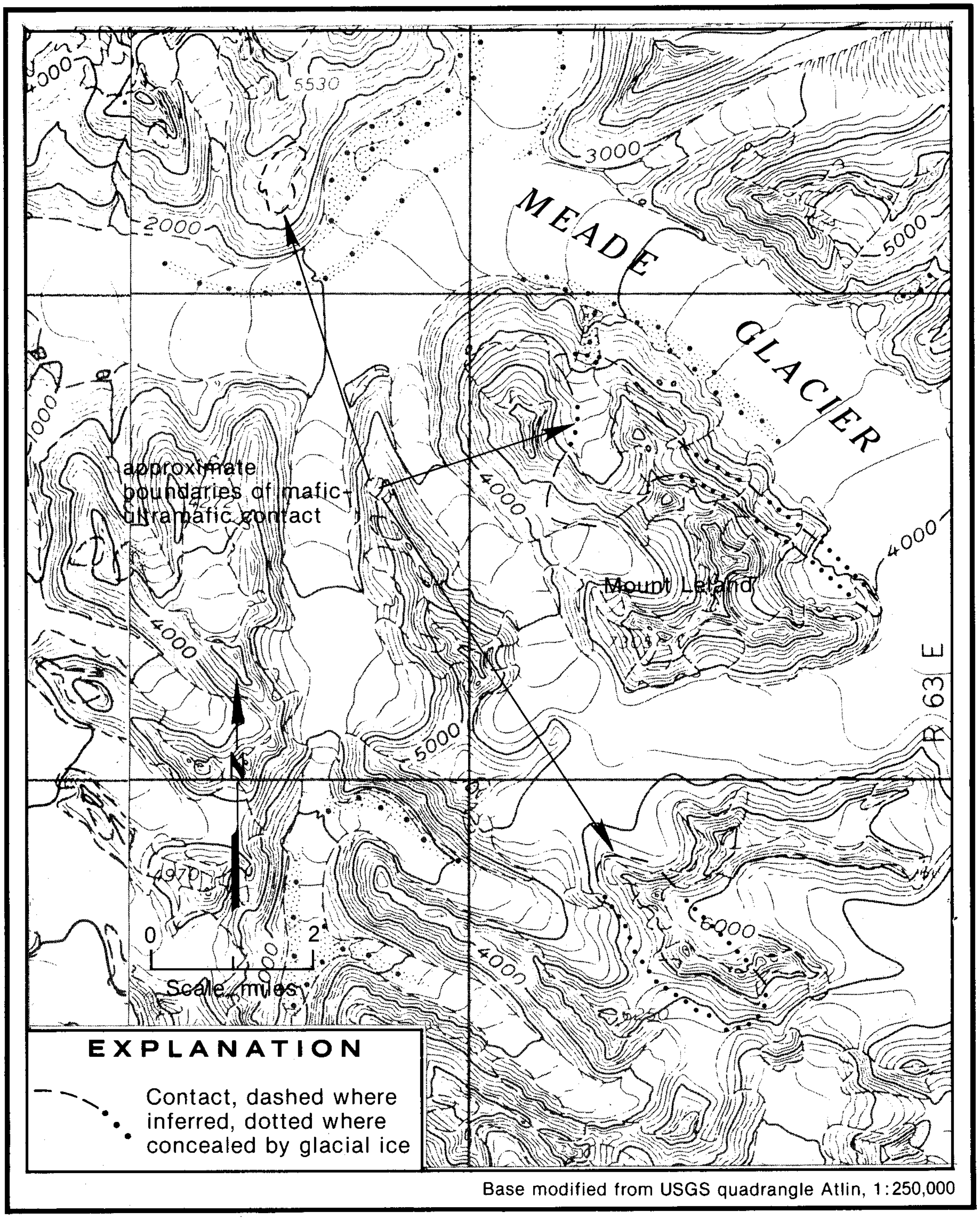

Figure E-8.—Outcrop map of mafic-ultramafic rocks near Mount Leland.

Geology and Mineralization

The South of Mount Leland area is shown as unmapped on the regional geologic map (*E-4*). Bureau investigations in this area revealed a contact between mafic to felsic volcanic and black argillic rocks. Narrow and discontinuous quartz veins are noted near the contact. The quartz veins both parallel and crosscut the regional foliation. Noteworthy are pods of massive sulfide consisting predominantly of pyrite and pyrrhotite. The podiform sulfide occurrences approximate the regional foliation. Individual sulfide pods are up to 3 feet long and average several inches in thickness.

Bureau Investigations

Bureau investigators collected samples of the mafic volcanic rocks, sulfide pods, quartz veins, and argillite in the South of Mount Leland area. Select samples of the massive sulfide pods yielded the highest metal values. Sample 8437 (fig. E-7, No. 94) a 1-foot select sample of massive pyrite and pyrrhotite, assayed 140 ppm arsenic, 0.090 ppm gold, 170 ppm chrome, 870 ppm copper, and 7 ppm tungsten. Sample 8438 (fig. E-7, No. 94) a 1-foot select sample of massive pyrite and pyrrhotite, assayed 130 ppm arsenic, 0.020 ppm gold, 440 ppm chrome, 460 ppm copper, and 20 ppm tungsten.

Bedrock exposures at the South of Mount Leland site are poor, consisting predominantly of rubbly outcrops covered by mud. These outcrops were barely exposed through recently melted firn at the time of the Bureau visit.

Recommendations

The assay values obtained from the initial sampling effort at the South of Mount Leland area are interesting. Therefore, detailed mapping and sampling is suggested for this little understood and exposed area. This can only be accomplished late in the ablation season and in years of moderate winter snowfall.

West of Mount London area

Introduction and Previous Work

This area lies approximately 5 miles to the west of Mount London (fig. E-4) in a very remote portion of the northern Juneau Icefield. This area is on a prominent bluff overlooking icefalls which flow into the Antler River (fig. E-4). Because of this remote location, Bureau investigations in this area were very limited. No previous work is known for this area, nor is anything published on its geology or mineralization.

Geology and Mineralization

Bedrock exposures at this site consist of massive, fine-grained diorite which is highly frost shattered. The diorite is cut locally by steeply dipping, equally frost shattered felsic (aplitic) dikes. These dikes contain conspicuous pyrite along with hematite boxworks. The fine-grained diorite is not altered or obviously mineralized. This area is shown as unmapped on the most recently published regional geologic map (*E-4*).

Bureau Investigations

Bureau investigations consisted of collecting a rock sample of the best exposed and accessible felsic dike in the area. Sample 7909, a 1-foot select sample, (fig. E-4, No. 103) taken from the felsic dike, assayed 13 ppm silver, 44 ppm arsenic, 23.0 ppm gold, 160 ppm copper, 500 ppm lead, and 710 ppm zinc. Bureau investigations in this remote area were limited to a several-hour examination of the most accessible sites. No additional sampling or geologic investigation were conducted.

Recommendations

The unaltered fine-grained diorite in the West of Mount London area is not of great interest. However, the felsic dikes which contained the high metal values require further study. Additional mapping and sampling of the felsic dikes in this area is recommended.

Kakuhan Range Area

Introduction and Previous Work

The Kakuhan Range lies to the north of Berners Bay, forming the topographic divide between Lynn Canal and the Berners River (figs. E-1, E-4, and E-9). Investigations were initiated by the Bureau because the Kakuhan Range contains (at least in part) the same stratigraphy as the northern portion of the Juneau Gold Belt (*E-4*).

The southern portion of the Kakuhan Range was undoubtedly prospected while the Comet, Kensington, and associated mines and prospects were active in the early 1900's. More recently, Placid Oil Company staked several claims in the vicinity of Bureau sample sites 108, 109 and 110 (fig. E-9). It is not known whether these claims have been kept current by the Kensington Joint Venture since it was formed by Echo Bay Mines and Coeur d'Alene Mines in 1987.

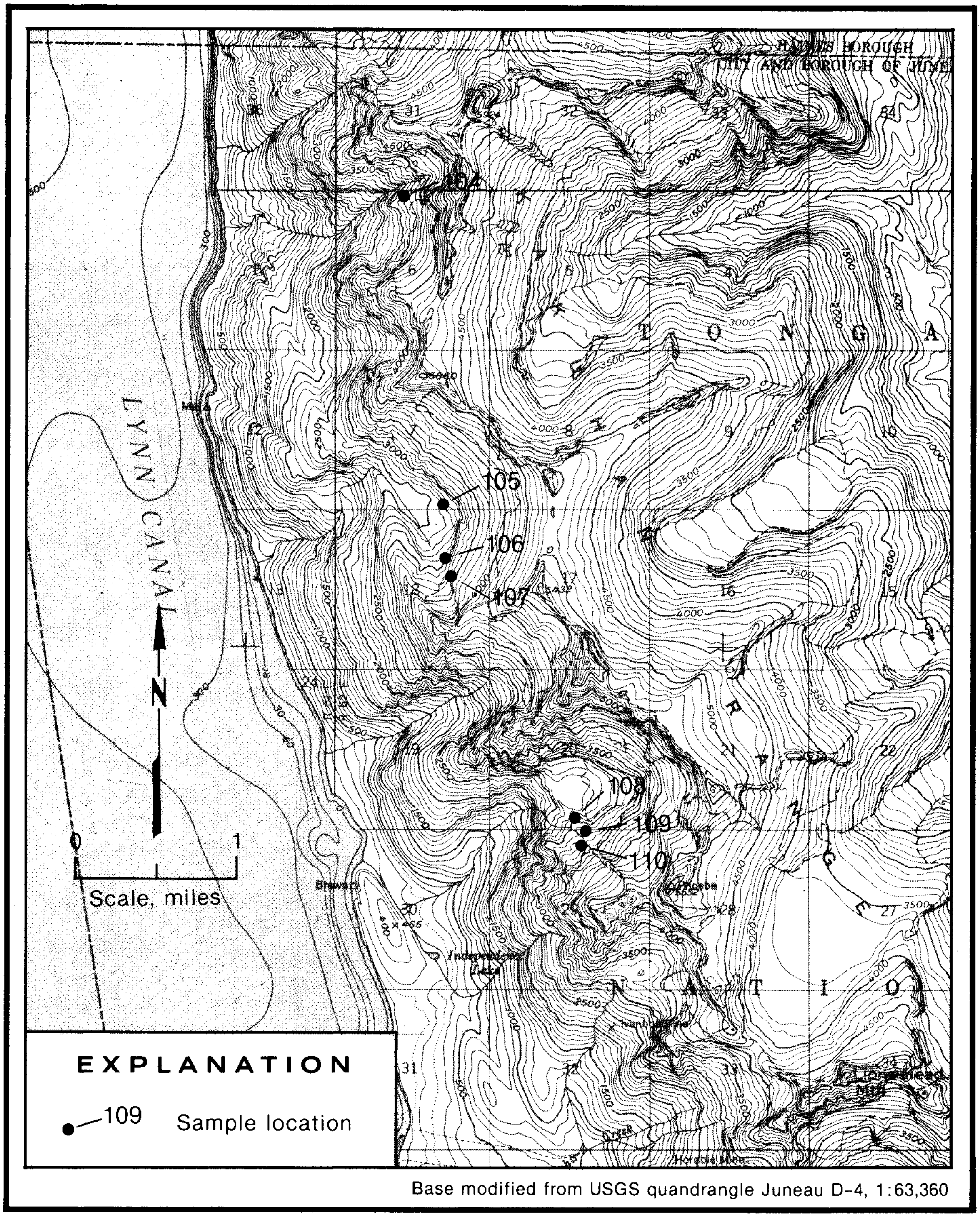

Figure E-9.—Sample locations for Kakuhan Range area.

Geology and Mineralization

Bedrock in the Kakuhan Range consist of north-northwest striking, steeply-dipping to overturned metasedimentary and metavolcanic rocks. These rocks are mapped as undifferentiated and thought to be Mesozoic in age (*E-8*). The eastern and northern parts of the Kakuhan Range are composed predominantly of gneisses and high-grade schists of the Coast Range Plutonic complex. To the east, granitic rocks predominate. The eastern portion of this area has no published geologic mapping available (*E-4*, *E-8*). The Mesozoic metamorphic rocks contain quartz vein and massive and disseminated sulfide mineralization. The known mineral occurrences are small, isolated, and discontinuous. No mineralization or alteration is known within the granitic rocks, gneisses or high-grade schists.

Bureau Investigations

The Bureau made several trips into this area during the 1986 and 1987 field seasons. Bureau investigations concentrated on sampling areas with favorable geology for vein mineralization. An effort was made to time Bureau investigations late in the ablation season to maximize the available outcrop. Bureau work was hampered by poor weather, steep terrain, and persistent heavy snow packs during both seasons.

During the 1986 season several samples were taken from quartz-calcite veins and calcite breccias located in a high cirque (figs. E-4 and E-9). This cirque (fig. E-9) is located several miles to the northwest of the Kensington Mine.

A 1-foot channel cut across a quartz-calcite vein in metavolcanic rocks (fig. E-9. No. 108, sample 7664) assayed 50.0 ppm gold, 490 ppm copper, 70 ppm lead, and 14 ppm tungsten.

Recommendations

Geologic investigations and analytical results show that high-grade precious metal mineralized quartz veins exist to the north of the Kensington area. The remote nature of the cirque where the high gold values were obtained makes it likely that this part of the Kakuhan Range has not be exhaustively prospected and explored. Therefore, this remote part of the Coast Range area is recommended for further reconnaissance exploration efforts.

Persistent snow cover over the course of the JMD study precluded further Bureau investigations in the Kakuhan Range area. This same snow situation indicates that exploration efforts should be timed for late in the summer and early fall to maximize outcrops available for examination.

Other Occurrences in the Northern portion of the Coast Range Subarea

Bureau investigations in the northern portion of the Coast Range subarea resulted in the collection of selected rock samples from sites which have no other data available. Some of these samples contained significant metal values. Because of the lack of data these samples are not individually discussed in the text of this report. The information of these samples is confined to the analytical data. These data are located in appendix E-2 of this report. Sample locations are given in the various figures from the northern part of the Coast Range subarea.

SOUTHERN PORTION OF THE COAST RANGE SUBAREA

Boundary Creek Area

Introduction and Previous Work

The Boundary Creek area is located to the north of Taku River and south of the Juneau Icefield (figs. E-1, E-11, and E-12). Boundary Creek flows from north to south and occupies an impressive hanging valley. Aside from snow cover and glacial ice, outcrops in the upper reaches of Boundary Creek are extremely well exposed. Due to the remote location and hanging valley nature, the only timely access to Boundary Creek is by helicopter.

Molybdenite mineralization was first reported in the Boundary Creek area (fig. E-12) by the USGS in 1967 (*E-3*). Later investigations by the USGS located other molybdenum mineralization in the Boundary Creek area which has been termed the Boundary Creek II occurrence (*E-14*).

Aside from the regional geologic investigations by the USGS which located the Boundary Creek and Boundary Creek II occurrences, no additional work is known for this area.

Geology and Mineralization

Molybdenite at the Boundary Creek and the Boundary Creek II occurrences is contained within Tertiary or younger intrusives (*E-3*, *E-14*). These plutons are part of the Coast Range Plutonic complex. Alteration in these mineralized areas is rare, commonly confined to silicification coincident with the observed mineralization. Though iron staining is common, as with the silicification, it seems to be associated only with observable mineralization, and due to weathering of accessory pyrite and pyrrhotite. Country rocks surrounding the Boundary

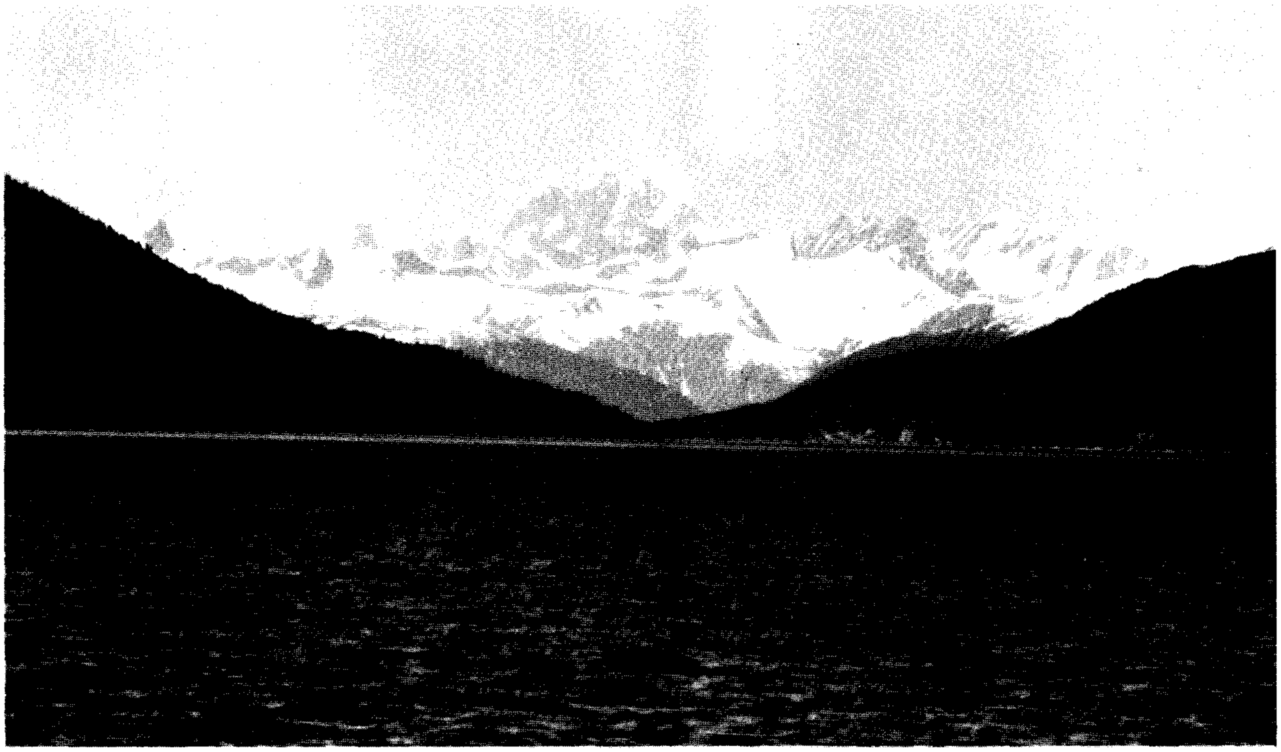

Figure E-10.—Photograph showing Taku Inlet and Coast Mountains, southern portion of Coast Range subarea.

Creek occurrences are predominantly granodiorite (*E-4*) and are likely older. Investigations by the Bureau show these older intrusive rocks to be unaltered and not mineralized.

The USGS located molybdenite with significant silver values in iron-stained granodiorite and aplite. These rocks are thought to be Tertiary in age, though no age dates have been published. Much of this mineralization is exposed on a steep glaciated face near the headwall of Boundary Creek valley (fig. E-12). Additional work by the USGS (*E-14*) also reported molybdenum mineralization along the divide between Boundary and Bacon Creeks. This mineralization, termed the Boundary Creek II occurrence, is contained in iron-stained alkali granite which is at least younger than 50 Ma (*E-14*). Molybdenite at this occurrence consists of fine- to coarse-grained flakes cropping out in an area approximately 330 feet square. This area is intensely iron-stained due to weathering of associated pyrite.

Bureau Investigations

Bureau investigations in the Boundary Creek area consisted of examining and sampling mineralized exposures in and near the vicinity of the known occurrences. The mineralization noted in both of these areas seems to be confined to relatively small, discrete areas within the host plutonic rocks. Bureau investigations conducted in 1987 suggest that some of the mineralization at the Boundary Creek II occurrence (*E-14*) may be related to miarolitic cavities in the granitic host rock.

Samples collected by Bureau geologists contained high metal values at both Boundary Creek occurrences. Interesting sample results from the original Boundary Creek occurrence are listed below. Sample 7888, a 3-foot select sample taken from a garnet skarn, (fig. E-12, No. 2) assayed 1,000 ppm molybdenum, 45 ppm copper, and 300 ppm zinc. Sample 7180, a 6-foot chip taken from an aplite dike, (fig. E-12, No. 3) assayed 260 ppm molybdenum. Sample 7893, a 2-foot select sample, (fig. E-12, No. 6) from a syenite, assayed 33 ppm copper, 57 ppm molybdenum, and 400 ppm tungsten. Sample 7894, a 4-foot select sample from a syenite (fig. E-12, No. 7) assayed 240 ppm molybdenum and 240 ppm tungsten. Sample 7172 (fig. E-12, No. 8), a float sample of siliceous alaskite, assayed 1.0% molybdenum and 30 ppm zinc. Samples obtained from the area of the Boundary Creek II occurrence also contained high metal values. Sample 7860 (fig. E-12, No. 9), a 5-foot chip from an aplite dike, assayed 0.200 ppm gold, 120 ppm copper, 170 ppm lead, and 270 ppm zinc. Sample 7861, a 5-foot chip from unaltered granodiorite (fig. E-12, No. 10) assayed

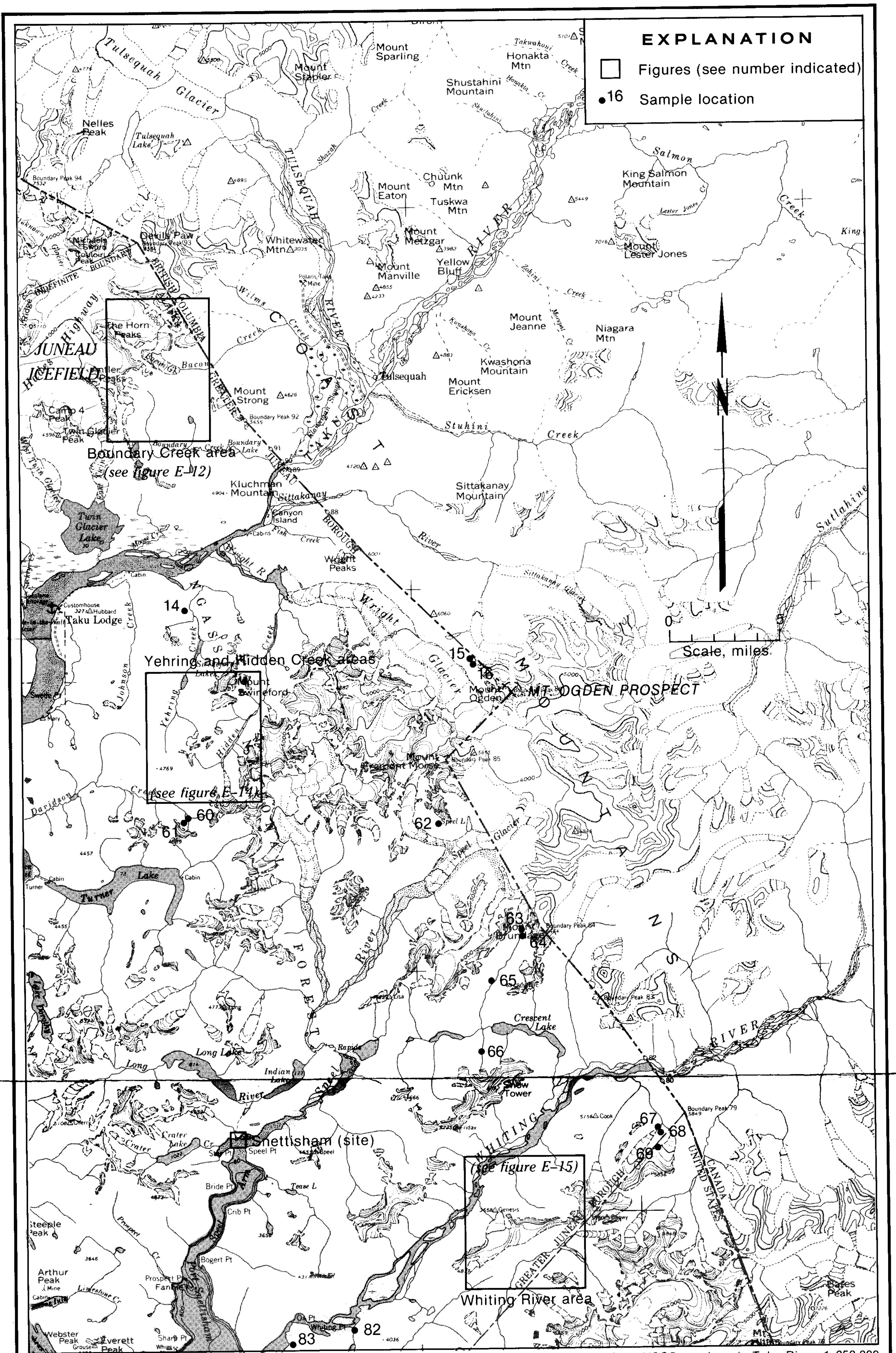

Figure E-11. — Southern portion of Coast Range subarea, sample location map.

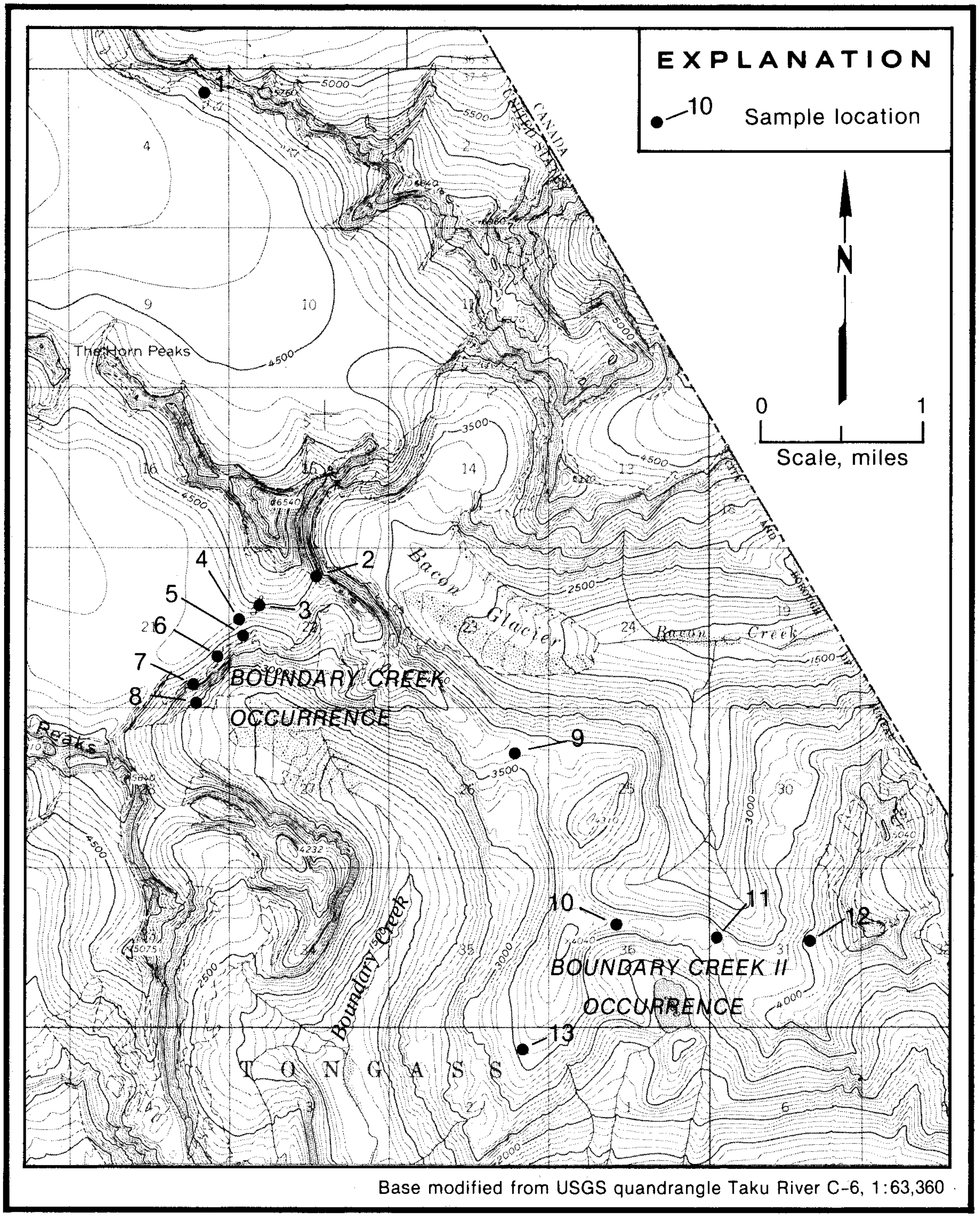

Figure E-12.—Boundary Creek area, sample location map.

Figure E-13.—Photograph showing Yehring Creek drainage and Swineford Lakes.

260 ppm molybdenum, 230 ppm lead, and 290 ppm tungsten. Sample 7867, a 2-foot chip from gossanous aplite, (fig. E-12, No. 12) assayed 380 ppm molybdenum and 110 ppm lead. Finally, sample 7866, a 4-foot select sample from alaskite (fig. E-12, No. 13) assayed 250 ppm silver, 0.210 ppm gold, 4,800 ppm molybdenum, and 1,600 ppm lead.

Several traverses were made in the vicinity of these mineral occurrences along with local spot helicopter landings to investigate the geology. No additional mineralization was noted during these efforts. Bureau investigations show that, as a rule, the granitic rocks in the Boundary Creek area are conspicuous for their lack of alteration and mineralization.

Recommendations

The Boundary Creek occurrences, as currently known, are thought to be fairly insignificant. However, the presence of molybdenite in this area may be used as evidence for metal enrichment in some of the Tertiary (younger) coast range plutons at this latitude within the Coast Range Plutonic complex. Therefore, the region is considered a favorable area for molybdenum exploration. Exploration should concentrate on the Tertiary or younger plutons, which are the host rocks for molybdenum mineralization throughout much of the Coast Range Plutonic complex.

Yehring Creek Area

Introduction and Previous Work

Yehring Creek is one of the prominent north-trending drainages in the southern portion of the Coast Range subarea. It flows from south to north into Taku River several miles east of Taku Lodge (figs. E-11 and E-14). Yehring Creek is contained within a hanging valley and is not navigable. No previous investigations, either public or private, are known for the Yehring Creek area. Indeed, the Yehring Creek area is shown as unmapped in the 1985 reconnaissance geologic compilation map of the region (*E-4*).

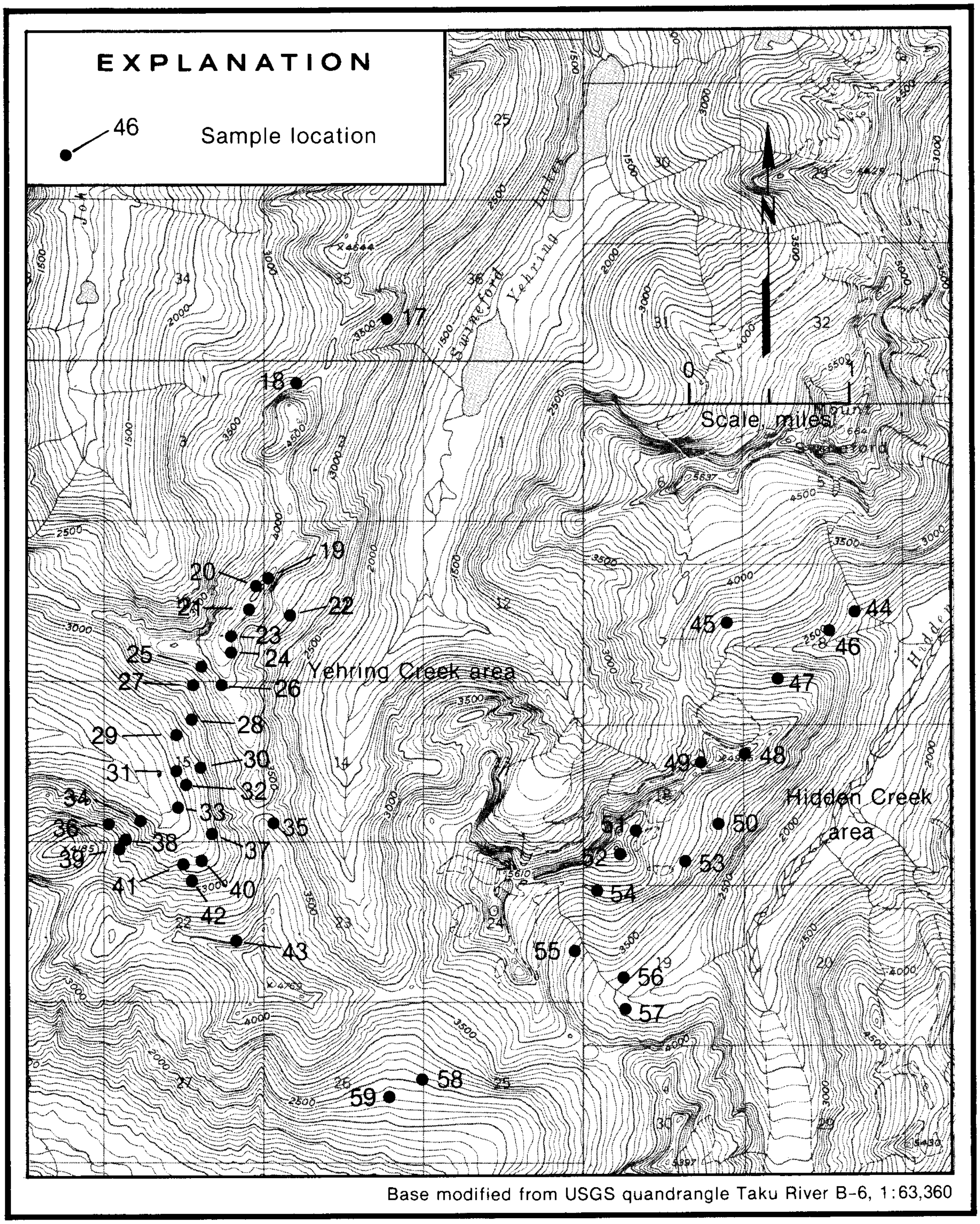

Figure E-14.—Yehring and Hidden Creek areas, sample location map.

Geology and Mineralization

The geology of the Yehring Creek area, as revealed during Bureau investigations, is typified by intrusive igneous rocks, ranging in composition from granite to granodiorite. Mineralization is concentrated along the contact between a quartz monzonite and unaltered granodiorite. The nature of the contact is uncertain and is likely either a fault or the intrusive contact between the older granodiorite and younger quartz monzonite. Mineralization consists of coarse-grained molybdenite, chalcopyrite, pyrite, and pyrrhotite in a granular iron-stained quartz monzonite host rock. The mineralization is limited in both horizontal and vertical extent. The best exposures of in situ mineralization are in an overhanging cliff face at the top of a steep talus field (fig. E-14). Numerous blocks have spalled off this overhang and afford easily obtained specimens.

Bureau Investigations

Molybdenum mineralization was first noted in the Yehring Creek drainage (figs. E-11, and E-14) by the Bureau in 1985. Cursory sampling was undertaken with follow-up work being done in 1986 and 1987.

Bureau investigations in the Yehring Creek area involved sampling of accessible mineralization in float and outcrop. Additional mineralization was looked for throughout the upper reaches of Yehring Creek valley, as well as near Swineford Lakes (figs. E-11 and E-14), with limited success.

The ridge area above and to the west of the Yehring Creek occurrence was carefully examined for extensions of known mineralization. Except for along the strike of the initial discovery none was noted. In fact, all of the rocks exposed are unaltered granodiorite to quartz monzonite. The distribution of molybdenite is erratic at best, seemingly only associated with the iron-staining noted at the original Yehring Creek occurrence. Highlights of Bureau sampling in the Yehring Creek area are as follows. Sample 3048, a stream sediment sample obtained from a tributary to Yehring Creek to the west of Swineford Lakes (fig. E-14, No. 18), assayed 0.09 ppm gold. Sample 3243, diorite float (fig. E-14, No. 33), assayed 283 ppm copper. Sample 3134, a select sample of granodiorite (fig. E-14, No. 36), assayed 374 ppm copper and 68 ppm molybdenum. Sample 3045, tonalite float (fig. E-14, No. 37), assayed 10 ppm silver, 0.020 ppm gold, 0.606% copper, and 1.80% molybdenum. Sample 3046, also tonalite float (fig. E-14, No 37), assayed 8 ppm silver, 0.035 ppm gold, 0.42% copper and >2.00% molybdenum.

Recommendations

The occurrence shows that at least some of the plutonic rocks within the Yehring Creek area are significantly enriched in molybdenum. More detailed molybdenum exploration is warranted within the Yehring Creek area. Good age control on the regions plutonic rocks would help, allowing exploration to be focused on the Tertiary intrusive rocks, which are the common host for molybdenum mineralization elsewhere in the Coast Mountains, and avoid the seemingly barren Cretaceous intrusive rocks.

Hidden Creek Area

Introduction and Previous Work

Hidden Creek flows from south to north entering the Wright River near the terminus of the Wright Glacier (figs. E-11 and E-14). The Wright River subsequently flows into the Taku River, several miles west of the international boundary. Hidden Creek occupies a spectacular hanging valley, and is not navigable.

Bureau workers located float of granitic rocks bearing sparse molybdenite. No additional activity is known, though it is likely that other government and industry geoscientists have investigated the geology and mineralization of this area.

Geology and Mineralization

The Hidden Creek area lies within the Coast Range Plutonic complex. The area is indicated as unmapped on the most recent geologic compilation for the region (*E-4*). Very cursory geologic investigations by the Bureau show the area to be composed of gneisses and high-grade schist along with granitic igneous rocks. The Bureau did not attempt to map any areal geology in this area. The ages of plutonic rocks in the area are not known. However, based on other similar areas within the Coast Range Plutonic complex, both Cretaceous and Tertiary plutons are probably present. It is likely that molybdenum in the area has as its source the younger plutons. This would be consistent with other nearby molybdenum occurrences.

The Hidden Creek area borders the Tulsequah area of British Columbia. It is unknown whether any of the volcanic rocks of the Tulsequah area trend into the Hidden Creek area. The Tulsequah area is significant for containing volcanogenic massive sulfide and vein gold deposits.

Bureau Investigations

The Hidden Creek drainage (figs. E–11 and E–14) was investigated by the Bureau during the 1985 and 1986 seasons. Granitic float bearing sparse molybdenite was located. In addition, the Bureau collected stream sediment samples, some of which were assayed enriched in molybdenum. Bureau efforts were cursory in nature due to the lack of success in the initial investigation.

Bureau sampling in the Hidden Creek area located a stream sediment sample with significant metal values. Sample 3415 (fig E–14, No. 46), taken from a tributary on the eastern side of Hidden Creek assayed 0.100 ppm gold and 300 ppm copper. Sample 3412, a stream sediment (fig. E–14, No. 48) assayed 12 ppm molybdenum. Stream sediment sample 7066 (fig. E–14, No. 49) assayed 24 ppm molybdenum. However, bedrock sources for these stream sediment samples values were not found.

Recommendations

The Hidden Creek area holds potential for two main types of mineralization. First, porphyry molybdenite mineralization, which is common throughout the Coast Range Plutonic complex in the Tertiary plutons, is an obvious exploration target and should be pursued. Second, the area also holds potential for hosting volcanogenic massive base and precious metal mineralization similar to the Tulsequah area of British Columbia (approximately 10 miles to the northwest). The publication of regional geologic mapping, which is currently being compiled by the USGS, should greatly aid exploration efforts in the Hidden Creek area.

Mount Brundage Area

Introduction and Previous Work

The Mount Brundage area lies to the north of Crescent Lake, near the international boundary (fig. E–11). This area was briefly investigated by the Bureau in 1987. The Bureau did not conduct any follow-up investigations after the 1987 work. The only other geologic work known for this area is regional geologic mapping published by the USGS (*E–4*).

Geology and Mineralization

The geology of the Mount Brundage area, as mapped by the USGS (*E–4*), consists of Eocene biotite-hornblende granodiorite. Lesser bands of north-trending marble, calc-silicate schists, and granofels are also noted. No in situ mineralization is known in this area. However, the presence of Eocene intrusives, marble, and calc-silicate schists is significant. The Eocene intrusives are permissive hosts for porphyry molybdenum mineralization within the Coast Range Plutonic complex. Additionally, the contact zones between the intrusives, marbles, and calc-silicate schists give this area significant potential for skarn mineralization.

Bureau Investigations

Area rocks are predominantly granitic with accessible outcrops rare due to steep terrain and persistent snow cover. Bureau investigations in this area consisted of short traverses in an attempt to see if the Eocene intrusive or schist belt were mineralized. A sample of quartz diorite float collected from a closed cirque near Mount Brundage (fig. E–11, No. 64, sample 6365) assayed 83 ppm silver, 2,500 ppm arsenic, and 5.0 ppm gold. In hand specimen this sample contained pyrrhotite and chalcopyrite. Similar rock types were looked for in outcrop but none were found.

Recommendations

The sample of quartz diorite float (6365) which contained high silver, arsenic, and gold values could be from an exoskarn zone of mineralization. Therefore, the skarn potential of the area should be thoroughly investigated. The Mount Brundage area also has potential for porphyry molybdenum mineralization, although not confirmed by sampling. This is indicated by the presence of Tertiary intrusives in the area as shown on the regional reconnaissance geologic map (*E–4*).

Due to this area's remote location and persistent snow cover, all field investigations should be conducted during the late summer and early fall months.

Whiting River Area

Introduction and Previous work

The Whiting River area (figs. E–11 and E–15) is located in the southeast corner of the Coast Range subarea. Prospecting likely took place in this area during the initial development of the Juneau Gold Belt area prior to 1900. The outcome of this activity was the staking of the Whiting River silver-gold prospect (fig. E–15) in 1901 (*E–13*). This discovery has been located, over the years, as the Lost Charlie Ross, the Miss Pickle, the Silver Moon, and again the Miss Pickle (*E–13*). Other prospecting activity undoubtedly took place in the region but the silver-gold occurrence is the only discovery of significance known to have taken place. No additional

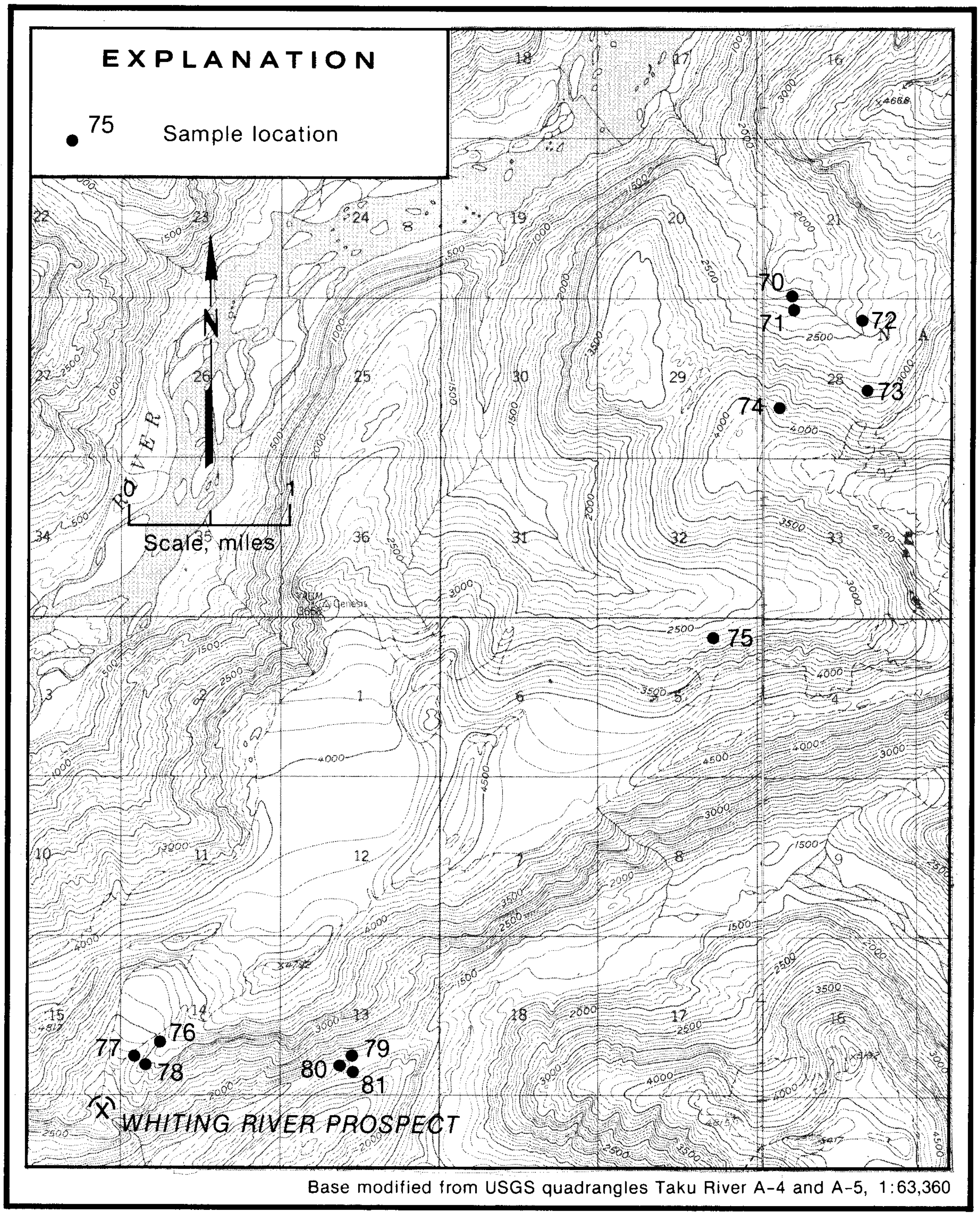

Figure E-15.—Whiting River area, sample location map.

activity is recorded for the area except for regional geologic and mineral investigations by government agencies (*E-4*, *E-13*). Private exploration companies probably have data on the area, but none of it was available to the Bureau for this study.

The only known workings in the area are at the Whiting River silver-gold prospect. The reader is referred to USGS Bulletin 1525 (*E-13*) for a discussion of this area.

Geology and Mineralization

The geology of the Whiting River area consists of granitic rocks of the Coast Range Plutonic complex (*E-4*). These rocks are predominantly granodiorite and biotite granite. Paleozoic metamorphic rocks crop out discontinuously (*E-4*) to the south of the Whiting River. These Paleozoic rocks are the host for the Whiting River silver-gold prospect. Aside from the Whiting River prospect, no other mineralization is known for this area.

The Whiting River area holds potential for hosting three different types of mineralization. These are porphyry copper-molybdenum, vein gold-silver, and volcanogenic massive sulfide. The plutonic terranes of this area are potential hosts for porphyry molybdenum potential. The southwestern portion of this area contains similar lithologies to the Juneau Gold Belt and could contain vein-type precious metal mineralization. Finally, the metamorphic assemblages in the eastern portion may be similar to metavolcanic rocks in the Tulsequah area that host massive sulfide and vein gold deposits.

Bureau Investigations

Bureau work in the Whiting River area consisted of investigating areas in which USGS geochemical sampling showed elevated metal values (*E-1*). Areas defined by stream sediment and pan concentrate sample results were traversed and sampled where appropriate. No significant in situ mineralization was located from this effort. Sample locations are shown on figures E-11 and E-15.

Recommendations

The area has potential for porphyry molybdenum, volcanogenic massive sulfide, and vein gold mineralization. The Whiting River area should be thoroughly investigated for all of these deposit types. This would involve a regional exploration program, which is beyond the scope of Bureau investigations.

Other investigations in the southern portion of the Coast Range Subarea

The area of most significance which was not investigated during this study is the Mount Ogden molybdenum deposit (fig. E-11). This porphyry molybdenum deposit was discovered in 1978 and actively explored into the early 1980's (*E-19*). The reason for excluding the Mount Ogden deposit from this report is that the known deposit lies in British Columbia. A smaller claim group was staked in the United States; however these claims have been allowed to lapse. The Mount Ogden deposit is related to an alaskite intrusive of unknown age and consists of stockwork, vein, and fracture-filling molybdenum mineralization. After the fall of the molybdenite market in the mid 1980's exploration and development activities were curtailed in the area and assessment work has not been maintained on the claims. The Bureau made several efforts to visit the deposit over the course of field investigations for the JMD study but, during each attempt to visit the area, poor or unsettled weather prohibited reaching the remote site.

Bureau work in the southern portion of the Coast Range subarea also defined scattered rock samples with high metal values. These sample results are included in appendix E-2. Sample locations are provided on the various accompanying figures. Insufficient data was generated with these samples to warrant special mention in the text.

SUMMARY

Bureau work underscores the dearth of published geologic data available for the Coast Range subarea. No comprehensive mineral investigation has been published for the Coast Range subarea. Similarly, no comprehensive geologic investigation has been published. Indeed, as indicated throughout this text, much of the subarea is shown as "unmapped", on recent geologic maps. Finally, even reconnaissance geologic and mineral investigations are lacking for the region. Aside from the western and northern parts of the southern portion of the Coast Range subarea, no regional mineral deposit type data was available.

The lack of geologic and mineral deposit data on the Coast Range subarea severely hampered the Bureau's efforts in this region. With these caveats in place, the following section will provide the user with the Bureau's thoughts on where mineral deposit investigation should proceed in the Coast Range subarea and why.

During the introductory remarks for this report, six deposit types were listed as permissive for mineralization in the Coast Range subarea. These deposit types, by way of review, are: porphyry molybdenum, precious metal and tungsten skarns, magmatic uranium-thorium, magmatic oxide or sulfide copper, nickel, chrome, and PGM, vein gold, and volcanogenic massive sulfides. Investigations in the Coast Range subarea were concentrated in areas with potential for hosting the indicated deposit types.

The following section discusses each deposit type. Furthermore, the areas investigated in this report which have the greatest potential for hosting each type are indicated. Additionally, areas which the Bureau's investigations shown not to contain significant mineralization in the given deposit types are also mentioned.

PORPHYRY MOLYBDENUM

Porphyry molybdenum deposits offer the best potential for hosting significant mineralization within the Coast Range subarea of the JMD. Molybdenum occurrences are known at Clifton, Boundary Creek, Yehring Creek, and Hidden Creek. Furthermore, the molybdenum mineralization at Mount Ogden (outside of the district within British Columbia, Canada) qualifies as an explored prospect. The presence of these molybdenum occurrences and prospects in the Coast Range subarea underscores the potential for additional occurrences and prospects in the region.

After investigating the known molybdenum occurrences in the Coast Range subarea it is believed that none of the known occurrences offer great potential for the delineation of significant resources. In general, these occurrences seem to be related to pluton margins, discontinuous fracture systems, or the tops of plutons. Though some of the molybdenum mineralization observed is outstanding, containing over 2% molybdenum in selected samples, these are isolated cases. None of the occurrences examined show characteristics of significant molybdenum deposits, specifically hydrothermal alteration and stockwork development are lacking.

The importance of the known molybdenum occurrences is simply that they show the potential for additional, hopefully larger, molybdenum occurrences in the Coast Range area. The presence of molybdenum occurrences, in other words, demonstrates that porphyry molybdenum systems occur in the region and that the region, as an entity, is prospective for significant mineralization.

It is recommended that the identified molybdenum occurrences be used as starting points for porphyry molybdenum exploration in the Coast Range area. Noteworthy is that, should significant molybdenum deposits be present in the Coast Range subarea, they could either be lateral to or beneath the known occurrences. Finally, with so little data available on the plutonic rocks of the Coast Range area, reconnaissance-scale molybdenum investigations are very much called for. These investigations need to be regional in scope since most of the Coast Range subarea has the permissive regional geology for hosting porphyry molybdenum deposits.

PRECIOUS METAL AND TUNGSTEN SKARNS

Little is known about skarn mineralization within the Coast Range subarea. Since much of the area is unmapped it is not possible to know the amount of granitic-carbonate contact, a very important parameter to know in defining skarn potential.

The known skarn occurrences at Inspiration Mine, Mount Canning, and, possibly, at Mount Brundage are believed to have little potential. However, the areas surrounding the Mount Brundage and Mount Canning occurrences are believed to be favorable for hosting skarn mineralization. The publication of a complete regional geologic map should aid greatly in the search for skarns in the Coast Range. Much of the subarea has the proper geologic environment for skarn development with numerous granitic plutons of Cretaceous and younger age, along with carbonate rocks. The Mount Canning area is thought to be the most permissive for hosting significant skarn mineralization.

MAGMATIC URANIUM-THORIUM

The only known radioactive mineralization in the area consists of the uranium and thorium occurrences in and around the community of Skagway. These occurrences are believed to be insignificant, and no additional work is recommended on them.

MAGMATIC OXIDE OR SULFIDE COPPER, NICKEL, CHROME, AND PGM

The mafic-ultramafic complex in the Mount Leland region is interesting since similar complexes elsewhere in Southeast Alaska host significant copper, nickel, and PGM mineralization. Although only minor mineralization has been located associated with this deposit, it still warrants detailed investigation. As indicated in the text, the serpentinized nature along with the severe terrain in the Mount Leland area hinder the exploration of this complex. Since other of the mafic-ultramafic complexes in Southeast Alaska are known to contain significant mineralization (Brady Glacier, Klukwan, Snettisham, and Yakobi Island), the Mount Leland area is highly recommended for additional exploration.

VEIN GOLD

Vein gold occurrences have been identified (in order of importance) at the Kakuhan Range, Klondike Highway, West of Mount London, Whiting River, and the Mount Van Wagenen areas. The veins at the Kakuhan Range and along the Klondike Highway have impressive gold values associated with them. However, all of these occurrences are small, as currently known, and not thought to offer large tonnage potential.

The preponderance of granitic, gneissic, and high-grade schist which make up the majority of the Coast Range subarea limit the potential for vein gold mineralization. However, locating Juneau Gold Belt equivalent rocks within the marginal zones or preserved as roof pendants would present the best potential for significant vein gold mineralization. Using this approach, the Kakuhan Range and the Whiting River area are the best places to examine for these deposit types.

VOLCANOGENIC MASSIVE SULFIDES

The volcanogenic massive sulfide mineralization potential for the Coast Range subarea is unknown. It is believed that the South of Mount Leland, Hidden Creek, and Whiting River areas all offer potential for containing this type of mineralization. This presupposes that volcanic rocks are present in these areas. This has not be demonstrated except at the South of Mount Leland occurrence. Regional geologic mapping is needed to provide the baseline data in order to guide exploration efforts.

CONCLUSIONS

In conclusion, none of the mineral occurrences known in the Coast Range subarea are thought to represent a significant deposit when grade and tonnage parameters are considered. However, the molybdenum, magmatic oxide sulfide, vein gold, skarn, and volcanogenic massive sulfide occurrences are believed to be the most important. These deposit types show the area's potential and are recommended as a starting point to guide more detailed mineral investigations. The radioactive potential of the area is deemed low, with further work not recommended.

EXPLANATION OF ANALYTICAL TECHNIQUES

Samples collected during this investigation were submitted to Nuclear Activation Services, Inc., of Ann Arbor Michigan for analysis. All samples were crushed and ground to -200 mesh prior to analysis. Grinding was accomplished using chrome steel mills.

Samples were analyzed for copper, lead, and tin by using direct current plasma emission spectrometry. All other elements were determined using instrumental nuclear activation analytical techniques.

Detection limits for each element listed are given as follows, with the minimum detection limit shown in parenthesis following the element symbol; Au (0.005–0.01 depending on technique), Ag (0.5), As (2), Ba (150), Co (1), Cr (2), Cu (1), Mo (5), Ni (200), Pb (2), Sb (0.2), Sn (2), Th (0.5), U (0.5), W (3), and Zn (20). All values are given in ppm.

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APPENDIX E-1. GLOSSARY OF ABBREVIATIONS.

Cc = rock chip sample, representative sample taken across a measured interval.
Ch = Channel sample, continuous sample across a measured interval.
Fl = Float sample, commonly a grab sample from mineralized rock fragments.
Pc = Pan concentrate, heavy mineral concentrate obtained by hydraulic reduction of stream sediments.
Pl = Placer sample, obtained by processing 0.10 cubic yards of gravel through a sluice box.
S = Select sample, commonly a grab sample and not necessarily from a measured interval.
Ss = Stream sediment sample.

APPENDIX E-2.—
Complete assay results, Northern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
1	Mt. Van Wagenen	7700 (1)	Cc	Quartz monzonite	11	11	<.010	1500	3	3	28	<5	<200	110	.7	100	12	1.7	<3	50
2	Mt. Van Wagenen	7699 (2)	Cc	Quartz porphyry	<0.5	3	<.010	900	2	4	<1	<5	<200	20	<.2	8	13	4.9	<3	30
3	Mt. Van Wagenen	7697 (6)	Cc	Porphyritic granite	<0.5	5	<.010	1500	4	4	<1	<5	<200	12	.3	2	15	2.4	<3	30
	Mt. Van Wagenen	7698 (8)	Cc	Latite dike	<0.5	4	<.010	500	2	5	7	<5	<200	22	.3	4	14	5.8	<3	30
4	Nourse River	7675 (na)	S	Granite	<0.5	3	<.010	1400	2	2	3	<5	<200	24	<.2	<2	12	2.1	<3	20
5	Nourse River, trib.	7691 (4)	Cc	Aplite dike	<0.5	<2	.010	500	1	<2	<1	<5	<200	24	<.2	<2	9.9	3.3	<3	30
6	White Pass	7670 (2)	S	Granite	<0.5	<2	<.010	1200	1	<2	<1	<5	<200	18	<.2	<2	9.9	2	<3	30
7	Mt. Cleveland	8418 (2)	S	Quartz monzonite	<0.5	<2	<.010	3100	2	<2	15	<5	<200	20	<.2	3	11	2.1	<3	180
	Mt. Cleveland	8419 (na)	S	Aplite dike	<0.5	<2	<.010	700	1	6	7	<5	<200	27	<.2	3	22	12.6	<3	60
8	Klondike Highway	8441 (1)	Cc	Quartz vein	<10	16	<.010	400	51	200	140	6	<200	77	<.2	4	1.1	2.9	9	60
9	Klondike Highway	8442 (1)	S	Quartz-calcite vein	70	24	2.600	1200	6	140	2	7	<200	33	1.6	4	3.8	1.6	<3	40
	Klondike Highway	8443 (1)	S	Quartzdiorite	<0.5	2	<.010	900	5	89	6	5	<200	33	0.3	2	13	4.1	<3	70
10a	Inspiration Mine	7681 (5)	Ch	Diorite	<0.5	<2	<.010	1300	3	12	6	<5	<200	18	.2	<2	11	2.8	<3	40
10b	Inspiration Mine	7682 (4)	Ch	Sheared diorite	<0.5	4	<.010	1000	8	24	<1	5	<200	22	1.1	6	8.9	7.1	<3	150
10c	Inspiration Mine	7683 (6)	Ch	Skarn	<0.5	3	<.010	1200	12	24	13	<5	<200	300	1.8	38	8	5.3	<3	350
10d	Inspiration Mine	7684 (5)	Ch	Skarn	<0.5	5	<.010	1400	7	9	35	5	<200	1000	4.1	46	6.5	5.1	<3	1100
10e	Inspiration Mine	7663 (4)	Cc	Skarn	5	<2	<.010	<150	7	35	8	<5	<200	280	1.2	82	6.8	3.6	270	550
10f	Inspiration Mine	7662 (na)	S	Skarn	27	<2	<.010	200	12	13	1500	12	<200	>4000	2.7	660	10	6	12	24000
10g	Inspiration Mine	7685 (5)	Ch	Garnet skarn	<0.5	<2	<.010	1100	13	29	75	11	<200	7200	.4	360	19	4.7	<3	2400
11	Klondike Highway	8444 (1)	S	Quartz-calcite vein	<0.5	3	<.010	1100	3	140	6	5	<200	10	2.3	3	5.0	1.9	<3	60
12	Klondike Highway	7742 (1)	S	Quartz-calcite vein	200	20	23.000	300	6	5	7	6	<200	180	1.6	18	4.9	2.3.	<3	310
13	Klondike Highway	7671 (1)	S	Skarn	<0.5	<2	.010	<150	8	7	10	<5	<200	20	<.2	42	8.3	6.6	5	110
14	Mt. Carmack	7615 (na)	Ch	Biotite schist	<0.5	<2	.010	700	34	340	83	<5	<200	8	.4	12	5.6	4.5	<3	160
15	Inspiration Mine	7661 (4)	Cc	Skarn	<0.5	<2	.720	<150	25	10	800	110	<200	10	.2	4	3.2	6.8	11	180
16	Skagway River	7740 (2)	S	Quartz-calcite vein	9	38	.010	700	7	6	60	<5	<200	44	2	<2	6	5	<3	50
17	N. Warm Pass	8425 (1)	S	Mafic dike	<0.5	<2	<.010	900	33	170	25	<5	<200	7	<.2	5	3.5	0.9	<3	30
18	N. Warm Pass	7735 (2)	S	Granite	120	2	<.010	1000	13	35	1100	14	<200	390	<.2	8	6.8	4.1	12	230
19	Skagway Road	7672 (na)	S	Granite	<0.5	<2	<.010	600	1	3	<1	<5	<200	26	<.2	4	16	5.3	<3	30
20	Warm Pass Creek	7736 (na)	Ss	na	<0.5	<2	<.010	1000	2	6	1	<5	<200	20	.6	8	12	5.9	<3	30
	Warm Pass Creek	7737 (na)	Pc	na	<0.5	<2	<.010	600	2	21	1	<5	<200	18	.4	20	67	19.6	7	70
21	West Creek	7804 (na)	Ss	na	<0.5	4	<.010	1800	8	11	1	<5	<200	16	<.2	6	5.2	3.1	<3	120
22	Warm Pass Creek	7733 (na)	Ss	na	<0.5	<2	<.010	800	1	8	<1	<5	<200	16	<.2	<2	7.1	3.5	<3	20
	Warm Pass Creek	7734 (na)	Pc	na	<0.5	2	<.010	1800	3	59	2	<5	<200	18	.4	12	200	80	11	60
23	Warm Pass Creek	7725 (na)	Ss	na	<0.5	<2	<.010	1000	2	7	<1	<5	<200	16	<.2	<2	7.4	3.4	<3	30
	Warm Pass Creek	7726 (na)	Pc	na	<0.5	<2	.020	800	11	180	<1	<5	<200	<2	<.2	12	510	133	27	<30
24	Warm Pass Creek	7731 (na)	Ss	na	<0.5	<2	<.010	1000	4	11	3	<5	<200	18	<.2	4	10	3.5	6	30
	Warm Pass Creek	7732 (na)	Pc	na	<0.5	3	<.010	800	6	36	3	<5	<200	30	.2	16	120	36.1	20	40
25	Warm Pass Creek	7727 (na)	Ss	na	<0.5	<2	<.010	1300	6	13	1	<5	<200	14	.2	4	5.1	2.5	<3	80
	Warm Pass Creek	7728 (na)	Pc	na	<0.5	<2	<.010	1100	10	36	1	<5	<200	12	.4	2	57	19.3	44	50
26	Warm Pass Creek	7729 (na)	Ss	na	<0.5	<2	<.010	1500	4	16	1	<5	<200	16	<.2	8	15	5.8	4	30
26	Warm Pass Creek	7730 (na)	Pc	na	<0.5	3	<.010	1100	5	16	<1	<5	<200	8	.3	6	130	53.8	41	30
27	Clifton	7695 (2)	S	Siliceous granite	<0.5	<2	.010	800	1	2	<1	210	<200	36	<.2	<2	15	5.1	<3	40
28	Clifton	7694 (1)	S	Diabase dike	<0.5	<2	<.010	1000	29	120	8	<5	<200	8	<.2	<2	2	1	<3	80
29	Clifton	7693 (2)	Ch	Sheared granite	<0.5	<2	<.010	1200	3	15	12	<5	<200	20	1.3	8	17	9.8	<3	60
30	White Pass Road	7743 (2)	S	Altered dike	<0.5	<2	<.010	2600	7	8	2	<5	<200	16	<.2	2	9.9	4.2	<3	90

APPENDIX E-2.—Continued

Complete assay results, Northern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
	White Pass Road	7744 (2)	S	Granite	<0.5	<2	<.010	2800	8	9	2	<5	<200	14	<.2	4	10	4.1	<3	40
31	AB Mountain	7678 (1)	S	Granodiorite	<0.5	2	<.010	4500	3	<2	1	<5	<200	18	<.2	4	8.6	1.9	<3	40
	AB Mountain	7679 (1)	S	Biotite gneiss	<0.5	<2	<.012	2000	3	160	25	<5	<200	<2	<.2	4	5.5	6.4	<3	110
32	Dyea Road	7604 (4)	S	Granodiorite	<0.5	<2	<.010	1700	6	23	<1	<5	<200	12	<.2	<2	7.1	1.4	<3	80
33	East Fork	7721 (na)	Ss	na	<0.5	<2	<.010	1400	7	21	6	<5	<200	22	<.2	<2	9.8	2.8	<3	70
	East Fork	7722 (na)	Pc	na	<0.5	2	<.010	1500	7	21	6	9	<200	30	.2	<2	36	6.3	10	80
34	Skagway Road	7609 (2)	Cc	Biotite gneiss	<0.5	<2	.010	600	17	44	150	<5	<200	6	<.2	2	2.5	2.2	<3	50
35	Skagway Road	7673 (2)	S	Felsic dike	<0.5	<2	<.010	<150	1	<2	<1	<5	<200	30	<.2	<2	15	7.4	<3	30
36	White Pass RR	7613 (10)	Ch	Felsic dike	<0.5	<2	<.010	<150	1	3	<1	<5	<200	28	<.2	<2	19	8.1	<3	20
37	White Pass RR	7612 (2)	Cc	Felsic dike	<0.5	<2	<.010	200	2	13	<1	<5	<200	50	<.2	<2	16	7	<3	180
38	East Fork	7719 (na)	Ss	na	<0.5	<2	<.010	1500	7	26	4	<5	<200	12	<.2	2	14	4.1	<3	60
	East Fork	7720 (na)	Pc	Granite	<0.5	2	<.010	1400	7	22	5	<5	<200	16	<.2	2	35	13.2	5	30
39	East Fork	7717 (na)	Ss	na	<0.5	<2	<.010	1600	7	19	4	<5	<200	18	<.2	<2	8.7	2.6	<3	80
	East Fork	7718 (na)	Pc	na	<0.5	2	<.010	2400	11	33	8	<5	<200	18	.2	8	50	11.1	14	60
40	East Fork	7713 (na)	Ss	na	<0.5	4	<.010	1500	8	13	8	<5	<200	14	.2	4	7.2	3.4	<3	70
	East Fork	7714 (na)	Pc	na	<0.5	<2	<.010	1400	6	14	6	<5	<200	14	<.2	<2	18	4.2	<3	30
41	Skagway River	7611 (4)	Cc	Pyrrhotite skarn	<0.5	<2	<.010	2000	9	84	12	<5	<200	18	.2	4	11	4.2	<3	40
42	East Fork	7711 (na)	Ss	na	<0.5	<2	<.010	1700	5	22	3	<5	<200	14	<.2	2	7	2.2	<3	50
	East Fork	7712 (na)	Pc	na	<0.5	4	<.010	1300	6	24	6	<5	<200	34	<.2	4	48	9.6	5	30
43	Skagway River	7610 (na)	Fl	Pegmatite	<0.5	<2	<.010	900	3	7	<1	<5	<200	38	<.2	6	17	10.5	<3	20
44	East Fork	7715 (na)	Ss	na	<0.5	<2	<.010	1500	7	15	5	<5	<200	18	<.2	<2	8.6	2.9	<3	60
	East Fork	7716 (na)	Pc	na	<0.5	5	<.010	1100	10	20	6	<5	<200	30	<.2	<2	41	7.4	4	60
45	East Fork	7701 (na)	Ss	na	<0.5	2	<.010	2000	8	32	3	<5	<200	16	<.2	6	8.3	2.3	<3	60
	East Fork	7702 (na)	Pc	na	<0.5	<2	<.010	2200	7	25	8	<5	<200	38	<.2	4	9	2.1	3	90
46	East Fork	7723 (na)	Ss	na	<0.5	<2	<.010	1000	5	6	<1	<5	<200	8	<.2	<2	7.4	1.6	<3	40
	East Fork	7724 (na)	Pc	na	<0.5	3	.010	800	11	25	5	<5	<200	10	<.2	4	73	26.7	7	70
47	East Fork	7703 (na)	Ss	na	<0.5	<2	<.010	1700	7	11	5	<5	<200	110	<.2	6	7.1	2.2	<3	120
	East Fork	7704 (na)	Pc	na	<0.5	<2	.010	1200	6	18	5	<5	<200	18	<.2	4	20	2.9	18	40
48	East Fork	7708 (na)	Pc	na	<0.5	3	<.010	1300	8	22	8	<5	<200	14	<.2	2	33	5.3	4	60
	East Fork	7707 (na)	Ss	na	<0.5	2	<.010	1300	8	21	6	<5	<200	20	<.2	<2	7.5	3	<3	90
49	Burro Creek	7614 (1)	Cc	Quartz vein	<0.5	<2	<.010	1000	1	2	<1	<5	<200	24	.2	2	7.3	2.1	<3	30
	Burro Creek	7676 (3)	S	Granodiorite	<0.5	<2	<.010	2600	3	<2	<1	<5	<200	18	<.2	<2	5.7	2.3	<3	80
50	Dyea Road	7608 (4)	S	Granite	<0.5	<2	<.010	1800	4	6	<1	<5	<200	18	<.2	6	5.9	1	<3	70
51	Dyea Road	7605 (4)	S	Granodiorite	<0.5	<2	<.010	1700	5	17	<1	<5	<200	16	<.2	<2	9.1	.7	<3	60
52	Dyea Road	7606 (4)	S	Granodiorite	<0.5	<2	<.010	1800	5	7	<1	<5	<200	18	<.2	<2	4.9	1	<3	90
53	East Fork	7705 (na)	Ss	na	<0.5	<2	<.010	1300	5	14	2	<5	<200	12	<.2	4	7	2.6	<3	30
	East Fork	7706 (na)	Pc	na	<0.5	10	.010	1300	8	28	8	<5	<200	20	<.2	<2	62	64.3	9	50
54	Dyea Road	7607 (2)	S	Granite	<0.5	<2	<.010	1800	5	6	1	<5	<200	16	<.2	<2	5.2	1	<3	70
	Dyea Road	7547 (6)	Cc	Rhyolite	<0.5	<2	<.010	<150	1	8	<1	<5	<200	18	<.2	<2	13	6.1	<3	30
54	Dyea Road	7546 (6)	Cc	Rhyolite	<0.5	<2	<.010	<150	1	<2	2	<5	<200	28	<.2	<2	12	5	<3	30
55	Dewey Lakes Trail	7545 (2)	Cc	Mafic dike	<0.5	<2	<.010	1800	23	120	20	5	<200	12	.6	<2	3.8	1.4	<3	120
56	Dewey Lakes Trail	7544 (2)	Cc	Quartz monzonite	<0.5	<2	<.010	2400	4	<2	5	<5	<200	12	<.2	<2	5.9	1.1	<3	80
57	Schubee Glacier	7677 (na)	S	Quartzdiorite	<0.5	<2	<.010	1800	4	3	<1	<5	<200	18	<.2	<2	5.2	1	<3	50
58	N. Katzehin River	7788 (6)	Cc	Biotite gneiss	<0.5	2	.080	1200	4	60	10	<5	<200	16	<.2	<2	14	3.9	3	30

APPENDIX E-2.—Continued
Complete assay results, Northern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
59	N. Katzehin River	7789 (5)	Ch	Graphitic argillite	<0.5	<2	<.010	3000	1	70	26	18	<200	4	<.2	<2	3.1	6.5	<3	120
60	N. Katzehin River	7782 (2)	Ch	Biotite schist	<0.5	<2	.010	2200	3	44	8	<5	<200	4	<.2	<2	3.5	1.4	<3	30
61	N. Katzehin River	7781 (2)	S	Quartz schist	<0.5	<2	<.010	2000	16	140	75	<5	<200	10	<.2	<2	4.3	3.9	<3	110
62	N. Katzehin River	7783 (3)	Ch	Quartz schist	<0.5	2	<.010	7000	12	410	67	<5	<200	6	<.2	2	3.6	5.6	<3	130
63	N. Meade Glacier	7686 (4)	S	Serpentinite	<0.5	<2	<.010	<150	110	2500	<1	<5	1400	26	<.2	<2	<.5	<.5	<3	80
64	N. Meade Glacier	7687 (2)	Ch	Quartz schist	<0.5	<2	<.010	1400	13	55	42	<5	<200	38	<.2	10	6.5	1.7	3	220
65	N. Katzehin River	7696 (5)	Cc	Argillite	<0.5	<2	<.010	3500	6	63	42	6	<200	14	<.2	<2	6.4	3.8	<3	110
66	N. Meade Glacier	7680 (2)	Cc	Serpentinite	<0.5	<2	<.010	<150	120	2900	<1	<5	1300	4	<.2	<2	<.5	<.5	<3	70
	N. Meade Glacier	7776 (na)	Fl	Chromitite	<0.5	<2	.010	300	100	45	50	<5	300	8	.2	2	2	1.7	3	70
	N. Meade Glacier	7777 (2)	S	Dunite	<0.5	<2	<.010	<150	120	2800	<1	<5	1400	4	<.2	<2	<.5	<.5	<3	90
	N. Meade Glacier	7778 (2)	S	Dunite	<0.5	<2	<.010	<150	110	2500	<1	<5	1200	6	<.2	<2	<.5	<.5	<3	80
67	N. Meade Glacier	8413 (1)	S	Pyroxenite	<0.5	<2	<.010	300	52	27	160	<5	<200	11	<.2	4	5.2	1.8	<3	120
	N. Meade Glacier	8414 (15)	Cc	Hornblendite	<0.5	<2	<.010	400	34	9	670	<5	<200	9	<.2	7	1.1	1.1	9	80
	N. Meade Glacier	8415 (10)	Cc	Hornblendite	<0.5	<2	<.010	400	50	39	290	<5	<200	10	<.2	5	1.6	1.7	<3	120
68	Mt. Canning	7653 (4)	Cc	Garnet skarn	<0.5	<2	<.01 1	3000	5	89	150	<5	<200	<2	<.2	<2	2.6	4.4	<3	70
	Mt. Canning	7654 (4)	Cc	Biotite schist	<0.5	<2	<.010	1100	4	29	29	<5	<200	20	<.2	<2	5.2	2.3	<3	30
69	Mt. Canning	7747 (2)	S	Biotite schist	<0.5	46	.010	800	67	14	560	15	<200	8	<.2	<2	2.6	10.6	<3	240
	Mt. Canning	7748 (na)	S	Marble	<0.5	<2	<.010	<150	1	3	<1	<5	<200	2	<.2	<2	<.5	1.1	<3	<20
70	Mt. Canning	7750 (na)	Fl	Gneiss	<0.5	22	.010	700	3	29	21	<5	<200	10	.3	<2	1.9	5.3	<3	450
	Mt. Canning	7751 (na)	Fl	Gneiss	<0.5	120	.020	900	16	26	85	7	<200	10	.7	2	3.6	2.8	<3	100
71	Mt. Canning	7651 (5)	Cc	Epidote skarn	<0.5	<2	.660	<150	9	19	52	<5	<200	10	.2	14	8	5.2	530	130
72	Mt. Canning	7749 (4)	Cc	Biotite gneiss	<0.5	2	.840	800	43	14	250	<5	<200	12	<.2	18	6.3	2.5	400	110
	Mt. Canning	7549 (1)	Ch	Quartz vein	<0.5	<2	<.010	200	2	3	18	<5	<200	6	<.2	<2	.7	<.5	<3	<20
73	Mt. Canning	7689 (2)	Cc	Siliceous argillite	<0.5	<2	.020	2500	6	48	12	<5	<200	28	<.2	6	16	4.3	17	60
74	Mt. Canning	8407 (20)	Cc	Quartzite	14	4	1.000	<150	1	<2	15	<5	<200	19	<.2	3	<0.5	<0.5	<3	20
75	Mt. Canning	7690 (2)	S	Chert	5	<2	.110	<150	1	2	<1	<5	<200	32	.3	<2	<.5	<.5	<3	20
76	Mt. Canning	8408 (5)	Cc	Quartzite	38	4	.430	<150	1	<2	13	<5	<200	18	<.2	3	<0.5	<0.5	<3	<20
77	Mt. Leland	8417 (3)	Cc	Aplite dike	<0.5	20	<.010	1100	1	3	43	<5	<200	17	.2	3	9.5	4.0	<3	<20
78	Mt. Leland	8428 (2)	S	Chromitite	<0.5	4	<.010	<150	98	2100	6	<5	1100	6	<.2	4	2.5	0.7	<3	130
79	Mt. Leland	7779 (4)	Cc	Serpentinite	<0.5	<2	.010	<150	110	2700	6	<5	1300	10	<.2	<2	<.5	<.5	<3	90
	Mt. Leland	7786 (4)	Cc	Chert	<0.5	<2	.010	<150	39	300	16	<5	<200	4	2.5	<2	<.5	<.5	<3	90
80	Mt. Leland	7787 (2)	S	Pyroxenite	<0.5	<2	.010	<150	120	1900	<1	<5	1300	8	<.2	<2	<.5	<.5	<3	60
81	S. Katzehin River	7674 (1)	S	Pegmatite	<0.5	<2	<.010	500	1	3	<1	<5	<200	34	<.2	4	7	4.3	<3	20
82	Mt. Leland	7780 (5)	Cc	Serpentinite	<0.5	<2	<.010	<150	110	3000	<1	<5	1300	2	<.2	6	<.5	<.5	<3	80
83	Mt. Leland	8426 (na)	Fl	Chromitite	<0.5	<2	<.010	<150	130	2800	270	<5	1500	7	<.2	4	<0.5	<0.5	<3	100
	Mt. Leland	8427 (na)	Fl	Chromitite	<0.5	<2	<.010	400	45	710	7	<5	<200	17	<.2	6	3.8	2.4	<3	90
84	Mt. Leland	7793 (2)	S	Biotite gneiss	<0.5	2	.010	<150	79	410	2800	<5	<200	4	.4	<2	<.5	.5	<4	130
85	Mt. Leland	7692 (4)	Cc	Pyroxenite	<0.5	<2	.050	<150	100	860	3200	<5	800	4	<.2	<2	<.5	<.5	<3	60
86	Mt. Leland	8087 (6)	Cc	Pyroxenite	<0.5	<2	<.010	<150	110	3700	12	<5	1700	5	<.2	4	<0.5	<0.5	<3	90
87	Mt. Leland	8412 (na)	Fl	Pyroxenite	<0.5	3	<.010	<150	64	160	230	<5	<200	13	1.5	4	<0.5	<0.5	<3	160
88	Mt. Leland	8433 (10)	Cc	Pyroxenite	<0.5	7	<.010	<150	100	3100	<1	<5	1600	3	1.0	3	<0.5	<0.5	<3	100
89	Mt. Leland	7652 (4)	Cc	Serpentinite	<0.5	4	<.010	<150	100	2600	3	<5	1200	4	.3	<2	<.5	<.5	<3	70
	Mt. Leland	7655 (na)	S	Chlorite schist	<0.5	<2	.120	700	14	94	740	<5	<200	8	.5	4	3.1	2.4	12	50
90	S. Mt. Pullen	7603 (10)	S	Tuff	<0.5	2	<.010	3800	11	5	3	15	<200	56	<.2	4	5.3	2.9	4	50

APPENDIX E-2.—Continued

Complete assay results, Northern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
91	S. Mt. Pullen	7660 (5)	Cc	Sericite schist	<0.5	3	.010	1700	13	21	4	24	<200	26	<.2	6	1.7	1.6	<3	60
92	S. Mt. Pullen	7784 (2)	Ch	Sericite schist	<0.5	8	.010	1200	24	9	<1	24	<200	20	<.2	6	4.1	2	<3	20
	S. Mt. Pullen	7785 (2)	Cc	Quartz vein	<0.5	9	.040	200	5	34	<1	<5	<200	46	.5	<2	1.2	.5	<3	60
93	E. Lynn Canal	7669 (na)	Fl	Quartz vein	<0.5	<2	<.010	<150	54	100	200	<5	<200	8	<.2	<2	14	4.2	<3	60
	E. Lynn Canal	7668 (5)	Cc	Garnet skarn	<0.5	<2	<.010	500	16	80	7	<5	<200	10	<.2	<2	12	4.2	4	70
94	S. Mt. Leland	8434 (4)	Cc	Mafic volcanic	<0.5	12	.010	600	5	43	27	<5	<200	17	19	3	4.1	4.0	5	90
	S. Mt. Leland	8435 (2)	S	Quartz vein	<0.5	4	.010	800	20	19	22	13	<200	8	3.2	4	6.0	2.5	9	40
	S. Mt. Leland	8436 (1)	S	Quartz vein	<0.5	5	.010	500	7	16	9	8	<200	8	5.0	3	2.5	0.7	3	20
	S. Mt. Leland	8437 (1)	S	Massive sulfide	<0.5	140	.090	<150	61	170	870	9	<200	5	3.4	8	0.5	0.8	7	80
	S. Mt. Leland	8438 (1)	S	Massive sulfide	<0.5	130	.020	<150	50	440	460	7	<200	8	0.9	8	1.9	3.8	20	30
95	S. Mt. Leland	8089 (5)	Cc	Argillite	<0.5	10	.020	3400	5	150	13	<5	<200	3	2.1	3	3.8	1.5	<3	60
	S. Mt. Leland	8439 (2)	S	Quartz-calcite vein	<0.5	2	<.010	<150	2	4	2	<5	<200	5	0.5	3	<0.5	<0.5	<3	<20
96	W. Mt. Hislop	7790 (5)	Cc	Siliceous argillite	<0.5	<2	.010	300	14	24	8	<5	<200	4	.2	<2	.8	<.5	3	110
	W. Mt. Hislop	7791 (1)	S	Quartz vein	<0.5	<2	.020	300	1	2	<1	<5	<200	6	<.2	<2	<.5	.7	<3	<20
97	W. Mt. Hislop	8416 (5)	Cc	Quartz schist	<0.5	84	.020	200	10	22	31	<5	<200	27	5.2	3	0.6	<0.5	10	80
98	S. Mt. Leland	7794 (2)	Cc	Pyroxenite	<0.5	11	<.010	<150	93	3300	290	<5	900	6	.2	<2	<.5	<.5	<6	100
99	S. Mt. Leland	8440 (2)	S	Pyroxenite	<0.5	<2	<.010	<150	120	3400	<1	<5	1900	6	<.2	2	<0.5	<0.5	<3	90
100	Mt. Service	7792 (2)	S	Biotite schist	<0.5	2	.010	700	7	100	23	17	<200	18	.6	6	12	5.3	<3	80
101	N. Mt. London	7908 (4)	S	Quartz schist	<0.5	<2	<.010	1000	4	5	8	<5	<200	22	<.2	4	11	5.8	<3	30
102	W. Lynn Canal	7548 (3)	Cc	Biotite schist	<0.5	<2	.010	800	14	73	32	<5	<200	24	<.2	<2	15	4.1	<3	90
103	W. Mt. London	7909 (1)	S	Aplite dike	13	44	23.000	50	2	<2	160	<5	<200	500	1.1	<2	0.9	0.9	<3	710
104	Kakuhan Range	8088 (na)	Fl	Biotite schist	<0.5	11	.060	200	170	78	260	5	200	10	0.3	6	7.9	2.5	12	80
105	Kakuhan Range	7656 (4)	Cc	Biotite gneiss	<0.5	3	.010	1100	23	110	41	<5	<200	14	<.2	<2	5.7	2.1	<3	130
106	Kakuhan Range	7657 (20)	Cc	Argillite	<0.5	3	<.010	2800	10	30	61	5	<200	<2	.2	<2	2.1	3	<3	70
	Kakuhan Range	7658 (5)	Cc	Chert	<0.5	10	<.010	1100	7	150	23	<5	<200	6	.3	<2	1.6	7.9	11	140
107	Kakuhan Range	7659 (3)	Cc	Argillite	<0.5	2	<.010	6300	9	34	34	8	<200	8	.2	<2	9.3	7.3	<3	340
108	Kakuhan Range	7664 (1)	Ch	Quartz-calcite vein	<0.5	2	50.000	<150	30	44	490	<5	<200	70	.4	<2	<.5	<.5	14	80
109	Kakuhan Range	7665 (1)	Ch	Quartz vein	<0.5	<2	.450	<150	11	28	4	<5	<200	30	.4	<2	<.5	<.5	3	40
	Kakuhan Range	7666 (2)	Ch	Calcite breccia	<0.5	9	<.010	200	33	160	59	<5	<200	14	7.4	<2	<.5	<.5	10	80
110	Kakuhan Range	7667 (1)	Ch	Quartz vein	<0.5	<2	.010	<150	4	16	1900	<5	<200	16	.3	<2	<.5	<.5	<3	20

NA Not available.

APPENDIX E-3.

Complete assay results, Southern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no Width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
1	Horn Peaks	7868 (2)	S	Aplite dike	<5	3	<.010	1400	<2	16	13	11	<200	16	0.7	3	9.0	4.7	3	<20
2	Boundary Creek	7888 (3)	S	Garnet skarn	<5	5	<.010	2700	16	82	45	1000	<200	10	1.9	4	8.1	4.3	6	300
3	Boundary Creek	7180 (6)	Cc	Aplite dike	<5	<2	<.010	<150	1	5	6	260	<200	26	<.2	6	23	16.6	3	<20
4	Boundary Creek	7181 (6)	Cc	Syenite	<5	<2	<.010	900	3	4	8	18	<200	26	<.2	2	21	6.3	8	<20
5	Boundary Creek	7889 (4)	S	Syenite	<5	<2	<.010	600	2	<3	32	28	<200	23	.2	4	18	7.5	7	80
	Boundary Creek	7890 (1)	S	Aplite	<5	<2	<.010	400	2	<2	30	6	<200	27	<.2	3	16	8.0	<3	40
	Boundary Creek	7891 (2)	S	Syenite	<5	<2	<.010	600	6	5	28	<5	<200	22	<.2	3	18	7.4	19	50
6	Boundary Creek	7892 (4)	S	Syenite	<5	<2	<.010	600	7	2	32	<5	<200	25	<.2	3	14	4.0	8	<30
	Boundary Creek	7893 (2)	S	Syenite	<5	<2	<.010	700	4	<2	33	57	<200	40	<.2	3	28	10.0	400	<20
7	Boundary Creek	7894 (4)	S	Syenite	<5	<2	<.010	500	5	<2	69	240	<200	19	<.2	4	18	9.8	240	<20
8	Boundary Creek	7172 (na)	Fl	Siliceous alaskite	<5	<2	<.010	700	1	—	13	10000	<200	34	<.2	<2	47	34.2	27	30
9	Bacon Creek	7860 (5)	Cc	Aplite dike	<5	<2	.200	1000	5	6	120	<5	<200	170	<.2	<2	2.6	1.2	3	270
10	Bacon Creek	7861 (5)	Cc	Granodiorite	<5	<2	.040	600	1	4	17	260	<200	230	.2	<2	18	9.0	290	20
11	Bacon Creek	7862 (na)	S	Alaskite	<5	<2	<.010	200	1	2	3	67	<200	35	<.2	<2	20	12.3	<3	30
12	Boundary Creek	7867 (2)	Cc	Gossanous aplite	<5	2	.010	<150	5	5	32	380	<200	110	.2	4	17	149	10	<20
13	Boundary Creek	7866 (4)	S	Alaskite	250	<2	.210	600	2	<2	25	4800	<200	1600	1.5	6	32	18.0	10	40
14	Yehring Creek	3047 (na)	Ss	na	<.2	—	.010	—	—	—	69	9	—	14	—	—	—	—	—	132
15	Wright Glacier	7906 (1)	S	Aplite dike	<5	4	<.010	<150	8	<2	40	<5	<200	18	0.9	4	28	9.4	<3	30
16	Wright Glacier	7907 (1)	S	Chlorite schist	<5	6	<.010	<150	32	75	34	<5	<200	20	1.9	4	2.4	0.6	<3	70
17	Yehring Creek	3133 (na)	Ss	na	<.2	—	<.005	—	—	—	25	4	—	8	—	—	—	—	—	33
18	Yehring Creek	3048 (na)	Ss	na	<.2	—	.090	—	—	—	9	3	—	21	—	—	—	—	—	52
19	Yehring Creek	3254 (na)	Ss	na	<.2	—	<.005	—	—	—	8	2	—	9	—	—	—	—	—	48
20	Yehring Creek	3253 (na)	Ss	na	<.2	—	<.005	—	—	—	3	5	—	13	—	—	—	—	—	16
21	Yehring Creek	3252 (na)	Ss	na	<.2	—	<.005	—	—	—	4	12	—	10	—	—	—	—	—	26
22	Yehring Creek	3041 (na)	Ss	na	<.2	—	<.005	—	—	—	1	<1	—	4	—	—	—	—	—	26
23	Yehring Creek	3251 (na)	Ss	na	<.2	—	<.005	—	—	—	2	5	—	7	—	—	—	—	—	20
24	Yehring Creek	3250 (na)	Ss	na	<.2	—	<.005	—	—	—	1	7	—	18	—	—	—	—	—	14
25	Yehring Creek	3249 (na)	Ss	na	<.2	—	<.005	—	—	—	1	2	—	12	—	—	—	—	—	30
26	Yehring Creek	3040 (na)	Ss	na	<.2	—	<.005	—	—	—	4	10	—	10	—	—	—	—	—	43
27	Yehring Creek	3248 (na)	Ss	na	<.2	—	<.005	—	—	—	11	12	—	13	—	—	—	—	—	26
28	Yehring Creek	3247 (na)	Ss	na	<.2	—	<.005	—	—	—	6	2	—	6	—	—	—	—	—	36
29	Yehring Creek	3246 (na)	Ss	na	<.2	—	<.020	—	—	—	16	3	—	16	—	—	—	—	—	51
30	Yehring Creek	3039 (na)	Ss	na	<.2	—	<.005	—	—	—	5	<1	—	13	—	—	—	—	—	59
31	Yehring Creek	3245 (na)	Ss	na	.2	—	<.005	—	—	—	8	38	—	10	—	—	—	—	—	31
32	Yehring Creek	3244 (na)	Ss	na	<.2	—	<.005	—	—	—	21	18	—	15	—	—	—	—	—	59
33	Yehring Creek	3243 (na)	Fl	Aplite	.9	—	<.005	—	—	—	283	—	—	8	—	—	—	—	—	33
34	Yehring Creek	3131 (na)	S	Diorite	<.2	—	.025	—	—	—	39	4	—	5	—	—	—	—	—	58
35	Yehring Creek	7878 (1)	S	Aplite dike	<5	2	<.010	<150	2	13	58	<5	<200	32	<.2	<2	37	14.5	<3	40
36	Yehring Creek	3134 (na)	S	Granodiorite	.3	—	.005	—	—	—	374	68	—	4	—	—	—	—	—	22
37	Yehring Creek	3044 (na)	Fl	Porphyritic diorite	<.2	—	<.005	—	—	—	75	11	—	6	—	—	—	—	—	46
	Yehring Creek	3045 (na)	Fl	Tonalite	10	—	.020	—	—	—	6060	10800	—	7	—	—	—	—	—	78
	Yehring Creek	3046 (na)	Fl	Tonalite	8	—	.035	—	—	—	4200	>20000	—	7	—	—	—	—	—	54

APPENDIX E-3.—Continued
Complete assay results, Southern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no Width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
38	Yehring Creek	8457 (2)	S	Aplite dike	<5	<2	<.010	300	1	<2	100	20	<200	29	<.2	7	9.6	10.1	<3	60
39	Yehring Creek	3049 (na)	Fl	Aplite	<.2	—	<.005	—	—	—	46	148	—	4	—	—	—	—	—	6
40	Yehring Creek	3038 (na)	Ss	na	<.2	—	<.005	—	—	—	18	3	—	15	—	—	—	—	—	67
41	Yehring Creek	3242 (na)	Fl	Granite	—	—	<.005	—	—	—	10	—	—	23	—	—	—	—	—	58
42	Yehring Creek	3037 (na)	Fl	Diorite	.2	—	<.005	—	—	—	13	—	—	9	—	—	—	—	—	58
43	Yehring Creek	8173 (na)	Fl	Quartz vein	<5	16	<.01	<150	17	2	74	12	<200	7	.2	3	<0.5	1.9	4	20
44	Hidden Creek	3416 (na)	Ss	na	<5	<300	<.02	200	<10	<10	30	<1	<8	<20	<700	<20	—	—	—	20
45	Hidden Creek	7067 (na)	Ss	na	<.2	—	<.005	—	—	—	30	1	—	5	—	—	—	—	—	49
46	Hidden Creek	3415 (na)	Ss	na	<20	<300	.100	700	<10	<6	300	<1	10	<20	<600	<50	—	—	—	10
47	Hidden Creek	3414 (na)	Ss	na	<5	<400	<.02	4000	<10	10	<6	<1	<5	<20	<600	<8	—	—	—	<2
48	Hidden Creek	3412 (na)	Ss	na	.3	—	<.005	—	—	—	21	12	—	12	—	—	—	—	—	45
49	Hidden Creek	7066 (na)	Ss	na	.2	—	<.005	—	—	—	20	24	—	15	—	—	—	—	—	66
50	Hidden Creek	3411 (na)	Ss	na	<.2	—	<.005	—	—	—	5	3	—	4	—	—	—	—	—	35
51	Hidden Creek	7065 (na)	Ss	na	<.2	—	<.005	—	—	—	9	2	—	13	—	—	—	—	—	47
52	Hidden Creek	7064 (na)	Ss	na	<.2	—	<.005	—	—	—	7	3	—	6	—	—	—	—	—	44
53	Hidden Creek	3410 (na)	Ss	na	<.2	—	<.005	—	—	—	9	2	—	7	—	—	—	—	—	42
54	Hidden Creek	7063 (na)	Ss	na	.2	—	<.005	—	—	—	9	8	—	7	—	—	—	—	—	59
55	Hidden Creek	7062 (na)	Ss	na	<.2	—	.045	—	—	—	24	2	—	9	—	—	—	—	—	45
56	Hidden Creek	3409 (na)	Ss	na	<.2	—	<.005	—	—	—	15	2	—	3	—	—	—	—	—	60
57	Hidden Creek	3408 (na	Ss	na	<.2	—	<.005	—	—	—	19	3	—	13	—	—	—	—	—	73
58	Davidson Creek	7167 (6)	Cc	Diorite	.8	—	<.002	—	—	—	84	—	—	8	—	—	—	—	—	146
59	Davidson Creek	7171 (3)	Cc	Aplite	<5	<2	<.01	1800	3	13	11	<5	<200	24	<.2	<2	13	12.1	5	<20
60	Davidson Creek	8006 (na)	Fl	Biotite granite	<5	<2	.020	400	1	2	4	<5	<200	24	<.2	2	8.8	11.5	<3	20
	Davidson Creek	8007 (na)	Fl	Biotite granite	<5	<2	.01	1100	4	5	14	100	<200	24	<.2	4	9.5	6.9	3	40
61	Davidson Creek	3360 (na)	Fl	Tonalite	<5	<2	.090	200	1	2	6	<5	<200	38	<.2	<2	6	16.1	<3	20
62	N. Speel Glacier	7905 (na)	Fl	Sheared granite	<5	75	.01	600	250	26	1400	<5	<200	10	17	4	0.9	<0.5	<3	160
63	Mt. Brundage Cirque	6364 (na)	Fl	Gneiss	<5	4	<.01	2500	18	140	60	<5	<200	18	.8	<2	11	3.4	<3	180
64	Mt. Brundage Cirque	6365 (na)	Fl	Quartz diorite	83	2500	5.00	200	7	24	450	7	<200	2400	680	<2	1.3	1	10	370
65	Mt. Brundage Cirque	8008 (na)	S	Granodiorite	<5	55	<.01	1700	5	8	9	<5	<200	22	<.2	<2	17	6.3	14	30
66	Crescent Lake Area	6389 (na)	S	Granite	<5	3	<.01	1000	1	3	2	<5	<200	16	<.2	2	11	4.8	<3	<20
67	S. Whiting River	7561 (3)	Cc	Biotite gneiss	<5	2	<.01	2000	21	200	66	<5	<200	6	<.2	<2	4	2	3	120
68	S. Whiting River	7562 (3)	Cc	Granite	<5	<2	<.01	2000	4	5	6	<5	<200	12	<.2	4	8.2	1	<3	20
69	S. Whiting River	7560 (3)	Cc	Quartz schist	<5	<2	<.01	2200	12	91	74	<5	<200	10	<.2	<2	7.6	2.3	<3	90
70	S. Whiting River	6402 (2)	S	Quartz monzonite	<5	<2	.010	200	1	<2	2	280	<200	26	<.2	6	11	9.9	<3	<20
	S. Whiting River	6403 (na)	Fl	Quartz monzonite	<5	<2	.02	1200	5	4	23	270	<200	20	.2	<2	9	6.5	6	80
71	S. Whiting River	7563 (na)	Fl	Granite	<5	<2	.08	3100	3	4	12	400	<200	12	<.2	2	4.3	5.6	<3	>20
72	S. Whiting River	8078 (na)	Fl	Quartzdiorite	<5	<2	<.01	1700	13	6	32	34	<200	15	0.2	3	5.3	1.7	<3	90
73	S. Whiting River	3340 (na)	S	Granite	<5	4	.02	1300	190	8	390	<5	<200	4	<.2	<2	1.9	.7	<3	130
74	S. Whiting River	8270 (2)	Cc	Aplite	<5	<2	.07	<150	2	2	30	8	<200	20	0.4	3	10	12.0	<3	60
	S. Whiting River	8271 (3)	Cc	Aplite	<5	<2	<.010	300	2	3	23	<5	<200	22	<.2	5	13	18.3	<3	40
	S. Whiting River	8272 (1)	S	Quartz vein	<5	<2	.03	<150	1	2	28	6	<200	26	<.2	3	5.1	7.4	<3	<20
	S. Whiting River	8273 (1)	Cc	Quartz vein	<5	<2	.04	1600	3	<2	53	5	<200	17	<.2	3	4.6	16.1	<3	20

APPENDIX E-3.—Continued

Complete assay results, Southern portion of Coast Range subarea; all elements reported in ppm, (—) indicates not analyzed for

Map no.	Name or Location	Sample no Width (ft)	Sample type	Sample lithology	Ag	As	Au	Ba	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Th	U	W	Zn
75	S. Whiting River	6400 (na)	Fl	Altered granite	<5	2	.02	200	4	3	1	<5	<200	16	.2	<2	2.9	1.7	<3	40
75	S. Whiting River	6401 (na)	Fl	Altered granite	<5	<2	.010	1200	8	<2	3	<5	<200	20	<.2	4	6.1	2.2	<3	80
76	Whiting River	6393 (4)	Cc	Quartz schist	<5	2	<.010	1000	14	77	73	8	<200	6	.2	<2	4.9	4.5	<4	110
77	Whiting River	6370 (na)	Fl	Gossan	<5	<2	.030	<150	11	20	410	<5	<200	10	.2	4	4.2	2.5	<4	100
	Whiting River	6371 (na)	Fl	Altered granite	<5	<2	<.010	2500	2	2	31	<5	<200	20	<.2	2	6	2.8	<3	<20
	Whiting River	6372 (na)	Fl	Epidote skarn	<5	<2	<.010	300	19	68	110	<5	<200	6	.5	6	7.1	2.5	<4	110
78	Whiting River	6392 (1)	S	Granofels	<5	<2	<.010	300	19	20	12	<5	<200	6	.2	4	42	7.3	7	110
79	Whiting River	6368 (1)	S	Limestone	<5	<2	<.010	1000	31	83	76	<5	<200	6	<.2	4	2.6	2.1	<6	160
80	Whiting River	6391 (4)	Cc	Biotite schist	<5	<2	<.010	900	15	87	30	<5	<200	16	<.2	<2	13	4.5	6	100
81	Whiting River	6369 (4)	S	Biotite gneiss	<5	<2	<.010	700	28	170	70	<5	<200	8	.2	<2	9.9	3.6	<5	100
82	Whiting River	6373 (na)	Fl	Biotite granodiorite	<5	<2	<.010	2100	2	9	23	15	<200	20	<.2	<2	12	3.7	4	50
83	Whiting River	6390 (4)	Cc	Aplite	<5	<2	<.010	1300	1	3	6	<5	<200	26	<.2	<2	5.2	3.5	<3	20

NA Not available.