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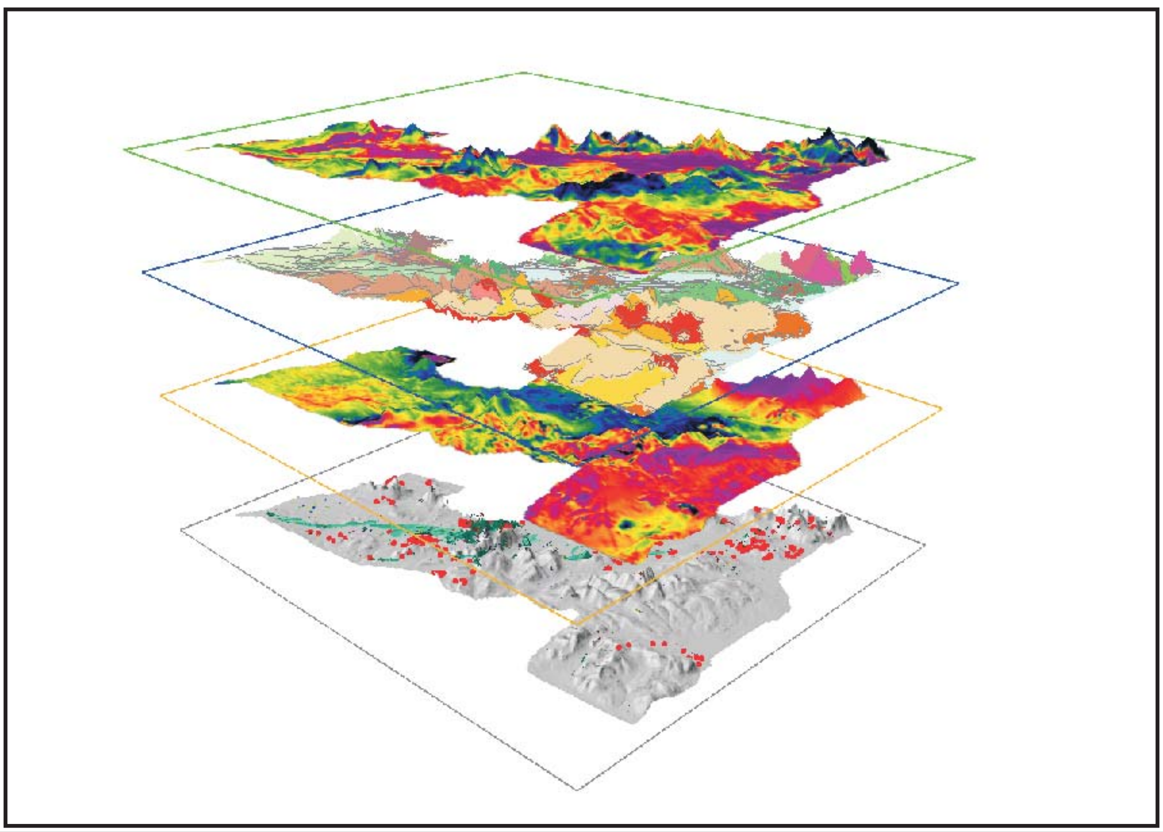
Stikine Airborne Geophysical Survey Follow-up, Central Southeast Alaska, 2000

Peter E. Bittenbender, Kirby W. Bean, and Jan C. Still



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The Bureau of Land Management sustains the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

Authors

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Cover Graphic

Resistivity, geology, total field magnetics, and geophysical models draped over a digital elevation model of the Duncan Canal area of Kupreanof Island, central Southeast Alaska.

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Table of Contents

Illustrations

Tables

Abstract

The BLM conducted a geochemically based follow-up of the Stikine airborne geophysical survey in 2000. The geophysical survey was flown in support of the BLM's mineral assessment program of public lands in Alaska and specifically, the Stikine area mineral assessment project. The aim of the follow-up was to define prospective mineralized areas.

The primary targets of the Stikine geophysical survey and BLM follow-up were volcanogenic massive sulfide (VMS) deposits. A belt of related deposits is hosted in Triassic rocks along the eastern margin of the Alexander terrane and extends through the Stikine area from Duncan Canal to Etolin Island.

The BLM collected stream sediment and/or soil samples from 43 geophysically anomalous zones in the Duncan Canal to Etolin Island area in order to evaluate 59 anomalous zones revealed by the geophysical survey. Higher priority was given to anomalous zones that included: 1) discrete geophysical anomalies that indicated strong bedrock responses, particularly sulfide responses; 2) Triassic Hyd Group geology; 3) VMS mineral occurrences; 4) geochemical anomalies from an existing, regional stream sediment sampling program; 5) similar geophysical signatures to other VMS mineral occurrences in the area; and 6) contained resistivity gradients from contacts between conductive and more resistive rocks.

The BLM follow-up defined 10 "Anomalous Areas" based on geochemical sampling that represent areas with elevated potential for hosting VMS mineral deposits. The areas were defined by the presence of samples with anomalous concentrations of elements that characterize VMS deposits in the Triassic belt. The most prospective include the Taylor Creek area, Woewodski Island, the RD8 area northwest of Duncan Canal, and the southeast side of Duncan Canal. Of these, the RD8 area and the southeast side of Duncan Canal are newly defined as representing areas with an elevated potential for hosting mineral occurrences.

Acknowledgments

The present authors gratefully acknowledge the field contributions made by Autumn Lowrey (Environmental Careers Organization) during this study. We are also grateful to Ms. Lowrey and to Shirley W. Mercer (BLM GIS specialist, Juneau) for their preparation of the figures and cover. This report benefitted greatly from the constructive reviews of Elizabeth A. McLean (BLM, Fairbanks), Steven M. Smith (USGS, Denver), and Cliff D. Taylor (USGS, Denver).

Introduction

In 2000 the Bureau of Land Management (BLM) conducted a geochemically-based follow-up of the Stikine airborne geophysical survey (Fig. 1). The Stikine survey and subsequent follow-up are part of the BLM Stikine mining district mineral assessment study, which in turn is part of the BLM program of mineral assessments of public lands in Alaska, a congressionally mandated responsibility of the BLM. The Stikine study started in 1997 with the evaluation of mines, prospects, and mineral occurrences in the area and was completed with the geophysical survey follow-up in 2000. Two reports have been published to date presenting the Stikine study's findings (McDonald and others, 1998; Bittenbender and others, 2000). A final Stikine mineral assessment report is scheduled for release by the end of 2001.

The Stikine airborne geophysical survey was conducted by the BLM in partnership with the City of Wrangell and administered by the State of Alaska, Division of Geological and Geophysical Surveys (ADGGS). The primary targets of the survey were volcanogenic massive sulfide (VMS) deposits hosted in Triassic rocks in the Duncan Canal area of Kupreanof Island, on Zarembo Island, and on Etolin Island (Fig. 1). Total field magnetics and three frequencies of electromagnetic (EM) data were collected by a geophysical contractor from helicopter-borne instrumentation flying at an altitude of approximately 100 feet (30 m) with a line spacing of 1/4 mile (400 m). The survey covered approximately 1,100 square miles (5,032 line miles) in five survey blocks. Field data were collected between March and May, 1997. Final survey products were released to the public in September, 1997. A full description of the survey equipment, logistics, results, and contractor personnel is available from the ADGGS (ADGGS and others, 1997).

The U.S. Geological Survey (USGS) followed up the Stikine geophysical survey in the Duncan Canal and Zarembo Island areas in 1998 and 1999 with new geologic mapping (Karl and others, 1999), re-analysis of stream sediment samples (Smith, 1998), descriptions of mineral occurrences and their geochemical signatures (Taylor, in press), geophysical modeling (McCafferty and others, in press), structural analysis (Haeussler and others, in press), and ground-based geophysical traverses (Wynn and others, in press). The BLM used much of this information, specifically the new geologic mapping, geochemistry, and geophysical modeling, in its follow-up of the geophysical survey.

The BLM follow-up of the Stikine geophysical survey concentrated on the belt of Triassic rocks in the Duncan Canal - Zarembo Island - Etolin Island area that have the highest potential for hosting a VMS deposit. The belt has been described as the Duncan Canal - Zarembo Island - Screen Island sub-belt by Brew and others (1984). The VMS potential was described by Berg and Grybeck (1980) and Berg (1981). In the late 1970's various mineral exploration companies targeted the area after recognizing the similarity or continuity of the rocks with those hosting Noranda's Greens Creek discovery to the north (e.g., Amoco Minerals Company, 1979).

The Stikine geophysical survey also targeted replacement-style deposits in the Groundhog Basin area and rare-earth occurrences on the northeastern end of Prince of Wales Island (Fig. 1). However, neither of these areas were targeted by the geophysical follow-up.

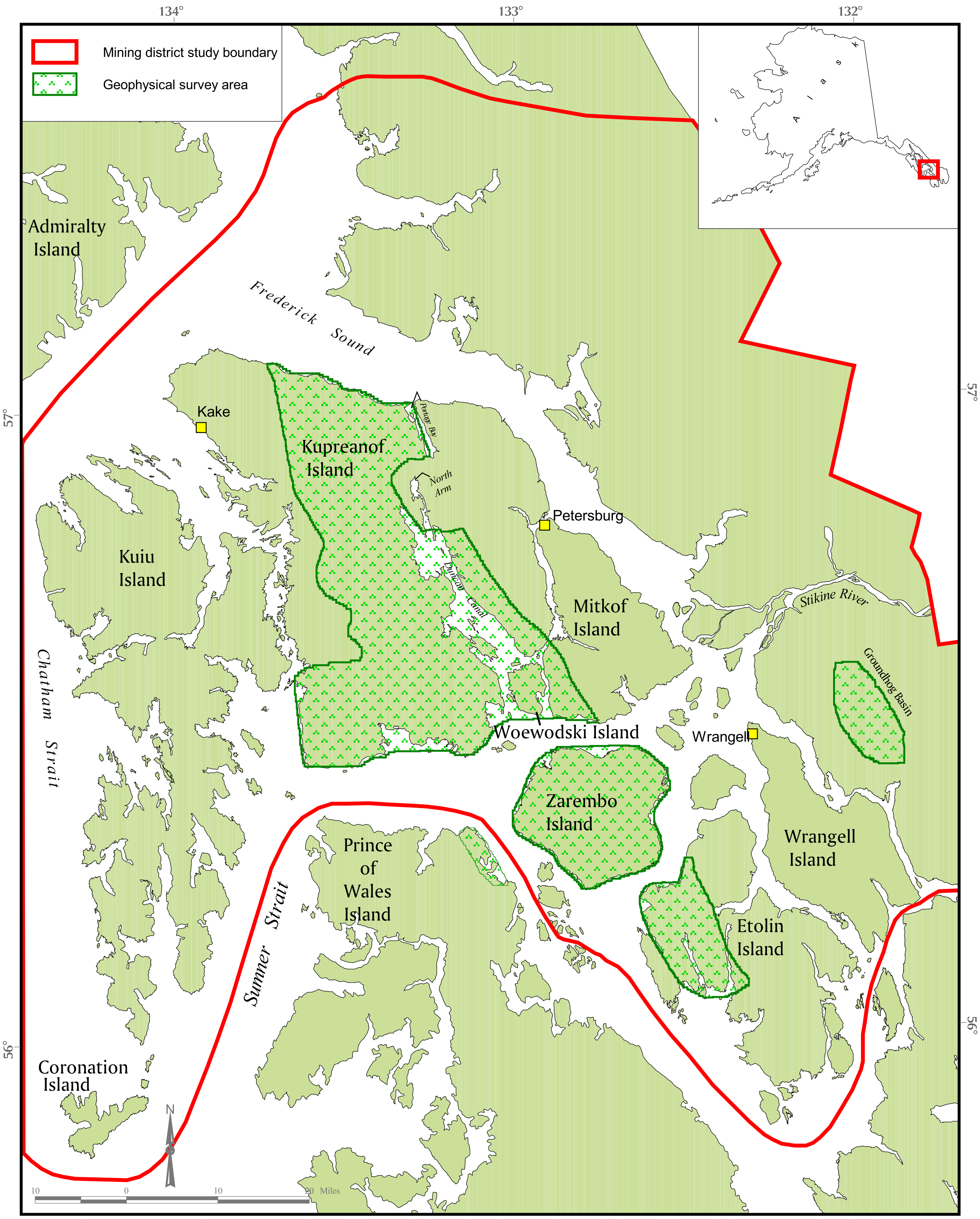

Figure 1. Location map of the Stikine mining district study and the Stikine airborne geophysical survey.

This report presents the results of the BLM follow-up of the airborne geophysical survey in the Duncan Canal to Etolin Island belt. Figures 3 through 32 depict the distribution of anomalous sample results for each of the elements selected to indicate the potential for VMS occurrences in the area. Fifteen of the figures show the distribution of anomalous stream sediment samples and fifteen show anomalous soil samples.

This report also describes 10 “Anomalous Areas” where a concentration of anomalous stream sediment and/or soil samples indicate a potentially mineralized area. Some of the anomalous areas correspond to known mineral occurrences, particularly those on Woewodski Island. Other areas were previously unknown to contain mineral occurrences. In several cases where there are known mineral occurrences, the BLM follow-up expanded the areas likely to host mineralized rock.

General Geology

The primary targets of the airborne geophysical survey were VMS deposits situated in the Alexander terrane, which extends the length of SE Alaska and into Canada, both to the northwest and to the southeast (Monger and Berg, 1987). The Alexander terrane is comprised of Late Precambrian through approximately Mid-Jurassic sedimentary, metamorphic, volcanic and associated plutonic rocks. These rocks represent a variety of tectonic environments beginning with an island arc system, followed by a stable marine setting, and finally a rift environment in the Late Triassic with associated bimodal volcanic rocks. The Alexander terrane was accreted to the North American continent by about the Middle Cretaceous (Gehrels and Berg, 1994).

The VMS deposits on the eastern margin of the Alexander terrane are hosted in a belt of Triassic rocks that extends the length of southeastern Alaska and into British Columbia to the northwest (Taylor and others, 1995a; Taylor, 1997; Newberry and others, 1997). The belt includes the world class Windy Craggy deposit in northwest British Columbia (Peter and Scott, 1999), approximately 230 miles to the northwest of the Stikine area. The belt also includes the Greens Creek deposit, a polymetallic, VMS deposit currently being mined by Kennecott Greens Creek Mining Company, approximately 80 miles to the northwest (Berg, 1981; Newberry and others, 1997; Taylor and others, 1999a; 2000). Approximately 60 miles to the southeast of the Stikine area, the belt includes VMS occurrences on Gravina and Annette Islands in southeastern Alaska (Berg, 1981).

The VMS deposits on the eastern margin of the Alexander terrane show evidence of having formed in a rift-related environment, possibly in a back-arc or intra-arc setting (MacIntyre, 1986; 1989; Taylor and others, 1995b; 1999b). The deposits, however, exhibit a systematic variation in structural appearance, mineralogy, and stratigraphic setting from south to north that suggests an evolution in tectonic setting. Deposits to the south are thought to be structurally controlled, have formed in shallow water in a near arc setting, and to be associated with bimodal, arc-like, rift-related volcanics. To the north the deposits are more stratiform, exhibit characteristics of deeper water formation in a rift basin setting and are associated with mafic volcanics and mafic to ultra-mafic intrusives of mid-ocean-ridge-basalt (MORB)-like affinity. Deposits in the middle of the VMS belt reflect a transition between the two settings (Taylor, 1997; Taylor and others, 1995a;

1995b; 1999b). The VMS deposits in the Duncan Canal to Etolin Island belt are in the middle of the larger VMS belt, but represent the southern extent of the northern deposit type. However, along with the Greens Creek deposit, they are somewhat transitional, and exhibit mineralogy, structure, and stratigraphy that suggests lower temperatures and shallower water depths than the deposits at the northern end of the belt (Taylor, 1997; in press; Taylor and others, 1999a; 2000).

The Upper Triassic VMS host rocks in the Duncan Canal to Etolin Island belt are a series of interbedded marine sedimentary and volcanic rocks of the Hyd Group (Karl and others, 1999; Brew and others, 1984). The sedimentary rocks of the group consist of carbonaceous and calcareous phyllite and slate, conglomerates, breccias, and limestones. The volcanic rocks are comprised of pillow basalts and breccias, volcaniclastics, and mafic to felsic tuff (Karl and others, 1999). Berg and Grybeck (1980) originally described the volcanic host rocks as felsic phyllitic metatuff or layered metarhyolite. Newberry and Brew (1989; 1999) recognized the intense hydrothermal alteration associated with the massive sulfides in the Greens Creek area and on Woewodski Island in Duncan Canal and determined a primarily basaltic composition for the volcanic rocks in the two areas. Although they described the immediate hosts of sulfide mineralization as felsic volcanics, Berg and Grybeck (1980) also recognized andesitic to basaltic flows, breccia, and tuff spatially related to the Duncan Canal to Etolin Island VMS occurrences.

Sulfides in the Duncan Canal to Etolin Island VMS deposits commonly include pyrite, pyrrhotite, sphalerite, chalcopyrite and minor galena. Barite predominates in some occurrences and gold and silver can be important constituents.

The VMS deposits and hosting rocks in the Duncan Canal to Etolin Island belt have been regionally and/or contact metamorphosed and deformed. The Duncan Canal shear zone cuts the VMS belt and reflects Jurassic right-lateral shear (McClelland & Gehrels, 1990). Haeussler and others (in press) define three additional episodes of deformation in the area that may have affected the deposits, a Mid-Cretaceous contractional-strike slip event, a Mid-Cretaceous to Paleocene contraction and uplift, and a middle to late Tertiary faulting and extension. The VMS deposits are likely to be metamorphosed as well, at least to a low grade. A Mid-Cretaceous, prehnite-pumpellyite- to lower greenschist-facies metamorphic event is recorded on Kupreanof Island and elsewhere in central Southeast Alaska (Dusel-Bacon, 1994). Taylor (in press) reports an Ar/Ar age of 92.0 $\pm$ 0.2 million years on fuchsite from quartz-carbonate vein material from the dump of the Maid of Mexico Mine on Woewodski Island. He suggests this early Late Cretaceous age correlates to the timing of accretion of the Alexander terrane onto North America and may reflect metamorphic remobilization of Late Triassic massive sulfide occurrences in the area (Taylor, in press). Contact metamorphism accompanied the Late Cretaceous intrusion of plutons in the area as well (Dusel-Bacon, 1994). Given this subsequent deformation and metamorphism, the Late Triassic VMS deposits in the area are commonly dismembered and metamorphosed with some possible remobilization of constituents.

Model

The follow-up of the Stikine airborne geophysical survey was based on a VMS target model, extensively the Greens Creek VMS model. The Greens Creek deposit is situated between a graphitic-pyritic argillite hanging wall and an altered phyllitic footwall of mafic protolith (Newberry and others, 1997; Newberry and Brew, 1999; Taylor and others, 1999a). Therefore our target model anticipated a conductive ore body that may be situated between a conductive hanging wall and a more resistive footwall. So we would target a strong bedrock conductor occurring in an area with a conductivity contrast or gradient.

The Greens Creek deposit is not a typical volcanic-hosted VMS deposit. It has been described as an hybrid between a VMS and a sedimentary exhalative (SEDEX) type deposit (Taylor and others, 1999a). VMS characteristics include mafic volcanics in the footwall, a zoned alteration profile, and sulfide mineralogy similar to that of a white smoker exhalative system. SEDEX characteristics include the lack of felsic volcanic rocks, the presence of mafic to ultra-mafic intrusives in the footwall, the hanging wall of graphitic, pyritic, argillite, and evidence that mineralization continued during and after deposition of the argillic cap (Taylor and others, 1999a; 2000).

In addition to the Greens Creek setting, the BLM follow-up was based on characteristics of known VMS occurrences in the Duncan Canal to Etolin Island belt (e.g., the Lost Show, Scott, East Duncan Pyrite, Taylor Creek, and Frenchie occurrences [Grybeck and others, 1984; Bittenbender and others, 2000]). These characteristics were used to prioritize geophysically anomalous zones and are described in the next section.

Methodology

There are 57 geophysically anomalous zones (Fig. 2) in the Duncan Canal to Etolin Island belt that were distinguished by the Stikine geophysical contractor and discussed in the contractor's project report (Pritchard, 1997). Most of these are resistivity anomalies, where the anomaly is more conductive than the surrounding country rock. The contractor described these as "conductive zones." In addition, the contractor defined 9 of the 57 anomalous zones by either anomalously high or low magnetic signature (Pritchard, 1997). The BLM distinguished two additional anomalous zones, for a total of 59, adjacent to the contractor's extensive RD1 conductive zone on the north side of Kupreanof Island. These are named "NW Portage" and "6030 End" (Fig. 2).

The 59 anomalous zones were prioritized for BLM follow-up based on 6 parameters:
1) geophysical responses, 2) geology, 3) mineral occurrences, 4) geochemistry, 5) geophysical models, and 6) resistivity gradients (Table 1). Following is a description of each of these parameters:

1) "Geophysical responses" refers to the discussion and assessment of the project results by the geophysical contractor (Pritchard, 1997). In each of the survey areas the contractor defined, named, and assessed anomalous geophysical responses. In the discussion of the resistivity responses the contractor concentrated on discrete resistivity responses that indicated possible bedrock sources. They did not consider other possible resistive anomalies, such as conductive overburden, cultural anomalies, etc. The contractor evaluated the limited number of concentrated magnetic responses in the survey area by the strength of each response (Pritchard, 1997). Since a

magnetic response did not directly fit the VMS target model (i.e., the expected VMS targets may have a variable magnetic response), the BLM reduced the maximum magnetic response prioritization factor from five to three. The BLM prioritization of the responses was based on the contractor's evaluation of groups of responses that make up a conductive or magnetic zone (Table 1).

2) The BLM included the mapped geology in an anomalous zone in its prioritization. The geology is based primarily on the work of Karl and others (1999), who followed up the Stikine geophysical survey in the Duncan Canal and Zarembo Island areas with new geologic mapping. The VMS deposits on the eastern margin of the Alexander terrane in the Stikine area are hosted in Triassic volcanic and sedimentary rocks of the Hyd Group. The BLM prioritized anomalous zones that corresponded to mapped occurrences of Hyd Group volcanic rocks (Table 1).

3) If there were known or suspected VMS occurrences associated with an anomalous zone, the BLM assigned a higher prioritization factor. Various stages of priority were assigned depending on the degree of association (Table 1).

4) Part of the USGS follow-up of the Stikine geophysical survey in 1998 and 1999 involved the re-analysis of stream sediment samples from a data set collected during a USGS Alaska Mineral Resource Assessment Program of the Petersburg 1:250,000-scale quadrangle (Cathrall and others, 1983). The BLM ranked the association of geochemical anomalies determined by the USGS with the anomalous zones. The prioritization was based primarily on the magnitude of geochemical anomalies (Table 1).

5) The USGS devised predictive geophysical models for several VMS deposits in the Duncan Canal to Etolin Island belt (McCafferty and others, in press). They modeled the geophysical signatures of the host rocks of known deposits and calculated the probability of finding similar host rocks elsewhere, based on similar geophysical signatures. The BLM compared the distribution of these predictive models to the anomalous zones (Table 1).

The USGS modeled the Lost Show, Scott, Taylor Creek, and Junior Creek (East Duncan Pyrite) prospects (McCafferty and others, in press). The Lost Show (Fig. 40) is a VMS prospect with disseminated and massive sulfides hosted in metavolcanic schist of the Triassic Hyd Group. The Scott prospect (Fig. 40) consists of bands or lenses and disseminations of sulfides also hosted in metavolcanic schist of the Hyd Group. The Taylor Creek deposit (Fig. 34) is hosted in dolomite of the Hyd Group that is underlain by limestone and overlain by greenstone. Mineralized rock consists of patches and disseminations of sulfides in what appears to be a replacement of the dolomite. The overlying greenstone may also host mineralized rock at Taylor Creek. The Junior Creek or East Duncan Pyrite occurrence (Fig. 37) consists of layers of pyrite hosted in slate of the Hyd Group. Descriptions of these prospects are available in Bittenbender and others (2000), and Taylor (in press).

6) The BLM prioritized anomalous zones by their association with resistivity gradients. The Greens Creek model calls for an ore body that is located between a conductive unit and a more resistive unit. Such a geophysical setting would be evident by a resistivity gradient. However, resistivity gradients are common across the survey area, even where there are no mineral

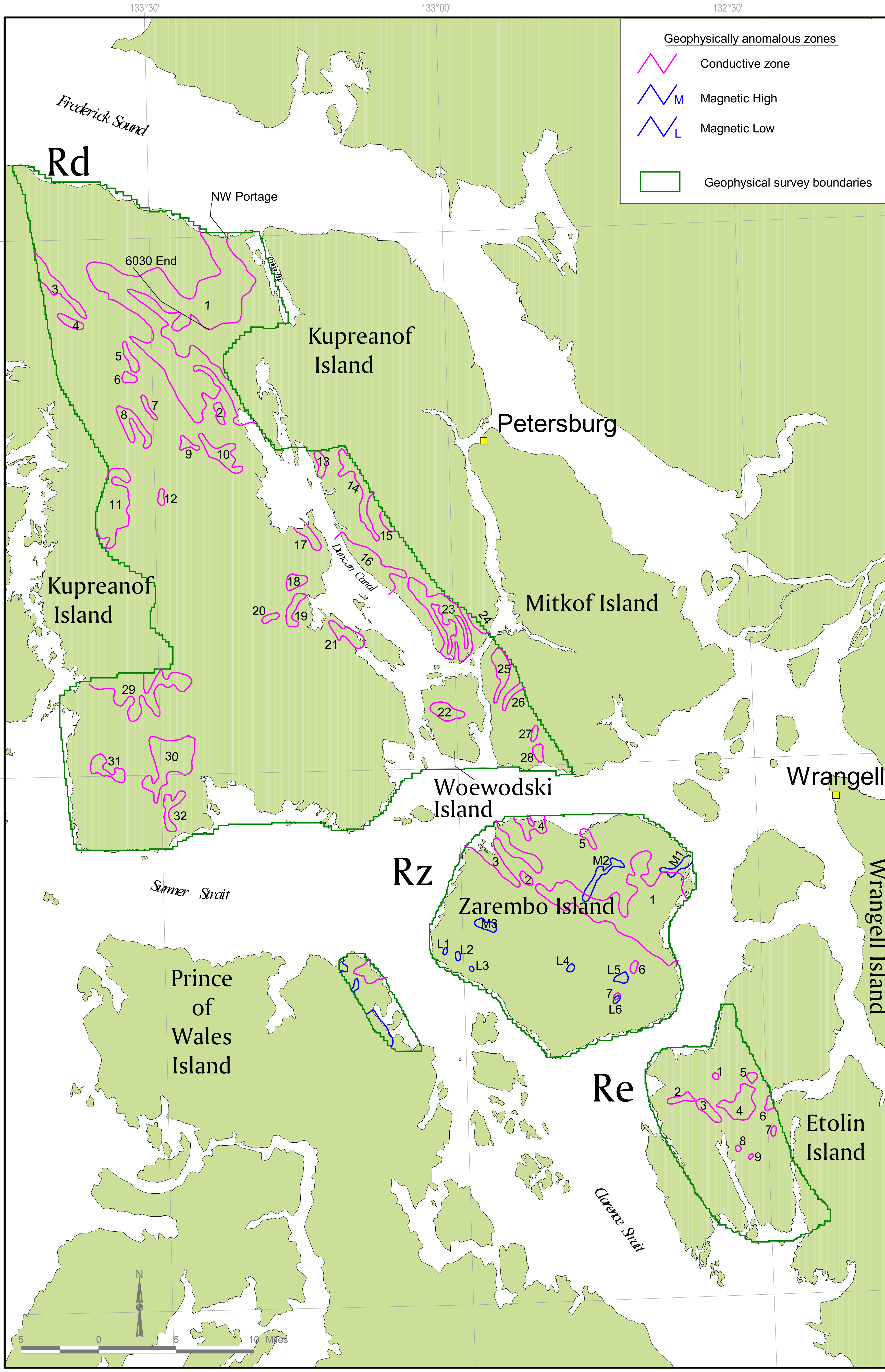

Figure 2. Fifty-nine geophysically anomalous zones in the Duncan Canal to Etolin Island VMS belt (after Pritchard, 1997)

Table 1 - Prioritization factors used to evaluate geophysically anomalous zones in the Duncan Canal to Etolin Island belt.

1) Geophysical Responses:	
Resistivity	5 = strong bedrock anomaly, possible sulfides
	4 = moderately strong bedrock anomaly
	3 = bedrock anomaly
	2.5 = moderately weak bedrock anomaly
	2 = weak bedrock anomaly
	1 = possible bedrock anomaly
Magnetic	3 = strong anomaly - high or low
	2 = moderately strong anomaly
	1 = weak anomaly
2) Geology:	5 = Hyd Group volcanics
	4 = Hyd Group
	3 = other volcanics - Gravina Belt, Paleozoic
	2 = undifferentiated Mesozoic/Paleozoic volcanics and sediments
	1 = intrusives, Quaternary and Tertiary rocks
3) Mineral Occurrences:	5 = associated with known VMS deposit
	3 = within about one mile of known deposit or in contiguous unit
	2 = associated with mineralized reconnaissance sample
	1 = no known association with mineral occurrence
4) Geochemical Anomalies:	5 = high element (>2 SDU's[1] above mean)
	4 = multiple elements present (2 SDU's above mean)
	3 = single element present (2 SDU's above mean)
	2 = minor presence (1.5 SDU's above mean)
	1 = very minor presence (1 SDU above mean) and "no coverage[2]"
5) Geophysical Models:	5 = good correspondence with single model
	4 = multiple corresponding models
	3 = model corresponds to part of area
	2 = model corresponds to small part of area
	1 = model corresponds to adjacent area, same unit / not modeled
6) Resistive Gradients:	3 = very strong
	2 = strong / very strong on small part of anomaly
	1 = Moderate / strong on small part of anomaly

[1] "SDU's" are Standard Deviation Units

[2] "no coverage" refers to areas where the USGS data set did not effectively evaluate a given conductive zone

occurrences. Given the ubiquitous nature of the gradients, the BLM reduced the prioritization factor from five to three for their association with the anomalous zones (Table 1).

The results of the anomalous zone prioritization are presented in Table 2. The names used for the zones are generally taken from Pritchard (1997), where the "R" refers to a resistivity anomaly, the "M" a magnetic high anomaly, the "L" a magnetic low anomaly, the "D" the Duncan Canal area (sheets A & B), the "Z" the Zarembo Island area (sheet C), the "E" the Etolin Island area (sheet D), and the numbers are simply numerically named geophysically anomalous zones.

Table 2 - Results of anomalous zone prioritization. Site names from Pritchard (1997). Prioritization parameters: GP - geophysical responses, Geology - mapped geologic units, Minerals - mineral occurrences, Geochem - geochemical anomalies, GP Models - geophysical models, Gradients - resistivity gradients.

Rank	Zone	GP	Geology	Minerals	Geochem	GP Models	Gradients	Totals	Remarks
1	RD23	5	4	5	5	5	1	25	
2	RZ3	2.5	4	5	5	4	2	22.5	
3	NW Portage	3	5	4	5	3	0	20	
4	RD19	2	4	5	3	5	0	19	
5	RD22	5	4	5	4	0	1	19	
6	RD2	3	4	3	4	2	1	17	
7	RD14	4	3	0	3	4	3	17	
8	RD20	2	4	5	0	5	1	17	
9	RZ7	1	1	5	4	3	3	17	
10	RD1	3	4	0	3	4	2	16	
11	RD10	3	4	3	0	3	3	16	
12	RD15	4	3	0	2	4	3	16	
13	RD28	5	3	0	2	3	3	16	
14	RZ1	3	3	1	5	2	2	16	
15	RD16	2	3	0	4	4	2	15	
16	6030 End	3	4	0	4	3	0	14	
17	RD18	2	4	0	5	3	0	14	
18	LZ6	3	1	3	4	3	0	14	
19	RD6	3	4	2	0	3	1	13	
20	RD7	3	4	2	0	3	1	13	
21	RD12	1	4	0	5	0	3	13	
22	RD21	2	4	0	2	5	0	13	
23	RD27	5	3	0	2	0	3	13	
24	RZ4	4	4	0	0	4	1	13	
25	RD8	3	2	2	0	2	3	12	
26	RD9	3	4	0	1	3	1	12	
27	RD25	4	3	0	2	0	3	12	
28	RZ5	3	3	0	1	3	2	12	
29	RZ6	1	4	0	1	3	3	12	
30	RD17	2	3	0	4	2	0	11	
31	RD24	5	4	0	1	0	1	11	Not Evaluated
32	RD30	1	1	5	2	2	0	11	
33	RD3	3	3	0	1	1	2	10	
34	RD13	3	4	0	1	1	1	10	

Table 2 (cont.). Results of anomalous zone prioritization.

Rank	Zone	GP	Geology	Minerals	Geochem	GP Models	Gradients	Totals	Remarks
35	RZ2	3	3	1	1	2	0	10	
36	LZ4	3	1	0	3	3	0	10	Not Evaluated
37	RD11	2.5	1	0	1	5	0	9.5	
38	RE3	2.5	3	0	1	1	2	9.5	
39	RD26	3	1	0	2	0	3	9	
40	LZ5	3	1	3	0	2	0	9	Not Evaluated
41	RE2	2.5	3	0	1	1	1	8.5	
42	RE4	2.5	3	0	1	1	1	8.5	
43	RE6	2.5	3	0	1	1	1	8.5	
44	RD5	3	4	0	0	0	1	8	
45	RD32	1	1	0	3	3	0	8	Not Evaluated
46	MZ1	2	1	5	0	0	0	8	Not Evaluated
47	RE7	1	3	0	0	1	3	8	
48	RE5	2.5	3	0	1	1	0	7.5	Not Evaluated
49	RD31	1	1	0	0	4	1	7	Not Evaluated
50	MZ2	2	1	0	1	3	0	7	Not Evaluated
51	LZ2	3	1	0	0	3	0	7	Not Evaluated
52	RE8	1	1	0	1	1	3	7	Not Evaluated
53	RE9	1	1	0	1	1	3	7	Not Evaluated
54	RD4	3	3	0	0	0	0	6	
55	LZ3	3	1	0	0	2	0	6	Not Evaluated
56	RE1	1	1	0	1	1	2	6	Not Evaluated
57	RD29	1	1	0	1	2	0	5	Not Evaluated
58	MZ3	2	1	0	0	1	0	4	Not Evaluated
59	LZ1	3	1	0	0	0	0	4	Not Evaluated

The BLM used stream sediment and soil samples to evaluate the likelihood of finding mineral occurrences in the geophysically anomalous zones in the Duncan Canal to Etolin Island belt. At a minimum, investigators attempted to collect stream sediment samples immediately downstream of the anomalous zones. Smaller drainages within the zones were also sampled if possible.

The BLM's soil sampling follow-up was aimed primarily at discrete resistivity responses from bedrock sources identified by the geophysical survey (ADGGS and others, 1997). Concentrations of these bedrock resistivity responses defined the "conductive zones" of the geophysical contractor (Pritchard, 1997). The responses are portrayed by approximately 100-meter diameter circles on the geophysical survey maps. BLM investigators collected soil samples from the centers of the responses. In some places soil samples were also collected adjacent to the resistivity responses to serve as background samples. The density of soil samples within an anomalous zone depended upon the density of resistivity responses, the priority determined for the conductive zone, the topography and overburden at the site of the response, and the time and logistical constraints of the BLM's follow-up program. The BLM also collected some soil samples within and adjacent to conductive zones that were aimed at evaluating the predictive geophysical models developed by the USGS (McCafferty and others, in press) and so are not associated with discrete resistivity responses.

Investigators collected approximately six cubic inches of sample material from each site and stored the materials in three-inch by five-inch cotton cloth sample bags. For the stream sediment predictive geophysical models developed by the USGS (McCafferty and others, in press) and so are not associated with discrete resistivity responses.

Investigators collected approximately six cubic inches of sample material from each site and stored the materials in three-inch by five-inch cotton cloth sample bags. For the stream sediment samples, BLM personnel targeted clay-, silt-, and sand-sized sediments from the active channels of streams. The samples were collected by hand and using stainless steel spoons. Soil samples were collected using 2-inch-diameter, Dutch-type hand augers. Soil horizons directly above bedrock were the target medium, though in places where soils were very thick or poorly developed, the best available material was sampled.

All processing of the samples was carried out by a commercial laboratory. The samples were dried, and sieved to a minus 80-mesh. Element concentrations were determined using inductively coupled argon plasma - atomic emission spectroscopy (ICP-AES) except for gold, barium, and mercury. For samples analyzed by ICP-AES, a 0.5-gram sample was dissolved in aqua regia for measurement. Samples were analyzed for gold by fire assay pre-concentration of a 30-gram sample followed by an atomic absorption spectrophotometry (AA) finish. Barium was analyzed by X-ray fluorescence - wavelength dispersive (XRF-WD), where a 10-gram pressed pellet was prepared for measurement. Mercury was analyzed by cold vapor AA methods.

Results

The BLM evaluated 43 of the 59 geophysically anomalous zones in the Duncan Canal to Etolin Island belt with a combination of stream sediment and soil sampling. Those zones not evaluated (Table 2) were generally of lower priority using the methodology described above. Some of the lower priority zones were evaluated because they may have been conveniently located adjacent to higher priority zones or may have been on road networks that BLM personnel were examining. We collected 255 stream sediment and 227 soil samples to evaluate the zones. The results of the sampling are presented below.

The BLM compared its analytical results for stream sediment samples with a regional geochemical data set of the USGS (Smith, 1998; Table 3). Smith (1998) analyzed 595 samples from an archived sample set and 56 recently collected samples using an ICP partial extraction method similar to one employed by the BLM in its follow-up. Given the similar analytical techniques, the BLM was able to compare results from the Duncan Canal to Etolin Island belt follow-up sampling to the regional USGS data set for copper, zinc, and molybdenum. Smith (1998) also analyzed 392 stream sediment samples by fire assay for gold, again a technique similar to that employed by the BLM.

Comparisons between the data sets for elements other than copper, zinc, and molybdenum were problematic due to various factors. For instance the USGS regional data set included areas with particularly high lead concentrations, such as Groundhog Basin and Shrubby Island. The result is that the USGS two-standard deviation threshold for lead is almost equal to the maximum value for lead obtained by the BLM. In the case of gold, the USGS mean is greater than the maximum value from the BLM, suggesting that the areas sampled by the USGS included areas relatively high in gold, but that the Duncan Canal to Etolin Island belt targeted by the BLM is particularly low in gold. The opposite was true for the cadmium, arsenic, and antimony comparisons where the BLM two-standard deviation thresholds were close to or greater than the maximum values obtained by the USGS (Table 3). For nickel, chromium, cobalt, barium, manganese, and mercury, the USGS did not use a partial extraction method in their analyses, so the BLM and USGS data sets would not be strictly comparable. So, other than for copper, zinc, and molybdenum, the anomaly thresholds described in this report reflect the basic statistics of the BLM data set alone and thereby only compare areas within the Duncan Canal to Etolin Island belt.

Since there is no publically available, regional soil sample data set for the Duncan Canal to Etolin Island area, the BLM determined anomaly thresholds for its soil sample analytical results using an internal comparison. The soil samples were collected to evaluate discrete resistive anomalies. In many cases, background samples were collected adjacent to the discrete anomalies. In addition, many of the soil samples likely sampled glacial till, rather than bedrock, so the soil sample data set includes samples that would represent more than just prospective mineralized areas. The basic statistics for the analytical data from the BLM soil sampling is presented in Table 4.

The results of the BLM follow-up sampling indicate several anomalous areas within the Duncan Canal to Etolin Island VMS belt. This report first describes the sampling results on a regional basis by element and then summarizes the results within 10 anomalous areas where analysis of stream sediment and/or soil samples reflect a concentration of anomalous sample results (e.g., Fig. 3). Some of the areas correspond to known mineral occurrences, e.g., Anomalous Areas 2, 5, 6, 8, and 9, which correspond to the Taylor Creek, East Duncan Pyrite-Spruce Creek, Go claims, Woewodski Island, and Frenchie occurrences respectively (Grybeck and others, 1984; Bittenbender and others, 2000). The other anomalous areas contain no previously documented mineral occurrences.

Table 3 - Basic statistics for analytical data from USGS Duncan/Zarembo (Smith, 1998) and BLM 2000 stream sediment samples. (in ppm, Au in ppb)

Element	Minimum		Maximum		Mean		Standard Deviation		2 Standard Deviations above mean		3 Standard Deviations above mean		No. of samples above lower detection limits	
	USGS	BLM	USGS	BLM	USGS	BLM	USGS	BLM	USGS	BLM	USGS	BLM	USGS	BLM
Au	5†	3. 75*	1360	101	15	11.4	86	15.0	187	**41.4**	273	**56.4**	57	144
Ag	0.08†	0.15*	2.8	0.9	0.10	0.17	0.14	0.10	0.38	**0.38**	0.52	**0.48**	45	22
Cu	0.8	3	384	217	22.4	43.3	23.0	34.9	**68.4**	113	**91.4**	148	650	255
Pb	1.0†	1.5*	977	96	9.4	12.6	40	10.7	89.4	**33.9**	129	**44.6**	640	254
Zn	16.2	10	500	1707	93	141	65.5	168	**224**	477	**289**	646	650	255
Mo	0.1†	0.75*	18.9	46	1.5	3.58	2.0	5.63	**5.5**	14.8	**7.5**	20.5	595	205
Ni		3		411		34.9		37.5		**110**		**148**		255
Cr		7		144		37.0		22.1		**81.1**		**103.2**		255
Co		0.75*		116		25.4		16.2		**57.8**		**74.0**		255
Cd	0.05†	0.15*	9.3	25.7	0.28	1.05	0.72	2.50	1.72	**6.05**	2.44	**8.56**	526	204
Ba		7.5*		3784		960		712		**2385**		**3097**		251
Mn		61		>20K		2569		2772		**8112**		**10883**		255
Hg		.0075*		1.83		0.154		0.247		**0.647**		**0.893**		202
As	1.0†	3.75*	158	247	4.6	23.2	8.2	36.9	21	**97.0**	29.2	**134.0**	636	211
Sb	1.0†	3.75*	9.0	56	1.2	4.65	0.83	4.72	2.86	**14.1**	3.69	**18.8**	107	17

† = lower detection limit

* = 75% of lower detection limit

Bold numbers indicate values used as anomaly thresholds in Figures 3 to 31 for stream sediment samples.

Table 4 - Basic statistics for analytical data from BLM 2000 soil samples (in ppm, Au in ppb).

Element	Minimum	Maximum	Mean	Standard deviation	2 Standard deviations above mean	3 Standard deviations above mean	Number of samples above detection limits
Au	3.75*	293	9.25	21.6	52.4	74.0	114
Ag	0.15*	1.2	0.19	0.13	0.45	0.58	25
Cu	0.75*	471	37.3	52.8	143	196	222
Pb	1.5*	147	12.2	14.1	40.5	54.6	211
Zn	5	1100	76.2	104	283	387	227
Mo	0.75*	139	3.13	10.0	23.2	33.2	166
Ni	0.75*	169	19.3	19.8	58.8	78.6	220
Cr	0.75*	294	41.0	32.1	105	137	226
Co	0.75*	82	10.3	9.48	29.2	38.7	211
Cd	0.15*	7.2	0.362	0.692	1.75	2.44	109
Ba	7.5*	4050	774	496	1766	2263	226
Mn	13	8007	442	826	2094	2921	227
Hg	0.015*	2.29	0.146	0.201	0.548	0.750	189
As	3.75*	458	14.5	39.9	94.3	134.2	126
Sb	3.75*	35	4.2	2.8	9.8	12.5	14

* = 75% of lower detection limit

Regional Results by Element

The anomaly distributions for 15 elements in stream sediment and soil samples are presented in maps of the Duncan Canal to Etolin Island VMS belt (Figs. 3 to 32). These elements characterize the geochemical signatures of the Triassic volcanic host rocks and/or VMS occurrences of the Alexander terrane in southeastern Alaska (Taylor and others, 1995b, Rowan and others, 1989).

Gold

The historic prospects on Woewodski Island, in Anomalous Area 8, are reflected in the distribution of gold anomalies in stream sediment and soil samples (Figs. 3 and 4). The stream sediment samples also show anomalies at the Taylor Creek claims in Anomalous Area 2 and the Go claims in Anomalous Area 6. The other gold anomalies in stream sediments reflect previously unknown mineralized areas. Two of these previously unknown areas fall within Anomalous Areas 1 and 4. These will be discussed in the following section, describing each anomalous area.

Two gold anomalies in stream sediments fall outside the 10 anomalous areas defined in this report (Fig. 3). The gold anomaly at the north end of Kupreanof Island, northwest of Portage Bay, had the highest gold value of any of the BLM stream sediment samples (101 ppb, sample 6397). However, no other elements were anomalous in the sample. The sample was collected to evaluate the margin of the argillite belt that makes up conductive zone RD1 and referred to as "NW Portage" in Figure 2 and in the BLM's prioritization of conductive zones (Table 2). The argillite belt is of interest because of its similarity with the Greens Creek model where the massive sulfide deposit is situated stratigraphically below an argillite cap. The other gold anomaly outside the 10 anomalous areas is on the southwest side of Mitkof Island, associated with conductive zones RD27 and RD28 (99 ppb gold, sample 6361). Pritchard (1997) evaluated the conductive anomalies in this area as possible sulfide responses. The area is mapped with Gravina Belt volcanics intruded by Cretaceous tonalites (Karl and others, 1999). Although the sample is the second highest of the BLM gold anomalies, it is not anomalous in any other element. The only mineral occurrence known in the area is an antimony occurrence associated with tonalite at December Point, about two miles to the northwest (Grybeck and Berg, 1998; Still and others, in press).

Silver

Neither the USGS nor the BLM stream sediment data sets are very robust with respect to silver analyses. Out of the USGS data set of 650 stream sediment samples, only 45 silver analyses were above detection limits. From the BLM stream sediment sample data set of 255 samples, only 22 analyses were above detection limits. Although the means and standard deviations of the two data sets are different, the two- and three-standard deviation anomaly thresholds are very similar (Table 3). Also, only a small percentage of the soil analyses for silver were above detection limits – 25 out of 227 samples (Table 4).

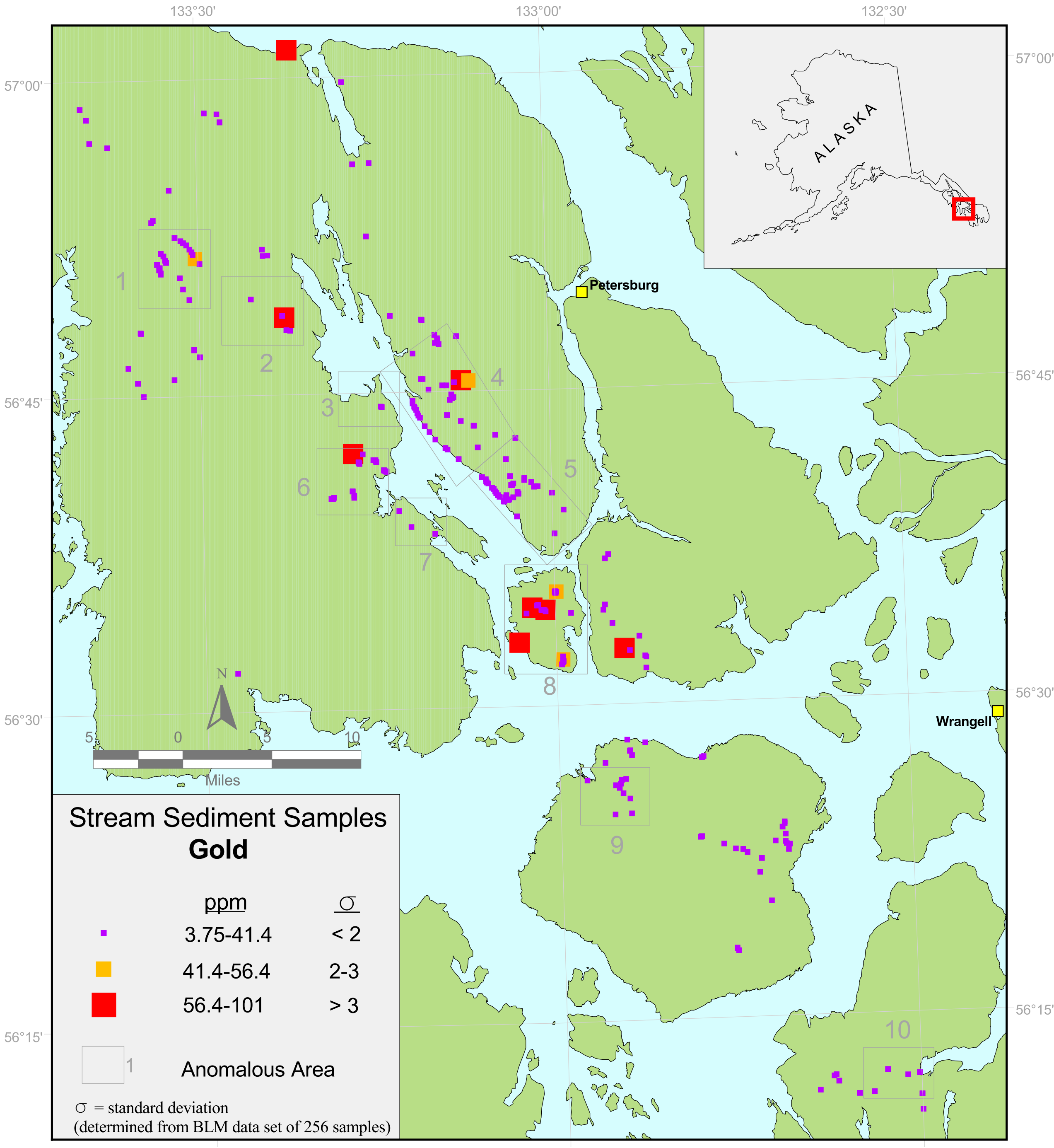

Figure 3. Distribution of gold anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

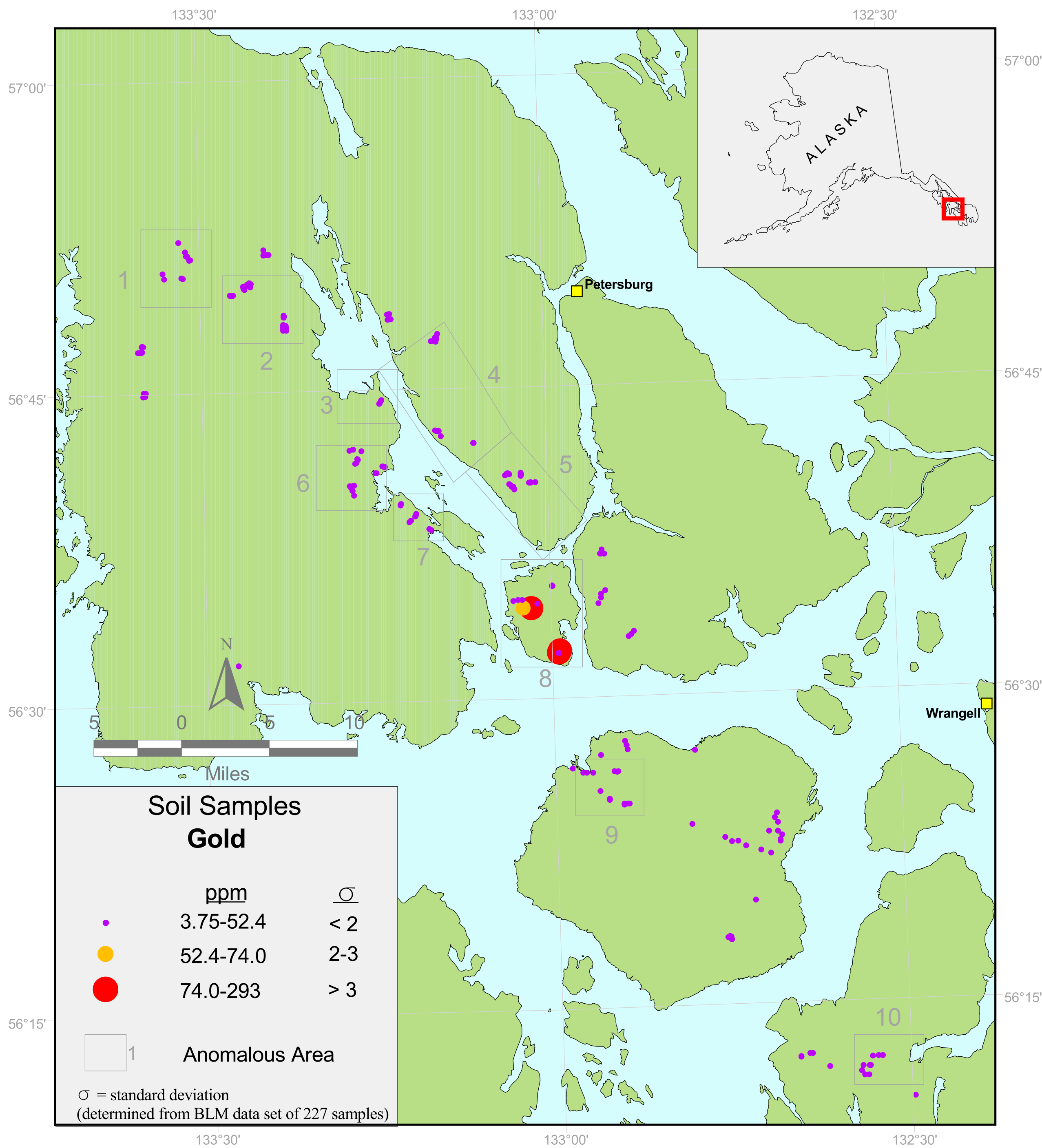

Figure 4. Distribution of gold anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

Anomalous silver results in stream sediment samples indicate two areas with previously unknown mineral occurrences – Anomalous Areas 1 and 4, (Fig. 5). The sample high in silver in Anomalous Area 1 is anomalous in numerous other elements and is associated with conductive zone RD8 (sample 1585). In Anomalous Area 4 the sample high in silver is associated with conductive zone RD16 (sample 963). This part of the east side of Duncan Canal includes Triassic volcanics and sediments of the Hyd Group that are prospective for VMS deposits.

The BLM found anomalous silver values in stream sediment samples from areas with known mineral occurrences as well. These are the Taylor Creek, East Duncan Pyrite-Spruce Creek, Go claims, and Woewodski Island occurrences in Anomalous Areas 2, 5, 6, and 8 respectively.

The BLM soil sampling indicates a result similar to that of the stream sediment samples (Fig. 6). The soils indicate silver anomalies in Anomalous Areas 1, 2, 3, 4, 5, and 8, similar to that of the stream sediments. Within these areas, however, the specific locations of the stream sediment and soil samples do not correspond. Instead they suggest a similar broad mineral potential for silver-bearing mineralized areas.

Copper

Copper anomalies in stream sediment samples from the Duncan Canal area are concentrated along the east side of Duncan Canal in Anomalous Areas 4 and 5 (Fig. 7). The area prospective for VMS occurrences here is newly expanded following the airborne geophysical survey and subsequent follow-up by the USGS (Karl and others, 1999). Prior to that, the east side of Duncan Canal was thought to consist mainly of Jurassic to Cretaceous Gravina Belt rocks (Brew and others, 1984).

The stream sediment copper anomalies farther to the north, east of the North Arm of Duncan Canal (sample 6395) and east of Portage Bay (sample 6365), are not associated with geophysical anomalies and lie outside the geophysical survey area. These anomalies were detected while searching for the Portage Mountain prospect (Still and others, in press) and following up a USGS geochemical anomaly respectively. They are shown on Figure 7 because they suggest a continuous trend of elevated copper concentrations in the area.

Soil samples from the area do not reflect the same concentration of copper anomalies along the east side of Duncan Canal (Fig. 8). However, the soil samples do not represent as broad a sampling of the rocks in the area as do the stream sediment samples.

The copper anomalies in stream sediment samples in Anomalous Areas 1, 2, 8, and 9 fall outside the trend described above. Anomalous Areas 2 and 8 are associated with known mineral occurrences, Taylor Creek and Woewodski Island, whereas the ones in areas 1 and 9 reflect newly discovered, potentially mineralized areas. Although the anomalies in area 9 are situated near the Frenchie prospect, the samples were collected upstream from the prospect and indicate an area of possible mineralization to the east of the historic Frenchie occurrence. The BLM also found anomalous zinc and arsenic values in the area.

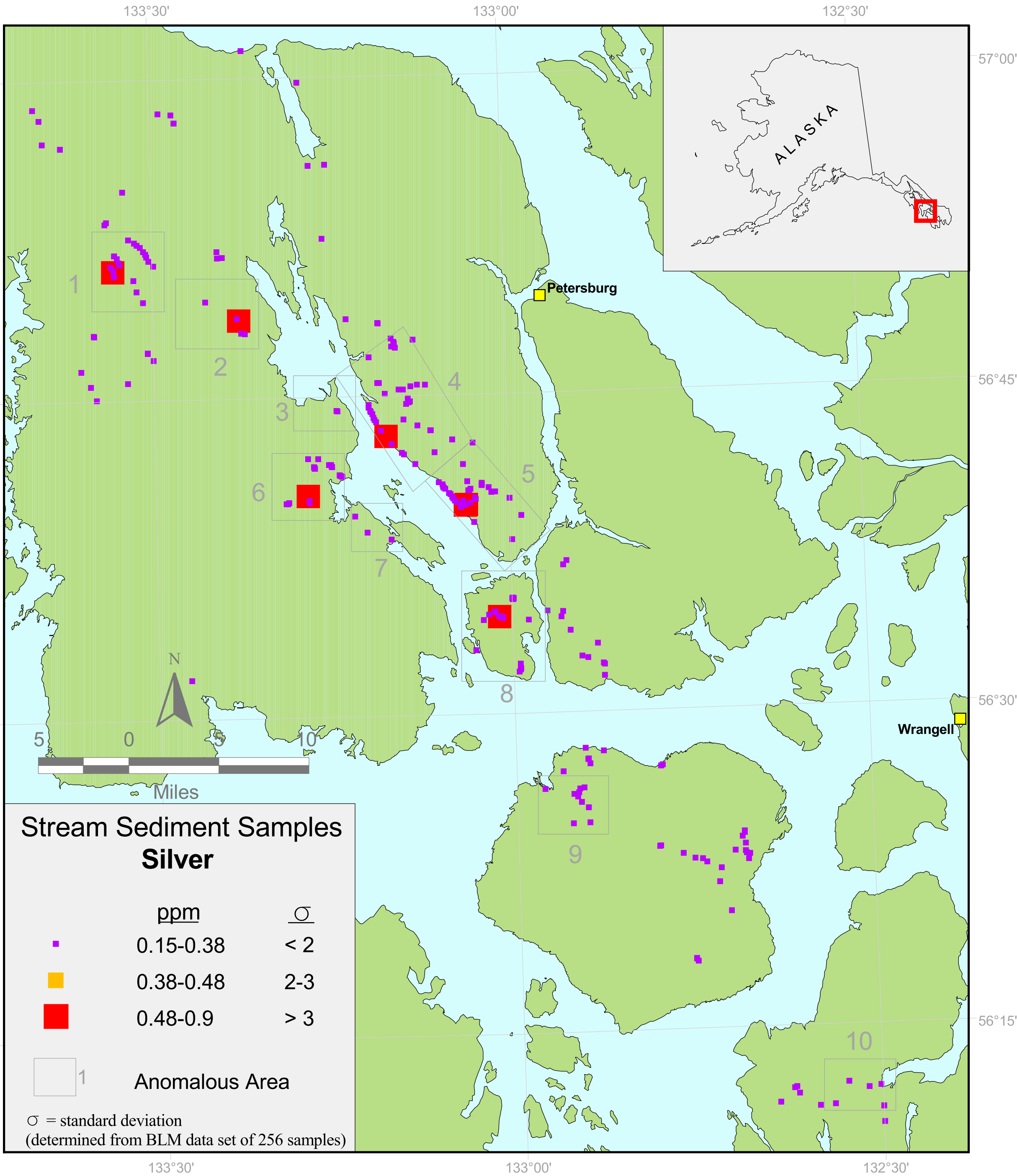

Figure 5. Distribution of silver anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

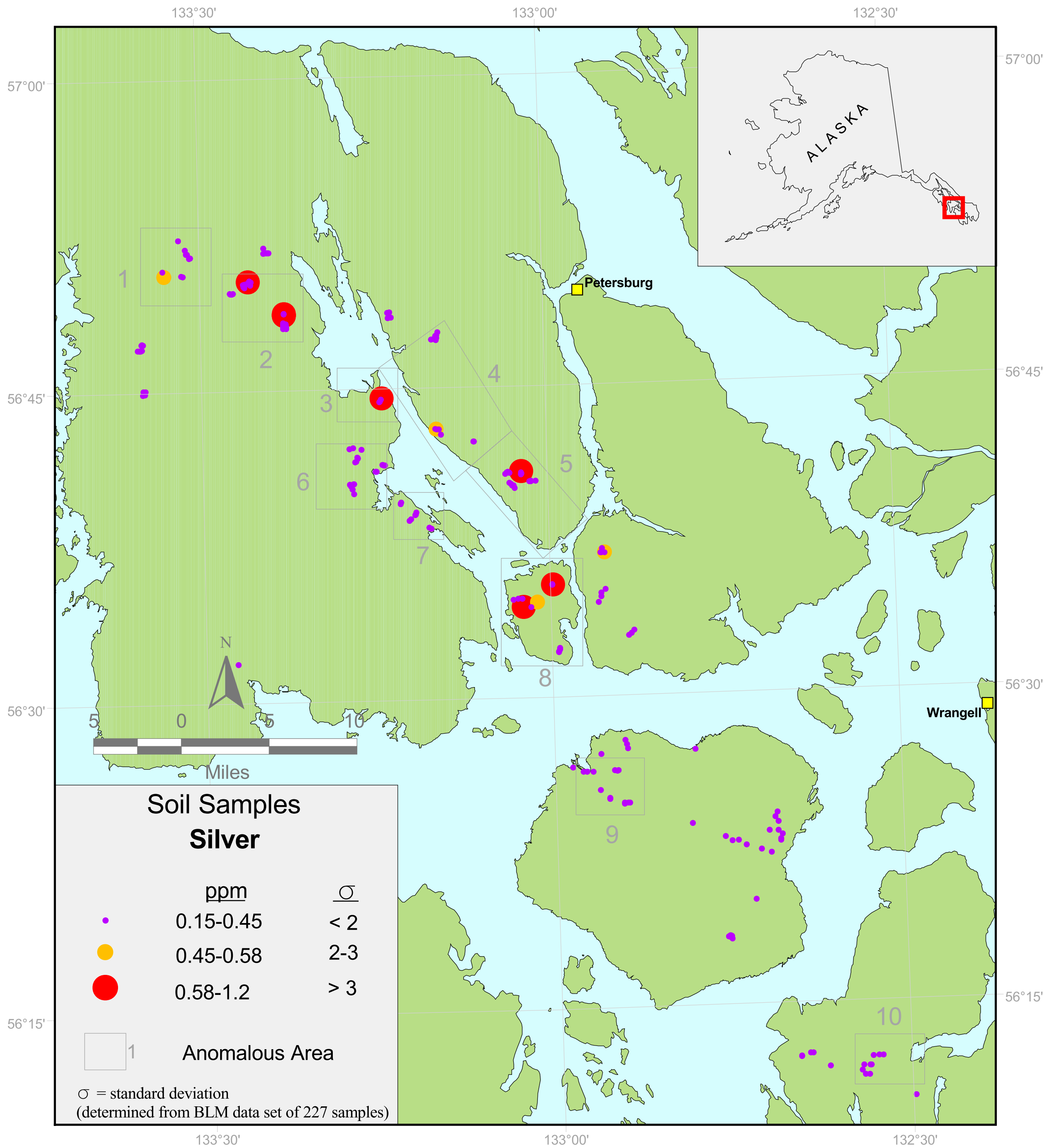

Figure 6. Distribution of silver anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

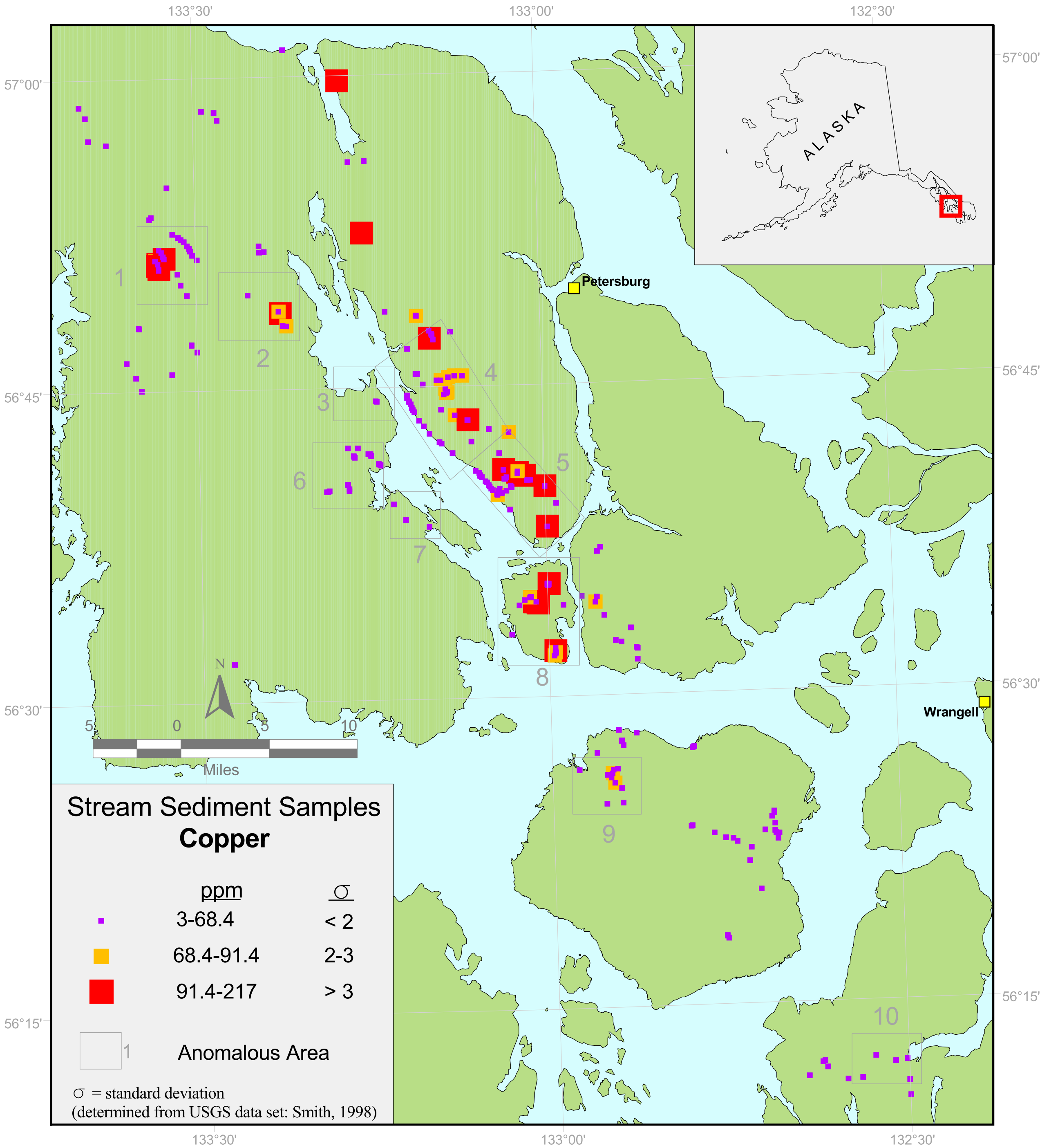

Figure 7. Distribution of copper anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

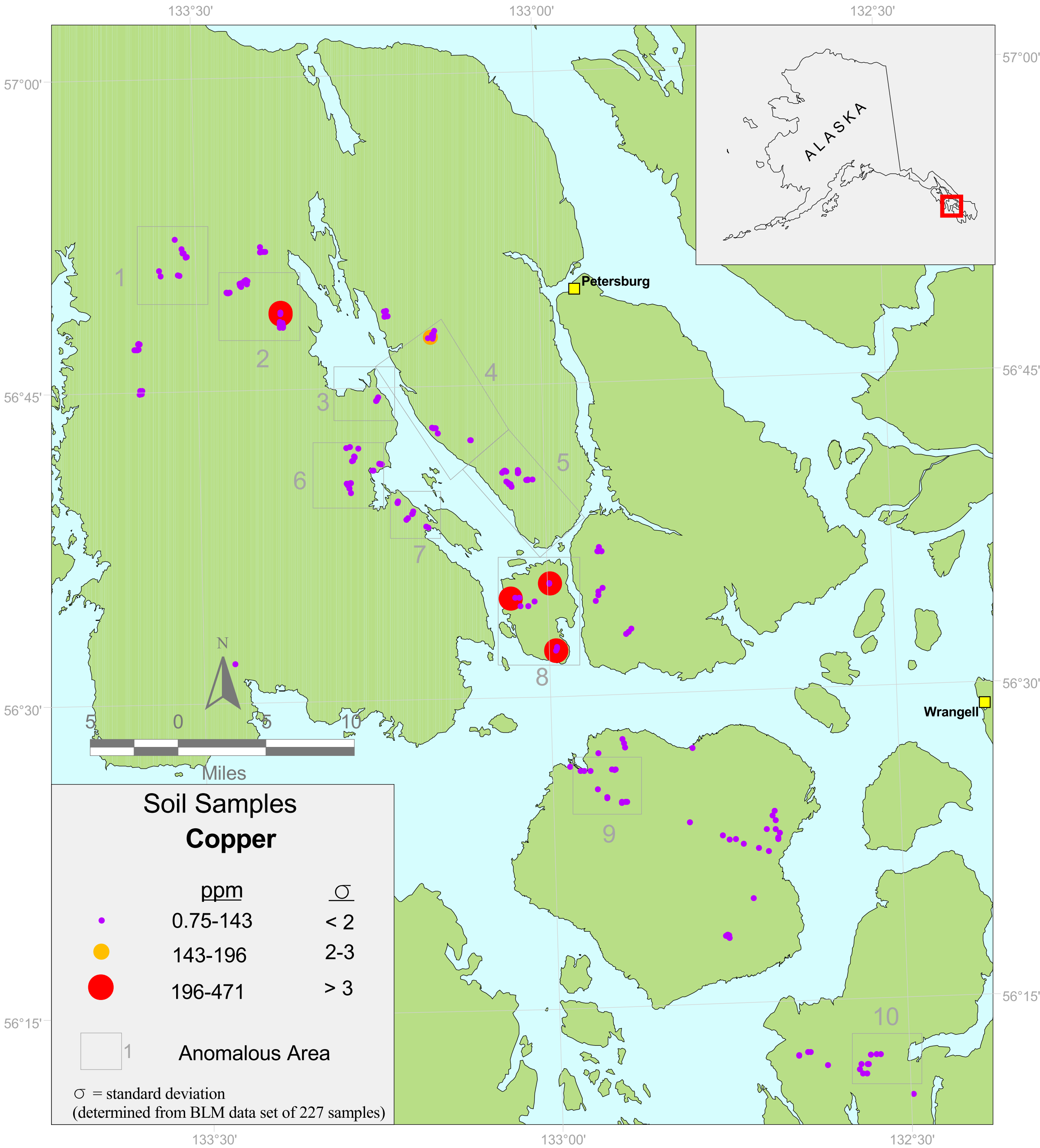

Figure 8. Distribution of copper anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

The three-standard deviation copper anomalies in soil samples mark known mineral occurrences in Anomalous Areas 2 and 8 (Fig. 8). The two-standard deviation anomaly in Anomalous Area 4 marks an area previously unknown to contain mineral occurrences. However, it lies within the belt of copper anomalies defined by the BLM's stream sediment samples.

Lead

The BLM stream sediment sample data set for lead is quite different from the USGS set (Table 3). Although the lower detection limits are very similar, the maximum value obtained by the USGS from their samples is over an order of magnitude higher than that of the BLM. The means are relatively close, but the standard deviation is significantly higher for USGS samples. The higher USGS values may be because their sampling included the lead-rich Groundhog Basin area east of Wrangell, as well as lead occurrences on northeastern Prince of Wales Island and on Shrubby Island between Zarembo and Prince of Wales islands. The Duncan Canal to Etolin Island VMS belt, where the BLM concentrated its sampling, is comparatively low in lead. For this reason the standard deviations used in Figure 9 reflect only the BLM data set.

Samples anomalous in lead in the BLM stream sediment sample data set indicate two previously unknown, potentially mineralized areas (Anomalous Areas 1 and 10), and two areas with historic prospects (Anomalous Areas 2 and 8). Outside the defined Anomalous Areas a two-standard deviation anomaly on east central Zarembo Island, east-southeast of Anomalous Area 9, marks another area with potential mineralization (sample 980). This sample is only slightly over the two-standard deviation threshold for lead, however, and there are no other anomalous elements in the sample nor in other samples in the immediate area. Another two-standard deviation anomaly is situated at the south end of Portage Bay (sample 6370). This sample lies outside the geophysical survey area. Mineralization in the area may be related to the intrusion of Cretaceous plutons.

The BLM soil samples also indicate known and previously unknown mineralized areas (Fig 10). Anomalous Areas 2, 6, and 9 represent areas with known occurrences. The soil sample from Anomalous Area 9, however, was collected northeast of the Frenchie deposit, the known occurrence in the area (Grybeck and others, 1984; Bittenbender and others, 2000). The lead anomalies in Anomalous Area 3 represent previously unknown, potentially mineralized areas.

The three-standard deviation lead anomaly on Etolin Island, west of Anomalous Area 10 (sample 831), was collected from an area of iron-stained, quartz-rich metavolcanics. The sample was not anomalous in any other VMS-indicator elements.

Zinc

The zinc in stream sediment samples from the BLM data set is significantly higher than that from the regional USGS data set (Table 3). So, when the USGS anomaly thresholds are used for comparison there are quite a few anomalous zinc samples, but they are concentrated within a few areas. The elevated zinc in the BLM versus USGS data sets likely reflects an increased

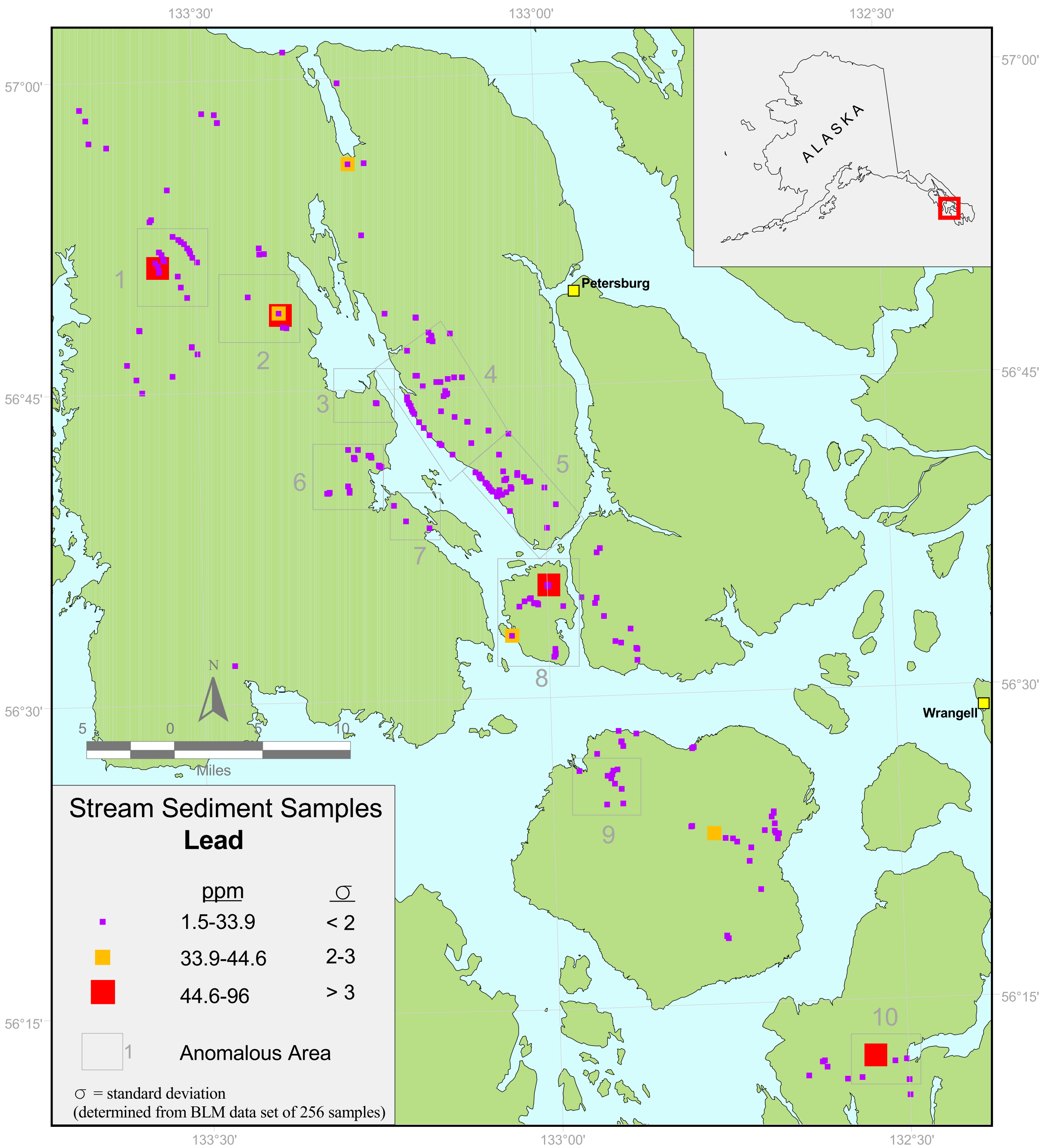

Figure 9. Distribution of lead anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

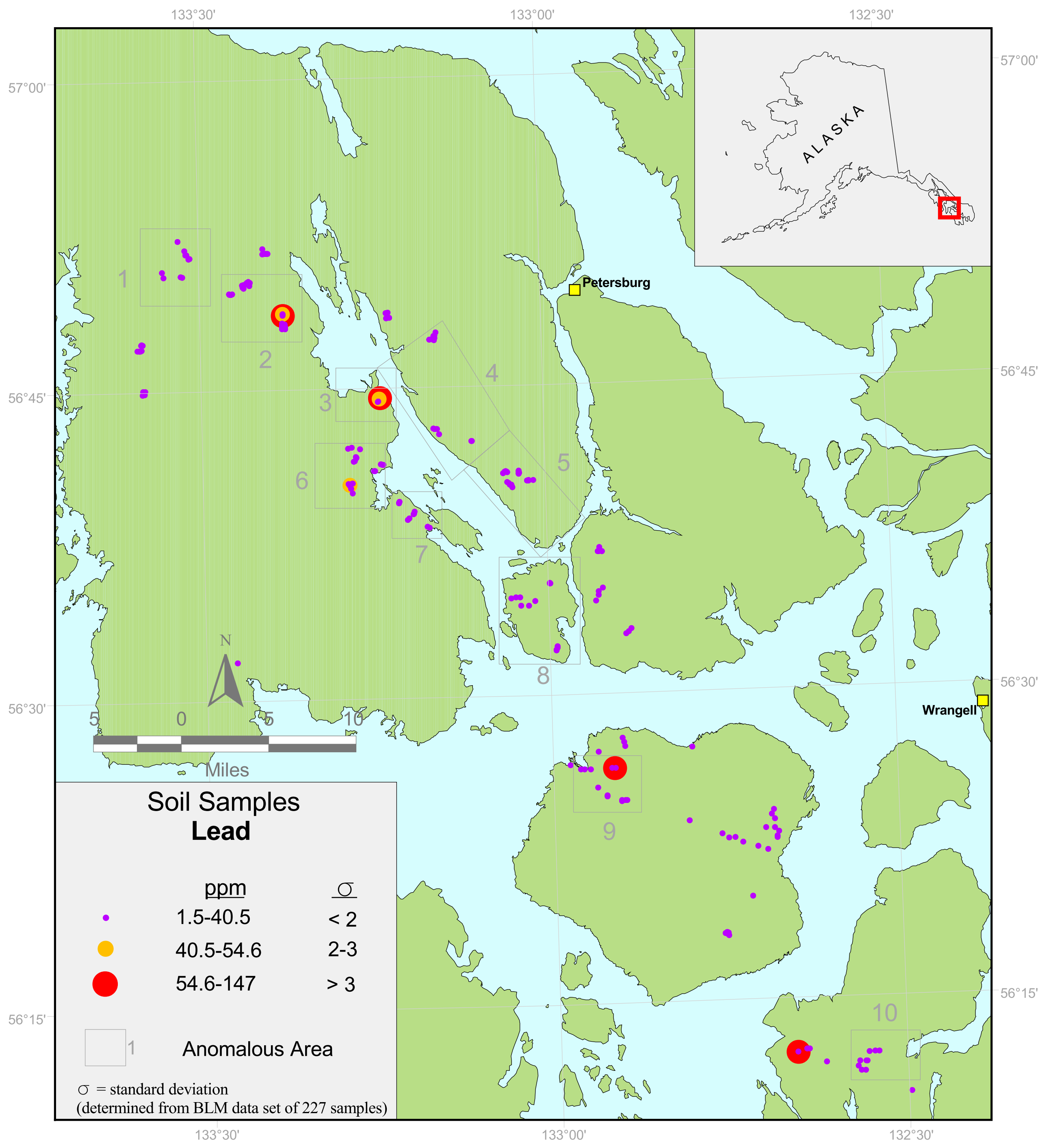

Figure 10. Distribution of lead anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

abundance of zinc in the targeted VMS deposits of the Duncan Canal to Etolin Island VMS belt as opposed to other mineral occurrences in the region.

The BLM found that most of the anomalous zinc stream sediment values correspond to areas anomalous in other elements as well, so most are found in the 10 defined Anomalous Areas (Fig. 11). The highest zinc values come from Anomalous Area 1, an area previously unknown to have an elevated likelihood of hosting mineral occurrences. Anomalous Areas 2, 5, 6, 8, and 9 contain zinc anomalies that are associated with known mineral occurrences, the Taylor Creek, East Duncan Pyrite-Spruce Creek, Go claims, Woewodski Island, and Frenchie historic prospects respectively. In the Taylor Creek, East Duncan Pyrite-Spruce Creek, Woewodski Island, and Frenchie areas, however, the zinc anomalies broaden the extent of prospective rocks associated with the prospects.

The BLM zinc soil anomalies in some cases reflect the zinc stream sediment anomalies and in other cases differ (Figs. 11 and 12). Both the soils and stream sediment anomalies mark Anomalous Areas 6 and 8, but the soils mark Anomalous Areas 4 and 7 as well. On the other hand, the soils generally do not highlight Anomalous Areas 1, 2, and 5 as the stream sediment zinc anomalies do. This dichotomy is not entirely inexplicable. In Anomalous Areas 1 and 2, the soil samples must not have encountered the mineralized areas responsible for the stream sediment anomalies. In some cases the discrete conductive anomalies the BLM targeted with the soil sampling may have been covered by glacial overburden, more deeply buried, or simply not reflective of the mineralized rock. In areas where soil samples indicated a zinc anomaly that was not reflected in the stream sediment samples (e.g., Anomalous Area 7 where the highest zinc value was obtained – 1,100 ppm zinc, sample 761) the areas may be poorly drained.

A low-level zinc stream sediment anomaly on northern Kupreanof Island, west of Portage Bay suggests an increased likelihood of there being mineralized rock in the area (sample 6959). This sample comes from the southern margin of a regionally extensive slate belt where the USGS also detected anomalous zinc in a stream sediment sample. The presence of the extensive slate belt fits well with the Greens Creek exploration model. The BLM also detected anomalous molybdenum in an adjacent sample.

<u>Molybdenum</u>

Molybdenum is one of the trace elements mentioned by Taylor and others (1995a) as being particularly useful in defining VMS occurrences in the Alexander terrane. Figure 13 shows the BLM stream sediment samples compared to the USGS regional anomaly thresholds.

In the Duncan Canal to Etolin Island belt molybdenum anomalies in stream sediments extend the length of the belt, from northern Kupreanof Island to Etolin Island (Fig. 13). In this area, there are no other occurrence types that are known to contain molybdenum, except for a potential porphyry molybdenum occurrence south of Portage Bay. This occurrence falls outside the geophysical survey area, however. Most of the stream sediment molybdenum anomalies fall

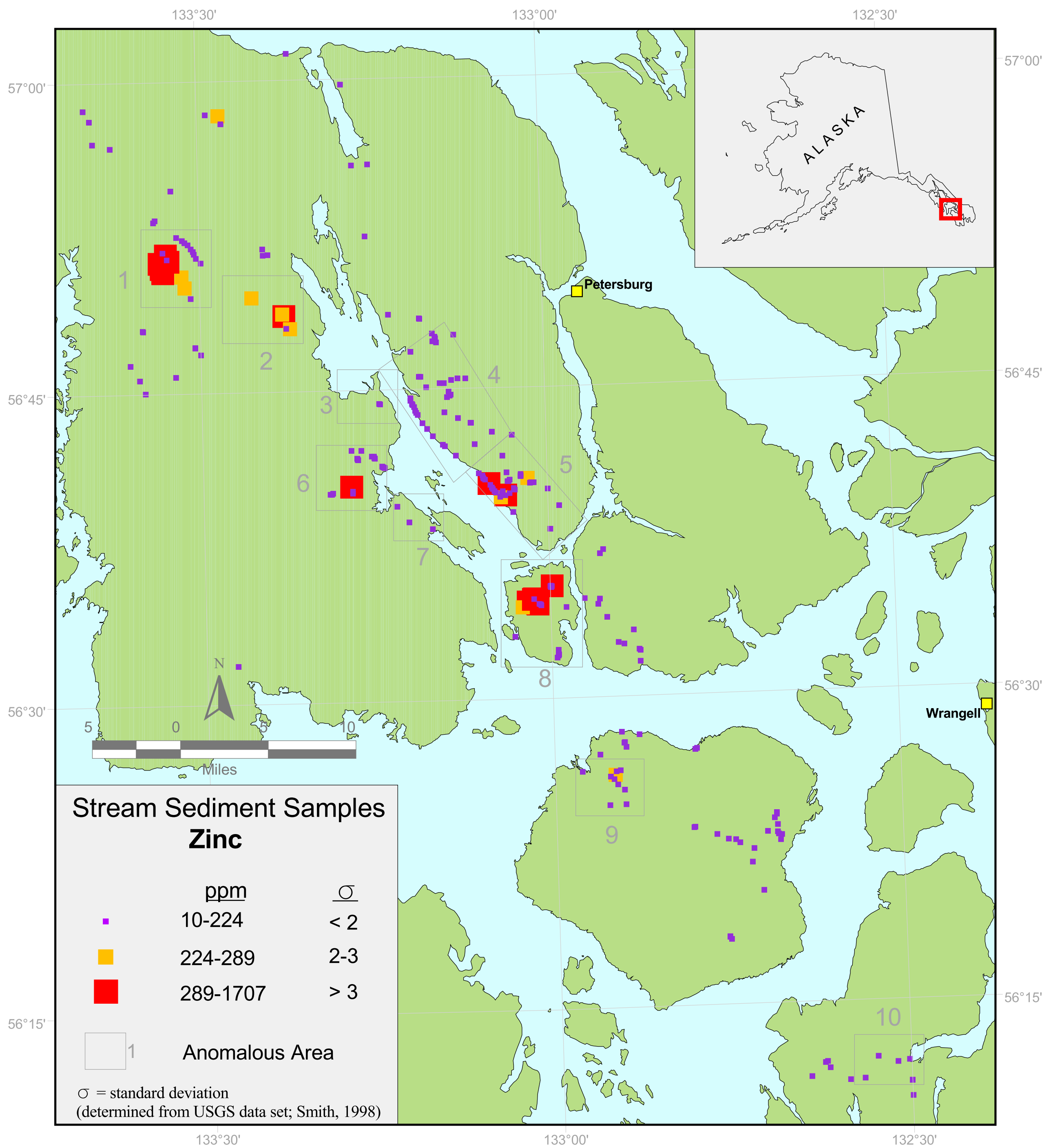

Figure 11. Distribution of zinc anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

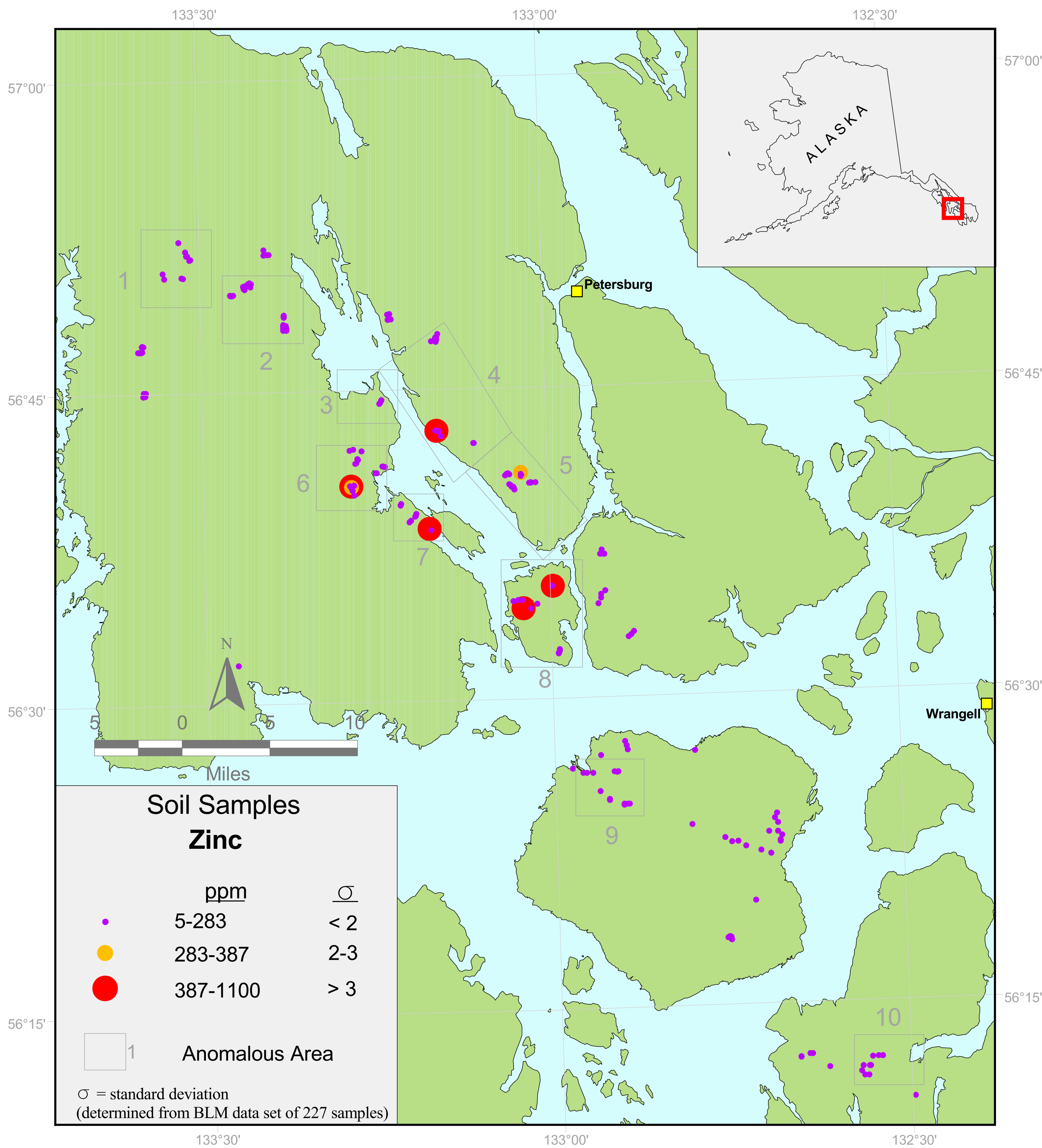

Figure 12. Distribution of zinc anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

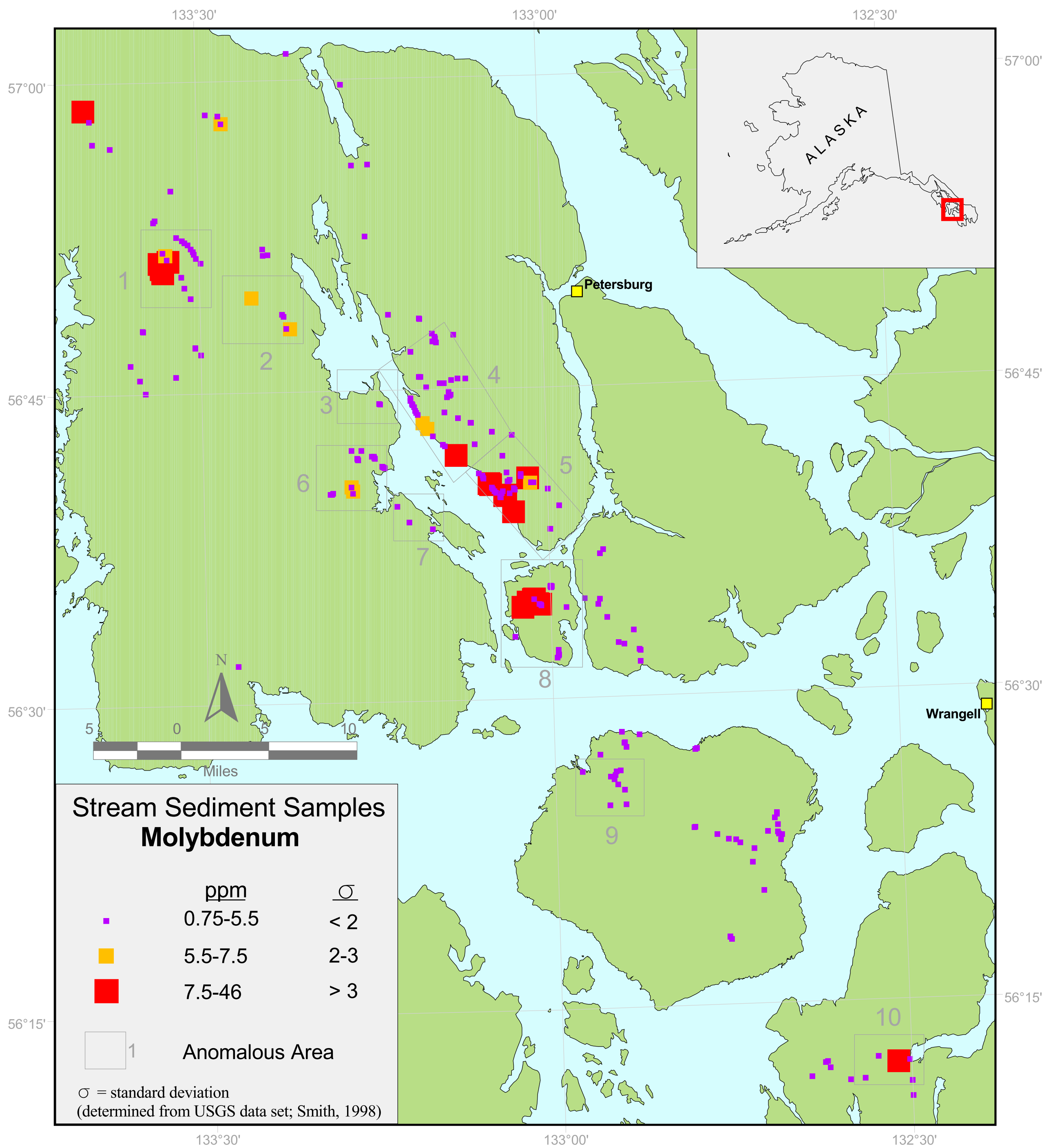

Figure 13. Distribution of molybdenum anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

within the defined Anomalous Areas and seem to mark the east side of Duncan Canal in particular.

The BLM collected three anomalous molybdenum soil samples in the Duncan Canal to Etolin Island belt (Fig. 14). Two of the three anomalous samples are associated with known mineral occurrences (sample 821 in Area 6 - Go claims; and sample 941 in Area 8 - Woewodski Island occurrences). The sample anomalous in molybdenum from Anomalous Area 7, with no previously known mineral occurrences, contained the highest value for molybdenum from the BLM's soil sample data set (139 ppm, sample 761). The sample was also elevated in zinc, nickel, cadmium, antimony, and arsenic.

Two stream sediment samples on the northern part of Kupreanof Island have elevated molybdenum. One is adjacent to a regional slate belt where the BLM and USGS also detected a zinc anomaly (sample 6958). The other is associated with the RD3 conductive zone (sample 1579). No other anomalous elements are associated with RD3, and the molybdenum anomaly, at 10 ppm, is only slightly above the three-standard deviation threshold of 7.5 ppm.

Nickel

Anomalous stream sediment nickel values in the BLM data set are restricted mainly to Anomalous Area 1 (Fig. 15). This area was previously unknown to contain mineral occurrences. Two minor nickel anomalies are associated with Anomalous Area 8. The BLM collected one of these at the historic Maid of Texas prospect (sample 723). The other is in a series of samples that are also anomalous in other elements (sample 975).

Anomalous nickel values in the BLM soil samples highlight Anomalous Areas 1, 4, 6, 7, and 8 (Fig. 16). None of the anomalous soil samples coincide with anomalous stream sediment samples, even within Anomalous Areas 1 and 8. This lack of correlation may be due to the fact that several high values for nickel in the stream sediment samples have raised the two- and three-standard deviation thresholds so as to mask potentially anomalous stream sediment samples that would otherwise correlate with the soil samples. Three out of the five anomalous soil samples indicate areas with previously unknown mineralized rock, i.e., Anomalous Areas 1, 4, and 7. The highest nickel value came from Anomalous Area 7 and is the same sample that had the highest zinc value (169 ppm nickel, 1,100 ppm zinc, sample 761). High nickel values in Anomalous Areas 6 and 8 coincide with the Go claims and Olympic Resources Gold claims respectively.

Chromium

Chromium characterizes the geochemical signature of the VMS deposits in the Alexander terrane in southeastern Alaska (Taylor and others, 1995b). However, the Duncan Canal to Etolin Island VMS belt includes other deposit types that also contain chromium, particularly magmatic segregation deposits related to Cretaceous mafic intrusive rocks. This type of deposit is likely the source of the chromium anomaly in a stream sediment sample on the north side of Zarembo Island (sample 8918; Fig. 17). The other stream sediment chromium anomalies, in Anomalous Areas 6, 8, and 10, may reflect VMS potential.

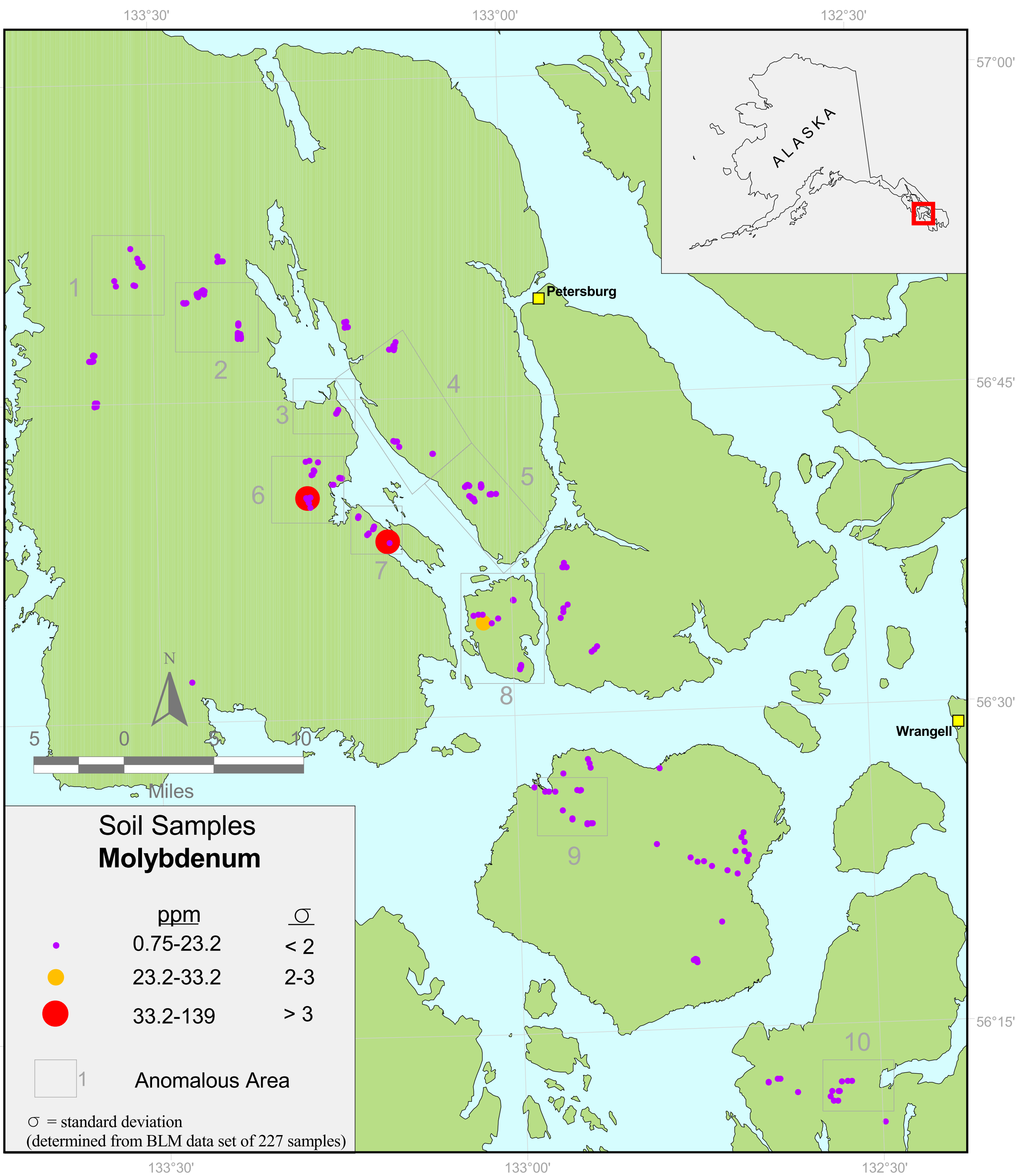

Figure 14. Distribution of molybdenum anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

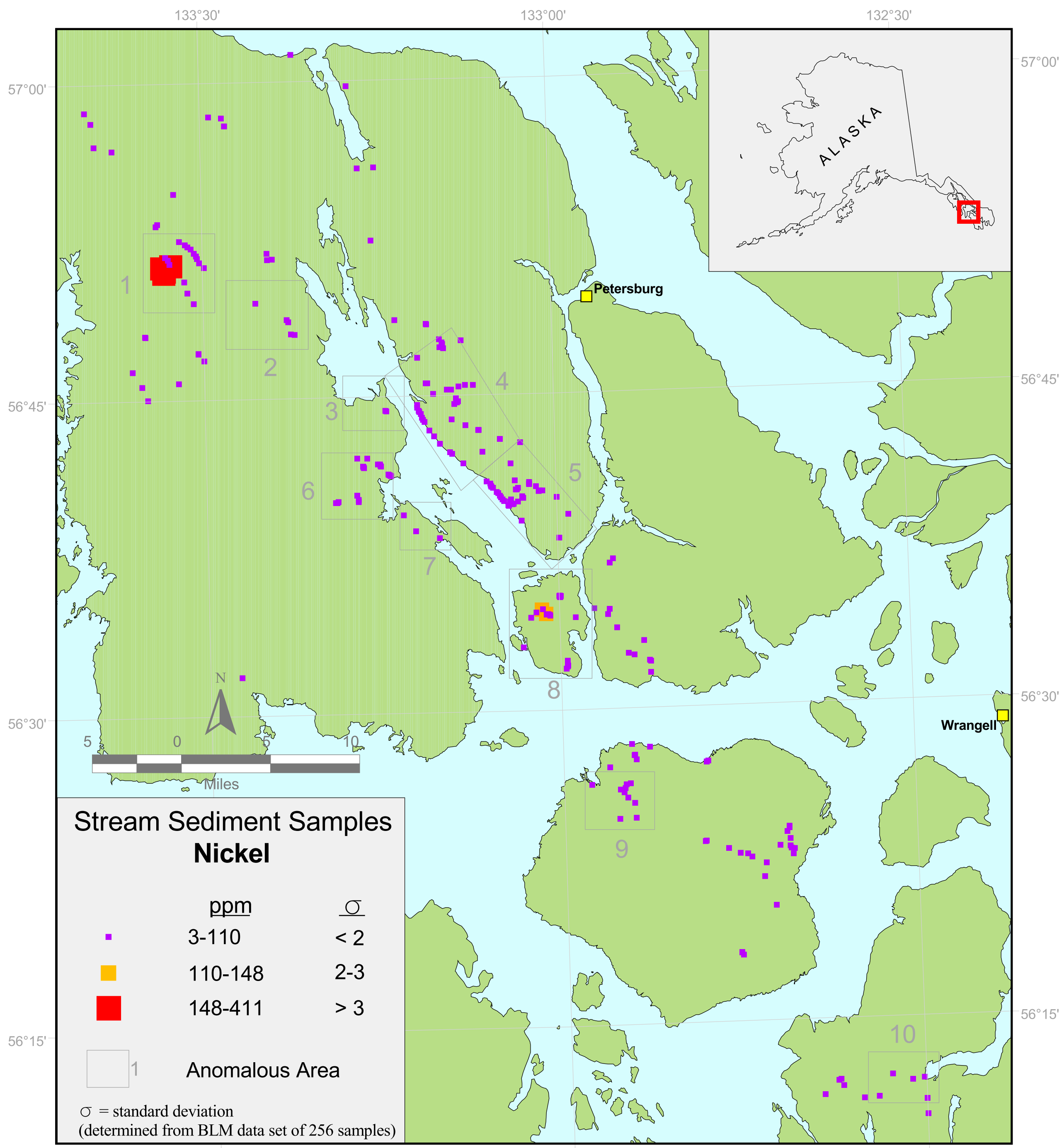

Figure 15. Distribution of nickel anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

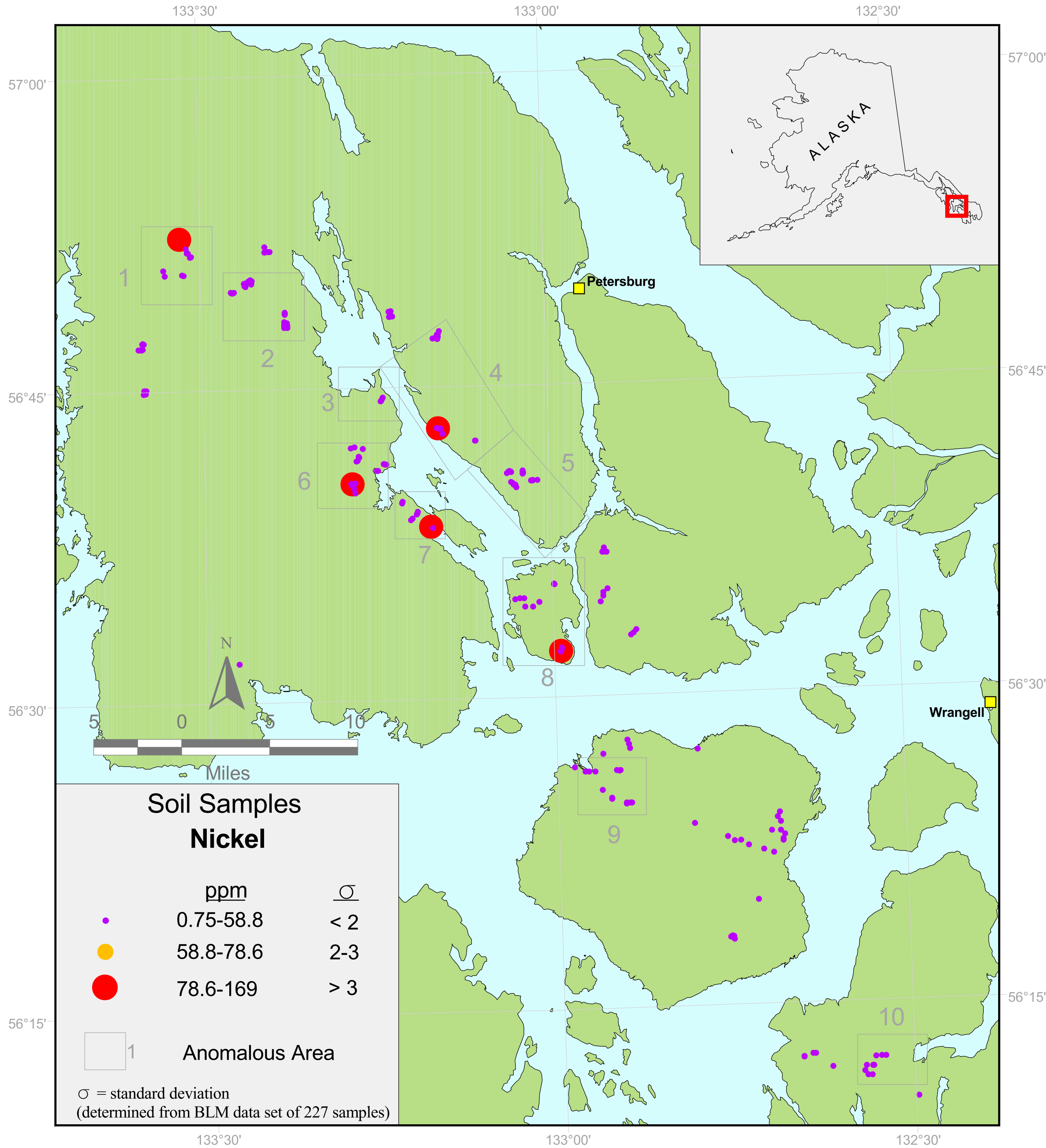

Figure 16. Distribution of nickel anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

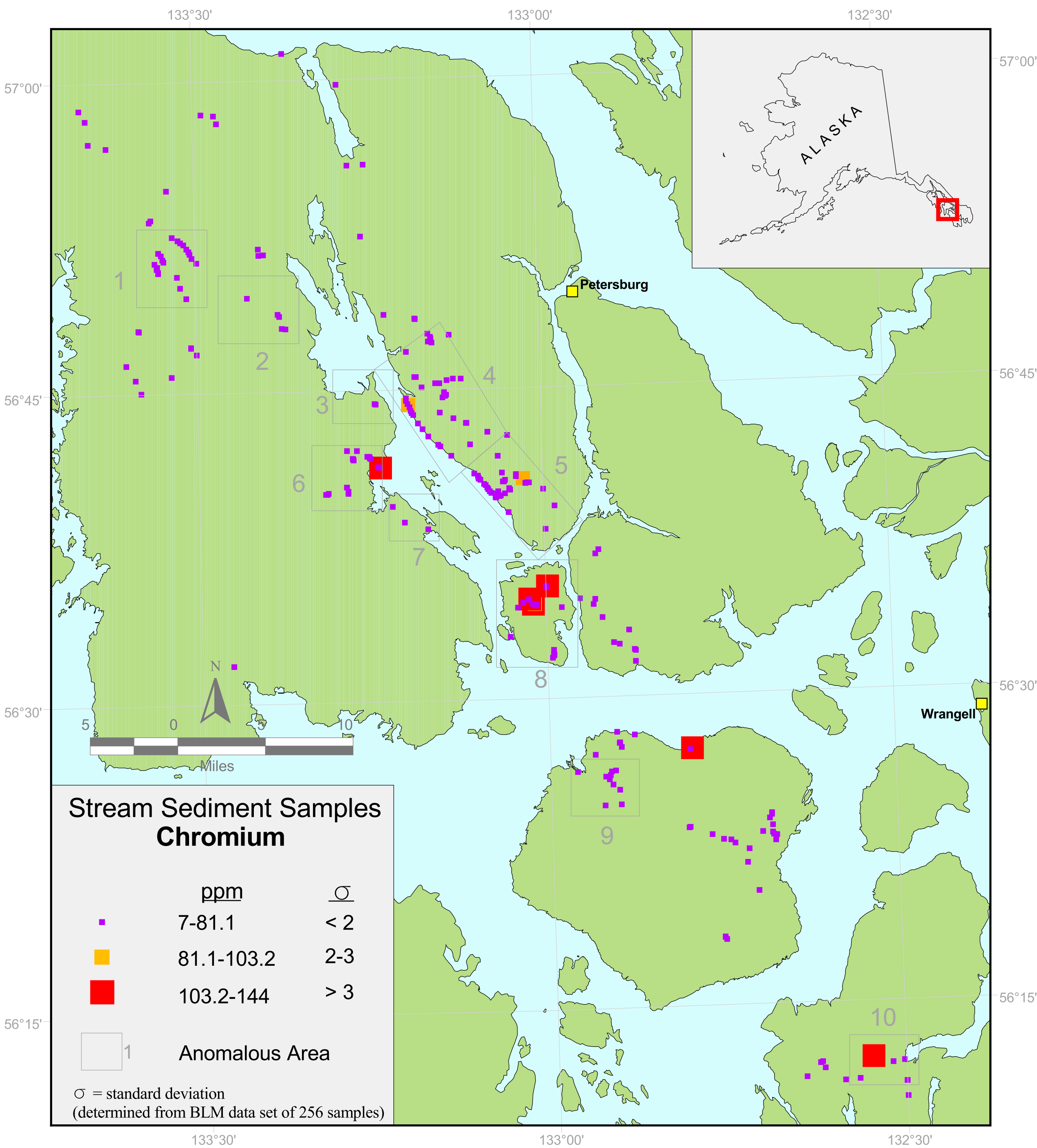

Figure 17. Distribution of chromium anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

Most of the chromium anomalies in the BLM soil sample set seem to indicate areas likely to host VMS deposits, i.e., in Anomalous Areas 1, 6, 8, and 9 (Fig. 18). Two isolated chromium anomalies on the west side of Kupreanof Island, south-southwest of Anomalous Area 1 are enigmatic (samples 9730, 9733). The BLM collected the samples in an area mapped as Tertiary and Quaternary volcanic rocks, predominantly rhyolite (Karl and others, 1999). Both of the samples are also anomalous in cobalt. Stream sediment samples from the area are anomalous in cobalt, but not in chromium.

<u>Cobalt</u>

Cobalt makes up about 0.07 percent of the resources measured at the huge Windy Craggy deposit in northwestern British Columbia, Canada (Peter and Scott, 1999; Taylor, 1997), at the north end of the Alexander terrane Triassic VMS belt. It is also one of the elements that characterize the VMS deposits in the Triassic belt in southeastern Alaska (Taylor and others, 1995b).

The cobalt anomalies in stream sediment samples in the Duncan Canal to Etolin Island VMS belt fall mainly within the Anomalous Areas defined by this report, areas 4, 5, 8, 9, and 10, and are particularly prevalent in area 5 (Fig. 19). The three-standard deviation anomaly on the western side of the geophysical survey area (sample 994) is associated with mapped Quaternary to Tertiary rhyolite (Karl and others, 1999). The source of this anomaly is unknown. The two-standard deviation anomaly on eastern Zarembo Island (sample 8942) is hosted in Cretaceous to Jurassic Seymour Canal formation rocks (Karl and others, 1999). The sample is not anomalous in any other elements.

The cobalt anomalies in soil samples also fall mainly within the Anomalous Areas, but differ somewhat from the stream sediment cobalt anomalies (Figs. 19 and 20). The prevalence of stream sediment cobalt anomalies in Anomalous Area 5 is not reflected in the soil samples from the area, however the two sample sets correspond very well in Anomalous Area 8. There is also good correspondence with the anomaly from the western side of the survey area. Two soil samples (samples 9730, 9733) were anomalous from this area of Quaternary to Tertiary rhyolite (Karl and others, 1999). These two samples were also anomalous in chromium.

<u>Cadmium</u>

Anomalous cadmium values in stream sediment samples mark Anomalous Areas 1, 6, and 8 (Fig. 21). Anomalous Areas 6 and 8 contain known mineral occurrences, whereas Anomalous Area 1 does not.

Anomalous cadmium values in soil samples mark Anomalous Areas 3, 5, 6, 7, and 8 (Fig. 22). Of these, Anomalous Areas 6 and 8 are also marked by high cadmium in stream sediment samples, whereas areas 3, 5, and 7 are not. Anomalous Areas 5, 6, and 8 contain known mineral occurrences; areas 3 and 7 are identified in this report as potential mineralized areas.

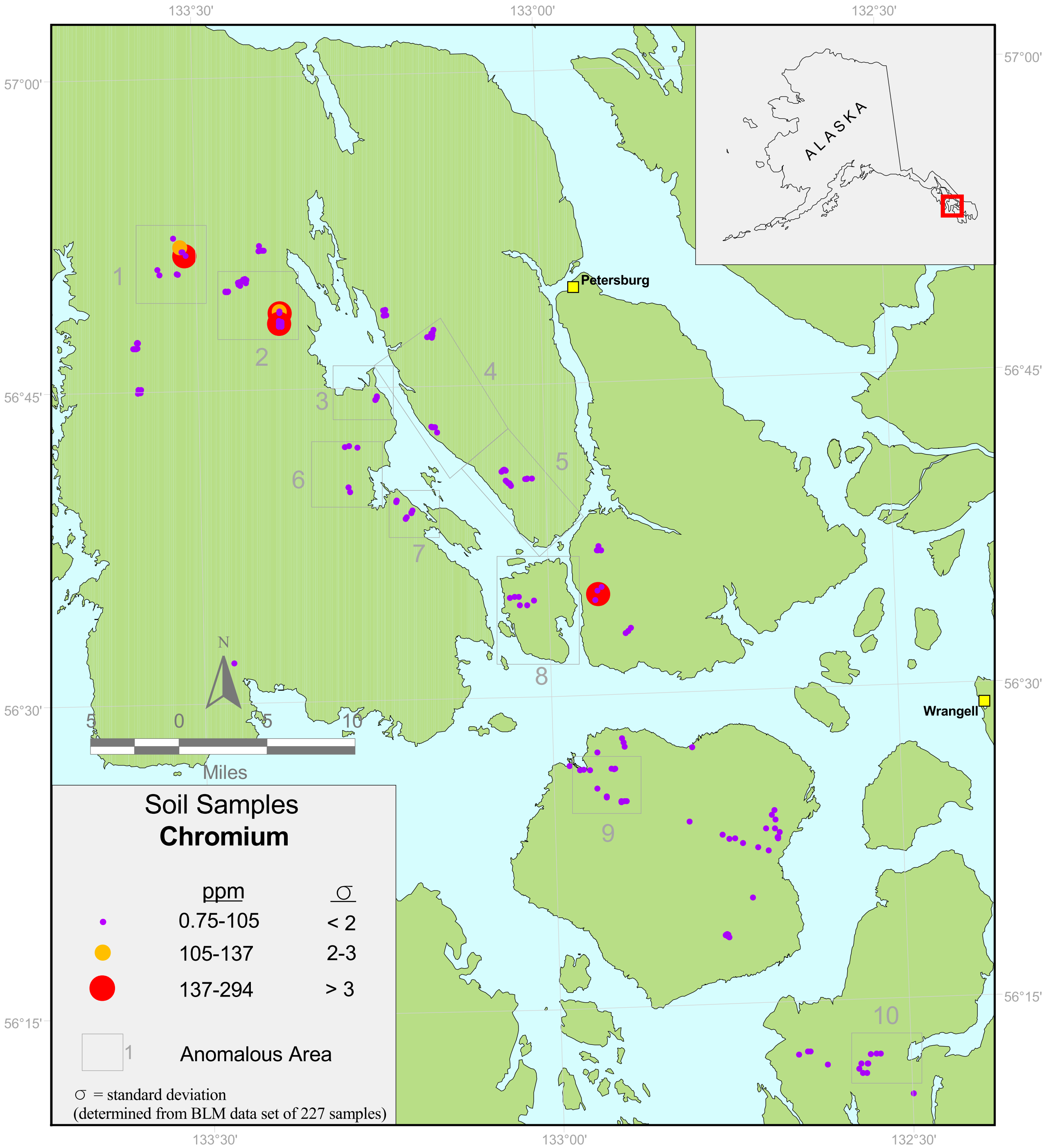

Figure 18. Distribution of chromium anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

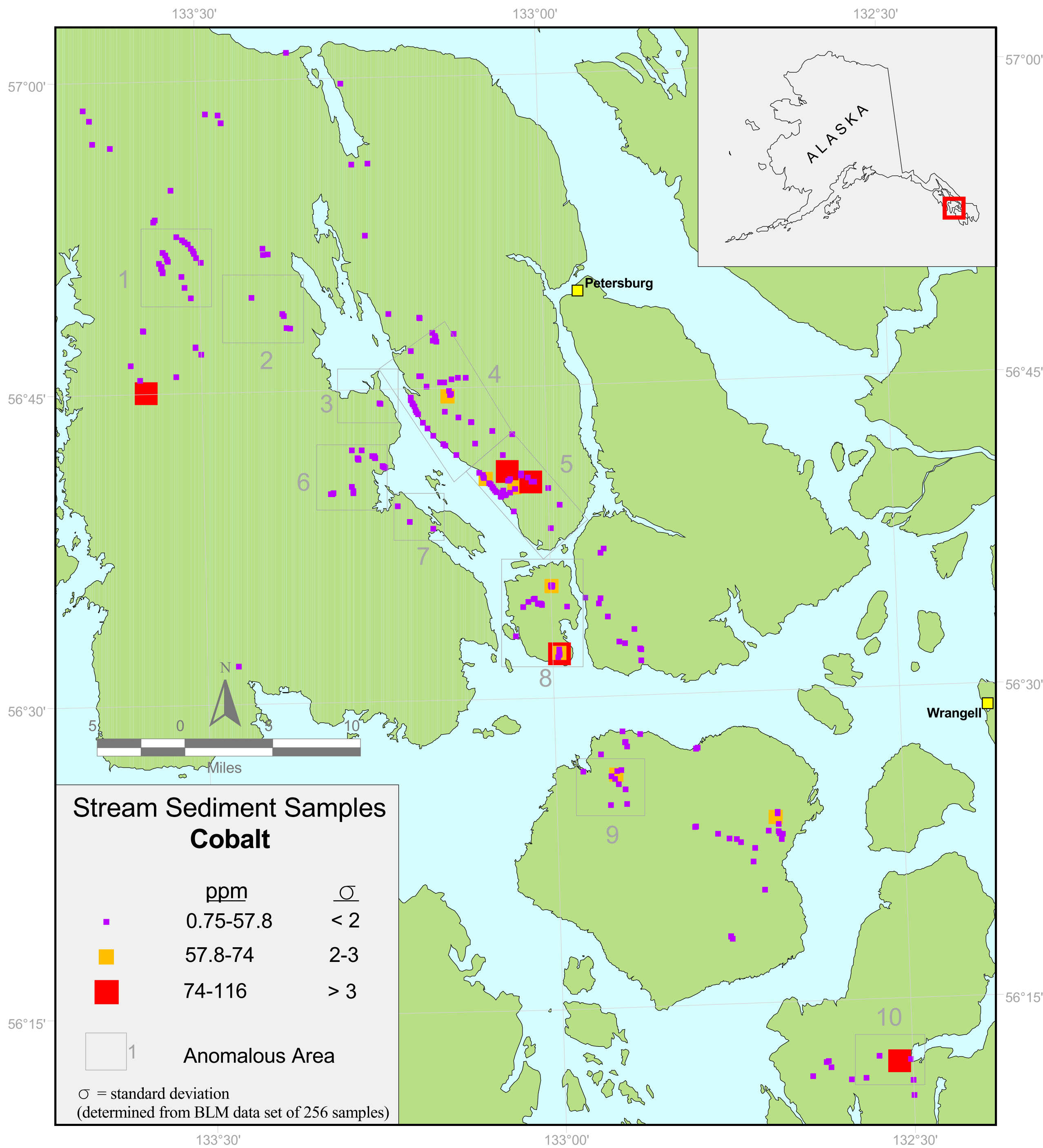

Figure 19. Distribution of cobalt anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

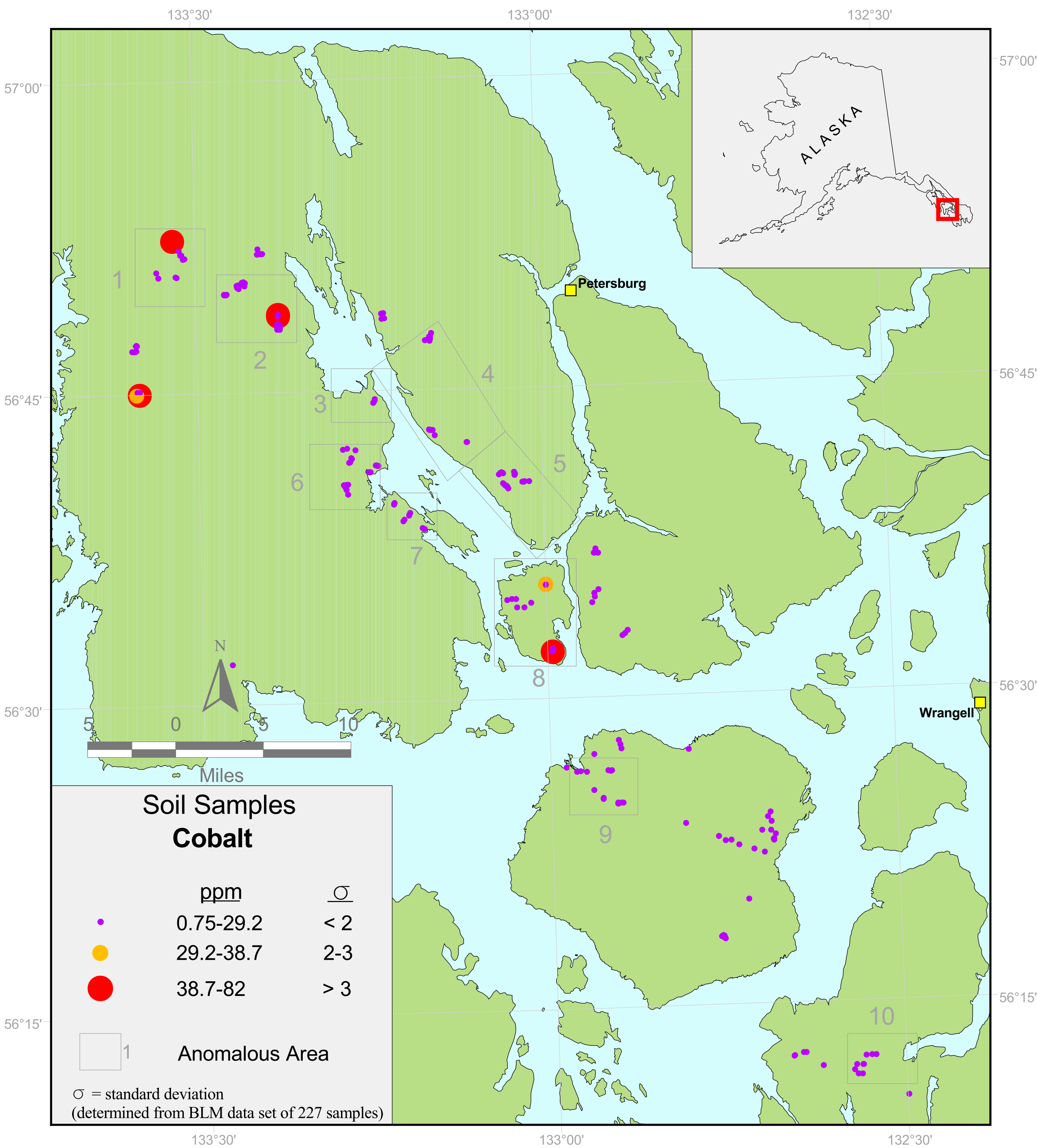

Figure 20. Distribution of cobalt anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

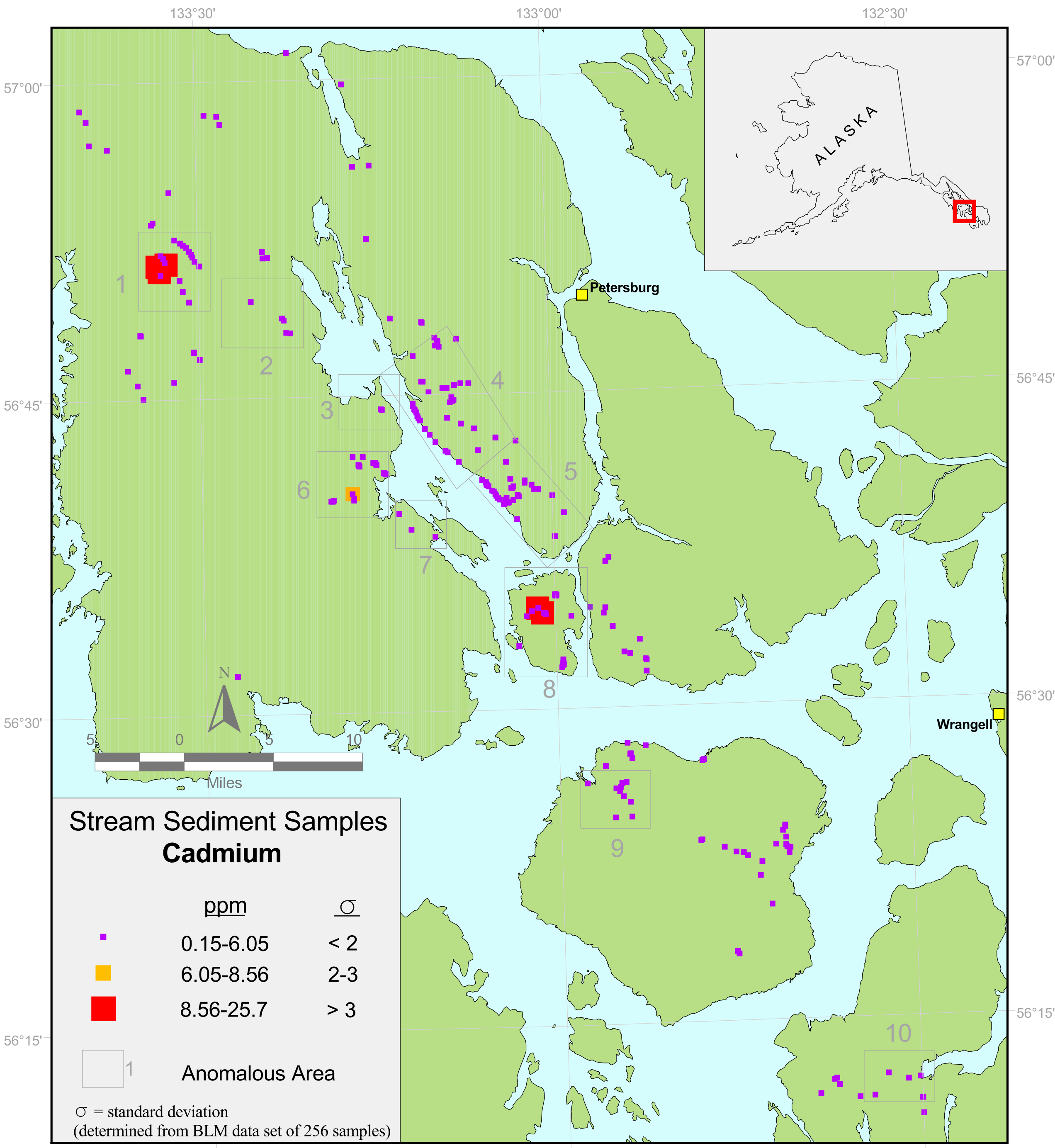

Figure 21. Distribution of cadmium anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

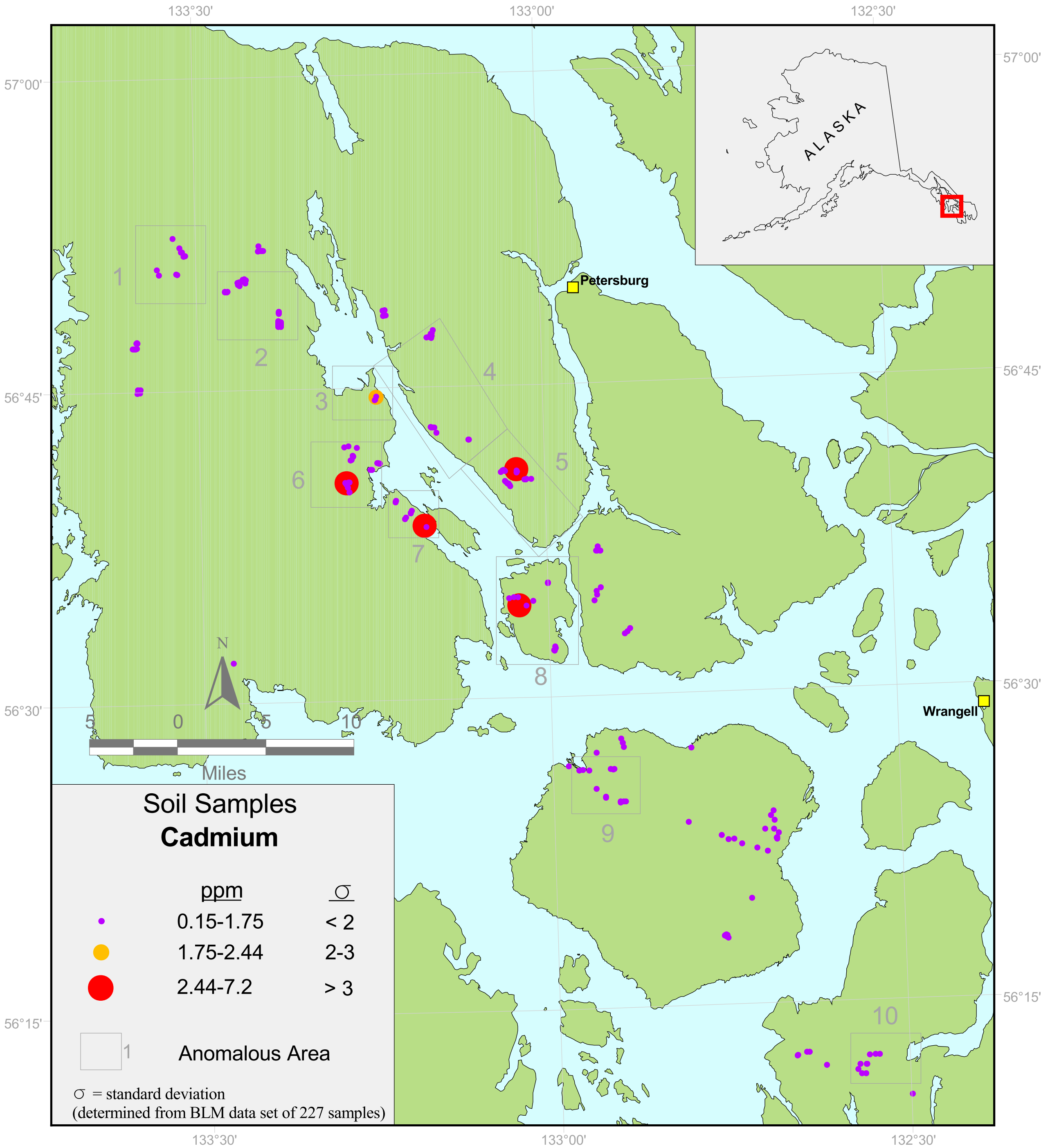

Figure 22. Distribution of cadmium anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

Barium

Barite is a common constituent of the VMS occurrences in the Alexander terrane in southeastern Alaska. Approximately 750,000 tons of barite were mined from the Castle Island deposit in Duncan Canal (Carnes, 1980), which represents the only commercial production from a VMS deposit in the Stikine area. So barium anomalies would likely be a good indicator for prospective VMS terrain. However, barite occurs in other deposit types in the Stikine area (e.g., replacement- type deposits; Bittenbender and others, 2000), so the presence of barium in stream sediment samples is not conclusive of VMS potential.

Anomalous barium in the BLM stream sediment samples distinctly mark the east side of Duncan Canal, in Anomalous Areas 4 and 5 (Fig. 23). The area corresponds well to the USGS regional data set where the east side of Duncan Canal is also distinguished (Smith, 1998). Some of the anomalous barium samples contain anomalous values for other elements, whereas some are only marked by barium. In both cases, the samples are restricted to those collected along the shoreline of Duncan Canal and none from farther inland. No other element anomalies are so distinctly geographically restricted, however, an approximately parallel belt of copper anomalies lies inland, to the east (Fig. 7).

The BLM soil samples do not show a similar distribution of barium anomalies as the stream sediment samples (Figs. 23 and 24). The BLM found only one barium anomaly in Anomalous Area 4 (sample 1574), in the belt marked by the stream sediments; the BLM did not collect many soil samples along the shoreline belt. The soil samples show anomalies on the west side of Duncan Canal, in Anomalous Areas 2, 6, and 7. In Anomalous Area 2, three samples with anomalous barium were collected near a known mineral occurrence (samples 912, 913, 915). A stream sediment sample with anomalous barium was also collected near this site (sample . The other anomaly, on the northwest side of Anomalous Area 2, marks an area previously unknown to be mineralized (sample 1549). The barium anomalies in Anomalous Area 6 correspond to the Go claims, but the anomaly in Anomalous Area 7 marks an area with no previously known mineral occurrences (sample 8883).

Manganese

Manganese is commonly associated with VMS deposits. It is an element that also characterizes the Triassic VMS occurrences in southeastern Alaska (Taylor and others, 1995b).

Almost all the stream sediment manganese anomalies in the Duncan Canal to Etolin Island belt fall within the Anomalous Areas defined by this report (areas 1, 4, 5, 8, 9, and 10), however, none are associated with previously known mineral occurrences, except for the one on southeastern Woewodski Island in Anomalous Area 8 (Fig. 25). By contrast, two of the BLM's four anomalous manganese soil samples mark known occurrences (Fig. 26).

The single stream sediment manganese anomaly on the southwest side of Mitkof Island that is not within an Anomalous Area (sample 6355) is associated with Cretaceous to Jurassic rocks of

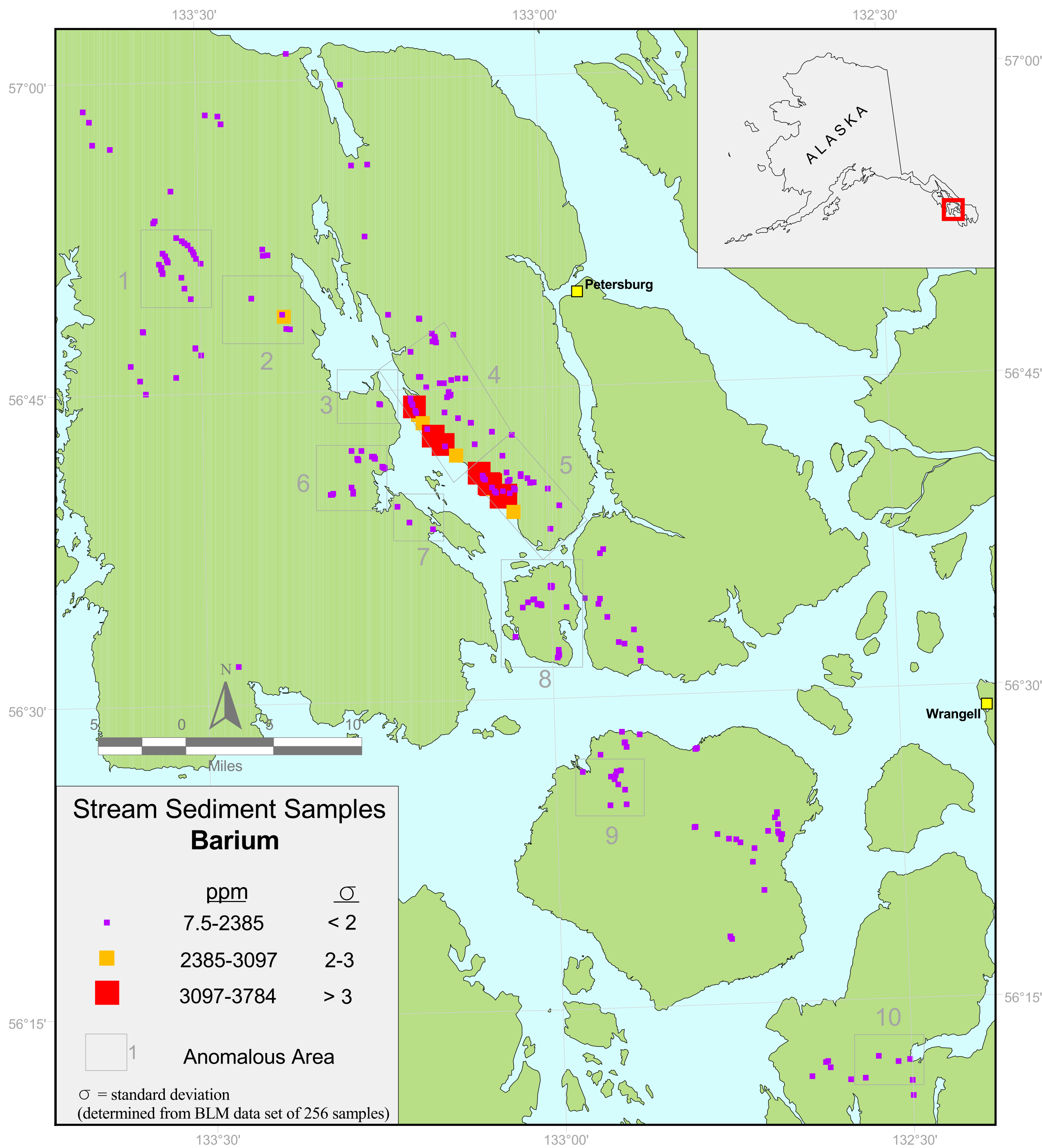

Figure 23. Distribution of barium anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

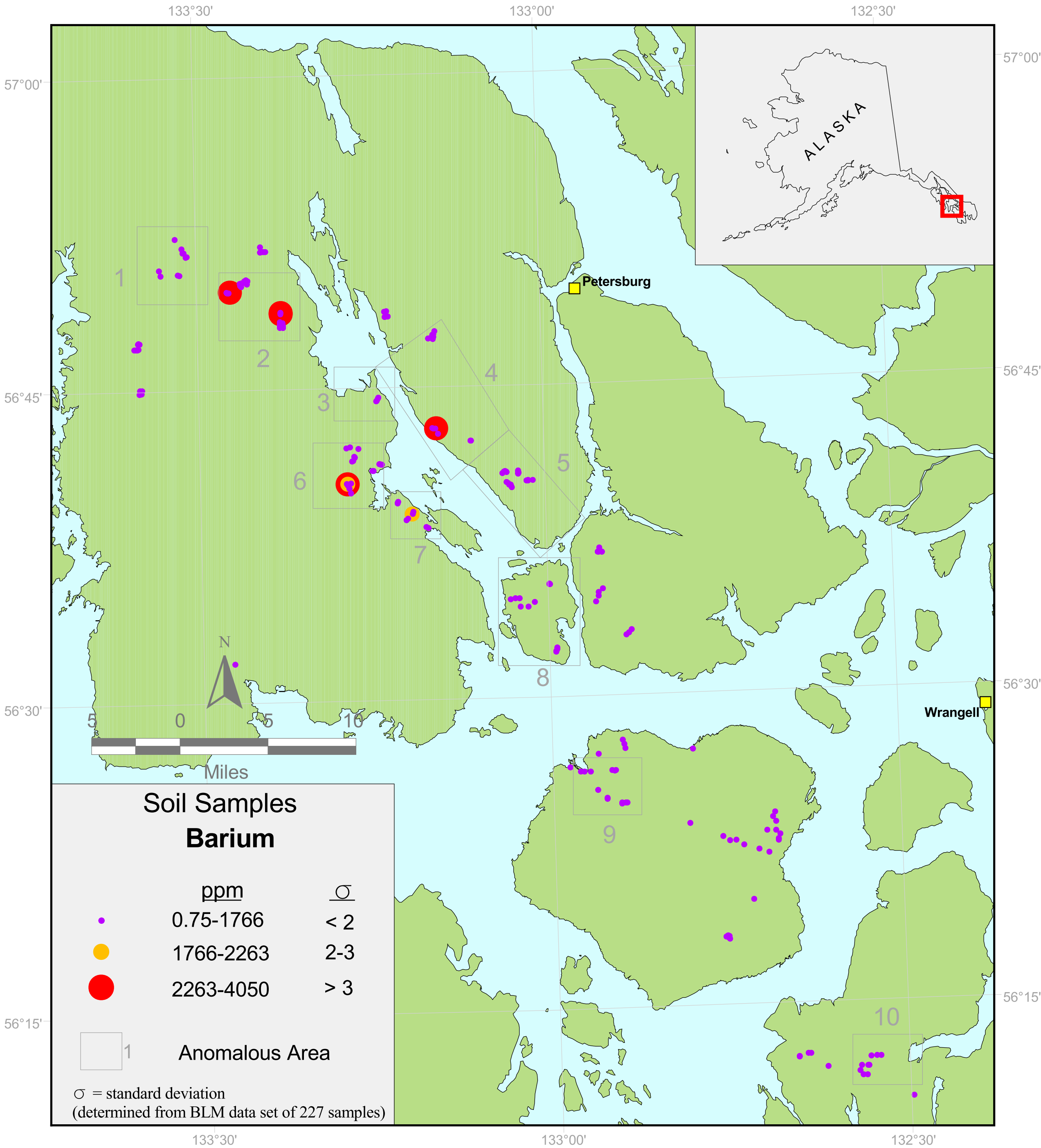

Figure 24. Distribution of barium anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

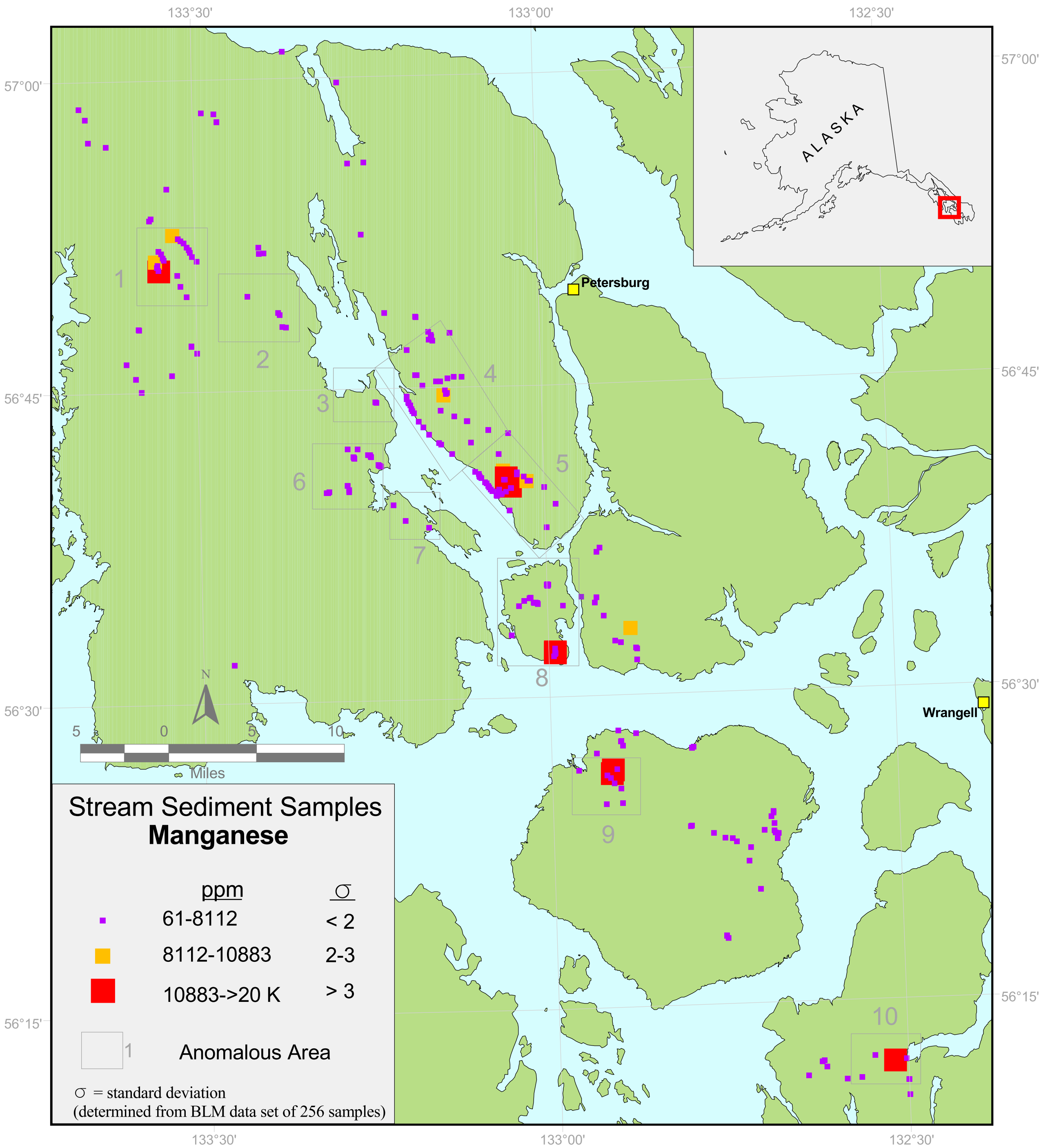

Figure 25. Distribution of manganese anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

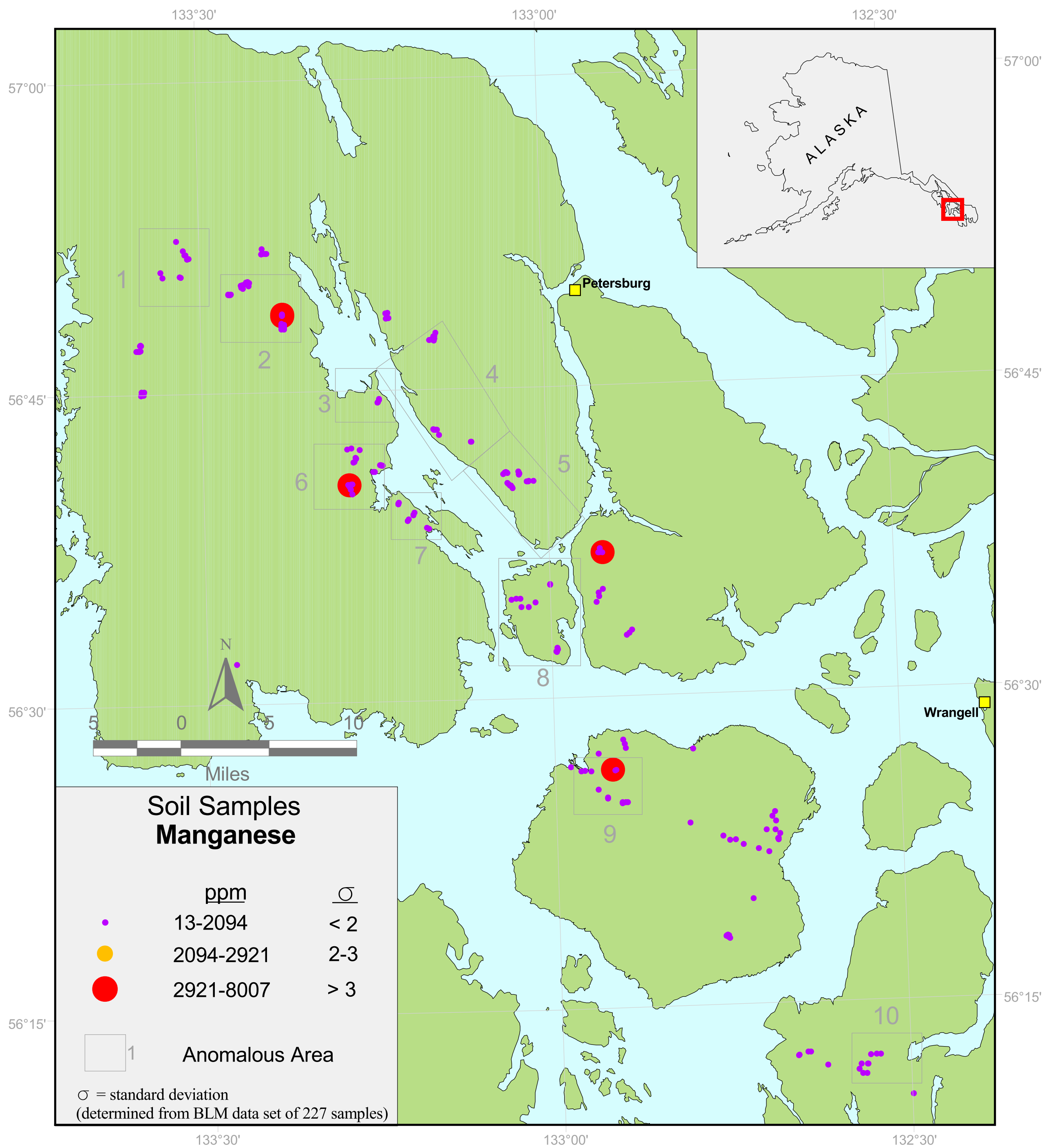

Figure 26. Distribution of manganese anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

the Seymour Canal Formation (Karl and others, 1999). A single gold anomaly was also detected in this area (sample 6361).

The only correlation between stream sediment and soil samples anomalous in manganese is in Anomalous Area 9. This area includes the Frenchie prospect, but the BLM collected both the anomalous stream sediment and soil samples to the northeast, or upstream, of the historic prospect. The BLM's other manganese soil anomalies mark known occurrences in Anomalous Areas 2 and 6, which correspond to the Taylor Creek and Go claims respectively. An additional anomalous manganese soil sample, on southwest Mitkof Island, is not associated with any known occurrences, nor does it correspond to the anomalous manganese stream sediment sample in the area. The sample is slightly elevated in silver along with the manganese (0.5 ppm silver, 2,976 ppm manganese, sample 9741).

Mercury

Taylor and others (1995b) list mercury as one of the elements that characterize the geochemical signature of Triassic VMS deposits in southeastern Alaska. In the Duncan Canal to Etolin Island VMS belt all the mercury anomalies in stream sediment samples detected by the BLM fall within the Anomalous Areas defined by this report. Most are concentrated in Anomalous Area 1, but are also found in areas 2, 5, and 8 (Fig 27).

Mercury anomalies in soil samples generally mark the same Anomalous Areas as do the BLM stream sediment samples, i.e., areas 1 and 2 (Fig. 28). In Anomalous Area 2 both the stream sediment and soil anomalies mark the Taylor Creek occurrence. In Anomalous Area 1, the BLM stream sediment samples lie to the west of and in a different drainage than the anomalous soil samples. This suggests the possibility of either a relatively large occurrence in the area or multiple occurrences.

A three-standard deviation mercury anomaly in a soil sample lies on southwestern Mitkof Island (sample 945). The BLM collected this anomalous sample from an area mapped predominantly as Cretaceous tonalite (Karl and others, 1999). The BLM also collected a stream sediment sample with a minor copper anomaly in the area (sample 947).

Arsenic

Arsenic is one of the elements listed by Taylor and others (1995b) that characterizes the geochemical signature of Triassic VMS deposits in southeastern Alaska. The BLM data set contains anomalous arsenic values in stream sediment samples in Anomalous Areas 1, 5, 8, and 10 (Fig. 29). The anomalies in areas 1 and 10 seem to indicate previously unknown mineralization, whereas the ones in areas 5 and 8 seem mark known occurrences. In Anomalous Area 5 the high arsenic may be originating from the Nicirque occurrence (Bittenbender and others, 2000). In the south end of Anomalous Area 8 prospecting since 1999 at the Olympic Resources Gold prospect has targeted gold in Triassic volcanic rocks, but there is no known evidence of a VMS occurrence.

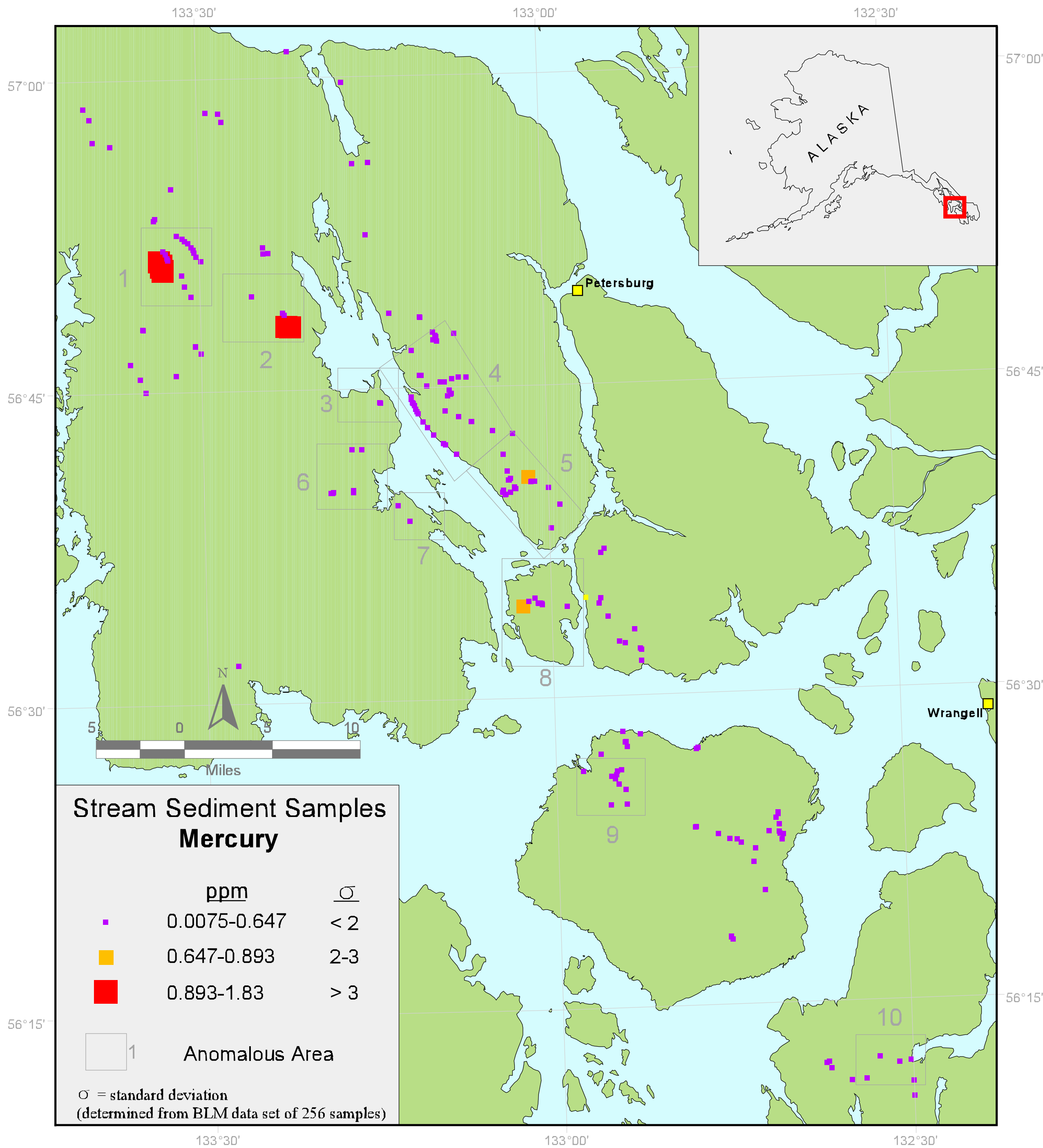

Figure 27. Distribution of mercury anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

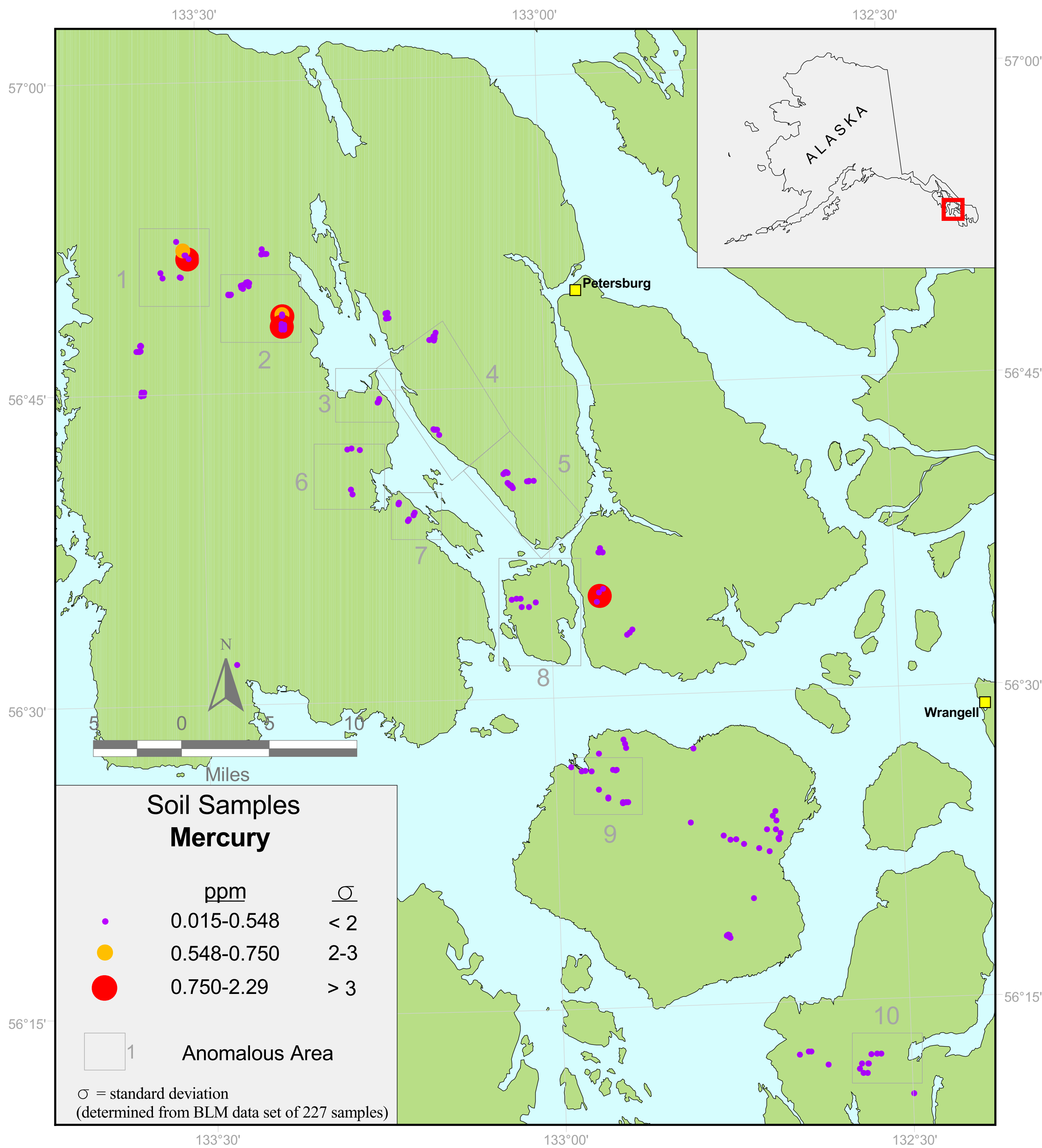

Figure 28. Distribution of mercury anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

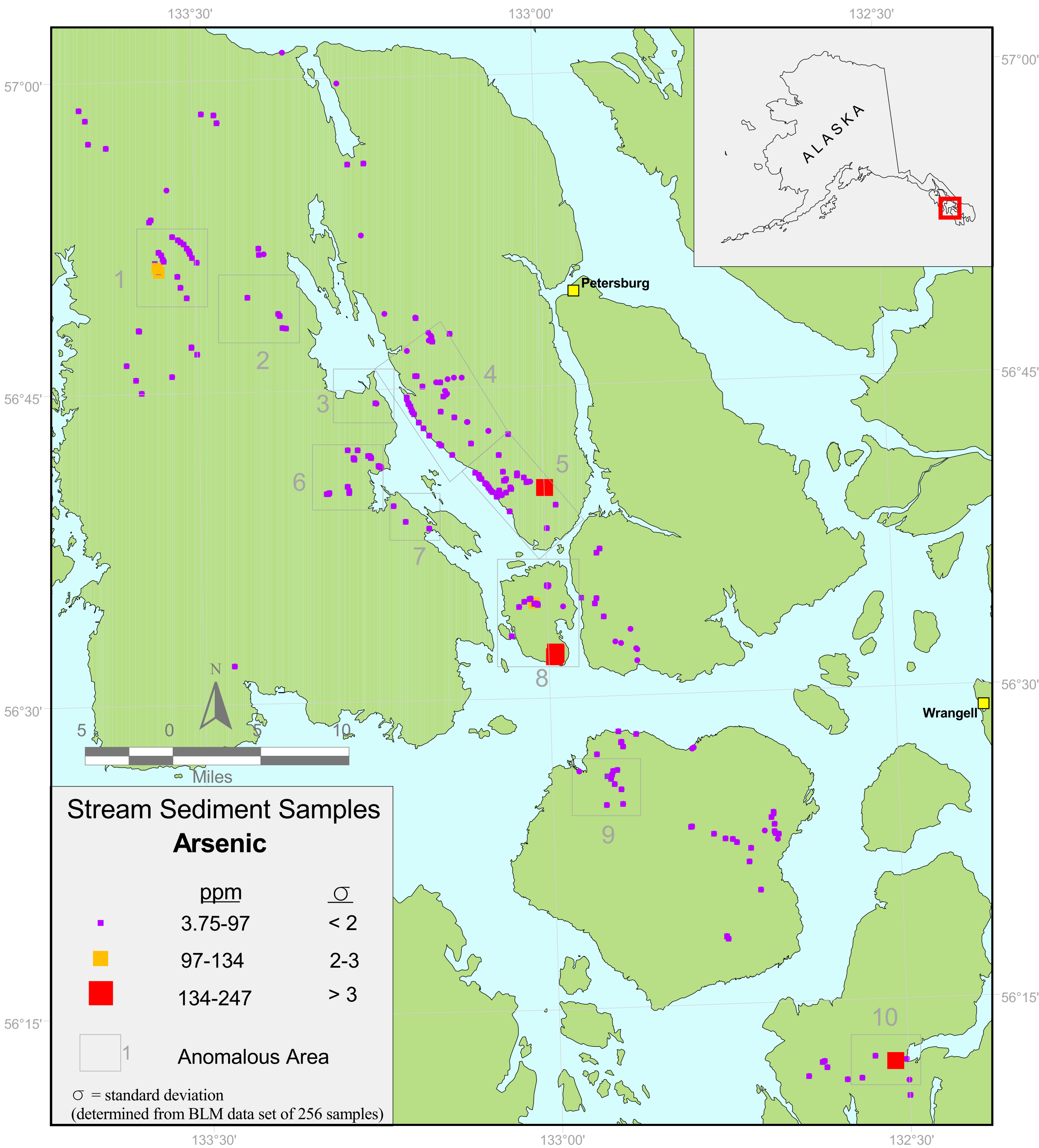

Figure 29. Distribution of arsenic anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

Arsenic anomalies in soil samples are concentrated in Anomalous Area 8 (Fig. 30), similar to the stream sediment arsenic anomalies. The soil samples also mark Anomalous Areas 2 and 7. Although Anomalous Area 2 includes the Taylor Creek occurrence, the area from which the BLM collected the anomalous sample is 2.7 miles to the northwest of the known occurrence (sample 907). The arsenic anomaly in Anomalous Area 7 corresponds to a sample that was also anomalous in zinc, molybdenum, nickel, cadmium, and antimony (sample 761).

Antimony

In the Duncan Canal area, the top five antimony anomalies in stream sediment samples from the BLM data set are found in Anomalous Area 1 (Fig. 31). This is an area with no previously known mineral occurrences. All the other antimony anomalies are in Anomalous Area 8, centered around the RD22 conductive zone. This area contains several nearby VMS occurrences. The antimony anomalies are geographically restricted and clearly mark two areas within the geophysical survey area.

Antimony anomalies in soil samples were found on the west side of Duncan Canal and on Woewodski Island (Fig. 32). The soil anomalies mark Anomalous Areas 1 and 8, similar to the stream sediment anomalies. They also highlight Anomalous Area 7, where the BLM collected two, three-standard deviation anomalies and where the highest antimony in soils was detected (35 ppm antimony, sample 761). The antimony soil anomaly in Anomalous Area 6 corresponds to the area of the Go claims (sample 821).

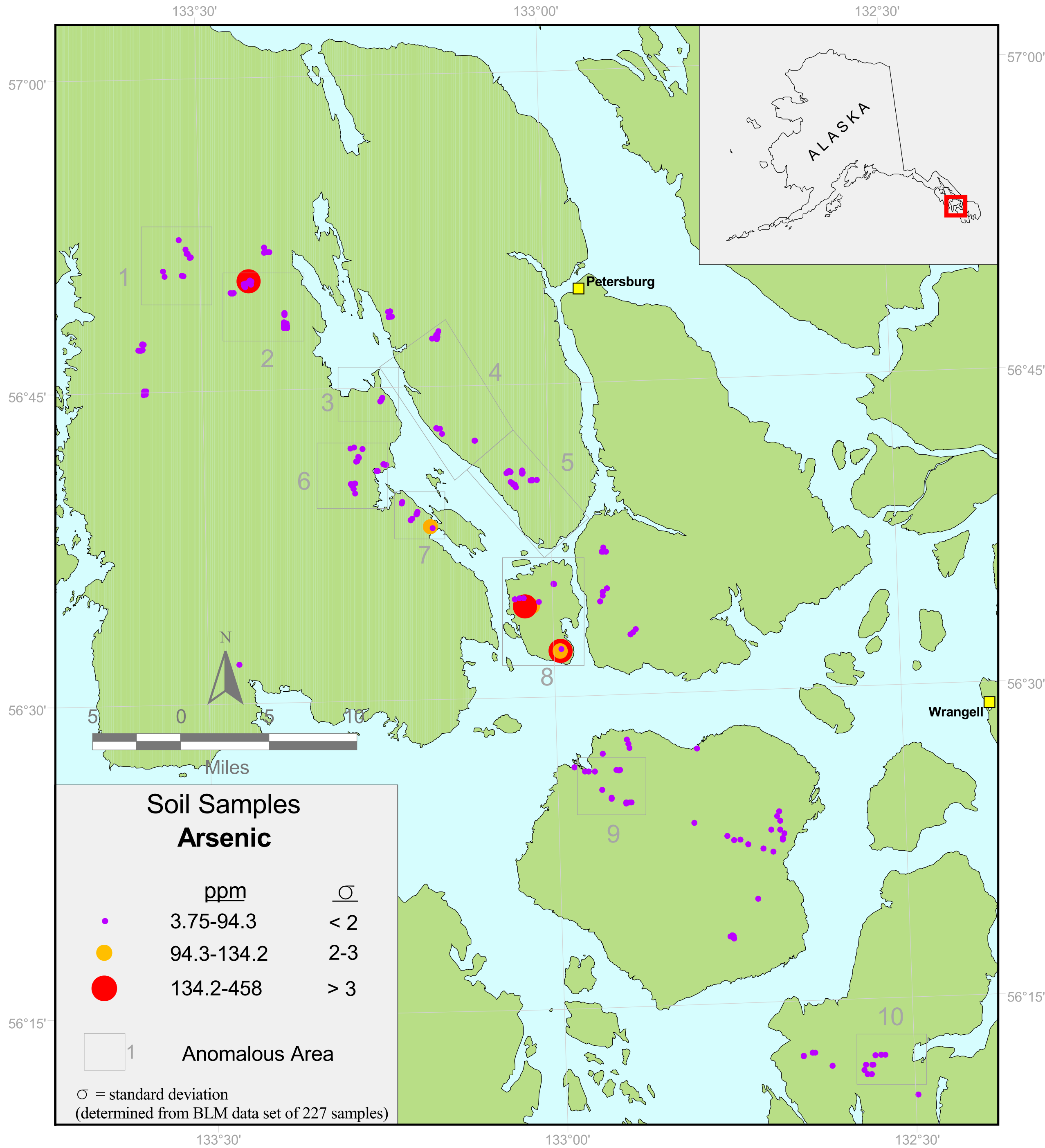

Figure 30. Distribution of arsenic anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

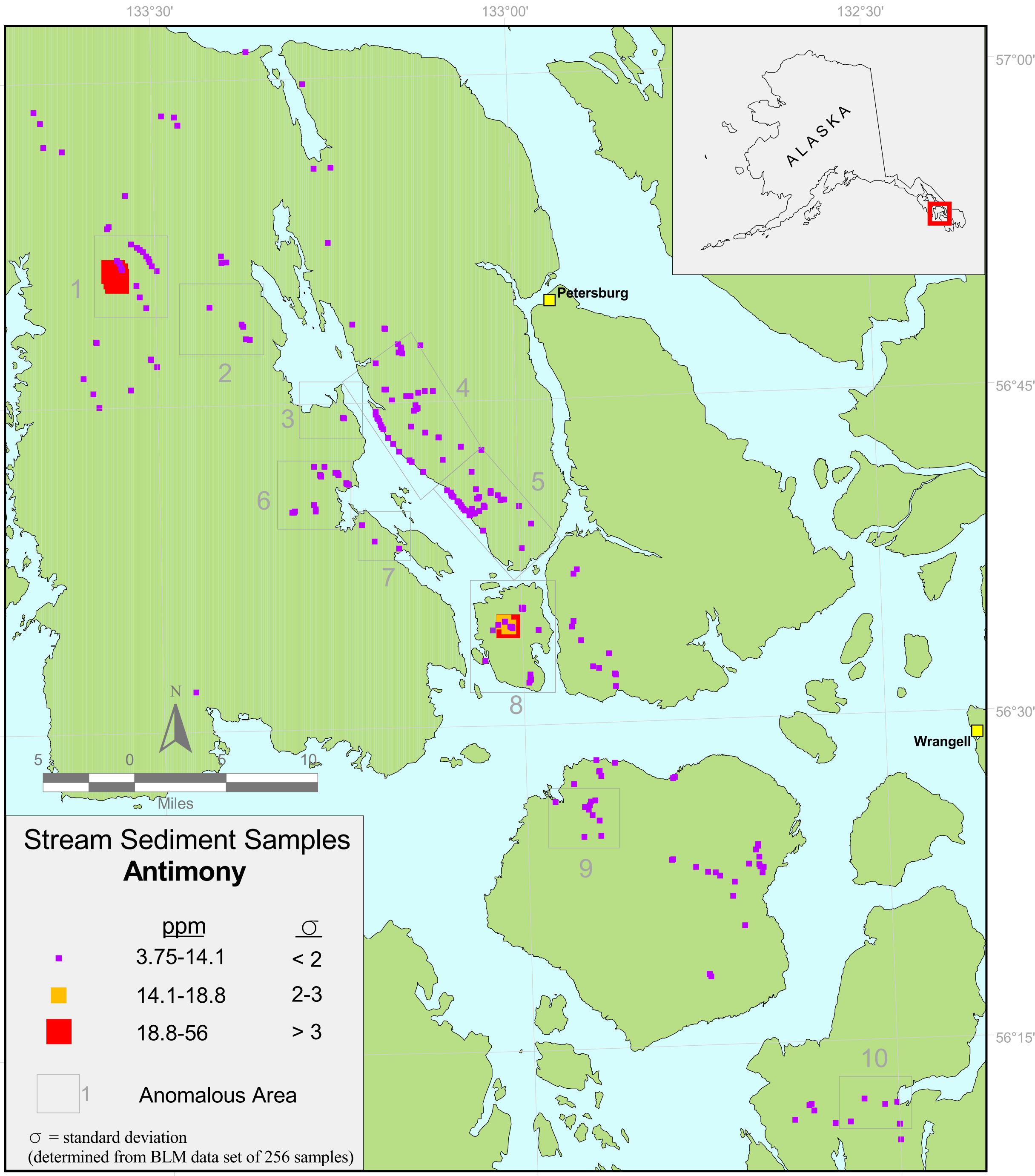

Figure 31. Distribution of antimony anomalies in stream sediment samples from the Duncan Canal - Etolin Island VMS belt.

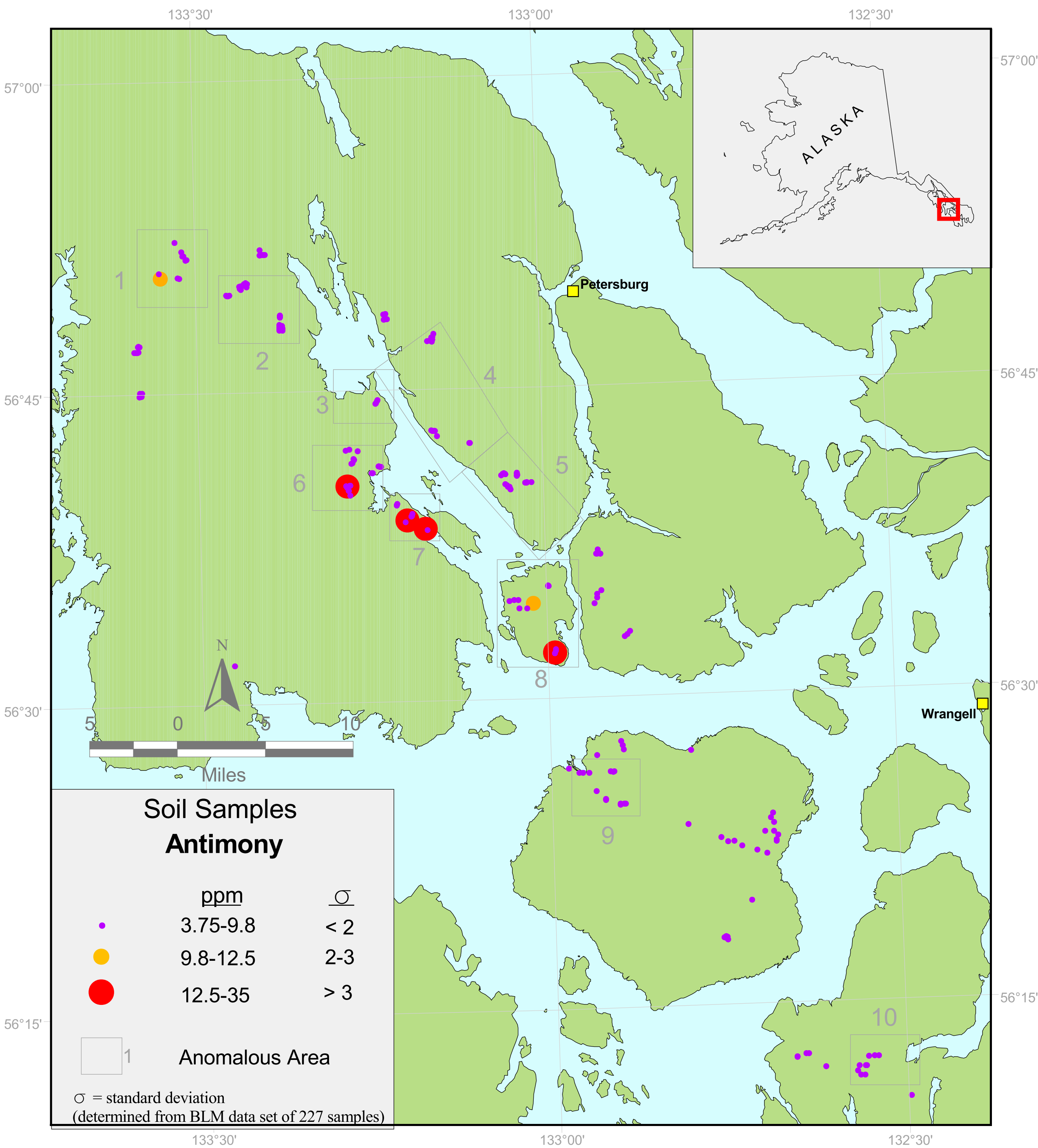

Figure 32. Distribution of antimony anomalies in soil samples from the Duncan Canal - Etolin Island VMS belt.

Results by Anomalous Area

Anomalous Area 1

General

Anomalous Area 1 (AA1; Fig. 33) includes the geophysical contractor's RD7 and RD8 conductive zones (Pritchard, 1997). These conductive zones are ranked number 20 and number 25 respectively on the BLM prioritization of conductive zones (Table 2). Both of the conductive zones were interpreted to contain thin bedrock sources for conductivity anomalies and coincide with magnetic lows (Pritchard, 1997). The geology of the zones has been mapped as Triassic Hyd Group at the contact with the Permian to Mississippian Cannery Formation for RD7 and Cannery Formation for RD8 (Karl and others, 1999). No known mineral occurrences are associated with the zones, however, BLM reconnaissance sampling along the Forest Service road network in the area in 1999 revealed bedded pyrite in siliceous schist and chert within or near the zones. No other sulfide minerals or base metals were detected in the samples. Prior to the geophysical follow-up, no other geochemical anomalies were known in the area. Taylor Creek-like geophysical signatures are predicted near both the RD7 and RD8 conductive zones (McCafferty and others, in press). The RD8 conductive zone is associated with a strong conductive gradient whereas the RD7 zone has only a moderate gradient.

Anomalous Samples

The highest zinc values in stream sediment samples from the BLM's investigation were found in AA1, particularly associated with the RD8 conductive zone (Table 5). This area contained the three highest concentrations of zinc and six of the highest eight. The six samples were also anomalous in copper, molybdenum, and nickel. Among the six samples there were also anomalies in silver, lead, cadmium, manganese, mercury, arsenic, and antimony.

The anomalous stream sediment samples in the RD8 conductive zone extend across an area about two miles north-south and one mile east-west. They extend from about 500 to 1,500 feet in elevation (Fig. 33).

Most of the soil sample anomalies in AA1 are associated with the RD7 conductive zone (Table 5). Only one anomalous soil sample, high in antimony, was collected in the RD8 zone (sample 1586). In RD7, three anomalous soil samples were collected (samples 1565, 1568, 1569). Two were anomalous in mercury, and one had greater than three-standard deviation anomalies in nickel, chromium, and cobalt. No soil samples from the area were anomalous in the precious or base metals.

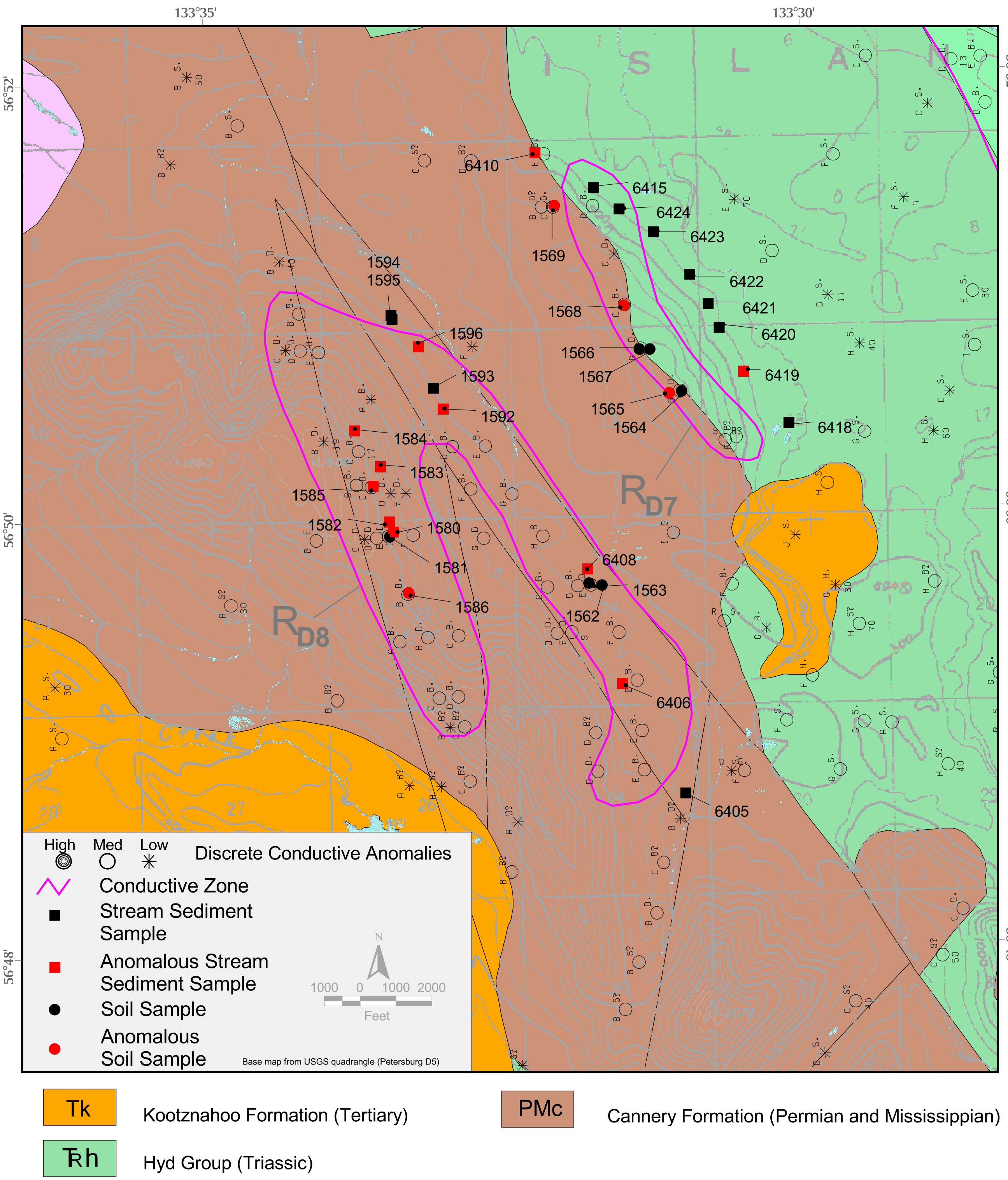

Figure 33. Anomalous Area 1 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Discussion / Conclusions

AA1 is one of the most promising potentially mineralized areas discovered during the BLM follow-up of the Stikine geophysical survey. Samples from the area, mainly stream sediments, are anomalous in a variety of elements and extend across a relatively broad area. In addition, the BLM's reconnaissance investigations of the Forest Service road network in the area revealed indications of alteration and mineralization indicative of VMS deposits (Still and others, in press).

Table 5. Analytical results from Anomalous Area 1. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment, S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
6410	RD7	SS	13	<0.2	23	7	155	4	43	63	39	1.3	1070	**8124**	0.19	20	<5
6415	RD7	SS	<5	<0.2	23	14	102	4	26	65	19	0.7	1317	2098	0.205	8	<5
6418	RD7	SS	7	<0.2	38	10	126	1	29	27	25	0.4	934	2095	0.055	15	<5
6419	RD7	SS	**53***	<0.2	34	11	115	1	26	29	37	0.3	799	3101	0.103	14	<5
6420	RD7	SS	11	<0.2	40	14	139	2	32	30	45	0.5	800	3397	0.139	16	<5
6421	RD7	SS	<5	<0.2	27	10	91	<1	22	27	29	0.3	800	2622	0.095	9	<5
6422	RD7	SS	<5	<0.2	25	7	73	<1	23	29	18	0.2	800	1054	0.049	6	<5
6423	RD7	SS	9	<0.2	15	9	73	1	15	26	11	<0.2	734	619	0.126	7	<5
6424	RD7	SS	6	<0.2	24	9	92	3	20	31	15	0.7	839	2533	0.181	9	<5
1580	RD8	SS	19	<0.2	**70**	27	**505***	**46***	**118**	31	44	**7.9**	963	**12147***	**0.953***	**125**	**28***
1582	RD8	SS	14	<0.2	**101***	31	**520***	**27***	**139**	25	33	5.8	689	5734	**1.827***	**97**	**56***
1583	RD8	SS	21	<0.2	**99***	21	**859***	**33***	**203***	19	37	**10.1***	1105	5831	**1.184***	82	**23***
1584	RD8	SS	32	0.3	**90**	30	**686***	**26***	**190***	22	39	**10.8**	2096	**9433**	**1.339***	86	**33***
1585	RD8	SS	25	**0.7***	**138***	**55***	**1707***	**33***	**411***	34	43	**25.7**	1491	5232	**1.324***	**99**	**26***
1592	RD8	SS	12	<0.2	**94***	19	**1361***	**12***	**249***	33	42	**19.2**	1004	4934	0.523	33	9
1593	RD8	SS	<5	<0.2	30	8	106	1	22	28	18	0.7	995	1784	0.12	7	<5
1594	RD8	SS	8	<0.2	28	7	158	3	34	28	16	0.9	1017	1815	0.232	10	<5
1595	RD8	SS	<5	<0.2	41	8	127	2	34	29	16	0.6	1029	1036	0.142	10	<5
1596	RD8	SS	7	<0.2	47	10	**303***	**6**	71	31	20	2.7	1070	2078	0.305	20	7
6405	RD8	SS	<5	<0.2	26	9	83	2	16	20	19	0.4	1004	2328	0.068	14	<5
6406	RD8	SS	<5	<0.2	28	7	**236**	3	71	33	24	3.7	891	4042	0.092	16	<5
6408	RD8	SS	5	<0.2	35	13	**226**	5	37	30	30	1.7	1018	4821	0.14	33	<5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
1564	RD7	S	<5	<0.2	17	9	24	1	7	16	3	<0.2	806	105	0.081	<5	<5
1565	RD7	S	<5	<0.2	8	6	35	1	11	30	3	0.5	194	309	**0.879***	11	7
1566	RD7	S	6	<0.2	33	10	61	2	21	32	6	0.8	1027	220	0.285	6	<5
1567	RD7	S	<5	<0.2	<1	13	8	<1	1	18	<1	<0.2	563	70	0.021	<5	<5
1568	RD7	S	6	<0.2	29	14	45	1	13	42	5	<0.2	797	246	**0.568**	7	<5
1569	RD7	S	<5	<0.2	32	13	99	2	**130***	**294***	**40***	1.1	602	212	0.055	<5	<5
1562	RD8	S	7	<0.2	13	9	37	2	10	32	4	0.2	672	176	0.091	6	<5
1563	RD8	S	6	<0.2	38	11	56	1	20	38	7	0.3	692	296	0.124	9	<5
1581	RD8	S	13	<0.2	10	8	95	<1	11	14	13	0.8	538	321	0.203	<5	<5
1586	RD8	S	18	0.5	45	10	149	7	30	39	20	0.7	1264	1258	0.407	31	**10**

Anomalous Area 2

General

Anomalous Area 2 (AA2; Fig. 34) is made up of the geophysical contractor's RD9 and RD10 conductive zones (Pritchard, 1997). These zones are ranked number 26 and number 11 respectively in the BLM prioritization of conductive zones (Table 2). Both are characterized by multiple, closely spaced, thin bedrock conductivity sources and are associated with magnetic lows (Pritchard, 1997). Both zones are mapped as undifferentiated Triassic Hyd Group that is bordered by Triassic Hyd Group volcanic rocks (Karl and others, 1999). The RD9 conductive zone has no associated known mineral occurrences. The RD10 zone on the other hand includes the historic Taylor Creek occurrence and has been the site of recent exploration activity by Kennecott Exploration, Inc. (Bittenbender and others, 2000). Kennecott drilled at least five holes in 2000 to test an apparent geophysical and geochemical anomaly (Russ Franklin, personal communication, 2001) in the RD10 conductive zone. The results of their drilling have not been made public. There were no geochemical anomalies associated with either the RD9 or RD10 zones prior to the BLM follow-up program. Taylor Creek-like geophysical signatures are predicted in the RD10 conductive zone and occur in the RD9 zone as well. In addition the RD10 zone has a minor association with other geophysical models, i.e., the Junior Creek and Lost Show models (McCafferty and others, in press). The RD10 conductive zone is associated with a strong conductive gradient whereas the RD9 zone has only a moderate gradient.

Anomalous Samples

Several of the samples collected in AA2 were collected from the site on which Kennecott Exploration, Inc. was working. The site, in conductive zone RD10, consists of a land slump that exposes mineralized rock (Fig. 34). Stream sediment and soil samples from the site contained the highest values of any samples collected in AA2 (Table 6). The samples were anomalous in gold, silver, copper, lead, zinc, molybdenum, cobalt, barium, manganese, and mercury. The second highest gold value and the highest silver value in stream sediments from the Stikine follow-up were detected in a sample collected below the land slump site in RD10 (sample 6337).

Three stream sediment samples from AA2, outside the Kennecott site, were found to be anomalous in copper, zinc, molybdenum, and/or mercury. One of these samples was collected from a stream that drained across a line of VMS bedrock conductive anomalies (Fig. 34, sample 6313). The BLM did not accomplish a follow-up of this sample due to time constraints nor did we collect soil samples from the discrete anomalies.

Only 2 of 25 soil samples collected outside the Kennecott site in AA2 were anomalous in any element. The BLM collected sample 6305 in RD10 that contained anomalous amounts of mercury, and sample 1549 from RD9 that was anomalous in barium.

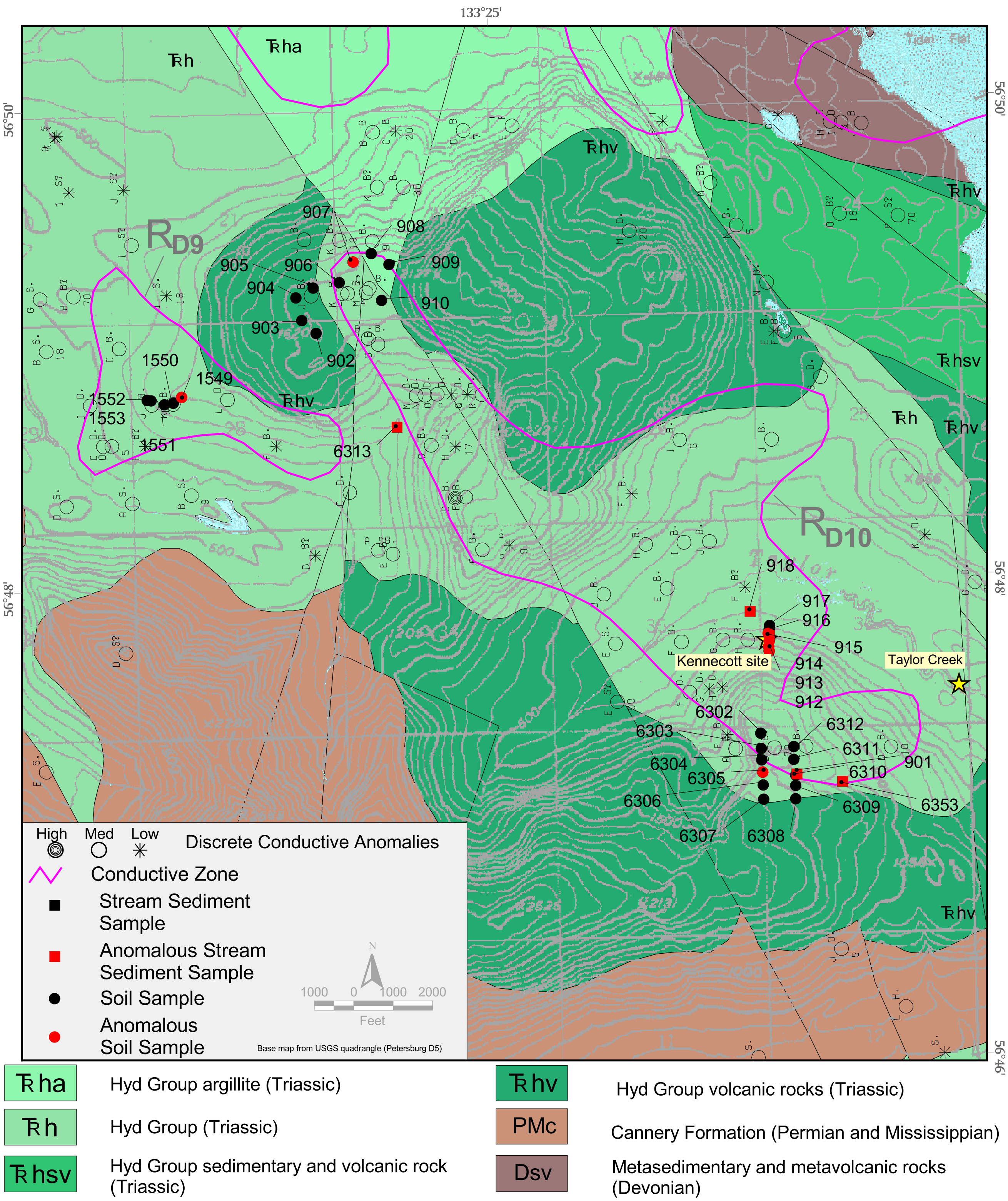

Figure 34. Anomalous Area 2 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Discussion / Conclusions

AA2 includes areas previously known to contain mineral occurrences, specifically the historic Taylor Creek prospect. Kennecott drilled an area outside the historic Taylor Creek property, but the sources that led to their discovery, whether by the airborne geophysical survey or other means, has not been made public. The BLM follow-up of conductive anomalies from the survey suggests three additional areas with the potential for hosting mineralized rock outside the known occurrences. Two are indicated by soil samples and one by a stream sediment sample. Further investigation is needed to determine the presence or extent of mineralized rock in these areas.

Table 6. Analytical results from Anomalous Area 2. Anomalous results > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm, Au in ppb, SS = stream sediment, S = soil, KS = Kennecott site

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
901	RD10	SS	8	<0.2	46	12	116	5	39	19	26	1	1297	4989	**1.261***	11	<5
918	RD10, KS	SS	11	<0.2	**88**	35	**232**	2	36	39	34	0.9	1741	2965	0.183	23	<5
6313	RD10	SS	<5	<0.2	57	30	**267**	**7**	31	27	25	2.3	1163	2266	0.07	59	<5
6337	RD10, KS	SS	**98***	**0.9***	**201***	**96**	**431***	1	53	54	52	1.9	**2603**	5810	0.444	51	7
6353	RD10	SS	<5	<0.2	**72**	13	**275**	**6**	44	15	23	4.5	1165	3176	**1.057***	16	<5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
1549	RD9	S	32	0.2	4	19	5	5	<1	8	<1	<0.2	**4050***	31	0.025	<5	<5
1550	RD9	S	9	<0.2	20	17	41	3	12	33	3	0.2	803	169	0.09	9	<5
1551	RD9	S	19	<0.2	15	18	32	2	9	29	3	0.2	748	175	0.168	8	<5
1552	RD9	S	7	<0.2	76	9	103	5	38	48	18	1.3	1100	589	0.078	14	<5
1553	RD9	S	8	<0.2	47	8	66	2	22	40	10	0.2	707	478	0.141	12	<5
902	RD10	S	7	<0.2	14	15	45	<1	13	35	7	<0.2	840	234	0.132	<5	<5
903	RD10	S	<5	0.2	6	8	40	2	2	4	19	<0.2	926	174	0.091	<5	<5
904	RD10	S	<5	<0.2	34	11	69	<1	21	42	9	<0.2	818	324	0.103	7	<5
905	RD10	S	6	<0.2	28	15	54	1	14	33	7	<0.2	896	248	0.085	7	<5
906	RD10	S	<5	<0.2	51	11	63	<1	21	42	10	<0.2	845	307	0.081	<5	<5
907	RD10	S	7	**0.9***	18	18	21	7	3	18	2	0.2	739	64	0.101	250	<5
908	RD10	S	11	<0.2	24	11	51	1	13	36	8	<0.2	673	254	0.113	8	<5
909	RD10	S	<5	0.3	15	36	39	1	8	27	6	<0.2	765	180	0.113	27	<5
910	RD10	S	6	0.3	5	10	28	1	4	20	11	<0.2	570	190	0.061	<5	<5
912	RD10, KS	S	48	**0.6***	**471***	**110***	270	5	71	74	**82**	1.2	**2232**	**8007***	**2.285***	76	6
913	RD10, KS	S	12	**0.6***	91	33	125	1	33	43	19	0.2	**2859***	1211	0.257	30	<5
914	RD10, KS	S	8	**0.8***	84	11	173	<1	27	40	13	0.2	741	659	0.244	12	<5
915	RD10, KS	S	26	**1.2***	**268***	**42**	154	<1	52	60	**52**	0.6	**2742***	**6956***	**0.563**	40	5
916	RD10, KS	S	8	<0.2	23	16	47	<1	11	39	7	<0.2	967	230	0.182	<5	<5
917	RD10, KS	S	<5	<0.2	22	14	52	2	13	41	9	<0.2	607	274	0.126	9	<5
6302	RD10	S	15	<0.2	30	8	52	<1	19	35	8	<0.2	832	317	0.05	<5	<5
6303	RD10	S	<5	<0.2	10	13	54	<1	17	52	10	<0.2	578	328	0.095	10	<5
6304	RD10	S	<5	<0.2	17	11	48	<1	15	43	8	<0.2	687	266	0.081	5	<5
6305	RD10	S	<5	<0.2	54	14	74	22	39	51	7	0.2	549	188	**0.836***	12	<5
6306	RD10	S	<5	<0.2	6	10	29	<1	7	29	6	<0.2	560	155	0.131	<5	<5
6307	RD10	S	<5	<0.2	25	11	82	<1	13	29	13	<0.2	530	357	0.24	<5	<5
6308	RD10	S	7	<0.2	82	9	71	<1	25	47	10	<0.2	728	376	0.143	5	<5
6309	RD10	S	<5	<0.2	67	13	89	<1	34	46	14	0.4	716	608	0.148	10	<5
6310	RD10	S	<5	<0.2	58	8	63	1	27	23	9	<0.2	1489	332	0.256	7	<5
6311	RD10	S	10	<0.2	14	12	51	1	15	38	8	<0.2	592	295	0.087	7	<5
6312	RD10	S	19	<0.2	33	12	60	<1	17	53	11	<0.2	549	410	0.11	7	<5

Anomalous Area 3

General

Anomalous Area 3 (AA3; Fig. 35) consists of the geophysical contractor's RD17 conductive zone (Pritchard, 1997). The zone is ranked number 30 in the BLM prioritization of conductive zones (Table 2). It is characterized by weak bedrock conductivity sources in a non-magnetic area (Pritchard, 1997). The mapped geology in AA3 indicates the presence of Permian to Mississippian Cannery Formation sediments and adjacent Quaternary basalt (Karl and others, 1999). This geology is an unlikely host for VMS deposits, although the Cannery Formation mapped in the AA1 area may host VMS mineralization. There are no known mineral occurrences in AA3, although the Indian Point occurrence is situated immediately to the north of the area (Grybeck and others, 1984; Bittenbender and others, 2000). A stream sediment sample collected by the USGS indicates a minor amount of barium in the area and very slightly elevated lead and zinc (Smith, 1998). There is some correlation between a Lost Show-type geophysical signature prediction and AA3 (McCafferty and others, in press). The RD17 conductive zone is not associated with a conductive gradient.

Anomalous Samples

The RD17 conductive zone is ranked quite low on the BLM prioritization of conductive zones, so not many samples were collected in the area. Only two stream sediment samples were collected and neither of them had anomalous values for any element (Table 7).

The present authors considered the RD17 area an anomalous area because of the results from soil sampling. Two soil samples were variably anomalous in silver, lead, and cadmium. In fact, one of the soil samples had the highest lead value of any collected in the follow-up (147 ppm lead, sample 8890).

Discussion / Conclusions

Although all early indications were that AA3 did not have significant potential for hosting mineralized rock, the fact that the highest lead sample of the data set was collected in the area raises its potential. In addition, the two samples with anomalous values were collected from the same general area, suggesting that the results are not accidental. Further follow-up in the area is warranted.

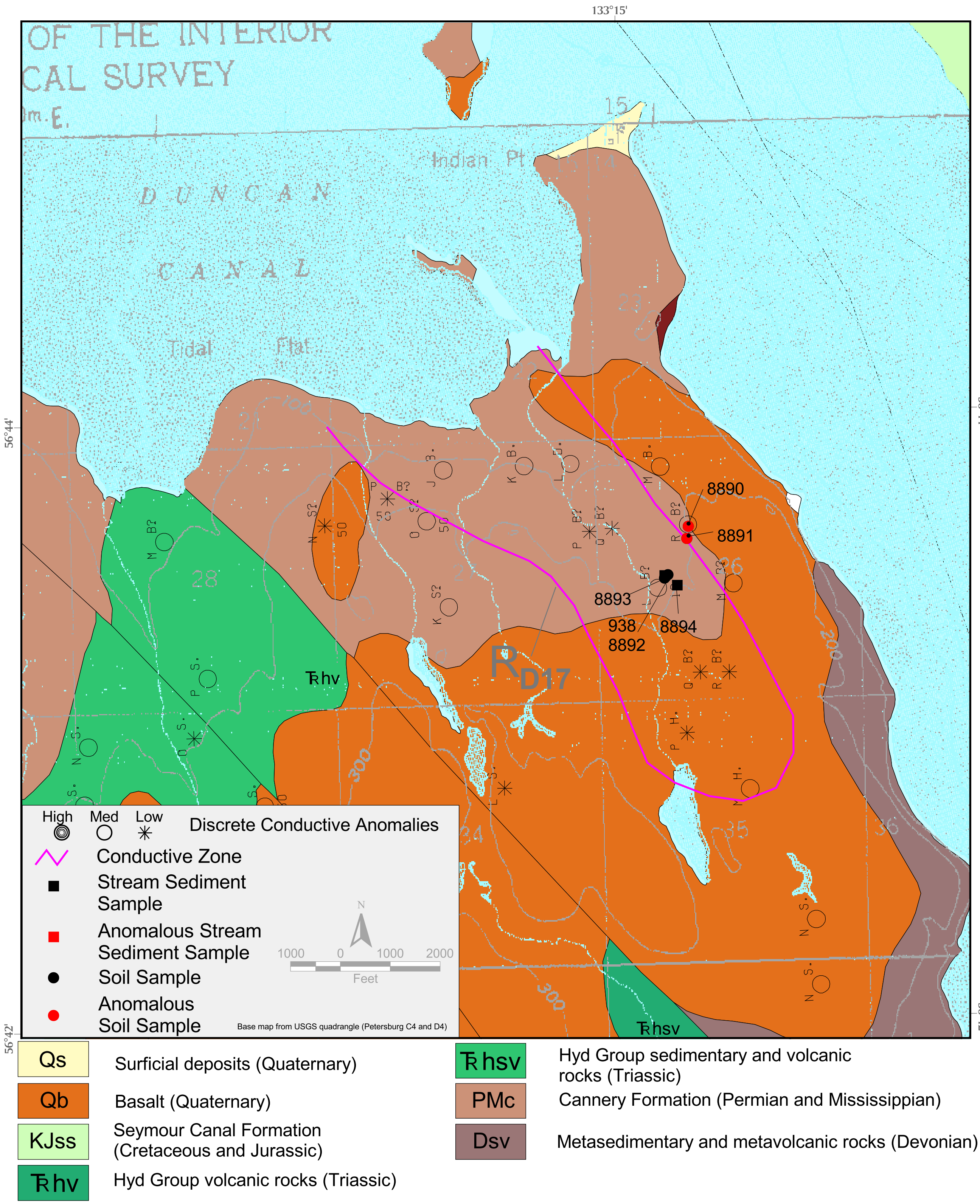

Figure 35. Anomalous Area 3 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Table 7. Analytical results from Anomalous Area 3. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment, S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
8893	RD17	SS	6	0.3	24	25	91	2	15	23	9	0.3	1305	726	0.148	9	<5
8894	RD17	SS	<5	<0.2	11	11	53	<1	8	13	4	0.2	1214	261	0.064	<5	<5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
938	RD17	S	9	<0.2	65	19	139	3	30	31	10	0.3	1518	295	0.121	8	<5
8890	RD17	S	9	**0.6***	68	**147***	226	4	17	33	6	1	820	270	0.303	14	<5
8891	RD17	S	10	<0.2	107	**49**	244	4	34	85	10	**2.4**	1384	540	0.258	9	<5
8892	RD17	S	7	<0.2	47	23	89	2	24	32	6	0.3	1238	285	0.192	8	<5

Anomalous Area 4

General

Anomalous Area 4 (AA4; Fig. 36) includes the geophysical contractor's RD14, RD15, and RD16 conductive zones (Pritchard, 1997). The zones are ranked numbers 7, 12, and 15 respectively in the BLM prioritization of conductive zones (Table 2). Conductive zones RD14 and RD15 are marked by strong bedrock conductive sources associated with magnetic highs. RD16 on the other hand is characterized by weak bedrock conductive sources and is associated with a nonmagnetic area (Pritchard, 1997).

The geology in AA4 is rather complex and apparently includes the eastern boundary of the Alexander terrane where the overlapping Gravina Belt rocks have been thrust to the southwest. Additional thrusts are mapped in the southwest part of AA4 where imbricate thrust sheets of Permian and Mississippian Cannery Formation are thrust to the southwest over Triassic Hyd Group sediments and volcanics. To the northeast Gravina Belt turbidites and greenstone units have been intruded by Cretaceous intrusives (Karl and others, 1999).

There are no known mineral occurrences in AA4. Stream sediment samples collected by the USGS indicate barium in the area along with minor amounts of copper and zinc (Smith, 1998). Geophysical signatures in various parts of the area resemble predictive models of the Scott, Lost Show, Taylor Creek, and Junior Creek mineral occurrences (McCafferty and others, in press). The RD14 and RD15 conductive zones are associated with strong conductive gradients, whereas the RD16 zone has a moderate gradient.

Anomalous Samples

Several stream sediment samples from AA4 were anomalous primarily in barium and copper (Table 8). The two highest concentrations of barium, and 6 out of the 15 highest barium values came from stream sediment samples collected in the RD16 conductive zone during the BLM follow-up. All of these samples with anomalous barium were collected from along the shoreline. The sample with the highest concentration of copper from the follow-up was collected in the north part of the RD14 conductive zone (sample 6316). But 11 of the 12 stream sediment samples anomalous in copper from AA4 were collected in or near the southern part of RD14 and in RD15.

Three stream sediment samples collected from AA4 indicate the presence of precious metals. Two of the samples anomalous in gold were also anomalous in copper (samples 6330, 6386). Another sample was relatively elevated in silver, but was not anomalous in any other element (sample 963).

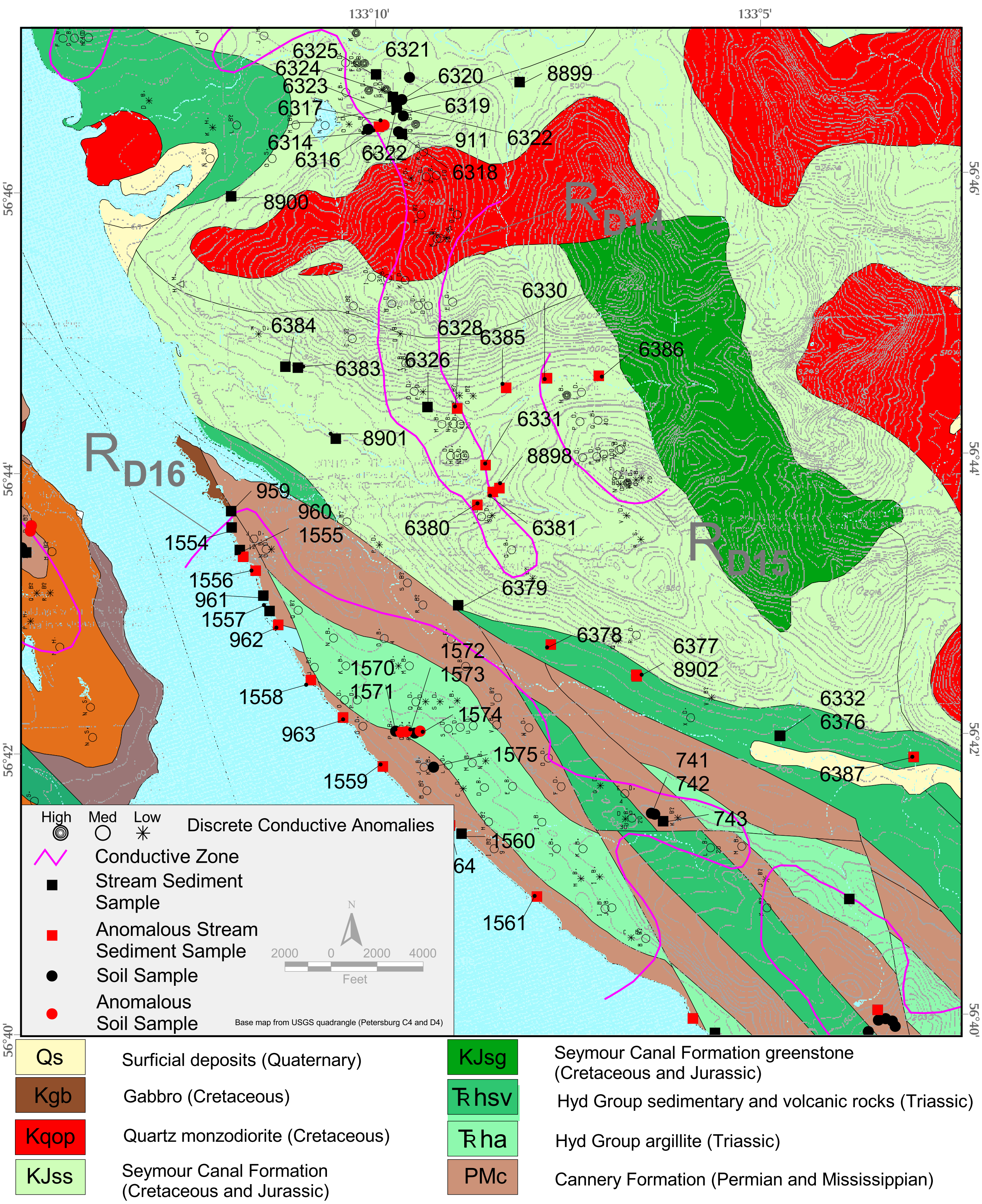

Figure 36. Anomalous Area 4 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Other samples from AA4 are geochemically anomalous, but do not suggest a pattern of mineralization. One sample was anomalous in cobalt and manganese (sample 6380), another was anomalous in molybdenum and barium (sample 1561), and another in chromium (sample 1555).

The BLM collected one soil sample from AA4 that was anomalous in silver, zinc, and nickel (sample 1571). None of these elements show up in anomalous quantities in the stream sediment samples. Two other soil samples were anomalous in barium (samples 1572, 1574), which corresponds with the numerous stream sediment barium anomalies in the area.

Discussion / Conclusions

The regional distribution of barium anomalies in stream sediment samples (Fig. 23) shows a concentration along the northeast side of Duncan Canal, adjacent to the Castle Islands where 787,000 tons of barium were mined between 1966 and 1980 (Carnes, 1980). The northern end of this trend is in AA4 and represents drainages off RD16. Interestingly, all the barium anomalies in this area are restricted to drainages that were sampled near the shoreline. Two soil samples from RD16 that were anomalous in barium (samples 1572, 1574) were collected in the approximate drainage area of one of the anomalous stream sediment samples (sample 1559).

More than half of the stream sediment samples collected in the southern part of the RD14 conductive zone or in its vicinity were anomalous in copper. The sample distribution suggests a broad area of elevated copper or a copper occurrence with a geochemical signature that extends throughout a three- by three-mile area. The probable source area for the copper has been mapped as Jurassic to Cretaceous Gravina Belt turbidites and greenstone (Karl and others, 1999). No soil samples were collected in the immediate area.

AA4 stands out in the BLM follow-up because it includes a concentration of anomalous barium and copper values in geochemical samples. The BLM sample results suggest the area has an elevated potential for hosting mineral occurrences, however, the Triassic VMS geochemical signature is generally lacking. Most of the VMS occurrences in the belt are zinc-rich, whereas in AA4 there is more elevated copper. Other indicator elements are scarce to absent e.g., nickle, chromium, cobalt, cadmium, manganese, mercury, arsenic, and antimony. The abundant Cretaceous intrusives in the area may be genetically related to an as yet unidentified mineralizing event.

Table 8. Analytical results from Anomalous Area 4. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment

No.	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
6316	RD14 N	SS	<5	<0.2	**217***	4	42	<1	29	36	22	<0.2	248	423	0.042	<5	<5
6318	RD14 N	SS	14	<0.2	42	6	68	<1	26	32	18	0.2	577	851	0.032	6	<5
6322	RD14 N	SS	<5	<0.2	42	8	61	<1	21	31	26	<0.2	549	1222	0.041	9	<5
6324	RD14 N	SS	<5	<0.2	28	4	58	<1	18	29	22	<0.2	567	1311	0.043	<5	<5
6325	RD14 N	SS	<5	<0.2	18	4	54	<1	16	30	11	<0.2	564	475	0.03	<5	<5
8899	RD14 N	SS	28	<0.2	33	8	69	<1	17	23	16	<0.2	544	827	0.019	5	<5
8900	RD14 N area	SS	<5	<0.2	36	4	80	<1	15	20	23	<0.2	503	1848	0.028	<5	<5
6326	RD14 S	SS	7	<0.2	64	9	85	<1	27	33	27	0.3	523	1444	0.039	<5	<5
6328	RD14 S	SS	6	<0.2	**81**	8	91	<1	26	31	31	0.2	603	2143	0.037	8	<5
6331	RD14 S	SS	19	<0.2	**69**	4	51	<1	13	17	18	0.2	363	803	0.022	<5	<5
6380	RD14 S	SS	18	<0.2	52	12	140	2	82	36	**66**	1	775	**8414**	0.096	13	<5
6381	RD14 S	SS	<5	<0.2	**84**	3	69	2	18	35	28	0.4	286	1247	0.025	<5	<5
6385	RD14 S	SS	6	<0.2	**80**	2	68	1	24	46	26	0.2	376	935	0.023	<5	<5
8898	RD14 S	SS	6	<0.2	**89**	9	70	1	19	33	28	<0.2	290	1255	0.021	<5	<5
6332	RD14 S area	SS	12	<0.2	66	5	70	<1	15	26	23	<0.2	529	1003	0.026	<5	<5
6376	RD14 S area	SS	<5	<0.2	64	6	75	<1	17	27	24	0.2	517	1370	0.015	<5	<5
6377	RD14 S area	SS	<5	<0.2	**86**	12	98	1	24	25	25	0.4	691	1780	0.02	<5	<5
6378	RD14 S area	SS	<5	<0.2	**82**	6	86	4	28	33	29	0.3	568	2296	0.094	5	<5
6379	RD14 S area	SS	5	<0.2	34	7	101	2	26	30	23	0.2	603	1342	0.019	7	<5
6383	RD14 S area	SS	<5	<0.2	29	6	110	<1	29	35	21	0.2	692	1181	0.042	5	<5
6384	RD14 S area	SS	<5	<0.2	45	9	101	1	30	36	22	0.2	595	1130	0.047	6	<5
6386	RD14 S area	SS	**44**	0.3	**90**	4	48	<1	15	26	22	<0.2	322	592	0.023	<5	<5
6387	RD14 S area	SS	8	<0.2	**73**	4	90	1	23	29	27	<0.2	483	1243	0.029	5	<5
8901	RD14 S area	SS	<5	<0.2	52	5	80	<1	23	26	22	0.3	517	1481	0.017	7	<5
8902	RD14 S area	SS	<5	<0.2	**101***	15	101	2	27	26	27	0.4	640	1977	0.03	<5	<5
6330	RD15	SS	**78***	<0.2	**85**	3	54	1	13	21	19	<0.2	342	581	0.027	<5	<5
743	RD16	SS	35	<0.2	5	5	25	<1	6	18	4	<0.2	714	187		7	<5
959	RD16	SS	18	<0.2	26	16	77	3	30	56	17	0.2	1270	1511	0.07	13	<5
960	RD16	SS	<5	<0.2	37	8	71	2	26	49	47	0.3	1436	3450	0.08	7	<5
961	RD16	SS	<5	0.3	13	9	87	4	24	31	8	<0.2	<10	439	0.046	8	<5
962	RD16	SS	<5	<0.2	18	12	75	4	20	24	7	0.2	**2963**	723	0.056	11	<5
963	RD16	SS	<5	**0.5***	7	10	21	**6**	6	11	2	0.2	1937	83	0.159	18	<5
964	RD16	SS	<5	0.3	5	15	29	2	9	16	7	<0.2	**3784***	625	0.071	8	<5
1554	RD16	SS	<5	<0.2	4	5	35	1	14	52	8	<0.2	1382	319	0.092	<5	<5
1555	RD16	SS	9	<0.2	46	2	97	<1	65	**92**	55	0.3	1863	5421	0.073	6	<5
1556	RD16	SS	7	<0.2	17	8	74	4	20	26	16	<0.2	**3645***	1684	0.058	13	<5
1557	RD16	SS	<5	<0.2	29	5	75	3	21	26	9	0.4	1327	295	0.065	9	<5
1558	RD16	SS	<5	0.2	12	14	66	**7**	16	19	11	0.4	**2746**	1238	0.113	20	<5
1559	RD16	SS	<5	0.3	16	9	86	5	18	18	5	0.3	**3458***	393	0.072	10	<5
1560	RD16	SS	<5	<0.2	26	8	94	3	22	24	15	0.5	2074	2155	0.049	11	<5
1561	RD16	SS	6	0.3	26	17	118	**16***	28	22	8	0.4	**2976**	470	0.097	29	5

Table 8 (cont.). Analytical results from Anomalous Area 4. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. S = soil

No.	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
911	RD14 N	S	6	<0.2	26	8	71	1	23	53	13	<0.2	493	442	0.098	5	<5
6314	RD14 N	S	8	<0.2	16	15	48	1	7	45	11	<0.2	271	226	0.075	<5	<5
6317	RD14 N	S	<5	<0.2	**155**	6	47	<1	17	33	11	<0.2	467	326	0.055	<5	<5
6319	RD14 N	S	<5	<0.2	67	7	79	<1	35	39	17	<0.2	664	597	0.026	<5	<5
6320	RD14 N	S	<5	<0.2	16	7	37	1	9	37	11	<0.2	397	219	0.12	<5	<5
6321	RD14 N	S	<5	<0.2	23	7	48	<1	14	32	9	<0.2	614	279	0.098	<5	<5
6323	RD14 N	S	<5	<0.2	18	5	44	<1	14	23	7	<0.2	562	313	0.049	<5	<5
741	RD16	S	6	<0.2	41	9	61	<1	21	51	12	<0.2	487	387		12	<5
742	RD16	S	6	<0.2	55	9	66	<1	23	49	11	<0.2	554	494		9	<5
1570	RD16	S	10	<0.2	65	12	81	2	26	40	6	0.4	1679	271	0.085	<5	<5
1571	RD16	S	9	**0.5**	62	13	**573***	14	**82***	28	5	1.3	1482	186	0.164	<5	<5
1572	RD16	S	9	<0.2	72	13	118	4	40	35	8	0.4	**1894**	280	0.09	7	<5
1573	RD16	S	10	<0.2	61	11	131	2	25	42	6	0.3	1161	258	0.091	13	<5
1574	RD16	S	<5	<0.2	3	19	25	6	4	20	<1	0.3	**2380***	43	0.028	11	<5
1575	RD16	S	22	<0.2	39	9	60	2	18	44	6	0.3	1118	256	0.127	11	<5

Anomalous Area 5

General

Anomalous Area 5 (AA5; Fig. 37) consists of the geophysical contractor's RD23 and RD24 conductive zones (Pritchard, 1997). These zones are ranked numbers 1 and 31 respectively in the BLM prioritization of conductive zones (Table 2).

Conductive zone RD23 is ranked number one in the BLM prioritization because of a prospective geophysical signature, permissive geology, associated mineral occurrences, the presence of geochemical anomalies, and good correlation with geophysical models. The geophysical signature of the zone indicates thin, strong bedrock conductors that the contractor defined as possibly resulting from the presence of sulfides (Pritchard, 1997). Like AA4, AA5 is made up of a series of imbricate, southwest-verging thrusts near the eastern contact of the Alexander terrane with overlapping Gravina Belt rocks. Units in the area include both sedimentary and volcanic sequences of the Triassic Hyd Group and Permian to Mississippian Cannery Formation sediments (Karl and others, 1999). Known mineral occurrences in or near AA5 include the Spruce Creek and Nicirque prospects and the East Duncan Pyrite (or Junior Creek) occurrence (Bittenbender and others, 2000; Taylor, in press). Little work has been done on these occurrences, but they indicate the presence of mineralized rock in the area. USGS geochemical sampling in the area also suggests the potential for mineralized rock in the form of barium, copper, zinc, and minor lead anomalies (Smith, 1998). Geophysical models developed by the USGS correlate well with AA5, specifically the Lost Show model, and also the Taylor Creek model (McCafferty and others, in press). The absence of strong conductive gradients in AA5 makes this the only BLM prioritization parameter that does not rank high.

The RD24 conductive zone lies adjacent to the RD23 zone and is on the margin of the geophysical survey area (Fig. 1). It is ranked much lower in the BLM prioritization than RD23 because of a lack of known mineral occurrences, lack of anomalous geochemical signature, no correlation with geophysical models, and no strong conductive gradients. Two factors in favor of RD24 were the geophysical signature and permissive geology. The zone is marked by thin, strong bedrock conductors that might reflect sulfides responses (Pritchard, 1997). And the zone is mapped as Triassic Hyd Group sediments and volcanics (Karl and others, 1999).

Anomalous Samples

The BLM targeted AA5 with 39 stream sediment and 20 soil samples. The stream sediment samples indicate anomalous occurrences predominantly of copper, zinc, molybdenum, and barium (Table 9). Minor anomalies were also detected for silver, chromium, cobalt, manganese, mercury, and arsenic.

Copper anomalies in stream sediments from the area are widespread; they occur across about four miles from north to south and generally lie on the east side of AA5. In several cases the

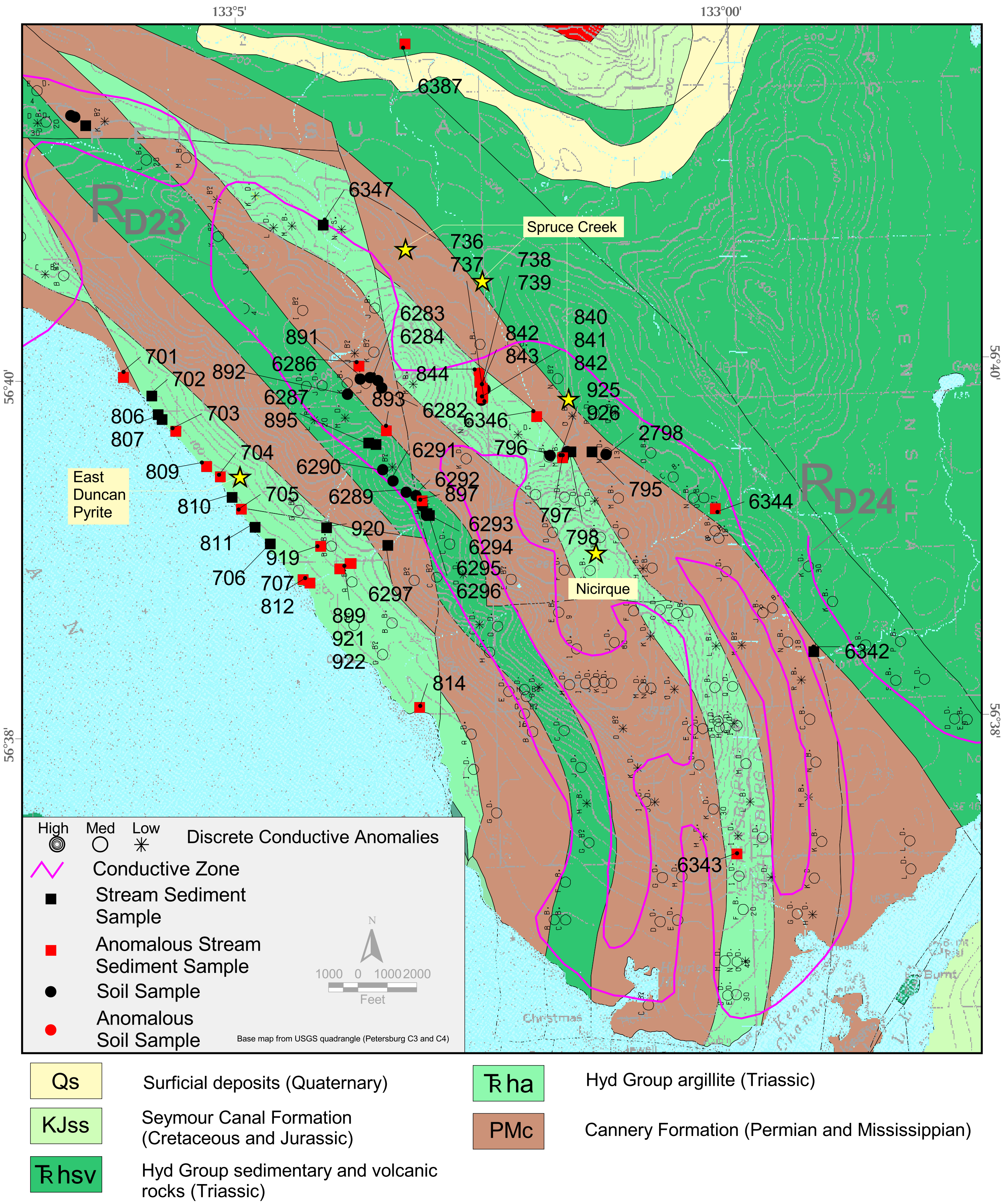

Figure 37. Anomalous Area 5 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

samples with elevated copper were not anomalous in any other element (samples 736 - 738, 6343).

On the other hand, zinc, molybdenum, and barium anomalies seem to display some correlation. Four out of six of the samples anomalous in zinc were also anomalous in molybdenum (samples 809, 899, 922, 6346) and four were also anomalous in barium (samples 809, 812, 899, 922). Several of the samples anomalous in barium, however, were not anomalous in any other element (samples 701, 705, 707, 814, 919). The anomalous zinc, molybdenum, and barium samples were concentrated along the western side of AA5 (Fig. 37).

Stream sediment sampling also seemed to indicate a correlation in cobalt and manganese. Three out of four samples anomalous in cobalt correlate with three out of four samples anomalous in manganese (samples 797, 897, 6286).

Only 1 of the 20 soil samples the BLM collected in AA5 contained elevated values. The sample was anomalous in silver, zinc, and cadmium (sample 844).

Discussion / Conclusions

Anomalous Area 5 contains the BLM's highest ranking conductive zone, RD23. Following the BLM geochemical investigation, it remains attractive for hosting mineral occurrences. More than half (23 out of 39) of the stream sediment samples collected in the area were anomalous in at least one element, and many were anomalous in multiple elements. A lower likelihood for hosting mineral occurrences is reflected in the results from the BLM soil samples, however. A possible explanation for this is the fact that the soil samples from the area were not directed to test discrete conductive anomalies, as elsewhere in the study area. Since the RD23 conductive zone is ranked first in the BLM prioritization, it was one of the first areas to be investigated. Early in the BLM follow-up the methodology of targeting discrete anomalies for soil sampling was still being developed.

The geology in the AA5 area is permissive for VMS deposits - Triassic Hyd Group sedimentary and volcanic rocks. Examination of the bluffs inland from the shoreline along AA5 and in the intertidal zone revealed the presence of bedded and nodular pyrite spread along several miles of the shoreline. The most significant exposures seem to be pyrite-bearing, quartz-sericite schist and chert interbedded with black slate. The quartz-sericite schist may be an alteration product of a chlorite-calcite schist protolith, which is found in the vicinity or it may represent a more felsic volcanic sequence. Disseminated pyrite is ubiquitous to about 2-3%, but is up to 20-30% in places and occurs in layers parallel to foliation/bedding. One such exposure extends for about 100 feet along the beach in steep bluffs up to 40 to 50 feet high (near sample 703 on Figure 37). Analytical results indicate pyrite as the only sulfide phase.

The permissive geology and anomalous stream sediment samples make AA5 a potential host for VMS mineral occurrences.

Table 9. Analytical results from Anomalous Area 5. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
701	RD23	SS	9	<0.2	50	14	178	3	39	20	17	1.1	**3406***	1831		20	<5
702	RD23	SS	11	<0.2	47	7	104	1	32	28	15	0.5	1429	1449		8	<5
703	RD23	SS	<5	<0.2	48	11	185	**6**	62	32	**72**	1	1721	4291		14	<5
704	RD23	SS	12	<0.2	61	17	222	**11***	68	41	24	1.7	**3472***	1765		29	<5
705	RD23	SS	29	<0.2	45	13	181	4	81	77	42	2.5	**2954**	3453		17	<5
706	RD23	SS	<5	<0.2	40	9	165	2	68	62	36	0.9	1684	2443		10	<5
707	RD23	SS	10	0.2	65	15	180	3	47	43	21	1.3	**3011**	1821		19	<5
736	RD23	SS	12	<0.2	**86**	8	117	1	38	54	25	0.7	891	1653		11	<5
737	RD23	SS	13	<0.2	**69**	8	100	1	35	70	22	0.4	787	1098		13	<5
738	RD23	SS	10	<0.2	**133***	12	178	2	58	67	34	0.9	1117	2883		10	<5
739	RD23	SS	7	<0.2	**70**	15	**224**	3	46	42	28	1.9	1120	3046		14	<5
795	RD23	SS	8	<0.2	7	13	10	1	3	31	<1	0.2	607	74	0.063	<5	<5
797	RD23	SS	<5	<0.2	34	17	84	**6**	23	24	**116***	1.8	433	**8883**	0.181	55	<5
798	RD23	SS	<5	<0.2	28	10	47	1	18	39	17	0.3	502	615	0.113	6	<5
806	RD23	SS	13	<0.2	39	13	141	4	45	26	25	0.8	1466	2762		15	<5
807	RD23	SS	6	<0.2	40	12	99	2	37	26	32	0.9	1335	2705		12	<5
809	RD23	SS	13	0.3	50	32	**302***	**17***	72	30	48	3.5	**3409***	3492		36	<5
810	RD23	SS	10	<0.2	47	19	171	5	51	36	41	1.5	1765	1821		18	<5
811	RD23	SS	17	<0.2	55	13	136	3	45	46	18	0.7	1707	1467		10	<5
812	RD23	SS	15	0.2	**81**	14	**227**	5	60	36	27	1.4	**3363***	1424		15	<5
814	RD23	SS	13	<0.2	51	14	144	**9**	33	29	15	0.5	**2503**	800		20	<5
893	RD23	SS	9	<0.2	54	13	141	2	41	33	41	0.9	955	**12267***	0.224	8	<5
895	RD23	SS	<5	<0.2	29	12	108	3	25	12	24	0.5	1511	3578	0.078	13	<5
897	RD23	SS	9	<0.2	37	22	132	3	38	14	**71**	1.2	1392	**11944***	0.215	11	<5
899	RD23	SS	8	**0.5***	61	23	**270**	**10***	55	19	27	2.5	**3502***	2428	0.319	26	<5
919	RD23	SS	10	<0.2	64	15	203	4	47	29	22	1.6	**2858**	1761	0.159	15	<5
920	RD23	SS	10	<0.2	59	16	127	2	34	24	22	0.6	1568	2363	0.15	9	<5
921	RD23	SS	7	0.2	59	16	198	**6**	46	22	27	1.5	**2565**	2493	0.28	16	<5
922	RD23	SS	<5	**0.9***	67	22	**312***	**10***	68	20	31	2.4	**3392***	3286	0.443	27	<5
6286	RD23	SS	11	<0.2	**101***	12	142	2	45	45	**82***	1	659	**9782**	0.543	13	<5
6287	RD23	SS	14	<0.2	45	27	213	3	33	20	30	1.2	1432	3553	0.207	11	<5
6295	RD23	SS	7	<0.2	44	14	103	2	24	17	24	0.5	1620	3850	0.13	8	<5
6296	RD23	SS	14	<0.2	53	21	119	3	29	15	25	0.6	1580	4165	0.201	11	<5
6297	RD23	SS	8	<0.2	55	14	131	2	28	20	24	0.5	1271	3058	0.158	7	<5
6343	RD23	SS	18	<0.2	**102***	16	150	5	51	42	29	0.9	1390	2037	0.338	18	<5
6344	RD23	SS	37	<0.2	**98***	13	194	4	53	57	35	1.8	1004	2756	0.626	**135***	<5
6346	RD23	SS	20	<0.2	**115***	9	**254**	**10***	101	**85**	29	2.4	801	1378	**0.656**	35	<5
6347	RD23	SS	10	<0.2	56	10	97	2	29	40	23	0.5	796	1643	0.133	10	<5
6342	RD24	SS	<5	<0.2	46	6	68	1	42	36	17	0.3	652	535	0.037	11	<5

Table 9 (cont.). Analytical results from Anomalous Area 5. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. S = soil

No	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
796	RD23	S	<5	<0.2	8	12	28	7	7	30	2	<0.2	611	172	0.045	<5	<5
840	RD23	S	<5	<0.2	18	6	27	<1	8	40	8	<0.2	469	189		<5	<5
841	RD23	S	9	<0.2	20	7	27	1	9	33	6	<0.2	714	154		<5	<5
842	RD23	S	6	<0.2	56	7	94	1	38	57	17	0.3	835	619		9	<5
843	RD23	S	8	<0.2	53	8	88	2	35	55	13	0.2	798	414		5	<5
844	RD23	S	<5	**0.7***	39	12	**288**	6	41	30	8	**2.9***	1314	472		8	<5
891	RD23	S	<5	<0.2	59	7	52	<1	24	78	10	<0.2	1764	294	0.219	<5	<5
892	RD23	S	10	<0.2	27	19	43	<1	10	26	6	<0.2	1248	150	0.131	<5	<5
925	RD23	S	6	<0.2	16	20	18	<1	7	41	<1	<0.2	610	116	0.07	<5	<5
926	RD23	S	7	<0.2	20	16	57	1	23	60	6	0.3	625	377	0.08	<5	<5
2798	RD23	S	6	<0.2	11	9	27	<1	7	33	1	<0.2	703	186	0.059	<5	<5
6282	RD23	S	<5	<0.2	46	11	83	1	30	56	14	<0.2	732	505	0.134	12	<5
6283	RD23	S	6	0.4	9	9	30	3	5	9	4	<0.2	1012	103	0.076	8	<5
6284	RD23	S	<5	<0.2	26	10	94	2	15	29	9	0.3	1056	421	0.128	7	<5
6289	RD23	S	6	<0.2	66	9	86	2	35	53	14	<0.2	1002	375	0.082	14	<5
6290	RD23	S	12	<0.2	98	13	63	1	35	60	15	<0.2	907	902	0.052	20	<5
6291	RD23	S	10	<0.2	15	7	36	1	9	27	7	<0.2	658	233	0.082	7	<5
6292	RD23	S	12	<0.2	72	10	96	1	37	45	17	<0.2	943	476	0.038	6	<5
6293	RD23	S	<5	<0.2	3	5	19	<1	1	1	<1	<0.2	1434	64	0.063	<5	<5
6294	RD23	S	<5	<0.2	5	12	22	1	3	8	4	<0.2	956	82	0.084	<5	<5

Anomalous Area 6

General

Anomalous Area 6 (AA6; Fig. 38) consists of the geophysical contractor's RD18, RD19, and RD20 conductive zones (Pritchard, 1997). The zones are ranked numbers 17, 4, and 8 respectively in the BLM prioritization of conductive zones (Table 2). Each of the zones is characterized by weak bedrock conductivity sources associated with nonmagnetic areas (Pritchard, 1997). Each of the conductive zones is mapped as Triassic Hyd Group rocks with argillite, mixed sediments and volcanics, and undifferentiated map units (Karl and others, 1999). AA6 also includes some structurally emplaced Permian to Mississippian Cannery Formation sediments. Conductive zone RD19 is adjacent to the Kupreanof Pyrite and West Duncan mineral occurrences (Berg and Grybeck, 1980, Bittenbender and others, 2000). In addition, it is included in the Go block of claims of Pacific Northwest Resources, Inc., a company exploring for VMS deposits in the area. The RD18 zone is not associated with any known mineral occurrences. However, RD18 is marked by high barium with minor copper, zinc, and lead in USGS geochemical investigations. RD19 displays a minor barium geochemical signature, whereas RD20 has essentially no anomalous geochemistry associated with it (Smith, 1998). Within AA6, the RD19 and RD20 conductive zones have a good correlation with predictive geophysical models for the Lost Show deposit. RD18 has a moderate correlation with the Lost Show and Junior Creek models (McCafferty and others, in press). None of the conductive zones in AA6 have significant conductive gradients associated with them.

Anomalous Samples

The BLM collected anomalous stream sediment samples in the RD18 and RD19 areas, but none of the samples from the RD20 area were anomalous (Table 10). The more highly anomalous samples were from RD19, but the RD18 and RD20 zones are in relatively flat-lying areas, so drainage is poor and the dispersion of elements from potential mineral occurrences may not be great. Two samples from RD19 (samples 718, 823), taken within about 100 feet of each other in the same drainage, were anomalous in silver and zinc. One of these (sample 718) was also anomalous in molybdenum and cadmium. From the vicinity of RD18, two samples were anomalous in chromium (samples 752, 756) and from the RD18 conductive zone, one sample was anomalous in gold (sample 8876).

Like the stream sediment samples, the soil samples that the BLM collected from AA6 indicate the RD19 conductive zone to have the highest likelihood of being mineralized. Here also though, the flat-lying nature of the RD18 and RD20 zones make effective soil sampling difficult. It was difficult to collect soil samples representative of bedrock from flat-lying, muskeg covered areas using the hand-auger sampling technique employed by BLM investigators. The RD18 area had only one anomalous soil sample, which was high in chromium (sample 851). The BLM did not attempt to collect soil samples from the RD20 zone because it is almost wholly situated in the Castle River drainage

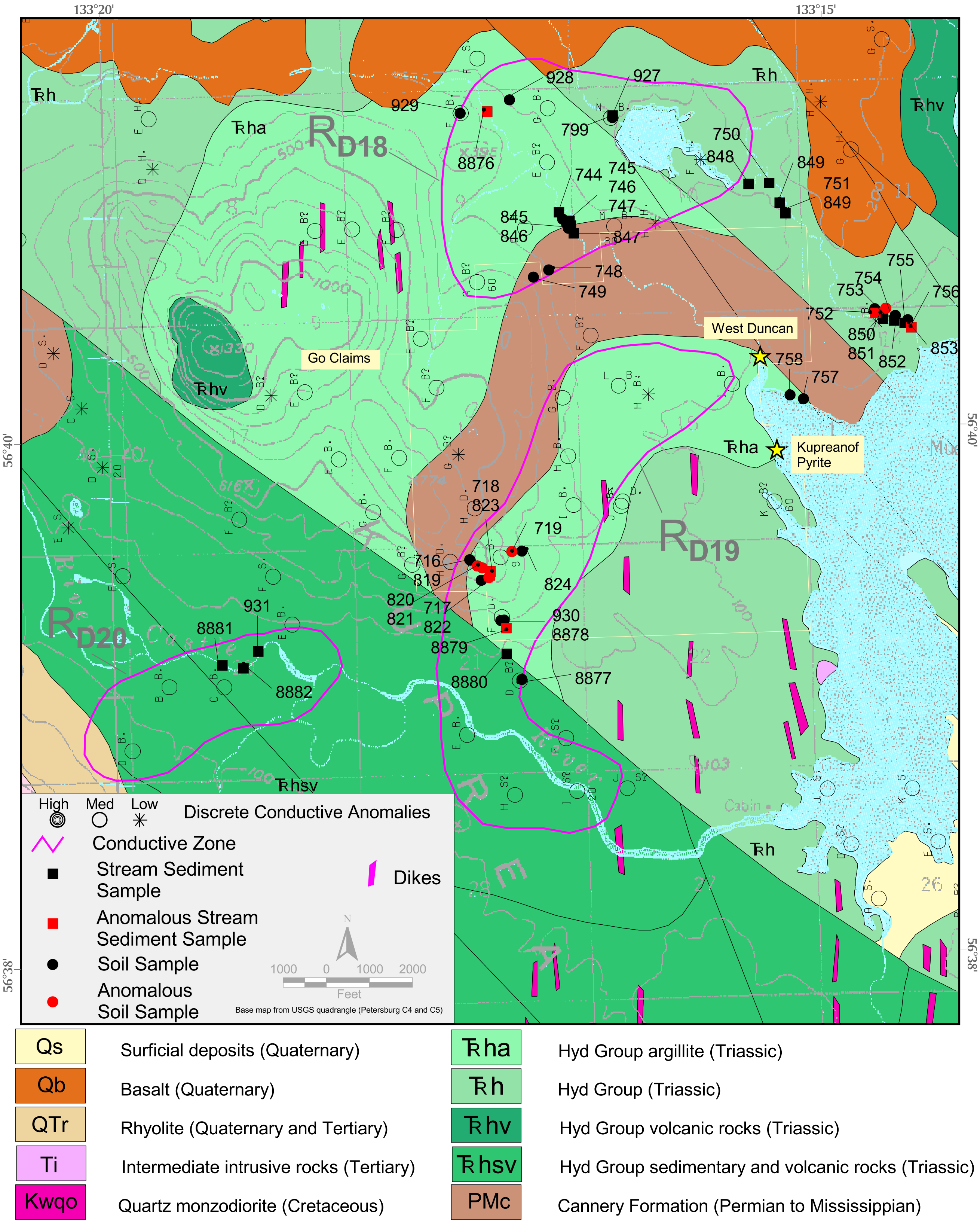

Figure 38. Anomalous Area 6 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

bottom and only one discrete geophysical anomaly is located outside the area that is likely covered with thick fluvial and/or glacial deposits. One soil sample collected from the RD19 zone was anomalous in zinc, molybdenum, nickel, cadmium, barium, manganese, and antimony (sample 821). A sample collected about 250 feet to the southeast was anomalous in lead and zinc (sample 822) and a sample from about 100 feet to the northwest was anomalous in barium (sample 820). One more sample, from about 800 feet northeast of 821, was also anomalous in barium (sample 719). Many of these soil samples were collected to evaluate predictive geophysical models developed by the USGS (McCafferty and others, in press) in addition to discrete geophysical anomalies.

Discussion / Conclusions

AA6 occupies an area of permissive geology – Triassic Hyd Group rocks – in which known occurrences are found both to the northwest and to the southeast. The results of the airborne geophysical survey suggest a continuity of the rocks through AA6 to the northwest and southeast (ADGGS and others, 1997). The VMS style of mineralization at the West Duncan and Kupreanof Pyrite occurrences (Grybeck and others, 1984; Bittenbender and others, 2000) within AA6 is indicative of the potential for mineral occurrences in the area. Exposures in the area are scarce due to the heavy brush and timber and the flat-lying nature of much of the terrain, so the area is relatively unexplored. These factors are likely the reason that Pacific Northwest Resources, Inc. recently staked a block of claims in the area. Results of the company's exploration activities have not been made public.

When the BLM began its follow-up of the airborne geophysical survey early in the field season of 2000 we did not have the methodology for conductive zone evaluation in place that we describe in this report. AA6 was one of the first areas to be examined with soil sampling, so several of the samples were collected outside the conductive zones. In most of these cases, BLM personnel were following up the predictive geophysical models developed by McCafferty and others, (in press) of the USGS instead of the conductive zone discrete anomalies. This is the case with the samples collected southeast of the RD18 conductive zone and some of the samples from the RD19 conductive zone that are not associated with discrete geophysical anomalies. Once the described methodology was in place the geophysical models were used to prioritize the conductive zones, but were generally not followed up independently.

The flat-lying nature of two of the conductive zones in AA6 made the area difficult to evaluate with stream sediment and soil sampling. Given the permissive geology and the hints of mineralized rock in the area, the BLM's unspectacular geochemical follow-up results do not significantly reduce the potential of the area for hosting mineral occurrences. This area is likely to see additional exploration attention in the future.

Table 10. Analytical results from Anomalous Area 6. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
744	RD18	SS	21	<0.2	20	9	79	1	10	11	9	<0.2	1106	705		13	<5
750	RD18	SS	12	<0.2	8	6	30	<1	9	24	4	<0.2	739	118		<5	<5
751	RD18	SS	6	<0.2	8	6	36	<1	10	19	6	<0.2	844	234		8	<5
799	RD18	SS	<5	<0.2	8	14	31	2	12	25	8	<0.2	621	235	0.058	8	<5
845	RD18	SS	9	<0.2	22	9	75	1	11	13	9	<0.2	1080	1056		8	<5
846	RD18	SS	16	<0.2	23	9	80	1	11	13	8	<0.2	1110	685		5	<5
847	RD18	SS	9	<0.2	19	8	71	1	11	11	11	<0.2	1135	1814		8	<5
848	RD18	SS	<5	<0.2	8	5	50	2	12	47	9	<0.2	756	247		10	<5
849	RD18	SS	<5	<0.2	9	7	48	<1	10	26	6	<0.2	1031	262		6	<5
8876	RD18	SS	**62***	<0.2	12	12	39	1	7	11	6	0.3	1093	823	0.216	5	<5
752	RD18 area	SS	24	<0.2	37	11	98	1	72	**94**	40	0.2	695	1753		17	<5
753	RD18 area	SS	8	<0.2	33	12	84	1	40	63	26	0.3	828	1230		14	<5
754	RD18 area	SS	8	<0.2	29	10	83	<1	48	64	28	0.3	811	1280		25	<5
755	RD18 area	SS	6	<0.2	27	10	105	<1	53	76	35	0.4	724	1640		15	<5
756	RD18 area	SS	19	<0.2	31	19	91	1	64	**105***	41	0.2	693	1925		35	<5
718	RD19	SS	20	**0.4**	68	15	**363***	**7**	52	38	16	**7.6**	1297	1781		15	<5
823	RD19	SS	13	**0.8***	35	14	**502***	4	50	34	12	5.4	1436	551		10	<5
8879	RD19	SS	<5	<0.2	23	18	89	**6**	12	28	32	0.5	<10	2691	0.296	11	<5
8880	RD19	SS	<5	<0.2	19	9	104	5	19	21	16	0.8	939	1905	0.157	14	<5
931	RD20	SS	<5	<0.2	13	27	74	2	15	20	12	0.3	902	1068	0.07	9	<5
8881	RD20	SS	<5	<0.2	14	8	87	3	23	29	14	0.3	1089	1095	0.047	14	<5
8882	RD20	SS	<5	<0.2	14	9	83	3	18	23	14	0.2	1034	1079	0.058	12	<5

Table 10 (cont.). Analytical results from Anomalous Area 6. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
745	RD18	S	8	<0.2	27	13	45	1	13	40	6	<0.2	962	176		<5	<5
746	RD18	S	9	<0.2	69	16	68	2	20	39	10	0.3	789	195		16	<5
747	RD18	S	<5	<0.2	10	13	76	<1	3	17	11	<0.2	168	245		<5	<5
748	RD18	S	9	<0.2	62	10	66	<1	26	41	15	<0.2	737	507		9	<5
749	RD18	S	7	<0.2	17	7	41	<1	11	31	7	<0.2	548	329		5	<5
927	RD18	S	<5	<0.2	43	10	55	<1	24	45	9	0.2	712	296	0.097	7	<5
928	RD18	S	7	<0.2	49	13	79	7	14	19	9	0.3	699	858	0.349	8	<5
929	RD18	S	7	<0.2	48	17	77	2	16	41	7	0.3	582	420	0.283	13	<5
930	RD18	S	<5	<0.2	17	<2	40	2	16	68	13	0.4	106	345	0.317	<5	<5
850	RD18 area	S	7	<0.2	14	5	45	1	17	49	13	<0.2	540	440		<5	<5
851	RD18 area	S	<5	<0.2	33	7	60	1	28	**151***	23	<0.2	369	320		<5	<5
852	RD18 area	S	6	<0.2	22	10	47	<1	16	85	13	<0.2	303	455		7	<5
853	RD18 area	S	<5	<0.2	15	7	56	1	36	80	12	<0.2	665	174		5	<5
716	RD19	S	8	<0.2	1	5	5	<1	<1	4	<1	<0.2	984	54		<5	<5
717	RD19	S	<5	<0.2	23	8	47	1	7	16	7	<0.2	1528	392		9	<5
719	RD19	S	9	<0.2	27	9	33	<1	3	8	2	<0.2	**2179**	49		<5	<5
819	RD19	S	12	<0.2	21	12	46	<1	10	26	5	<0.2	755	235		14	<5
820	RD19	S	<5	<0.2	14	6	36	1	4	12	2	0.2	**2844***	66		14	<5
821	RD19	S	15	<0.2	56	19	**548***	**47***	**114***	36	11	**5***	**2184**	**4587***		83	**22***
822	RD19	S	8	<0.2	26	**42**	**384**	5	14	26	11	0.6	1004	757		21	<5
824	RD19	S	<5	0.3	9	17	24	2	3	15	4	<0.2	1287	70		<5	<5
8877	RD19	S	<5	<0.2	15	8	37	2	7	20	5	<0.2	397	206	0.091	10	<5
8878	RD19	S	9	<0.2	26	11	82	7	14	39	18	0.4	461	999	0.229	8	<5
757	RD19 area	S	<5	<0.2	<1	4	14	1	1	3	<1	<0.2	1296	21		<5	<5
758	RD19 area	S	<5	<0.2	27	14	71	2	15	27	19	<0.2	1235	1666		21	<5

Anomalous Area 7

General

Anomalous Area 7 (AA7; Fig. 39) consists of the geophysical contractor's RD21 conductive zone (Pritchard, 1997). The zone is ranked number 22 in the BLM prioritization of conductive zones (Table 2). It is characterized by weak bedrock conductivity sources in a nonmagnetic environment (Pritchard, 1997). The geology in AA7 is made up of a diverse package of fault bounded slivers with a general northwest trend. Units in the area have been mapped as Triassic Hyd Group, Permian to Mississippian Cannery Formation, and Devonian sedimentary and volcanic rocks (Karl and others, 1999). There are no known mineral occurrences in AA7. Stream sediment samples collected by the USGS indicate only minor amounts of barium (Smith, 1998). A Lost Show-type geophysical signature is predicted for AA7 with good correlation (McCafferty and others, in press). The RD21 conductive zone is not associated with a conductive gradient.

Anomalous Samples

Because of the flat-lying nature of AA7, stream sediment samples are a poor indicator of mineralized rock in the area. Therefore the BLM collected only three stream sediment samples. None of the samples contained anomalous values (Table 11).

The authors considered AA7 an anomalous area because of the results from soil sampling, and in particular, one sample. Sample number 761 contained the highest values for zinc, molybdenum, nickel, cadmium, and antimony of all the 227 soil samples collected by the BLM. Two other soil samples from the area were anomalous in barium and antimony (samples 8883 and 933 respectively).

Discussion / Conclusions

Conductive zone RD21 is ranked only number 22 out of 59 in the BLM prioritization of conductive zones. Two parameters stand out in the area, the permissive geology and the excellent correlation with a USGS geophysical model that predicts a similar geophysical signature as the Lost Show VMS occurrence on Woewodski Island (McCafferty and others, in press; Bittenbender and others, 2000). It was while following up this geophysical model prediction for the area that the BLM collected sample 761, which was so uniquely anomalous. There are no discrete geophysical conductors associated with the sample site. Although only a single soil sample was significantly anomalous in the area, the fact that it contained the highest values for several elements from all the BLM soil samples collected makes the area attractive for future mineral exploration.

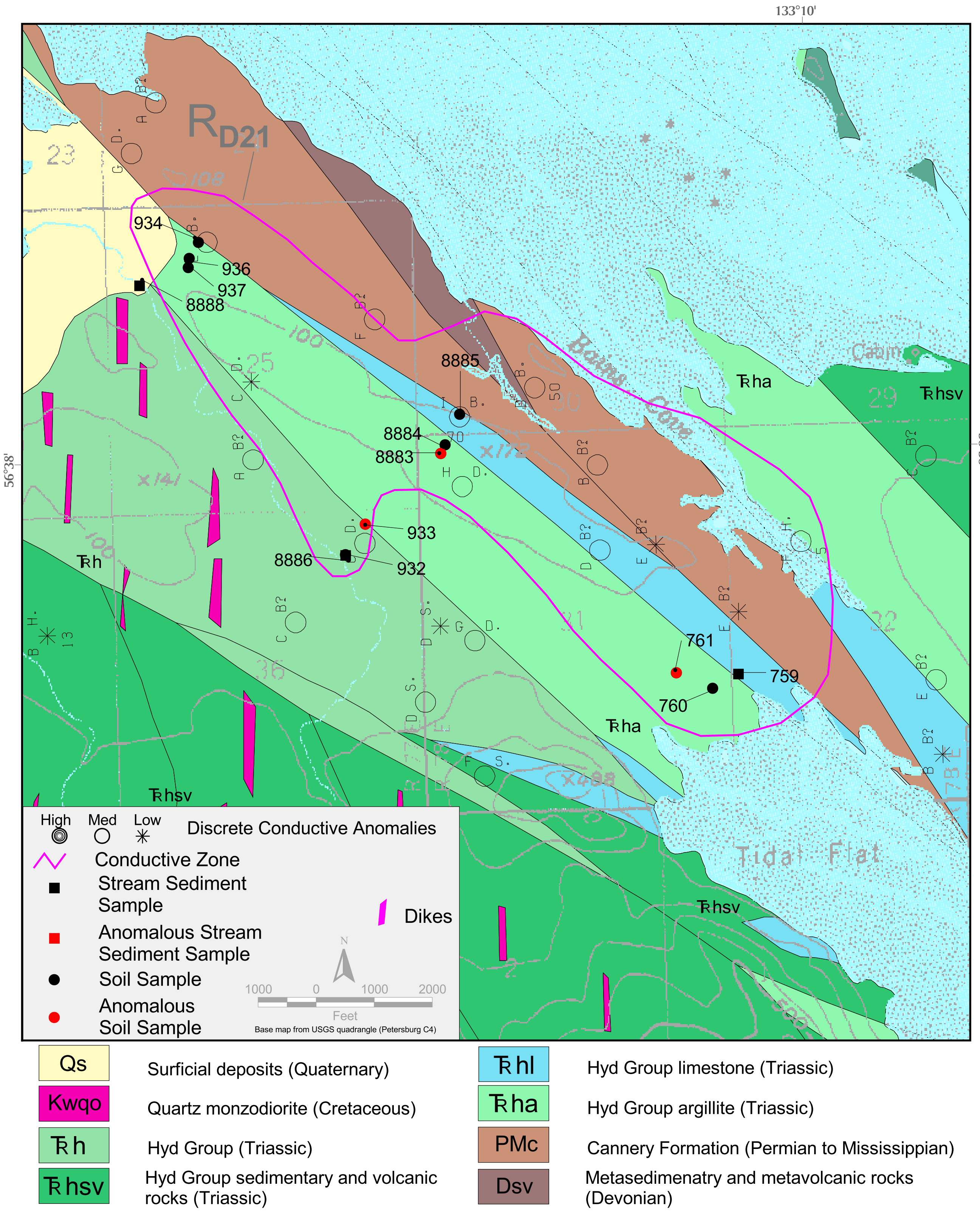

Figure 39. Anomalous Area 7 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Table 11. Analytical results from Anomalous Area 7. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment, S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
759	RD21	SS	8	<0.2	37	10	95	5	30	44	12	0.4	969	514		16	<5
8888	RD21	SS	<5	<0.2	21	13	99	1	26	28	18	0.3	838	1752	0.102	11	<5
8886	RD21	SS	<5	<0.2	36	14	73	2	19	28	9	0.2	631	591	0.205	11	<5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
761	RD21	S	10	<0.2	118	20	**1100***	**139***	**169***	37	19	**7.2***	<10	1160		**106**	**35***
760	RD21	S	15	<0.2	15	10	29	1	8	30	6	<0.2	717	156		7	<5
932	RD21	S	<5	<0.2	35	11	46	3	15	35	6	0.3	671	263	0.106	9	<5
933	RD21	S	<5	<0.2	25	25	73	8	48	9	6	0.3	642	236	0.056	46	**14***
934	RD21	S	<5	<0.2	34	10	58	2	19	31	9	0.2	1099	274	0.109	10	<5
936	RD21	S	<5	<0.2	39	15	40	1	20	39	16	0.4	692	889	0.164	<5	<5
937	RD21	S	<5	<0.2	29	17	57	1	9	28	4	0.3	907	213	0.065	<5	<5
8883	RD21	S	10	<0.2	66	15	58	2	12	10	9	0.3	**2182**	356	0.375	13	<5
8884	RD21	S	7	<0.2	6	6	9	1	2	2	1	0.3	1570	28	0.052	<5	<5
8885	RD21	S	<5	<0.2	58	13	66	2	16	36	7	0.4	711	286	0.118	<5	<5

Anomalous Area 8

General

Anomalous Area 8 (AA8; Fig. 40) consists of the geophysical contractor's RD22 conductive zone (Pritchard, 1997) in addition to two other known mineralized areas, the Scott and the Olympic Resources Gold prospects. The area is centered on Woewodski Island, which has been the site of exploration for many years, first for gold in quartz veins in the early parts of the twentieth century and more recently for VMS deposits (Grybeck and others, 1984; Bittenbender and others, 2000). In addition, the Olympic Resources Gold prospect targets low-grade, disseminated gold in volcanic rocks. The BLM follow-up of the geophysical survey concentrated on the RD22 conductive zone and the two prospects mentioned above.

The RD22 conductive zone is ranked number 5 in the BLM prioritization of conductive zones (Table 2). It is characterized by strong, highly conductive bedrock sources, both closely spaced and broad units (Pritchard, 1997). The geology in the area of the conductive zone has been mapped as Triassic Hyd Group argillite hosted in volcanic rocks (Karl and others, 1999). There are several known mineral occurrences near the conductive zone. Some are gold in quartz veins and others are little known VMS occurrences (Bittenbender and others, 2000). Stream sediment samples collected by the USGS indicate the presence of zinc, lead, copper and minor barium in the area (Smith, 1998). None of the McCafferty and others (in press) geophysical signature models are predicted in the RD22 conductive zone area. The conductive zone is associated with only a moderate conductive gradient.

Anomalous Samples

Stream sediment samples from AA8 were anomalous for many different elements. Anomalies were detected for all 15 elements presented in this report except barium (Table 12). The top five arsenic values detected during the follow-up were found in AA8, specifically at the Olympic Resources Gold prospect (samples 699, 700, 765, 803, 805). The second, third, fourth, and fifth highest chromium samples were also collected in AA8, in the RD22 conductive zone and at the Scott prospect (samples 722, 735, 837, 976).

The BLM soil samples also indicate anomalous values for many different elements in AA8. Samples were anomalous in gold, silver, copper, zinc, molybdenum, nickel, chromium, cobalt, cadmium, arsenic, and antimony. The top four gold values detected during the follow-up came from AA8, specifically from the Olympic Resources Gold prospect and the RD22 conductive zone (samples 693, 694, 940, 941). The gold values correlate well with elevated arsenic values. Besides gold and arsenic, the anomalous soil samples from AA8 had values in the top five for all of the elements listed above, with the exception of silver and nickel.

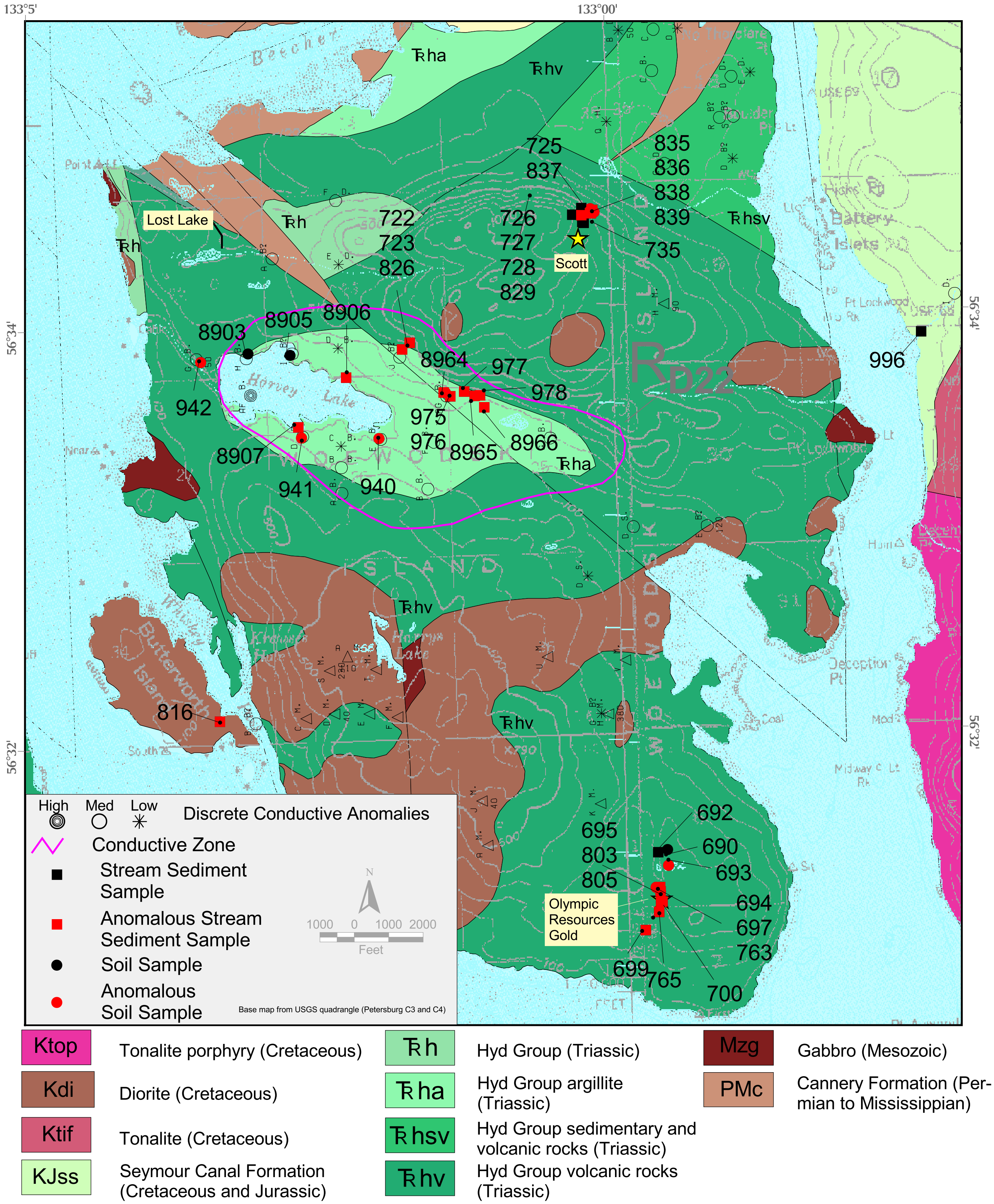

Figure 40. Anomalous Area 8 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Discussion / Conclusions

Many of the BLM samples from AA8 were anomalous - more than from any other area sampled during the follow-up. In addition, for several elements, many of the highest values detected during the follow-up came in samples from the area. Some of this, of course, is due to the fact that two known prospects were included in the follow-up in the AA8 area. Nevertheless, the high potential for locating mineralized rock in AA8 is reflected in the attention paid to the area by mineral exploration companies in the last 25 years (Bittenbender and others, 2000). The area is likely to attract exploration efforts in subsequent years as well.

Table 12. Analytical results from Anomalous Area 8. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment, S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
722	RD22	SS	-5	-0.2	5	-2	20	4	9	**142***	1	0.3	28	61	0.043	-5	-5
723	RD22	SS	23	-0.2	**77**	11	**645***	**27***	**128**	31	18	**9.1***	476	1277		42	**17**
826	RD22	SS	10	-0.2	60	16	**782***	**20***	92	13	21	5	185	867		44	12
975	RD22	SS	29	0.3	**124***	13	**405***	**24***	**117**	60	29	6.2	707	1624	0.496	**105**	**21***
976	RD22	SS	29	**0.8***	**121***	29	**453***	**15***	100	**135***	23	**9.6***	495	951	0.507	64	**16**
977	RD22	SS	16	-0.2	**110***	3	116	3	61	**102**	37	1.1	476	1462	0.34	70	-5
978	RD22	SS	**63***	-0.2	**171***	5	150	3	58	80	52	1.1	379	2196	0.388	93	-5
8906	RD22	SS	**70***	-0.2	52	11	**323***	**14***	73	44	26	4.6	610	2007	0.27	44	7
8907	RD22	SS	18	-0.2	63	6	**257**	**21***	61	28	27	4.1	717	2488	**0.649**	53	13
8965	RD22	SS	17	-0.2	**114***	5	123	**8***	61	53	35	0.9	556	1615	0.575	42	8
8966	RD22	SS	36	-0.2	**128***	4	126	2	44	56	38	0.6	450	1549	0.295	53	-5
692	Olympic Resources Gold	SS	-5	-0.2	27	6	53	-1	12	29	33	-0.2	425	2343		74	-5
695	Olympic Resources Gold	SS	**44**	-0.2	**154***	6	109	-1	55	77	34	0.4	457	1909		**138***	6
699	Olympic Resources Gold	SS	11	-0.2	**71**	7	116	-1	33	55	47	0.5	495	5528		**237***	-5
700	Olympic Resources Gold	SS	8	-0.2	**71**	9	130	-1	35	38	**77***	0.7	622	**12619***		**221***	-5
765	Olympic Resources Gold	SS	12	-0.2	64	6	108	2	30	36	39	0.5	661	6733		**158***	-5
803	Olympic Resources Gold	SS	6	-0.2	48	7	96	-1	23	34	**58**	0.6	498	**11398***		**247***	-5
805	Olympic Resources Gold	SS	15	-0.2	54	7	97	-1	29	51	45	0.5	368	5130		**237***	-5
725	Scott Gold	SS	-5	-0.2	63	7	79	-1	33	78	45	0.2	486	3124		7	-5
726	Scott Gold	SS	6	-0.2	33	9	44	-1	14	54	**72**	0.3	25	5008		-5	-5
727	Scott Gold	SS	6	-0.2	35	4	38	-1	14	66	12	-0.2	535	345		-5	-5
728	Scott Gold	SS	6	-0.2	32	7	63	-1	24	47	24	0.3	555	1355		7	-5
735	Scott Gold	SS	**51**	-0.2	**137***	**35**	219	-1	41	**135***	53	0.5	1278	3227		20	-5
829	Scott Gold	SS	-5	-0.2	15	9	37	-1	10	33	27	-0.2	31	2966		-5	-5
837	Scott Gold	SS	11	-0.2	**101***	**66***	**322***	-1	34	**112***	41	0.7	1000	2253		-5	-5
816	South Buttersworth	SS	**59***	-0.2	34	**38**	48	1	10	11	8	0.2	472	221		9	-5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
940	RD22	S	**93***	-0.2	47	3	49	-1	13	23	10	0.7	1176	134	0.287	**121**	-5
941	RD22	S	**57**	**0.6***	47	14	**422***	**30**	24	18	5	**4.5***	1120	553	0.224	**211***	7
942	RD22	S	7	0.3	**246***	-2	82	1	44	79	28	0.4	136	512	0.382	-5	-5
8903	RD22	S	20	-0.2	9	4	42	-1	8	68	5	0.2	1304	433	0.045	10	-5
8905	RD22	S	-5	-0.2	10	7	61	-1	11	32	6	-0.2	964	315	0.072	-5	-5
8964	RD22	S	32	**0.5***	114	35	174	14	51	91	6	0.4	380	267	0.392	62	**10**
690	Olympic Resources Gold	S	22	-0.2	15	29	18	-1	3	14	5	-0.2	418	82		10	-5
693	Olympic Resources Gold	S	**293***	-0.2	18	4	25	-1	11	30	11	-0.2	581	235		-5	-5
694	Olympic Resources Gold	S	**94***	-0.2	111	8	60	-1	14	16	19	0.9	476	920		**458***	**14***
697	Olympic Resources Gold	S	8	-0.2	**299***	6	185	-1	**99***	**130**	**47***	0.3	819	1140		**105**	**15***
763	Olympic Resources Gold	S	11	-0.2	**313***	3	124	1	**67**	**160***	**47***	0.5	300	1383		**97**	-5
835	Scott Gold	S	11	**0.6***	**211***	20	**538***	-1	42	**127**	**38**	1	943	885		6	-5
836	Scott Gold	S	-5	-0.2	68	28	261	-1	23	50	12	0.5	578	334		-5	-5
838	Scott Gold	S	8	-0.2	79	5	80	-1	31	55	16	-0.2	609	374		6	-5
839	Scott Gold	S	9	-0.2	115	6	73	-1	33	**132**	**34**	0.2	229	495		-5	-5

Anomalous Area 9

General

Anomalous Area 9 (AA9; Fig. 41) consists of the geophysical contractor's RZ2 and RZ3 conductive zones (Pritchard, 1997), situated on the northwest side of Zarembo Island. The RZ3 conductive zone is ranked number 2 in the BLM prioritization of conductive zones, whereas RZ2 is ranked number 35 (Table 2). RZ3 is characterized by multiple, closely spaced, moderately weak conductive bedrock sources (Pritchard, 1997). The geology in the area of the conductive zones has been mapped as Triassic Hyd Group sedimentary and volcanic rocks in association with Permian to Mississippian Cannery Formation and Cretaceous to Jurassic Seymour Canal Formation sediments (Karl and others, 1999). The RZ3 conductive zone includes the Frenchie prospect (also known as St. John Harbor), a VMS deposit that has been prospected since the early 1920's (Berg and Grybeck, 1980; Bittenbender and others, 2000). The RZ2 zone is not associated with any known mineral occurrence. USGS stream sediment samples indicate the presence of barium and minor copper and zinc in AA9. Barium values were particularly high for parts of the RZ3 conductive zone (Smith, 1998). Taylor Creek-, Lost Show-, and Scott-type geophysical signatures are predicted in AA9, especially for the RZ3 zone (McCafferty and others, in press). The RZ3 conductive zone is associated with a moderate to strong conductive gradient, whereas the RZ2 zone exhibits little to no gradient.

Anomalous Samples

Three stream sediment samples from AA9 were anomalous for four elements - copper, zinc, cobalt, and manganese (Table 13). The copper, zinc, and cobalt anomalies are relatively minor, but the manganese anomalies reflect the two highest manganese values obtained by the BLM (samples 8929, 8930).

Only 2 of the 13 soil samples collected by the BLM in AA9 had anomalous values. One of the samples was anomalous in lead and chromium (sample 8928) and another was anomalous in manganese (sample 956). Each of the soil anomalies fall within the three-standard deviation range.

Discussion / Conclusions

RZ3 within AA9 is ranked very high – number two – in the BLM prioritization of conductive zones. This was due to permissive geology, the presence of a known mineral occurrence, existing geochemical anomalies, and good correlation with USGS geophysical models. The BLM geochemical examination of the area revealed a much lower likelihood of hosting mineralized rock. Only 3 of 10 stream and 2 of 13 soil samples returned anomalous values. However, in each case the anomalous samples were collected away from the known Frenchie occurrence, so represent newly defined, potentially mineralized areas. For this reason the authors defined this area as an anomalous area.

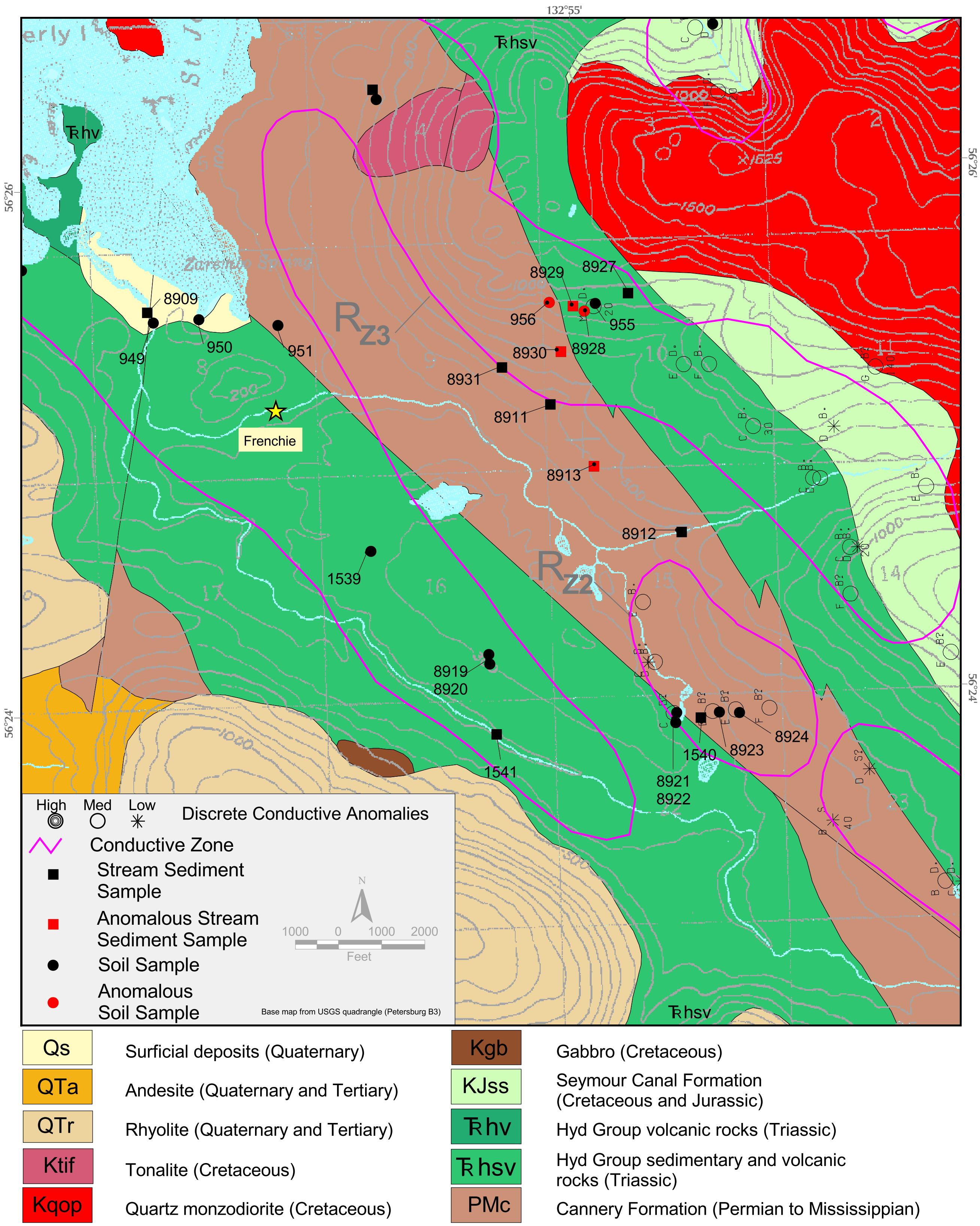

Figure 41. Anomalous Area 9 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Table 13. Analytical results from Anomalous Area 9. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment, S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
1540	RZ2	SS	-5	-0.2	30	9	134	5	50	59	12	0.3	796	707	0.028	23	-5
1541	RZ3	SS	-5	-0.2	18	11	119	2	28	39	22	0.4	677	2375	0.028	15	-5
8909	RZ3	SS	-5	-0.2	23	10	133	4	21	36	22	0.6	639	3448	0.19	-5	-5
8911	RZ3	SS	-5	-0.2	41	17	163	2	37	38	25	0.6	821	2935	0.053	26	-5
8912	RZ3	SS	-5	-0.2	38	15	143	2	25	32	25	0.5	623	3917	0.059	22	-5
8913	RZ3	SS	-5	-0.2	**74**	13	150	2	43	55	34	0.8	-10	5785	0.106	34	-5
8927	RZ3	SS	-5	-0.2	19	15	128	3	21	28	20	0.7	614	6689	0.19	7	-5
8929	RZ3	SS	-5	-0.2	21	20	159	2	30	22	57	1	822	**15895***	0.19	18	-5
8930	RZ3	SS	-5	-0.2	**78**	25	**231**	2	57	39	**59**	1.2	796	**>20000***	0.137	32	-5
8931	RZ3	SS	7	-0.2	53	21	168	2	39	33	37	1.2	759	7518	0.129	84	-5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
8921	RZ2	S	-5	-0.2	7	9	20	1	8	27	3	0.2	581	111	0.08	-5	-5
8922	RZ2	S	-5	-0.2	13	15	23	1	8	39	2	-0.2	605	135	0.125	-5	-5
8923	RZ2	S	-5	-0.2	12	15	32	2	9	45	5	0.3	610	201	0.147	7	-5
8924	RZ2	S	-5	-0.2	7	11	30	1	8	33	6	-0.2	563	199	0.034	-5	-5
949	RZ3	S	-5	-0.2	22	9	84	2	18	34	14	0.4	827	1127	0.048	11	-5
950	RZ3	S	-5	-0.2	14	6	46	5	17	29	7	0.3	713	256	0.025	6	-5
951	RZ3	S	-5	-0.2	2	11	13	2	1	7	-1	-0.2	437	94	0.039	-5	-5
955	RZ3	S	-5	-0.2	15	13	62	-1	8	17	8	0.3	551	185	0.218	-5	-5
956	RZ3	S	-5	-0.2	30	21	128	3	28	38	24	0.8	713	**3985***	0.29	24	-5
1539	RZ3	S	6	-0.2	23	26	46	2	3	6	1	0.3	221	219	0.178	-5	-5
8919	RZ3	S	-5	-0.2	-1	17	6	2	1	7	-1	-0.2	613	45	0.041	-5	-5
8920	RZ3	S	-5	-0.2	9	7	19	2	6	33	4	0.2	368	103	0.079	-5	-5
8928	RZ3	S	-5	-0.2	43	**67***	100	2	42	**186***	15	0.4	446	443	0.203	27	-5

Anomalous Area 10

General

Anomalous Area 10 (AA10; Fig. 42) includes the geophysical contractor's RE4 and RE6 conductive zones (Pritchard, 1997). A small part of the RE5 zone and a drainage from the RE7 zone also intersect AA10, but are only incidentally included in the anomalous area. The RE4 and RE6 conductive zones are ranked numbers 42 and 43 in the BLM prioritization of conductive zones (Table 2). Both of these zones are characterized by moderately weak bedrock conductivity sources with poorly defined shapes. Part of RE4 is associated with a weakly magnetic area. whereas RE6 is in a relatively nonmagnetic area (Pritchard, 1997). Both RE4 and RE6 conductive zones occupy areas mapped as Cretaceous Seymour Canal Formation sedimentary rocks (Karl and others, 1999). There are no known mineral occurrences in AA10. The stream sediment sampling program that the USGS conducted in the area (Cathrall and others, 1983) did not assess AA10 very well. The lack of a geochemical parameter adversely affected the area in the BLM prioritization. In addition, the USGS predictive geophysical modeling did not extend onto Etolin Island, and this also impacted the BLM prioritization. The RE4 and RE6 conductive zones are associated with only weak conductive gradients.

Anomalous Samples

Two of six stream sediment samples that the BLM collected in AA10 had anomalous values (Table 14). One sample was anomalous in molybdenum, cobalt, manganese, and arsenic (sample 8975). Each of these values was above the three-standard deviation threshold. The other sample was anomalous in lead and chromium (sample 8979).

None of the nine soil samples collected by the BLM returned anomalous values.

Discussion / Conclusions

The Triassic belt of rocks that host VMS deposits targeted by the airborne geophysical survey extends onto Etolin Island; however, no VMS occurrences have been reported from the island. The conductive zones in AA10 are ranked low in the BLM prioritization because of the absence of known occurrences and the lack of geochemical and geophysical modeling data. The stream sediment and soil samples collected by the BLM indicate some mineralized rock in AA10, but the flat-lying nature of the land around the RE4 and RE6 conductive zones makes assessment of the area difficult, particularly by soil sampling; thick overburden in the flat-lying areas makes hand-auger soil sampling difficult. AA10 may be targeted for mineral exploration in the future, but its priority would likely rank below that of other sites within the geophysical survey area.

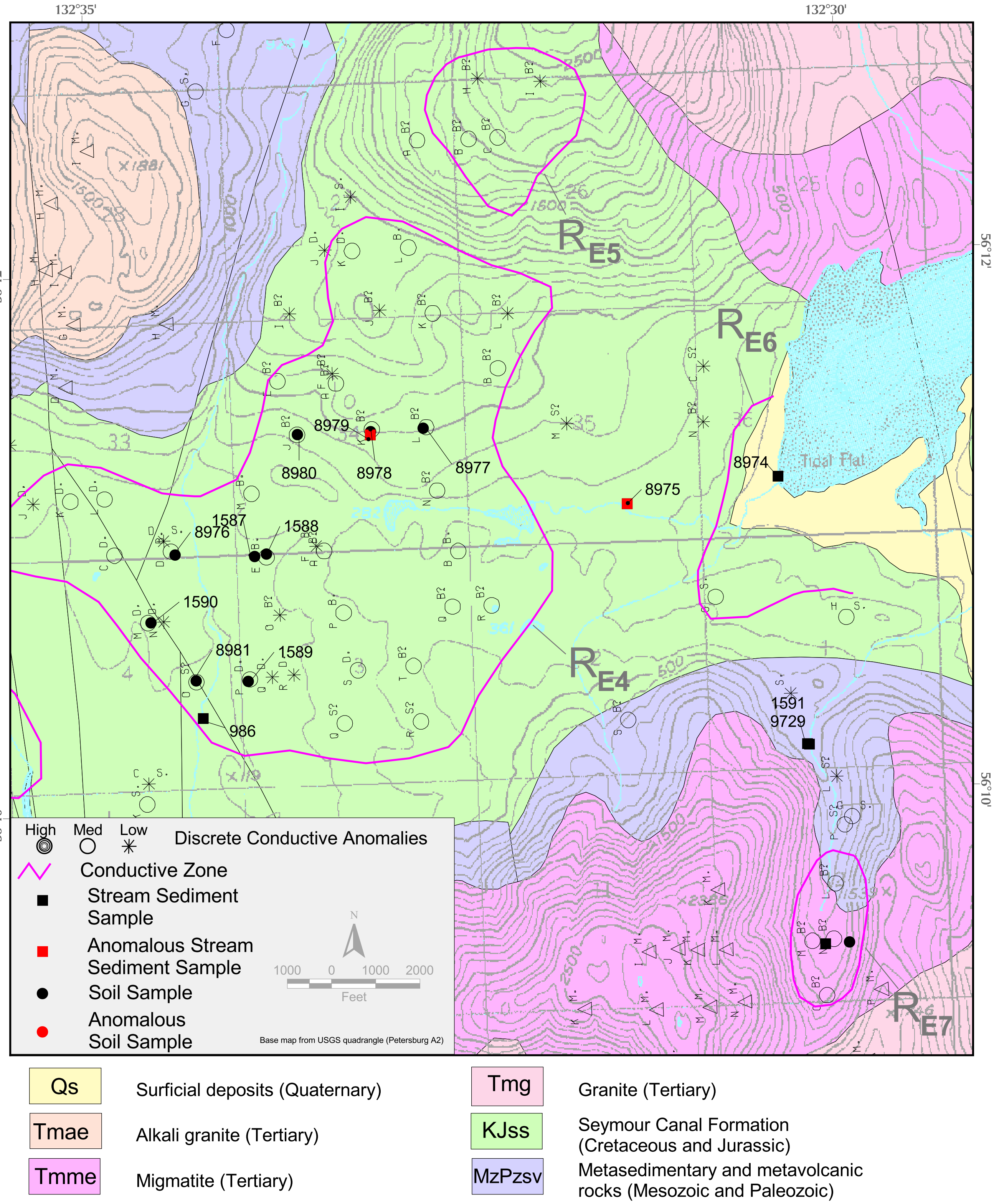

Figure 42. Anomalous Area 10 with stream sediment and soil samples, geology (Karl and others, 1999), conductive zones (Pritchard, 1997), and discrete anomalies (ADGGS and others, 1997).

Table 14. Analytical results from Anomalous Area 10. Anomalous samples > 2 standard deviations in bold, > 3 standard deviations with asterisk. Results in ppm except where noted. SS = stream sediment, S = soil

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
986	RE4	SS	15	-0.2	17	15	100	2	24	41	19	0.4	633	1134	0.06	19	-5
1591	RE4	SS	8	-0.2	12	5	58	-1	26	50	10	-0.2	676	409	0.024	-5	-5
8975	RE4	SS	-5	-0.2	4	14	79	**11***	21	38	**84***	0.5	567	**12319***	0.041	**149***	-5
8979	RE4	SS	8	-0.2	8	**78***	126	5	24	**108***	11	0.7	909	649	0.02	32	-5
8974	RE6	SS	19	-0.2	11	14	89	2	19	39	13	0.3	646	981	0.042	9	-5
9729	RE7	SS	-5	-0.2	13	-2	49	1	23	43	9	-0.2	690	349	0.024	-5	-5

Sample	Location	Type	Au ppb	Ag	Cu	Pb	Zn	Mo	Ni	Cr	Co	Cd	Ba	Mn	Hg	As	Sb
1587	RE4	S	6	-0.2	2	-2	28	3	9	66	9	-0.2	424	95	0.163	-5	-5
1588	RE4	S	-5	-0.2	7	-2	42	12	20	60	8	-0.2	533	133	0.089	71	-5
1589	RE4	S	32	-0.2	2	7	18	3	4	41	4	-0.2	600	58	0.092	-5	-5
1590	RE4	S	6	-0.2	10	3	31	3	11	55	5	-0.2	540	111	0.102	5	-5
8976	RE4	S	5	-0.2	21	-2	54	3	22	53	8	-0.2	669	202	0.046	-5	-5
8977	RE4	S	6	-0.2	8	7	33	3	10	56	8	-0.2	601	104	0.107	13	-5
8978	RE4	S	13	-0.2	7	5	46	5	12	41	9	-0.2	621	165	0.153	7	-5
8980	RE4	S	-5	-0.2	3	5	22	2	8	33	5	-0.2	686	89	0.078	7	-5
8981	RE4	S	-5	-0.2	2	4	21	2	7	40	4	-0.2	695	73	0.059	-5	-5

Summary

The methodology employed by BLM investigators seemed to be quite effective in following up the airborne geophysical survey for VMS deposits. The stream sediment and soil sampling distinguished known occurrences and highlighted newly prospective areas. Anomalous Areas 2, 5, 6, 8, and 9 contain known VMS occurrences, whereas Anomalous Areas 1, 3, 4, 7, and 10 do not. The BLM follow-up of the survey indicates that the potential for hosting mineralized rock extends the length of the survey area, but is concentrated in the 10 anomalous areas.

The BLM follow-up particularly highlights Anomalous Areas 1 and 5, both of which reflect largely unknown mineralized areas. Although there were historic claims in Anomalous Area 5, the BLM follow-up significantly expands the prospective mineralized area. Both stream sediment and soil anomalies were detected in these areas as well as altered rock exposures (Still and others, in press; Taylor, in press). Each area is likely to see additional mineral exploration activity in the future.

The follow-up also re-emphasizes the mineralized nature of two previously known areas – those in Anomalous Areas 2 and 8, which include the Taylor Creek and Woewodski Island occurrences. Again, both the BLM stream sediment and soil samples reflect the mineralized nature of these areas.

The BLM's geochemically-based follow-up of the airborne geophysical survey attempted to evaluate the conductive zones identified by the survey. This approach was hampered by the flat-lying nature of much of the area, where slow moving drainages prevent the dispersion of elements very far from their sources. In addition, the presence of thick glacial till in many areas covers much of the bedrock and also makes hand-auger soil sampling difficult or ineffective. Another method of evaluating the conductive zones may be ground-based geophysics. Due to the high acquisition costs of this method, however, prioritization of conductive zones, as accomplished by the BLM study, is essential.

The BLM's geochemically-based follow-up of the Stikine airborne geophysical survey has served to highlight parts of the Duncan Canal to Etolin Island VMS belt as having a higher likelihood of hosting mineral occurrences than other parts of the belt. This result fulfills the goal of the study and contributes to the BLM's objective of assessing the mineral potential of the Stikine area of central Southeast Alaska.

References

Alaska Division of Geological and Geophysical Surveys (ADGGS), Geoterrex-Dighem, and Watts, Griffis, and McOuat Limited, 1997, Various maps, disks, and reports presenting results of the airborne geophysical survey of the Stikine area, Southeast Alaska: Alaska Division of Geological and Geophysical Surveys Reports of Investigation 97-16 to 97-19, 97-38 to 97-45.

Amoco Minerals Company, 1979, Behm Canal project D-77-37, geology and geophysics map (unpublished), scale 1:24,000 [available from BLM, Juneau, Alaska].

Berg, H.C., 1981, Upper Triassic volcanogenic massive-sulfide metallogenic province identified in southeastern Alaska: U.S. Geological Survey Circular 823B, p. B104-108.

Berg, H.C., and Grybeck, D. J., 1980, Upper Triassic volcanogenic Zn-Pb-Ag(-Cu-Au) mineral deposits near Petersburg, Alaska: U.S. Geological Survey Open-File Report 80-527, 9 p.

Bittenbender P.E., Still, J.C., McDonald, M.E., Jr., Gensler, E.C., 2000, Mineral investigations in the Stikine area, central Southeast Alaska, 1997-1998: U.S. Bureau of Land Management Open File Report 83, 265 pp.

Brew, D. A., Ovenshine, A. T., Karl, S. M., and Hunt, S. J., 1984, Preliminary reconnaissance geologic map of the Petersburg and parts of the Port Alexander and Sumdum 1:250,000 quadrangles, southeastern Alaska: U.S. Geological Survey Open-File Report 84-405, 43 p., 2 sheets, scale 1:250,000.

Carnes, R.D., 1980, Update of Bureau of Mines Mineral Availability System (unpublished): [available from BLM, Juneau, Alaska].

Cathrall, J.B., Day, G.W., Hoffman, J.D., and McDanal, S.K., 1983, A listing and statistical summary of analytical results for pebbles, stream sediments, and heavy-mineral concentrates from stream sediments, Petersburg area, Southeast Alaska: U.S. Geological Survey Open-File Report 83-420 A-X.

Dusel-Bacon, C., 1994, Metamorphic history of Alaska: *in* Goldfarb, R.J., and Miller, L.D. (eds.), Mineral deposits of Alaska, Economic Geology Monograph 9, p. 495-533.

Gehrels, G.E., and Berg, H.C., 1994, Geology of southeastern Alaska, *in* Plafker, G., and Berg, H. C., (eds.), The geology of Alaska: Boulder, Colorado, Geological Society of America, The Geology of North America, v. G-1, p. 451-467.

Grybeck, D.J., and Berg, H.C., 1998, Alaska resource data file: Petersburg quadrangle: U.S. Geological Survey Open-File Report 98-784, 176 p.

Grybeck, D.J., Berg, H.C., and Karl, S.M., 1984, Map and description of the mineral deposits in the Petersburg and eastern Port Alexander quadrangles, southeastern Alaska: U.S. Geological Survey Open-File Report 84-837, 87 p., 1 sheet, scale 1:250,000.

Haeussler, P.J., Karl, S.M., Mortensen, J.K., McCafferty, A.E., Wynn, J., and Smith, B.D., in press, Structural geology of the Duncan Canal-Zarembo Island-Mosman Inlet area, southeastern Alaska: U.S. Geological Survey Open-File Report.

Karl, S.M., Haeussler, P.J., and McCafferty, A.E., 1999, Reconnaissance geologic map of the Duncan Canal/Zarembo Island area, southeastern Alaska: U.S. Geological Survey Open-File Report 99-168, 29 p., 1 sheet, scale 1:150,000.

MacIntyre, D.G., 1986, The geochemistry of basalts hosting massive sulphide deposits, Alexander terrane, Northwest British Columbia: British Columbia Ministry of Energy, Mines, and Petroleum Resources, Geological Fieldwork, 1985, Paper 1986-1, pp. 197-210.

MacIntyre, D.G., 1989, Late Triassic volcanics and massive sulphide deposits, Alexander terrane, Northwest B.C.: Abstracts of Professional Papers, Conference Juneau, April 20-21, 1989, Juneau Alaska, p. 15-16.

McCafferty, A.E., Smith, B.D., Sole, T.C., Karl, S.M., and Taylor, C.D., in press, Predictive geophysical models for select geologic units and mineralized environments, Kupreanof and Zarembo islands, Southeast Alaska: U.S. Geological Survey Open-File Report.

McClelland, W. C., and Gehrels, G. E., 1990, Geology of the Duncan Canal shear zone and its bearing on the accretionary history of the Alexander terrane, southeastern Alaska: Geological Society of America Bulletin, 102, pp. 1378-1392.

McDonald, M.E., Still, J.C., Bittenbender, P.E., and Coldwell, J.R., 1998, Mineral investigations in the Stikine area, Southeast Alaska, 1997: U.S. Bureau of Land Management Open-File Report 72, 29 p.

Monger, J.W.H., and Berg, H.C., 1987, Lithotectonic terrane map of western Canada and southeastern Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1874-B, 12 p., 1 sheet, scale 1:2,500,000.

Newberry, R.J., and Brew, D.A., 1999, Chemical and isotopic data for rocks and ores from the Upper Triassic Greens Creek and Woewodski Island volcanogenic massive sulfide deposits, southeastern Alaska: *in* Kelley, K.D., (ed.), Geologic studies in Alaska by the U.S. Geological Survey, 1997: U.S. Geological Survey Professional Paper 1614, p. 35-55.

Newberry, R.J., Crafford, T.C., Newkirk, S.R., Young, L.E., Nelson, S.W., and Duke, N.A., 1997, Volcanogenic massive sulfide deposits of Alaska, *in* Goldfarb, R.J., and Miller, L.D. (eds.), Mineral deposits of Alaska, Economic Geology Monograph 9, p. 120-150.

Peter, J.M., and Scott, S.D., 1999, Windy Craggy, northwestern British Columbia: The World's largest Besshi-type deposit: in Barrie, C.T., and Hannington, M.D., (eds.), Volcanic-associated massive sulfide deposits: Processes and examples in modern and ancient settings, Society of Economic Geologists Reviews in Economic Geology, v. 8, pp. 261-295.

Pritchard, R.A., 1997, Project report of the airborne geophysical survey for Stikine area, Southeast Alaska, Division of Geological and Geophysical Surveys Public-Data File 97-44, 199 p., 5 sheets, scale 1:63,360.

Rowan, E. L., Bailey, E. A., and Goldfarb, R. J., 1989, Geochemical orientation study for identification of metallic mineral resources in the Sitka quadrangle, southeastern Alaska: U.S. Geological Survey Bulletin 1950, p. B1-B12.

Smith, S.M., 1998, Results from the analysis of 723 stream-sediment samples from the Stikine geophysical survey area within the Petersburg, Sumdum, Bradfield Canal, and Sitka quadrangles, southeastern Alaska: U.S. Geological Survey Open-File Report 98-355, 116 p.

Still, J.C., Bittenbender, P.E., Bean, K.W., and Gensler, E.G., in press, Mineral resources of the Stikine area, Central Southeast Alaska: U.S. Bureau of Land Management Technical Report 51.

Taylor, C.D., 1997, An arc-flank to back-arc transect: Metallogeny of Late Triassic volcanogenic massive sulfide occurrences of the Alexander terrane, southeastern Alaska and British Columbia: [extended abstract] Society of Economic Geologists Neves Corvo Field Conference, May 7-17, 1997, Lisbon, Portugal, Abstracts and Programs volume, p. 68.

Taylor, C.D., in press, Descriptions of mineral occurrences and interpretation of mineralized rock geochemical data in the Stikine geophysical survey area, southeastern Alaska.

Taylor, C.D., Leventhal, J.S., Johnson, C.A., and Lear, K.G., 2000, The Greens Creek massive sulfide deposit, southeastern Alaska: Stable isotopic evidence for the involvement of biogenic sulfate reduction in the formation of ores and carbonates: *in* Volcanic environments and massive sulfide deposits, Program and Abstracts, Gemmell, Bruce and Pongratz, June (eds.), November 2000, Tasmania Australia, p. 209-210.

Taylor, C.D., Philpotts, J.A., Hall, T.E., Wakeman, B.W., and Snee, L.W., 1995a, New information on the geochemistry, age, and tectonic history of Late Triassic volcanic host rocks and associated volcanogenic massive sulfide occurrences of the Alexander terrane, Southeast Alaska: Abstracts of Professional Papers, Conference Juneau, April 19-21, 1995, Juneau Alaska, p. 31-32.

Taylor, C., Philpotts, J., Sutley, S., Gent, C., Harlan, S., Premo, W., Tatsumoto, M., Emsbo, P., and Meier, A., 1995b, Geochemistry of late Triassic volcanic rocks and age of alteration associated with volcanogenic massive sulfide occurrences, Alexander terrane, southeast Alaska, in Geology and ore deposits of the American cordillera, p. A74.

Taylor, C.D., Premo, W.R., Leventhal, J.S., Meier, A.L., Johnson, C.A., Newkirk, S.R., Hall, T.E., Lear, K.G., and Harris, A.G., 1999a, The Greens Creek deposit, southeastern Alaska: A VMS-SEDEX hybrid: *in* Stanley et al. (eds.), Mineral deposits: Processes to processing, Balkema, Rotterdam, p. 597-600.

Taylor, C.D., Premo, W.R., Meier, A.L., 1999b, The Late Triassic metallogeny of the Alexander Terrane, southeastern Alaska and British Columbia: Geological Society of America Abstracts with Programs, p. A-101.

Wynn, Jeffery, Karl, S.M., Smith, B.D., and McCafferty, A.E., in press, Ground geophysical profiles in the Duncan Canal - Zarembo Island area of the Stikine geophysical survey, southeastern Alaska: U.S. Geological Survey Open-File Report, 36 p.

Appendix - Analytical Results

The following table presents the analytical results for all stream sediment and soil samples collected by the BLM during the follow-up of the Stikine airborne geophysical survey. In addition to the analytical results, the following information is listed in the tables: sample number, sample location, and sample type.

Minimum Detection Limits

Element	Minimum, ppm	Analytical Technique
Au	0.005	Fire assay, atomic absorption (AA) finish
Ag	0.2	Inductively coupled argon plasma (ICP) spectroscopy
Cu	1	ICP
Pb	2	ICP
Zn	1	ICP
Mo	1	ICP
Ni	1	ICP
Cr	1	ICP
Co	1	ICP
Cd	0.2	ICP
Ba	10	X-ray fluorescence spectroscopy (XRF)
Mn	1	ICP
Hg (cold vapor)	0.01	Atomic absorption spectrophotometry (AA)
As	5	ICP
Sb	5	ICP

Units of measure

Results are recorded under the element's chemical symbol in the following units:
Au - parts per billion (ppb)
Ag, Cu, Pb, Zn, Mo, Ni, Cr, Co, Cd, Ba, Mn,, Hg, As, Sb - parts per million (ppm)

Sample locations

Latitudes and longitudes are presented for each sample - in decimal degrees, datum: NAD27.

Sample types

SS stream sediment
S soil

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
6397	RD1	SS	57.0075	-133.3712	101	<0.2	25	4	51	<1	16	22	9	0.3	789	522	0.045	<5	<5
6957	RD1	SS	56.9522	-133.4690	<5	<0.2	47	11	168	3	27	21	34	0.7	967	2859	0.154	15	<5
6958	RD1	SS	56.9522	-133.4690	20	<0.2	38	8	170	6	36	28	20	0.8	1353	1508	0.152	19	<5
6959	RD1	SS	56.9584	-133.4736	<5	<0.2	43	9	239	3	27	18	23	1.4	902	1580	0.147	16	<5
6960	RD1	SS	56.9597	-133.4917	6	<0.2	25	7	123	3	20	23	15	0.3	887	929	0.122	9	<5
6389	RD2	SS	56.8508	-133.4119	<5	<0.2	24	14	106	3	19	25	15	0.7	1007	1797	0.075	23	<5
6392	RD2	SS	56.8464	-133.4049	<5	<0.2	4	5	44	2	9	15	8	0.4	987	960	0.074	<5	<5
6393	RD2	SS	56.8461	-133.4112	<5	<0.2	37	9	89	2	22	30	19	0.5	853	2088	0.061	22	<5
1532	RD2	S	56.8504	-133.4105	<5	<0.2	25	8	62	2	16	30	7	0.2	875	284	0.051	6	<5
1533	RD2	S	56.8465	-133.4034	15	<0.2	23	12	94	6	15	23	13	0.6	445	680	0.186	8	<5
1534	RD2	S	56.8463	-133.4049	22	<0.2	7	12	37	9	8	20	5	<0.2	1017	139	0.097	9	<5
1535	RD2	S	56.8463	-133.4061	7	<0.2	20	14	59	4	11	33	7	0.3	630	293	0.116	11	<5
1536	RD2	S	56.8464	-133.4077	7	<0.2	47	13	135	3	29	48	8	0.6	802	521	0.087	7	<5
1537	RD2	S	56.8465	-133.4090	8	<0.2	35	12	83	1	25	42	11	0.3	933	555	0.074	8	<5
1538	RD2	S	56.8461	-133.4111	<5	<0.2	4	9	12	1	3	18	<1	<0.2	662	71	0.074	<5	<5
1576	RD3	SS	56.9335	-133.6321	16	<0.2	15	8	79	2	15	26	16	0.3	754	1384	0.085	17	<5
1578	RD3	SS	56.9557	-133.6618	<5	<0.2	8	6	76	5	20	35	9	0.2	1055	349	0.055	11	<5
1579	RD3	SS	56.9642	-133.6709	22	<0.2	16	13	120	10	25	38	8	0.5	1400	337	0.149	20	<5
8919	RD3	S	56.4026	-132.9282	<5	<0.2	<1	17	6	2	1	7	<1	<0.2	613	45	0.041	<5	<5
1577	RD4	SS	56.9370	-133.6579	<5	<0.2	12	6	64	2	22	34	20	<0.2	705	1335	0.076	8	<5
8916	RD4	SS	56.4570	-132.9077	<5	<0.2	29	9	93	1	26	36	16	0.3	701	1491	0.051	10	<5
6961	RD5	SS	56.8993	-133.5442	<5	<0.2	9	4	60	<1	13	24	8	<0.2	805	387	0.055	<5	<5
8917	RD5	SS	56.4414	-132.8018	<5	<0.2	20	5	132	2	46	84	23	0.3	626	1603	0.029	<5	<5
8918	RD5	SS	56.4422	-132.7999	<5	<0.2	13	4	67	1	65	144	22	0.2	673	1391	0.018	<5	<5
6394	RD6	SS	56.8753	-133.5684	<5	<0.2	16	4	66	1	14	25	11	0.2	978	636	0.058	6	<5
6398	RD6	SS	56.8741	-133.5705	6	<0.2	21	7	75	2	16	30	13	0.2	957	999	0.092	8	<5
6410	RD7	SS	56.8618	-133.5374	13	<0.2	23	7	155	4	43	63	39	1.3	1070	8124	0.19	20	<5
6415	RD7	SS	56.8590	-133.5293	<5	<0.2	23	14	102	4	26	65	19	0.7	1317	2098	0.205	8	<5
6418	RD7	SS	56.8408	-133.5028	7	<0.2	38	10	126	1	29	27	25	0.4	934	2095	0.055	15	<5
6419	RD7	SS	56.8448	-133.5090	53	<0.2	34	11	115	1	26	29	37	0.3	799	3101	0.103	14	<5
6420	RD7	SS	56.8482	-133.5122	11	<0.2	40	14	139	2	32	30	45	0.5	800	3397	0.139	16	<5
6421	RD7	SS	56.8500	-133.5137	<5	<0.2	27	10	91	<1	22	27	29	0.3	800	2622	0.095	9	<5
6422	RD7	SS	56.8523	-133.5162	<5	<0.2	25	7	73	<1	23	29	18	0.2	800	1054	0.049	6	<5
6423	RD7	SS	56.8556	-133.5211	9	<0.2	15	9	73	1	15	26	11	<0.2	734	619	0.126	7	<5
6424	RD7	SS	56.8574	-133.5258	6	<0.2	24	9	92	3	20	31	15	0.7	839	2533	0.181	9	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
1564	RD7	S	56.8434	-133.5177	<5	<0.2	17	9	24	1	7	16	3	<0.2	806	105	0.081	<5	<5
1565	RD7	S	56.8433	-133.5194	<5	<0.2	8	6	35	1	11	30	3	0.5	194	309	0.879	11	7
1566	RD7	S	56.8467	-133.5234	6	<0.2	33	10	61	2	21	32	6	0.8	1027	220	0.285	6	<5
1567	RD7	S	56.8466	-133.5220	<5	<0.2	<1	13	8	<1	1	18	<1	<0.2	563	70	0.021	<5	<5
1568	RD7	S	56.8500	-133.5254	6	<0.2	29	14	45	1	13	42	5	<0.2	797	246	0.568	7	<5
1569	RD7	S	56.8577	-133.5348	<5	<0.2	32	13	99	2	130	294	40	1.1	602	212	0.055	<5	<5
1580	RD8	SS	56.8331	-133.5582	19	<0.2	70	27	505	46	118	31	44	7.9	963	12147	0.953	125	28
1582	RD8	SS	56.8338	-133.5588	14	<0.2	101	31	520	27	139	25	33	5.8	689	5734	1.827	97	56
1583	RD8	SS	56.8381	-133.5598	21	<0.2	99	21	859	33	203	19	37	10.1	1105	5831	1.184	82	23
1584	RD8	SS	56.8408	-133.5633	32	0.3	90	30	686	26	190	22	39	10.8	2096	9433	1.339	86	33
1585	RD8	SS	56.8366	-133.5609	25	0.7	138	55	1707	33	411	34	43	25.7	1491	5232	1.324	99	26
1592	RD8	SS	56.8424	-133.5509	12	<0.2	94	19	1361	12	249	33	42	19.2	1004	4934	0.523	33	9
1593	RD8	SS	56.8440	-133.5522	<5	<0.2	30	8	106	1	22	28	18	0.7	995	1784	0.12	7	<5
1594	RD8	SS	56.8496	-133.5579	8	<0.2	28	7	158	3	34	28	16	0.9	1017	1815	0.232	10	<5
1595	RD8	SS	56.8493	-133.5578	<5	<0.2	41	8	127	2	34	29	16	0.6	1029	1036	0.142	10	<5
1596	RD8	SS	56.8472	-133.5542	7	<0.2	47	10	303	6	71	31	20	2.7	1070	2078	0.305	20	7
6405	RD8	SS	56.8127	-133.5183	<5	<0.2	26	9	83	2	16	20	19	0.4	1004	2328	0.068	14	<5
6406	RD8	SS	56.8211	-133.5268	<5	<0.2	28	7	236	3	71	33	24	3.7	891	4042	0.092	16	<5
6408	RD8	SS	56.8299	-133.5313	5	<0.2	35	13	226	5	37	30	30	1.7	1018	4821	0.14	33	<5
1562	RD8	S	56.8287	-133.5293	7	<0.2	13	9	37	2	10	32	4	0.2	672	176	0.091	6	<5
1563	RD8	S	56.8289	-133.5311	6	<0.2	38	11	56	1	20	38	7	0.3	692	296	0.124	9	<5
1581	RD8	S	56.8327	-133.5587	13	<0.2	10	8	95	<1	11	14	13	0.8	538	321	0.203	<5	<5
1586	RD8	S	56.8284	-133.5562	18	0.5	45	10	149	7	30	39	20	0.7	1264	1258	0.407	31	10
1549	RD9	S	56.8144	-133.4565	32	0.2	4	19	5	5	<1	8	<1	<0.2	4050	31	0.025	<5	<5
1550	RD9	S	56.8140	-133.4576	9	<0.2	20	17	41	3	12	33	3	0.2	803	169	0.09	9	<5
1551	RD9	S	56.8139	-133.4588	19	<0.2	15	18	32	2	9	29	3	0.2	748	175	0.168	8	<5
1552	RD9	S	56.8142	-133.4609	7	<0.2	76	9	103	5	38	48	18	1.3	1100	589	0.078	14	<5
1553	RD9	S	56.8142	-133.4604	8	<0.2	47	8	66	2	22	40	10	0.2	707	478	0.141	12	<5
901	RD10	SS	56.7872	-133.3797	8	<0.2	46	12	116	5	39	19	26	1	1297	4989	1.261	11	<5
6313	RD10	SS	56.8119	-133.4293	<5	<0.2	57	30	267	7	31	27	25	2.3	1163	2266	0.07	59	<5
6353	RD10	SS	56.7866	-133.3739	<5	<0.2	72	13	275	6	44	15	23	4.5	1165	3176	1.057	16	<5
902	RD10	S	56.8186	-133.4393	7	<0.2	14	15	45	<1	13	35	7	<0.2	840	234	0.132	<5	<5
903	RD10	S	56.8195	-133.4411	<5	0.2	6	8	40	2	2	4	19	<0.2	926	174	0.091	<5	<5
904	RD10	S	56.8211	-133.4417	<5	<0.2	34	11	69	<1	21	42	9	<0.2	818	324	0.103	7	<5
905	RD10	S	56.8217	-133.4395	6	<0.2	28	15	54	1	14	33	7	<0.2	896	248	0.085	7	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
906	RD10	S	56.8221	-133.4362	<5	<0.2	51	11	63	<1	21	42	10	<0.2	845	307	0.081	<5	<5
907	RD10	S	56.8235	-133.4344	7	0.9	18	18	21	7	3	18	2	0.2	739	64	0.101	250	<5
908	RD10	S	56.8241	-133.4321	11	<0.2	24	11	51	1	13	36	8	<0.2	673	254	0.113	8	<5
909	RD10	S	56.8233	-133.4299	<5	0.3	15	36	39	1	8	27	6	<0.2	765	180	0.113	27	<5
910	RD10	S	56.8208	-133.4309	6	0.3	5	10	28	1	4	20	11	<0.2	570	190	0.061	<5	<5
6302	RD10	S	56.7901	-133.3841	15	<0.2	30	8	52	<1	19	35	8	<0.2	832	317	0.05	<5	<5
6303	RD10	S	56.7890	-133.3841	<5	<0.2	10	13	54	<1	17	52	10	<0.2	578	328	0.095	10	<5
6304	RD10	S	56.7882	-133.3841	<5	<0.2	17	11	48	<1	15	43	8	<0.2	687	266	0.081	5	<5
6305	RD10	S	56.7874	-133.3840	<5	<0.2	54	14	74	22	39	51	7	0.2	549	188	0.836	12	<5
6306	RD10	S	56.7865	-133.3840	<5	<0.2	6	10	29	<1	7	29	6	<0.2	560	155	0.131	<5	<5
6307	RD10	S	56.7855	-133.3840	<5	<0.2	25	11	82	<1	13	29	13	<0.2	530	357	0.24	<5	<5
6308	RD10	S	56.7855	-133.3799	7	<0.2	82	9	71	<1	25	47	10	<0.2	728	376	0.143	5	<5
6309	RD10	S	56.7864	-133.3799	<5	<0.2	67	13	89	<1	34	46	14	0.4	716	608	0.148	10	<5
6310	RD10	S	56.7871	-133.3798	<5	<0.2	58	8	63	1	27	23	9	<0.2	1489	332	0.256	7	<5
6311	RD10	S	56.7882	-133.3800	10	<0.2	14	12	51	1	15	38	8	<0.2	592	295	0.087	7	<5
6312	RD10	S	56.7891	-133.3800	19	<0.2	33	12	60	<1	17	53	11	<0.2	549	410	0.11	7	<5
918	RD10, Kennecott Site	SS	56.7985	-133.3851	11	<0.2	88	35	232	2	36	39	34	0.9	1741	2965	0.183	23	<5
6337	RD10, Kennecott Site	SS	56.7968	-133.3828	98	0.9	201	96	431	1	53	54	52	1.9	2603	5810	0.444	51	7
912	RD10, Kennecott Site	S	56.7958	-133.3828	48	0.6	471	110	270	5	71	74	82	1.2	2232	8007	2.285	76	6
913	RD10, Kennecott Site	S	56.7961	-133.3829	12	0.6	91	33	125	1	33	43	19	0.2	2859	1211	0.257	30	<5
914	RD10, Kennecott Site	S	56.7965	-133.3828	8	0.8	84	11	173	<1	27	40	13	0.2	741	659	0.244	12	<5
915	RD10, Kennecott Site	S	56.7970	-133.3829	26	1.2	268	42	154	<1	52	60	52	0.6	2742	6956	0.563	40	5
916	RD10, Kennecott Site	S	56.7973	-133.3828	8	<0.2	23	16	47	<1	11	39	7	<0.2	967	230	0.182	<5	<5
917	RD10, Kennecott Site	S	56.7976	-133.3827	<5	<0.2	22	14	52	2	13	41	9	<0.2	607	274	0.126	9	<5
994	RD11	SS	56.7368	-133.5867	8	<0.2	13	16	91	2	14	27	76	<0.2	583	7712	0.067	21	<5
1597	RD11	SS	56.7871	-133.5894	6	<0.2	14	12	124	1	14	29	40	0.4	646	6701	0.131	8	<5
1598	RD11	SS	56.7868	-133.5882	<5	<0.2	17	13	117	1	16	28	26	0.2	573	3794	0.128	8	<5
1599	RD11	SS	56.7594	-133.6080	<5	<0.2	14	10	129	<1	21	25	34	0.3	332	3724	0.104	53	<5
1600	RD11	SS	56.7474	-133.5944	6	<0.2	3	18	59	2	4	7	14	0.3	831	3232	0.049	46	<5
3954	RD11	SS	56.7497	-133.5423	<5	<0.2	12	16	84	2	12	19	22	0.4	563	5869	0.088	18	<5
3955	RD11	S	56.7702	-133.5904	<5	<0.2	11	<2	86	2	8	34	12	0.3	362	333	0.158	8	<5
3956	RD11	S	56.7700	-133.5923	11	<0.2	15	<2	83	<1	17	37	25	0.3	393	656	0.122	6	6
3957	RD11	S	56.7699	-133.5935	8	<0.2	19	2	73	<1	13	35	13	0.2	555	567	0.106	11	<5
3958	RD11	S	56.7701	-133.5948	7	<0.2	6	11	58	<1	5	31	7	0.2	371	143	0.198	<5	<5
3959	RD11	S	56.7702	-133.5964	6	0.2	<1	30	63	<1	5	24	12	0.5	213	159	0.242	<5	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
9730	RD11	S	56.7348	-133.5873	<5	0.2	7	<2	114	<1	26	132	42	0.8	345	1306	0.066	9	7
9731	RD11	S	56.7371	-133.5867	<5	<0.2	6	6	31	2	4	18	5	<0.2	737	136	0.077	<5	<5
9732	RD11	S	56.7371	-133.5900	6	<0.2	7	8	65	<1	10	35	11	0.4	543	300	0.147	<5	<5
9733	RD11	S	56.7344	-133.5906	5	<0.2	<1	15	144	<1	9	169	30	0.7	161	456	0.054	<5	8
9734	RD11	S	56.7744	-133.5912	8	<0.2	19	<2	69	2	14	48	11	<0.2	543	280	0.13	11	<5
9735	RD11	S	56.7748	-133.5904	<5	<0.2	13	6	36	1	13	69	14	<0.2	504	231	0.116	<5	<5
9736	RD11	S	56.7747	-133.5891	10	<0.2	8	11	28	1	7	40	10	<0.2	581	153	0.144	<5	<5
924	RD12	SS	56.7728	-133.5128	<5	<0.2	20	27	97	5	15	21	23	0.6	761	3664	0.061	62	<5
6351	RD12	SS	56.7732	-133.5129	8	<0.2	26	31	123	4	16	22	27	0.8	690	4798	0.074	72	<5
6352	RD12	SS	56.7671	-133.5045	6	0.3	64	33	154	4	23	44	19	0.6	845	1771	0.063	46	<5
6396	RD13	SS	56.7963	-133.2309	6	<0.2	14	5	42	<1	11	21	8	0.2	674	408	0.043	<5	<5
1542	RD13	S	56.7923	-133.2316	7	<0.2	21	8	33	2	8	31	2	0.3	436	186	0.088	<5	<5
1543	RD13	S	56.7925	-133.2301	<5	<0.2	44	2	59	1	21	31	7	<0.2	616	298	0.024	<5	<5
1544	RD13	S	56.7925	-133.2286	<5	<0.2	70	7	52	<1	16	23	8	<0.2	593	366	0.02	<5	<5
1545	RD13	S	56.7925	-133.2271	<5	<0.2	63	3	58	2	18	30	11	0.2	475	357	0.053	<5	<5
1546	RD13	S	56.7964	-133.2322	<5	<0.2	44	4	67	2	19	33	9	0.3	529	437	0.041	<5	<5
1547	RD13	S	56.7964	-133.2302	<5	<0.2	26	9	45	2	13	38	4	0.4	567	254	0.111	6	<5
1548	RD13	S	56.7967	-133.2290	9	<0.2	46	3	51	1	18	34	8	0.3	493	292	0.058	6	<5
6316	RD14 N	SS	56.7741	-133.1666	<5	<0.2	217	4	42	<1	29	36	22	<0.2	248	423	0.042	<5	<5
6318	RD14 N	SS	56.7732	-133.1617	14	<0.2	42	6	68	<1	26	32	18	0.2	577	851	0.032	6	<5
6322	RD14 N	SS	56.7763	-133.1626	<5	<0.2	42	8	61	<1	21	31	26	<0.2	549	1222	0.041	9	<5
6324	RD14 N	SS	56.7776	-133.1634	<5	<0.2	28	4	58	<1	18	29	22	<0.2	567	1311	0.043	<5	<5
6325	RD14 N	SS	56.7803	-133.1669	<5	<0.2	18	4	54	<1	16	30	11	<0.2	564	475	0.03	<5	<5
6349	RD14 N	SS	56.7926	-133.1858	6	<0.2	47	6	65	<1	23	26	16	0.3	435	883	0.032	<5	<5
6350	RD14 N	SS	56.7923	-133.1853	10	<0.2	76	8	85	<1	20	32	23	0.2	462	1015	0.031	10	<5
8899	RD14 N	SS	56.7789	-133.1359	28	<0.2	33	8	69	<1	17	23	16	<0.2	544	827	0.019	5	<5
911	RD14 N	S	56.7735	-133.1623	6	<0.2	26	8	71	1	23	53	13	<0.2	493	442	0.098	5	<5
6314	RD14 N	S	56.7739	-133.1689	8	<0.2	16	15	48	1	7	45	11	<0.2	271	226	0.075	<5	<5
6317	RD14 N	S	56.7743	-133.1654	<5	<0.2	155	6	47	<1	17	33	11	<0.2	467	326	0.055	<5	<5
6319	RD14 N	S	56.7754	-133.1612	<5	<0.2	67	7	79	<1	35	39	17	<0.2	664	597	0.026	<5	<5
6320	RD14 N	S	56.7773	-133.1614	<5	<0.2	16	7	37	1	9	37	11	<0.2	397	219	0.12	<5	<5
6321	RD14 N	S	56.7799	-133.1597	<5	<0.2	23	7	48	<1	14	32	9	<0.2	614	279	0.098	<5	<5
6323	RD14 N	S	56.7769	-133.1626	<5	<0.2	18	5	44	<1	14	23	7	<0.2	562	313	0.049	<5	<5
8900	RD14 N	SS	56.7663	-133.1990	<5	<0.2	36	4	80	<1	15	20	23	<0.2	503	1848	0.028	<5	<5
6326	RD14 S	SS	56.7406	-133.1578	7	<0.2	64	9	85	<1	27	33	27	0.3	523	1444	0.039	<5	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
6328	RD14 S	SS	56.7404	-133.1514	6	<0.2	81	8	91	<1	26	31	31	0.2	603	2143	0.037	8	<5
6331	RD14 S	SS	56.7336	-133.1455	19	<0.2	69	4	51	<1	13	17	18	0.2	363	803	0.022	<5	<5
6380	RD14 S	SS	56.7289	-133.1475	18	<0.2	52	12	140	2	82	36	66	1	775	8414	0.096	13	<5
6381	RD14 S	SS	56.7303	-133.1442	<5	<0.2	84	3	69	2	18	35	28	0.4	286	1247	0.025	<5	<5
6385	RD14 S	SS	56.7427	-133.1406	6	<0.2	80	2	68	1	24	46	26	0.2	376	935	0.023	<5	<5
8898	RD14 S	SS	56.7308	-133.1426	6	<0.2	89	9	70	1	19	33	28	<0.2	290	1255	0.021	<5	<5
6332	RD14 S	SS	56.7004	-133.0836	12	<0.2	66	5	70	<1	15	26	23	<0.2	529	1003	0.026	<5	<5
6376	RD14 S	SS	56.7004	-133.0835	<5	<0.2	64	6	75	<1	17	27	24	0.2	517	1370	0.015	<5	<5
6377	RD14 S	SS	56.7082	-133.1142	<5	<0.2	86	12	98	1	24	25	25	0.4	691	1780	0.02	<5	<5
6378	RD14 S	SS	56.7120	-133.1325	<5	<0.2	82	6	86	4	28	33	29	0.3	568	2296	0.094	5	<5
6379	RD14 S	SS	56.7170	-133.1523	5	<0.2	34	7	101	2	26	30	23	0.2	603	1342	0.019	7	<5
6383	RD14 S	SS	56.7457	-133.1855	<5	<0.2	29	6	110	<1	29	35	21	0.2	692	1181	0.042	5	<5
6384	RD14 S	SS	56.7459	-133.1882	<5	<0.2	45	9	101	1	30	36	22	0.2	595	1130	0.047	6	<5
6386	RD14 S	SS	56.7438	-133.1205	44	0.3	90	4	48	<1	15	26	22	<0.2	322	592	0.023	<5	<5
6387	RD14 S	SS	56.6975	-133.0548	8	<0.2	73	4	90	1	23	29	27	<0.2	483	1243	0.029	5	<5
8901	RD14 S	SS	56.7372	-133.1777	<5	<0.2	52	5	80	<1	23	26	22	0.3	517	1481	0.017	7	<5
8902	RD14 S	SS	56.7080	-133.1141	<5	<0.2	101	15	101	2	27	26	27	0.4	640	1977	0.03	<5	<5
6330	RD15	SS	56.7437	-133.1317	78	<0.2	85	3	54	1	13	21	19	<0.2	342	581	0.027	<5	<5
743	RD16	SS	56.6905	-133.1089	35	<0.2	5	5	25	<1	6	18	4	<0.2	714	187		7	<5
959	RD16	SS	56.7289	-133.2007	18	<0.2	26	16	77	3	30	56	17	0.2	1270	1511	0.07	13	<5
960	RD16	SS	56.7243	-133.1991	<5	<0.2	37	8	71	2	26	49	47	0.3	1436	3450	0.08	7	<5
961	RD16	SS	56.7187	-133.1943	<5	0.3	13	9	87	4	24	31	8	<0.2	<10	439	0.046	8	<5
962	RD16	SS	56.7152	-133.1913	<5	<0.2	18	12	75	4	20	24	7	0.2	2963	723	0.056	11	<5
963	RD16	SS	56.7040	-133.1778	<5	0.5	7	10	21	6	6	11	2	0.2	1937	83	0.159	18	<5
964	RD16	SS	56.6908	-133.1553	<5	0.3	5	15	29	2	9	16	7	<0.2	3784	625	0.071	8	<5
1554	RD16	SS	56.7269	-133.2007	<5	<0.2	4	5	35	1	14	52	8	<0.2	1382	319	0.092	<5	<5
1555	RD16	SS	56.7235	-133.1984	9	<0.2	46	2	97	<1	65	92	55	0.3	1863	5421	0.073	6	<5
1556	RD16	SS	56.7217	-133.1958	7	<0.2	17	8	74	4	20	26	16	<0.2	3645	1684	0.058	13	<5
1557	RD16	SS	56.7169	-133.1930	<5	<0.2	29	5	75	3	21	26	9	0.4	1327	295	0.065	9	<5
1558	RD16	SS	56.7086	-133.1845	<5	0.2	12	14	66	7	16	19	11	0.4	2746	1238	0.113	20	<5
1559	RD16	SS	56.6981	-133.1695	<5	0.3	16	9	86	5	18	18	5	0.3	3458	393	0.072	10	<5
1560	RD16	SS	56.6899	-133.1528	<5	<0.2	26	8	94	3	22	24	15	0.5	2074	2155	0.049	11	<5
1561	RD16	SS	56.6821	-133.1370	6	0.3	26	17	118	16	28	22	8	0.4	2976	470	0.097	29	5
741	RD16	S	56.6914	-133.1107	6	<0.2	41	9	61	<1	21	51	12	<0.2	487	387		12	<5
742	RD16	S	56.6916	-133.1114	6	<0.2	55	9	66	<1	23	49	11	<0.2	554	494		9	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

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1570	RD16	S	56.7023	-133.1664	10	<0.2	65	12	81	2	26	40	6	0.4	1679	271	0.085	<5	<5
1571	RD16	S	56.7021	-133.1653	9	0.5	62	13	573	14	82	28	5	1.3	1482	186	0.164	<5	<5
1572	RD16	S	56.7022	-133.1640	9	<0.2	72	13	118	4	40	35	8	0.4	1894	280	0.09	7	<5
1573	RD16	S	56.7020	-133.1623	10	<0.2	61	11	131	2	25	42	6	0.3	1161	258	0.091	13	<5
1574	RD16	S	56.7022	-133.1612	<5	<0.2	3	19	25	6	4	20	<1	0.3	2380	43	0.028	11	<5
1575	RD16	S	56.6978	-133.1585	22	<0.2	39	9	60	2	18	44	6	0.3	1118	256	0.127	11	<5
8893	RD17	SS	56.7251	-133.2465	6	0.3	24	25	91	2	15	23	9	0.3	1305	726	0.148	9	<5
8894	RD17	SS	56.7246	-133.2453	<5	<0.2	11	11	53	<1	8	13	4	0.2	1214	261	0.064	<5	<5
938	RD17	S	56.7250	-133.2465	9	<0.2	65	19	139	3	30	31	10	0.3	1518	295	0.121	8	<5
8890	RD17	S	56.7278	-133.2440	9	0.6	68	147	226	4	17	33	6	1	820	270	0.303	14	<5
8891	RD17	S	56.7272	-133.2442	10	<0.2	107	49	244	4	34	85	10	2.4	1384	540	0.258	9	<5
8892	RD17	S	56.7252	-133.2462	7	<0.2	47	23	89	2	24	32	6	0.3	1238	285	0.192	8	<5
744	RD18	SS	56.6813	-133.2807	21	<0.2	20	9	79	1	10	11	9	<0.2	1106	705		13	<5
750	RD18	SS	56.6828	-133.2564	12	<0.2	8	6	30	<1	9	24	4	<0.2	739	118		<5	<5
751	RD18	SS	56.6809	-133.2546	6	<0.2	8	6	36	<1	10	19	6	<0.2	844	234		8	<5
753	RD18	SS	56.6740	-133.2436	8	<0.2	33	12	84	1	40	63	26	0.3	828	1230		14	<5
754	RD18	SS	56.6739	-133.2424	8	<0.2	29	10	83	<1	48	64	28	0.3	811	1280		25	<5
755	RD18	SS	56.6737	-133.2411	6	<0.2	27	10	105	<1	53	76	35	0.4	724	1640		15	<5
756	RD18	SS	56.6734	-133.2404	19	<0.2	31	19	91	1	64	105	41	0.2	693	1925		35	<5
799	RD18	SS	56.6875	-133.2745	<5	<0.2	8	14	31	2	12	25	8	<0.2	621	235	0.058	8	<5
845	RD18	SS	56.6808	-133.2795	9	<0.2	22	9	75	1	11	13	9	<0.2	1080	1056		8	<5
846	RD18	SS	56.6804	-133.2794	16	<0.2	23	9	80	1	11	13	8	<0.2	1110	685		5	<5
847	RD18	SS	56.6799	-133.2791	9	<0.2	19	8	71	1	11	11	11	<0.2	1135	1814		8	<5
848	RD18	SS	56.6828	-133.2588	<5	<0.2	8	5	50	2	12	47	9	<0.2	756	247		10	<5
849	RD18	SS	56.6816	-133.2552	<5	<0.2	9	7	48	<1	10	26	6	<0.2	1031	262		6	<5
8876	RD18	SS	56.6880	-133.2890	62	<0.2	12	12	39	1	7	11	6	0.3	1093	823	0.216	5	<5
745	RD18	S	56.6809	-133.2803	8	<0.2	27	13	45	1	13	40	6	<0.2	962	176		<5	<5
746	RD18	S	56.6806	-133.2798	9	<0.2	69	16	68	2	20	39	10	0.3	789	195		16	<5
747	RD18	S	56.6803	-133.2797	<5	<0.2	10	13	76	<1	3	17	11	<0.2	168	245		<5	<5
748	RD18	S	56.6777	-133.2820	9	<0.2	62	10	66	<1	26	41	15	<0.2	737	507		9	<5
749	RD18	S	56.6773	-133.2838	7	<0.2	17	7	41	<1	11	31	7	<0.2	548	329		5	<5
850	RD18	S	56.6747	-133.2445	7	<0.2	14	5	45	1	17	49	13	<0.2	540	440		<5	<5
851	RD18	S	56.6747	-133.2433	<5	<0.2	33	7	60	1	28	151	23	<0.2	369	320		<5	<5
852	RD18	S	56.6742	-133.2422	6	<0.2	22	10	47	<1	16	85	13	<0.2	303	455		7	<5
853	RD18	S	56.6739	-133.2407	<5	<0.2	15	7	56	1	36	80	12	<0.2	665	174		5	<5

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Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
927	RD18	S	56.6874	-133.2745	<5	<0.2	43	10	55	<1	24	45	9	0.2	712	296	0.097	7	<5
928	RD18	S	56.6887	-133.2864	7	<0.2	49	13	79	7	14	19	9	0.3	699	858	0.349	8	<5
929	RD18	S	56.6879	-133.2922	7	<0.2	48	17	77	2	16	41	7	0.3	582	420	0.283	13	<5
930	RD18	S	56.6556	-133.2889	<5	<0.2	17	<2	40	2	16	68	13	0.4	106	345	0.317	<5	<5
752	RD18	SS	56.6744	-133.2445	24	<0.2	37	11	98	1	72	94	40	0.2	695	1753		17	<5
718	RD19	SS	56.6586	-133.2896	20	0.4	68	15	363	7	52	38	16	7.6	1297	1781		15	<5
823	RD19	SS	56.6585	-133.2900	13	0.8	35	14	502	4	50	34	12	5.4	1436	551		10	<5
8879	RD19	SS	56.6551	-133.2883	<5	<0.2	23	18	89	6	12	28	32	0.5	<10	2691	0.296	11	<5
8880	RD19	SS	56.6535	-133.2883	<5	<0.2	19	9	104	5	19	21	16	0.8	939	1905	0.157	14	<5
716	RD19	S	56.6594	-133.2919	8	<0.2	1	5	5	<1	<1	4	<1	<0.2	984	54		<5	<5
717	RD19	S	56.6581	-133.2907	<5	<0.2	23	8	47	1	7	16	7	<0.2	1528	392		9	<5
719	RD19	S	56.6599	-133.2871	9	<0.2	27	9	33	<1	3	8	2	<0.2	2179	49		<5	<5
819	RD19	S	56.6595	-133.2923	12	<0.2	21	12	46	<1	10	26	5	<0.2	755	235		14	<5
820	RD19	S	56.6591	-133.2915	<5	<0.2	14	6	36	1	4	12	2	0.2	2844	66		14	<5
821	RD19	S	56.6590	-133.2909	15	<0.2	56	19	548	47	114	36	11	5	2184	4587		83	22
822	RD19	S	56.6584	-133.2901	8	<0.2	26	42	384	5	14	26	11	0.6	1004	757		21	<5
824	RD19	S	56.6600	-133.2863	<5	0.3	9	17	24	2	3	15	4	<0.2	1287	70		<5	<5
8877	RD19	S	56.6519	-133.2866	<5	<0.2	15	8	37	2	7	20	5	<0.2	397	206	0.091	10	<5
8878	RD19	S	56.6557	-133.2885	9	<0.2	26	11	82	7	14	39	18	0.4	461	999	0.229	8	<5
757	RD19	S	56.6691	-133.2530	<5	<0.2	<1	4	14	1	1	3	<1	<0.2	1296	21		<5	<5
758	RD19	S	56.6694	-133.2546	<5	<0.2	27	14	71	2	15	27	19	<0.2	1235	1666		21	<5
931	RD20	SS	56.6540	-133.3170	<5	<0.2	13	27	74	2	15	20	12	0.3	902	1068	0.07	9	<5
8881	RD20	SS	56.6532	-133.3211	<5	<0.2	14	8	87	3	23	29	14	0.3	1089	1095	0.047	14	<5
8882	RD20	SS	56.6530	-133.3188	<5	<0.2	14	9	83	3	18	23	14	0.2	1034	1079	0.058	12	<5
759	RD21	SS	56.6232	-133.1734	8	<0.2	37	10	95	5	30	44	12	0.4	969	514		16	<5
8886	RD21	SS	56.6294	-133.2070	<5	<0.2	36	14	73	2	19	28	9	0.2	631	591	0.205	11	<5
8888	RD21	SS	56.6423	-133.2241	<5	<0.2	21	13	99	1	26	28	18	0.3	838	1752	0.102	11	<5
760	RD21	S	56.6225	-133.1756	15	<0.2	15	10	29	1	8	30	6	<0.2	717	156		7	<5
761	RD21	S	56.6233	-133.1787	10	<0.2	118	20	1100	139	169	37	19	7.2	<10	1160		106	35
932	RD21	S	56.6294	-133.2070	<5	<0.2	35	11	46	3	15	35	6	0.3	671	263	0.106	9	<5
933	RD21	S	56.6308	-133.2053	<5	<0.2	25	25	73	8	48	9	6	0.3	642	236	0.056	46	14
934	RD21	S	56.6443	-133.2189	<5	<0.2	34	10	58	2	19	31	9	0.2	1099	274	0.109	10	<5
936	RD21	S	56.6436	-133.2197	<5	<0.2	39	15	40	1	20	39	16	0.4	692	889	0.164	<5	<5
937	RD21	S	56.6431	-133.2198	<5	<0.2	29	17	57	1	9	28	4	0.3	907	213	0.065	<5	<5
8883	RD21	S	56.6341	-133.1986	10	<0.2	66	15	58	2	12	10	9	0.3	2182	356	0.375	13	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
8884	RD21	S	56.6345	-133.1983	7	<0.2	6	6	9	1	2	2	1	0.3	1570	28	0.052	<5	<5
8885	RD21	S	56.6359	-133.1970	<5	<0.2	58	13	66	2	16	36	7	0.4	711	286	0.118	<5	<5
723	RD22	SS	56.5648	-133.0306	23	<0.2	77	11	645	27	128	31	18	9.1	476	1277		42	17
826	RD22	SS	56.5653	-133.0294	10	<0.2	60	16	782	20	92	13	21	5	185	867		44	12
975	RD22	SS	56.5613	-133.0248	29	0.3	124	13	405	24	117	60	29	6.2	707	1624	0.496	105	21
976	RD22	SS	56.5609	-133.0238	29	0.8	121	29	453	15	100	135	23	9.6	495	951	0.507	64	16
977	RD22	SS	56.5613	-133.0218	16	<0.2	110	3	116	3	61	102	37	1.1	476	1462	0.34	70	<5
978	RD22	SS	56.5609	-133.0195	63	<0.2	171	5	150	3	58	80	52	1.1	379	2196	0.388	93	<5
8906	RD22	SS	56.5627	-133.0387	70	<0.2	52	11	323	14	73	44	26	4.6	610	2007	0.27	44	7
8907	RD22	SS	56.5588	-133.0459	18	<0.2	63	6	257	21	61	28	27	4.1	717	2488	0.649	53	13
8965	RD22	SS	56.5609	-133.0203	17	<0.2	114	5	123	8	61	53	35	0.9	556	1615	0.575	42	8
8966	RD22	SS	56.5600	-133.0190	36	<0.2	128	4	126	2	44	56	38	0.6	450	1549	0.295	53	<5
940	RD22	S	56.5577	-133.0343	93	<0.2	47	3	49	<1	13	23	10	0.7	1176	134	0.287	121	<5
941	RD22	S	56.5580	-133.0454	57	0.6	47	14	422	30	24	18	5	4.5	1120	553	0.224	211	7
942	RD22	S	56.5642	-133.0596	7	0.3	246	<2	82	1	44	79	28	0.4	136	512	0.382	<5	<5
8903	RD22	S	56.5648	-133.0528	20	<0.2	9	4	42	<1	8	68	5	0.2	1304	433	0.045	10	<5
8905	RD22	S	56.5645	-133.0467	<5	<0.2	10	7	61	<1	11	32	6	<0.2	964	315	0.072	<5	<5
8964	RD22	S	56.5613	-133.0245	32	0.5	114	35	174	14	51	91	6	0.4	380	267	0.392	62	10
725	Scott Gold	SS	56.5756	-133.0042	<5	<0.1	64	7	83	<1	33	78	45	0.2	486	3124		7	<5
726	Scott Gold	SS	56.5750	-133.0042	6	<0.1	34	9	46	2	14	54	72	0.3	25	5008		<5	<5
727	Scott Gold	SS	56.5744	-133.0039	6	<0.1	38	5	39	<1	14	66	12	<0.2	535	345		<5	<5
728	Scott Gold	SS	56.5751	-133.0055	6	<0.1	34	8	59	<1	24	47	24	0.3	555	1355		7	<5
735	Scott Gold	SS	56.5751	-133.0028	51	<0.2	137	35	219	<1	41	135	53	0.5	1278	3227		20	<5
829	Scott Gold	SS	56.5745	-133.0041	<5	<0.2	15	9	37	<1	10	33	27	<0.2	31	2966		<5	<5
837	Scott Gold	SS	56.5754	-133.0026	11	<0.1	99	74	336	2	34	112	41	0.7	1000	2253		<5	<5
835	Scott Gold	S	56.5753	-133.0023	11	0.6	211	20	538	<1	42	127	38	1	943	885		6	<5
836	Scott Gold	S	56.5754	-133.0025	<5	<0.2	68	28	261	<1	23	50	12	0.5	578	334		<5	<5
838	Scott Gold	S	56.5755	-133.0027	8	<0.2	79	5	80	<1	31	55	16	<0.2	609	374		6	<5
839	Scott Gold	S	56.5756	-133.0028	9	<0.2	115	6	73	<1	33	132	34	0.2	229	495		<5	<5
816	South Buttersworth	SS	56.5355	-133.0583	59	<0.2	34	38	48	1	10	11	8	0.2	472	221		9	<5
692	Olympic Resources Gold	SS	56.5242	-132.9958	<5	<0.2	27	6	53	<1	12	29	33	<0.2	425	2343		74	<5
695	Olympic Resources Gold	SS	56.5214	-132.9957	44	<0.2	154	6	109	<1	55	77	34	0.4	457	1909		138	6
699	Olympic Resources Gold	SS	56.5180	-132.9979	11	<0.2	71	7	116	<1	33	55	47	0.5	495	5528		237	<5
700	Olympic Resources Gold	SS	56.5202	-132.9956	8	<0.2	71	9	130	<1	35	38	77	0.7	622	12619		221	<5
765	Olympic Resources Gold	SS	56.5194	-132.9959	12	<0.2	64	6	108	2	30	36	39	0.5	661	6733		158	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
803	Olympic Resources Gold	SS	56.5211	-132.9956	6	<0.2	48	7	96	<1	23	34	58	0.6	498	11398		247	<5
805	Olympic Resources Gold	SS	56.5202	-132.9954	15	<0.2	54	7	97	<1	29	51	45	0.5	368	5130		237	<5
690	Olympic Resources Gold	S	56.5244	-132.9944	22	<0.2	15	29	18	<1	3	14	5	<0.2	418	82		10	<5
693	Olympic Resources Gold	S	56.5231	-132.9943	293	<0.2	18	4	25	<1	11	30	11	<0.2	581	235		<5	<5
694	Olympic Resources Gold	S	56.5214	-132.9962	94	<0.2	111	8	60	<1	14	16	19	0.9	476	920		458	14
697	Olympic Resources Gold	S	56.5214	-132.9957	8	<0.2	299	6	185	<1	99	130	47	0.3	819	1140		105	15
763	Olympic Resources Gold	S	56.5211	-132.9956	11	<0.2	313	3	124	1	67	160	47	0.5	300	1383		97	<5
701	RD23	SS	56.6670	-133.1038	9	<0.2	50	14	178	3	39	20	17	1.1	3406	1831		20	<5
702	RD23	SS	56.6652	-133.0990	11	<0.2	47	7	104	1	32	28	15	0.5	1429	1449		8	<5
703	RD23	SS	56.6619	-133.0951	<5	<0.2	48	11	185	6	62	32	72	1	1721	4291		14	<5
704	RD23	SS	56.6575	-133.0878	12	<0.2	61	17	222	11	68	41	24	1.7	3472	1765		29	<5
705	RD23	SS	56.6544	-133.0844	29	<0.2	45	13	181	4	81	77	42	2.5	2954	3453		17	<5
706	RD23	SS	56.6511	-133.0796	<5	<0.2	40	9	165	2	68	62	36	0.9	1684	2443		10	<5
707	RD23	SS	56.6477	-133.0743	10	0.2	65	15	180	3	47	43	21	1.3	3011	1821		19	<5
736	RD23	SS	56.6642	-133.0432	12	<0.2	86	8	117	1	38	54	25	0.7	891	1653		11	<5
737	RD23	SS	56.6643	-133.0430	13	<0.2	69	8	100	1	35	70	22	0.4	787	1098		13	<5
738	RD23	SS	56.6651	-133.0431	10	<0.2	133	12	178	2	58	67	34	0.9	1117	2883		10	<5
739	RD23	SS	56.6656	-133.0435	7	<0.2	70	15	224	3	46	42	28	1.9	1120	3046		14	<5
806	RD23	SS	56.6635	-133.0981	13	<0.2	39	13	141	4	45	26	25	0.8	1466	2762		15	<5
807	RD23	SS	56.6630	-133.0974	6	<0.2	40	12	99	2	37	26	32	0.9	1335	2705		12	<5
809	RD23	SS	56.6585	-133.0901	13	0.3	50	32	302	17	72	30	48	3.5	3409	3492		36	<5
810	RD23	SS	56.6555	-133.0859	10	<0.2	47	19	171	5	51	36	41	1.5	1765	1821		18	<5
811	RD23	SS	56.6527	-133.0821	17	<0.2	55	13	136	3	45	46	18	0.7	1707	1467		10	<5
812	RD23	SS	56.6474	-133.0731	15	0.2	81	14	227	5	60	36	27	1.4	3363	1424		15	<5
814	RD23	SS	56.6355	-133.0552	13	<0.2	51	14	144	9	33	29	15	0.5	2503	800		20	<5
893	RD23	SS	56.6615	-133.0598	9	<0.2	54	13	141	2	41	33	41	0.9	955	12267	0.224	8	<5
895	RD23	SS	56.6603	-133.0616	<5	<0.2	29	12	108	3	25	12	24	0.5	1511	3578	0.078	13	<5
897	RD23	SS	56.6549	-133.0541	9	<0.2	37	22	132	3	38	14	71	1.2	1392	11944	0.215	11	<5
899	RD23	SS	56.6488	-133.0683	8	0.5	61	23	270	10	55	19	27	2.5	3502	2428	0.319	26	<5
919	RD23	SS	56.6509	-133.0715	10	<0.2	64	15	203	4	47	29	22	1.6	2858	1761	0.159	15	<5
920	RD23	SS	56.6526	-133.0704	10	<0.2	59	16	127	2	34	24	22	0.6	1568	2363	0.15	9	<5
921	RD23	SS	56.6492	-133.0664	7	0.2	59	16	198	6	46	22	27	1.5	2565	2493	0.28	16	<5
922	RD23	SS	56.6492	-133.0666	<5	0.9	67	22	312	10	68	20	31	2.4	3392	3286	0.443	27	<5
6286	RD23	SS	56.6676	-133.0641	11	<0.2	101	12	142	2	45	45	82	1	659	9782	0.543	13	<5
6287	RD23	SS	56.6604	-133.0629	14	<0.2	45	27	213	3	33	20	30	1.2	1432	3553	0.207	11	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
6295	RD23	SS	56.6535	-133.0530	7	<0.2	44	14	103	2	24	17	24	0.5	1620	3850	0.13	8	<5
6296	RD23	SS	56.6537	-133.0533	14	<0.2	53	21	119	3	29	15	25	0.6	1580	4165	0.201	11	<5
6297	RD23	SS	56.6508	-133.0602	8	<0.2	55	14	131	2	28	20	24	0.5	1271	3058	0.158	7	<5
6343	RD23	SS	56.6211	-133.0026	18	<0.2	102	16	150	5	51	42	29	0.9	1390	2037	0.338	18	<5
6344	RD23	SS	56.6534	-133.0046	37	<0.2	98	13	194	4	53	57	35	1.8	1004	2756	0.626	135	<5
6346	RD23	SS	56.6624	-133.0343	20	<0.2	115	9	254	10	101	85	29	2.4	801	1378	0.656	35	<5
6347	RD23	SS	56.6808	-133.0696	10	<0.2	56	10	97	2	29	40	23	0.5	796	1643	0.133	10	<5
840	RD23	S	56.6640	-133.0432	<5	<0.2	18	6	27	<1	8	40	8	<0.2	469	189		<5	<5
841	RD23	S	56.6645	-133.0433	9	<0.2	20	7	27	1	9	33	6	<0.2	714	154		<5	<5
842	RD23	S	56.6650	-133.0425	6	<0.2	56	7	94	1	38	57	17	0.3	835	619		9	<5
843	RD23	S	56.6656	-133.0433	8	<0.2	53	8	88	2	35	55	13	0.2	798	414		5	<5
844	RD23	S	56.6665	-133.0435	<5	0.7	39	12	288	6	41	30	8	2.9	1314	472		8	<5
891	RD23	S	56.6664	-133.0639	<5	<0.2	59	7	52	<1	24	78	10	<0.2	1764	294	0.219	<5	<5
892	RD23	S	56.6650	-133.0662	10	<0.2	27	19	43	<1	10	26	6	<0.2	1248	150	0.131	<5	<5
6282	RD23	S	56.6655	-133.0603	<5	<0.2	46	11	83	1	30	56	14	<0.2	732	505	0.134	12	<5
6283	RD23	S	56.6662	-133.0610	6	0.4	9	9	30	3	5	9	4	<0.2	1012	103	0.076	8	<5
6284	RD23	S	56.6665	-133.0623	<5	<0.2	26	10	94	2	15	29	9	0.3	1056	421	0.128	7	<5
6289	RD23	S	56.6557	-133.0567	6	<0.2	66	9	86	2	35	53	14	<0.2	1002	375	0.082	14	<5
6290	RD23	S	56.6579	-133.0606	12	<0.2	98	13	63	1	35	60	15	<0.2	907	902	0.052	20	<5
6291	RD23	S	56.6568	-133.0589	10	<0.2	15	7	36	1	9	27	7	<0.2	658	233	0.082	7	<5
6292	RD23	S	56.6554	-133.0551	12	<0.2	72	10	96	1	37	45	17	<0.2	943	476	0.038	6	<5
6293	RD23	S	56.6544	-133.0541	<5	<0.2	3	5	19	<1	1	1	<1	<0.2	1434	64	0.063	<5	<5
6294	RD23	S	56.6536	-133.0535	<5	<0.2	5	12	22	1	3	8	4	<0.2	956	82	0.084	<5	<5
795	RD23, Spruce Creek	SS	56.6590	-133.0252	8	<0.2	7	13	10	1	3	31	<1	0.2	607	74	0.063	<5	<5
797	RD23, Spruce Creek	SS	56.6585	-133.0301	<5	<0.2	34	17	84	6	23	24	116	1.8	433	8883	0.181	55	<5
798	RD23, Spruce Creek	SS	56.6590	-133.0287	<5	<0.2	28	10	47	1	18	39	17	0.3	502	615	0.113	6	<5
796	RD23, Spruce Creek	S	56.6588	-133.0322	<5	<0.2	8	12	28	7	7	30	2	<0.2	611	172	0.045	<5	<5
925	RD23, Spruce Creek	S	56.6586	-133.0300	6	<0.2	16	20	18	<1	7	41	<1	<0.2	610	116	0.07	<5	<5
926	RD23, Spruce Creek	S	56.6591	-133.0293	7	<0.2	20	16	57	1	23	60	6	0.3	625	377	0.08	<5	<5
2798	RD23, Spruce Creek	S	56.6587	-133.0227	6	<0.2	11	9	27	<1	7	33	1	<0.2	703	186	0.059	<5	<5
6342	RD24	SS	56.6398	-132.9886	<5	<0.2	46	6	68	1	42	36	17	0.3	652	535	0.037	11	<5
996	RD25	SS	56.5650	-132.9557	<5	<0.2	63	7	97	2	24	40	25	0.3	827	1690	0.246	8	<5
9739	RD25	SS	56.6004	-132.9321	<5	<0.2	7	9	36	2	9	18	14	<0.2	618	1674	0.048	5	<5
9742	RD25	SS	56.6036	-132.9268	6	<0.2	5	5	82	2	12	24	11	<0.2	676	1383	0.053	32	<5
997	RD25	S	56.5997	-132.9255	10	<0.2	20	<2	50	2	17	36	9	<0.2	648	341	0.072	5	<5

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Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
9738	RD25	S	56.6002	-132.9318	7	<0.2	22	6	41	2	8	33	12	<0.2	559	278	0.11	<5	<5
9740	RD25	S	56.5999	-132.9304	8	<0.2	65	<2	56	2	22	60	16	0.3	564	350	0.074	<5	<5
9741	RD25	S	56.6001	-132.9256	6	0.5	11	6	54	1	13	27	26	<0.2	632	2976	0.044	5	<5
9743	RD25	S	56.6033	-132.9292	20	<0.2	92	3	69	2	21	44	14	<0.2	791	390	0.071	10	<5
946	RD26	SS	56.5640	-132.9340	<5	<0.2	23	10	68	1	13	29	17	<0.2	445	1802	0.102	6	<5
947	RD26	SS	56.5600	-132.9363	<5	<0.2	85	6	99	1	22	29	28	0.4	414	2085	0.251	9	<5
8908	RD26	SS	56.5492	-132.9241	9	<0.2	26	11	83	2	18	30	13	0.2	786	1041	0.063	11	<5
943	RD26	S	56.5707	-132.9262	<5	<0.2	32	16	63	<1	20	24	10	0.3	674	662	0.039	<5	<5
944	RD26	S	56.5679	-132.9324	<5	<0.2	33	7	88	1	33	40	12	0.3	607	511	0.417	5	<5
945	RD26	S	56.5650	-132.9319	<5	<0.2	11	13	18	3	9	27	2	<0.2	585	43	0.757	12	<5
948	RD26	S	56.5602	-132.9358	<5	<0.2	106	<2	80	2	15	26	23	0.3	351	1007	0.076	6	<5
8963	RD26	S	56.3190	-132.7222	<5	<0.2	9	10	31	2	10	30	3	<0.2	679	170	0.081	8	<5
6355	RD27	SS	56.5387	-132.8862	10	<0.2	26	8	107	1	30	36	53	0.3	642	8537	0.079	<5	<5
6360	RD27	SS	56.5275	-132.9004	<5	<0.2	19	9	70	2	18	34	32	<0.2	457	3342	0.077	<5	<5
6361	RD27	SS	56.5290	-132.9080	99	<0.2	17	6	71	<1	12	21	14	<0.2	539	1857	0.061	<5	<5
6364	RD27	SS	56.5229	-132.8787	<5	<0.2	58	6	131	1	41	42	28	0.2	646	2021	0.061	<5	<5
6357	RD27	S	56.5372	-132.8860	<5	<0.2	34	8	84	3	21	39	16	<0.2	457	714	0.133	<5	<5
6358	RD27	S	56.5349	-132.8899	<5	<0.2	31	6	75	1	32	61	11	<0.2	581	437	0.098	<5	<5
6359	RD27	S	56.5335	-132.8938	<5	<0.2	17	8	48	2	13	42	9	<0.2	474	304	0.12	<5	<5
6362	RD28	SS	56.5135	-132.8774	<5	<0.2	23	5	62	<1	20	29	14	<0.2	637	818	0.05	<5	<5
6363	RD28	SS	56.5223	-132.8772	<5	<0.2	45	5	72	1	19	31	19	<0.2	471	1151	0.029	<5	<5
9744	RD30	SS	56.5169	-133.4597	<5	<0.2	11	8	104	2	11	24	24	<0.2	406	2396	0.091	9	<5
998	RD30	S	56.5173	-133.4598	<5	<0.2	17	4	72	<1	10	28	14	0.3	516	749	0.101	7	<5
968	RZ1	SS	56.3731	-132.6868	<5	<0.2	14	7	135	2	23	27	34	0.5	697	6131	0.066	9	<5
969	RZ1	SS	56.3716	-132.6855	<5	<0.2	13	7	99	2	28	39	23	<0.2	776	1957	0.024	15	<5
979	RZ1	SS	56.3786	-132.8071	12	<0.2	20	22	221	3	31	39	30	1.4	451	3703	0.234	8	<5
980	RZ1	SS	56.3725	-132.7746	18	<0.2	28	41	149	1	27	34	24	0.6	637	4258	0.119	6	<5
983	RZ1	SS	56.3496	-132.7243	9	<0.2	20	27	129	2	24	35	19	0.4	652	1809	0.046	12	<5
8941	RZ1	SS	56.3885	-132.6874	<5	<0.2	13	7	67	2	16	19	56	0.5	609	2956	0.072	45	<5
8942	RZ1	SS	56.3845	-132.6911	6	<0.2	57	19	117	3	63	48	62	1	740	5542	0.113	19	<5
8945	RZ1	SS	56.3666	-132.6827	<5	<0.2	20	9	27	1	9	12	3	0.3	237	142	0.087	<5	<5
8959	RZ1	SS	56.3679	-132.7477	6	<0.2	33	10	146	1	30	32	23	0.3	802	1903	0.039	9	<5
8961	RZ1	SS	56.3655	-132.7419	<5	<0.2	37	13	112	2	34	35	31	0.5	725	3172	0.081	15	<5
8962	RZ1	SS	56.3267	-132.7092	<5	<0.2	18	10	80	3	19	29	14	0.3	636	1335	0.05	12	<5
8968	RZ1	SS	56.3788	-132.8054	6	<0.2	35	14	195	2	35	54	40	0.4	619	6419	0.064	6	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
8969	RZ1	SS	56.3603	-132.7216	13	<0.2	45	15	140	2	53	39	31	0.6	784	2839	0.113	11	<5
8986	RZ1	SS	56.3739	-132.7008	<5	<0.2	4	5	30	<1	9	23	3	<0.2	800	159	0.036	<5	<5
8987	RZ1	SS	56.3708	-132.6811	<5	<0.2	15	5	107	1	26	39	21	<0.2	718	1610	0.026	8	<5
970	RZ1	S	56.3662	-132.6838	<5	<0.2	14	9	59	1	21	51	7	<0.2	656	373	0.101	<5	<5
981	RZ1	S	56.3627	-132.7337	<5	<0.2	6	9	32	<1	7	35	8	<0.2	468	147	0.13	<5	<5
982	RZ1	S	56.3589	-132.7122	7	<0.2	22	4	82	2	24	50	15	<0.2	564	292	0.117	<5	<5
988	RZ1	S	56.3706	-132.6810	<5	<0.2	45	<2	95	4	31	55	15	<0.2	562	270	0.117	7	<5
8940	RZ1	S	56.3880	-132.6876	<5	<0.2	25	4	54	2	31	56	10	0.2	595	338	0.124	6	<5
8943	RZ1	S	56.3806	-132.6864	<5	<0.2	17	5	45	2	18	44	4	<0.2	674	203	0.095	<5	<5
8944	RZ1	S	56.3736	-132.6873	<5	<0.2	31	5	56	3	13	48	7	0.4	359	377	0.11	7	<5
8946	RZ1	S	56.3656	-132.6837	<5	<0.2	2	18	8	1	<1	9	<1	<0.2	381	179	0.023	<5	<5
8947	RZ1	S	56.3668	-132.6836	<5	<0.2	12	14	18	2	3	20	<1	<0.2	614	113	0.081	<5	<5
8957	RZ1	S	56.3698	-132.7634	<5	<0.2	28	10	84	2	26	52	10	0.3	666	323	0.069	7	<5
8958	RZ1	S	56.3663	-132.7536	<5	<0.2	12	9	29	2	8	41	3	0.2	444	162	0.166	<5	<5
8960	RZ1	S	56.3667	-132.7449	<5	<0.2	50	8	84	2	42	46	18	0.3	911	478	0.038	<5	<5
8967	RZ1	S	56.3812	-132.8099	<5	<0.2	19	5	45	2	6	46	7	0.2	724	233	0.139	<5	<5
8970	RZ1	S	56.3563	-132.6978	<5	0.2	14	5	62	2	20	41	19	<0.2	681	655	0.153	<5	<5
8985	RZ1	S	56.3736	-132.7001	<5	<0.2	29	<2	56	2	26	40	12	<0.2	753	340	0.069	6	<5
833	RZ2	SS	56.1759	-132.6491	7	<0.2	44	8	79	<1	18	32	16	<0.2	512	632		14	<5
1540	RZ2	SS	56.3988	-132.9042	<5	<0.2	30	9	134	5	50	59	12	0.3	796	707	0.028	23	<5
8921	RZ2	S	56.3992	-132.9069	<5	<0.2	7	9	20	1	8	27	3	0.2	581	111	0.08	<5	<5
8922	RZ2	S	56.3985	-132.9071	<5	<0.2	13	15	23	1	8	39	2	<0.2	605	135	0.125	<5	<5
8923	RZ2	S	56.3991	-132.9020	<5	<0.2	12	15	32	2	9	45	5	0.3	610	201	0.147	7	<5
8924	RZ2	S	56.3991	-132.8997	<5	<0.2	7	11	30	1	8	33	6	<0.2	563	199	0.034	<5	<5
965	RZ3	SS	56.3874	-132.6879	<5	<0.2	8	12	70	2	16	26	40	0.2	753	3708	0.031	20	<5
967	RZ3	SS	56.3789	-132.6866	<5	<0.2	45	8	76	1	24	31	20	0.3	676	1452	0.053	6	<5
1541	RZ3	SS	56.3981	-132.9276	<5	<0.2	18	11	119	2	28	39	22	0.4	677	2375	0.028	15	<5
8909	RZ3	SS	56.4255	-132.9661	<5	<0.2	23	10	133	4	21	36	22	0.6	639	3448	0.19	<5	<5
8911	RZ3	SS	56.4189	-132.9203	<5	<0.2	41	17	163	2	37	38	25	0.6	821	2935	0.053	26	<5
8912	RZ3	SS	56.4106	-132.9057	<5	<0.2	38	15	143	2	25	32	25	0.5	623	3917	0.059	22	<5
8913	RZ3	SS	56.4149	-132.9155	<5	<0.2	74	13	150	2	43	55	34	0.8	<10	5785	0.106	34	<5
8914	RZ3	SS	56.4392	-132.9396	<5	<0.2	19	17	113	4	33	35	46	0.9	<10	6657	0.216	19	<5
8927	RZ3	SS	56.4258	-132.9111	<5	<0.2	19	15	128	3	21	28	20	0.7	614	6689	0.19	7	<5
8929	RZ3	SS	56.4251	-132.9174	<5	<0.2	21	20	159	2	30	22	57	1	822	15895	0.19	18	<5
8930	RZ3	SS	56.4223	-132.9189	<5	<0.2	78	25	231	2	57	39	59	1.2	796	20000	0.137	32	<5

Appendix - Analytical results and locations for all stream sediment and soil samples.

Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
8931	RZ3	SS	56.4214	-132.9257	7	<0.2	53	21	168	2	39	33	37	1.2	759	7518	0.129	84	<5
949	RZ3	S	56.4248	-132.9655	<5	<0.2	22	9	84	2	18	34	14	0.4	827	1127	0.048	11	<5
950	RZ3	S	56.4250	-132.9602	<5	<0.2	14	6	46	5	17	29	7	0.3	713	256	0.025	6	<5
951	RZ3	S	56.4245	-132.9512	<5	<0.2	2	11	13	2	1	7	<1	<0.2	437	94	0.039	<5	<5
952	RZ3	S	56.4386	-132.9392	<5	<0.2	20	12	73	1	25	33	5	<0.2	785	149	0.078	6	<5
953	RZ3	S	56.4404	-132.8028	<5	<0.2	17	3	48	2	33	71	21	0.3	291	199	0.127	<5	<5
954	RZ3	S	56.4284	-132.9804	7	<0.2	17	27	25	7	13	32	3	<0.2	658	117	0.152	<5	<5
955	RZ3	S	56.4253	-132.9148	<5	<0.2	15	13	62	<1	8	17	8	0.3	551	185	0.218	<5	<5
956	RZ3	S	56.4254	-132.9201	<5	<0.2	30	21	128	3	28	38	24	0.8	713	3985	0.29	24	<5
966	RZ3	S	56.3844	-132.6911	<5	<0.2	27	14	41	4	17	34	7	0.3	596	223	0.105	49	<5
1539	RZ3	S	56.4100	-132.9413	6	<0.2	23	26	46	2	3	6	1	0.3	221	219	0.178	<5	<5
8920	RZ3	S	56.4032	-132.9282	<5	<0.2	9	7	19	2	6	33	4	0.2	368	103	0.079	<5	<5
8928	RZ3	S	56.4248	-132.9161	<5	<0.2	43	67	100	2	42	186	15	0.4	446	443	0.203	27	<5
8933	RZ4	SS	56.4486	-132.9035	<5	<0.2	29	11	139	2	42	55	25	0.5	686	4995	0.124	9	<5
8934	RZ4	SS	56.4447	-132.9013	<5	<0.2	25	9	111	2	36	53	18	0.5	652	2562	0.128	6	<5
8935	RZ4	SS	56.4482	-132.9044	<5	<0.2	35	9	104	2	28	41	17	0.3	689	1535	0.045	12	<5
957	RZ4	S	56.4458	-132.9017	<5	<0.2	31	11	84	3	52	106	16	<0.2	615	303	0.17	<5	<5
958	RZ4	S	56.4428	-132.9004	11	<0.2	14	9	53	3	12	29	7	0.3	557	137	0.084	20	<5
8932	RZ4	S	56.4492	-132.9034	<5	0.4	47	11	101	6	29	53	14	0.9	689	289	0.207	<5	<5
8971	RZ5	SS	56.4412	-132.8024	<5	<0.2	21	7	134	2	40	74	21	<0.2	653	1360	0.046	<5	<5
972	RZ7	SS	56.2905	-132.7608	<5	<0.2	5	8	54	1	15	30	10	<0.2	698	728	0.041	6	<5
8948	RZ7	SS	56.2884	-132.7586	<5	<0.2	11	14	58	3	13	28	9	<0.2	499	412	0.09	7	<5
8951	RZ7	SS	56.2898	-132.7604	<5	<0.2	18	7	66	2	16	31	12	0.3	659	776	0.029	13	<5
8956	RZ7	SS	56.3686	-132.7582	<5	<0.2	32	11	102	2	29	32	28	0.4	794	2882	0.032	17	<5
971	RZ7	S	56.2898	-132.7592	<5	<0.2	75	6	80	6	28	40	14	<0.2	530	382	0.028	7	<5
8949	RZ7	S	56.2879	-132.7582	<5	<0.2	15	10	55	3	14	37	8	0.3	537	320	0.064	<5	<5
8950	RZ7	S	56.2888	-132.7600	<5	<0.2	1	13	15	6	3	9	<1	<0.2	813	112	0.033	8	<5
8952	RZ7	S	56.2901	-132.7608	<5	<0.2	23	8	11	<1	<1	3	<1	<0.2	190	13	0.072	<5	<5
8953	RZ7	S	56.2905	-132.7607	<5	<0.2	14	8	23	1	7	26	2	<0.2	631	150	0.035	<5	<5
8954	RZ7	S	56.2899	-132.7621	<5	<0.2	8	13	14	2	2	11	1	0.2	662	93	0.062	<5	<5
8955	RZ7	S	56.2897	-132.7632	<5	<0.2	12	18	44	1	18	38	5	<0.2	689	310	0.064	5	<5
8984	RE2	SS	56.4542	-132.8821	<5	<0.2	15	6	114	1	23	37	15	<0.2	670	1386	0.023	8	<5
831	RE2	S	56.1917	-132.6642	<5	<0.2	9	56	79	7	4	22	6	0.9	301	159		16	<5
8983	RE2	S	56.1945	-132.6473	6	<0.2	8	3	40	2	16	38	8	<0.2	627	265	0.075	36	<5
8991	RE2	S	56.1925	-132.6637	8	0.3	11	8	21	3	<1	7	<1	<0.2	540	33	0.138	<5	<5

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Sample No	Location	Sample Type	Latitude (d.dddd)	Longitude (-d.dddd)	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Cr ppm	Co ppm	Cd ppm	Ba ppm	Mn ppm	Hg ppm	As ppm	Sb ppm
987	RE3	SS	56.1726	-132.5943	18	<0.2	24	13	134	2	22	31	18	0.4	615	1314	0.037	21	<5
8996	RE3	SS	56.1876	-132.6264	13	<0.2	28	12	173	3	32	54	20	0.2	624	975	0.059	41	<5
8997	RE3	SS	56.1868	-132.6293	<5	<0.2	19	10	147	4	22	38	16	<0.2	666	925	0.048	42	<5
8999	RE3	SS	56.1828	-132.6228	18	<0.2	19	14	141	4	26	39	20	0.3	952	1584	0.038	48	<5
8998	RE3	S	56.1834	-132.6232	<5	<0.2	1	<2	5	<1	<1	<1	<1	<0.2	539	24	0.015	<5	<5
986	RE4	SS	56.1734	-132.5727	15	<0.2	17	15	100	2	24	41	19	0.4	633	1134	0.06	19	<5
8975	RE4	SS	56.1857	-132.5248	<5	<0.2	4	14	79	11	21	38	84	0.5	567	12319	0.041	149	<5
8979	RE4	SS	56.1906	-132.5530	8	<0.2	8	78	126	5	24	108	11	0.7	909	649	0.02	32	<5
1587	RE4	S	56.1833	-132.5663	6	<0.2	2	<2	28	3	9	66	9	<0.2	424	95	0.163	<5	<5
1588	RE4	S	56.1834	-132.5650	<5	<0.2	7	<2	42	12	20	60	8	<0.2	533	133	0.089	71	<5
1589	RE4	S	56.1756	-132.5675	32	<0.2	2	7	18	3	4	41	4	<0.2	600	58	0.092	<5	<5
1590	RE4	S	56.1794	-132.5781	6	<0.2	10	3	31	3	11	55	5	<0.2	540	111	0.102	5	<5
8976	RE4	S	56.1836	-132.5751	5	<0.2	21	<2	54	3	22	53	8	<0.2	669	202	0.046	<5	<5
8977	RE4	S	56.1909	-132.5471	6	<0.2	8	7	33	3	10	56	8	<0.2	601	104	0.107	13	<5
8978	RE4	S	56.1908	-132.5530	13	<0.2	7	5	46	5	12	41	9	<0.2	621	165	0.153	7	<5
8980	RE4	S	56.1907	-132.5611	<5	<0.2	3	5	22	2	8	33	5	<0.2	686	89	0.078	7	<5
8981	RE4	S	56.1757	-132.5733	<5	<0.2	2	4	21	2	7	40	4	<0.2	695	73	0.059	<5	<5
8982	RE4	S	56.1945	-132.6511	7	<0.2	14	<2	171	4	37	54	16	0.3	540	311	0.143	9	<5
8974	RE6	SS	56.1871	-132.5079	19	<0.2	11	14	89	2	19	39	13	0.3	646	981	0.042	9	<5
1591	RE7	SS	56.1705	-132.5055	8	<0.2	12	5	58	<1	26	50	10	<0.2	676	409	0.024	<5	<5
8993	RE7	SS	56.1581	-132.5045	9	<0.2	25	19	112	2	36	70	16	0.2	759	901	0.034	9	<5
9729	RE7	SS	56.1705	-132.5057	<5	<0.2	13	<2	49	1	23	43	9	<0.2	690	349	0.024	<5	<5
8992	RE7	S	56.1582	-132.5018	<5	<0.2	9	7	32	1	<1	4	3	0.4	921	65	0.046	<5	<5
6365	Portage Bay area	SS	56.9818	-133.2926	<5	<0.2	121	3	56	<1	23	33	28	<0.2	377	421	0.031	<5	<5
6367	Portage Bay area	SS	56.9171	-133.2558	29	<0.2	21	18	66	2	18	35	17	0.3	534	972	0.033	24	<5
6370	Portage Bay area	SS	56.9166	-133.2793	24	<0.2	21	36	159	1	11	23	16	1.4	373	539	0.061	35	<5
6395	Portage Mtn Group	SS	56.8593	-133.2617	13	<0.2	115	3	74	3	33	52	47	0.4	208	1090	0.05	<5	<5