Geologic Field Notes, Geochemical Analyses, and Field Photographs of Outcrops and Rock Samples from the Big Delta B-1 Quadrangle, East-Central Alaska

By Warren C. Day and J. Michael O'Neill

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.03937	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
kilometer (km)	0.5400	mile, nautical (nmi)
meter (m)	1.094	yard (yd)

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Abstract

The U.S. Geological Survey, in cooperation with the Alaska Department of Natural Resources Division of Mining, Land, and Water, has released a geologic map of the Big Delta B-1 quadrangle of east-central Alaska (Day and others, 2007). This companion report presents the major element oxide and trace element geochemical analyses, including those for gold, silver, and base metals, for representative rock units and for grab samples from quartz veins and mineralized zones within the quadrangle. Also included are field station locations, field notes, structural data, and field photographs based primarily on observations by W.C. Day with additions by J.M. O'Neill and B.M. Gamble, all of the U.S. Geological Survey. The data are provided in both Microsoft Excel spread sheet format and as a Microsoft Access database.

Introduction

This report presents the geochemical analyses and field data that support the geologic map of Day and others (2007) for the Big Delta B-1 quadrangle, east-central Alaska. The effort was conducted as part of a five-year U.S. Geological Survey (USGS) project effort, funded by the Mineral Resources Program, formally entitled "Tintina Metallogenic Province: Integrated Studies on Geologic Framework, Mineral Resources, and Environmental Signatures," a brief overview of which is given in Gough and Day (2007).

The field work to support the geologic mapping campaign occurred as one- and two-week-long field sessions during the summers of 2003–2006 by Warren C. Day and J. Michael O'Neill, both with the U.S. Geological Survey. The field work during the summer of 2005 was severely curtailed due to regional wildfire activity, which obscured the area in a thick blanket of smoke, preventing the safe use of a helicopter critical for field work in this remote area. The rock samples and observations were collected by both W.C. Day and J.M. O'Neill. The photographs presented herein were taken by W.C. Day.

Analytical Geochemistry Methods

The analytical procedures used for the geochemical data given in this report followed the methods presented in Taggart (2002). The analytical method, lower limit of detection, and laboratory used for the analyses reported in this data release are listed in table 1, and the geochemical analyses are given in table 2. Two laboratories were used. The USGS Central Region Mineral Resources and Crustal Imaging and Characterization Teams laboratories in Denver, Colo., were utilized for the wavelength dispersive X-ray fluorescence (WDXRF), loss on ignition (LOI) at 950^{o}C, energy dispersive X-ray fluorescence (EDXRF), and sinter digestion inductively coupled plasma–mass spectrometry (ICP–MS) analytical techniques. Ferrous iron oxide (FeO), arsenic, and gold analyses were provided by SGS (formerly XRAL) Laboratory of Toronto, Canada, using the methods listed in table 1. The ferric iron oxide (Fe_2O_3) concentrations reported in table 2 were calculated by subtracting the ferrous iron oxide component from the total iron oxide ($FeTO_3$) concentrations reported from the WDXRF data on a per iron atom basis (Fe_2O_3=$FeTO_3$-1.11*FeO).

Geologic Field Notes

The geologic field notes (table 3) are keyed to unique location identifiers, which include the year the observation was made, an identifier for the field geologist making the observation, and a field station number. For example, the field number 03AD002 refers to a site that was occupied during the 2003 field season by W.C. Day (A=Alaska, D=Day), and was the second site (----002) visited that year. The field stations with "MO" refer to observations by J. Michael O'Neill, and those with "AG" are observations by Bruce M. Gamble (USGS) during reconnaissance field work of 1998 while he was working on the Big Delta B-2 geologic map (Day and others, 2003).

The latitude and longitude location information for the field stations is given in decimal degrees based on the North American Datum of 1927 (NAD 27) and the Clarke 1866

Table 1. Analytical methods, detection limits, and laboratory used for geochemical analyses for rocks samples. wt % = weight percent; ppm=parts per million; n.a.=not analyzed; inf=interference of the spectra of the element of interest by another element, usually of high concentration

Element(s)	Analytical Method	Lower Limit of Detection	Laboratory
Major element oxides (wt %) SiO_2, Al_2O_3, $FeTO_3$, MgO, K_2O, TiO_2, MnO	WDXRF	0.01 wt %	USGS
CaO, TiO_2	WDXRF	0.02 wt %	USGS
NaO	WDXRF	0.15 wt %	USGS
P_2O_5	WDXRF	0.05 wt %	USGS
Loss on ignition (wt %) (LOI)	Weight loss on 950^{o}C ignition	0.01 wt %	USGS
FeO (wt %)	Acid digestion and titration	0.01 wt %	Contract laboratory
Fe_2O_3 (wt %)	Calculated	0.01 wt %	n.a.
Au (ppm)	Fire assay direct coupled plasma spectrophotometry	0.005 ppm	Contract laboratory
As Hyd (ppm)	Hydride generation atomic absorption spectroscopy	0.6 ppm	Contract laboratory
Ag, Br, Cd, Se (ppm)	EDXRF	1 ppm	USGS
As, Cu, Ga, Ge, Mo, Nb, Ni, Rb, Sb, Sn, Sr, Y, Zn, Zr (ppm)	EDXRF	2 ppm	USGS
Pb (ppm)	EDXRF	3 ppm	USGS
Th, U (ppm)	EDXRF	4 ppm	USGS
Ba, Bi, Ce, Cr, Cs, Cu, La, V, W (ppm)	EDXRF	5 ppm	USGS
Nd (ppm)	EDXRF	10 ppm	USGS
Eu, Tb	Sinter ICP-MS	0.005 ppm	USGS
Tm, Yb	Sinter ICP-MS	0.006 ppm	USGS
Ho, Ta	Sinter ICP-MS	0.015 ppm	USGS
Lu	Sinter ICP-MS	0.03 ppm	USGS
Gd, Sm, U	Sinter ICP-MS	0.02 ppm	USGS
Dy, Er, La, Pr, Y	Sinter ICP-MS	0.04 ppm	USGS
Hf	Sinter ICP-MS	0.06 ppm	USGS
Ce, Nb, Th	Sinter ICP-MS	0.1 ppm	USGS
Nd	Sinter ICP-MS	0.15 ppm	USGS
Ba	Sinter ICP-MS	0.25 ppm	USGS
Sn (ppm)	Sinter ICP-MS	0.5 ppm	USGS
Zr	Sinter ICP-MS	2 ppm	USGS

ellipsoid. The geologic field notes presented in table 3 should be considered initial impressions of outcrops or field stations. The notes contain observations that were made as the geologist progressed from one field station to another, often referring to a given reference field station within an area as a point of reference. Amalgamations of these observations were used as map unit descriptions for the map by Day and others (2007). As such, the column heading in the Microsoft Access database (Big-Delta_B1 quadrangle MS Access database) entitled "Map_Unit" is taken from the location of the field station with respect to the geologic map and is the predominant rock type at the area; the column heading "Rock_Type" is a short description of the dominant of rock type present at the field station; and the column heading "Notes" is a short, informal description of the rock type, potential correlation with other field stations, and thoughts about the origin of the unit.

The structural data recorded for the strike and dip of the foliation (planar fabrics, or S fabrics), trend and plunge of lineation (mineral and stretching lineations, or L fabrics), and the trend and plunge of fold axes (F fabrics) are given in standard notation as azimuth degrees from true north (strike or trend) and degrees of departure from the horizontal (dip or plunge). The structural data are keyed to the regional deformational episode. The earliest penetrative fabrics are related to the D1 deformational episode. Therefore, the fields S1 and F1 refer to the oldest known deformational fabrics recorded. These fabrics preceded the regional Mesozoic metamorphic and tectonic episode. The second deformational episode, D2, was the strong, regional Mesozoic episode of dynamothermal metamorphism, recrystallization, and thrusting. The mesoscopic fabrics associated with this episode are recorded as S2, L2, and F2, corresponding to planar (S) and linear (L) fabrics and folded schistosity (F). Often, the S2 fabrics were folded by contemporaneous D2 folding events, yielding the F2 folds. The L2 fabrics are dominantly stretching lineations in the augen gneiss, whereas in the biotite gneiss, the L fabrics are mineral and intersection lineations. Occasionally, secondary lineations were developed during the peak D2 regional metamorphism and are noted by the "L2b_trend" and "L2b_plunge" notation. Later, post-peak metamorphic deformation (D3) generated local planar (S3) fabrics within the axes of (F3) folds. The D3 fabrics are uncommon to rare, but do exist within the study area.

Field Photographs

Digital photographs were taken of selected outcrops to record rock textures, colors, and structural fabrics. The field photographs are keyed to the field station ("Field_Number" in Access database and tables 2, 3, and 4) for a given location and informal notes are given in table 4 ("Descriptions"). Often several photographs were taken at a single location. Each photograph is assigned a unique identifier starting with the field number and are sequentially ordered alphabetically. Their location information can be linked to the unique field number listed in table 3.

Geologic Setting

The following is excerpted from Day and others (2007) to provide a context for the geologic notes (tables 3 and 4) and the geochemical data (table 2) presented in this report. Weber and others (1978) provide an excellent regional geologic map of the Big Delta 1:250,000 quadrangle. A more detailed reconnaissance geologic map for the Big Delta B-1 quadrangle at a scale of 1:63,360 was produced by Weber and others (1975).

Paleozoic Units

The oldest units in the map area are schists and gneisses of pre-Late Devonian age. The protolith rocks for the schist units were pelite intermixed with sandstone, graywacke, aluminous quartzofeldspathic epiclastic sediments, as well as basaltic flows or volcaniclastic sediments. The depositional age of the protoliths is poorly constrained, but Aleinikoff and others (1986) dated a zircon fraction from the unit that yielded a Late Devonian age (~383 Ma), which they interpreted to be from a felsic volcaniclastic unit within the biotite schist deposited contemporaneously within the protolith sediment. Dusel-Bacon and others (2001) reported a Late Devonian crystallization age (361±3 Ma) for the protolith of the amphibolite gneiss intersected in drill core through the augen gneiss near the Brink intrusion. The supracrustal rocks were invaded by sills of trondhjemite and granodiorite. One such granodioritic horizon, or neosome, within unit Pzgn yields a crystallization age of 351 ± 3 Ma. Where observed, the zircons from these and similar units (Dusel-Bacon and others, 2006) contain Neoproterozoic to Paleoproterozoic cores, indicating a continental source for the sediments.

Two rock types intruded the pre-Late Devonian metasedimentary rocks—the protoliths for the augen gneiss and the biotite orthogneiss. The augen gneiss, which is well exposed in the Central Creek watershed, forms a regionally extensive body whose protolith is interpreted to have been a granodiorite intrusion (Dusel-Bacon and Aleinikoff, 1985). Rafts of biotite schist and amphibolite gneiss mapped within the Middle to Late Devonian augen gneiss, like those analyzed by Dusel-Bacon and others (2001), probably represent country rock entrained during the Late Devonian plutonism. Both the metamorphosed country rocks and the Devonian intrusive units were subsequently strongly deformed during regional ductile Mesozoic metamorphism and tectonism. Several mafic gneiss bodies (Day and others, 2003) form klippes on top of the augen gneiss in the Big Delta B-2 quadrangle to the west.

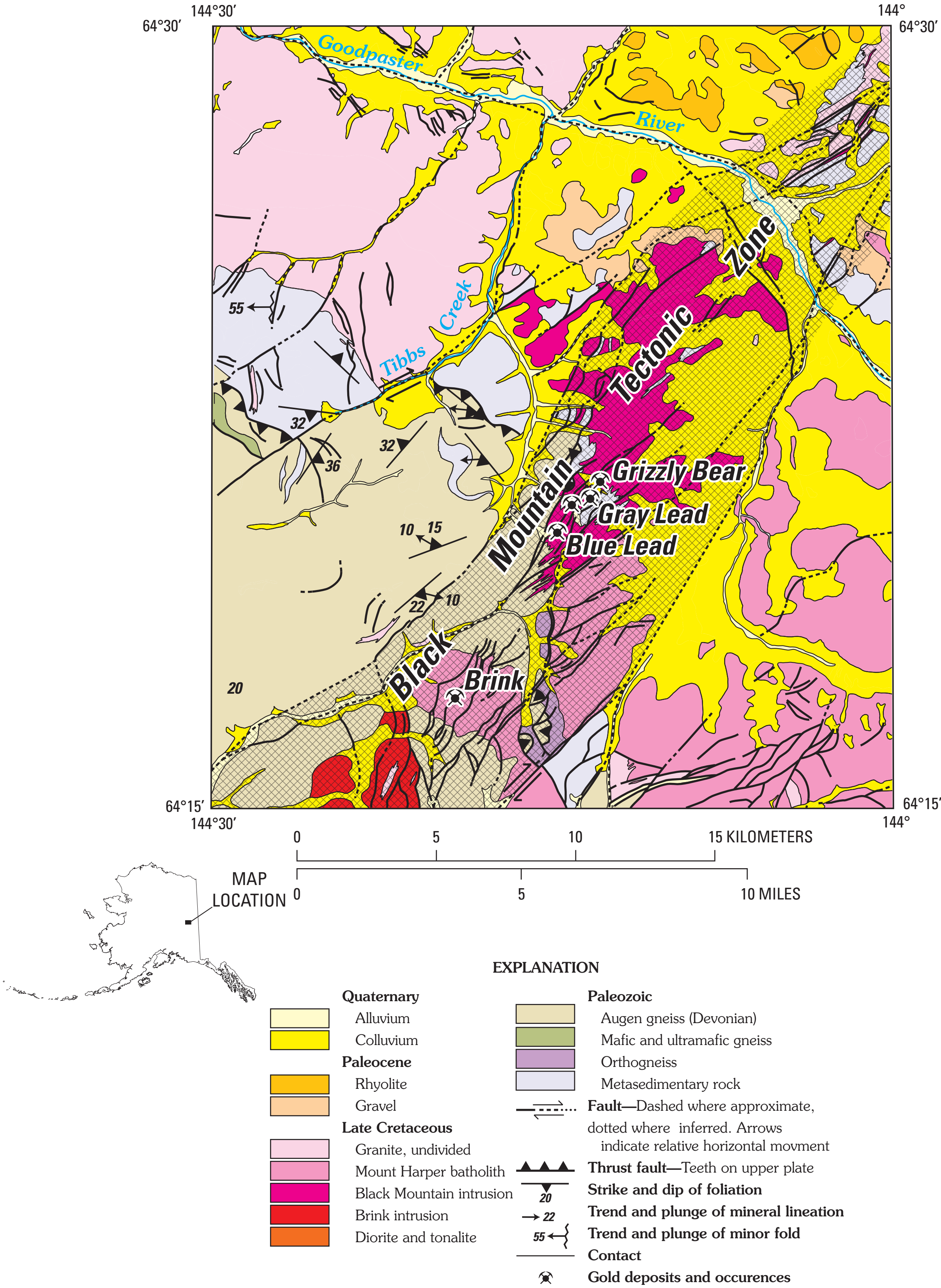

Figure 1. Simplified geologic map of the Big Delta B-1 from Day and others, 2007, Alaska showing the location of gold deposit and prospects and the extent of the Black Mountain tectonic zone.

Sensitive high resolution ion-microprobe (SHRIMP) U-Pb zircon data indicate Late Devonian igneous crystallization age for the augen gneiss (~360-372 Ma), allowing for analytical uncertainties; (Dusel-Bacon and Aleinikoff, 1985; Day and others, 2003). The augen gneiss ages overlap the crystallization age for the amphibolite gneiss, indicating coeval, bimodal magmatism for the protoliths of these units (Dusel-Bacon and others, 2006).

The other unit intruding the pre-Late Devonian supracrustal rocks is the biotite orthogneiss, whose composition includes tonalite, trondhjemite, and granodiorite. The unit forms sills and massive intrusions within the biotite schists. The few reliable crystallization ages available indicate the unit is Devonian, with an age range that overlaps the presumed crystallization age of the protolith of the augen gneiss (Dag). All of the zircon cores are xenocrystic and have Proterozoic to Devonian ages, indicating that the protolith melts were derived from continental crustal material.

Mesozoic Units

Peak metamorphism and deformation in the Fortymile assemblage in the eastern part of the Yukon-Tanana Upland of Alaska ended in the Jurassic by about 196 ± 4 Ma as indicated by the intrusion of nonfoliated leucogranite (Day and others, 2002). However, in the Lake George assemblage, metamorphism and ductile deformation peaked at about 117 ± 3 Ma as evidenced by metamorphic overgrowths of zircon in mylonite zones (Day and others, 2003). The Brink intrusion, which crystallized at about 113 Ma, is the oldest post-kinematic pluton in the map area. This follows the observations of Foster (1992), who noted that the ages of plutonism in the eastern part of the Yukon-Tanana Upland were Jurassic and Cretaceous, whereas in the western part the age of plutonism was Cretaceous. The Early Cretaceous Mount Harper batholith, whose western margin lies in the Big Delta B-1 quadrangle, marks the easternmost extent of the Cretaceous-only plutons within the Upland. The Mount Harper batholith also lies within the northeast-trending regional geophysical anomaly noted by Saltus (2005) and Saltus and Day (2007), which is interpreted to be the deep crustal component of the Black Mountain tectonic zone mapped herein.

The main pulse of Cretaceous plutonism occurred during the waning stages of regional dynamothermal tectonism at about 111 Ma with the emplacement of the Mount Harper batholith, the granite of Tibbs Creek, and the Goodpaster batholith, all of which are I-type biotite granodiorite to granite in composition. Intrusion of the I-type biotite and hornblende-biotite granodiorite and hornblende-biotite diorite followed closely thereafter from about 109 to 107.6 Ma. This later suite of intrusions is spatially associated with known gold (±antimony) lode vein and disseminated prospects and deposits such as the Brink, Blue Lead, Gray Lead, and the Grizzly Bear mine. To the west in the Big Delta B-2 quadrangle, the Pogo gold deposit lies adjacent to the biotite-hornblende granodiorite of the Goodpaster batholith, which extends into the Big Delta B-1 quadrangle. As described below, the Black Mountain tectonic zone controlled the emplacement of at least the Early Cretaceous diorite dikes and associated lode gold vein prospects and deposits in the Big Delta B-1 quadrangle.

A distinctive second pulse of Cretaceous intrusion is represented by quartz biotite-bearing, feldspar-megacrystic porphyry dikes and small intrusions. U-Pb SHRIMP ages for two samples from the unit yield crystallization ages of 95.4 ± 0.9 Ma and 99.5 ± 0.9 Ma, respectively. The nonfoliated (post-kinematic) quartz feldspar porphyry was emplaced along east-northeast-trending ductile shear zones in the southeastern part of the quadrangle. The shear zones that host the Cretaceous quartz feldspar porphyry were kinematically linked to the northeast-trending faults and shear zones assigned to the Black Mountain tectonic zone.

Cenozoic Units

The 57.2 Ma (Paleocene) rhyolite tuffs form part of a rhyolite flow-dome complex made up of crystal-rich tuffaceous flows, rhyolite dikes, and sinter deposits in the northeastern part of the Big Delta B-1 quadrangle. Post-Paleocene erosion resulted in the sculpting of broad, open terraces in the northern part of the Big Delta B-1 quadrangle, leaving behind residual boulder and gravel deposits. The surface is best developed along the current location of the Goodpaster River and in the headwaters region of the Eisenmenger Fork. Locally, gravel deposits were developed upon the Goodpaster batholith. The contact is interpreted to be a simple, conformable contact. However, the rhyolite does occur adjacent to or overlying buried northeast-trending high-angle faults associated with the northeast-trending Black Mountain tectonic zone.

Fine-grained nonfoliated basalt dikes locally crosscut the granitoid rocks. Although the absolute age for the basaltic dikes is unknown, they may be correlative with a 50–54 Ma bimodal dike swarm commonly observed throughout the Yukon-Tanana Upland (Newberry and others, 1998).

Weber and others (1978) noted glacial deposits in the Eisenmenger Fork region of the Big Delta B-1 quadrangle and along the Boulder Creek drainage. Our mapping has revealed that the extent of glacial deposits are limited to moraines within the U-shaped valley of the eastern fork of Boulder Creek in the southeast corner of the quadrangle.

Quaternary surficial deposits form terrace and alluvial fan deposits of sand and silt that were shed off of the highlands of crystalline basement. Active erosion has down cut through the older Paleocene and Pleistocene(?) terrace deposits, forming unconsolidated deposits of pebbles, cobbles, and boulders along the stream banks. Locally, solifluction deposits associated with freeze-thaw areas underlain by permafrost occur in the highland regions of the map area.

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Table 2. Major element oxide, trace element, gold and rare earth element analyses.

Field_Number	Latitude	Longitude	SiO2	Al2O3	FeTO3	FeO	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO	LOI	Au ppm	Ag edxrf	As Hyd
03AD002	64.384	-144.4701	71.6	14.4	2.61	1.8	0.61	0.65	2.46	2.66	3.63	0.38	0.14	0.06	0.7	<0.005	<1	1.2
03AD006	64.3812	-144.4897	53.7	15.4	11.7	7.47	3.41	4.88	8.12	2.54	0.31	1.33	0.17	0.16	1.33	<0.005	<1	0.8
03AD015	64.4144	-144.3763	71.3	13.5	5.24	3.8	1.02	1.99	0.66	0.88	2.78	0.71	0.1	0.05	2.29	0.009	<1	1.1
03AD028	64.3976	-144.4009	68.4	15	3.25	2.64	0.32	1.17	3.76	2.27	2.7	0.65	0.17	0.04	1.75	<0.005	<1	0.8
03AD029	64.3978	-144.3983	72.9	15.3	0.48	0.2	0.26	0.19	1.87	3.11	4.3	0.04	0.08	0.02	0.94	<0.005	<1	0.8
03AD036	64.4018	-144.364	79.1	10.5	3.28	2.19	0.85	1.1	0.34	0.84	2.16	0.37	0.09	0.05	1.89	<0.005	<1	4.1
03AD052	64.3327	-144.2174	69.8	15	3.38	2.12	1.03	0.91	2.47	2.96	3.35	0.42	0.17	0.07	1.06	<0.005	<1	1.4
03AD055	64.3381	-144.2357	66.9	15.7	4.29	3.35	0.57	1.53	3.64	2.88	2.71	0.54	0.2	0.08	0.83	<0.005	<1	0.8
03AD056	64.3431	-144.2449	69.7	14.8	3.42	2.7	0.42	1.06	2.69	2.78	3.36	0.42	0.17	0.05	0.9	<0.005	<1	1.1
03AD057	64.3447	-144.2507	96.8	0.84	0.56	0.06	0.49	<0.10	0.02	<0.15	0.17	0.03	0.05	0.01	0.44	0.506	<1	3151
03AD060	64.3522	-144.208	94.6	1.89	1.02	0.16	0.84	<0.10	0.03	<0.15	0.46	0.08	0.05	0.02	0.8	4.47	<1	6976
03AD062	64.3569	-144.1929	87.8	6.03	0.85	0.1	0.74	0.17	0.23	0.66	1.64	0.09	0.07	0.01	1.19	69	7	1519
03AD066	64.3482	-144.3482	73	13.9	2.34	1.61	0.55	0.48	1.68	2.76	3.7	0.26	0.13	0.05	0.84	<0.005	<1	2.5
03AD067	64.3493	-144.201	94.5	2.46	0.49	0.06	0.42	<0.10	0.04	<0.15	0.71	0.06	0.06	0.01	0.51	0.059	<1	397
03AD071	64.3575	-144.2047	98.1	0.84	0.42	0.1	0.31	<0.10	<0.02	<0.15	0.22	0.04	0.05	0.01	0.31	<0.005	<1	26.2
03AD073	64.3609	-144.2125	70.3	15.1	2.58	1.61	0.79	0.77	2.19	2.88	3.86	0.38	0.17	0.05	0.89	<0.005	<1	1.4
03AD088	64.4051	-144.1871	68.5	15.1	4.00	2.7	1.00	1.28	3.07	2.89	3.23	0.47	0.18	0.09	0.66	<0.005	<1	0.7
03AD096	64.4087	-144.2506	72.5	14.1	2.11	1.54	0.40	0.53	1.64	2.63	4.3	0.26	0.13	0.05	1.03	0.012	<1	<0.6
03AD105	64.3725	-144.4657	71.1	13.5	4.52	3.41	0.73	1.48	1.85	2.36	2.68	0.6	0.13	0.06	1.08	<0.005	<1	<0.6
03AD106	64.3748	-144.192	64.2	16	5.27	3.73	1.13	1.87	4.56	2.78	2.08	0.6	0.22	0.11	1.51	<0.005	<1	<0.6
03AD107	64.3327	-144.2175	69.3	14.6	3.23	1.99	1.02	1.06	2.85	2.84	3.73	0.4	0.16	0.07	0.64	<0.005	<1	0.8
03GL001R	64.4673	-144.2587	98	0.51	0.37	0.03	0.34	<0.10	<0.02	<0.15	0.1	0.02	<0.05	0.01	0.21	<0.005	<1	47.8
03GL008R1	64.3749	-144.2142	82.9	9.32	1.55	0.29	1.23	0.25	0.08	<0.15	2.79	0.15	0.1	0.01	1.92	12.3	5	1683
03GL008R2	64.3749	-144.2142	73.4	14.7	2.22	0.19	2.01	0.25	0.12	1.82	4.69	0.24	0.14	0.05	2.01	<0.005	<1	34.5
03GL014R	64.3432	-144.2528	97.6	0.33	0.42	0.16	0.24	<0.10	0.02	<0.15	0.05	0.03	<0.05	0.01	0.35	163	10	287
04AD209A	64.4117	-144.4695	64	16	7.12	4.84	1.74	1.81	4.75	1.43	2.27	0.64	0.17	0.29	0.91	<0.005	<1	<0.6
04AD217	64.4126	-144.4292	69.8	15	2.32	1.8	0.32	0.65	1.54	2.92	5.45	0.36	0.1	0.04	0.67	<0.005	<1	1.4
04AD219	64.414	-144.4259	62	15.4	6.27	4.88	0.85	0.94	4.99	3.02	1.63	0.5	0.23	0.12	3.94	<0.005	<1	3.1
04AD220	64.416	-144.4241	72.6	14.1	1.86	1.41	0.29	0.56	2.06	2.78	3.84	0.24	0.12	0.04	0.39	<0.005	<1	0.28
04AD225	64.4146	-144.1627	63.5	16.4	5.31	3.14	1.82	2.04	5.21	2.74	2.16	0.63	0.2	0.11	0.76	<0.005	<1	0.28
04AD232	64.3569	-144.0194	67.1	15.4	3.89	2.08	1.58	1.41	3.38	3.06	3.35	0.49	0.19	0.08	0.43	<0.005	<1	0.76
04AD233	64.4127	-144.0046	76.4	11.6	3.5	1.99	1.29	1.36	0.34	0.41	2.24	0.21	0.07	0.03	2.38	<0.005	<1	0.7
04AD235	64.4162	-144.0155	71	13.8	4.78	3.01	1.44	1.71	0.15	0.62	3.14	0.54	0.09	0.05	3.35	<0.005	<1	8.3
04AD239	64.4953	-144.0453	72.2	13.6	2.12	0.51	1.55	0.32	0.89	2.56	5.4	0.33	0.1	0.03	1.49	<0.005	<1	1.7
04AD241A	64.4931	-144.0549	74.6	11.9	1.87	0.9	0.87	0.21	1.1	1.86	6.66	0.29	0.14	0.03	0.89	<0.005	<1	1.5
04AD241B	64.4931	-144.0549	74.1	12	1.86	0.58	1.22	0.18	1.05	1.58	7.28	0.31	0.1	0.05	0.84	<0.005	<1	1.4
04AD242	64.4932	-144.0622	70	13.3	2.64	1.54	0.93	0.31	1.53	3.74	3.91	0.36	0.12	0.04	3.29	<0.005	<1	2
04AD246	64.4697	-144.0432	52.5	16.9	9.69	7.63	1.21	6.6	10.1	1.36	0.78	0.75	0.11	0.16	0.8	<0.005	<1	2.6
04AD262	64.2609	-144.3511	53.4	16.8	8.09	6.06	1.36	4.31	7.19	2.48	1.42	0.93	0.21	0.16	4.08	0.005	1	1.2
04AD271	64.2608	-144.3951	68	15.4	3.08	2.12	0.72	1.59	3.11	3.17	3.36	0.38	0.16	0.08	0.71	<0.005	<1	0.65
04AD274	64.2515	-144.3648	98.1	<0.10	0.29	0.03	0.26	<0.10	0.06	<0.15	0.02	<0.02	<0.05	<0.01	0.11	1.575	<1	13
04GL030R	64.297	-144.2621	77	12.2	1.41	0.22	1.17	0.2	1.15	2.65	3.1	0.18	0.16	0.06	1.96	<0.005	<1	4.5
04MO086	64.482	-144.0236	74.1	13.7	1.27	0.64	0.56	0.23	1.12	2.93	4.25	0.15	0.12	0.04	0.94	<0.005	<1	0.25
05AD306A	64.3429	-144.2528	69.9	14.3	3.39	2.39	0.73	1.09	2.62	2.67	3.55	0.41	0.17	0.05	0.85	0.01	<1	5
05AD306B	64.3429	-144.2528	97.9	0.2	0.45	0.04	0.41	<0.10	0.08	<0.15	0.02	<0.02	0.06	<0.01	0.5	2.35	<1	2240
05AD309	64.3078	-144.2307	68	15.5	4.17	2.91	0.94	1.23	3.82	3.03	1.98	0.51	0.23	0.06	0.78	<0.005	<1	9.7
05AD315	64.2923	-144.2269	70.1	14.7	2.79	1.87	0.71	0.91	2.38	2.82	3.87	0.35	0.17	0.08	1.03	<0.005	<1	2.6
05AD317	64.2999	-144.2481	71.7	14	3.13	1.94	0.97	0.91	2.69	2.53	2.66	0.31	0.11	0.07	0.96	0.049	<1	1.9
05AD318	64.3	-144.2495	71.3	15.7	0.21	0.04	0.17	<0.10	0.40	2.55	8.13	0.03	0.08	0.01	0.78	<0.005	<1	2
05AD319	64.2999	-144.2506	76.2	12.9	1.57	0.18	1.37	0.59	0.06	1.39	3.43	0.37	0.09	0.01	2.49	0.06	<1	101
05AD320	64.2998	-144.252	63.3	15.7	5.34	3.49	1.46	2.83	4.19	2.9	2.56	0.68	0.18	0.1	1.54	<0.005	<1	3.4
05AD323	64.2804	-144.2355	94.9	1.37	0.75	0.11	0.63	<0.10	0.06	<0.15	0.42	0.03	0.07	0.01	0.56	0.158	45	98.8
05AD324	64.2781	-144.241	75.3	14	0.86	0.22	0.62	<0.10	0.44	3.31	4.56	0.06	0.17	0.1	0.9	<0.005	<1	4.5
05AD325	64.2775	-144.2471	67.5	15.3	4.35	3.04	0.97	1.39	3.17	2.83	2.85	0.65	0.22	0.07	1.04	<0.005	<1	3.2
05AD332	64.2891	-144.2551	73.7	13.7	1.6	0.54	1.01	0.24	0.99	2.48	5.27	0.21	0.14	0.03	0.92	<0.005	<1	5.9
05AD339	64.262	-144.2469	69.3	15.3	3.27	2.13	0.90	1.1	3.00	2.95	3.86	0.41	0.19	0.07	0.35	0.01	<1	5.4
05AD349	64.2777	-144.1684	74.5	13.6	1.76	1.13	0.50	0.34	1.59	3.00	3.61	0.18	0.14	0.04	0.72	<0.005	<1	2.3
05AD352	64.2667	-144.1859	95.2	0.35	1.53	0.11	1.41	<0.10	0.06	<0.15	0.09	0.02	0.08	<0.01	1.39	0.471	65	9310
05AD353	64.2659	-144.1874	70.5	14.7	3.1	2.1	0.77	1.13	2.64	3.23	3.19	0.4	0.17	0.03	0.68	<0.005	<1	22.9
05AD355	64.2638	-144.1884	97.4	0.51	0.54	0.11	0.42	<0.10	0.08	<0.15	0.16	0.05	0.06	0.01	0.38	0.179	<1	19.7
05AD368	64.2564	-144.1409	72.2	13.9	2.6	1.74	0.67	0.76	2.17	2.83	3.7	0.33	0.18	0.06	0.76	<0.005	<1	4.6
05AD378	64.4543	-144.2988	65	16.7	4.25	3.17	0.73	1.65	4.08	3.02	3.16	0.55	0.22	0.08	0.88	<0.005	<1	2.5
05AD392	64.4698	-144.0215	61.3	15.8	5.44	3.55	1.50	2.1	4.33	2.81	2.05	0.64	0.22	0.1	4.79	<0.005	<1	2.5
05GL042R	64.2797	-144.2451	75	14.7	1.47	0.11	1.35	0.45	0.09	0.7	4.14	0.33	0.09	0.01	2.37	0.039	<1	64
05GL044R	64.2849	-144.2445	98.6	0.36	0.21	0.04	0.16	<0.10	0.07	<0.15	0.08	0.02	0.07	<0.01	0.11	0.01	<1	2.8
05MO122-4B	64.2764	-144.3866	69.2	14.9	3.89	2.97	0.59	1.24	3.13	2.81	3.09	0.52	0.2	0.05	0.92	0.016	<1	5
05MO125-3	64.2687	-144.1365	53.2	16.9	10.3	6.98	2.55	3.88	8.28	2.36	1.07	1.4	0.25	0.18	1.53	<0.005	<1	11.2
05MO126-1	64.2699	-144.1196	72.4	13.8	2.64	1.78	0.66	0.63	1.74	3.08	3.63	0.25	0.13	0.05	1.06	<0.005	<1	70.1
05MO141-3	64.2676	-144.0458	77.1	13.1	0.8	0.11	0.68	<0.10	0.6	3.12	4.15	0.05	0.08	0.01	1.21	<0.005	<1	11.9
05MO159	64.4667	-144.0506	63.5	16.4	5.67	3.36	1.94	2.13	2.70	3.89	1.4	0.67	0.22	0.1	3.86	<0.005	<1	2.2
06AD415	64.3187	-144.0199	69.1	15.3	3.67	2.07	1.37	1.19	3.39	2.73	3.23	0.46	0.21	0.08	1.07	0.02	<1	n.a.
06AD436	64.4274	-144.0424	71.8	14.7	4.88	3.00	1.55	1.73	0.3	0.37	3.02	0.7	0.13	0.05	3.17	<0.005	<1	n.a.
06AD441	64.4128	-144.0922	67.2	16.4	4.25	2.94	0.98	1.72	3.99	2.54	2.99	0.59	0.2	0.08	0.9	<0.005	<1	n.a.
06AD453	64.2614	-144.3542	70.6	15.2	2.81	1.91	0.69	1.22	2.97	2.53	3.79	0.36	0.17	0.06	0.7	0.01	<1	n.a.
06MO195A	64.2664	-144.3501	64	16.8	5	3.52	1.09	2.7	5.23	2.59	2.56	0.64	0.2	0.09	0.96	<0.005	<1	n.a.
06MO195B	64.2664	-144.3501	60.9	16.2	5.5	3.68	1.41	2.67	3.72	2.72	2.46	0.8	0.23	0.10	4.65	0.006	<1	n.a.

Field_Number	As edxrf	Ba edxrf	Bi edxrf	Br edxrf	Cd edxrf	Ce edxrf	Cr edxrf	Cs edxrf	Cu edxrf	Ga edxrf	Ge edxrf	La edxrf	Mo edxrf	Nb edxrf	Nd edxrf	Ni edxrf	Pb edxrf	Rb edxrf	Sb edxrf	Se edxrf
03AD002	<2	819	<5	<1	<1	83	9	7	3	16	<2	44	<2	13	42	4	17	136	<2	<1
03AD006	<2	73	<5	<1	<1	<5	24	<5	38	20	<2	6	<2	3	<10	25	4	8	<2	<1
03AD015	<2	683	<5	<1	<1	66	76	5	12	17	<2	34	<2	12	34	20	9	123	<2	<1
03AD028	<2	861	<5	<1	<1	66	11	7	<2	16	<2	37	<2	13	33	3	12	76	<2	<1
03AD029	<2	1140	<5	<1	<1	22	6	13	4	15	<2	17	<2	<2	17	3	61	94	<2	<1
03AD036	5	579	<5	<1	<1	66	38	8	7	14	<2	37	2	9	36	14	7	81	3	<1
03AD052	<2	1110	<5	<1	<1	69	12	12	<2	17	<2	41	<2	13	41	3	22	138	4	<1
03AD055	<2	871	<5	<1	<1	64	13	7	3	19	<2	33	<2	12	42	8	13	103	<2	<1
03AD056	<2	862	<5	<1	<1	62	10	6	<2	16	<2	34	<2	13	31	4	11	122	<2	<1
03AD057	1960	57	inf	2	<1	18	<5	<5	9	3	inf	12	2	<2	26	6	<3	8	7	<1
03AD060	5610	78	inf	8	<1	12	<5	<5	4	6	inf	7	2	<2	13	15	7	23	93	<1
03AD062	1210	298	inf	2	<1	42	6	<5	8	8	inf	22	<2	7	25	4	14	71	43	<1
03AD066	3	1010	<5	<1	<1	91	11	8	<2	15	<2	50	<2	15	34	3	21	127	3	<1
03AD067	329	172	<5	<1	<1	26	5	<5	<2	5	inf	12	<2	2	27	<2	4	33	13	<1
03AD071	23	68	<5	<1	<1	20	<5	<5	3	2	<2	14	8	<2	19	<2	25	11	11	<1
03AD073	<2	779	<5	<1	<1	76	13	12	4	17	<2	46	<2	17	38	10	24	169	<2	<1
03AD088	<2	813	<5	<1	<1	61	10	6	3	18	<2	32	<2	12	34	5	20	119	<2	<1
03AD096	<2	1160	<5	<1	<1	85	11	14	<2	15	<2	50	<2	13	42	5	22	160	<2	<1
03AD105	<2	662	<5	<1	<1	83	65	8	19	17	<2	42	2	17	30	20	18	122	<2	<1
03AD106	<2	970	<5	<1	<1	64	15	7	5	18	<2	35	2	11	39	5	11	73	<2	<1
03AD107	<2	1030	<5	<1	<1	88	12	10	<2	16	<2	51	<2	12	46	4	23	129	<2	<1
03GL001R	40	37	<5	<1	<1	16	<5	<5	3	<2	<2	11	<2	<2	32	<2	<3	6	<2	<1
03GL008R1	1490	447	inf	2	3	57	8	5	8	15	inf	30	3	9	29	4	14	137	753	<1
03GL008R2	32	1180	<5	<1	<1	97	12	12	4	17	<2	55	5	14	55	5	19	181	28	<1
03GL014R	278	30	2180	4	<1	9		<5	17	<2	inf	<5	7	<2	16	5	41	32	87	12
04AD209A	<2	1000	<5	<1	<1	92	63	<5	9	24	<2	47	3	17	43	22	16	111	<2	<1
04AD217	<2	1240	<5	<1	<1	129	6	6	6	17	<2	77	2	15	58	11	34	161	<2	<1
04AD219	2	827	<5	<1	<1	48	6	<5	5	22	<2	23	2	12	24	7	7	71	5	<1
04AD220	<2	1050	<5	<1	<1	74	8	10	4	16	<2	44	<2	11	49	3	19	138	<2	<1
04AD225	<2	825	<5	<1	<1	64	10	6	8	20	<2	34	2	11	29	10	10	83	<2	<1
04AD232	<2	1020	<5	<1	<1	64	7	5	6	19	<2	36	2	13	38	8	21	123	<2	<1
04AD233	<2	417	<5	<1	<1	78	38	5	14	16	<2	40	<2	4	45	8	7	79	<2	<1
04AD235	8	758	<5	<1	<1	93	55	5	7	20	<2	35	<2	12	29	22	13	125	<2	<1
04AD239	<2	741	<5	<1	<1	90	9	12	7	21	<2	35	5	23	24	8	29	292	<2	<1
04AD241A	<2	706	<5	<1	<1	111	<5	8	6	18	<2	58	3	22	45	4	27	287	<2	<1
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04AD242	3	820	<5	<1	<1	132	<5	18	9	22	<2	72	4	23	56	9	28	307	<2	<1
04AD246	4	107	<5	<1	<1	23	166	<5	25	18	<2	11	3	4	<10	31	6	15	<2	<1
04AD262	<2	952	<5	<1	<1	26	44	<5	26	18	<2	12	<2	6	17	8	30	54	4	<1
04AD271	<2	607	<5	<1	<1	50	23	9	5	16	<2	29	<2	16	34	12	26	149	<2	<1
04AD274	14	26	55	<1	<1	15	inf	<5	9	2	inf	11	5	<2	<10	<2	<3	<2	2	<1
04GL030R	<2	819	<5	<1	<1	61	<5	<5	<2	9	<2	29	13	10	33	2	16	106	5	<1
04MO086	<2	939	<5	<1	<1	65	6	8	5	15	<2	37	<2	12	36	4	23	132	<2	<1
05AD306A	<2	845	<5	<1	<1	68	<5	<5	<2	11	<2	32	<2	11	40	3	10	134	<2	<1
05AD306B	2400	16	inf	2	<1	5	<5	<5	<2	<2	inf	<5	<2	<2	13	2	3	3	21	<1
05AD309	<2	699	<5	<1	<1	68	<5	<5	2	13	<2	37	<2	12	43	3	11	90	<2	<1
05AD315	<2	1270	<5	<1	<1	65	<5	<5	11	11	<2	36	<2	10	32	2	20	141	2	<1
05AD317	<2	873	<5	<1	<1	67	10	<5	8	12	<2	41	<2	11	37	2	8	127	<2	<1
05AD318	<2	828	<5	<1	<1	<5	<5	<5	<2	14	<2	<5	<2	5	<10	2	52	223	<2	<1
05AD319	107	851	<5	<1	<1	134	<5	<5	<2	13	inf	80	<2	14	75	2	<3	209	25	<1
05AD320	<2	693	<5	<1	<1	130	59	<5	46	14	<2	70	<2	16	54	8	21	113	<2	<1
05AD323	111	80	inf	<1	5	9	<5	<5	115	3	inf	<5	29	<2	<10	<2	1910	29	655	4
05AD324	4	60	<5	<1	<1	18	<5	<5	16	16	<2	10	4	24	10	2	33	164	12	<1
05AD325	<2	615	<5	<1	<1	98	18	<5	8	14	<2	43	<2	22	52	3	14	110	2	<1
05AD332	3	773	<5	<1	<1	92	<5	<5	<2	12	<2	40	<2	26	37	2	26	217	<2	<1
05AD339	<2	1030	10	<1	<1	66	16	<5	4	12	<2	41	<2	13	46	2	26	145	<2	<1
05AD349	<2	1090	<5	<1	<1	64	<5	<5	<2	11	<2	29	<2	14	29	2	20	132	<2	<1
05AD352	2610	77	inf	4	<1	<5	<5	<5	445	2	inf	<5	10	<2	<10	3	375	19	584	8
05AD353	3	1380	<5	<1	<1	27	15	<5	31	12	<2	8	7	12	20	2	13	139	4	<1
05AD355	13	37	127	<1	<1	6	9	<5	683	<2	inf	7	<2	<2	<10	2	18	12	9	<1
05AD368	<2	916	<5	<1	<1	61	10	<5	19	11	<2	27	<2	12	22	2	17	121	<2	<1
05AD378	<2	793	<5	<1	<1	132	<5	<5	2	14	<2	66	<2	9	60	3	16	130	<2	<1
05AD392	<2	754	<5	<1	<1	66	<5	<5	7	12	<2	26	<2	10	36	3	9	73	<2	<1
05GL042R	81	630	<5	<1	<1	62	14	<5	<2	12	<2	31	<2	12	30	2	16	178	22	<1
05GL044R	<2	32	19	<1	<1	6	<5	<5	<2	<2	<2	<5	84	<2	<10	2	<3	3	7	<1
05MO122-4B	3	860	<5	<1	<1	82	<5	<5	2	11	<2	42	<2	12	51	3	7	114	3	<1
05MO125-3	8	620	<5	<1	<1	35	<5	<5	5	17	<2	16	<2	7	36	3	3	37	4	<1
05MO126-1	53	1280	<5	<1	<1	41	<5	<5	2	12	<2	19	<2	9	30	3	12	153	5	<1
05MO141-3	8	903	<5	<1	<1	36	<5	<5	<2	10	<2	19	<2	15	32	2	10	122	<2	<1
05MO159	<2	385	<5	<1	<1	65	<5	<5	2	13	<2	27	<2	9	36	3	9	57	3	<1
06AD415	<2	986	<5	<1	<1	68	<5	<5	<2	12	<2	33	<2	11	43	3	18	120	<2	<1
06AD436	<2	896	<5	<1	<1	75	73	<5	28	14	<2	38	<2	11	27	2	12	113	<2	<1
06AD441	<2	911	<5	<1	<1	72	<5	<5	<2	14	<2	36	<2	11	36	3	15	113	<2	<1
06AD453	<2	754	<5	<1	<1	67	10	<5	<2	11	<2	29	2	3	27	2	22	142	<2	<1
06MO195A	<2	751	<5	<1	<1	85	34	<5	2	13	<2	42	<2	12	47	4	13	94	<2	<1
06MO195B	<2	1460	<5	<1	<1	49	<5	<5	7	14	<2	25	<2	8	31	9	8	98	12	<1

Table 2. Major element oxide, trace element, gold and rare earth element analyses—Continued.

Sn edxrf	Sr edxrf	Th edxrf	U edxrf	V edxrf	W edxrf	Y edxrf	Zn edxrf	Zr edxrf	La_ICPMS	Ce_ICPMS	Pr_ICPMS	Nd_ICPMS	Sm_ICPMS	Eu_ICPMS	Gd_ICPMS	Tb_ICPMS	Dy_ICPMS	Ho_ICPMS	Er_ICPMS	Tm_ICPMS	Yb_ICPMS	Lu_ICPMS	Hf_ICPMS	Nb_ICPMS	Ta_ICPMS	Zr_ICPMS	Y_ICPMS	Ba_ICPMS	Sn_ICPMS
3	160	14	<4	41	<5	25	42	148	41.5	82.2	9.05	35	6.37	1.12	5.97	0.872	5.56	0.958	2.98	0.447	2.89	n.a.	4.6	13	1	163	n.a.	920	n.a.
<2	143	<4	<4	332	<5	33	47	77	3.34	10	1.6	9.72	3.3	1.16	4.68	0.802	5.96	1.17	3.72	0.552	3.64	n.a.	2.2	< 4	< 0.5	84.6	n.a.	82.6	n.a.
<2	102	8	<4	71	<5	26	66	202	40.3	79.5	8.92	34.3	5.91	1.03	5.53	0.944	7.51	1.76	6.62	1.12	7.47	n.a.	7.28	14	0.61	286	n.a.	760	n.a.
<2	271	10	<4	68	<5	17	42	206	48.1	94.7	10.4	41.4	6.63	1.5	5.85	0.75	4.29	0.73	2.2	0.311	1.94	n.a.	5.33	13	0.88	216	n.a.	1020	n.a.
<2	373	<4	<4	6	<5	<2	8	21	6.49	10.4	1	3.68	0.586	0.799	0.53	0.0777	0.547	0.094	0.32	0.0508	0.371	n.a.	0.7	< 4	< 0.5	27.2	n.a.	1280	n.a.
<2	103	8	<4	37	<5	9	44	210	35.4	71.2	7.96	30.3	5.16	1.09	4.11	0.553	3.06	0.497	1.55	0.235	1.5	n.a.	6.93	6.7	< 0.5	264	n.a.	668	n.a.
4	239	11	<4	55	<5	23	53	127	35.2	67.6	7.63	29.3	5.39	1.18	4.91	0.738	4.74	0.842	2.69	0.411	2.67	n.a.	4.3	13	0.94	155	n.a.	1210	n.a.
<2	275	7	5	72	<5	30	46	131	25.2	53.5	6.42	27.2	6.07	1.35	6.4	1	6.7	1.19	3.72	0.558	3.63	n.a.	4.1	13	0.84	153	n.a.	1030	n.a.
<2	236	11	6	47	<5	23	21	131	36.3	72.8	8.08	31.4	5.92	1.22	5.28	0.754	4.64	0.815	2.49	0.383	2.42	n.a.	4.4	11	0.57	165	n.a.	986	n.a.
<2	2	<4	<4	5	61	<2	4	6	2.2	4.1	0.48	1.9	0.326	0.054	0.26	<0.005	0.222	0.04	0.115	0.016	0.13	n.a.	< 0.5	< 4	< 0.5	13.1	n.a.	55.1	n.a.
3	5	<4	<4	9	<5	2	18	12	3.11	5.8	0.69	2.6	0.462	0.11	0.48	0.0655	0.4	0.07	0.212	0.033	0.218	n.a.	< 0.5	< 4	< 0.5	15.1	n.a.	75.3	n.a.
3	27	4	<4	7	<5	8	23	52	18.9	37	4.15	15.8	2.87	0.489	2.51	0.376	2.18	0.381	1.18	0.18	1.03	n.a.	2.2	8.3	0.92	71.6	n.a.	332	n.a.
3	211	14	4	21	<5	20	41	144	46.8	94.4	10.3	39.5	6.89	1.22	5.86	0.796	4.48	0.746	2.22	0.313	2.13	n.a.	5.07	18	0.99	182	n.a.	1130	n.a.
<2	3	<4	<4	<5	<5	4	7	16	5.64	10.7	1.2	4.52	0.859	0.14	0.69	0.112	0.79	0.13	0.428	0.07	0.447	n.a.	0.5	< 4	< 0.5	26	n.a.	177	n.a.
<2	2	<4	<4	9	<5	<2	7	5	1.8	3.4	0.39	1.5	0.255	0.048	0.2	<0.05	0.18	0.033	0.096	0.012	0.095	n.a.	< 0.5	< 4	< 0.5	9.5	n.a.	58.8	n.a.
5	219	15	6	42	<5	26	46	149	38.8	75.2	8.15	31.1	5.62	1.05	5.16	0.744	4.88	0.878	2.8	0.424	2.64	n.a.	5.11	16	1.2	185	n.a.	862	n.a.
4	240	12	5	48	<5	25	48	128	39.3	78.9	8.89	34.6	6.09	1.14	5.55	0.796	4.88	0.834	2.52	0.369	2.53	n.a.	4.3	12	0.77	164	n.a.	906	n.a.
3	229	15	4	20	<5	19	37	124	44.1	87	9.51	36.5	6.35	1.09	5.56	0.741	4.25	0.695	1.98	0.285	1.81	n.a.	3.8	12	1.3	134	n.a.	1250	n.a.
<2	209	14	6	66	<5	21	70	224	41.6	84.7	9.2	36.2	5.9	1.28	5.14	0.732	4.46	0.82	2.58	0.386	2.49	n.a.	8.9	16	0.73	347	n.a.	750	n.a.
<2	302	10	<4	78	<5	27	73	153	35	71.8	8.42	33.9	6.31	1.45	5.97	0.873	5.61	0.99	3.07	0.463	2.95	n.a.	4.9	10	< 0.5	191	n.a.	1100	n.a.
2	260	12	<4	48	<5	20	43	122	36.2	70.8	8.02	31.8	5.74	1.18	5.16	0.755	4.68	0.824	2.51	0.369	2.36	n.a.	4.9	12	0.64	178	n.a.	1210	n.a.
<2	<2	<4	<4	<5	<5	<2	4	<2	1.4	2.6	0.34	1.3	0.254	0.04	0.27	<0.005	0.264	0.044	0.137	0.02	0.12	n.a.	< 0.5	< 4	< 0.5	9.4	n.a.	33.8	n.a.
10	13	5	4	13	<5	15	17	93	29	57	6.54	25.3	4.48	0.729	4.06	0.578	3.48	0.596	1.79	0.256	1.66	n.a.	2.8	6.5	< 0.5	96.3	n.a.	497	n.a.
5	82	13	<4	21	<5	23	67	141	48.3	97.2	10.8	41.6	7.56	1.12	6.25	0.876	5.17	0.857	2.6	0.364	2.4	n.a.	4.8	13	0.88	165	n.a.	1320	n.a.
2	3	13	14	<5	<10	<2	11	22	0.87	1.3	<0.3	0.89	0.14	0.026	0.13	<0.05	0.12	0.02	0.058	0.0088	0.052	n.a.	< 0.5	< 4	< 0.5	14.9	n.a.	30.5	n.a.
3	242	17	<4	67	<5	24	161	144	52.9	105	11	41.4	7.84	1.13	6.17	0.871	4.62	0.915	2.99	0.468	2.79	0.44	5.02	16.6	n.a.	173	28.3	1270	2.29
3	201	29	<4	25	<5	24	35	121	84.6	155	15.6	55.2	10.4	1.54	7.98	1.1	5.19	0.855	2.21	0.307	1.52	0.24	3.73	15.2	n.a.	128	25.4	1190	2.73
<2	419	5	<4	37	<5	31	67	162	27.1	54.8	6.23	25.4	5.9	1.38	5.95	0.896	5	1	3.26	0.476	2.93	0.46	4.12	10.9	n.a.	145	31.4	832	1.62
4	274	10	<4	19	<5	16	39	112	31.9	60.3	6.4	23.3	4.66	0.739	3.65	0.493	2.44	0.45	1.4	0.235	1.27	0.22	3.16	10.2	n.a.	104	14.5	1020	3.25
<2	316	14	6	73	<5	26	60	138	35.5	69.6	7.67	29.7	5.95	1.21	5.35	0.752	4.06	0.801	2.6	0.395	2.34	0.37	3.37	10.7	n.a.	123	25	845	1.68
3	278	13	4	50	<5	23	52	138	32.9	63.6	6.75	24.8	5.18	1.03	4.66	0.706	3.84	0.799	2.56	0.403	2.51	0.39	4.7	14.4	n.a.	161	25.2	1000	2.97
<2	56	8	<4	35	<5	11	47	187	46	89.9	9.53	36	6.69	0.699	4.84	0.601	2.62	0.41	1	0.182	0.9	0.18	7.25	114	n.a.	254	11.8	400	1.3
<2	53	14	<4	61	<5	13	80	215	34.5	92.1	7.58	28	5.3	0.896	4.08	0.589	3.16	0.625	2.05	0.334	2.02	0.33	6.11	10.9	n.a.	218	18.1	728	1.27
7	78	32	12	20	<5	27	52	238	31.4	85.7	6.23	20.9	4.39	0.788	3.66	0.644	3.93	0.837	3.07	0.506	3.43	0.5	7.54	23.3	n.a.	266	25.8	727	6.01
8	69	28	13	18	<5	38	48	222	56.3	108	11.3	40.6	8.05	0.775	6.69	1	5.71	1.16	3.84	0.595	3.9	0.57	6.44	24	n.a.	232	37.1	692	7.89
10	66	28	9	18	<5	39	54	233	53.6	106	10.7	39.1	7.72	0.751	6.71	1.02	5.6	1.14	3.73	0.564	3.5	0.53	6.46	19.9	n.a.	226	38.1	694	9.36
11	92	32	13	22	<5	47	62	274	75.3	144	14.9	52.7	10.5	0.954	8.96	1.35	7.33	1.43	4.58	0.675	4.29	0.64	7.74	23.9	n.a.	272	45.9	808	9.46
<2	182	<4	<4	192	<5	13	81	52	9.94	20.8	2.48	10.5	2.64	0.849	2.64	0.403	2.23	0.441	1.43	0.234	1.3	0.22	1.56	4.18	n.a.	51.9	12.9	109	0.86
<2	375	<4	<4	129	<5	20	110	95	13.6	27.7	3.38	14.5	3.69	1	3.95	0.61	3.47	0.732	2.37	0.372	2.22	0.37	2.45	6.08	n.a.	86.3	21.8	1000	0.64
6	225	12	4	48	<5	20	41	92	26.7	50.9	5.36	19.4	4.02	0.77	3.58	0.592	3.39	0.692	2.3	0.37	2.41	0.4	2.87	16.1	n.a.	95.9	22.6	621	5.47
<2	<2	4	<4	<5	353	<2	4	<2	0.47	1.04	0.13	0.49	0.14	0.035	0.16	0.029	0.17	0.036	0.12	0.065	0.11	0.06	< 0.5	< 0.7	n.a.	8.16	1.06	15.3	< 0.5
<2	164	28	61	5	<5	11	22	54	32.5	52.2	6.58	24.4	4.97	0.982	4.01	0.63	3.7	0.816	2	0.328	1.97	0.22	3.14	8.82	n.a.	94.2	21.7	754	2.08
<2	147	9	<4	14	<5	15	19	83	27.9	52.1	5.58	20.5	4.44	0.688	3.8	0.581	3.16	0.584	1.83	0.291	1.67	0.28	2.32	10.8	n.a.	73	19.5	872	1.1
<2	206	5	4	37	<5	28	20	120	37.4	70	8.52	32.4	7.02	1.28	6.54	1.09	6.49	1.52	3.89	0.664	4.11	0.62	4.46	13.6	n.a.	127	39.3	837	1.35
<2	5	<4	<4	<5	<5	<2	6	<2	0.35	0.76	0.096	0.41	0.1	0.024	0.094	0.016	0.089	0.02	0.05	0.008	0.05	< 0.03	0.19	< 0.7	n.a.	5.13	0.42	24.6	< 0.5
<2	360	<4	<4	87	<5	16	52	189	44.9	82.2	10.1	39.6	7.95	1.74	6.59	0.95	4.82	1.01	2.3	0.337	1.91	0.22	5.32	14.1	n.a.	174	24.2	704	3.13
<2	211	5	4	25	<5	20	55	122	43.3	78.8	9.47	35.6	7.36	1.41	6.19	0.959	5.24	1.17	2.91	0.468	2.8	0.37	4.18	10.4	n.a.	125	30.6	1320	4.12
3	121	8	<4	53	<5	20	40	117	41.3	67.3	7.9	27.9	5.36	1.02	4.69	0.747	4.22	0.963	2.44	0.407	2.53	0.34	5.38	12.4	n.a.	163	25.6	888	4.94
<2	135	<4	5	<5	<5	13	3	18	3.03	5.15	0.61	2.38	0.87	0.417	1.3	0.307	2.1	0.483	1.17	0.207	1.25	0.066	2.28	4.21	n.a.	17.4	15.9	760	1.17
21	34	6	5	46	<5	17	6	200	53	107	11.8	43.5	8.13	1.06	5.67	0.762	3.92	0.846	2.08	0.334	2.04	0.24	5.77	14.9	n.a.	188	21.4	813	33.3
3	294	25	4	133	<5	26	196	133	80.9	139	15.6	54.2	8.89	1.41	6.72	1.02	5.45	1.27	3.25	0.549	3.42	0.52	6.7	18.4	n.a.	213	33.1	708	42.8
<2	17	6	<4	6	<5	inf	69	17	4.51	8.06	0.97	3.57	0.67	0.105	0.46	0.061	0.29	0.062	0.15	0.026	0.17	< 0.03	0.72	4.66	n.a.	24.5	1.44	88.2	3.55
4	19	<4	<4	<5	<5	17	78	41	7.44	17.3	2.38	9.08	3.54	0.076	3.44	0.763	4.76	1.03	2.6	0.484	3.14	0.4	3.12	29.3	n.a.	70.2	27.5	66.2	4.66
3	217	11	5	102	<5	32	86	230	47.8	86.4	10.5	40.4	8.73	1.43	7.9	1.28	7.47	1.78	4.6	0.79	4.78	0.74	6.89	20.9	n.a.	216	45.9	663	3.5
8	101	21	6	7	<5	30	64	145	51.8	100	12	44	9.47	0.91	7.51	1.18	6.27	1.34	3.26	0.527	3.09	0.42	4.88	27.2	n.a.	135	34.6	837	8.56
3	283	15	5	32	<5	24	70	149	46.8	69	9.65	35.6	6.64	1.4	5.3	0.776	4.14	0.96	2.48	0.43	2.79	0.4	4.1	13.1	n.a.	114	26.3	1080	3.02
3	220	6	5	7	<5	23	51	136	34.6	65.8	7.69	28.8	5.93	1.32	4.87	0.795	4.48	1.01	2.48	0.411	2.49	0.31	3.6	14	n.a.	101	25.5	1110	3.74
221	11	10	<4	<5	<5	<2	50	5	1.01	1.65	0.22	0.85	0.2	0.048	0.14	0.022	0.12	0.026	0.059	0.01	0.064	< 0.03	0.11	< 0.7	n.a.	< 2	0.53	93	156
<2	237	6	5	13	<5	18	64	100	19.3	36.2	4.26	16.4	3.86	1.07	3.38	0.57	3.36	0.799	2.04	0.357	2.3	0.29	3.48	10.3	n.a.	93.8	20.5	1480	3.5
5	10	<4	<4	<5	inf	<2	61	3	1.82	3.69	0.5	2.16	0.56	0.145	0.51	0.08	0.46	0.098	0.21	0.033	0.17	< 0.03	1.71	1.16	n.a.	80.4	1.85	46.8	5.4
2	200	6	5	17	<5	23	104	136	39.7	72.6	8.81	33.1	7.06	1.25	5.59	0.883	4.78	1.07	2.6	0.43	2.57	0.33	4.54	14.7	n.a.	138	26.5	1040	3.22
<2	291	14	4	79	<5	22	43	126	83.8	150	17.9	64.6	11.2	1.53	8.18	1.15	5.56	1.18	2.84	0.441	2.63	0.342	3.91	11.1	n.a.	120	29.1	849	3.29
<2	280	<4	<4	89	<5	22	58	145	36	61.1	7.79	30.4	6.39	1.43	5.51	0.852	4.91	1.12	2.82	0.452	2.76	0.38	3.85	9.94	n.a.	115	28.6	755	2.48
3	34	4	4	33	<5	21	8	122	35	55.8	7.03	25.8	5.16	0.863	4.09	0.661	3.89	0.878	2.21	0.362	2.18	0.26	3.22	11.6	n.a.	89.6	23.6	608	5.93
<2	4	<4	<4	<5	<5	<2	<2	<2	0.46	0.78	0.11	0.41	0.09	0.018	0.078	0.013	0.075	0.016	0.04	0.007	0.04	< 0.03	0.17	< 0.7	n.a.	< 2	0.39	33.1	0.72
<2	248	<4	<4	64	<5	21	19	135	34.5	57.2	7.14	26.8	5.47	1.12	4.47	0.704	4.22	0.955	2.36	0.388	2.3	0.29	3.68	9.93	n.a.	114	24.9	721	1.56
<2	378	<4	<4	353	<5	23	98	115	19.8	34.7	4.92	21.7	5.35	1.59	5.36	0.838	4.93	1.15	2.88	0.462	2.79	0.38	3.47	7.53	n.a.	110	29.5	662	1.97
<2	183	10	4	6	<5	18	21	95	26.2	41.1	4.88	17.8	3.92	0.812	3.57	0.618	3.68	0.876	2.34	0.41	2.7	0.37	3.64	10.9	n.a.	96.6	24	1280	4.51
<2	65	15	<4	<5	<5	35	<2	56	16.3	27	3.49	13.4	4.01	0.398	4.21	0.819	5.53	1.37	3.75	0.687	4.47	0.7	3.1	15	n.a.	52.2	39.5	857	2.92
<2	284	<4	<4	99	<5	22	61	160	33.5	59.5	7.14	27.6	5.81	1.23	4.94	0.769	4.43	1.01	2.56	0.433	2.63	0.36	4.76	10.6	n.a.	156	26.9	375	5.2
<2	262	11	<4	46	<5	21	44	138	42.5	76.7	8.95	34.1	6.62	1.17	5.24	0.738	4.24	0.83	2.3	0.347	2.29	0.36	4.64	11.4	< 0.1	142	26.6	1050	3.46
<2	75	9	<4	76	<5	14	48	223	41.4	79.3	8.84	33.5	6.07	0.965	4.45	0.607	3.46	0.704	1.99	0.298	1.86	0.3	5.87	10.5	< 0.1	185	21.6	915	0.92
<2	294	<4	<4	59	<5	20	50	152	41.8	78	9.05	35.1	6.84	1.25	5.26	0.749	4.2	0.815	2.24	0.333	2.11	0.34	5.13	11.4	< 0.1	159	25.1	935	3.15
3	241	4	<4	39	<5	2	29	21	34.6	65.1	7.14	26.5	5.24	0.927	4.19	0.604	3.53	0.686	1.88	0.288	1.89	0.3	4.66	14.3	0.29	139	21.5	767	3.88
<2	344	6	<4	104	<5	19	40	123	51.7	92.3	10.2	37.3	6.62	1.23	5.26	0.725	4.2	0.845	2.32	0.345	2.25	0.36	5.13	12.3	< 0.1	154	24.9	787	2.78
<2	397	<4	<4	<5	<5	14	68	164	32.6	58.6	6.78	26.7	5.15	1.24	4.11	0.571	3.19	0.613	1.65	0.242	1.53	0.23	4.63	7.94	< 0.1	149	18.6	1510	1.4

Table 3. Geologic field notes.

Field_Number	Latitude	Longitude	Date	Map_Unit	Rock_Type	Notes	S1_strike	S1_dip	S2_strike	S2_dip	S3_strike	S3_dip	L2_trend	L2_plunge	L2b_trend	L2b_plunge	F_1_trend	F_1_plunge	F2_trend	F2_plunge	F3_trend	F3_plunge
00AD053	64.3505	-144.4349	15-Jul-00	Dag	hornblende-biotite granodiorite	Augen gneiss unit																
01AD216	64.4432	-144.4995	11-Jul-01	Kgtc	biotite quartz diorite	Weakly foliated, medium-grained biotite quartz diorite. Kg																
01AD217	64.4342	-144.4791	11-Jul-01	Kgtc	biotite-muscovite quartz diorite	Weakly foliated, medium-grained biotite-muscovite quartz diorite. Troublesome rock but map as Cretaceous intrusion																
03AD002	64.384	-144.4701	14-Jul-03	Kgcd	biotite granite dike	Medium gray, medium-grained, equigranular biotite granite intrusion. Forms series of dikes. Lacks pegmatites like in B-2																
03AD004	64.3807	-144.4817	14-Jul-03	Dag	augen gneiss	Augen gneiss			122	54			255	21								
03AD005	64.3809	-144.4862	14-Jul-03	Dag	augen gneis	Medium gray mylonitic augen gneiss; 5% augens ribbon quartz; augens in isoclinal folds; S-C fabric shows western transport;	154	34	145	68			280	65								
03AD006	64.3812	-144.4897	14-Jul-03	Dag	biotite schist interlayered with hornblende-rich schist	Interlayered biotite schist (metasediment) and hornblende-biotite schist (mafic horizion). Sample of hornblende-biotite horizon; photo with hammer			123	50			120	22								
03AD008	64.3723	-144.4673	14-Jul-03	Dag	augen gneiss	Augen gneiss highly srained; mullions developed on C-surface (3' surface) that reorients L(stretching) and merges with S-surface; western transport direction	130	32	200	32			296	28								
03AD009	64.4056	-144.417	15-Jul-03	Pzgn	strongly foliated quartzofeldspathic biotite gneiss	Dominant gneissic fabric folded	300	62											130	25		
03AD010	64.4058	-144.4154	15-Jul-03	Pzgn	strongly foliated quartzofeldspathic biotite gneiss	Gneissic fabric folded into crenulation folds			288	75			290	50					290	50		
03AD011	64.4049	-144.4099	15-Jul-03	Kgtc	leucogranite (post-tectonic)	Nonfoliated, course-grained, biotite-poor leucogranite																
03AD012	64.4109	-144.3994	15-Jul-03	Kgtc	leucogranite (post-tectonic)	Pzgn biotite gneiss xenoliths entrained in medium grained leucogranite. Looks like border phase of leucogranite intrusion			112	64												
03AD013	64.4119	-144.3892	15-Jul-03	Kgtc	leucogranite (post-tectonic)	Leucogranite has strong Fe oxide alteration causing reddening of granite. Enclaves of biotite gneiss within granite all along ridge to west																
03AD014	64.3772	-144.3892	15-Jul-03	Dag	leucogranite (post-tectonic)	Leucogranite has strong Fe oxide alteration causing reddening of granite. Enclaves of biotite gneiss within granite all along ridge to west																
03AD015	64.4144	-144.3763	15-Jul-03	Kgtc	leucogranite (post-tectonic)	Leucogranite with low (<5%) biotite content																
03AD025	64.395	-144.4147	18-Jul-03	Pzgn	biotite gneiss	Classic biotite gneiss (paragneiss?); L very weak			320	76												
03AD026	64.3959	-144.4112	18-Jul-03	Pzgn	gray biotite orthogneiss	Layered granodioritic gneiss veins in biotite paragneiss			314	78												
03AD027	64.3972	-144.401	18-Jul-03	Pzgn	hornblende-quartzofeldspathic biotite gneiss	Hornblende-biotite gneiss (more mafic protolith?) Pzgn with same uscovite Kg float as on ridge to north. Contact on west side of saddle			305	84												
03AD028	64.3976	-144.4009	18-Jul-03	Pzgn	biotite granite/granodiorite dike	Fine-grained, light-gray, equigranular biotite granite/granodiorite dike with some associated bull quartz veins. Dike and veins trend N45W thru saddle																
03AD029	64.3978	-144.3983	18-Jul-03	Kgcd	pegmatite dike	Leucocratic pegmatite dike, 10 ft wide trends NW; has distinctive 0.5-1 in. diameter clots of sulfides, alt. Micas (green). Looks like other gold-bearing dikes in NE corner of B-1 quad.																
03AD030	64.3989	-144.3954	18-Jul-03	Kgtc	dominantly fine-grained leucogranite	Dominantly fine-grained leucogranite intrusion with septa of Pzgn biotite gneiss xenoliths.																
03AD031	64.3989	-144.3922	18-Jul-03	Kgtc	quartzofeldspathic biotite gneiss with K leucogranite	Pzgn biotite gneiss xenoliths in nonfoliated muscovite granite			310	78												
03AD033	64.3969	-144.3879	18-Jul-03	Kgtc	orthogneiss cut by K leucogranite	Folded dark gray orthogneiss cut by late dikes of unfoliated pegamite and biotite granodiorite																
03AD034	64.3985	-144.3844	18-Jul-03	Kgtc	reddened granite	Altered biotite granite like on ridge to north. Saw brecciated granite in saddle just to west--unit cut by late faults. Weak foliation in granite, which implies it is a late-kinematic intrusion	340	75														
03AD035	64.403	-144.3733	18-Jul-03	Kgtc	reddened granite	Medium-grained, equigranular altered biotite granite (didn't see pink K-spars, is this a tonalite?). Fresh surface is medium-gray. Unit altered to oragne/rust color																
03AD036	64.4018	-144.364	18-Jul-03	Kgtc	biotite granite	Dark-gray, medium-grained biotite granite																
03AD037	64.4007	-144.3582	18-Jul-03	Kgtc	biotite granite	Same granite unit																
03AD038	64.3867	-144.3919	18-Jul-03	Pzgn	orthogneiss	Orthogneiss																
03AD039	64.3867	-144.3919	18-Jul-03	Pzgn	sheared biotite gneiss	Strongly sheared biotite gneiss			140	85												
03AD040	64.3874	-144.3903	18-Jul-03	Pzgn	sheared biotite granodiorite gneiss	Strongly sheared biotite granodiorite gneiss																
03AD041	64.3579	-144.3308	18-Jul-03	Dag	augen gneiss	Beautiful, classic augen gneiss with golf ball sized augens			202	24			240	18								
03AD042	64.3597	-144.3354	18-Jul-03	Dag	augen gneiss	Tectonic transport down dip (westerly) based on assymetries of augens. Matrix has foliation-parallel cataclasis of crystall			192	28												
03AD043	64.3664	-144.3511	18-Jul-03	Dag	augen gneiss	Stretching lineation with westerly oriented transport direction based on assymetries of augens																
03AD044	64.3666	-144.3563	18-Jul-03	Dag	augen gneiss	Strong flattening strain; mylonitic fabric developed in matrix. Polycrystalline augen showing west-vergent assym. (down dip)			222	32			280	32								
03AD045	64.3712	-144.3764	18-Jul-03	Dag	augen gneis	Float of augen gneiss (Dag)																
03AD046	64.3337	-144.2679	18-Jul-03	Dag	augen gneiss	Classic augen gneiss, augen assymetry show up-dip (NE) flow			220	2			345	15								
03AD047	64.3325	-144.2591	19-Jul-03	Dag	augen gneiss	Bull quartz and brecciated Dag on east side of saddle: fault zone. Soil reddened to light ochre color																
03AD048	64.3319	-144.2533	19-Jul-03	Dag	augen gneiss	S-tectonite (mylonite). Matrix has ribbon quartz and orthomylonite fabric. Augens are polycrustalline; Le and assym. on S show NW-vergence; oriented sample slab for thin section			206	34			290	18								
03AD049	64.3329	-144.2522	19-Jul-03	Dag	biotite granite	Ffoliated dark gray, medium-grained biotite granodiorite. Talus up south side of saddle is K granite intrusion and not gneisses as mapped																
03AD050	64.3541	-144.2479	19-Jul-03	Pzgn	augen gneiss	Relatively "unstrained" augen layered with orthomylonitic augen gneiss with augens flatted to <0.25 thick and 2 in. long; NW-vergent transport			202	32			262	32								
03AD052	64.3327	-144.2174	19-Jul-03	Kbm	biotite granodiorite of Black Mountain	Weakly foliated equigranular medium grained biotite granodiorite of Black Mountain																
03AD053	64.3364	-144.2258	19-Jul-03	Dag	biotite orthogneiss	Blocks of augen gneiss with stringers of light-gray granite both parallel and x-cutting to foliation and			225	35			350	22								
03AD054	64.3368	-144.2306	19-Jul-03	Dag	silicified brecciated gneiss and granite	Little exploration pit on silicified brecciated gneiss surrounded by float of fine-grained biotite granite																
03AD055	64.3381	-144.2357	19-Jul-03	Kbm	foliated granite west flank Black Mtn	Foliated, light gray course-grained leucogranite. Map as zone up to 500 yds. wide along margin of K pluton as a complex zone of augen and biotite gneiss xenoliths																
03AD056	64.3431	-144.2449	19-Jul-03	Kbm	nonfoliated biotite granite west flank Black Mtn 110Ma	Fresh outcrop of equigranular, nonfoliated, medium-gray biotite granite identical in appearance to that on top of Black Mountain. Sample for dating																
03AD057	64.3447	-144.2507	19-Jul-03	Dag	fault zone quartz vein	Prospect pit with tent pad above Gray Lead(?) mine. Fault between Kgranite on east and Dag on west. quartz material with some Fe-oxide veining in pits. Sample of quartz vein																
03AD058	64.345	-144.2528	19-Jul-03	Dag	augen gneiss	Augen gneiss all up hill; S-C fabric all W-vergent on stretching lineation (Le)			220	22			285	20								
03AD059	64.3491	-144.258	19-Jul-03	Dag	augen gneiss	No outcrop, augen gneiss float																
03AD060	64.3522	-144.208	19-Jul-03	Kbm	quartz veins cutting biotite granite	Quartz veins cutting biotite granite (same as 03AD056); new unit on dump of feldspar porphyry; prophylitic alt. Of equigranular biotite granite																
03AD061	64.3619	-144.1937	19-Jul-03	Kbm	Kg biotite granite	Same nonfoliated, equigranular biotite granite (same as 03AD056). Greissen viens in granite and lots of quartz float to east																
03AD062	64.3569	-144.1929	19-Jul-03	Qc	Kg	Grizzly mill site (stibnite ore mineral). quartz veining and argillic alteration of biotite granite; magmatic hydrothermal Sb system																
03AD063	64.3442	-144.2104	20-Jul-03	Pzg	orthogneiss	Pzgn (orthogneiss) phase of lower plate rocks																
03AD064	64.3448	-144.2089	20-Jul-03	Pzg	contact zone	Contact zone between orthogneiss and nonfoliated biotite granite. Medium-granite biotite granite (~5% biotite). Simple contact, no otc. But good float																
03AD065	64.3468	-144.2042	20-Jul-03	Kbm	synkinematic granite; fault zone?	First sight of porphyritic granite in saddle. Saw bull quartz and Pzgn (minor), fault zone?																
03AD066	64.3482	-144.3482	20-Jul-03	Dag	Black Mtn granite porphyry	Feldspar porphyrys up to 1 in. long set in a biotite-rich (15%), medium-grained, light-gray equigranular matrix																
03AD067	64.3493	-144.201	20-Jul-03	Pzg	quartz vein in sheared granite	Prospect pit in quartz vein with sheared and silicified granites (non-porphyritic). Occurs within fault zone. Banding within comp. horizons in quartz trend N70E, 90 and cut by later brittle cleavage and breccia bands that are parallel to comp. layering																
03AD068	64.3502	-144.1997	20-Jul-03	Kbm	tourmaline? granite	Dark gray, medium-grained, sheared and foliated tourmaline-bearing granite. Shear bands=N50W																
03AD069	64.3536	-144.19727	20-Jul-03	Kbm	granite orthogneiss	Contact of roof pendant of foliated and folded (isocline and open) of dark gray granodioritic orthogneiss (~15-20% biotite). Deformation more intense than in synkinematic granites.																
03AD070	64.3547	-144.2009	20-Jul-03	Kbm	course-grained granite	Quartz vein trending E-W; based on float pattern; host ks course-grained granite similar to site 03AD064																
03AD071	64.3575	-144.2047	20-Jul-03	Kbm	granite	Series of prospect pits cut on quartz vein trending N70E across saddle. Multistage quartz vein with dark brown cut by light buff quartz. Host is reddened typical medium- to course-grained granite																
03AD072	64.3593	-144.2092	20-Jul-03	Kbm	quartzofeldspathic biotite gneiss	Quartzofeldspathic biotite gneiss																
03AD073	64.3609	-144.2125	20-Jul-03	Kbm	biotite (ortho?)gneiss	Prospect pit; moderately foliated, homogeneous, medium-grained biotite gneiss. Biotite altered more than typical granite. Is this Dog or synkinematic Kg																
03AD074	64.3624	-144.2192	20-Jul-03	Kbm	quartzofeldspathic biotite gneiss	Foliated biotite schist of Pzgn fame																
03AD075	64.3644	-144.2287	20-Jul-03	Dag	strongly deformed augen gneiss	Strongly deformed augen gneiss at base of upper plate; West-vergent stretching lineation			155	40			280	20								
03AD076	64.3657	-144.2356	20-Jul-03	Dag	augen gneiss	Dag float; bull quartz in saddle to east																
03AD077	64.3656	-144.2399	20-Jul-03	Dag	augen gneiss	Augen gneiss			156	26												
03AD078	64.3809	-144.1823	20-Jul-03	Kbm	augen-free gneiss	Augen-free zone of augen gneiss																
03AD079	64.3809	-144.1823	20-Jul-03	Kbm	microporphyritic diorite	New unit: diorite? non-foliated, equigranular, medium-grained equant crystals of plag+quartz+bio set in fine-grained dark- to med-gray matrix. Plags sholw strong zoning; looks like same texture seen in Kgcd dikes																
03AD080	64.382	-144.1888	20-Jul-03	Kbm	granite porphyry	Fault zone; cleaved typical granite porphyry. Granite predominantly porphyritic biotite granite/granodiorite																
03AD081	64.3848	-144.1974	20-Jul-03	Kbm	granite porphyry	Typical granite porphyry. Sample of float, but entire hill is this unit																
03AD083	64.3853	-144.21	20-Jul-03	Kbm	biotite granite	Same granite without porphyrys. Light-gray biotite granite cut by brittle cleavage			30	65												
03AD084	64.3852	-144.2136	20-Jul-03	Kbm	biotite granite	Same biotite granite without feldspar porphyrys																
03AD085	64.3869	-144.2228	20-Jul-03	Kbm	biotite granite	Same biotite granite without feldspar porphyrys; see quartz veining starting to increase																
03AD086	64.3865	-144.2272	20-Jul-03	Kbm	biotite granite	Unusual biotite-porphyry unit with lots of silicification																
03AD087	64.3866	-144.2318	20-Jul-03	Kbm	silicified biotite granite	Silicified biotite granitic margin of the pluton; back in normal finer-grained granite w/o unusual biotite porphyrys																
03AD088	64.4051	-144.1871	21-Jul-03	Kbm	biotite granodiorite	Fresh equigranular, nonfoliated, medium-grained biotite granite/granodiorite (~10% biotite).																
03AD089	64.4094	-144.1918	21-Jul-03	Kbm	microporphyritic diorite	Dike of dark gray microporphyry (biotite-plag) diorite; porphyries (<1 mm dia) set in fine-grained, dk gray matrix. Feldspars strongly zoned. No quartz obvious																
03AD090	64.4133	-144.2065	21-Jul-03	Kbm	microporphyritic diorite	Biotite porphyritic diorite. A little more biotite than sample 03AD089b, but is the same unit																
03AD091	64.4138	-144.2066	21-Jul-03	Kbm	biotite granite	Typical biotite granite float (as station 03AD088)																
03AD093	64.4127	-144.228	29-Jun-03	Pzgn	silicified granodiorite+granite	Slope of nonfoliated, medium-grained, light gray, tan weathering granodiorite; Looks like zone on west side of Tibbs Ck (03AD033) along margin of Cretaceous intrusion with mixture of Pzgn (Dog) and K granite. Reddened soil and intense alteration.	285	28	60	90												
03AD094	64.4097	-144.2348	29-Jun-03	Pzgn	quartzofeldspathic biotite gneiss-altered	Intense alteration has destroyed original biotite in gneiss. As well, later brittle cleavage (secondary S) has chopped up unit.	275	80	195	80												
03AD095	64.4079	-144.2434	29-Jun-03	Pzgn	quartzofeldspathic biotite gneiss-altered	Intensely altered biotite gneiss. Outcrop has blocky fracturing (brittle)			225	78												
03AD096	64.4087	-144.2506	29-Jun-03	Pzgn	nonfoliated granite	Good, clean nonfoliateed, light-gray, medium-grained biotite granite. Sample for chem and thin section																
03AD097	64.4089	-144.2574	29-Jun-03	Pzgn	quartzofeldspathic biotite gneiss-altered	Higly altered biotite gneiss roof pendent within Cretaceous intrusion																
03AD098	64.4083	-144.2621	29-Jun-03	Kbm	biotite granite (slightly altered)	Homogeneous, medium-grained, light gray gray biotite granite; slightly altered																
03AD099	64.411	-144.2618	29-Jun-03	Kbm	biotite granite (fresh)	Biotite granite, fresh																
03AD100	64.4125	-144.2625	29-Jun-03	Kbm	biotite granite-highly altered	Granite? Highly altered																
03AD101	64.4143	-144.2673	29-Jun-03	Kbm	foliated granodiorite	Large biotite (recrystallized biotite gneiss?) in foliated granodiorite (K orthogneiss?). quartz vein trends S80W 100yds long																
03AD102	64.4148	-144.2685	29-Jun-03	Kbm	quartzofeldspathic biotite gneiss	Boudinaged biotite gneiss; switch in atitudes																
03AD103	64.4192	-144.2725	29-Jun-03	Kgtc	biotite granite	Medium-grained, equigranular biotite granite float																
03AD104	64.4231	-144.2758	29-Jun-03	Pzgn	quartzofeldspathic biotite gneiss-highly altered	Highly altered and brecciated biotite gneiss											320	20				
03AD105	64.3725	-144.4657	30-Jun-03	Dag	mylonitic augen gneiss	Isotope sample of mylonitic augen gneiss just structurally above (100 ft) detachement fault. Oriented sample. Same site as 03AD008			80	60			280	5								
03AD106	64.3748	-144.192	30-Jun-03	Kdi	biotite diorite of Black Mtn	Isotope sample of dark greenish gray, biotite-plagioclase micoporphysy set in fine-grained dark greenish gray matrix. Spatially associated with stibnite ore zone of Grizzly Bear mine																
03AD107	64.3327	-144.2175	30-Jun-03	Kbm	biotite granite of Black Mtn	Isotope sample of equigranular, homogeneous, biotite granite (fresh)																
03GL001R	64.4673	-144.2587			quartz vein (cobble)	Bull qz cobble float from Tibbs Cr. -- vuggy, pyritic. Collected by Gregory Lee																
03GL008R1	64.3749	-144.2142			quarz vein	Pyritic qz vein and silicified granite from mine diggings. Collected by Gregory Lee																
03GL008R2	64.3749	-144.2142			biotite granite	Rusty country rock: qz-plag-hornblende-biotite granite. Collected by Gregory Lee																
03GL014R	64.3432	-144.2528			quarz vein	Mixed dump material from Gray Lead Mine -- mostly quartz vein chips with sulfides. Collected by Gregory Lee																
03MO003	64.3809	-144.486	14-Jul-03	Dag	contact quartzofeldspathic biotite gneiss/augen gneiss	Contact zone with biotite gneiss and medium crystaline augen gneiss; augens 0.5-2 cm; some biotite-poor gneissic layers 15-20cm thick, but all med-gnd. Well lineated; foliation in augen gn. Is planar-strong w/ isoclinal folding of planar and linear fabric																
03MO004	64.3809	-144.4861	14-Jul-03	Dag	augen gneiss-biotite rich	Augen gneis penetratively deformed; biotite-rich; mixed unit of hornblende gn. And qgb seems to have somewhat diferent attitude and lin. Orientation; no augen and not as sheared																
03MO006	64.3723	-144.467	14-Jul-03	Dag	augen gneiss	Augen gneiss, highly sheared, isoclinally folded; stretching lineations (west-vergent) are folded; secondary folds have axial planar lineations, which are parallel to stretching lineations. Isoclinal folds verge west			110	56			281	13			281	13				
03MO007	64.4056	-144.417	15-Jul-03	Pzgn	quartzofeldspathic biotite gneiss	Biotite gneiss w/ quartz vins (sills) folded about open folds, but may be some isoclinal folds. Unit includes weakly foliated, coarse-grained, biotite granitic gneis as thin (10-100cm) interlayers w/in well-fol biotite gneiss.			307	49			287	18			287	18	305	9		
03MO007A	64.4056	-144.417	15-Jul-03	Pzgn	quartzofeldspathic biotite gneiss				259	49			305	9								
03MO007C	64.4056	-144.417	15-Jul-03	Pzgn	quartzofeldspathic biotite gneiss				308	62												
03MO008	64.4108	-144.3992	15-Jul-03	Kgtc	leucogranite	Leucogranite with numerous xenoliths of biotite gneiss; weakly foliated, biotite-poor, quartz-rich; locally prominent sub-horizontal fractures (near roof?)	102	62														
03MO010	64.3689	-144.4153		Dag	amphibolite	Foliated amphibolite with mineral lineations; dike of Kgru;			48	41			274	17								
03MO012	64.3584	-144.4375		Pzgn	gray gneiss	Gray, quartz-feld-biotite gneiss+amphibolite			215	32			300	32								
03MO012.5	64.3584	-144.4375		Pzgn	augen-free gray quartzofeldspathic biotite gneiss	Augen-free quartz-feld-biotite gneiss with mineral lineations			156	17			311	13								
03MO013	64.368	-144.4475		Dag	augen gneiss	Foliated augen gneiss with stretching lineations																
03MO014	64.3537	-144.4537		Dag	augen gneiss	Biotite orthogneiss with stretching lineations	277	7	142	36			301	5								
03MO015	64.3766	-144.4271		Pzgn	augen gneiss	Biotite augen gneiss with stretching (rodding) lineations			93	32			247	11								
03MO015.4	64.3721	-144.4204		Dag	augen gneiss	Biotite augen gneiss with lineations in B-tectonic axis; sample for zircons																
03MO016	64.3766	-144.4272		Pzgn	granite	quartz-feldspar-biotite gneiss with minor equigranular, med-grained, nonfoliated (K) granite as dikes or sills																
03MO017	64.3795	-144.4301		Pzgn	quartzofeldspathic biotite gneiss	quartz-feldspar-biotite gneiss w/o augens			100	56							245	42				
03MO019	64.3699	-144.4033		Dag	augen gneiss	quartz-feldspar-biotite augen gneiss with stretching lineations			67	31			72	2								
03MO020	64.3699	-144.3939		Dag	augen gneiss	quartz-feldspar-biotite augen gneiss with stretching lineations			89	48			271	4								
03MO022	64.3617	-144.3204		Pzgn	quartzofeldspathic biotite gneiss	Abrupt change in lithology, fault zone?; biotite gneiss horizon in augen gneiss?																
03MO023	64.3634	-144.3147		Pzgn	augen gneiss	Quartz-feldspar-biotite augen gneiss with stretching lineations																
03MO024	64.3629	-144.3063		Dag	contact of augen gneiss and leucogranite	Intrusive contact zone of augen gneiss and leucogranite dikes and sills			138	35			268	17								
03MO025	64.3615	-144.2898		Dag	augen gneiss	Good augen gneiss and bull quartz			80	31			110	22								
03MO026	64.3781	-144.3125		Dag	augen gneiss	Biotite augen gneiss			133	64			281	64								
03MO027	64.3615	-144.2896		Dag	mixed gneiss	Metasediments; gneiss w/amp; leucocratic qfb gneiss; crs xtln biotite schist; strongly folded			288	76												
03MO029	64.3826	-144.2777		Pzgn	float	Med-grained granodiorite float in saddle; biotite-rich gneiss otc.			131	65												
03MO030	64.3682	-144.3005		Dag	augen gneiss																	
03MO032A	64.3714	-144.2837		Dag	augen gneiss	Augen gneiss with bull quartz; basal part of augen gneiss sequence			90	56			104	20								
03MO032B	64.3714	-144.2837		Dag	augen gneiss	Augen gneiss with bull quartz; basal part of augen gneiss sequence			340	47												
03MO032C	64.3714	-144.2837		Dag	augen gneiss	Augen gneiss with bull quartz; basal part of augen gneiss sequence			145	22												
03MO034	64.3479	-144.2203		Pzg																		
04AD202	64.4191	-144.4959	10-Aug-04	Pzgn	quartzofeldspathic biotite gneiss	Foliated biotite gneiss of the lower structural plate; orthogneiss protolith?; no good otc for structural measurements.																
04AD203	64.4177	-144.4935	10-Aug-04	Pzgn	granite dike	Medium-grained, light gray, nonfoliated, equigranular biotite granite dike 100' thick; NE-trending																
04AD204	64.4171	-144.4908	10-Aug-04	Pzgn	migmatized Pzgn	Migmatite with Pzgn biotite gneiss paleosome intruded by light gray granite																
04AD205	64.4165	-144.4901	10-Aug-04	Pzgn	migmatized Pzgn	Migmatite with Pzgn biotite gneiss paleosome intruded by light gray granite			265	30												
04AD206	64.4153	-144.4822	10-Aug-04	Pzgn	migmatized Pzgn	Light gray biotite granite dikes variably foliated (strong to weak) cutting biotite gneiss. Poor otc on ridge, but see 65-70% granite dikes. Is this a contact zone with batholith?			300	70			305	65								
04AD207	64.4155	-144.4733	10-Aug-04	Pzgn	migmatized Pzgn	Medium-grained, light gray strongly foliated biotite granite/granodiorite neosome (>50%) with Pzgn biotite gneiss paleosome (<50%) with quartz veins			335	62												
04AD208	64.4137	-144.4725	10-Aug-04	Pzgn	migmatized Pzgn	Folded migmatite cut by granite dikelet (~110 Ma); older neosome was synkinematic with major D1 deformation--strongly foliated (367 Ma; 190 Ma, or 116 Ma?)			186	35							255	38				
04AD209	64.4117	-144.4695	10-Aug-04	Pzgn	migmatized Pzgn	Pzgn paragneiss with interlayered light gray, foliated granite gneiss. Sample 04AD209a of synkinematic granite gneiss; Sample 04AD209b of paragneiss country rock																
04AD209A	64.4117	-144.4695	10-Aug-04	Pzgn	migmatized Pzgn	Synkinematic granitic neosome in Pzgn gneiss.																
04AD210	64.4123	-144.4655	10-Aug-04	Pzgn	migmatized Pzgn	Lower plate migmatized Pzgn; Thought: use Pzgn unit lable on map with stippled overlay pattern for areas of >50% granite neosome			335	28			335	28								
04AD211	64.4109	-144.4609	10-Aug-04	Pzgn	migmatized Pzgn	Sillimanite-bearing country rx with numerous light-gray granite sills; plot N-trending high-angle fault here; photo looking NW; note smole from nearby forest fires																
04AD212	64.4107	-144.4572	10-Aug-04	Pzgn	Pzgn	Pzgn																
04AD213	64.4098	-144.4555	10-Aug-04	Pzgn	quartzofeldspathic biotite gneiss	photo of folds							275	25			275	25				
04AD214	64.4078	-144.4361	10-Aug-04	Pzgn	quartzofeldspathic biotite gneiss	"Normal" Pzgn with 20-30% synkinematic granitic horizons	300	45														
04AD215	64.41	-144.435	10-Aug-04	Pzgn	migmatized Pzgn	Zone of >50% granite neosome (foliated, white to light gray granite). >80% granite makes up slope																
04AD216	64.411	-144.4309	10-Aug-04	Pzgn	migmatized Pzgn	Folds (F2?) fold dominante schistosity (S1?); no S2 in F2 folds			320	30			65	15					65	15		
04AD217	64.4126	-144.4292	10-Aug-04	Pzgn	synkinematic orthogneiss	Fresh boulders of strongly foliated, light gray, medium-granited biotite granite neosome (Devonian or Cretaceous?). Sample for daing																
04AD218	64.4134	-144.428	10-Aug-04	Pzgn	basalt dike	Fresh, dark gray to black aphanitic Tertiary basalt; very limited otc (50') tried to define orientation and failed																
04AD219	64.414	-144.4259	10-Aug-04	Pzgn	altered granite	Reddened and altered course-grained biotite granite; typical of reddened granite west of Tibbs Ck																
04AD220	64.416	-144.4241	10-Aug-04	Kgtc	biotite granite Goodpaster Batholith	Fresh otc of light gray to white, nonfoliated equigranular medium-grained biotite granite similar to the border phase unit of Goodpaster																
04AD221	64.4216	-144.4176	10-Aug-04	Kgtc	biotite granite Goodpaster Batholith	Nonfoliated equigranular biotite granite; soil weathers buff orange; border phase of Goodpaster batholith																
04AD222	64.406	-144.1834	12-Aug-04	Kbm	porphyritic biotite granodiorite	Porphyritic biotite-hornblende granodiorite, salman fine-grained matrix with subangular quartz and feldspars distinctive blades (5-10 mm) of biotite (hornblende pseudomorphs), elongated mafic clots. 2 photos with nickel for scale																
04AD223	64.40749	-144.1759	12-Aug-04	Kdi	porphyritic hornblende-biotite diorite	Hornblende-biotite porphyritic diorite dike?. Green matrix with biotite porphyry (hornblende pseudos?) laths and rounded felds phenocrysts: shallow subvolcanic intrusion																
04AD224	64.40746	-144.175	12-Aug-04	Kdi	biotite granite	Equigranular, medium-grained, nonfoliated biotite granite (similar to Mt Harper). No otc on ridge-totally boulder strewn, but map as composite intrustion of porphyritic diorite, granodiorite, and granite. This is predominantly grantite, but are boulders																
04AD225	64.4146	-144.1627	10-Aug-04	Kdi	porphyritic diorite and granodiorite	phase																
04AD226	64.4185	-144.1588	12-Aug-04	Kdi	porphritic granodiorite	Black Mtn. intrusion. Porphyritic granodiorite. No bull quartz or alteration seen on this northern end of Black Mountain on this traverse. Out of the zone of mineralization?																
04AD227	64.4203	-144.1528	12-Aug-04	Kdi	biotite-hornblende granodiorite	Black Mtn. intrusion. biotite-hornblende granodiorite intruding hornblende-biotite diorite. Good otc. 2 photos w/ blue pencil pointing at diorite clots in granodiorite along contact with bk gray diorite (on right)																
04AD228	64.422	-144.1608	12-Aug-04	Kbm	biotite granite/granodiorite	Biotite granodiorite to granite intrusions (110 Ma) mapped to the south along western flank of Black Mtn. 2 photos of fresh otc.																
04AD229	64.4254	-144.1625	12-Aug-04	Kbm	biotite granite	Light-buff, medium-grained, nonfoliated, massive biotite granite. Biotite 25-30%. Weathers to rounded cobbles with ochre arkosic soil. Map as separate unit from diorite/granodiorite complex to east. Same as on western flank of Black Mtn. (110 Ma)																
04AD230	64.4335	-144.1277	12-Aug-04	Pzgm	quartzofeldspathic biotite gneiss migmatite / granite	Silicified, altered, country rock of biotite gneiss migmatite																
04AD231	64.431	-144.1306	12-Aug-04	Kbm	porphyritic biotite granodiorite	Porphyritic granodiorite. Map as part of Black Mtn. intrusive complex.																
04AD232	64.3569	-144.0194	12-Aug-04	Kgmh	Mt. Harper granite	Light gray, equigranular, massive, biotite (hornblende?) granodiorite with mafic enclaves (cognate inclusions?). Photos with hammer. 2 photos with pencil of fresh surface with mafic xenoliths																
04AD233	64.4127	-144.0046	12-Aug-04	Pzg	altered quartzofeldspathic biotite gneiss migmatite	Reddened medium-grained biotite granite. Forms bright orange soil and float. Weathers to rounded topography. Sample for chemistry--gold?. Unit just like on south side of Goodpaster batholith. Intense regional hydrothermal alt? (Fe-staining).																
04AD234	64.4132	-144.0084	12-Aug-04	Pzg	highly altered quartzofeldspathic biotite gneiss	Preserved folded gneissic fabric typical of Pzgn. >50% granitic neosome. Highly altered, leached biotite, Fe-stained (Fe hydrous oxide)			255	38												
04AD235	64.4162	-144.0155	12-Aug-04	Pzg	highly altered quartzofeldspathic biotite gneiss	Preserved folded gneissic fabric typical of Pzgn. >50% granitic neosome. Highly altered, leached biotite, Fe-stained (Fe hydrous oxide). Photo 1: preserved foliation (w/ hammer), Photo 2: typical orange colored soil.			200	65												
04AD236	64.4178	-144.0188	12-Aug-04	Pzg	highly altered quartzofeldspathic biotite gneiss	Relict gneissic fabric preserved. Syntectonic granite neosome ~50% of unit. Map as our new unit Pzgn-mig. Photo (w/ sharpie). Sample for testing for gold due to widespread regional alteration. What has been leached?			200	64												
04AD237	64.4182	-144.0282	12-Aug-04	Pzg	highly altered quartzofeldspathic biotite gneiss	Preserved relict foliation in highly Fe-stained otc. Looks like this area was mapped correctly. Regional low-T alteration has leached mafic minerals, leaving Fe oxyhdroxides.																
04AD238	64.4953	-144.0453	14-Aug-04	Tr	crystal-rich hornblende-biotite rhyolite	Crystal-rich rhyolite. No flow banding or penetrative fabric here. Phenocrysts of quartz, sanidine, biotite, hornblende? Set in a buff to cream-colored welded and altered matrix. quartz both smoky and clear. Subvolcanic intrusion																
04AD239	64.4953	-144.0453	14-Aug-04	Tr	crystal-rich hornblende-biotite rhyolite	Crystal-rich rhyolite. No flow banding or penetrative fabric here. Phenocrysts of quartz, sanidine, biotite, hornblende? Set in a buff to cream-colored welded and altered matrix. quartz both smoky and clear. Subvolcanic intrusion																
04AD240	64.4943	-144.0507	14-Aug-04	Tr	crystal-rich rhyolite	Crystal-rich rhyolite. Subvolcanic intrusion? Parting isn't compositional. Silicified zone near fault																
04AD241A	64.4931	-144.0549	14-Aug-04	Tr	crystal-rich rhyolite-weathered	hornblende-bio, quartz, felds phenos set in gray, fine-grained to aphanitic matrix. Matrix is less altered here. Evenly-spaced joints trend N45W-vert. Photos of silicification front.																
04AD241B	64.4931	-144.0549	14-Aug-04	Tr	crystal-rich rhyolitic tuff	Quartz vein cutting silicified rhyolite																
04AD242	64.4932	-144.0622	14-Aug-04	Tr	vitrophyre	Black, crystal-rich vitrophyre. Fissure vent facies. Vent trends N59E. Black Mtn. tectonic zone underlies felsic volcanic complex. Original layering recorded as S_dominant; jointing is recorded as S_2nd	160	33	65	60												
04AD243	64.4941	-144.0636	14-Aug-04	Tr	crystal-rich rhyolite	Photo of regularly spaced high-angle jointing cutting anastamosing, low-anle flow parting. Jointing recorded as S_2nd			60	67												
04AD244	64.4956	-144.0725	14-Aug-04	Tr	crystal-rich rhyolite	Altered crystal-rich rhyolite as in first stop (04AD238). Depositional partings cut by regularly-spaced jointing. Depositional partings recorded as S_dom	230	58														
04AD245	64.4954	-144.0804	14-Aug-04	Tr	crystal-rich rhyolite	No evidence for tectonic base to this beautiful rhyolite flow dome complex. No brecciation, penetrative fabric, nada																
04AD246	64.4697	-144.0432	14-Aug-04	Pzam	amphibolite	Chaotic zone. Foliated amphibolite cut by anastomosing shear bands within the Black Mountain tectonic zone	75	15	50	75			135	15								
04AD246A	64.4697	-144.0432	14-Aug-04	Pzam	migmatized foliated quartzofeldspathic biotite gneiss	Poor otc. Rubble of foliated and altered granodiorite (orthogneiss) and amphibolite																
04AD248	64.4727	-144.0516	14-Aug-04	Pzg	migmatized foliated quartzofeldspathic biotite gneiss	Highly altered granitic gneiss. Map as Pzgn-mig-alt unit																
04AD249	64.4729	-144.0534	14-Aug-04	Pzg	biotite granite	Nonfoliated, biotite granite																
04AD250	64.476	-144.0659	14-Aug-04	Kgb	hornblende-biotite granodiorite	Medium-grained hornblende-biotite granodiorite with 20%. Equivalent to Goodpaster batholith; different granitoid than 04AD249. map a fault in the saddle; zone covered by vegetation.																
04AD251	64.4729	-144.0675	14-Aug-04	Tr	crystal-rich rhyolite	Crystal-rich, welded rhyolite tuff with broken quartz phenocrystals; 10% mafics; matrix is a white, aphanitic, and slightly altered forms cap on Goodpaster batholith; cut by NE-trending evenly spaced joints with no slickensides			40	75												
04AD252	64.477	-144.0697	14-Aug-04	Kgb	hornblende-biotite granodiorite	Speckled hornblende-biotite granodiorite forms ochre-colored soil. Map as Goodpaster batholith																
04AD253	64.4765	-144.0793	14-Aug-04	Kgb	hornblende-biotite granodiorite	speckled granodiorite. Map as Goodpaster batholith																
04AD254	64.4786	-144.08	14-Aug-04	Tr	crystal-rich rhyolite	Top of knob is crystal-rich rhyolite																
04AD255	64.2574	-144.3249	15-Aug-04	Dag	augen gneiss	Top of Brink Mtn composed of augen gneiss. Otc is poor																
04AD256	64.257	-144.3355	15-Aug-04	Dag	augen gneiss	All Dag from site 04AD255 to here. No good otc for structural data																
04AD257	64.2563	-144.3423	15-Aug-04	Dag	augen gneiss	Bull quartz boulder train in Dag trending N60W. No otc for structural data																

Table 3. Geologic field notes—Continued.

04AD258	64.2563	-144.3433	15-Aug-04	Dag	augen gneiss	Augen gneiss with prominent lineations. Dominant S-C fabric show predominantly to W (down dip). Note ribbon quartz indicates unit is a orthomylonite. Lineations are stretching type			185	32			280	28								
04AD259	64.2567	-144.3443	15-Aug-04	Dag	augen gneiss	Augen gneiss			220	15			300	15								
04AD260	64.2593	-144.3509	15-Aug-04	Kgbr	biotite granite	Light-gray, medium-grained, massive hornblende-biotite granodiorite. Looks like Black Mtn. granodiorite. Check chemistry.																
04AD261	64.2593	-144.3493	15-Aug-04	Kgbr	quartz feldspar porphyry	Distinctive nonfoliated quartz, feldspart porphyry with feldspar megacrysts. Groundmass of biotite granite. Otc trends N50E																
04AD262	64.2609	-144.3511	15-Aug-04	Kgbr	basalt dike	Dark gray, nonfoliated basalt dike trending N80E; 15' wide and at least 100' long																
04AD263	64.2619	-144.3537	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Looks similar to Black Mtn granodiorite																
04AD264	64.2607	-144.3577	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Fault trending N30E. Lots of seep springs, boggy on this bench. Faults in area noted by stair stepping down-to-the-west normal faulting of Q erosional surface																
04AD265	64.2599	-144.3608	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Boulder of hornblende-biotite granodiorite with sheeted quartz veins																
04AD266	64.2587	-144.3654	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Fault "scarp" sharp break in slope trending N10W																
04AD267	64.2579	-144.3678	15-Aug-04	Kgbr	quartz feldspar porphyry	Megacrystic quartz feldspar porphyry																
04AD268	64.2574	-144.3699	15-Aug-04	Kqfp	quartz feldspar porphyry	Megacrystic quartz feldspar porphyry																
04AD269	64.2573	-144.3775	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Hornblende-biotite granodiorite. Unit the same as 04AD260																
04AD270	64.2565	-144.3832	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Hornblende-biotite granodiorite. Unit the same as 04AD260																
04AD271	64.2608	-144.3951	15-Aug-04	Qc	bio granodiorite	Hornblende-biotite granodiorite. Unit the same as 04AD260. Walked across Kqfp in saddle																
04AD272	64.2557	-144.3499	15-Aug-04	Kgbr	granodiorite to east; augen gneiss to west	Fault between granodiorite to east and augen gneiss to west. Is this the western margin of the NE-trending Black Mountain tectonic zone																
04AD273	64.2515	-144.3631	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Drill pad on Brink gold prospect. All hornblende-biotite granodiorite exposed from east to here. No Kqfp seen to here																
04AD274	64.2515	-144.3648	15-Aug-04	Kgbr	quartz vein in hornblende-biotite granodiorite	Exploration pit-not bedrock; quartz veining in hornblende-biotite granite/granodiorite. Brink prospect is an intrusion-related gold deposit-type																
04AD275	64.2513	-144.3715	15-Aug-04	Kgbr	hornblende-biotite granodiorite	Brittle quartz veins cutting hornblende-biotite granodiorite. No Kqfp seen on ridge from here east																
04GL030R	64.297	-144.2621			quartz vein	Pyritic granite float with half-inch quartz vein. Collected by Gregory Lee																
04MO051	64.418	-144.496	10-Aug-04	Pzgn	granite dike	Weakly foliated, medium-grained, qfb granite compositionally a granite; abundant quartz; limonite stained. 2) Just early pak in fine-granied, equigranular granite-may be a Kg dike on B2; no more than 20 m thick in EW-direction																
04MO052	64.4164	-144.4905	10-Aug-04	Pzgn	quartzofeldspathic biotite gneiss migmatite	outcrop			75	50			264	2								
04MO053	64.415	-144.402	10-Aug-04	Kgtc	quartzofeldspathic biotite gneiss migmatite	Sills of granite in metaseds of qfb locally sills are foliated, elsewhere, non-fol and asso. With bull quartz; 2) Fol. N40W 57 NE within sills of granite; 3) Faults in here? ~N-S broad flat area; 5) fn-grn granite in cores of sills, crs-grn at margins			60	70			245	56								
04MO055	64.4317	-144.4724		Kgtc	quartzofeldspathic biotite gneiss	Quartzofeldspathic biotite gneiss with thin granitic sills (<1-2ft) cut by nonfoliated granite	222	60					255	45								
04MO056	64.4065	-144.4741		Pzgn	mixed gneiss				126	59												
04MO057	64.4031	-144.4777		Pzgn			120	55					310	21								
04MO058	64.3926	144.4834		Pzgn	foliated granite	Major structure here or rock out of place.																
04MO059	64.3926	-144.4254		Pzgn																		
04MO060	64.3935	-144.4324		Pzgn	quartzofeldspathic biotite gneiss	Compositionally banded and folded quartz bio gneiss	122	48										215	50			
04MO061	64.3924	-144.4421		Pzgn	quartzofeldspathic biotite gneiss	Compositional layering isoclinally folded about axial planar strong schisosity	146	54					145	35								
04MO062	64.3898	-144.4481		Pzgn	quartzofeldspathic biotite gneiss	Quartzofeldspathic biotite gneiss with orthogneiss and nonfoliated biotite granite	214	50														
04MO065	64.384	-144.1732		Kbm	biotite granite, diorite, granodiorite	No otc but rocks trend about N45E, 1-2 m thick, and hornblende-bearing granitoid occus near contact with dikes. Diorite intrudes granite suggested by sharp thin contact with granite, foliated diorite, minor foliation in granite, and hornblende phenos																
04MO066	64.3859	-144.1745		Kbm	quartzofeldspathic biotite gneiss and amphibolite?	Large xenolith, roof pendant, or Kdi xenolith in biotite granite intrusion																
04MO067	64.394	-144.1745		Kbm	biotite granite	Medium-grained, equigranular, nonfoliated light-grey biotite granite																
04MO068	64.3935	-144.164		Kbm	contact zone (fault?)	Drainage divide location of contact (fault?) between equigranular granite on west and granodiorite/diorite on east. No exposure or float in divide																
04MO069	64.3938	-144.1571		Kbm	hornblende granodiorite	Hornblende-bearing, green-cream weathered granodiorite. Weakly to moderately foliated xenoliths. North 1/2 of knob is mostly gneiss, v. strongly injected with leucogranite, quartz veins, some diorite. South 1/2 is mixture of gd, gr, di, peg, quartz vein																
04MO070	64.4071	-144.1547		Kbm	porphyritic diorite	Small otc in flats all porphyritic diorite																
04MO071	64.4083	-144.1401		Kbm	(fault?)	Granite, medium-grained, non-foliated, biotite granite on west side of knob. Center begin quartzofeldspathic biotite gneiss, quartz vein, diorite-the mixed bag of site 04MO069																
04MO072	64.4088	-144.1254		Kbm	biotite granite	All light grey, equigranular, medium-grained biotite granite. No fracturing or shearing here. Rather widely spaced flat and vertical joings on 5-20 cm spacing with some limonite staining																
04MO073	64.4099	-144.1103		Kbm	biotite granite	Same biotite granite as last pt, but here is fine crystalline, light grey, nonfoliated with sparse biotite phenocrysts. Some quartz veins. Summary: have mapped NE-trending tectonic zone this is the continuation of the Black Mtn fault zone and is complex																
04MO074	64.4681	-144.2854		Kgb	biotite granite/granodiorte	Area mapped as gneiss, but is granodiorite, diorite, and biotite granite. Diorite float in granite forms trend (dike?) of N5W																
04MO075	64.4712	-144.2963		Kgb	biotite granite	No otc, float of equigranular, light-grey to cream, medi xtln grnite as in 04MO074. No mafic float																
04MO076	64.4567	-144.2421		Qc	biotite granite	Equigranular, fine- to medium-grained, nonfoliated biotite granite 10-15% biotite. Not as course as points 74&75. no dioritic rock and certainly no metaseds. Granite float to north o fhill all mapped before as Pzgn (sillimanite-biotite gneiss)																
04MO077	64.4486	-144.3221		Kgb	biotite granite	Equigranular, fine- to medium-grained, nonfoliated leucogranite (~5% biotite). Mapped originally as biotite gneiss, but is granite																
04MO078	64.4295	-144.0993		Kdi	mafic dike	Mafic dike intruse med xtln, equigranular biotite granite. Dike is ~25m thick trends N57E 85SE with chilled, black margin andaphanitic porphoritic core. West margin dips 45 NW east margin N57E 85 E																
04MO079	64.4954	-144.045		Tr	crystal-rich rhyolite	Cream-tan, porphyritic rhyolite tuff. Phenocrysts of quartz, felds (sanidine), biotite. Not welded, no layering. Most xtls are euhedral. Small saddle ~150m to summit from point. Silicified fault zone; w/ slicks, trends N5W. Platy layering up ridge elev	323	50														
04MO080	64.493	-144.0548		Tr	crystal-rich rhyolite	Platy rhyolite tuff is lost here. Much silicification of groundmass, leaving quartz phenos. Silica veins as much as 5 cm thick; layering defined by color (yellow-green-tan). N46W joints, vertical, in biotite-hornblende granodiorite dike at top of knob																
04MO081	64.4936	-144.0622		Tr	vitrophyre	Obsidian fills linear fracture vitrophyre fracture trends N59E. As seen in Mogellon volc field of NM, glass matrix to euhedral feldspar and euhedral quartz. No spheriulitic texture																
04MO083	64.4696	-144.0432		Pzam	hornblende-plag gneiss	Hornblende content 15-40%-protolith? 10m to east is pegmatite, then fine-med gnd, equigranular biotite granite, nonfoliated. Then 10m to W, nonfoliated amphibolite; granite occurs as pods in amphibolitic rock	287	59					135	15								
04MO084	64.4736	-144.037		Kgtc	sheared granite, amphibolite	Sequence of sheared granite, fresh granite, foliated amphibolite																
04MO085	64.4763	-144.0329		Kgtc	sheared granite, amphibolite	Sequence of sheared granite, fresh granite, foliated amphibolite	17	22														
04MO086	64.482	-144.0236		Pzg	contact metaseds w/ leucogranite	Contact of gn metaseds (unaltered) w/ fine-med gnd leucogranite intrusions trending N20E. Granite bounded on N by sheared & altered gran ite and qfb gneiss, all strongly stained with limonite. "Old" Pz granite in these hills is very altered and sheared.																
04MO087	64.2577	-144.3243		Dag	augen gneiss	Brink hill. Augen gneiss; quartz veins trend N15E. Quartz veins form pods 150m wide. Asymmetry of augens show west transport direction			174	6			279	20								
04MO088	64.2635	-144.3163		Dag	augen gneiss	Thin quartz "sills" in gneiss			170	18			273	18								
04MO089	64.2668	-144.3002		Qsl	augen gneiss	Bull quartz; fault on east; If Black Mtn is left lateral slip NE-trending tectonic zone,, then NW tension gashes are likely																
04MO090	64.2668	-144.3002		Qsl	fault zone	Much bull quartz float in gna, slow below pt also has h																
04MO092	64.2734	-144.2832		Kgmh	Mt. Harper granite	Limonite-stained sheared granite. Break in slope trends N50E down to NW and is asso with slickensides and stained granite.																
04MO093	64.2778	-144.2825		Kgmh	Mt. Harper granite	Another major break in slope, with rubblyh, hummocky terrane betwee pt 92&93 suspect fault here N45E. Granite here is fine- to med grained equigranular, with abundant biotite																
04MO094	64.2854	-144.2808		Kgmh	Mt. Harper granite	Light grey to cream-colored, equigranular, nonfoliated Mt. Harper. Can only say that composition of granite stays about the same % biotite; but color vairesto med grey.																
04MO095	64.2901	-144.2802		Kgmh	Mt. Harper granite	Mt Harper granite, no surprises																
04MO096	64.2916	-144.29		Kgmh	fault zone	Abrupt break in slope flat on west, contact of Mt Harper granite with ?;																
04MO097	64.2919	-144.2978		Kgmh	fault in Mt. Harper granite	Sheared granite, much pegmatite, and fault scarp (N20E trend); Mt Harper on both sides of fault																
04MO098	64.2925	-144.3028		Kgmh	fault	Another fault scarp with 20m; much pegmatite along fault line; trends N33E!; quartz veins w/ alteration; down ridge (elev 3950) small scarp many quartz veins																
05AD300	64.3332	-144.254	30-Jul-05	Dag	augen gneiss	Rubble of augen gneiss with some float of medium grained equigranular biotite granite																
05AD301	64.3299	-144.2562	30-Jul-05	Kbm	biotite granite dike	Fine- to medium-grained equigranular light gray biotite granodiorite. Contact trends N35E ~200'-wide NE-trending dike																
05AD302	64.3288	-144.2556	30-Jul-05	Kbm	augen gneiss	Lineated augen gneiss.			180	25			295	15								
05AD303	64.3348	-144.2602	30-Jul-05	Dag	augen gneiss	Good augen gneiss, mylonitic fabric indicating near basal fault zone																
05AD304	64.3364	-144.2627	30-Jul-05	Dag	augen gneiss	Good clean augen gneiss, not strongly mylonitic suggesting higher above basal fault zone			270	45			270	0								
05AD305	64.3399	-144.2627	30-Jul-05	Qaf	float of augen gneiss and biotite granite	Gray Lead mine area. Walked up from valley floor.																
05AD306	64.3429	-144.2528	30-Jul-05	Dag	Gray Lead lower mine dump	Quartz vein within dark gray nonfoliated, equigranular biotite (hornblende?) granodiorite. Approximately 15% mafic minerals. No tectonic fabric seen adjacent to quartz veins in granodiorite suggesting not shear zone-type lode system,																
05AD306A	64.3429	-144.2528	30-Jul-05	Dag	biotite granodiorite	Fresh biotite granodiorite host for Gray Lead deposit																
05AD306B	64.3429	-144.2528	30-Jul-05	Dag	quartz vein	Quartz vein material from mine dump																
05AD306C	64.3399	-144.2535	30-Jul-05	Qaf	hornblende biotite diorite	Foliated hornblende biotite diorite with dessiminated sulfides. Looks to be associated with mineralization. Is this a genetic key?																
05AD307	64.3446	-144.2503	30-Jul-05	Dag	quartz vein	Chalcedonic bull quartz vein material																
05AD308	64.3077	-144.2285	31-Jul-05	Kgmh	biotite granodiorite	Biotite granodiorite on ridge crest of southern part of Black Mtn. Numerous N40E-trending faults step down planar erosional surface to west																
05AD309	64.3078	-144.2307	31-Jul-05	Kgmh	biotite-rich granodiorite	Fine- to medium-grained nonfoliated biotite granodiorite. Complex intrusion with biotite-rich granodiorite, diorite, and leucogranite all cut by late quartz veins																
05AD310	64.3087	-144.2331	31-Jul-05	Kgmh	biotite granodiorite	Another faulted bench with N60E trend. Displaced 40' down to the west.																
05AD311	64.3086	-144.2373	31-Jul-05	Kgmh	biotite granodiorite	Float block of fine-grained biotite granodiorite cutting biotite granodioritic gneiss (K?)																
05AD312	64.3091	-144.2414	31-Jul-05	Kgmh	leucogranite	Fine-grained biotite leucogranite with distinctive larger (10 mm) biotite flakes. Looks like biotite granodiorite to north by Gray Lead mine (sample 03AD052) and granite to west of Black Mtn. up in northern Tibbs Ck																
05AD313	64.3094	-144.2455	31-Jul-05	Kgmh	biotite granodioritic gneiss	Scabs of foliated biotite gneiss on east side of saddle																
05AD314	64.3093	-144.2507	31-Jul-05	Dog	biotite-rich granodiorite	Fine-grained biotite-rich granodiorite. Was mapped as Pz biotite gneiss. Drill collar pointing into fault zone																
05AD315	64.2923	-144.2269	31-Jul-05	Kgmh	biotite granite	Course-grained biotite granite with distinctive biotite "flakes". Map as same unit as 05AD312																
05AD316	64.295	-144.2351	31-Jul-05	Kgmh	foliated biotite granodiorite	Moderately foliated blocks of biotite granodiorite. Unit could be syntectonic intrusion.																
05AD317	64.2999	-144.2481	31-Jul-05	Kgmh	foliated biotite granodiorite	Synkinematic biotite granodiorite. 15-20% biotite. Cut by quartz veins just east of ochre-stained zone.																
05AD318	64.3	-144.2495	31-Jul-05	Kgmh	foliated biotite granodiorite	Quartz-rich pegmatite float block looks like gold-bearing K pegmatite dikes in B2 quad																
05AD319	64.2999	-144.2506	31-Jul-05	Shear zone	silicified fault zone	Quartz vein material with weathered out casts of pyrite in fault zone. Soil distinctive ochre colored due to altered sulfides.																
05AD320	64.2998	-144.252	31-Jul-05	Dog	foliated hornblende biotite granodiorite	Strongly foliated hornblende-biotite granodiorite. Mapped previously as Pz biotite gneiss, but looks to be synkinematic Cretaceous intrusive unit. Sampled for possible age dating																
05AD321	64.2896	-144.2246	02-Aug-05	Kgmh	biotite granodiorite	Typical medium-grained, nonfoliated, light gray biotite granodiorite. Equivalent to Mount Harper biotite granodiorite																
05AD322	64.2851	-144.2304	02-Aug-05	Kgmh	biotite granodiorite	Same medium-grained, nonfoliated, buffish gray biotite granodiorite. 25% biotite. Map as biotite-rich phase of intrusion.																
05AD323	64.2804	-144.2355	02-Aug-05	Kgmh	biotite granodiorite	Quartz vein in saddle of typical biotite granodiorite. Same for gold from exploration dog hole. Same as sample 03AD319. Weathered pyrite casts and vugs. Broad zone of quartz vein material at least 200 ft wide																
05AD324	64.2781	-144.241	02-Aug-05	Kgmh	foliated biotite granodiorite	Moderately foliated biotite granodiorite on south side of saddle. Small rhyolite or aplite dike cuts granodiorite at N20W down drainage. Sample of white, aphanitic nonfoliated rhyolite with quartz phenocrysts																
05AD325	64.2775	-144.2471	02-Aug-05	Dog	foliated biotite tonalite	Foliated biotite tonalitic border phase of Black Mtn intrusion. Walked acrss several zones of nonfoliated granite and dark gray biotite tonalite like at Gray Lead mine (see photo from Gray Lead)																
05AD326	64.2773	-144.2503	02-Aug-05	Dog	augen gneiss	Augen gneiss roof pendent on top of Black Mtn intrusion. Southwest-vergent transport direction on stretching lineation			140	30			255	25								
05AD327	64.2798	-144.2518	02-Aug-05	Dog	augen gneiss/granodoirite contact	Conact of augen gneiss (above) and foliated granodiorite/diorite. Elev. 4775																
05AD327A	64.28105	-144.2528	02-Aug-05	Dog	augen gneiss	Good augen gneiss being stepped down on down-to-the-west normal fault. West-vergent tectonic transport from stretching lineations. 3 photos looking north along western margin of intrusion along 45-dipping normal fault			180	38			270	38								
05AD328	64.2819	-144.2535	02-Aug-05	Dog	augen gneiss	Augen gneiss in roof pendent above intrusion			190	38			255	32								
05AD329	64.2825	-144.2543	02-Aug-05	Dog	foliated diorite	deformation?			155	28												
05AD330	64.2843	-144.2559	02-Aug-05	Dog	augen gneiss	Near roof contact zone. Stepped down on a down-to-the-west N70E-trending normal fault																
05AD331	64.2865	-144.2556	02-Aug-05	Dog	mylonitic granodiorite	Blocks not in place, but where seen S-fabric is parallel to D2 fabric in augen gneiss. Lineated and S-C mylonitic fabric formed during emplacement of intrusion?																
05AD332	64.2891	-144.2551	02-Aug-05	Dog	mylonitic granodiorite	Biotite granodiorite with mylonitic fabric. Cretaceous or Devonian?			175	60			265	60								
05AD333	64.2924	-144.2581	02-Aug-05	Dag	tectonized Dag?	Saw augen fabric in biotite granodiorite. Is this mylonitic Cretaceous biotite granodiorite or Dag or both? Looks like could be roof pendent contact zone that is tectonize within west-dipping fault zone or foliated Devonian roof pendant			180	50			250	48								
05AD334	64.2721	-144.2609	02-Aug-05	Dog	augen gneiss	Big blocks of augen gneiss on south side of saddle. Speckled Cretaceous/Devonian? foliated diorite in saddle (border phase). Put conatct at base of knob																
05AD335	64.2721	-144.2471	02-Aug-05	Dog	augen gneiss	Mylonitic augen gneiss			220	30			250	25								
05AD336	64.27	-144.2471	02-Aug-05	Dog	biotite granodiorite	Foliated biotite granodiorite			152	38			274	33								
05AD337	64.2702	-144.2437	02-Aug-05	Dog	foliated biotite grandioirte	Foliated biotite granodiorite compositionally equivalent to make phase of Black Mtn intrusion																
05AD338	64.2649	-144.2421	03-Aug-05	Dog	foliated biotite granodiorite	Foliated Mount Harper biotite granodiorite orthogneiss, like unit Kog in B2 quad. S-fabric not folded. Buff gray, 5-10% biotite.	135	50														
05AD339	64.262	-144.2469	03-Aug-05	Dog	oliated biotite granodiorite	Lineated and foliated Mount Harper biorite granodiorite along ridge. Unfortunately, all blocks are rotated, but unit is both lineated and foliated. Late brittle fractures filled with quartz venis. This is a part of Createceous intrusive comple																
05AD340	64.2608	-144.2528	03-Aug-05	Kgmh	augen gneiss	Beautiful augen gneiss. Crossed fault at break in slope to north																
05AD341	64.2589	-144.2539	03-Aug-05	Kgmh	augen gneiss	Beautiful augen gneiss. Crossed fault at break in slope to north																
05AD343	64.2517	-144.2619	03-Aug-05	Kgmh	augen gneiss	Augen gneiss																
05AD344	64.2527	-144.2214	03-Aug-05	Dag	augen gneiss	Sliver of highly deformed augen gneiss in a tectonic zone through Divide Ck(?). See shear bands cutting foliation and strong limonitic staining. Map as tectonized Dag																
05AD345	64.2726	-144.1472	03-Aug-05	Kgmh	biotite granodiorite	Massive, nonfoliated medium-grained Mt. Harper biotite granodiorite equivalent in handspecimen to bio granodiorite on Black Mountain. Station on west side of knob																
05AD346	64.2732	-144.1495	03-Aug-05	Kgmh	biotite granodiorite	Zone of hydrothermally altered biotite granodiorite (Mt. Harper). Quartz veins trending N60E, vert.																
05AD347	64.2768	-144.157	03-Aug-05	Kgmh	biotite granodiorite	Massive, nonfoliated Mt. Harper biotite granodiorite. North top of knob. Photo with red pencil																
05AD349	64.2777	-144.1684	03-Aug-05	Kgmh	biotite granodiorite	Mt. Harper massive nonfoliated medium-grained biotite granodiorite																
05AD351	64.2718	-144.1764	03-Aug-05	Kgmh	biotite granite	Photo looking east toward Mt. Harper. N. side of saddle, which trends N70E																
05AD352	64.2667	-144.1859	03-Aug-05	Kqfp	apy-bearing quartz vein	Arsenopyrite-bearing quartz vein in Mt. Harper massive nonfoliated medium-grained biotite granodiorite																
05AD353	64.2659	-144.1874	03-Aug-05	Kqfp	quartz feldspar porphyry	Distinctive biotite quartz feldspar porphyry subvolcanic intrusion. Rounded quartz and feldspar megacrysts, medium-grained biotite set in a fine-grained dark gray goundmass.																
05AD354	64.265	-144.1862	03-Aug-05	Kgmh	biotite granodiorite	Same old Mt. Harper. Drill pad into underlying Kqfp intrusion.																
05AD355	64.2638	-144.1884	03-Aug-05	Kgmh	apy-bearing quartz vein	Intense zone of quartz veining in host biotite granodiorite. Use a symbol to show zone of quartz alteration. Sample of arsenopyrite-bearing quartz vein																
05AD356	64.2639	-144.1917	03-Aug-05	Kqfp	altered quartz feldspar porphyry	Quartz and feldspar porphyry megacrysts larger . Groundmass is medium-grained biotite-felds-quartz matrix. Alteration induced reddening of rock																
05AD357	64.2607	-144.1881	03-Aug-05	Kqfp	quartz feldspar porphyry	Quartz feldspar megacrystic porphyry forms knob and slope to south																
05AD358	64.2592	-144.1889	03-Aug-05	Kqfp	quartz feldspar porphyry	Quartz feldspar porphyry dike trends N60E, vertical																
05AD359	64.2579	-144.1912	03-Aug-05	Kgmh	biotite granodiorite	Back into biotite granodiorite																
05AD360	64.2566	-144.1937	03-Aug-05	Kqfp	altered quartz feldspar porphyry	Area is a complex series of NE-trending dikes of Kqfp that intrude typical Kgmh, highly altered Dag, and foliated Kgmh. Pre-intrusive faulting that juxaposed the Devonian augen gneiss with the Cretaceous granodiorite, along which the dikes injected																
05AD361	64.2646	-144.15633	04-Aug-05	Kgmh	biotite granodiorite	Typical massive biotite granodiorite (20% mafics). Photo to south showing NE-trending "stair steps" of Miocene erosional surface caused by downfaulting																
05AD362	64.2639	-144.1576	04-Aug-05	Kgmh	Kgmh/Kqfp contact	N70E-trending contact of foliated biotite granodiorite with K quartz feldspar porphyry dike.																
05AD363	64.2621	-144.1623	04-Aug-05	Shear zone	Kqfp/Dag contact	Southern contact of Kqfp dike with Dag. Kqfp intruded into shear zone and is cut by later brittle fault. Z-folds in Dag (post-D2) show dextral shearing within pre-Kqfp shear zone. Kqfp nondeformed															245	30
05AD364	64.2609	-144.1638	04-Aug-05	Kqfp	Dag (tectonic zone)	A major NE-trending dextral tectonic zone goes through here within Dag. S2 schistosity folded into tight Z-folds.																
05AD365	64.2586	-144.1679	04-Aug-05	Shear zone	Dag (tectonic zone)	Blocks of Dag and foliated Kgmh with folded D2 fabrics only in Dag, not in ajoining Kgmh, so dextral D3 deformation was pre- to syn-emplacement of 110 ma batholith																
05AD366	64.2564	-144.1684	04-Aug-05	Kgmh	nonfoliated biotite granodiorite	Nonfoliated biotite granodiorite typcial of Mt. Harper batholith. Passed just s. into a 100' wide dike of Kqfp, then back into Kgmh																
05AD367	64.2525	-144.1714	04-Aug-05	Kgmh	nonfoliated biotite granodiorite	Good old fashion nonfoliated biotite granodiorite (Mt. Harper)																
05AD368	64.2564	-144.1409	03-Aug-05	Kgmh	biotite granodiorite	Walked entire saddle and only found 2 small Kqfp dikes instead of larger intrusion of Kqfp as expected. Saw foliated granodiorite, but no major Dag like ridge to west																
05AD368A	64.2564	-144.1409	04-Aug-05	Kgmh	quartz feldspar megacrystic porphyry	Kqfp dikes in saddle within nonfoliated Kgmh. Saw no Dag like ridges to west. Shear zone dying out to the east?																
05AD369	64.2709	-144.0151	04-Aug-05	Kgmh	nonfoliated biotite granodiorite	Kgmh-typcial																
05AD370	64.2722	-144.0159	04-Aug-05	Kqfp	quartz feldspar megacrystic porphyry	Kqfp dike. Down-to-the-northwest fault																
05AD371	64.275	-144.0211	04-Aug-05	Kgmh	nonfoliated biotite granodiorite	10's of square miles of nonfoliated, gray biotite granodiorite (Mt. Harper) intrusion. Lost Kqfp dikes as I moved to the north																
05AD372	64.2787	-144.0182	04-Aug-05	Qc	nonfoliated biotite granodiorite	Typical Kgmh																
05AD373	64.2807	-144.0197	04-Aug-05	Kgmh	nonfoliated biotite granodiorite	Incredible view of U-shaped valley carved in granite massif. Several photos down valley with small terminal moraine in floor forming small lake																
05AD374	64.4338	-144.3363	05-Aug-05	Kgb	foliated biotite granite	Medium-grained, foliated biotite granite south of Goodpaster batholith. Looks like there are screens of biotite gneiss xenoliths partly digested. Unit is not highly altered like ridge to the south.					5	60										
05AD375	64.4432	-144.3214	05-Aug-05	Kgb	nonfoliated biotite granite	Earlier border phase (?) of Goodpaster batholith. Moderate flow foliation. Unit south of main batholithic intrusion					60	90										
05AD376	64.4453	-144.3014	05-Aug-05	Kgb	Goodpaster granodiorite	Foliated course-grained biotite-hornblende granodiorite (Goodpaster batholith). Plenty of float. Border phase of main intrusion. Foliation is flow foliation, not penetrative tectonic fabric																
05AD377	64.452	-144.3014	05-Aug-05	Kgb	Goodpaster granodiorite	Massive, nonfoliated, Goodpaster hornblende-biotite granodiorite																
05AD378	64.4543	-144.2988	05-Aug-05	Kgb	Goodpaster granodiorite	Beautiful nonfoliated medium-grained biotite hornblende granodiorite. Classic reddened gruess soil																
05AD379	64.4564	-144.2964	05-Aug-05	Kgb	Goodpaster granodiorite	Good otc of typical Goodpaster granite (granodiorite). Weakly foliated					150	80										
05AD380	64.4813	-144.13312	05-Aug-05	Tr	rhyodacite tuff	53 Ma crystal-rich biotite-hornblende welded tuff. Weathers ochre red																
05AD381	64.4879	-144.1321	05-Aug-05	Tg	rhyodacite tuff	Crystal-rich welded tuff. Unit forms thin veneer upon the Goodpaster batholith. Erupted along Black Mountain tectonic zone																
05AD383	64.4889	-144.1337	05-Aug-05	Tg	Goodpaster granodiorite	Float, but good old Goodpaster																
05AD384	64.3532	-144.1793	05-Aug-05	Kbm	foliated biotite granodiorite	Weakly to moderately foliated biotite granodiorite (Mt. Harper). No hornblende seen																
05AD385	64.3557	-144.1676	05-Aug-05	Kbm	foliated biotite granodiorite	Weakly foliated biotite granodiorite (Mt. Harper). No hornblende seen																
05AD386	64.356	-144.1636	05-Aug-05	Kbm	nonfoliated biotite granodiorite	Nonfoliated Kghm biotite granodiorite																
05AD387	64.3548	-144.1502	05-Aug-05	Kbm	foliated biotite granodiorite	Weakly to moderately foliated biotite granodiorite (Mt. Harper?). No hornblende seen																
05AD388	64.3592	-144.134	05-Aug-05	Kgmh	foliated biotite granodiorite	Moderately foliated biotite granodiorite (Mt. Harper). Unit is higher in percentage biotite (25-30%) and has stronger flow foliation. Not otc but plent of float.																
05AD389	64.3607	-144.1317	05-Aug-05	Kgmh	nonfoliated biotite granodiorite	Nonfoliated Kgmh biotie granodiorite at top of knob																
05AD390	64.472	-144.0235	05-Aug-05	Kgtc	tectonized biotite leucogranite	Ductly foliated and altered biotite leucogranite. Could be tectonized Mt. Harper. Chl+Musc+Fe oxide alteration.																
05AD391	64.4711	-144.0229	05-Aug-05	Kgtc	tectonized granite	Brittlely deformed and altered granitoid. Ochre-colored soil																
05AD392	64.4698	-144.0215	06-Aug-05	Kdi	diorite dike	Nonfoliated porphyritic diorite dike within the Black Mountain tectonic zone. Unit is post-tectonic.																
05AD393	64.4676	-144.0205	05-Aug-05	Shear zone	Paleozoic biotite orthogneiss	Altered Paleozoic biotite orthogneiss like at station 04AD236			35	34												
05AD394	64.4664	-144.0178	05-Aug-05	Kgtc	Paleozoic quartzite	Paleozoic feldspathic quartzite horizon approximately 30 ft thick (wide). Crossed another Kdioritic dike in saddle																
05AD395	64.4647	-144.0162	05-Aug-05	Pzq	Paleozoic quartzite	Paleozoic feldspathic quartzite horizon in biotite paragneiss cut by nonfoliated dark gray dioritic dike trending N10E																
05AD396	64.4728	-144.0066	05-Aug-05	Pzg	Paleozoic biotite orthogneiss	Paleozoic biotite orthogneiss																
05AD397	64.4423	-144.0006	05-Aug-05	Pzg	Paleozoic biotite orthogneiss	Paleozoic biotite orthogneiss																
05AD398	64.4226	-144.0858	05-Aug-05	Kbm	altered Paleozoic biotite gneiss	Top of knob west of Eisenmenger Fork. Paleozoic biotite gneiss (altered) with biotite granite float.																
05AD399	64.3109	-144.4381	07-Aug-05	Dag	augen gneiss	The tectonic fabric is typical of that in the B2 quad. The stretching lineation plunges SE, whereas it plunges W in areas to the north of here.			5	28			160	25								
05AD400	64.3086	-144.4438	07-Aug-05	Dag	augen gneiss	Augen gneiss			25	28			177	20								
05AD401	64.3088	-144.4517	07-Aug-05	Dag	augen gneiss	W-vergent transport direction determined from S-C fabric and assymetric augens			25	10			160	10								
05AD402	64.3044	-144.4663	07-Aug-05	Dag	augen gneiss	Post-D2 N-plunging open folds seem to be folding the S-fabric, but the Le is still plunging to the SE			170	12												
05AD403	64.3033	-144.4692	07-Aug-05	Dag	augen gneiss	Augen gneiss			12	25												
05AD404	64.3017	-144.4805	07-Aug-05	Dag	augen gneiss	SE-plunging lineation			30	10												
05AD405	64.2941	-144.4869	07-Aug-05	Dag	augen gneiss	S-fabric was folded during the NW-vergent tectonic transport event			85	20			145	20								
05AD406	64.3196	-144.3484	07-Aug-05	Dag	augen gneiss	SE-plunging lineation still			50	22			105	10								
05AD407	64.3169	-144.35	07-Aug-05	Dag	augen gneiss	West-vergent assymetry to augen shapes			0	0			170	0								
05AD408	64.3114	-144.3483	07-Aug-05	Dag	augen gneiss	Mylonitized Dag with cataclastic texture in S-fabric like seen near top of intrusion on S end of Black Mountain. Soil is ochre with quartz vein float																
05AD409	64.3103	-144.3465	07-Aug-05	Dag	augen gneiss	Tectonized Dag in saddle. See remnant feldspar augen, but unit is now a biotite orthogneiss. No granite intrusion, yet.			170	22												
05AD410	64.304	-144.3377	07-Aug-05	Qfy	augen gneiss	Hornblende granodiorite! Same looking rock as Brink intrusion. Good otc																
05GL042R	64.2797	-144.2451			quartz vein in granitic gneiss	Granitic gneiss w/ vuggy quartz veins, possible pyrite. Collected by Gregory Lee																
05GL044R	64.2849	-144.2445			quartz vein float	Bull quartz cobble float, slightly pyritic. Collected by Gregory Lee																
05MO122-4B	64.2764	-144.3866		Kgbr	biotite granodiorite	Biotite granodiorite of Brink area																
05MO125-3	64.2687	-144.1365		Tb	basalt dike	Basalt dike																
05MO126-1	64.2699	-144.1196		Kqfp	quartz feldspar porphyry	Quartz feldspar porphyry																
05MO141-3	64.2676	-144.0458		Tr	rhyolite dike	Rhyolite dike																
05MO159	64.4667	-144.0506			andesite dike	Andesite dike																
06AD415	64.3187	-144.0199	14-Jun-06	Kgmh	Mount Harper Biotite granodiorite	Sampled for zircons; medium-gray, medium-grained, nonfoliated, massive biotite granodiorite. Slightly porphyritc with 5 percent 1/2 in plag porphyries																
06AD416	64.3272	-144.2131	14-Jun-06	Kgmh	Mount Harper Biotite granodiorite	Mediumm-gray, medium-grained nonfoliated biotite granodiorite, 15-20 percent biotite																
06AD418	64.3302	-144.2169	14-Jun-06	Kgmh	Biotite granodiorite (with clots)	Medium-grained, weakly foliated biotite granite to granodiorite; 20 percent mafic minerals. Has distinct biotite clots not common in Kgmh																
06AD419	64.3304	-144.2174	14-Jun-06	Shear zone	mylonite in tectonic zone	Southern boundary of Black Mountain tectonic zone. Biotite-rich mylonite with ubiquitous quartz veining. Transition from massive Kgmh to Kgbm with biotite clots, plag phenos set in fine grained matrix.																
06AD420	64.3296	-144.196	14-Jun-06	Kgmh	Biotite granodiorite	Moderately porphyritic, nonfoliated biotite granodiorite with 1/2 inch plagioclase porphyries																
06AD421	64.3282	-144.1922	14-Jun-06	Kgmh	Biotite granodiorite	Moderately porphyritic, nonfoliated biotite granodiorite with 1/2 inch plagioclase porphyries. 10-15 perent biotite																

Table 3. Geologic field notes—Continued.

06AD422	64.3263	-144.1841	14-Jun-06	Kgmh	Biotite granodiorite	Moderately porphyritic, nonfoliated biotite granodiorite with 1/2 inch plagioclase porphyries. 10-15 perent biotite																
06AD423	64.3275	-144.1774	14-Jun-06	Qc	Biotite granodiorite	Moderately porphyritic Kgmh in sea of Q colluvium																
06AD424	64.3183	-144.1979	14-Jun-06	Kgmh	Biotite granodiorite	Nonfoliated, moderately porhyritic, massive biotite granite/granodiorite																
06AD425	64.2927	-144.2312	14-Jun-06	Kgmh	Biotite granodiorite	Nonfoliated, slighly porphyritic with 20 percent biotite																
06AD426	64.2811	-144.22737	14-Jun-06	Kgmh	Biotite granodiorite	Nonfoliated, lost porphyries and some leucogranite float																
06AD427	64.278	-144.2224	14-Jun-06	Shear zone	leucogranite dikes in biotite granodiorite	Nonfoliated medium grained (5 percent) biotite leucogranite dikes in Kgmh																
06AD428	64.2776	-144.2212	14-Jun-06	Dog	Foliated biotite granodiorite	Walked through saddle with strongly foliated biotite granodiorite (Kgmh/Dog?) and back into equigranular non foliated Kgmh. Shear zone in little saddle																
06AD429	64.2765	-144.2208	14-Jun-06	Dog	biotite gneiss	Contact zone; good biotite gneiss screens with foliated biotite granodiorite interlayers. Map as Paleozoic unit																
06AD430	64.2732	-144.2198	14-Jun-06	Dog	layered biotite and granodiorite gneiss	Map as Paleozoic; foliated-lineated biotite granodiorite with horizons of alternating leucocratic and melanocratic units; ductily deformed. Cut by weakly foliated Kgmh dikes																
06AD431	64.4875	-144.3174	14-Jun-06	Qaf	Goodpaster granodiorite	Classic fresh course-grained, light gray, nonfoliated biotite-hornblende granodiorite. Sampled for zircons																
06AD432	64.4243	-144	15-Jun-06	Kmgh	granite-rich gneiss	Granite gneiss with some biotite-muscovite horizons. Actually, there is more neosome relative to paleosome here, could map as Dog?																
06AD433	64.4366	-144.0148	15-Jun-06	Qaf	rounded boulder of Kgmh	Quaternary glacial outwash till.																
06AD434	64.4371	-144.0159	15-Jun-06	Qaf	glacial outwash; till	Rounded boulders, cobbles, and pebbles of mixed granite and geniss set in sand matrix																
06AD435	64.4385	-144.0199	15-Jun-06	Qaf	leucogranite in tectonic zone	Equigranular, medium-grained, nonfoliated (7-10 percent) biotite leucogranite subcrop of angular blocks (not transported Q till).																
06AD436	64.4274	-144.0424	15-Jun-06	Pzg	mylonitic Pzgn?	Cataclastically milled biotite granite gneiss. Numberous quartz veins in float. Large sample for dating zircons from tectonic zone																
06AD437	64.4263	-144.0439	15-Jun-06	Pzg	mylonitic Pzgn?	Tight folds of Pzgn foliation into subhorizontal folds.			50	90			50	10					50	10		
06AD438	64.4112	-144.1048	15-Jun-06	Kbm	biotite granodiorite	Classic large biotite flakes (1/4-1/2 in) set in fine- to medium-grained matrix (subvolcanic texture) typical of units in Black Mountain intrusive complex																
06AD439	64.4113	-144.102	15-Jun-06	Kbm	biotite granodiorite	Fine-grained, massive, biotite granite/granodiorite distinct from typical "biotite flake" bearing unit. Map as separate intrusion																
06AD440	64.4127	-144.0988	15-Jun-06	Kbm	biotite granodiorite	Typical "flakey" biotite granodiorite of Black Mountain intrusive suite.																
06AD441	64.4128	-144.0922	15-Jun-06	Kbm	biotite-hornblende granodiorite	Good outcrop of hornblende-biotite granodiorite.																
06AD442	64.4153	-144.0907	15-Jun-06	Kbm	fine-grained diorite	Fine-grained diorite																
06AD443	64.2691	-144.2422	16-Jun-06	Qaf	biotite gneiss	Foliated quartz-muscovite-biotite gneiss. More quartz rich here. Lots of quartz veining in saddle typical of fault zone																
06AD444	64.2702	-144.2442	16-Jun-06	Qaf	foliated and lineated biotite granodiorite	Looks like Pz intrusive phase, but lacks internal folding of compositional layers like Dog was in the B-2 quadrangle			173	37												
06AD445	64.272	-144.2538	16-Jun-06	Qaf	foliated and lineated biotite granodiorite	Looks like Pz intrusive phase, but lacks internal folding of compositional layers like Dog was in the B-2 quadrangle. Good measurement			185	27			277	27								
06AD446	64.273	-144.2541	16-Jun-06	Kbm	augen gneiss	Highly deformed augen gneiss with ribbon quartz																
06AD448	64.2707	-144.2732	16-Jun-06	Kbm	augen gneiss	Augen gneiss forms foliation-parallel contact with structurally underlying Dog																
06AD449	64.2707	-144.2732	16-Jun-06	Kbm	foliated biotite granodioirite	Foliated biotite granodioirite																
06AD450	64.2642	-144.3086	16-Jun-06	Kbm	Dag/Dog contact	Contact between Dag and structurally underlying Dog (foliated biotite granodiorite). Traverse was terrible. Blowing rain, boulder-covered scree slopes, ceiling lowered and chopper barely got us out.																
06AD451	64.3748	-144.2316	16-Jun-06	Kgb	muscovite-biotite sillimanite schist	Muscovite-biotite sillimanite schist with biotite gneiss float																
06AD452	64.2586	-144.3464	17-Jun-06	Dag	augen gneiss	Augen gneiss																
06AD453	64.2614	-144.3542	17-Jun-06	Kgbr	biotite granodiorite	Medium-grained, massive, light-gray biotite + hornblende(?) granodiorite. Characteristic clots of biotite distinquish it from Mt. Harper granodiorite																
06AD454	64.2635	-144.3584	17-Jun-06	Kgbr	biotite granodiorite	Stepped across down to the west, NE-trending fault. Medium-grained, massive, light-gray biotite + hornblende(?) granodiorite. Characteristic clots of biotite distinquish it from Mt. Harper granodiorite																
06AD455	64.2644	-144.3628	17-Jun-06	Kgbr	biotite granodiorite	Biotite granodiorite with characteristic clots seen in Kgbr																
06AD456	64.2657	-144.3701	17-Jun-06	Kgbr	biotite granodiorite	Same unit all the way down traverse. Are hornblendes present in center of clots? Biotite granodiorite with characteristic clots seen in Kgbr																
06AD457	64.2665	-144.3478	17-Jun-06	Dag	Augen gneiss	Contact with hornblende-bearing Brink granodiorite to south. Beautiful quartz veining along vertical contact. Mike found slickensides. Map as fault zone. Mike has photo of quartz veining																
06AD458	64.2787	-144.3483	17-Jun-06	Dag	Augen gneiss	Entire knob is augen gneiss down northern slope until base of hill, which is covered and must be colluvium																
06AD459	64.2809	-144.3519	17-Jun-06	Dag	Augen gneiss	Entire knob is augen gneiss down northern slope until base of hill, which is covered and must be colluvium																
06AD460	64.2775	-144.2492	18-Jun-06	Dog	Orthogneiss	Devonian (?) orthogneiss. Mylonitic biotite graniodiorite. Don't see any metasediment horizons that would put this into Pzgn. Dog may not be correct term, but fits the best. It is the lower plate rock																
06AD461	64.2498	-144.0202	18-Jun-06	Kgmh	Biotite granodiorite	Massive biotite granodiorite of Mount Harper batholith. Photo looking east across NW-trending high-angle fault																
06AD462	64.242	-144.04	18-Jun-06	Kqfp	Quartz feldspar porphyry	Mapped by Weber et al. (1978) as felsic tuff, but is the Kqfp subvolcanic 95-100 Ma intrusive rock. Has 1in diameter rounded quartz phenos, less feldspar that across valley																
06AD463	64.2593	-144.0651	18-Jun-06	Kgmh	biotite granodiorite	Mount Harper batholith																
06AD464	64.2568	-144.0717	18-Jun-06	Kg	Fine-grained biotite granite	Fine-grained, equigranular biotite granite intrusion trends NE. Unit has fine-grained leucogranite phase with 1/4 in quartz phenocrysts																
06AD465	64.256	-144.0727	18-Jun-06	Kgmh?	Biotite-hornblende granodiorite	Biotite-hornblende granodiorite. Saw a dike with quartz phenocrysts																
06AD466	64.2524	-144.0813	18-Jun-06	Kgmh	Biotite granodiorite	Typical Mount Harper intrusion																
06AD467	64.3333	-144.3326	18-Jun-06	Dag	augen gneiss	Augen gneiss			250	15			300	10								
06AD468	64.3335	-144.3335	18-Jun-06	Dag	augen gneiss	Augen gneiss			250	40			330	36								
06AD469	64.3333	-144.3203	18-Jun-06	Dag	augen gneiss	Augen gneiss			260	12			315	8								
06AD470	64.3342	-144.3157	18-Jun-06	Dag	augen gneiss	Augen gneiss			255	25												
06AD471	64.3357	-144.311	18-Jun-06	Dag	augen gneiss	Augen gneiss			245	65			315	20								
06AD472	64.338	-144.3068	18-Jun-06	Dag	augen gneiss	Augen gneiss			240	28												
06AD473	64.3409	-144.3062	18-Jun-06	Dag	augen gneiss	Augen gneiss, with ribbon quartz and S-C mylonitic frabric			155	35												
06AD474	64.3464	-144.2885	18-Jun-06	Pzgn	biotite-muscovite schist	Island of biotite-muscovite schist. May either be part of megaxenolith within Dag intrusion or top of lower structural plate with Pzgn																
06AD475	64.3494	-144.3523	18-Jun-06	Dag	augen gneiss	Augen gneiss			270	48			330	32								
06AD476	64.3493	-144.3596	18-Jun-06	Dag	augen gneiss	Augen gneiss, west vergent, down dip motion from S-C mylontic fabric in photo			265	30			320	20								
06MO195A	64.2664	-144.3501	17-Jun-06	Kgbr	hornblende-biotite granodiorite	Course-grained hornblende-biotite granodiorite from Brink																
06MO195B	64.2664	-144.3501	17-Jun-06	Kg?	mafic dike	Mafic dike																
98AG040A	64.3388	-144.2519	28-Jun-98		bio granite (CI = 15)	Biotite granite																
98AG040B	64.3389	-144.2519	28-Jun-98		quartz vein with stibnite, aspy, py	Quartz vein with stibnite, aspy, py																
98AG040C	64.3389	-144.2519	28-Jun-98		quartz vein with stibnite, aspy, py	Quartz vein with stibnite, aspy, py																
98AG041A	64.3403	-144.2505	28-Jun-98		bio granite (CI = 15)	Biotite granite (CI = 15)																
98AG041B	64.3403	-144.2505	28-Jun-98		augen gneiss	Augen gneiss																
98AG042A	64.3542	-144.1891	28-Jun-98		quartz vein with stibnite, aspy, py	Quartz vein with stibnite, aspy, py																
98AG042B	64.3542	-144.1892	28-Jun-98		Granite; rusty weathering	Granite; rusty weathering																
98AG043	64.4711	-144.4094	28-Jun-98	Kgmh	bio granodiorite (CI = 15)	Biotite granodiorite (CI = 15)																

Table 4. Notes for field photographs. Click on blue photo number to view photograph.

Photo_Number	Field_Number	Latitude	Longitude	Description
03AD004A	03AD004	64.3807	-144.4817	Typical augen gneiss
03AD004B	03AD004	64.3807	-144.4817	S-Cfabric in augen gneiss. Transport direction to right (west)
03AD006	03AD006	64.3812	-144.4897	Hbl-bio schist horizon in paragneiss body within augen gneiss
03AD008A	03AD008	64.3723	-144.4673	S-C frabric in augen gneis. Transport to right (westerly). Note fish hook fold in augen
03AD008B	03AD008	64.3723	-144.4673	Mike O'Neill in field examining augen gneiss outcrop
03AD008C	03AD008	64.3723	-144.4673	Rootless fold of S1 gneissic fabric in augen gneiss
04AD213B	04AD213	64.4098	-144.4555	F2 folding earlier strong gneissic fabric in Pzgn migmatite
03AD044	03AD044	64.3666	-144.3563	Close up of sigmoidally shaped quartz-feldspar augens in Dag augen gneiss
03AD008D	03AD008	64.3723	-144.4673	Looking down fold hinge (to southwest) of folded S1 gneissic fabric in augen gneiss
03AD033	03AD033	64.3969	-144.3879	Basaltic dike cutting folded dark gray orthogneiss
03AD046A	03AD046	64.3337	-144.2679	Northwest-vergent (to right) transport direction within S-plane (rolling augen)
03AD046B	03AD046	64.3337	-144.2679	Ribbon quartz in mylonitic augen gneiss (good photo)
03AD046C	03AD046	64.3337	-144.2679	Ribbon quartz in mylonitic augen gneiss
03AD048	03AD048	64.3319	-144.2533	S-tectonite (mylonitic augen gneiss)
03AD050A	03AD050	64.3541	-144.2479	High strain zone within augen gneiss; S-C mylonite showing northwest vergence (to right)
03AD050B	03AD050	64.3541	-144.2479	3-D view of strain field. Stretching lineation in overhang (top), high strain zone (middle), assymetric augens (lower). Transport direction to northwest (right) and down dip (down stretching lineation)
03AD050C	03AD050	64.3541	-144.2479	High strain zone within augen gneiss; S-C mylonite showing northwest vergence (to right)
03AD053	03AD053	64.3364	-144.2258	Stringers of Black Mountain granodiorite cutting biotite augen gneiss on western flank of intrusion; post-tectonic intrusion (good photo)
03AD054	03AD054	64.3368	-144.2306	Silicified and brecciated gneiss in exploration pit
03AD056	03AD056	64.3431	-144.2449	Non-foliated biotite hornblened granodiorite of Black Mountain
03AD062A	03AD062	64.3569	-144.1929	Gregory Lee in front of old mill workings at Grizzley mine
03AD062B	03AD062	64.3569	-144.1929	Warren Day in front of old mill workings at Grizzley mine
03AD062C	03AD062	64.3569	-144.1929	Old mill workings at Grizzley mine (poor photo; out of focus)
03AD062D	03AD062	64.3569	-144.1929	Brecciated quartz vein material from Grizzley mine dump (sampled for geochemistry)
03AD062E	03AD062	64.3569	-144.1929	Brecciated quartz vein material from Grizzley mine dump. Country rock was altered Cretaceous granite that was silicified and later brecciated
03AD065A	03AD065	64.3468	-144.2042	Syn-kinematic Cretaceous? granite
03AD065B	03AD065	64.3468	-144.2042	Syn-kinematic Cretaceous? granite intruded by post-kinematic granite
03AD066	03AD066	64.3482	-144.3482	Porphyritic granodiorite. Feldspar porphyries (up to 1 in long) set in a biotite-rich (15% biotite) medium-grained, light gray equigranular groundmass
03AD093	03AD093	64.4127	-144.228	Silicified horizon in orthogneiss (red pencil pointing down dip) cut by NE-trending brittle cleavage (green pencil) within Black Mountain tectonic zone. (poor outcrop)
04AD206A	04AD206	64.4153	-144.4822	Synkinematic granite sill within Pzgn paragneiss
04AD206B	04AD206	64.4153	-144.4822	Synkinematic granite sill within Pzgn paragneiss

Table 4. Notes for field photographs. Click on blue photo number to view photograph—Continued.

04AD206C	04AD206	64.4153	-144.4822	Synkinematic granite sill within Pzgn paragneiss
04AD207	04AD207	64.4155	-144.4733	Foliated synkinematic granite sill in Pzgn forming migmatite
04AD208A	04AD208	64.4137	-144.4725	Layered migmatite cut by later biotite granite dike (Cretaceous)
04AD208B	04AD208	64.4137	-144.4725	Layered migmatite cut by later biotite granite dike (Cretaceous)
04AD209	04AD209	64.4117	-144.4695	Layered biotite gneiss (Pzgn) with synkinematic granite sills
04AD211	04AD211	64.4109	-144.4609	Pzgn with enfolded synkinematic granite sill looking NW. Note smoke from forest fires
04AD213A	04AD213	64.4098	-144.4555	F2 folding earlier strong gneissic fabric in Pzgn migmatite
04AD217A	04AD217	64.4126	-144.4292	Synkinematic granite sill within Pzgn paragneiss cut by nonfoliated biotite granite (Cretaceous)
04AD217B	04AD217	64.4126	-144.4292	Close-up of synkinematic granite sill within Pzgn paragneiss cut by nonfoliated biotite granite (Cretaceous)
04AD219	04AD219	64.414	-144.4259	Nonfoliated border phase of Goodpaster Batholith. Unusually fresh-normally highly altered.
04AD222	04AD222	64.406	-144.1834	Black Mtn biotite prophyritic granodiorite.
04AD224	04AD224	64.40746	-144.175	Black Mtn equigranular biotite granite with dioritic enclave. Granite mapped as Mt. Harper granodiorite by Weber and others.
04AD225	04AD225	64.4146	-144.1627	Black Mtn diorite
04AD227	04AD227	64.4203	-144.1528	Black Mtn. mafic xenolith from adjacent diorite within porphyritic biotite granodiorite (Black Mtn. diorite older than granodiorite)
04AD228A	04AD228	64.422	-144.1608	Biotite granite from western flank of Black Mountain (new unit)
04AD228B	04AD228	64.422	-144.1608	Biotite granite from western flank of Black Mountain (new unit) close-up
04AD232A	04AD232	64.3569	-144.0194	Mt. Harper granodiorite. Mafic enclaves of diorite forming resistive weathering nodules in dominant granodioritic batholith rock type
04AD232B	04AD232	64.3569	-144.0194	Mt. Harper granodiorite. Fresh surface with mafic enclave of diorite in dominant granodioritic batholith rock type
04AD232C	04AD232	64.3569	-144.0194	Mt. Harper biotite granodiorite (fresh surface)
04AD232D	04AD232	64.3569	-144.0194	"Castle" -shaped outcrop of Mt. Harper granodiorite at top of ridge
04AD235A	04AD235	64.4162	-144.0155	Altered biotite gneiss migmatite (Pzgn mig) with preserved gneissic fabric. Note prevasive Fe staining. Biotites leached during regional alteration
04AD235B	04AD235	64.4162	-144.0155	Typical ochre-colored soil developed over highly altered (Fe-stained) biotite gneiss
04AD237	04AD237	64.4182	-144.0282	Preserved gneissic fabric in country rock paleosome invaded by syntectonic granite neosome, all of which is reddened by regional alteration
04AD241A	04AD241A	64.4931	-144.0549	Silicification of Tertiary crystal-rich hbl-bio rhyolite from flow dome complex on NE corner of B-1 Big Delta at headwaters of Goodpaster
04AD241B	04AD241B	64.4931	-144.0549	Silicification vein cutting Tertiary crystal-rich hbl-bio rhyolite from flow dome complex on NE corner of Big Delta B1 at headwaters of Goodpaster
04AD241C	04AD241B	64.4931	-144.0549	Silicification vein cutting Tertiary crystal-rich hbl-bio rhyolite from flow dome complex on NE corner of Big Delta B1 at headwaters of Goodpaster
04AD242	04AD242	64.4932	-144.0622	Black crystal-rich rhyolitic vitrophyre from flow-dome complex on NE corner of Big Delta B1 at headwaters of Goodpaster River
04AD243	04AD243	64.4941	-144.0636	Spaced jointing (NE-trending) cutting low-angle partings within Tertiary rhyolite flow
04AD258A	04AD258	64.2563	-144.3433	Looking NW down stretching lineation (down pencil) in Devonian augen gneiss
04AD258B	04AD258	64.2563	-144.3433	Looking NE latitudinally along stretching lineation. Asysmetric augens predominantly indicate down-dip transport (to NW)
04AD261A	04AD261	64.2593	-144.3493	Cretaceous metacrystic quartz feldspar porphyry in Brink prospect
04AD261B	04AD261	64.2593	-144.3493	Cretaceous metacrystic quartz feldspar porphyry in Brink prospect
04AD265A	04AD265	64.2599	-144.3608	Quartz veining in hbl-bio granodiorite at Brink prospect. Note fracture was brittle failure-no penetrative fabric formed. Depth of emplacement relatively shallow (above brittle-ductile transition zone)
04AD265B	04AD265	64.2599	-144.3608	Quartz veining in hbl-bio granodiorite at Brink prospect. Note fracture was brittle failure-no penetrative fabric formed. Depth of emplacement relatively shallow (above brittle-ductile transition zone)
04AD275	04AD275	64.2513	-144.3715	Quartz veining in hbl-bio granodiorite at Brink prospect. Note fracture was brittle failure-no penetrative fabric formed. Depth of emplacement relatively shallow (above brittle-ductile transition zone)
05AD302	05AD302	64.3288	-144.2556	Augen gneiss (left) cut by biotite-rich granodiorite (center), which is itself cut by biotite-poor granodiorite.

Table 4. Notes for field photographs. Click on blue photo number to view photograph—Continued.

05AD306A	05AD306	64.3429	-144.2528	Gray Lead mine dump. Biotite-rich granodiorite cut by leucogranite vein.
05AD306B	05AD306	64.3429	-144.2528	Gray Lead mine dump. Mike O'Neil framed by old "bobcat" front end loader (looking south)
05AD306C	05AD306	64.3429	-144.2528	Gray Lead mine dump. Mike O'Neil near by old "bobcat" front end loader (looking south) across old mine workings.
05AD311A	05AD311	64.3086	-144.2373	Foliated synkinematic biotite granodiorite (looks like Pz biotite gneiss) cut by granodiorite (intrusive contact)
05AD311B	05AD311	64.3086	-144.2373	NE-trending faults along east-west-trending ridge (looking south)
05AD311C	05AD311	64.3086	-144.2373	NE-trending faults along east-west-trending ridge (looking south)
05AD318A	05AD318	64.3	-144.2495	Fe-oxide alteration of biotite granodiorite forming ochre-colored soil, predominantly west of west-dipping fault in saddle (site 05AD314 on knob to west). Photo taken looking north
05AD318B	05AD318	64.3	-144.2495	Fe-oxide alteration of biotite granodiorite forming ochre-colored soil, predominantly west of west-dipping fault in saddle (site 05AD314 on knob to west). Photo taken looking north
05AD318C	05AD318	64.3	-144.2495	Fe-oxide alteration of biotite granodiorite forming ochre-colored soil, predominantly west of west-dipping fault in saddle. Photo taken looking south
05AD320	05AD320	64.2998	-144.252	Foliated (synkinematic?) biotite granodiorite (looking north). Sampled for possible age dating.
05AD322A	05AD322	64.2851	-144.2304	Caribou in saddle on Black Mountain looking south to Alaska Range (far distance in haze)
05AD322B	05AD322	64.2851	-144.2304	Caribou in saddle on Black Mountain looking south
05AD322C	05AD322	64.2851	-144.2304	Typical nonfoliated, massive, medium-grained biotite-rich granodiorite of Black Mountain (equivalent to Mt. Harper granodiorite). Approximately 25% biotite
05AD325A	05AD325	64.2775	-144.2471	photo with hammer of foliated Mt. Harper biotite granodiorite
05AD325C	05AD325	64.2775	-144.2471	Photo looking NE across terrane with smooth, continuous (pre-faulting) erosional surfaces. These surfaces were faulted and stepped down to the west on west side of Black Mountain
05AD325B	05AD325	64.2775	-144.2471	Border phase of Blk Mountain/Mt. Harper intrusion with mafic dioritic clots (rifle butt for scale)
05AD326A	05AD326	64.2773	-144.2503	Foliated Cretaceous (109 Ma?) dioritic sill cutting west-vergent (to left) mylonitic fabric augen gneiss at a low angle. Some syn-tectonic intrusion during early phase of Black Mountain/Mt. Harper intrusive complex.
05AD326B	05AD326	64.2773	-144.2503	Foliated Cretaceous (109 Ma?) dioritic sill cutting west-vergent (to left) mylonitic fabric augen gneiss at a low angle. Some syn-tectonic intrusion during early phase of Black Mountain/Mt. Harper intrusive complex.
05AD327A-1	05AD327A	64.28105	-144.2528	Looking N. along western margin of Black Mountain intrusive phase of Mt. Harper batholith. Note west-dipping low-angle normal fault
05AD327A-2	05AD327A	64.28105	-144.2528	Looking N. along western margin of Black Mountain intrusive phase of Mt. Harper batholith. Note west-dipping low-angle normal fault
05AD327A-3	05AD327A	64.28105	-144.2528	Looking N. along western margin of Black Mountain intrusive phase of Mt. Harper batholith. Note west-dipping low-angle normal fault
05AD338A	05AD338	64.2649	-144.2421	Foliated and lineated fabric in border zone of Cretaceous Ht Harper Intrusion on SE side of Black Mountain
05AD338B	05AD338	64.2649	-144.2421	Foliated and lineated fabric in border zone of Cretaceous Ht Harper Intrusion on SE side of Black Mountain
05AD347	05AD347	64.2768	-144.157	Massive, nonfoliated Mt. Harper biotite granodiorite
05AD351	05AD351	64.2718	-144.1764	Looking east toward Mt. Harper
05AD352	05AD352	64.2667	-144.1859	Arsenopyrite-bearing quartz veining of reddened host Mt. Harper biotite granodiorite (Kgmh)
05AD353	05AD353	64.2659	-144.1874	Quartz veining in quartz-feldspar megacrystic porphyry (Kqfp) dike.
05AD361	05AD361	64.2646	-144.15633	Photo looking to southwest along ridge showing "stepping" of Miocene erosional surface by NE-trending high-angle normal faults. Alaska Range in far background
05AD363A	05AD363	64.2621	-144.1623	Z-folded augen gneiss in NE-trending tectonic zone
05AD363B	05AD363	64.2621	-144.1623	Z-folded augen gneiss in NE-trending tectonic zone
05AD363C	05AD363	64.2621	-144.1623	SW-plunging D3 episode L fabric developed on D2 S fabrics in Dag. L=F=S65W 30SW
05AD363D	05AD363	64.2621	-144.1623	Chaotic shear zone within mixed Dag and Creatceous (110 ma) Mt Harper dioritic border phase
05AD363E	05AD363	64.2621	-144.1623	Chaotic shear zone within mixed Dag and Creatceous (110 ma) Mt Harper dioritic border phase
05AD363F	05AD363	64.2621	-144.1623	Close up of chaotic shear zone within mixed Dag and Creatceous (110 ma) Mt Harper dioritic border phase
05AD363G	05AD363	64.2621	-144.1623	SW-plunging open fold of Dag (D3 episode folding of S2 fabric)
05AD373A	05AD373	64.2807	-144.0197	Looking WNW down headwaters of Eisenmenger Fork in glaciated valley with terminal morane and small lake
05AD373B	05AD373	64.2807	-144.0197	Looking N across valley on NE-trending fault scarp with Q loess (light patch) in E hanging wall of fault