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**GEOCHEMICAL MAJOR-OXIDE AND TRACE-ELEMENT DATA  
FROM ROCKS COLLECTED IN THE PETERSVILLE (YENTNA)  
MINING DISTRICT, 1998**

by

D.S. Pinney, D.J. Szumigala, J.L. Mayer, S.A. Liss, and K.H. Clautice

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794 University Avenue, Suite 200  
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# GEOCHEMICAL MAJOR-OXIDE AND TRACE-ELEMENT DATA FROM ROCKS COLLECTED IN THE PETERSVILLE (YENTNA) MINING DISTRICT, 1998

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## INTRODUCTION

In June and August, 1998, the Alaska Division of Geological & Geophysical Surveys carried out a geological field survey of the Petersville (Yentna) mining district to provide ground-truthing of airborne geophysical surveys that had been previously flown. During the survey 41 rock samples were collected for major oxide analysis. The locations of these samples are shown on Sheet 1. An abbreviated description for each sample is tabulated in Table 1. Location data and major-oxide and petrogenetically important trace element data are tabulated for each sample in Table 2.

## ANALYTICAL METHODS

All analyses were whole rock, and were performed by Chemex Labs, Inc. Major oxides were analyzed by meta-borate fusion - XRF. Trace elements and ferrous iron were also analyzed using XRF methods. Analytical detection limits are tabulated in Table 3.

Table 1. Rock samples collected in the Petersville (Yentna) mining district during June and August, 1998, and analyzed for major-oxides and trace elements.  
 (Samples marked "\*" were collected in the Yenlo Hills, outside of the map area)

Sample	Description
98DS008A	Fine-grained granitic rock, surface minorly oxidized, overall pale green color; rubble subcrop; probable dike, 50(?) - 100(?) ft wide
98DS011A	Black fissile phyllite; 15-20% andalusite; outcrop with good exposure; grab sample
98DS012A	Fine grained biotite granite, equigranular (1-3mm) w/ porphyritic feldspar; no visible veining or mineralization; blocky rubble crop
98DS014A	Dark gray, fine grained border phase of biotite granite, abundant fine grained black biotite to 1mm; 75-100 ft wide rubble crop
98DS026A	Black Kahiltna graywacke & lithic sandstone; subcrop & rubble
98DS031A	Light gray felsic dike; 1% arsenopyrite (0.5x1mm) & pyrite (0.2-0.5mm); sericite alteration; quartz eyes; 5-10 ft-wide dike; rubble crop
98DS039A	Medium gray, fine grained monzodiorite w/ disseminated pyrite < 1%; feldspar phenocrysts (0.1mm); some sericite alteration; 15ft-wide boulder train
98DS050A	White to light gray felsic igneous rock; ~5% quartz eyes (<1mm), ~5% orange (limonite?) spots (1mm); trace very fine grained silvery-black sulfides
98DS054A	Dark gray to black, fine grained, hornfelsed lithic sandstone; trace very fine grained pyrrhotite; low outcrop & rubble crop
98DS058A	Greenish gray, fine grained monzodiorite w/ trace disseminated pyrite; probable dike, at least 25 ft wide; boulder rubble
98DS070A	Pale green, epidote-altered granite; poorly exposed boulders; probably dike, width unknown
98DS072A	Limonite-stained, fine grained granodiorite; sucratic texture; subangular to rounded black carbonaceous xenoliths (Kahiltna); rubble subcrop
98DS081A	Light gray alaskite dike; 10% biotite; possible hornblende; sparse quartz veins; minor sericite alteration; rubble crop; select sample
98DS088A	Fine grained, hornblende-biotite granite; minor quartz veins; maximum dike width is 10ft; float and subcrop
98DS090A*	Light gray hornfels w/ disseminated pyrrhotite & minor quartz veins & sulfides
98DS091A*	Light gray hornfels w/ disseminated pyrrhotite & pyrrhotite or aplite veinlets
98DS092B*	Fine grained gabbro; slumped exposures dug by hand
98DS113A	Gray alaskite dike; glassy quartz eyes and some altered feldspar phenocrysts; iron oxide spots; 40ft-wide dike; well-exposed outcrop
98DS114A	Pale gray to gray-green alaskite dike; rounded gray quartz eyes; sucratic texture; disseminated iron oxide spots; well-exposed outcrop
98DS116A	Fine grained biotite granite dike; roughly 30ft-wide dike; rubble crop
98DS124A	Pink to light gray alaskite dike w/ iron oxide spots; slightly sericitized; sucratic texture; 1% chlorite spots; 10ft-wide dike; roadcut outcrop
98KC019A	Medium grained biotite granite; rubble crop
98KC019C	Fine grained biotite monzodiorite dike; rubble crop
98KC020A	Fine grained biotite-feldspar porphyry dikes; gray aphanitic ground mass; feldspars to 2mm and biotite to 1mm diameter; 2-3m-wide dike; mostly rubble crop
98KC022X	Fine grained biotite monzodiorite; biotite to 3mm diameter; rubble crop
98KC022Y	Fine grained biotite monzodiorite; biotite to 3mm diameter; rubble crop
98KC023	Dark gray, fine grained diorite; 50ft-wide rubble crop
98KC024A	Biotite monzonite; rubble crop
98KC024B	Biotite monzonite; contains black needle-like mineral that does not appear to be tourmaline; rubble crop
98SL051	Porphyritic K-spar alkali granite; probably dike, width unknown
98SL053A	Felsic dike; quartz is predominant phenocryst
98SL099	Aplite dike
98SL104	Syenite-monzonite intrusive; prominent 1-3mm diameter feldspars; locally very altered
98 SL 130	Medium grained biotite granites and hornblend

Table 1. Rock samples collected in the Petersville (Yentna) mining district during June and August, 1998, and analyzed for major-oxides and trace elements.  
(Samples marked "\*" were collected in the Yenlo Hills, outside of the map area)

Sample	Description
98SL159A	Quartz and feldspar, minor biotite
98SL163	Quartz rich granite
98SL174	Leucocratic granite with minor biotite
98SL187	Alaskite like dike rock with remains of pyrite
98SL188	Biotite granite
98SL192B	Granite
98SL202A	Biotite-hornblende granite

Table 2. Location and concentration of major-oxides and trace elements in Petersville (Yentna) mining district rock samples collected in June and August, 1998.  
(Samples marked "\*" were collected in the Yenlo Hills, outside of the map area)

Sample	Long.	Lat.	Al <sub>2</sub> O <sub>3</sub>	CaO	Cr <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	MgO	MnO	Na <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	SiO <sub>2</sub>	TiO <sub>2</sub>	LOI	Total	Ba	Rb	Sr	Nb	Zr	Y	FeO
98DS008A	151.02496	62.50160	15.79	2.39	<.01	2.13	2.30	0.50	0.05	4.31	0.11	67.46	0.32	3.62	98.98	1785	84	658	20	177	10	0.00
98DS011A	151.07604	62.52371	16.49	0.68	0.01	6.97	2.43	2.20	0.11	1.28	0.21	63.84	0.84	3.48	98.54	1015	88	162	12	156	24	0.00
98DS012A	151.07756	62.52286	15.78	2.63	<.01	2.94	3.56	0.81	0.05	3.77	0.13	67.74	0.44	0.92	98.77	1915	104	774	28	207	12	0.00
98DS014A	151.07982	62.52138	16.30	2.83	<.01	2.99	3.00	0.81	0.05	3.83	0.15	68.78	0.47	0.62	99.83	1930	94	858	24	225	14	0.00
98DS026A	151.05749	62.53995	12.97	0.32	0.01	5.87	1.96	1.68	0.10	1.51	0.21	70.13	0.70	3.58	99.04	1235	78	98	12	171	22	0.00
98DS031A	150.89756	62.61110	15.03	1.60	<.01	1.46	2.26	0.10	0.04	4.34	0.04	72.17	0.11	2.63	99.78	1745	98	594	34	102	6	0.00
98DS039A	150.89753	62.60693	16.34	5.91	<.01	8.69	1.79	3.15	0.17	2.97	0.44	51.43	1.35	7.15	99.39	835	58	644	14	159	26	0.00
98DS050A	150.89386	62.62485	14.70	0.12	<.01	0.80	3.71	0.01	0.03	4.95	0.01	73.59	0.01	0.86	98.79	95	306	20	32	57	4	0.44
98DS054A	150.71348	62.57815	10.94	0.33	0.02	4.26	1.43	2.11	0.05	2.25	0.13	74.51	0.64	2.42	99.09	695	62	94	12	150	20	0.00
98DS058A	150.84348	62.60951	13.40	6.91	0.02	7.23	0.30	6.66	0.14	3.58	0.46	50.88	1.06	8.73	99.37	300	16	1170	20	183	24	5.43
98DS070A	150.98255	62.52692	14.99	0.17	<.01	1.32	2.35	0.16	0.02	4.27	0.04	73.78	0.13	1.59	98.82	2030	90	402	30	87	6	0.63
98DS072A	150.99754	62.54785	16.07	0.51	<.01	2.83	2.82	0.54	0.09	4.41	0.13	68.41	0.48	2.18	98.47	1440	88	504	10	162	18	0.71
98DS081A	150.97150	62.59834	15.41	2.26	<.01	2.00	2.09	0.69	0.04	5.01	0.11	67.95	0.34	3.08	98.98	1420	62	680	10	129	10	1.29
98DS088A	150.95710	62.58773	16.02	3.35	<.01	3.38	3.60	1.33	0.07	3.74	0.18	65.56	0.47	0.65	98.35	1885	100	938	30	186	14	2.38
98DS090A*	151.23925	62.17838	15.40	1.95	0.01	8.21	2.57	3.26	0.22	1.81	0.18	59.45	0.80	4.77	98.63	660	98	246	8	105	20	0.00
98DS091A*	151.24538	62.17698	16.18	3.02	<.01	10.28	2.57	4.53	0.11	1.86	0.17	53.19	1.19	5.65	98.75	740	70	220	8	111	20	0.00
98DS092B*	151.24783	62.17460	7.37	9.69	0.21	9.87	0.35	13.23	0.16	0.59	0.17	49.93	0.77	7.12	99.46	70	16	202	6	60	12	6.91
98DS113A	150.89262	62.62398	14.32	0.19	<.01	0.83	3.99	0.03	0.03	4.25	0.01	74.23	0.01	1.09	98.98	65	292	10	30	60	8	0.38
98DS114A	150.94619	62.61087	14.05	0.12	<.01	1.09	3.34	<.01	0.03	4.45	0.04	74.56	0.02	1.05	98.75	75	246	8	30	63	6	0.39
98DS116A	150.88579	62.62698	15.49	2.39	<.01	2.20	2.31	0.85	0.04	4.80	0.11	67.35	0.37	2.99	98.90	1450	70	692	12	135	10	1.36
98DS124A	150.79630	62.52320	15.38	1.21	<.01	1.48	1.65	0.44	0.04	5.85	0.07	69.84	0.25	2.23	98.44	975	62	458	8	129	8	0.74
98KC019A	150.92750	62.45726	16.62	2.94	<.01	3.83	1.91	1.21	0.08	4.81	0.21	65.23	0.47	1.68	98.99	1165	50	1230	28	201	30	0.00
98KC019C	150.92750	62.45726	13.91	1.44	<.01	2.50	2.17	0.61	0.06	4.19	0.04	72.53	0.24	1.21	98.90	1115	56	518	30	135	32	0.00
98KC020A	151.09959	62.53111	16.23	2.21	<.01	2.77	3.23	0.76	0.05	4.02	0.13	67.75	0.45	1.09	98.69	1890	84	794	24	216	16	0.00
98KC022X	151.10224	62.52922	17.16	1.62	<.01	4.64	2.48	1.14	0.06	4.05	0.27	65.13	0.66	1.90	99.11	2040	86	1140	44	285	28	0.00
98KC022Y	151.10224	62.52922	16.77	1.46	<.01	2.99	2.35	0.81	0.04	4.27	0.14	68.64	0.45	1.79	99.71	2020	70	844	26	222	12	0.00
98KC023	151.10555	62.52555	16.49	4.43	<.01	6.72	3.67	1.59	0.17	3.60	0.37	60.95	0.89	0.59	99.47	2290	96	1210	38	321	36	0.00
98KC024A	151.10841	62.52518	16.09	3.72	<.01	6.02	3.88	1.30	0.13	3.64	0.31	61.71	0.79	1.74	99.33	2290	98	1065	36	300	32	0.00
98KC024B	151.10841	62.52518	16.39	3.80	<.01	5.87	3.66	1.23	0.13	3.82	0.30	62.11	0.80	0.81	98.92	2480	88	1140	46	315	32	0.00
98SL051	150.95090	62.45441	16.59	3.13	<.01	5.15	1.59	1.54	0.11	4.94	0.25	62.52	0.60	2.35	98.77	1015	48	1265	26	249	32	0.00
98SL053A	150.94192	62.45911	14.43	0.86	<.01	1.07	3.92	<.01	0.03	4.14	0.02	73.68	0.01	1.56	99.72	195	168	56	16	54	2	0.00
98SL099	150.87814	62.47574	14.60	0.29	<.01	1.07	4.32	<.01	0.04	4.11	0.02	74.09	0.01	1.26	99.81	150	178	46	16	54	2	0.00
98SL104	150.85397	62.46870	16.21	3.31	<.01	2.82	1.30	1.73	0.05	4.24	0.09	66.15	0.30	3.12	99.32	385	40	312	6	117	14	0.00
98 SL 130	150.92584	62.4574	15.91	3.08	<.01	4.2	2.29	1.35	0.08	4.7	0.22	64.7	0.49	1.8	98.75	645	54	1155	20	192	24	0.00

Table 2. Location and concentration of major-oxides and trace elements in Petersville (Yentna) mining district rock samples collected in June and August, 1998.  
 (Samples marked "\*" were collected in the Yenlo Hills, outside of the map area)

Sample	Long.	Lat.	Al <sub>2</sub> O <sub>3</sub>	CaO	Cr <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	MgO	MnO	Na <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	SiO <sub>2</sub>	TiO <sub>2</sub>	LOI	Total	Ba	Rb	Sr	Nb	Zr	Y	FeO
98SL159A	150.83633	62.5048	14.37	4.98	0.02	8.84	1.01	5.78	0.19	3.01	0.22	51.2	0.84	8	98.47	475	36	562	12	105	18	0.00
98SL163	150.82473	62.5084	14.67	6.35	0.01	7.48	1.95	4.78	0.14	2.68	0.3	54.7	1.04	4.7	98.74	660	42	566	12	129	22	0.00
98SL174	150.79022	62.6017	15.58	0.53	<.01	2.41	3.3	0.58	0.05	3.72	0.16	70	0.41	2.3	99.03	2100	104	298	26	183	10	0.00
98SL187	150.77947	62.5215	15.52	0.15	<.01	1.57	2.35	0.31	0.03	5	0.07	71.4	0.29	1.6	98.28	1370	70	384	10	138	12	0.00
98SL188	150.75783	62.5354	16	0.67	<.01	3.86	1.7	1.4	0.07	5.39	0.18	66.6	0.51	2.3	98.65	690	48	390	24	186	24	0.00
98SL192B	151.00313	62.6275	15.08	3.83	<.01	6.51	4.6	2.61	0.14	2.57	0.46	61.1	0.89	1	98.77	2500	90	1075	20	213	30	0.00
98SL202A	150.95866	62.6375	13.08	6.31	0.03	8.83	2.4	7.18	0.19	2.51	0.35	54	1.07	2.8	98.65	1815	44	626	14	135	26	0.00

Table 3. Detection limits for major-oxide and trace element analyses.  
 (\*LOI = Loss on ignition)

Element	Units	Lower Detection Limit	Upper Detection Limit	Analytical Method
Al <sub>2</sub> O <sub>3</sub>	percent	0.01	100.00	XRF
CaO	percent	0.01	100.00	XRF
Cr <sub>2</sub> O <sub>3</sub>	percent	0.01	100.00	XRF
Fe <sub>2</sub> O <sub>3</sub>	percent	0.01	100.00	XRF
K <sub>2</sub> O	percent	0.01	100.00	XRF
MgO	percent	0.01	100.00	XRF
MnO	percent	0.01	100.00	XRF
Na <sub>2</sub> O	percent	0.01	100.00	XRF
P <sub>2</sub> O <sub>5</sub>	percent	0.01	100.00	XRF
SiO <sub>2</sub>	percent	0.01	100.00	XRF
TiO <sub>2</sub>	percent	0.01	100.00	XRF
LOI*	percent	0.01	100.00	XRF
Total	percent	0.01	105.00	Calculation
Ba	ppm	5	50000	XRF
Rb	ppm	2	50000	XRF
Sr	ppm	2	50000	XRF
Nb	ppm	2	50000	XRF
Zr	ppm	3	50000	XRF
Y	ppm	2	50000	XRF
FeO	percent	0.01	100.00	XRF