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Gold, platinum, and silver analytical results and gold signatures from the Bonnifield mining district, Fairbanks and Healy quadrangles, Alaska

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INTRODUCTION

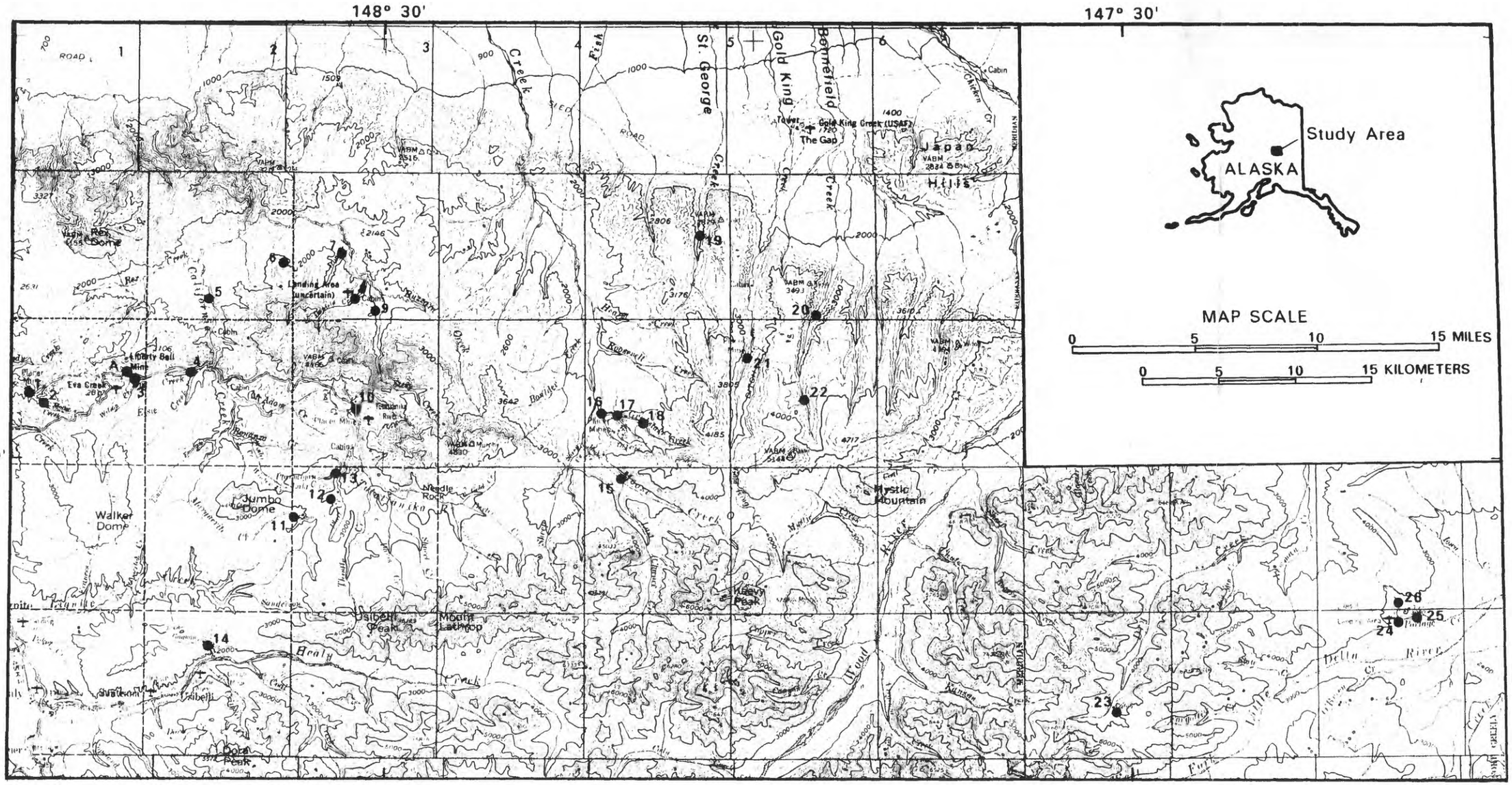
Geochemical studies of Alaskan gold deposits were begun in 1984 as a joint study by the U.S. Geological Survey and the State of Alaska Division of Geological and Geophysical Surveys. The objectives of the study are (1) to characterize the deposits, (2) to determine relationships of gold in placer deposits to possible lode sources, (3) to identify possible sources of gold in placer deposits, (4) to study processes of placer formation, (5) to contribute to existing knowledge of the principles of prospecting for placer deposits, and (6) to determine if minerals associated with placer deposits might suggest economic deposits of other metals. The purpose of this report is to release both the analytical data and gold signatures for placer and lode gold samples and also the analytical data for platinum and silver samples collected from placer gold deposits of the Bonnifield mining district in Alaska. Gold signatures comprise the alloy proportions and ratios of gold, silver, and copper, and the content of trace elements (Antweiler and Campbell, 1976).

SAMPLING AND ANALYTICAL PROCEDURE

Placer and lode gold samples were obtained from most of the active claims in the Bonnifield mining district. At some localities, miners provided us with ample sample amounts for analysis and at other localities the samples were collected by the USGS. To determine whether differences in composition could be correlated with physical attributes, these samples were prepared in various ways. Some were sieved into two or more size ranges; others were separated by color; and some were separated on the basis of physical characteristics, e.g., rounded, angular, blocky, delicate, etc. Descriptive information, when available, is included in table 1. If no descriptive information is provided, the samples were generally small, and no sorting of individual grains was attempted prior to analysis.

A total of 197 emission spectrographic analyses using a technique described by Mosier (1975) were made on samples from 27 mines and prospects. These are the numbered and lettered sites on the sample locality map (fig. 1) and correspond to the locality index (table 1). The elements analyzed and their lower limits of determination are listed on table 2. Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides, graphite, and 99.999 percent pure metallic gold. Pure Al_2O_3 was added to the standards and samples as a codistillation agent. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. Standard concentrations are based on a 5-mg gold sample weight. Because of the nature of native gold, it is often difficult to weigh exact 5-mg samples and in many instances there is less than 5-mg of gold available for analysis. Therefore, the reported concentration values (table 2) are corrected to reflect a 5-mg sample weight by the following formula:

$$\text{reported concentration value} = \text{determined value} \times \frac{5\ \text{mg}}{\text{sample weight in mg}}.$$



Base from the U.S. Geological Survey, 1956

Fig. 1 Localities of Samples from the Bonnefield Mining District, Fairbanks and Healy Quadrangles, Alaska

Explanation for Figure 1

●3--Locality where placer gold/platinum/silver sample collected.

●A--Locality where lode gold sample collected.

Locality Index

A	Liberty Bell mine
1	Moose Creek
2	Little Moose Creek
3	Eva Creek, below Liberty Bell mine, above Wilson Creek
4	Eva Creek, lower
5	California Creek
6	Nenana Gravel
7	Iron Creek
8	Daniels Creek
9	Unnamed stream in sect. 34, T.9S., R.5W.
10	Totatlanika River
11	Marguerite Creek
12	Shannon Creek
13	Platt Creek
14	Gagnon Creek
15	Moose Creek
16	Tatlanika Creek
17	Grubstake Creek, lower
18	Grubstake Creek, upper
19	Saint George Creek
20	Bonnifield Creek, upper
21	Gold King Creek
22	Bonnifield Creek, upper
23	Glory Creek
24	Portage Creek, A
25	Portage Creek, B
26	Portage Creek, upper

The trace-element content of natural gold varies greatly from grain to grain as well as from deposit to deposit and this creates a problem in determining the precision of the analytical technique. However, studies using artificial melts show that the precision of the analytical method far exceeds the natural variance of trace elements in native gold (Mosier, 1975).

RELIABILITY OF GOLD ANALYSES

Differences in the composition of native gold from different geological settings can be readily distinguished using the analytical procedures mentioned above if enough analyses are made to ascertain the magnitude of natural variations in gold samples. In this study, five or more spectrographic analyses for a single sample site were found to be desirable in obtaining a reliable signature. However, in the context of many other analyses from this district, a single analysis is still of value.

The composition of native gold varies considerably (for example, see Gay, 1963; Jones and Fleischer, 1969). Variations in composition are present even from point to point within the same grain (Desborough, 1970). Native gold in oxidized zones and in associated placers generally contains lesser amounts of silver and other elements compared with the native gold in the corresponding primary deposits; within some specific deposits, single particles of native gold are relatively homogeneous, but in other deposits the native gold is heterogeneous (Boyle, 1979). Even when heterogeneous, gold compositional data are useful in characterizing conditions of ore deposition and are often locally distinctive for mines, districts, or regions. Moreover, they are useful in determining the relationships of gold in placer deposits to possible lode sources, and in meeting the other objectives stated in the introductory section of this report.

The natural variability of composition for Ag and Cu in gold from a single locality was determined by repeatedly analyzing portions of individual nuggets (Mosier, 1975; Antweiler and Campbell, 1987). The silver content of one such nugget ranged from 4.7 to 8.1 percent in four analyses with a mean silver content of 5.7 percent, and a standard deviation (S.D.) of ±1.6 percent and the copper content of this nugget ranged from .048 to .08 percent with a mean copper content of .062 percent, and a standard deviation of ±.0144 percent. Replicate analyses of portions of another nugget from the same locality showed silver content ranging from 18.9 to 19.8 percent, a mean silver content of 19.3 percent, and a standard deviation of ±0.56 percent; and copper content ranging from .038 to .055 percent, a mean of .047 percent, and a standard deviation of ±.012 percent. These results indicate considerable natural variability. Another nugget from the same locality was washed with hydrofluoric acid to remove surface coatings, then heated to 1300 °C for 30 minutes to homogenize silver and copper content. Analyses of ten 5-mg portions of that nugget each time showed excellent precision; 10 percent silver (S.D.=0), and 0.05 percent copper (S.D.=0). Without acid washing and heat treating, ten 5-mg portions ranged in silver content from 1.5 to 15 percent and in copper content from .015 to .05 percent indicating their natural variation (Mosier, 1975). The concentration of other elements in nuggets from the locality ranged somewhat more widely than copper and silver, even after the homogenization treatment. Significantly, however, the mean values for most elements, including copper and silver from 10 analyses of the natural sample, were almost the same as the mean values for those elements on the homogenized sample, except for elements removed by the acid and heat treatment.

Accuracy is much more difficult to determine than precision because homogeneous gold samples with known amounts of impurities are not readily available. However, standards prepared with known amounts of copper and silver show the method to be accurate within a factor of two for determination of those elements (Mosier, 1975).

One test for reliability of the method is comparison of fineness on samples from localities where large lots of gold have been analyzed for the U.S. Mint or banks or by commercial refiners. Compilations of gold fineness data have been made by Smith (1941) and by Metz and Hawkins (1981). Also, the First National Bank in Fairbanks made available to us records of gold purchases from 1903 to 1937 from many Alaskan placer deposits. These compilations show excellent agreement for some areas with each other, and poor agreement in other areas. The U.S. Geological Survey data, although acquired by analyses of relatively small samples, agree as well as the data from those sources and are therefore reliable to the extent permitted by natural variation of gold composition.

DESCRIPTION OF DATA TABLES

The analytical results for lode and placer gold (table 3) are given in weight percent and are presented by site numbers and gold type which are keyed to table 1. The USGS-assigned sample number is given under "Sample." When sufficient gold was available from a particular site, multiple analyses were made and the results are listed. For this study, fineness is defined as:

$$\text{fineness} = \frac{\text{Au wt\%}}{\text{Au wt\% + Ag wt\%}} \times 1{,}000 \ .$$

The gold value was determined by difference, that is:

$$\text{Au\%} = 100\text{-}(\text{Ag\%} + \text{X\%}),$$

where X% is the sum of elements other than gold and silver. If an element was not detected at the lower limit of detection, "--" was entered. The actual weight in milligrams of the gold sample analyzed is given under "smpl. wt." The values under r = Au/Ag, Au/Cu, Ag/Cu, and r/Cu are alloy ratios that are part of the gold signature (Antweiler and Campbell, 1976). Because the corrected values shown in table 3 are computer-generated data, these results often carry more digits than are significant. The analysts did not determine these values to the accuracy suggested by the extra numbers.

OTHER PUBLICATIONS

Other U.S. Geological Survey publications showing principally analytical results, geochemical signatures, mineralogical data, and sample locality maps of placer/lode gold and heavy-mineral concentrates from other gold mining districts in Alaska are:

1. Mosier, E.L., and Lewis, J.S., 1986, Analytical results, geochemical signatures, and sample locality map of lode gold, placer gold, and heavy-mineral concentrates from the Koyukuk-Chandalar mining district, Alaska: U.S. Geological Survey Open-File Report 86-345, 172 p., 1 pl.

2. Cathrall, J.B., Antweiler, J.C., and Mosier, E.L., 1987, Occurrence of platinum in gold samples from the Tolovana and Rampart mining districts, Livengood quadrangle, Alaska: U.S. Geological Survey Open-File Report 87-330, 12 pages, 1 pl.
3. McDanal, S.K., Cathrall, J.B., Mosier, E.L., Antweiler, J.C., and Tripp, R.B., 1988, Analytical results, geochemical signatures, mineralogical data, and sample locality map of placer gold and heavy-mineral concentrates from the Manley Hot Springs, Tofty, Eureka, and Rampart mining districts, Tanana and Livengood quadrangles, Alaska: U.S. Geological Survey Open-File Report 88-443, 54 p.
4. Cathrall, J.B., McDanal, S.K., VanTrump, G., Mosier, E.L., and Tripp, R.B., 1988, Analytical results, geochemical signatures, mineralogical data, and sample locality map of lode gold, placer gold, and heavy-mineral concentrates from the Tolovana mining district, Livengood quadrangle, Alaska: U.S. Geological Survey Open-File Report 88-578, 32 p.
5. Cathrall, J.B., Tripp, R.B., McDanal, S.K., Mosier, E.L., and VanTrump, G., 1988, Analytical results, geochemical signatures, mineralogical data, and sample locality map of placer gold and heavy-mineral concentrates from the Circle mining district, Circle quadrangle, Alaska: U.S. Geological Survey Open-File Report 88-676, 48 p., 1 pl.
6. Mosier, E.L., Cathrall, J.B., Antweiler, J.C., and Tripp, R.B., 1989, Geochemistry of placer gold, Koyukuk-Chandalar mining district, Alaska: Journal of Geochemical Exploration, v. 31, p. 97-115.
7. Cathrall, J.B., Albanese, M., VanTrump, G., Mosier, E.L., and Lueck, L., 1989, Geochemical signatures, analytical results, mineralogical data, and sample locality map of placer and lode gold, and heavy-mineral concentrates from the Fortymile mining district, Eagle quadrangle, Alaska: U.S. Geological Survey Open-File Report 89-451, 32 p.

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Antweiler, J.C., and Campbell, W.L., 1976, Application of gold compositional analysis to mineral exploration in the United States [abs.]: 25th International Geological Congress, Sydney, Australia, v. 2. p. 433-434.

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Gay, N.C., 1963, A review of geochemical characteristics of gold in ore deposits: University of Witwatersrand, Economical Geological Research Unit Information Circular 12, 70 p.

Jones, R.S., and Fleischer, Michael, 1969, Gold in minerals and the composition of native gold: U.S. Geological Survey Circular 612, 17 p.

Metz, Paul A., and Hawkins, D.B., 1981, A summary of gold fineness values for Alaska Placer deposits: School of Mineral Industry, University of Alaska, Fairbanks, Alaska 99701, MIRL Report 45.

Mosier, E.L., 1975, Use of emission spectroscopy for the semiquantitative analysis of trace elements and silver in native gold, in Ward, F.N., ed., New and refined methods of trace analysis useful in geochemical exploration: U.S. Geological Survey Bulletin 1408, p. 97-105.

Smith, P.S., 1941, Fineness of gold from Alaska placers: U.S. Geological Survey Bulletin 910-C, p. 147-272.

TABLE 1.--Index for site, type of sample, locality name, and sample description for lode gold, placer gold, placer platinum, and placer silver samples from the Bonnifield mining district, Fairbanks and Healy quadrangles, Alaska

Site type	Locality name	Sample description
A.01	Liberty Bell mine	Unsorted gold.
1.01	Moose Creek	Plus 20-mesh gold; flat thin worn flakes.
1.02	--Do-------	Plus 20-mesh gold; ragged, thin little worn.
1.03	--Do-------	Plus 20-mesh gold; nuggety, 3-D, little worn.
1.04	--Do-------	Plus 20-mesh gold; black Fe-Mn stained.
1.05	--Do-------	Minus 20-, plus 60-mesh gold; flat grains.
1.06	--Do-------	Minus 20-, plus 60-mesh gold; 3-D grains.
1.07	--Do-------	Minus 60-, plus 100-mesh gold.
1.08	--Do-------	Minus 100-, plus 160-mesh gold.
1.09	--Do-------	Silver nugget (Aurian ?).
1.10	--Do-------	Minus 160-mesh gold mixed with heavy-mineral concentrate.
2.01	Little Moose Creek	Plus 20-mesh gold; flat, thick grains.
2.02	--Do----------	Minus 20-, plus 60-mesh gold; flat, thin, flakes.
2.03	--Do----------	Minus 20-, plus 60-mesh gold; 3-D grains, some rusty.
2.04	--Do----------	Minus 60-, plus 60-mesh gold.
2.05	--Do----------	Minus 100-, plus 160-mesh gold mixed with heavy-metal impurities.
2.06	--Do----------	Minus 160-mesh gold mixed with heavy-metal impurities.
3.01	Eva Creek, below Liberty Bell mine above Wilson Creek	Flat, thin flakes of gold.
3.02	--Do----------	Nuggety grains of gold.
4.01	Eva Creek, lower	Flattened grains of gold.
4.02	--Do----------	3-D grains of gold, not flattened.
5.01	California Creek	Flat flakes of gold.
5.02	--Do----------	Nuggety, spherical 3-D gold.
6.01	Nenana Gravel	Flat grains of gold.
7.01	Iron Creek	One grain of gold.
7.02	--Do------	Nuggety, 3-D grains of gold.
7.03	--Do------	Gold nugget cut in half; quartz inclusions.

TABLE 1.--Continued

7.04	--Do------	Gold with white grains.
8.01	Daniels Creek	Minus 20-, plus 60-mesh gold.
8.02	--Do---------	Plus 20-mesh gold; flat grains.
8.03	--Do---------	Minus 60-, plus 100-mesh gold.
8.04	--Do---------	Minus 100-, plus 160-mesh gold.
8.05	--Do---------	Minus 160-mesh gold.
8.06	--Do---------	Plus 20-mesh gold; nuggety, blocky.
8.07	--Do---------	Unsorted gold; mixed with heavy-mineral impurities.
8.08	--Do---------	Platinum mixed with white gold.
9.01	Unnamed stream in sect. 34, T.9S., R.5W.	Minus 20-, plus 60-mesh gold; mostly flat.
9.02	--Do----------	Plus 20-mesh gold; flat grains.
9.03	--Do----------	Nuggety 3-D grains of gold.
9.04	--Do----------	Minus 60-, plus 100-mesh gold mixed with platinum-colored grains.
9.05	--Do----------	Minus 100-mesh gold; mixed with some heavy-mineral concentrate and silver white platinum-colored grains.
10.01	Totatlanika River	Minus 20-, plus 60-mesh gold; flat.
10.02	--Do----------	Nuggety 3-D grains of gold.
10.03	--Do----------	Plus 20-mesh gold.
11.01	Marguerite Creek	Plus 20-mesh gold; flat.
11.02	--Do----------	Minus 20-mesh gold; mostly spherical
11.03	--Do----------	Minus 20-mesh gold; black-stained grains.
12.01	Shannon Creek	Small flakes of gold.
13.01	Platt Creek	Plus 30-mesh gold; flat, flakey.
13.02	--Do-------	Plus 30-mesh gold; nuggety.
13.03	--Do-------	Unsorted gold.
14.01	Gagnon Creek	Plus 20-mesh gold; flattened 3-D grains.
14.02	--Do--------	Minus 20-mesh gold; blocky angular 3-D grains.
14.03	--Do--------	Minus 60-, plus 100-mesh gold; flat thin flakes.
14.04	--Do-------	Minus 100-mesh gold; mixed with grains of heavy-mineral concentrate.

TABLE 1--Continued

14.05	--Do-------	Scrapings from 2 oz silver nugget.
14.06	--Do-------	0.2 mg platinum grain.
15.01	Moose Creek	Unsorted gold.
16.01	Tatlanika Creek	Very small grains of gold; little worn.
17.01	Grubstake Creek, lower	Unsorted gold.
18.01	Grubstake Creek, upper	Unsorted gold.
19.01	Saint George Creek	Unsorted gold.
20.01	Bonnifield Creek, lower	Minus 20-mesh gold.
20.02	--Do------------------	Plus 20-mesh gold.
21.01	Gold King Creek	Flat flakes of gold.
21.02	--Do----------	Plus 20-mesh gold; nuggety, spherical, 3-D grains.
21.03	--Do----------	Flat grains of gold amalgam.
21.04	--Do----------	Platinum grains; silver white, slightly magnetic.
22.01	Bonnifield Creek, upper	Unsorted gold.
23.01	Glory Creek	Balls and flakes of gold.
24.01	Portage Creek, A	Unsorted gold.
25.01	Portage Creek, B	Plus 20-mesh gold.
25.02	--Do----------	Minus 20-, plus 60-mesh gold; ellipses, crinkly wires.
25.03	--Do----------	Minus 60-, plus 100-mesh gold; flat, thin.
25.04	--Do----------	Minus 60-, plus 100-mesh gold.
25.05	--Do----------	Minus 100-mesh gold.
25.06	--Do----------	Plus 20-mesh gold; 3-D grains.
25.07	--Do----------	Minus 20-, plus 60-mesh gold; flat flakes.
25.08	--Do----------	Minus 60-, plus 100-mesh gold.
25.09	--Do----------	Rounded gold with amalgam.
25.10	--Do----------	Nugget gold.
25.11	--Do----------	Platinum; white magnetic grains.
25.12	Portage Creek, B	Silver nugget (Aurian ?).
25.13	--Do----------	Minus 20-, plus 60-mesh silver-colored gold; blocky, spheres 3-D grains.
26.01	Portage Creek, upper	Plus 20-mesh gold; 3-D, blocky.
26.02	--Do----------	Minus 20-, plus 60-mesh gold; 3-D grains.
26.03	--Do----------	Minus 20-, plus 60-mesh gold; flat grains.

TABLE 2.--Lower limits of determination for the spectrographic analyses of gold, platinum, and silver based on a 5-mg sample

Elements	Lower determination limit
	Percent
Silver (Ag)	0.001
Copper (Cu)	.0005
Zinc (Zn)	.005
Gallium (Ga)	.0002
Lead (Pb)	.0002
Arsenic (As)	.005
Antimony (Sb)	.002
Cadmium (Cd)	.0002
Bismuth (Bi)	.0002
Indium (In)	.0005
Mercury (Hg)	.002
Tellurium (Te)	.005
Nickel (Ni)	.0005
Cobalt (Co)	.0005
Tin (Sn)	.0005
Molybdenum (Mo)	.0005
Germanium (Ge)	.0005
Platinum (Pt)	.001
Palladium (Pd)	.0002
Barium (Ba)	.0005
Strontium (Sr)	.01
Zirconium (Zr)	.0005
Vanadium (V)	.001
Chromium (Cr)	.001
Yttrium (Y)	.0005
Lanthanum (La)	.002
Scandium (Sc)	.0005
Niobium (Nb)	.001
Boron (B)	.0005
Tantalum (Ta)	.005
Beryllium (Be)	.0001
Tungsten (W)	.005
Manganese (Mn)	.0001
Iron (Fe)	.001
Magnesium (Mg)	.0005
Calcium (Ca)	.001
Titanium (Ti)	.001
Silicon (Si)	.0002

TABLE 3.--Analytical results for lode and placer gold, placer platinum, placer silver, and gold signatures from the Bonnifield mining district, Fairbanks and Healy quadrangles, Alaska

[Fine = fineness, where fineness = $\frac{Au\%}{Au\% + Ag\%} \times 1{,}000$; x = sum of elements other than gold and silver; smpl. wt = sample weight in milligrams; all element and X values are given in percent; Ga, Cd, Ge, Sr, In, Sc, and Ta analyzed, but not detected; -- = not detected; * = estimated value, major constituent; analyst: E.L. Mosier. See table 1 for locality name and sample description which corresponds with site locality and analysis]

Sample	SiteType	Au %	Fineness	Ag %	Sum X %	Cu %	Zn %	Pb %	As %	Sb %	Bi %	Hg %	Te %	Ni %
3320A	A.01	97.2	979	2.1	.66	.2123	--	.0016	.0531	.0106	.0005	.0531	--	--
3320B	1.01	91.2	918	8.1	.63	.0233	--	.0023	.0581	.0023	--	.1744	--	--
3320NA	1.02	90.7	930	6.8	2.43	.0293	--	.0146	.0977	.0293	.0488	1.9531	--	--
3320NB	1.02	92.3	932	6.8	.98	.0290	--	.0193	.0676	.0193	.0014	.1448	--	.0005
3320NC	1.02	88.6	893	10.6	.79	.0213	--	.0053	.1064	.0074	--	.1064	--	--
3320PA	1.03	83.4	870	12.4	4.17	.0249	--	.0087	.1866	.0187	.0037	.0871	--	.0012
3320PB	1.03	91.8	924	7.5	.67	.0216	--	.0054	.0754	.0075	.0011	.1078	--	--
3320PC	1.03	89.8	907	9.2	.99	.0277	--	.0046	.0462	.0185	.0006	.1386	--	--
3320QA	1.04	92.3	949	4.9	2.77	.0493	--	.0030	.1972	--	.0049	.4931	--	.0015
3320QB	1.04	86.0	909	8.6	5.41	.0369	--	.0037	.1843	.0123	.0061	.1229	--	.0018
3320QC	1.04	91.5	943	5.6	2.91	.0222	--	.0022	.3333	--	.0006	.0778	--	.0006
3320RA	1.05	88.3	889	11.0	.72	.0330	--	.0055	.0769	.0055	.0055	.0549	--	--
3320RB	1.05	88.1	889	11.0	.90	.0221	--	.0033	.1104	.0110	.0011	.2208	--	--
3320RC	1.05	90.3	918	8.1	1.66	.0230	--	.0081	.1152	.0173	.0012	.2304	--	--
3320SA	1.06	88.0	938	5.8	6.15	.0350	--	.0117	.2331	.0583	2.3310	.8159	.0117	.0017
3320SB	1.06	89.6	912	8.6	1.71	.0247	--	.0062	.2469	.0617	.0617	.2469	.0123	--
3320SC	1.06	88.9	907	9.1	2.07	.0389	--	.0259	.1295	.0130	--	.1295	--	--
3320TA	1.07	73.3	854	12.5	14.24	.0375	--	2.5000	.1875	.1250	6.2500	.1250	--	--
3320TB	1.07	83.9	879	11.5	4.55	.0230	--	1.7281	.1728	.0230	.2304	.3456	--	--
3320UA	1.08	84.8	872	12.5	2.66	.0250	--	.8333	.2500	.0250	.2500	.4167	--	.0008
3320UB	1.08	87.1	893	10.5	2.40	.0314	--	.5241	.2096	.0210	.1572	.1048	--	.0010
X3320WA	1.09	42.1	426	56.8	1.03	.0019	--	.0019	--	.0473	--	.2841	--	.0005
X3320WB	1.09	44.0	443	55.4	.61	.0018	--	.0046	--	.0646	--	.1845	--	--
X3320VA	1.10	66.9	993	.5	32.63	.0100	--	.9960	.4980	--	.4980	.0498	--	.0020
X3320VB	1.10	58.0	979	1.2	40.81	.0122	--	1.2225	1.2225	--	.6112	.1222	--	.0024
3326	2.01	90.6	909	9.1	.31	.0906	--	.0027	--	.0181	.0127	.0181	--	--
3326NA	2.02	88.0	888	11.1	.93	.0166	--	.0166	--	.0166	.0022	.5543	--	--
3326NB	2.02	90.5	909	9.1	.37	.0182	--	.0018	--	.0014	.0182	.0909	--	--
3326NC	2.02	85.5	859	14.1	.43	.0141	--	.0047	.0028	.0014	.0094	.0938	--	--
3326PA	2.03	86.8	878	12.1	1.07	.0242	--	.0605	.0061	.0242	.1211	.2421	.0242	--
3326PB	2.03	90.5	915	8.5	1.08	.0242	--	.0036	.0060	.0085	.0242	.3623	--	--
3326PC	2.03	90.3	912	8.8	.97	.0250	--	.0125	.0087	.0125	.0250	.1250	--	--
3326Q	2.04	88.9	908	9.0	2.19	.0179	--	.8961	.0045	.0179	.0179	.2688	--	.0027
3326R	2.05	75.6	894	9.0	15.45	.3584	.3584	2.6882	.0538	.0179	.0896	.1792	--	.0013
X3326SA	2.06	43.8	834	8.8	47.41	.0087	--	2.5000	.0250	--	.0250	.1875	--	.0006
X3326SB	2.06	56.5	900	6.3	37.20	.0063	--	1.8018	.0270	--	.0450	.1802	--	.0005
3094A	3.01	81.7	840	15.6	2.73	.0312	--	.0312	.0042	.0208	.0052	1.5593	--	.0010
3094B	3.01	87.8	893	10.6	1.59	.0211	--	.0211	.0053	.0074	.0211	1.0571	--	.0011
3094C	3.01	86.5	899	9.7	3.78	.0145	--	.0097	--	.0097	1.9380	1.4535	--	.0015
3094NA	3.02	87.9	898	10.0	2.12	.0030	--	.0070	--	.0030	.0150	2.0000	--	--
3094NB	3.02	87.5	892	10.6	1.93	.0317	--	.0016	--	.0053	.0074	1.5856	--	--
3094NC	3.02	84.0	863	13.4	2.60	.0267	--	.0134	.0053	.0040	.0668	2.0053	--	--
3152A	4.01	84.3	849	15.0	.67	.0200	--	.0007	--	.0100	.0100	.1000	--	.0010
3152B	4.01	83.9	848	15.0	1.09	.1000	--	.0005	.0040	.0070	.0020	.5000	--	--
3152C	4.01	88.0	903	9.4	2.53	.0660	--	.0283	.0038	.0142	.0189	1.4151	--	--
3152NA	4.02	91.8	937	6.2	2.01	.2481	--	.0002	--	--	--	1.2407	--	--
3152NB	4.02	83.4	846	15.2	1.35	.0217	--	.0109	--	.0109	.0326	.4348	--	--
3148A	5.01	89.2	899	10.0	.76	.0300	--	.0300	--	.0018	.0500	.5000	--	--
3148B	5.01	89.3	899	10.0	.70	.0300	--	.0150	--	.0150	.0200	.3000	--	--
3148C	5.01	89.3	899	10.0	.69	.0300	--	.0070	--	.0050	.0007	.5000	--	--

Bonnifield Gold Data--Continued

Sample	SiteType	Co %	Sn %	Mo %	Pt %	Pd %	Ba %	Zr %	V %	Cr %	Y %	La %	Nb %	B %
3320A	1.01	--	--	--	--	--	.0011	--	--	.0011	--	--	--	--
3320B	1.01	--	--	--	--	--	--	--	--	.0008	--	--	--	--
3320NA	1.02	--	--	--	--	--	.0010	--	--	.0007	--	--	--	--
3320NB	1.02	--	--	--	--	--	.0019	--	--	.0014	--	--	--	--
3320NC	1.02	--	--	--	--	--	.0007	--	--	.0016	--	--	--	--
3320PA	1.03	.0019	--	--	--	--	.0124	--	.0009	.0062	--	--	--	.0062
3320PB	1.03	--	--	--	--	.0005	.0022	--	--	.0011	--	--	--	--
3320PC	1.03	--	--	--	--	--	.0014	--	--	.0014	--	--	--	--
3320QA	1.04	.0015	--	--	--	--	.0049	--	--	.0049	--	--	--	.0010
3320QB	1.04	.0037	--	--	--	--	.0086	.0012	.0025	.0086	--	--	--	.0012
3320QC	1.04	.0006	--	--	--	--	.0011	--	--	.0056	.0003	--	--	.0003
3320RA	1.05	.0005	--	--	--	--	.0011	.0011	--	.0022	--	--	--	.0022
3320RB	1.05	.0008	--	--	--	--	.0011	--	--	.0017	--	--	--	--
3320RC	1.05	.0012	--	--	--	--	.0346	.0012	--	.0023	.0006	.0023	--	.0017
3320SA	1.06	.0035	--	.0006	--	--	.0117	--	.0023	.0058	.0006	--	--	.0012
3320SB	1.06	--	--	--	--	--	.0025	--	--	.0025	--	--	--	.0062
3320SC	1.06	.0006	.0648	--	--	--	.0019	.0065	--	.0026	--	.0091	--	.0019
3320TA	1.07	.0025	2.5000	.0250	.0019	--	.1250	.1250	.0019	.0025	.0013	--	.0013	.0062
3320TB	1.07	.0012	.5760	.0576	--	.0023	.2304	.0346	--	.0023	.0012	.0173	.0017	.0012
3320UA	1.08	.0017	.1667	.0006	.0167	.0006	.0083	.0025	--	.0017	--	--	--	.0008
3320UB	1.08	.0021	.1048	.0105	.0314	.0007	.0031	.0021	--	.0031	.0005	.0105	.0021	.0003
X3320WA	1.09	--	--	--	--	--	.0014	--	--	--	--	--	--	--
X3320WB	1.09	--	--	--	--	--	.0005	--	--	--	--	--	--	--
X3320VA	1.10	.0050	24.9004	.0299	--	--	.0498	.0996	.0199	.4980	.0299	.0299	.0050	--
X3320VB	1.10	.0086	30.5624	.0611	--	--	.0611	.1222	.0244	.6112	.0367	.0367	.0061	--
3326	2.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3326NA	2.02	--	--	--	--	.0006	.0017	--	--	--	--	--	--	--
3326NB	2.02	--	--	--	--	--	.0014	--	--	--	--	--	--	--
3326NC	2.02	--	--	--	--	--	.0009	--	--	--	--	--	--	--
3326PA	2.03	--	--	--	--	--	.0024	--	--	--	--	--	--	--
3326PB	2.03	--	--	--	--	--	.0060	.0012	--	--	--	--	--	--
3326PC	2.03	--	--	--	--	--	.0625	--	--	--	.0013	.0125	--	--
3326Q	2.04	.0004	.1792	.0009	--	.0003	.0090	.0134	--	--	.0004	--	--	.0013
3326R	2.05	--	8.9606	.0036	--	.0004	.0896	.3584	--	--	.0896	.0896	.0538	--
X3326SA	2.06	--	6.2500	.0250	--	--	.1250	31.2500	--	.1250	.2500	2.5000	--	.0025
X3326SB	2.06	--	4.5045	.0180	--	--	.0901	22.5225	--	.1351	.2703	1.8018	--	--
3094A	3.01	--	--	--	--	--	.0007	--	--	--	--	--	--	.0016
3094B	3.01	.0007	--	--	--	--	.0005	--	--	--	--	--	--	.0021
3094C	3.01	--	--	--	--	--	.0029	--	--	--	--	--	--	.0019
3094NA	3.02	--	--	--	--	--	.0005	--	--	--	--	--	--	.0007
3094NB	3.02	--	--	--	--	--	.0004	--	--	--	--	--	--	.0003
3094NC	3.02	--	--	--	--	--	.0067	--	--	--	--	--	--	.0201
3152A	4.01	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3152B	4.01	--	--	--	--	--	.0015	--	--	--	--	--	--	.0005
3152C	4.01	--	--	--	--	--	.0014	--	--	--	--	--	--	.0009
3152NA	4.02	--	--	--	--	.0186	.0006	--	--	--	--	--	--	.0002
3152NB	4.02	--	--	--	--	--	.0033	.0109	--	--	--	--	--	.0043
3148A	5.01	--	--	--	--	--	.0100	--	--	--	--	--	--	.0010
3148B	5.01	--	--	--	--	--	.0050	--	--	--	--	--	--	.0007
3148C	5.01	--	--	--	--	--	.0010	--	--	--	--	--	--	.0030

Bonnifield Gold Data--Continued

Sample	SiteType	Be %	W %	Mn %	Fe %	Mg %	Ca %	Ti %	Si %	Smpl Wt	r=Au/Ag	Au/Cu	Ag/Cu	r/Cu
3320A	1.01	--	--	.0021	.2123	.0032	.0053	.0011	.1062	4.71	45.8	458	10	216
3320B	1.01	--	--	.0012	.2326	.0035	.0023	.0081	.1163	4.30	11.2	3,923	350	482
3320NA	1.02	--	--	.0010	.1953	.0029	.0020	.0049	.0488	5.12	13.3	3,097	233	453
3320NB	1.02	--	--	.0019	.4826	.0048	.0019	.0068	.1931	5.18	13.7	3,186	233	472
3320NC	1.02	--	--	.0021	.3191	.0053	.0032	.0016	.2128	4.70	8.3	4,163	500	391
3320PA	1.03	--	--	.0087	1.2438	.0373	.0062	.0249	2.4876	4.02	6.7	3,352	500	270
3320PB	1.03	--	--	.0054	.2155	.0108	.0022	.0016	.2155	4.64	12.2	4,259	350	565
3320PC	1.03	--	--	.0028	.4621	.0092	.0018	.0009	.2773	5.41	9.7	3,238	333	350
3320QA	1.04	--	--	.0069	1.4793	.0197	.0049	.0069	.4931	5.07	18.7	1,872	100	380
3320QB	1.04	--	--	.0086	2.4570	.0614	.0123	.0246	2.4570	4.07	10.0	2,333	233	271
3320QC	1.04	.0001	--	.0033	2.2222	.0111	.0033	.0056	.2222	4.50	16.5	4,119	250	741
3320RA	1.05	--	--	.0022	.3297	.0110	.0033	.0165	.1648	4.55	8.0	2,678	333	244
3320RB	1.05	--	--	.0022	.3311	.0077	.0055	.0110	.1656	4.53	8.0	3,989	500	361
3320RC	1.05	--	--	.0023	.5760	.0346	.0058	.0230	.5760	4.34	11.2	3,918	350	486
3320SA	1.06	.0001	--	.0082	2.3310	.0117	.0058	.0350	.2331	4.29	15.1	2,517	167	432
3320SB	1.06	--	--	.0025	.6173	.0370	.0062	.0037	.3704	4.05	10.4	3,631	350	420
3320SC	1.06	--	--	.0026	.6477	.0130	.0130	.0648	.9067	3.86	9.8	2,287	233	252
3320TA	1.07	.0001	.2500	.0062	.6250	.0250	.0375	.0250	1.2500	4.00	5.9	1,954	333	156
3320TB	1.07	--	.2304	.0035	.5760	.0115	.0346	.0115	.2304	4.34	7.3	3,643	500	316
3320UA	1.08	--	.0042	.0058	.4167	.0125	.0167	.0417	.1667	6.00	6.8	3,393	500	271
3320UB	1.08	--	.1048	.0105	.7338	.0105	.0052	.1048	.2096	4.77	8.3	2,770	333	264
X3320WA	1.09	--	--	.0019	.1894	.0189	.0019	.0095	.4735	5.28	.7	22,255	30,000	392
X3320WB	1.09	--	--	.0014	.0646	.0092	.0018	.0046	.2768	5.42	.8	23,867	30,000	431
X3320VA	1.10	.0001	.4980	.1992	1.9920	.0996	.0498	.0747	1.9920	5.02	134.3	6,714	50	13,482
X3320VB	1.10	.0001	.6112	.2445	2.4450	.1834	.0611	.0917	2.4450	4.09	47.4	4,742	100	3,879
3326	2.01	--	--	.0018	.0272	.0036	.0036	.0054	.1268	2.76	10.0	1,001	100	110
3326NA	2.02	--	--	.0011	.0776	.0055	.0022	.0111	.2217	4.51	7.9	5,291	667	477
3326NB	2.02	--	--	.0009	.0455	.0045	.0018	.0045	.1818	5.50	10.0	4,980	500	548
3326NC	2.02	--	--	.0009	.0938	.0047	.0019	.0094	.1876	5.33	6.1	6,076	1,000	432
3326PA	2.03	--	--	.0018	.3632	.0061	.0061	.0085	.1816	4.13	7.2	3,586	500	296
3326PB	2.03	--	--	.0024	.3623	.0060	.0060	.0242	.2415	4.14	10.7	3,745	350	443
3326PC	2.03	--	--	.0025	.3750	.0250	.0038	.0250	.2500	4.00	10.3	3,611	350	413
3326Q	2.04	--	.0896	.0013	.1792	.0179	.0090	.0134	.4480	5.58	9.9	4,958	500	553
3326R	2.05	--	.1792	.0179	.5376	.0179	.0538	.3584	.8961	2.79	8.4	211	25	24
X3326SA	2.06	.0001	.2500	.0375	.6250	.0625	.0375	.6250	2.5000	4.00	5.0	5,010	1,000	573
X3326SB	2.06	.0001	.0901	.0450	.6306	.0450	.0270	.4505	4.5045	5.55	9.0	8,959	1,000	1,421
3094A	3.01	--	--	.0208	.7277	.0104	.0021	.0021	.3119	4.81	5.2	2,619	500	168
3094B	3.01	--	.0053	.0074	.3171	.0106	.0053	.0021	.1057	4.73	8.3	4,155	500	393
3094C	3.01	--	--	.0145	.1938	.0097	.0291	.0048	.0969	5.16	8.9	5,953	667	614
3094NA	3.02	--	--	.0010	.0300	.0050	.0005	--	.0500	5.00	8.8	29,295	3,333	2,929
3094NB	3.02	--	--	.0021	.2114	.0032	.0011	.0011	.0740	4.73	8.3	2,759	333	261
3094NC	3.02	--	--	.0040	.2005	.0401	.0067	.0027	.2005	3.74	6.3	3,143	500	235
3152A	4.01	--	--	.0100	.3000	.0100	.0020	.0020	.2000	5.00	5.6	4,217	750	281
3152B	4.01	--	--	.0070	.1500	.0150	.0050	.0020	.3000	5.00	5.6	839	150	56
3152C	4.01	--	--	.0189	.4717	.0142	.0028	.0019	.4717	5.30	9.3	1,333	143	141
3152NA	4.02	--	--	.0025	.2481	.0620	.0025	--	.1861	4.03	14.8	370	25	60
3152NB	4.02	--	--	.1087	.4348	.0326	.0065	.0217	.2174	2.30	5.5	3,838	700	252
3148A	5.01	--	--	.0001	.0300	.0050	.0010	--	.1000	5.00	8.9	2,975	333	297
3148B	5.01	--	--	.0010	.1500	.0100	.0010	.0010	.1500	5.00	8.9	2,977	333	298
3148C	5.01	--	--	.0007	.0700	.0050	.0010	.0015	.0700	5.00	8.9	2,977	333	298

Bonnifield Gold Data--Continued

Sample	SiteType	Au %	Fineness	Ag %	Sum X %	Cu %	Zn %	Pb %	As %	Sb %	Bi %	Hg %	Te %	Ni %
3148D	5.01	90.2	907	9.3	.53	.0556	--	.0037	--	.0032	.0004	.1852	--	--
3148NA	5.02	81.1	831	16.5	2.41	.0220	--	.1648	--	.0033	.0077	1.0989	--	--
3148NB	5.02	88.4	893	10.5	1.04	.0316	--	.0316	--	.0032	.0011	.5274	--	--
3148NC	5.02	82.7	846	15.0	2.28	.0200	--	.0200	--	.0200	.0005	2.0000	--	--
3148ND	5.02	82.6	846	15.0	2.40	.0300	--	.0050	--	.0100	.0100	2.0000	--	--
3153	6.01	96.0	989	1.1	2.92	2.1142	--	.0011	--	--	--	.1586	--	--
3150A	7.01	83.3	854	14.3	2.38	.0286	--	.0010	--	.0019	--	1.9048	--	--
3150B	7.01	83.5	851	14.6	1.94	.0291	--	.0007	--	.0068	--	1.4563	--	--
3150C	7.01	83.2	851	14.6	2.19	.0097	--	.0010	--	.0068	.0146	1.9417	--	--
3150NA	7.02	84.1	894	10.0	5.85	.1000	.0050	.0150	.0100	--	.0005	5.0000	--	--
3150NB	7.02	81.4	844	15.0	3.62	.0500	--	.0300	.0050	.0050	.0030	3.0000	--	--
3150NC	7.02	82.5	846	15.0	2.52	.0500	--	.0007	--	.0050	--	2.0000	--	--
3150SA	7.03	89.5	963	3.4	7.06	.1701	--	.0170	--	--	.0057	5.6689	--	--
3150SB	7.03	92.8	969	3.0	4.16	.1000	--	.0070	--	--	.0010	3.0000	--	--
3150W	7.04	92.0	964	3.5	4.57	.1152	--	.0346	--	--	.0008	3.4562	--	--
3144A	8.01	91.2	932	6.7	2.10	.0476	--	.1429	.0048	.0286	.0095	.0476	--	.0007
3144B	8.01	78.5	800	19.6	1.95	.0196	--	.0685	.0049	.0098	.0068	.2935	--	--
3144C	8.01	88.7	899	10.0	1.27	.0100	--	.0500	--	.0300	--	.5000	--	--
3144XA	8.02	84.4	849	15.0	.56	.0200	--	.0300	--	--	--	.2000	--	--
3144XB	8.02	91.2	925	7.4	1.41	.0211	--	.0211	--	.0074	.0002	.0526	--	--
3144XC	8.02	84.9	855	14.4	.71	.0096	--	.0096	--	.0144	--	.2879	--	--
3144RA	8.03	81.4	844	15.0	3.62	.0150	--	.7000	.0050	.0200	.0050	.1000	--	.0010
3144RB	8.03	83.8	846	15.2	.97	.0051	--	.0305	--	.0102	.0152	.3049	--	.0005
3144RC	8.03	82.5	846	15.0	2.51	.0200	--	.2000	--	.0500	.0100	.3000	--	.0015
3144SA	8.04	84.1	849	15.0	.94	.0070	--	.2000	--	.0100	.0070	.5000	--	--
3144SB	8.04	83.7	848	15.0	1.32	.0070	--	.3000	--	.0070	.0050	.5000	--	--
3144SC	8.04	88.3	898	10.0	1.67	.0200	--	.2000	--	.0200	.0070	.2000	--	--
3144TA	8.05	82.7	847	15.0	2.26	.0300	--	1.0000	.0050	.0200	.0070	.5000	--	.0010
3144TB	8.05	83.0	847	15.0	1.96	.0200	--	1.0000	.0100	.0100	.1000	.5000	--	--
3144TC	8.05	86.7	882	11.6	1.66	.0233	--	.5814	--	.0116	.0035	.5814	--	.0008
3144NA	8.06	81.6	826	17.2	1.26	.0017	--	.0258	--	.0430	--	.0601	--	--
3144NB	8.06	83.9	848	15.0	1.08	.0020	--	.0500	--	.0150	.0005	.5000	--	--
3144NC	8.06	83.7	848	15.0	1.29	.0050	--	.1000	--	.0700	.0020	.0700	--	--
3144YA	8.07	83.4	848	15.0	1.57	.0300	--	.1000	--	.0150	.0007	.2000	--	--
3144YB	8.07	84.9	895	10.0	5.15	.0200	--	1.0000	.0040	.0200	.0030	.2000	--	--
3144YC	8.07	85.7	895	10.0	4.35	.0500	--	.7000	.0050	.0150	.0500	.2000	.0040	--
3144W	8.08	65.2	709	26.7	8.08	.1908	--	.1145	--	.0763	--	1.1450	--	--
3233A	9.01	74.4	788	20.0	5.60	.0200	--	.0100	--	.0500	--	5.0000	--	--
3233B	9.01	88.7	899	10.0	1.27	.5000	--	.0050	--	.0030	--	.3000	--	--
3233C	9.01	84.4	849	15.0	.64	.0200	--	.0020	--	.0030	--	.2000	--	.0010
3233XA	9.02	80.0	810	18.7	1.32	.0468	--	.0003	--	--	--	.9363	--	--
3233XB	9.02	81.9	827	17.1	.96	.0086	--	.0002	--	.0015	--	.5993	--	--
3233XC	9.02	88.1	889	11.0	.86	.0771	--	.0011	--	--	--	.3304	--	--
3233NA	9.03	91.4	929	7.0	1.56	.0300	--	.0100	--	--	.0050	.7000	--	--
3233NB	9.03	83.4	856	14.0	2.57	.0281	--	.0009	--	.0019	--	1.8727	--	.0009
3233NC	9.03	88.3	898	10.0	1.72	.0200	--	.0200	--	.0100	.0150	1.0000	--	.0010
3233RA	9.04	78.6	840	15.0	6.39	.1000	--	.2000	.7000	.0100	.0070	.5000	--	.0100
3233RB	9.04	81.1	844	15.0	3.87	.0200	--	.0200	.5000	.0150	.0005	.2000	--	.0050
3233RC	9.04	80.4	889	10.0	9.59	.0500	--	.5000	.5000	.0150	.0050	.5000	--	.0070
3233SA	9.05	74.2	881	10.0	15.85	.0500	--	1.0000	.2000	.0100	.0070	.1000	--	.0070

Bonnifield Gold Data--Continued

Sample	SiteType	Co %	Sn %	Mo %	Pt %	Pd %	Ba %	Zr %	V %	Cr %	Y %	La %	Nb %	B %
3148D	5.01	--	--	--	--	--	.0013	--	--	--	--	--	--	.0926
3148NA	5.02	--	--	--	--	--	.0220	--	--	--	--	.0055	--	.0077
3148NB	5.02	--	--	--	--	--	.0074	--	--	--	--	.0021	--	.0053
3148NC	5.02	--	--	--	--	--	.0020	--	--	--	--	--	--	.0005
3148ND	5.02	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3153	6.01	--	--	--	--	.0011	--	--	--	--	--	--	--	--
3150A	7.01	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3150B	7.01	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3150C	7.01	--	--	--	--	--	.0005	--	--	--	--	--	--	.0029
3150NA	7.02	--	--	--	--	--	.0030	--	--	--	--	--	--	--
3150NB	7.02	--	--	--	--	--	.0010	--	--	--	--	--	--	.0015
3150NC	7.02	--	--	--	--	--	.0007	--	--	--	--	--	--	--
3150SA	7.03	--	--	--	--	--	.0057	--	--	--	--	--	--	.0001
3150SB	7.03	--	--	--	--	--	.0050	--	--	--	--	--	--	.0002
3150W	7.04	--	--	--	--	--	.0017	--	--	--	--	--	--	--
3144A	8.01	--	--	--	--	--	.0143	--	--	--	--	--	--	.0143
3144B	8.01	--	--	--	--	--	.0015	--	--	--	--	--	--	.0147
3144C	8.01	--	.0015	--	--	--	.0010	--	--	--	--	--	--	.0050
3144XA	8.02	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3144XB	8.02	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3144XC	8.02	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3144RA	8.03	--	.3000	--	.1000	.0070	.0015	.0500	.0020	.0050	.0050	.0500	--	.0050
3144RB	8.03	--	.2033	--	--	--	--	--	--	--	--	--	--	.0010
3144RC	8.03	--	.2000	--	.2000	.0100	.0005	.0100	.0030	.0500	--	.0070	--	.0020
3144SA	8.04	--	.0200	--	.0030	--	.0004	--	--	--	--	--	--	.0007
3144SB	8.04	--	.1500	--	.0100	--	.0004	.0010	--	--	--	.0030	--	.0010
3144SC	8.04	--	.5000	--	--	--	.0004	.0010	.0020	--	.0005	.0030	--	.0015
3144TA	8.05	--	.1000	--	.0700	.0200	.0007	.0050	--	--	--	.0030	--	.0005
3144TB	8.05	--	.0300	--	.0100	.0050	.0005	.0005	--	--	--	--	--	.0005
3144TC	8.05	--	.0581	--	.0174	.0035	.0005	.0023	--	--	--	--	--	.0006
3144NA	8.06	--	--	--	--	--	.0017	--	--	--	--	--	--	--
3144NB	8.06	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3144NC	8.06	--	--	--	--	--	.0020	--	--	--	--	--	--	.0010
3144YA	8.07	--	.1500	--	--	--	.0004	.0050	.0020	.0200	.0005	.0070	--	.0007
3144YB	8.07	--	1.0000	--	.0200	.0020	.0005	.1000	.0050	.0300	.0100	.0500	--	.0005
3144YC	8.07	--	.5000	--	--	--	.0004	.1000	.0020	.0300	.0020	.0150	--	.0020
3144W	8.08	--	.0763	--	3.8168	.0573	--	.0115	--	--	--	--	--	--
3233A	9.01	--	--	--	--	--	--	--	--	--	--	--	--	.0015
3233B	9.01	--	--	--	--	.0030	.0005	--	--	--	--	--	--	--
3233C	9.01	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3233XA	9.02	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3233XB	9.02	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3233XC	9.02	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3233NA	9.03	--	--	--	--	--	.0007	--	--	--	--	--	--	.0020
3233NB	9.03	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3233NC	9.03	--	--	--	--	--	.0030	--	--	--	--	--	--	--
3233RA	9.04	.0020	.0700	--	1.0000	.0150	.0020	.0500	.0010	.0200	.0010	.0100	--	.0070
3233RB	9.04	.0005	.2000	--	--	--	.0020	.0500	.0009	.0150	.0005	--	--	.0070
3233RC	9.04	.0015	.0050	--	2.0000	.0020	.0020	.0300	.0009	.0300	.0010	.0150	--	.0010
3233SA	9.05	.0020	5.0000	--	1.0000	.0200	.0010	5.0000	.0015	.0050	.0200	.1000	--	.0005

Bonnifield Gold Data--Continued

Sample	SiteType	Be %	W %	Mn %	Fe %	Mg %	Ca %	Ti %	Si %	Smpl Wt	r=Au/Ag	Au/Cu	Ag/Cu	r/Cu
3148D	5.01	--	--	.0004	.0370	.0185	.0019	--	.1296	2.70	9.7	1,624	167	175
3148NA	5.02	--	--	.0011	.1099	.1648	.0330	.0033	.7692	4.55	4.9	3,690	750	224
3148NB	5.02	--	--	.0011	.0527	.0527	.0105	.0016	.3165	4.74	8.4	2,794	333	265
3148NC	5.02	--	--	.0005	.0500	.0200	.0010	--	.1500	5.00	5.5	4,136	750	276
3148ND	5.02	--	--	.0100	.1500	.0100	.0200	.0010	.1500	5.00	5.5	2,753	500	184
3153	6.01	--	--	.0011	.1057	.0053	.0032	.0016	.5285	4.73	90.8	45	--	43
3150A	7.01	--	--	.0014	.2857	.0067	.0019	.0019	.1429	5.25	5.8	2,917	500	204
3150B	7.01	--	--	.0010	.2913	.0029	.0019	.0010	.1456	5.15	5.7	2,867	500	197
3150C	7.01	--	--	.0005	.0971	.0146	.0019	--	.0971	5.15	5.7	8,575	1,500	589
3150NA	7.02	--	--	.0050	.5000	.0100	.0030	--	.2000	5.00	8.4	841	100	84
3150NB	7.02	--	--	.0030	.3000	.0200	.0020	.0015	.2000	5.00	5.4	1,628	300	109
3150NC	7.02	--	--	.0015	.3000	.0100	.0020	.0010	.1500	5.00	5.5	1,650	300	110
3150SA	7.03	--	--	.0113	.5669	.0340	.0057	.0057	.5669	4.41	26.3	526	20	155
3150SB	7.03	--	--	.0070	.3000	.0300	.0050	.0020	.7000	5.00	30.9	928	30	309
3150W	7.04	--	--	.0115	.3456	.0230	.0023	.0035	.5760	4.34	26.6	798	30	231
3144A	8.01	--	--	.0095	.6667	.1429	.0095	.0048	.9524	5.25	13.7	1,916	140	287
3144B	8.01	--	--	.0068	.6849	.1468	.0068	.0015	.6849	5.11	4.0	4,010	1,000	205
3144C	8.01	--	--	.0030	.3000	.0700	.0010	.0010	.3000	5.00	8.9	8,873	1,000	887
3144XA	8.02	--	--	.0007	.2000	.0050	.0015	.0010	.1000	5.00	5.6	4,222	750	281
3144XB	8.02	--	--	.0074	.7368	.0211	.0021	.0158	.5263	4.75	12.4	4,333	350	588
3144XC	8.02	--	--	.0007	.1919	.0048	.0014	.0014	.1919	5.21	5.9	8,846	1,500	614
3144PA	8.03	--	.0100	.0300	1.5000	.1000	.0100	.1000	.5000	5.00	5.4	5,425	1,000	362
3144RB	8.03	--	--	.0030	.1524	.0305	--	.0071	.2033	4.92	5.5	16,490	3,000	1,082
3144RC	8.03	--	--	.0200	1.0000	.0500	.0050	.0700	.3000	5.00	5.5	4,125	750	275
3144SA	8.04	--	--	.0010	.0300	.0100	.0005	.0010	.1500	5.00	5.6	12,008	2,143	801
3144SB	8.04	--	--	.0150	.1500	.0200	.0015	.0030	.1500	5.00	5.6	11,954	2,143	797
3144SC	8.04	--	--	.0100	.5000	.0200	.0015	.0300	.1500	5.00	8.8	4,417	500	442
3144TA	8.05	--	--	.0050	.3000	.0200	.0100	.0100	.1500	5.00	5.5	2,758	500	184
3144TB	8.05	--	--	.0050	.1000	.0200	.0020	.0010	.1500	5.00	5.5	4,152	750	277
3144TC	8.05	--	--	.0023	.2326	.0174	.0035	.0012	.1163	4.30	7.5	3,729	500	321
3144NA	8.06	--	--	.0026	.1718	.0859	.0017	.0026	.8591	5.82	4.7	47,469	10,000	2,763
3144NB	8.06	--	--	.0015	.3000	.0050	.0020	--	.2000	5.00	5.6	41,962	7,500	2,797
3144NC	8.06	--	--	.0030	.5000	.0300	.0020	.0010	.5000	5.00	5.6	16,743	3,000	1,116
3144YA	8.07	--	--	.0150	.7000	.0700	.0010	.0500	.2000	5.00	5.6	2,781	500	185
3144YB	8.07	--	--	.0500	2.0000	.1000	.0300	.2000	.3000	5.00	8.5	4,243	500	424
3144YC	8.07	--	.0050	.0500	2.0000	.1000	.0150	.2000	.3000	5.00	8.6	1,713	200	171
3144W	8.08	--	--	.0382	1.9084	.0191	--	.0573	.5725	1.31	2.4	342	140	13
3233A	9.01	--	--	.0020	.3000	.0100	.0020	.0070	.2000	5.00	3.7	3,720	1,000	186
3233B	9.01	--	--	.0020	.3000	.0070	.0020	.0020	.1500	5.00	8.9	177	20	18
3233C	9.01	--	--	.0010	.3000	.0030	.0030	.0050	.1000	5.00	5.6	4,218	750	281
3233XA	9.02	--	--	.0009	.1873	.0047	.0009	.0008	.1404	5.34	4.3	1,708	400	91
3233XB	9.02	--	--	.0009	.1712	.0043	--	.0017	.1712	5.84	4.8	9,568	2,000	559
3233XC	9.02	--	--	.0011	.2203	.0055	.0011	.0011	.2203	4.54	8.0	1,143	143	104
3233NA	9.03	--	--	.0020	.3000	.0100	.0015	.0010	.5000	5.00	13.1	3,048	233	435
3233NB	9.03	--	--	.0047	.4682	.0047	.0009	.0014	.1873	5.34	5.9	2,968	500	211
3233NC	9.03	--	--	.0015	.3000	.0150	.0100	.0200	.3000	5.00	8.8	4,414	500	441
3233RA	9.04	--	--	.0500	3.0000	.0300	.0050	.1000	.5000	5.00	5.2	786	150	52
3233RB	9.04	--	--	.0300	2.0000	.0500	.0050	.0500	.7000	5.00	5.4	4,056	750	270
3233RC	9.04	--	--	.0700	5.0000	.0500	.0050	.1000	.7000	5.00	8.0	1,608	200	161
3233SA	9.05	--	.0070	.0500	2.0000	.0500	.0150	.2000	1.0000	5.00	7.4	1,483	200	148

Bonnifield Gold Data--Continued

Sample	SiteType	Au %	Fineness	Ag %	Sum X %	Cu %	Zn %	Pb %	As %	Sb %	Bi %	Hg %	Te %	Ni %
3233SB	9.05	60.2	801	15.0	24.80	.0500	--	2.0000	.7000	.0150	.0070	.1000	--	.0015
3233SC	9.05	75.0	882	10.0	14.97	.0200	--	1.0000	.5000	.0100	.0500	.2000	--	.0010
3234A	10.01	93.9	949	5.0	1.07	.1000	--	.0070	--	--	.0002	.5000	--	.0010
3234B	10.01	77.9	796	20.0	2.06	.0070	--	.3000	--	.0100	.0100	.5000	--	.0010
3234C	10.01	79.4	805	19.2	1.36	.0067	--	.0019	--	--	--	.9615	--	--
3234NA	10.02	92.5	932	6.7	.73	.0192	--	.0960	--	--	.0067	.1919	--	--
3234NB	10.02	88.8	899	10.0	1.17	.0500	--	.0100	--	--	.0005	.5000	--	--
3234NC	10.02	82.1	846	15.0	2.91	.0100	.0100	.0300	--	.0020	.0200	1.0000	--	.0050
3234XA	10.03	80.8	832	16.3	2.91	.0054	.0076	.0054	--	--	--	2.1739	--	.0011
3234XB	10.03	77.4	800	19.4	3.15	.0068	--	.0049	--	--	--	1.9417	--	.0015
3234XC	10.03	83.9	859	13.8	2.28	.0184	.0460	.0018	--	--	--	1.8382	--	--
3234XD	10.03	83.7	848	15.0	1.34	.0070	--	.0200	--	--	.0002	1.0000	--	--
3234XF	10.03	79.5	824	17.0	3.45	.0170	--	.0034	--	--	.0002	2.2676	--	--
3317A	11.01	93.3	939	6.1	.58	.0244	--	.0018	--	--	--	.2445	--	--
3317B	11.01	87.8	882	11.8	.41	.0083	--	.0118	--	--	--	.1769	--	--
3317NA	11.02	93.7	942	5.7	.56	.0230	--	.0017	--	--	--	.2299	--	--
3317NB	11.02	87.5	884	11.5	1.07	.1639	--	.0025	.0049	--	.0003	.2459	--	.0016
3317P	11.03	78.1	796	20.0	1.87	.0333	--	.0033	--	--	--	.6667	--	--
3319	12.01	86.5	936	5.9	7.64	.0197	--	.1969	--	--	--	.1969	--	--
3089SA	13.01	87.7	898	10.0	2.33	.0500	--	.0700	--	--	--	2.0000	--	.0020
3089SB	13.01	83.8	857	14.0	2.17	.0187	--	.0654	--	.0093	--	1.8692	--	--
3089SC	13.01	84.9	859	13.9	1.24	.0278	--	.0926	--	.0019	--	.9259	--	--
3089XA	13.02	78.7	811	18.3	2.97	.0046	--	.1835	--	--	--	1.8349	--	.0009
3089XB	13.02	88.4	886	11.3	.24	.0006	--	.1134	--	.0020	.0003	.0057	--	--
3089XC	13.02	74.3	788	20.0	5.66	.0030	--	.1500	--	--	.0010	5.0000	--	--
3089	13.03	76.0	836	14.9	9.07	.0060	--	2.9762	--	--	.0089	5.9524	--	--
3315NA	14.01	92.6	929	7.1	.38	.0101	--	.0050	--	--	.0007	.1008	--	--
3315NB	14.01	86.9	872	12.8	.36	.0085	--	.0043	--	.0085	.0017	.1276	--	--
3315NC	14.01	87.8	881	11.8	.38	.0118	--	.0035	--	.0024	.0012	.1182	--	--
3315PA	14.02	93.3	940	6.0	.65	.0180	--	.0024	--	--	.0002	.1202	--	--
3315PB	14.02	83.7	838	16.2	.14	.0216	--	.0022	--	--	--	.0022	--	--
3315PC	14.02	89.1	895	10.5	.37	.0073	--	.0005	--	.0157	--	.0524	--	--
3315Q	14.03	86.9	874	12.5	.56	.0250	--	.0062	--	.0062	.0013	.1875	--	--
3315R	14.04	77.9	884	10.2	11.91	.0170	--	6.8027	--	.0238	.0680	.2381	--	--
X3315S	14.05	9.0	91	89.9	1.06	.0054	--	.0054	--	.1799	.0007	.3597	--	.0252
X3315	14.06	--	--	--	99.97	5.0000	--	--	--	.1750	--	.7500	--	.2500
3240	15.01	65.0	695	28.6	6.41	.0714	--	.0071	--	.0286	--	.0286	--	.0143
3325	16.01	70.5	725	26.8	2.70	.0536	--	--	--	--	--	.8929	--	--
3323	17.01	84.3	858	13.9	1.85	.0231	--	.2315	--	.0324	.0046	.6944	--	--
3146	18.01	66.8	687	30.5	2.72	.0305	--	.1829	--	--	--	1.8293	--	--
3151	19.01	78.7	836	15.4	5.86	.2315	--	.0008	--	--	.0008	.1080	--	.2315
3113	20.01	83.7	855	14.2	2.16	.0030	--	.0142	--	--	--	2.0243	--	--
3113XA	20.02	87.5	892	10.6	1.89	.0053	--	.0212	--	--	--	1.5924	--	.0011
3113XB	20.02	89.9	921	7.7	2.35	.0077	--	.0111	--	.0055	--	2.2124	--	--
3113XC	20.02	80.2	822	17.3	2.52	.0023	--	.0346	--	.0173	--	2.3095	--	--
3113XD	20.02	88.6	899	10.0	1.37	.0100	--	.0010	--	--	--	1.0000	--	.0010
3149A	21.01	78.9	813	18.2	2.88	.0121	--	.0006	--	--	--	2.4272	--	--
3149B	21.01	86.8	899	9.7	3.42	.0975	--	.0010	--	--	--	2.9240	--	--
3149C	21.01	87.6	882	11.7	.76	.0250	--	.0025	--	.0033	--	.5000	--	--
3149XA	21.02	87.8	886	11.3	.84	.0226	--	.0079	--	.0079	--	.2262	--	--

Bonnifield Gold Data--Continued

Sample	SiteType	Co %	Sn %	Mo %	Pt %	Pd %	Ba %	Zr %	V %	Cr %	Y %	La %	Nb %	B %
3233SB	9.05	.0020	5.0000	--	1.0000	.0100	.0015	10.0000	.0020	.0200	.0500	.2000	--	.0005
3233SC	9.05	.0015	2.0000	--	.5000	.0050	.0010	7.0000	.0010	.0020	.0200	.0700	--	.0005
3234A	10.01	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3234B	10.01	--	--	--	--	--	.0020	--	--	--	--	--	--	--
3234C	10.01	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3234NA	10.02	--	--	--	--	.0005	.0192	--	--	.0008	--	--	--	--
3234NB	10.02	--	--	--	--	--	.0020	--	--	--	--	--	--	--
3234NC	10.02	.0005	--	--	--	--	.0010	--	--	--	--	--	--	--
3234XA	10.03	--	--	--	--	--	.0008	--	--	--	--	--	--	--
3234XB	10.03	--	--	--	--	--	.0010	--	--	--	--	--	--	--
3234XC	10.03	--	--	--	--	--	--	--	--	--	--	--	--	--
3234XD	10.03	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3234XE	10.03	--	--	--	--	--	.0006	--	--	--	--	--	--	--
3317A	11.01	--	--	--	--	--	.0009	--	--	--	--	--	--	--
3317B	11.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3317NA	11.02	--	--	--	--	--	--	--	--	.0008	--	--	--	--
3317NB	11.02	--	--	--	--	--	--	.0328	--	.0011	.0016	.0164	--	--
3317P	11.03	--	--	--	--	--	.0033	--	--	--	--	--	--	--
3319	12.01	--	.7874	.0039	--	--	.1969	.3937	.0039	.0079	.0118	.1969	--	--
3089SA	13.01	--	--	--	--	--	.0004	--	--	--	--	--	--	--
3089SB	13.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3089SC	13.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3089XA	13.02	--	--	--	--	--	.0006	--	--	--	--	--	--	--
3089XB	13.02	--	--	--	--	--	--	--	--	--	--	--	--	--
3089XC	13.02	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3089	13.03	--	--	--	--	--	--	--	--	--	--	--	--	--
3315NA	14.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3315NB	14.01	--	--	--	--	--	.0170	--	--	--	--	--	--	--
3315NC	14.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3315PA	14.02	--	--	--	--	--	.0008	--	--	--	--	--	--	--
3315PB	14.02	--	--	--	--	--	--	--	--	--	--	--	--	--
3315PC	14.02	--	--	--	--	--	--	--	--	--	--	--	--	--
3315Q	14.03	.0019	--	--	--	--	.0006	--	--	--	--	--	--	.0004
3315R	14.04	--	1.7007	--	--	--	--	1.7007	--	--	.0170	.0340	--	.0010
X3315S	14.05	--	.0054	--	--	--	--	--	--	--	--	--	--	--
X3315	14.06	.0175	--	--	79.8870*	1.2500	--	--	--	--	--	--	--	--
3240	15.01	--	--	--	--	--	.2143	--	--	--	--	--	--	--
3325	16.01	--	--	--	--	--	--	.8929	--	--	.0179	.1250	--	--
3323	17.01	--	.1389	--	--	--	--	.2315	--	--	.0046	.0463	--	--
3146	18.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3151	19.01	.0154	--	--	1.0802	.0772	.0011	.0231	--	.0013	.0015	.0309	--	--
3113	20.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3113XA	20.02	--	--	--	--	--	--	--	--	--	--	--	--	--
3113XB	20.02	--	--	--	--	--	.0006	--	--	--	--	--	--	--
3113XC	20.02	--	--	--	--	--	--	--	--	--	--	--	--	--
3113XD	20.02	--	--	--	--	--	.0010	--	--	--	--	--	--	--
3149A	21.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3149B	21.01	--	--	--	--	--	.0007	--	--	--	--	--	--	--
3149C	21.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3149XA	21.02	--	--	--	--	--	--	--	--	--	--	--	--	--

Bonnifield Gold Data--Continued

Sample	SiteType	Be %	W %	Mn %	Fe %	Mg %	Ca %	Ti %	Si %	Smpl Wt	r=Au/Ag	Au/Cu	Ag/Cu	r/Cu
3233SB	9.05	--	.0050	.0700	3.0000	.0500	.0200	1.0000	1.5000	5.00	4.0	1,204	300	80
3233SC	9.05	--	--	.0500	2.0000	.0300	.0100	.5000	1.0000	5.00	7.5	3,751	500	375
3234A	10.01	--	--	.0020	.3000	.0030	.0010	.0015	.1500	5.00	18.8	939	50	188
3234B	10.01	--	--	.0070	.7000	.0150	.0020	.0020	.5000	5.00	3.9	11,135	2,857	557
3234C	10.01	--	--	.0029	.2885	.0019	.0010	.0008	.0962	5.20	4.1	11,798	2,857	613
3234NA	10.02	--	--	.0014	.2879	.0019	.0096	.0019	.0960	5.21	13.8	4,822	350	718
3234NB	10.02	--	--	.0030	.5000	.0020	.0020	.0050	.1000	5.00	8.9	1,777	200	178
3234NC	10.02	--	--	.0150	1.5000	.0100	.0030	.0030	.3000	5.00	5.5	8,209	1,500	547
3234XA	10.03	--	--	.0054	.5435	.0033	.0022	.0022	.1630	4.60	5.0	14,864	3,000	912
3234XB	10.03	--	--	.0146	.9709	.0146	--	.0019	.1942	5.15	4.0	11,393	2,857	587
3234XC	10.03	--	--	.0018	.2757	.0018	.0018	.0009	.0919	5.44	6.1	4,566	750	331
3234XD	10.03	--	--	.0020	.2000	.0020	.0020	.0015	.1000	5.00	5.6	11,952	2,143	797
3234XE	10.03	--	--	.0023	.5669	.0170	.0023	.0079	.5669	4.41	4.7	4,677	1,000	275
3317A	11.01	--	--	.0183	.0856	.0061	.0061	.0061	.1834	4.09	15.3	3,816	250	624
3317B	11.01	--	--	.0024	.1179	.0035	.0035	.0024	.0825	4.24	7.4	10,636	1,429	902
3317NA	11.02	--	--	.0017	.1149	.0034	.0057	.0017	.1724	4.35	16.3	4,076	250	709
3317NB	11.02	--	--	.0115	.2459	.0082	.0011	.1639	.1639	3.05	7.6	533	70	46
3317P	11.03	--	--	.1333	.6667	.0200	.0047	.0067	.3333	.75	3.9	2,344	600	117
3319	12.01	--	--	.0787	2.7559	.0276	.0028	1.9685	.7874	1.27	14.6	4,392	300	744
3089SA	13.01	--	--	.0010	.1000	.0010	.0030	.0020	.1000	5.00	8.8	1,753	200	175
3089SB	13.01	--	--	.0009	.1402	.0014	.0019	.0009	.0654	5.35	6.0	4,484	750	320
3089SC	13.01	--	--	.0019	.1389	.0009	.0019	.0009	.0463	5.40	6.1	3,055	500	220
3089XA	13.02	--	--	.0046	.4587	.0138	.0018	.0046	.4587	5.45	4.3	17,153	4,000	935
3089XB	13.02	--	--	.0011	.0567	.0011	.0011	--	.0567	4.41	7.8	155,979	20,000	13,757
3089XC	13.02	--	--	.0030	.3000	.0015	.0020	.0030	.2000	5.00	3.7	24,779	6,667	1,239
3089	13.03	--	--	.0009	.0298	.0045	.0060	--	.0893	1.68	5.1	12,776	2,500	859
3315NA	14.01	--	--	.0010	.1512	.0101	.0030	.0015	.1008	4.96	13.1	9,182	700	1,301
3315NB	14.01	--	--	.0017	.0425	.0060	.0043	.0009	.1276	5.88	6.8	10,218	1,500	801
3315NC	14.01	--	--	.0024	.1182	.0059	.0024	.0008	.1182	4.23	7.4	7,427	1,000	628
3315PA	14.02	--	--	.0018	.1202	.0084	.0060	.0120	.3606	4.16	15.5	5,177	333	861
3315PB	14.02	--	--	.0011	.0539	.0054	.0022	.0008	.0539	4.64	5.2	3,883	750	240
3315PC	14.02	--	--	.0010	.0734	.0073	.0031	.0007	.2096	4.77	8.5	12,149	1,429	1,159
3315Q	14.03	--	--	.0025	.1250	.0087	.0038	.0062	.1875	4.00	7.0	3,477	500	278
3315R	14.04	--	--	.0068	.5102	.0170	.0238	.0680	.6803	1.47	7.6	4,580	600	449
X3315S	14.05	--	--	.0036	.3597	.0072	--	.0025	.1079	1.39	.1	1,668	16,653	19
X3315	14.06	--	--	.0125	12.5000	.0075	.0500	--	.0750	.20	--	--	--	--
3240	15.01	--	--	.0143	4.2857	.2857	.0143	.0214	1.4286	.35	2.3	910	400	32
3325	16.01	--	--	.0268	.1786	.0179	.0125	.1250	.3571	.28	2.6	1,316	500	49
3323	17.01	--	--	.0046	.1389	.0093	.0139	.0463	.2315	1.08	6.1	3,640	600	262
3146	18.01	--	--	.0061	.1829	.0305	--	.0305	.4268	.82	2.2	2,191	1,000	72
3151	19.01	--	--	.0154	3.0864	.0231	.0046	.1543	.7716	3.24	5.1	340	67	22
3113	20.01	--	--	--	.0101	.0040	.0040	--	.1012	2.47	5.9	27,555	4,667	1,945
3113XA	20.02	--	--	.0021	.1592	.0032	.0021	.0318	.0743	4.71	8.2	16,483	2,000	1,553
3113XB	20.02	--	--	.0002	.0332	.0022	.0033	--	.0774	4.52	11.6	11,610	1,000	1,499
3113XC	20.02	--	--	.0006	.0346	.0058	.0012	--	.1155	4.33	4.6	34,708	7,500	2,004
3113XD	20.02	--	--	.0010	.2000	.0070	.0020	.0010	.1500	5.00	8.9	8,863	1,000	886
3149A	21.01	--	--	.0012	.2427	.0085	.0012	.0012	.1820	4.12	4.3	6,503	1,500	357
3149B	21.01	--	--	.0010	.1949	.0068	.0010	.0019	.1949	5.13	8.9	891	100	91
3149C	21.01	--	--	.0017	.0500	.0083	.0017	.0017	.1667	3.00	7.5	3,503	467	300
3149XA	21.02	--	--	.0017	.3394	.0034	.0023	.0010	.2262	4.42	7.8	3,883	500	343

Bonnifield Gold Data--Continued

Sample	SiteType	Au %	Fineness	Ag %	Sum X %	Cu %	Zn %	Pb %	As %	Sb %	Bi %	Hg %	Te %	Ni %
3149XB	21.02	86.7	874	12.5	.83	.0375	--	.0188	--	.0125	--	.1250	--	.0013
3149XC	21.02	83.4	853	14.4	2.17	.0048	.0096	.0096	--	--	--	.1923	--	.0014
3149SA	21.03	83.3	847	15.0	1.66	.0150	--	.0200	--	.0030	--	1.5000	--	--
3149SB	21.03	82.8	847	15.0	2.18	.0100	--	.0030	--	.0150	--	2.0000	--	--
3149SC	21.03	82.9	847	15.0	2.10	.0050	--	.0200	--	.0020	--	2.0000	--	--
3149WA	21.04	--	--	2.3	87.70	1.1521	--	.0058	--	--	--	.1152	--	.2304
3149WB	21.04	--	--	5.1	84.90	1.0204	--	.0102	--	--	--	.1020	--	.1531
3149WC	21.04	--	--	--	79.99	1.1905	--	--	--	--	--	.0298	--	.1786
3147	22.01	67.8	726	25.6	6.64	.0192	--	.0090	--	.0026	.0026	6.3939	--	--
3321	23.01	82.5	879	11.4	6.18	.0162	--	3.2468	.1623	.0114	.4870	.1623	--	--
3239	24.01	69.6	807	16.7	13.71	.0833	--	2.5000	--	--	.0333	.3333	--	--
3316A	25.01	88.0	885	11.4	.55	.0172	--	.0572	--	--	.0002	.1144	--	--
3316B	25.01	87.2	878	12.1	.72	.0121	--	.0024	--	--	--	.0845	--	--
3316C	25.01	78.1	785	21.4	.46	.0054	--	.0107	--	.0054	--	.3212	--	--
3316ZP	25.01	91.0	913	8.7	.28	.0434	--	.0061	--	.0043	.0003	.1736	--	--
3316NA	25.02	81.6	823	17.5	.92	.0061	--	.0044	--	--	.0004	.1751	--	--
3316NB	25.02	82.0	829	16.9	1.09	.0127	--	.0042	--	.0423	.0025	.8460	--	--
3316NC	25.02	80.9	812	18.7	.37	.0125	--	.0006	--	--	.0002	.0623	--	--
3316UB	25.02	83.3	843	15.6	1.13	.0104	--	.0010	--	.0021	.0002	.7261	--	.0005
3316QA	25.03	82.1	824	17.5	.39	.0175	--	.0023	--	.0023	.0006	.1752	--	--
3316QB	25.03	91.2	918	8.2	.65	.0350	--	.0018	--	--	.0004	.2336	--	--
3316QC	25.03	87.3	889	10.9	1.87	.0217	--	.0022	--	--	.0002	.1630	--	.0011
3316RA	25.04	92.4	927	7.3	.36	.0207	--	.0031	--	--	.0016	.1556	--	--
3316RB	25.04	92.5	929	7.1	.35	.0213	--	.0028	--	--	.0284	.0994	--	--
X3316SA	25.05	88.9	968	3.0	8.17	.1976	--	.0198	--	--	.0040	.1383	--	.0030
3316TA	25.06	93.4	937	6.3	.39	.0250	--	.0013	--	--	.0087	.2500	--	--
3316VA	25.07	84.0	848	15.1	.89	.0151	--	.0007	--	.0015	.0030	.5020	--	--
3316VB	25.07	85.0	859	14.0	1.02	.0093	--	.0007	.0047	.0047	.0002	.6518	--	.0005
3316W	25.08	91.9	924	7.5	.54	.0226	--	.0015	--	--	.0030	.1506	--	--
3316XA	25.09	84.1	922	7.1	8.79	.0306	.0510	.0510	.0510	--	.0015	6.3776	--	.0010
3316XB	25.09	85.6	932	6.2	8.17	.0373	.0249	.0187	--	--	.0002	7.7736	--	--
3316XC	25.09	87.1	929	6.7	6.20	.0190	.0476	.0048	--	.0019	.0002	5.9524	--	--
3316ZA	25.10	91.2	915	8.5	.29	.0423	--	.0042	--	.0025	--	.1692	--	--
X3316YA	25.11	--	--	.5	99.50	7.0000	--	.0700	--	--	.0020	.1000	--	.1000
X3316YB	25.11	--	--	.7	99.32	6.7961	--	.9709	--	--	.0097	.0971	--	.0485
3316MA	25.12	38.8	391	60.5	.69	.0020	.0050	.1008	--	.3024	--	.2016	--	--
X3316MB	25.12	48.0	484	51.3	.70	.0026	.0427	.0085	--	.2564	--	.2564	--	--
X3316MC	25.12	34.7	349	64.7	.62	.0032	.0108	.0754	--	.3233	--	.1616	--	--
X3316MD	25.12	42.7	433	56.1	1.18	.0019	--	.6542	--	.2804	--	.1869	--	--
3316TB	25.13	52.2	524	47.4	.34	.0095	--	.0009	--	--	--	.1423	--	.0005
3316UA	25.13	43.7	442	55.1	1.26	.0110	--	.0006	--	.0330	--	1.1013	--	--
3324A	26.01	86.9	874	12.5	.64	.0125	--	.0025	--	.0017	.0008	.4167	--	--
3324B	26.01	95.5	956	4.4	.16	.0263	--	.0018	--	--	--	.0877	--	--
3324C	26.01	93.9	941	5.9	.22	.0355	--	.0024	--	--	--	.1182	--	--
3324N	26.02	74.2	746	25.3	.55	.0063	--	.0019	--	.0025	--	.2525	--	--
3324Q	26.03	89.8	902	9.7	.45	.0279	--	.0021	.0975	.0097	.0028	.0975	--	--
3322	27.01	85.1	896	9.9	5.04	.0198	--	.0198	.0395	.0296	.9881	.0988	--	--

Bonnifield Gold Data--Continued

Sample	SiteType	Co %	Sn %	Mo %	Pt %	Pd %	Ba %	Zr %	V %	Cr %	Y %	La %	Nb %	B %
3149XB	21.02	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3149XC	21.02	--	--	--	--	--	.0014	--	--	--	--	--	--	--
3149SA	21.03	--	.0020	--	--	--	--	--	--	--	--	--	--	--
3149SB	21.03	--	--	--	--	--	--	--	--	--	--	--	--	--
3149SC	21.03	--	--	--	--	--	--	--	--	--	--	--	--	--
3149WA	21.04	.0115	.0058	--	82.9460*	.1728	--	.0012	--	.0115	--	--	--	--
3149WB	21.04	.0071	.0510	--	81.1800*	.2041	--	.0020	--	.0510	--	--	--	--
3149WC	21.04	.0089	.0030	--	76.4690*	.5952	--	.0009	.0006	.0030	--	--	--	--
3147	22.01	--	--	--	--	--	.0006	.0019	--	--	--	--	--	.0013
3321	23.01	.0024	--	--	--	--	.0008	.0162	--	.0049	.0024	.0081	--	--
3239	24.01	--	--	--	--	--	--	.8333	--	--	.0083	.0833	--	--
3316A	25.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3316B	25.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3316C	25.01	--	--	--	--	.0005	--	--	--	--	--	--	--	--
3316ZB	25.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3316NA	25.02	--	--	--	--	--	.0018	--	--	.0009	--	--	--	--
3316NB	25.02	--	--	--	--	--	.0004	--	--	.0006	--	--	--	--
3316NC	25.02	--	--	--	--	--	--	--	--	--	--	--	--	--
3316UB	25.02	--	--	--	--	--	.0010	--	--	.0007	--	--	--	--
3316QA	25.03	--	--	--	--	--	--	--	--	--	--	--	--	--
3316QB	25.03	--	--	--	--	--	.0008	--	--	--	--	--	--	--
3316QC	25.03	--	--	--	--	--	.0016	--	--	.0016	--	--	--	--
3316RA	25.04	--	--	--	--	--	.0016	--	--	--	--	--	--	--
3316RB	25.04	--	--	--	--	--	.0007	.0028	--	--	.0007	.0071	--	--
X3316SA	25.05	.0020	.3953	--	--	--	.0138	.1976	--	.3953	.0395	.0988	--	.0040
3316TA	25.06	--	--	--	--	--	--	--	--	--	--	--	--	--
3316VA	25.07	--	--	--	--	--	.0005	--	--	--	--	--	--	--
3316VB	25.07	.0005	--	--	--	--	.0009	--	--	.0007	--	--	--	--
3316W	25.08	--	--	--	--	--	.0008	.0030	--	--	--	--	--	--
3316XA	25.09	.0005	.0010	--	.0153	.0020	.0102	.0005	--	.0051	--	--	--	--
3316XB	25.09	--	.0037	--	.1866	.0006	.0009	--	--	--	--	--	--	--
3316XC	25.09	--	.0014	--	.0010	.0002	.0005	--	--	--	--	--	--	--
3316ZA	25.10	--	--	--	--	--	--	--	--	--	--	--	--	--
X3316YA	25.11	.0030	1.0000	--	58.2230*	.2000	.0500	2.0000	.0020	25.0000	.0300	.0500	--	--
X3316YB	25.11	.0019	.9709	--	53.4330*	.1942	.0485	1.9417	.0029	24.2719	.0291	.0971	--	--
3316MA	25.12	--	--	--	--	--	--	--	--	--	--	--	--	--
X3316MB	25.12	--	--	--	--	--	--	--	--	--	--	--	--	.0003
X3316MC	25.12	--	--	--	--	--	--	--	--	--	--	--	--	--
X3316MD	25.12	--	--	--	--	--	--	--	--	--	--	--	--	--
3316TB	25.13	--	--	--	--	--	--	--	--	--	--	--	--	--
3316UA	25.13	--	--	--	--	--	--	--	--	--	--	--	--	--
3324A	26.01	--	--	--	--	--	.0083	--	--	--	.0004	--	--	--
3324B	26.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3324C	26.01	--	--	--	--	--	--	--	--	--	--	--	--	--
3324N	26.02	--	--	--	--	--	--	--	--	--	.0126	--	--	--
3324Q	26.03	--	--	--	--	--	--	--	--	--	--	--	--	--
3322	27.01	--	.3953	--	--	--	.2964	.9881	--	.0040	.0198	.1976	--	--

Bonnifield Gold Data--Continued

Sample	SiteType	Be %	W %	Mn %	Fe %	Mg %	Ca %	Ti %	Si %	Smpl Wt	r=Au/Ag	Au/Cu	Ag/Cu	r/Cu
3149XB	21.02	--	--	.0013	.3750	.0062	.0019	.0011	.2500	4.00	6.9	2,311	333	185
3149XC	21.02	--	--	.0067	1.4423	.0192	.0048	.0014	.4808	5.20	5.8	17,348	3,000	1,203
3149SA	21.03	--	--	--	.0150	.0020	.0020	--	.1000	5.00	5.6	5,556	1,000	370
3149SB	21.03	--	--	.0003	.0500	.0015	.0015	.0009	.1000	5.00	5.5	8,282	1,500	552
3149SC	21.03	--	--	.0002	.0200	.0020	.0015	--	.0500	5.00	5.5	16,580	3,000	1,105
3149WA	21.04	--	.0081	.0230	2.8802	.0115	.0058	.0346	.0806	4.34	--	--	--	--
3149WB	21.04	--	.0071	.0102	2.5510	.0153	.0031	.0071	.0714	4.90	--	--	--	--
3149WC	21.04	--	.0060	.0006	1.4881	.0003	.0012	.0006	.0179	8.40	--	--	--	--
3147	22.01	--	--	.0009	.0639	.0128	.0013	.0026	.1279	3.91	2.7	3,534	1,333	138
3321	23.01	--	--	.0049	1.6234	.0162	.0081	.0812	.3247	3.08	7.3	5,079	700	447
3239	24.01	--	--	.2500	5.0000	.0833	.3333	1.6667	2.5000	.30	4.2	835	200	50
3316A	25.01	--	--	.0017	.1144	.0057	.0057	.0011	.2288	4.37	7.7	5,128	667	448
3316B	25.01	--	--	.0060	.3623	.0060	.0036	.0036	.2415	4.14	7.2	7,220	1,000	598
3316C	25.01	--	--	.0016	.0535	.0032	.0032	.0007	.0535	4.67	3.6	14,594	4,000	682
3316ZB	25.01	--	--	.0009	.0174	.0026	.0026	--	.0260	5.76	10.5	2,098	200	242
3316NA	25.02	--	--	.0044	.2627	.0175	.0044	.0044	.4378	5.71	4.7	13,307	2,857	760
3316NB	25.02	--	--	.0025	.0846	.0059	.0042	.0008	.0846	5.91	4.8	6,461	1,333	382
3316NC	25.02	--	--	.0019	.0873	.0087	.0037	.0037	.1870	4.01	4.3	6,490	1,500	347
3316UP	25.02	--	--	.0021	.1556	.0104	.0052	.0052	.2075	4.82	5.4	8,031	1,500	516
3316QA	25.03	--	--	.0018	.0584	.0058	.0058	.0012	.1168	4.28	4.7	4,685	1,000	267
3316QB	25.03	--	--	.0023	.1168	.0082	.0058	.0082	.2336	4.28	11.1	2,602	233	318
3316QC	25.03	--	--	.0054	.5435	.0326	.0054	.0054	1.0870	4.60	8.0	4,014	500	369
3316RA	25.04	--	--	.0052	.0519	.0052	.0104	.0052	.1037	4.82	12.7	4,452	350	613
3316RB	25.04	--	--	.0021	.0284	.0043	.0043	.0071	.1420	3.52	13.0	4,344	333	612
X3316SA	25.05	.0002	--	.0395	1.9763	.3953	.0988	.1976	3.9526	2.53	30.0	450	15	152
3316TA	25.06	--	--	.0009	.0375	.0025	.0025	--	.0625	4.00	14.9	3,734	250	597
3316VA	25.07	--	--	.0020	.1506	.0100	.0030	.0030	.2008	4.98	5.6	5,581	1,000	371
3316VB	25.07	--	--	.0028	.1862	.0093	.0047	.0047	.1397	5.37	6.1	9,130	1,500	654
3316W	25.08	--	--	.0030	.1506	.0045	.0030	.0452	.1506	3.32	12.2	4,069	333	540
3316XA	25.09	--	--	.0204	2.0408	.0102	.0204	.0306	.0714	4.90	11.8	2,746	233	384
3316XB	25.09	--	--	.0025	.0249	.0025	.0062	.0019	.0871	4.02	13.8	2,294	167	369
3316XC	25.09	--	--	.0010	.0476	.0019	.0048	.0190	.0952	5.25	13.1	4,575	350	686
3316ZA	25.10	--	--	.0013	.0254	.0042	.0025	--	.0423	5.91	10.8	2,157	200	255
X3316YA	25.11	--	--	.0500	5.0000	.0500	.0500	.5000	.0200	5.00	--	--	--	--
X3316YB	25.11	--	--	.0485	9.7087	.0485	.0680	.4854	.0485	5.15	--	--	--	--
3316MA	25.12	--	--	.0010	.0202	.0030	.0020	.0010	.0504	4.96	.6	19,258	30,000	318
X3316MB	25.12	--	--	.0013	.0598	.0043	.0017	.0017	.0598	5.85	.9	18,728	20,000	365
X3316MC	25.12	--	--	.0016	.0216	.0022	.0022	.0011	.0216	4.64	.5	10,740	20,000	166
X3316MD	25.12	--	--	.0009	.0187	.0019	.0019	.0007	.0280	5.35	.8	22,871	30,000	408
3316TB	25.13	--	--	.0014	.0664	.0190	.0019	.0007	.0949	5.27	1.1	5,504	5,000	116
3316UA	25.13	--	--	.0011	.0330	.0055	.0022	--	.0771	4.54	.8	3,965	5,000	72
3324A	26.01	--	--	.0008	.0583	.0083	.0017	.0058	.1250	6.00	6.9	6,949	1,000	556
3324B	26.01	--	--	.0006	.0132	.0018	.0018	.0013	.0263	5.70	21.8	3,627	167	827
3324C	26.01	--	--	.0012	.0236	.0035	.0024	.0024	.0355	4.23	15.9	2,647	167	448
3324N	26.02	--	--	.0013	.0631	.0088	.0025	.0063	.1894	3.96	2.9	11,753	4,000	465
3324Q	26.03	--	--	.0014	.0975	.0070	.0042	.0028	.0975	3.59	9.2	3,224	350	331
3322	27.01	.0010	--	.0138	.5929	.1383	.0099	.1976	.9881	2.53	8.6	4,305	500	436