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TO: Jane Howe, Kit Resources, Ltd.

FROM: Steve Sibbick, NDM

SUBJECT: Goose Lake ABA Results

DATE: October 9, 1997

BACKGROUND

Acid-base accounting (ABA) was conducted in 1994 by Homestake Canada, Inc on selected ore and waste rock samples and composite samples from the Goose Lake property. Based on an evaluation of this data, further ABA testing was recommended to Kit (Arauco) Resources, Ltd by Norecol, Dames & Moore to provide an adequate database for initial assessment of the deposits' potential to generate acid rock drainage (ARD). This report is an evaluation of the 1994 and 1997 databases and their implications for ARD at the Goose Lake property.

RESULTS AND DISCUSSION

Acid-base Accounting

Total sulphur contents of the rock samples range from 0.02 to 8.04% (Table 1). Almost all of this sulphur exists as sulphide sulphur. Visual estimates of sulphide content generally correlate with total sulphur contents. However, low total sulphurs tend to be overestimated while high total sulphurs are underestimated. Sulphate-sulphur determinations are at or below detection limit, reflecting the lack of oxidation of the core samples.

pH values for the samples are all highly similar, ranging from 8.1 to 9.5. This high pH range further suggests that little or no oxidation of sulphides has occurred within the rock samples.

Neutralization potential (NP) of the rock samples ranges from 5.6 to 221 kg $CaCO_3$/ tonne. The highest overall NP values are found in the Oxide Iron Formation samples from the Lower Iron Formation (LIF) Unit.

Mudstones have the lowest overall NP. Inorganic CO2 measurements and NP values suggest that only about 35% of the carbonate is available in a form (ie. calcite, dolomite) able to neutralize acidity (Figure 1). The remainder is likely in the form of Fe-carbonate (ie. siderite).

Maximum Potential Acidity (MPA) has a range of 0.6 to 251 kg $CaCO_3$ / tonne. Sulphide–bearing oxide iron formation samples had the highest MPA (110 to 251 kg $CaCO_3$ / tonne), followed by the oxide iron formation of the LIF. Mudstones, greywackes and felsic volcanic samples generally had the lowest MPA values, although both the mudstones and greywackes reported isolated high values.

Neutralization Potential Ratios (NPR, the ratio of NP/MPA) range from 0.1 to 25.5; with about half of the NPRs (13 of 25) less than 2 (Figure 2). NPRs are lowest in the sulphide-bearing oxide iron formation samples. These three samples were visually estimated to contain 6-18% sulphide; all three samples reported NPR values less than 1.0. Silicate iron formation samples had NPR values of <2.0. Each rock type reported at least one sample with a NPR <2.0.

Metals Data

Arsenic is the major element of concern in the Goose Lake samples. Concentrations range from 5 to 19,881 ppm, with a mean value of 1584 ppm. The crustal average for arsenic is 1.8 ppm. Visual identifications of (up to 6%) arsenopyrite have been made on core samples with high arsenic levels. Samples with high arsenic concentrations generally also have low (<2) NPR values. The tendency for these samples to produce acidity may also result in the generation of dissolved arsenic into the drainage waters.

Concentrations of other elements in the samples are generally at or below crustal averages. Exceptions to this are iron, and a few copper and silver concentrations of individual samples. However, these elements do not show the same level of enrichment as arsenic and likely do not potentially pose as serious a problem.

CONCLUSIONS AND RECOMMENDATIONS

Based on the acid-base accounting and metals data reviewed here, the following conclusions and recommendations can be made:

- Approximately one-half of the samples have low NPR values which indicate that they may generate acid when weathered.

- Low NPR values are independent of rock type. In general, the sulphide content of each sample determines if it has the potential to generate acidity when weathered. Iron Formation samples NPR values are also determined by the proportion of neutralizing minerals present.

- Visual identification of sulphide content may be a suitable means of distinguishing potentially acid generating (PAG) rock from potentially acid consuming (PAC) rock. Reviewing drill logs for observed sulphide content can be used to determine the volumes of PAG and PAC rock to be excavated and exposed to weathering. However, sulphide contents for some PAG rock are low (ie. 0.1%) and this may not be foolproof method.

- Some of the samples are characterized by high arsenic concentrations. Leaching of arsenic from temporary stockpiles, tailings and waste rock may become a problem for water quality. EPA 1312 leach tests are recommended for a suite of As-bearing samples to determine water quality characteristics over time. Any temporary ore stockpiles should be designed to retard infiltration of precipitation. Outflow should be monitored for water quality. Humidity cells should be considered as a method of determining the leaching rates of arsenic (and possibly other metals such as copper and iron) from rock units exposed during mining.

- Further ABA testing is recommended for samples with a range of sulphide contents to verify if visual identification of sulphides can be used to discriminate between PAG and PAC rock.

Regards,
Steve

Table 1
Goose Lake ABA
1994 and 1997 Data

Sample	Rock Type	Rock Unit	pH	CO_2 Inorg %	Total Sulphur %	Sulphate Sulphur %	Sulphide Sulphur %	MPA (kg $CaCO_3$/T)	NP (kg $CaCO_3$/T)	NNP (kg $CaCO_3$/T)	NPR	Reported Sulphide
AR9862	Felsic Volcanic	Felsic Dyke	8.3	0.48	0.25	<0.01	0.25	7.8	11.6	3.8	1.5	trace
AR9863	Felsic Volcanic	Felsic Dyke	9.3	0.22	<0.02	<0.01	0.02	0.6	9.9	9.9	15.7	0%
Comp2	Felsic Volcanic	Footwall Main Zone	9.2	n/a	0.09	0.01	0.08	2.8	7.8	5.0	2.8	0%
94G056128	Gabbro	Gabbro Dyke	9.1	n/a	0.19	0.01	0.18	5.9	16.0	10.1	2.7	0.10%
94G056123	Greywacke	Footwall Main Zone	8.8	n/a	1.95	0.01	1.94	60.9	12.1	-48.8	0.2	0.30%
94G056130	Greywacke	Upper Iron Formation	9.1	n/a	0.07	0.01	0.06	2.2	9.9	7.7	4.5	0%
94G056132	Greywacke	Footwall Main Zone	9.4	n/a	0.24	0.01	0.23	7.5	12.6	5.1	1.7	0.10%
AR9859	Mudstone	Middle Mudstone	9.1	3.68	1.61	<0.01	1.61	50.3	39.2	-11.1	0.8	5%
AR9860	Mudstone	Middle Mudstone	8.6	0.90	<0.02	<0.01	0.02	0.6	7.0	7.0	11.1	0%
AR9864	Mudstone	Middle Mudstone	8.6	0.87	0.04	<0.01	0.04	1.3	6.0	4.7	4.6	0%
94G056129	Mudstone	Upper Iron Formation	8.6	n/a	0.05	0.01	0.04	1.6	8.4	6.8	5.4	0.10%
94G056131	Phyllitic Mudstone	Middle Mudstone	8.6	n/a	0.01	0.01	0	n/a	5.6	5.6	n/a	0.10%
AR9853	Oxide IF	Lower Iron Formation	8.5	0.87	1.93	<0.01	1.93	60.3	8.9	-51.4	0.1	0-2%
AR9854	Oxide IF	Lower Iron Formation	8.9	2.80	1.17	<0.01	1.17	36.6	58.2	21.6	1.6	0-2%
AR9855	Oxide IF	Lower Iron Formation	8.3	0.56	1.06	<0.01	1.06	33.1	22.4	-10.8	0.7	0-2%
AR9856	Oxide IF	Lower Iron Formation	8.4	2.27	0.92	0.01	0.91	28.4	80.2	51.8	2.8	trace
AR9857	Oxide IF	Lower Iron Formation	8.7	6.76	0.22	<0.01	0.22	6.9	175.7	168.8	25.5	trace
AR9858	Oxide IF	Lower Iron Formation	8.8	1.67	0.34	<0.01	0.34	10.6	43.3	32.7	4.1	trace
Comp3	Oxide IF	Lower Iron Formation	8.8	n/a	0.43	0.02	0.41	12.8	62.9	50.1	4.9	0%
94G069020	Oxide IF	Lower Iron Formation	8.2	n/a	0.32	0.01	0.31	9.7	93.6	83.9	9.7	0%
AR9861	Silicate IF	Footwall Main Zone	8.2	7.18	4.29	<0.01	4.29	134.1	221.1	87.0	1.6	6-7%
94G056058	Silicate IF	Footwall Main Zone	8.1	n/a	0.81	0.01	0.8	25.3	10.6	-14.7	0.4	6%
94G070001	Silicate IF	Upper Iron Formation	8.5	n/a	0.13	0.01	0.12	3.8	6.7	3.0	1.8	0.10%
AR9851	Sx-oxide IF	Lower Iron Formation	9.2	1.76	4.89	<0.01	4.89	152.8	35.9	-116.9	0.2	15%
AR9852	Sx-oxide IF	Lower Iron Formation	8.5	2.41	8.04	<0.01	8.04	251.3	70.7	-180.6	0.3	18%
Comp1	Sx-oxide IF	Lower Iron Formation	9.5	n/a	3.52	0.01	3.51	110.0	55.5	-54.5	0.5	6%

Figure 1
Goose Lake ABA Data
Neutralization Potential versus Neutralization Potential
Estimated using Inorganic Carbon Concentrations

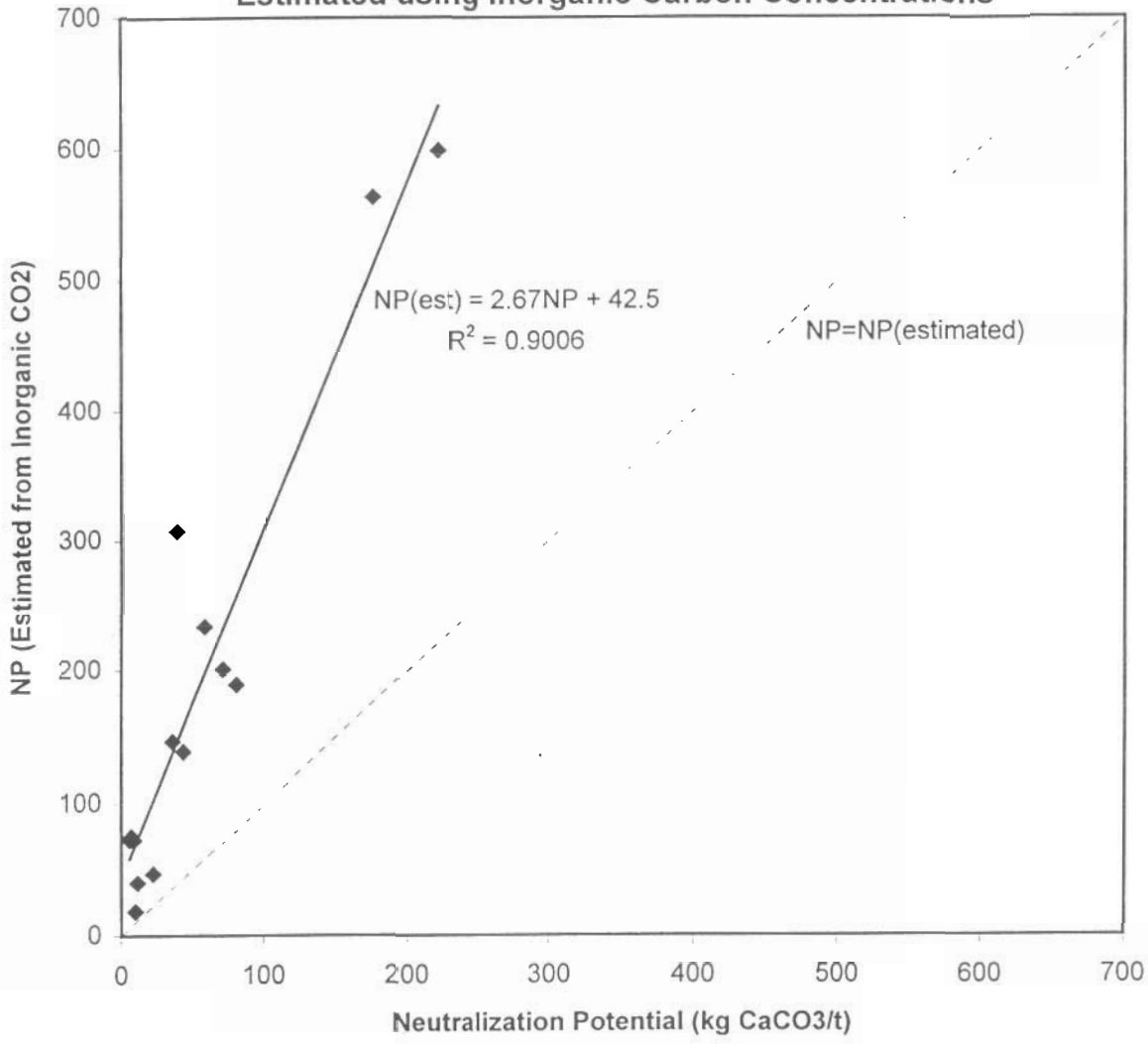

Figure 2
Goose Lake ABA
Neutralization Potential versus Maximum Potential Acidity
1994 and 1997 Data