VANGORDA - SPECIFIC GRAVITIES FROM REGRESSION ANALYSIS OF DIAMOND DRILL CORE PULPS

The attached table I shows the results of using multiple regression analysis to estimate (pulp) specific gravity. The database comprised a total of 542 records from the Vangorda diamond drill hole database. Records selected all contained data for :pulp S.G.; % Pb; % Zn; % Fe*; % Ba(O); Ag g/t; Au g/t. The last two were not used in the analysis of specific gravity.

The programmes used were supplied by R. Pakalnis ("PCMULT") and the U.S.G.S. (Statpac programmes "CARD2STP" and "REGRESS".) Nearly identical results were obtained no matter which software was used. However, "PCMULT" software is limited to 100 records, and could not accommodate any file containing "ALL" rock types. Statpac alone was used on those files.

RESULTS:

High correlation coefficients (0.863-0.943) obtained for all rock types except a mixed bag of rocks classified as 4HJK (H= pyrrhotitic ore; J= pyrite free base metal mineralization $\pm$ magnetite; K= carbonate bearing massive pyrite.) These rock types are not particularly common at Vangorda. When all rock types were included, or when all ore rock types were included, the correlation coefficient rose to 0.95. This indicates that there is an exceptionally good fit between the data and the regression formula. (a correlation coefficient of 1.0 is a perfect correlation)

CONCLUSION:

As coefficients for individual variables show only very small differences between rock types the regression formula "ALL (4A-4K)" for all ore rock types:

$$S.G. = 2.38+0.04*\%Pb+0.02*\%Zn+0.04*\%BaO+0.043*\%Fe$$

can conveniently be used. The blasthole database often cannot calculate regression densities for waste rock types as these are not routinely assayed, so mean values will be used.

The recently completed whole rock specific gravity data will be used to check the above regression formula, and to provide an estimate of porosity.

* THAT IS TOTAL IRON, RECORDED IN DATABASE AS "PY+PO"

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TABLE 1

VANGORDA

REGRESSION ON S.G. PULPS FROM OLD (PRE 1990) DRILL CORE USING STATPAC AND PCMULT

	CO-EFFICIENTS							MEANS				
Rock Type	Const	Pb	Zn	BaO	Fe	Corr	Std. Error	SG	Pb	Zn	BaO	Fe
4A	2.31	.07	.01	.02	.04	.943	.09	2.94	2.08	3.19	.72	10.96
4C	2.47	.04	-0.00	.04	.04	.863	.19	3.62	1.91	2.08	3.18	23.55
4D	2.67	.07	-0.02	.05	.03	.940	.17	3.87	3.91	5.15	9.10	21.57
4E	2.28	.04	.03	.04	.05	.917	.17	3.98	3.30	3.43	5.89	26.65
4G	2.30	.04	.04	.03	.05	.922	.16	4.24	5.17	6.85	18.03	19.36
4HJK	3.35	-0.05	.03	.03	.021	.658	.20	4.04	4.00	4.07	4.89	29.85
4L	2.66	.01	.10	.01	.022	.916	.10	3.12	1.23	1.68	3.03	11.93
5ABD	2.55	.02	.06	.01	.03	.894	.20	3.12	1.59	1.52	3.23	11.80
ALL (4 & 5)	2.38	.04	.02	.04	.043	.950	.18	3.65	2.98	3.58	6.06	20.17
ALL (4A-4K)	2.32	.03	.02	.04	.045	.950	.18	3.74	3.24	3.89	6.53	21.44

N.B.: REGRESSION FORMULAE FOR INDIVIDUAL ROCK TYPES VERY SIMILAR TO REGRESSION FORMULA FOR "ALL" ROCK TYPES

O = 16

Ba = 137.3