60001923

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud assay verification, sample protocol, and list of bogus assays
AUTHOR	Matlock B; Dixon R; Jenkins F; Muerhoff C; Clayton R; Johnson G
DATE OF DOC(S)	1996
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7½'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Rosebud Project; Santa Fe Pacific Gold; Hecla Mining Co.; Bondar-Clegg; American Assay
COMMODITY If not obvious	gold; silver
NOTES	Correspondence about assay verification; correspondence about sample protocol; list of samples with bogus assays; handwritten notes 5p.

Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

SS: DP 9/10/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

SAMPLING

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34-[illegible]

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SANTA FE PACIFIC GOLD
INTERNAL CORRESPONDENCE

To: RICH DIXON

From: BILL MATLACK

Date: JUNE 17, 1996

ROSEBUD DATABASE ASSAY VERIFICATION

Assays for the Rosebud project are stored in three EXCEL spreadsheets: SOUTH.XLS, NORTH.XLS, and EAST.XLS. These spreadsheets were compared against the original assay certificates with differences and omissions noted. A four digit code was established to identify each gold assay by laboratory (X), assay method (Y), and size of charge (ZZ): XYZZ. The spreadsheets were reorganized to include these codes and to facilitate viewing of the assay data by moving columns. These spreadsheets were renamed SOUTH2.XLS, NORTH2.XLS and EAST2.XLS and reside in the X:\SFPM\VOL4\ROSEBUD\TEMP directory.

The assay laboratories are:

1) American Assay (Hecla)
2) GSI (Lac)
3) Bondar-Clegg (Lac)

The assay methods are:

1) AA finish
2) Gravimetric finish

The charge sizes are:

30: grams (1 AT)
60: grams (2 AT)

In many instances, the charge size of the fire assays with gravimetric finish are not listed. These are assumed to be the same as the corresponding fire assays with AA finish.

For the American Assay data, few significant problems exist. The major problems identified are data entry (usually getting a decimal place off) and entering preliminary assay results and failing to update the database with final results.

The GSI data are extremely disorganized with numerous typographic errors evident in sample numbering. Moreover, sample numbers are frequently out of sequence and various portions of several holes are commonly included in the same report. Check assays certificates are commonly missing from the drill hole file.

The Bondar-Clegg data are generally well-organized and complete, although only a very small amount of these data have been checked.

The databases for the drill holes have been checked to the following rows. Assays before these rows which are not coded did not have supporting certificates:

EAST2.XLS	row 3404
NORTH2.XLS	row 1269
SOUTH2.XLS assay1	all
SOUTH2.XLS assay2	row 194

Changes to the database for the portion of the database verified to date will be made by Skip McIntosh June 18.

NOTES ON HECLA SAMPLING PROTOCOL FROM CHARLIE MUERHOFF

All gold assays are 2 AT. Check assays were run on samples above 0.05 opt. All gravimetric finish assays are under the gravimetric column, so AU1, AU2, etc are AA finish. Holes in the South zone deposit before 94-303 have no gravimetric finish check assays. A comparison of AU1 vs. GRAV for 1038 samples showed a 98% correlation. All AA finish and gravimetric finish checks were done from the original pulp. Metallic screen and cyanide soluble gold pulps were made from the coarse rejects. Hecla calculates gold for a sample by averaging all samples. In the 1995 reserve, this included only the fire assays with AA and gravimetric finishes. In 1996, this was expanded to include metallic screen assays and cyanide soluble (value plus value of reject) gold.

Muerhoff noted that Lac did alot of check assays which are in the database but for which no assay certificates exist. Hecla took Lac's numbers at face value. Lac used Barringer, GSI, Chemex, and Bondar Clegg. Muerhoff noted much higher variance in Lac's reverse circulation versus core holes. Lac's core holes also has a much higher variance than Hecla's which Muerhoff attributes to the difference between assaying split core (Lac) and whole core (Hecla).

Rich,
Comments?
Let's discuss.
FRED

HECLA MINING COMPANY
ROSEBUD PROJECT

July 16, 1996

Memorandum to: Fred Jenkins, SFPG cc: R. Clayton, G. Johnson

From: Charlie Muerhoff Charlie

RE: Preliminary Sample Protocol and Stope Reconciliation Procedures

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Here are my thoughts concerning sampling protocols and stope reconciliation procedures to be implemented at Rosebud. Please consider this to be very preliminary, as the final procedures will need to factor in several pending or unresolved issues, mainly: 1.) The results of the heterogeneity study being performed on the Rosebud ores, 2.) the decision whether to blend or batch the Rosebud ore at the Pinion Mill, and 3.) the sampling protocol developed at the Pinion Mill for Rosebud ore. For the purposes of this discussion, sample weights given are estimates only, and assumptions made are the Rosebud ore will be batched through the Pinion Mill, and the Pinion Mill is properly equipped to sample the Rosebud ore.

There are four main steps that comprise the sampling / reconciliation procedure: face and rib sampling, muck sampling, stockpile management, and stope reconciliation.

Face/Rib Sampling

In each active production heading, a series of face and rib samples will be collected for each round. Estimated size of each sample is 12 to 15 pounds. For each face or rib, the stope geologist will complete a sketch map and measure the dimensions of each of the various lithologies, structures, ore controls, etc., with individual samples taken for each defined area. Where there is an observable control on mineralization, channel sampling will generally be done perpendicular to the perceived orientation of the mineralization, and in areas where there is no visual ore control (i.e., disseminated), random chip sampling will be performed.

Upon receipt of the assay results, each face and rib for any given round will be assigned a gold and silver value based on the area-weighted composite from the samples taken at that face or rib. The initial determination of the grade of any particular round will be determined by the weighted average grade derived from both faces and ribs corresponding to that round.

Truck Sampling

Every truck hauling material from underground production areas to the surface will be sampled. A sampling station with an array of sample bins will be located near the decline portal. Upon exiting the decline, each truck will stop at the sampling station and the truck driver will collect a large (estimated 50 to 60 pound sample size) sample with a shovel from approximately eight different locations within the truck. The sampling station will be constructed so as to allow for movement along the entire length of the truck bed. The sample will be placed in a bin that has been identified with the stope name and round number, and with a stockpile designation. A completed bin will consist of samples taken from five or six trucks which are hauling muck from the same stope round (approximately ten to 12 trucks will be required to haul a single rounds' muck to the surface). Once a day, a technician will empty each bin, cone and quarter the sample, package and label the sample (stope ID and round number), and re-label the bin for the next sample set.

Stockpile Management

Stockpile management at the Rosebud site and at the Pinion Mill will play a critical role in the overall ability to reconcile material tonnages and grades back to the individual stopes. I anticipate that there will be four active stockpiles and several temporary stockpiles at any given time at the Rosebud minesite.

Active Stockpiles

1. Run-of-Mine stockpile - material actively being hauled to mill.
2. Run-of-Mine stockpile - stockpile currently being built.
3. Run-of Mine stockpile - high silver content (will probably consist of several small stockpiles).
4. Low-grade stockpile - must-take material that has been broken and daylighted, where the grade is less than cut-off but greater than milling + trucking costs.

Temporary Stockpiles

Material derived from fringe areas of the ore zones or from suspected internal waste pillars will be stored in temporary stockpiles as needed so as to ascertain the grade of the material before determining its final location.

The mine geologist will be responsible for the determination of each rounds' muck destination. This decision will be based on face and rib assay results, block model predictive grades, grade domain modeling, operating experience, etc. Ore-grade material daylighted will be stockpiled on the surface after the truck sample is taken. Stockpile destinations will be posted at the sampling station so that the truck driver will know where to place his material. If the material has been designated as ore-grade, it will be placed in a Run-of Mine stockpile. When that stockpile reaches a maximum of 27,000 tons (estimate), a second Run-of-Mine stockpile will be started. Ore from the completed stockpile will be trucked to the Pinon Mill as a single batch, stockpiled as a batch, and milled as a batch. This process will continue so that there is always one completed Run-of-Mine stockpile from which material is being transported to the mill and one Run-of-Mine stockpile which is being built. Based on an assumed total metals content limitation at the mill, ore-grade material with high silver content will be located on a separate stockpile(s) so that it can be blended with material of lower silver content.

Stope Reconciliation

There will be five sets of data pertaining to the same material from which the reconciliation of ounces recovered + tail + in-process inventory, as reported by the mill, with the production from each stope will be made: block model grades, face/rib sample assays, muck sample assays, stockpile composite assays, and mill totals. When the total ounces are reported by the mill for a given batch, that number will be compared back to the stockpile composite grade. The stockpile total will be adjusted accordingly so as to match the mill report. Since muck has been tracked from each individual stope to its destination stockpile, the stockpile total will be able to be proportioned back into the stope rounds which comprised that stockpile/batch. The back-calculated grades will be compared with the face/rib samples, muck samples, and block model grades.

sorted by smpl #

BOGUS

Rock #	UTM E	UTM N	Au ppb	Au ppm	Ag ppm
Rock #	UTM E	UTM N	Au ppb	Au ppm	Ag ppm
A6238	1177904.5	14824638.2	140	0.14	0.138
A6252	1178286.7	14826960.5	243	0.243	0.72
B6865	1174780.5	14821821.3	141	0.141	1.82
C1133	1174226.8	14824076.5	240	0.24	3.66
C1147	1174544.4	14824854.9	119	0.119	2.11
C2780	1177973.2	14824022.9	204	0.204	0.68
C2901S	1177970.2	14826622.2	2490	2.49	115
C2902S	1177794.1	14826642.4	3500	3.5	136
C2903S	1177452.6	14826521.5	639	0.639	70
C2904S	1177381.3	14826574.8	560	0.56	90.5
C2905S	1177153.8	14825851.8	13100	13.1	184
C2906S	1176749.8	14825479.1	1680	1.68	157
C2907S	1176802.4	14825372.1	568	0.568	100
C2908S	1176408.3	14825629.3	971	0.971	165
C2909S	1176299.8	14825271.2	342	0.342	121
C2910S	1176223.4	14825114.6	574	0.574	125
C2911S	1176883.6	14825021.6	2300	2.3	108
C2912S	1176739.8	14824682.2	936	0.936	96
C2913S	1176640.2	14824471	2590	2.59	103
C2914S	1176417.6	14824294	1300	1.3	105
C2915S	1175460.5	14824503.3	936	0.936	154
C2916S	1175702.6	14824595.9	1400	1.4	198
C2917S	1175623.4	14825223.4	1010	1.01	153
C2918S	1175509.5	14825191.5	2480	2.48	440
C2919S	1175715.3	14824937.7	655	0.655	92.1
C2920S	1175769.9	14824792.7	1220	1.22	165
C2921S	1173177.3	14822955.4	2080	2.08	105
C2922S	1173193.1	14823063.1	7580	7.58	176
C2923S	1173238.5	14823100.3	6250	6.25	245
C2924S	1173599	14823540.8	2050	2.05	122
C2925S	1173438.3	14823564.7	15200	15.2	328
C2931S	1173311.5	14821060.7	726	0.726	110
C2932S	1173395.4	14821501.3	5170	5.17	119
C2933S	1173687.9	14821824	1080	1.08	104
C2934S	1173757.9	14821626.7	498	0.498	93.1
C2935S	1173845	14822034.2	1330	1.33	136
C2936S	1173966.2	14821932	962	0.962	205
C2937S	1173956.6	14822245.2	1370	1.37	145
C2938S	1174165.8	14822267.4	2210	2.21	150
C2939S	1174249.6	14822291.9	1270	1.27	90.6
C2940S	1174132.4	14822630.1	5470	5.47	171
C2941S	1174304.7	14822664	5440	5.44	273
C2942S	1174886.3	14822918.5	1500	1.5	107
C2943S	1174854	14823061.1	760	0.76	78.9
C2944S	1175147.1	14823309.8	1690	1.69	140
C2945S	1175557.5	14823551.4	1070	1.07	96.5
C2946S	1175891.6	14823808.4	1090	1.09	83.5
C2947S	1175982.5	14823806.8	855	0.855	95.6
C2948S	1174658.4	14823323.6	2920	2.92	155
C2949S	1174728.1	14823701.4	3580	3.58	129
C2950S	1175026.7	14824198.1	7360	7.36	186
C2951S	1174858.3	14824718.2	323	0.323	127
C2952S	1174802.4	14825199.3	1370	1.37	141
C2953S	1174695.4	14825320.2	574	0.574	107
C2954S	1174601.8	14825073.9	2830	2.83	168
C2955S	1174693.7	14824750.2	6330	6.33	219
H5152	1177370.9	14825873.9	104	0.104	0.2