60001970

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud – Dreamland 1998
AUTHOR	Langstaff G; Blattman M; Allen K; Gili M; Clayton R
DATE OF DOC(S)	1998
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7½'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine
COMMODITY If not obvious	gold; silver
NOTES	Correspondence; rock nomenclature; geology handwritten notes; assays; geochemistry 27p

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 9/12/08 (Initials / Date)
DB: (Initials / Date)
SCANNED: (Initials / Date)

Revised: 1/22/08

DREAMLAND 1998

60001970 4010

NEWMONT GOLD COMPANY
ROSEBUD J.V.

To: Whomever Date: November 23, 1998

From: George Langstaff

Subject: **GL's Descriptive Rock Nomenclature for Rosebud Logging**

Rocks are identified as felsic volcanic rock (F), mafic volcanic rock (M), tuff (T), breccia (B), or sedimentary rock (S) as follows:

A. **Volcanic Rocks** (dominantly aphanitic)

1. Root Name – Composition
   - **F** – felsic, few mafic minerals (e.g., trachyte, dacite)
   - **M** – mafic, more mafic minerals (e.g., andesite, trachyte)
2. Prefix - Structure
   - **b** – brecciated (includes flow breccia as well as strongly fractured rock)
   - **s** – pseudobreccia (formed by alteration along fractures)
3. 1st Suffix – Texture
   - **a** – aphyric (no phenocrysts >=1 mm)
   - **p** – porphyritic
     - distinctive varieties:
     - **sp** – sparsely porphyritic (=<1% phenocrysts)
     - **cp** – coarsely porphyritic (some phenocrysts >4 mm)

   a. 2nd Suffix – Minerals (precede with dash; if more than one, list from least to most abundant, left to right, e.g., Fp-q,p,k)

q – quartz	**b** - biotite
f – feldspar	**h** - hornblende
p – plagioclase	**y** - pyroxene
k - K-feldspar	**o** - olivine

4. Parentheses – Descriptive Features

am – amygdaloidal	**sp** - spherulitic
bd – banded	**ve** - vesicular
gl - glassy	
lm – laminated (planar features =<2 mm)	
mmb – contains mafic magma blobs	

Examples: Mcp-y,p – coarsely porphyritic pyroxene < plagioclase-phyric basalt
bFa – brecciated, aphyric rhyolite
Fsp-f(mmb) – sparsely porphyritic, feldspar(can't be identified)-phyric latite with mafic magma blobs

Note: Alteration can eliminate mafic phenocrysts, can make K-feldspar and plagioclase indistinguishable, and can make porphyritic rocks appear to be aphyric.

The abundance of phenocrysts can vary within the same unit and some types of phenocrysts (e.g., quartz) may not be present everywhere.

B. **Pyroclastic Rocks**

1. Root Name
   T - Tuff
2. 1st Suffix – Fragment Type (if more than one, list from least to most abundant left to right and separate by slashes, e.g., Tv/c)
   a – ash (=<2 mm by definition but more useful to identify pyroclasts >=1 mm as lithic, vitric, or crystal)
   b - blocks ± lapilli ± ash (>6.4 cm)
   l - lithic lapilli ± ash
   v - vitric lapilli ± ash (icludes shards and pumice)
   c - crystal lapilli ± ash
   a. 2nd Suffix – Minerals
   see A.3.a. above
3. Parentheses – Descriptive Features
   lp - lithophysal
   sw - strongly welded
   ww - weakly welded
   and see A.4. above

Examples: Ta – ash tuff
Tl/c-q,k – lithic < crystal lapilli-ash tuff with quartz < sanidine phenocrysts

C. **Breccias** – if extrusive, pyroclastic, or sedimentary origin is uncertain; otherwise use protolith root name; can include fault breccias if protolith is uncertain

1. Root Name
   B - Breccia
2. 1st Suffix – Number of Clast Types
   m – monomict
   p - polymict
3. 2nd Suffix – Support
   c – clast-supported
   x – matrix-supported
4. 3rd Suffix – Rounding of Clasts
   r – rounded
   s – subrounded to subangular
   a – angular

Examples: Bmca – monomict, clast-supported breccia with dominantly angular clasts
Bpxa/s – polymict, matrix-supported breccia with subrounded clasts more abundant than angular clasts

D. Sedimentary Rocks

1. Root Name
   S – clastic sedimentary rock
2. 1st Suffix – Dominant Clast Size
   c – conglomerate (>2 mm)
   a. Prefix – Support
      c – clast-supported
      x – matrix-supported
   s – sandstone (.0625 to 2 mm)
   m – mudstone (<.0625 mm, includes silt and clay)
3. 2nd Suffix – Secondary Clast Size (if more than one, list from least to most abundant and separate by slashes, e.g., Sst/p)
   p – pebbly, conglomeratic
   n - sandy
   d - muddy
   t - tuffaceous
4. 3rd Suffix – Structure
   1 - massive (beds >10 m thick)
   2 - thick-bedded (.05-10 m thick)
   3 - medium-bedded (.01-.05 m thick)
   4 - thin-bedded (1-10 cm thick)
   5 - laminated (<1 cm thick)
5. Parentheses – Descriptive Features
   bt - bioturbated
   cs - cross stratification
   fs - fossils
   gn - normally graded bedding
   gr - reversely graded bedding
   sf - syn-sedimentary folds

Examples: xSct1 – tuffaceous, matrix-supported conglomerate without apparent bedding
Ssd4(gn) – thin-bedded, muddy sandstone with normally graded bedding
Sm – massive mudstone

KDA

Hydrothermal Breccia in RS-425

Interval	from depth	to depth	Au(FA)	Ag(AA)	Al(%)	As(ppm)	Ca(%)	Cu	Fe(%)	Hg(ppb)	K(%)	Mn	Mo	Na(%)	P(%)	Pb	Sb	Se	Zn
4.8	1604.6	1609.4	0.007	0.01	1.15	22	0.16	1	1.06	25	0.66	700	0	0.03	0.008	25	0	3.5	68
4.8	1609.4	1614.2	0.012	0.7	1.12	16	0.16	2	1.26	60	0.69	1071	1	0.03	0.009	27	0	4.2	75
5.1	1614.2	1619.3	0.006	0.9	1.12	16	0.16	2	1.26	60	0.69	1071	1	0.03	0.009	27	0	4.2	75
4.7	1619.3	1624	0.009	0.6	1.12	16	0.16	2	1.26	60	0.69	1071	1	0.03	0.009	27	0	4.2	75
5	1624	1629	0.176	0.8	1.12	16	0.16	2	1.26	60	0.69	1071	1	0.03	0.009	27	0	4.2	75
4.6	1629	1633.6	0.45	0.9	0.85	103	0.2	3	1.73	40	0.53	404	2	0.03	0.008	26	4	14.2	92
5	1633.6	1638.6	0.084	0.8	0.85	103	0.2	3	1.73	40	0.53	404	2	0.03	0.008	26	4	14.2	92
4.6	1638.6	1643.2	0.058	0.9	0.85	103	0.2	3	1.73	40	0.53	404	2	0.03	0.008	26	4	14.2	92
5.3	1643.2	1648.5	0.145	0.9	0.85	103	0.2	3	1.73	40	0.53	404	2	0.03	0.008	26	4	14.2	92
5	1648.5	1653.5	0.54	1.5	0.6	72	0.2	5	1.14	0	0.4	96	9	0.03	0.007	67	0	16.1	90
2.2	1653.5	1655.7	0.173	1	0.6	72	0.2	5	1.14	0	0.4	96	9	0.03	0.007	67	0	16.1	90
2.9	1655.7	1658.6	8.359	7.4	0.6	72	0.2	5	1.14	0	0.4	96	9	0.03	0.007	67	0	16.1	90
2.9	**1658.6**	**1661.5**	**47.793**	**46.5**	**0.6**	**72**	**0.2**	**5**	**1.14**	**0**	**0.4**	**96**	**9**	**0.03**	**0.007**	**67**	**0**	**16.1**	**90**
1.8	1661.5	1663.3	0.222	0.5	0.55	88	0.11	4	1.04	10	0.36	102	4	0.02	0.007	13	3	9.5	76
1.3	1663.3	1664.6	1.397	1.7	0.57	177	0.16	4	1.28	15	0.39	68	5	0.02	0.008	20	4	18.9	81
2	1664.6	1666.6	0.293	0.6	0.56	103	0.14	3	1.11	10	0.38	44	3	0.03	0.01	14	0	7.5	94
4.6	1666.6	1671.2	0.08	0.5	0.55	138	0.19	2	1.24	10	0.37	82	4	0.03	0.01	18	0	10.8	90
4.4	1671.2	1675.6	0.371	1	0.53	156	0.26	3	1.29	0	0.36	145	5	0.04	0.008	22	0	17.2	73
2.9	1675.6	1678.5	0.155	1.6	0.53	134	0.35	5	1.56	10	0.36	258	10	0.04	0.009	26	6	21.9	83
5	1678.5	1683.5	0.027	0.9	0.67	18	0.26	2	1.32	15	0.34	556	7	0.05	0.01	20	3	8.8	72
5.2	1683.5	1688.7	0.008	0.8	0.81	9	0.25	2	1.46	15	0.37	844	7	0.05	0.012	22	0	2.1	86
4.9	1688.7	1693.6	0.007	0.001	0.8	9	0.37	2	1.24	10	0.37	566	7	0.05	0.011	21	0	0.3	76
5	1693.6	1698.6	0.008	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
5.1	1698.6	1703.7	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
5.3	1703.7	1709	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
4.9	1709	1713.9	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
5.1	1713.9	1719	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
4.7	1719	1723.7	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
4.8	1723.7	1728.5	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
5	1728.5	1733.5	0.006	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
2	1733.5	1735.5	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
4.9	1735.5	1740.4	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
5.1	1740.4	1745.5	0.006	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
4.5	1745.5	1750	0.001	0.001	0.84	5	0.52	2	1.61	15	0.36	1398	3	0.04	0.012	23	0	0.3	87
3.6	1750	1753.6	0.009	0.01	0.8	7	0.35	3	4.06	85	0.33	4040	1	0.05	0.009	22	0	0.9	95

HECLA MINING COMPANY

COEUR D'ALENE, IDAHO 83815

BY KAA	DATE 4/9/99	JOB TITLE	JOB NO.
CHK.	DATE	George Langstaff - Deep Steamboat	DIVISION
DWG. NO.			SHEET 1 OF 4

- follow up for Hole RS-425
- Location of Gold Deposit associated w/ RS-425 not easily predictable
- Needs several Holes

- 5 2400' RVC + Core tails = $300,000.00

- George Believes drilling one or two Holes would not provide sufficient info & if not willing to spend 300,000.00 it would be better to spend this money elsewhere.

- the existing holes don't adequately test the target.

- RS-425 - attitude of Breccia 30-40° to CA
  RS-450 - Bladed Calcs - indicative of Boiling
  RS-423 - " " " " "

RS-450 - Manc + wc + calcs - 1560' 6560 ppb Au (30° to CA)
Pyrite & green clay 0.5 ppm Au (< 30° to CA)

RS-443 - 2 intercepts
A) HydroBx 1605' 1.4 ppm Au - wc, manc, Pyrite, quartz
B) " " 370 ppb Au -

RS-444 - 220 ppb Au @ 1803' green clay.

RS 401 - Hydro Bx w/ quartz, manc, pyrite + Banded calcs
426 - Bx Veins w/ Black mx 1240 .09 opt Au 15-25° to CA

- For Ranking meeting - George constructed possible vein targets that have not been intersected w/ drilling.
- Estimated 0.500 opt Au & constructed tabular bodies through the area to illustrate what the potential is.
- This demonstrates there is potential for ore bodies up to 500,000 oz Au

HECLA MINING COMPANY

COEUR D'ALENE, IDAHO 83815

BY KDA	DATE 4/9/99	JOB TITLE	JOB NO.
CHK.	DATE		DIVISION
DWG. NO.			SHEET 2 OF

Model 1) Dipping 65° to the south
710' Dip length _ 6' thick, ⇒ 500,000 Au oz

No Geologic Constraints

Constraints - RS 401
488
423

This model is probably the most Geologically Reasonable.

Model 2) strike 110° Dips 45° to North
the Dip is the same as the vein in 426.
447,000 Au oz of 6' thick

{ not very Geologically feasable.

model 3) strike 15° 75° west.
Strike length of 2,000' 6' thick
= 660,000 Au oz.

Costly Target to Pursue.

CORE - Looked at intercept w/in 425.

Sections:

Assumptions - 1) units Dip Eastrly
2) units thickness doesn't change much
3) Faults are all Normal

2 sets of sections
- 1) one set at NW Heading similar to mine set
- 2) one set of Fence Diagrams.

Rosebud quartz LATITE ⇒ FP + quartz ± (mmb)

George Has several sections - of which I don't understand STRATIGRAPHY.

HECLA MINING COMPANY

COEUR D'ALENE, IDAHO 83815

BY KDA	DATE 4/9/99	JOB TITLE	JOB NO.
CHK.	DATE		DIVISION
DWG. NO.			SHEET 3 OF

Doesn't look anything like 450

Key for George's steps is the "Biotite phyric unit."

- George likes the Aphyric unit for hosting (top part of a massive) ore.

- In conclusions -
  - one NS Holes
  - one EW Holes

- I need to get a copy of these sections & plan maps. The geology, names of formations are so different I can't tell what the units are. Just need to continue w/ the mine set. [The cores need relogged]

- Ramsey thinks the alteration in 450 is interesting.

~~the 2 Holes~~

⊛ George Recommends first 2 Holes directly at the intercept. to Define the geometry & control of the 425 intercept.

⊛ Georges Geochemical comparisons to the EAST Zone are based on only 3 holes which may not have intercepted the actual East ore zone.

⊛ Geochem, there appears to be an elevation control.

- George Recommends choosing one of) Because of costs of Deep target.
  - DL
  - WA
  - LB
  - BP

HECLA MINING COMPANY

COEUR D'ALENE, IDAHO 83815

BY CDA DATE 4/9/99	JOB TITLE		JOB NO.
CHK. DATE			DIVISION
DWG. NO.	DREAMLAND REVIEW		SHEET 4 OF 4

RANDY THINKS BY PURSUING DREAMLAND, WE ARE CHASING A "RED HERRING" SPENDING A MIN OF 120,000.00 FOR DRILLING THE FIVE HOLES.

- I HAVE ASKED FOR COPIES OF GEORGES FENCE & AGREEMENTS.

- IP DOWN HOLE SURVEY IN 425 SHOWS NO chargeable Body WITHIN RADIUS OF 500'.

Strat Column of Greater Dreamland Area

xSc – muddy, generally matrix-supported conglomerate with minor sandstone and mudstone

Fp-±g,f(mmb) – weakly porphyritic rhyolite flows and intrusions with very rare quartz ≤1mm and 1-2% anhedral-subhedral kspar+plag <3mm phenocrysts and rare to 5% mafic magma blobs <2cm

Fp-b,f(mmb) – weakly porphyritic rhyolite flows and intrusions with very rare to 1% biotite ≤1mm and 1-2% anhedral-subhedral kspar+plag <3mm phenocrysts and rare to 5% mafic magma blobs; may be gradational with Fp-g,f(mmb)

Sc/Ss/Sm – various conglomerates, sandstones, and mudstones

Fp-b,f(am) – weakly porphyritic rhyolite-quartz latite flows with ≤1% euhedral biotite ≤1mm and <1% to locally 5% subhedral kspar+plag phenocrysts <3mm; locally amygdaloidal with up to 10% irregular amygdales ≤5mm

Sc – discontinuous conglomerate and conglomeratic sandstone

Fp-h,b – weakly porphyritic felsic flow with ≤1% euhedral biotite ≤1mm and possibly rare hornblende phenocrysts

Sc – commonly clast-supported conglomerate, possibly with intercalation of Fa or Fa(mmb)

Fa or Fsp-f – aphyric or sparsely feldspar-phyric rhyolite flow with no or rare subhedral kspar or plagioclase phenocrysts usually ≤1mm

Sc – ~~discontinuous~~ local commonly clast-supported conglomerate, possibly with intercalation of Fa or Fsp-f

Fa or Fsp-f – see above; may be intercalated with or laterally equivalent to aphyric rhyolite flow with rare to 1% mafic magma blobs <~~6~~ 2cm

Sc – ~~local conglomerate~~ discontinuous, commonly clast-supported conglomerate and volcanic breccia

Fa – essentially aphyric alkali-feldspar rhyolite to rhyolite flow but may have rare kspar and plag phenocrysts ≤1mm locally

Sc+Ss – conglomerate and sandstone

Mp-b/h,p – porphyritic rhyodacite to andesite flow or intrusion with 15-30% subhedral plag ≤3mm and either ~5% euhedral biotite and hornblende or 5-15% euhedral to embayed hornblende phenocrysts ≤3mm, locally with rare amygdales <2mm

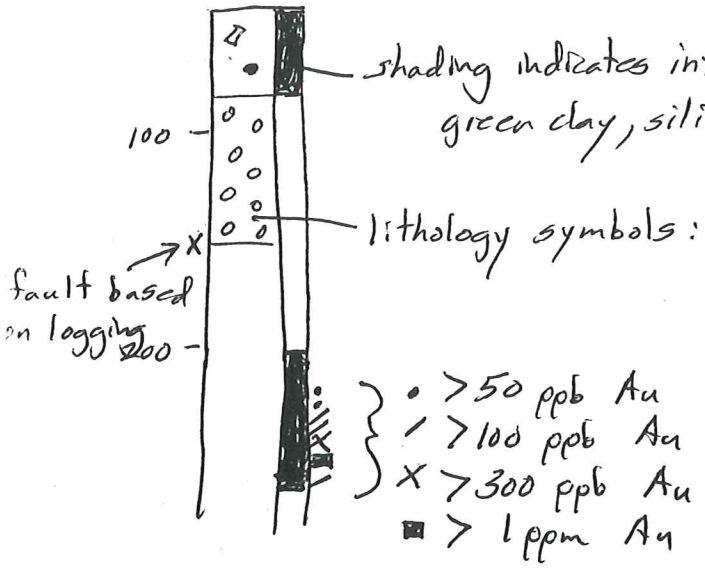
Sc+Ss – sandstone or conglomerate

M(am) – amygdaloidal mafic flow or intrusion (andesite?) with 3-15% subhedral hornblende microphenocrysts and up to 10% irregular, cuspate amygdales

Ss+Sm – ~~fine~~ moderately to well sorted fine to very coarse sandstone and siltstone, including normally graded turbidite beds

Sc+Ss – heterogeneous matrix- and clast-supported conglomerate and sandstone with volcanic rock and pumice (?) clasts as well as common basement (phyllite, vein quartz, granitoid) clasts

Legend for drill hole strip charts



THE ROSEBUD MINING CO., LLC
MEMORANDUM

TO: Matt Blattman

FROM: Kurt D. Allen

DATE: April 16, 1998

SUBJECT: Dreamland Geology Items You Requested.

3.2.2 Down-hole Survey

The down-hole survey of hole RS-425 was completed by Wellbore Navigation at 15032 Redhill, STE. D, Tustin, CA 92680. Survey results were obtained with the use of a surface recording gyroscopic survey system.

3.2.3 Assay Information

Significant assay results from drill hole RS-425 include two intercepts as follows:

From	To	Length	Average Gold Grade (opt)
1655.7'	1658.6'	2.9'	0.247
1658.6'	1661.5'	2.9'	1.400

These intercepts appear to be associated with a silica and sulfide hydrothermal breccia/ breccia vein. This hydrothermal breccia appears to be hosted within fine-grained, aphanitic, rhyolitic?, volcanic rock. This rock unit appears to have a large similarity to the Dozer Formation observed at Rosebud. The lower contact is gradational into a series of weakly mineralized clay-marcasite veinlets and joints oriented 20-30 degrees to the core axis. Silver values across the 5.8 feet are relatively low at 0.79 oz/ton, for a Ag:Au ratio of 1:1. This ratio is in contrast to a mineralized intercept in the pre-collar (25 feet of 0.038 oz/ton Au and 6.65 oz/ton Ag from 115-140 feet), that has a ratio of 175:1. The 5.8-foot intercept contains anomalous selenium (11-16 ppm), but subdued levels of arsenic (97 ppm), antimony (7 ppm), and mercury (100 ppb).

The nearest hole, RS-408, which contained visually attractive alteration at similar depths, but only 0.030 oz/ton gold, is 500 feet southwest. The next closest holes are RS-401 (1000 feet northwest) and RS-424 (900 feet southeast). The intercept in RS-425 is located 3800 feet northwest of the existing mine workings, and only 200 feet lower than the North Zone deposit. Historic Rosebud drill intercepts of similar high-grades (+1 oz/ton) are rare outside of the known deposits. Additionally, low silver : gold ratios are seen in Rosebud deposits, in contrast to many isolated or peripheral drill intercepts which have silver : gold ratios of 100-1000:1.

3.3 Rosebud Shear

The Rosebud shear is a fault zone with very little known about its actual location, size, competency, content, or sense of offset. The proposed drift to gain access to the intercept in hole RS-425 and set up underground exploration drill stations will cross the Rosebud shear. Main benefit to drilling the pilot hole described below is to locate the shear zone and determine the size and competency of the shear zone.

3.3 **Pilot Hole** etc, etc, etc,.

FOR MATT

3. Geology

3.1. Overview

3.2. Drill Hole Information

3.2.1. Collar

Drill hole RS-425 was surveyed by Rosebud Mine personnel and the results of this survey are as follows:

Northing	2,207,270.600
Easting	479,388.479
Elevation	5,641.958

3.2.2. Down-hole survey

Results from the down-hole survey, obtained from the ***BLAH –BLAH-BLAH-BLAH***

3.2.3. Assay information

Drill hole RS-425

Interval	Length	Average Grade (opt)
1655.7 – 1658.6	2.9 feet	0.208
1658.6 – 1661.5	2.9 feet	1.504

BLAH –BLAH-BLAH-BLAH

3.2.4. Coordinates of intercept

The drill hole information, such as collar coordinates, down-survey, and assay intervals, was entered in the Rosebud Mine's SURPAC database to obtain mine coordinates of the intercept. The calculations realized a value of:

Northing	2,207,342.166
Easting	479,391.176
Elevation	3,982.823

3.3. Rosebud Shear

BLAH –BLAH-BLAH-BLAH

3.4. Pilot hole

The proposed Dreamland drift, to intersect the gold intercept from exploration drill hole RS-425, needs to have a core hole drilled along its trace before development drifting begins. It is conceivable that the core hole to be drilled along the drift trace could possibly consist of one hole up to 4,000 feet in length, depending on ground conditions. The main purpose for the core hole would be for gathering geotechnical data for rock mass classification. This data will be used for assisting the driving of the drift by being able to anticipate areas of poor ground conditions which may need special ground control attention.

In addition to the geotechnical needs, a low-angle core hole form Stope 31 access to the Dreamland intercept, should cut some moderately- to highly-perspective, possibly gold-bearing northeast trending structures. The most notable structure would be the Mother Load structure. At the surface, the Mother Load structure contains anomalous geochemical values, which could become stronger with depth. There may also be several other, as yet undefined, high-angle gold bearing structures in the area between Stope 31 access and the Dreamland intercept.

The hole would require the mobilization of the LM 75 to the site, which will allow us to use HQ sized core rods. The drill should be able to get up to 2,500 feet with HQ before having to reduce down to NQ sized core rods, depending on ground conditions. This hole could take up 30 days to drill and up to 27 days to log.

To: Ron Clayton

From: Matt Blattman

Matt Gili

CC: Rosebud Joint Venture Committee

Date: 04/13/98

Re: Proposed Dreamland Exploration Drift

AFE

In response to favorable exploration drill hole results, it is proposed that an exploration drift be driven from the current Rosebud Mine workings to the Dreamland area. This exploration drift will allow access for underground drilling and mapping of the potential ore structure.

Prior to driving the drift, a pilot hole will need to be drilled down the centerline of the drift. This hole will enable us to better understand the geologic and ground conditions before mining, thus allowing us to be better prepared for hazardous mining conditions. Drilling will cost approximately $156,500.

The drift will be driven from the Stope 31 access directly to the high grade intercept found in the exploration drill hole RS-425. Phase 1 will be composed of driving the drift a distance of 4,050 feet at a 15.3% grade, muckbays will be driven on 400 foot intervals, and pumping stations will be created every 500 feet. At the end of the 4,050 main drift, two 250 foot cross-cuts will be mined to provide drilling stations for extensive underground drilling. Total equivalent footage to be mined is 5,250 feet at a cost of $300 per foot. Budgeted mining costs for Phase 1 are $1,983,000. Mining rate for the project is scheduled at an average 19.2 feet per day, requiring approximately 10 months to complete the mining of Phase 1.

If supplementary drilling is deemed necessary, Phase 2 is scheduled to add an extra 1,540 equivalent feet of mining will similar muckbay and pumping station intervals at a total mining cost of $564,000. An extra 3 months will be needed to complete Phase 2 mining.

The additional mining will require an expansion of the Rosebud Mine's equipment fleet. It is foreseen that required equipment will include: one LHD, two 20-ton trucks, one jumbo, one bolter, and an extra lift tractor. Expected equipment cost total is $1,817,600.

Manpower costs to operate this equipment are included in the mining cost. The drift will be mined by two miners, two truck drivers, and one mechanic per shift. The mechanic's cost is separate from the mining cost and therefore added to the total at $215,000.

Ventilation for the tunnel will be provided by two 150hp fans in series, blowing air through an oval 48" fiberglass duct, exhausting at the working face. Total capital costs for the ventilation is estimated at $289,000. A savings of approximately $133,500 could be obtained by using round 48" steel duct.

Mine dewatering will be conducted by using the same type of development pump skids as are currently being used in the Rosebud Mine. A total of fours skids will be necessary to complete Phase 1 and the fourth skid providing dewatering capabilities for Phase 2. Capital costs for dewatering are approximately $125,300.

The 750 kva transformer being used near Stope 13 will be moved to the new Dreamland drift and will provide power for the majority of Phase 1. Near the completion of Phase 1, it will become necessary to

purchase a single 1,000 kva transformer. This new transformer will then have enough power to finish Phase 1 and also Phase 2. Total costs for the electrical equipment is estimated to be $36,750.

Cost summaries are as follows:

Phase 1 Totals		Phase 2 Totals	
Equipment	1,817,600	Equipment	0
Ventilation	155,221	Ventilation	0
Electrical	36,743	Electrical	5,511
Dewatering	125,315	Dewatering	0
Manpower	165,066	Manpower	49,520
Mining	1,982,625	Mining	563,625
Subtotal	***4,282,570***	***Subtotal***	***618,656***
Drilling	929,219	Drilling	733,594
Total	**5,212,000**	**Total**	**1,353,000**

Northwest Drilling
A Division of Boart Longyear Company
194 Arden Drive, Belgrade, Montana 59714
Telephone: 406-388-0002 • Fax: 406-388-6588
E-mail: thess@boartlongyear.com
Website: www.boartlongyear.com

Fax Message

NORTHWEST DRILLING

To: Kurt Alka

Page 1 of 2

Company: Hecla Mining

Fax Number: 702-623-6967

From: Tony Hess

Date/Time Sent:

Date: 4-14-98

Reference No.:

Northwest Drilling
A Division of Boart Longyear Company
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Website: www.boartlongyear.com

NORTHWEST DRILLING

April 14, 1998

Hecla Mining Company
PO Box 2610
58 Miles West of Winnemucca
Winnemucca, NV 89446

Re: Deep hole prices for Rosebud Underground Mine

Mr. Kurt Allen

Dear Kurt;

The drill we are proposing is the Longyear LM90 125 HP drill, which is capable of drilling 3000 to 4000 feet depth, depending on hole conditions. We feel that drilling HQ to approximately 2000 feet and then reducing to NQ would give us the best opportunity to reach the maximum depth. 3000 feet is probably feasible under average hole conditions, and then it will depend on what the formation gives us without the cost becoming too high with hole stabilizing operations such as cementing.

Footage Rates

Depth	HQ	NQ
0-500	$ 17.50	$ 14.50
500-1000	20.00	16.50
1000-1500	22.50	19.00
1500-2000	26.00	21.75
2000-2500		25.00
2500-3000		28.50
3000-3500		33.00
3500-4000		38.00

Since the LM90 is a larger more expensive drill to own, maintain and operate the hourly rates will be as follows:

Operating	$ 97.50
Non-operating	$ 87.50

All other parts of the current contract will be as stated.

Regards

Tony Hess
Northwest Drilling

THE ROSEBUD MINING CO., LLC
MEMORANDUM

TO: Ron Clayton

FROM: Kurt D. Allen

DATE: April 8, 1998

SUBJECT: Preliminary Cost Estimate for the Pilot Core Hole for the Dreamland Drift.

The proposed Dreamland drift, to intersect the gold intercept from exploration drill hole RS-425, needs to have a core hole drilled along its trace before development drifting begins. The core hole to be drilled along the drift trace could possibly consist of one hole up to 4,000 feet in length, depending on ground conditions. The main purpose for the core hole would be for gathering geotechnical data for rock mass classification. This data will be used for assisting the driving of the drift by being able to anticipate areas of poor ground conditions which may need special ground control attention.

In addition to the geotechnical needs, a low-angle core hole form Stope 31 access to the Dreamland intercept, should cut some moderately- to highly-perspective, possibly gold-bearing northeast trending structures. The most notable structure would be the Mother Load structure. At the surface, the Mother Load structure contains anomalous geochemical values, which could become stronger with depth. There may also be several other, as yet undefined, high-angle gold bearing structures in the area between Stope 31 access and the Dreamland intercept.

The hole would require the mobilization of the LM 75 to the site, which will allow us to use HQ sized core rods. We should be able to get up to 2,500 feet with HQ before we have to reduce down to NQ sized core rods (depending on ground conditions). This hole could take up 30 days to drill and up to 27 days to log. Preliminary costs for the hole total $156,500.00 consisting of $125,000.00 for the drilling, $13,500 for the logging, and up to $18,000 for the assaying. Actual estimates for the above drilling will be received April 13th.

4,000' Hole w/ LM 75 DRILL

- 2,500' HQ @ 3-4 + THIN $2.5-3.00/FOOT
- [illegible]' NQ @ -

0-500	HQ @	$21.50/ft	=	10,750.00
500-1000	HQ @	$24.50/ft	=	12,250.00
1000-1500	HQ @	$27.50/ft	=	13,750.00
1500-2000	HQ @	$30.50/ft	=	15,250.00
2000-2500	HQ @	$33.50/ft	=	16,750.00
2500-3000	NQ @	$32.50/ft	=	16,250.00
3000-3500	NQ @	$35.50/ft	=	17,750.00
3500-4000	NQ @	$38.50/ft	=	19,250.00

$122,000.00

LM75	MOBILIZATION	1,500.00
LM75	De-MOBILIZATION	1,500.00

LOGGING - 27 DAYS @ 500.00/DAY = 13,500.00

ASSAYING - 18,000.00

$156,500.00

3/31/98 - Dreamland Drive meeting w/
RANDY / GEORGE / MARK / MATT / KURT.

- RANDY SAID they will cut A section through TRACE of PROPOSED DRIFT.

- IS Cave fault ROSEBUD SHEAR -
  - SHAFT
  - motherload

Goldcorp
(604) 298 - 6623
Bill Forsyth.
ALAN MOSS

J.J M.B R.C
M.C M.B K.A

DREAMLAND MEETING 3/26/98

1) CHECK ON DRILL RIGS FOR LONG HOLES 2000 feet.

2) CHECK ON DROPAGE FOR STAYING ON LINE OF PROPOSED DRIFT.

250
4000
100,000

3) Talk to RANDY - TUESDAY meet w/ ENG.

D-53-94

WALCK
DISCOVERY + GEOLOGY
+ GOLD MINERALIZATION

30-28

GEOLOGY

NUMBER CLAIMS
FOR ROCKLAND DISTRICT