60001569

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud Drill Hole File - Hole No. D-121-95
AUTHOR	C. Muerhoff
DATE OF DOC(S)	1995
MULTI_DIST Y / N? Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Rosebud Project; Hecla Mining Co.; South Zone
COMMODITY If not obvious	gold silver
NOTES	Drill log; geology; assay; total depth 201' 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: DD 5/29/08
Initials Date
DB: mah
Initials Date
SCANNED: NV Blue
Initials Date

Revised: 1/22/08

D-121-95 SOUTH ZONE / 775N

60001519 4010

- ☐ quartz, chalcedony, silicification
- ☐ faults, fractures, joints
- ☐ FeO_X
- ☐ sulfide
- ☐ calcite, carbonate
- ☐ argillization, white clays
- ☐ propylitization
- ☐ potassic alteration
- ☐ chlorite, chloritic clays

Hecla MINING COMPANY

ROSEBUD PROJECT
DIAMOND DRILL LOG

6,0001569

HOLE NUMBER	D-121-95	LOCATION	South Zone / 775 N	REMARKS	
PAGE 1 OF 4		NORTHING	2,203,819.129	Drilled from decline @ station 14½	
DATE	11/11/95	EASTING	481,680.910	NW Drilling - Hagby On-ram 1000	
LOGGED BY	C. Muenhoff	ELEVATION	4657.488	NDBGM Core (2.12" diameter)	
SCALE	1"=10'	AZIMUTH	collar: 125° (S55°E)	100': 124° (S56°E)	200': 124° (S56°E)
TOTAL DEPTH	201'	INCLINATION	collar: -3°	100': -4°	200': -4°

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		0'-201' LBT 0'-46'(±) Ash flow / flow breccia. Light pink vfg ash tuff flow with elongated, discontinuous convoluted bands of k-altered to propylitic to argillic vfg ash (I don't think they're altered pumice). Also small(≤ ¼") rounded, argillized coarse-ash fragments. Flow banding @ 0°-20° to c.a. - 10'-20' flow is strongly carbonate-flooded; also discontinuous laminations are replaced by calcite + pyrite. 46'-112.2' Distinct flow / flow breccia grades into massive, matrix-supported breccia w/ variations as noted: 46'-68'(±) Matrix-supported with reddish-tan, hard, glassy irregularly-rounded fragments >> small(≤ ¼") sub-rounded argillized vfg ash frags. All floating in a light pink-tan glassy groundmass	10 20 30 40 50		0'-46' fracture set @ 60° to c.a. No mineralization or gouge on very planar surfaces (~1/3 ft.). 15'-20' Strong fracture/shear zone. 11 separate shear planes over this 5' interval @ 10°-40° to c.a. Strongly slicked @ 65°. Post-mineral. Light green waxy clay on surfaces, but no carbonate or sulfides. -past 20' to 46', pick up another set of fractures @ 30°-40° to c.a. This set is mineralized with grey pyritic clay + white clay (w/ carbonates) + fg euhedral pyrite. (~1/2 ft.) 46'-56' fractures @ 5° to 20° to c.a. (~1/ft.) w/ minor white clay + grey pyritic clay/rock flour gouge & fractures @ 70°-80° (also ~1/ft.) to c.a. w/ marc + pyrite ± white clays.	0'-20' No stockwork. The only mineralization present is calcite + pyrite replacing the discontinuous convoluted ash bands. 20'-46' Pyrite + calcite stockwork. Preferentially oriented @ ±60° & 10°-30° to c.a. Typically thin (≤ ⅛"), but locally up to ¼" thick. Averages ~5-8/ft., but locally exceeds 20/ft. 46'-56'(±) Flow is pervasively silicified & strongly stockworked by grey to black chalcedony + calcite + pyrite + marcasite stringers preferentially @ 40°-50° & 5°-10° to c.a. >10/ft.

ANALYTICAL DATA (opt)

FROM	TO	W	Au	Ag	Au2	Au grav ~~Ag2~~
0'	5'	5'	<0.001	0.02		
5'	10'	5'	0.003	0.04		
10'	15'	5'	0.001	0.03		
15'	20'	5'	0.001	<0.02		
20'	25'	5'	0.005	0.05		
25'	30'	5'	0.003	0.07		
30'	35'	5'	0.025	0.09		
35'	40'	5'	0.060	0.12	0.051	
40'	46'	6'	0.109	0.16		
46'	51'	5'	0.151	0.22		0.156

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%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		~68'-70', breccia includes argillized, elongated, discontinuous vfg ash bands @ ±0° to c.a. ~70'-77' reddish-tan glassy fragments rare, small sub-rounded, argillized fg ash frags dominate. Groundmass is light pink in color → loses glassy appearance. 77'-81.4' breccia is intensely hydrofractured & cemented by grey, pyritic chalcedony. 81.4'-98'(±) breccia grades into nearly a massive, light pink (k-alt) fg ash tuff. Just a scattering of light brown, sub-rounded small (≤1/4") aphanitic, glassy frags & rare tan→bleached sub-angular ash tuff frags. Groundmass is strongly to locally pervasively silicified/silica-flooded. 98'-112.2' Near massive ash tuff grades into matrix-supported breccia w/ angular to sub-angular, bleached fg ash frags & sub-angular brown glassy frags & light tan fragments w/ discontinuous bleached to k-altered pink vfg bands. All floating in a light pinkish-tan fg groundmass which is moderately to locally strongly silica-flooded. 115.0'-141.0' Light tan to light pink massive fine-grained ash tuff with occassional argillized, sub-rounded to sub-angular vfg bleached ash frags.	60 70 80 90 100 110 120		56'-96'(±) 2 fracture sets: 50° & 30° to c.a. Set @ 50° to c.a. (~1/2 ft.) is generally unmineralized with minor white rock flour/clay ± v. minor pyrite. Set @ 30° to c.a. (~1/ft) w/ white "soapy" clay ± grey chalcedony + pyrite w/ occassional marcasite & calcite. ↓ increasing calcite on 30° fracture surfaces ↓ to 96' past 96'(-112.2') fracture density decreases rapidly. Only set @ 50° persists, but now < 1/5 ft. Appears to be post-mineral; just minor white rock flour/clay on surfaces. 112.2'-115.0' Fault zone(?) Core is extremely broken. Irregular surface @112.2'-60° to c.a. Sharp slip @115' @ 50° to c.a. Internal interval composed of small (≤2") pieces of competent core & abundant white rock flour/clay gouge? - rock frags are strongly argillized.	56'-73'(±) Groundmass is still moderately to strongly overprinted by silica. Also abundant (~1%) vfg "silvery" colored disseminated pyrite. Stockwork of grey to black chalcedony ± calcite + pyrite + marcasite ± white clay. Often vuggy. Lose the high * structures; nearly all stringers are @ 60°-70° to c.a. (8-10/ft.) ~73'-77' Stockwork continues (same mineralogy as above), but increases in intensity to >10/ft; also thin hairline stringers (discontinuous) nearly parallel to c.a. 77'-81.4' hydrofracturing appears to post-date stockwork mineralization. Interval is vuggy with coarse marcasite + pyrite ± white clay in vugs. 81.4'-96'(±) Same as 73'-77' interval, except now with minor zones of hydrofracturing(?) by calcite. 96'-112.2' Stockwork density decreases to ≤5/ft. Pyrite + chalcedony 30°-50° to c.a. & Pyrite + calcite ± marcasite stringers @ ±70° to c.a. Minor hydrobrecciation & cementation by grey chalcedony over last foot of interval. 115.0'-141.0' see next page.

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	~~Ag2~~ AuGrav
51'	56'	5'	0.142	0.51		0.165
56'	61'	5'	0.233	0.36		0.230
61'	66'	5'	0.034	0.09		
66'	71'	5'	0.265	10.20		0.274
71'	77'	6'	0.214	2.55		0.215
77'	81.4'	4.4'	0.085	0.17		
81.4'	86	4.6'	0.197	1.86		0.180
86'	91'	5'	0.653	7.08		0.682
91'	96'	5'	1.270	7.65		1.170
96'	101'	5'	0.033	4.04		
101'	106'	5'	0.056	0.72		
106'	112.2'	6.2'	2.230	7.81		2.270
112.2'	115'	2.8'	2.160	11.50		2.450
115'	120'	5'	0.380	7.20		0.387

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%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		142.1'- 155.6' Light tan to strongly bleached & argillized fine-grained ash tuff / tuff breccia. Intensely re-brecciated & healed by grey to locally black chalcedony → often to the point where ash frags are floating matrix-supported in chalcedony. Occassional short intervals of ash tuff breccia w/ strongly argillized/clay-replaced rounded ash frags floating in pervasively silicified vfg tan ash groundmass.	130 140 150		115.0'-141.0' Fracture sets @ 50° > 30° to c.a. Set @ 50° appears to be post-mineral - just minor white rock flour/ clay on surfaces (~1/ft.); Set @ 30° is mineralized with black "sooty" pyrite + white "soapy" clays. (~1/5ft.) 141.0'-142.1' Fault /shear zone. Strongly bleached & argillized vfg, pyritic ash tuff fragments cemented by grey to black chalcedony & consequently sheared @ ±55° to c.a. Re-healed by grey-white clay/ minor euhedral tale barite in the clay. 142.1'-155.6' Occassional post-mineral fractures @ ±50° with white clay (sericite?) on planar surfaces (~1/2ft.). 155.6'-172.5' Open-spaced mineralized fracture set @ ±60° to c.a. (~1/ft.) w/ white clay + grey clay + grey chalcedony + marcasite blades ± pyrite. 172.5'-185.8' Zone of intense fracturing @ 0° to c.a. (±5°). All fractures with abundant sulfide-poor white "taky" clay. Nearly entire interval of core is split in half by fractures.	115.0 - 141.0' Strong stockwork of grey chalcedony + pyrite ± marcasite ± calcite ± white clays. Very randomly oriented. Local zones of hydrobrecciation. Stringers >10/ft. ~132 - 141' hydrothermal brecciation by grey chalcedony increases (short intervals of matrix-supported brciation). Cut by later white chalcedony + pyrite stringers, discontinuous @ ±70° to c.a. Very little carbonate in this interval. 142.1'- 155.6' Chalcedony-matrix breccia is cut by later black chalcedony + pyrite + dark grey sulfide ± white clay. Preferentially @ 50° ± 40° to c.a., but also quite random. (>10/ft) 155.6'-185.8' Entire interval is intensely stockworked & locally hydrothermally brecciated by grey chalcedony + pyrite ± marcasite ± white clay (sericite - illite?). Preferentially @ ±60° to c.a., but extremely randomly oriented. Locally >20/ft. fractures @ 60° persist, but clearly offset by fractures sub-parallel to core axis.
		155.6'- 185.8' Matrix-supported monolithic breccia with angular to sub-rounded bleached ash frags with abundant vfg disseminated pyrite & moderately overprinted by silica; floating in a pervasively silicified light brown to light pinkish-brown fg to fragmental groundmass.	160 170			
		↓ Although crossing fracturezone, I think this is a gradational contact, not a fault contact ↓	180			
		185.8'- 194.1' Matrix-supported grading to clast-supported monolithic grading to heterolithic breccia. Bleached, argillized, pyritic vfg angular to sub rounded ash frags → joined by planar(±) laminated (con't)	190			

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	~~Ag2~~ AGrav
120'	126'	6'	1.240	4.58		1.220
126'	132'	6'	0.301	0.88		0.273
132'	137'	5'	0.225	1.12		0.195
137'	141'	4'	0.064	0.38		
141	142.1'	1.1'	0.414	3.54		0.469
142.1'	147'	4.9'	0.482	3.78		0.498
147'	152'	5'	0.113	0.68		
152'	155.6'	3.6'	0.080	0.52		
155.6'	160'	4.4'	0.196	0.91		0.197
160'	165'	5'	0.058	0.22		
165'	170'	5'	0.064	0.20		
170'	172.5'	2.5'	0.026	0.14		
172.5'	177'	4.5'	0.010	0.10		
177'	182'	5'	0.007	0.07	0.007	
182'	185.8'	3.8'	0.009	0.12		
185.8'	190'	4.2'	0.006	0.10		

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%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		(con't) clasts > cone diameter in size (frags of following unit). Tan/light brown, moderately-silicified fg to fragmental groundmass. 194.1'-201' Planar-bedded, thickly-laminated (up to 1/8") med-grain ash flow. First couple of feet are light pink in color & mildly argillized → grades into v. light green & intensely argillized (near total replacement by clay). 45°-50° to c.a.	200	T.D. 201'	185.8'-194.1' V. competent unit - no natural fractures. 194.1' Sharp contact @ 30° to c.a. w/ white clay on surface. fault? conformable contact? Silicification drops to nothing beyond 194.1'. 194.1'-201' A couple of fractures @ ± 40° to c.a with sulfide-poor white "talcy" clay. (post-mineral)	185.8'-194.1' Strong stockwork of grey chalcedony + pyrite + white clay @ very random ∠'s to c.a. >10/ft. 194.1'-201' Stockwork of pyrite ± marcasite ± white clay ± calcite. Preferentially @ 50°-70° to c.a. ±10/ft. ~196'-199' Short intervals of hydrothermal brecciation by black chalcedony.

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
190'	194.1'	4.1'	0.039	0.27		
194.1'	201'	6.9'	0.049	0.19		

HECLA MINING COMPANY - ROSEBUD PROJECT
1995 SOUTH ZONE FILL-IN DRILLING PROGRAM

Date: 11/11/95

HOLE ID: D-121-95

By: C. Muerhoff

Sample ID	Description	Mass (g)	H2O Level (cc)		Displacement (cc)	Sp. Grav. (g/cc)
			Beginning	Ending		
86.9' - 87.2'	stockworked massive tuff	486.7	1080	1290	210	2.32
115.1' - 115.5'	silicified, vugy, clast-supported breccia	540.0	1290	1510	220	2.46
151.8' - 152.2'	chalcedony + pyrite + coarse mica + white clay matrix fault / hydrothermal breccia. (vugy)	557.0	1290	1515	225	2.48