60001540

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-90-94
AUTHOR	L. Bernard; C. Muerhoff; S. Fairchild
DATE OF DOC(S)	1994
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 599' handwritten notes; underground 25 p.

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)

	Initials	Date
SS:	DD	5/29/08
DB:	mah	
SCANNED:	NV BJC	

Revised: 1/22/08

D-90-94 underground (North Cove)

6000 1540 4010

6000154D

Hecla
MINING COMPANY

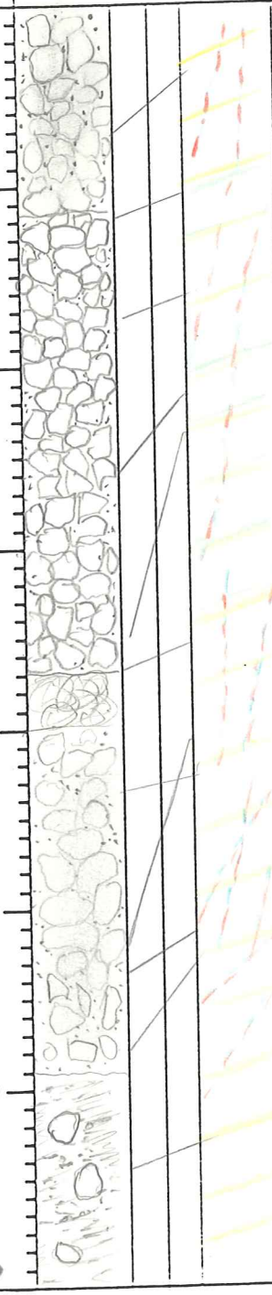
ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	D-90-94	LOCATION		REMARKS	
PAGE 1 OF 9		NORTHING			
DATE	11/13/94	EASTING			
LOGGED BY	LJB	ELEVATION			
SCALE		AZIMUTH			
TOTAL DEPTH	1" = 10'	INCLINATION			

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		0-87 Heterolithic volcanic breccia 0-19.5 1/4" to 1ft lt green/gry (wk chl) clast some the larger are spherulitic; sub-Angular to sub-round with both matrix and clast support. Matrix is tan-pink fine grain w/ fine + Ox pyrite disser			9-14 .4 frac/ft @ 30	0-4 blebs of py, ca vn 1" 2-3 brecciated pink matrix w/ silica cements 3-25 mod sil, -Arg continuous steeped 1/8" MAPC-py vn @ 20-50 w/ calcite clay films dull, brassy, blk FeOx 2-3 vn/ft white clay is calcareous
		19.5-44.5 matrix supported volcanic brecc with gost clasts. as before with sub-round to sub angular lt gr clasts in a grayish pink fine-med grain matrix clast size 1/4 to 2"			19-44 NO major frac	25-61.5 SAb w/ vn @ 0-15
		44-61.5 SAb w/ med grain matrix			44-54 poor recovery 28% Mist Latch, vugy w/ barite clay poss fault ??	45 vugy w/ barite, MAPC vn, white clay

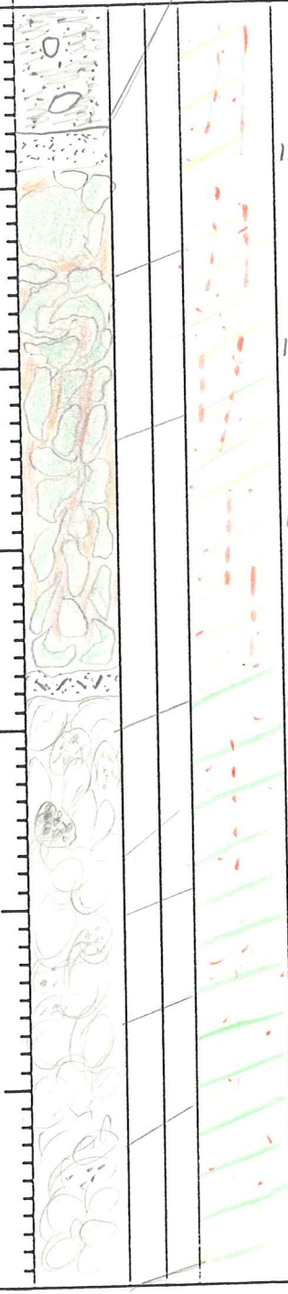
ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
0	4	4	0.005	0.08		
4	9	5	0.003	0.05		
9	14	5	0.002	0.03		
14	19	5	0.004	0.07		
19	24	5	0.007	0.09		
24	29	5	0.023	0.08		
29	34	5	0.007	0.06		
34	39	5	0.141	0.32	0.126 (g)	
39	44	5	0.033	0.10		
44	54	10(2)	0.111	0.17	0.111 (g)	

HOLE NUMBER D-90-94 PAGE 2 OF 9

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		61.5-87 matrix supported bx w/ more pronounced clasts due to wk-mod chloritization of matrix / partial dk green	60, 70, 80, 90, 100, 110, 120		54-64 .4 frac/ft @ 50,70 64-72 .1 frac/ft @ 70 72-82 .3 frac/ft @ 40,15 82-89 .2 frac/ft @ 70 89-99 .3 frac/ft @ 80,20 99-109 .2 frac/ft @ 60,40 109-119 .3 frac/ft @ 70 119-125 .1 frac/ft @ 25	61.5-82 mod sil-Arg wk chl matrix minor py-clay vnlets, @10 .5-1 vnlet/ft 82-93 wk-mod sil-Arg AH mod marc/clay vnlets @ 0-20 93-129 wk mod sil-argillic AH w/ minor marc-py vnlets @ 10-30
		87-90 lt green/white spherulitic Tuff w/ dk green weathering rings, Ashy-fine grain				
		90-109 Volcanic breccia w/ gost clasts - matrix supported ?? matrix fine grain w/ py dissem, brownish gray, rare frothy text. Angular to sub-rounded clast 1/4-2"				
		109-127 Brownish gray frothy or glassy tuff 2" matrix supported clasts (20%?) fine-med grain no foliation				

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
54	59	5	0.221	0.16	0.187 (g)	
59	64	5	0.492	0.26	0.459 (g)	
64	69	5	0.023	0.12		
69	74	5	0.004	0.06		
74	79	5	0.005	0.04		
79	84	5	0.005	0.05		
84	87	3	0.029	0.07		
87	92	5	0.181	0.19	0.170 (g)	
92	97	5	0.040	0.13		
97	102	5	0.080	0.26	0.075 (g)	
102	107	5	0.087	0.12	0.091 (g)	
107	112	5	0.013	0.12		
112	117	5	0.006	0.06		
117	122	5	0.024	0.08		

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		126 foliation @ 40+ 127-129 ashy to fine grain lt gray tuff w/ disseminated marc. 129-158.5 lt. pastel green/pink volcanic breccia gost textures w/ green blocks (80-90%) in pink matrix clast + matrix supports fine grain clasts + matrix fine py dissem some clasts spherulitic, others frothy, shard rich clast size 1"-1.5 ft? 157.3-158.5 shard or cryst-rich med grain tuff v. lt green / gray white gradational contact 158.5-199.5 lt. blue/green ashy spherulitic tuff. dk green chl cracks, spherulitic blebs	170 140 150 160 170 180 190		129-139 .3 frac/ft @ 70 und 139-149 .2 frac/ft @ 70 und 149-159 no frac 159-164 .4 frac/ft @ 70 164-172 .4 frac/ft @ 50, 70 172-179 .5 frac/ft @ 50 179-189 .4 frac/ft @ 60 189-199 .4 frac/ft @ 70	129-158.5 wk-mod sil-arg alt wk chl. Minor discontinuous py-marc veinlets @ high angles (0-30) 158.5-199.5 mod chl alt str chl + py films on frac V minor py veinlet < 1/20" 0°

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
122	127	5	0.005	0.07		
127	129	2	0.002	0.04		
129	134	5	0.007	0.05		
134	139	5	0.003	0.04		
139	144	5	<0.001	0.03		
144	149	5	0.004	0.07		
149	154	5	0.018	0.07		
154	158.5	4.5	0.005	0.05		
158.5	164	5.5	0.001	0.03		
164	169	5.	<0.001	0.02		
169	174	5	<0.001	<0.02		
174	179	5	<0.001	<0.02		
179	184	5	<0.001	<0.02		
184	189	5	<0.001	<0.02		

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		199.5 - 279 glassy or frothy volcanic breccia fine grain brown matrix and frothy brown gray or brown green/gy blocky clasts clast supported, clasts wkly foliated ¼" to 6"+ large possible clasts 1 ft or greater Rare large spherulitic block(s) - Ashy (contact @ 25 (2" gradational))	200		199-209 .4 frac/ft @60	191-194 v. minor silica cem bx
						199.5- 279 wk-mod sil-Arg Alt wk chl
			210		209-219 .2 frac/ft @ 70	v. Minor calcite vuletr @ 35-65 1/20"
		224-279 minor dk chloritization of matrix Local zones	220		219-229 no frac	
						224-279 v. minor dk green chlorization of matrix
			230		229-239 .8 frac/ft @50	
			240		239-249 .1 frac/ft @ 60	
			250		249-259 .6 frac/ft @ 70	
			260			

ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
189	194	5	<0.001	<0.02		
194	199	5	<0.001	<0.02		
199	204	5	<0.001	<0.02		
204	209	5	"	"		
209	214	5				
214	219	5				
219	224	5				
224	229	5				
229	234	5				
234	239	5				
239	244	5				
244	249	5				
249	254	5				
254	259	5				

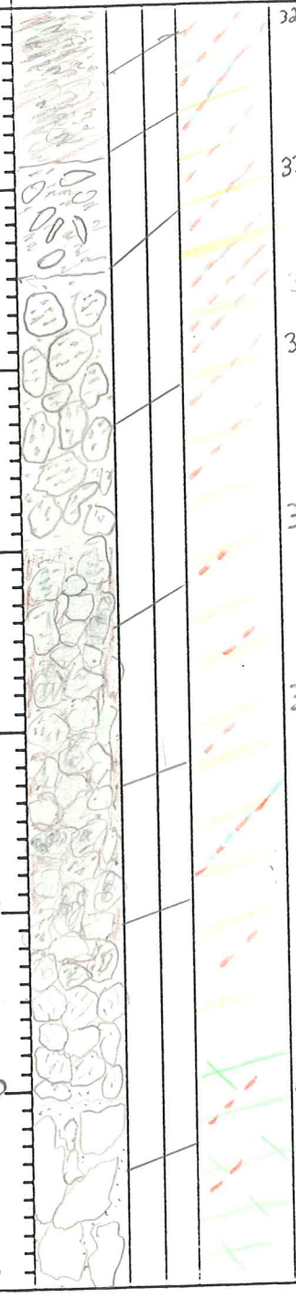
HOLE NUMBER D-90-94 PAGE 5 OF 9

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		279-295 volcanic breccia w/ frothy clast as above, but an olive green hue, clast supported	270, 280		259-269 no frac 269-279 .3 frac/ft @60 279-289 .7 frac/ft @20-40 289-299 no frac.	279-310 wk sil wk-mod Arg/chl/AH fine discontinuous calcite vnlets v. fine py disseminated
		heterolith. volcanic clastic 255-310 matrix w/ minor clast supported sub-rounded yellow/green 1/2-3" clasts in a tanish/green matrix ashy-fine grain	290, 300		299-309 .2 frac/ft @80	310-321 SAB w/ increase in calcite vn @30 1/5-1/4"
		310-339 lt green & brown frothy ash-fine grain tuff, some spherulitic tuff. poss gost clasts	310, 320, 330		309-319 .4 frac/ft @60. 319-329 .5 frac @40	321-357 wk sil wk-mod argill-chl mod py-marc vnlets @40 1/10-1/5" ± calcite (rare) hartite chl vnlets 2vn/ft.

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
259	264	5	<0.001	<0.02		
264	269	5	"	"		
269	274	5				
274	279	5				
279	284	5				
284	289	5				
289	294	5				
294	299	5				
299	304	5				
304	310	6				
310	314	4				
314	319	5				
319	324	5				
324	329	5				

REC	RQD	LITHOLOGY	FT
		339-345 frothy tuff as above w/ 10-20% elongated matrix supported clasts sub-rounded	340
		345-360 frothy volcanic breccia gost clasts	350
		360-391 Volcanic breccia pastel green clasts w/ frothy + spherulitic textures, matrix an ashy tan/brown gost clasts clast supported	360 370 380
		391-416 Volcanic breccia like above w/ apparent large lt green blocks over 1 foot. lt brown ashy matrix, some matrix caught up as clasts. green ashy blocks → mod argillic, chl clast supported wk argill matrix	390 400

GRAPHIC LOG



STRUCTURE	ALTERATION AND MINERALIZATION
329-339 .6 frac/ft @60	
339-349 .6 frac/ft @50	
349-359 .6 frac/ft @60	
359-369 .3 frac/ft @60	357-397 minor discontinuous py-marc veinlets @40 rare assoc. calcite
369-379 .4 frac/ft @70	mod. chl alt wk-mod argillic
379-389 .4 frac/ft @70	
389-399 . . 2 frac/ft @70	

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
329	334	5	0.002	0.06		
334	339	5	0.014	0.19		
339	344	5	0.043	0.12		
344	349	5	0.006	0.08		
349	354	5	0.879	0.18	0.895 (g)	
354	359	5	0.041	0.10		
359	364	5	0.004	0.04		
364	369	5	<0.001	0.02		
369	374	5	0.170	0.22	0.163 (g)	
374	379	5	2.868	4.04	3.522 (g)	
379	384	5	0.003	0.04		
384	389	5	0.008	0.06		
389	394	5	0.013	0.07		
394	399	5	0.108	0.22	0.098 (g)	

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
					399-409 .5 frac/ft @ 70	397-418 1/5" py-marc vn @ 45-50 w/ minor white clay 0.5 vn/ft	399	404	5	0.123	0.09	0.138 (g)	
							404	409	5	0.023	0.07		
					409-419 .4 frac/ft @50	discontinuous py vnlets 45;0	409	414	5	0.177	0.12	0.208 (g)	
			410				414	419	5	0.915	0.44	1.170 (g)	
		416-422 grayish brown & green med grain Tuff minor frothy clast				418-422 vugy zone w/ py-marc filling; w/minor white clays	419	422	3	0.460	0.35	0.545 (g)	Au3 0.214
			420		419-439 .6+ frac/ft @ 60?		422	427	5	0.104	0.14	0.134 (g)	
		422-435 lt. green fine grain Tuff WAVY looking w/ str chl.			424-6" str chl shear? Zone	mod argillic wk chl-sil 424-424.5 str chl 424.5-429 mod chl, Arg minor sil clay vnlets	427	431	4	0.118	0.13	0.132 (g)	
					623-29 broken Rk								
			430			429-435 wk-mod sil vugy w/ drussy qtz, bladed marcasite, minor barite, minor white clays	431	436	5	1.958	1.55	1.925 (g)	
		435-449 Silica floated & hydro bx Volcanic breccia, homolithic green clasts, sub-angular 1/4 to 2" brown & green matrix. Matrix & point contact supports					436	439	3	0.177	0.48	0.168 (g)	
			440		439-449 1.7 frac/ft @40	435-449 Silica floated volcanic breccia overprinted by tectonic breccia(?)	439	444	5	0.285	0.39	0.241 (g)	
						vugy filling of frosty qtz, bladed marc/py white clays and sil white clays, tr barite	444	449	5	0.084	0.11	0.083 (g)	
		449-450.5 lt gray/white bx vn, vugy w/ some vessicular looking cavities in a 2" band, pass. boiling (@50)	450		449-459 .7 frac/ft @60		449	450.5	1.5	0.019	0.10		
							450.5	454	3.5	0.010	0.09		
		450.5-464.5 hydro brecciated foliated tuff as noted bellow fine py dissem				449-450.5 frothy looking sil vn bx lt gray/white w/ dkbr sub-angular erratic clasts.	454	459	5	0.015	0.56		
			460		459-469 1.2 frac/ft @40		459	464	5	0.024	0.11		
		Ashy to fine grain				450.5-464.5 tectonic crackle bx Tuff. gray silica cem w/ marc., white clay filling 20° frac (former) vugy w/ drussy qtz, marc/py blades cream clays mod-str sil	464	469	5	0.060	0.20	0.055 (g)	
		464.5-493 flow banded Tuff lt gray/brown w/ chl selvages on flow bands, some frothy textures, foliation @ 5 fine py dissem strong	470										

HOLE NUMBER D-90-94 PAGE 8 OF 9

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		strongly flow banded tuff w/ chl selvages on flow banding @5			469-479 1.4 frac/ft @45	464.5-482 Mod Arg, wk sil PY ± qtz vnlets @ 15, 30 ± white clay. Vugy in places w/ blades of marc/py
			480		479-489 1.0 frac/ft @60	Mod-str white clay on frac. ± marc
		483-531.5 Tuff w/ wk flow banding Minor clastic beds ashy to fine grain wk chl selvages and hairline chl crackle stockwork some vnlets FeOx			489-499 1.0 frac/ft @60	482-495 v. minor py vnlets wk-mod white clay on frac.
			490			495-526 hairline chl-hem vnlets stock work or 1/10" calcite vn 1-2/ft @ ~20
			500		499-509 1.0 frac/ft @60	
			510		509-519 1.4 frac/ft @70	mod argillic, mod sil
			520		519-529 1.2 frac/ft @70	526-531.5 SAB w/ white clay on frac.
			530		529-539 .7 frac/ft @55	mod sil, wk-mod Arg.
		531.5-588 wk-mod flow banded tuff w/ str. chl. selvages along foliation foliation @10				531.5-560 mod chl selvages on flow foliation minor ca/marc vnlets @ 5-20 Minor white clay on frac. rare clay vn + marc. (447-449 @ 0-5)
			540			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
469	474	5	0.272	0.31	0.284 (g)	
474	479	5	0.104	0.17	0.113 (g)	
479	484	5	0.013	0.10		
484	489	5	0.017	0.06		
489	494	5	0.002	0.06		
494	499	5	<0.001	0.05		
499	504	5	0.001	0.04		
504	509	5	<0.001	0.02		
509	514	5	<0.001	<0.02		
514	519	5	0.003	0.03		
519	524	5	0.006	0.02		
524	529	5	0.003	0.03		
529	534	5	<0.001	<0.02		
534	539	5	<0.001	0.02		

HOLE NUMBER D-90-94 PAGE 9 OF 9

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
					539-549 .7 frac/ft @ 30	
					549-559 .6 frac/ft @50	
			550			
					559-569 .7 frac/ft @60	560-599 wk chl. mod sil minor discontinous calcite veinlets, and large ¼" ca vn as noted. Sine py disseminations
			560			
					569-579 .7 frac/ft @60	
			570			573 ¼" ca vn @40
					579-589 .6 frac/ft @45	
			580			
					589-599 .9 frac/ft 60,0	586 ½" ca vn @60
		588-599 SAb but w/ minor pre-mineral fracturing w/ disruption at flow banding Minor assoc. bx.	590			593 ⅛" ca vn @70
			599 EOH			

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
539	544	5	0.013	0.11		
544	549	5	0.009	0.07		Au3 0.012
549	554	5	0.002	0.05		
554	559	5	<0.001	<0.02		
559	564	5	<0.001	0.02		
564	569	5	<0.001	<0.02		
569	574	5	0.002	<0.02		
574	579	5	<0.001	<0.02		
579	584	5	0.001	0.02		
584	589	5	0.002	0.02		
589	594	5	<0.001	<0.02		
594	599	5	<0.001	0.02		

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # D-90-94 DATE: 11/13/94 LOGGED BY: LJB PAGE 1 OF 6

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)	
0	9	92	92	.65		R2	?	—	—	—					
9	19	93	93	.69		R2	.4	30	R	chl films	10.5	545.3	240	2.27	1
19	29	94	94	.89		R2	0	—	—	—	20	643.2	280	2.30	2
29	34	98	98	.84		R2	0	—	—	—	30	585.5	250	2.34	3
34	44	100	100	.97		R2	0	—	—	—	40	564.6	235	2.40	4
44	54	19	28	.07		R2	?	0			—				
54	64	95	95	.92		R2	.4	50, 70	R	clay fill ± py	60	602.7	245	2.46	5
64	72	93	93	.86		R3	.1	70	S	chl films	70	706.0	280	2.52	6
72	82	94	98	.67		R2	.3	40, 15	R	SAb	80	459.7	190	2.42	7
82	89	100	100	.85		R2	.2	70	R	nil	—				
89	99	98	98	.94		R2	.3	80, 20	R	clay films	90.5	662.8	285	2.32	8

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # D-90-94 DATE: 11/13/94 LOGGED BY: LJB/ PAGE 2 OF 4

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)	
99	109	99	99	.70		R2	.2	60,40	VR	clay films	100	501.0	230	2.18	1
109	119	88	96	.74		R2	.3	70	R	PY films	110	496.3	220	2.26	2
119	129	92	92	.86		R2	.1	25	R	clay + PY films	120	604.7	240	2.52	3
129	139	101	101	.95		R2	.3	70	R undulating	nil	130	747.3	305	2.45	4
139	149	97	97	.92		R2	.2	70 und	R	nil	140	580.3	260	2.23	5
149	159	94	94	.83		R3	0	—	—	—	150	598.1	250	2.39	6
159	164	103	104	.92		R2	.4	70	R	chl films	160	555.4	245	2.27	7
164	172	90	90	.90		R2	.4	50,70	R	SAS	170	594.6	250	2.37	8
172	179	120	121	1.08		R3	.5	50	S	chl films	—	—	—		
179	189	101	101	.90		R3	.4	60	S	sab	180	439.3	180	2.44	9
189	199	100	100	.96		R3	.4	70	R	chl films	190	689.9	280	2.46	10

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # D-90-94 DATE: 11/15/94 LOGGED BY: LJB PAGE 3 OF 6

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY g/cc	
199	209	95	95	.82		R3	.4	60	VR	minor chl films	200	752.5	315	2.39	1
209	219	98	98	.92		R3	.2	70	R	SAB	210	618.5	260	2.38	2
219	229	95	95	.89		R2	0				220	631.5	270	2.34	3
229	239	99	99	.67		R3	.8	50	R	SAB	230	723.8	280	2.58	4
239	249	100	100	.90		R3	.1	60	VR	calcite film	240	503.5	210	2.40	5
249	259	100	100	.91		R2	.6	70	S	chl films	250	633.4	270	2.34	6
259	269	100	100	.94		R2	0				260	481.2	205	2.37	7
269	279	92	92	.91		R3	.3	60	R	nil	270	728.3	300	2.43	8
279	289	100	100	.75		R2	.7	30-40	R	nil	280	609.5	260	2.34	9
289	299	100	100	.97		R3	0				290	558.9	225	2.48	10
299	309	100	100	.98		R3	.2	80	R	nil mica	300	621.2	275	2.26	11

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # D-90-94 DATE: 11/15 LOGGED BY: LJB PAGE 4 OF 6

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)	
309	319	102	102	.98		R3	.4	60	VR	minor chl chl/ck	310	696.7	300	2.32	1
319	329	98	98	.96		R3	.5	40	R	chl films	320	733.9	320	2.29	2
329	339	98	98	.94		R3	.6	60	R	SAS	330	544.5	235	2.32	3
339	349	95	95	.93		R3	.6	50	R	chl+py films	340	692.1	300	2.31	4
349	359	100	102	.69		R2	.6	60	R	chl+py films	350	610.1	265	2.30	5
359	369	100	100	.98		R3	.3	60	R	SAS	360	655.6	285	2.30	6
369	379	99	99	.98		R3	.4	70	R	chl. films	370	506.3	220	2.30	7
379	389	90	90	.89		R3	.4	70	R	chl films	380	525.4	215	2.44	8

3.7

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # D-90-94 DATE: 11/16/94 LOGGED BY: LJB PAGE 5 OF 6

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
389	399	100	100	.94		R2	.2	70	R	PY + clay	390 1	556.7	240	2.31
399	409	102	102	.96		R2	.5	70	R	PY unbl	400 2	731.0	305	2.40
409	419	91	92	.82		R2	.4	50	R	PY unbl	410 3	672.3	285	2.36
419	~~429?~~	↓	↓	↓		R2	↓	↓	↓	↓	420 4	674.3	290	2.32
~~429?~~	439	.56	91	.64		R2	.6+ Frac Rk salt	60	VR	silrk Marcasite crystl, clay	430 5	747.4	305	2.45
439	449	95	100	.80		R3	1.7	40	VR	SAB	440 6	769.8	300	2.57
449	459	86	90	.65		R3	.7	60	VR	SAB	450 7	763.8	310	2.46
459	469	84	94	.46		R3	1.2	40	VR	SAB	460 8	461.9	180	2.56
469	479	100	100	.70		R3	1.4	45	VR	SAB	470 9	694.7	280	2.48
479	489	96	96	.73		R3	1.0	60	R	SAB	480 10	689.4	280	246
489	499	98	98	.78		R3	1.0	60	R	SAB	490 11	387.4	170	2.28

15.7

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # D-90-94 DATE: 11/17/94 LOGGED BY: LJB PAGE 6 OF 6

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
499	509	90	90	64		R3	1.0	60	R	Py ± chl films	510 1	709.8	280	2.53
509	519	90	90	.65		R3	1.4	70	R	SAB	520 2	623.5	225	2.77
519	529	90	90	.81		R3	1.2	70	R	SAB	530 3	670.2	260	2.60
529	539?	93	93	.78		R3	.7	55	R	SAB	540 4	659.1	255	2.58
539	549	95	95	.76		R3	1.0	45	R	Py + chl films ± clay	550 5	812.0	315	2.60
549	559	99	99	.65		R3	.7	30	R	Py, chl, ca films	560 6	644.5	250	2.58
559	569	91	91	.80		R3	.6	50	R	nil	570 7	766.7	305	2.51
569	579	92	92	.58		R3	.7	60	R	calcite film	580 8	684.6	275	2.49
579	589	91	91	.74		R3	.6	45	R	SAB	590 9	665.5	265	2.51
589	599	99	99	.76		R3	.9	60.0	R	SAB				

ANALYSIS REPORT

American Assay Laboratories

P.O. BOX 71060
RENO, NV,,U.S.A.,
Ph.1-702-356-0606, Fax.1-702-356-1413
Telex:

HECLA MINING CO.

COPIES TO : CHARLIE MUERHOFF

:

:

:

CLIENT REFERENCE No: D-90-94

LABORATORY JOB No. : SP031825

SAMPLE TYPE :

RECEIVED : 2 DEC 1994

REPORTED : 16 DEC 1994

No. SAMPLES : 45

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA60	15%	OPT	0.001
Au(RZ)	FA60	15%	OPT	0.001
AuGRAV	GRAV	15%	OPT	0.001
Ag(OZ)	D210	15%	OPT	0.02

SIGNATORY : Sue Faircloth M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-90-94
JOB NUMBER : SP031825
REPORTED : 16 DEC 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-90-94 384-389	0.008			0.06
D-90-94 389-394	0.013			0.07
D-90-94 394-399	0.108		0.098	0.22
D-90-94 399-404	0.123		0.138	0.09
D-90-94 404-409	0.023			0.07
D-90-94 409-414	0.177		0.208	0.12
D-90-94 414-419	0.915		1.170	0.44
D-90-94 419-422	0.460		0.545	0.35
D-90-94 422-427	0.164	0.214	0.134	0.14
D-90-94 427-431	0.118		0.132	0.13
D-90-94 431-436	1.958		1.925	1.55
D-90-94 436-439	0.177		0.168	0.48
D-90-94 439-444	0.285		0.241	0.39
D-90-94 444-449	0.084		0.083	0.11
D-90-94 449-450.5	0.019			0.10
D-90-94 450.5-454	0.010			0.09
D-90-94 454-459	0.015			0.56
D-90-94 459-464	0.024			0.11
D-90-94 464-469	0.060		0.055	0.20
D-90-94 469-474	0.272		0.284	0.31
D-90-94 474-479	0.104		0.113	0.17
D-90-94 479-484	0.013			0.10
D-90-94 484-489	0.017			0.06
D-90-94 489-494	0.002			0.06
D-90-94 494-499	<0.001			0.05

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-90-94
JOB NUMBER : SP031825
REPORTED : 16 DEC 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-90-94 499-504	0.001			0.04
D-90-94 504-509	<0.001			0.02
D-90-94 509-514	<0.001			<0.02
D-90-94 514-519	0.003			0.03
D-90-94 519-524	0.006			0.02
D-90-94 524-529	0.003			0.03
D-90-94 529-534	<0.001			<0.02
D-90-94 534-539	<0.001			0.02
D-90-94 539-544	0.013			0.11
D-90-94 544-549	0.009	0.012		0.07
D-90-94 549-554	0.002			0.05
D-90-94 554-559	<0.001			<0.02
D-90-94 559-564	<0.001			0.02
D-90-94 564-569	<0.001			<0.02
D-90-94 569-574	0.002			<0.02
D-90-94 574-579	<0.001			<0.02
D-90-94 579-584	0.001			0.02
D-90-94 584-589	0.002			0.02
D-90-94 589-594	<0.001			<0.02
D-90-94 594-599	<0.001			0.02

ANALYSIS REPORT

American Assay Laboratories

P.O. BOX 71060
RENO, NV,,U.S.A.,
Ph.1-702-356-0606, Fax.1-702-356-1413
Telex:

HECLA MINING CO.

COPIES TO : CHARLIE MUERHOFF

:

:

:

CLIENT REFERENCE No: D-90-94

LABORATORY JOB No. : SP031820

SAMPLE TYPE :

RECEIVED : 1 DEC 1994

REPORTED : 16 DEC 1994

No. SAMPLES : 77

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA60	15%	OPT	0.001
Au(RZ)	FA60	15%	OPT	0.001
AuGRAV	GRAV	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Sue Faircloth M.S.

AMERICAN ASSAY LABORATORIES
ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-90-94
JOB NUMBER : SP031820
REPORTED : 16 DEC 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-90-94 0-4	0.005			0.08
D-90-94 4-9	0.003			0.05
D-90-94 9-14	0.002			0.03
D-90-94 14-19	0.004			0.07
D-90-94 19-24	0.007			0.09
D-90-94 24-29	0.023			0.08
D-90-94 29-34	0.007			0.06
D-90-94 34-39	0.141		0.126	0.32
D-90-94 39-44	0.033			0.10
D-90-94 44-54	0.111		0.111	0.17
D-90-94 54-59	0.221		0.187	0.16
D-90-94 59-64	0.492		0.459	0.26
D-90-94 64-69	0.023			0.12
D-90-94 69-74	0.004			0.06
D-90-94 74-79	0.005			0.04
D-90-94 79-84	0.005			0.05
D-90-94 84-87	0.029			0.07
D-90-94 87-92	0.181		0.170	0.19
D-90-94 92-97	0.040			0.13
D-90-94 97-102	0.080		0.075	0.26
D-90-94 102-107	0.087		0.091	0.12
D-90-94 107-112	0.013			0.12
D-90-94 112-117	0.006			0.06
D-90-94 117-122	0.024			0.08
D-90-94 122-127	0.005			0.07

AMERICAN ASSAY LABORATORIES
ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-90-94
JOB NUMBER : SP031820
REPORTED : 16 DEC 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-90-94 127-129	0.002			0.04
D-90-94 129-134	0.007			0.05
D-90-94 134-139	0.003			0.04
D-90-94 139-144	<0.001			0.03
D-90-94 144-149	0.004			0.07
D-90-94 149-154	0.018			0.07
D-90-94 154-158.5	0.005			0.05
D-90-94 158.5-164	0.001			0.03
D-90-94 164-169	<0.001			0.02
D-90-94 169-174	<0.001			<0.02
D-90-94 174-179	<0.001			<0.02
D-90-94 179-184	<0.001			<0.02
D-90-94 184-189	<0.001			<0.02
D-90-94 189-194	<0.001			<0.02
D-90-94 194-199	<0.001			<0.02
D-90-94 199-204	<0.001			<0.02
D-90-94 204-209	<0.001			<0.02
D-90-94 209-214	<0.001			<0.02
D-90-94 214-219	<0.001			<0.02
D-90-94 219-224	<0.001			<0.02
D-90-94 224-229	<0.001			<0.02
D-90-94 229-234	<0.001			<0.02
D-90-94 234-239	<0.001			<0.02
D-90-94 239-244	<0.001			<0.02
D-90-94 244-249	<0.001			<0.02

AMERICAN ASSAY LABORATORIES
ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-90-94
JOB NUMBER : SP031820
REPORTED : 16 DEC 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-90-94 249-254	<0.001			<0.02
D-90-94 254-259	<0.001			<0.02
D-90-94 259-264	<0.001			<0.02
D-90-94 264-269	<0.001			<0.02
D-90-94 269-274	<0.001			<0.02
D-90-94 274-279	<0.001			<0.02
D-90-94 279-284	<0.001			<0.02
D-90-94 284-289	<0.001			<0.02
D-90-94 289-294	<0.001			<0.02
D-90-94 294-299	<0.001			<0.02
D-90-94 299-304	<0.001			<0.02
D-90-94 304-309	<0.001			<0.02
D-90-94 309-314	<0.001			<0.02
D-90-94 314-319	<0.001			<0.02
D-90-94 319-324	<0.001			<0.02
D-90-94 324-329	<0.001			<0.02
D-90-94 329-334	0.002			0.06
D-90-94 334-339	0.014			0.19
D-90-94 339-344	0.043			0.12
D-90-94 344-349	0.006			0.08
D-90-94 349-354	0.879		0.895	0.18
D-90-94 354-359	0.041			0.10
D-90-94 359-364	0.004			0.04
D-90-94 364-369	<0.001			0.02
D-90-94 369-374	0.170		0.163	0.22

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-90-94
JOB NUMBER : SP031820
REPORTED : 16 DEC 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-90-94 374-379	2.868		3.522	4.04
D-90-94 379-384	0.003			0.04

SAMPLE SUBMITTAL FORM

American Assay Laboratories Inc.

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 71060
Reno, NV. 89570
Telephone
(702) 356-0606
Fax
(702) 356-1413

Elko Office
2320 Last Chance Rd.
Nevada 89801
Box 2908
Elko, NV. 89801
Telephone
(702) 738-9100
Fax
(702) 738-2594

Company: Hecla Mining Co

Address:

Telephone Number: ( ) Fax Number: ( )

Project Name: Rosebud Purchase Order Number:

Transport Company: Waybill Number:

Date Shipped: Number of Packages: 45 [ ] Prepaid [ ] Collect

ANALYSIS REQUIRED

D-90-94 SAMPLE			TYPE	ELEMENTS REQUIRED
384-389	450.5-454	524-529	core	Au & Ag 2 AT FA
389-394	454-459	529-534	HQ	w/ Hecla-Rosebud
394-399	459-464	534-539		custom prep.
399-404	464-469	539-544		
404-409	469-474	544-549		* if Au ≥ .05 OPT
409-414	474-479	549-554		repeat w/ gravi. finish
414-419	479-484	554-559		
419-422	484-489	559-564		
422-427	489-494	564-569		
427-431	494-499	569-574		
431-436	499-504	574-579		
436-439	504-509	579-584		
439-444	509-514	584-589		
444-449	514-519	589-594		
449-450.5	519-524	594-599		

COARSE REJECTS (Normally Discarded)

[ ] Return COD after analysis complete
[X] By prior arrangements

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month
[ ] Return COD after one month
[X] By prior arrangements

RESULTS AND INVOICES TO BE SENT TO:

Please mark invoice person and address [I]

(1) Charlie Muerhoff

(2)

(3)

Comments:

HQ core
< 15 lb

CLIENT FILE COPY

SAMPLE SUBMITTAL FORM

American Assay Laboratories Inc.

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 71060
Reno, NV. 89570
Telephone
(702) 356-0606
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(702) 356-1413

Elko Office
2320 Last Chance Rd.
Nevada 89801
Box 2908
Elko, NV. 89801
Telephone
(702) 738-9100
Fax
(702) 738-2594

Company: Hecla Mining Co.

Address:

Telephone Number: ( ) Fax Number: ( )

Project Name: Rosebud Purchase Order Number:

Transport Company: Waybill Number:

Date Shipped: Number of Packages: 77 [ ] Prepaid [ ] Collect

ANALYSIS REQUIRED

D-90-94	SAMPLE				TYPE		ELEMENTS REQUIRED
0-4	79-84	149-154	224-229	299-304	NQ	374-379	Au & Ag 2 AT FA
4-9	84-87	154-158.5	229-234	304-309	CORE	379-385	w/ Hecla-Rosebud
9-14	87-92	158.5-164	234-239	309-314		EOH!	custom prep
14-19	92-97	164-169	239-244	314-319			
19-24	97-102	169-174	244-249	319-324			
24-29	102-107	174-179	249-254	324-329			* if Au ≥ .05 OPT
29-34	107-112	179-184	254-259	329-334			repeat w/ grav. finish.
34-39	112-117	184-189	259-264	334-339			
39-44	117-122	189-194	264-269	339-344			
ok 44-54	122-127	194-199	269-274	344-349			
54-59	127-129	199-204	274-279	349-354			
59-64	129-134	204-209	279-284	354-359			
64-69	134-139	209-214	284-289	359-364			
69-74	139-144	214-219	289-294	364-369			
74-79	144-149	219-224	294-299	369-374			

COARSE REJECTS (Normally Discarded)

[ ] Return COD after analysis complete
[x] By prior arrangements

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month
[ ] Return COD after one month
[x] By prior arrangements

RESULTS AND INVOICES TO BE SENT TO:

Please mark invoice person and address [I]

(1) Charlie Muerhoff

(2)

(3)

Comments:

NQ CORE < 15 lb.

CLIENT FILE COPY