60000534

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 RS-427
AUTHOR	K. Allen; V Reid; M. Jex; D. White S. King
DATE OF DOC(S)	1998
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine, [redacted]; Hecla Mining Co.; Rosebud Mining Co, LLC Rosebud Project
COMMODITY If not obvious	gold; silver
NOTES	drill logs; assay; geology; photographs; geochemistry; total depth 900'; invoices 74p.

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 3/18/08
Initials Date
DB:
Initials Date
SCANNED:
Initials Date

Revised: 1/22/08

RS-427

60000534
4010

6600 0534

- quartz, chalcedony, silicification
- faults, fractures
- FeOx
- BARITE
- sulfide
- calcite, carbonate
- argillization, white clays
- propylitization
- potassic alteration
- chlorite, chloritic clays

Hecla
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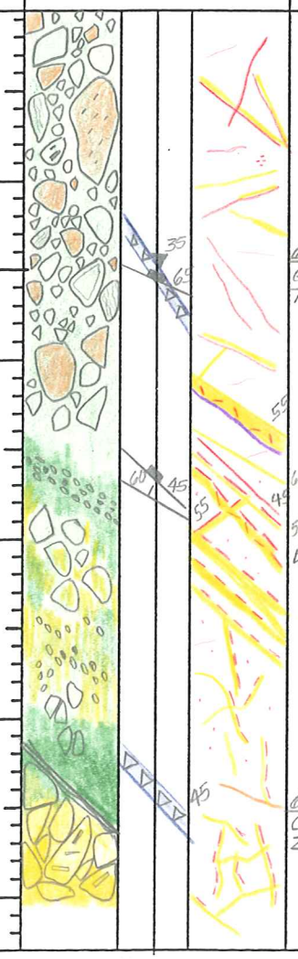
ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	RS-427	LOCATION	SURFACE, EAST	REMARKS	PILOTED RC TO
PAGE 1 OF 4		NORTHING			650'
DATE	03/14/98	EASTING			
LOGGED BY	KSM	ELEVATION			
SCALE	1"=10'	AZIMUTH	—		
TOTAL DEPTH	900'	INCLINATION	-90°		

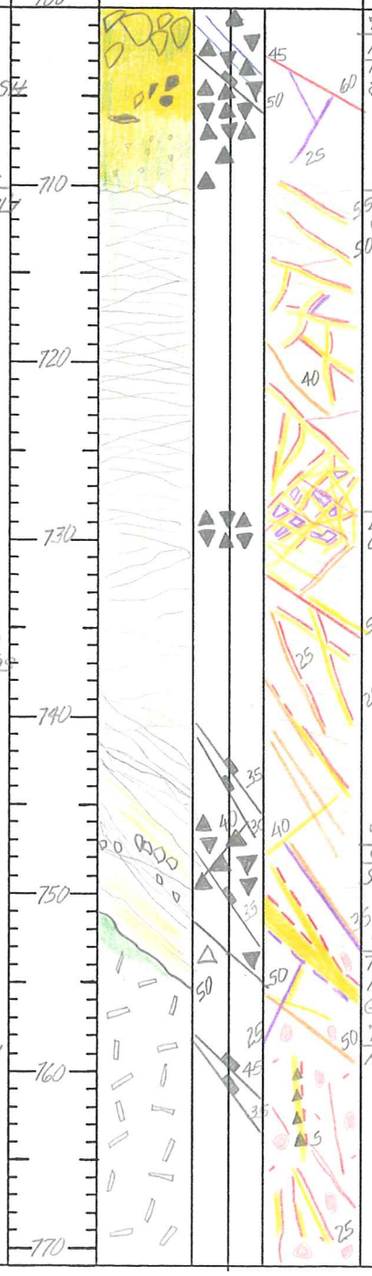
TH.	OX/RED.	LITHOLOGY (CORE POINT: 650')	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
650-694.7' UBUD? OR VOLCANOCLASTIC CHOCOLATE BRECCIA		650.0-675.1': COARSE GRAINED LITHIC LAPILLI TUFF. FINES & SOME FRAGMTS SHOW STR. TO MOD. GRN CLAY ALTERATN. PALE FLESH-PINK FRAGMT POPULATION IS VARIABLY PUNKY & MODLY ARGILLIZED BUT NOT SUBJECT TO STR. GRN CLAY ALTERATION. —THIS CONGLOMERATIC UBUD SUB-UNIT IS STR'LY TO MOD'LY HETEROLITHIC. INDURATED, SUB-ANGULAR, ~~BEY~~ PLAG-BEARING LITHICS OF CHOCOLATE AFFINITY, ANGULAR APHANITIC LT. GRN PUNKY (JUVENILE?) FRAGMTS, AND DARKER GRN RAGGEDY PUMICEOUS FRAGMTS MAKE UP THE REMAINDER OF THE FRAGMT POPULATION. FINELY COMMINUTED MATRIX MAT'L IS SPECKLED LT. TO DK GRN & STRLY GRN CLAY-ALTERED.	650 660 670 680 690 700		664.5-665.5': STRLY/MODLY EDUGY SHEAR ZONE AT 35° TO C/A.	NO CALCITE! 650-678.0': MODERATE SILICA-PYRITE VNLTS; NO PREFERED ORIENTATION. STR. GRN CLAY ALT'N, MOD. PUNKY SPOTTY ARGILIZATION. 664.5-665.5': STR. ARGILIZATION; MOD DISS'D Py. MOD/WK BLCHING ATTENDENT W/ ARGILLIZATION. 672.3-673.3': VUGGY MILKY SILICA + BLOCKY BARITE + WK BLADED MARCASITE VN. 670-675.1: STR MILKY SILICA VNING + PY A/O MARC +/- BARITE, +/- WHT CLAY. 675.1-678.7': STR. GRN CLAY ALT'N WK SILICA + MARC VNING. 678.7-682.5': INTENSE MILKY SILICA VNING W/ MARC BLADE OVERPRINTED W/ BOTH BRASSY & DARK VFG Py. MOD SiO_2. 682.5-690': MOD. SILICA + MARC VNS & DK GRN CLAY/CHLORITE VNING. CONT'D MOD/STR. GRN CLAY ALT'N. MOD/STR. SiO_2 690-694.7': DARKER GRN STR. PERVASIVE GRN CLAY ALT'N. MOD. DISS'D MARC.; MOD. MILKY SILICA VNLTS +/- WHT CLAY. TR. SiO_2 694.7-698.6': STRLY TO MODLY SILICIFIED. WHT. TO GRY SILICA CEMENT MODLY/WKLY SiO_2'd FRAGMTS
TRUE UBUD FROM 675.1		675.1-678.7': BEDDED VCG SAND-SIZED UBUD. STRLY GRN CLAY ALTERED.				
		678.7-~684': COARSE CONGLOMERATIC UBUD. PERVASIVE STR. GRN CLAY ALT'N; LOCAL WALLRK SILICIFICATION.				
		684-690': LT. GRN VCG SAND SIZED BUD INTERBED. MOD. PERVASIVE SILICIFICATION.				
		690-694.7: PEBBLE TO VCG SAND SIZED LLT. STRLY GRN CLAY ALTERED WK SPOTTY SILICIFICATION.				
694.7-710.3		694.7-698.6' CRACKLE TO MOSAIC BRECCIATED FLESH/ORANGE COLORED PORPHYRY. APHANITIC HARD LT. ORANGE GROUNDMASS IS FLECK W/ MARCASITE/PY AFTER PHENOCRYSTS, PROBABLY PLAG, ORIGINALLY. BXA IS CEMENTED WITH SILICA +/- MARC. 698.6-703.2': STRONGLY SILICIFIED, MILLED, MIXED LITHOLOGY MATRIX-RICH A/O MATRIX-SUPPORTED FAULT-BRECCIA.			694.7-694.7': PUNKY GRN CLAY IN SHEARED CONTACT ZONE.	

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ac
650.0	655.2					
655.2	660.0					
660.0	664.5					
665.5	665.5					
665.5	670.0					
670.0	675.1					
675.1	678.7					
678.7	682.5					
682.5	686.2					
686.2	690.0					
690.0	694.7					
694.7	698.6					

HOLE NUMBER RS-427 PAGE 2 OF 4

LITH.	OX/RED.	LITHOLOGY
694.7-710.3 FAULT		703.2-707.7': >90% TO TOTAL REPLACEMT SILICA. LT. GRN ISH TO TRANSLUCENT GRY MULTI-EPISODE FULLY HEALED HYDROTHERMAL SILICA BXA.
		707.7-710.3': LT. GRN STRLY SILICIFIED MILLED OR MYLONITIC FG BXA. STR. TEXTURE DESTRUCTION. PROTOLITH PROBABLY DOZER.
710.3-753.2' DOZER		710.3-714.1': LT. GRN-TO-CRM. CATACLASTIZED DOZER. STRLY SILICA + MARCASITE VNED. WAXY GRN-BRN CLAY MATRIX TO SOME CATACLASTIC BXATN.
		714.1-727.1': AS ABOVE: LT. SAGE GRN TO WARM GRAY DOZER, STRLY VEINED WITH SILICA + MARCASITE VNLTS + LATER WHT CLAY. CONT'D FAINT CATACLASTIC OR ALTD BXATD TEXTURE IN GROUNDMASS.
		727.1-728.1': BROKEN CLAY ZONE.
		728.1-731.6': SILICA + MARCASITE + LATER BARITE CEMENTED VEIN BRECCIA. LATE WHT CLAY IN VUGS.
		733.7-~745.0: GRNISH TINGE FADES FROM GROUNDMASS, BUT IS SPOTTILY PRESENT TO ~739'. RUDDY FAINT HmOx STAINING PICKS UP & MOTTLES THE LT. GRY-TAN GROUNDMASS. IT TENDS TO FOLLOW THE HI & TO C/A CATACLASTIC FABRIC DESCRIBED ABOVE. SILICA + MARCASITE VNING DECREASED TO MOD. W/ LESS. MILKY SILICA +/- WHT CLAY. CONT'D MOD. FRIABLE WHT CLAY ON FRAX. PYRITIC BLEBBING IN GROUNDMASS BY 740'.
		~745-749.3': HEALED CATACLASTIC OR BRECCIA ZONE. SHEARED MILLED AND MOTTLED CATACLASTIZED DOZER. INCREASED RUDDY HmOx STAINING OF DOZER GROUNDMASS & ROCK FLOUR BRECCIA MATRIX. STR. SILICA + MARCASITE VNING.
		749.3-753.2': STRLY SILICA + MARCASITE VNED GRY DOZER.
753.5-796.2 PORPHYRY DIKE		753.2-753.5': SILICA-HEAL INTRUSION BXA IN DOZER WALLROCK. MODLY GRN CLAY ALTERED DOZER FRAGMTS IN SILICA-HEALED DOZER +/- DIKE RK FLOUR.
		753.5-753.7': STRLY GRN CLAY ALTERED SHEAR PORPHYRY DIKE MARGIN.
		753.7-796.2': GRAY PORPHYRY BMB-TYPE DIKE. LT. GRY HARD FEATURELESS APHANITIC GROUNDMASS. GLOMERO-PORPHYRITIC. ~~THE~~ PLAGIOCLASE RELICTS NOW SHOT TO WHT CLAY +/- MARC (+/- SILICA?). EDHEDRAL ELONGATE LARGER SINGLE XTL PHENOCRYSTS CONTAIN MORE MARC. POSSIBLY AN EARLIER GENERATION OF PLAG? NOTED BY DON CAMERON AS POSS. MAFIC RELICTS. I'VE SEEN IT BEFORE IN THIS DIKE UNIT. LESS ABUNDANT THAN PLAG CLUSTER PHENOS.

FT



GRAPHIC LOG

STRUCTURE

700.0-701.0': WK SHEARS POST-SILICIFICATION, AT 45 TO C/A. MINOR MILLED GRIT & WHT CLAY

707.7-710.3': INTENSE SILICA & OVERPRINTING MODEST GRN CLAY ALT'N.

727.1-728.1': WKLY GOUGY, DIRTY WHT TO LT. GRN-GRY CLAY IN BROKEN ZONE.

745-749.3': HEALED SHEAR ZONE ABOVE FAIRLY SHARP INTRUSIVE CONTACT.

753.2-753.5': CATACLASTIC TO MYLONITIC BXA PROBABLY IN DOZER. ALTHO FAINT SAGE GRN W/ CLAY ALT'N.

753.5-753.7': PUNKY CLAY-ALTERED PORPHYRY DIKE MARGIN

ALTERATION AND MINERALIZATION

698.6-703.2': STRLY SILICIFIED MOD. DISS'D MARC. STR. GRN CLAY ALT'N OF INDIVIDUAL CLASTS

FROM ~704': WK BARITE ON FRAX. BY ~710' BARITE + STIBNITE.

703.2-707.7: GRY TO WHT TOTAL REPLACEMT SILICA. MOD. MARC.

710.3-733.7: STRONG SILICA + MARCASITE VNING +/- WHT CLAY. SOME SILICA OVERPRINT ON WHT CLAY, SOME WHT CLAY IS LATE WRT SILICA. TO ~712' SILICA VNS ARE LT. SAGE GRN POSSIBLY DUE TO GRN CLAY ALT'N AS DESCRIBED ABOVE.

733.7-~745': TR. GRN CLAY IN GROUNDMASS? MOD. SI-MARC VNING, +/- WHT CLAY. MOD. /WK PY BLEBBING.

~745-753.2': STR. SILICA + MARC VNING. STR. RUDDY HmOx STAINING.

753.2-753.7': VUGGY STR. SILICA + MARCASITE VNING AT ~40° TO C/A. + BARITE.

753.7-758.7': WK TO TR WALLROCK SILICIFICATION, DECREASING DOWN. MOD. MARC +/- CLAY +/- SI VNLTS & FRAX COATINGS. MOD. PY BLEBS & HALOS. WK/MOD. MARC REPLACEMT IN PHENOS

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2
698.6	703.2				
703.2	707.7				
707.7	710.3				
710.3	714.1				
714.1	719.1				
719.1	723.6				
723.6	727.1				
727.1	728.1				
728.1	731.6				
731.6	733.7				
733.7	739.6				
739.6	744.1				
744.1	749.3				
749.3	753.7				
753.7	758.7				
758.7	763.9				
763.9	769.1				

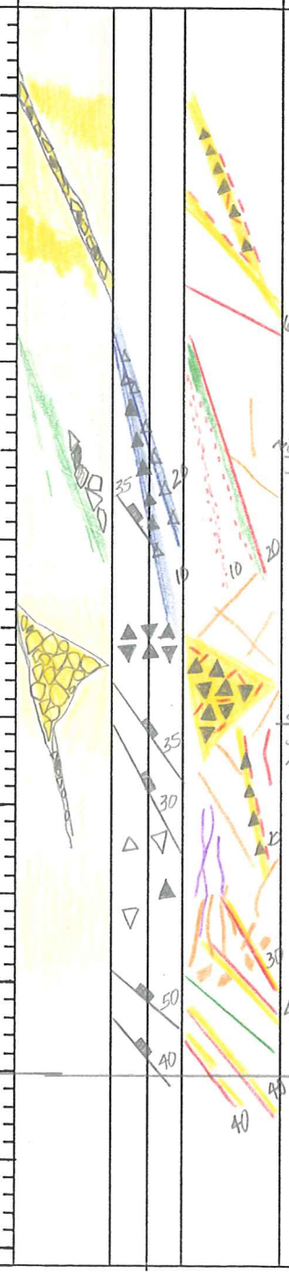
HOLE NUMBER RS-427 PAGE 3 OF 4

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
753.2-796.8 PORPHYRY DIKE		753.7-796.3': CONT'D PORPHYRY DIKE. DESCRIPTN A.2.	770			
			780			758.7-784.7': STR./MOD. SILICA + MARCASITE VNING. +/- LATE BARITE & STIBNITE. VNING DECREASES TO WK/MOD. ~783'.
						~781-783': STR WHT CLAY + BARITE + STIBNITE.
			790			FROM ~790': WAXY GRN CLAY IN PHENOCRYST SITES.
		795.6-796.3': STRLY CLAY ALTER. LT. GRN DIKE MARGIN; WKLY SHEARED.			795.6-796.3': PUNKY, WKLY SHEARED DIKE MARGIN.	795.6-796.3': STR. GRN CLAY ALT'N. MOD. PY.
		796.3'-798.2': MIXED LITHOLOGY BRECCIA ZONE. CATACLASTIC DOZER + SHEARED GRN CLAY ALTERED BAND FROM 797.5-798.2 WHICH MAY BE DIKE MATERIAL. BXA IS OVER-PRINTED WITH MOD. TO STR. SILICA + MARC +/- LATE WHT CLAY VNLTS. ERRATIC SEMI-HEALED FRAX.				796.3-798.2': STR GRN CLY 797.5-798.2: MOD. SILICA + MARC +/- WHT CLAY VNING; MOD. SiO_2 IN BXA'D DOZER.
796.2-900' DOZER		798.2-804.8': CLAST-SUPPORTED, WKLY SILICIFIED INTRUSN BXA IN DOZER. STRONG TECTONIC/HYDROTHERMAL OVERPRINT.	800			798.2-800.5': STR. SILICA + SULFIDE VNING. MOD. SILICIFICATION IN DOZER.
		804.8-807.8': MATRIX-SUPPORTED TECTONIC BXA. PEBBLE-SIZED MODLY ARGILLIZED DOZER FRAGMTS IN DOZER MATRIX (RK FLOUR?). LOOKS A LITTLE LIKE AUTOBXA BUT IS ONLY SEEN PROXIMAL TO SHEARING & INTRUSION.				800.5-804.8': MOD. SPOTTY SILICIFICATION OVERPRINTS WK/MOD ARGILLIZATION AS ABOVE. MORE WHT CLAY IN WITH SILICA VNING.
			810		811: WK PUNKY GRN CLAY SHEAR.	804.8-807.8': DECREASED SILICIFICATION. CONT'D MOD. ARGILLIZATION +/- BLCHING OF FRAGMTS. MOD DISS'D PY; WK PY VNLTS.
		807.8-817.7': DOZER WITH INTERMITTENT BRECCIA FABRIC (AUTOBRECCIA?) AS DESCRIBED ABOVE. ROCK IS WKLY MOTTLED W/ FAINT RUDDY HmOx STAINING PREFERENTIALLY IN THE MATRIX. COBWEB STRINGERS OF WAXY GRN CLY VNLTS ALSO IN MATRIX RK FLOUR. FRAGMTS ARE PALE TAN WKLY/MODLY ARGILLIZED LOCALLY PUNKY & SUBANGULAR.	820		817.7-820.4 & 828.2-835': VISIBLE SHEARING IS WK TO ABSENT; THESE ALTERED ZONE MAY NOT BE FAULT RELATED.	807.8-817.7': MOD. ARGILLIZATION OF FRAGMTS; WK GRN CLAY IN MATRIX. WK SILICA + PY VNLTS; MOD/WK WHT CLY ON FRAX.
		817.7-820.4': STR PUNKY ARGILLIZATION IN CRACKLE BRECCIATED FAULTED DOZER. LACEY SILICA + Py CRACKLE VN BRECCIA.				817.7-820.4': INTENSE ARGILLIZATN, STR. BLCHING OF WALLROCK & FRAGMTS. STR. SILICA + PY BXA VNING.
		828.2-835.0: 2ND ZONE OF STRLY ARGILLIZED & BLCHD PUNKY CRACKLE BRECCIAT'D	830		830': MOD. SHEAR AT LOW ANGLE TO C/A.	820.4-828.2': TR. WALLRK ARGILLIZATN. WK SILICA + PY VNLTS. TR WHT CLY FRAX
						828.2-835': AS FROM 817.7 TO 820.4.
			840			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2
769.1	774.1				
774.1	779.1				
779.1	784.7				
784.7	790.0				
790.0	795.6				
795.6	796.3				
796.3	798.2				
798.2	800.5				
800.5	804.8				
804.8	807.8				
807.8	812.0				
812.0	817.7				
817.7	820.4				
820.4	824.4				
824.4	828.2				
828.2	835.0				

HOLE NUMBER RS-427 PAGE 4 OF 4

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
796.2-900 DOZER		835-844.6': WKLY ARGILLIZED MASSIVE DOZER. WKLY COBWEBBED SILICA IN WALLROCK. 844.6-846.3': MOD'LY SILICAFIED CRACKLE BRECCIA IN DOZER. HEALED TO SEMI-HEALED W/ SILICA + MARC. 846.3'-849': WKLY SILICIFIED, WKLY ARGILLIZED DOZER. 849'-853.1': CRACKLE BRECCIA VNLTS. i) SILICA-CEMENTED MOSAIC BXA VN WHERE SILICA & VFG PY SOAK RK FLDR MATRIX. 853.1-862.1': WKLY/TR ARGILLIZED SOLID DOZER ~864'-866.8': SEMI-HEALED SHEAR AT LO∠ TO C/A. 866.8'-875.1': TR/WK ARGILLIZED & SOME TR. SILICIFICATION NEAR BXA ~874-875'. 875.2-880.0': SILICA-CEMENTED IRREGULAR RUBBLY BRECCIA. 880.0-884.0': MOD. VN BXA. SOME DISRUPTION OF DOZER ROCK FABRIC. 884.0-888.3': DOZER UNDISRUPTED. TR. WALLROCK ALT'N. 888.3'-895.1': BARITE TO WHT CLAY BXA VNLTS SUB-// TO C/A. WK SILICIFICATION. 895.1-900': DOZER, MASSIVE UNDISRUPTED. 900' TD.	840 850 860 870 880 890 900		~864'-866.8': SEMI-HEALED SHEAR AT 20° TO C/A. 875.1-884': SILICA + PYRITE SOAKED RK FLDDR BXA VNS AT ~10-20° TO C/A.	FROM ~843': MOD. GREASY WHT CLY ON FRAX. BRN HmOX MOTTLING. 835.0-844.6': WK-GRG PERVASIVE ARGILLIZATION + TR. BLCHING. MOD. DISS'D PY, WK SILICA + PY VNING. 844.6-846.3': SILICA-MARC VNLT STKWK IN MOD'LY/WKLY SILICIFIED DOZER. SILICIFICATION OF WALLROCK CONTINUES MODERATE DOWN TO 853.1. 850.5-853.1': SILICA CEMENTED BXA VNS IN SLIGHTLY GRNISH DOZER. +/- WHT CLAY. 853.1-862.1: SPOTTY TRACE TO WK ARGILLIZATION, WK MARC +/- SILICA & WHT CLAY VNS; WK DISS'D PY. 862.1-866.8': SPOTTY MOD. ARGILLIZATION TO SHEAR AT ~864-866.8': STR. LT GRN CLY ALT'N + BLOCK PY (MOD.) IN SHEAR. VFG PY RIMS SHEAR EDGES. 875.2-880.0': RUBBLY SEMI HEALED SILICA + FG MARC BXA. 880.0-884: WK WALLRK ARGILLIZATION, SPOTTY WK SILICA. SILICA HEALED BXA VNING. MOD/WK SILICA + MARC 884.0-888.3: INCREASING WALLROCK SILICIFICATION, MOD/WK SILICA + MARC. 888.3-~891': LATE BARITE BRECCIA VNS IN SILICIFIED DOZER. // TO C/A. CONT'D MOD/WK SILICA + MARC. 892-895.1': MOD. OPEN CRACKLE BRECCIA WKLY CEMENTED W/ SILICA, COPIOUS LATE WHT CLAY IN VUGS. 895.1'-900': MOD. Si-MARC-CLY VNING.	840.0 844.6 849.0 853.1 857.0 862.1 866.8 871.0 875.2 880.0 884.0 888.3 892.0 895.1	844.6 849.0 853.1 857.0 862.1 866.8 871.0 875.2 880.0 884.0 888.3 892.0 895.1 900.0				

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-427 DATE 03/13/98 LOGGED BY: HSM PAGE 1 OF 3

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)
650.0	660.0	97.0	98.0	50.0										
660.0	670.0	104.0	104.0	76.0										
670.0	680.0	100.0	100.0	84.0										
680.0	690.0	102.0	102.0	89.0										
690.0	700.0	102.0	102.0	79.0										
700.0	707.5	98.0	98.7	22.7										
707.5	717.8	97.1	97.1	70.9										
717.8	728.1	101.0	103.0	76.7										
728.1	733.7	91.1	91.1	67.9										
733.7	740.0	106.3	106.3	88.9										
740.0	750.0	99.0	99.0	75.0										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-427 DATE: 03/14/98 LOGGED BY: HSM PAGE 2 OF 3

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)
750.0	760.0	102.0	103.0	74.0										
760.0	770.0	100.0	100.0	85.0										
770.0	780.0	103.0	103.0	74.0										
780.0	790.0	101.0	101.0	92.0										
790.0	800.0	100.0	100.0	67.0										
800.0	810.0	101.0	101.0	52.0										
810.0	820.0	100.0	100.0	57.0										
820.0	830.0	102.0	102.0	68.0										
830.0	840.0	103.0	103.0	36.0										
840.0	850.0	102.0	102.0	97.0										
850.0	860.0	100.0	100.0	96.0										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-427 DATE: 03/16/98 LOGGED BY: AM PAGE 3 OF 3

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)
860.0	870.0	100.0	100.0	70.0										
870.0	880.0	101.0	101.0	70.0										
880.0	890.0	99.0	99.0	77.0										
890.0	900.0	104.0	104.0	82.0										
	TD													

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

Quick Log.

HOLE NUMBER RS-427 RVC PRE-COLLAR
PAGE 1 OF 4
DATE 6/23/98
LOGGED BY LDA
TOTAL DEPTH 650 RVC 900' CORE

LOCATION EAST ZONE
NORTHING
EASTING
ELEVATION
AZIMUTH VERT
INCLINATION -90

AREA EAST ZONE
DRILLING CO. EKLUND
RIG TYPE RVC
HOLE SIZE 6 1/2"
DOWN HOLE SURVEY BY WRENAU

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION CLASTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AG-SULF %	SULFATE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MIXTURE	ANALYTICAL DA: FROM	TO	W	Au
10		Col	Colluvium -																		X																			
20		TCLT																			X																			
30																					X																			
40																					X																			
50																					X																			
60																				X																				
70																					X																			
80																					X																			
90																					X																			
100																			X																					
110																																								
120																																								
130																																								
140																																								
150																																								
160																																								
170																																								
180																																								
190																																								
200																																								

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-427
PAGE 2 OF 4
DATE
LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION CLASTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AC-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOCLURE	ANALYTICAL DA: FROM	TO	W	Au
210		TCUT																																						
220																																								
230																																								
240																																								
250																																								
260																																								
270																																								
280																																								
290																																								
300																																								
310																																								
320																																								
330																																								
340																																								
350																																								
360	VITRO VITRO	VIT	CLAY - PROBABLE VITROPHYRE	S									X																											
370		FGPP	FINE-GRAINED PINK PORPHYRY																																					
380																																								
390																																								
400																																								

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-427
PAGE 3 OF 4
DATE
LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION CLASTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AC-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MIXTURE	ANALYTICAL DA: FROM	TO	W	Au
410		FGPP	Fine-Grained Pink Porphyry																																					
420																																								
430																																								
440	VITRO	VIT	Clay - Probable Vitrophyre	S									X																											
450	VITRO	VIT		S									X																											
460	D	UBUD																																						
470																																								
480	D																																							
490																																								
500	D																																							
510																																								
520	D																																							
530	D																																							
540																																								
550	D																																							
560																																								
570	D																																							
580	D																																							
590	D																																							
600																																								

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-427
PAGE 4 OF 4
DATE
LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																	MINERALIZATION									METALLURGY				ANALYTICAL DA			
						SILICIFICATION					ARGILLIC				PROPYLITIC %		POTASSIC %		OXIDATION			VIENING		SULFIDES			PY	CPY	MAR	AC-SULF	STIBNITE	BARITE	OXIDE	SULF	CARBON	MIXTURE	FROM	TO	W	Au
						5%	15%	+25%	MATRIX %	CLASTS %	5%	15%	+25%	TYPE	CHLORITE	CALCITE	K-SPAR	ALUNITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%								
610		UBUD																																						
620		PABX	Porphyritic Autobreccia.																																					
630																																								
640																																								
650		MBUD																																						
			RUC - PRE-COLLAR T.D. @ 650'																																					

American Assay Laboratories

INVOICE

Remit To: P.O. Box11530
Reno, Nevada 89510
Phone NO.: 702-356-0606
Fax No.: 702-356-1413

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV 89431

(702) 356-0606

INVOICE NO: SP 0048336-IN
INVOICE DATE: 04/09/98

INVOICE TO:
THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

CUSTOMER P.O.	PROJECT	TERMS
RS-427	DEVELOPMENT	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
15	SAMPLES RECEIVED	.00	.00
15	DRYING	1.00	15.00
15	JAW CRUSHING CHARGE	1.30	19.50
15	COARSE MILLING CHARGE	4.50	67.50
15	SPLITTING CHARGE	2.40	36.00
15	RING MILLING CHARGE	2.00	30.00
15	Au (1 A.T. FIRE ASSAY)	8.00	120.00
15	HYDROCHLORIC/NITRIC DIGESTION	2.00	30.00
15	Ag ANALYSES	1.00	15.00
1	Ag (ore grade) ANALYSES	5.00	5.00

86-5210-477
EAA

NET INVOICE:	338.00
LESS DISCOUNT:	67.60
FREIGHT:	.00
INVOICE TOTAL:	270.40

xAMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048336

American Assay Laboratories

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

CLIENT REFERENCE No: RS-427 RECEIVED : 20 MAR 1998

No. SAMPLES : 15 REPORTED : 25 MAR 1998

MAIN SAMPLE TYPE : DRILL CORE

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048336

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 25 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-427 835-840	0.025	0.029	0.09
RS-427 840.0-844.6	0.003		0.08
RS-427 844.6-849.0	0.006		0.22
RS-427 849.0-853.1	0.006		0.10
RS-427 853.1-857.0	0.005		0.09
RS-427 857.0-862.1	0.005		0.06
RS-427 862.1-866.8	0.007		0.07
RS-427 866.8-871.0	0.007		0.07
RS-427 871.0-875.~~5~~2	0.003		0.08
RS-427 875.2-880.0	0.011	0.012	0.09
RS-427 880-884	0.014		0.18
RS-427 884.0-888.3	0.013		0.13
RS-427 888.3-892.0	0.003		0.08
RS-427 892.0-895.1	0.020	0.028	4.52
RS-427 895.1-900.0	0.003		0.20

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RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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CLIENT REFERENCE No: RS-427 RECEIVED : 20 MAR 1998

No. SAMPLES : 15 REPORTED : 25 MAR 1998

MAIN SAMPLE TYPE : DRILL CORE

12

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048336

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 25 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-427 835-840	0.025	0.029	0.09
RS-427 840.0-844.6	0.003		0.08
RS-427 844.6-849.0	0.006		0.22
RS-427 849.0-853.1	0.006		0.10
RS-427 853.1-857.0	0.005		0.09
RS-427 857.0-862.1	0.005		0.06
RS-427 862.1-866.8	0.007		0.07
RS-427 866.8-871.0	0.007		0.07
RS-427 871.0-875.5 /2	0.003		0.08
RS-427 875.2-880.0	0.011	0.012	0.09
RS-427 880-884	0.014		0.18
RS-427 884.0-888.3	0.013		0.13
RS-427 888.3-892.0	0.003		0.08
RS-427 892.0-895.1	0.020	0.028	4.52
RS-427 895.1-900.0	0.003		0.20

American Assay Laboratories

INVOICE

Remit To: P.O. Box11530
Reno, Nevada 89510
Phone NO.: 702-356-0606
Fax No.: 702-356-1413

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV 89431

(702) 356-0606

INVOICE NO: SP 0048324-IN
INVOICE DATE: 03/31/98

INVOICE TO:
THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

CUSTOMER P.O.	PROJECT	TERMS
RS-427	DEVELOPMENT	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
45	SAMPLES RECEIVED	.00	.00
45	DRYING	1.00	45.00
45	JAW CRUSHING CHARGE	1.30	58.50
45	COARSE MILLING CHARGE	4.50	202.50
45	SPLITTING CHARGE	2.40	108.00
45	RING MILLING CHARGE	2.00	90.00
45	Au (1 A.T. FIRE ASSAY)	8.00	360.00
8	Au ANALYSES/GRAVIMETRIC	8.75	70.00
45	HYDROCHLORIC/NITRIC DIGESTION	2.00	90.00
45	Ag ANALYSES	1.00	45.00
1	Ag (ore grade) ANALYSES	5.00	5.00

86-5210-477
CAA

NET INVOICE:	1,074.00
LESS DISCOUNT:	214.80
FREIGHT:	.00
INVOICE TOTAL:	859.20

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ANALYSIS REPORT SP048324

American Assay Laboratories

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

CLIENT REFERENCE No: RS-427 RECEIVED : 19 MAR 1998

No. SAMPLES : 45 REPORTED : 26 MAR 1998

MAIN SAMPLE TYPE : DRILL CORE

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
AuGRAV	GRAV	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048324

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 26 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-427 650.0-655.2	0.004			0.06
RS-427 655.2-660.0	0.004			0.06
RS-427 660.0-664.5	0.003			0.05
RS-427 664.5-665.5	0.003			0.06
RS-427 665.5-670.0	0.006			0.03
RS-427 670.0-675.1	0.078		0.079	0.12
RS-427 675.1-678.7	0.002			0.05
RS-427 678.7-682.5	0.003			0.03
RS-427 682.5-686.2	0.002			0.05
RS-427 686.2-690.0	0.005			0.11
RS-427 690.0-694.7	0.004			0.39
RS-427 694.7-698.6	0.004			1.33
RS-427 698.6-703.2	0.033		0.045	23.74
RS-427 703.2-707.7	0.242		0.255	0.54
RS-427 707.7-710.3	0.053		0.047	0.84
RS-427 710.3-714.1	0.031			0.14
RS-427 714.1-719.1	0.055		0.058	0.16
RS-427 719.1-723.6	0.119		0.147	0.38
RS-427 723.6-727.1	0.017			0.19
RS-427 727.1-728.1	0.022			0.89
RS-427 728.1-731.6	0.012			0.19
RS-427 731.6-733.7	0.005			0.30
RS-427 733.7-739.6	0.029			0.21
RS-427 739.6-744.1	0.022			0.08
RS-427 744.1-749.3	0.087		0.124	0.08

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ANALYSIS REPORT SP048324

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 26 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-427 749.3-753.7	0.052		0.045	0.09
RS-427 753.7-758.7	0.011			0.26
RS-427 758.7-763.9	0.015			0.07
RS-427 763.9-769.1	0.009			0.11
RS-427 769.1-774.1	0.025	0.032		0.16
RS-427 774.1-779.1	0.016			1.12
RS-427 779.1-784.7	0.025			0.52
RS-427 784.7-790.0	0.011			0.12
RS-427 790.0-795.6	0.024			0.22
RS-427 795.6-796.3	0.006			0.13
RS-427 796.3-798.2	0.010			0.20
RS-427 798.2-800.5	0.006			0.09
RS-427 800.5-804.8	0.006			0.43
RS-427 804.8-807.8	0.027	0.019		0.09
RS-427 807.8-812.0	0.021			0.13
RS-427 812.0-817.7	0.006			0.05
RS-427 817.7-820.4	0.013			0.23
RS-427 820.4-824.4	0.005			0.10
RS-427 824.4-828.2	0.011			0.07
RS-427 828.2-835.0	0.013			0.24

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ANALYSIS REPORT SP048324

American Assay Laboratories

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN
:
:
:

CLIENT REFERENCE No: RS-427 RECEIVED : 19 MAR 1998

No. SAMPLES : 45 REPORTED : 26 MAR 1998

MAIN SAMPLE TYPE : DRILL CORE

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
AuGRAV	GRAV	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048324

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 26 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-427 650.0-655.2	0.004			0.06
RS-427 655.2-660.0	0.004			0.06
RS-427 660.0-664.5	0.003			0.05
RS-427 664.5-665.5	0.003			0.06
RS-427 665.5-670.0	0.006			0.03
RS-427 670.0-675.1	0.078		0.079	0.12
RS-427 675.1-678.7	0.002			0.05
RS-427 678.7-682.5	0.003			0.03
RS-427 682.5-686.2	0.002			0.05
RS-427 686.2-690.0	0.005			0.11
RS-427 690.0-694.7	0.004			0.39
RS-427 694.7-698.6	0.004			1.33
RS-427 698.6-703.2	0.033		0.045	23.74
RS-427 703.2-707.7	0.242		0.255	0.54
RS-427 707.7-710.3	0.053		0.047	0.84
RS-427 710.3-714.1	0.031			0.14
RS-427 714.1-719.1	0.055		0.058	0.16
RS-427 719.1-723.6	0.119		0.147	0.38
RS-427 723.6-727.1	0.017			0.19
RS-427 727.1-728.1	0.022			0.89
RS-427 728.1-731.6	0.012			0.19
RS-427 731.6-733.7	0.005			0.30
RS-427 733.7-739.6	0.029			0.21
RS-427 739.6-744.1	0.022			0.08
RS-427 744.1-749.3	0.087		0.124	0.08

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048324

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 26 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-427 749.3-753.7	0.052		0.045	0.09
RS-427 753.7-758.7	0.011			0.26
RS-427 758.7-763.9	0.015			0.07
RS-427 763.9-769.1	0.009			0.11
RS-427 769.1-774.1	0.025	0.032		0.16
RS-427 774.1-779.1	0.016			1.12
RS-427 779.1-784.7	0.025			0.52
RS-427 784.7-790.0	0.011			0.12
RS-427 790.0-795.6	0.024			0.22
RS-427 795.6-796.3	0.006			0.13
RS-427 796.3-798.2	0.010			0.20
RS-427 798.2-800.5	0.006			0.09
RS-427 800.5-804.8	0.006			0.43
RS-427 804.8-807.8	0.027	0.019		0.09
RS-427 807.8-812.0	0.021			0.13
RS-427 812.0-817.7	0.006			0.05
RS-427 817.7-820.4	0.013			0.23
RS-427 820.4-824.4	0.005			0.10
RS-427 824.4-828.2	0.011			0.07
RS-427 828.2-835.0	0.013			0.24

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048324

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413.

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

CLIENT REFERENCE No: RS-427 Cole RECEIVED : 19 MAR 1998

No. SAMPLES : 45 REPORTED : 26 MAR 1998

MAIN SAMPLE TYPE : DRILL CORE

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
AuGRAV	GRAV	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

03/30/1998 11:40 7023561413 AMERICAN ASSAY LABS PAGE 05

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048324

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 26 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	AuGRAV	Ag(OZ)	
RS-427 650.0-655.2	0.004			0.06	
RS-427 655.2-660.0	0.004			0.06	
RS-427 660.0-664.5	0.003			0.05	
RS-427 664.5-665.5	0.003			0.06	
RS-427 665.5-670.0	0.006			0.03	
RS-427 670.0-675.1	0.078		0.079	0.12	
RS-427 675.1-678.7	0.002			0.05	
RS-427 678.7-682.5	0.003			0.03	
RS-427 682.5-686.2	0.002			0.05	
RS-427 686.2-690.0	0.005			0.11	
RS-427 690.0-694.7	0.004			0.39	698.6 - 707.7 =
RS-427 694.7-698.6	0.004			1.33	
RS-427 698.6-703.2 4.6	0.033		0.045	23.74	0.136 Au
RS-427 703.2-707.7 4.5	0.242		0.255	0.54	12.27 Ag
RS-427 707.7-710.3	0.053		0.047	0.84	
RS-427 710.3-714.1	0.031			0.14	
RS-427 714.1-719.1	0.055		0.058	0.16	
RS-427 719.1-723.6	0.119		0.147	0.38	
RS-427 723.6-727.1	0.017			0.19	
RS-427 727.1-728.1	0.022			0.89	
RS-427 728.1-731.6	0.012			0.19	
RS-427 731.6-733.7	0.005			0.30	
RS-427 733.7-739.6	0.029			0.21	
RS-427 739.6-744.1	0.022			0.08	
RS-427 744.1-749.3	0.087		0.124	0.08	

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048324

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 26 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	AuGRAV	Ag(OZ)
RS-427 749.3-753.7	0.052		0.045	0.09
RS-427 753.7-758.7	0.011			0.26
RS-427 758.7-763.9	0.015			0.07
RS-427 763.9-769.1	0.009			0.11
RS-427 769.1-774.1	0.025	0.032		0.16
RS-427 774.1-779.1	0.016			1.12
RS-427 779.1-784.7	0.025			0.52
RS-427 784.7-790.0	0.011			0.12
RS-427 790.0-795.6	0.024			0.22
RS-427 795.6-796.3	0.006			0.13
RS-427 796.3-798.2	0.010			0.20
RS-427 798.2-800.5	0.006			0.09
RS-427 800.5-804.8	0.006			0.43
RS-427 804.8-807.8	0.027	0.019		0.09
RS-427 807.8-812.0	0.021			0.13
RS-427 812.0-817.7	0.006			0.05
RS-427 817.7-820.4	0.013			0.23
RS-427 820.4-824.4	0.005			0.10
RS-427 824.4-828.2	0.011			0.07
RS-427 828.2-835.0	DTF			0.24

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048336

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

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:

CLIENT REFERENCE No: RS-427 Core RECEIVED : 20 MAR 1998

No. SAMPLES : 15 REPORTED : 25 MAR 1998

MAIN SAMPLE TYPE : DRILL CORE

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048336

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 25 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-427 835-840	0.025	0.029	0.09
RS-427 840.0-844.6	0.003		0.08
RS-427 844.6-849.0	0.006		0.22
RS-427 849.0-853.1	0.006		0.10
RS-427 853.1-857.0	0.005		0.09
RS-427 857.0-862.1	0.005		0.06
RS-427 862.1-866.8	0.007		0.07
RS-427 866.8-871.0	0.007		0.07
RS-427 871.0-875.5	0.003		0.08
RS-427 875.2-880.0	0.011	0.012	0.09
RS-427 880-884	0.014		0.18
RS-427 884.0-888.3	0.013		0.13
RS-427 888.3-892.0	0.003		0.08
RS-427 892.0-895.1	0.020	0.028	4.52
RS-427 895.1-900.0	0.003		0.20

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PROVISTIONAL REPORT SP048279

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RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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NSI

CLIENT REFERENCE No: RS-427 RJC RECEIVED : 12 MAR 1998

No. SAMPLES : 66 REPORTED : 18 MAR 1998

MAIN SAMPLE TYPE : DRILL CUTTINGS

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

03/10/1998 14:40 7023561413 AMERICAN ASSAY LABS PAGE 01
7023561413

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048279

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-427 000-010	<0.001		<0.02
RS-427 010-020	<0.001		<0.02
RS-427 020-030	<0.001		0.02
RS-427 030-040	<0.001		0.05
RS-427 040-050	0.003		0.22
RS-427 050-060	<0.001		0.02
RS-427 060-070	<0.001	<0.001	0.09
RS-427 070-080	0.002		0.34
RS-427 080-090	0.003		0.48
RS-427 090-100	0.002		0.12
RS-427 100-110	<0.001		0.05
RS-427 110-120	0.001		0.06
RS-427 120-130	0.002		0.07
RS-427 130-140	<0.001		<0.02
RS-427 140-150	<0.001		0.02
RS-427 150-160	0.005	0.005	0.27
RS-427 160-170	<0.001		0.02
RS-427 170-180	<0.001		<0.02
RS-427 180-190	<0.001		<0.02
RS-427 190-200	0.003	0.003	0.11
RS-427 200-210	<0.001		<0.02
RS-427 210-220	<0.001		<0.02
RS-427 220-230	<0.001		<0.02
RS-427 230-240	<0.001		<0.02
RS-427 240-250	0.001		0.34

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048279

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-427 250-260	<0.001		<0.02
RS-427 260-270	<0.001		<0.02
RS-427 270-280	<0.001		<0.02
RS-427 280-290	<0.001	0.001	0.03
RS-427 290-300	<0.001		<0.02
RS-427 300-310	<0.001		<0.02
RS-427 310-320	<0.001		<0.02
RS-427 320-330	<0.001		<0.02
RS-427 330-340	<0.001		<0.02
RS-427 340-350	<0.001		0.02
RS-427 350-360	0.002		0.06
RS-427 360-370	0.002		0.08
RS-427 370-380	0.003		0.08
RS-427 380-390	0.002	0.001	0.09
RS-427 390-400	0.003		0.08
RS-427 400-410	0.001		0.06
RS-427 410-420	0.001		0.08
RS-427 420-430	<0.001		0.04
RS-427 430-440	0.002		0.07
RS-427 440-450	<0.001		0.03
RS-427 450-460	<0.001		0.03
RS-427 460-470	<0.001		0.03
RS-427 470-480	0.001		0.06
RS-427 480-490	0.001		0.05
RS-427 490-500	0.001		0.03

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048279

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-427 500-510	<0.001		0.02
RS-427 510-520	0.001		0.04
RS-427 520-530	0.006		0.05
RS-427 530-540	0.005		0.04
RS-427 540-550	0.006		0.17
RS-427 550-560	0.005		0.05
RS-427 560-570	0.006		0.15
RS-427 570-580	0.046		0.06
RS-427 580-590	0.008		0.20
RS-427 590-600	0.007		0.10
RS-427 600-610	0.018		0.31
RS-427 610-620	0.003		0.06
RS-427 620-630	0.002		0.04
RS-427 630-640	0.002		0.06
RS-427 640-650	0.003		0.05
27773	0.553		4.46

American Assay Laboratories

INVOICE

Remit To: P.O. Box11530
Reno, Nevada 89510
Phone NO.: 702-356-0606
Fax No.: 702-356-1413

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV 89431

(702) 356-0606

INVOICE NO: SP 0048279-IN
INVOICE DATE: 03/23/98

INVOICE TO:
THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

CUSTOMER P.O.	PROJECT	TERMS
RS-427	DEVELOPMENT	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
66	SAMPLES RECEIVED	.00	.00
65	DRYING	2.00	130.00
65	EXCESSIVE WETNESS	2.00	130.00
65	JAW CRUSHING CHARGE	2.60	169.00
65	SPLITTING CHARGE	1.80	117.00
65	FINE MILLING CHARGE	2.00	130.00
66	Au (1 A.T. FIRE ASSAY)	8.00	528.00
66	HYDROCHLORIC/NITRIC DIGESTION	2.00	132.00
66	Ag ANALYSES	1.00	66.00

86-5210-477
KA

NET INVOICE:	1,402.00
LESS DISCOUNT:	420.60
FREIGHT:	.00
INVOICE TOTAL:	981.40

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ANALYSIS REPORT SP048279

American Assay Laboratories

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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CLIENT REFERENCE No: RS-427 RECEIVED : 12 MAR 1998

No. SAMPLES : 66 REPORTED : 18 MAR 1998

MAIN SAMPLE TYPE : DRILL CUTTINGS

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-427 000-010	<0.001		<0.02
RS-427 010-020	<0.001		<0.02
RS-427 020-030	<0.001		0.02
RS-427 030-040	<0.001		0.05
RS-427 040-050	0.003		0.22
RS-427 050-060	<0.001		0.02
RS-427 060-070	<0.001	<0.001	0.09
RS-427 070-080	0.002		0.34
RS-427 080-090	0.003		0.48
RS-427 090-100	0.002		0.12
RS-427 100-110	<0.001		0.05
RS-427 110-120	0.001		0.06
RS-427 120-130	0.002		0.07
RS-427 130-140	<0.001		<0.02
RS-427 140-150	<0.001		0.02
RS-427 150-160	0.005	0.005	0.27
RS-427 160-170	<0.001		0.02
RS-427 170-180	<0.001		<0.02
RS-427 180-190	<0.001		<0.02
RS-427 190-200	0.003	0.003	0.11
RS-427 200-210	<0.001		<0.02
RS-427 210-220	<0.001		<0.02
RS-427 220-230	<0.001		<0.02
RS-427 230-240	<0.001		<0.02
RS-427 240-250	0.001		0.34

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-427 250-260	<0.001		<0.02
RS-427 260-270	<0.001		<0.02
RS-427 270-280	<0.001		<0.02
RS-427 280-290	<0.001	0.001	0.03
RS-427 290-300	<0.001		<0.02
RS-427 300-310	<0.001		<0.02
RS-427 310-320	<0.001		<0.02
RS-427 320-330	<0.001		<0.02
RS-427 330-340	<0.001		<0.02
RS-427 340-350	<0.001		0.02
RS-427 350-360	0.002		0.06
RS-427 360-370	0.002		0.08
RS-427 370-380	0.003		0.08
RS-427 380-390	0.002	0.001	0.09
RS-427 390-400	0.003		0.08
RS-427 400-410	0.001		0.06
RS-427 410-420	0.001		0.08
RS-427 420-430	<0.001		0.04
RS-427 430-440	0.002		0.07
RS-427 440-450	<0.001		0.03
RS-427 450-460	<0.001		0.03
RS-427 460-470	<0.001		0.03
RS-427 470-480	0.001		0.06
RS-427 480-490	0.001		0.05
RS-427 490-500	0.001		0.03

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-427 500-510	<0.001		0.02
RS-427 510-520	0.001		0.04
RS-427 520-530	0.006		0.05
RS-427 530-540	0.005		0.04
RS-427 540-550	0.006		0.17
RS-427 550-560	0.005		0.05
RS-427 560-570	0.006		0.15
RS-427 570-580	0.046		0.06
RS-427 580-590	0.008		0.20
RS-427 590-600	0.007		0.10
RS-427 600-610	0.018		0.31
RS-427 610-620	0.003		0.06
RS-427 620-630	0.002		0.04
RS-427 630-640	0.002		0.06
RS-427 640-650	0.003		0.05
27773	0.553		4.46

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

American Assay Laboratories

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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CLIENT REFERENCE No: RS-427 RECEIVED : 12 MAR 1998

No. SAMPLES : 66 REPORTED : 18 MAR 1998

MAIN SAMPLE TYPE : DRILL CUTTINGS

NEVADA LEGISLATIVE DISCLAIMER :-
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ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA30	15%	OPT	0.001
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SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

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CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
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SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-427 000-010	<0.001		<0.02
RS-427 010-020	<0.001		<0.02
RS-427 020-030	<0.001		0.02
RS-427 030-040	<0.001		0.05
RS-427 040-050	0.003		0.22
RS-427 050-060	<0.001		0.02
RS-427 060-070	<0.001	<0.001	0.09
RS-427 070-080	0.002		0.34
RS-427 080-090	0.003		0.48
RS-427 090-100	0.002		0.12
RS-427 100-110	<0.001		0.05
RS-427 110-120	0.001		0.06
RS-427 120-130	0.002		0.07
RS-427 130-140	<0.001		<0.02
RS-427 140-150	<0.001		0.02
RS-427 150-160	0.005	0.005	0.27
RS-427 160-170	<0.001		0.02
RS-427 170-180	<0.001		<0.02
RS-427 180-190	<0.001		<0.02
RS-427 190-200	0.003	0.003	0.11
RS-427 200-210	<0.001		<0.02
RS-427 210-220	<0.001		<0.02
RS-427 220-230	<0.001		<0.02
RS-427 230-240	<0.001		<0.02
RS-427 240-250	0.001		0.34

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

American Assay Laboratories

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PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-427

REPORTED : 18 MAR 1998

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RS-427 290-300	<0.001		<0.02
RS-427 300-310	<0.001		<0.02
RS-427 310-320	<0.001		<0.02
RS-427 320-330	<0.001		<0.02
RS-427 330-340	<0.001		<0.02
RS-427 340-350	<0.001		0.02
RS-427 350-360	0.002		0.06
RS-427 360-370	0.002		0.08
RS-427 370-380	0.003		0.08
RS-427 380-390	0.002	0.001	0.09
RS-427 390-400	0.003		0.08
RS-427 400-410	0.001		0.06
RS-427 410-420	0.001		0.08
RS-427 420-430	<0.001		0.04
RS-427 430-440	0.002		0.07
RS-427 440-450	<0.001		0.03
RS-427 450-460	<0.001		0.03
RS-427 460-470	<0.001		0.03
RS-427 470-480	0.001		0.06
RS-427 480-490	0.001		0.05
RS-427 490-500	0.001		0.03

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048279

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RS-427 510-520	0.001		0.04
RS-427 520-530	0.006		0.05
RS-427 530-540	0.005		0.04
RS-427 540-550	0.006		0.17
RS-427 550-560	0.005		0.05
RS-427 560-570	0.006		0.15
RS-427 570-580	0.046		0.06
RS-427 580-590	0.008		0.20
RS-427 590-600	0.007		0.10
RS-427 600-610	0.018		0.31
RS-427 610-620	0.003		0.06
RS-427 620-630	0.002		0.04
RS-427 630-640	0.002		0.06
RS-427 640-650	0.003		0.05
27773	0.553		4.46

SP

SUBMITTAL FORM

American Assay Laboratories

Geochemical • Environmental • Metallurgical

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Nevada 89431
Box 11530
Reno, NV 89510
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(702) 356-0606
Fax
(702) 356-1413

Tucson Office
2775 E. Ganley
Tucson, AZ 85706
Telephone
(520) 294-8078
Fax
(520) 294-6352

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

Mazatlan Office
Telephone/Fax
011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina

Company: Rosebud Mine

Address: P.O. Box 2610

City Winnemucca State NV Zip 89446

Telephone Number: (702) 623-6912 Fax Number: (702) 623-6967

Project Name: Development Purchase Order Number: _____

Date Submitted: 3/10/98 Number of Samples: _____

RESULTS REPORTED IN: ppm [ ] ppb [ ] opt [ ]

SAMPLE IDENTIFICATION	TYPE	ELEMENTS REQUIRED
RS 427 0-10' → 640-650' (65 samples)	Drill Chip	Au-Ag According to Rosebud protocol.
RS 428 0-10' → 540-550' (55 samples)		
RS429 0-10' → 590-600' (60 samples)		
RS 430 0-10' → 590-600' (60 samples)		

COARSE REJECTS (Normally Discarded After 60 Days)

[ ] Return COD after analysis complete

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month
[ ] Return COD after one month

RESULTS AND INVOICES TO BE SENT TO:

Invoice to:
Kurt Allen

Results to:
Kurt Allen

Comments:

CLIENT FILE COPY

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **ROSEBUD MINING COMPANY** *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-427

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/07/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****

PROJECTED F/860' T/900'.

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** **********
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-427

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R CLOS.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION
50.0	50.00	0.23	0.115	-89.42	338.85	0.24 N	0.09 W	1.16	0.58	0.25	AT 338.85
100.0	100.00	0.58	0.376	-89.55	359.29	0.67 N	0.19 W	0.45	0.22	0.69	AT 344.52
150.0	150.00	0.99	0.511	-89.36	309.83	1.04 N	0.40 W	0.98	0.49	1.12	AT 338.94
200.0	199.99	1.55	0.619	-89.32	334.91	1.49 N	0.74 W	0.58	0.29	1.67	AT 333.54
250.0	249.99	2.03	0.648	-89.48	289.25	1.83 N	1.08 W	0.98	0.49	2.13	AT 329.46
300.0	299.99	2.32	0.518	-89.79	283.35	1.93 N	1.39 W	0.62	0.31	2.38	AT 324.33
350.0	349.99	2.53	0.411	-89.66	286.25	1.99 N	1.62 W	0.26	0.13	2.57	AT 320.95
400.0	399.98	3.16	0.276	-88.86	303.59	2.31 N	2.17 W	1.64	0.82	3.17	AT 316.74
450.0	449.97	4.42	0.391	-88.20	325.41	3.23 N	3.03 W	1.71	0.85	4.43	AT 316.81
500.0	499.94	6.17	0.644	-87.72	315.58	4.59 N	4.18 W	1.18	0.59	6.20	AT 317.69
550.0	549.89	8.38	0.666	-87.21	309.66	6.08 N	5.81 W	1.15	0.57	8.41	AT 316.28
600.0	599.82	10.99	0.461	-86.78	305.16	7.66 N	7.89 W	0.98	0.49	11.00	AT 314.14
650.0	649.73	13.87	0.227	-86.58	308.93	9.41 N	10.20 W	0.59	0.30	13.88	AT 312.68
700.0	699.65	16.70	0.108	-86.93	309.77	11.20 N	12.39 W	0.71	0.35	16.70	AT 312.11
750.0	749.58	19.35	0.051	-87.00	311.26	12.92 N	14.40 W	0.21	0.11	19.35	AT 311.89
800.0	799.52	21.94	0.033	-87.06	311.44	14.63 N	16.35 W	0.12	0.06	21.94	AT 311.83
850.0	849.45	24.55	0.048	-86.95	312.65	16.38 N	18.29 W	0.25	0.13	24.55	AT 311.85
860.0	859.43	25.08	0.047	-87.04	310.65	16.73 N	18.68 W	1.38	0.14	25.08	AT 311.85
900.0	899.38	27.15	0.001	-87.02	310.31	18.07 N	20.26 W	0.07	0.03	27.15	AT 311.74

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   900.0 FEET EQUALS    27.15   FEET AT  311.74             *
*                          ********                         *
*************************************************************
```

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **ROSEBUD MINING COMPANY** *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-427 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/07/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****

PROJECTED F/860' T/900'.

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** ********** **
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-427 / VS 305.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION
50.0	50.00	0.14	-0.210	-89.42	338.85	0.24 N	0.09 W	1.16	0.58	0.25	AT 338.85
100.0	100.00	0.44	-0.535	-89.55	359.29	0.67 N	0.19 W	0.45	0.22	0.69	AT 344.52
150.0	150.00	0.62	-0.928	-89.36	309.83	1.04 N	0.40 W	0.98	0.49	1.12	AT 338.94
200.0	199.99	0.80	-1.463	-89.32	334.91	1.49 N	0.74 W	0.58	0.29	1.67	AT 333.54
250.0	249.99	0.88	-1.939	-89.48	289.25	1.83 N	1.08 W	0.98	0.49	2.13	AT 329.46
300.0	299.99	0.79	-2.242	-89.79	283.35	1.93 N	1.39 W	0.62	0.31	2.38	AT 324.33
350.0	349.99	0.71	-2.468	-89.66	286.25	1.99 N	1.62 W	0.26	0.13	2.57	AT 320.95
400.0	399.98	0.65	-3.106	-88.86	303.59	2.31 N	2.17 W	1.64	0.82	3.17	AT 316.74
450.0	449.97	0.91	-4.339	-88.20	325.41	3.23 N	3.03 W	1.71	0.85	4.43	AT 316.81
500.0	499.94	1.36	-6.053	-87.72	315.58	4.59 N	4.18 W	1.18	0.59	6.20	AT 317.69
550.0	549.89	1.64	-8.243	-87.21	309.66	6.08 N	5.81 W	1.15	0.57	8.41	AT 316.28
600.0	599.82	1.75	-10.860	-86.78	305.16	7.66 N	7.89 W	0.98	0.49	11.00	AT 314.14
650.0	649.73	1.85	-13.752	-86.58	308.93	9.41 N	10.20 W	0.59	0.30	13.88	AT 312.68
700.0	699.65	2.07	-16.575	-86.93	309.77	11.20 N	12.39 W	0.71	0.35	16.70	AT 312.11
750.0	749.58	2.32	-19.209	-87.00	311.26	12.92 N	14.40 W	0.21	0.11	19.35	AT 311.89
800.0	799.52	2.61	-21.784	-87.06	311.44	14.63 N	16.35 W	0.12	0.06	21.94	AT 311.83
850.0	849.45	2.93	-24.377	-86.95	312.65	16.38 N	18.29 W	0.25	0.13	24.55	AT 311.85
860.0	859.43	2.99	-24.897	-87.04	310.65	16.73 N	18.68 W	1.38	0.14	25.08	AT 311.85
900.0	899.38	3.19	-26.960	-87.02	310.31	18.07 N	20.26 W	0.07	0.03	27.15	AT 311.74

```
*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   900.0 FEET EQUALS     27.15   FEET AT  311.74            *
*                         ********                          *
*************************************************************
```

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-427 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/07/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****

PROJECTED F/860' T/900'.

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** ********** **
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311

WELL NAME: RS-427 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION
50.0	50.00	-0.21	-0.141	-89.42	338.85	0.24 N	0.09 W	1.16	0.58	0.25	AT 338.85
100.0	100.00	-0.53	-0.441	-89.55	359.29	0.67 N	0.19 W	0.45	0.22	0.69	AT 344.52
150.0	150.00	-0.93	-0.624	-89.36	309.83	1.04 N	0.40 W	0.98	0.49	1.12	AT 338.94
200.0	199.99	-1.46	-0.796	-89.32	334.91	1.49 N	0.74 W	0.58	0.29	1.67	AT 333.54
250.0	249.99	-1.94	-0.882	-89.48	289.25	1.83 N	1.08 W	0.98	0.49	2.13	AT 329.46
300.0	299.99	-2.24	-0.787	-89.79	283.35	1.93 N	1.39 W	0.62	0.31	2.38	AT 324.33
350.0	349.99	-2.47	-0.705	-89.66	286.25	1.99 N	1.62 W	0.26	0.13	2.57	AT 320.95
400.0	399.98	-3.11	-0.645	-88.86	303.59	2.31 N	2.17 W	1.64	0.82	3.17	AT 316.74
450.0	449.97	-4.34	-0.907	-88.20	325.41	3.23 N	3.03 W	1.71	0.85	4.43	AT 316.81
500.0	499.94	-6.05	-1.363	-87.72	315.58	4.59 N	4.18 W	1.18	0.59	6.20	AT 317.69
550.0	549.89	-8.24	-1.645	-87.21	309.66	6.08 N	5.81 W	1.15	0.57	8.41	AT 316.28
600.0	599.82	-10.86	-1.748	-86.78	305.16	7.66 N	7.89 W	0.98	0.49	11.00	AT 314.14
650.0	649.73	-13.75	-1.854	-86.58	308.93	9.41 N	10.20 W	0.59	0.30	13.88	AT 312.68
700.0	699.65	-16.57	-2.067	-86.93	309.77	11.20 N	12.39 W	0.71	0.35	16.70	AT 312.11
750.0	749.58	-19.21	-2.321	-87.00	311.26	12.92 N	14.40 W	0.21	0.11	19.35	AT 311.89
800.0	799.52	-21.78	-2.608	-87.06	311.44	14.63 N	16.35 W	0.12	0.06	21.94	AT 311.83
850.0	849.45	-24.38	-2.929	-86.95	312.65	16.38 N	18.29 W	0.25	0.13	24.55	AT 311.85
860.0	859.43	-24.90	-2.990	-87.04	310.65	16.73 N	18.68 W	1.38	0.14	25.08	AT 311.85
900.0	899.38	-26.96	-3.187	-87.02	310.31	18.07 N	20.26 W	0.07	0.03	27.15	AT 311.74

```
*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   900.0 FEET EQUALS     27.15   FEET AT   311.74           *
*                         ********                          *
*************************************************************
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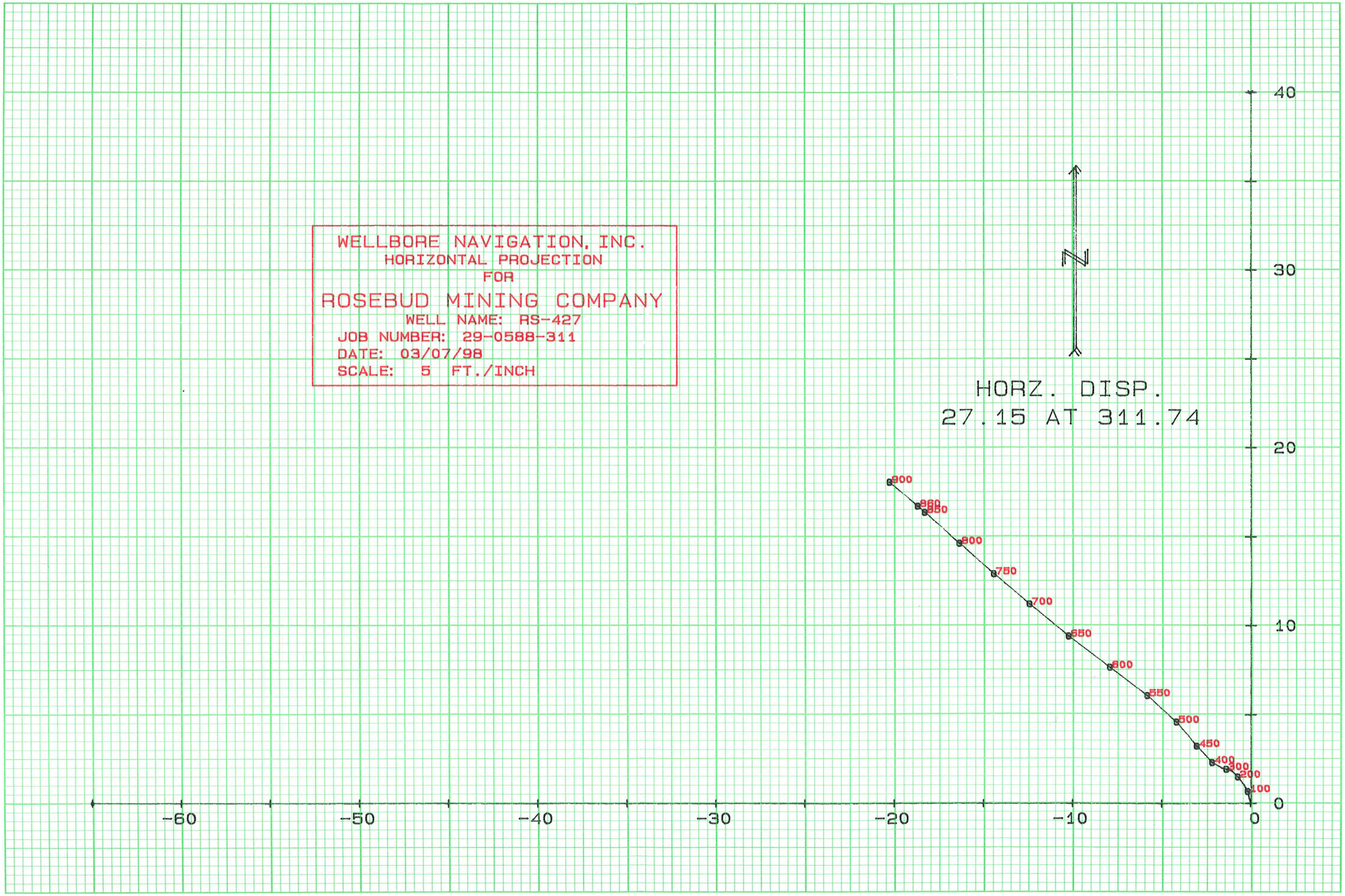
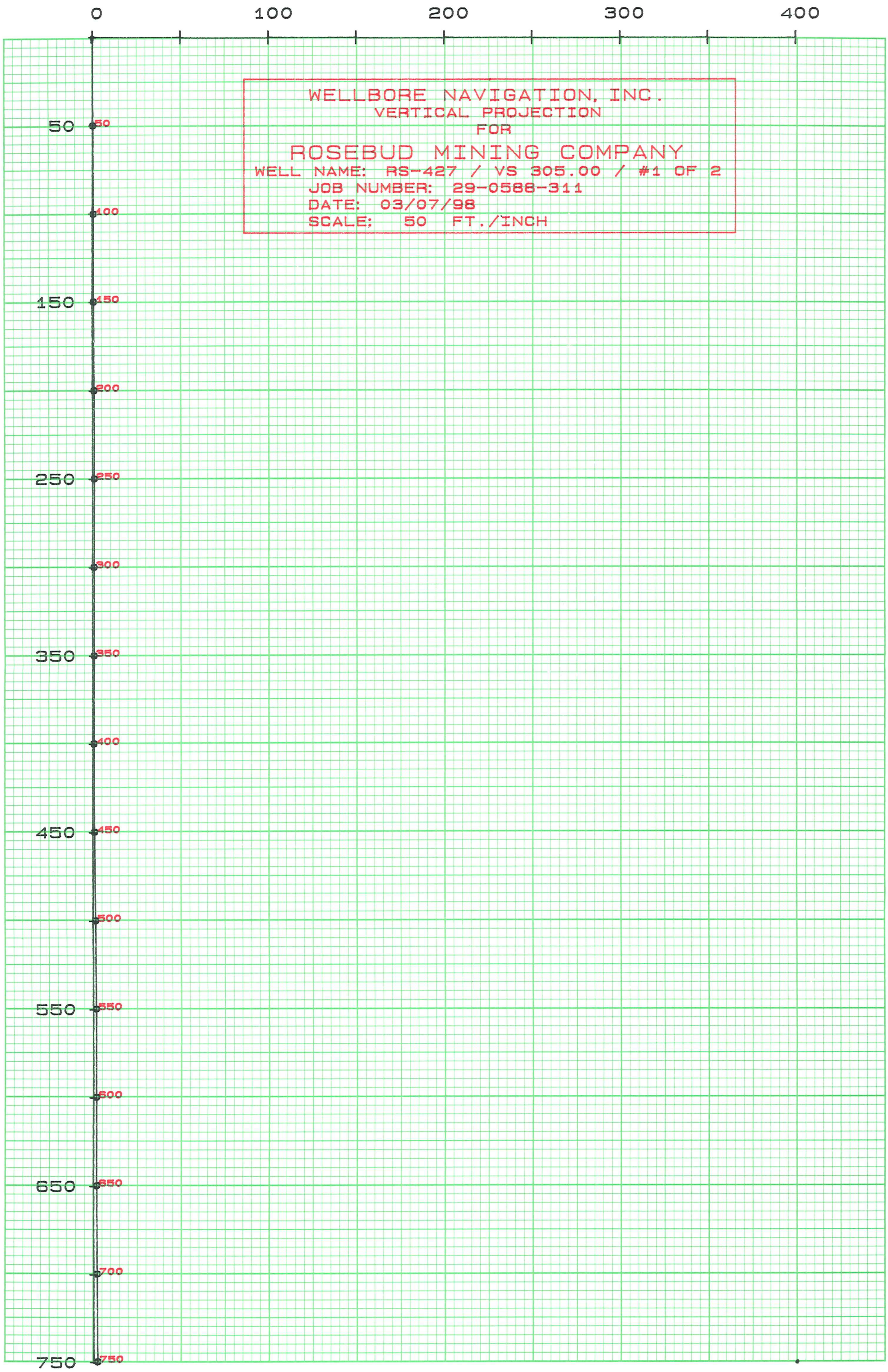
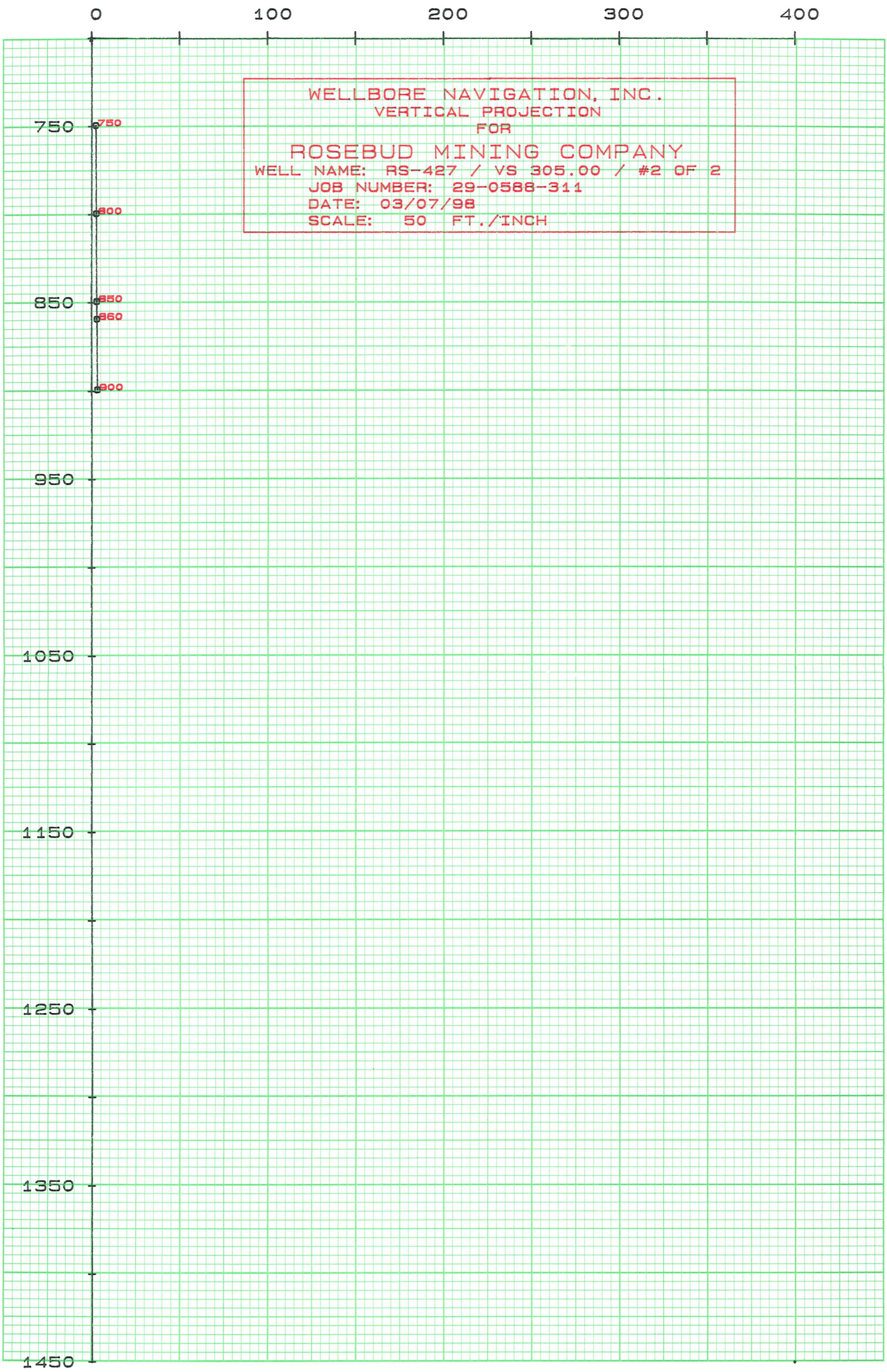


STARLIGHT PRINTING (801) 487-2841

STARLIGHT PRINTING (801) 467-2841

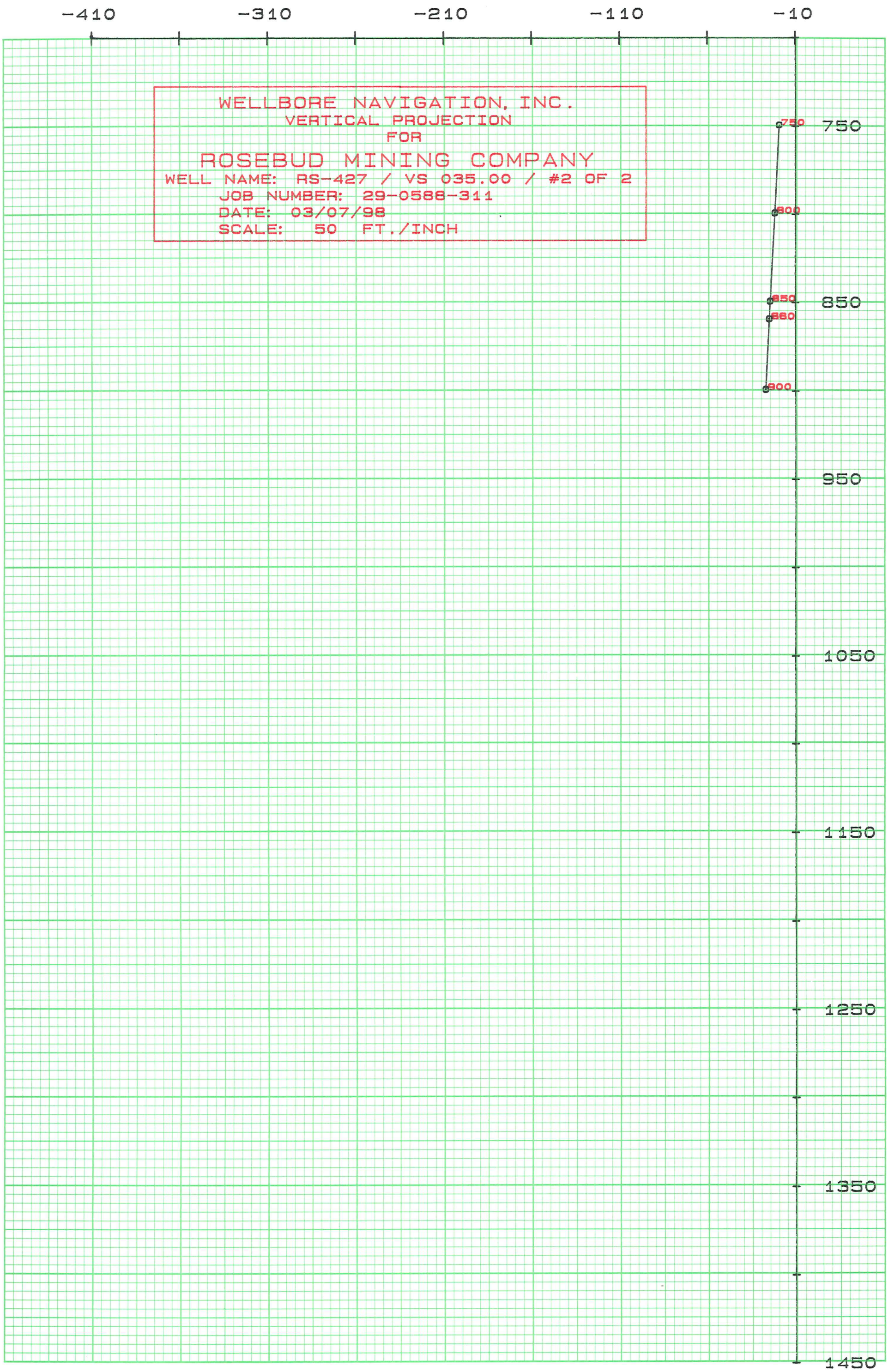


STARLIGHT PRINTING (801) 467-2841



STARLIGHT PRINTING (801) 467-2841

STARLIGHT PRINTING (801) 467-2841



SP

SUBMITTAL FORM

American Assay Laboratories

Geochemical • Environmental • Metallurgical

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 11530
Reno, NV 89510
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(520) 294-6352

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Nevada 89801
Box 2908
Elko, NV 89801
Telephone
(702) 738-9100
Fax
(702) 738-2594

Mazatlan Office
Telephone/Fax
011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina

Company: ROSEBUD MINING CO LLT

Address: P.O. BOX 2610

City WINNEMUCCA State NV Zip 89820

Telephone Number: (702) 623-6912 Fax Number: (702) 623-6967

Project Name: DEVELOPMENT Purchase Order Number:

Date Submitted: 03/18/98 Number of Samples: 45

RESULTS REPORTED IN: ppm [ ] ppb [ ] opt [X]

RS-427 SAMPLE IDENTIFICATION			TYPE	ELEMENTS REQUIRED
650.0-655.2	710.3-714.1	774.1-779.1	CORE	AU-AG ACCORDING TO
655.2-660.0	714.1-719.1	779.1-784.7		ROSEBUD MINE PROTOCOL
660.0-664.5	719.1-723.6	784.7-790.0		
664.5-665.5	723.6-727.1	790.0-795.6		
665.5-670.0	727.1-728.1	795.6-796.3		
670.0-675.1	728.1-731.6	796.3-798.2		
675.1-678.7	731.6-733.7	798.2-800.5		
678.7-682.5	733.7-739.6	800.5-804.8		
682.5-686.2	739.6-744.1	804.8-807.8		
686.2-690.0	744.1-749.3	807.8-812.0		
690.0-694.7	749.3-753.7	812.0-817.7		
694.7-698.6	753.7-758.7	817.7-820.4		
698.6-703.2	758.7-763.9	820.4-824.4		
703.2-707.7	763.9-769.1	824.4-828.2		
707.7-710.3	769.1-774.1	828.2-835.0		

COARSE REJECTS (Normally Discarded After 60 Days)

[ ] Return COD after analysis complete

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month
[ ] Return COD after one month

RESULTS AND INVOICES TO BE SENT TO:

Invoice to:

KURT ALLEN

Results to:

KURT ALLEN

Comments:

CLIENT FILE COPY

SP

SUBMITTAL FORM

American Assay Laboratories

Geochemical • Environmental • Metallurgical

Sparks Office
1500 Glendale Ave.
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Reno, NV 89510
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Elko, NV 89801
Telephone
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Fax
(702) 738-2594

Mazatlan Office
Telephone/Fax
011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina

Company: Rosebud Mining Co. LLT

Address: P.O. Box 2610

City Winnemucca State NV Zip 89446

Telephone Number: (702) 623-6912 Fax Number: (702) 623-6967

Project Name: Development Purchase Order Number:

Date Submitted: 03/18/98 Number of Samples: 15

RESULTS REPORTED IN: ppm [ ] ppb [ ] opt [X]

RS-427 SAMPLE IDENTIFICATION	TYPE	ELEMENTS REQUIRED
835.0-840.0	Core	Au-Ag According to
840.0-844.6		Rosebud Mine Protocol
844.6-849.0		
849.0-853.1		
853.1-857.0		
857.0-862.1		
862.1-866.8		
866.8-871.0		
871.0-875.5		
875.2-880.0		
880.0-884.0		
884.0-888.3		
888.3-892.0		
892.0-895.1		
895.1-900.0		

COARSE REJECTS (Normally Discarded After 60 Days)

[ ] Return COD after analysis complete

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month

[ ] Return COD after one month

RESULTS AND INVOICES TO BE SENT TO:

Invoice to:

Kurt Allen

Results to:

Kurt Allen

Comments:

CLIENT FILE COPY

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **ROSEBUD MINING** *
****

JOB NUMBER: 29- -311

WELL NAME: RS-427

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/05/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WATER CONTACT= 604'

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **
NOTE: NEW DECLINATION
15.7 DEG..

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
** **
** **
** ********** **
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

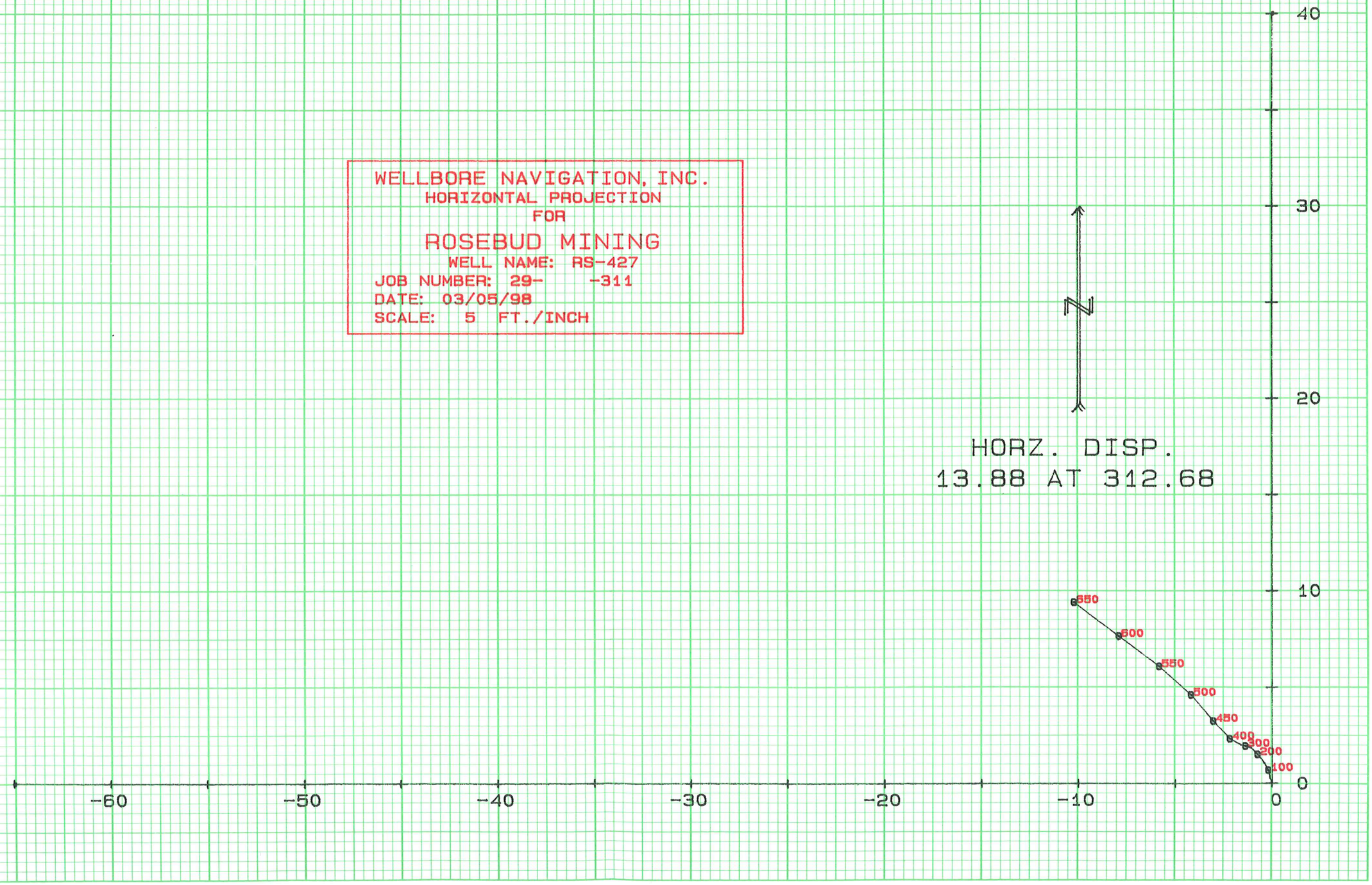
JOB NUMBER: 29- -311 WELL NAME: RS-427

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R CLOS.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG F
50.0	50.00	0.23	0.112	-89.42	338.85	0.24 N	0.09 W	1.16	0.58	0.25	AT 338.85	060.82
100.0	100.00	0.59	0.366	-89.55	359.29	0.67 N	0.19 W	0.45	0.22	0.69	AT 344.52	060.70
150.0	150.00	1.00	0.495	-89.36	309.83	1.04 N	0.40 W	0.98	0.49	1.12	AT 338.94	060.65
200.0	199.99	1.56	0.593	-89.32	334.91	1.49 N	0.74 W	0.58	0.29	1.67	AT 333.54	060.49
250.0	249.99	2.04	0.615	-89.48	289.25	1.83 N	1.08 W	0.98	0.49	2.13	AT 329.46	060.58
300.0	299.99	2.33	0.480	-89.79	283.35	1.93 N	1.39 W	0.62	0.31	2.38	AT 324.33	060.78
350.0	349.99	2.54	0.369	-89.66	286.25	1.99 N	1.62 W	0.26	0.13	2.57	AT 320.95	060.95
400.0	399.98	3.16	0.224	-88.86	303.59	2.31 N	2.17 W	1.64	0.82	3.17	AT 316.74	061.22
450.0	449.97	4.42	0.319	-88.20	325.41	3.23 N	3.03 W	1.71	0.85	4.43	AT 316.81	061.54
500.0	499.94	6.18	0.542	-87.72	315.58	4.59 N	4.18 W	1.18	0.59	6.20	AT 317.69	062.06
550.0	549.89	8.39	0.528	-87.21	309.66	6.08 N	5.81 W	1.15	0.57	8.41	AT 316.28	062.52
600.0	599.82	11.00	0.280	-86.78	305.16	7.66 N	7.89 W	0.98	0.49	11.00	AT 314.14	064.16
650.0	649.73	13.88	-0.001	-86.58	308.93	9.41 N	10.20 W	0.59	0.30	13.88	AT 312.68	065.31

****
* ******** *
* THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF *
* ******** *
* 650.0 FEET EQUALS 13.88 FEET AT 312.68 *
* ******** *
****

WELLBORE NAVIGATION, INC.
HORIZONTAL PROJECTION
FOR
ROSEBUD MINING
WELL NAME: RS-427
JOB NUMBER: 29- -311
DATE: 03/05/98
SCALE: 5 FT./INCH



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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **ROSEBUD MINING** *
****

JOB NUMBER: 29- -311

WELL NAME: RS-427 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/05/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00
WATER CONTACT= 604'

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **
NOTE: NEW DECLINATION
15.7 DEG..

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** **********
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29- -311 WELL NAME: RS-427 / VS 305.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG F
50.0	50.00	0.14	-0.210	-89.42	338.85	0.24 N	0.09 W	1.16	0.58	0.25	AT 338.85	060.82
100.0	100.00	0.44	-0.535	-89.55	359.29	0.67 N	0.19 W	0.45	0.22	0.69	AT 344.52	060.70
150.0	150.00	0.62	-0.928	-89.36	309.83	1.04 N	0.40 W	0.98	0.49	1.12	AT 338.94	060.65
200.0	199.99	0.80	-1.463	-89.32	334.91	1.49 N	0.74 W	0.58	0.29	1.67	AT 333.54	060.49
250.0	249.99	0.88	-1.939	-89.48	289.25	1.83 N	1.08 W	0.98	0.49	2.13	AT 329.46	060.58
300.0	299.99	0.79	-2.242	-89.79	283.35	1.93 N	1.39 W	0.62	0.31	2.38	AT 324.33	060.78
350.0	349.99	0.71	-2.468	-89.66	286.25	1.99 N	1.62 W	0.26	0.13	2.57	AT 320.95	060.95
400.0	399.98	0.65	-3.106	-88.86	303.59	2.31 N	2.17 W	1.64	0.82	3.17	AT 316.74	061.22
450.0	449.97	0.91	-4.339	-88.20	325.41	3.23 N	3.03 W	1.71	0.85	4.43	AT 316.81	061.54
500.0	499.94	1.36	-6.053	-87.72	315.58	4.59 N	4.18 W	1.18	0.59	6.20	AT 317.69	062.06
550.0	549.89	1.64	-8.243	-87.21	309.66	6.08 N	5.81 W	1.15	0.57	8.41	AT 316.28	062.52
600.0	599.82	1.75	-10.860	-86.78	305.16	7.66 N	7.89 W	0.98	0.49	11.00	AT 314.14	064.16
650.0	649.73	1.85	-13.752	-86.58	308.93	9.41 N	10.20 W	0.59	0.30	13.88	AT 312.68	065.31

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   650.0 FEET EQUALS    13.88    FEET AT  312.68           *
*                          ********                         *
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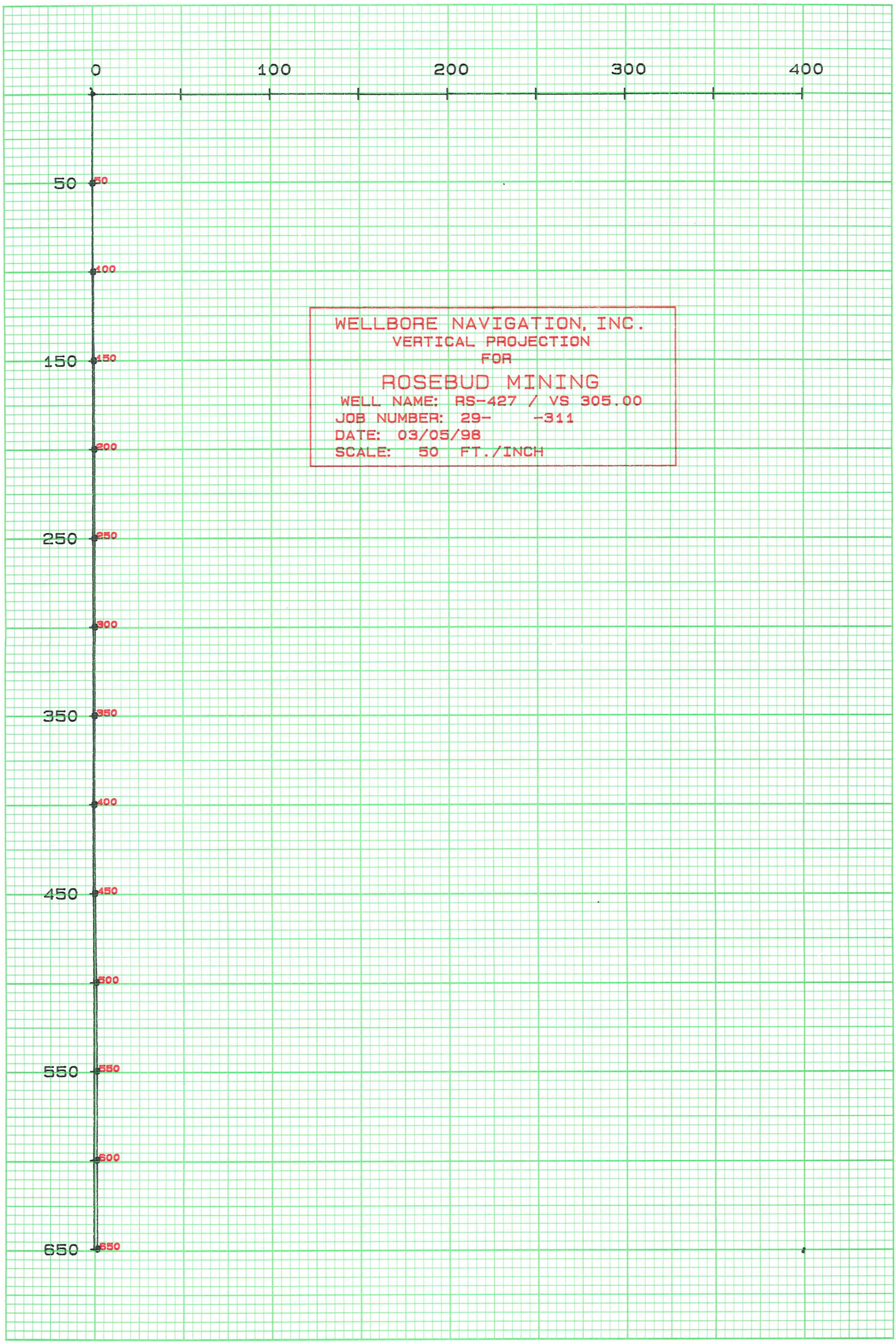

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **ROSEBUD MINING** *
****

JOB NUMBER: 29- -311

WELL NAME: RS-427 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/05/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 604'

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **
NOTE: NEW DECLINATION
15.7 DEG..

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** **********
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29- -311 WELL NAME: RS-427 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG F
50.0	50.00	-0.21	-0.141	-89.42	338.85	0.24 N	0.09 W	1.16	0.58	0.25	AT 338.85	060.82
100.0	100.00	-0.53	-0.441	-89.55	359.29	0.67 N	0.19 W	0.45	0.22	0.69	AT 344.52	060.70
150.0	150.00	-0.93	-0.624	-89.36	309.83	1.04 N	0.40 W	0.98	0.49	1.12	AT 338.94	060.65
200.0	199.99	-1.46	-0.796	-89.32	334.91	1.49 N	0.74 W	0.58	0.29	1.67	AT 333.54	060.49
250.0	249.99	-1.94	-0.882	-89.48	289.25	1.83 N	1.08 W	0.98	0.49	2.13	AT 329.46	060.58
300.0	299.99	-2.24	-0.787	-89.79	283.35	1.93 N	1.39 W	0.62	0.31	2.38	AT 324.33	060.78
350.0	349.99	-2.47	-0.705	-89.66	286.25	1.99 N	1.62 W	0.26	0.13	2.57	AT 320.95	060.95
400.0	399.98	-3.11	-0.645	-88.86	303.59	2.31 N	2.17 W	1.64	0.82	3.17	AT 316.74	061.22
450.0	449.97	-4.34	-0.907	-88.20	325.41	3.23 N	3.03 W	1.71	0.85	4.43	AT 316.81	061.54
500.0	499.94	-6.05	-1.363	-87.72	315.58	4.59 N	4.18 W	1.18	0.59	6.20	AT 317.69	062.06
550.0	549.89	-8.24	-1.645	-87.21	309.66	6.08 N	5.81 W	1.15	0.57	8.41	AT 316.28	062.52
600.0	599.82	-10.86	-1.747	-86.78	305.16	7.66 N	7.89 W	0.98	0.49	11.00	AT 314.14	064.16
650.0	649.73	-13.75	-1.854	-86.58	308.93	9.41 N	10.20 W	0.59	0.30	13.88	AT 312.68	065.31

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   650.0 FEET EQUALS    13.88    FEET AT  312.68           *
*                         ********                          *
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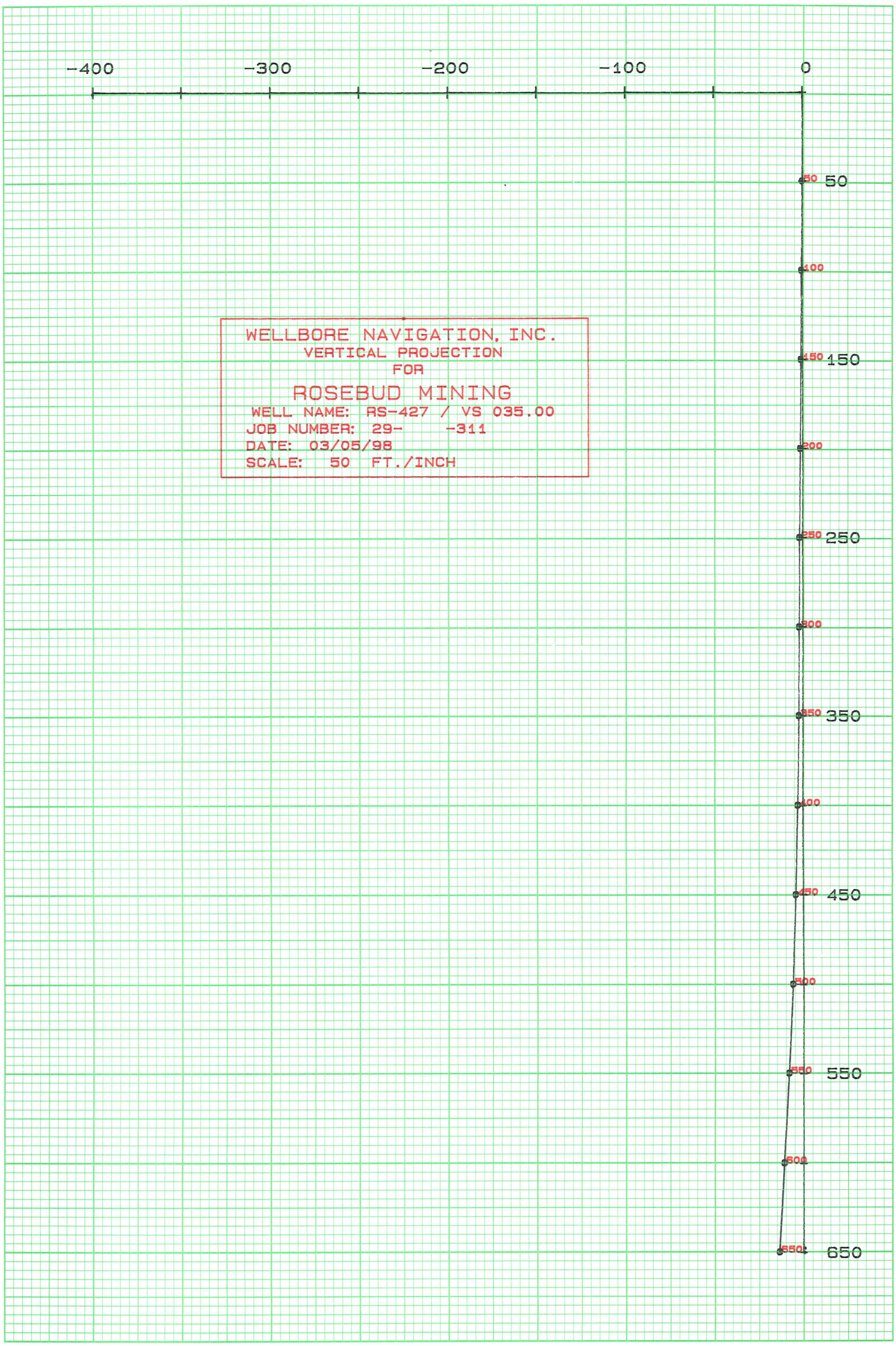


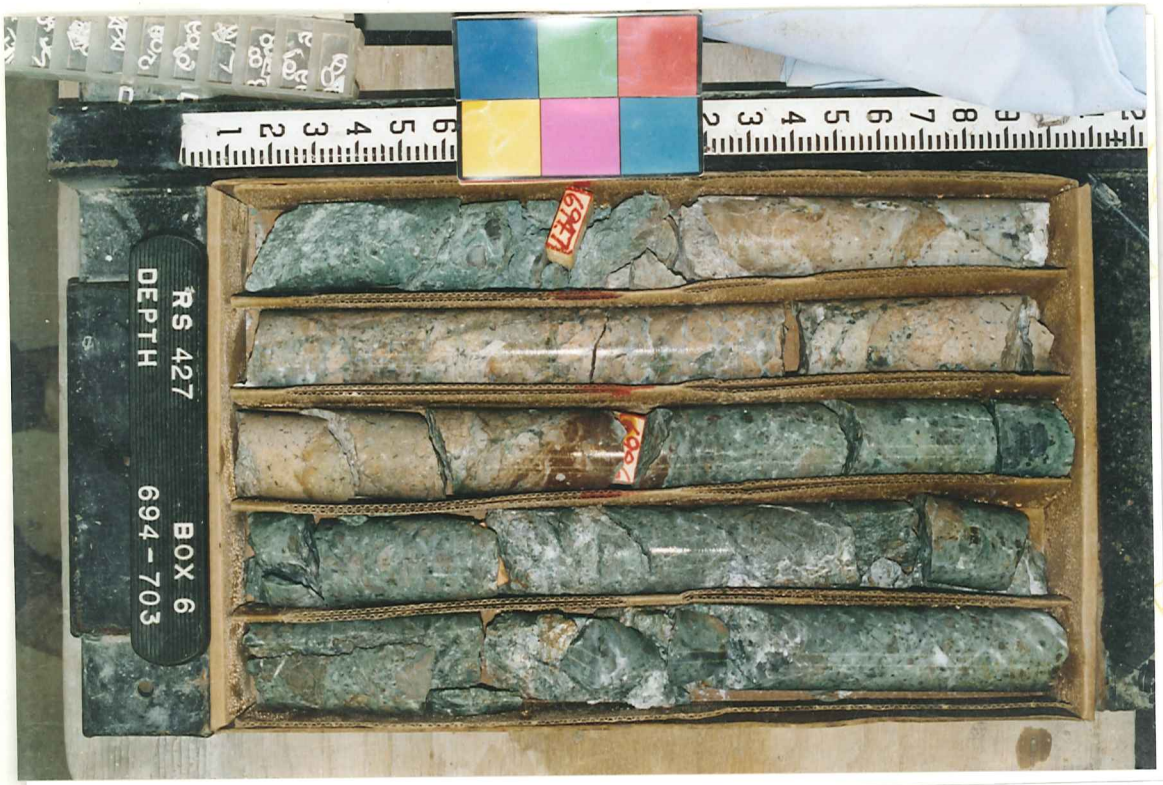
6552
RS 427
DEPTH
BOX 1
650 - 659

6545
660
6555
RS 427
DEPTH
BOX 2
659 - 667.5

RS 427
DEPTH
BOX 3
667.5 - 677
670
6751

680.0
678.7
RS 427
DEPTH
BOX 4
677 - 686

686.2
690.0
RS 427
DEPTH
BOX 5
686 - 694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DEPTH
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694 - 703

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707.7
707.5
710.3
RS 427
BOX 7
DEPTH
703-712

714.1
719.1
717.8
RS 427
BOX 8
DEPTH
712-721

723.6
728.1
722.1
RS 427
BOX 9
DEPTH
721-728.3

7396
RS 427
BOX 10
DEPTH
728.3-739.3

7441
740
RS 427
BOX 10
DEPTH
739.3-749.3

740
7441
RS 427
BOX 11
DEPTH
739.3-749.3

753.7
749.3
RS 427
BOX 11
DEPTH
749.3-756.5

753.7
749.3
RS 427
BOX 12
DEPTH
749.3-756.5

RS 427
BOX 13
DEPTH
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758.1
760
763.9

RS 427
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RS 427
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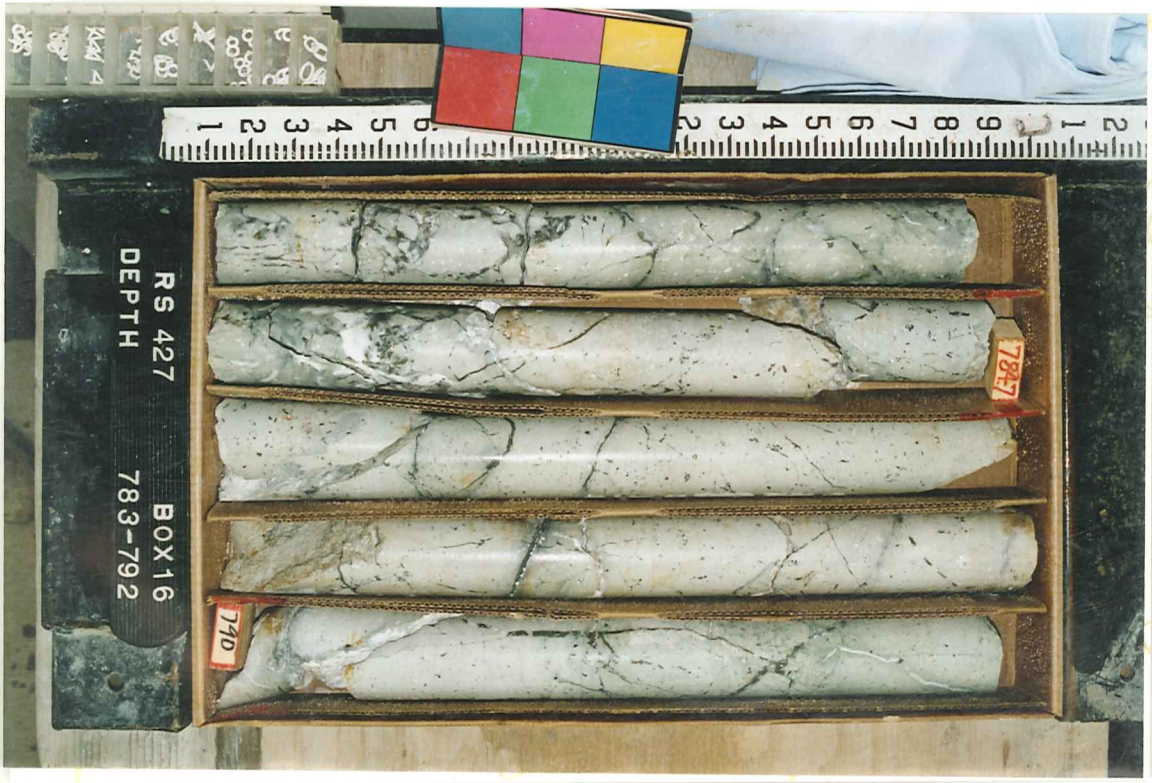
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RS 427
DEPTH
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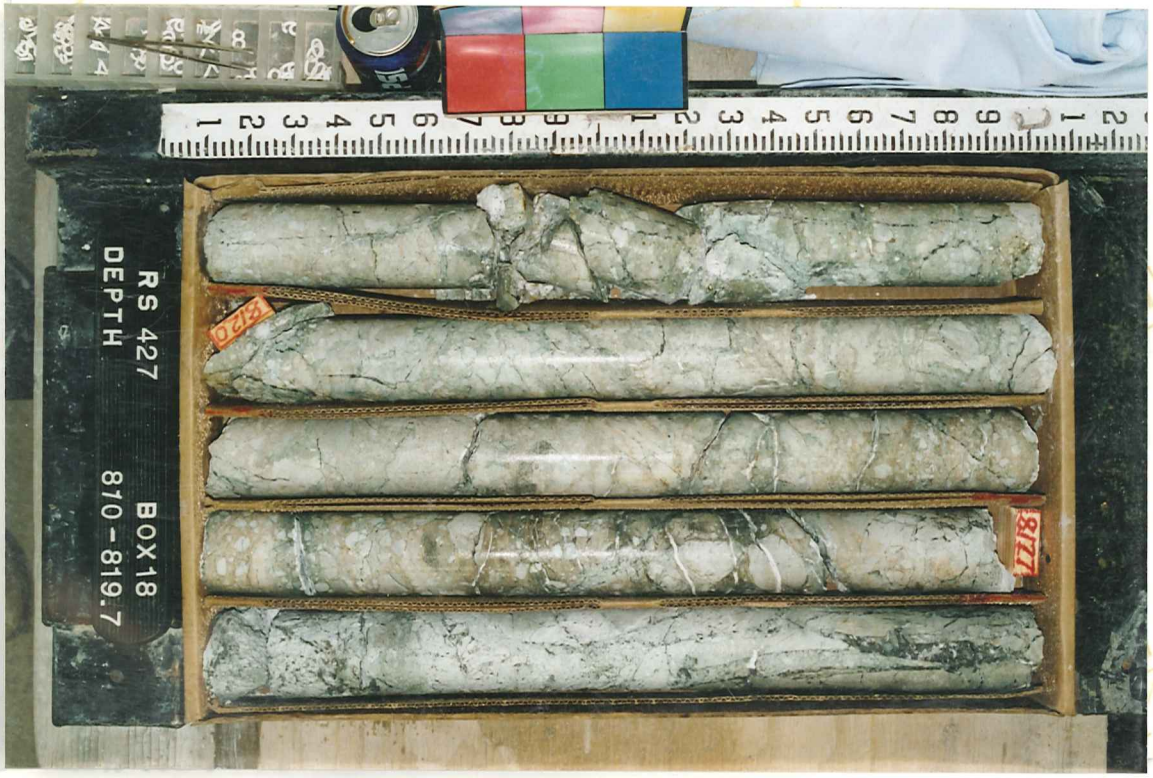
804.8
807.8
810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DEPTH
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RS 427
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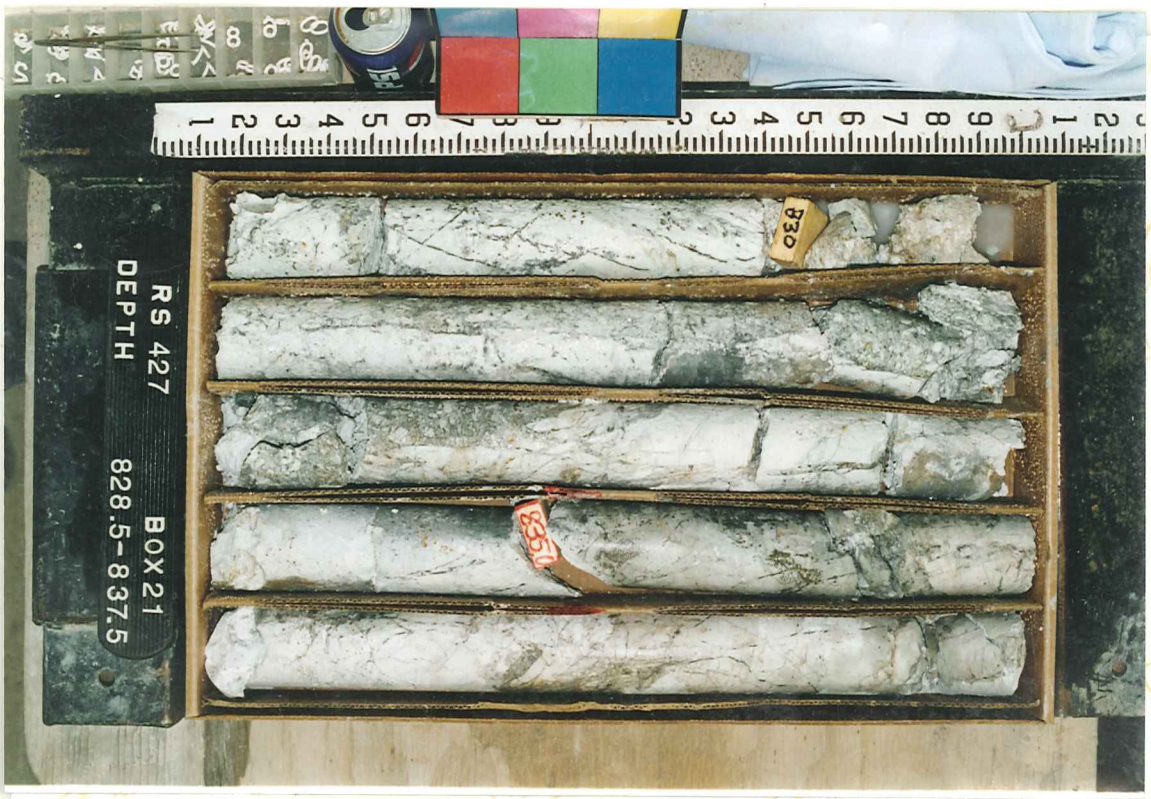
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BOX 21
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RS 427
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BOX 23
846.5-855.5

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862.0
RS 427
DEPTH
BOX 23
855.5-865

RS 427
DEPTH
BOX24
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860.0
862

RS 427
DEPTH
BOX 25
865-874
866.8
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BOX 27
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RS 427
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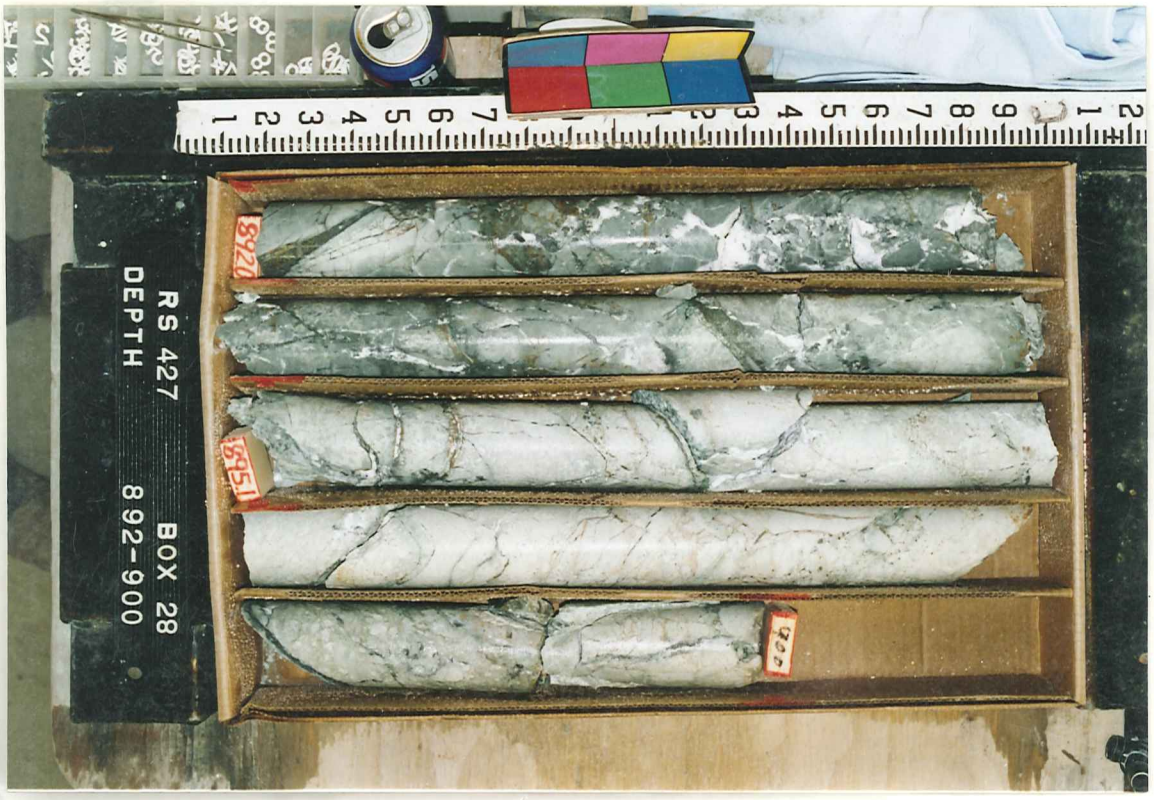
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