60000544

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-437
AUTHOR	K. Allen; S King; M. Jex; V. Reid; D. White
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, Hecla Mining Co; Rosebud Project; Rosebud Mining Co. LLC
COMMODITY If not obvious	gold; silver
NOTES	drill logs; assay; geology; photographs; geochemistry; total depth 900'; invoices 74 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)

SS: DD 3/19/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

RS-437

6000 0544
4010

6000 0544

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

Hecla MINING COMPANY

ROSEBUD PROJECT DIAMOND DRILL LOG

HOLE NUMBER	RS-437	LOCATION		REMARKS	RC PILOTED TO 650'
PAGE 1 OF 4		NORTHING			
DATE	04/16/98	EASTING			
LOGGED BY	JRM	ELEVATION			
SCALE	1" = 10'	AZIMUTH	—		
TOTAL DEPTH	900'	INCLINATION	-90°		

LITH.	OX / RED.	LITHOLOGY (CORE POINT: 650)	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
650.0-658.2 UPPER BOD		650.0'-658.2': DULL SPECKLED DARK TO MEDIUM-GRN STRONGLY CLAY-ALTERED LAPILLI TUFF. LAPILLI FRAGMTS VARY IN SIZE FROM PEBBLE TO VERY COARSE SAND. 651.5'-655': ANOMALOUS DULL BRN BRECCIA? OR WELDED SUB-UNIT IN THE LAPILLI ASH TUFF. LESS ARGILLIZED.	650			650.0-655.0': MOD. PY VNLTS, WK DISS'D PYRITE. STR. GRN CLAY ALTN. 655.0-658.2: STR. PYRITE BLEBS & VNLTS, STR. GRN CLAY ALTERATION.
658.2-725.9' BMB	PORPHYRY	658.2': VERY SHARP, VERY IRREGULAR CONTACT WITH THE BMB. NOT FAULTED. APPEARANCE OF AN INTRUSIVE CHILL MARGIN. TOP OF BMB IS NOT NOTICEABLY FINER GRAINED THAN INTERIOR HOWEVER. 658.2'-721.7': TAN TO RUDDY-TAN APHANITIC GROUNDMASS. FLECKED WITH SLIGHTLY RESORBED PLAG PHENO CRYSTS NOW ALTERED TO FRIABLE WHITE CLAY + PYRITE/MARCASITE.	660		~668-671.8': MOD/STR BROKEN ZONE	658.2-667.3': TR. ARG, MOD. RUDDINESS IN GROUNDMASS. WHT CLAY + PY OR WAXY GRN CLAY IN PHENO SITES. DOMINANTLY PLAG. MOD/WK BARITE + SILICA + MARC PY ON FRAX, AS VNS. GRN CLAY SELVAGES ON SOME FRAX + FeOx.
			670			667.3-680.9': SILICA + MARC + BARITE +/- WHT CLAY ON VNS & FRAX. GRN ~~SELVAGE~~ CLAY HALOS ON THIN PYRITIC FRAX.
			680			680.9-721.7': AS ABOVE, LARGELY
			690		~694'-700': HEALED, WK SHEAR TEXTURES, MYLONITE & CRACKLE BRECCIA IN UNDISTURBED DIKE	FROM 689': DK GRN CHL?/CLAY SELVAGES APPEAR ON PY VNS. ~686-702': PYRITE + PUNKY LT. GRN ARGILLIC BLEBS MOD. IN GROUNDMASS.
			700			

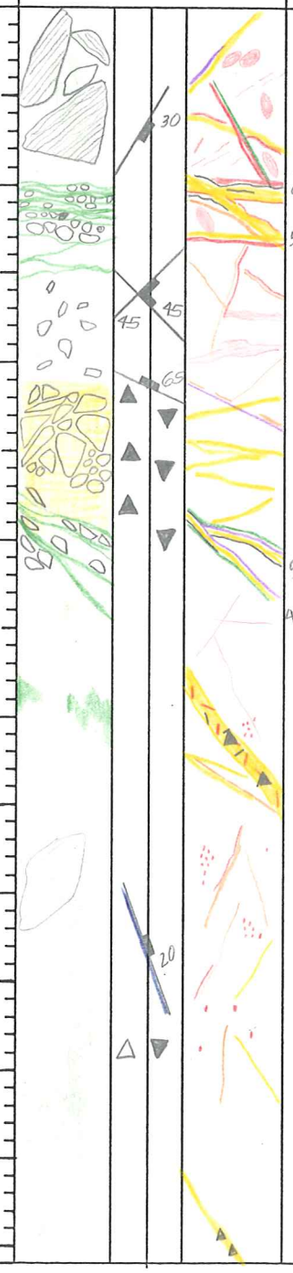
ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag
650.0	654.2					
654.2	658.2					
658.2	662.2					
662.2	667.3					
667.3	672.1					
672.1	676.9					
676.9	680.9					
680.9	686.2					
686.2	691.1					
691.1	696.1					
696.1	701.6					

HOLE NUMBER RS-437 PAGE 2 OF 4

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
650.0 - 725.9' BMB PORPHYRY		721.7-725.9': DARKER DULLER TAN PORPHYRY DIKE IS WKLY TO MODLY SILICIFIED & INTERMITTENTLY CATACLASTIC IN TEXTURE. GRY SILICA VNLTS AT HI ∠'S TO C/A.	700 710 720	75 90 55	~710-712': WK CRACKLE BRECCIA MDN, SEMI-HEALED. FROM ~ 714': FAINT BACKGROUND MYLONITE OR SHEAR TEXTURE AT HI ∠'S TO C/A. 721.7-725.9': STRLY BROKEN TO 723.5' WHERE MILLED SILICIFIED GRIT IS PACKED IN CRM CLAY GOUGE. THIS UNHEALED FAULTING OVERPRINTS A SILICIFIED CATACLASIS THAT EXTENDS TO ~ 725'	680.9-721.7': TRACE ARG. IN GROUNDMASS. STR. WHT CLAY + PY OR WAXY GRN CLAY IN PHENOCRYST SITES. WK SILICA + PY & PY VNLTS W/ GRN HALOS. BELOW 712': GRN & WHT CLAY SELVAGES ON PY VNLTS. 721.7-725.9': MOD/WK PERVASIVE SILICIFICATN, MOD. GRY SILICA + MARC +/- WHT CLAY & BARITE(?)
		725.9': ABRUPT CONTACT LOST IN BROKEN ZONE				
725.9'- 739.4' SOUTH RIDGE FAULT		727.5-729.1': HETEROLITHIC, MATRIX-SUPPORTED FLT BRECCIA WITH A SPECKLED GRN BLD-DERIVED MATRIX COMPRISING 60-70% BY VOLUME.	730			725.9-729.1': STR GRN CLAY ALT'N IS OVERPRINTED W/ MOD/STR PERVASIVE SILICIFICATION. MODLY STOCKWORKED WITH BARITE VNLTS; MOD. DISS'D MARC/PY. MOD. EARLIER DIFFUSE GRAY SILICA VNLTS.
		LOSS				
739.4'- DOZER	897.7	729.1- ~ 739': TOTAL REPLACEMT WITH GRAY SILICA. 729.1-732.0': GRY REPLACEMT SILICA IS MODERATELY STOCKWORKED WITH FINE WHT BARITE VNLTS. TO CRACKLE BXA BY ~ 730.7' WITH BARITE CEMENTING EARLIER SILICIFIED HETEROLITHIC BXA. DARK SOOTY SULFIDE IN INTERSTICES BTWN SILICA FRAGMENTS APPEARS TO PRE-DATE THE BARITE. 733.0-733.9': BLK SILICA-SULFIDE CUTS & CEMENTS GRY-WHT REPLACEMT SILICA. 733.9'-739.4': GRY REPLACEMT SILICA-FLOODED FAULT BRECCIA. SILICA FLOODING WANES DOWNWARDS. FRAGMT POPULATION IS DOMINANTLY ANGULAR, SILICIFIED TAN DOZER. MINOR GRNISH FRAGMTS. FROM 739.4'- ~ 751 : STR'LY STOCKWORKED TO LOCALLY CRACKLE BRECCIATED DOZER. LT. GRNISH-TAN APHANITIC DOZER IS MOTTLED WITH RUDDY ~ 751 - 761.7': "FLOW" BANDED MOTTLED DOZER. WK/MOD SILICA + MARC VNLTS & BARITE + STIBNITE + WHT CLAY FRAX COATINGS.	740 750 760 770	40 75	725.9-729.1': HEALED, WKLY MILLED, MATRIX-SUPPORTED BRECCIA. ~ 730.7-732.0': BARITE SEMI-HEALED CRACKLE BXA. WKLY MILLED BY 732. OVERPRINTS HETEROLITHIC SILICA HEALED FAULT BRECCIA. 733.0-733.9': HEALED SULFIDIC FLT BXA AT 40° TO C/A. 733.9-739.4': HEALED SILICA-FLOODED FOOTWALL CRACKLE BXA. 739.4'-751': HYDROTHERMAL CRACKLE BRECCIA IN INTACT RK 761.7-766.6': SILICA HEALED MILLED HYDROTHERMAL BRECCIA. 766.6-769.3': STR. SILICA BXA VNS.	FICATION. MODLY STOCKWORKED WITH BARITE VNLTS; MOD. DISS'D MARC/PY. MOD. EARLIER DIFFUSE GRAY SILICA VNLTS. 729.1-732.0': TOTAL GRY SILICA REPLACEMT. STR. BARITE STKWK TO CRACKLE BXA. MOD. SOOTY SULFIDE W/ SILICA. 733.0-733.9': BLK SILICA-SULFIDE CEMENTS FRAGMTS OF LT. GRY REPLACEMT SILICA. 733.9-739.4': >80% GREY REPLACEMENT SILICA GRADING DOWN INTO STR'LY SILICIFIED DOZER BRECCIA 739.4-751': STR TO MOD. GRY SILICA + MARC VNS WITH BARITE + TR/WK STIBNITE ON VUGS +/- TR WHT CLAY. 751-761.7': MOD/WK GRY SILICA + MARC VNLTS LATE WHT CLAY + BARITE +/- STIBNITE

ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
696.1	701.6				
701.6	707.4				
707.4	712.4				
712.4	717.0				
717.0	721.7				
721.7	725.9				
727.5	729.1				
729.1	732.0				
733.0	733.9				
733.9	739.4				
739.4	743.5		0.248		
743.5	746.7				
746.7	751.0				
751.0	756.2		0.146		
756.2	761.7				
761.7	766.6				
766.6	769.3				

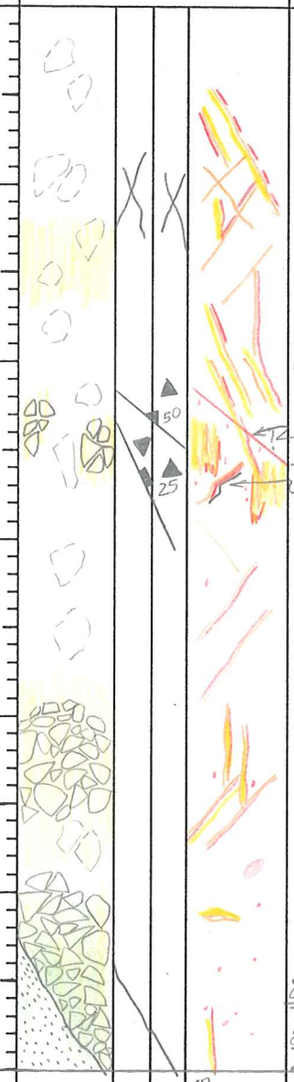
HOLE NUMBER RS-437 PAGE 3 OF 4

ITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
739.4-897.7' DOZER		769.3'-779.5' : DISRUPTED FLOW BANDING : DOZER IS BRECCIATED, AUTOBRECCIATED BELOW MILLED HYDROTHERMAL SILICA VEIN BRECCIA ZONE. PEBBLE TO COBBLED SIZED, FLOW BANDED DOZER FRAGMENTS ARE PICKED OUT BY FAINT RUDDY STAINING. 779.5'-~783': WKLY SHEARED ZONE: SUB-ROUNDED PEBBLE-SIZED FRAGMENTS OF DOZER IN RUDDY OR GRN CLAY ALTERED STRINGERS. ~783'-790.9': CONT'D FG "AUTOBRECCIA". PEBBLE-SIZED FRAGMENTS ARE PREFERENTIALLY MOD'LY ARGILLIZED. MATRIX DOZER IS RUDDY TO GRNISH. 790.9-799.1': SILICA STKWK'D ZONE W/ WK/MOD. PERVASIVE SILICA IN GROUNDMASS. AUTOBXA TEXTURE IS OVERPRINTED WITH TEXTURE OBSCURING ALTERATION AND PROBABLE 2NDARY HYDROTHERMAL BRECCIATION. 799.1-801.6': WANING AUTOBRECCIA IN NON-SILICIFIED DOZER: PREFERENTIALLY BLCHED & MOD'LY ARGILLIZED DOZER FRAGMTS FLOAT IN MYLONITIC/SHEARED DOZER. 801.6-~809': MASSIVE, WKLY/MODLY ARGILLIZED LIGHT GRN-TAN DOZER. 810.0-813.0 : ~~MODLY~~/STRLY SILICA+SULFIDE VEINED 813.0-827.0': FAINT DISTURBED FLOW BANDING TO ~~MOD~~ MASSIVE DOZER. 827.0-829.0': STR. CRACKLE AUTOBXA. 829.0'-841.4': MASSIVE LT. GRN-TAN DOZER.	770 780 790 800 810 820 830 840		779.5-783': ZONE OF WK GRN CLAY ALT'N & SHEARING. "AUTOBXA" IS FG & MILLED THRU THIS STRETCH.	761.7-766.6': STR/INTENSE SILICA + MARC +/-TR CLAY. 766.6-769.3': STR. GRY SILICA MARC + BARITE + STIBNITE. ~778': STUBBY STIBNITE? 779.5-780': SUBHEDRAL PY & ARGERITE W/ SILICA, MARC VNS. 769.3'-779.6' MOD. RUDDY STAINED ~~OR~~ WALL RK, MOD. PYRITIC BLEBBING & SILICA + LT. GRN CLAY + MARCASITE +/- WHT CLAY. 779.5'-783.8': MOD. GRN CLAY ALT'N. MOD/WK WHT CLAY +/- SILICA & MARC ON FRAX. WK DISS'D MARC/PY, MOD/STR SILICA VNING ~783-790.9': SPOTTY MOD. ARG IN TR. BLCHED FRAGMENTS. WK WHT CLAY + PY FRAX COATINGS & DISS'D PYRITE. 790.9-799.1': STR. GRY SILICA + MARC & BLK PY VNING WITH SOME LOCAL SILICA FLOODING. SILICA OVERPRINTS WAXY GRN CLAY & RUDDINESS IN RK FLOUR MATRIX. MINOR WHT BANDED (LAYERED) SiO_2 AND WHT CLAY ON FRAX = LATEST EVENTS. 799.1-~809': MOD. ARG WK PY + WHT CLAY VNLTS, WK PY DISS'D. 809-810.0': STR. ARGILLIZATION. 810.0-811': SILICA + STIBNITE + PYRITE VN. STR. WHT SILICA VNS TO 813. 813.0-827.0': TR ARG, WK DISS'D PY & SILICA + PY + WHT CLAY VNLTS. 827.0'-832.5': MOD. DISS'D PY, SPOTTY MODERATE ARGILLIZATION.

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2
769.3	775.1				
775.1	779.5				
779.5	783.8				
783.8	787.3				
787.3	790.9				
790.9	794.5				
794.5	799.1				
799.1	801.6				
801.6	805.4				
805.4	810.0				
810.0	813.0				
813.0	818.1				
818.1	823.5				
823.5	827.0				
827.0	832.5				
832.5	836.8				

HOLE NUMBER RS-437 PAGE 4 OF 4

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
739.4'-897.7' DOZER		841.1-866.0': AUTOBRECCIATED VARIABLY FLOW-BANDED TO MASSIVE DOZER CUT BY STRONG TO MOD. WHT CLAY +/- SILICA + BLADED MARCASITE VEINS AND FRACTURE COATINGS ~856-857': MOTTLED RUDDY STAINING IN SILICIFIED GROUND MASS. 878.5-887.6': HEALED CATACLASTIC DOZER (AUTOBRECCIA?) 887.6-890': WKLY AUTOBXA'D DOZER. 890.0'-895.6': CATACLASTIC MOSAIC BRECCIA IN DOZER IMMEDIATELY ABOVE CONTACT. SILICA CEMENTED ANGULAR PEBBLE-SIZED DOZER IN A TIGHT-PACKED, VARIABLY CLAST- TO MATRIX-SUPPORTED BRECCIA. DOZER IS INCREASINGLY TINGED WITH LT. GRN CLAY ALTERATION DOWNHOLE 895.6-897.7': FG CATACLASTIC MIXED LITHOLOGY ~~AUTO-~~ BRECCIA AT CONTACT. MOTTLED GRY TO RUDDY WITH STRONG SPOTTY GRN CLAY ALTERATION. PEA-SIZED TO PEBBLE-SIZED DOZER 897.0-897.7': SILICA + PY/MARC VNED CONTACT AT 30° TO C/A.	840 850 860 870 880 890 900		848-853': BROKEN ZONE 860.5-866.0': SEMI-HEALED VEIN CRACKLE BRECCIA. 863': RUDDY VNLT W/ BLOCKY OVERGROWN PY. 864': SILICA + CLAY + PYRARGERITE 890.0-897.0': BXA AT CONTACT. 897.0-897.7': PLASTIC DEFORMATION OF SS UNIT APPARENT AT CONTACT.	841.1-866.0': WHT CLAY + SILICA + BLADED MARCASITE VNS & FRAX COATINGS. WK/MOD ARGILLIZATN. FROM 853': LESS BROKEN, INCREASED SILICA HEALING OF VEINS & SPOTTY WK TO MODERATE SILICIFICATION OF WALLRK. ~855-860.5': VNLTS TREND AT 20° TO C/A. 860.5-866.0': SILICA CEMENTED CRACKLE BRECCIA CUT & INFILLED BY WHT CLAY + SILICA + BLADED MARC. 866.0'-878.5': MOD/WK ARGILLIZATION WK WHT CLAY +/- PYRITE OR MARC ON FRAX, LOCAL MOD. DISS'D PYRITE. 878.5-887.6': FAINT RUDDINESS PERVASIVE WEAK SILICIFICATION, MOD. WHT CLAY + SILICA + MARCASITE VNS & FRAX COATINGS. WK DISS'D MARCASITE. 890.0'-895.6': STRONG QUAR CEMENT & MOD. SILICA OVERPRINT IN FRAGMTS. WK TO MOD. GRN CLAY ALTERATN. WK DISS'D MARC, WHT CLAY 895.6-897.7': STR. SPOTTY PUNKY GRN CLAY ALTERATION. MOD. OVERPRINTING PERVASIVE SILICIFICATION
897.7-900' TCS		897.0-900.0': ~~EE TO~~ MEDIUM GRAY-GRN, WKLY CLAY ALTERED, COARSE TO FINE-GRAINED SANDSTONE. T.D. 900'				

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2
836.8	841.1				
841.1	844.2				
844.2	848.0				
848.0	851.8				
851.8	856.4				
856.4	860.5				
860.5	866.0				
866.0	870.0				
870.0	874.2				
874.2	878.5				
878.5	883.7				
883.7	887.6				
887.6	890.0				
890.0	895.6				
895.6	897.7				
897.7	900.0				

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-437 DATE: 04/16/98 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	104.0	104.0	78.0										
660.0	669.0	88.0	88.0	54.0										
669.0	679.0	102.0	102.0	51.0										
679.0	689.3	100.0	100.0	37.9										
689.3	698.0	103.4	103.4	44.8										
698.0	704.0	100.0	100.0	48.0										
704.0	710.0	102.0	102.0	52.0										
710.0	720.0	98.0	98.0	55.0										
720.0	727.5	70.0	80.0	16.0										
727.5	732.5	80.0	80.0	8.0										
732.5	733.0	100.0	100.0	0										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-437 DATE: 04/16/98 LOGGED BY: HBM PAGE 2 OF 3

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
733.0	737.0	82.5	82.5	40.0										
737.0	743.5	98.5	98.5	98.5										
743.5	746.0	84.0	84.0	52.0										
746.0	750.0	97.5	97.5	50.0										
750.0	760.0	103.0	103.0	79.0										
760.0	770.0	97.0	97.0	78.0										
770.0	780.0	100.0	100.0	81.0										
780.0	790.0	101.0	101.0	62.0										
790.0	800.0	100.0	100.0	72.0										
800.0	810.0	102.0	102.0	79.0										
810.0	820.0	102.0	102.0	87.0										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-437 DATE: 04/22/98 LOGGED BY: KDM 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)
820.0	830.0	100.0	100.0	61.0										
830.0	840.0	100.0	100.0	85.0										
840.0	850.0	100.0	100.0	73.0										
850.0	860.0	100.0	100.0	56.0										
860.0	870.0	100.0	100.0	69.0										
870.0	880.0	102.0	102.0	74.0										
880.0	890.0	99.0	99.0	68.0										
890.0	900.0	102.0	102.0	77.0										
	T.D.													

SP

SUBMITTAL FORM

American Assay Laboratories

Geochemical • Environmental • Metallurgical

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 11530
Reno, NV 89510
Telephone
(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 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: 04/ /98 Number of Samples: 59

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

RS-437 SAMPLE IDENTIFICATION			TYPE	ELEMENTS REQUIRED	
650.0-654.2	721.7-725.9		CORE	Au-Ag ACCORDING TO ROSEBUD	
654.2-658.2	727.5-729.1			MINE PROTOCOLS	
658.2-662.2	729.1-732.0				
662.2-667.3	~~732.0~~	779.5-783.8		827.0-832.5	883.7-887.6
667.3-672.1	733.0-733.9	783.8-787.3		832.5-836.8	887.6-890.0
672.1-676.9	733.9-739.4	787.3-790.9		836.8-841.1	890.0-895.6
676.9-680.9	739.4-743.5	790.9-794.5		841.1-844.2	895.6-897.7
680.9-686.2	743.5-746.7	794.5-799.1		844.2-851.8	897.7-900.0
686.2-691.1	746.7-751.0	799.1-801.6		851.8-856.4	
691.1-696.1	751.0-756.2	801.6-805.4		856.4-860.5	
696.1-701.6	756.2-761.7	805.4-810.0		860.5-866.0	
701.6-707.4	761.7-766.6	810.0-813.0		866.0-870.0	
707.4-712.4	766.6-769.3	813.0-818.1		870.0-874.2	
712.4-717.0	769.3-775.1	818.1-823.5		874.2-878.5	
717.0-721.7	775.1-779.5	823.5-827.0		878.5-883.7	

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

xAMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048698

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-437 RECEIVED : 29 APR 1998

No. SAMPLES : 60 REPORTED : 8 MAY 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 SP048698

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 8 MAY 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
RS-437 650.0-654.2	0.003			0.03
RS-437 654.2-658.2	0.003			0.07
RS-437 658.2-662.2	0.003	0.005		0.06
RS-437 662.2-667.3	<0.001			<0.02
RS-437 667.3-672.1	0.003			0.05
RS-437 672.1-676.9	0.003			0.05
RS-437 676.9-680.9	0.003			0.16
RS-437 680.9-686.2	0.006			0.03
RS-437 686.2-691.1	0.002			0.06
RS-437 691.1-696.1	0.002			0.05
RS-437 696.1-701.6	0.003			0.06
RS-437 701.6-707.4	0.003			0.06
RS-437 707.4-712.4	0.002			0.07
RS-437 712.4-717.0	0.004			0.06
RS-437 717.0-721.7	0.004			0.05
RS-437 721.7-725.9	0.009			3.15
RS-437 727.5-729.1	0.015	0.023		2.88
RS-437 729.1-732.0	0.007			6.72
RS-437 733.0-733.9	0.004	0.004		5.44
RS-437 733.9-739.4	0.064		0.043	0.77
RS-437 739.4-743.5	0.248		0.187	1.26
RS-437 743.5-746.7	0.070		0.067	0.99
RS-437 746.7-751.0	0.087		0.030	0.17
RS-437 751.0-756.2	0.146		0.100	0.94
RS-437 756.2-761.7	0.093		0.040	0.22

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RS-437 761.7-766.6	0.116		0.145	0.38
RS-437 766.6-769.3	0.014			0.63
RS-437 769.3-775.1	0.009			0.30
RS-437 775.1-779.5	0.054		0.060	2.79
RS-437 779.5-783.8	0.083		0.099	0.57
RS-437 783.8-787.3	0.005			0.07
RS-437 787.3-790.9	0.003			0.07
RS-437 790.9-794.5	0.019			0.39
RS-437 794.5-799.1	0.120		0.189	0.36
RS-437 799.1-801.6	0.012			0.47
RS-437 801.6-805.4	0.007			0.06
RS-437 805.4-810.0	0.040			0.08
RS-437 810-813	0.123		0.131	0.47
RS-437 813.0-818.1	0.007			0.04
RS-437 818.1-823.5	0.006	0.006		0.05
RS-437 823.5-827.0	0.002			0.04
RS-437 827.0-832.5	0.004			0.09
RS-437 832.5-836.8	0.002			0.02
RS-437 836.8-841.1	0.002			0.05
RS-437 841.1-844.2	0.043			0.08
RS-437 844.2-848.0	0.066		0.155	0.08
RS-437 848.0-851.8	0.004			0.05
RS-437 851.8-856.4	0.006			0.06
RS-437 856.4-860.5	0.064		0.053	0.32
RS-437 860.5-866.0	0.040	0.048		0.61

AMERICAN ASSAY LABORATORIES

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RS-437 870.0-874.2	0.008			0.07
RS-437 874.2-878.5	0.004			0.02
RS-437 878.5-883.7	0.030			0.02
RS-437 883.7-887.6	0.030	0.022		0.10
RS-437 887.6-890.0	0.022			0.02
RS-437 890.0-895.6	0.018			0.33
RS-437 895.6-897.7	0.018			0.13
RS-437 897.7-900.0	0.022	0.020		0.08
31042	0.180			2.93

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-437
PAGE 1 OF 4
DATE 6/25/97
LOGGED BY DA
TOTAL DEPTH 650' RUC PRE-COLLAR 900' CORE.

LOCATION EAST ZONE
NORTHING
EASTING
ELEVATION
AZIMUTH VERT
INCLINATION -90

AREA EAST ZONE
DRILLING CO. EKLUND
RIG TYPE RUC
HOLE SIZE 5 1/2
DOWN HOLE SURVEY BY WELNAV.

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION QUARTZ %	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 %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOCDUPE	ANALYTICAL DA: FROM	TO	W	Au
10	D	TCLLT	FINE-GRAINED, ANDESITIC TO LATITIC AUTO BRECCIA OR VOLCANIC BRECCIA.																																					
20																																								
30	D																																							
40																																								
50	D																																							
60																																								
70																																								
80	L																																							
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120																																								
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180																																								
190	D																																							
200																																								

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-437
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

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210		TcLT																																						
220																																								
230																																								
240																																								
250																																								
260																																								
270																																								
280																																								
290																																								
300		Tcfg	Fine-Grained, propylitized & Argillized. Andesitic to Latitic Flow.																																					
310																																								
320																																								
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340																																								
350																																								
360																																								
370																																								
380																																								
390		UBcb	PROPYLITIZED, Fine- to COARSE GRAINED matrix to CLAST SUPPORTED volcanic BRECCIA (ASH-POLY) OR Epiclastic																																					
400																																								

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

HOLE NUMBER RS-437
PAGE 3 OF 4
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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-SUL	STIBNITE	BARITE	OXIDE	SULF	CARBON	MOCURE	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%	%	%	%	%	%	%								
410		CBUS																																						
420																																								
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560																																								
570		PABX	FINE-GRAINED, SLIGHTLY PORPHYRITIC ANDESITE																																					
580																																								
590																																								
600																																								

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RS-437
PAGE 4 OF 4
DATE
LOGGED BY
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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	AG-SULF	SULFATE	BARITE	OXIDE	SULF	CARBON	MOCURE	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		PABX																																						
620		MBUD	Fine- to Coarse Grained Ash-flow tuff or Epiclastic																																					
630																																								
640																																								
650																																								
			RUC PRE-COLLAR TD=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 0048698-IN
INVOICE DATE: 05/13/98

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-437	DEVELOPMENT	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
60	SAMPLES RECEIVED	.00	.00
59	JAW CRUSHING CHARGE	2.60	153.40
59	COARSE MILLING CHARGE	9.00	531.00
59	SPLITTING CHARGE	2.40	141.60
59	RING MILLING CHARGE	2.00	118.00
60	Au (1 A.T. FIRE ASSAY)	8.00	480.00
13	Au ANALYSES/GRAVIMETRIC	8.75	113.75
60	HYDROCHLORIC/NITRIC DIGESTION	2.00	120.00
60	Ag ANALYSES	1.00	60.00
5	Ag (ore grade) ANALYSES	5.00	25.00

86-5210-477

NET INVOICE:	1,742.75
LESS DISCOUNT:	348.55
FREIGHT:	.00
INVOICE TOTAL:	1,394.20

xAMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048698

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-437 RECEIVED : 29 APR 1998

No. SAMPLES : 60 REPORTED : 8 MAY 1998

MAIN SAMPLE TYPE : DRILL CORE

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SIGNATORY : Susan King M.S.

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RS-437 676.9-680.9	0.003			0.16
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RS-437 686.2-691.1	0.002			0.06
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RS-437 887.6-890.0	0.022			0.02
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AMERICAN ASSAY LABORATORIES

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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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RS-437 783.8-787.3	0.005			0.07
RS-437 787.3-790.9	0.003			0.07
RS-437 790.9-794.5	0.019			0.39
RS-437 794.5-799.1	0.120		0.189	0.36
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RS-437 805.4-810.0	0.040			0.08
RS-437 810-813	0.123		0.131	0.47
RS-437 813.0-818.1	0.007			0.04
RS-437 818.1-823.5	0.006	0.006		0.05
RS-437 823.5-827.0	0.002			0.04
RS-437 827.0-832.5	0.004			0.09
RS-437 832.5-836.8	0.002			0.02
RS-437 836.8-841.1	0.002			0.05
RS-437 841.1-844.2	0.043			0.08
RS-437 844.2-848.0	0.066		0.155	0.08
RS-437 848.0-851.8	0.004			0.05
RS-437 851.8-856.4	0.006			0.06
RS-437 856.4-860.5	0.064		0.053	0.32
RS-437 860.5-866.0	0.040	0.048		0.61

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048698

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 8 MAY 1998

SAMPLES	Au(OZ)	Au(RZ)	AuGRAV	Ag(OZ)
RS-437 866-870	0.015			0.05
RS-437 870.0-874.2	0.008			0.07
RS-437 874.2-878.5	0.004			0.02
RS-437 878.5-883.7	0.030			0.02
RS-437 883.7-887.6	0.030	0.022		0.10
RS-437 887.6-890.0	0.022			0.02
RS-437 890.0-895.6	0.018			0.33
RS-437 895.6-897.7	0.018			0.13
RS-437 897.7-900.0	0.022	0.020		0.08
31042	0.180			2.93

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 0048365-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-438	DEVELOPMENT	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
60	SAMPLES RECEIVED	.00	.00
60	DRYING	1.00	60.00
60	EXCESSIVE WETNESS	1.00	60.00
60	JAW CRUSHING CHARGE	1.30	78.00
60	SPLITTING CHARGE	1.20	72.00
60	FINE MILLING CHARGE	2.00	120.00
60	Au (1 A.T. FIRE ASSAY)	8.00	480.00
60	HYDROCHLORIC/NITRIC DIGESTION	2.00	120.00
60	Ag ANALYSES	1.00	60.00

86-
5210-477

NET INVOICE:	1,050.00
LESS DISCOUNT:	315.00
FREIGHT:	.00
INVOICE TOTAL:	735.00

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ANALYSIS REPORT SP048365

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-438

No. SAMPLES : 60

MAIN SAMPLE TYPE : DRILL CUTTINGS

RECEIVED : 26 MAR 1998

REPORTED : 9 APR 1998

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 SP048365

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-438 000-010	0.001		<0.02
RS-438 010-020	<0.001		<0.02
RS-438 020-030	<0.001		0.02
RS-438 030-040	0.001		0.02
RS-438 040-050	0.001		<0.02
RS-438 050-060	<0.001		<0.02
RS-438 060-070	0.001		<0.02
RS-438 070-080	0.001		0.03
RS-438 080-090	<0.001		0.02
RS-438 090-100	<0.001		<0.02
RS-438 100-110	<0.001	<0.001	<0.02
RS-438 110-120	<0.001		<0.02
RS-438 120-130	<0.001		<0.02
RS-438 130-140	<0.001		<0.02
RS-438 140-150	<0.001		<0.02
RS-438 150-160	<0.001		<0.02
RS-438 160-170	<0.001		0.04
RS-438 170-180	<0.001	<0.001	<0.02
RS-438 180-190	<0.001		<0.02
RS-438 190-200	<0.001		<0.02
RS-438 200-210	<0.001		0.02
RS-438 210-220	<0.001		0.02
RS-438 220-230	<0.001		<0.02
RS-438 230-240	<0.001		<0.02
RS-438 240-250	0.001		<0.02

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ANALYSIS REPORT SP048365

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-438 250-260	<0.001		<0.02
RS-438 260-270	<0.001		<0.02
RS-438 270-280	<0.001		<0.02
RS-438 280-290	<0.001		0.02
RS-438 290-300	0.002	0.002	0.10
RS-438 300-310	<0.001		<0.02
RS-438 310-320	0.003		0.05
RS-438 320-330	0.001		0.06
RS-438 330-340	0.001		0.05
RS-438 340-350	<0.001	<0.001	0.02
RS-438 350-360	<0.001		0.03
RS-438 360-370	0.002		0.04
RS-438 370-380	<0.001		0.03
RS-438 380-390	<0.001		0.03
RS-438 390-400	0.003		0.13
RS-438 400-410	0.006		0.12
RS-438 410-420	0.004		0.11
RS-438 420-430	0.003		0.12
RS-438 430-440	<0.001		0.04
RS-438 440-450	0.001		0.08
RS-438 450-460	0.001		0.04
RS-438 460-470	0.001		0.04
RS-438 470-480	0.005		0.03
RS-438 480-490	0.007		0.05
RS-438 490-500	0.002		0.03

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ANALYSIS REPORT SP048365

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-438 500-510	0.002		0.04
RS-438 510-520	0.002		0.07
RS-438 520-530	0.004		0.09
RS-438 530-540	0.003		0.07
RS-438 540-550	0.002		0.08
RS-438 550-560	0.002		0.06
RS-438 560-570	0.004		0.05
RS-438 570-580	0.004		0.04
RS-438 580-590	0.018		0.07
RS-438 590-600	0.004		0.15

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·ANALYSIS REPORT SP048365

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-438 RECEIVED : 26 MAR 1998

No. SAMPLES : 60 REPORTED : 9 APR 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 SP048365

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-438 000-010	0.001		<0.02
RS-438 010-020	<0.001		<0.02
RS-438 020-030	<0.001		0.02
RS-438 030-040	0.001		0.02
RS-438 040-050	0.001		<0.02
RS-438 050-060	<0.001		<0.02
RS-438 060-070	0.001		<0.02
RS-438 070-080	0.001		0.03
RS-438 080-090	<0.001		0.02
RS-438 090-100	<0.001		<0.02
RS-438 100-110	<0.001	<0.001	<0.02
RS-438 110-120	<0.001		<0.02
RS-438 120-130	<0.001		<0.02
RS-438 130-140	<0.001		<0.02
RS-438 140-150	<0.001		<0.02
RS-438 150-160	<0.001		<0.02
RS-438 160-170	<0.001		0.04
RS-438 170-180	<0.001	<0.001	<0.02
RS-438 180-190	<0.001		<0.02
RS-438 190-200	<0.001		<0.02
RS-438 200-210	<0.001		0.02
RS-438 210-220	<0.001		0.02
RS-438 220-230	<0.001		<0.02
RS-438 230-240	<0.001		<0.02
RS-438 240-250	0.001		<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048365

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-438 250-260	<0.001		<0.02
RS-438 260-270	<0.001		<0.02
RS-438 270-280	<0.001		<0.02
RS-438 280-290	<0.001		0.02
RS-438 290-300	0.002	0.002	0.10
RS-438 300-310	<0.001		<0.02
RS-438 310-320	0.003		0.05
RS-438 320-330	0.001		0.06
RS-438 330-340	0.001		0.05
RS-438 340-350	<0.001	<0.001	0.02
RS-438 350-360	<0.001		0.03
RS-438 360-370	0.002		0.04
RS-438 370-380	<0.001		0.03
RS-438 380-390	<0.001		0.03
RS-438 390-400	0.003		0.13
RS-438 400-410	0.006		0.12
RS-438 410-420	0.004		0.11
RS-438 420-430	0.003		0.12
RS-438 430-440	<0.001		0.04
RS-438 440-450	0.001		0.08
RS-438 450-460	0.001		0.04
RS-438 460-470	0.001		0.04
RS-438 470-480	0.005		0.03
RS-438 480-490	0.007		0.05
RS-438 490-500	0.002		0.03

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048365

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-438 500-510	0.002		0.04
RS-438 510-520	0.002		0.07
RS-438 520-530	0.004		0.09
RS-438 530-540	0.003		0.07
RS-438 540-550	0.002		0.08
RS-438 550-560	0.002		0.06
RS-438 560-570	0.004		0.05
RS-438 570-580	0.004		0.04
RS-438 580-590	0.018		0.07
RS-438 590-600	0.004		0.15

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048353

PO BOX 11538
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 355-1413

HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

NSI

CLIENT REFERENCE No: RS-437

RECEIVED : 23 MAR 1998

No. SAMPLES : 65

REPORTED : 30 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(BZ)	FA30	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048353

CLIENT : BECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-437 000-010	<0.001		<0.02
RS-437 010-020	<0.001		<0.02
RS-437 020-030	<0.001		<0.02
RS-437 030-040	<0.001		<0.02
RS-437 040-050	<0.001		<0.02
RS-437 050-060	<0.001	<0.001	<0.02
RS-437 060-070	<0.001		<0.02
RS-437 070-080	<0.001		<0.02
RS-437 080-090	<0.001		<0.02
RS-437 090-100	<0.001		<0.02
RS-437 100-110	<0.001		<0.02
RS-437 110-120	<0.001		<0.02
RS-437 120-130	<0.001		<0.02
RS-437 130-140	<0.001		<0.02
RS-437 140-150	<0.001		<0.02
RS-437 150-160	<0.001		<0.02
RS-437 160-170	<0.001		<0.02
RS-437 170-180	<0.001	<0.001	<0.02
RS-437 180-190	<0.001		<0.02
RS-437 190-200	<0.001		<0.02
RS-437 200-210	<0.001		<0.02
RS-437 210-220	<0.001		<0.02
RS-437 220-230	<0.001		0.04
RS-437 230-240	<0.001		0.05
RS-437 240-250	<0.001		<0.02

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP048353

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-437 250-260	<0.001		<0.02
RS-437 260-270	<0.001		<0.02
RS-437 270-280	<0.001		<0.02
RS-437 280-290	<0.001	<0.001	<0.02
RS-437 290-300	<0.001		<0.02
RS-437 300-310	<0.001		<0.02
RS-437 310-320	<0.001		<0.02
RS-437 320-330	<0.001		<0.02
RS-437 330 340	<0.001		<0.02
RS-437 340-350	<0.001		<0.02
RS-437 350-360	<0.001	<0.001	<0.02
RS-437 360-370	0.002		<0.02
RS-437 370-380	<0.001		0.02
RS-437 380-390	0.001		<0.02
RS-437 390-400	0.002		0.05
RS-437 400-410	0.002		0.07
RS-437 410-420	<0.001		0.04
RS-437 420-430	0.001		0.04
RS-437 430-440	<0.001		0.04
RS-437 440-450	0.003		0.05
RS-437 450-460	<0.001		0.03
RS-437 460-470	<0.001		<0.02
RS-437 470-480	0.001		0.03
RS-437 480-490	<0.001		0.02
RS-437 490-500	0.002		0.02

AMERICAN ASSAY LABORATORIES

PROVISIONAL REPORT SP0483353

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ)	Au(RZ)	Ag(OZ)
RS-437 500-510	0.006		0.02
RS-437 510-520	0.003		<0.02
RS-437 520-530	<0.001		<0.02
RS-437 530-540	0.003		0.03
RS-437 540-550	0.003		0.05
RS-437 550-560	0.010	0.008	0.29
RS-437 560-570	0.003		0.19
RS-437 570-580	0.001		0.03
RS-437 580-590	0.001		0.03
RS-437 590-600	0.002		0.04
RS-437 600-610	<0.001		0.03
RS-437 610-620	0.002		0.03
RS-437 620-630	0.002		0.04
RS-437 630-640	0.006		0.03
RS-437 640-650	0.011	0.008	<0.02

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 0048353-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-437	DEVELOPMENT	NET 30 - DUE IN U.S. DOLLARS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
65	SAMPLES RECEIVED	.00	.00
65	DRYING	1.00	65.00
65	JAW CRUSHING CHARGE	1.30	84.50
65	SPLITTING CHARGE	1.20	78.00
65	FINE MILLING CHARGE	2.00	130.00
65	Au (1 A.T. FIRE ASSAY)	8.00	520.00
65	HYDROCHLORIC/NITRIC DIGESTION	2.00	130.00
65	Ag ANALYSES	1.00	65.00

86-5210-477
EAA

NET INVOICE:	1,072.50
LESS DISCOUNT:	321.75
FREIGHT:	.00
INVOICE TOTAL:	750.75

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ANALYSIS REPORT SP048353

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-437 RECEIVED : 23 MAR 1998

No. SAMPLES : 65 REPORTED : 30 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 SP048353

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-437 000-010	<0.001		<0.02
RS-437 010-020	<0.001		<0.02
RS-437 020-030	<0.001		<0.02
RS-437 030-040	<0.001		<0.02
RS-437 040-050	<0.001		<0.02
RS-437 050-060	<0.001	<0.001	<0.02
RS-437 060-070	<0.001		<0.02
RS-437 070-080	<0.001		<0.02
RS-437 080-090	<0.001		<0.02
RS-437 090-100	<0.001		<0.02
RS-437 100-110	<0.001		<0.02
RS-437 110-120	<0.001		<0.02
RS-437 120-130	<0.001		<0.02
RS-437 130-140	<0.001		<0.02
RS-437 140-150	<0.001		<0.02
RS-437 150-160	<0.001		<0.02
RS-437 160-170	<0.001		<0.02
RS-437 170-180	<0.001	<0.001	<0.02
RS-437 180-190	<0.001		<0.02
RS-437 190-200	<0.001		<0.02
RS-437 200-210	<0.001		<0.02
RS-437 210-220	<0.001		<0.02
RS-437 220-230	<0.001		0.04
RS-437 230-240	<0.001		0.05
RS-437 240-250	<0.001		<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048353

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-437 250-260	<0.001		<0.02
RS-437 260-270	<0.001		<0.02
RS-437 270-280	<0.001		<0.02
RS-437 280-290	<0.001	<0.001	<0.02
RS-437 290-300	<0.001		<0.02
RS-437 300-310	<0.001		<0.02
RS-437 310-320	<0.001		<0.02
RS-437 320-330	<0.001		<0.02
RS-437 330-340	<0.001		<0.02
RS-437 340-350	<0.001		<0.02
RS-437 350-360	<0.001	<0.001	<0.02
RS-437 360-370	0.002		<0.02
RS-437 370-380	<0.001		0.02
RS-437 380-390	0.001		<0.02
RS-437 390-400	0.002		0.05
RS-437 400-410	0.002		0.07
RS-437 410-420	<0.001		0.04
RS-437 420-430	0.001		0.04
RS-437 430-440	<0.001		0.04
RS-437 440-450	0.003		0.05
RS-437 450-460	<0.001		0.03
RS-437 460-470	<0.001		<0.02
RS-437 470-480	0.001		0.03
RS-437 480-490	<0.001		0.02
RS-437 490-500	0.002		0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048353

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-437 500-510	0.006		0.02
RS-437 510-520	0.003		<0.02
RS-437 520-530	<0.001		<0.02
RS-437 530-540	0.003		0.03
RS-437 540-550	0.003		0.05
RS-437 550-560	0.010	0.008	0.29
RS-437 560-570	0.003		0.19
RS-437 570-580	0.001		0.03
RS-437 580-590	0.001		0.03
RS-437 590-600	0.002		0.04
RS-437 600-610	<0.001		0.03
RS-437 610-620	0.002		0.03
RS-437 620-630	0.002		0.04
RS-437 630-640	0.006		0.03
RS-437 640-650	0.011	0.008	<0.02

xAMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048353

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-437 RECEIVED : 23 MAR 1998

No. SAMPLES : 65 REPORTED : 30 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 SP048353

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-437 000-010	<0.001		<0.02
RS-437 010-020	<0.001		<0.02
RS-437 020-030	<0.001		<0.02
RS-437 030-040	<0.001		<0.02
RS-437 040-050	<0.001		<0.02
RS-437 050-060	<0.001	<0.001	<0.02
RS-437 060-070	<0.001		<0.02
RS-437 070-080	<0.001		<0.02
RS-437 080-090	<0.001		<0.02
RS-437 090-100	<0.001		<0.02
RS-437 100-110	<0.001		<0.02
RS-437 110-120	<0.001		<0.02
RS-437 120-130	<0.001		<0.02
RS-437 130-140	<0.001		<0.02
RS-437 140-150	<0.001		<0.02
RS-437 150-160	<0.001		<0.02
RS-437 160-170	<0.001		<0.02
RS-437 170-180	<0.001	<0.001	<0.02
RS-437 180-190	<0.001		<0.02
RS-437 190-200	<0.001		<0.02
RS-437 200-210	<0.001		<0.02
RS-437 210-220	<0.001		<0.02
RS-437 220-230	<0.001		0.04
RS-437 230-240	<0.001		0.05
RS-437 240-250	<0.001		<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048353

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-437 250-260	<0.001		<0.02
RS-437 260-270	<0.001		<0.02
RS-437 270-280	<0.001		<0.02
RS-437 280-290	<0.001	<0.001	<0.02
RS-437 290-300	<0.001		<0.02
RS-437 300-310	<0.001		<0.02
RS-437 310-320	<0.001		<0.02
RS-437 320-330	<0.001		<0.02
RS-437 330-340	<0.001		<0.02
RS-437 340-350	<0.001		<0.02
RS-437 350-360	<0.001	<0.001	<0.02
RS-437 360-370	0.002		<0.02
RS-437 370-380	<0.001		0.02
RS-437 380-390	0.001		<0.02
RS-437 390-400	0.002		0.05
RS-437 400-410	0.002		0.07
RS-437 410-420	<0.001		0.04
RS-437 420-430	0.001		0.04
RS-437 430-440	<0.001		0.04
RS-437 440-450	0.003		0.05
RS-437 450-460	<0.001		0.03
RS-437 460-470	<0.001		<0.02
RS-437 470-480	0.001		0.03
RS-437 480-490	<0.001		0.02
RS-437 490-500	0.002		0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP048353

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-437

REPORTED : 30 MAR 1998

SAMPLES	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag(OZ) D210 OPT
RS-437 500-510	0.006		0.02
RS-437 510-520	0.003		<0.02
RS-437 520-530	<0.001		<0.02
RS-437 530-540	0.003		0.03
RS-437 540-550	0.003		0.05
RS-437 550-560	0.010	0.008	0.29
RS-437 560-570	0.003		0.19
RS-437 570-580	0.001		0.03
RS-437 580-590	0.001		0.03
RS-437 590-600	0.002		0.04
RS-437 600-610	<0.001		0.03
RS-437 610-620	0.002		0.03
RS-437 620-630	0.002		0.04
RS-437 630-640	0.006		0.03
RS-437 640-650	0.011	0.008	<0.02

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY, LLC *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-437

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/23/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

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

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

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

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-437

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	0.05	-0.144	-89.65	103.07	0.03 S	0.15 E	0.70	0.35	0.15	AT 103.07
100.0	100.00	0.21	-0.412	-89.63	123.18	0.16 S	0.43 E	0.25	0.13	0.46	AT 109.99
150.0	150.00	0.64	-0.488	-89.24	181.88	0.58 S	0.56 E	1.30	0.65	0.80	AT 136.03
200.0	199.99	1.36	-0.591	-89.03	152.39	1.28 S	0.74 E	0.97	0.48	1.48	AT 149.97
250.0	249.98	2.14	-0.871	-89.08	154.93	2.02 S	1.11 E	0.13	0.07	2.31	AT 151.27
300.0	299.98	2.89	-1.179	-89.04	148.01	2.74 S	1.50 E	0.24	0.12	3.12	AT 151.31
350.0	349.97	3.76	-1.597	-88.76	147.33	3.55 S	2.01 E	0.56	0.28	4.08	AT 150.44
400.0	399.96	4.76	-2.070	-88.70	149.09	4.49 S	2.60 E	0.14	0.07	5.19	AT 149.97
450.0	449.95	5.58	-2.400	-89.28	155.70	5.27 S	3.02 E	1.18	0.59	6.07	AT 150.18
500.0	499.95	6.06	-2.604	-89.51	143.01	5.72 S	3.28 E	0.53	0.26	6.60	AT 150.21
550.0	549.94	6.35	-2.818	-89.66	128.11	5.99 S	3.52 E	0.37	0.18	6.95	AT 149.53
600.0	599.94	6.50	-2.883	-89.86	215.56	6.13 S	3.60 E	0.72	0.36	7.11	AT 149.55
650.0	649.94	6.66	-2.687	-89.56	227.26	6.31 S	3.43 E	0.61	0.30	7.18	AT 151.49
700.0	699.94	6.96	-2.337	-89.37	218.58	6.65 S	3.11 E	0.41	0.21	7.35	AT 154.92
750.0	749.94	7.30	-1.893	-89.34	233.59	7.04 S	2.71 E	0.34	0.17	7.54	AT 158.94
800.0	799.93	7.33	-1.367	-89.31	286.85	7.12 S	2.19 E	1.21	0.61	7.45	AT 162.90
850.0	849.93	7.12	-0.743	-89.18	277.29	6.99 S	1.55 E	0.36	0.18	7.16	AT 167.51
900.0	899.92	6.99	-0.001	-89.09	269.42	6.95 S	0.80 E	0.30	0.15	6.99	AT 173.47

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   900.0 FEET EQUALS      6.99   FEET AT  173.47            *
*                          ********                         *
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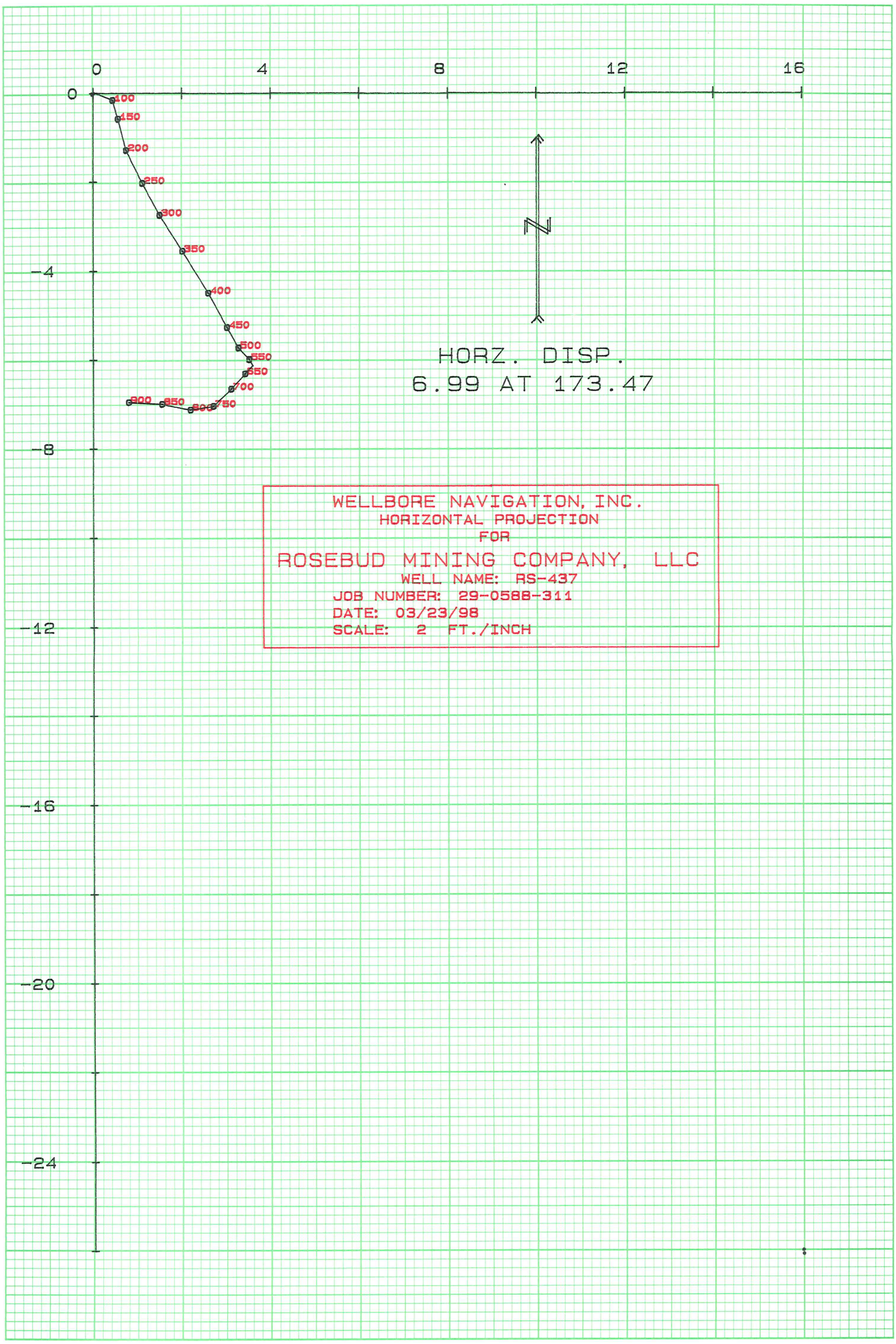

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY, LLC *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-437 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/23/98

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 *****

****
****
*** 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-437 / 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	0.06	0.142	-89.65	103.07	0.03 S	0.15 E	0.70	0.35	0.15	AT 103.07
100.0	100.00	0.12	0.445	-89.63	123.18	0.16 S	0.43 E	0.25	0.13	0.46	AT 109.99
150.0	150.00	-0.15	0.787	-89.24	181.88	0.58 S	0.56 E	1.30	0.65	0.80	AT 136.03
200.0	199.99	-0.63	1.344	-89.03	152.39	1.28 S	0.74 E	0.97	0.48	1.48	AT 149.97
250.0	249.98	-1.02	2.068	-89.08	154.93	2.02 S	1.11 E	0.13	0.07	2.31	AT 151.27
300.0	299.98	-1.38	2.801	-89.04	148.01	2.74 S	1.50 E	0.24	0.12	3.12	AT 151.31
350.0	349.97	-1.75	3.687	-88.76	147.33	3.55 S	2.01 E	0.56	0.28	4.08	AT 150.44
400.0	399.96	-2.19	4.705	-88.70	149.09	4.49 S	2.60 E	0.14	0.07	5.19	AT 149.97
450.0	449.95	-2.58	5.493	-89.28	155.70	5.27 S	3.02 E	1.18	0.59	6.07	AT 150.18
500.0	499.95	-2.81	5.967	-89.51	143.01	5.72 S	3.28 E	0.53	0.26	6.60	AT 150.21
550.0	549.94	-2.88	6.318	-89.66	128.11	5.99 S	3.52 E	0.37	0.18	6.95	AT 149.53
600.0	599.94	-2.95	6.466	-89.86	215.56	6.13 S	3.60 E	0.72	0.36	7.11	AT 149.55
650.0	649.94	-3.20	6.424	-89.56	227.26	6.31 S	3.43 E	0.61	0.30	7.18	AT 151.49
700.0	699.94	-3.66	6.367	-89.37	218.58	6.65 S	3.11 E	0.41	0.21	7.35	AT 154.92
750.0	749.94	-4.21	6.258	-89.34	233.59	7.04 S	2.71 E	0.34	0.17	7.54	AT 158.94
800.0	799.93	-4.58	5.880	-89.31	286.85	7.12 S	2.19 E	1.21	0.61	7.45	AT 162.90
850.0	849.93	-4.84	5.277	-89.18	277.29	6.99 S	1.55 E	0.36	0.18	7.16	AT 167.51
900.0	899.92	-5.24	4.637	-89.09	269.42	6.95 S	0.80 E	0.30	0.15	6.99	AT 173.47

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   900.0 FEET EQUALS      6.99   FEET AT  173.47            *
*                          ********                         *
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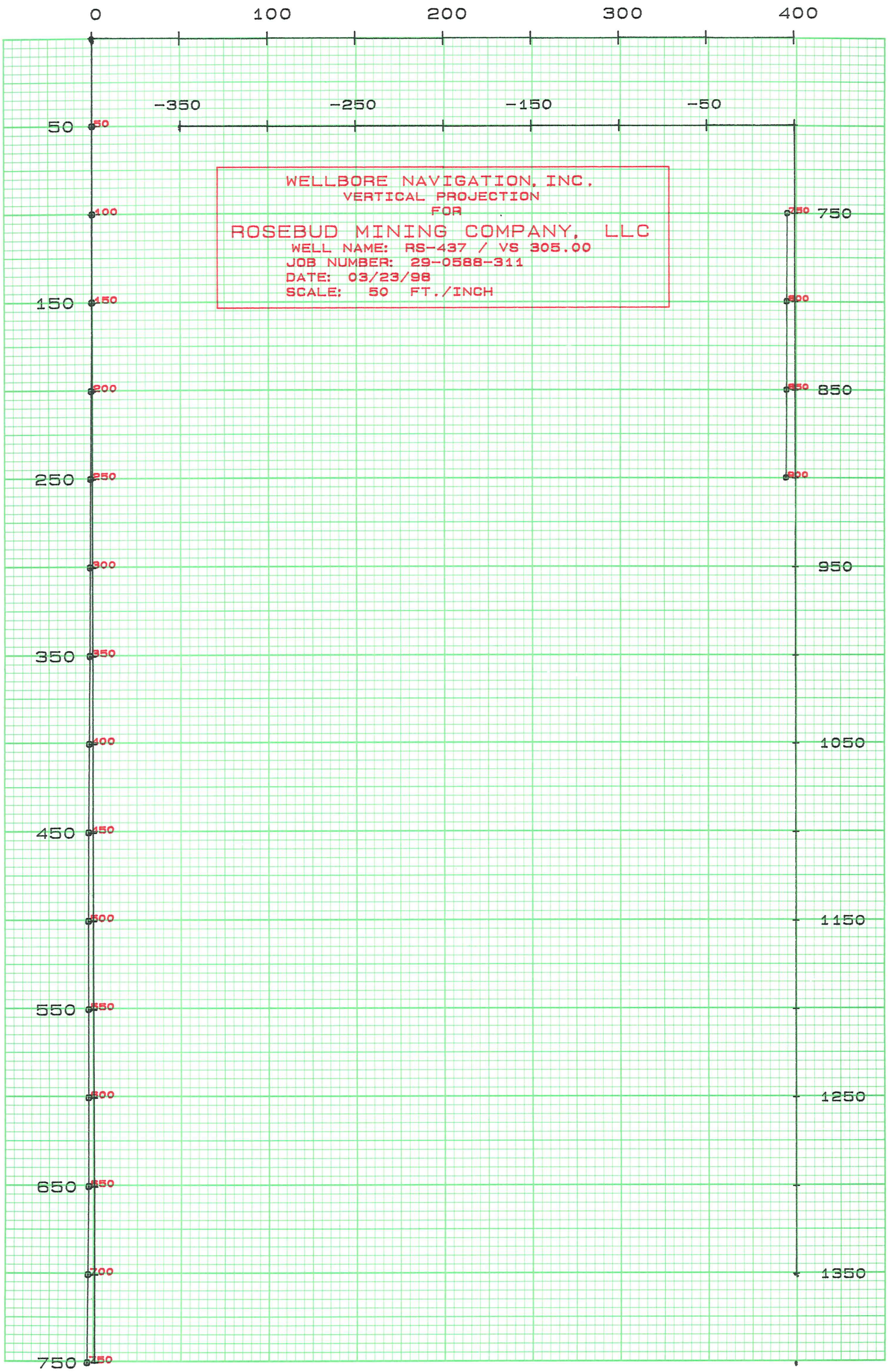

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY, LLC *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-437 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/23/98

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 *****

****
****
*** 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-437 / 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	0.14	-0.057	-89.65	103.07	0.03 S	0.15 E	0.70	0.35	0.15	AT 103.07
100.0	100.00	0.44	-0.119	-89.63	123.18	0.16 S	0.43 E	0.25	0.13	0.46	AT 109.99
150.0	150.00	0.79	0.153	-89.24	181.88	0.58 S	0.56 E	1.30	0.65	0.80	AT 136.03
200.0	199.99	1.34	0.626	-89.03	152.39	1.28 S	0.74 E	0.97	0.48	1.48	AT 149.97
250.0	249.98	2.07	1.021	-89.08	154.93	2.02 S	1.11 E	0.13	0.07	2.31	AT 151.27
300.0	299.98	2.80	1.385	-89.04	148.01	2.74 S	1.50 E	0.24	0.12	3.12	AT 151.31
350.0	349.97	3.69	1.754	-88.76	147.33	3.55 S	2.01 E	0.56	0.28	4.08	AT 150.44
400.0	399.96	4.71	2.191	-88.70	149.09	4.49 S	2.60 E	0.14	0.07	5.19	AT 149.97
450.0	449.95	5.49	2.583	-89.28	155.70	5.27 S	3.02 E	1.18	0.59	6.07	AT 150.18
500.0	499.95	5.97	2.810	-89.51	143.01	5.72 S	3.28 E	0.53	0.26	6.60	AT 150.21
550.0	549.94	6.32	2.884	-89.66	128.11	5.99 S	3.52 E	0.37	0.18	6.95	AT 149.53
600.0	599.94	6.47	2.953	-89.86	215.56	6.13 S	3.60 E	0.72	0.36	7.11	AT 149.55
650.0	649.94	6.42	3.202	-89.56	227.26	6.31 S	3.43 E	0.61	0.30	7.18	AT 151.49
700.0	699.94	6.37	3.663	-89.37	218.58	6.65 S	3.11 E	0.41	0.21	7.35	AT 154.92
750.0	749.94	6.26	4.211	-89.34	233.59	7.04 S	2.71 E	0.34	0.17	7.54	AT 158.94
800.0	799.93	5.88	4.578	-89.31	286.85	7.12 S	2.19 E	1.21	0.61	7.45	AT 162.90
850.0	849.93	5.28	4.838	-89.18	277.29	6.99 S	1.55 E	0.36	0.18	7.16	AT 167.51
900.0	899.92	4.64	5.235	-89.09	269.42	6.95 S	0.80 E	0.30	0.15	6.99	AT 173.47

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   900.0 FEET EQUALS      6.99    FEET AT   173.47         *
*                          ********                         *
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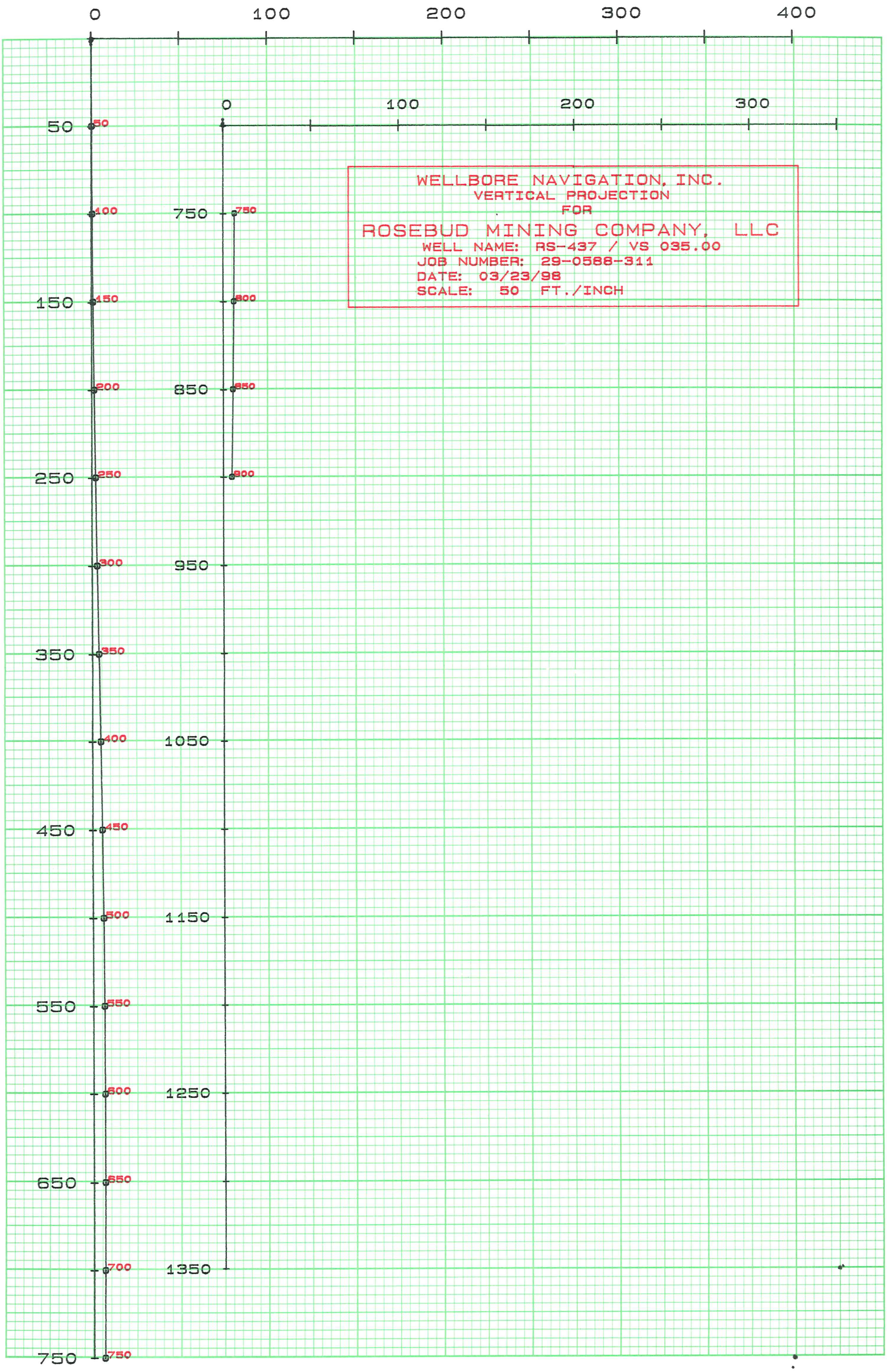

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY, LLC *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-437

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/22/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WATER CONTACT= 590'

WELNAV

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

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **

****
****
*** 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-437

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 DISPLACEMENT DISP.	DIRECTION	TEMP. DEG F
50.0	50.00	0.10	-0.114	-89.65	103.07	0.03 S	0.15 E	0.70	0.35	0.15	AT 103.07	076.26
100.0	100.00	0.34	-0.305	-89.63	123.18	0.16 S	0.43 E	0.25	0.13	0.46	AT 109.99	075.40
150.0	150.00	0.77	-0.214	-89.24	181.88	0.58 S	0.56 E	1.30	0.65	0.80	AT 136.03	074.77
200.0	199.99	1.48	-0.039	-89.03	152.39	1.28 S	0.74 E	0.97	0.48	1.48	AT 149.97	073.69
250.0	249.98	2.31	-0.009	-89.08	154.93	2.02 S	1.11 E	0.13	0.07	2.31	AT 151.27	072.26
300.0	299.98	3.12	-0.010	-89.04	148.01	2.74 S	1.50 E	0.24	0.12	3.12	AT 151.30	071.41
350.0	349.97	4.08	-0.075	-88.76	147.33	3.55 S	2.01 E	0.56	0.28	4.08	AT 150.44	070.66
400.0	399.96	5.19	-0.138	-88.70	149.09	4.49 S	2.60 E	0.14	0.07	5.19	AT 149.97	069.77
450.0	449.95	6.07	-0.138	-89.28	155.70	5.27 S	3.02 E	1.18	0.59	6.07	AT 150.18	069.15
500.0	499.95	6.59	-0.147	-89.51	143.01	5.72 S	3.28 E	0.53	0.26	6.60	AT 150.21	068.75
550.0	549.94	6.94	-0.237	-89.66	128.11	5.99 S	3.52 E	0.37	0.18	6.95	AT 149.53	068.57
600.0	599.94	7.10	-0.241	-89.86	215.56	6.13 S	3.60 E	0.72	0.36	7.11	AT 149.55	065.25
650.0	649.94	7.18	-0.000	-89.56	227.26	6.31 S	3.43 E	0.61	0.30	7.18	AT 151.49	066.24

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*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   650.0 FEET EQUALS      7.18   FEET AT   151.49          *
*                         ********                          *
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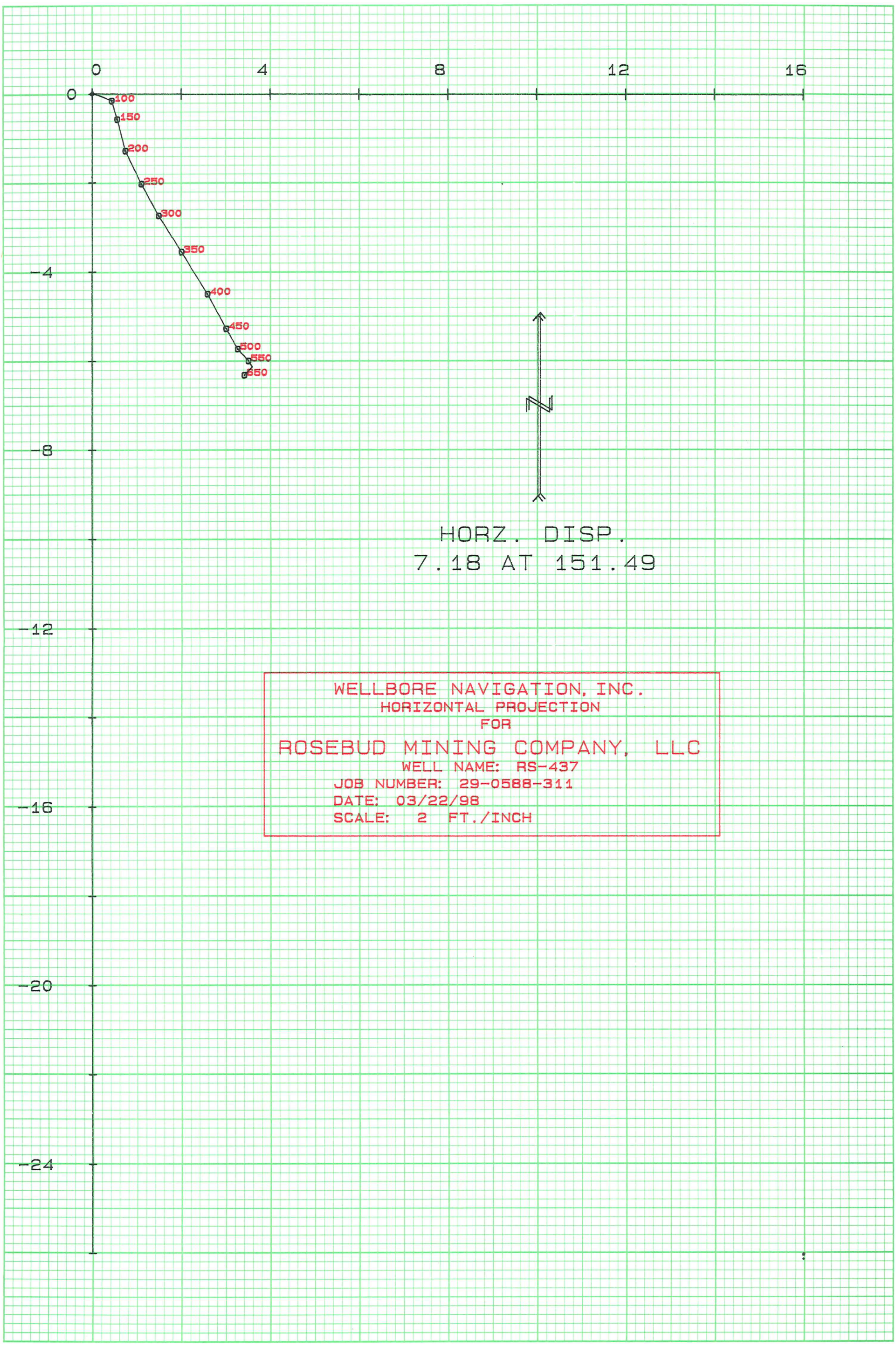

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY, LLC *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-437 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/22/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00
WATER CONTACT= 590'

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

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **

****
****
*** 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-437 / 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	0.06	0.142	-89.65	103.07	0.03 S	0.15 E	0.70	0.35	0.15	AT 103.07	076.26
100.0	100.00	0.12	0.445	-89.63	123.18	0.16 S	0.43 E	0.25	0.13	0.46	AT 109.99	075.40
150.0	150.00	-0.15	0.787	-89.24	181.88	0.58 S	0.56 E	1.30	0.65	0.80	AT 136.03	074.77
200.0	199.99	-0.63	1.344	-89.03	152.39	1.28 S	0.74 E	0.97	0.48	1.48	AT 149.97	073.69
250.0	249.98	-1.02	2.068	-89.08	154.93	2.02 S	1.11 E	0.13	0.07	2.31	AT 151.27	072.26
300.0	299.98	-1.38	2.801	-89.04	148.01	2.74 S	1.50 E	0.24	0.12	3.12	AT 151.30	071.41
350.0	349.97	-1.75	3.687	-88.76	147.33	3.55 S	2.01 E	0.56	0.28	4.08	AT 150.44	070.66
400.0	399.96	-2.19	4.705	-88.70	149.09	4.49 S	2.60 E	0.14	0.07	5.19	AT 149.97	069.77
450.0	449.95	-2.58	5.493	-89.28	155.70	5.27 S	3.02 E	1.18	0.59	6.07	AT 150.18	069.15
500.0	499.95	-2.81	5.967	-89.51	143.01	5.72 S	3.28 E	0.53	0.26	6.60	AT 150.21	068.75
550.0	549.94	-2.88	6.318	-89.66	128.11	5.99 S	3.52 E	0.37	0.18	6.95	AT 149.53	068.57
600.0	599.94	-2.95	6.466	-89.86	215.56	6.13 S	3.60 E	0.72	0.36	7.11	AT 149.55	065.25
650.0	649.94	-3.20	6.424	-89.56	227.26	6.31 S	3.43 E	0.61	0.30	7.18	AT 151.49	066.24

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   650.0 FEET EQUALS      7.18    FEET AT   151.49         *
*                          ********                         *
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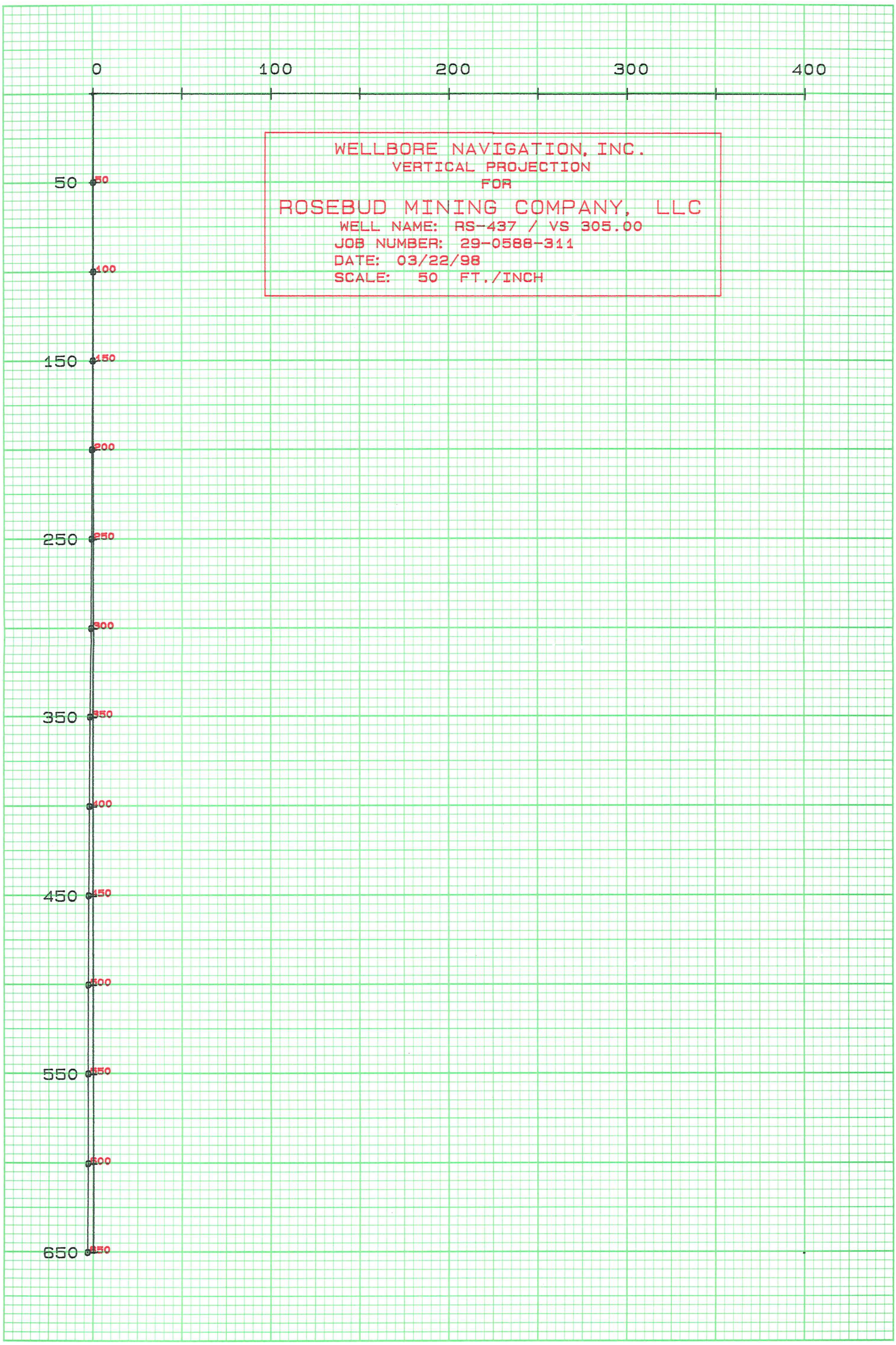

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* ROSEBUD MINING COMPANY, LLC *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-437 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/22/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 590'

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

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **

****
****
*** 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-437 / 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	0.14	-0.057	-89.65	103.07	0.03 S	0.15 E	0.70	0.35	0.15	AT 103.07	076.26
100.0	100.00	0.44	-0.119	-89.63	123.18	0.16 S	0.43 E	0.25	0.13	0.46	AT 109.99	075.40
150.0	150.00	0.79	0.153	-89.24	181.88	0.58 S	0.56 E	1.30	0.65	0.80	AT 136.03	074.77
200.0	199.99	1.34	0.626	-89.03	152.39	1.28 S	0.74 E	0.97	0.48	1.48	AT 149.97	073.69
250.0	249.98	2.07	1.021	-89.08	154.93	2.02 S	1.11 E	0.13	0.07	2.31	AT 151.27	072.26
300.0	299.98	2.80	1.385	-89.04	148.01	2.74 S	1.50 E	0.24	0.12	3.12	AT 151.30	071.41
350.0	349.97	3.69	1.754	-88.76	147.33	3.55 S	2.01 E	0.56	0.28	4.08	AT 150.44	070.66
400.0	399.96	4.71	2.191	-88.70	149.09	4.49 S	2.60 E	0.14	0.07	5.19	AT 149.97	069.77
450.0	449.95	5.49	2.583	-89.28	155.70	5.27 S	3.02 E	1.18	0.59	6.07	AT 150.18	069.15
500.0	499.95	5.97	2.810	-89.51	143.01	5.72 S	3.28 E	0.53	0.26	6.60	AT 150.21	068.75
550.0	549.94	6.32	2.884	-89.66	128.11	5.99 S	3.52 E	0.37	0.18	6.95	AT 149.53	068.57
600.0	599.94	6.47	2.953	-89.86	215.56	6.13 S	3.60 E	0.72	0.36	7.11	AT 149.55	065.25
650.0	649.94	6.42	3.202	-89.56	227.26	6.31 S	3.43 E	0.61	0.30	7.18	AT 151.49	066.24

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   650.0 FEET EQUALS      7.18   FEET AT  151.49           *
*                         ********                          *
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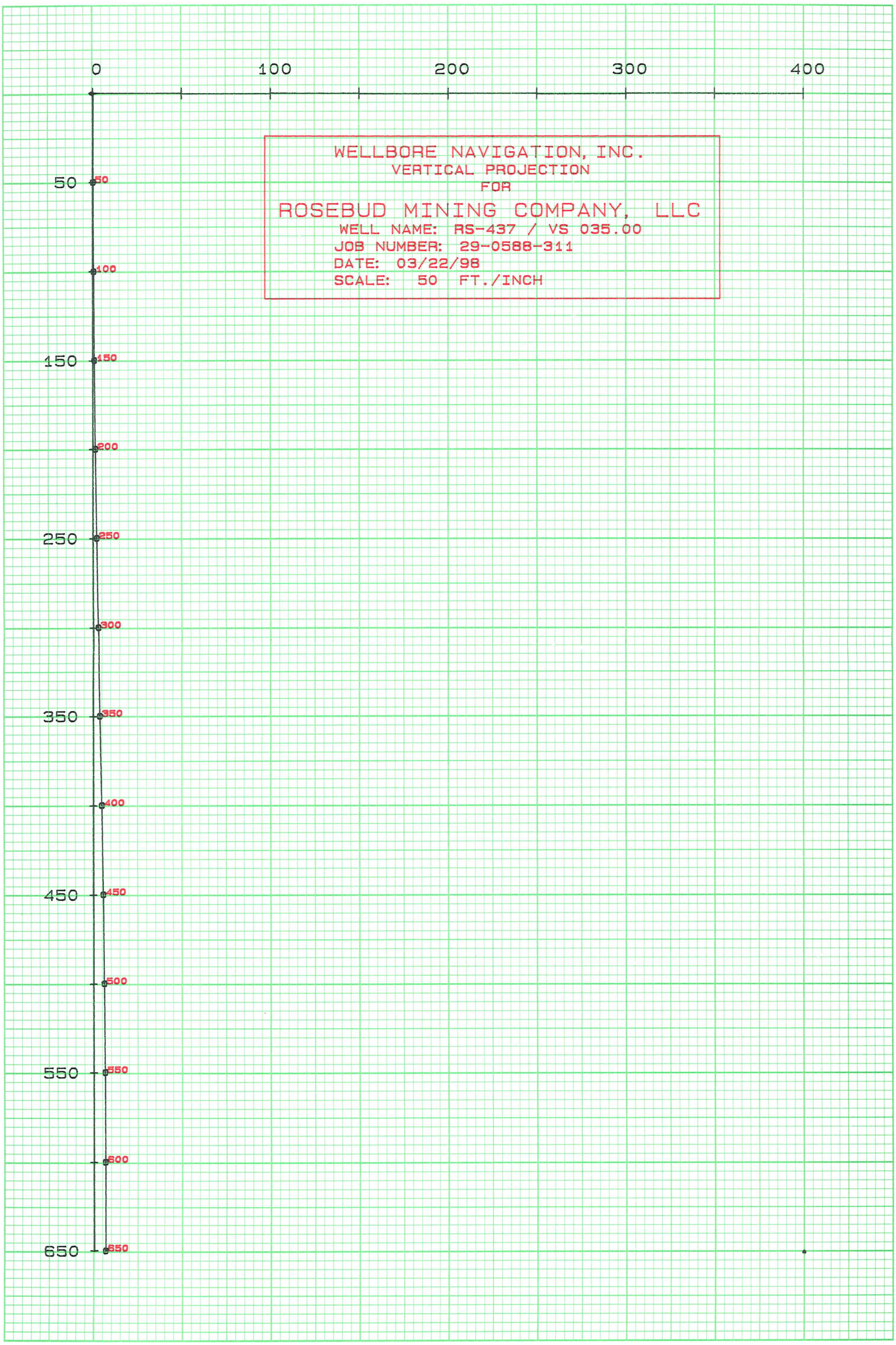


RS - 437 BOX 1
DEPTH- 650. - 659.

RS - 437 BOX 2
DEPTH- 659. - 668.

RS - 437 BOX 3
DEPTH- 668. - 678.
669

RS - 437 BOX 4
DEPTH- 678. - 687.

RS - 437 BOX 5
DEPTH- 687. - 696.

RS - 437 BOX 6
DEPTH- 696. - 704.
704
704

710
RS - 437 BOX 7
DEPTH- 704. - 713.

720
RS - 437 BOX 8
DEPTH- 713. - 722.

733
RS - 437 BOX 9
DEPTH- 722. - 734.

743.5
737
RS - 437 BOX 10
DEPTH- 734. - 743.5

750
746
RS - 437 BOX 11
DEPTH- 743.5 - 753.

RS - 437 BOX 12
DEPTH- 753. - 762.

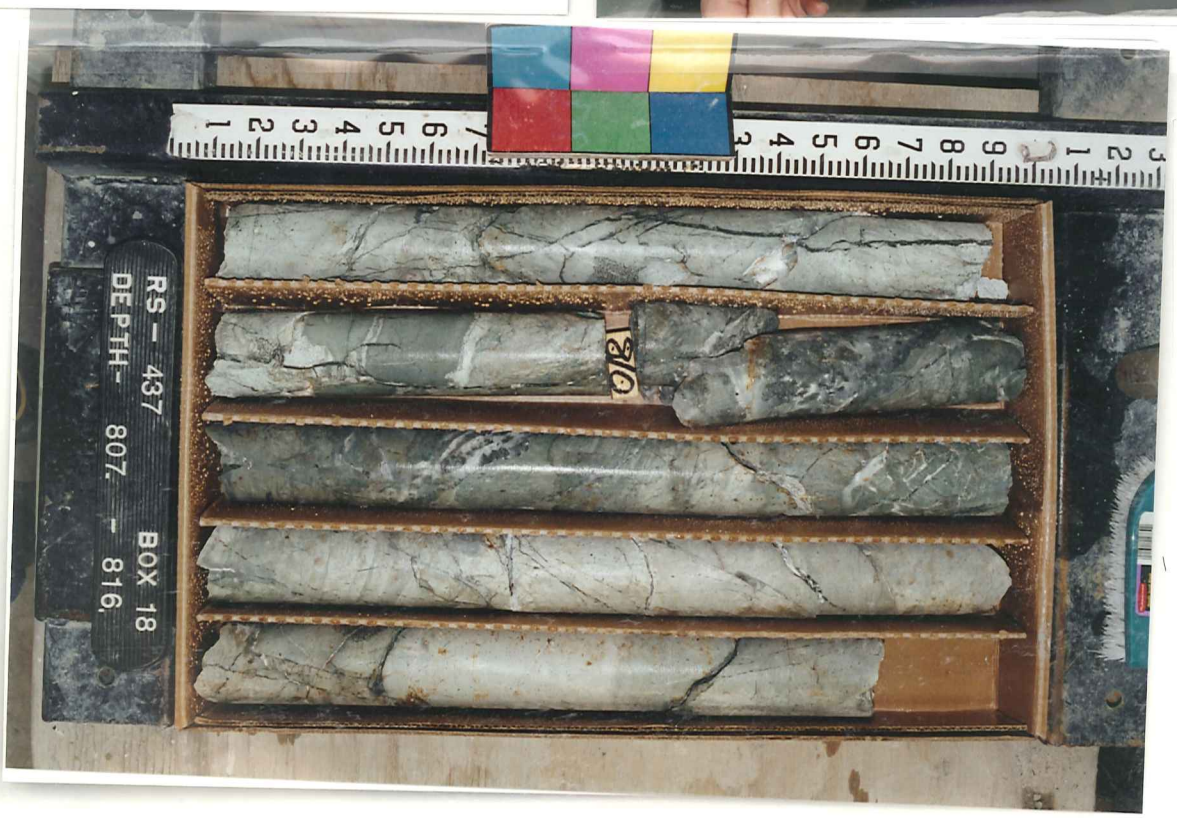
770
RS - 437 BOX 13
DEPTH- 762. - 771.

RS - 437 BOX 14
DEPTH- 771. - 780.

RS - 437 BOX 15
DEPTH- 780. - 789.

1790
RS - 437 BOX 16
DEPTH- 789. - 798.

1800
RS - 437 BOX 17
DEPTH- 798. - 807.


1810
RS - 437 BOX 18
DEPTH- 807. - 816.

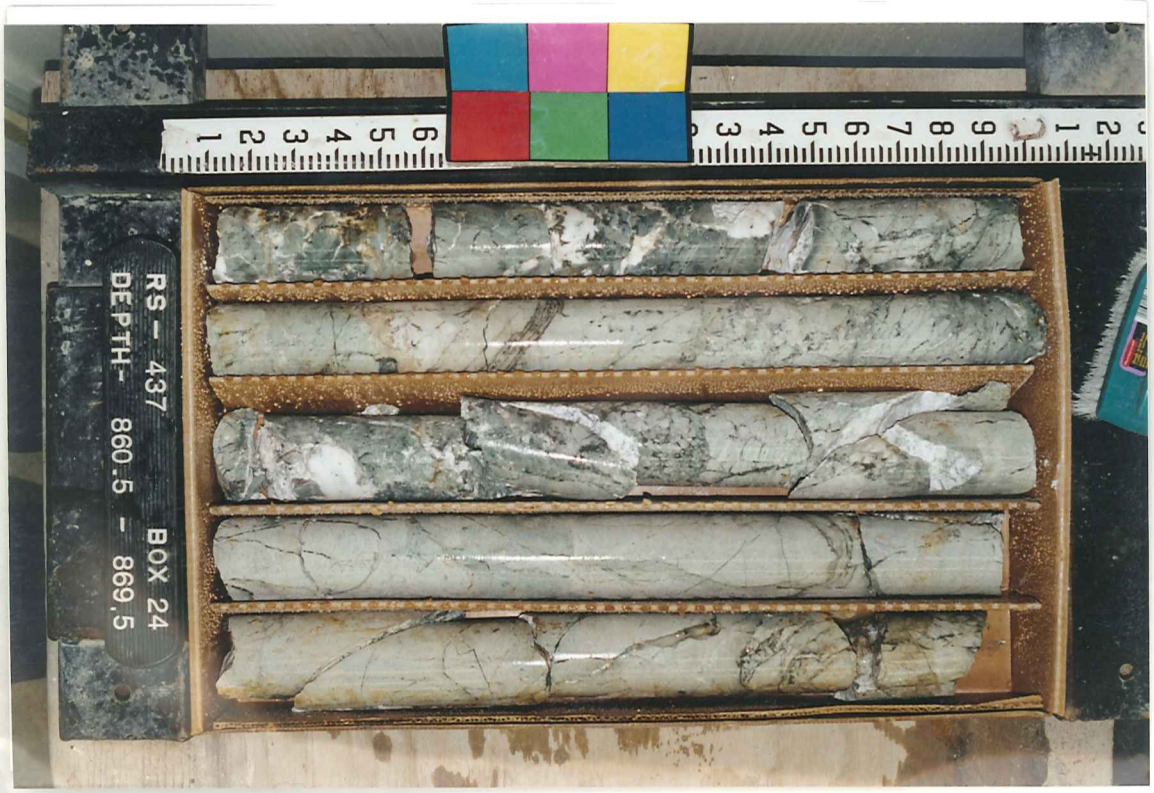
RS - 437 BOX 19
DEPTH- 816. - 825.

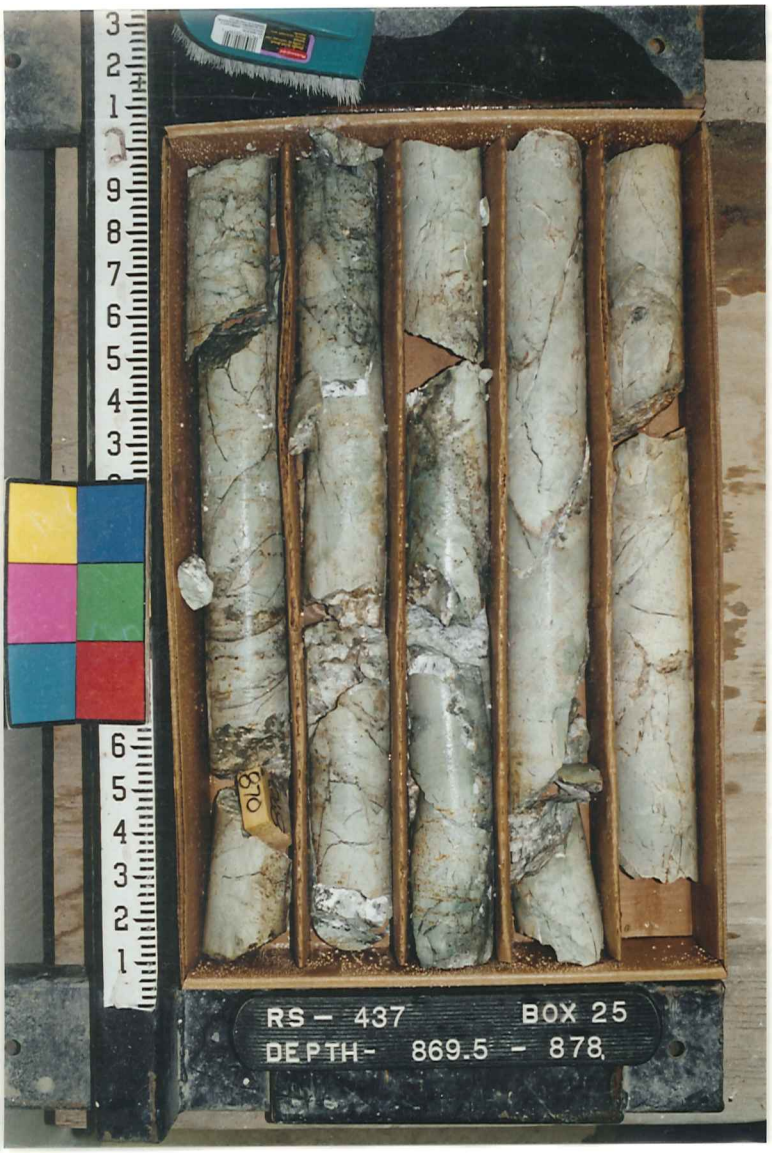
RS - 437 BOX 20
DEPTH- 825. - 834.

RS - 437 BOX 21
DEPTH- 834. - 843.

RS - 437 - BOX 22
DEPTH- 843. - 852.

RS - 437 - BOX 23
DEPTH- 852. - 860.5


RS - 437 BOX 24
DEPTH- 860.5 - 869.5


RS - 437 BOX 25
DEPTH- 869.5 - 878.

RS - 437 BOX 26
DEPTH- 878. - 888.

RS - 437 BOX 27
DEPTH- 888. - 898.

RS - 437
BOX 28
DEPTH- 898. - 400, TD